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ENVIRONMENTAL MANAGEMENT PLAN

UPGRADE OF THE RAILWAY LINE BETWEEN WALVIS BAY AND KRANZBERG STATION RENEWAL AND AMENDMENT REPORT

PREPARED FOR THE MINISTRY OF WORKS AND TRANSPORT

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Environmental Compliance Consultancy Contact Details:

We welcome any enquiries regarding this document and its content please contact:

Stephan Bezuidenhout

Environmental Compliance Consultancy
Office: +264 81 669 7608
Email: stephan@eccenvironmental.com
www.eccenvironmental.com

Jessica Bezuidenhout Mooney

Environmental Compliance Consultancy
Office: +264 81 669 7608
Email: jessica@eccenvironmental.com
www.eccenvironmental.com

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DEFINITIONS AND ABBREVIATIONS

DEO	Designated Environmental Officer
EAP	Environmental Assessment Practitioner
ECC	Environmental Compliance Consultancy
ECO	Environmental Control Officer
EMA	Environmental Management Act
EMP	Environmental Management Plan
EPCM	Engineering, Procurement, and Construction Management
ER	Engineering Representative
I&AP	Interested and affected parties
IEC	Independent Environmental Consultant
IECO	Independent Environmental Control Officer
MEFT	Ministry of Environment, Forestry and Tourism
MOWT	Ministry of Works and Transport
PM	Project Manager
PPE	Personnel Protective Equipment
QCPs	Construction quality control points
SADC	Southern African Development Community
SM	Site Manager

1 INTRODUCTION

1.1 BACKGROUND TO THE PROPOSED PROJECT

The Ministry of Works and Transport (MoWT) has commenced with the upgrading of the railway line from the Walvis Bay to the Kranzberg stations, with a route length of 220 kilometres (Figure 1). The project is located in the Erongo Region traversing the arid and semi-arid landscape with unique biodiversity and heritage features. Access to the worksite is from the B2 highway onto a gravel access road, leading from district roads, sometimes within privately owned farms.

The overall goal of the project is to improve safety, travel times, and meet the minimum Southern African Development Community (SADC) railway standards. The project involves upgrading the existing railway line to a standard of 18.5 tons axle load (tal), which will enable safe rail traffic at a maximum speed of 100 km/h for passengers and 80 km/h for freight. It is anticipated that the infrastructural improvements underway will cater for the current and future rail transport logistics service predictions up to the year 2025.

Environmental Compliance Consultancy (ECC) has been appointed by Bigen Kuumba Infrastructure Services (BKIS) on behalf of MoWT for the provision of Environmental Control Officer (ECO) services for the duration of the project. BKIS has been appointed as the Engineer's Representative (ER), who is responsible for all aspects of Engineering, Procurement, and Construction Management (EPCM) by the MoWT. ECC was requested to revise the current and approved Environmental Management Plan (EMP) for the renewal of the environmental clearance certificate as per the Environmental Management Act No.7 of 2007 and its associated regulations. An application for the renewal of the environmental clearance will be submitted to the Ministry of Environment, Forestry and Tourism (MEFT).

The current environmental clearance certificate was granted on the 27th of October 2017 and it expires on the 27th of October 2020 for the project. An approval was granted on the 14th November 2019 for the amendment that were required for additional components such as the new bridge over the Khan River and additional structures to the three existing bridges that were required to ensure structural integrity. The current environmental clearance certificate is still valid and covers the entire railway upgrade works.

This report describes only the potential environmental impact of the current and planned work and EMP conditions applicable to the railway upgrade activities. Wherever possible this report has remained consistent with the original EMP to avoid ambiguity concerning the environmental matters.

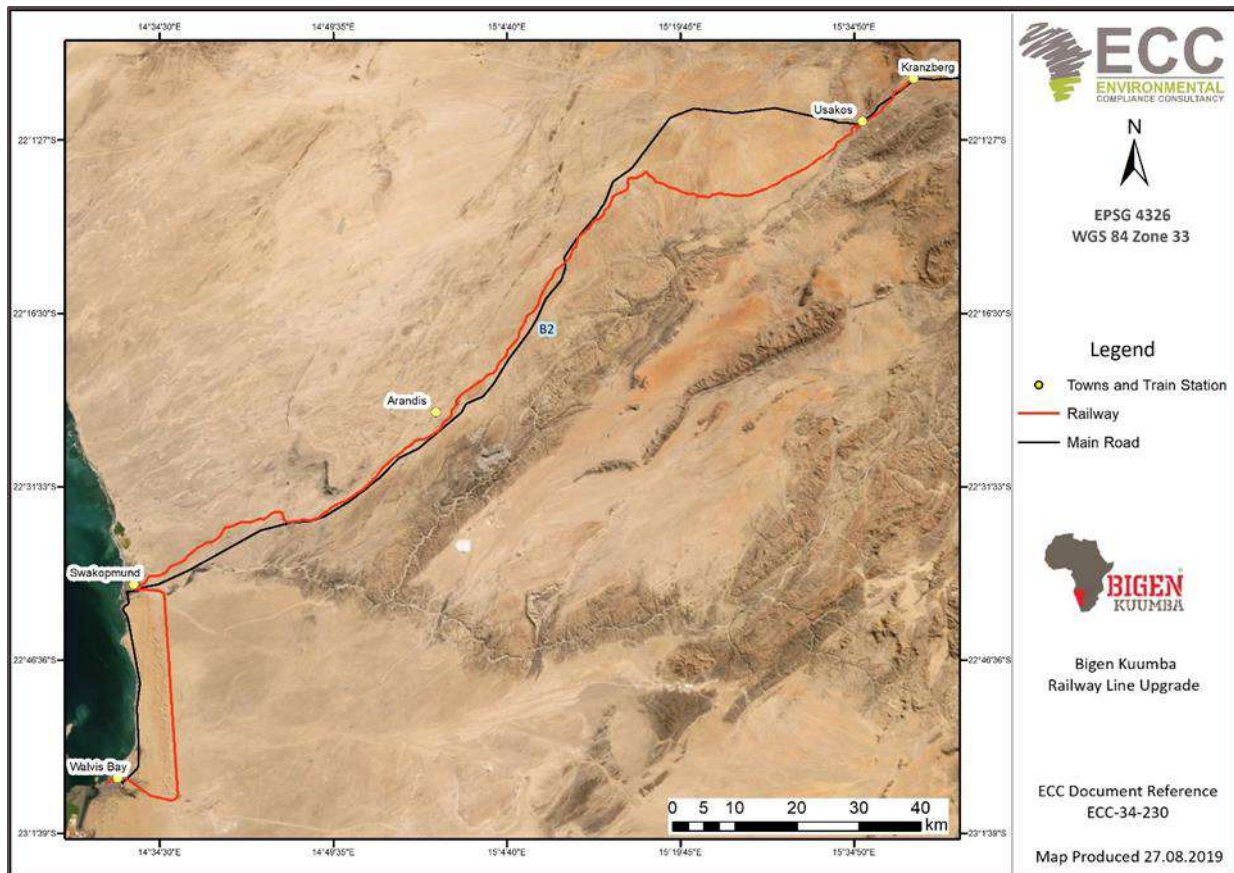


FIGURE 1 – A SATELLITE IMAGE SHOWING THE LOCATION OF THE RAILWAY LINE UPGRADE FROM WALVIS BAY TO KRANZBERG

1.2 CHANGES OR AMENDMENTS TO THE EXISTING APPROVAL

SAND ABSTRACTION

The project requires the use of sand for construction related activities. The establishment of borrow pits and the abstraction of sand from borrow pits is required and will be done in accordance with this EMP; over and above the EMP commitments that the project complies with the proponent will ensure the following:

- Locations of borrow pits will be assessed by the ECO and the engineer prior to sand abstraction, where possible existing borrow pits for sand removal will be used;
- Borrow pit locations will be recorded and mapped using GIS;
- Provide the engineer a method statement prior to sand abstraction;
- Borrow pits will be rehabilitated and photo evidence before and after will be maintained and reported to MEFT;
- The volumes of sand removed will be recorded by the contractor and reported monthly;
- The contractor will be responsible for rehabilitation of the borrow pit; and
- The contractor shall have a written agreement with the landowner, who authorised the contractor to extract sand and other construction materials from their property.

– FUEL STORAGE

In the previous EMP it was stated that fuel tanks should not be larger than 22m³ however the project requires additional fuel storage capacity and therefore propose to store two 23,000lt diesel tanks for the project.

Fuel will be delivered to the contractor's camp in a suitably sized fuel storage / transport tank. The contractor must ensure that fuel tanks are in good condition without leaks. Fuel tanks must be located on an impermeable, concrete slab that is bunded. The storage volume of the bunded area must be 110% greater than the volume of the storage tank (or combined volume of storage tanks). The tank(s) (including the fuel pump) shall be inspected daily for leaks. The contractor shall store and handle fuel tanks of more than 30 m³ at one location in compliance to the Petroleum Products and Energy Act, 1990 and its associated regulations. The contractor shall ensure that all necessary approvals are in place for storing and handling the above-mentioned fuel capacity

1.3 ENVIRONMENTAL REGULATORY REQUIREMENTS

As per the Environmental Management Act, No.7 of 2007 regulations, an environmental clearance certificate is valid for three (3) years, thereafter, it should be renewed with a revised EMP, and therefore this report forms a component of the renewal. This revised EMP and environmental audit report forms part of the submission to the MEFT to support the decision-making process for the environmental clearance certificate renewal. The revised EMP and has been undertaken in accordance with the requirements of the Environmental Management Act, No. 7 of 2007 and its regulations.

1.4 PURPOSE AND SCOPE OF THIS REPORT

This is a revised EMP and will replace all earlier versions, including the amendments to the original project scope of work. Furthermore, the scope of work for the physical works remains the same, which include a new bridge over the Khan River alongside the old bridge and additional structures to the three existing bridges.

The purpose of this EMP is to provide management actions for the current as well as additional planned activities including the diesel tank infrastructure requirements for the project. This EMP will provide a management framework for better planning, implementation operation and decommissioning of construction activities. Moreover, this EMP will provide construction standards and operating arrangements which will allow potential environmental and social impacts of the project to be identified, avoided, mitigated, or minimised practically and ensure that statutory requirements including applicable legal obligations are fulfilled. The EMP also presents protocols, procedures, roles and responsibilities for the project team to ensure the management arrangements are appropriately and effectively developed, implemented and monitored.

The EMP forms an appendix to the environmental scoping report and all preceded EMPs for the railroad upgrade project which should be referred to for further information on the project, assessment methodology, and applicable legislation and assessment findings.

This EMP is a dynamic document and shall be reviewed at predetermined intervals, and/or updated when the scope of works alters, or when further data/information can be added. All personal working on the project will be legally required to comply with the standards set out in the EMPs.

The scope of this EMP includes the duration of the project life: construction, operation and decommissioning. The current understanding of each phase is as follows:

- **Construction phase:** Construction of new Khan River Bridge and upgrading and strengthening of Kranzberg, Stingbank and Swakop River Bridges and building of berms between Walvis Bay and Swakopmund were necessary to prevent sand build-up on the railway tracks. If necessary, the establishment of additional service roads to access works points along the railway line.
- **Operations phase:** The operational phase is partially covered in this report, but, it is detailed in the original EMP.
- **Decommissioning phase:** Decommissioning refers to the reinstatement of material storage areas, overnight camps and other areas used during the project to their original state. This is best achieved by a series of before and after photographs which will be presented.

1.5 MANAGEMENT OF THIS EMP

The proponent will hold the environmental clearance certificate for the project and shall be responsible for the implementation and management of this EMP. If necessary, this EMP shall be reviewed, amended and approved before implementation. The implementation and management of this EMP is therefore done through monitoring of compliance which shall be undertaken through daily duties and activities as well as monthly inspections.

This EMP shall be circulated to all contractors (including subcontractors) and shall be made available upon request.

1.6 LIMITATIONS, UNCERTAINTIES AND ASSUMPTIONS OF THIS EMP

This EMP does not include measures for compliance with statutory occupational health and safety requirements. This will be provided in the safety management plan to be developed by the proponent.

Where there is any conflict between the provisions of this EMP and any contractor's obligations under their respective contracts, including statutory requirements (such as licences, project approval conditions, permits, standards, guidelines and relevant laws), the contract and statutory requirements are to take precedence.

The information contained in this EMP has been based on the project description as provided in the environmental scoping report as well as the current and planned scope of work. Where the design or project methods alter, this EMP may require updating and potential further assessment undertaken.

1.7 ENVIRONMENTAL CONSULTANCY

ECC, a Namibian consultancy registration number CC/2013/11401, has prepared this document on behalf of the proponent. ECC operates exclusively in the environmental, social, health and safety fields for clients across Southern Africa in the public and private sector. The curriculum vitae's of the authors of this report are contained in Appendix B. ECC is independent of the proponent and has no vested or financial interest in the proposed project expect for fair remuneration for professional services rendered.

All compliance and regulatory requirements regarding this document should be forwarded by email or post to the following address:

Environmental Compliance Consultancy

PO BOX 91193
Klein Windhoek, Namibia
Tel: +264 81 669 7608
Email: info@eccenvironmental.com

2 PROJECT MANAGEMENT PERSONNEL

The Ministry of Works and Transport hold the current and approved environmental clearance certificate for the railway line and shall be responsible for the implementation and management of this EMP across the development of the project for its entire lifetime. The proponent shall provide a project team to oversee and undertake the construction works. The project team shall be composed of the proponent’s personnel, contractors and consultants. A nominated role shall be identified to ensure the maintenance of the development is undertaken through the operations phase, and before the project moving into the decommissioning phase, a nominated role shall also be identified to ensure the management of decommissioning and the implementation of this EMP is applied throughout.

2.1 ORGANISATIONAL STRUCTURE, ROLES AND RESPONSIBILITIES

The proponent shall be responsible for:

- Ensuring all members of the project team, including contractors, comply with the procedures set out in this EMP;
- Ensuring that all personnel are provided with sufficient training, supervision, and instruction to fulfil this requirement; and
- Ensuring that all personnel allocated specific environmental responsibilities are notified of their appointment and confirm that their responsibilities are clearly understood.

Contractors shall be responsible for ensuring and demonstrating that all personnel employed by them are compliant with this EMP, and meet the responsibilities listed above. The key personnel and environmental responsibilities of each role through the project life are presented in Table 1.

TABLE 1 – ROLES AND RESPONSIBILITIES

ROLE	RESPONSIBILITY & DUTIES
MoWT	The Proponent, MoWT, will review reports regarding the implementation of the EMP, and make payments to the Contractor, Engineer and IECO based on satisfactory performance, including satisfactory implementation of the EMP. MoWT can also give formal warnings and impose fines and penalties on the Contractor when the Contractor neglects to implement the EMP satisfactorily.
Bigen Kuumba	Bigen Kuumba is the Contractors appointed to do the railway upgrade, bridge construction, repair and strengthening. The company and its appointed representatives and/or sub-contractors have the overall responsibility to ensure that the EMP is complied with and that various best practice and mitigation measures are applied to avoid and reduce effects as far as reasonably practicable, as well as ensure the environment is protected and unforeseen effects are avoided.
Engineer’s Representative (ER)	The person who represents MoWT on-site and is responsible for construction supervision contract administration and communicate formally with the Contractor on behalf of MoWT on all matters.

ROLE	RESPONSIBILITY & DUTIES
	<ul style="list-style-type: none"> - Responsible for ensuring compliance with this EMP including overseeing the construction works, day to day activities during operations, and routine and non-routine maintenance during operations, as well as the decommissioning of the development. - Ensuring all personnel are aware of the commitments made in this EMP and any other relevant regulatory requirements applicable to the project - Ensuring adequate resources are made available for implementation of this EMP - Daily monitoring of the project regarding compliance with the EMP - Maintain the Community Issues and Concern Register, and keep records of complaints, non-compliance, fines, and penalties and assist in damage assessments where incidents and accidents or serious infringements have occurred both verbally and in writing. Issue instructions for the remedying of these situations accordingly - Ensuring all employees and contractors participate in a Site Induction process before commencing work on the project - Maintain up to date register of employees who have completed the Site Induction - Report any non-compliance or accidents to the Regulatory Authority, and - Enforce temporary work stoppages where serious environmental, social, or health & safety infringements and non-compliances have occurred.
<p style="text-align: center;">Independent Environmental Control Officer (IECO)</p>	<p>Independent of the Contractor and Engineer, who has been appointed by the Proponent and who is familiar with all aspects of the EMP and is responsible for monitoring the Contractor’s compliance with the EMP.</p> <ul style="list-style-type: none"> - MoWT will appoint an IECO who will visit and inspect the construction site every month. The IECO will perform environmental audits of the Contractor’s operations and participate in the monthly site meetings with the MoWT, ER and Contractor, providing his/her input on EMP-related issues. - Review the credentials of the Contractor’s proposed DEO and make a recommendation to MoWT and the ER regarding whether the proposed DEO should be approved - Be the principal contact point in relation to the environmental performance of the project - Reporting environmental performance to the Site Manager (construction) and PM (operations) - Reviewing environmental management content of method statements - Guiding personnel in dealing with environmental matters, including legal and statutory requirements affecting the works - Being responsible for all environmental management plans, environmental monitoring and EMP compliance assessments, and production of associated audit reports/records (EPAR) which will be provided to MEFT, ER and MoWT - Being responsible for responding to environment-related complaints received from the public or other stakeholders and will make recommendations to the ER and MoWT regarding corrective actions to be taken by the Contractor, penalties and fines, etc. which will be issued to the Contractor by the ER - Undertake damage assessments where incidents, accidents and serious infringements have occurred - Ensuring that best environmental practice is undertaken throughout the project - Undertaking checks of the construction site and construction activities - Undertaking checks of maintenance work during operations

ROLE	RESPONSIBILITY & DUTIES
	<ul style="list-style-type: none"> – Provisioning of environmental awareness/management training and inductions – Responsible for the management, maintenance and revisions of this EMP subsequent environmental plans (e.g. Waste Management Plan) – Timely distribution of any relevant environmental documentation, including revisions to this EMP, to all construction managers and contractors, and – Inspect and approve any areas that have been rehabilitated by the Contractor. <p>Note: If this role is not filled due to the low impact associated with this project the Project Manager must take on the responsibilities and sign off on this position.</p>
<p>Contractor’s Designated Environmental Officer (DEO)</p>	<p>Appointed by the Contractor and approved by the ER and MoWT to manage the performance of the construction and operational maintenance activities. The DEO must be on-site at all times. Responsible for the EMP implementation and ensuring all activities are compliant with this EMP on behalf of the Contractor, as well as:</p> <ul style="list-style-type: none"> – Managing the preparation and implementation of method statements for certain activities, and ensuring the ER and IECO reviews all method statements and the relevant environmental protocols are incorporated – Implement and ensure compliance of the EMP as well as any conditions stipulated in the ECC issued by MEFT or any other competent regulatory body having authority over the project for the duration of the construction/ upgrading and reporting any non-compliance or accidents to the ER and IECO – Ensuring that all staff have attended a site induction session before commencement of any work on-site and that they are adequately informed of the requirements of this EMP and Health and Safety issues – Daily inspections of the Contractor’s camps to ensure EMP stipulations are being complied with – Ensuring that all contract workers, sub-contractors and visitors to the site are conversant with the requirements of this EMP, relevant to their roles on site and adhere to this EMP at all times – Receiving, responding to and recording complaints and serve as the Contractor’s communicator on all EMP-related issues – Notify the ER and IECO immediately in the event of any accident or infringements of the EMP and ensure appropriate remedial action is taken – Notify the ER and IECO at least 10 working days in advance of any activity that may have significant environmental impacts, so that planned mitigation measures may be reviewed and approved well in advance – Ensure compliance by all of the Contractor’s and Sub-Contractors’ staff with designated “No-Go” areas – Inform the ER and IECO of any plans to rehabilitate areas affected by construction activities, so that the planned measures may be reviewed and approved well in advance – Submit monthly reports to the ER and IECO, regarding any environmental management and health and safety measures implemented, as well as any training or awareness-raising sessions performed; the status of training received by all staff including Sub-Contractors’ staff; and descriptions of any issues or incidents concerning environmental management or health and safety, and what the Contractor has done to address the issues and incidents.
<p>Construction workers/maintenance</p>	<p>Responsible for being compliant with this EMP throughout the construction works, in addition to:</p>

ROLE	RESPONSIBILITY & DUTIES
<p>workers</p>	<ul style="list-style-type: none"> - Ensuring they have undertaken a site induction and are conversant with the requirements of this EMP - Ensuring appropriate briefings for certain activities have been provided and fully understood - Adherence to this EMP at all times, and - Reporting of any operations and conditions that deviate from the EMP or any non-compliant issues or accidents to the ER and IECO, and Site/Project Manager.
<p>Independent Environmental Consultants / Nominated expert (IEC)</p>	<p>A specialist consultant who will act in an advisory capacity, on request, from the proponents, ER and IECO. Responsible for:</p> <ul style="list-style-type: none"> - Ensuring they have undertaken a site induction and are conversant with the requirements of this EMP - Liaise closely with the ER and IECO throughout their work on site - Reporting any issues of concerns to the ER, IECO and Site/Project Manager as soon as the issue arises, and take appropriate action as they deem necessary in line with this EMP - Record any issues or concerns and submit a written report to the ER, IECO and Site/Project Manager - Adherence to this EMP at all times - Reporting of any operations and conditions that deviate from the EMP or any non-compliant issues or accidents to the ER, IECO and Site/Project Manager - Monthly audits and inspections during construction - Annual audit of compliance, and - Undertake site visits as and when required during construction and operation.

2.2 CONTRACTORS

Any contractors hired during the project activities or for any accessory works for the project, or contractors appointed for maintenance activities, shall be compliant with this EMP and shall be responsible for the following:

- Undertaking activities in accordance with this EMP as well as relevant policies, procedures, management plans, statutory requirements, and contract requirements;
- Implementing appropriate environmental management measures;
- Reporting of environmental issues, including actual or potential environmental incidents and hazards, to the Project Manager; and
- Ensuring appropriate corrective or remedial action is taken to address all environmental hazards and incidents reported.

2.3 EMPLOYMENT

The proponent (and all contractors) shall comply with the requirements of the Regulations for Labour, Health and Safety and any amendments to these regulations. The following shall be complied with:

- In liaison with local government, community, stakeholders and relevant authorities the proponent shall ensure that local people have access to information about job opportunities and are considered first for construction/maintenance contract employment positions;

- The number of job opportunities shall be made known together with the associated skills and qualifications;
- The maximum length of time the job is likely to last for shall be indicated;
- Foreign workers without proof of permanent legal residence shall not be hired; and
- Every effort shall be made to recruit from the pool of unemployed workers living in the local area.

2.4 HIRING OF LOCAL LABOUR

The contractor will be instructed in the tender documents and contracts to hire local labourers during the construction. The contractor will be required to appoint an experienced Community Liaison Officer (CLO). The CLO will be responsible for contacting community leaders, local and relevant authority that will then assist to identify and select local labourers. A labour employment plan will be developed which will inform the CLO, community leaders and contractor about the guidelines to be followed in the selection process. Selected local labourers will be remunerated in compliance with gazetted industry minimum rates.

3 WORKING ARRANGEMENTS

3.1 WORKING HOURS

The contractor will be restricted to working between the hours of 06h30 – 18h30 during summer and 07h00 – 17h30 during winter, Monday to Saturday. The contractor shall not work on Sundays or public holidays.

Any variations to the above must be reviewed and approved in advance by the ER, MoWT, and local authorities if the work is to occur in or near to urban areas. Such variations must comply with the Labour Act and any other relevant legislation.

3.2 CONTRACTOR'S CAMP AND FACILITIES WITHIN THE RAILWAY SERVITUDE

LOCATION OF CONTRACTOR'S CAMP

It is the contractor's responsibility to communicate with landowners and find one who agrees to the contractor's camp being established on their property if it cannot be developed in the servitude. The contractor's camp shall have a delineated boundary so that employees stay within the approved and demarcated campsite.

EMPLOYEE FACILITIES

The contractor shall provide a designated and fully functional dining area with cooking facilities, tables, chairs, trash bins and washing facilities inside the contractor's camp. Shaded facilities shall also be provided for dining and break times, within the servitude.

Cooking facilities shall be located a safe distance from fuel storage areas. Fires shall only be permitted in designated, safe areas within the contractor's camp.

The camp shall include toilets at a minimum ratio of one toilet per 15 workers, separate for both male and female employees. The toilets must be maintained in a clean, hygienic condition, and stocked with toilet paper. The toilets should not be located in depressed areas prone to flooding. The toilets must be secured to the ground. The waste cannot under any circumstances be discharged into the environment. Handwashing facilities must be provided near to the toilets. Toilets and handwashing facilities must also be provided in the railway servitude near construction activities, as per the above requirements.

Enclosed sleeping areas with beds and adequate bedding, as well as adequate privacy, must be provided at the camp for all employees.

Security guards shall be provided by the contractor to look after the employees' personal property and facilities, as well as the other areas of the contractor's camp.

3.3 STORAGE OF PLANT, EQUIPMENT AND MATERIALS

3.3.1 MATERIAL STORAGE AT THE CONTRACTOR'S CAMP AND WITHIN THE RAILWAY SERVITUDE

All construction materials will be stored within the contractor's camp when practical or within dedicated lay down areas for per way construction and within the existing railway servitude. All storage areas are to be maintained in a neat and tidy state.

Stockpiles of ballast and other materials shall have a minimum stockpile base width while maintaining natural, stable stockpile side slopes.

The material stockpiles shall not pose a safety risk in any way for persons or vehicles moving in their vicinity.

Hazardous substances shall be stored in secondary containers. As previously stated, material safety data sheets shall be available on-site at all times.

A weatherproof, impervious container/skip shall be provided at the camp for the temporary storage of hazardous waste. The container/skip shall only be disposed of at a landfill that is licensed to receive hazardous waste. The contractor shall provide the ER with a copy of the certificate of disposal after each disposal of the container /skip.

3.3.2 FUEL STORAGE AND RE-FUELLING AT THE CONTRACTOR'S CAMP

Fuel will typically be delivered to the contractor's camp in a suitably sized fuel storage / transport tank. The contractor must ensure that fuel tanks are in good condition without leaks. Fuel tanks must be located on an impermeable, concrete slab that is bunded. The storage volume of the bunded area must be 110% greater than the volume of the storage tank (or combined volume of storage tanks). *The tank(s) (including the fuel pump) shall be inspected daily for leaks. The contractor shall store and handle fuel tanks of more than 30 m³ at one location in compliance to the Petroleum Products and Energy Act, 1990 and its associated regulations. The contractor shall ensure that all necessary approvals are in place for storing and handling the above-mentioned fuel capacity.* A leaking tank must be repaired immediately, or replaced immediately.

The fuel storage and re-fuelling area shall be in a designated area where only authorised employees are allowed entry.

The contractor must provide adequate fire suppression equipment at the fuel storage and re-fuelling areas.

3.4 TRANSPORT OF CONSTRUCTION MATERIALS AND MACHINERY TO AND FROM THE RAILWAY SERVITUDE

It is important that no new access or service roads or tracks will be constructed or inadvertently created for the purposes of this project. Only existing roads to the railway servitude will be utilised by construction-related vehicles and machinery.

The Engineer will prepare a construction traffic plan that is to be included in the construction tender documents.

Any area located outside of the railway servitude, contractor's camp, or existing access roads will be considered as a No-Go area for vehicles, materials and employees.

If for whatever reason the contractor believes it is necessary to venture into a No-Go area, then the ER and IECO must first be notified. The IECO must then notify MEFT and national park managers (i.e. if in national park areas) to review the situation and obtain approval or denial. Furthermore, a biodiversity specialist may need to be hired to study the specific site to be disturbed and the potential environmental impacts of such disturbance.

If by accident a No-Go area is ventured into by the contractor, then the contractor must immediately inform the ER and IECO about such incursion and disturbance. The IECO must then notify MEFT and national park managers, and the No-Go area must be inspected for potential impacts and damage, and the way forward determined.

3.5 EXISTING NAMWATER PIPELINE CROSSINGS

This will not be an issue for the bridge construction, repair and strengthening component, but maybe relevant for berm construction to keep wind-blown sand off the tracks. It has been extracted from the original EMP (Hartz, C., 2017). Two NamWater pipelines cross the existing railway line. These pipelines include:

- The pipeline from the Areva desalination plant to the Swakopmund Reservoir crosses under the railway line at one point located just east of Swakopmund (Figure 2).
- The Kuiseb – The Swakopmund water pipeline runs from the Swakopmund Reservoir to a reservoir located south of the Dune 7 (east of Walvis Bay) and then continues southward. This pipeline crosses under the railway line in two locations: i) south of the Swakopmund River, and ii) where the railway makes a ninety-degree turn towards Walvis Bay, near Dune 7.

Details about the crossings and conditions for working in the vicinity of the crossings are to be obtained from NamWater when the application for Way of Leave is submitted by the Engineer and approved by NamWater. The contractor and ER are to consult closely with NamWater before and during construction activities occurring in the pipeline crossing areas.



FIGURE 2 – A PHOTO SHOWING NAMWATER PIPELINE FROM THE AREVA DESALINATION PLANT THAT CROSSES UNDERNEATH THE RAILWAY EAST OF SWAKOPMUND (HARTZ, C., 2017)

4 COMMUNICATION AND TRAINING

To ensure potential risks and impacts are minimised, personnel must be appropriately informed and trained on operational procedures that include the above mitigation measures. It is also important that regular communications are maintained with all the stakeholders and that they are made aware of potential impacts and how to minimise or avoid them. This section sets out the framework for communication and training concerning the EMP.

4.1 COMMUNICATION

The project manager and/or site manager shall communicate any environmental issues to the project team through the following means (as and when required):

- Site induction;
- Audits and site inspections;
- Toolbox talks, including instruction on incident response procedures; and
- Briefings on key project-specific environmental issues.

This EMP shall be distributed to the workforce team including any contractors and personnel working on the site to ensure that the environmental requirements contained herein are adequately communicated. Key activities and environmentally sensitive operations shall be identified and briefed to workers and contractors.

During the project activities, communications between the management team shall include discussing any complaints received and actions to resolve them, any inspections, audits or non-conformance with this EMP, and any objectives or target achievements.

4.1.1 ENVIRONMENTAL COMMUNICATION: COMMUNITY AND STAKEHOLDERS

The Project Manager shall represent the project and shall liaise with the local communities and stakeholders during the construction phase and through the operations phase where necessary. Clear contact details of the proponent and Project Manager shall be circulated in the community, in case there should be any questions, concerns or complaints. This EMP will be published on ECC’s and the proponent’s website.

4.1.2 LIAISON WITH LOCAL AUTHORITIES AND LAND OWNERS

The ER shall stay in regular contact throughout the construction period with all local authorities and landowners along with the project limits. The ER will communicate with local authorities, the Dorob National Park, the MEFT, and landowners to keep them abreast of the progress of the construction activities and to let them know when and where construction activities are planned to occur. Through this regular communication, the authorities and landowners will know when to expect the contractor to be working in their respective areas.

4.2 ENVIRONMENTAL EMERGENCY AND RESPONSE

Table 2 contains a list of numbers to be contacted in case of an emergency. All personnel will be made aware of these numbers.

TABLE 2 – GENERAL PROJECT EMERGENCY CONTACT DETAILS

TOWN	AMBULANCE	POLICE	FIRE BRIGADE	WATER & SEWAGE
Usakos	+264 (67) 53-0023	+264 (67) 1-0111	+264 (67) 53-0023	+264 (64) 53-0023
Arandis	+264 (64) 51-0022	+264 (64) 1-0111	+264 (64) 51-0171	+264 (64) 51-0171
Swakopmund	+264 (64) 40-5731	+264 (64) 1-0111	+264 (64) 410-4111	+264 (64) 410-4279

Walvis Bay	+264 (67) 20-5443	+264 (67) 1-0111	+264 (67) 20-3117	+264 (64) 201-3310
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For large-scale spills and other significant environmental incidents, the fire services shall be contacted as required and the MEFT office informed of the incident (telephone +264 61 284 2111). All correspondence with MEFT should be undertaken by the project manager as guided by the DEO / ER and IECO.

For the clean-up of smaller spills, the relevant Material Safety Data Sheet (MSDS) should be obtained online and be consulted to determine the appropriate clean-up procedure. Basic spill response training must be provided as part of the site environmental induction, spill response equipment, including relevant MSDS copies, must be provided in areas where potentially environmentally hazardous chemicals may be used.

All environmental incidents, regardless of their size or significance, should be recorded and reported to the project manager / Site Manager, DEO, ER and IECO during the environmental meetings held.

4.3 COMPLAINTS HANDLING AND RECORDING

Any complaints received verbally by any personnel on the project site shall be recorded by the site manager or the receiver, including the name and contact details of the complainant, date and time of the complaint, and the nature of the complaint. The information shall be given to the project manager who is overall responsible for the management of complaints and will provide a written response to the complainant. The site manager shall inform the project manager of issues, concerns or complaints. It is the duty of both the site manager and project manager to maintain a complaint register that details the name of the complainant, date and time of the complaint and action taken to resolve the issues.

The workforce shall be informed about the complaints register, its location and the person responsible, to refer residents or the general public who wish to complain. The complainant shall be informed in writing of the results of the investigation and action to be taken to rectify or address the matter(s). Where no action is taken, the reasons why are to be recorded in the register.

The complaints register shall be kept on-site for the duration of the project and will be available for government or public review upon request.

4.4 TRAINING AND AWARENESS

All personnel working on the project shall be competent to perform tasks that have the potential to cause an environmental impact. Competence is defined in terms of appropriate education, training, and experience.

4.4.1 SITE INDUCTION

All personnel involved in the project shall be inducted to the site with a specific environment and social awareness training component. The environment and social awareness training shall ensure that personnel is familiar with the principles of this EMP, the environment and social aspects and impacts associated with their activities, the procedures in place to control these impacts and the consequences of departure from these procedures.

The project manager shall ensure a register of completed training is maintained.

The Site induction should include, but not limited to the following:

- A general site-specific induction that outlines:
 - o What is meant by “environment” and “social”;
 - o Why the environment needs to be protected and conserved;
 - o How construction activities can impact on the environment;
 - o What can be done to mitigate against such impacts;
 - o Awareness about the environmental sensitivity of the Dorob National Park and the Namib Desert;
 - o Clear instructions about “No-Go” areas. No work is to be performed outside of the existing railway servitude, and no vehicles or persons are to travel outside of existing roads, access roads, railway servitude or the Contractor’s camp;
 - o Awareness about national heritage sites in the vicinity of the project site;
 - o No trapping, poisoning or shooting of animals is allowed;
 - o No removal or disturbance of vegetation or the land area outside of the existing railway servitude and minimisation of disturbance of vegetation within the servitude wherever possible. This includes no chopping down or collection of trees for firewood;
 - o No domestic animals are allowed to site;
 - o Information regarding all way leave conditions;
 - o Instructions on proper handling of hazardous materials and proper storage of these materials and machinery;
 - o Health & safety instruction, including the importance of wearing personal protective equipment(PPE), about only using the designated toilet, washing and eating facilities and areas and Information about HIV / AIDS, sexually transmitted diseases (STDs), tuberculosis and preventative measures (e.g. free condoms to all camp staff);
- The inductee’s role and responsibilities concerning implementing the EMP;
- The site environmental rules;
- Details of how to deal with, and who to contact if environmental problems should they occur;
- Basic vegetation clearing principals and species identification sheets;
- The potential consequences of non-compliance with this EMP and relevant statutory requirements; and
- The role of responsible people for the project.

All staff should receive an induction refresher course every quarter. Due to the environmental sensitivity of the landscape adjacent to the railway, a representative from the MEFT shall be given the opportunity to review and comment upon the induction course materials before the contractor utilising them for the project. The following person should be contacted:

Mr. Siegfried Gawiseb
Chief Control Warden for Erongo Region
Ministry of Environment and Tourism
Siegfried.gawiseb@met.gov.na

Tel: +264 64 404 576
P/Bag 5010
Swakopmund

4.4.2 TOOLBOX TALKS

The contractor, under the leadership of the contractor's DEO, shall incorporate pertinent environmental, health & safety topics into the contractor's daily toolbox talks. The toolbox topics could include reminders of topics covered in the induction course or new topics, such as the importance of staying within the existing railway servitude, and only travelling on existing roads and access roads; proper handling of hazardous materials; only using the designated toilet, washing and eating facilities; information about HIV / AIDS and STDs.

5 REPORTING, COMPLIANCE AND ENFORCEMENT

5.1 ENVIRONMENTAL RISKS AND MITIGATION MEASURES

The register of Environmental Risks and Issues, which identifies mitigation and monitoring measures, as well as roles responsible, will be subject to regular review by the ER, IECO and DEO together with the project/site manager and updated when necessary. The project/site manager, ER, IECO and DEO will use this register to undertake monthly inspections to ensure the project is compliant with this EMP.

5.2 CONSTRUCTION: ENVIRONMENTAL INSPECTIONS & COMPLIANCE MONITORING

A copy of this EMP shall be on-site throughout the construction works and shall be available upon request. It is the responsibility of the project/site manager, ER and DEO to ensure this EMP is complied with through their daily roles. Daily inspections will be undertaken by the site manager or DEO. Any environmental problems or risks identified shall be notified to the PM, ER and IECO and actioned as soon as is reasonably practicable.

5.3 MONTHLY COMPLIANCE MONITORING

Monthly inspections shall be undertaken by the DEO / ER/site manager to check that the standards and procedures set out in this EMP are being complied with and pollution control measures are in place and working correctly.

Monthly Inspection and Compliance Reports shall be produced (Refer: Appendix C (1) and C (2)). The inspection and compliance reports shall be completed by the DEO / site manager and issued to the PM, ER and IECO who will review.

5.4 OPERATIONS: ENVIRONMENTAL INSPECTIONS & COMPLIANCE MONITORING

Annual inspections of all the construction activities and camps will be undertaken by the project/site manager, ER, DEO, IECO and IEC. All operations will be inspected to ensure; no significant environmental damage has been caused; and no leaks exist in fuel or chemical containers or spills have occurred or any other significant impact has taken place that is associated with the upgrade, construction, repair and strengthening work being undertaken. For the construction phase monthly inspection and compliance report templates are included in Appendix C (1) and C (2) respectively and must be completed. During any maintenance activities, the contractor shall fill in the compliance report Appendix C (3). These shall be submitted to the PM, ER, DEO and IECO. These inspection, compliance and maintenance reports shall contain a brief description of any areas of non-conformance with the contract specification, the reason for the non-conformance, the responsible party, the result (consequence), the corrective action taken and any necessary follow up measures required.

5.5 REPORTING

There shall be a requirement to ensure that any incident or non-compliance, including any environmental issue/impact, failure of equipment or accident or environmental incident, is reported to the project/site manager, ER, DEO and IECO. The contractor shall maintain a copy of the EMP on-site throughout construction. The contractors DEO, shall maintain records on-site throughout the construction of the following:

- Significant incidents (e.g. spills, impacts, health and safety), as well as actions, are taken;

- A register of public complaints in which all complaints are recorded, as well as descriptions of remedial actions taken by the contractor;
- Records of staff attending and the content presented at all training and awareness-raising sessions, such as the induction course, induction rehearse course, and daily toolbox talks;
- A list of all hazardous materials stored on-site, with MSDS provided for each.

5.6 ENVIRONMENTAL PERMITS

Whilst the Water Resources Management Act, No. 11 of 2013 is not enforced, it is best practice to adhere to its stipulations while ensuring compliance with the Water Act, No. 54 of 1956, which is maintained still. A licence to abstract and use water may be required if boreholes are to be created, although this is unlikely. If required, the proponent will apply for relevant permits and shall operate in accordance with any conditions of the licence.

Minimal vegetation will be cleared across the working areas to allow the project activities to commence. It is unlikely that an area greater than 15ha will be cleared, shall this be required, a permit under the Forest Act, No. 12 of 2001 as amended by the Forest Amendment Act, No. 13 of 2005 and its regulations of 2015 should be obtained.

5.7 NON-COMPLIANCE

5.7.1 NON-COMPLIANCE EVENT

Where it has been identified that works are not compliant with this EMP, the project manager shall employ corrective actions so that the works return to being compliant as soon as possible. In instances where the requirements of the EMP are not upheld, a non-conformance and corrective action notice shall be produced. The notice shall be generated during the inspections and the project manager shall be responsible for ensuring a corrective action plan is established and implemented to address the identified shortcoming.

A non-compliance event/situation, for example, is considered if:

- There is evidence of a contravention of this EMP and associated indicators or objectives;
- The project manager and/or contractor have failed to comply with corrective or other instructions issued by the project manager or qualified authority, or;
- The project manager and/or contractor fail to respond to complaints from the public.

Activities shall be stopped in the event of non-compliance until corrective action(s) has been completed.

5.8 INCIDENT REPORTING

The project manager must ensure that an accident and incident (including minor or near-miss) reporting system is maintained so that all applicable statutory requirements are covered. For any serious incident involving a fatality, or permanent disability, the incident scene must be left untouched until witnessed by a representative of the police. This requirement does not preclude immediate first aid being administered and the location being made safe.

The project manager must investigate the cause of all work accidents and significant incidents and must provide the results of the investigation and recommendations on how to prevent a recurrence of such incidents. A formal root-cause investigation process should be followed.

5.8.1 DISCIPLINARY ACTION

This EMP is a legally binding document and non-compliance with it shall result in disciplinary action being taken against the perpetrator(s). Such action may take the form of (but is not limited to):

- Fines/penalties;
- Legal action;
- Monetary penalties imposed by the proponent on the contractor;
- Withdrawal of licence(s); and
- Suspension of work.

The disciplinary action shall be determined according to the nature and extent of the transgression / non-compliance, and penalties are to be weighed against the severity of the incident.

6 ENVIRONMENTAL AND SOCIAL MANAGEMENT

6.1 ENVIRONMENTAL PERFORMANCE MEASUREMENT

This chapter provides a register of environmental risks and issues, which identifies mitigation and monitoring measures, as well as roles responsible. This register will be subject to regular review by the project manager and updated when necessary.

The project manager and/or site manager (if applicable) will use this register to undertake monthly inspections (see next section) to ensure the project is compliant with this EMP.

6.2 OBJECTIVES AND TARGETS

Environmental objectives for the project are as follows:

- Zero pollution incidents;
- Use natural resources effectively and efficiently;
- Minimize waste sent to landfill or being burnt;
- Minimal vegetation clearing and earthworks;
- Protect local flora and fauna, and

6.3 CONSTRUCTION PHASE

6.3.1 METHOD STATEMENTS AND RISK ASSESSMENTS

Method Statements and Risk Assessments shall be produced for specific activities before works commencing, and shall include environmental protection and mitigation measures, as well as emergency preparedness appropriate to the activity covered. The Site Manager and DEO shall draft each one and the PM, IECO and ER shall review, providing advice where necessary.

Method Statement briefings shall be provided before personnel carry out key activities for the first time.

Method Statements shall be produced for a range of activities, including, but not limited to:

- Establishment of access roads and camps/material storage sites;
- Removal and clearance of vegetation; and
- Ground excavation and foundations associated with bridge construction or strengthening.

6.3.2 QUALITY CONTROL POINTS

Quality control points (QCPs) shall be identified in the project schedule (especially for the construction phase) before specific activities commencing. QCPs are required to control project risks, including environmental and social risks, during specific activities, and to allow for stringent monitoring and accountability to reduce risk. At QCPs, sign off is required upon completion of the activity to allow the following activity to commence. This sign off shall be undertaken by the project manager.

QCPs shall be identified and implemented by incorporating them into method statements and must include the key responsibility personnel that will sign off and or witness each quality control point (critical).

All QCPs shall be closed before the construction phase are closed and signed off.

6.3.3 MAINTENANCE OF CONSTRUCTION AREAS

The construction area shall be established and managed to minimise impacts on the environment and society, and shall include the following considerations:

- Plant and equipment shall be brought onto site only as and when required;
- Plant and equipment shall be stored in specific areas taking into consideration impacts on residents and groundwater (e.g. start-up of equipment, noise levels, flooding and spill runoff to aquifer considerations);
- Amenities (e.g. portable toilets) shall be provided and set up in a suitable location and secured to the ground to avoid impacts on residents;
- Waste collection area and material storage areas shall be set up at specific sites to avoid impacts on local communities;
- Lighting shall only be used when necessary and will be designed to minimise spillage of light, and orientated away from community areas.

A 'good housekeeping' policy shall be adopted across the construction and maintenance working areas, and will include the following requirements:

- Fires shall only be permitted in designated, safe areas within the contractor's camp;
- Considerate behaviour of all site staff;
- Maintenance of staff welfare facilities;
- Removal of food waste and other rubbish at frequent intervals; and
- No littering or discarding of random solid waste.
- Under no circumstances can solid waste be burned, dumped or buried at the Camp or railway servitude.

6.3.4 COMMUNITY NUISANCES AND HAZARDS

All personnel shall respect the property and rights of local inhabitants at all times and shall treat all such persons with courtesy. A Method Statement shall be produced detailing the specific measures that are to be implemented to manage nuisances and hazards to the community. Measures are detailed in these next sections that shall be included in the Method Statement.

6.3.5 DUST CONTROL

The contractor shall minimise the generation of dust from transport and construction activities. If needed, construction and transport activities should be temporarily stopped during high wind conditions. The contractor will be required to do dust suppression employing water carts on access roads.

6.3.6 NOISE CONTROL

Noise should be minimised as much as possible during construction works. The following measures shall be applied:

- Limit working hours to 06h30 – 18h30 during summer and 07h00 – 17h30 during winter, Monday to Saturday. No construction work on Sunday or public holidays;
- Inform local communities of scheduling and duration of noisy activities through notices or face-to-face communications;
- Regular maintenance and servicing of vehicles, plant and equipment; and
- All plant to be shut down or throttled back between periods of use;
- Any variations to the above must be reviewed and approved in advance by the ER, MoWT, and local authorities if the work is to occur in or near to urban areas. Such variations must comply with the Labour Act and any other relevant legislation.

The contractor shall comply with the World Health Organization(WHO) guidelines for the management of community noise (<http://apps.who.int/iris/handle/10665/66217>).

6.3.7 POLLUTION CONTROL AND CONTINGENCY PLAN

6.3.8 HANDLING OF FUEL, OIL AND CHEMICALS

The Site Manager / contractor shall take all reasonable precautions to prevent fuel, oil and chemical whilst undertaking works on site. To this end, the site manager / contractor shall ensure that:

- All necessary approvals are in place before bringing fuel, oil or chemicals on to site;
- All fuel, oil and chemical deliveries (if any) shall be supervised by a responsible person, who shall be trained to deal with any spills;
- All mobile plants shall be fuelled before coming on to the construction area, and when required, shall be refuelled in a designated area on an impermeable surface or over a spill/drip tray. A spill kit will be located at each designated refuelling point. A drip tray must also be available to catch any spills;
- Regular checks are performed to verify that no leaking or defective equipment is brought onto the site;
- Any vehicles and/or plant that have leaking lubricants, fuels or other hazardous fluids shall be repaired or removed from the site;
- A properly bunded wash bay shall be installed and approved by the IECO and monitored by the DEO, IECO and ER. The washing of vehicles and plant shall be kept to a minimum. Only environmentally friendly, low phosphate, low nitrate, low foaming detergents will be allowed and must be approved by the IECO before use; and
- Equipment is maintained regularly to ensure that no fuel, oil or hydraulic leaks occur.

The Site Manager / ER and DEO shall ensure that there are sufficient absorbent material and spill kits available on-site to manage accidental spills. The location of and instructions on how to use this equipment shall be included in the Site Induction, and nominated personnel will be appropriately trained to use spill kits.

Any accidental spillages of fuels and oils, or other hazardous substances, shall be cleaned up immediately and be reported to the project/site manager, ER, DEO and IECO. The following responses shall be undertaken:

- Minor spill: Only diesel and oil, with no human injury, contamination to water bodies or other environmental receptors. Contain and clean up the spill using available spill kit. The site manager / contractor shall inform the project manager and ER, DEO and IECO, supplying the following information:
 - o Date, time, and location;
 - o Substance spilled and quantity;
 - o Before and after photographs; and
 - o Actions are taken and any future remediation required.
- Major Spill: Resulting in human injury or/and environmental contamination and waterbody contamination. Personnel shall contain the spill if possible and report the spill to the project/site manager, who shall then alert the appropriate emergency services (Table 2), and the ER, DEO and IECO. In addition to the above information for a minor spill, the project/site manager shall also be informed of any immediate dangers, e.g. fire, explosion, the release of chemical fumes.

6.3.9 CONCRETE BATCHING

Concrete batching shall be performed on an impermeable surface that is properly bunded. The concrete batching area shall be located at least 25m away from any surface water resource. If concrete trucks are employed, care must be taken to ensure the concrete is not poured onto the ground. Any spillage must be cleaned immediately.

6.3.10 GENERAL FIRE PREVENTION

The site manager / contractor shall take all necessary precautions to prevent the ignition and spread of fires caused either deliberately or accidentally as a result of the work being performed (E.g. welding or grinding during steelworks).

The site manager / contractor shall prepare and implement a Fire Prevention Plan for fire prevention and emergency management. The Plan shall include, but shall not be limited to, the following:

- Potential sources of fire risk;
- Procedures to be followed to control an accidental fire;
- Identification and location of fire-fighting equipment that will be maintained on-site and deployed in the event of an emergency.

The Site Induction will include a briefing of the risks and potential consequences of starting fires. Employees shall also be warned of the risks of careless disposal of burning cigarette butts.

The Site Manager shall provide fire-fighting equipment, the location of which will be included in the Site Induction.

6.3.11 FIRE PRECAUTIONS AT THE FUEL TANK (S)

The following precaution measures shall be adhered to regarding the fuel tank(s) storage and handling:

- The contractor shall ensure that all buildings, road works, structures and plant are designed, constructed, equipped and maintained to prevent or minimise the danger of fires and explosions;
- The contractor shall ensure that all personnel involved in the project must act cautiously and comply with the provisions of the Petroleum Product Regulations and other laws relating to fires and explosions;
- Buildings, structures and plant where fuel products are handled or stored must be suitably signposted clearly;
- The contractor shall ensure when storing, keeping, handling, conveying, using or disposing of a fuel product take adequate precautions to prevent the outbreak of fires;
- Adequate fire-extinguishing appliances shall be available, maintained in good working order (and tested at least once a year) and kept at accessible places where fuel products are kept;
- The contractor shall ensure that a written fire emergency plan is available on their premises. The plan shall indicate the location of fire-fighting equipment and include a plan of action for employees. Employees must be trained and the fire-fighting plan must be provided to employees;
- Under no circumstances any person may near fuel tank (s) or any other fuel products throw, leave or create any open or naked spark, light or flame or any burning or smouldering material that may cause danger or fire explosion;
- No person may keep a vehicle running while petrol or diesel is being dispensed into the tank of the vehicle;
- No person may smoke in the forecourt of a retail outlet where petrol or diesel is dispensed;
- No person may keep a cellular phone active (or any other electronic communication apparatus) within two (2) metres from a dispensing pump or within fifteen (15) metres from a vehicle while a fuel tank (s) is being discharged from that vehicle into an underground storage tank.

6.4 OPERATIONS

6.4.1 ENVIRONMENTAL MONITORING

The environmental monitoring during the operational phase will be the same as that described for the greater railroad upgrade project. To avoid unnecessary repetition, the EMP for the greater project (Hartz, C., 2017) will be used for this purpose. All site-specific environmental monitoring points shall be identified, developed and monitored regularly as practical as possible.

6.4.2 ANNUAL OPERATIONAL MAINTENANCE CHECKS

Annual maintenance checks will be the same as that described for the greater railroad upgrade project. To avoid unnecessary repetition, the EMP for the greater project (Hartz, C., 2017) will be used for this purpose.

6.5 DECOMMISSIONING AND REINSTATEMENT

The construction and strengthening of bridges will take place within the existing railway servitude, and the transport of materials and machinery to the site will only occur on existing roadways and within the railway servitude.

The area disturbed within the railway servitude will be rehabilitated once construction activities have been completed. The DEO / ER and IECO will take photographs of the railway servitude and the contractor's campsite before either area has been disturbed. The DEO / ER and IECO will specify precisely how the land is to be rehabilitated at the end of the construction so that it is returned to a similar condition before the bridge construction, repair and strengthening. The rehabilitation work will include removal of all equipment and waste and levelling the disturbed ground to a smoothly contoured surface condition to be in a similar state as to when it was found.

6.6 SOLID WASTE MANAGEMENT

The Environmental Management Act, No.7 of 2007, Section 3, paragraph (i) states that waste must be reduced, reused and recycled where possible, therefore in accordance with the Act, waste generated as a result of the project shall be managed and dealt with in accordance with a Waste Management Plan. This Plan will be produced before construction activities commencing, shall cover any waste produced during the operational phase, and shall be updated before commencing the decommissioning phase. The plan shall include the following information:

- Describe each waste type expected to be produced during construction activities;
- Estimate the quantity of each waste type;
- Identify the waste management action proposed for each waste stream, including re-using, recycling, recovery and disposal; and
- Designated areas to collect and separate waste.

A draft template for a Waste Management Plan is provided in Appendix D. This plan shall be drafted before construction works and shall be updated regularly to ensure all waste and disposal routes are identified. The Waste Management Plan aims to achieve sustainable waste management. The main purpose is to outline waste streams and identify the best treatment and disposal option for each one, applying the waste management hierarchy and avoiding as much waste as possible ending up at landfill or being burnt. Besides, it will also outline any potential economical and investment requirements for the treatment and / or disposal of waste.

The following waste management measures will be followed:

- Scavenger-proof waste bins shall be provided throughout the camp, at the following locations (but limited to these locations): ablution area, dining area, sleeping area, office area, workshop area, storage and laydown areas, and at Camp entrances /exits.
- Waste will be collected, separated and stored in a designated area, where a temporary fence is required;
- A waste storage container shall be provided at the Camp into which the bins are dumped regularly;
- Waste storage areas shall be kept clean and tidy at all times;
- Waste shall be transported to a permitted landfill facility regularly to avoid pests and bad odours; and
- Under no circumstances can solid waste be burned, dumped or buried at the Camp or railway servitude

Portable toilets/toilet facilities will be provided for the construction workforce. These will be emptied and maintained regularly by the contractor.

The existing rails that are replaced by new rails will be cut on-site to reduce their length, placed in containers, and transported off-site for recycling purposes elsewhere.

The old concrete sleepers that have been replaced will be crushed on-site and worked into the railway embankment as recycled material.

All other construction-related waste will be transported and disposed of off-site in a permitted landfill facility.

It is unlikely that hazardous material and wastes will be produced, however, if they do, they shall be managed safely and responsibly to prevent contamination of soils, pollution of water and/or harm to people or animals as a result of the use of these materials. Hazardous and non-hazardous waste shall be stored separately at all times.

6.7 REGISTER OF ENVIRONMENTAL RISKS AND ISSUES

An environmental review of the project has been completed to identify all the commitments and agreements made within the environmental scoping report. From this, a schedule of environmental commitments and risks has been produced (Table 3), which details deliverables including measures identified for the prevention of pollution or damage to the environment during the project.

Table 3 provides a register of environmental risks and issues, which identifies mitigation and monitoring measures, as well as the responsible person. This register will be subject to regular review by the project manager and updated when necessary. The project manager will use this register to undertake monthly inspections to ensure the project is compliant with this EMP.

6.8 ENVIRONMENTAL PERMITS

ECOLOGY

Article 23 (b) of the Forest Act, 2001 and associated Regulations, states that the clearance of vegetation on an area of land greater than 15 hectares will require a permit. This will include the removal of any protected or important species. This is not anticipated to be necessary during the amended works on the bridges but if it becomes necessary (e.g. berm construction) an application shall be made to the Directorate of Forestry, under Ministry of Environment, Forestry and Tourism and approval will be in place before construction activities commencing.

HERITAGE

Pre-colonial archaeological sites are governed by the National Heritage Act (27 of 2004) and may be investigated or destroyed under a permit issued by the National Heritage Council. The precautionary treatment of graves applies in all cases, but the more recent Christian graves at Okanguati are governed by the Burial Place Ordinance (27 of 1966). Destruction or the exhumation of such graves with the purpose to reinter the remains requires a permit issued by the Office of the President of Namibia.

In the absence of the legal system that guides memorial sites along with the railway servitude or roadside in Namibia, if discovered, a precautionary decision by the landowner shall take precedence to remove or relocate the memorial site.

7 REGISTER OF ENVIRONMENTAL RISKS AND ISSUES

7.1 INTRODUCTION AND KEY RISKS

An environmental review of the project has been completed to identify all the commitments and agreements made within the environmental scoping report for the amended portions of the project. That is the Khan River Bridge construction and the strengthening and repair work to the Kranzberg, Stingbank and Swakop River Bridges as well as the berm construction to prevent sand build-up on the railway tracks, where necessary. Moreover, there are additional components that were not covered in the preceded EMP, which include storage and handling of more than 30 cubic meters of diesel tanks at one location and establishment of additional service roads to access work points along the railway line, if required. From this, a schedule of environmental commitments and risks has been produced, which details deliverables including measures identified for the prevention of pollution or damage to the environment during the construction phase. Monitoring criteria to adhere are listed in Appendix E.

It has been evaluated that the key risk associated with the bridge construction; repair and strengthening component would be contamination of the aquifer due to spillage as well as noise and dust pollution. The spillage could either be attributed to leaking fuels or chemicals; wastes associated with camp activities or derailment owing to the railway track repairs. This EMP stipulates various measures to be implemented to prevent spillages and to minimise impacts should an accident happen and a spillage occurs. This includes the stipulation that spillage containment kits need to be available at each site where this potential impact exists, as well as, having people trained to handle any spills that might occur.

TABLE 3 – ENVIRONMENTAL RISKS AND ISSUES, AND MITIGATION AND MONITORING MEASURES

ACTIVITY	RISKS AND POTENTIAL IMPACTS	MANAGEMENT / MITIGATION MEASURES	MONITORING REQUIREMENTS	FREQUENCY	RESPONSIBILITY
Development of access roads	<ul style="list-style-type: none"> - Removal of vegetation - Injury or mortality of reptiles and amphibians and unique biodiversity - Soil disturbance 	<ul style="list-style-type: none"> - Use existing tracks as practical as possible; - Route new or additional access tracks or roads around established and protected trees, and clumps of vegetation; - Identify important tree species (protected species) and mark with red/white tape to highlight to construction workers; - Remove invasive species; - Visually check the area before undertaking construction works for any environmentally sensitive fauna and flora; - Relocate slow-moving reptiles and amphibians and unique biodiversity away from the construction area; - No driving off designated access routes (into the bush) / off-road driving; - Speed restrictions applied; - Avoid natural drainage lines; - Install any erosion control measures to avoid surface runoff during the wet season, if required. 	<ul style="list-style-type: none"> - Daily visual observations during activity 	<ul style="list-style-type: none"> - Daily - Duration of works 	<ul style="list-style-type: none"> - Site Manager
Establishment and Management of Construction and associated work areas	<ul style="list-style-type: none"> - Noise and dust - Residential visual amenity - Community severance - Impacts on flora and fauna 	<ul style="list-style-type: none"> - Bring in plant and equipment only as and when required; - Suitable siting of construction office, waste collection area, and storage area for plant and equipment; - Downward lighting; - Application of good housekeeping; - No snares or poaching of animals (both wild and domestic) for pets or food; - Enforcement of QCPs; 	<ul style="list-style-type: none"> - Daily visual observations. - Site Manager to oversee the set-up of the construction working areas 	<ul style="list-style-type: none"> - Daily - Duration of construction works 	<ul style="list-style-type: none"> - Site Manager
Removal of vegetation in	<ul style="list-style-type: none"> - Loss of established 	<ul style="list-style-type: none"> - Identify important tree species (protected species) and mark with red/white tape to highlight it to construction workers, before 	<ul style="list-style-type: none"> - Oversee work - Daily 	<ul style="list-style-type: none"> - Duration of works 	<ul style="list-style-type: none"> - Site Manager

ACTIVITY	RISKS AND POTENTIAL IMPACTS	MANAGEMENT / MITIGATION MEASURES	MONITORING REQUIREMENTS	FREQUENCY	RESPONSIBILITY
servitudes and campsite areas	<ul style="list-style-type: none"> vegetation and protected species - Injury or mortality of reptiles and amphibians and unique biodiversity 	<ul style="list-style-type: none"> construction work commences; - Any trees felled, to be used in accordance with the permit or approval received from the local authority; - No animals or birds may be collected, caught, consumed or removed from the site by the contractor or personnel on-site; - Catch and release slow-moving reptiles and amphibians, move them at least 50m away from the site; - Clear only enough vegetation to meet the purpose intended; - Avoid removing established vegetation that does not interfere with the construction work; - Remove any invasive or alien species along the route; - Identify and mark some large individuals of <i>Acacia erioloba</i> and <i>Combretum imberbe</i> trees and other unique biological soil crust where they are present and make sure they are protected; - Inspect the working area before construction works commencing and continue with daily inspections; - Avoid disturbing geological features and rocky areas; - Enforcement of QCPs; 	observations		
Ground excavation including foundations and trenching	<ul style="list-style-type: none"> - Loss of established vegetation and protected species - Injury or mortality reptiles and amphibians 	<ul style="list-style-type: none"> - Site Manager or appropriate person to oversee all ground excavation works; - Daily inspection of the open trench for reptiles which must be removed to a safe location and not killed or harmed; - Ensure members of the team are trained in safe snake species identification and handling. Appoint a trained snake handler for the project (this can be a trained worker); - In the event of a heritage discovery, works to cease until advice from a specialist is obtained. A permit from the National Heritage Council will be required to relocate remains; 	<ul style="list-style-type: none"> - Daily visual observations. - Site Manager to oversee the set-up of the construction working areas 	<ul style="list-style-type: none"> - Daily - Duration of construction works 	<ul style="list-style-type: none"> - Site Manager

ACTIVITY	RISKS AND POTENTIAL IMPACTS	MANAGEMENT / MITIGATION MEASURES	MONITORING REQUIREMENTS	FREQUENCY	RESPONSIBILITY
		<ul style="list-style-type: none"> - Minimise stockpiling and specific works during high winds; - Apply precautionary principle when removing or relocating memorial sites, if discovered within the railway servitude. 			
<p>General construction activities: Generation of waste</p>	<ul style="list-style-type: none"> - Generation of waste, odours and pests 	<ul style="list-style-type: none"> - Application of a Waste Management Plan; - Waste to be collected, separated and stored in appropriately marked areas/containers (e.g. wood, metals, building rubble, garden waste, domestic waste); - Waste storage areas shall be appropriately signposted, well maintained and good housekeeping must be applied; - Waste will be disposed of to designated and appropriate facilities, which will be identified in the Waste Management Plan (most likely the waste dump site close to the route alignment); - Waste will not be burnt on site (burnt on designated disposal site); - Site induction and training of staff. 	<ul style="list-style-type: none"> - Operate in accordance with the Waste Management Plan. - Update the Waste Management Plan as and when required. - Daily and weekly checks of the waste collection area. 	<ul style="list-style-type: none"> - Daily - Weekly - Duration of construction works 	<ul style="list-style-type: none"> - Site Manager - DEO
<p>Operating plant and equipment</p>	<p>Local Community:</p> <ul style="list-style-type: none"> - Reduced local air quality (vehicle emissions) - Increase in local noise levels 	<ul style="list-style-type: none"> - Avoid idling of plant and equipment (i.e. turn off when not in use); - Minimise the multiple uses of noisy plant and equipment; - Vehicles to be kept in good working order and well maintained and serviced in accordance with specific requirements; - Notice to the surrounding community of when noisy and dusty activities are to be undertaken; - Site inductions should be conducted. 	<ul style="list-style-type: none"> - Daily observations - Weekly checks by the Site Manager 	<ul style="list-style-type: none"> - Daily - Weekly 	<ul style="list-style-type: none"> - Site Manager

ACTIVITY	RISKS AND POTENTIAL IMPACTS	MANAGEMENT / MITIGATION MEASURES	MONITORING REQUIREMENTS	FREQUENCY	RESPONSIBILITY
<p>Use and maintenance of plant and equipment: Spills of fuels, oils or chemicals</p>	<ul style="list-style-type: none"> - Loss of containment, causing localised ground contamination, potential groundwater contamination - Fuel tank (s) explosion, fire and spills 	<ul style="list-style-type: none"> - Spill kits in designated areas around sites; - Contain and clean up the spill following emergency procedures; - Report spill as soon as possible; - All plant and material to be well maintained and have appropriate containment (drip trays); - Site Induction and appropriate training of nominated persons; - Suitable PPE and equipment when handling hazardous chemicals, liquids and materials; - Storage of vehicles away from the area where the aquifer / shallow groundwater is located; - Buildings, roadworks, structures and plant are designed, constructed, equipped and maintained to prevent or minimise the danger of fires and explosions; - Awareness and training of staff to act cautious and comply with the provisions of the Petroleum Product Regulations and other laws relating to fires and explosions; - Buildings, structures and plant where fuel are handled or stored must be suitably signposted clearly; - Adequate fire-extinguishing appliances shall be available, maintained in good working order and easily accessible; - A written fire emergency plan should be available on the premises; - Employees must be trained on fire fighting and the fire-fighting plan must be provided to employees; - No person may near fuel tank (s) or any other fuel products throw, leave or create any open or naked spark, light or flame or any burning or smouldering material that may cause danger or fire explosion; - No person may keep a vehicle running while petrol or diesel is being 	<ul style="list-style-type: none"> - Daily observations and checks of plant and equipment 	<ul style="list-style-type: none"> - Daily 	<ul style="list-style-type: none"> - Site Manager

ACTIVITY	RISKS AND POTENTIAL IMPACTS	MANAGEMENT / MITIGATION MEASURES	MONITORING REQUIREMENTS	FREQUENCY	RESPONSIBILITY
		<ul style="list-style-type: none"> – dispensed into the tank of the vehicle; – No person may smoke in the forecourt of a fuel tank (s) where petrol or diesel is dispensed; – No person may receive or make calls from or keep active, a cellular telephone or any other electronic communication apparatus within two (2) metres from a dispensing pump In the case of a fuel spill, steps in accordance with good petroleum industry practices to clean up such spill shall be undertaken; – For a major spill that is a spill of more than 200 litres, the Minister must be informed as per the Petroleum products regulations. 			
General construction activities: Energy, water and materials use	<ul style="list-style-type: none"> – Use of resources 	<ul style="list-style-type: none"> – Turn off plant and equipment when not in use; – Regular maintenance of plant and equipment; – Minimise/optimize workforce travel; – Source sustainable material where possible; – Apply waste hierarchy and reuse and recycle; – Source materials locally to reduce transportation costs; – Source sustainable material where possible; – Use natural resources sustainably. 	<ul style="list-style-type: none"> – Daily observations 	<ul style="list-style-type: none"> – Daily 	<ul style="list-style-type: none"> – Site Manager
Vehicle movements on site	<ul style="list-style-type: none"> – Hazards to workers (collisions leading to injuries) 	<ul style="list-style-type: none"> – The speed limit of 40km/hr (or as determined by the ER) should be enforced; – Site induction and training of staff; – Reversing of vehicles overseen with appropriate warnings (lights/sounds). 	<ul style="list-style-type: none"> – Daily observations 	<ul style="list-style-type: none"> – Daily 	<ul style="list-style-type: none"> – Site Manager
General construction activities: Heritage Sites	<ul style="list-style-type: none"> – Heritage impacts Monuments, graves 	<ul style="list-style-type: none"> – The contractor’s vehicles, materials and employees must never venture or operate within 50m of the heritage monuments. Should a grave be unearthed the PM should contact the National Heritage Council who will advise what to do. 	<ul style="list-style-type: none"> – Case by case 	<ul style="list-style-type: none"> – Case by case 	<ul style="list-style-type: none"> – Site Manager

8 IMPLEMENTATION OF THE EMP


No significant impacts are anticipated for the activities that have been identified and management and mitigation measures are in place for potential risks.

This EMP:

- A. Has been prepared according to a contract with the proponent
- B. Has been prepared based on information provided to ECC up to September 2020
- C. Is for the sole use of the proponent, for the sole purpose of an EMP
- D. Must not be used (1) by any person other than the proponent or (2) for a purpose other than an EMP, and
- E. Must not be copied without the prior written permission of ECC.

ECC has prepared the EMP based on information provided by the proponent, specialist reports and the environmental scoping report for the bridge construction, repair and strengthening works.

APPENDIX A – ENVIRONMENTAL CLEARANCE CERTIFICATE



REPUBLIC OF NAMIBIA

MINISTRY OF ENVIRONMENT AND TOURISM

Tel: (00 26461) 284 2111
Fax: (00 26461) 232 057

E-mail: rikka.shikongo@met.gov.na

Enquiries: Ms. Rikka Shikongo

Cnr Robert Mugabe &
Dr Kenneth Kaunda Street
Private Bag 13306
Windhoek
Namibia

14th November 2018

OFFICE OF THE ENVIRONMENTAL COMMISSIONER

Mr. Willem Goeiemann
Permanent Secretary
Ministry of works and Transport
Private Bag 13341
Windhoek

Dear Mr. Goeiemann

SUBJECT: ENVIRONMENTAL CLEARANCE CERTIFICATE FOR THE PROPOSED UPGRADE OF THE EXISTING RAILWAY LINE LOCATED BETWEEN WALVIS BAY STATION AND KRANZBERG STATION, ERONGO REGION

Environmental Scoping Report and Environmental Management Plan submitted are sufficient as these have made an adequate provisions of the environmental management concerning the proposed activities. From this perspective regular environmental monitoring and evaluations on environmental performance should be conducted. Targets for improvements should be established and monitored from time to time.

This Ministry reserves the right to attach further legislative and regulatory conditions during the operational phase of the project. I issue the clearance with the following condition that all applicable permits should be obtained.

On the basis of the above, this letter serves as an environmental clearance certificate for the project to commence. However, this clearance letter does not in any way hold the Ministry of Environment and Tourism accountable for misleading information, nor any adverse effects that may arise from this project's activities. Instead, full accountability rests with the Ministry of Works and Transport and their consultant.

This environmental clearance certificate is valid for a period of 3 (three) years, from the date of issue (27 October 2017) unless withdrawn by this office.

Yours sincerely,



MINISTRY OF ENVIRONMENT AND TOURISM

Private Bag 13306
Windhoek, Namibia

2018-11-15

ENVIRONMENTAL COMMISSIONER

Office of the
Environmental Commissioner

Teofilus Nghitila
ENVIRONMENTAL COMMISSIONER
Office of the
Environmental Commissioner



“Stop the poaching of our rhinos”

All official correspondence must be addressed to the Permanent Secretary

APPENDIX B – AUTHOR’S CURRICULUM VITAE

APPENDIX C (1) – CONSTRUCTION MONTHLY INSPECTION REPORT

INSPECTION DATE: _____

CONTRACTORS ON SITE: _____

INSPECTION COMPLETED BY: _____

SUMMARY OF CONSTRUCTION ACTIVITIES OCCURRING:

CONSTRUCTION					
Ref No.	Item	Requirements	Responsibility	Compliant	Notes / Action Taken / Corrective Action Required
1	- Development of access roads	<ul style="list-style-type: none"> - Use existing tracks as much as possible - Route new or additional access roads or tracks around established and protected trees, and clumps of vegetation - Identify important tree species (protected species) and mark with red/white tape to highlight to construction workers - Remove invasive species - Visually check the area before undertaking construction works - Relocate slow-moving reptiles and amphibians and unique biodiversity away from the construction area - No driving off designated access routes (into the 	Site Manager	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	

CONSTRUCTION					
Ref No.	Item	Requirements	Responsibility	Compliant	Notes / Action Taken / Corrective Action Required
		<ul style="list-style-type: none"> bush) / off-road driving – Speed restrictions applied – Avoid natural drainage lines – Install any erosion control measures to avoid surface runoff during the wet season 			
2	Establishment and Management of Construction working areas	<ul style="list-style-type: none"> – Bring plant and equipment as and when required – Suitable siting of construction office, waste collection area, and storage area for plant and equipment – Downward lighting – Application of good housekeeping – No snares or catching of animals (wild and domestic) for pets or food – Enforcement of QCPs 	Site Manager	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	
3	Removal of vegetation in servitudes and campsite areas	<ul style="list-style-type: none"> – Identify important tree species (protected species) and mark with red/white tape to highlight to construction workers, before vegetation removal – Any trees felled, to be used in accordance with the permit – Avoid removing established vegetation that does not interfere with the construction work – No animals or birds may be collected, caught, consumed or removed from the site by the Contractor or personnel on site – Catch and release slow-moving reptiles and amphibians, move at least 50m from the site – Clear only enough vegetation to meet the purpose intended 	Site Manager	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	

CONSTRUCTION					
Ref No.	Item	Requirements	Responsibility	Compliant	Notes / Action Taken / Corrective Action Required
		<ul style="list-style-type: none"> - Remove any invasive or alien species along the route - Identify and mark some large individuals of <i>Acacia erioloba</i> and <i>Combretum imberbe</i> trees and biological soil crust where they are present and make sure they are protected - Check the working area before construction works commencing daily - Avoid disturbing geological features and rocky areas - Enforcement of QCPs 			
4	Ground excavation and trenching or foundations	<ul style="list-style-type: none"> - Site Manager or appropriate person to oversee all ground excavation works - Daily inspection of the open trench for reptiles. Must be removed to a safe location and not killed or harmed - Ensure members of the team are trained in safe snake handling or appoint a trained snake handler for the project (this can be a trained worker) - In the event of a heritage discovery, works to cease until advice from a specialist is obtained. A permit from the National Heritage Council will be required to relocate remains - Apply precautionary principle when removing or relocating memorial sites, if discovered within the railway servitude - Minimise stockpiling and specific works during high winds 	Site Manager	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	
5	General construction activities: Generation of	<ul style="list-style-type: none"> - Application of Waste Management Plan - Waste to be collected, separated and stored in 	- Site Manager	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	

CONSTRUCTION					
Ref No.	Item	Requirements	Responsibility	Compliant	Notes / Action Taken / Corrective Action Required
	waste	<p>appropriately marked areas/containers (e.g. wood, metals, building rubble, garden waste, domestic waste)</p> <ul style="list-style-type: none"> – Waste storage areas shall display appropriate signage, be well maintained and good housekeeping will be applied – Waste will be disposed of to designated and appropriate facilities, which will be identified in the Waste Management Plan – Site induction and training of staff 	DEO		
6	Operating plant and equipment	<ul style="list-style-type: none"> – Avoid idling of plant and equipment (turn off when not in use) – Minimise the multiple uses of noisy plant and equipment – Vehicles to be in good working order and well maintained and serviced in accordance with specific requirements – Notice to the surrounding community of when noisy and dusty activities are to be undertaken – Site Induction 	Site Manager	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	
7	Use and maintenance of plant and equipment: Spills of fuels, oils or chemicals, fuel tank (s) explosion, fire and spills	<ul style="list-style-type: none"> – Spill kits in designated areas around the site – Contain and clean up spill following emergency procedures – Report spill as soon as possible – All plant and material to be well maintained and have appropriate containment (drip trays) – Site Induction and appropriate training of nominated persons to contain/clean up spills 	Site Manager	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	

CONSTRUCTION					
Ref No.	Item	Requirements	Responsibility	Compliant	Notes / Action Taken / Corrective Action Required
		<ul style="list-style-type: none"> – Suitable PPE and equipment when handling hazardous chemicals, liquids and materials – Storage of vehicles away from the area where the aquifer / shallow groundwater is located – Buildings, roadworks, structures and plant are designed, constructed, equipped and maintained to prevent or minimise the danger of fires and explosions – Awareness and training of staff to act cautious and comply with the provisions of the Petroleum Product Regulations and other laws relating to fires and explosions – Buildings, structures and plant where fuel are handled or stored must be suitably signposted clearly – Adequate fire-extinguishing appliances shall be available, maintained in good working order and easily accessible – A written fire emergency plan is available on the premises and implemented – Employees must be trained on fire fighting and the fire-fighting plan must be provided to employees – No person may near fuel tank (s) or any other fuel products throw, leave or create any open or naked spark, light or flame or any burning or smouldering material that may cause danger or fire explosion – No person may keep a vehicle running while petrol or diesel is being dispensed into the tank of the 			

CONSTRUCTION					
Ref No.	Item	Requirements	Responsibility	Compliant	Notes / Action Taken / Corrective Action Required
		vehicle – No person may smoke in the forecourt of a fuel tank (s) where petrol or diesel is dispensed – No person may receive or make calls from or keep active, a cellular telephone or any other electronic communication apparatus within two (2) metres from a dispensing pump In the case of a fuel spill, steps in accordance with good petroleum industry practices to clean up such spill shall be undertaken			
8	General construction activities: Energy, water and material use	– Turn off plant and equipment when not in use – Regular maintenance of plant and equipment – Minimise/optimize workforce travel – Source sustainable material where possible – Apply waste hierarchy and reuse and recycle – Source materials locally to reduce transportation – Source sustainable material where possible – Apply waste hierarchy and reuse and recycle material where possible – Use water and energy sustainably	Site Manager	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	
10	Vehicle movements on site	– The speed limit of 40km/hr. – Site induction and training of staff. – Reversing of vehicles overseen with appropriate warnings (lights/sounds).	Site Manager	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	
11	General construction activities:	– The Contractor’s vehicles, materials and employees must never venture or operate within 50m of the heritage monuments. Should a grave be unearthed the PM should contact the appropriate authorities who will advise what to do	Site Manager	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	

APPENDIX C (2) – CONSTRUCTION MONTHLY COMPLIANCE REPORT

INSPECTION DATE: _____

INSPECTION COMPLETED BY: _____

APPROVED BY: _____

SUMMARY OF CONSTRUCTION ACTIVITIES OCCURRING:

CONTRACTORS ON SITE:

NON-CONFORMANCE

AREA OF ACTIVITY:

REASON:

RESPONSIBLE PARTY

RESULT:

CORRECTIVE ACTION TAKEN:

FOLLOW-UP ACTION TO BE TAKEN:

ADDITIONAL COMMENTS:

GOOD PERFORMANCE

Description of activity or action in which contract went beyond compliance towards responsible care for the environment:

ADDITIONAL COMMENTS

APPENDIX C (3) – MAINTENANCE MONTHLY INSPECTION REPORT

INSPECTION DATE: _____

INSPECTION COMPLETED BY: _____ CONTRACTORS ON SITE: _____

SUMMARY OF MAINTENANCE ACTIVITIES OCCURRING:

OPERATIONS: MAINTENANCE					
Ref No.	Item	Requirements	Responsibility	Compliant	Notes / Action Taken / Corrective Action Required
12	Construction and campsite environmental condition	<ul style="list-style-type: none"> - Regular monitoring: Identify and mark some large individuals of <i>Acacia erioloba</i> and <i>Combretum imberbe</i> trees and biological soil crusts where they are present and make sure they are protected. Use them as an indicator of environmental/aquifer wellbeing in the area - Regular communication with the community 	Site Manager and DEO	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	
13	Increase in population in the area/community activities	<ul style="list-style-type: none"> - Borehole/aquifer protection measures to be implemented - Educating local communities 	Site Manager and DEO		

OPERATIONS: MAINTENANCE					
Ref No.	Item	Requirements	Responsibility	Compliant	Notes / Action Taken / Corrective Action Required
14	Monthly checks and maintenance activities: Use of plant and equipment	<ul style="list-style-type: none"> - Spill kits in designated areas around the site - Contain and clean up any spills following emergency procedures - All plant and material to be well maintained and have appropriate containment (drip trays) - Major maintenance activities of plant and equipment shall be undertaken off-site - Site Induction and appropriate training of nominated persons - Suitable PPE and equipment when handling hazardous chemicals, liquids and materials 	Site Manager	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	
15	Monthly checks and maintenance activities: Generation of waste	<ul style="list-style-type: none"> - Application of Waste Management Plan - Waste to be collected and separated - Waste will be disposed of to designated and appropriate facilities, which will be identified in the Waste Management Plan 	Site Manager and DEO	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	
16	Maintenance of swathe within the servitude	<ul style="list-style-type: none"> - Visually check the area before undertaking maintenance works - Relocate slow-moving reptiles and amphibians and biodiversity away from the cleared area - No driving off designated access routes (into the bush) / off-road driving - Speed restrictions applied 	Site Manager	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	

APPENDIX D – TEMPLATE WASTE MANAGEMENT PLAN

INTRODUCTION

This Waste Management Plan aims to achieve sustainable waste management. The main purpose is to outline waste streams and identify the best treatment and disposal option for each one, applying the waste management hierarchy and avoiding as much waste as possible ending up at landfill or being burnt. Besides, it also outlines any potential economical and investment requirements for the treatment and/or disposal of waste.

This Waste Management Plan is a dynamic document and should be updated during the annual review, which is undertaken by the PM / Site Manager, ER, DEO and IECO.

PRINCIPLES

The following principles should be applied to the management of waste on site:

- The waste hierarchy (avoid, reuse, recycle, recovery, disposal) should be applied for each waste stream so that the impact on the environment is reduced as much as possible;
- Waste collection area will be identified before construction activities, and demarcated and secured with appropriate fencing;
- Bins shall be emptied regularly to avoid pests and bad odours;

Table 1 – Waste Management Roles – to be completed before the commencement of the project

ROLE	INDIVIDUALS NAME	CELL NUMBER
Site Manager		
Contractors (i.e. where applicable)		
Responsible person for the Waste Management Plan		

The following waste management measures shall be followed:

- Waste will be collected, separated and stored in a designated area which will be appropriately fenced and signposted to keep out unauthorised people and animals;
- Waste collection containers will be of appropriate design to ensure that no waste can escape, and will be labelled with the waste type (e.g. wood, metals, building rubble, garden waste, domestic waste);
- Waste storage areas shall be kept clean and tidy at all times;
- Bins shall be emptied regularly to avoid pests and bad odours; and
- No burning of waste on-site will be allowed.

Any hazardous material and wastes (including medical waste, if necessary) shall be managed safely and responsibly to prevent contamination of soils, pollution of water and/or harm to people or animals as a result of the use of these materials. Hazardous and non-hazardous waste shall be stored separately at all times.

WASTE MANAGEMENT ARRANGEMENTS

The project shall have a dedicated waste collection, sorting and pickup area. This area will be fenced off, clearly signposted and access shall be by those authorised.

The following information shall be provided in this section:

- Location plan of the dedicated area
- Arrangements to appropriately secure and designate the area (fencing, locked gate)
- Access arrangements
- Drainage arrangements
- Set up the site
- Authorised personnel
- Any rules or codes of conduct

WASTE GENERATED

Provide all waste streams, type and quantity, allowing a review to be undertaken and the most appropriate waste disposal options are identified.

Table 2 – Waste Type and Management

WASTE TYPE	ESTIMATED QUANTITY	WASTE MANAGEMENT	WASTE CARRIER INFORMATION AND SITE
Vegetation	(example only) 1 small Thorn tree Other bushes and vegetation	Recover, store and replant thorn tree Other bushes etc. give away to community or compost	
Packaging and plastic	(example only) 3 cubic meters	Take to an approved and permitted landfill site	Company Name: Phone No:
Extracted Material	(example only) 100m ³	Contour along the riverbank, flatten and rake to mould in with the environment, in an area where minimum smothering of other vegetation occurs	

APPENDIX E – MONITORING PLAN

Item	Rationale	Monitoring Area / Site Description / Details	Frequency	Phase (Construction, Operations, Decommissioning)	Parameters	Quality Control Point
Groundwater monitoring	Should it become necessary to drill borehole sensors must be installed to monitor water level changes? Groundwater abstractions, rest water level, water quality	Water monitoring level sensors (pressure sensors) installed in the boreholes if it is necessary to drill a borehole. Abstraction sites or boreholes location	Daily/Weekly/Monthly/Yearly monitoring	Before construction and during construction	Water level, water quality, abstraction volumes	Yes
Vegetation Clearing	Prevent alien species entering the project area. Inspect and ensure equipment is clean before use on-site and arrives free from soil, mud and seeds from other areas. Remove any invasive or alien species along the route. Identify and mark protected flora/trees where they are present and make sure they are least impacted	Visual inspections for weed and seeds. Visual inspection, marking off with red and white tape	Daily Weekly	Construction	Complete forms as stipulated in EMP	No

Biodiversity Protection	Ensure reptiles that fall into any construction holes during the night are removed safely in the morning. Observe the presence of endemic, rare and endangered biodiversity within the construction site	Visual inspections/observations	Daily	Construction	Species identification and abundance records	Yes
Aquifer protection	Control activities that could lead to groundwater contamination.	Check that spill kits are appropriately distributed. Ensure bunded refuelling area and wash bays and enforce the use of drip trays. No major maintenance on site. Best practice camp waste management. Concrete batching on an impermeable surface. Check equipment and tanks for leaks. Chemicals properly stored. Environmentally friendly washing detergents used. Adequate portable toilets	Daily Weekly Annually	Construction and Operations	Complete forms as stipulated in EMP	Yes
Community disturbance	Noise, dust and camp lighting but also interaction with the community (e.g. HIV/Aids), increased road traffic etc. It is always best to have good community communications and to work with the local community. The number and type of complaints from the community is a good indication of what needs to be improved to reduce impact in this regard.	Ensure dust suppression measures are enforced (e.g. water cart) and no stacking of ground soil during high wind conditions. Visual checks Point covered lights downwards and away from other settlements. HIV/Aids education Speed restrictions	Daily Weekly Annually	Construction and Operations	Complete forms and enforce measures as stipulated in EMP	Yes

Waste Management	Avoid, reuse, recycle, recovery, appropriate disposal should be applied for each waste stream to reduce impacts	Visual and smell and the absence of pests scrounging are the best checks. Also regular checks on the condition of the waste area and bins (not cracked or broken), that waste is being properly separated and disposed of.	Daily Weekly Annually	Construction and Operations	Complete forms and enforce measures as stipulated in the EMP waste management plan	Yes
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