



SAFE ROADS TO PROSPERITY

ENVIRONMENTAL AND SOCIAL PLAN

PROCUREMENT REFERENCE NO: W/DP/RA-10/2023

**CONSTRUCTION OF DR 4103 OKATANA-AMUTANGA-
OMULATHITU-ONANIME, IN THE OKATANA
CONSTITUENCY**

ENVIRONMENTAL AND SOCIAL PLAN

SECTION V – EMPLOYER’S REQUIREMENTS

PART D: ENVIRONMENTAL AND SOCIAL PLAN

ENVIRONMENTAL AND SOCIAL MANAGEMENT PROGRAMME

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INTRODUCTION

The ESMP forms part of the Environmental Investigation done on the proposed premises. The Environmental Management Plan must be read in conjunction with the contract documents including the Specifications and where applicable, the Bill of Quantities. Where a conflict exists between the Specifications or Bill of Quantities and the Environmental Management Plan the matter shall be brought to the attention of the Engineer for resolution.

Environmental Management Plans (ESMPs) are important tools that bridge the gap between the completion of the Environmental Investigation and the implementation and the continuation of a project, particularly with regard to implementing the mitigation measures recommended during the construction and operation of the proposed project. Monitoring, auditing and taking corrective actions during their implementation are also described in this section as crucial interventions to successfully implant the ESMP.

An ESMP is typically drawn up after an Environmental assessment procedure and is implemented during the construction phase and in some cases, such as in the operational phase of the road construction, throughout the project lifecycle up to and including decommissioning. An ESMP allocates responsibility, resources and deadlines to each of the actions.

An ESMP must detail actions to ensure compliance with regulatory bodies and that environmental performance is verified through information on impacts as they occur.

An ESMP Must:

- define the various measures to be taken during the life of a project (in this case, construction and operation) in order to enhance positive and minimise adverse environmental effects and meet the performance specifications;
- define the actions needed to implement these measures;
- describe how this will be achieved; and
- allocate responsibilities.

ESMP implementation is a cyclical process that converts mitigation measures into actions and through cyclical monitoring, auditing, review and corrective action, ensures conformance with stated ESMP aims and objectives. Through monitoring and auditing, feedback for continual improvement in environmental performance must be provided and corrective action taken to ensure that the ESMP remains effective.

The objectives of an ESMP should include (Hill, 2000):

- ensuring compliance with regulatory authority stipulations which may be local, national and/or international;
- ensuring that there is sufficient allocation of resources so that the scale of Environmental Assessment follow-up activities is consistent with the significance of project impacts;
- verifying environmental performance through information on impacts as they occur;

- responding to changes in project implementation not considered in the environmental investigation;
- responding to unforeseen events; and
- providing feedback for continual improvement in environmental performance.

This section documents the measures that need to be taken to mitigate the potential impacts of the project. It envisaged that the life of the road will extend to at least 7 years and the ESMP is thus drafted on this presumption. As the ESMP is a working document, changes may be made with regards to future extensions of the project life as well as the consideration of Best Available Technology (BAT).

a. Adherence To The Environmental Management Plan

The Resident Engineer will be _____ who, with the Environmental Control Officer (ECO), will be responsible for monitoring compliance with the Environmental Management Plan.

The Contractor shall ensure that all construction staff, sub-contractors, suppliers, etc. are familiar with, understand and adhere to, the Environmental Management Plan. Failure by any Employee of the Contractor, Sub-contractors, and Suppliers etc. to show adequate consideration to the environmental aspects of this contract shall be considered sufficient cause for the ECO to instruct the Principal Agent to have the Employee removed from the site. The Principle Agent will also order the removal of equipment form the site that is causing continual environmental damage (e.g. leaking oil or diesel).

The Principal Agent shall order the Contractor to suspend part or all of the works if the Contractor and/or any Sub-contractors, Suppliers, etc., fail to comply with both the Environmental Management Plan and construction procedures supplied by the Contractor. The suspension will be enforced until such time as the offending procedure or requirement is corrected and/or if required remedial measures put in place. No extension of time will be granted for such delays and all costs will be borne by the Contractor.

b. Roles And Responsibilities

The implementation of the ESMP requires the involvement of several stakeholders, each fulfilling a different but vital role to ensure sound environmental management during each phase.

i. Engineer's Representative (ER)

The Engineer will delegate powers to the Engineer's Representative (ER) on site who would act as the Employer's implementing agent and has the responsibility to ensure that the Employer's responsibilities are executed in compliance with relevant legislation and the ESMP. The Engineer also has the responsibility to approve the appointment of the Environmental Control Officer (ECO).

Any on-site decisions regarding environmental management are ultimately the responsibility of the ER. The ER will have the following responsibilities in terms of the implementation of this ESMP:

- Controlling that the necessary environmental authorizations and permits have been obtained by the Contractor.
- Assisting the Contractor in finding environmentally responsible solutions to problems with input from the ECO (Environmental Control Officer) where necessary.
- Taking appropriate action if the specifications are not followed.
- Ordering the removal of person(s) and/or equipment not complying with the ESMP specifications.
- Recommending and issuing fines for transgressions of site rules and penalties for contravention of the ESMP.
- Advising on the removal of person(s) and/or equipment not complying with the specifications.
- Auditing the implementation of the ESMP and compliance with authorization on a monthly basis.
- Undertaking a continual review of the ESMP and recommending additions and/or changes to the document after completion of the contract.

ii. Environmental Control Officer (ECO)

The Environmental Control Officer (ECO) will be a competent person from the staff of Contractor to implement the on-site environmental management of this ESMP by the Contractor. The ECO shall be on site daily and the ECO's duties will include the following:

- Assisting the ER in ensuring that the necessary environmental authorizations and permits have been obtained.
- Maintaining open and direct lines of communication between the ER, Employer, Contractor and interested and affected parties (I&APs) with regard to environmental matters.
- Convening and facilitating public meetings.
- Regular site inspections of all construction areas with regard to compliance with the ESMP.
- Monitoring and verifying adherence to the ESMP, monitoring and verifying that environmental impacts are kept to a minimum.
- Assisting the Contractor in finding environmentally responsible solutions to problems.
- Monitoring the undertaking by the Contractor of environmental awareness training for all new personnel coming onto site.

iii. Liaising with Contractors

The ECO is responsible for informing the contractors of any decisions that are taken concerning environmental management during construction phase. This may also include advising and informing the contractors of the necessary corrective action to be taken.

iv. ESMP Administration

Copies of the ESMP shall be kept at the site office and will be distributed to all senior contract personnel. All senior personnel shall be required to familiarize themselves with the contents of this document.

c. Environmental Awareness Training

Before any work is commenced on the Site, the Contractor shall ensure that adequate environmental awareness training of senior site personnel takes place and that all construction workers receive an induction presentation on the importance and implications of the ESMP. The Contractor shall liaise with the Engineer during establishment phase to fix a date and venue for the training and to agree on the training content.

The Contractor shall provide a suitable venue and ensure that the specified Employees' attend the course. The Contractor shall ensure that all attendees sign an attendance register, and shall provide the ER with a copy of the attendance register. The presentation shall be conducted, as far as is possible, in the Employees' language of choice.

As a minimum, training should include:

- Explanation of the importance of complying with the ESMP.
- Discussion of the potential environmental impacts of construction activities.
- The benefits of improved personal performance.
- Employees' roles and responsibilities, including emergency preparedness.
- Explanation of the mitigation measures that must be implemented when carrying out their activities.
- Explanation of the specifics of this ESMP and its specification (no-go areas, etc.)
- Explanation of the management structure of individuals responsible for matters pertaining to the ESMP.
- The contractor shall keep records of all environmental training sessions, including names, dates and the information presented.

d. Public Participation

An on-going process of public participation shall be maintained during construction to ensure the continued involvement of interested and affected parties (I&APs) in a meaningful way. Public meetings to discuss progress and any construction issues that may arise shall be held at least every two months and more regularly if deemed necessary by the ER. These meetings shall be arranged by the ECO but shall be facilitated by the ER. The Contractor shall present a progress report at each public meeting. All I&APs that participated in or were informed during the EIA shall be invited to each of the public meetings.

D. Environmental And Social Management Plan

The ESMP applies in two sections of the proposed project. The first is the Construction phase. During the construction phase the mentioned activities in the

next table will be executed. The impacts are summarized in the section – Environmental Management Issues Requiring Mitigation. To mitigate and manage the bio-physical and socio-economic impacts during the construction period, the following:

e. Site Establishment

Permission from the Tsandi Settlement office will be obtained for an approved site where equipment, materials, and accommodation can be set up and stored.

f. Construction Procedures

The Contractor shall submit written procedures for all activities that could be potentially harmful to the environment. Such construction procedures shall include timing of activities, equipment and materials to be used (where applicable), visual screening, protection of the site, methods for cleaning the site both during construction and on completion of the works, disposal of waste and any other information deemed necessary. Construction procedures shall be submitted to the Principal Agent at least five working days prior to commencing work on an activity. The Contractor shall not commence work on any activity until such time as the construction procedure has been scrutinized and agreed to in writing by the Principal Agent.

In addition, the Principal Agent may call for emergency construction procedures to be submitted within 24 hours of work commencing on activities that are deemed harmful to the environment and for activities of which he was previously unaware. If absolutely necessary, changes may be made to construction procedures once construction has commenced. In such instances the proposed changes must be agreed to in writing by the Principal Agent prior to commencing with the change.

g. Hours Of Operation

The Contractor's hours of operation shall be as agreed with the Principle Agent. The Principal Agent shall be notified of any written agreements varying the standard hours of work prior to the work taking place.

h. Third Party Or Public Complaints

The Contractor shall be responsible for responding to the Principal Agent in writing with respect to queries and/or complaints relating to construction activities. The Contractor shall notify the Principal Agent of any complaints being lodged by a third party. The Contractor shall be responsible for maintaining a complaint's register in which all complaints are recorded, as well as actions taken. This register shall be made available to the Principal Agent on request. The complaint register should at all times be available to the ECO.

i. Emergency Procedures

i. Fire

The Contractor shall take all the necessary precautions to ensure that fires are not started as a result of activities on site. The Contractor shall report all fires immediately to the Principal Agent.

The Contractor shall be liable for any expenses incurred by any organizations called to assist with fighting fires and for any costs relating to the rehabilitation of burnt areas and/ or property, and/or persons should the fire be caused by activities on the site. No open fires for heating or cooking shall be permitted on site. Closed fires or stoves shall only be permitted at agreed designated safe sites in the construction site. Adequate suitable firefighting equipment shall be provided at each fire place or stove. The Contractor is advised that sparks generated during operations involving welding, cutting of metal or gas cutting can cause fires. Every possible precaution shall therefore be taken when working with this equipment near potential sources of combustion. Such precautions include having a suitable, tested, and approved fire extinguisher immediately available at the site of any such activities and the use of welding curtains. The Contractor shall be responsible for providing the necessary basic fire-fighting equipment. All equipment shall be maintained in good operating order.

ii. Accidents on Site

The Contractor shall comply with the Occupational Health and Safety Act, National Building Regulations and any other national, regional, or local regulations with regard to safety onsite. The Contractor shall ensure that contact details of the local medical services are available to the relevant construction personnel prior to commencing work.

iii. Petroleum, Chemical, Harmful and Hazardous Materials

The Contractor shall ensure that he is familiar with the requirements for the safe storage, handling and disposal of petroleum, chemical, harmful and hazardous materials. The Contractor shall be responsible for establishing an emergency procedure for dealing with spills or release of these substances. He shall also ensure that the relevant construction personnel are familiar with these emergency procedures. The Contractor shall submit his emergency procedure to the Principal Agent prior to bringing on site any such substances. All spills or accidents involving such materials are to be recorded. The clean-up of spills and any damage caused by the spill shall be for the Contractor's account.

CONSTRUCTION PHASE

ENVIRONMENTAL MANAGEMENT IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITY FOR IMPLEMENTATION
SOCIAL ENVIRONMENT				
Conflict.	Communities dissatisfied with the activities Nuisances caused by the building contractor	<p>Clear communication between contractor and community and farmers, on the schedule/timeframe for operations and the duration of the construction phase. This should be provided for in the form of a Public Consultation Plan (PCP) which should include at least:</p> <ul style="list-style-type: none"> • One meeting for site-handover and to introduce the local community and farmers to the Contractor • A system for the on-going management of the communication between the Contractor and local community and farmers, which should include: <ul style="list-style-type: none"> ○ A means for lodging a complaint concerning construction activity ○ Provision of feedback to the plaintiff from the Contractor stating how the issue is being addressed ○ Report back on issues raised and how addressed from the Contractor to the RE and client • RE and contractor should present detailed construction programme during a meeting with the local community and farm owners. 	Minutes of meetings Draw up PCP	RE, EC and Contractor
		<ul style="list-style-type: none"> • Ensure that relevant stakeholders are adequately informed throughout construction and that there is effective communication with and feedback to the RE and client. • The contractor shall appoint a person from the construction team to take responsibility for the 	Meetings and communication.	RE, EC and Contractor.

ENVIRONMENTAL MANAGEMENT IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITY FOR IMPLEMENTATION
		implementation of all provisions of this EMP.		
	Delayed construction, which has cost implications and causes low user satisfaction.	<ul style="list-style-type: none"> Programme delays into the schedule and communicate this to the community. 	RE and Contractor to constantly monitor delays and adapt programme accordingly. Constantly update communities on delays and latest schedules.	RE and Contractor.
	Poaching and trapping	<ul style="list-style-type: none"> No poaching or trapping will be allowed and is a criminal offence. 	RE , EC and Contractor to monitor	Contractor.
Dangerous work area	Existence of dangerous/hazardous work areas	<ul style="list-style-type: none"> The work areas must be set out and isolated and demarcated by means of danger tape on a daily basis. The demarcated work area may only contain materials, equipment, and personnel required to execute the work. Once the work for the day is completed, the demarcated area must be cleaned of any spilled materials and waste products. This must be disposed of in the allocated containers. If the work area is dangerous or sensitive, the danger tape should stay in place until work is complete or not sensitive anymore. 	Inspections for approval. Record excavation/backfill schedule in the site instruction records.	RE and Contractor.

ENVIRONMENTAL MANAGEMENT IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITY FOR IMPLEMENTATION
Threats to the health and safety of construction workers.	Insufficient provision of safety equipment Negligent behaviour	<ul style="list-style-type: none"> The contractor must adhere to the regulations pertaining to health and safety, including the provision of protective clothing, failing which the contract may be suspended with immediate effect. Failure to remedy such lack of provision may result in the immediate cancellation of the contract according to the clauses stipulated in the Specific and General Conditions of Contract. The contractor should comply with all relevant labour laws as stipulated by the Labour Act. First aid kits to be readily available in case of injuries 	Regular visual inspection and records kept of safety equipment and materials issued.	RE and Contractor.
		<ul style="list-style-type: none"> Dust protection masks shall be provided to staff members if they complain about dust. 	Regular inspections and attendance to work complains.	RE, EC and Contractor.
		<ul style="list-style-type: none"> Workers in the vicinity of sources of high noise should wear necessary protection gear. 	Regular Inspection	RE, EC and Contractor.
		<ul style="list-style-type: none"> NO person is allowed to smoke close to fuel storage facilities and in portable toilets at the construction site since the chemicals used in chemical toilets are highly flammable. 	Regular Inspection.	RE, EC and Contractor.
		<ul style="list-style-type: none"> Workers should not be allowed to make use of the existing neighbourhood facilities. Potable water must be provided to workers to avoid dehydration. 	Regular Inspection.	RE, EC and Contractor.
		<ul style="list-style-type: none"> Portable toilets should be available at the construction site in the following ratio: 2 toilets for every 50 females and one toilet for every 50 males. 	Regular Inspection.	RE, EC and Contractor.

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	Low productivity and increase health risk of workforce due to high temperatures.	<ul style="list-style-type: none"> • Provide hats, ample drinking water. • Provide regular breaks. 	Daily checking of weather forecast.	RE, EC and Contractor.
	Fire incident.	<ul style="list-style-type: none"> • Foam fire extinguishers must be in close proximity to fuel kept on site. • There should be trained personnel to handle this equipment. • At least two extinguishers should be placed in the workshop. 	Foam fire extinguisher should be available when work commences.	RE, EC and Contractor.
Health and social pathology.	<p>Increase prostitution and associated social pathologies and health risks</p> <p>Sex workers are hired from the local communities by the construction team.</p>	<ul style="list-style-type: none"> • Prohibit unauthorized people on site and secure construction area, while monitoring entrance and exits. Contract penalties. • Workers are not allowed to reside on the construction site. 	<p>Daily monitoring by contractor.</p> <p>Record visitors in a site-visit book</p>	Contractor
	<p>Health and safety risks to the workers and public due to uncontrolled access to the public during construction</p> <p>Unsafe traffic conditions, the lack of personal protective clothing, etc.</p>	<ul style="list-style-type: none"> • Specify health and safety risk avoidance measures. 	Daily monitoring by contractor	Contractor

ENVIRONMENTAL MANAGEMENT IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITY FOR IMPLEMENTATION
Alcohol abuse.	Use of alcohol on construction site.	<ul style="list-style-type: none"> At no stage may a construction worker be allowed on site under the influence of alcohol. 	Daily monitoring by contractor. Spot checks.	RE and Contractor
Lack of privacy.	Intrude on neighbouring properties.	<ul style="list-style-type: none"> Under no circumstance are workers allowed to intrude on neighbouring properties. 	Regular monitoring by RE.	RE and Contractor
CONSTRUCTION AREA				
Disorderly and unwanted settlement in the road reserve	Informal market stalls providing services to construction workers	<ul style="list-style-type: none"> In consultation with the regional council and traditional authorities, to determine the conditions for of market stalls next to the road and at lay-byes. No settlement will be allowed. 	Set conditions for market stalls Regular inspection of site	Contractor
Construction site	Visual nuisance of the construction activities.	<ul style="list-style-type: none"> The boundaries of the construction area shall be demarcated prior to any work commencing on the site The construction area should be clearly marked. 	RE and Contractor should agree on demarcation lines.	RE, EC and Contractor.
	Improper conduct on construction site.	<ul style="list-style-type: none"> The construction area should adhere to the following requirements: Access should be controlled and only workers allowed within the boundaries of the campsite: Records should be kept, and all visitors should sign in and sign out of a visitors logbook The contractor should in no way permit or allow prostitution to take place at the construction area. 	Regular visual and record inspection by the RE.	RE, EC and Contractor.
CAMPSITE ESTABLISHMENT				

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Negative impact on the social and ecological environment.	Establishment of campsite.	<ul style="list-style-type: none"> • One campsite should be established for all construction activity (i.e. for all three sites). • The contractor must negotiate the use of existing facilities before considering entering new terrain. • The contractor must receive approval to use a facility or land in writing. This approval must state the remuneration and conditions of use. • Devise a layout for the site so that internal circulation of workers and vehicles in relation to the various construction functions is optimised. 	Contractor and RE should agree on a satisfactory area.	Contractor with approval of the Client, EC and RE
	Conduct on campsite.	<ul style="list-style-type: none"> • No one is allowed to reside on the campsite, save for construction personnel. • The campsite may act as a facility for the storage of construction material, temporary stockpile sites, and fuel installations etc, required by the Contractor or subcontractors and suppliers. • Materials must be stored in a separate closed-off premise that is sufficiently prepared to protect the environment for pollution, such as impermeable floors, closed containers and a security fence. 	Daily monitoring by contractor.	Contractor.
	Stockpiling materials on site.	<ul style="list-style-type: none"> • Stockpile materials such as bricks, sand, and stones in neat piles store sensitive materials such cement, hazardous materials, and consumables separately in a demarcated area on site. • Store only small amounts of materials on site to avoid unsupervised use that may lead to accidents and spills. 	Daily monitoring by contractor. Regular visual and records inspection by the RE.	RE and Contractor.

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		<ul style="list-style-type: none"> Stockpiles must be of a safe height of less than 2m high and 45° slope angle. Cement stacks must not be higher than 1.5m. Protect all fluids containers from low temperatures to avoid leaks and pollution. 	Regular visual and records inspection by the RE.	RE and Contractor.
BIOPHYSICAL ENVIRONMENT				
Drainage issues.	Surface run-off.	<ul style="list-style-type: none"> Surface protection work is recommended on the riverbed. 	Daily inspection of the surface protection work.	EC, Contractor.
Soil pollution	Garbage, cement, concrete, sewage, chemicals, fuels, oils or any other objectionable or undesirable material.	<ul style="list-style-type: none"> Hazardous waste should be disposed of in the prescribed manner in order to prevent contamination of soils (see waste management heading). In case of accidental spills, the contaminated soil must be suitably disposed of in a container for hazardous waste. 	Daily monitoring and regular visual inspection by contractor.	EC, Contractor
	Soil pollution by fuel leaks	<ul style="list-style-type: none"> If fuel is stored at the construction camp, fuel tanks must be properly banded. The volume of the banded area must be sufficient to hold 1.5 times the capacity of the storage tanks. The floor of the banded area must be impermeable and the sides high enough to achieve the 1.5 times holding capacity. 	Daily monitoring by Contractor and regular visual inspection by RE	EC, Contractor
		<ul style="list-style-type: none"> Drip trays should be available for all equipment that is intended to be used during construction. These trays should be placed underneath each vehicle while the vehicles are parked. The drip trays should be cleaned 	Daily monitoring and regular visual inspection by contractor.	EC, Contractor

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		every morning and the spillage handled as hazardous waste.		
	Soil pollution by cement mixed on the ground.	<ul style="list-style-type: none"> Under no circumstances should cement be mixed on open soil. A designated metal container should be made available for this purpose. 	Daily monitoring by Contractor and regular visual inspection by RE	EC, Contractor
	Cleaning of equipment.	<ul style="list-style-type: none"> All cleaning of equipment should take place within the construction site and the water from washing operation should be collected in a tank and disposed of in agreed manner. 	Daily monitoring by Contractor.	EC, Contractor
	Heavy vehicles/ movement of vehicles across site.	<ul style="list-style-type: none"> The movement of vehicles to and across the site should be controlled. Construction material required should be moved to where it is needed by means of wheelbarrows (when possible) instead of trucks thereby minimizing the impact on the soil. 	Daily visual inspection and monitoring by Contractor.	EC, Contractor
Borrowpit sites	Sand mining/ road material mining	<ul style="list-style-type: none"> The contractor in consultation with the environmental consultant and/or RE shall visit all potential excavation sites prior to excavation. The engineers and surveyors must then draft a plan for approval before commencement of excavations. This plan must indicate the required resources and sensitive areas that may not be mined (indication of the mature trees). No removal of trees with a stem diameter of 200mm or more. Protect clusters of trees and individual trees with a space buffer of at least 5m. The top 150mm of topsoil must be stored separately for use to rehabilitate the borrow pit. The removal of material at excavation sites shall be 	Contractor and environmental consultant to visit all potential excavation sites.	EC, Contractor

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		<p>focused where the least significant vegetation exists.</p> <ul style="list-style-type: none"> • The contractor shall liaise with the applicable local residents regarding the location of excavation sites. 		
WATER CONSERVATION				
Irresponsible use of water.	Water wastage due to careless practices during construction.	<p>Establish a water plan which, should include at least the following:</p> <ul style="list-style-type: none"> • A description of: <ul style="list-style-type: none"> ○ The source of the water ○ Where and how the water will be stored ○ How the water will be distributed/utilised • Describe measures that will be taken to conserve water at each of the above mentioned phases. • Educate the work force on sustainable and effective use of water, e.g. clean equipment in containers. • No member of the construction team is allowed to wash clothes OR vehicles on the construction site. 	Daily inspections and condition reports.	RE, EC and contractor.
	Leaks from tanks and taps.	<ul style="list-style-type: none"> • Water should be used sparingly throughout the construction of the development. It is the responsibility of the site coordinator to ensure that water conservation is strictly enforced. 	Daily inspections and condition reports.	RE, EC and contractor.
		<ul style="list-style-type: none"> • Water tanks / taps must be fixed. The water tank or taps must have water meters and be accessible to visual inspection. All faulty and leaking taps and pipes shall be 	Daily inspections and condition reports.	RE, EC and contractor.

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		immediately repaired.		
Groundwater contamination.	Refuse, garbage, cement, concrete, chemicals, fuels, oils or any other objectionable or undesirable material.	<ul style="list-style-type: none"> Accidental spills must be cleaned immediately to avoid the pollution of the wetland, and ground water, since the soil around the site is highly permeable. No member of the construction team is allowed to wash clothes OR vehicles on the construction site. 	Inspection daily, reporting, and regular clean up.	RE, EC and contractor.
CONSERVATION OF VEGETATION:				
Loss of biodiversity	Clearing of vegetation (removal of trees etc).	<ul style="list-style-type: none"> The area to be constructed on the site, as well as lay-down areas, access routes, etc should be clearly demarcated. The workforce must be instructed to operate within these boundaries. Any activity resulting in the chopping down of trees or removal of vegetation without the required authorisation is strictly prohibited. 	Regular review of photographic records. Take photographs before construction starts as a record. Monitoring by the EC	RE, EC and contractor.
	Planting of alien vegetation.	<ul style="list-style-type: none"> No alien vegetation may be introduced to the site in the form of seeds or plants, for beautification or any other reason. At the end of construction all alien vegetation that has established should be eradicated. 	Regular inspection of site vegetation by the EC.	RE, EC and contractor.
WASTE MANAGEMENT:				
Construction waste.	Incorrect or infrequent disposal of building rubble.	<ul style="list-style-type: none"> Building rubble and construction waste should be stored in skips and should regularly be removed off the site for disposal at an applicable municipal waste disposal site. 	Regular inspection on site.	RE, EC and contractor.
	Construction waste blown by wind (e.g. cement	<ul style="list-style-type: none"> Empty cement bags, plastics, wrapping waste, strapping, etc. to be secured in containers for general waste to 	Daily inspection and clean up.	RE, EC and contractor.

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	bags).	prevent wind-blown waste.		
Increased general waste.	Domestic waste from construction team.	<ul style="list-style-type: none"> Waste shall be separated according to cardboard/paper materials, plastic, bottles and tins. The various waste types shall be disposed of at appropriate municipal and recycling facilities. Appropriate containers shall be placed on site for waste separation and the workforce trained sensitised accordingly. Only the general waste, which cannot be recycled shall be disposed of at the municipal waste disposal facility. 	Daily inspection and clean up.	RE, EC and contractor.
Domestic waste.	Domestic waste from construction team.	<ul style="list-style-type: none"> The workforce must be sensitised to dispose of waste in a responsible manner and not to litter, not at the construction site and not at the campsite. Sufficient waste bins should be supplied. 	Daily inspection and clean up.	RE, EC and contractor.
		<ul style="list-style-type: none"> Domestic waste which cannot be recycled should be stored in a skip and removed via truck once a week. 	Regular inspection.	RE, EC and contractor.
Hazardous waste.	Accidental / negligent spillages from equipment working on site.	<ul style="list-style-type: none"> Spillages of any potentially toxic materials, whether by accident or through negligence, must be scooped up immediately into drums. Contact Wesco Group to salvage the spilled materials (see Appendix A for the contact details). 	Daily inspection and clean up.	RE, EC and contractor.
	Storage of hazardous materials.	<ul style="list-style-type: none"> Bitumen products waste, oil sludge, oily rags, contaminated spill clean-up materials, contaminated soils and other hazardous materials waste must be kept off-site or in a dedicated separate container on site. These containers must be locked and only accessible by the site 	Daily inspection and clean up.	RE, EC and contractor.

ENVIRONMENTAL MANAGEMENT IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITY FOR IMPLEMENTATION
		foreman. Wesco Group should be approached to collect these wastes periodically or as needed.		
Ablution waste.	Construction team.	<ul style="list-style-type: none"> Only portable chemical toilets will be used on site and at the campsite. Under no circumstances may the waste from these toilets be dumped in the veld. The waste should be removed at least once a week to the nearest municipal sewage site. Alternatively, it may be pumped out into sealable containers and stored until it can be removed by truck. If stored, the containers should be kept out of direct sunlight and should not be stored for longer than a month. People responsible for cleaning these toilets should be provided with latex gloves and masks. Spillage or leakage to be cleaned-up and fixed immediately. 	Daily inspections and clean-up.	RE, EC and contractor.
DUST CONTROL:				
Dust generation.	Dust proliferation due to fines content of soil.	<ul style="list-style-type: none"> Soil stacks should be placed downwind from the main activity areas and from the road detour. All construction areas and soil stacks should be regularly wetted. 	Visual monitoring for dust nuisance and safety	RE, EC and contractor.
NOISE CONTROL:				
Noise generation.	Noise from vehicles and construction activities.	<ul style="list-style-type: none"> All machinery should be calibrated and maintained regularly. Construction activities should be discontinued during night-time hours (18h00 to 07h00) and over week-ends. 	Daily monitoring. Complaints from neighbours. Records of how these have been addressed.	RE, EC and contractor.

POST-CONSTRUCTION PHASE

ENVIRONMENTAL MANAGEMENT IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITY FOR IMPLEMENTATION
Hazardous unattended construction site	Temporary structures, equipment, materials, waste and facilities used for construction activities.	<ul style="list-style-type: none"> • Clear and clean the construction site to the satisfaction of the RE. 	Inspection of the site by the RE	RE, EC
Unightly borrow areas	<ul style="list-style-type: none"> • Unstable slopes of unrehabilitated borrow pit. • Loose sediment washed away from unstable slopes. 	<ul style="list-style-type: none"> • Shape all sides of the borrow pit to 30° to horizontal. Rip the terrain and access routes and replace the stored topsoil evenly over the terrain. 	Inspection by RE , EC after rehabilitation.	Contractor, EC and Engineer.

OPERATIONAL PHASE:

These mitigation measures are included in the required maintenance as specifications required by the Roads Authority. Therefore, no environmental specifications are required.

ENVIRONMENTAL AUDITING

Environmental auditing should be conducted at least once every three months during the Construction phase.

Benefits derived from the audit process might include:

- Identification of Environmental Risk
- Development or Improvement of The Environmental Management System
- Avoidance of Financial Loss
- Avoidance of Legal Sanctions
- Increase In Staff Awareness
- Identify Potential Cost Savings
- Improve Dealings With Employees', Environmental Groups, The Community, Regulators,
- Media, Shareholders, Or Insurance & Finance Institutions; And
- Establish A History of Environmentally Responsible Operations, E.G. Through Environmental Incident Reports, Environmental Monitoring & Recording, & Reporting To Committees or Authorities.

Commonly, the audit of a site will cover all management procedures, operational activities & systems, and environmental issues. The environmental audit will be compiled objectively and conducted by an independent, competent entity.

The environmental auditing protocol has been established and was conducted as follows:

j. Planned Activities

This is the auditing procedure that should be followed:

- First meeting with service station owner / manager.
- Acquiring relevant documentation –
 - Record of Decision
 - Previous Audit Reports
 - Environmental Accident Reports
 - Complaints Register
- Site inspection
 - Focus on the audit checklist

- Photographs

- Interviews with relevant personnel
- Compilation of draft audit report
- Signing of the draft audit report
- Compilation of the final report incorporating

Audit protocol, documentation provided by the site operator, auditor's notes & observations, recommendations, results of sampling/monitoring if undertaken, and photos, maps, plans, diagrams & other illustrative material.

k. OVERVIEW OF ENVIRONMENTAL AUDIT ACTIVITIES FOR THE CONSTRUCTION OF DR 4103 OKATANA-AMUTANGA-OMULATHITU-ONANIME, IN THE OKATANA CONSTITUENCY

Decide on the type of audit

Select suitably experienced auditors

Conduct site activities

Evaluate Evidence:
Compliance

Prepare Draft Report
Findings

Review Draft Report

Issue Final report

Prepare Action Plan
Proposed Actions
Responsibilities

NON-COMPLIANCE

I. Procedures

The Contractor shall comply with the environmental specifications and requirements on an on-going basis and any failure on his part to do so will entitle the ER to impose a penalty. In the event of non-compliance the following recommended process shall be followed:

- The ER shall issue a notice of non-compliance to the Contractor through the ECO, stating the nature and magnitude of the contravention.
- The Contractor shall act to correct the non-conformance within 24 hours of receipt of the notice, or within a period that may be specified within the notice.
- The Contractor, through the ECO, shall provide the ER with a written statement describing the actions to be taken to discontinue the non-conformance, the actions taken to mitigate its effects and the expected results of the actions.
- In the case of the Contractor failing to remedy the situation within the predetermined time frame, the Engineer shall impose a monetary penalty based on the conditions of contract.
- In the case of non-compliance giving rise to physical environmental damage or destruction, the Engineer shall be entitled to undertake or to cause to be undertaken such remedial works as may be required to make good such damage and to recover from the Contractor the full costs incurred in doing so.
- In the event of a dispute, difference of opinion, etc. between any parties with regard to or arising from interpretation of the conditions of the ESMP, disagreement regarding the implementation or method of implementation of conditions of the ESMP, etc. any party shall be entitled to require that the issue be referred to specialists for determination.
- The Engineer shall at all times have the right to stop work and/or certain activities on site in the case of non-compliance or failure to implement remedial measures.

m. Offences And Penalties

Where the Contractor inflicts non-repairable damage upon the environment or fails to comply with any of the environmental specifications, he shall be liable to pay a penalty fine over and above any other contractual consequence.

The Contractor is deemed NOT to have complied with this Specification if:

- a) within the boundaries of the site, site extensions and haul/access roads there is evidence of contravention of the Specification;
- b) environmental damage due to negligence;

- c) the Contractor fails to comply with corrective or other instructions issued by the ER within a specific time;
- d) the Contractor fails to respond adequately to complaints from the public.

Penalties for the activities detailed below, might be imposed on discretion of the ER should the Contractor and/or his Subcontractors be found to be Non-Compliant:

a) Actions leading to major erosion.	A penalty equivalent in value to the cost of rehabilitation plus 20%.
b) Oil spills due to negligence and/or reluctance towards mitigation measures mentioned in the ESMP.	A penalty equivalent in value to the cost of clean-up operation plus N\$10,000.
c) Damage to indigenous vegetation due to reluctance towards the ESMP.	A penalty equivalent in value to the cost of restoration plus N\$ 5 000.
d) Damage to demarcated sensitive environments.	A penalty equivalent in value to the cost of restoration plus N\$ 5 000.
e) Damage to demarcated cultural sites.	A penalty to a maximum of N\$100 000 shall be paid for any damage to any cultural/ historical sites identified during the EIA and made known to the Contractor.
f) Damage to trees	A penalty to a maximum of N\$5 000 shall be paid for each tree removed without prior permission, or a maximum of N\$5 000 for significant damage to any tree, which is to be retained on site.
g) Damage to natural fauna (due to negligence and/or reluctance towards the mitigation measures mentioned in the ESMP).	A penalty to a maximum of N\$5 000 for deliberate injury to any natural occurring animal.
h) Any persons, vehicles, plant, or thing related to the Contractors operations within the designated boundaries of a "no-go" area.	N\$4,000
i) Litter on site.	N\$ 1,000
j) Deliberate lighting of illegal fires on site.	N\$ 1,000
k) Individuals not making use of the site toilet facilities.	N\$ 100

l) Any person, vehicle, item of plant, or anything related to the Contractors operations causing a public nuisance outside the demarcated construction areas.	N\$ 1,000
m) Any spillage from sewage either at the contactor camp or mobile toilets.	N\$ 20,000

Penalties may be issued per incident at the discretion of the Engineer. The Engineer will inform the Contractor of the contravention and the amount of the fine and will deduct the amount from monies due under the Contract.

For each subsequent similar offence, the fine may, at the discretion of the ER, be doubled in value to a maximum value of N\$50,000.

Payment of any fines in terms of the contract shall not absolve the offender from being liable from prosecution in terms of any law.

In the case of a dispute in terms of this section, the Engineer shall determine as to what constitutes a transgression in terms of this document.