



ENVIRONMENTAL MANAGEMENT PROGRAMME

**Construction and Maintenance of Vodacom
Cellular Base Station –
Bosbok
(BS 113075)**

1. DETAILS OF PERSON WHO PREPARED THE ENVIRONMENTAL MANAGEMENT PROGRAMME

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2. INTRODUCTION

In terms of the National Environmental Management Act of 1998 (Act No. 107 of 1998) activities related to the construction of cellular base stations and associated infrastructure may have an impact on the environment and it is imperative that precautions be taken to ensure that environmental damage is minimised. The purpose of the Environmental Management Programme (EMPr) is to give effect to precautionary measures, which are to be put in place for controlling the activities that take place on site during the construction & operational phases of a project and to serve as a working document concentrating specifically on certain activities with the purpose of reducing the danger of adverse impacts or effects on the environment.

The EMPr specifies procedures and practices, which should be implemented during construction activities, and monitored by an Environmental Control Officer (ECO) appointed by Vodacom.

The objectives of the EMPr are to:

- Ensure that all pertinent environmental issues and the concerns of DEDET are addressed;
- Determine environmental conditions and sensitivities of the site and areas outside that may be impacted on by the project;
- Ensure acceptability of design and construction practices with respect to identified impacts and prescribed mitigation measures;
- Provide strategies for obtaining and/or complying with all environmental approvals, permits and agreements, and to provide a monitoring program;
- Integrate environmental strategies with all design and construction work; and
- Provide input and strategies for environmental quality control and risk management during all phases of the project.

The EMPr presented here incorporates these components through the environmental design criteria and specifications for cellular base stations and associated infrastructure. To ensure the effective implementation of these criteria and specifications, Vodacom must

be committed to undertaking a program of environmental monitoring during the construction phase. An ECO must provide this service to the applicant. The ECO should ensure compliance with the requirements of the EMPr.

3. ENVIRONMENTAL DESIGN AND SPECIFICATIONS

The project involves the establishment of a telecommunication base station that may include the following activities for which environmental design criteria and specifications have been developed:

- A 35m telecommunication mast;
- Equipment housing;
- Receiving and transmission equipment of any size or design;
- Electronic cabling connections;
- Electrical connection;
- Security fencing and walling;
- Any equipment or activity necessary for the establishment of the base station;
- Access road.

4. DEFINITIONS

In this document, unless the context requires otherwise -

- **Pre-construction**
Involves all facets for the preparation of the site for construction.
- **Construction**
For the purpose of this document construction is defined as the erection of cellular structures and the installation of electronic equipment.
- **Post-construction / Operational**
This phase includes the take-over of the site by the service provider and the period during which the structure is operational.
- **Decommissioning Phase**
This phase includes dismantling of the cellular structure and the removal of equipment.

5. THE CONTRACT

The EMPr shall form part of the legal contract between Vodacom, the contractor and the subcontractors. Vodacom shall build the EMPr into all contracts and commit the contractors to make the EMPr part of any works subcontracted. Failing to adhere to the EMPr requirements shall lead to severe penalties to be levied against the contractor and/or subcontractors.

A commitment from Vodacom and its contractors and subcontractors are required on the following issues:

- Always behave professionally on and off site;
- Ensure quality of work done, technical and environmental;
- Resolve problems and claims arising from construction and/or maintenance damage immediately to ensure a smooth flow of operations;
- To use this EMPr for the benefit of all involved;
- To preserve the natural environment by limiting destructive actions on site;

An agreement is to be signed by the contractors and/or subcontractors that:

- He knows and understands the contents of the EMPr;
- He is able and shall comply with all legislation pertaining to the nature of the work to be done and all things incidental thereto.

Vodacom will institute contractual measurements to ascertain that its contractors and/or subcontractors and representatives adhere to the environmental obligations agreed upon.

6. ENVIRONMENTAL CONSTRUCTION SUPERVISION

An Environmental Control Officer (ECO) must be appointed to ensure that construction activities associated with the establishment of a base station will comply with environmental specifications and regulatory requirements, thus minimizing adverse biophysical and social impacts and resulting liabilities.

During construction, the ECO's key responsibility will be to ensure that the environmental management measures, controls, and specifications are properly implemented as per the terms and conditions issued by DEDET. Responsibilities will include:

- Delivering environmental education and awareness to construction staff prior to and during on-site works;
- Providing technical assistance on environmental matters to construction staff;
- Inspecting all activities during construction to ensure compliance with terms and conditions of approvals; and
- Documenting construction activities by notes and photographs.

7. ENVIRONMENTAL SPECIFICATIONS AND CONDITIONS

To assist in complying with the applicable national and municipal laws, regulations, permits, licenses and approvals, the following Environmental Specifications and Conditions have been drafted. These specifications are not exhaustive and are meant to clarify various regulatory requirements. In the event of a discrepancy between these guidelines and legislation and/or regulations, the latter shall apply or if regulations or laws are amended, the amended regulations may apply.

7.1 General Obligations during the Pre-Construction and Construction Phase

7.1.1 IMPACT: Infrastructure quality			
Activity	Mitigation Measures	Responsible	Time Frame
Specification of the design and materials to be utilised	The specification of the design and materials to be utilised in the construction of the cellular base station and associated infrastructure must comply with the minimum specification requirements as prescribed by Vodacom.	Vodacom and contractor responsible for construction	During planning/pre-construction phase

7.1.2 IMPACT: Infrastructure requirements specified in the Environmental Authorization			
Activity	Mitigation Measures	Responsible	Time Frame
Requirements and recommendations specified in the Environmental Authorization	The site must be positioned and designed in accordance with the specific conditions as set out in the Environmental Authorization. The contractor shall observe all requirements and recommendations specified in the Environmental Authorization with specific reference to the type, height and colour of the mast and equipment.	Vodacom and contractor responsible for construction	During planning/pre-construction phase

7.1.3 IMPACT: Dust, Noise and Water Pollution			
Activity	Mitigation Measures	Responsible	Time Frame
Earthworks and vegetation clearance	Affected parties on or in the vicinity of the site, including in particular surrounding landowners and any official responsible for existing installations on the site, shall be advised in advance of unavoidable disturbances.	Contractor responsible for construction	During planning/pre-construction phase & construction phase

	<p>Activities that generate unavoidable disturbances through the creation of noise or dust must be limited to normal working hours in order to avoid complaints by the surrounding landowners. The contractor shall address any complaints.</p> <p>The contractor shall identify any water resource in the proximity of the site and shall ensure that drainage from construction areas is such that the clarity and quality of water is in no way affected by construction activities.</p>		
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7.1.4 IMPACT: Protection of Flora and Fauna

Activity	Mitigation Measures	Responsible	Time Frame
Disturbance of fauna and flora by construction activities	Trampling and disturbance associated with construction activities should be limited to within five metres of the footprint of the site. Ensure minimal disturbance to the natural flora and fauna of the area.	Contractor responsible for construction	Construction phase

7.1.5 IMPACT: Litter

Activity	Mitigation Measures	Responsible	Time Frame
Littering by construction workers and construction debris	The contractor shall not permit work teams to litter tins, paper, glass etc. and construction debris. On completion of the project all litter and construction debris shall be removed from the site immediately. Under no circumstances shall litter and debris be buried or hidden on or near the site after project completion.	Contractor responsible for construction	Construction phase

7.1.6 IMPACT: Blasting			
Activity	Mitigation Measures	Responsible	Time Frame
Blasting	<p>The Contractor shall notify residents should blasting be required and shall adhere to the requirements of the Explosives Act, 1956. Notices shall be placed on site in order to inform the adjacent owners of blasting activities and the contractor shall give all potentially affected parties notice of his intent to execute any blasting work. Blasting will be done at appropriate times of the day to ensure that noise disturbance and vibrations are kept to a minimum, and blasting will be undertaken using appropriate techniques.</p> <p>The contractor will be bound to ensure that blasting operations do not cause damage to property. The contractor shall also be obliged to ensure that the dangers of fly rock to people and properties are eliminated. The contractor shall keep a photographic record of the condition of the affected buildings or structures and shall acquire the signature of the surrounding owners/occupants agreeing to the condition of the structures.</p>	Contractor responsible for construction/sub-contractor responsible for blasting	Construction phase

7.1.7 IMPACT: Excavations			
Activity	Mitigation Measures	Responsible	Time Frame
Earthworks	Unless otherwise specified by the Vodacom Environmental Representative, topsoil shall be stockpiled separately from the base course material. Fill slopes are to be allowed to slump to their naturally occurring slope and cut embankments are to be cut back to a 1:3 slope. All slopes are to be covered by a minimum of 200mm	Contractor responsible for construction	Construction & Rehabilitation phase

	depth of topsoil during the rehabilitation phase of the project.		
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7.1.8 IMPACT: Surfacing material			
Activity	Mitigation Measures	Responsible	Time Frame
Surfacing	Surfacing material selected shall be compatible with the surrounding environment.	Contractor responsible for construction	Construction & Rehabilitation phase

7.1.9 IMPACT: Historical Sites and Objects			
Activity	Mitigation Measures	Responsible	Time Frame
Earthworks and vegetation clearance	If a seemingly historical object, gravestone, geological feature or other distinguishable area of disturbance is observed on the site, the said object or area shall not be removed or tampered with. The contractor shall immediately report the presence of seemingly historical sites and objects to Vodacom.	Vodacom and contractor responsible for construction	During pre-construction phase & construction phase

7.1.10 IMPACT: Site Access Road			
Activity	Mitigation Measures	Responsible	Time Frame
Construction vehicles making use of the access road to the construction site	The access road to the construction site as well as the installation of new gates in fence lines shall be established in consultation with the landowner. Vehicles are to make use of existing roads and tracks as far as possible. Access to the site used by the contractor shall be maintained during construction to avoid dust.	Contractor responsible for construction	Construction phase

	<p>The area affected by the access road, turning circles and parking of vehicles around the site shall be minimised. Vehicles shall adhere to the designated roads and areas and not be allowed to depart from it. The contractor shall implement the rehabilitation of the area affected by the construction vehicles.</p>		
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7.1.11 IMPACT: Stormwater Management

Activity	Mitigation Measures	Responsible	Time Frame
Stormwater Management	<p>Before the commencement of construction, the ECO shall indicate which stormwater measures should be applied during the construction of the cellular base station and associated infrastructure.</p> <p>During construction and particularly during the rainy season, berm walls shall be installed around the stockpiled areas on the site to prevent stormwater depositing this material onto adjacent properties or roads.</p> <p>The contractor and subcontractors shall adhere to the recommendations of the ECO and the design specifications.</p>	ECO and contractor responsible for construction	During planning/pre-construction phase & construction phase

7.1.12 IMPACT: Servicing of Vehicles and Equipment on Site

Activity	Mitigation Measures	Responsible	Time Frame
Servicing of Vehicles and Equipment on Site	<p>No servicing of vehicles is to be permitted on site. Servicing of equipment may take place on site but only when unavoidable, such as generators. In this case, all steps must be taken to ensure that no oil</p>	Contractor responsible for construction	Construction phase

	is spilt and that all waste, such as filters, is removed from the site and disposed in an environmentally legal manner.		
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7.1.13 IMPACT: Noise from generator

Activity	Mitigation Measures	Responsible	Time Frame
Temporary Power Supply	Should a generator be deployed such generator shall comply with the maximum noise levels as stipulated in the Noise Control Regulations published under the Environment Conservation Act, 1989 (Act No 73 of 1989)	Contractor responsible for construction	Construction phase

7.1.14 IMPACT: Fires

Activity	Mitigation Measures	Responsible	Time Frame
Fires	No open fires shall be allowed in the veld under any circumstances. The contractor shall ensure that adequate fire fighting equipment, fit for purpose and reasonable in the circumstances, is available on site at all times. All personnel on the site shall be trained in the use of such equipment.	Contractor responsible for construction	Construction phase

7.1.15 IMPACT: Cooking and Washing Facilities

Activity	Mitigation Measures	Responsible	Time Frame
Cooking and Washing Facilities	Ensure that safe and adequate provisions are made for the contractor's personnel to cook and wash	Contractor responsible for	Construction phase

	without creating risks of fire and water pollution. If methane gas is used, care should be taken to ensure that no leakage or risk of explosion exists.	construction	
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7.2 Construction Camp

The contractor shall pay specific attention to the following aspects:

7.2.1 IMPACT: Staff Facilities			
Activity	Mitigation Measures	Responsible	Time Frame
Construction camp	Define the area of the construction camp and place it so as to have minimal impact on the environment.	ECO and contractor responsible for construction	During planning/pre-construction phase & construction phase

7.2.2 IMPACT: Workers Accommodation			
Activity	Mitigation Measures	Responsible	Time Frame
Workers Accommodation	Make suitable arrangements for accommodating the workers in a designated area that has been approved by the landowner and ECO.	Contractor responsible for construction	During planning/pre-construction phase & construction phase

7.2.3 IMPACT: Ablution Facilities			
Activity	Mitigation Measures	Responsible	Time Frame
Ablution Facilities	Should existing toilet facilities not be available on or near the construction site, such facilities shall be supplied and maintained for the use of the contractor's staff. Regular inspections shall be carried out to ensure toilets are kept in a hygienic state. Toilet paper shall be supplied to all toilets. Staff shall be advised to the fact that they should use these toilets at all times.	Contractor responsible for construction	Construction phase

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7.2.4 IMPACT: Security and Privacy of surrounding properties

Activity	Mitigation Measures	Responsible	Time Frame
Activities of construction workers	During the construction period the inconvenience to the surrounding property owners should be kept to an absolute minimum. The management of workers during construction is essential to avoid intrusion of people's privacy and properties. Define the area of the construction camp in such a manner as to limit the movement of site personnel.	Contractor responsible for construction	Construction phase

7.2.5 IMPACT: Water Supply

Activity	Mitigation Measures	Responsible	Time Frame
Water Supply	Agree upon the source of water supply with the ECO and the landowner.	Contractor responsible for construction	During planning/pre-construction phase & construction phase

7.2.6 IMPACT: Solid Waste Disposal

Activity	Mitigation Measures	Responsible	Time Frame
Solid Waste Disposal	Agree upon the method of waste disposal with the ECO. Particular attention shall be given to the disposal of solvents and other products used in the painting as well as any plastic components used in electrical wiring. The collection point for waste material shall be an enclosed structure to eliminate the risk of wind scatter. All waste must be disposed to a previously identified, registered or permitted waste disposal site.	Contractor responsible for construction	During planning/pre-construction phase & construction phase

7.3 Cellular Installation Site

The contractor shall pay specific attention to the following aspects:

7.3.1 IMPACT: Site Clearance and Leveling			
Activity	Mitigation Measures	Responsible	Time Frame
Site Clearance and Leveling	<p>Clear the area of the site paying specific attention to the specifications of the EMPr.</p> <p>Level the area of the site and remove any surplus material from the site. Topsoil should be stockpiled to be used in the rehabilitation process.</p>	Contractor responsible for construction	Construction phase & Rehabilitation phase

7.3.2 IMPACT: Foundation Preparation			
Activity	Mitigation Measures	Responsible	Time Frame
Foundation Preparation	<p>Material emanating from the excavation of foundations should be stockpiled for later use in the rehabilitation of the site. When casting concrete foundations, care must be taken to avoid spilling concrete on the site. Any material spilled must be collected and disposed of with the other waste from the site.</p> <p>Ensure that no erosion of the foundation takes place, especially if gravel is used beyond the perimeter of the fence for the leveling of the foundation. All fill originating from the site shall be leveled and incorporated into the surroundings and rehabilitated in such a way that it blends in with the surrounding natural environment. All excess construction material shall be removed from the site by the contractor and disposed to a previously identified waste disposal site as approved by the</p>	Contractor responsible for construction	Construction & Rehabilitation phase

	ECO.		
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7.3.3 IMPACT: Herbicides and Insecticides

Activity	Mitigation Measures	Responsible	Time Frame
Use of herbicides and insecticides to protect the installations	<p>Should it be necessary to make use of herbicides and insecticides to protect the installations, the application of such chemicals shall be restricted to the base station site.</p> <p>The application of the herbicides and insecticides shall be done in accordance with the stipulations of The Fertilizers, Farm Feeds, Agricultural Remedies and Stock Remedies Act No 36 of 1947.</p> <p>The contractor applying any herbicides and insecticides shall be in possession of a Pest Control Operator (PCO) license.</p> <p>The application of the chemicals shall not exceed the prescribed dosage for the specific product used.</p> <p>In all instances the application of the herbicides and insecticides should be of such nature that it will not cause any environmental harm.</p>	Contractor responsible for construction	Construction phase

7.3.4 IMPACT: Fencing and Security of the Sites

Activity	Mitigation Measures	Responsible	Time Frame
Fencing and Security of the Sites	When required in terms of the Specific Conditions of the Environmental Authorization a security fence shall be erected around the site.	Contractor responsible for	Construction phase

	Lighting of the site shall be done in such a way that it will not be an inconvenience to surrounding landowners.	construction	
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7.3.5 IMPACT: Sourcing Materials from the Site

Activity	Mitigation Measures	Responsible	Time Frame
Sourcing Materials from the Site	The contractor shall store sand, stone and cement in a demarcated area and care shall be taken not to allow any materials to spill beyond the site. Concrete mixing shall take place in a defined area and on top of boarding or sheeting so as to protect the ground. These boards and/or sheeting shall be removed from the site once the mixing is complete. Any spillage or overrun of material, which may occur, must be cleaned and removed from the site by the contractor.	Contractor responsible for construction	Construction phase

7.3.6 IMPACT: Chemical, Fuel, and Oil Handling

Activity	Mitigation Measures	Responsible	Time Frame
Chemical, Fuel, and Oil Handling	All Contractors shall ensure that an emergency cleanup program is in place in event of an accidental spill or leak of fuel, oil or chemicals. Spillage of oil from crankcase oil draining or other such activities shall be prevented. If an accident occurs and fuels, oils or chemicals are spilled or dumped on the ground, the affected soil shall be removed, placed in drums and disposed of in compliance with national legislation.	Contractor responsible for construction	Construction phase

	<p>Disposal and storage of materials such as water, rags, and pads, containing oils, filters, chemicals, liquid fuels, lubricating oils, or other potentially hazardous materials shall be in a manner satisfactory to the ECO.</p> <p>Hazardous chemicals, fuels, and other noxious or toxic substances shall be stored in covered containers in fenced areas for security reasons.</p>		
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7.3.7 IMPACT: Structure Assembly Area

Activity	Mitigation Measures	Responsible	Time Frame
Structure Assembly	An area shall be defined by the contractor to allow for the assembly of the mast. This must take into account the need for off-loading or the component parts and positioning of the crane on solid ground for the final erection of the mast. This shall be planned to require the minimal removal of vegetation or risk of damage to the surrounding structures.	Contractor responsible for construction	Construction phase

7.3.8 IMPACT: Priming and Painting

Activity	Mitigation Measures	Responsible	Time Frame
Priming and Painting	Care must be taken by the contractor to avoid the spillage of painting and solvent material on site. Adequate containers for cleaning of equipment and for the storage of waste products must be provided and all waste products resulting from the painting operation must be entirely removed from the site by the contractor.	Contractor responsible for construction	Construction phase

7.3.9 IMPACT: Waste from Electrical Connections			
Activity	Mitigation Measures	Responsible	Time Frame
Work on Electrical Connections	All waste products resulting from electrical connections must be removed from the site by the contractor.	Contractor responsible for construction	Construction phase

7.3.10 IMPACT: Visual Impacts of construction activities			
Activity	Mitigation Measures	Responsible	Time Frame
Visual Impacts of construction activities	<p>The contractor shall ensure that the visual impact of the construction activities is minimised. Construction activities should be kept clustered on site.</p> <p><i>Due to the fact that the infrastructure in question will be a 35m high mast located on the premises of the Marakapula Nature Reserve, adjacent to the access road to the workers accommodation area, is it deemed important that the visual impact be minimized. The proposed mast will be a lattice mast and one can look "through" it. This will assist to lessen the visual impact. Vodacom will implement elements of good visual design. The contractor shall comply with the visual requirements of the Environmental Authorization and CAA Approval.</i></p>	Contractor responsible for construction	Construction phase

7.3.11 IMPACT: Rehabilitation			
Activity	Mitigation Measures	Responsible	Time Frame
Rehabilitation	When the civil and construction work is complete,	Contractor	Construction & Rehabilitation

	<p>the site shall be cleaned and rehabilitated by the contractor.</p> <p>All waste materials, infrastructure, equipment, plant and other items used during the construction shall be removed from the site. No burial of any foreign material on the site shall be allowed.</p> <p>Areas devoid of vegetation or where spoils have been compacted shall be covered with topsoil and if necessary, be seeded, in order to allow for the vegetation to re-establish.</p>	responsible for construction	phase
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7.4 Post-Construction and Operational Phases

This phase will determine the ultimate success of the implementation of the management proposals of the EMPr. A post construction environmental audit is to be conducted by the ECO in order to ensure that all conditions of the EMPr have been adhered to.

7.4.1 IMPACT: Servicing and Maintenance			
Activity	Mitigation Measures	Responsible	Time Frame
Servicing and Maintenance	<p>Herbicides and Insecticides should be applied according to the specifications of this EMPr and within the prescribed dosage.</p> <p>Where repainting has been undertaken, all waste materials shall be removed from the site.</p> <p>Existing access roads to the site shall be used. Where such roads have been damaged by erosion, repairs shall be undertaken to avoid further damage of the road and the surrounding environment.</p>	Contractor responsible for maintenance of the site	Post-Construction and Operational Phases

7.5 Decommissioning Phase

7.5.1 IMPACT: Decommissioning of the site			
Activity	Mitigation Measures	Responsible	Time Frame
Decommissioning of the cellular base station	<p>Should a cellular base station be decommissioned this process shall comply with the stipulations of the Occupational Health and Safety Act (Act 85 of 1993). The decommissioned structures shall be removed from the site.</p> <p>When a new structure is to be erected on the same site, the contractor shall comply with all the conditions as set out in the EMPr.</p> <p>When the site is no longer required, the area of the base station shall be rehabilitated to conform to the immediate surrounding environment.</p>	Vodacom and contractor responsible for decommissioning of the base station	Decommissioning Phase

8. AMENDMENTS TO THE EMPr

Any issues that may arise during the construction or operational phase which are not covered in this EMPr shall be addressed as addendums to the EMPr and submitted for approval prior to implementation.