
PROPOSED RIVERBANK WIND MONITORING MAST, NEAR WESLEY EASTERN CAPE

DRAFT ENVIRONMENTAL MANAGEMENT PLAN (EMP) FOR CONSTRUCTION & OPERATION OF THE PROPOSED WIND MONITORING MAST:

Submitted as part of the Basic Assessment Report

March 2010

Prepared for

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PROJECT DETAILS

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Title	: Draft Environmental Management Plan for the proposed Riverbank Wind Monitoring Mast near Wesley, Eastern Cape
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PURPOSE & OBJECTIVES OF THE EMP

CHAPTER 1

An Environmental Management Plan (EMP) provides a description of the methods and procedures for mitigating and monitoring impacts and contains environmental objectives and targets which the project proponent or developer needs to achieve in order to reduce or eliminate negative impacts throughout the project life cycle.”¹ The objective of this EMP is to provide consistent information and guidance for implementing the management and monitoring measures established in the permitting process and help achieve environmental policy goals. The first two chapters provide background to the EMP and the proposed project. The chapters which follow consider the:

- » Planning, and design
- » Construction activities
- » Operation activities
- » Decommissioning activities

These chapters set out the procedures necessary for Just Energy and their project consultants and contractors to achieve environmental compliance during all phases of the proposed project. For each of the phases, an over-arching environmental **goal** is stated. In order to meet this goal, a number of **objectives** are listed. The management plan has been structured in table format in order to show the links between the goals for each phase and their associated objectives, activities/risk sources, mitigation actions monitoring requirements and performance indicators. A specific EMP table has been established for each environmental objective. The information provided within the EMP table for each objective is illustrated below:

OBJECTIVE: Description of the objective, which is necessary in order to meet the overall goals; these take into account the findings of the environmental impact assessment specialist studies

Project component/s	List of project components affecting the objective
Potential Impact	Brief description of potential environmental impact if objective is not met
Activity/risk source	Description of activities which could impact on achieving the objective
Mitigation: Target/Objective	Description of the target; include quantitative measures and/or dates of completion

Mitigation: Action/control	Responsibility	Timeframe
List specific action(s) required to meet the mitigation target/objective described above.	Who is responsible for the measures	Time periods for implementation of measures

¹ DEAT (2004) *Environmental Management Plans, Integrated Environmental Management, Information Series 12*, Department of Environmental Affairs and Tourism (DEAT), Pretoria.

Performance Indicator	Description of key indicator(s) that track progress/indicate the effectiveness of the management plan.
Monitoring	Mechanisms for monitoring compliance; the key monitoring actions required to check whether the objectives are being achieved, taking into consideration responsibility, frequency, methods and reporting

This EMP provides specific environmental guidance for the construction and operation phases of a project, and is intended to manage and mitigate construction and operation activities so that unnecessary or preventable environmental impacts do not result. The purpose of the EMP is to help ensure continuous improvement of environmental performance, reducing negative impacts and enhancing positive effects during the construction and operation of any development. An effective EMP is concerned with both the immediate outcome as well as the long-term impacts of the project.

The EMP has the following objectives:

- » To outline mitigation measures and environmental specifications which are required to be implemented for the planning, construction, rehabilitation and operation phases of the project in order to minimise the extent of environmental impacts, and to manage any environmental impacts associated with the wind monitoring mast.
- » To ensure that the construction and operation phases do not result in undue or reasonably avoidable adverse environmental impacts, and ensure that any potential environmental benefits are enhanced.
- » To identify entities who will be responsible for the implementation of the measures and outline functions and responsibilities.
- » To propose mechanisms for monitoring compliance, and preventing long-term or permanent environmental degradation.

The mitigation measures identified within the Basic Assessment Process for the wind monitoring mast are systematically addressed in the EMP, ensuring the minimisation of adverse environmental impacts to an acceptable level.

It should be noted that since this EMP is part of the Basic Assessment Process undertaken for the proposed project, it is important that this document be read in conjunction with the Basic Assessment Report to help place the EMP in context.

1.1. Project Team

This draft EMP was compiled by Tammy Kruger and Karen Jodas of Savannah Environmental. The Savannah Environmental team have considerable experience in environmental assessment and environmental management, and have been actively involved in undertaking environmental studies for a wide variety of projects throughout South Africa. Strong competencies have been developed in project management of environmental EIA processes, as well as strategic environmental assessment and compliance advice, and the identification of environmental management solutions and mitigation/ risk minimising measures.

PROJECT DETAILS

CHAPTER 2

Just Energy proposes the development of one wind monitoring mast up to 60 m high for the purpose of recording wind measurements. The undertaking of wind measurement is part of a feasibility study to measure the wind potential (wind energy) in an area located approximately 4 km north-east of Wesley in the Eastern Cape. One site has been identified for erection of the wind monitoring mast on Portion 2 of the farm Sandflat 149.

This EMP has been developed and must be implemented to protect the immediate and surrounding environment of the proposed wind monitoring mast as identified through the Basic Assessment Process (Savannah Environmental, 2010). This is achieved through controlling construction and operation activities that could have a negative impact on the environment, and avoiding or minimising potential environmental impacts.

One type of wind monitoring mast is being considered by the project proponent, namely a 60 m guyed steel tubular structure. The mast will be constructed upon a galvanised steel base plate of approximately 0.71 m² in size and will be anchored to the ground through 24 guy wires attached at four separate points. The development footprint will consist of the baseplate and the anchor points which will cover a total area of <10 m². The mast will be required to be in compliance with the colour and lighting specifications as required by the Civil Aviation Authority (CAA). The period of utilisation of the wind monitoring mast is of a temporary short-term nature (anticipated to be up to 48 months). The mast will be decommissioned once wind measurements in the area are complete.

The EMP has been developed and must be implemented to protect sensitive on-site and off-site features through controlling construction and operation activities that could have a detrimental effect on the environment, and to avoid or minimise potential environmental impacts.

The main activities/components associated with the development of the wind monitoring mast are detailed in Table 1 and comprise the following:

Table 1: Summary of activities that form part of the monitoring project

Main Activity/Project Component	Components of Activity	Details
Installation of the Mast		
Conduct surveys	» Site survey.	» All surveys to be undertaken prior to initiating installation of mast.
Transport of components and equipment to site	» A 4x4 vehicle with a trailer will be used to transport all components to the site.	» The mast will be transported to the site in sections where required. » The equipment will be transported to the site using appropriate national, provincial and local roads, and, as far as possible, the existing access roads will be utilised to access the mast site. » No permanent roads will be established to the mast position – any access not via existing roads will be once-off.
Erect mast	» Monitoring mast components: * Tubular tower of 60 m high and 203 - 250 mm wide; * Galvanised steel base plate of 0.71 m ² ; * 24 guy wires; * Diagnostic equipment to be attached to the mast including three anemometers, a wind vane, a temperature sensor and a internet-enabled micro power wind energy data logger; * CAA specified lighting on the mast	» The guy radius will not impact on the surrounding ground cover as the guys are anchored directly into the ground. » During construction, the construction footprint will extend in a radius from the centre anchor to the furthest guy line (~50 m).
Operation		
Operation	» Wind monitoring mast	» Inspection and maintenance of the mast may be necessary; however no permanent staff will be required on site for any extended period of time. » Monitoring mast will be self-sufficient, energy being supplied by two 1.5 Volt D-Cell batteries » The potential lighting impact associated with the wind monitoring mast pertains to the fitting of an aircraft warning light (as prescribed by the

Main Activity/Project Component	Components of Activity	Details
		<p>CAA). The light is a relatively toned-down red light that is not expected to cause significant visual impacts in terms of glare, light trespass or sky glow.</p> <p>» Should emergency maintenance be required for safety reasons, the mast will be disassembled by hand.</p>
Decommissioning		
Disassemble monitoring mast	<p>» The mast components will be disassembled and removed from site.</p>	<p>» Mast components would be reused, recycled or disposed of in accordance with regulatory requirements.</p>

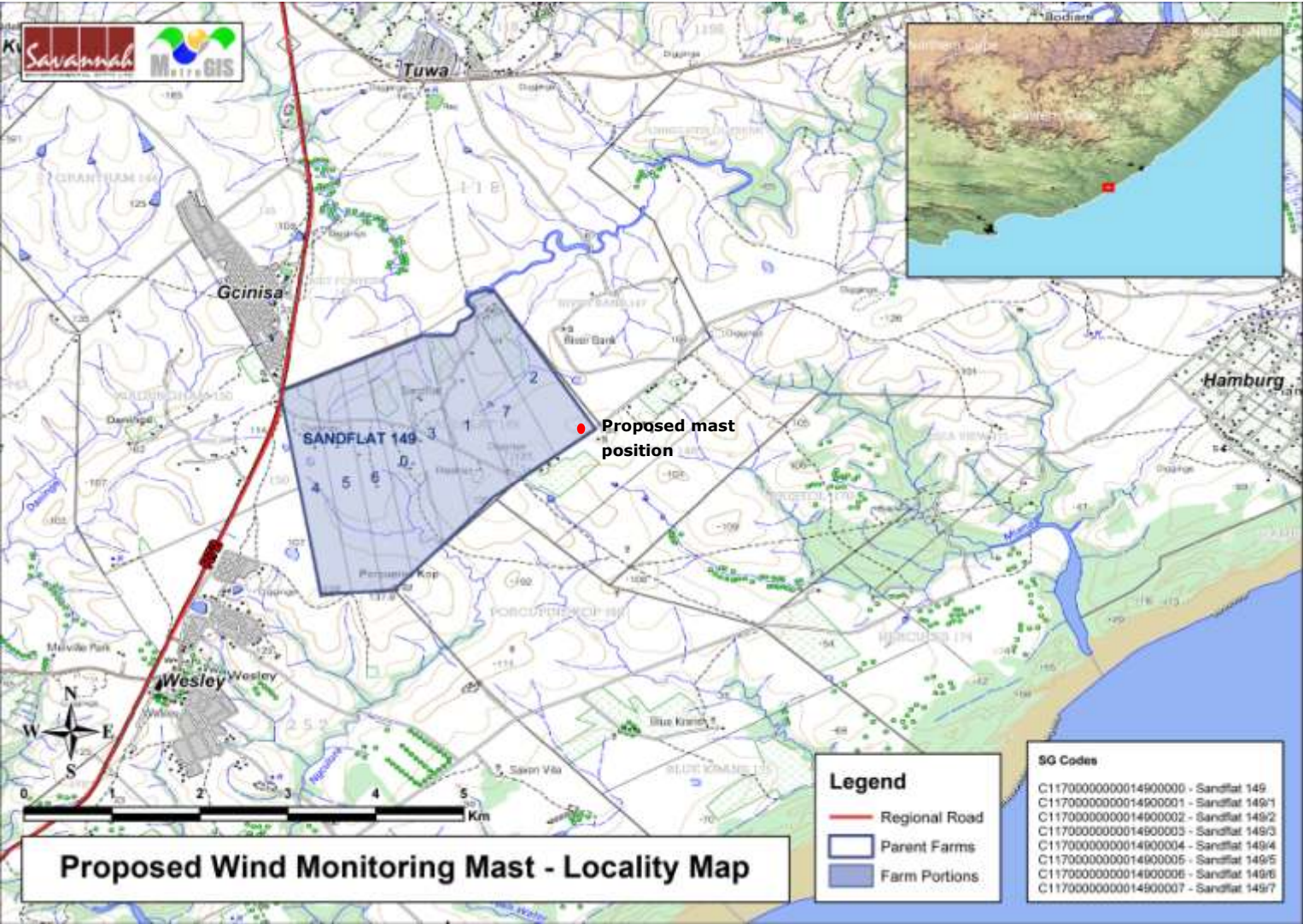


Figure 2: Site map showing the proposed Riverbank wind monitoring mast near Wesley, Eastern Cape

The Basic Assessment Report identified various potential impacts from the construction, operational and decommissioning of the wind monitoring mast, including:

- » Disturbances to the ecological environment (flora and fauna);
- » Negative visual impacts; and
- » Potential avifaunal impacts.

Due to the relatively small development footprint of the mast (i.e. $<10 \text{ m}^2$), the above-mentioned environmental impacts will be localised and will have a low impact significance prior to mitigation measures being implemented, and would result in a low – negligible impact significance after mitigation. During the development of the mast, a low level of ecological and visual disturbance will occur, however this will be within reasonable limits provided that mitigation measures are adhered to.

The key environmental impacts that are associated with the proposed wind monitoring mast are as follows:

- » **Planning or Design Phase Impacts:** There will be no impacts resulting from the planning or design phases for the proposed mast.
- » **Construction Phase Impacts:** Negative impacts on ecology will be short-term in duration and local in extent and will be of low significance. The ecology is unlikely to be affected by the small footprint of the wind monitoring mast, should the recommended mitigation measure be implemented during construction. Limited adverse visual impacts are anticipated.
- » **Operational Phase Impacts:** Negative visual impacts will be short-term (up to 48 months or once monitoring is complete) in duration and local in extent. The visual impact assessment undertaken by MetroGIS suggests that the overall visual impact of the proposed wind monitoring mast would be primarily low (along some sections of road and at some residences and facilities within a 1km radius of the mast). This is due mainly to the temporary (short term) operational phase of the wind monitoring mast and the high reversibility of the impacts after decommissioning.
- » **Decommissioning Phase Impacts:** The short term (i.e. up to 48 months or once monitoring is complete) operational phase of the wind monitoring mast and the high reversibility of the impacts after decommissioning further mitigate the long term visual impacts of the proposed wind monitoring mast.

The environmental consequences associated with any impacts will not be considered significant if appropriately managed during and after construction, operation and decommissioning. Therefore the proposed site is considered acceptable from an environmental perspective.

Just Energy must ensure that implementation of the project complies with the requirements of any and all environmental authorisations and permits, and obligations emanating from other relevant environmental legislation. This obligation is partly met through integration and subsequent implementation of the EMP into the contract documentation.

**MANAGEMENT PLAN FOR THE WIND MONITORING MAST:
PLANNING, DESIGN AND CONSTRUCTION**

CHAPTER 3

The installation of the wind monitoring mast will be undertaken over a two to three day period. No significant environmental impacts are associated with the planning, design and construction phases of the project. No waste will be generated, noise will be minimal, no water is required for construction and no significant emissions will be generated.

Overall Goal for Planning & Construction: Undertake the construction phase of the wind monitoring mast in a way that:

- » Ensures that planning and construction activities are properly managed in respect of environmental aspects and impacts.
- » Minimises the impact on vegetation and faunal habitats.

3.1. Planning and design phases

No impacts were identified to be associated with the planning and design phases of the proposed wind monitoring mast at the identified site. Therefore, no management measures are applicable.

3.2. Construction phase

The following potential impacts were identified for the construction phase for the proposed wind monitoring mast:

- » *Ecological impacts*
Limited, albeit heavily grazed, vegetation may be affected through the construction activities within the construction footprint.
- » *Visual impacts*
The installation of the proposed mast will be undertaken over a two to three day period. Visual impacts associated with construction activities will be limited to the site (localised) over a very short-term.

3.2.1. Mitigation Measures during the Construction Phase

OVERALL GOAL: To ensure that the construction of the wind monitoring mast responds to the identified environmental constraints and opportunities

Objective	Mitigation: Action/control	Responsibility	Timeframe
Minimisation of noise / visual impacts	On-site construction activities must be limited to 06:00 to 18:00 Monday – Saturday (excluding public holidays) (in terms of the Environment Conservation Act). Should Just Energy require construction activities to be undertaken outside of these times, surrounding residents must be appropriately informed.	Just Energy	Duration of construction
Protection of vegetation	Responsible construction practices must be adopted aimed at containing the construction activities to specifically demarcated areas, thereby keeping the removal of remaining vegetation to the minimum. Sufficient care will be taken during the construction phase to ensure that areas outside of the development footprint will not be disturbed through trampling.	Just Energy	Duration of construction
Minimisation of development footprint	Access to the mast site must be limited to existing access roads as far as possible. No other permanent access roads are to be established.	Just Energy	Duration of construction
Minimisation of potential noise impacts	All construction equipment, including vehicles, must be properly and appropriately maintained in order to minimise noise generation.	Just Energy	Duration of construction

Performance Indicator	<ul style="list-style-type: none"> » No complaints received concerning construction activities. » Zero disturbance outside of designated work areas. » Minimised clearing of existing vegetation. » Zero areas of soil erosion left unrehabilitated. » Minimisation of visual impacts on surrounding communities.
Monitoring	<ul style="list-style-type: none"> » An incident reporting register should be kept on site and used to record all non- conformance to the EMP.

MANAGEMENT PLAN FOR THE WIND MONITORING MAST: OPERATION

CHAPTER 4

Overall Goal for Operation: To ensure that the operation of the wind monitoring mast does not have unforeseen impacts on the environment and to ensure that all impacts are monitored and the necessary corrective action taken in all cases. In order to address this goal, it is necessary to operate in a way that:

- » Ensures that operation activities are properly managed in respect of environmental aspects and impacts.
- » Enables the wind monitoring mast operational activities to be undertaken without significant disruption to other land uses in the area.

4.1. Mitigation Measures during the Operational Phase

OVERALL GOAL: To ensure that the operation of the project responds to the identified environmental constraints and opportunities

The main impact of the operational phase for the proposed wind monitoring mast is its visual impact. Due to the height of the proposed mast (up to 60 m) it could be visible. Although tubular mast structures are not as bulky, as is the case with other masts (e.g. telecommunication masts that are much shorter), this mast could potentially be visible due mainly to its occurrence on an open elevated area. The visual exposure of the mast in this landscape would not benefit from any visual shielding effects from vegetation cover as the vegetation types (thicket, bushland and grassland) have a relatively low growth form. Visual exposure is primarily affected by the visual distance/observer proximity (i.e. the reasonable distance from which a viewer would be impacted by the proposed infrastructure).

A potential impact during the operational phase may be related to avifaunal collisions with either the mast structure or the associated guy wires. However, mitigation measures will only be required should collisions be reported.

Objective	Mitigation: Action/control	Responsibility	Timeframe
Minimisation of development footprint	Access to the mast site must be limited to existing access roads throughout the operational phase.	Just Energy	Duration of operation
Minimisation of visual impacts	Removal of the wind monitoring mast after the period of utilisation (which will be of a temporary short-term nature anticipated to be up to 48 months) or once monitoring is complete.	Just Energy	Completion of operation

Objective	Mitigation: Action/control	Responsibility	Timeframe
Minimisation of avifaunal impacts	Should avifaunal collisions be noted; then the installation of bird diverters on the guy wires may need to be implemented.	Just Energy	Duration of Operational Phase
Performance Indicator	» Zero disturbance outside of designated work areas / access roads » Removal of mast after completion of monitoring activities		
Monitoring	» An incident reporting system will be used to record non-conformances to the EMP.		

MANAGEMENT PLAN FOR THE WIND MONITORING MAST: DECOMMISSIONING

CHAPTER 5

The decommissioning of the wind monitoring mast will be undertaken over a two to three day period. No significant environmental impacts are associated with this phase of the project; no significant waste, noise or emissions will be generated.

Overall Goal for Decommissioning: To ensure that the decommissioning of the wind monitoring mast does not have unforeseen impacts on the environment and to ensure that all impacts are monitored and the necessary corrective action taken in all cases. In order to address this goal, it is necessary to operate in a way that:

- » Ensures that decommissioning activities are properly managed in respect of environmental aspects and impacts.
- » Enables the wind mast decommissioning activities to be undertaken without significant disruption to other land uses in the area.

5.1. Mitigation Measures during Decommissioning Phase

OVERALL GOAL: To ensure that the decommissioning of the project responds to the identified environmental constraints and opportunities

Removal of the wind monitoring mast will occur following the period of utilisation (of a temporary short-term nature anticipated to be up to 48 months), or once wind monitoring is completed. There will be no significant negative environmental impacts while the mast is being removed from the site or after it has been taken down. After decommissioning, the mast components will be reused, recycled or disposed of in accordance with regulatory requirements.

Objective	Mitigation: Action/control	Responsibility	Timeframe
Minimisation of noise / visual impacts	Decommissioning activities will be limited to 06:00 to 18:00 Monday – Saturday (excluding public holidays) (in terms of the Environment Conservation Act). Should Just Energy require decommissioning activities to be undertaken outside of these times, surrounding residents must be appropriately informed.	Just Energy	Duration of Decommissioning
Protection of vegetation	Responsible practices must be adopted aimed at containing the activities to specifically demarcated areas and vegetation must not be disturbed through trampling. Disturbed footprint to be appropriately rehabilitated to avoid	Just Energy	Duration of Decommissioning

Objective	Mitigation: Action/control	Responsibility	Timeframe
	erosion.		
Minimisation of development footprint	Access to the mast site must be limited to along existing access roads.	Just Energy	Duration of Decommissioning
Minimisation of waste	Components must be reused or recycled in accordance with regulatory requirements.	Just Energy	N/A

Performance Indicator	<ul style="list-style-type: none"> » Removal of mast after monitoring period is complete » Zero disturbance outside of designated work areas / access roads » Rehabilitation of disturbed area » Erosion control measures in place
Monitoring	<ul style="list-style-type: none"> » An incident reporting system will be used to record non-conformances to the EMP.