

ENVIRONMENTAL MANAGEMENT PROGRAM

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2. ENVIRONMENTAL MANAGEMENT PROGRAM

2.1 INTRODUCTION

Mitigation seeks to find better ways of doing things, minimise or eliminate negative impacts, enhance project benefits and protect public and individual rights. The applicant/proponent has a responsibility to avoid or minimise impacts, and plan for managing impacts.

This section serves to prescribe measures to reduce, limit, eliminate or compensate for impacts, to acceptable/insignificant levels. The term 'mitigate' means to 'allay, moderate, palliate, temper, intensify'. In environmental terminology this term is used as follows:

- mitigation of a negative impact;
- to reduce the significance of an impact;
- mitigation/optimization of a positive impact;

Hereunder the potential to mitigate each of the negative impacts identified will be discussed. Certain mitigation measures will be proposed and an indication will be given of how these proposed mitigation measures will influence the significance and status of each identified impact. Recommendations are arranged in order of sequence i.e. Planning/construction and Operational phases.

Mitigation should permeate through all stages of the development process. It is also essential that the mitigation plan be monitored during the construction and operational phases, to ensure compliance.

The stipulations of this report should be conveyed to contractors and persons responsible for construction. This mitigation section should be issued as a stand along document to all parties involved with the planning, implementation and operation of the proposed project.

2.2 WHAT IS AN ENVIRONMENTAL MANAGEMENT PROGRAM?

It is essential to develop measures to eliminate, offset or reduce impacts on the environment, to acceptable levels before the implementation and operational phases of a project commence. The integration of such measures to protect the environment during the implementation and operational phase of a project can be done by clearly defining environmental requirements within an Environmental Management Program (or EMPR) (World Bank, 1999: 1).

EMPR's provide a link between 1) the predicted environmental impacts (that will be induced by a certain development/project), and 2) implementation and operational activities.

Generally an EMPR performs the following functions;

- it outlines the anticipated environmental impacts of a project,
- it outlines the measures to be taken to mitigate these impacts,
- it outlines responsibilities for mitigation of impacts.

Definition of an "Environmental Management Program" (EMPR):

An EMPR is a guideline document/directive outlining the mitigation, monitoring and institutional measures to be taken during project implementation, construction and operation to avoid or control adverse environmental impacts, as well as the actions needed to implement these measures (World Bank, 1999: 1).

Definition of "mitigation measures":

Mitigation measures encompass all actions taken to eliminate, offset or reduce potentially adverse environmental impacts to acceptable levels (World Bank, 1999:1).

2.3 THE PROJECT

The proposed project is the development of a Housing Project at Tom Burke.

The project will consist of the following:

- 79 Residential 1 Erven
- 1 Residential 3 Erf
- 3 Public Open Space Erven
- 3 Business 1 Erven
- 1 Filling Station
- 1 Undetermined Erf
- Roads with a length of 2 016m

The size of the project will be approximately 18,2ha.

Engineering services will include the following:

- Graded access track,
- Engineering services viz;
 - water reticulation infrastructure
 - electricity infrastructure
 - sewerage infrastructure
 - storm water management infrastructure (where required).

Several potentially negative and positive impacts/effects can arise from a development such as the proposed housing project. These can however be mitigated through the implementation of a number of mitigation measures.

2.4 REQUIREMENT FOR AN EMPR TO BE SUBMITTED

One of the normal conditions in an Environmental Authorisation is that an Environmental Management Program (EMPR) be submitted.

Due to the above it was decided to be pro-active and to submit an Environmental Management Program (EMPR), addressing a number of environmental issues related to the different phases of the project, to LEDET for approval (simultaneously with the issuing of the Environmental Authorisation).

2.5 GENERAL REQUIREMENTS

2.5.1 Geographic scope of this EMPR

This EMPR shall apply to all areas that will be affected by activities that will be undertaken at Portion 7 of the farm Vanwyksfontein 3 LR. The proposed site is located in Tom Burke.

2.5.2 Time frame of this EMPR

This EMPR shall apply to all actions that will be undertaken at the above mentioned property, between the date of issuing of the Environmental Authorisation and the date of completion of construction.

2.5.3 EMPR to inform planning

During planning and design, the proponent and its planning consultants and contractors, should take into account the recommendations of this EMPR so that it is positively utilised on a pro-active basis to aid in the mitigation of impacts.

2.5.4 EMPR to contractors

The stipulations of this mitigation program (EMPR) should be conveyed to contractors prior to the commencement of construction. Contractors should acknowledge receipt thereof in writing (this can be achieved by including this EMPR as an annexure to the tender documents).

2.5.5 Incorporate recommendations into construction contracts

Construction-phase mitigation guidelines and clauses should be written into contract documents as specifications, in addition to the minimum requirements as set out in the SABS Standardised Specification for Civil Engineering Construction.

Additional clauses should be added as necessary in response to specific impacts that may be identified during the detailed design stage.

2.5.6 EMPR monitoring

Implementation of this EMPR (adherence to this EMPR) should be monitored to ensure compliance. There should also be penalties for non-compliance.

2.5.7 Notifying the public

Adjacent landowners shall be informed of the fact that construction activity will take place at the site (personal letters of notification should be used as the means of notification).

2.6 RECOMMENDED ENVIRONMENTAL IMPACT MANAGEMENT MEASURES

2.6.1 PLANNING PHASE MITIGATION GUIDELINES

IMPACT: Impact on ecology, water and soil				
Activity	Specific Impacts	Mitigation Measures	Responsible	Time Frame
Positioning of development and impact on the adjacent environment	Layout of development	The development must take place around the protected <i>Sclerocarya birrea</i> and <i>Boscia albitrunca</i> trees.	Developer and planning team	During planning phase

2.6.2 CONSTRUCTION PHASE MITIGATION GUIDELINES

IMPACT: Air pollution and soil				
Activity	Specific Impacts	Mitigation Measures	Responsible	Time Frame
Earthworks and vegetation clearance	Smoke and health problems	Vehicles used on or entering the site to be in good order and serviced regularly in order to reduce excessive smoke or fumes.	Developer and contractor	Regular servicing
Construction of roads	Dust	Damping down of access roads and cleared areas should take place. Topsoil should be seeded to prevent wind erosion. As much natural vegetation should be retained as is possible.	Developer and contractor	Windy and dry conditions
Excavations for installation of services	Noise and nuisance	All equipment and vehicles on the site will be equipped with noise suppressing measures and kept in proper working order. Where working at the site noise levels must be within ambient noise level so as not to cause a nuisance to adjacent areas of residence. Working hours should be limited to between 06h00 and 17h00 (Mondays to Saturdays only). Adjacent residents shall be informed of unusually noisy	Developer and contractor	During construction hours

		activities that will be undertaken.		
Burning of waste	Air pollution and smoke	Burning of any waste (including garden waste) inside the development shall be prohibited.	Developer and contractor	During construction phase

IMPACT: Ground- and surface water pollution

Activity	Specific Impacts	Mitigation Measures	Responsible	Time Frame
Toilet facilities	Water pollution and health risk	The use of portable chemical toilets for use by the labour force is essential to avoid pollution and attraction of vermin and flies.	Developer and contractor	During construction phase
Storage of fuels and chemicals	Water pollution	Due to very limited amounts of the fuels and chemicals being used during construction, leaching thereof into the underground water is highly unlikely. Adequate fuel containment facilities should however be used. Storage should take place in bund walls.	Developer and contractor	During construction phase
Soil erosion	Siltation of streams and water courses	When soil is cleared of vegetation, management techniques to prevent water erosion should be employed (e.g. reduction of water velocity and the diversion of surface water runoff downslope).	Developer and contractor	During construction phase

IMPACT: Loss of biodiversity

Activity	Specific Impacts	Mitigation Measures	Responsible	Time Frame
Plant collection, utilising of trees for firewood	Loss of biodiversity	Effective site control and monitoring by site engineer should take place. No fires should be allowed on site except in designated areas. Access to the site should be controlled - local disadvantaged residents should be allowed to collect firewood (only where bush is to be cleared).	Developer and contractor	During construction phase
Hunting and capture of birds and	Loss of biodiversity	Capture or snaring of birds or other fauna must be strictly prohibited on site - especially with regards to	Developer and contractor	During construction phase

other fauna		contractors employees.		phase
Visual impact of construction activities	Loss of biodiversity	Retain as many existing trees as possible to screen construction works. Construction activities should be kept clustered on site at all times.	Developer and contractor	During construction phase
Proliferation of alien plant species	Loss of biodiversity	Regulation 15 of the Act on the Conservation of Agricultural Resources (as amended), Act No. 43 of 1983, determines that the establishment of declared weeds and invasive plants during and after development should be prohibited. It is recommended that alien species be removed and destroyed, preferably burned, before commencement of any construction activities.	Developer and contractor	During construction phase

IMPACT: Archaeological findings				
Activity	Specific Impacts	Mitigation Measures	Responsible	Time Frame
Earth moving, trenching and soil clearance	Uncovering of heritage or archaeological sites / resources / graves	In the case of an archaeological/heritage resources "find", all excavation work should be halted and a heritage resources practitioner should be consulted (or alternatively the nearest SAHRA office). If found, graves shall be relocated in accordance with the stipulations of the South African Heritage Resources Act and its relevant regulations pertaining to graves.	Developer and contractor	During construction phase

IMPACT: Soil pollution and degradation				
Activity	Specific Impacts	Mitigation Measures	Responsible	Time Frame
Construction impacts on soils	Soil pollution	Selective stripping of topsoil, subsoil and overburden should take place. Stockpiling of removed earth (separately) should take place and be returned for backfilling in the correct soil horizon order. In all construction areas (e.g. material laydown areas),	Developer and contractor	During construction phase

		topsoil and subsoils should be protected from contamination/pollution (e.g. by fuel etc.). Stockpiling of removed earth should not occur in drainage lines or impede surface water runoff.		
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IMPACT: Visual				
Activity	Specific Impacts	Mitigation Measures	Responsible	Time Frame
Clearing of site	Visual disturbance	Retain as many existing trees as possible to screen construction works. Construction activities should be kept clustered on site at all times.	Developer and contractor	During construction phase
Buildings and gardens	Visual intrusion	Structures/buildings should be architect designed so as to blend in with the character of the area.	Architect and developer	Design and construction phase
Lights	Nuisance	Selective and sensitive location and design of the lighting requirements for the development is a necessity. A possible alternative is to reduce the height at which exterior lights are fixed and to identify zones of high and low lighting requirements. Lights should be focussed inward rather than outward.	Architect and developer	Design and construction phase

IMPACT: Safety, security and fire hazards				
Activity	Specific Impacts	Mitigation Measures	Responsible	Time Frame
Construction activities	Increase risk on safety of people	Implementation of an Occupational Health and Safety management system should be required of contractors. Safety measures and work procedures to be communicated to construction workers. First aid facilities to be on hand at all times. Medical screening of employees. Contractors shall implement adequate and mandatory	Developer and contractor	Safety of workers daily

		<p>safety precautions relating to all aspects of the operation. Warning and advisory signage should also be implemented (also with regards to vehicular movement along public roads).</p> <p>Appointed contractors should be required to implement security measures at construction camps/material laydown areas. Security gate control measures should be implemented in order that only labourers and authorised persons obtain access to the construction camps/material laydown areas.</p>		
Burning of waste		Burning of any waste (including garden waste) inside the development shall be prohibited.		
Construction activities	High positive expectations regarding employment opportunities	Local employment and procurement should receive priority when embarking upon planning and construction activities. Contractors should be required to make use of local labour and suppliers where possible.	Contractor	Before commencement of construction activities

2.6.3 OPERATIONAL PHASE MITIGATION GUIDELINES

IMPACT: The bio-physical environment				
Activity	Specific Impacts	Mitigation Measures	Responsible	Time Frame
Clearing of site	Loss of biodiversity and soil erosion	<p>Seeding of topsoil to prevent wind and water erosion should take place.</p> <p>Management techniques should be employed to prevent erosion e.g. seeding topsoil and subsoil and stockpiles, brush packing and contour channels/berms etc.</p> <p>When soil is cleared of vegetation, management techniques to prevent water erosion should be employed (e.g. reduction of water velocity and the</p>	Tenants	Continuous

		diversion of surface water runoff down slope).		
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IMPACT: Alien species				
Activity	Specific Impacts	Mitigation Measures	Responsible	Time Frame
Clearing of site	Increasing of alien plant species	<p>Areas where construction has taken place shall be kept free of invaders/weeds.</p> <p>Regulation 15 of the Act on the Conservation of Agricultural Resources (as amended), Act No. 43 of 1983, determines that the establishment of declared weeds and invasive plants during and after development should be prohibited.</p>	Tenants	Continuous

IMPACT: Air Pollution and Noise				
Activity	Specific Impacts	Mitigation Measures	Responsible	Time Frame
Induced traffic	Heavy vehicles will impact on vehicle movements in the immediate area of the site	Vehicles must comply with the municipal noise and emissions regulations.	Tenants	Continuous
On site waste water treatment works	Odour	The proposed waste water treatment works on site must be maintained regularly so that it is odour free.	Waste water treatment works manager	Continuous

IMPACT: Soil Erosion				
Activity	Specific Impacts	Mitigation Measures	Responsible	Time Frame
Stormwater flow over open areas	Loss of topsoil	Cleared areas must be kept covered by vegetation or paving to limit the effect of erosion and siltation.	Tenants	Continuous

IMPACT: Ground Water Pollution				
Activity	Specific Impacts	Mitigation Measures	Responsible	Time Frame
Underground storage tanks and equipment	Negative impacts on the underground water quality	<p>Check the fuel in all underground fuel tanks and report suspected leaks immediately.</p> <p>Check if water has entered underground tank.</p> <p>Regular monitoring (three-monthly) of the monitoring wells must be undertaken to prevent pollution. Records of monitoring must be kept and made available to the DWA on request. Should contamination be detected, monitoring must be extended to the monitoring boreholes as identified during the hydro census. If contamination is detected in the extended borehole survey, a rehabilitation plan must be compiled and executed.</p> <p>Monthly stock reconciliations must be taken and reported monthly to the Department of Water Affairs (DWA).</p> <p>The leak detectors must be regularly tested and records kept.</p> <p>All machinery must be maintained in good working order as to prevent soil or water pollution from oil, fuel or other leaks.</p>	Filling station manager	Continuous
Potential degradation of groundwater resources due to system failure of the on-site waste water treatment works	Negative impacts on the underground water quality	Adjacent landowners should be notified of any system failures and non-compliance with the General Standard. Daily records should be kept of significant events in the works. Significant events include peculiar color of water, failure of equipment, strange smell, recording the date and time at which this	Waste water treatment works manager	Continuous

		occurred.		
Discharged treated effluent	Negative impacts on the underground water quality	It is proposed that the treated effluent be utilised for irrigation. Groundwater and discharged water qualities should be monitored. Monitoring programme to be implemented according to DWA guidelines.	Waste water treatment works manager	Continuous

2.6.4 DECOMMISSIONING PHASE

Should the Housing Development for any reason be closed, an Environmental Management Plan relating to the rehabilitation of the area shall be submitted to LEDET for approval.

2.6.5 MONITORING AND REPORTING

- The proponent should monitor compliance with this EMPR - especially the following shall be monitored:
 - Limiting of disturbance caused by construction activities (geographical area),
 - Effective waste management;
 - Disturbance of biota,
 - Legal compliance (including the stipulations of the Environmental Authorisation, as issued by LEDET).
- The proponent shall conduct inspections of the construction site on a weekly basis. The following persons shall attend such inspections - the site engineer, the contractor & the proponent.
- The proponent shall document the findings of his monitoring actions.
- The proponent shall report to LEDET on a monthly basis.
- The proponent shall keep a documented complaints register.
- For the purposes of receiving complaints, the contact details of the proponent shall be clearly displayed at the main entrance to the site.
- The nature of complaints that are received shall be brought to the attention of LEDET and all contractor(s).
- A suitable written response shall be given, by the proponent to complainants, where required.
- In an instance where an "environmental incident" is recorded, the proponent shall take appropriate action to correct the "environmental incident". Such action shall be in accordance with the nature and scale of the recorded incident. Such corrective action shall be implemented as soon as possible after the occurrence of the incident. "Corrective action" undertaken by the proponent shall also include the rehabilitation of secondary environmental disturbance/damage resulting from undertaking corrective action.
- The re-occurrence of an environmental incident shall be avoided through the implementing of suitable precautionary measures to prevent the recurrence of such.
- The proponent contractor shall document "environmental incidents" on an "Environmental Incident Report Sheet" (EIRS) within 1 day (24 hours) from the time that the incident has occurred. Supplementary documentation can be attached to the EIRS.
- Environmental incidents shall be reported to the proponent by contractors during the weekly site visits. A course of action shall then be decided upon jointly (as a precautionary measure to avoid the re-occurrence of these types of incidents).