

APPENDIX G: ENVIRONMENTAL MANAGEMENT PROGRAMME

ENVIRONMENTAL MANAGEMENT PROGRAMME

**Township Establishment on Portion 3, Riekerts Laager 165JR,
Dr. J.S. Moroka Local Municipality**

DEDET Reference: 17/2/3N-331
Date of Authorization:
Date of EMP Submission:

Content

- 1. Background Information
 - 1.1 Location and size
 - 1.2 Project details
 - 1.3 Details of the EAP/ECO

- 2. Objectives

- 3. Responsibilities
 - 3.1 Applicant
 - 3.2 Contractors and owners
 - 3.3 Environmental Control Officer
 - 3.4 Environmental Incidents

- 4. Legal Requirements

- 5. Environmental Monitoring and Reporting

- 6. Environmental Management Tables

- Appendixes

1. Background Information

The EIA process for this project was undertaken by Afrika Enviro & Biology. The Environmental Management Programme (EMP) is formulated in order to manage and mitigate potential environmental impacts in order to minimize their magnitude. This EMP must be submitted to the Provincial Authority for approval as a partial requirement of the Environmental Authorization.

1.1 Location

The proposed development site is located on Portion 3 of Riekerts Laager 165JR. Central site coordinates are: S25°09'47.3"; E28°49'44.6". The property is located in the Dr. J.S. Moroka Local Municipality and is approximately 1161Ha in size of which 70Ha will be used to formalize an existing residential township and provide new serviced stands. The objective of the project is to formalize the existing residential dwellings and provide services to improve living conditions of the residents. New houses will be provided in the central eastern section with roads, and Municipal services. Approximately 500 stands will be supplied (including the existing stands). The proposed land uses are: residential = 481, business = 8, Institutional = 10 (churches - 6 and crèches - 4) municipality = 4 erven and public open space = 4. The access road to the site will be on D-1944 road connecting to R568 road. There will be proposed 13m roads providing direct access to the erven. Due to the location of the site near adjacent to the existing Vaalbank Township, municipal services is already available on site and will be upgraded to include the additional demand.

1.2 Description of proposed activity

The applicant intends to establish a mixed township development on the property. The proposal entails the following activities that are listed in the EIA Regulations (2010):

Indicate the number and date of the relevant notice:	Activity No (s) (in terms of the relevant notice) :	Describe each listed activity as per the detailed project description (and not as per wording of the relevant Government Notice) ¹ :
No. R.544 June 18 2010	9	The construction of infrastructure exceeding 1000m in length for the bulk transportation of water, sewage and storm water with an internal diameter of 0.36m or more and a peak throughput of 120L/second or more.
No. R.544 June 18 2010	22(i)	The construction of roads, outside urban areas, with a reserve wider than 13.5 metres.
No. R.544 June 18 2010	26	The property is located in an area identified by the Mpumalanga Biodiversity Conservation Plan as a sensitive area and therefore Section 53 of the National Environmental Management Biodiversity Act is applicable.
No. R.545 June 18 2010	15	The proposed development is 70Ha in size and will transform more than 20Ha of vacant land.
No. R.546 June 18 2010	4(ii)	The construction of roads wider than 4m outside an urban area in a sensitive biodiversity management area.
No. R.546 June 18 2010	13(a)	The clearance of more than 1ha of indigenous vegetation within a critical biodiversity area and ecological support area.
No. R.546 June 18 2010	13(c)iii(ff)	The clearance of more than 1ha of indigenous vegetation outside urban areas within 5km of a protected area.
No. R.546 June 18 2010	14(a)i	The clearance of more than 5ha of indigenous vegetation outside an urban area.

2. Objectives

The objectives of environmental management are to oversee that the potential environmental impacts are managed and mitigated to a satisfactory level and also to ensure that the terms as set in the RoD are complied with. The environmental management programme (EMP) will form the basis as tool to measure compliance by the developer. It is also this tool that gives guidance during monitoring, auditing and taking corrective actions during its implementation, thereby ensuring continuous monitoring of the environment. An EMP is developed after an environmental assessment, depending on the level of such assessment. It can also be drawn after the authorization by the environmental authority, to incorporate the conditions thereof.

An EMP is normally implemented throughout the project life-cycle, i.e. during planning, construction, rehabilitation, operation and decommissioning, in order to minimize negative impacts and enhance positive ones. An effective EMP will be a practical working document that sets out the requirements and the goals required in mitigation. The main terms of the EMP will be detailed to achieve the following:

- To allocate responsibilities;
- To provide time frames.
- To define measures to be taken during planning, construction, and operation and decommissioning/closure;
- To define the actions needed to implement those measures;
- To describe how these will be achieved;

These objectives are defined and discussed in the following sections.

3. Responsibilities

3.1 Owner

The owner of the authorization is responsible for ensuring that the activity is implemented according to the requirements of the EMP. The owner must ensure that relevant professionals are appointed to perform functions as required by the authorities and legislation. The owner will have the following responsibilities:

- To ensure there is sufficient allocation of resources to the professional role players to perform their tasks in terms of the EMP;
- In event that the Environment is significantly negatively affected, the owner will be responsible for rehabilitation and restoring the affected areas to an acceptable level;
- The owner must include the EMP with all tender and contractual documents in order to ensure that all parties involved are bound to the terms of the EMP;
- The Environmental Control Officer (ECO) must be appointed oversee the environmental aspects of the development and ensure compliance with the EMP.
- The owner or developer must provide the contractors with a copy of the EMP and any other relevant documentation or supporting documents.

3.2 Contractors and owners

The contractor/owner is bound to the terms and conditions of the EMP by way of the contract with the developer. The contractor must be familiar with the terms of the EMP before commencement of the activities on site and must request clarification on any issues that be unclear. The main responsibilities of the contractor are as follows:

- The contractor/owner must comply with all the terms and conditions of the EMP and must ensure that all sub contractors are initiated with the EMP and comply with the terms of the EMP;
- The contractor/owner must attend a site inspection and orientation session with the ECO to identify and be informed of the sensitive elements of the site and take cognizance of the boundaries of the construction area. The ECO must point out any particular site-specific elements of importance;
- The contractor/owner must ensure that the construction crew attends an environmental briefing and training session presented by the ECO prior to commencing activities on site;
- The contractor/owner must adhere to all verbal all written orders given by the Environmental Control Officer (ECO) or other responsible persons (project manager or site engineer) in terms of the EMP;

3.3 Environmental Control Officer

The applicant must appoint an independent environmental officer (ECO) that will have the responsibility of implementing the EMP and ensuring compliance with the conditions of this environmental authorization. The main responsibilities and duties of the ECO are as follows:

- The priority of the ECO is to ensure that the site environment is not significantly negatively affected by the proposed activities and that minimal environmental damage is done during construction and adequate measures is emplaced to ensure that future operations and maintenance does not significantly impact on the environment.
- The ECO shall liaison with relevant authorities and keep record of all correspondence with external interested and affected parties;
- To ensure that the proponent, construction team, the operational and maintenance workers are acquainted with their responsibilities.
- To ensure compliance with regulatory authorities requirements.
- To respond to changes in the project implementation not considered during the assessment phase, and respond to unforeseen events.
- To verify environmental performance through information on impacts as they occur.
- To establish proper communication channels and provide feedback for continual improvement.

3.4 Environmental Incidents

In order for the EMP to be efficient in case of any environmental incidents, the following criteria should be adhered to:

- In event of a significant environmental incident occurring the contractor must notify the ECO and/or the authorities within 24 hours of occurrence;
- Investigate the cause of the incident and compile an environmental incident report;
- Take corrective measures to mitigate the incident;
- Rehabilitate any residual damage to the environment;
- Introduce alternative operating procedures and/or technology to prevent a recurrence of the incident;

4. Legal Requirements

Legislation and guidelines are considered during this process are as follows:

- Constitution of the Republic of South Africa (No 108 of 1996)
- National Environmental Management Act (No 107 of 1998)
- National Environmental Management: Waste Act (No 59 of 2008)
- National Environmental Management: Air Quality Act.
- National Environmental Management: Biodiversity Act (No 10 of 2004)
- National Environmental Management: Protected Areas Act (No 31 of 2004)
- Mineral & Petroleum Resources development Act (No 28 of 2002)
- Environmental Conservation Act (No 73 of 1989)
- National Water Act (No 36 of 1998)
- Conservation of Agricultural Resources Act (No 43 of 1983)
- National Heritage Resources Act (No 25 of 1999)
- Occupational Health and Safety Act (No 85 of 1993)
- Promotion of Access to Information Act (2000)
- National Roads Act (No. 7. 1998)
- Advertising on Roads and Ribbon Development Act (No. 21, 1940)
- EIA regulations and guidelines (2010)
- All relevant Provincial regulations and Municipal bylaws

5. Environmental Monitoring and Reporting

The ECO appointed on behalf of the owner will be responsible to monitor compliance with the conditions of the authorization, environmental legislation and this EMP for the duration of the planning, construction and rehabilitation phases of the project and must submit compliance reports on a monthly timeframe. After completion of the rehabilitation phase a post construction audit must be carried out and submitted. The services of the ECO will terminate as soon as an acceptable level of rehabilitation has been reached.

6. Environmental Management Tables

The EIA report and specialist reports were used as basis in order to compile the EMP for this project. The impacts, objectives, mitigation measures, time frames (phases) and responsibilities are condensed into the EMP tables for easy reference. These tables list

the key activities and relate these activities with resulting environmental impacts identified during the EIA process as well as the conditions included with the authorization granted by the competent authority. The tables are included on the following pages:

Table 1 Compliance with legislation and regulatory authorities

Relevance		Compliance with regulatory authorities. Non compliance may result in legal liabilities.	
Environmental Statement			
Ref:	Responsibility	Mitigation	Phase
1.2	Applicant	All requirements of the National Water Act (1998) and the South African Heritage Resources Act (1999) must be complied with.	All phases
1.3	Applicant	The owner is responsible for compliance with the provisions for Duty of Care and Remediation of environmental damage as contained in section 28 of NEMA.	All phases

Table 2 Protection of sensitive areas and habitats

Impact		Inadequate planning and the construction activities may cause unnecessary environmental damage and the degradation and destruction of sensitive areas and habitats.	
Environmental Statement			
Ref:	Responsibility	Mitigation and objectives	Phase
2.1	Development Planner	Construction activities must remain within the defined development areas and no disturbance to the natural environment is allowed outside thereof.	Planning Construction
2.2		Known heritage sites must be protected and managed according to the specialist heritage report. Destruction permits will have to be obtained in the case that any sites are to be disturbed or destroyed.	Planning

Table 3 Management of construction camp and labor discipline

Impact		<ul style="list-style-type: none"> The establishment of the construction camp on an inappropriate site may cause damage to the environment. The construction camp may cause pollution due to sewage, littering and domestic waste which may enter the environment. The spread of uncontrolled fires is dangerous to people, property and the environment. Poor discipline and long working hours will impact on the social integrity of the local area. 	
Environmental Statement			
Ref:	Responsibility	Mitigation and objectives	Phase
3.1	Contractor	Prior to establishing the construction camp, the contractor shall produce a plan showing the positions of all structures, lay-down yards and other infrastructure for approval by the ECO.	Planning
3.2	Contractor	Prior to the commencement of construction activities, the contractor and construction personnel must be initiated with regards to the conditions of the environmental authorization as well as the EMP.	Planning Construction
3.3	Contractor	The construction camp must have a minimum buffer zone of 50m from the 1:100 year flood line or any watercourse or	Planning Construction

		sensitive habitats.	
3.4	Contractor	The construction camp must be fenced off and contractors and the personnel's movements must be limited to the construction sites only. This must be enforced in terms of appointment contracts.	Construction
3.5	Contractor	No indigenous trees or shrubs will be felled or damaged for the purpose of obtaining firewood or construction material.	Construction
3.6	Contractor	Lighting and noise disturbance or any other form of disturbance that may have an effect on the landowners/tenants/persons lawfully living in the vicinity, will be kept to a minimum.	Construction
3.7	Contractor	All personal washing operations will take place at a location within the construction camp perimeter, where wastewater can be disposed of in an acceptable manner.	Construction
3.8	Contractor	A designated place for food preparation and eating must be established at the construction camp.	Construction
3.9	Contractor	Dry chemical toilets must be made available at a ration of 1 toilet per 10 staff, within the campsite perimeter and effluent must be disposed off site at an approved municipal facility.	Construction
3.10	Contractor	Fires will only be allowed on pre designated sites approved by the ECO areas and in facilities or equipment specially constructed for this purpose.	Construction
3.11	Contractor	If required by applicable legislation, a firebreak shall be cleared around the perimeter of the camp and office sites.	Construction
3.12	Contractor	Construction activities must be limited to normal working hours (7h00-17h00).	Construction

Table 4 Waste management and disposal

Impact		Inadequate waste disposal will result in environmental pollution.	
Environmental Statement			
Ref:	Responsibility	Mitigation and objectives	Phase
4.1	Contractor	An adequate number of appropriate refuse bins must be provided at the construction camp and sites for refuse and solid waste. These bins must be emptied on a daily basis into an appropriate container bin that should be located in a designated waste storage area. This waste should be removed regularly to a registered dumping site for disposal.	Construction
4.2	Contractor	The contractor may not dispose of any waste and/or construction debris by burning or by burying.	Construction
4.3	Contractor	All general construction waste such as packaging and off-cuts, empty cement bags must be disposed to central collection points on a daily basis.	
4.4	Contractor	A specific site should be allocated for the collection of construction waste e.g. empty cement bags, etc. A low temporary fence may be erected around such a site in order to contain the waste and assist the effective removal thereof from the site. Construction waste should be removed on a weekly basis.	Construction
4.5	Contractor	The contractor must maintain good housekeeping practices to ensure that the construction site is kept tidy and litter free.	Construction
4.6	Contractor Owners	All general and construction waste must be disposed of at a permitted landfill site.	Construction Operational

Table 5 Protection of water resources and soil

Impact		<ul style="list-style-type: none"> ○ Soil and water resources may be polluted by various activities during the construction and operational phases of the proposed development if not properly managed. ○ Topsoil may be lost if not handled and stockpiled with care. ○ Inadequate storm water management will cause erosion of topsoil and degradation of water courses and wetlands. 	
Environmental Statement			
Ref:	Responsibility	Mitigation and objectives	Phase
5.1	Contractor	Pollution of any kind or reason is strictly prohibited. Reasonable precautions must be taken to prevent the pollution of soil and surface or groundwater on and adjacent to the site. It is the developer's responsibility to rectify and address any pollution caused by the activities on site.	Construction
5.2	Contractor	No natural water resource is to be used for washing, the cleaning of tools or any other apparatus or the dumping of refuse and waste. This includes for purposes of bathing, or the washing of clothes etc.	Construction
5.3	Contractor	Adequate sanitation facilities and water supplies must be available to the construction personnel.	Construction
5.4	All	No water is allowed to go to waste. This resource must be used responsibly and reticulation pipes, taps and reservoirs must be monitored for leaks.	All phases
5.5	Contractor	Topsoil shall be removed from all areas where physical disturbance of the surface will occur.	Construction
5.6	Contractor	Topsoil must be stockpiled separately for rehabilitation later and may not be used as filling material. Topsoil stockpiles are not to exceed 5m in height.	Construction
5.7	Contractor	Soil that has become compacted as result of construction activities must be loosened to allow for seed germination.	Rehabilitation
5.8	Developer	Establishment and use of sand/gravel/soil borrow pits must be authorized and comply with relevant legislation.	Construction
5.8	Contractor	During construction, all areas susceptible to erosion must be protected by the installation of the necessary, temporary and permanent drainage works as soon as possible. a) The drainage diversion system should also prevent run-off from areas of potential pollution. b) There should be monitoring and inspection of the site's drainage system to ensure that the water flow is unobstructed. c) Measures must be taken to prevent ponds of surface water.	Construction
5.9	Developer Contractor	Prevent soil erosion and correct any cause of erosion at the onset thereof in the most appropriate manner.	Construction
5.10	Developer	Existing signs of erosion must be rehabilitated using interventions such as gabions or geotextile fabric and ingenious methods of landscaping.	Construction
5.11	Developer	Areas with a high potential of erosion must be protected by the, the use of groundcover or grass and the construction of cut of berms, and terracing should be applied to steep slopes.	Construction Operational
5.12	Developer	A detailed storm water management plan must be formulated and be approved by DWA before commencement of the construction phase. This plan must have the have the following objectives: a) The increase in peak flows must be mitigated by retaining storm water until after peak flows e.g. by method of attenuation dams;	Construction

		<p>b) Storm water management measures must be designed to promote infiltration and to slow the rate of flow before water is released into the natural drainage areas (wetlands and watercourses);</p> <p>c) No surface storm water may be channeled directly into any water course or wetland and the point of overland storm water discharge must be located 20m away from watercourses and wetlands and must occur over areas with a minimum vegetation cover of 80%;</p> <p>d) The rate of storm water runoff must be reduced by mechanisms such as the construction of earth berms and grass swales. Where erosion at the base of swales or channels and at pipe/culvert outlets is likely to occur, inverts must be armoured to obviate scour and where appropriate, swales must be vegetated with grass or be lined;</p> <p>e) Infiltration at storm water outlets will be promoted by gabion type mattresses.</p>	
5.13	Contractor	Surface water rich in sediment or pollutants must be prevented from entering any water course or wetland and mechanisms for dissipating water energy (such as those listed in the above cell) must be implemented at the inception of the construction phase	Construction
5.14	Owners	Rain water runoff from roofs must be directed into gardens or rainwater tanks as opposed to storm water drains.	Operational

Table 6 Management of construction vehicles, building materials and construction sites

Impact		<ul style="list-style-type: none"> o Poorly maintained vehicles and the servicing of construction vehicles may cause environmental pollution. o Inadequate stockpiling, handling and storage of building materials may cause degradation of the environment and pollution. o Improper storage and handling of hazardous substances pose a health threat. 	
Environmental Statement			
Ref:	Responsibility	Mitigation	Phase
6.1	Contractor	There must be proper handling, storage and control of all materials, fuels and chemicals that could potentially leak or spill and thereby pollute the environment.	Construction
6.2	Contractor	The surface at the servicing and refueling areas must be protected against pollution caused by spills and/or tank overfills. The protection used must be impervious so as to prevent any soil contamination.	Construction
6.3	Contractor	Refueling, maintenance and repair work of any vehicles or machinery may only be carried out at the construction site within an area designated for this purpose, equipped with the necessary pollution containment measures. In the event of a breakdown or emergency repair, any accidental spillage must be cleaned up and removed immediately.	Construction
6.4	Contractor	All construction equipment and machinery must be maintained in good order. Regular checks must be undertaken for leaks. Any potential causes of pollution must be immediately repaired, and spills must be cleaned immediately. No spills may be hosed down into a storm water drain or sewer, or into the surrounding natural environment. All contaminated soil is to be excavated to the depth of contaminant penetration, placed in 200 liter drums and removed to a registered landfill site.	Construction
6.6	Contractor	Construction vehicles have to be parked in the construction camp	Construction

		area after working hours.	
6.8	Contractor	Tar, oil based products and chemicals should be applied according to the manufacturer's specifications. Care should be taken to identify signs of pollution and suitable methods of decontamination should be used.	Construction
6.9	Contractor	The mixing of cement, concrete, chemicals (e.g. solvents, asphalt, sealants, adhesives, paints, etc.) will be carried out in designated areas on concrete aprons, protected linings, and provision will be made to contain spillages or overflows.	Construction
6.10	Contractor	Oil residue shall be treated with oil absorbent product such as <i>Drizit</i> , or a similar product, and this material must then be moved to an approved waste site.	Construction
6.11	Contractor	Stockpiles and storage yards must be demarcated in areas already disturbed or where they will cause minimal disturbance and must be within the boundary of the construction camp site.	Construction
6.12	Contractor	Construction activities and the use of machinery must be respectful of the environment. No unnecessary vegetation clearing, excavations or temporary roads is allowed.	Planning
6.13	Contractor/ECO	All temporary roads for construction or any other purposes must be planned and approved by the ECO before use.	Construction
6.14	Contractor/ECO	Any complaints received from the public must be addressed and resolved to the satisfaction of all concerned.	Construction
6.15	Contractor	Warning signs must be used to warn the general public regarding dangers around the construction sites.	Construction

Table 7 Management of noise and dust

Impact		Noise and dust pollution can be caused by various activities during both the construction and operational phases of the development if not properly managed.	
Environmental Statement			
Ref:	Responsibility	Mitigation and objectives	Phase
7.1	Contractor	Noise disturbance or any other form of disturbance that may have an affect on the persons lawfully living in the vicinity must be kept to a minimum and mitigated.	Construction Operational
7.2	Contractor	Machinery such as pumps/compressors should be placed in a manner that will allow the noise generated from them to be directed away from the closest neighbors.	Construction
7.3	Contractor	Stringent measures must be applied to minimize the generation of dust from the site or construction vehicles.	Construction Operational
7.4	Developer	A speed limit must be enforced to limit the levels of dust pollution.	Construction

Table 8 Visual Aspects

Impact		The construction of the proposed development may impact negatively on the visual character of the area.	
Environmental Statement			
Ref:	Responsibility	Mitigation and objectives	Compliance Rating
8.1	Contractor	The contractor must ensure that the site is kept tidy at all times, that sufficient refuse bins are provided, and that they are emptied regularly. Refuse or building rubble generated on the premises must not be deposited on adjacent properties, road verges or open spaces.	Construction
8.2	Developer	Disturbed and open areas must be rehabilitated and re-vegetated as soon as possible after construction. No unnecessary removal of indigenous vegetation should be allowed, but should rather be incorporated into the landscaping design.	Operational

Table 11 Rehabilitation

Impact		Disturbed sites have the potential to cause erosion and environmental degradation if not appropriately rehabilitated	
Environmental Statement			
Ref:	Responsibility	Mitigation and objectives	Phase
11.1	ECO	The Environmental Control Officer must ensure that all temporary structures, roads, materials, waste and facilities used for construction activities are removed upon completion and affected areas must be rehabilitated.	Rehabilitation
11.2	ECO	With completion of construction a proper site cleanup must be undertaken to ensure that all building rubble, excess materials, concrete spills and litter are collected and disposed of in the correct manner.	Rehabilitation
11.3	Contractor	All uneven surfaces must be leveled and excavations must be backfilled. Soils that have become compacted during the construction phase must be loosened to allow for vegetation growth.	Rehabilitation
11.4	Contractor	Bare soil surfaces must be protected from erosion.	Rehabilitation
11.5	ECO	If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the area must be prepared and planted with indigenous trees or an appropriate grass seed.	Rehabilitation