



**NKT CONSULTING SERVICES** (PTY) LTD  
WATER & ENVIRONMENTAL SERVICES

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**ENVIRONMENTAL MANAGEMENT PROGRAMME  
FOR THE PROPOSED CONSTRUCTION OF  
ADDITIONAL EIGHTEEN BROILER HOUSES ON  
PORTIONS 17 & 19 OF THE FARM MODDERBULT  
511 IR, BALFOUR, DIPALISENG LOCAL  
MUNICIPALITY**

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## **NOTATIONS AND TERMS**

**“Activity”** – means an activity identified in any notice published by the Minister or MEC in terms of section 24 D (1) (a) of the Act as a listed activity or specified activity.

**“Alternatives”** – in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity.

**“Applicant”** – Person/organisation applying for site specific activity.

**“Cumulative impact”** – in relation to an activity, means the impact of an activity that in itself may not be significant, but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.

**“Development footprint”** – in respect of land, means any evidence of physical alteration as a result of the undertaking of any activity.

**“ECO”** – Environmental Control Officer: person tasked with monitoring and supervision of the implementation and controlling of environmental issues.

**“Environmental consultant”** – An independent environmental consultant with experience in the environmental management of construction contracts.

**“Environmental Impact Assessment”** – means a systematic process of identifying, assessing and reporting environmental impacts associated with an activity and includes basic assessment and S&EIR.

**“Environmental Management Programme”** – (i) Defines the measures to be taken during the life of a project, including design, construction, and operation and decommissioning to prevent and / or manage adverse environmental impacts; (ii) defines the actions needed to implement these measures; and (iii) describes how this will be achieved.

**“Environmental Management Programme Audit”** – A systematic, documented and objective evaluation of the environmental performance of a project by objectively obtaining and analyzing evidence to determine whether the implementation of the EMPr conforms to its requirements.

**“Environmental Management System”** – The part of the overall management system that includes organisational structure, planning activities, responsibilities, procedures, processes and resources for developing, implementing, achieving, reviewing and maintaining an environmental policy.

**“Indigenous vegetation”** – refers to vegetation consisting of indigenous plant species occurring naturally in an area, regardless of the level of alien infestation and where the topsoil has not been lawfully disturbed during the preceding ten years.

**“Interested and affected party”** – means any person, group of persons or organization interested in or affected by an activity and any organ of state that may have jurisdiction over any aspect covered by the activity.

**“Land rehabilitation”** – is the process of returning the land in a given area to some degree of its former state, after some process (industry, natural disasters etc.) has resulted in its damage. Many projects and developments will result in the land becoming degraded, for example mining, farming and forestry. While it is rarely possible to restore the land to its original condition, the rehabilitation process usually attempts to bring some degree of restoration. Modern methods have in many cases not only restored degraded land but actually improved it, depending on what criteria are used to measure 'improvement'.

**“Management requirements”** – Detail on the management requirements / specifications required.

**“Phased activities”** – means an activity that is developed in phases over time on the same or adjacent properties to create a single or linked entity.

**“Responsible party”** – The person that will assume overall responsibility for ensuring that the requirement /specification is met.

**“Scheduling”** – The date by which the requirement shall be achieved. Should the requirement be applicable throughout the life of the project or a period thereof, the date will be indicated as ‘ongoing’.

**“Significant impact”** –means an impact that by its magnitude, duration, intensity or probability of occurrence may have a notable effect on one or more aspects of the environment.

**“Systematic biodiversity plan”** – is a plan that identifies important areas for biodiversity conservation, taking into account biodiversity patterns and the ecological and evolutionary processes that sustain them.

**“The Act”** – means the National Environmental Management Act, 1998 (Act No. 107 of 1998).

**“The regulations”** – means the Environmental Impact Assessment Regulations made under section 24 (5) of the Act.

**“The works”** – all areas within which the contractor activities will take place, including the construction right of way, access roads, campsites, borrow pits and the like.

**“Watercourse”** – means a river or spring; a natural channel or depression in which water flows regularly or intermittently; a wetland, lake or dam into which or from which water flows; and any collection of water which the Minister may, by notice in the gazette, declare to be a watercourse as defined in the National Water Act, 1998 (Act No. 36 of 1998). A reference to a watercourse includes, where relevant, its bed and banks.

**“Wetland”** – means land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered

*with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil.*

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## LIST OF ABBREVIATIONS

AIA	Archaeological Impact Assessment
CBA	Critical Biodiversity Area
DWS	Department of Water Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EMP	Environmental Management Programme
EMS	Environmental Management System
ESA	Environmentally Sensitive Area
I&AP	Interested and Affected Party
NEMA	National Environmental Management Act (Act No. 107 of 1998)
NHRA	National Heritage Resources Act (Act No. 25 of 1999)
NWA	National Water Act (Act No. 36 of 1998)
PSC	Project Steering Committee
SAHRA	South African Heritage Resources Agency

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## **1 Purpose and objectives of environmental management programme**

The main driving force behind the compilation of this EMPr is to outline measures that are to be implemented in order to minimise adverse environmental impacts that are either direct, indirect or cumulative impacts associated with the proposed mixed used development. This is done by encouraging good management practices through planning and commitment of environmental issues and complying with all applicable laws, regulations, standards and guidelines for the protection of the environment. The EMPr serves as a guide for contractors, sub-contractors and employees on their roles and responsibilities concerning environmental management on site. Furthermore, it provides a framework for environmental monitoring throughout the development's life cycle. This document provides appropriate mitigation measures designed to minimise or eliminate the significant adverse impacts that may be caused as a result of the proposed project and to also enhance positive impacts.

### **1.1 Objectives of the EMPr**

The EMPr aims to achieve the following objectives:

- To provide a structure or framework within the environmental management requirements which will be implemented, audited and reported on, in order to ensure that potential impacts on the environment are minimized.
- To set out the mitigation measures and environmental specifications which are required to be implemented during various phases of the development in order to minimize the extent of environmental impacts, to manage environmental impacts and where possible to improve the condition of the environment.
- To state standards and guidelines that are required to be achieved in terms of environmental legislation and authorization conditions.
- To provide a clear indication of the environmental management requirements of each of the role players involved.

## **1.2 Structure of the environmental management programme**

It is intended to be an overview document that specifies the on-site environmental management philosophy of the proposed mixed use development and the organisational structure necessary to achieve that vision. In addition, it specifies common environmental management and monitoring principles that will be applied to all aspects of the proposed project.

The EMPr provides mitigation and management measures for the following phases of the project

## **1.3 Why EMPr?**

A typical EMPr will outline how negative environmental impacts will be managed and minimised; how positive impacts will be maximised; and how the activities of the proposed mixed use development and associated infrastructure will be managed. The programme will provide guidelines for the planning and design (where necessary),

construction, operation, maintenance and eventual decommissioning of the proposed development, as well as a holistic management and monitoring programme for the entire project. Recommendations will be given with regard to the responsible parties for the implementation of the EMPr. The aims of this EMPr are to:

- Encourage good management practices through planning and commitment to environmental issues;
- Comply with all applicable laws, regulations, standards and guidelines for the protection of the environment; and,
- Adopt the best practicable means available to prevent or minimise adverse environmental impacts.
- Ensure safe storage and distribution of all products;
- Ensure effective maintenance of equipment and facilities;
- Describe all monitoring procedures required to identify impacts on the environment; and,
- Train employees and contractors with regard to environmental obligations and aspects of the proposed development;
- Define how the management of the environment is reported and performance evaluated. Outline guidelines for operational management for the sound management of environmental issues pertaining to the execution of work associated with the facility;
- Provide detailed specifications for the management and mitigation of activities that have the potential to impact negatively on the environment.

## 2 Guideline to EMPr

An Environmental Management Programme must contain-

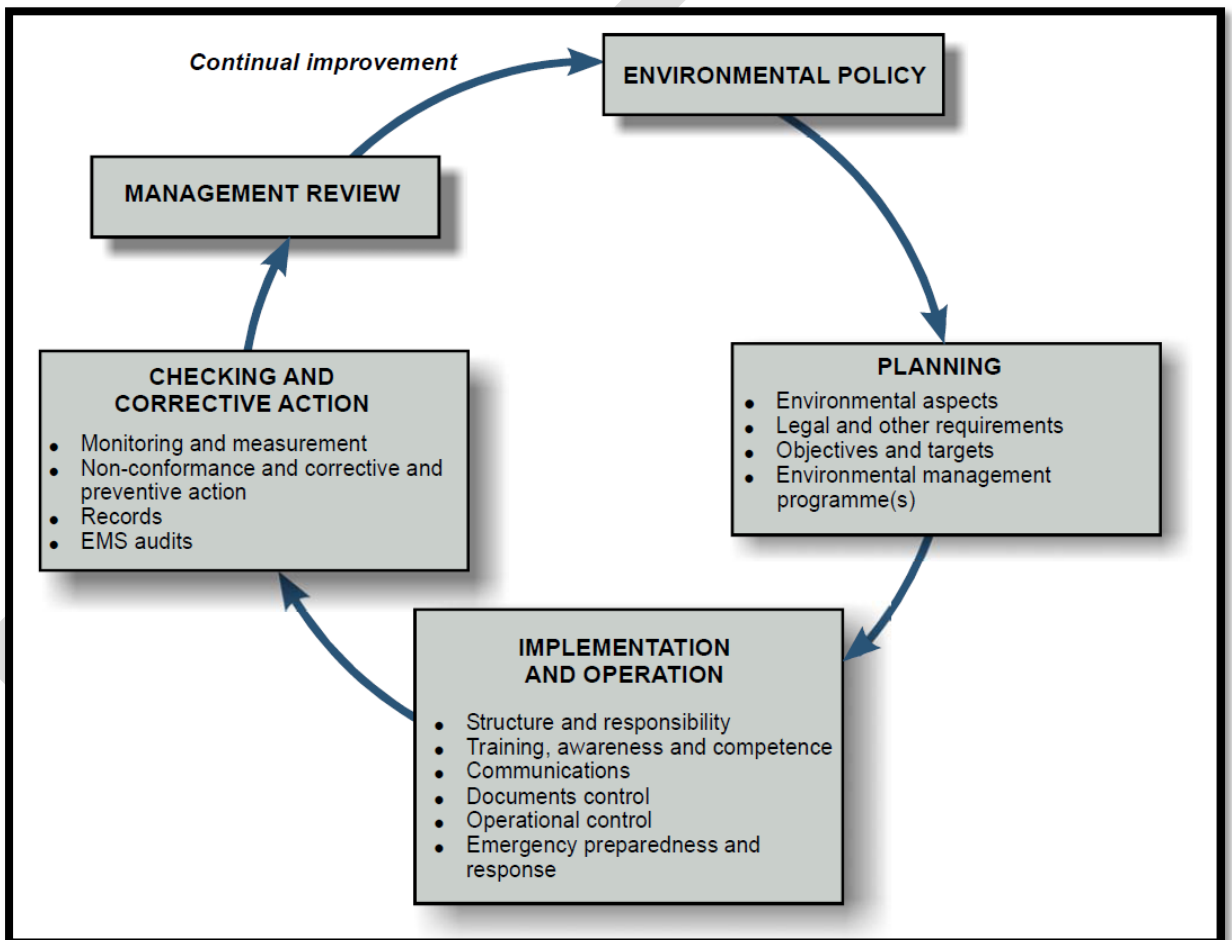
- Information on any proposed management, mitigation, protection or remedial measures that shall be undertaken to address the environmental impacts that have been identified in a report contemplated in the New EIA Regulations, including environmental impacts or objectives in respect of –
  - planning and design;
  - pre-construction and construction activities;
  - the operation or undertaking of the activity in question;
  - the rehabilitation of the environment; and
  - Closure, where relevant.
- Details of –
  - the person who prepared the environmental management programme; and
  - the expertise of that person to prepare an environmental management programme
- A detailed description of the aspects of the activity that are covered by the draft environmental management plan;
- Information identifying the persons who shall be responsible for the implementation of the measures contemplated in paragraph (a);

- Information in respect of the mechanisms proposed for monitoring compliance with the environmental management programme.
- As far as is reasonable practicable, measures to rehabilitate the environment affected by the undertaking of any listed activity or specified activity to its natural or predetermined state or to a land use which conforms to the generally accepted principle of sustainable development; and
- A description of the manner in which it intends to-
  - Modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;
  - Remedy the cause of pollution or degradation and mitigation of pollutants; and
  - Comply with any prescribed environmental management standards or practices.

The environmental management programme must, where appropriate-

- Set out time periods within which the measures contemplated in the environmental management programme must be implemented;
- Contain measures regulating responsibilities for any environmental damage, pollution, pumping and treatment of extraneous water or ecological degradation as a the proposed project

- Develop an environmental awareness plan describing the manner in which-
  - the applicant intends to inform his or her employees of any environmental risk which may result from their work; and
  - risks must be dealt with in order to avoid pollution or the degradation of the environment



**Figure 1: Showing environmental management circle**

### **3 APPLICABLE LEGISLATION AND GUIDELINES**

#### **3.1 National Water Act**

The purpose of this Act is to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in ways that take into account, amongst other factors (National Water Act No. 36 of 1998, 1998), the following:

- a) Meeting the basic human needs of present and future generations;
- b) Promoting equitable access to water;
- c) Promoting the efficient, sustainable and beneficial use of water in the public interest;
- d) Reducing and preventing pollution and degradation of water resources;
- e) Facilitating social and economic development; and
- f) Providing for the growing demand for water use.

The NWA also provides for General Authorizations (GA) for certain water uses published by way of notices in the Government Gazette. Several GAs have been published under the NWA. Each specifies the Section 21 water use and the conditions under which such water use must be conducted.

#### **3.2 National Environmental Management Act**

NEMA provide for co-operative, environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote co-operative governance and procedures for co-ordinating environmental functions exercised by organs of state and to provide for matters connected therewith.



This Act formulates a set of general principles to serve as guidelines for land development and it is desirable that:

- a) The law develops a framework for integrating good environmental management into all development activities;
- b) The law should promote certainty with regard to decision-making by organs of state on matters affecting the environment;
- c) The law should establish principles guiding the exercise of functions affecting the environment;
- d) The law should ensure that organs of state maintain the principles guiding the exercise of functions affecting the environment;
- e) The law should establish procedures and institutions to facilitate and promote cooperative government and inter-governmental relations;
- f) The law should establish procedures and institutions to facilitate and promote public participation in environmental governance; and
- g) The law should be enforced by the State and that the law should facilitate the enforcement of environmental laws by civil society

### **3.3 Environmental Impact Assessment Regulations**

In April 2017 the Minister of Environmental Affairs passed the Amended Environmental Impact Assessment Regulations (The Regulations) in terms of Chapter 5 of the National Environmental Management Act, 1998 (NEMA) (National Environmental Management Act No.107 of 1998, 1998). The Amended Regulations replaced the 2014 Environmental Impact Assessment (EIA) regulations, which were also promulgated in terms of the

National Environment Management Act, 1998 (Act No. 107 of 1998). The new regulations came into effect in April 2017 and, therefore, all new applications must be made in terms of the New NEMA regulations and not in terms of the 2014 EIA Regulations of the NEMA. The purpose of this process is to determine the possible negative and positive impacts of the proposed development on the surrounding environment and to provide measures for the mitigation of negative impacts and to enhance positive impacts. According to EIA regulations (Environmental Impact Assessment Regulations of 2014 as amended , 2017)the activities triggered are explained below:

#### GNR 923 Listing Notice 1

Activity 40: The expansion and related operation of facilities for the concentration of poultry, excluding chicks younger than 20 days, where the capacity of the facility will be increased by—

(ii) More than 5 000 poultry per facility situated outside an urban area

### **3.4 National Environmental Management: Air Quality Act (Act No. 39 of 2004)**

The NEMA: Air Quality Act, 2004 serves to repeal the Atmospheric Pollution Prevention Act, 1965 (Act 45 f 1965). The Air Quality Act regulates air quality in order to protect the environment. It provides reasonable measures for the prevention of pollution and ecological degradation and for securing ecological sustainable development while promoting justification economic and social development (NEMA: Air Quality Act, 2004, 2004).

The purpose of the Act is to set norms and standards that relate to:

- a) Institutional frameworks, roles and responsibilities;
- b) Air Quality management planning;
- c) Air Quality monitoring and information management;
- d) Air Quality management measures;
- e) General compliance and enforcement

The Act describes various regulatory tools that should be developed to ensure the implementation and enforcement of air quality management plans. These include:

- a) Priority Areas, which are air pollution “hot spots”;
- b) Listed activities, which are ‘problem’ processes that require an Atmospheric Emission License;
- c) Controlled emitters, which include the setting of emission standards for ‘classes’ of emitters, such as motor vehicles, incinerators, etc.;
- d) Control of noise;
- e) Control of odours

#### Implications for the Proposed Development

Significant –faecal waste and dead carcasses might impact on the ambient air quality of the area due to foul odours.

### **3.5 The National Heritage Resources Act, 1999 (Act 25 of 1999) (NHRA)**

The NHRA requires Heritage Resources Impact Assessments for various categories of development stipulated in Section 38 of the Act. It also provides for the grading of heritage resources and the implementation of a three-tier level of responsibilities and

functions for heritage resources to be undertaken by the State, Provincial Authorities, depending on the grade of the heritage resource. The Act defines cultural significance, archaeological and paleontological sites and materials (section 35), historical sites and structures (section 34), and graves and burial sites (section 36) that fall under its jurisdiction. Archaeological sites and material are generally those resources older than a hundred years, including gravestones and grave dressing. Procedures for managing graves and burial grounds are set out in Section 36 of the NHRA. Graves older than 100 years are legislated as archaeological sites and must be dealt with accordingly. Section 38 of the NHRA makes provision for application by developers for permits before any heritage resource may be damaged or destroyed (National Heritage Resources Act No. 25 of 1999, 1999).

### **Implications on the Proposed Development**

Not Significant - Due to the highly disturbed and totally transformed state of the study area, it was not deemed necessary to conduct a Heritage Impact Assessment in terms of the requirements as provided for in Section 38 of the NHRA, 1999. No significant cultural/historical resources/features were identified on the study area and therefore it is subsequently anticipated that the impact on any cultural resources are regarded as low to neutral. However, the buildings/structures older than 60 years will require a demolition permit should these buildings be demolished for purpose of the proposed development. If any remains/cultural resources are exposed or uncovered during the construction phase, it should immediately be reported to the South African Heritage Resources Agency (SAHRA). Burial remains should not be disturbed or removed until inspected by an archaeologist.

### **3.6 National Environmental Management: Protected Areas Act, 2003 (Act No 57 of 2003)**

The purpose of this Act is to provide for the protection, conservation and management of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes, for the management of those areas in accordance to national norms and standards, as well as for the intergovernmental co-operation and public consultation in matters concerning protected areas. Protected areas are to be conserved for their biodiversity and ecological integrity (NEMA: Protected Areas Act No. 57 of 2003, 2003).

#### **Implications for proposed development**

Not significant- the area is not located within or close to a conservancy or protected area.

### **3.7 National Environmental Management: Waste Act, 2008 (Act 59 of 2008)**

The National Environmental Management: Waste Act (Act No. 59 of 2008) (NEM:WA) is subsidiary and supporting legislation to NEMA. The NEM:WA is a framework legislation that provides the basis for the regulation of waste management in South Africa. The Act also contains policy elements and gives a mandate for further regulations to be promulgated. Subservient Regulations and Norms and Standards under the NEM:WA include:

- a) Waste Classification and Management Regulations (GNR 634 of 2013);
- b) National Norms and Standards for the Assessment of Waste to Landfill Disposal (GNR 635 of 2013);

- c) National Norms and Standards for Disposal of Waste to Landfill (GNR 636 of 2013);
- d) National Norms and Standards for the Storage of Waste (GNR 926 of 2013);
- e) Revised definitions of waste contained in the National Environmental Management Waste Amendment Act 26 of 2014 (GNR 449 of 2014); and
- f) List of activities that have, or are likely to have, a detrimental effect on the environment (GNR 921 of 2013 as amended) – activities which require a Waste Management License (WML) (i.e. WML Regulations).

Waste management activities requiring a Waste Management (WML) are identified within GNR 921 of 2013, as amended. A person who wishes to commence, undertake or conduct a waste management activity listed under Category A, must conduct a Basic Assessment process as set out in the EIA Regulations 2014, as amended, as part of a WML application. A person who wishes to commence, undertake or conduct a waste management activity listed under Category B, must conduct a scoping and EIA as set out in the EIA Regulations 2014, as amended. Under the new Waste Management activities, animal manure is not regarded as waste and is defined as *“a by-product which is biodegradable in nature and could further be used for fertilization purpose”* and therefore NEM: WA is not triggered thus the proposed facility does not enquire a WML.

**Implications for proposed development:**

Not Significant: The construction and operation of the proposed development are not subjected to any activity as listed in Category A and B of NEMA: WA, 2008

### 3.8 Environmental Conservation Act

The Environment Conservation Act (Act 73 of 1989) (ECA) was, prior to the promulgation of the NEMA, the backbone of environmental legislation in South Africa. To date the majority of the ECA has been repealed by various other Acts, however Section 25 of the Act and the Noise Regulations (GNR 154 of 1992) promulgated under this section are still in effect. These regulations serve to control noise and general prohibitions relating to noise impact and nuisance.

The noise control regulations will need to be considered by the applicant in relation to the potential noise that may be generated during the construction of the proposed project. The two key aspects of the noise control regulations relate to disturbing noise and noise nuisance. Section 4 of the regulations prohibits a person from making, producing or causing a disturbing noise, or allowing it to be made produced or caused by any person, machine, device or apparatus or any combination thereof. A disturbing noise is defined in the regulations as 'a noise level which exceeds the zone sound level or if no zone sound level has been designated, a noise level which exceeds the ambient sound level at the same measuring point by 7 dBA or more.

Section 5 of the noise control regulations in essence prohibits the creation of a noise nuisance. A noise nuisance is defined as 'any sound which disturbs or impairs or may disturb or impair the convenience or peace of any person'. Noise nuisance is anticipated from the proposed project particularly to those residents that are situated in close proximity to the project site. South African National Standard 10103 also applies to the measurement and consideration of environmental noise and should be considered in conjunction with the ECA noise regulations (Mahlangu, 2017).

### **3.9 National Forest Act**

According to this act, the Minister may declare a tree, group of trees, woodland or a species of trees as protected. The prohibitions provide that ‘ no person may cut, damage, disturb, destroy or remove any protected tree, or collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a licence granted by the Minister’. No protected trees are anticipated within the vicinity of the proposed project due to the fact that the area has been disturbed through agricultural activities. However it is recommended that proper mitigation be implemented to protect those trees if encountered when selecting sites for construction camps and lay down areas.

### **3.10 National Environmental Management: Biodiversity Act**

The National Environmental Management: Biodiversity Act (Act 10 of 2004)(NEMBA), ‘provides for: the management and conservation of South Africa’s biodiversity within the framework of the NEMA; the protection of species and ecosystems that warrant national protection; the sustainable use of indigenous biological resources; the fair and equitable sharing of benefits arising from bio-prospecting involving indigenous biological resources; the establishment and functions of a South African National Biodiversity Institute (SANBI); and for matters conducted therewith”.

In terms of the Biodiversity Act, the Applicant has a responsibility for:

- a) The conservation of endangered ecosystems and restriction of activities according to the categorization of the area (not just by listed activity as specified in the EIA regulations);
- b) Promote the application of appropriate environmental management tools in order to ensure integrated environmental management of activities thereby



ensuring that all development within the area are in line with ecological sustainable development and protection of biodiversity; and

- c) Limit further loss of biodiversity and conserve endangered ecosystems.

Regulations published under the NEMBA also provide a list of protected species, according to the Act (GNR 151 dated 23 February 2007, as amended in GNR 1187 dated 14 December 2007).

### **Implications for proposed development**

Not Significant. The portion is completely transformed and used for the growing Lucerne. There is no evidence of protected vegetation and animal species.

### **3.11 Conservation of Agricultural Resources Act**

This Act is applicable since it protects the quality and quantity of arable land in South Africa. Loss of arable land should be avoided and declared Weeds and Invaders in South Africa are categorized according to one of the following categories, and require control or removal:

- a) Category 1 plants: are prohibited and must be controlled;
- b) Category 2 plants: (commercially used plants) may be grown in demarcated areas providing that there is a permit and that steps are taken to prevent their spread; and
- c) Category 3 plants: (ornamentally used plants) may no longer be planted; existing plants may remain, as long as all reasonable steps are taken to prevent the spreading thereof, except within the flood line of watercourses and wetlands.

The provisions of this act have been considered and where relevant will be incorporated into the requirements of the EMPr.

### **3.12 Guideline Documents**

The following guideline documents were considered amongst others:

- DEAT (2005) Guideline 3: General Guide to Environmental Impact assessment Regulations 2005, Integrated Environmental Management Guideline Series, Department of Environmental Affairs and Tourism (DEAT), Pretoria.
- DEAT (2005) Guideline 4: Public Participation, in support of the EIA Regulations 2005,
- Integrated Environmental Management Guideline Series, Department of Environmental Affairs and Tourism (DEAT), Pretoria; and
- DEAT (2006) Guideline 5: Assessment of Alternatives and Impacts in support of the Environmental Impact Assessment Regulations 2005, Integrated Environmental Management Guideline Series, Department of Environmental Affairs and Tourism (DEAT), Pretoria.

### **3.13 Sustainable Development**

The principle of Sustainable Development has been established in the Constitution of the Republic of South Africa (108 of 1996) and given effect by NEMA and the ECA. Section 1(29) of NEMA states that sustainable development means the integration of social, economic and environmental factors into the planning, implementation and decision-making process so as to ensure that development serves present and future generations

Thus Sustainable Development requires that:

The disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied; That pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimised and remedied;

- That the disturbance of landscapes and sites that constitute the nation's cultural heritage is avoided, or where it cannot be altogether avoided, is minimised and remedied;
- That waste is avoided, or where it cannot be altogether avoided, minimised and re-used or recycled where possible and otherwise disposed of at a registered landfill site.
- a risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions;
- Negative impacts on the environment and on people's environmental rights be anticipated; and, prevented and where they cannot altogether be prevented, are minimised and remedied.

## **4 MANAGEMENT PROGRAMME AND INSTITUTIONAL MATTERS**

### **4.1 Roles and Responsibilities**

The most important role players in the management of the environment on site may include but are not limited to:

- Project Proponent/ Developer
- Construction Manager
- Environmental Officer (EO)

- Contractor
- Environmental Control Officer (ECO)
- Competent Authority (CA)

#### **4.1.1 Proponent/ Developer**

The Proponent remains ultimately accountable for the site and remains liable for any environmental damage caused by activities undertaken on the site. It is from this point of view that the Proponent set out a range of requirements in terms of the management of the environmental aspects for the site, to which the Contractor has to adhere as a prerequisite to his appointment.

It is the responsibility of the Proponent to ensure that the principles of integrated environmental management, in terms of the requirements of Chapter 5 of NEMA, are implemented and maintained on the site and that environmentally sustainable practices are undertaken on the site. The Proponent has to ensure that an approved EMPr and the conditions of the Environmental Authorisation (EA) be supplied to the Contractor for the activities undertaken on the site and also monitor the Contractor's compliance to the requirements set out in the EMPr and EA and take disciplinary action for non-compliance.

The proponent must appoint an independent Environmental Control Officer (ECO) during the construction phase to oversee all the environmental aspects relating to the development. Regular reports from the ECO regarding the compliance of the Contractor must be taken into consideration by the Proponent when evaluating the performance of the Contractor and taking corrective or punitive decisions towards eliminating the occurrence of the noncompliance incidents in future and to rectify current issues.

Should the EMPr require to be reviewed due to its effectiveness the Proponent must submit the recommended changes to the Competent Authority (CA) for approval, prior to implementation.

#### **4.1.2 Construction Manager**

The Construction Manager has overall responsibility for environmental management on site which includes the implementation of the EMPr, Environmental Standards and authorized conditions and reports to the Project manager. The Construction Manager is supported by the Environmental Officer. The specific environmental tasks during the construction phase will include:

- Reviewing the monthly reports compiled by the EO;
- Communicating directly with the Contractor; and
- Issuing non-conformance notification to Contractors that do not comply with the requirements of the EMPr, Environmental Standards and/or authorized conditions.

#### **4.1.3 Environmental Officer (EO)**

The Environmental Officer reports to the Construction Manager and is responsible for conducting the tasks required to ensure that the EMPr, Environmental Standards and authorized conditions are implemented on the construction site.

The Environmental Officer will conduct the following tasks:

- Ensure that environmental issues receive adequate attention in the site induction training;
- Prepare and conduct awareness training (e.g. posters, tool box talks, signage)

- Conduct monthly observation & inspections and audit of all work places
- Monitor the Contractor's compliance with the EMP, Environmental Standards and authorized conditions on site
- Conduct monthly observations and environmental audits of all Contractor's and work areas
- Ensure that all environmental monitoring programmes (sampling, measuring, recording etc. when specified) are carried out according to protocols and schedules
- Measurement of completed work (e.g. areas top soiled, re-vegetated, stabilised etc.)
- Maintain site documentation related to environmental management (permits, EMP, method statements, EA, reports, audits, monitoring results, receipts for waste removal etc.). Documentation to be maintained on the relevant site Document Control System
- Attendance at scheduled SHE meetings and project coordination meetings
- Inspect and report on environmental incidents and check corrective action
- Keep a regular photographic record of all environmental incidents
- Implementation of environmental-related actions arising out of the minutes from scheduled meetings
- Management of complaints register

- Review and Sign off Method Statements prepared by Contractor's
- Audit Environmental Method Statements
- Collate information received, including monitoring results into a monthly report to the Construction Manager showing progress against targets
- The compilation of the Project Environmental Management File

The key deliverables will include the compilation of:

- Project Start Up Checklist
- Monthly inspection/environmental audit report
- Monitoring results
- Site close-out reports
- Incident reports
- Environmental Incident Register
- Environmental Non-Conformance Register
- Complaints Register
- Method Statements Register
- Hazardous Substances Register
- Site Close Out Inspection

#### **4.1.4 Contractor**

The Contractor is responsible for ensuring that all activities pertaining to the project/development complies with the requirements of the EMPr and the principles of Chapter 5 of the National Environmental Management Act (Act 107 of 1998) and any other relevant environmental legislation. The Contractor has the prerogative to appoint specific role players to perform functions on its behalf, delegating the aforementioned responsibility to whoever is appointed.

It is furthermore the responsibility of the Contractor to allocate sufficient resources (time, financial, manpower, equipment, etc.) in order to ensure that compliance with the recommendations and specifications of the EMPr is achieved by all parties involved in the proposed project. The Contractor must ensure that the Contractor's EO has access to all relevant documentations related to the project – this includes any environmental authorization's, permits, licenses, EMPr, and other relevant documentation.

The Contractor is responsible to inform and update any person or Sub-contractor in its employ of the requirements of the EMPr and environmental legislative requirements and put reporting and compliance monitoring measures in place to ensure conformance by the Subcontractors in relation to the EMPr or applicable environmental legislation.

#### **4.1.5 Environmental Control Officer (ECO)**

The ECO operates independently to objectively monitor the implementation of the EMPr and its conditions and requirements. It is the responsibility of the ECO to monitor the degree of compliance to environmental legislation and the conditions stipulated in the EMPr by means of regular compliance audits.

All audit reports need to include a general description of the sites general state and if applicable identify and highlight specific areas of non-conformance. In the instance of



major non-compliance (non-conformance) the ECO may in conjunction with the EO and Construction Manager suggest corrective action measures to the Proponent to eliminate the occurrence of the noncompliance incidents in future and to rectify the current issue. The ECO has the authority to stop works if in his/her opinion the operation poses a serious threat to the environment or if an incident has occurred due to neglect or disregard of the imposed measures. Any non-compliance recorded in terms of the conditions of the EMP, constitutes as a breach of Contract allowing the ECO to suspend part or all of the works, as required and report the matter to the relevant authorities. The ECO must conduct inspections to assess compliance of the Contractor with the EMP and report and provide feedback to the Proponent/Lessor on any environmental matters associated with the development.

#### **4.2 MONITORING REQUIREMENTS AND RECORD KEEPING**

To ensure that the procedures outlined throughout the EMP are implemented effectively it will be necessary to monitor the implementation of the EMP and evaluate the success of achieving the objectives listed in the EMP. To ensure that all personnel on site are aware of their obligation to protect the environment, induction training will also include environmental awareness.

The audit procedure will include a Compliance audit, conducted by the Environmental Officer. Where the objectives of the EMP are not being met the reasons will be determined and remedial action or variation to the tasks will be recommended. Major residual effects shall be documented in a Non-Conformance Report. Follow-up audits are conducted if and when required.

## 5 GENERAL MANAGEMENT SPECIFICATIONS

A copy of the EMPr should always be available on site in an Environmental File/Compliance Record. All employees, Contractors and sub-contractors are required to receive training regarding the contents of the EMPr relevant to their function, level of responsibility and accountability.

The following measures aim to provide pre-empted solutions for common project issues during the execution of the project. These measures have been derived from prior experiences and are based on anticipated environmental issues:

- Where existing infrastructure is being utilized for project activities, and are in a state of disrepair, a photographic record must be kept – documenting the status before, during and after the project activities;
- No personnel are to be housed on site. Housing arrangements need to be made away from site;
- The Proponent and any person or Contractor in its employ must adhere to all conditions of the EMPr;
- Adequate storage and control of hazardous substances and hydrocarbons are required;
- All equipment must be maintained at regular intervals to prevent spillages and or environmental incidents; and
- Control and monitoring of storm water runoff is essential during operations.

## **5.1 Environmental Compliance Records**

The Contractors and the EO will follow the Environmental Governance framework on site whereby records will be kept on all matters environmental. All records kept must adhere to the following standards:

- Records must be legible;
- Records must be compiled as soon as practicable and should form part of the external audit report; and
- If amended, amendment must be done in such a way that the original and any subsequent amendments remain legible and are easily retrievable.

Records will include but not be limited to:

### **a) Induction and Environmental Awareness Training Register;**

It is the responsibility of the Contractors EO to ensure that any and all persons working on site has received a suitable degree of environmental training. This allows the Contractor to keep its environmental obligations in check. Environmental induction/training may take the form of inductions, toolbox talks, demonstrations, media or a written test – whereby the employees' understanding of environmental issues pertaining to his/her job is explained and assessed.

The degree of specialised training/induction is dependent on the function performed by the employee and will be determined by the EO and ECO. All levels of management and employees need to undergo environmental training and training attendance records has to be kept and available for review by the ECO. Copies/samples of the toolbox talks/induction/training material also need to be kept in the Environmental File available for review by the ECO.

## **b) Complaints Register**

A Complaints Register has to be kept on site at all times. This register has to be easily accessible to all stakeholders and Interested and Affected Parties (I & APs) and made available for review to the ECO during audits. The Register has to illustrate what measures have been implemented to address the complaints as well as indicate what the timeline was in resolving the complaints.

## **c) Stakeholder Liaison and Communications**

Copies of all documents referring to stakeholder liaisons must be kept on record (preferably signed) and maintained. All communications need to be made available to the ECO during auditing.

## **d) Method Statements**

The Contractor shall provide Method Statements for approval by the EO and the Construction Manager prior to work commencing on aspects of the project deemed or identified to be of greater risk to the environment and/or which may not be covered in sufficient detail in the construction phase of the EMPr, when called upon to do so by the EO and the Construction Manager. A Method Statement is a “live document” in that modifications are negotiated between the Contractor and the EO and the Construction Manager, as circumstances unfold. All Method Statements will form part of the construction phase of the EMPr documentation and are subject to all terms and conditions contained within the construction phase of the EMPr.

Note that a Method Statement is a ‘starting point’ for understanding the nature of the intended actions to be carried out and allows for all parties to review and understand the procedures to be followed in order to minimise risk of harm to the environment, changes to, and adaptations of Method Statements can be implemented with the prior consent of all parties.

A Method Statement describes the scope of the intended work in a step-by-step description in order for the EO and the Construction Manager to understand the Contractors intentions. This will enable them to assist in devising any mitigation measures, which would minimize environmental impact during these tasks. All Method Statements are to be to the satisfaction of the EO and the Construction Manager.

#### **e) Emergency Procedure**

The Contractors EO has to ensure that there is an Emergency Procedure on site that provides a detailed explanation of actions to be taken in the event of emergency situations. This procedure has to be known to all persons working on site and has to also provide contact information of the emergency services. The plan is to be reviewed annually and after each emergency and or accident. The procedure needs to address, amongst other the following emergencies:

- Fire;
- Accidental leaks and spillages of hydrocarbons (oil, fuel; etc.);
- Destruction of habitat or animal fatalities; and
- Acts of nature such as floods, lightning storms, etc.

#### **f) Site Documentation**

A copy of the EMPr has to be available on site and easily accessible to any and all persons working for and or on behalf of the Contractor. Issues and conditions of the Site Documentation need to be explained to all employees.

#### **g) Declaration of Understanding (DoU)**

The Declaration of Understanding in the Contractor's Guideline Document will be signed and provided by the Contractor as part of his Tender Document. The signed DoU is a

written confirmation by the Contractor that the requirements of the EMPr, Environmental Standards and authorised conditions are understood and will be complied with for the duration of their works on site.

#### **h) Appointment of Contractor's Environmental Officer**

The Contractor will appoint an Environmental Officer or assign to a competent person roles and responsibilities for environmental management during construction. The Contractor will forward details of the appointment to the Construction Manager and Environmental Officer for their review and approval. Should the Contractor's Environmental Officer or the person originally assigned with responsibilities for environmental management change from that person identified during either the tender stage, or the construction period, the Contractor will submit the details of such appointment or assignment for the Project Manager's approval. No work will proceed until the new Environmental Officer is assigned or appointed.

#### **5.2 Non-Compliance with Documentation**

Any non-compliance with the EMPr, the recommendations and conditions contained in the EA, and any written instruction issued by the Construction Manager/ Project Manager will be treated as serious. The Proponent will be responsible for the implementation of said documentation and will be held accountable for any non-compliance thereof. A penalties/disciplinary schedule will be developed and agreed to by the project Proponent and Contractor prior to and during the Construction Phase. These measures will be implemented where practical based on the scale and complexity of the construction activities associated with the proposed project.

### **5.3 Site Inspections- Internal Audits**

In order to ensure all information pertaining to the management of the site is recorded the EO will have to undertake monthly audit inspections to record all forms of non-compliance and incidents. These findings have to be compiled into a monthly Internal Environmental Audit report, and needs to be provided to the ECO on a monthly basis. This internal report will inform the Proponent of all environmental matters that require addressing and will provide a detailed review of the degree of compliance with the EMPr. The EO and Contractors EO needs to be available for the monthly compliance audits as well as be able to attend environmental meetings with the Proponent.

### **5.4 Monthly Inspections- External Audits**

In order to ensure compliance with the EMPr is achieved it is the ECO's responsibility to undertake monthly site inspections or external audits. These inspections will aim to ensure that all persons working for and on behalf of the Proponent adheres to the EMPr and other relevant site documentation.

During these external audits the ECO will determine if:

- The Contractors EO's record of major incidents (e.g. spills, impacts, complaints, and legal transgressions) is updated and that corrective and preventive actions identified and recommended have been implemented;
- A review of the public complaints register is conducted and that adequate measures have been employed by the Contractors EO to address these complaints;
- Findings of the weekly Site Inspection Forms are adequately recorded and addressed;

- Notice of any major incidents and complaints was given to the relevant authorities or the Proponent, whichever is relevant depending on the severity of the incident, and that adequate follow up actions were taken;
- The Method Statements and Management Programme being used are reviewed and updated regularly and records of variations to the EMPr /Method Statements are kept;
- Environmental monitoring is conducted, findings recorded and remedial action is taken where limits are exceeded;
- Appropriate environmental training of personnel is undertaken;
- Adequate emergency procedures are in place, visibly displayed and effectively communicated to personnel; and
- The system for implementing the EMPr is operating effectively.

Each monthly compliance audit will entail:

- A site visit, accompanied by the EO.
- The recording of findings of the site visit in the Environmental Checklist and reported on in the Environmental Audit Report.
- Action steps resulting from non-compliance with the EMPr:

Any non-compliance with the EMPr will be treated as very serious and will be handled in accordance with the agreed schedule of penalties/disciplinary actions and/or Section 32, 33 and 34 of the National Environmental Management Act, Act 107 of 1998.



## 6 ENVIRONMENTAL INCIDENTS

An environmental incident is defined as any unplanned event that results in actual or potential damage to the environment, whether of a serious or non-serious nature. An incident may involve non-conformance with any of the following:

- Legal requirements
- Requirements of the EMP
- Any verbal or written order given by the ECO on site

In the event of any incident, the Environmental Incident Log, should be completed. Corrective action to mitigate the impact (appropriate to the nature and scale of the incident) should be conducted immediately and affected parties notified. In the case of serious incidents or emergencies, the incident report should be sent to the relevant authority as soon as possible after the incident has been recorded.

## 7 ENVIRONMENTAL MANAGEMENT PROGRAMME

The following table forms the core of this EMP for the planning, construction and operational phases of this proposed Township Establishment Project. This table ought to be used as a checklist on site, especially during the construction phase. During the construction phase, compliance with this EMP must be audited monthly. These audits must be followed up with annual audits for a period of two years during the operational phase.

<b>Management Measure</b>	<b>Objective</b>
<b>Avoidance</b>	<ul style="list-style-type: none"><li>• Avoiding activities that could result in adverse impacts.</li></ul>

	<ul style="list-style-type: none"> <li>• Avoiding resources or areas considered as sensitive.</li> </ul>
<b>Prevention</b>	<ul style="list-style-type: none"> <li>• Preventing the occurrence of negative environmental impacts and / or preventing such an occurrence having negative environmental impacts.</li> </ul>
<b>Preservation</b>	<ul style="list-style-type: none"> <li>• Preventing any future actions that might adversely affect an environment resource. Typically achieved by extending legal protection to selected resources beyond the immediate needs of the project.</li> </ul>
<b>Rehabilitation</b>	<ul style="list-style-type: none"> <li>• Repairing or enhancing affected resources, such as natural habitats or water sources, particularly when previous development has resulted in significant resource degradation</li> </ul>
<b>Restoration</b>	<ul style="list-style-type: none"> <li>• Restoring affected resources to an earlier (and possibly more stable and productive) state, typically 'background / pristine' condition.</li> </ul>
<b>Compensation</b>	<ul style="list-style-type: none"> <li>• Creation, enhancement or protection of the same type of resource at another suitable and acceptable location, compensating for lost resources.</li> </ul>

## 7.1 Administration and General Issues

ITEM	ACTIVITY	OBJECTIVE	REQUIREMENTS	RESPONSIBILITY	FREQUENCY
7.1.1	Compliance to legislation	Avoidance Prevention	<p>When an issue of non-compliance be found on site the ECO has the authority to:</p> <ul style="list-style-type: none"> <li>Issue a warning letter and site instruction to the contractor to cease the activity,</li> <li>The contractor will be informed to rehabilitate the impacted region, and</li> <li>A copy of the warning letter will be forwarded to the Principal Agent of the project</li> </ul> <p>Should no improvement be noted by the next site visit the following actions will take place:</p> <ul style="list-style-type: none"> <li>A STOP ORDER will be issued by the ECO to the contractor and all construction activities that are related to the identified activity of non-compliance will cease</li> </ul>	Principal Agent Contractor ECO	Daily
7.1.2	Working hours and work period	Avoidance and prevention of noise	All construction work shall be restricted to between the hours of 06h00 and 18h00	Contractor	Daily

		disturbance			
7.1.3	Dust generation	Minimisation	Dust shall be controlled to ensure no detrimental effect to land owners, occupants, employees or the general public.  Measures may include dust suppression using water spray	Contractor	As Required
7.1.4	Noise management	Minimisation	Noise levels should be controlled to ensure no detrimental effect to landowners, occupants, employees or the general public. All vehicles and equipment must be maintained regularly to prevent excessive emissions and noise	Contractor	As Required
7.1.5	Housekeeping	Avoidance Preservation	At all times the works will be maintained in a tidy manner and no littering will be permitted	Contractor	At all times
7.1.6	Ensure compliance with legislation.	Health and Safety	Adherence to the Occupational Health and Safety Act (Act No. 85 of 1993) and the regulations applicable at the time of the construction phase	Principal Agent Contractor Contractor HSO External HSO	At all times
7.1.7	Appointment of an Environmental Control Officer(ECO)`	Ensure compliance with EMPr and environmental authorisation.	An ECO will be appointed prior to the commencement of the construction phase that will monitor the entire construction phase.  The ECO will monitor the EMPr and ensure compliance.  The ECO will need to inspect the site at least once a month	Principal Agent	Once-off

			during construction to ensure ongoing compliance.		
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## 7.2 Employment and Labour Management

ITEM	ACTIVITY	OBJECTIVE	REQUIREMENTS	RESPONSIBILITY	FREQUENCY
7.2.1	Employment	Legal compliance	Employment will be undertaken and managed according to the South African labour law and the following should be addressed	Principal Agent Contractor	Daily

## 7.3 Community Liaison

ITEM	ACTIVITY	OBJECTIVE	REQUIREMENTS	RESPONSIBILITY	FREQUENCY
7.3.1	General	Avoidance Prevention Preservation Minimisation	Access over land, the integrity of fences, control of bush fires, littering, dust control, noise abatement, harassment of domestic and wild animals, sedimentation and contamination of ground and surface waters, damage to landscape and vegetation and all such environmental matters, shall be controlled in the best interests of the landowner / occupier and the general public.	Principal Agent Contractor	Daily
7.3.2	Communication /liaison	Minimisation	Close liaison between the Project Steering Committee and the contractor with regards to the scheduling of activities that will affect the local communities. The requirements of the local community must be heard	Contractor Principal Agent	Daily

## 7.4 Vector Control

ITEM	ACTIVITY	OBJECTIVE	REQUIREMENTS	RESPONSIBILITY	FREQUENCY
7.4.1	Pesticide Management	Prevention	The disposal of waste pesticides and pesticides containers will be as per EMPr requirement	Principal Agent Contractor	Daily
7.4.2		Prevention Avoidance	Should pesticides be used they will be selected so as to avoid any negative effects on non-target organisms	Contractor Principal Agent	Daily

## 7.5 Fire Prevention and Management

ITEM	ACTIVITY	OBJECTIVE	REQUIREMENTS	RESPONSIBILITY	FREQUENCY
7.5.1	Fire prevention and management	Prevention	All necessary preventions will be taken to prevent the ignition of bush fires caused either deliberately or accidentally, including education.	Principal Agent Contractor	Daily
7.5.2		Prevention	Adequate fire fighting equipment must be provided at specified localities on the work site. This equipment should include but not be limited to, fire extinguishers, fire resistant clothing for fire fighters and fire fighting flails	Contractor Principal Agent	Daily
7.5.3		Prevention	Should any burning of vegetation be required this shall be done with the consent of the local authorities and shall be done at times when there is no wind and appropriate fire fighting equipment shall be immediately available	Contractor	Burning of Vegetation
7.5.4		Avoidance	No open fires are allowed at site and fires for cooking must be restricted to designated protected areas and where possible should preferably be done on gas stove	Contractor	Daily

## 7.6 Earthworks and vegetation clearance

ITEM	ACTIVITY	OBJECTIVE	REQUIREMENTS	RESPONSIBILITY	FREQUENCY
7.6.1	General	Preservation	The principle of minimizing vegetation clearing and topsoil moving wherever possible will be followed at all times.	Contractor	During earthworks and vegetation clearance
7.6.2	Access to areas	Avoidance Preservation	Access to construction areas will be by use of existing routes of access only. No new routes are to be constructed.	Contractor	At all times
7.6.3	Clearance of vegetation	Prevention Compensation	Removal of vegetation should be confined to the proposed construction areas.  The removal of vegetation close to the slopes should be kept to the minimum. No indigenous trees may be cut or wood be collected for firewood or any other purposes. Protected tree species may only be removed after a permit from the Department of Agriculture Fisheries and Forestry (DAFF) has been obtained. Large indigenous trees should be retained as far as possible during the construction and operation phase.	Contractor	At all times
7.6.4		Preservation	Earth moving machinery operators are to be instructed about the importance of minimising disturbance to the soils and the unnecessary vegetation clearing	Contractor	During earthworks
7.6.5		Prevention	In areas of unstable or steep slopes, where the clearing of vegetation may cause erosion, the earthworks crew shall use erosion prevention techniques	Contractor	During earthworks

			such as drainage diversion ditches or bundled cut vegetation to reduce runoff velocity and erosion hazard		
7.6.6		Avoidance Preservation	The principle of avoidance of locally sensitive ecological components must be adhered to during the earthworks – especially in close vicinity to drainage lines and wetlands	Contractor	At all times
7.6.7	Earthworks for foundations	Prevention Rehabilitation	Topsoil must be stockpiled and protected for further use during the rehabilitation phase. Storm water drainage on site should conform to the natural drainage regime of the site, and be constructed prior to any development. Gabion stabilisation will be constructed as required. The contractor should monitor the formation of erosion channels and carry out repairs as required, limiting erosion damage to the works and the natural environment. Foundations should only be as deep as required and be backfilled as soon as possible	Contractor	At all times

## 7.7 Site preparation

ITEM	ACTIVITY	OBJECTIVE	REQUIREMENTS	RESPONSIBILITY	FREQUENCY
7.7.1	Topsoil stripping and stockpiling	Preservation	<p>Topsoil should be stripped for later use in landscaping and rehabilitation.</p> <p>Topsoil stripping and management requirements shall be as follows:</p> <ul style="list-style-type: none"> <li>• The top 150mm of soil shall be stripped and stockpiled</li> <li>• Topsoil should be stockpiled separately from subsoil or rocky material</li> </ul>	Contractor	During site preparation where topsoil will be removed



			<p>(the topsoil contains both the seedbed and the nutrient supply necessary for plant growth: if mixed with subsoil the usefulness of the topsoil for rehabilitation / landscaping of the site will be lost).</p> <ul style="list-style-type: none"> <li>• Topsoils must not be compacted and should not exceed 1.5m in height.</li> <li>• Soil stockpiles should be located away from drainage lines and areas of temporary inundation.</li> <li>• Topsoil and other stockpile areas should be clearly defined.</li> <li>• Stockpiles shall not be allowed to become contaminated with oil, diesel, petrol, garbage or any other material which may inhibit the later growth of vegetation</li> </ul>		
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## 7.8 Water and effluent management

ITEM	ACTIVITY	OBJECTIVE	REQUIREMENTS	RESPONSIBILITY	FREQUENCY
7.8.1	Obstruction of water flow	Prevention	Impediments to natural water flow should be avoided, or, if unavoidable, be allowed for in the design by means of appropriately sized and positioned drains, culverts etc.	Contractor	At all times
7.8.2	Effluent management	Prevention	No seepage fields, soakaways or evaporation ponds shall be developed without the approval from the competent authority	Contractor	N/A
7.8.3	Stormwater management	Prevention	Stormwater shall not be allowed to be contaminated in any manner and should be kept separate from site runoff. Measures such as stormwater diversions, drainage channels etc. should be considered	Contractor	At all times

7.8.4		Prevention Minimisation	Every effort shall be made to ensure the maintenance of the natural flow of water following storm events. This may include the use of drainage channels, installation of culverts etc. No works shall increase the risk of erosion during storm events and where unavoidable specific erosion control measures shall be implemented.	Contractor	At all times
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## 7.9 General Waste Management

ITEM	ACTIVITY	OBJECTIVE	REQUIREMENTS	RESPONSIBILITY	FREQUENCY
7.9.1	Waste generation	Minimisation	Reduction of waste volumes where possible with specific emphasis on reducing the quantities of hazardous wastes requiring disposal	Contractor	At all times
7.9.2	Waste storage and transport	Avoidance	A clear distinction should be made between the hazardous and non-hazardous components of the waste stream with separation occurring at source. Wastes should be placed in separate containers and transported to their disposal facilities separately.	Contractor	At all times
7.9.3		Prevention	Waste containers should be in good condition, free from corrosion, leaks or ruptures.	Contractor	At all times
7.9.4		Prevention	Waste containers shall be stored above ground, over drip pads and under covering.	Contractor	At all times
7.9.5		Prevention	Domestic waste must be contained and storage areas shall be contained to prevent scavenging by persons or animals	Contractor	At all times
7.9.6		Minimisation	In all cases, the necessary tools and materials, including absorbent material,	Contractor	At all times

			shovels and bags shall be readily available to clean up spills or drips.		
7.9.7	Waste disposal	Avoidance	Burning of domestic waste and cement bags should be authorized by the ECO. Waste should be disposed of at a licensed waste site.	Contractor	At all times
7.9.8		Avoidance	The frequency of waste collection and the interim measures for the storage of waste on site would have to be such that it does not pose an unacceptable risk to either the environment or human health and safety	Contractor	At all times

### 7.10 Hazardous waste management

ITEM	ACTIVITY	OBJECTIVE	REQUIREMENTS	RESPONSIBILITY	FREQUENCY
7.10.1	Disposal of hazardous waste	Avoidance	All waste oils, greases, fuels etc. should be collected and disposed of in an appropriate manner off site. The contents of grease traps or other waste oil, grease and / or fuel disposal / storage containers should under no circumstances be voided to the surrounding area. Hazardous wastes should be removed to a hazardous waste landfill site by an approved waste contractor.	Contractor	At all times
7.10.2	Hydrocarbon spill (incl. oil, fuel, diesel, lubricants etc.)	Avoidance	Contaminated soil should be removed and disposed of as per hazardous waste disposal requirements.	Contractor	Immediately after any spill

### 7.11 Materials management (Incl. fuels and chemicals)

ITEM	ACTIVITY	OBJECTIVE	REQUIREMENTS	RESPONSIBILITY	FREQUENCY
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7.11.1	General	Prevention	Manage all hazardous materials and wastes in a safe and responsible manner. Prevent contamination of soils, pollution of water and / or harm to people or animals as a result of the use of these materials	Contractor	At all times
7.11.2	Spill management	Minimisation	All spills of fuels, oils or other hazardous substances must be immediately cleaned up and measures taken to remediate the spill	Contractor	Immediately following any spill
7.11.3		Minimisation	The necessary tools, materials and expertise must be readily available to deal with spills of oil, fuels, lubricants and other hazardous materials. Spill clean up kits should be available on site.	Contractor	At all times
7.11.4	Storage facilities	Prevention	Proper storage facilities should be provided for the storage of oils, grease, fuels, chemicals and any hazardous materials to be used during construction. These storage facilities (including any tanks) should be stored on an impermeable surface and surrounded by a bund wall, in order to ensure that accidental spillage does not pollute local soil or water resources. No fuel storage tanks shall be located in any location other than at approved plant yards of campsites. Chemicals, fuels, lubricating oils and any other hazardous materials shall not be stored within 100m of a surface water body or within the floodplain of rivers or any area of temporary inundation. An impermeable berm / bund should be constructed around fuel storage facilities. No fuel storage or refuelling facility should be within 100m of a watercourse or wetland, within a floodplain or where there is the potential for spilled fuel to enter a watercourse or groundwater. No smoking signs	Contractor	At all times

			<p>should be posted in fuel storage areas. No fuel or any other chemical storage will be below ground (either partially or completely). Storage tanks must be at least 3.5m from any buildings, boundaries or combustible / flammable material(s). Symbolic safety signs (in accordance with SABS 1186) must be erected at storage facilities and tank capacities must be clearly indicated (in accordance with SABS 0232). Adequate fire fighting equipment must be available onsite and particularly at fuel storage areas at all times and personnel must be trained in the use thereof. Proper dispensing equipment must be utilized</p>		
7.11.5	Cement	Avoidance	<p>Cement will be delivered in sound and properly secured bags or in approved bulk containers. Cement products in bags will be stored in storage containers at the construction camp. The storage facility and surrounding area will be swept and cleaned regularly as required to ensure that cement products do not enter and pollute the surrounding environment. Cement should be stored and mixed on an impermeable substratum and storm water diversion measures should be made use of at the mixing site to prevent contamination of runoff water</p>	Contractor	Cement mixing
7.11.6	Refuelling	Avoidance Prevention	<p>Refuelling and maintenance of vehicles should occur within specified depots only. Working / fuel transfer areas within these depots should be underlain by an impermeable surface and should have grease traps to ensure that no spillage or greases, oils, or fuels occurs into local soil or water resources.</p>	Contractor	At all times

### 7.12 Vehicle movement

ITEM	ACTIVITY	OBJECTIVE	REQUIREMENTS	RESPONSIBILITY	FREQUENCY
7.12.1	Vehicle and machinery movement	Limit unnecessary compaction of topsoils. Prevent disturbance of domestic animals and plants outside of construction areas	No new access, haul or maintenance roads are to be constructed without the approval of the Environmental Consultant and competent authorities. Safe travelling speeds for all vehicles and machinery must be enforced	Contractor	At all times

### 7.13 Civils

ITEM	ACTIVITY	OBJECTIVE	REQUIREMENTS	RESPONSIBILITY	FREQUENCY
7.13.1	Sourcing of construction materials	Avoidance	Soils or sands should not be removed from any river, wetland areas (i.e. areas of periodic inundation) or other sensitive areas. All construction materials should be obtained from authorised sources	Contractor	At all times

7.13.2	Construction activities	Avoidance Minimisation	Dust generated must be minimised as far as possible. Measures could include sprays, division panels, dust screens etc	Contractor	Prior and during construction activities
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#### 7.14 Steelwork and mechanical

ITEM	ACTIVITY	OBJECTIVE	REQUIREMENTS	RESPONSIBILITY	FREQUENCY
7.14.1	Welding	Avoidance	Any welding or other sources of heating of materials should be done in a controlled environment wherever possible and under appropriate supervision, in such a manner as to minimise the risk of bush fires and injury to staff.	Contractor	At all times

#### 7.15 Vehicle and machinery use & maintenance (incl. workshops) and refuelling

ITEM	ACTIVITY	OBJECTIVE	REQUIREMENTS	RESPONSIBILITY	FREQUENCY
7.15.1	Vehicle and machinery use - general	Minimisation	Vehicles and machinery must be serviced on a regular basis to ensure they do not produce excessive smoke and noise	Contractor	At all times
7.15.2	Vehicle Maintenance	Prevention	All equipment and machinery is to be maintained in good working order as to prevent oil, fuel or other such leaks. Vehicle maintenance will only be performed within the camp site at a designated area. The surface of this area must be either: i) impermeable or ii) be overlain by a disposable absorbent pa	Contractor	At all times
7.15.3		Avoidance	The area(s) intended for the maintenance of equipment, vehicles and	Contractor	At all times

			<p>machinery shall be located on an impermeable surface and shall have a drainage and collective sump system. No hydrocarbon contaminated water may be voided to the environment. Vehicles and equipment must be well serviced so that it does not produce excessive smoke.</p>		
7.15.4	Refuelling	<p>Avoidance Prevention</p>	<p>Fuel transfer shall be performed in a manner to minimise spillage. Fuel transfer should take place over an impermeable surface. All reasonable precautions must be taken to prevent fuel and lubricant spills during the course of construction. The following must be ensured:</p> <ul style="list-style-type: none"> <li>• Regular inspections are performed to verify that no leaking or defective equipment is brought onto site.</li> <li>• Any oils or lubricants discharged during vehicle servicing on site are captured using drip trays, containers or other appropriate containment measures</li> </ul>	Contractor	At all times

## 7.16 Landscaping

ITEM	ACTIVITY	OBJECTIVE	REQUIREMENTS	RESPONSIBILITY	FREQUENCY
7.16.1	Landscaping	Avoidance	<p>The planting of alien plant species for landscaping purposes will not be permitted. Only grass species that are indigenous to the study area should be used for the creation of lawns</p>	Contractor	At all times



### 7.17 Habitat Modification

ITEM	ACTIVITY	OBJECTIVE	REQUIREMENTS	RESPONSIBILITY	FREQUENCY
7.17.1	General	Minimisation Avoidance Prevention	<p>The removal of vegetation should only occur on the footprint area of the development and not over the larger area. The clearing and damage of plant growth in these areas should be restricted to the footprint way leave area. Revegetation of disturbed areas must be undertaken with site indigenous species.</p> <p>Limit pesticide use to non-persistent, immobile pesticides and apply in accordance with label and application permit directions and stipulations for terrestrial and aquatic applications. Where earthworks pose a risk to animal safety, they should be adequately cordoned off to prevent animals falling in and getting trapped and/or injured. Poisons for the control of problem animals should rather be avoided. The use of poisons for the control of rats, mice or other vermin should only be used after approval from an ecologist.</p>	Contractor	At all times

### 7.18 Habitat fragmentation

ITEM	ACTIVITY	OBJECTIVE	REQUIREMENTS	RESPONSIBILITY	FREQUENCY
7.18.1	General	Prevention Minimisation	<p>Use existing facilities (e.g. current road surface) to the extent possible to minimize the amount of new disturbance. Ensure protection of important</p>	Contractor	At all times

		Avoidance	resources by establishing protective buffers to exclude unintentional disturbance. All possible efforts must be made to ensure as little disturbance as possible to the entire riparian zone, forests and natural vegetation representation during construction. During construction, sensitive habitats must be avoided by construction vehicles and equipment, wherever possible, in order to reduce potential impacts. Only necessary damage must be caused and, for example, unnecessary driving around in the veld or bulldozing natural habitat must not take place. Construction activities must remain within defined construction areas and the road servitudes. No construction / disturbance will occur outside these areas		
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### 7.19 Soil erosion and Sedimentation

ITEM	ACTIVITY	OBJECTIVE	REQUIREMENTS	RESPONSIBILITY	FREQUENCY
7.19.1	General	Prevention Minimisation Avoidance	Ensure storm water management around permanent infrastructure, rehabilitate disturbed areas, protect topsoil and protect sensitive soils.  The water quality in the streams supplied by wetlands that will be affected should be tested prior to the commencement of construction activities with the objective of establishing baseline data for further monitoring of water quality. Locate stockpiles away from concentrated flows and riverine areas and divert run-off around them. Minimize the amount of land disturbance and develop and implement stringent erosion and dust control practices.	Contractor	At all times

			<p>Control dust on construction sites and access roads using water-sprayers.</p> <p>Institute a storm water management plan including strategies such as:</p> <ul style="list-style-type: none"> <li>• Minimising impervious area;</li> <li>• Increasing infiltration to soil by use of recharge areas;</li> <li>• Use of natural vegetated swales instead of pipes; or</li> <li>• Installing detention or retention facilities with graduated outlet control structures.</li> </ul> <p>The control of soil erosion and siltation associated with construction and operation is important at all locations on site, and particularly adjacent to drainage lines, streams and wetland communities. Both temporary and permanent soil erosion control measures must be used. Any earth-worked areas, which may lay bare for extended periods, should be temporarily grassed. Temporary control plans should include:</p> <ul style="list-style-type: none"> <li>• Silt fencing.</li> <li>• Culverts should be regularly maintained and cleared so as to ensure effective drainage.</li> <li>• Temporary silt traps basins.</li> <li>• Short term seeding or mulching of exposed soil areas.</li> </ul> <p>Short term seeding or mulching of exposed soil areas. Bare surfaces should be grassed as soon as possible after construction to minimise time of</p>		
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			<p>exposure. Locally occurring, indigenous runner grasses should be used, for example <i>Stenotaphrum secundatum</i>, <i>Dactyloctenium australe</i> and <i>Cynodon dactylon</i>. Where runners cannot be locally sourced from natural areas within a 50 km radius, then a sterile variety of Couch Grass (<i>Cynodon dactylon</i>) can be commercially sourced and planted. Alien invasive grasses such as <i>Pennisetum clandestinum</i> (Kikuyu) must not be used.</p>		
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## 7.20 Soil and Water Pollution

ITEM	ACTIVITY	OBJECTIVE		RESPONSIBILITY	FREQUENCY
7.20.1	General	Prevention Minimisation Avoidance	<p>Water falling on areas polluted with oil/diesel or other hazardous substances must be contained. Any excess or waste material or chemicals should be removed from the site and discarded in an environmental friendly way. All construction vehicles should be inspected for oil and fuel leaks regularly, and any vehicle showing signs of leaking should be serviced immediately. Vehicle maintenance yards must not be situated in any close proximity to water courses and all used oil and other waste products should be disposed of in an accepted way – preferably it should be removed from the site and recycled. Ensure that refueling stations on site are constructed so as to prevent spillage of fuel or oil onto the soil, and put in place measures to ensure that any accidental spillages can be contained and cleaned up promptly.</p>	Contractor	At all times

## 7.21 Spread and establishment of alien invasive species

ITEM	ACTIVITY	OBJECTIVE		RESPONSIBILITY	FREQUENCY
7.21.1	General	Prevention Minimisation Avoidance	<p>Institute strict control over materials brought onto site, which should be inspected for potential invasive invertebrate species and steps taken to eradicate these before transport to the site. Routinely fumigate or spray all materials with appropriate low-residual insecticides prior to transport on site. The contractor is responsible for the control of weeds and invader plants within the construction site for the duration of the construction phase. Alien invasive tree species should be eradicated. Control involves killing the plants present, killing the seedlings which emerge, and establishing and managing an alternative plant cover to limit re-growth and reinvasion. Weeds and invader plants will be controlled in the manner prescribed for that category by the Conservation of Agricultural Resources Act or in terms of Working for Water guidelines.</p> <p>Institute a monitoring programme to detect alien invasive species early, before they become established and, in the case of weeds, before the release of seeds. Institute an eradication/control programme for early intervention if invasive species are detected, so that their spread to surrounding natural ecosystems can be prevented. A plan should be developed for control of noxious weeds and invasive plants that could occur as a result of new</p>	Contractor	At all times

			<p>surface disturbance activities at the site. The plan should address monitoring, weed identification, the manner in which weeds spread, and methods for treating infestations. Require the use of certified weed-free mulching. Prohibit the use of fill materials from areas with known invasive vegetation problems. The spread of invasive non-native plants should be avoided by keeping vehicles and equipment clean and reseeding disturbed areas with native plants</p>		
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## 7.22 Human Activities

ITEM	ACTIVITY	OBJECTIVE		RESPONSIBILITY	FREQUENCY
7.22.1	General	<p>Prevention Minimisation Avoidance</p>	<p>Staff that will stay on site should be accommodated in one location of the site to ensure that the impact will be minimal on the larger area. Maintain proper firebreaks around entire development footprint. Construction activities must remain within defined construction areas and the road servitudes. No construction / disturbance will occur outside these areas. Construction activities must be restricted to working hours Monday to Saturday, unless otherwise approved by the appropriate competent person in consultation with the affected residents. Educate workers regarding the occurrence of important resources in the area and the importance of protection. Instruct employees, contractors, and site visitors to avoid harassment and disturbance of wildlife, especially during reproductive (e.g.</p>	Contractor	At all times

			courtship, nesting) seasons		
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### 7.23 Air Pollution

ITEM	ACTIVITY	OBJECTIVE		RESPONSIBILITY	FREQUENCY
7.23.1	General	Prevention Minimisation Avoidance	Dust suppression must be undertaken. Implement standard dust control measures, including periodic spraying (frequency will depend on many factors including weather conditions, soil composition and traffic intensity and must thus be adapted on an on-going basis) of construction areas and access roads. Soil dumps may be covered if necessary	Contractor	At all times

### 7.24 Use, distribution and proposed changes to the EMPr

ITEM	ACTIVITY	OBJECTIVE		RESPONSIBILITY	FREQUENCY
7.24.1	General	Compliance with the EMPr	All contractors as well as engineers and the ECO are to have a copy of the EMPr prior to coming on site. Each will be required to sign a document indicating that they have read and understood the EMPr and will abide by its restrictions. A meeting will be held prior to construction to ensure that all relevant parties have understood the EMPr and to discuss any questions arising. Monitoring reports with written site instructions are to be made available on a monthly basis to all contractors and the principal agent	Principal Agent ECO Contractor	Prior to commencement and ongoing

## **8 REHABILITATION**

### **8.1 General**

Rehabilitation will commence, as soon as feasible, on each of the construction areas to run concurrent with the construction phase, and will not be left until completion of the works. This will increase the chances of successful rehabilitation through improved monitoring throughout the construction period. All areas disturbed by development activities will be rehabilitated on completion of the construction phase. A meeting will be held between the principal agent, contractor and ECO to approve all remediation activities and ensure that the site has been restored to a condition, which has been approved by the environmental consultant.

Once rehabilitation / reinstatement have been completed the maintenance period shall commence. The environmental consultant shall verify the suitability of the reinstatement work completed and will confirm the commencement of the maintenance period. Over a period of one year and at three monthly intervals an environmental consultant will review the re-vegetation process. At any point should re-vegetation not be deemed to meet the needs of suitable cover with pioneer and secondary species, further reinstatement work may be instructed.



### 8.1.1 Construction and Camp Site

ITEM	ACTIVITY	OBJECTIVE	REQUIREMENTS	RESPONSIBILITY	FREQUENCY
8.1.1.1	Closure and rehabilitation of sites	Prevention Rehabilitation Restoration	Once construction is completed, all redundant infrastructure, waste and construction materials should be removed from site by the contractor and disposed off as per EMPr requirements. Concrete platforms will be broken up and rubble taken to a registered waste disposal site. The exposed surface will be checked for contaminant and, if any is found, the contaminated soil will be removed along with the concrete to the waste disposal site. Soil containing contaminated soil in the compacted earth platforms will be removed according to the method described above. All chemical toilets will be removed from site on dismantling of the construction camp. All structures within the construction camp will be removed. All spillages will be cleaned and contaminated soil will be removed and disposed of appropriately. Compacted and un-compacted earth platforms, as well as temporary access roads required during construction, will be rehabilitated. The revegetation processes as defined by EMPr should be followed.	Contractor	At completion of construction prior to demobilisation and/or commissioning
8.1.1.2		Rehabilitation	Disturbed camp site areas that are to remain free of infrastructure should be rehabilitated to a state comparable to the surrounding vegetation Areas compacted during construction may have to be scarified / ripped to allow	Contractor	Prior to demobilisation

			penetration of plants roots and the regrowth of natural vegetation. Stocked topsoil should be used as the final cover for all disturbed areas where revegetation is required		
<b>8.1.1.3</b>	Camp demobilisation	Restoration	All campsites will be free of refuse / litter at the time of demobilisation	Contractor	At demobilisation.

## 8.1.2 Construction Activities

ITEM	ACTIVITY	OBJECTIVE	REQUIREMENTS	RESPONSIBILITY	FREQUENCY
<b>8.1.2.1</b>	Backfilling	Rehabilitation	After completion of the backfilling, re-contouring and erosion control works, topsoil should be evenly spread at a uniform depth over the areas from which it was removed. Consideration must be given to preventing the development of preferential flow paths that may develop along the foundation route following backfilling. This is more likely to occur where the foundation is aligned with the direction of flow. This effect can be reduced by creating lenticular shaped berms perpendicular to the foundation route	Contractor	After backfilling
<b>8.1.2.2</b>	Reinstatement	Rehabilitation	Restore construction right of way to natural contours of the ground and allow for normal surface drainage. It is suggested that photographic records of all areas before and after construction are taken and kept on record for consultation	Contractor	Immediately following backfilling
<b>8.1.2.3</b>		Rehabilitation	Remove all temporary works along the construction right of way and restore any damages to original conditions	Contractor	Immediately following

					backfilling
<b>8.1.2.4</b>		Rehabilitation	Loosen compacted soils along the construction right of way by means of a scarifier. Care should be taken to avoid topsoil inversion and any ripping or scarifying operation shall not exceed a depth of 100mm.	Contractor	Immediately following backfilling
<b>8.1.2.5</b>		Prevention Minimisation Rehabilitation	Prevent concentrated run off along, or next to the construction right of way by shaping the land, establishing vegetation and taking other appropriate measures to absorb and disperse runoff. In all cases the backfilled foundations shall be backfilled evenly with topsoil to a minimum depth of 150mm.	Contractor	Immediately following backfilling
<b>8.1.2.6</b>		Preservation Rehabilitation	Cleared brush and tree limbs should be spread of the construction right of way to assist in the regeneration of natural vegetation, erosion control and provision of habitat for animals	Contractor	Immediately following backfilling
<b>8.1.2.7</b>	Stockpiles	Rehabilitation	Once stockpiles have been removed the ground surface will be inspected for compaction. Should it be required, the surface will then be ripped and the prescribed revegetation process followed	Contractor	Following reinstatement
<b>8.1.2.8</b>	Land Rehabilitation	Rehabilitation	Upon completion of construction, immediate rehabilitation will be performed within all parts of the construction activities. Revegetation of all construction areas will be conducted through the encouragement of natural processes of secondary succession, except in areas with steeper gradients and/or highly erodible soils, where the contractor must revegetate disturbed areas using a seed mix not containing any species not indigenous	Contractor	Following reinstatement.

			to the area. In order to encourage the establishment of indigenous pioneer (seral) plant communities those areas where soils have been compacted, must be tilled		
8.1.2.9		Rehabilitation Preservation	Re-seeding shall only be done in those areas where erosion hazard requires and immediate short term grass cover. Reseeding should only make use of indigenous plant species.	Contractor	As needed
8.1.2.10		Rehabilitation	All building rubble must be removed from site. All domestic waste and cement bags must be removed from the site.	Contractor	As needed
8.1.2.11		Restoration	Alien vegetation growing in disturbed areas will be removed.	Contractor	As needed
8.1.2.12	Landscaping and preparation for revegetation	Rehabilitation	Areas that require reshaping will be cut, filled and compacted so as to follow the contours of the surrounding landscape. Topsoil initially removed from the area will be replaced. Care will be taken not to mix the topsoil and subsoil during shaping operations. Should a crust form on the soil before revegetation is commenced, the contractor will loosen the crust by scarifying to a depth of 150 mm. Topsoil will be replaced at a minimum uniform depth of 100 mm.	Contractor	As needed

### 8.1.3 Materials and Infrastructure

ITEM	ACTIVITY	OBJECTIVE	REQUIREMENTS	RESPONSIBILITY	FREQUENCY
8.1.3.1	General	Rehabilitation Restoration	Any fences, barriers or demarcations utilized for the construction phase will be removed. The remaining stockpiled material will be removed to spoil or	Contractor	Post construction

			spread out on the site, as decided by the engineer / principal agent. The remaining building materials will be removed from site. Any damage incurred on the neighbouring properties will be repaired.		
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## 8.2 Revegetation process

The basic re-vegetation steps which will be implemented are detailed below:

**Step 1:** Preparing the area to be re-vegetated for top soiling - this may require soil ripping, scarifying and/ or digging of steps or terraces. The scarification will take place to a minimum depth of 150 mm. If ridges are formed, they will be approximately 100 mm high and 400 mm wide.

**Step 2:** Stockpiled topsoil will be placed on areas to be re-vegetated to a minimum depth of 100 mm spread when dry by means of hand raking or mechanical blading and trimmed to a uniform thickness.

**Step 3:** If required when sodding or hydro-seeding, appropriate organic fertilizers will be applied and worked into the soil to a minimum depth of 150 mm.

**Step 4:** Fresh, good quality seed - which is certified by the supplier and free from contamination by seeds of other species - will be used for the re-vegetation process. Although seed harvested from site is preferable, the rehabilitation grass seed mix can also be seeded at a minimum density of 30 kg/ha, utilizing a mixture of the species identified by a fauna and flora specialist or botanist.

**Step 5:** Mulch will be applied to protect the seeded area from erosion. The mulch will be composed of straw or other material of cellulose origin and free of undesirable seeds. The mulch will not be excessively fresh and green or in an advanced state of decomposition as it could smother growth. It will be applied to a depth and density that will prevent erosion by wind and water, but not completely block out the access of sunlight to the soil or prevent penetration by young plants.

**Step 6:** Re-vegetated areas will be enclosed within an erected safety barrier to prevent excessive trampling and any other factors that might cause erosion or compaction. No road building equipment, trucks or other heavy equipment will be permitted onto re-vegetated areas.

**Step 7:** Suitable temporary and permanent drainage protection will be installed prior to the institution of the re-vegetation process.

**Step 8:** All plants rescued during the site clearing process will be reintroduced onto the site. These will be replaced in soil and slope conditions similar to those from which they were originally removed.

**Step 9:** Re-vegetated areas will be irrigated on a regular basis, or as required.

**Step 10:** An appropriate maintenance and monitoring program should be implemented during the operational phase. This program should include monitoring of the success of seed germination, growth of the plants, removal of invasive weeds, replanting of areas where re-vegetation has not been successful once the cause of the inhibiting factor has been identified and remedied, and repair of any funnels or erosion channels. The contractor should not allow erosion to develop on a large scale before implementing repairs