

CEN INTEGRATED ENVIRONMENTAL MANAGEMENT UNIT



Environmental and Rural Development Specialist

Draft Environmental Management Programme – Development of
Irrigation Basins on Farm No. 65, Farm No. 67 and the Remainder
Portion of Farm No. 519, Graaff-Reinet, Dr Beyers Naudé
Municipality, Eastern Cape

December 2019

Project Title:

Draft Environmental Management Programme – Development of Irrigation Basins on Farm No. 65, Farm No. 67 and the Remainder Portion of Farm No. 519, Graaff-Reinet

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1 Chapter 1: Introduction and Project Background

1.1 Background

CEN Integrated Environmental Management Unit (CEN IEM Unit) was appointed by Mr Justin Kingwill (the Applicant) as the independent Environmental Assessment Practitioner (EAP) to undertake the Section 24G Application for the rectification process for the commencement of unauthorised activities in terms of the Environmental Impact Assessment Regulations 2014, as amended.

The Applicant has commenced with listed activities which require an Environmental Authorisation (EA) in terms of the EIA Regulations 2014, as amended. In terms of Section 24 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA), an environmental authorisation must be obtained from the relevant competent authority before commencing with any listed activities that may impact on the environment.

The Applicant commenced with the clearing of vegetation and earthworks in January 2018 with the intention to develop irrigation basins for the cultivation of lucerne, within the footprint of an old dam and old fallow lands. The dam had no economic value as the storage capacity was of little significance due to the dam being three quarters silted up. The structural integrity of the dam wall was compromised.

Prior to the commencement of the activity, the site area consisted of an old dam and old fallow lands that were no longer in use. The Sundays River used to run into the dam and exit over a damaged spillway and would continue downstream.

The development entailed two irrigation basins, one with six dam bays situated in the footprint of the old dam and one with 13 dam bays situated south of the old dam, and associated infrastructure such as weirs and sluice gates. The Sundays River has been diverted to the east, in order to accommodate the footprint of the old dam, by means of an earth lined channel.

1.2 Environmental Assessments Undertaken for the Development

Activities that commenced unauthorised in terms of NEMA and the EIA Regulations, 2014 (as amended), require rectification in terms of Section 24G of NEMA.

The main purpose of the rectification assessment is to integrate the findings and present recommendations for the proposed development. The draft Environmental Management Programme (EMPr) is also generated, which takes the findings of the environmental assessment and presents these in a series of measurable controls that will serve to mitigate impacts to acceptable levels through the provision of controls for the project's life cycle.

The information provided from the rectification assessment is passed on to the competent authority, DEDEAT, for consideration during the decision-making phase.

The assessment has also identified potential negative and positive impacts should the activity relating to the development of the lucerne pasture be allowed to continue.

1.3 Details of the Authors

The details and expertise of the persons who prepared the EMPr are provided below, as per the requirements of the EIA Regulations, 2014 (as amended).

The reports were prepared by Mrs Irma van der Merwe. Irma has a M.Sc. in Environmental Sciences, and over 3 years' experience.

All reports are reviewed and approved by Dr Mike Cohen, Director at CEN IEM Unit and the project specific EAP. Mike has over 30 years of experience, has a D.Sc. in Wildlife Management, is a registered Professional Natural Scientist (PrSciNat), a member of IAIA and Institute of Ecologists and Environmental Scientists.

1.4 Methodology

A number of steps are essential in order to ensure that environmental damage will be minimised or eliminated:

1. Potential impacts must be identified and their significance assessed.
2. Suitable mitigation measures need to be defined.
3. A system to ensure that the necessary mitigation is being implemented must be established.
4. The effectiveness of the management must be monitored.
5. The project team and the representatives of the developer must be in a position to verify the work undertaken and to monitor the environmental management process.

The purpose of this EMPr is to describe:

1. How adverse environmental impacts should be managed;
2. How environmental damage or degradation will be mitigated;
3. How site rehabilitation will be undertaken; and
4. What monitoring is necessary to ensure that the above measures are successful.

The EMPr should be viewed as a dynamic document, which may require updating and / or revision as the project develops.

1.5 Purpose and Scope of the Environmental Management Programme

This EMPr deals with the rectification and life cycle phases of the development of the lucerne pasture.

The EMPr outlines structures and procedures to be employed by the project team. It is aimed at minimising and managing environmental impacts during the construction and operational phases of the project. The specific aims of the EMPr are to:

1. Formulate procedures to rectify impacts created through the development and to minimise any additional potential secondary environmental impacts.
2. Suggest methods to ensure compliance with the EMPr, including record keeping.

The successful implementation of this EMPr is dependent on it forming part of the project's management system. Without regular checks on performance and corrections of deviations from the environmental objectives, procedures and targets; the plan will fall into disuse and become ineffective. The EMPr therefore includes various elements of an Environmental Management System (EMS) such as objectives and targets, the allocation of responsibilities, checking of corrective action, regular audits, and management review of the system.

The EMPr is a management tool and will be used primarily by the project team responsible for the onsite work. It is recommended that this EMPr is kept on-site at all times and should be available to the public upon request.

1.6 Structure of this Environmental Management Program

Chapter 1 introduces the scope of the EMPr and the constraints of the development. The purpose of the EMPr is also explained. The EMPr is designed for use by the Applicant and representatives to rectify any adverse environmental impacts associated with the development.

Chapter 2 identifies the land in question and presents application details. The environment, which will be affected by the development, was fully described in the assessment report and is not repeated in this report.

Chapter 3 briefly discusses environmental policy. It presents a suggested organisational structure for the development to ensure that responsibilities are allocated and that there is adequate control over the work.

Chapter 4 recommends general environmental management requirements – with specific objective and targets – which apply to all stages and elements of the construction and rehabilitation process.

Chapter 5 presents elements of the Environmental Management System designed to facilitate the implementation, management and regular audit of the EMPr.

2 Chapter 2: Description of Project and Environmental Management Impacts

The following section identifies the land in question. The environment, which will be affected by the development, was fully described in the S24G Report and is not repeated here.

2.1 Location

The property, Farm Blaauwater, No. 65 is located in Ward 2 of the Dr Beyers Naudé Local Municipality, Sarah Baartman District Municipality in the Eastern Cape. The property is located approximately 60km north of Graaff-Reinet and approximately 110 km south of Noupoot. The farm is situated at the foot of the Lootsberg mountain range.

2.2 Development Description

The Applicant has commenced with listed activities which require an Environmental Authorisation (EA) in terms of the EIA Regulations 2014, as amended. In terms of Section 24 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA), an environmental authorisation must be obtained from the relevant competent authority before commencing with any listed activities that may impact on the environment.

The Applicant commenced with the clearing of vegetation and earthworks in January 2018 with the intention to develop irrigation basins for the cultivation of lucerne, within the footprint of an old dam and old fallow lands. The dam had no economic value as the storage capacity was of little significance due to the dam being three quarters silted up. The structural integrity of the dam wall was compromised.

Prior to the commencement of the activity, the site area consisted of an old dam and old fallow lands that were no longer in use. The Sundays River used to run into the dam and exit over a damaged spillway and would continue downstream.

The development entailed two irrigation basins, one with six dam bays situated in the footprint of the old dam and one with 13 dam bays situated south of the old dam, and associated infrastructure such as weirs and sluice gates. The Sundays River has been diverted to the east, in order to accommodate the footprint of the old dam, by means of an earth lined channel.

2.3 Legislative Framework

In terms of the EIA Regulations, 2014, made under Section 24(5) of the National Environmental Management Act 1998 (NEMA), the following listed activity (Table 1) within Government Notice R. 327 (of 4 December 2014 as amended) is triggered by the proposed development, thereby requiring an EA from the Department of Economic Development, Environmental Affairs and Tourism (DEDEAT).

The listed activities have commenced, and as a result this would be regarded as the unlawful commencement of activities as no Environmental Authorisation has been obtained for the clearing of vegetation.

Section 24G of NEMA involves the consequences of unlawful commencement of a listed activity and makes provision for the submission of an application to the relevant environmental authority, i.e. DEDEAT. If the Section 24G Application is successful, it will enable continuation of the development.

Table 1: EIA Listed Activities

EIA Listed Activities and Applicability
<p>2014: GNR 327 Listing Notice 1: Activity 12 The development of – ii. infrastructure or structures with a physical footprint of 100 square metres or more;</p> <p>where such development occurs-</p> <p>(a) within a watercourse; (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;</p> <p>The development of the irrigation basins and associated structures, have a combined footprint of more than 100 square metres. Some of the structures (off take sluice north of Block B, and off-take sluice north of Block A) are situated within the non-perennial river (Sundays River), and the irrigation basins are situated within 32 metres of the non-perennial river.</p>
<p>2014: GNR 327 Listing Notice 1: Activity 19 The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse; but excluding where such infilling, depositing, dredging, excavation, removal or moving-</p> <p>(a) will occur behind a development setback; (b) is for maintenance purposes undertaken in accordance with a maintenance management plan; (c) falls within the ambit of activity 21 in this Notice, in which case that activity applies; (d) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or (e) where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies.</p> <p><i>More than 10 cubic metres of soil was moved in a watercourse. The site is situated outside an urban area within a terrestrial CBA as mapped by the ECBCP.</i></p>
<p>2014: GNR 327 Listing Notice 1: Activity 27 The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for-</p> <p>(i) The undertaking of a linear activity; or (ii) Maintenance purposes undertaken in accordance with a maintenance management plan</p> <p><i>The applicant cleared approximately 4 ha of indigenous vegetation for the cultivation of virgin soil.</i></p>
<p>2014: GNR324 Listing Notice 3: Activity 12 The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.</p> <p>a. Eastern Cape ii. within critical biodiversity areas identified in bioregional plans</p> <p><i>Approximately 18 ha of vegetation were cleared to allow for the development of the irrigation basins and associated structures.</i></p> <p><i>The site is situated within a terrestrial CBA as mapped by the ECBCP.</i></p>
<p>2014: GNR324 Listing Notice 3: Activity 14 The development of –</p>

i. Dams or weirs, where the dam or weir, including infrastructure and water surface area exceeds 10 square metres; or
 ii. Infrastructure or structures with a physical footprint of 10 square metres or more
 Where such development occurs-

a) Within a watercourse;
 b) In front of a development setback; or
 c) If no development setback has been adopted within 32 metres of a watercourse measured from the edge of a watercourse.

a. Eastern Cape
 i. Outside urban areas:
 (ff) critical biodiversity areas or ecosystem services areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans

*Structures with a physical footprint of more than 10 square metres, where developed within the non-perennial river.
 The site is situated in the Eastern Cape, outside an urban area, within a terrestrial CBA as mapped by the ECBCP.*

GNR324 Listing Notice 3: Activity 23
 The expansion of –
 (i) dams or weirs where the dam or weir is expanded by 10 square metres or more; or
 (ii) infrastructure or structures where the physical footprint is expanded by 10 square metres or more;
 Where such expansion occurs-

(a) within a watercourse;
 Excluding the expansion of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour.

a. Eastern Cape
 i. Outside urban areas:
 (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans

*Structures with a physical footprint of more than 10 square metres, where developed within the non-perennial river.
 The site is situated outside an urban area within a terrestrial CBA as mapped by the ECBCP.*

2.4 Summary of Impacts

The impacts, as assessed in the S24G Report, are summarised in Table 2.

Table 2: Summary of Impacts

Possible Impacts	Significance rating of impacts after mitigation (Low, Medium, Medium-High, High, Very High):
Loss of biodiversity and habitat	Medium
Erosion and destabilization of soil	Low
Destruction of riparian habitat	Medium
Waste management	Low
Impact on heritage	Low
Noise impact	Low
Contamination of ground and surface water	Low
Air pollution	Low
Employment opportunities	Low Positive

3 Chapter 3: Organisational Requirements

3.1 Background to Environmental Policy

An environmental policy is a statement of the environmental values of an organisation. It conveys these environmental values to employees, demonstrates to stakeholders the importance that senior management attaches to environmental protection and management, and provides a guiding framework for conducting the organisation's business in an environmentally compatible manner.

The philosophy behind the EMPr is for it to become an effective means of managing environmental performance by:

1. Enabling the identification of critical environmental issues;
2. Developing action plans and setting targets;
3. Ensuring environmental performance;
4. Raising environmental awareness amongst management, staff and the community which it serves; and;
5. Providing appropriate training.

3.2 Organisational Overview

Managers should be familiar with the requirements of the EMPr and should execute all construction, decommissioning and maintenance activities in an environmentally responsible manner.

This overview offers a perspective of the proposed organisation of the EMPr and the recommended responsibilities of key members of the project team. Ultimate responsibility and public accountability for the EMPr and general environmental management during construction phase resides with the developer (i.e. Applicant).

The contractors are responsible for implementing and managing the EMPr. It is recommended that the contractors nominate a member of their team as an on-site environmental officer who is responsible for ensuring that the requirements of the EMPr are implemented on a day to day basis. The contractors report to the Resident Engineer or his representative regarding compliance with the conditions as stipulated in the EMPr. The Developer or his representative works through the Environmental Control Officer (ECO) to assist with environmental management.

An independent and external Environmental Control Officer (ECO) is appointed by the developer to assist and advise on the implementation of the EMPr. The ECO is to conduct bi-monthly audits and must be available for discussion.

Where procedures in the EMPr and methods delineated in the Method Statements are persistently transgressed and appropriate corrective action is not implemented, the ECO through the Developer or his representative may order the suspension of related activities or impose a fine on the transgressor.

Regular meetings should be held to ensure that the CEMPr is effectively implemented.

3.3 Roles and Responsibilities for the Implementation of the Environmental Management Program

3.3.1 Authorities

The authorities are responsible for the timely processing and issuing of the necessary permits and authorisations for the development. The authorities will ensure that the developer complies with the terms that are stipulated within the Environmental Authorisation and other permits/approvals. Where necessary, the authorities will assist the developer in understanding and meeting the specified requirements.

The authorities may perform random controls to ensure compliance with the conditions. In such case, the developer will assist the authorities in every possible way to facilitate control. In case of long-term non-compliance, the developer will be required to provide an action plan with corrective measures for approval by the authorities

3.3.2 Developer

The developer has the overall accountability and responsibility for environmental management during the design, construction and operational phases.

The EMPr is to form part of the contractual documentation with the Contractor and becomes legally binding on the Contractor and anyone acting on behalf of the Contractor or the Developer during construction, operation and decommissioning activities.

With respect to the EMPr, the developer is responsible for:

- Implementing any environmental monitoring programmes that are recommended by the ECO or the authorities.
- Liaising with the project engineer to ensure that all components of the development are designed to meet all the listed environmental conditions as well as all of the legal requirements.
- Reviewing the Method Statements prepared by project engineers, the contractors and sub-contractors for specific activities relating to the construction phase.
- Reviewing and approving management plans prepared by the project engineers, contractors and sub-contractors.
- Reviewing and approving any environmental monitoring programs that are recommended by the ECO, the ESO or the authorities.
- Advising on actions to be taken in the event of incidents or public complaints.
- Providing the results of environmental reports to the relevant authority
- Regular site inspections and monitoring to ensure compliance with the prescribed procedures in the EMPr.
- Ensuring that the required audits are undertaken on a timely basis and that the results of the audits are communicated to all operation personnel.

3.3.3 Responsibilities: Contractors and Sub-contractors

The contractor/s and sub-contractors have final responsibility and are accountable to the developer for the effective implementation and monitoring of the EMPr.

The contractor and sub-contractors are responsible to the Resident Engineer or his representative for the effective implementation of the EMPr within their respective line functions. Specific responsibilities include:

- The full implementation of all of the requirements of the EMPr in terms of the approved method statements.
- Ensuring that all sub-contractors are familiar with and implement the EMPr
- Identifying procedures applicable to the activities they perform and / or control
- Identifying, in consultation with the Resident Engineer or his representative which sub-contractors are responsible for compiling which method statements
- Compiling method statements to meet the procedures and targets set out in the EMPr
- Submitting method statements to the Resident Engineer or his representative for approval
- Devising a system for monitoring compliance with method statements and procedures
- Identifying environmental training needs and implementing the environmental awareness training program commissioned by the Resident Engineer or his representative
- Implementing corrective and preventive actions recommended by the Resident Engineer or his representative
- Reviewing of the EMPr implementation and effectiveness at site meetings with the Resident Engineer or his representative and the ECO
- Ensuring regular internal auditing of the implementation of the EMPr.
- Maintaining and submitting records of waste disposal activities and corrective actions taken to rectify environmental problems on site.
- Attending Environmental Management Program monitoring meetings with the Resident Engineer or his representative
- Keeping a complaints register on site.

3.3.4 Environmental Control Officer

An Environmental Control Officer (ECO) must be appointed by the contractor to advise and assist the project team where necessary and to monitor the implementation of the EMPr. The ECO reports to the developer. The ECO role is to be fulfilled by a person with previous experience in environmental management and compliance monitoring regarding construction processes.

The ECO's duties include:

- To raise the awareness of the contractor and sub-contractors and their staff to the environmental sensitivity of the project area and to foster an appropriate environmental attitude during the contract period.
- Supporting and advising the Resident Engineer or his representative, especially with regards to reviewing Method Statements, auditing, monitoring and corrective and preventive action

- Undertaking environmental site audits at a frequency determined by the developer and the Resident Engineer.
- Recommending environmentally appropriate solutions to environmental problems
- Recommending additional environmental management measures as appropriate
- Attending project progress meetings, as necessary or on a basis determined by the developer and the Resident Engineer or his representative.
- Respond to repetitive non-conformances and/or incidents, and provide advice on corrective action and procedures
- Oversee rehabilitation
- Assist developer where required in liaising with authorities

It must be noted that the ECO is responsible for providing an independent evaluation of compliance with the EMPr and not for enforcement of the conditions of the EMPr. The responsibility of enforcement of the conditions of the EMPr lies with the Developer.

3.4 Method Statements

The contractors must submit Method Statements to the Developer or his representative, and the ECO outlining proposed construction activities, phasing and procedures and methods to comply with the targets stipulated in this EMPr. Method Statements should, where applicable, include drawings and plans with sufficient detail to assess the potential impact of the activities and to determine the degree of safeguarding provided against possible risks.

Method Statements indicate how the procedures will be applied to meet the relevant targets and are central to the proper implementation of the EMPr. It is anticipated that in addition to assessing the systems and performance of the EMPr, the ECO will scrutinise the formulation of, and adherence to "Method Statements" in some detail.

Method Statements must be submitted and approved before any work on the project is undertaken. The various method statements must be approved by Developer or his representative (in consultation with the ECO). The Developer or his representative must keep copies of these Method Statements and letters of approval (including conditions attached) in a Method Statements file.

The Developer or his representative (and the ECO) must approve any deviations from the approved Method Statements. All amendments must be in writing and must be submitted to the Developer or his representative.

3.5 Meetings

It is anticipated that progress meetings, attended by the Developer or his/her representative and other members of the project team, will be held on a regular basis. It is recommended that the EMPr and outcomes of the environmental compliance audits are discussed at these meetings.

The Developer or his representative may call for additional meetings in response to particular environmental problems. The ECO will attend progress meetings if requested to do so by the Developer or his representative.

4 Chapter 4: Environmental Management Program Requirements

4.1 Introduction

The Environmental Management Requirements are designed to address the legislation as well as the issues and impacts raised through the environmental assessment as they relate to the proposed development.

Please note that specific measures have been included as implementation measures instead of separate management plans.

Each of the Environmental Management Requirements is presented as follows:

- A. **Objective:** potentially significant impacts to be mitigated.
- B. **Aspects:** activities likely to cause significant impacts - this list is not exhaustive and other unspecified activities might also cause the respective significant impacts (to be monitored and addressed where required)
- C. **Procedure:** steps and/or actions required to manage and minimise/prevent the relevant aspects.
- D. **Target:** the level of performance, sometimes determined by legislation, which must be met.
- E. **Responsibility:** Main persons responsible for procedures.

4.2 Legislation

Compliance with applicable environmental legislation is listed as one of the Environmental Management Requirements in the EMPr. However, the list provided is not exhaustive and it is the responsibility of the Developer or his representative and the contractors to ensure compliance with all environmental (and other) legislation. The ECO must provide advice on this matter as and when required.

Table 3: Applicable Legislation

Issue	Legislation	Authority
Water Use and Water Quality	National Water Act (Act 36 of 1998)	Department of Water and Sanitation (DWS)
Air quality and dust generation	Air Quality Act (Act 39 of 2004)	DEA
Worker health and safety	Occupational Health and Safety Act, 1993 (Act 85 of 1993)	Dept Labour
A socially responsible workforce	Labour Relations Act, 1995 (Act 66 of 1995)	Dept Labour
Preservation of archaeological and cultural artefacts	National Heritage Act, (Act 25 of 1999)	

Issue	Legislation	Authority
Waste disposal	National Environmental Management: Waste Act (Act 59 of 2008) and Camdeboo Municipality By-Laws	Department of Economic Development, Environmental Affairs and Tourism (DEDEAT), Department of Environmental Affairs (DEA),
Noise	Environment Conservation Act 1989 (Act 73 of 1989) Sec 25 and Dr Beyers Naudé Municipality By-Laws	DEA
Protected Animals and Plants	Cape Provincial Ordinance 19 of 1974, National Environmental Management: Biodiversity Act (Act No 10 of 2004)	DEDEAT, DEFF
Agricultural resources	Conservation of Agricultural Resources Act (Act No 73 of 1983)	DEFF
Health issues	Health Act (Act 63 of 1977)	Department of Health
Quarry related activities and Environmental Management Plans	Mineral Act (Act 50 of 1991) Sections 38 and 39	Mineral and Energy Affairs
Toxic and hazardous substances	Hazardous Substances Act (Act 15 of 1973) National Environmental Management: Waste Act (Act 59 of 2008) National Water Act	DEFF, DWS
Fencing	Fencing Act (Act 31 of 1963)	DEFF
Alien Vegetation	Conservation of Agricultural Resources Act, NEM: Biodiversity Act (list of alien and invasive species)	DEFF

4.3 Environmental Commitment

All persons involved must be made aware of the environmental goals and policy of the Developer and of the appointed project managers and contractors, and encouraged to develop a commitment to compliance with the environmental legislations and to being good neighbours.

4.4 Rectification

4.4.1 Aquatic Health & Water Quality

Objective

1. Loss of vegetation, along and within a watercourse is generally considered harmful, not only due to loss of vegetation, but due to indirect impacts, such as soil erosion, sedimentation, and reduced water quality.
2. Sedimentation of aquatic areas.
3. Changes to hydrology of the riparian system.

Aspects

1. To limit erosion within riparian areas.
2. To limit sedimentation within riparian areas.

Procedure

1. All invasive alien plants propagating within the disturbed areas must be removed and disposed of as waste. All disturbed areas must be regularly monitored for the emergence of alien invasive species.
2. The earth berms should be monitored for vegetation regrowth.
3. If sufficient vegetation does not establish, additional topsoil must be sourced and a layer of no less than 100mm should be spread to enable revegetation of the banks. If all else fails, the unvegetated areas must be hydro-seeded with a seed-mix appropriate to the area. A botanical specialist should be consulted regarding the correct seed-mix.
4. All erosion gullies / channels created should be filled immediately. If necessary, geo-textile material must be installed to stabilise bare areas.
5. A professional engineer / hydrologist needs to provide an opinion regarding the appropriateness of the diversion channel developed.

Targets

1. No invasive alien plants within the riparian areas.
2. Regrowth of vegetation within the riparian areas.
3. Stabilisation of earth berms and bare soil areas.

4.4.2 Flora and Fauna Management

Environmental impacts, such as erosion caused by storm water run-off and weed invasion, increase proportionally with the increasing area of disturbance. Land clearing and disturbance provides opportunity for the invasion of exotic weeds. Weed invasion can be minimised by taking measures to ensure that operations do not introduce exotic species to an area, and also by adopting measures to manage weed infestations at the site.

Objective

1. To minimise damage to indigenous flora and fauna utilising the surrounding areas.
2. To control and prevent alien vegetation growth.

3. To revegetate bare areas to alleviate erosion potential.

Aspect

Areas surrounding the site area cleared of indigenous vegetation.

Procedure

1. The Conservation of Agricultural Resources Act (Act 43 of 1983) states that no person shall dispense any weed in the country, and the National Environmental Management: Biodiversity Act (Act No. 10 of 2004) regulates alien and invasive species. In accordance with the Act every effort must be made to ensure that the site and other clearly marked areas relating to the operation and decommissioning is kept free of weeds or invasive plants.
2. Care must be taken to remove all alien vegetation, which invades the site. The site must be inspected on a regular basis.
3. Removal of alien vegetation must be included as a routing activity.
4. Permits must be obtained from DEDEAT prior to the removal of protected and SSCs and from the Department of Agriculture, Forestry and Fisheries (DAFF) for protected trees.
5. All bare areas must be revegetated and maintained to control erosion and minimise dust.

Targets

1. Permits for protected species.

4.4.3 Stormwater and soil management

Environmental impacts, such as erosion caused by storm water run-off, increase proportionally with the increasing area of disturbance. Land clearing and disturbance provides opportunity for erosion and increased stormwater runoff. Erosion can be minimised and prevented by taking measures to ensure that operations do not cause erosion, and also by adopting measure to manage stormwater runoff at site.

Objective

1. To prevent erosion
2. To revegetate bare areas to alleviate erosion potential.

Aspects

Bare surface areas, earth berms. To limit erosion and sedimentation in the riparian areas.

Procedure

1. The earth berms should be monitored for vegetation regrowth.
2. If sufficient vegetation does not establish, additional topsoil must be sourced and a layer of no less than 100mm should be spread to enable revegetation of the banks. If all else fails, the unvegetated areas must be hydro-seeded with a seed-mix appropriate to the area. A botanical specialist should be consulted regarding the correct seed-mix.
3. All erosion gullies / channels created should be filled immediately. If necessary, geo-textile material must be installed to stabilise bare areas.

4. A professional engineer / hydrologist needs to provide an opinion regarding the appropriateness of the diversion channel developed.

Targets

1. Stabilisation of earth berms and bare areas
2. Revegetated bare areas with indigenous vegetation
3. To have the berms constructed to specification.

4.5 Operation

This section presents the environmental requirements during the operational phase.

4.5.1 Flora and Fauna Management

Objective

To limit the spread of alien vegetation.

Aspect

Controlling the spread of alien vegetation.

Procedure

1. Alien and noxious plant regrowth to be monitored regularly by the Developer and area to be kept free of alien invasive and noxious plants.
2. Removal of alien vegetation either physically or through chemical means.
3. Licence from the Department of Agriculture, Forestry and Fisheries (DAFF) obtained for pruning or cutting of any protected tree.

Targets

No alien or invasive species within the site area other than the lucerne cultivated for fodder.

4.5.2 Erosion Prevention

Objective

Poor drainage management can lead to damage or destruction of the rehabilitation investment.

Aspects

An increase in bare ground results in an increase in stormwater / surface water flow which may cause erosion.

Procedure

1. Any erosion gullies/channels should be filled and stabilised as soon as possible.

2. Regular maintenance checks must be conducted.

Targets

Controlling and prevention of soil erosion.

4.6 Response to Public Complaints

The Developer or his representative must respond to queries and complaints from the public regarding construction activities. In responding to such queries and / or complaints the Developer or his representative must document all such communications in a complaints register. All queries and complaints must be reported to the developer. All remedial action taken on a complaint must be recorded in the complaints register.

5 Chapter 5: Environmental Management and Monitoring Requirements

5.1 Introduction

This chapter outlines the systems to ensure that the EMPr and environmental management requirements listed in Chapter 4 are effectively implemented. This includes monitoring requirements, corrective action, and auditing. The training, incentives and supporting documentation required to effect implementation of the EMPr are also described.

5.2 Environmental Compliance Monitoring

The Developer or his representative and / or the ESO must devise a monitoring program to ensure compliance with the procedures and targets outlined in the previous chapter.

The Developer or his representative is responsible for monitoring the procedures and targets applicable to each environmental management requirement. The Developer or his representative in conjunction with the ECO must decide on the frequency of inspections.

For each of the environmental management requirements, the specific elements listed below should be monitored. This list is intended as a guide and is not necessarily exhaustive; consequently, other elements might need to be monitored to ensure compliance with the relevant target.

5.2.1 Erosion control

Site inspections should be conducted to detect signs of erosion to be carried out by the environmental representative / developer. It must be ensured that the erosion minimisation measures installed are effective.

5.2.2 Flora and Fauna

All animal mortalities must be recorded and reported to the Developer or his representative. A list of plants and animals that are relocated must be kept. Permit is needed in terms of the Provincial Nature and Conservation Ordinance if any carcasses are collected for monitoring purposes.

5.2.3 Air Quality

Dust must be visually monitored on a regular basis (daily), or more frequently in conditions conducive to dust generation, as determined by the ECO. Vehicles and construction equipment must be inspected daily to determine if they are in sound working order to prevent emissions.

5.2.4 Water Quality

The ECO must visually inspect runoff basins, drainage ditches and sediment traps on a daily basis to ensure that they are in an acceptable condition.

Other potential sources of surface and surface and groundwater pollution must be inspected daily (e.g. fuel and materials storage areas, vehicles and construction equipment).

5.2.5 Stormwater and soil management

The representative / developer are to inspect site to ensure stormwater management systems are effective and no ponding of site is occurring. Visual inspection must be conducted to detect any source of surface, soil and groundwater pollution on a regular basis.

5.2.6 Site Rehabilitation

The ECO must monitor re-vegetation, commencing after construction in phased areas
Monitor the erosion control measures.
Check for alien invasive vegetation.

5.3 Environmental Training

The contractors and the Developer or his representative are responsible for ensuring that all personnel have a general environmental awareness as well as specific knowledge of the potential environmental impacts associated with their work activities. All personnel associated with the project must understand the purpose and benefits of the EMPr. The appropriate training must occur as part of an induction program, i.e. before commencing on-site work, and should also focus on the benefits of sound environmental management.

Specific elements of environmental awareness training should include:

- Ability to recognise archaeological and palaeontological artefacts.
- Awareness on the importance of site rehabilitation.
- Instruction in temporary waste storage and disposal systems and facilities.
- Water conservation and water quality protection.
- Awareness of social issues.
- Incentives and rewards for good environmental practice.
- Instruction in erosion control measures.
- Prevention of soil and surface water contamination from spills, materials handling and cement mixing.
- Response to polluting incidents – control, manage, remediate, and reporting.
- Poaching.
- Restriction to work areas – materials stores, stockpiling, vehicle movement and storage.
- No speeding.
- Dust generating activities – prevention, detection, mitigation.
- Detection of emissions from equipment – procedures and reporting.
- Faunal incidences – prevention of disturbance to fauna, reporting any faunal mortalities.
- Noise prevention and control.
- Soil conservation.
- How to recognise alien vegetation and methods for removal, control and disposal.

This list is not intended to be exclusive or exhaustive.

The Developer or his representative must devise a system (including records) to evaluate regularly the training program and recommend changes as appropriate (e.g. to co-incide with the phasing of construction activities and re-training in areas of high rates of non-compliance).

5.4 Environmental Management after the Completion of Construction (Decommissioning)

Environmental management associated with the termination of construction work on a specific site is:

- ❖ All cleared areas are to be rehabilitated in line with the specifications of the rehabilitation method statement. There must be no signs of erosion.
- ❖ All visible alien plants must be removed from disturbed sites.
- ❖ All recyclable rubble and waste, for example, scrap metal, bottles, cans and plastics are to be collected and disposed of through a registered recycling company.
- ❖ All non-recyclable rubble and solid waste be collected and disposed of at a registered waste disposal facility.
- ❖ An erosion control procedure must be established to ensure that disturbed areas are rehabilitated to satisfaction and that erosion does not become a problem.

5.5 Environmental Administration Matters

5.5.1 Corrective and Preventive Action / Management of Environmental Problems

The ECO must devise a Corrective Action Procedure for implementing corrective and preventive action. The Corrective Action Procedure is to be implemented by all contractors and sub-contractors on site. This system should:

- ❖ Report non-compliance with procedures or targets identified during monitoring and inspections (on Incident Forms)
- ❖ Report other issues creating environmental problems
- ❖ Report imminent non-compliance and potential environmental problems
- ❖ Through the Developer or his representative delegate responsibility for corrective and preventive action
- ❖ Document the resolution of the reported non-compliance or environmental problem
- ❖ Impose disciplinary action where persistent non-compliance occurs.

Where possible, the Environmental Corrective Action Procedure should be integrated with the Quality, Health, Safety and, possibly, Maintenance, Corrective Action Procedures.

All contractors and sub-contractors must retain copies of the Corrective Action Procedure and other relevant documentation and submit copies of all documentation to the Developer or his representative at a frequency to be determined by the Developer or his representative..

5.5.2 Documentation

The ECO and Developer or his representative must devise forms (i.e. *pro forma*) for:

- ❖ Daily, weekly and monthly (or as appropriate) monitoring of environmental management requirements and targets (these should be integrated with those for Quality, Health, Safety and, possibly, Maintenance).
- ❖ Non-compliance (time, offender), including a register of “offenders”
- ❖ Recommended corrective action
- ❖ Resolution of non-compliance problems.

The ECO and Developer or his representative must also devise forms for:

- ❖ Method Statements
- ❖ Logging complaints received in a complaints register
- ❖ Spills registers
- ❖ Environmental Incidence registers
- ❖ Environmental training registers
- ❖ Waste registers
- ❖ Evaluating the environmental awareness training program
- ❖ Evaluating the job-specific environmental training plans
- ❖ Auditing of activities

The ECO, Developer or his representative, Contractor and sub-contractors must keep a record of all meetings attended, waste disposal documents, audits undertaken and other environmental issues as appropriate.

The above documentation must be kept on file at the site office, and must be continuously updated. Other documents to be kept on file include:

- EMPr
- Environmental Authorisation
- Map of environmentally sensitive areas
- Roles and Responsibilities chart and reporting structure for environmental incidents
- Registers
- Method statements
- Any other permits
- Waste disposal slips
- Ablution cleaning slips

5.5.3 Penalties

Transgressions relate to actions by the contractor or sub-contractor or contractor whereby damage or harm is inflicted upon the environment and where any of the conditions or specifications of the EMPr are infringed upon.

In the instance of environmental damage, the damage, where possible, is to be repaired and rehabilitated using appropriate measures, as specified and undertaken by appropriate specialists, for the account of the contractor or other guilty party.

Where infringement of the specifications or conditions of the EMPr is registered, remedial action or measures are to be implemented for the account of the contractor. Where non-repairable damage is inflicted upon the environment or non-compliance with any of the EMPr conditions is registered, the contractor may face a monetary penalty to an amount specified by the ECO in conjunction with the Developer or his representative. A first offence warning may be implemented.

5.5.4 Incentives

Where commendable performance by a contractor, sub-contractor or team member is noted for work undertaken on site, in particular with regard to compliance with the specifications of the EMPr, the ECO in conjunction with the Developer or his representative may issue an Environmental Performance Certificate to the individual or team which has earned such recognition.

6 Chapter 6: Glossary of Terms

Term	Explanation
Ambient (air)	Current surrounding atmospheric condition
dB(A) (decibels A-scale)	A frequency-weighted noise unit used for traffic and industrial noise measurement
Environment	The surroundings in which an organisation operates, including air, water, land, natural resources, flora, fauna, humans, and their interrelation
Environmental Aspect	An element of an organisation's activities, products or services that can interact with the environment
Environmental Impact	Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation's activities, products or services
Environmental Impact Assessment (EIA)	A study of the environmental consequences of a proposed course of action. An environmental evaluation or assessment is a study of the environmental effects of a decision, activity or undertaking. It is most often used within an IEM Planning process as a decision support tool to compare different options
Environmental Management System	The part of the overall management system that includes organisational structure, Planning activities, responsibilities, practices, procedures, processes and resources for developing, implementing, achieving, reviewing and maintaining the environmental policy
Exotic	Any Plant species not falling under the indigenous definition.
Integrated Environmental Management (IEM)	A process that involves the authorities and public, and integrates environmental issues with all aspects of planning*
Invasive	Tending to displace, or increase in cover relative to, surrounding vegetation.
Palaeontology	(study of) life in geological past

7 Appendix 1: Framework for method statements

Method Statement for: (e.g. vegetation clearing)					
<i>WHO</i>	Compiled by:	Submitted to:	Date submitted:	Approved by:	Date approved:
<i>PERIOD</i>	Commencement date:	Completion date:	Indication of phasing:		
<i>LOCATION</i>	Where to be implemented on site (site plan):	Indicate any restricted areas/environmentally sensitive areas:			
<i>RISKS</i>	Identify and describe any potential risks associated with construction activity:				
<i>METHOD</i>	Explain how activity will be done to meet requirements of EMPr and the Environmental Authorisation. Demonstrate how risks will be prevented through the suggested construction method.				
<i>MATERIALS AND EQUIPMENT</i>	Indicate what materials and equipment are required for the activity				
<i>COMMENTS</i>	Any additional notes/comments				

8 Appendix 2: General Code of Conduct for Contractors for Environmental Management

1. The purpose of this Code of Conduct is to ensure control over construction activities within the development area to minimise the impact of these activities on the receiving environment.
2. The rules and regulations prescribed in this Code of Conduct are intended to ensure that the quality of the environment is not compromised and that potential environmental impacts related to the construction phase are kept to a minimum while at the same time providing guidelines to promote efficient construction by contractors.
3. Failure to adhere to or any breach of this Code of Conduct may result in a fine being levied by the developer against the offending or defaulting contractor and/or suspension of work, depending on the severity of the non-compliance
4. Contractors must provide proof of registration with the relevant bodies, and must have at least 3 references of similar contracts done under the auspices of the registration
5. Contractors shall at all times be responsible for their sub-contractors and employees whilst they are on the development site
6. Contractors must understand and acknowledge that they are working in an environmentally sensitive development area and shall agree and undertake to conform to all environmental controls specified in the CEMPr as may be revised from time to time, as well as conditions of any other regulatory approvals. The CEMPr forms an integral part of the management and the development of the site, and as such is legally enforceable by the Developer
7. Contractors must conduct their operations in an open and transparent fashion, with clear communication channels and procedures for reporting on environmental compliance
8. Contractors must commit to the following:
 - a. conduct their operations in an environmentally responsible manner in line with the requirements of the EMPr and any other relevant legislation / guidelines
 - b. educate, inform and motivate their employees and sub-contractors to ensure their activities are conducted in an environmentally responsible manner through the development and implementation of an environmental awareness and induction training program.
 - c. prevent pollution, ensure efficient use of resources and minimise waste through promotion and implementation of cleaner operation principles and technology, and good site practice.

- d. pursue continuous improvement in environmental performance through development and implementation of objectives and targets, reviewing Policy and Procedures and regularly monitoring and auditing their performance.

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