CEN INTEGRATED ENVIRONMENTAL MANAGEMENT UNIT

Environmental and Rural Development Specialist

DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME

PROPOSED KWANONKQUBELA / ALEXANDRIA

COMMUNITY HEALTH CENTRE ON ERF 623, ALEXANDRIA,

NDLAMBE LOCAL MUNICIPALITY,

EASTERN CAPE

DEDEAT REFERENCE NO: EC05/C/LN1&3/M/66-2014

January 2015

Table of Contents

Table of Figures

List of Tables

Chapter 1

Chapter 1: Introduction to the Environmental Management Programme

1.1 Background

CEN Integrated Environmental Management Unit (CEN IEM Unit) was appointed to undertake the environmental assessment for the Proposed Kwanonkqubela / Alexandria Community Health Centre on Erf 623, Alexandria, Ndlambe Local Municipality, Eastern Cape.

The purpose of this document is to provide a framework for the management of environmental impacts associated with the Proposed Kwanonkqubela / Alexandria Community Health Centre located on P Erf 623, Alexandria situated within the Ndlambe Local Municipality, Eastern Cape.

This Environmental Management Programme (EMPr) is a framework Programme and does not provide specific management plans detailing how management actions are to be implemented, but rather is structured around a number of activities and identifies where more detailed Method Statements should be developed by the contractors and the subcontractors respectively.

The EMPr also identifies and clarifies the roles and responsibilities of key role-players in the implementation of the specific requirements of the EMPr as well as in monitoring, reporting, auditing and review requirements which are components of the construction phase environmental management system.

1.2 Environmental Assessments Undertaken for the Development

A Basic Assessment was done for the Proposed Kwanonkqubela / Alexandria Community Health Centre under the EIA Regulations (2010). This EMPr has been drafted during the Basic Assessment phase and includes the mitigation measures recommended in the Basic Assessment Report.

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, 2010.

The report was prepared by Mrs Lucille Behrens. Lucille has 10 years of experience in the environmental management field, has a B.Sc. Honours in Environmental Monitoring and Modelling, and is a member of IAIAsa. Her area of expertise is EIAs and related processes, and as project manager.

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 IAIAsa 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 Manager, Resident Engineer, Environmental Control Officer 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 will 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 during the operation and decommissioning of the project.

1.5 Purpose and Scope of the Environmental Management Programme

This EMPr deals with the planning and design, construction, rehabilitation and operational phases of the Proposed Kwanonkqubela / Alexandria Community Health Centre.

The EMPr is intended primarily as a management tool for the developer and contractors who will be appointed to undertake the required work, to ensure that environmentally acceptable practices are followed during all phases of the project.

The EMPr outlines structures and procedures to be employed by the Developer, Resident Engineer and the contractors. 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 construction 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 its 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 EMPr will fall into disuse and become ineffective. The EMPr, therefore, includes various elements of an Environmental Management System such as objectives and targets, the allocation of responsibilities, checking of corrective action, regular audits, and management review of the system.

1.5.1 For Whom is the Programme Intended?

The EMPr is a management tool and will be used primarily by the Developer, Project Manager, Resident Engineer and the Contractors 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 Programme

Chapter 1 of this EMPr serves to introduce the scope of the EMPr and the constraints of the project. The purpose of the EMPr is also explained. The EMPr is designed for use by the Developer, Project Manager, Resident Engineer and Contractors to rectify any adverse environmental impact associated with the project.

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 environmental assessment report and is not repeated in this report.

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

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

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

A Glossary of Terms is presented in **Chapter 6**.

Table 1 presents a cross reference to the information requirements per Regulation 33 of Government Notice R.543 (of 18 June 2010, NEMA EIA Regulations).

- **Table 1: Information Requirements per Regulation 33 of GN R.543**

Description	GN R543 Regulation 33	Chapter in EMPr
Details and expertise of the person preparing the EMPr.	*33 (a)*	**Chapter 1**
Detailed description of the aspects of the activity.	*33 (c)*	**Chapter 2**
Identification of persons responsible for implementation of measures.	*33 (d)*	**Chapter 3**
Proposed management or mitigation measures to address the environmental impacts in respect of the various project phases, including measures to rehabilitate the environment affected. Time periods within which the measures must be implemented.	*33 (b), (f), (g), (h) and (i)*	**Chapter 4**
Proposed mechanism for monitoring compliance with and performance assessment against the environmental management programme and reporting thereon. Environmental awareness training	*33 (e), (j)*	**Chapter 5**
Closure plans, including closure objectives, where appropriate.	*33 (k)*	**N/A**

Chapter 2

Chapter 2: Description of Project and Environmental Management Issue

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

2.1 Project Location

The Proposed Kwanonkqubela / Alexandria Community Health Centre, will be located on Erf 623 in KwaNonkqubela Township, Alexandria, situated within the Ndlambe Local Municipality, Eastern Cape. The 21 digit Surveyor General code for the property is C00400010000062300000. The central GPS coordinates are 33°39’15.94”S, 26°25’09.34”E. The boundary co-ordinates of the proposed Alexandria CHC are:

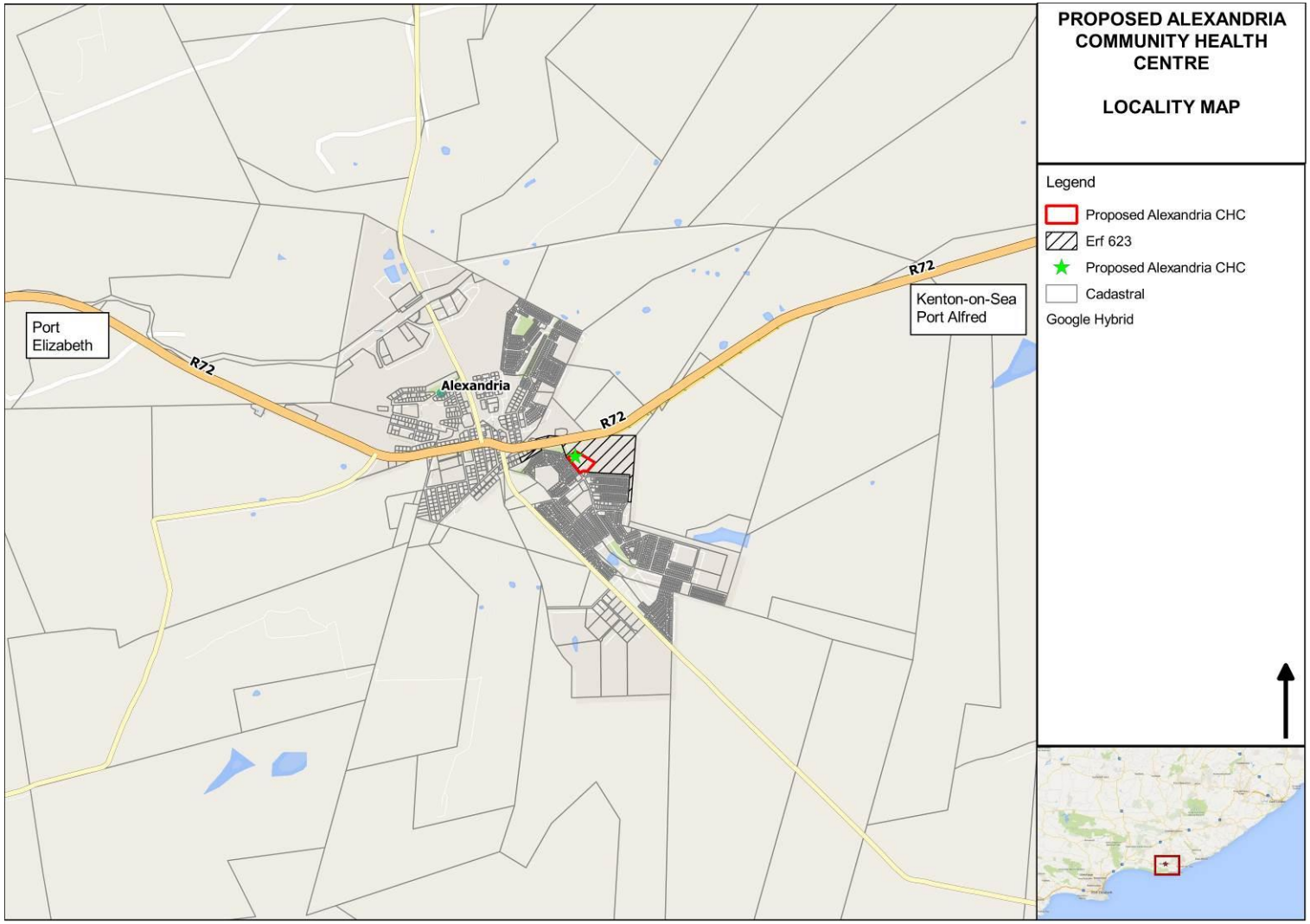
33°39'16.06"S, 26°25'7.11"E

33°39'14.46"S, 26°25'9.05"E

33°39'17.76"S, 26°25'16.33"E

33°39'21.26"S, 26°25'12.10"E.

The total project site is approximately 3.37ha in extent, and within this area approximately 1.73ha will be used for the CHC (footprint area). Refer to the locality map, **Figure 1**.
The site is located along and directly to the east of Winnie Madikizela Street, from which it can be accessed. The Winnie Madikizela Street is the main access road into the KwaNonkqubela Township, from the R72.



➢ **Figure 1: Locality Map**

2.2 Project Description (Application)

The Proposed Kwanonkqubela / Alexandria Community Health Centre will involve the following:

a) Construction of the new Alexandria Community Health Centre (building footprint 4491.1 m²);

b) Construction of staff housing (300 m²);

c) Construction of parking bays, access roads and a drop-off zone;

d) Installation of service infrastructure (water, sewerage, stormwater, electricity, etc.);

e) Installation of security fencing around the site..

2.3 Legislative Framework

2.3.1 Listed Activities in terms of the EIA Regulations

This basic assessment report is a standard template report required by the Department of Economic Development, Environmental Affairs and Tourism in terms of the EIA Regulations, 2010 and 2014.

The Minister of Environmental Affairs and Tourism has in terms of Sections 24 and 24D of the National Environmental Management Amendment Act (Act No. 107 of 1998) (NEMA) as amended, listed the activities that require an environmental assessment.

An application for Environmental Authorisation was submitted on 17 November 2014, in terms of the Environmental Impact Assessment (EIA) Regulations, 2010. The application reference number is EC05/C/LN1&3/M/66-2014.

The EIA Regulations, 2014, were published on 4 December 2014 in terms of the NEMA and came into effect on 8 December 2014. Section 53 of the EIA Regulations (2014) states that an application submitted in terms of the EIA Regulations (2010), and which is pending when the EIA Regulations (2014) take effect, must despite the repeal of the former, be dispensed with in terms of the former as if they were not repealed. Therefore, the EIA Regulations (2014) are not applicable to this application.

In addition, if an activity that is listed under EIA Regulations (2010) does not form part of the EIA Regulations (2014), the Competent Authority (i.e. DEDEAT) will consider the said activity to be withdrawn from the application.

In terms of the EIA Regulations, 2010, made under Section 24(5) of NEMA, listed activities within Government Notice R. 544, and R 546 (of 18 June 2010 as amended) are triggered by the proposed development, thereby requiring environmental

authorisation from the Eastern Cape Department of Economic Development, Environmental Affairs and Tourism (DEDEAT).

- **Table 2: EIA Listed Activities**

Detailed description of listed activities associated with the project:		
EIA Regulations, 2010	**EIA Regulations, 2014**	**Description of project activity that triggers listed activity / Applicability**
GN R. 544 Item 11: The construction of: … (vi) bulk storm water outlet structures; (xi) infrastructure or structures covering 50 square metres or more where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.	**GN R. 983 Item 12:** The development of- (vi) bulk storm water outlet structures exceeding 100 square metres in size; (xii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs- (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; - excluding- (cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies; (dd) where such development occurs within an urban area; or (ee) where such development occurs within existing roads or road reserves	Stormwater bulk outlets would be located on the northern and/or north eastern side of the site. The sewer pipeline may tie in with the existing sewerage line, located to the north east of the site. The existing sewer line is located further than 32m from a watercourse. No development setback occurs for the watercourse located on the north eastern side and the 32m would apply. *Activity is no longer applicable* as the stormwater bulk outlets and sewer line will be located outside of the 32m threshold from a watercourse.
GN R. 544 Item 13: The construction of facilities or infrastructure for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 but not exceeding 500 cubic metres.	**GN R. 983 Item 14:** The development of facilities or infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres.	The proposed facilities include storage of dangerous goods (fuel and gas) and is approximately 24 cubic metres (Gas store = 18m^3 (9m^2*2m), Garage Store = 6m^3 (3m^2*2m)). *Activity is no longer applicable* as threshold is not exceeded.
GN R. 544 Item 23: The transformation of undeveloped, vacant or derelict land to… (ii) residential, retail, commercial, recreational, industrial or institutional use, outside an urban area and where the total area to be transformed is bigger than 1 hectare but less than 20 hectares;…	**GN R. 983 Item 28:** Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture or afforestation on or after 01 April 1998 and where such development: (ii) will occur outside an urban area, where the total land to be developed is bigger than 1hectare; excluding where such	The footprint area of the proposed Community Health Centre and associated facilities will be bigger than 1 hectare. However the land is not being used for agriculture or afforestation. *Activity is not applicable* due to change in listed activity (specific reference to agriculture or afforestation)

Detailed description of listed activities associated with the project:		
EIA Regulations, 2010	**EIA Regulations, 2014**	**Description of project activity that triggers listed activity / Applicability**
	land has already been developed for residential, mixed, retail, commercial, industrial or institutional purposes.	
GN R. 544 Item 24: The transformation of land bigger than 1000 square metres in size, to residential, retail, commercial, industrial or institutional use, where, at the time of the coming into effect of this Schedule or thereafter such land was zoned open space, conservation or had an equivalent zoning	**GN R. 983 Item 26:** Residential, retail, recreational, tourism, commercial or institutional developments of 1000 square metres or more, on land previously used for mining or heavy industrial purposes.	The proposed Community Health Centre and associated facilities will transform an area bigger than 1 hectare to institutional use from open space. However the land was not previously used for mining or heavy industrial purposes. *Activity is not applicable* due to change in listed activity (specific reference to mining or heavy industrial purposes).
No similar listed activity in GN R. 544.	**GN R. 983 Item 27:** The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for- (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.	An area of approximately 2.5 hectares will be cleared of vegetation. *Activity is applicable*.
GN R. 546 Activity 2: The construction of reservoirs for bulk water supply with a capacity of more than 250 cubic metres. a) In Eastern Cape, … iii. Outside urban areas, in:… (dd) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; … (ff) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve…	**GN R. 985 Activity 2:** The development of reservoirs for bulk water supply with a capacity of more than 250 cubic metres. (b) In Eastern Cape: … iii. Outside urban areas, in: … (dd) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; … (ff) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve…	An elevated water tank may be required for the Community Health Centre. The water tank will be under 250 cubic meters. *Activity is not applicable* as the 250 cubic metre capacity is not anticipated to be exceeded

Detailed description of listed activities associated with the project:		
EIA Regulations, 2010	**EIA Regulations, 2014**	**Description of project activity that triggers listed activity / Applicability**
GN R. 546 Item 4: The construction of a road wider than 4 metres with a reserve less than 13,5 metres. (a) In Eastern Cape … ii. Outside urban areas, in:.. (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans… (gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve…	**GN R. 985 Activity 4:** The development of a road wider than 4 metres with a reserve less than 13,5 metres (b) In Eastern Cape: ii. Outside urban areas, in:… (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;… (gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve, excluding disturbed areas;…	Internal access roads will be approximately 4.5 m wide. The site falls within a Critical Biodiversity Area of the Eastern Cape Biodiversity Plan. The site is located within 10 km of the Addo Elephant National Park. *Activity is applicable*.
GN R. 546 Item 10: The construction of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres. (a) In Eastern Cape … ii. Outside urban areas, in:.. (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans… (gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve…	**GN R. 985 Activity 10:** The development of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres. (b) In Eastern Cape:… ii. Outside urban areas, in:… (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;… (gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve;… (ii) Areas on the watercourse side of the development setback line or within 100 metres from the edge of a watercourse where no such setback line has been	The proposed facilities include storage of dangerous goods (fuel and gas) and is approximately 24 cubic metres (Gas store = 18m^3 (9m^2*2m), Garage Store = 6m^3 (3m^2*2m)). *Activity is no longer applicable* as threshold is not exceeded.

Detailed description of listed activities associated with the project:		
EIA Regulations, 2010	**EIA Regulations, 2014**	**Description of project activity that triggers listed activity / Applicability**
	determined;…	
GN R. 546 Item 13: The clearance of an area of 1 hectare or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation. (a) Critical biodiversity areas and ecological support areas as identified in systematic biodiversity plans adopted by the competent authority. … (c) In Eastern Cape… ii. Outside urban areas, the following: … (ff) Areas within10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve…	**GN R. 985 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. (a) In Eastern Cape: iv. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning.	An area larger than 1 hectare will be cleared of vegetation. The site falls within a Critical Biodiversity Area of the Eastern Cape Biodiversity Plan. The site is located within 10km of the Addo Elephant National Park. The proposed Community Health Centre and associated facilities will clear an area bigger than 300 square meters on land zoned as open space. *Activity is applicable.*
GN R. 546 Activity 16: The construction of: … (iv) infrastructure covering 10 square metres or more where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line. (a) In Eastern Cape, … ii. Outside urban areas, in: … (ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; … (hh) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area	**GN R. 985 Activity 14:** The development of- (vi) bulk storm water outlet structures exceeding 10 square metres in size (xii) infrastructure or structures with a physical footprint of 10 square metres or more where such development occurs …(c) if no development setback has been adopted, within 32 metres of a watercourse measured from the edge of a watercourse. (c) In Eastern Cape:... ii. Outside urban areas, in:… (ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;… (hh) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in	Stormwater bulk outlets would be located on the northern and/or north eastern side of the site. The sewer pipeline may tie in with the existing sewerage line, located to the north east of the site. The existing sewer line is located further than 32m from a watercourse. No development setback occurs for the watercourse located on the north eastern side and the 32m would apply. *Activity is no longer applicable* as the stormwater bulk outlets and sewer line will be located outside of the 32m threshold from a watercourse.

Detailed description of listed activities associated with the project:		
EIA Regulations, 2010	**EIA Regulations, 2014**	**Description of project activity that triggers listed activity / Applicability**
identified in terms of NEMPAA or from the core area of a biosphere reserve;	terms of NEMPAA or from the core area of a biosphere reserve…	

2.3.2 Listed Activities in terms of the National Environmental Management: Waste Act

No waste management activities as listed in GN R.921 of 29 November 2013 in terms of Section 19 (1) of the National Environmental Management: Waste Act No. 59 of 2008 (NEM:WA) are triggered.

2.3.3 Listed Activities in terms of the National Heritage Act

A Heritage Impact Assessment was undertaken and no heritage resources were identified within the proposed site. Refer to Appendix D.

2.4 Summary of Impacts

Potential impacts that are associated with the Proposed Kwanonkqubela / Alexandria Community Health Centre were identified, assessed and are summarised in **Table 3**.

- **Table 3: Summary of Impacts (significance with mitigation measures in place)**

Impact	Construction phase		Operational Phase	
	No-go	***Preferred alternative***	**No-go**	***Preferred alternative***
Biodiversity	Long term, Low neg.	Long term, Low neg.	Long term, Low neg.	Long term, Very Low neg.
Noise	No change in status	Short term, Very Low neg.	N/A	N/A
Air quality (dust)	No change in status	Short term, Low neg.	N/A	N/A
Soil destabilisation / erosion	No change in status	Short term, Low neg.	N/A	N/A
Surface and groundwater contamination	Long term, Low Neg.	Short term, Very Low neg.	N/A	N/A
Waste management	Long term, Low neg.	Short term, Very Low neg.	Long term, Moderate neg.	Long term Very Low neg.
Heritage Resources (Archaeological and heritage impacts)	No change in status	Permanent Very Low neg.	N/A	N/A
Traffic impacts	No change in	Short term,	No change in	Long term

Impact	Construction phase		Operational Phase	
	No-go	*Preferred alternative*	No-go	*Preferred alternative*
	status	Low neg.	status	Low neg.
Visual Impacts	No change in status	Short term, Very Low neg.	No change in status	Long term, Low neg.
Socio-economic impacts: Employment creation	No change in status	Short term, Moderate pos.	No change in status	Long term, Moderate pos.
Social impacts: Infrastructure & Services	No change in status	Short term Very Low neg	No change in status	Long term Low neg.
Social impacts Health, Safety & Security; Provision of health care services	No change in status	Short term Very Low neg.	Long term, High neg.	Long term, High pos.

2.5 Construction and Operational Activities

Construction Phase

The construction phase will be undertaken in approximately 26 months. The following construction activities will be undertaken:

a) Site clearing and Site office establishment

b) Construction of infrastructure and services (civil) and CHC facilities

c) Rehabilitation

Operation and Maintenance Phase

The following activities will be undertaken during the operational phase:

a) Maintenance of the CHC Facilities and of the erosion control measures and stormwater management system.

b) Monitoring of waste disposal.

Chapter
3

Chapter 3: Organisational Requirements

3.1 Introduction

The Developer and their appointed Project Managers must make the Resident Engineer and Contractors aware of their environmental objectives and policy.

3.2 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 among management, staff and the community which it serves; and,
5. Providing appropriate training.

3.3 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 the general environmental management during the construction phase resides with the Developer.

The Contractors are responsible for implementing and managing the EMPr during the construction phase. It is recommended that the Contractors appoint a member of their team as the Contractor's 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 Resident Engineer or his representative works through the Environmental Control Officer to assist with environmental management.

An Environmental Control Officer (ECO) is appointed by the Developer (through the Resident Engineer or his representative) to assist and advise on the implementation of the EMPr. The ECO is to conduct 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 Resident Engineer 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 EMPr is effectively implemented.

3.4 Roles and Responsibilities for the Implementation of the Environmental Management Programme

This section defines the roles of the key parties involved in the implementation of the EMPr for the Proposed Kwanonkqubela / Alexandria Community Health Centre and mitigation measures presented in the Basic Assessment Report relevant to the various phases of the development.

3.4.1 Eastern Cape Department of Health (The Developer)

The Developer, as the project initiator, has the overall accountability and responsibility for environmental management during the design, construction and operational phases of the Proposed Kwanonkqubela / Alexandria Community Health Centre. Further it is their responsibility to ensure that the conditions of the Environmental Authorisation and mitigation measures presented in the Basic Assessment Report are communicated to, implemented and complied with by the project managers, contractors and sub-contractors.

The EMPr forms part of tender documentation to 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.

While it is the responsibility of the Contractors and the sub-contractors to prepare and implement the detailed Method Statements, the Developer will remain accountable for their implementation.

The Developer (and not the Resident Engineer or the contractors) will be responsible for liaison with the relevant authorities with respect to the implementation of the Environmental Authorisation and the EMPr.

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

1. Liaising with the project engineer and contractors, 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.
2. Reviewing the Method Statements prepared by project engineers, the contractors and sub-contractors for specific activities relating to the construction phase.
3. Reviewing and approving management plans prepared by the project engineers, contractors and sub-contractors.
4. An Environmental Control Officer (ECO) is to be appointed, whose primary role shall be to coordinate the environmental management activities during the construction phase of the development.
5. Reviewing and approving any environmental monitoring programmes that are recommended by the ECO or the authorities.
6. Advising on actions to be taken in the event of incidents or public complaints.
7. Providing the results of environmental reports to the relevant authority.

Ensuring that the required audits are undertaken on a timely basis and that the results of the audits are communicated to all operation personnel.

3.4.2 Authorities

The authorities are responsible for the timely processing and issuing of the necessary permits and authorisations for the Proposed Kwanonkqubela / Alexandria Community Health Centre. The authorities will ensure that the Developer complies with the terms that are stipulated within the Environmental Authorisation (should one be issued). 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 so as to facilitate the 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.

3.4.3 Resident Engineer

All obligations relevant to the Developer concerning the implementation of the EMPr, will apply to the Resident Engineer or his representative, contractors and sub -contractors associated with the construction phase of the Proposed Kwanonkqubela / Alexandria Community Health Centre. The Developer will inform the Resident Engineer or his representative of these obligations, as well as of the Method Statements required in terms of these obligations, and will control their implementation. The Resident Engineer or his representative is to convey the requirements of the EMPr to the contractors and their sub-contractors; and ensure that they comply with these obligations.

The Resident Engineer is to ensure that the EMPr forms part of the tender documentation to the Contractor and becomes legally binding on the Contractor and anyone acting on behalf of the Contractor during construction.

It is the responsibility of the project engineers, contractors and sub -contractors to prepare and implement Method Statements which detail the means they will employ in order to meet the objectives set in the EMPr.

The contractors and sub-contractors will be required, where specified, to provide Method Statements to the Resident Engineer or his representative setting out in detail how the management actions will be implemented in order to ensure that the environmental management objectives will be achieved.

The Resident Engineer or his representative working in close cooperation with the ECO ensures that the EMPr is implemented. The Resident Engineer or his representative is the direct link between the ECO and the Contractors and sub-contractors.

Specific responsibilities include:

1. Distribution of copies of the EMPr to the project team.
2. Advising the Developer on the appointment of any specialist if required.
3. Attending Project Progress Meetings, where the performance of the EMPr is discussed and / or reviewed.
4. Commission of monitoring programme recommended by the ECO.
5. Ensuring that measures are taken to address any problems in the implementation of the EMPr.
6. Briefing the contractors regarding their EMPr responsibilities and ensure that they implement the conditions of the EMPr.
7. Formalising systems and delegating authority to ensure that the EMPr is effectively implemented.

8. Regular site inspections and monitoring to ensure compliance with the prescribed procedures in the EMPr.
9. Devising a Corrective Action Procedure for implementing corrective and preventive action.
10. Regular consultation with the ECO, as appropriate.
11. Facilitating the implementation of a general and specific environmental awareness training programme.
12. Devising a system to evaluate the training programme regularly and recommend changes as required.
13. The creation, in consultation with the ECO, of a Method Statement pro-forma, for distribution to the appropriate contractors and their sub-contractors.
14. The examination, revision and approval, of contractors Method Statements.
15. Keeping records of waste disposal, audits, inspections, monitoring and corrective actions.
16. Ensuring that copies of the EMPr are available to all contractors and sub-contractors.
17. Identification of any new significant environmental impacts and their associated aspects, and the necessary environmental management requirements to manage them.
18. Organising audits on the implementation of the EMPr.

3.4.4 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:

1. Appointing a Contractor's Environmental Officer who is responsible for ensuring that the requirements of the EMPr are implemented on a day to day basis.
2. The full implementation of all of the requirements of the EMPr in terms of the approved method statements.
3. Ensuring that all sub-contractors are familiar with and implement the EMPr.
4. Identifying procedures applicable to the activities they perform and / or control.

5. Identifying, in consultation with the Resident Engineer or his representative which sub-contractors are responsible for compiling (which) method statements.
6. Compiling method statements to meet the procedures and targets.
7. Submitting method statements to the Resident Engineer or his representative for approval.
8. Devising a system for monitoring compliance with method statements and procedures.
9. Identifying environmental training needs and implementing the environmental awareness training programme commissioned by the Resident Engineer or his representative.
10. Implementing corrective and preventive actions recommended by the Resident Engineer or his representative.
11. Reviewing of the EMPr implementation and effectiveness at site meetings with the Resident Engineer or his representative and the ECO.
12. Ensuring regular internal auditing of the implementation of the EMPr.
13. Maintaining and submitting records of waste disposal activities and corrective actions taken to rectify environmental problems on site.
14. Attending EMPr monitoring meetings with the Resident Engineer or his representative.
15. Keeping of a complaints register on site.

3.4.5 Environmental Control Officer

An ECO is to be appointed by the Developer / Project Manager to advise and assist the Resident Engineer or his representative and project team where necessary and to monitor the implementation of the EMPr. The ECO reports to the Developer through the Resident Engineer or his representative. 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:

1. Supporting and advising the Resident Engineer or his representative, especially as regards to the review of Method Statements, auditing, monitoring and corrective and preventive action.
2. Undertaking monthly environmental site audits.
3. Recommending environmentally appropriate solutions to environmental problems.
4. Recommending additional environmental management measures as appropriate.

5. Attending Project Progress Meetings, as necessary or on a basis determined by the Developer and the Resident Engineer or his representative.
6. Providing a monthly report on environmental compliance to the Developer and Project Manager / Resident Engineer.

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 and Project Manager, while the DEA or DEDEAT's Environmental Management Inspectors may also enforce existing and potentially new conditions through compliance notices.

3.5 Method Statements

The appropriate Contractors must submit Method Statements to the Resident Engineer or his representative and 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 Site Establishment Drawings and Plans with sufficient detail to assess the potential impact of the site facilities or to assess the degree of safeguarding provided against pollution and other impacts.

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

The Resident Engineer 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 Resident Engineer or his representative.

3.6 Meetings

It is anticipated that Progress Meetings, attended by the Resident Engineer or his representative and other members of the project team will be held on a regular basis. It is recommended that a minimum of one meeting every month be held where the EMPr can be discussed. The discussions on the EMPr must continue for the entire construction phase with the last meeting being held two months after construction has been

terminated. This final meeting should be preceded by a final site audit by the ECO. The audit will be presented at this final meeting.

The Resident Engineer 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 Resident Engineer or his representative. The ECO shall decide whether other specialists (archaeologist, etc.) need to attend various meetings or not. At each of the meetings, Contractors will report performance against their defined EMPr objectives and targets.

Chapter 4

Chapter 4: Environmental Management Programme 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 Kwanonkqubela / Alexandria Community Health Centre.

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.

C. **Procedure**: steps and/or actions required to manage (and minimise) the relevant aspects.

D. **Target**: the (quantitative) level of performance, sometimes determined by legislation, which must be met.

E. **Responsibility**: main persons responsible for procedures.

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 Resident Engineer or his representative and the Contractors to ensure compliance with all environmental (and other) legislation.

4.2 Legislation

The following list of environmental legislation applies to the Proposed Kwanonkqubela / Alexandria Community Health Centre. The list presented here is not necessarily

exhaustive. Ultimately, the Developer, Resident Engineer or his representative and the Contractors are responsible for ensuring identification of and compliance with all appropriate legislation at the national, provincial and local level.

- **Table 4: Major Legislation Applicable**

Issue	Legislation	Authority
Duty of care and remediation of environmental damage. Control of emergency incidents.	National Environmental Management Act (No. 107 of 1998, as amended)	Department of Environmental Affairs (DEA) Dept. of Economic Development, Environmental Affairs & Tourism (DEDEAT)
Air quality and dust generation	National Environmental Management: Air Quality Act (Act No. 39 of 2004) and Regulations	DEA Nelson Mandela Bay Municipality (NMBM)
Preservation of archaeological and cultural artefacts	National Heritage Act, (Act 25 of 1999)	South African Heritage Resource Agency (SAHRA) Eastern Cape Provincial Heritage Resource Authority (ECPHRA)
Protected Animals, Trees and Plants	Cape Provincial Nature & Environmental Ordinance 19 of 1974 National Environmental Management: Biodiversity Act (Act No 10 of 2004) National Forest Act of 1998 (Act 84 of 1998)	DEDEAT, DEA DAFF
Rezoning and subdivision of land	Land Use Planning Ordinance, 1985 (Ordinance 15 of 1985)	NMBM
Agricultural resources	Conservation of Agricultural Resources Act (Act No 73 of 1983)	DAFF
Pests Control of the use of registered pesticides, herbicides (weed killers) and fertilisers	Agricultural Pests Act (Act 36 of 1983) Fertilisers, Farm Feeds, Agricultural Remedies and Stock Remedies Act (No 36 of 1947) and regulations	DAFF
Worker health and safety	Occupational Health and Safety Act, 1993 (Act 85 of 1993)	Dept. of Labour
Use of water resources	National Water Act (Act 36 of 1998)	Dept. of Water Affairs (DWA)
A socially responsible workforce	Labour Relations Act, 1995 (Act 66 of 1995)	Dept. of Labour
Waste disposal	National Environmental Management: Waste Act (Act 59 of 2008)	DEDEAT, DEA
Noise	Environment Conservation Act 1989 (Act 73 of 1989) Sec 25	DEA

Issue	Legislation	Authority
Health issues	Health Act (Act 63 of 1977)	Dept. of Health
Toxic and hazardous substances	Hazardous Substances Act (Act 15 of 1973) National Environmental Management: Waste Act (Act 59 of 2008)	Dept. of Health DEA
Fencing	Fencing Act (Act 31 of 1963)	DAFF

It is recommended that the Developer and Resident Engineer or his representative and / or the Contractors obtain copies of all relevant legislation. An updated file of all legislation should be maintained at the Resident Engineer or his representative's office. Copies of the Environmental Authorisation and the EMPr are to be kept at the site office.

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 legislation and to being good neighbours.

4.4 Planning & Design

The following section identifies the management actions that must be completed prior to the commencement of construction activities.

4.4.1 Environmental Authorisation Conditions

Objective

To ensure that all conditions and requirements of the Environmental Authorisation and the EMPr stipulated as pre-requisites for construction are met.

Aspect

Actions are to be completed by the Developer prior to the commencement of the relevant construction activity.

Procedure

Review the full Environmental Authorisation and convey the outstanding actions to the responsible team member.

Targets

Ensure that all requirements of the Environmental Authorisation are in place and that any approval is obtained in writing prior to commencing any construction activities.

Responsibility

Developer, Resident Engineer

4.4.2 Site Planning

Prior to construction commencing the Resident Engineer in consultation with the ECO and other project staff must compile a “detailed” site plan indicating where the various infrastructures will be located and which areas of the selected site will be utilised for construction and associated operations. The plan should include items such as the location of topsoil stockpile sites. Plans for the location of construction roads / tracks, turning circles, working areas and facilities should seek to minimise the total area that is to be disturbed. A plan of drainage works and the final drainage pattern should generally be included in the rehabilitation plan for the site. Plans for the removal and disposal of wastes and any hazardous or contaminated materials (such as; fuel drums, soil which has been contaminated with leaked fuel or oil, and alien weed infested soil) should be described, as appropriate for the scale of the operation. The construction camp site should also be located on this plan.

The ‘construction planning’ team should plan for the final rehabilitation and restoration of the site before commencing with any construction. For final rehabilitation and restoration of the site to be successful, it is essential that the future rehabilitation requirements be considered in the planning stages and that operators plan for progressive rehabilitation while operations are ongoing.

The following issues (**Table 5**) must be addressed and where appropriate shown on the Environmental Management Site Plan:

- **Table 5: Issues to be addressed on Site Plan**

Issue	Nature / Description
Sequence of events	Description of the nature of the process required. Briefly describe the sequence of events that will take place from the time that the contractor moves onto site to the time when the site is handed over to the Project Developer.
Health and safety	Potential risks and hazards and precautions that will be taken. Cooking area, hazardous materials site, first aid kit, fuel store, security issues, fire control. Safety of surrounding sensitive receptors (e.g. residents and road users).
On site toilets	How many required for the particular development? How long are the toilets required on site? Location of toilets (Site Plan)
Workforce	Number of on-site workers Training of workforce in terms of environmental awareness Management of workforce, particularly sub-contractors

Issue	Nature / Description
Transport and traffic	Transport required for site workers Routes to be used by construction vehicles Demarcate location of traffic turning circle and parking areas (Site Plan)
Infrastructure and associated equipment	Nature and extent of infrastructure construction
Topsoil	Approximation of quantity to be excavated Where to be stockpiled (Site Plan) How long to be stockpiled Area required for stockpile
Earthworks/cleaning	Volume of material to be excavated/cleaned Duration of operations Where stocks to be kept on site (Site Plan) How long to be kept on site Where, when and how to be disposed of
Equipment needed for construction activities	Area required for material and equipment storage Duration of works Nature of equipment and necessary materials
Drinking water	Quantity required Duration of period in which required Source of water Location of potable water (Site Plan)
Cooking/Eating/Rest areas	Area required Equipment required e.g. gas stoves, matches etc. Location - must take into consideration the vegetation conditions (Site Plan)
Existing structures	Indication of location of any structures that need to be removed and/or protected
Life of project	Working hours Time frame
Construction site	Work area required Location of construction site and work area (Site Plan)
Environmentally sensitive areas and possible environmental risks associated with construction activities	A training programme on possible environmental risks that may result from construction activities and how to deal with these (including a reporting structure) must be made available prior to construction commencing
Waste management	Litter drums - number, type, size, location (Site Plan) Construction of a waste transfer station within the site boundaries Closest registered waste disposal site (Location map) Waste management plan Recycling / material re-use options

Objective

1. To Plan the construction site together with access routes and associated work areas to allow for sound environmental management and effective rehabilitation of the total site.

2. Positioning of the site camp away 80m from the stream / drainage line (located to the north east of the proposed site) to reduce any sediment and pollution entering the watercourse, impacting on water quality and aquatic ecosystems.

Aspect

1. All activities related to the construction of the Proposed Kwanonkqubela / Alexandria Community Health Centre, and construction camp.

Procedure

1. In areas to be disturbed, indigenous vegetation that can successfully be translocated must be removed and stored for site rehabilitation. Any necessary permits must be obtained prior to the removal of protected and threatened species from the DEDEAT or DAFF.
2. Appropriate design of the access roads, to stabilise vulnerable areas, and anti-erosion measures to be included to disperse run-off so as to reduce the volume and velocity of surface water flow.
3. Compile an annotated base Plan / map of the site indicating the various activity zones, roads and tracks, all stockpile areas, campsites and all other areas which will be used or altered during the construction phase.
4. Indicate details of the access and internal roads and track.
5. Indicate all “no go” areas.
6. Note the location of registered waste disposal sites.
7. Vehicle parking area must be located within the defined activity zone.
8. Designate a main entrance to the construction site. This entrance should be a stabilised access or crossover access point. Identify the best location to place the entry / exit point. It should ideally be located in an elevated position with little or no water flowing to it from upslope and away from any down slope stormwater structures. All deliveries should be able to be made through this point.
9. Once the final details of the site plan have been determined, the Resident Engineer or his representative / and / or the ECO should photograph the proposed construction site and surrounding areas.
10. The site camp to be located 80m from the stream / drainage line (located to the north east of the proposed site).
11. The site camp to be located in an already disturbed area with existing access, to minimise additional disturbance and clearing of vegetation. Only shrubs are to be removed for the construction camp area and laydown areas. Grass is to be left in place.
12. No activities are to take place within 80m of the stream / drainage line.

13. Planted specimens of *Podocarpus falcatus* (Outeniqua Yellowwood) are to remain on site, and are not to be disturbed in any way. The planted specimens of *Erythrina caffra* (Coral Tree) are also to remain on site.
14. Play park to be incorporated into the CHC area

Targets

Approved site plan before commencing with construction.

Responsibility

Developer, Resident Engineer

4.5 Construction

This section presents the environmental requirements for the construction activities. The requirements are worded in broad terms and details of the actions to be undertaken must be presented in the Method Statement for each aspect. Method statements are compiled by the Contractors or their sub-contractors and approved by the Resident Engineer or his representative and the ECO.

4.5.1 Restriction of Working Areas

Objective

1. To restrict access to the site in order to reduce the potential for accidents, dust generation, water pollution, fires, and environmental damage to flora, fauna and other sensitive environmental elements.
2. To keep the demarcated and /or fenced off work area as small as possible.

Aspects

1. Effective demarcation of the construction site.
2. Minimising of traffic within construction areas.
3. Control of vehicles entering the site.

Procedure

1. Prior to any construction beginning, the actual site to be worked must be clearly defined and demarcated by means of highly visible durable materials, e.g. orange netting, no danger tape is to be used.
2. All construction material and machinery required for construction to be located within the demarcated activity zone. Vegetation within the demarcated zone may be cleared while vegetation outside of the zone must be left intact.

3. The demarcated area must cover as small an area as possible. This will prevent the unnecessary trampling of vegetation during the construction and operational phases. It will also result in a smaller area requiring rehabilitation.
4. Once the demarcated area has been approved, a written motivation to alter the boundary must be submitted to the Resident Engineer or his representative for consideration and (possible) approval.
5. The markings of the site must be maintained throughout the construction period, as and where determined by the Resident Engineer or his representative.
6. No activities or dumping may take place outside of the demarcated activity zone. This is to ensure that unnecessary damage is not done to the surrounding areas. It will also ensure the safety of people working on site and people moving in the vicinity of the site.
7. Construction workers are not to be accommodated on-site.
8. Only shrubs are to be removed for the construction camp area and laydown areas. Grass is to be left in place.
9. At the end of construction activities all components of the marking system (netting and/or poles) must be removed, to the satisfaction of the Resident Engineer or his representative. All damaged areas must be fully rehabilitated.
10. Vehicles must be instructed to remain on the track and deviations from the approved track must not be permitted, as this leads to creating multiple tracks and increasing the potential for erosion. In exceptional circumstances where a vehicle is forced to deviate from an approved track (e.g. to fight fires) the deviation must be rehabilitated immediately after such an event. All deviations must be reported to the Resident Engineer or his representative.
11. Turning of vehicles should only take place within a clearly demarcated “turn area” located adjacent to the construction site. The contractors must co-ordinate the loading and offloading of material during the construction phase so as to ensure that vehicular movement is in one direction only at any one time and that sidetracks are not created on the site.
12. Production of an Area Restriction Method Statement which includes the access road.

Targets

1. Approved Area Restriction Method Statement.
2. Controlled access to the site for the contractors, work crews, sub-contractors.
3. Prohibited access to the public, with adequate sign posting.

Responsibility

Developer, Resident Engineer, Contractor

4.5.2 Flora, Fauna and Avifauna Management

Environmental impacts, such as erosion caused by storm water run-off and weed invasion, increase proportionally with the increasing area of disturbance. It is very important that the total disturbed area be minimised. Land clearing and disturbance provides opportunity for the invasion of exotic weeds. The construction of roads can also provide an avenue by which exotic species can be transported into an area. Weed invasion can be minimised by taking measures to ensure that construction operations do not introduce exotic species to an area, and also by adopting measures to manage weed infestations at the site until such time as native species have become established after rehabilitation.

Objective

1. To minimise damage to indigenous flora and fauna utilising the construction site and the surrounding areas.
2. To re-vegetate the area as necessary to alleviate erosion potential and to improve any aesthetic issues.
3. To ensure minimum disturbance to indigenous flora, fauna and avifauna occupying the area influenced by construction.
4. To control and prevent alien vegetation growth.

Aspects

Areas to be cleared for construction, areas to be re-vegetated; lighting of fires

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 weekly by the Contractor's Environmental Officer.
3. Removal of alien vegetation (either physically (preferred) or through chemical means) must be included as a routine activity during the construction phase.
4. All alien vegetation must be removed from site and a maintenance programme for continual removal and/or follow-up actions must be developed.

5. In areas to be disturbed, indigenous vegetation that can successfully be translocated must be removed and stored for site rehabilitation. Any necessary permits must be obtained prior to the removal of protected and threatened species.
6. A Flora and Fauna Method Statement incorporating the procedures and the site maintenance plan, including timing and physical boundaries, must be submitted by the appropriate contractors to the Resident Engineer or his representative for approval.
7. All cleared areas adjacent to the work area to be re-vegetated and maintained to control erosion and minimise dust.
8. Where possible, vegetation occurring inside the demarcated activity zone should be cut to ground level, leaving the roots and soil undisturbed rather than removed. This will assist in preventing soil erosion if any heavy rains fall during the construction period.
9. All the areas cleared must be rehabilitated with suitable indigenous vegetation upon completion of the construction works.
10. Fires are to be prohibited on and adjacent to the site, during the construction phase.
11. Excess soil from excavations must not be spread on the surrounding vegetation.
12. Surrounding vegetation is a valuable resource that can be needlessly destroyed by brief activities with heavy machinery and indiscriminate use of the area by humans. All site workers must be informed of the limits of the site and should be instructed not to utilise areas outside of the defined activity zone.
13. Vegetation that was cleared may provide useful fauna habitat. Logs, limbs and stumps should be cleared and stockpiled separately to the topsoil stripping operation.
14. Rehabilitation should be undertaken in a progressive manner. Re-vegetation of the disturbed areas with indigenous material should be undertaken as soon as construction activities at an individual site have been completed.
15. Work areas must be clearly demarcated, e.g. with droppers and/or orange netting but not with danger tape, so that construction workers limit their impact to these areas alone.
16. All construction vehicles must stay on single demarcated access tracks to avoid small fauna.
17. The site camp to be located in an already disturbed area with existing access.
18. Until such time as vegetation has established, temporary soil stabilization measures must be used. These can include the use of gravel bags, straw and other matting materials, hay bales, siltation fences, sedimentation basins, grassy swales, hydro-seeding, and straw mulching.
19. Provide an information programme for contractors and site staff about the need to conserve the fauna and flora of the area. All construction staff must receive training on environmentally safe work methods.

20. Fires are to be prohibited on and adjacent to the site. Safe cooking areas must be provided for staff.
21. No activities are to take place within 80m of the stream / drainage line.
22. Planted specimens of *Podocarpus falcatus* (Outeniqua Yellowwood) are to remain on site, and are not to be disturbed in any way. The planted specimens of *Erythrina caffra* (Coral Tree) are also to remain on site..
23. An expert who holds a Competency Certificate to handle Dangerous and Venomous Reptiles should be contracted to remove animals.
24. A search and rescue to be undertaken prior to construction and animals to be removed from the site.

Targets

1. Approved Flora and Fauna Method Statement.
2. All vertebrate species encountered must be relocated from the demarcated areas immediately prior to beginning with construction work.
3. No fires are permitted.

Responsibility

Resident Engineer, Contractor

4.5.3 Cultural Historic, Archaeological and Palaeontological

Objective

To limit damage to possible cultural historic, archaeological and palaeontological artefacts and sites, features and objects.

Aspects

Clearing of sites, excavations and related activities

Procedure

1. The Resident Engineer or his representative must ensure that all staff are trained to recognise potential cultural historic, archaeological and palaeontological artefacts and sites. The Resident Engineer or his representative must also ensure that a system is in place to halt the specific activity if such a site is identified. The Resident Engineer or his representative may consider offering a reward to personnel who identify such sites.
2. Should any heritage artefacts be exposed during excavation, work on the area where the artefacts were discovered, shall cease immediately and the find brought to the immediate attention of the Resident Engineer or his representative who will report it to the Eastern Cape Provincial Heritage Resources Authority (ECPHRA, 043 6422811). The area will

be fenced off with a radius of 20m around the unearthed item, demarcated as a no-go area and access will be prohibited.

3. The Resident Engineer or his representative must then arrange for the appointment of a qualified archaeologist to examine the site and recommend further action.
4. Following consultation with the archaeologist and ECPHRA, the Resident Engineer or his representative will be responsible for approving the Contractor's resumption of normal activities.
5. Under no circumstances shall any artefacts be removed, destroyed or interfered with by anyone on the site.
6. Contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the National Heritage Resources Act (Act No. 25 of 1999), Section 51.(1).
7. A Cultural Historic, Archaeological and Palaeontological Method Statement incorporating the above procedures and the site clearance Programme, including timing, physical boundaries, the maximum depth of excavations and programming of these excavations, must be submitted by the appropriate contractor(s) to the Resident Engineer or his representative for approval.
8. Human remains confirmed younger than 60 years (to be confirmed by the police forensic unit or archaeologist) are to be reported directly to the nearest police station.

Targets

1. Approved Cultural Historic, Archaeological and Palaeontological Method Statement.
2. No cultural historic, archaeological or palaeontological artefacts or sites may be purposefully damaged or destroyed. (It is illegal to disturb fossils or other historic and or cultural sites and objects without the prior consent of the Eastern Cape Provincial Heritage Resources Authority).

Responsibility

Developer, Resident Engineer, Contractor

4.5.4 Soil Management

Topsoil is usually the darker, upper soil layer. Though only 10 - 30 cm deep it contains nutrients, minerals, seed, and organic matter, which helps to bind it all together. The regenerative capacity of the natural soil should be protected during the construction activities. Topsoil is a very important requirement for low cost revegetation of disturbed sites.

Clearing of vegetation will expose soils and make them vulnerable to destabilisation by wind and water. This may result in erosion and impact on areas beyond the site boundary i.e. the stream along the north-eastern section of the site, and the downstream environment. The site contains clayey soils, on a gentle slope, which may be sensitive to erosion e.g. at storm water culverts/outlets/channels, and on steeper areas.

Erosion and sedimentation can be avoided by good work practices and prompt rehabilitation. Rehabilitating the open space areas and maintaining a good vegetation cover will assist in preventing erosion.

Objective

To reduce the size of all stripped areas and to store stripped topsoil separately for use in site rehabilitation and landscaping once construction has been completed.

Aspects

Storage of stockpiles of soil, conservation of additional topsoil areas, erosion control.

Procedure

1. Disturbance and clearing of natural vegetation should be kept to the minimum required for construction
2. Newly cleared and exposed areas must be promptly rehabilitated with indigenous vegetation to avoid soil erosion. Where necessary, temporary stabilization measures must be used until vegetation establishes
3. Minimise the total amount of bare soil exposed to erosive forces by (1) controlling the amount of ground that is cleared at one time in preparation for construction, and (2) limiting the amount of time that bare ground may remain exposed before rehabilitation measures are put into place
4. The setback line from the drainage area must be clearly demarcated and no activities must be allowed in this area to prevent erosion and sedimentation of the river
5. Erosion control is particularly important along access roads. Drainage structures should be incorporated into roads, where run-off water must be well-dissipated to prevent erosion at discharge points
6. During construction phase, all soil stockpiles should be located on level areas, which are not susceptible to erosion.
7. The shallow topsoil layer to be stockpiled separately from the subsoil layers, should the excavation exceed 0.5m.
8. Topsoil must be stripped from the work area and stockpiled on an area outside of the immediate work area, but inside the demarcated work area.

9. Site clearing and construction should be undertaken in a progressive manner (i.e. the entire development area should not be cleared at once, but should rather be undertaken in stages) so as to minimise the area of soil exposed at any one time.
10. Wherever possible, stripped topsoil should be placed directly onto an area being rehabilitated. This avoids stockpiling and double handling of the soil. Topsoil placed directly onto rehabilitation areas contains viable seed, nutrients and microbes that allow it to revegetate more rapidly than topsoil that has been in stockpile for long periods.
11. Topsoil must be stockpiled separately from the subsoil layers and used during reinstatement thus allowing plants to rapidly re-colonise the bare soil areas.
12. Topsoil should not be stripped or stockpiled when wet, as compaction will occur
13. Stockpiled soils shall be neat, and the dumped soil shall be flattened immediately after placement to ensure minimum exposure to wind and water.
14. Stockpiles are not to be higher than 1.5 m and steeper than 1:3, and are not to be placed within 80m of the drainage line.
15. Stormwater runoff to be diverted away from stockpiles.
16. Sediment fencing should be erected downslope of all stockpiles to intercept any sediment, and upslope runoff should be diverted away from stockpiles.
17. Vegetation being cleared may contain small amounts of seed, or provide useful fauna habitat. Logs, limbs and stumps should be cleared and stockpiled separately to the topsoil stripping operation. Smaller sized vegetative material may provide useful mulch for later use in erosion control works, or else it should be combined with the topsoil.
18. Topsoil must be utilised in the rehabilitation of the site once the construction work has been completed. Any excess topsoil must be removed from the site. Excess topsoil can be used in erosion control works on any other disturbed area.
19. *Cynodon dactylon* (kweek) (or an alternative such as *Stenotaphrum secundatum* or other suitable species) should be used to revegetate the topsoil stockpiles if they are to be left for longer than 90 days. A typical seeding rate would be 6 kg seed per hectare. (Applicable only where stockpiled soil will be retained for longer than 3 months). For shorter periods a mulch of natural vegetation cut on site during the clearing operation (grass and shrubs) can be placed over the stockpiled soil.
20. Appropriate erosion control measures must be implemented on and adjacent to the access tracks and all construction areas and a monitoring programme established to ensure that no erosion is taking place. At the first sign of erosion the necessary remedial action must be taken
21. Care must be taken to ensure that runoff is well dispersed so as to limit erosion

22. When constructing erosion-control structures, it is important that the structure should trap silt, but allow for continued flow of water. Solid structures divert, rather than slow down, water flow. The effect of water diversion is to initiate a new erosion area/donga. This must be avoided
23. The maintenance of soil erosion control measures must be strictly monitored and reported.
24. Special attention should be paid to storm water control over the site. Site drainage must prevent ponding near structures and roads, and ensure that uncontrolled surface run-off does not encourage unwanted surface erosion and scour
25. Plan for the worst case, that is, for heavy rainfall and runoff events, or high winds
26. A Topsoil Preservation Method Statement incorporating the above procedures, including timing, must be submitted to the Resident Engineer or his representative for approval.
27. Foundation trenches and cut platforms should also be constructed with a slight fall of ground to prevent ponding of storm water. A sump will be required to remove water from the trenches
28. Cut to-fill platforms will require stringent storm water management. Measures must be put in place to prevent storm water ingress behind any cut and fill slopes, behind retaining walls and to the in situ colluvium and structural fill

Targets

1. Approved Topsoil Preservation Method Statement.
2. All topsoil must be separately stripped and stored.
3. No erosion and sedimentation in the stream / drainage line

Responsibility

Resident Engineer, Contractor

4.5.5 Air Quality Management

Objective

1. To minimise nuisance and potential health problems, and potential damage to flora, associated with dust and/or sand.
2. Air pollution from construction activities.

Aspects

1. Vehicle movement, stockpiling (of sand) and site clearing.

2. Poorly maintained construction vehicles and burning materials for warmth during winter by contraction staff.

Procedure

1. Staff should be trained to report dust-generating activities as soon as they detect them.
2. Dust can be suppressed by a combination of:
    a) Daily spraying of exposed areas with water (not potable or contaminated water), at a frequency to be determined by the Resident Engineer or his representative.
    b) Compacting exposed areas.
    c) Using environmentally acceptable chemical and other suppression methods where appropriate.
    d) Covering long-term stockpiles or temporarily re-vegetating them.
    e) Halting dust generating activities when wind speed exceeds 35 km/h (See Table 6).
    f) Imposing a 25 km/h speed limit on access roads.
    g) Re-vegetating exposed areas during the operating and decommissioning phases.
3. Prompt rehabilitation and wetting down of recently cleared areas to minimize dust creation.
4. Stockpiles (e.g. soil) should be maintained for as short a time as possible and should be enclosed by wind breaking enclosures of similar height to the stockpile. Stockpiles should be situated away from the site boundary, main roads, and nearby receptors and should take into account the predominant wind direction.
5. Until vegetation used in rehabilitation efforts has established, temporary stabilization methods must be used (e.g. protecting exposed soils with coarse granular materials, mulches, or straw).
6. Construction should be undertaken in a phased manner, so as to limit the size of the area to be exposed at any one time.
7. The Contractor will be responsible for the continued control of dust arising from his operations. Should a dust control method prove to be ineffective by the Project Manager and ECO, alternative methods will need to be conducted by the Contractor. Any changes in the dust control methods shall be for the cost of the Contractor.
8. Any complaints about dust recorded in the complaints register must be immediately investigated by the Resident Engineer or his representative and addressed. Contact details (e.g. telephone number) should be located at the entrance of the site for reporting of excessive dust after hours.

9. The Resident Engineer or his representative (advised by the ECO) must implement a more rigorous dust-monitoring programme (instrument measurement) if there are persistent complaints about dust in the area.
10. No waste, vegetation or any other material shall be burnt in compliance with smoke control regulations issued in accordance with the Air Quality Act (Act 39 of 2004).
11. Trucks transporting any form of soil or waste should be covered with a tarpaulin.
12. The speed of the traffic on the access roads needs to be kept slow (25 km/h) to curb any unnecessary dust.
13. Vehicles and machinery will be maintained in good running condition.
14. No waste may be buried.

- **Table 6: Table of Wind Speeds to be Used as a Guide for Dust Control**

Wind speed (km/h)	Designation	*Description*
< 2	calm	*smoke rises vertically, trees do not move*
2-5	light air	*smoke drift indicates wind direction*
6-11	light breeze	*weather vane moves, leaves rustle*
12-19	gentle breeze	*leaves and twigs in constant motion*
20-29	moderate breeze	*dust and loose paper raised, small branches move*
30-38	fresh breeze	*small trees sway*
39-50	strong breeze	*large branches move, wind whistles wires*
51-61	moderate gale	*whole trees move, walking affected*
62-74	fresh gale	*twigs break off trees, walking difficult*
75-86	strong gale	*slight structural damage occurs, branches break*
87-100	whole gale	*trees uprooted, considerable structural damage*
101-118	storm	*widespread damage*
119+	*hurricane*	*severe and extensive damage*

Targets

1. Approved Air Quality Method Statements.
2. Dust levels are not to exceed 1200mg/m^2/day (30 day average) for industrial and rural areas (non-residential areas). In residential areas, dust is not to exceed 600mg/m^2/day (30 day average).

3. Excessive dust generation as determined visually by the ECO, Resident Engineer or his representative is not permitted.

Responsibility

Resident Engineer, Contractor

4.5.6 Noise Management

Objective

To avoid disturbing residents, and fauna (especially birds), with particular reference to construction and decommissioning activities on the site.

Aspects

Operation of construction equipment, assorted maintenance and vehicle operation, construction staff.

Procedure

1. Where possible the contractors must use equipment, which limits noise generation.
2. A noise complaints register must be kept at the site office. Any complaints pertaining to noise and vibrations as recorded in the complaint register must be immediately investigated by the Resident Engineer or his representative and addressed. SABS 0103 - 1983 Code of Practice indicates that an increase of ambient noise levels by 5 dB (A) will induce “sporadic complaint” from the community.
3. Construction activities to be limited to weekdays between 07:00 and 17:00; and Saturdays until 13:00. No work is to be undertaken on Sundays or public holidays.
4. Vehicles and machinery to be kept in good working order with the prescribed mufflers and silencers.
5. Attempts must be made to schedule noisy activities so that they occur simultaneously and over as short a period as possible.
6. Vibration inducing activities must also be simultaneously scheduled wherever possible.
7. A formal noise monitoring programme must be implemented by the Resident Engineer or his representative if there are persistent complaints.
8. A Noise and Vibration Method Statement must be submitted by the appropriate contractors (s) to the Resident Engineer or his representative for approval.
9. No loud music will be allowed on site or in the construction camp.
10. No construction staff to be housed on site.
11. If blasting is to occur, neighbours must first be informed.
12. The normal municipal by-laws with regards to noise control must apply.

13. Construction staff must be informed about the sensitivity of neighbours to noise.

Targets

1. Approved Noise and Vibration Method Statement.
2. The Occupational Health and Safety Act 85 of 1993 stipulates that noise levels in excess of 85 dB (A) at 1 metre from equipment are not permitted.
3. Excessive noise as determined subjectively by the Resident Engineer or his representative.

Responsibility

Resident Engineer, Contractor

4.5.7 Water Consumption

Objective

To minimise the consumption of water

Aspects

Equipment servicing areas, domestic water use, water required for construction and related activities.

Procedure

1. Opportunities to reduce consumption of or re-use water must be adopted wherever possible.
2. Methods must be employed to ensure that water is not wasted. Environmental awareness training must ensure that staff is aware of the need to conserve water and to minimise the pollution of water.
3. A Water Consumption Method Statement must be submitted by the appropriate contractor(s) to the Resident Engineer or his representative for approval.
4. Potable water tanks must be installed at the construction site for human consumption and sanitation purposes. The contractor will ensure safe drinkable water for the labourers during the construction phase.

Targets

1. Approved Water Consumption Method Statement
2. The Resident Engineer or his representative to set a realistic water consumption quota.

Responsibility

Resident Engineer, Contractor

4.5.8 Water Quality and Stormwater Management

Sediment derived from erosion by water, and other water borne contaminants such as diesel and oil, are often sources of pollution arising from construction activities. If environmental management is inadequate, water quality may be affected beyond the boundary of the project.

Objective

1. To minimise the potential contamination of ground and surface water
2. To minimise soil erosion.

Aspects

1. Poorly maintained equipment and vehicles, vehicle parking areas, and contaminated run-off during the construction.
2. Spillages from construction materials, such as diesel, oils and cement.
3. Construction activities leading to soil erosion.

Procedure

1. The Resident Engineer or his representative shall ensure that all precautions are taken to ensure that no surface or ground water becomes polluted. Any deliberate or unplanned pollution of water is an offence in terms of the National Water Act (Act 36 of 1998) and is punishable with a fine not exceeding R50 000 and / or two years imprisonment.
2. Ensure all construction machinery is in sound working order and free of leaks from oil, fuel or hydraulic and excessive exhaust fume emissions.
3. No rock, silt, cement, grout, asphalt, petroleum product, timber, vegetation, domestic waste, or any deleterious substance should be placed or allowed to disperse into any drainage line or areas that will not be developed
4. Establish a dedicated area for construction vehicles, machinery or equipment to refuel and where cement can be mixed. Vehicle re-fuelling and cement mixing must only take place on impervious surfaces.
5. No vehicle must be refuelled, serviced or repaired on the construction site, except in designated areas. Only emergency repairs to be conducted on site, all regular service maintenance to be conducted off site.
6. Large volumes of fuel should not be stored on site
7. Toilet facilities must be made available to construction staff, and secured to the ground
8. Adequate waste disposal bins must be positioned on site. These must be properly secured and covered to prevent scavengers from tipping them

9. Temporary storm-water runoff basins and drainage ditches may have to be constructed in order to capture storm-water. Care must be taken to ensure that runoff is well dispersed so as to limit erosion
10. Wherever possible, drainage works should seek to mimic natural drainage patterns and utilise natural drainage lines with retained vegetation.
11. Anti-erosion measures to be included to disperse run-off so as to reduce the volume and velocity of surface water flow and vulnerable areas to be stabilised.
12. A cut-off drain or diversion banks above all excavation/cuts will help prevent water from entering the site. Cut-off drains should discharge into vegetated natural drainage lines or via a level sill that distributes run-off across a stable vegetated area.
13. Contour drains can also be used to capture and slow down water that would otherwise gather momentum as it travels down the slope. Rate of run-off increases dramatically following vegetation removal; hence the total area exposed should be kept to a minimum.
14. Gradients on access tracks should be controlled, drainage structures well maintained, and regular cross drains or culverts installed.
15. Sedimentation into drainage lines must be minimised through the effective stabilisation (e.g. gabions and Reno mattresses) and the re-vegetation of cleared areas. Silt fences to be included around stock piles and along the north eastern boundary adjacent to the stream / drainage line.
16. Special attention should be paid to storm water control over the site. Site drainage must prevent ponding near structures and roads, and ensure that uncontrolled surface run-off does not encourage unwanted surface erosion and scour
17. Appropriate erosion control measures must be implemented on and adjacent to the access tracks and all construction areas and a monitoring programme established to ensure that no erosion is taking place. At the first sign of erosion the necessary remedial action must be taken
18. When constructing erosion-control structures, it is important that the structure should trap silt, but allow for continued flow of water. Solid structures divert, rather than slow down, water flow. The effect of water diversion is to initiate a new erosion area/donga. This must be avoided
19. Foundation trenches and cut platforms should also be constructed with a slight fall of ground to prevent ponding of storm water. A sump will be required to remove water from the trenches
20. Cut to-fill platforms will require stringent storm water management. Measures must be put in place to prevent storm water ingress behind any cut and fill slopes, behind retaining walls and to the in situ colluvium and structural fill

21. The maintenance of soil erosion control measures must be strictly monitored and reported
22. Details of storage of all chemicals must be submitted to the Resident Engineer or his representative for approval. Refer to **Section 4.5.10** for additional measures.
23. Emergency plans must be in place in case of spillages onto road surfaces and/or open areas. Spill kits for small spills to be kept on site.
24. Contaminated soil (e.g. in vehicle parking areas, under generators) must be removed to an appropriate permitted solid waste disposal facility. Waste manifests to be kept by contractors to prove legal disposal of contaminated soil.
25. Environmental awareness training must ensure that staff is aware of the need to prevent water pollution. Educate all construction staff on sound environmental work practices
26. A Water Quality Method Statement must be submitted by the appropriate contractor(s) to the Resident Engineer or his representative for approval.
27. Should a polluting incident occur, the Resident Engineer or his representative shall immediately contact the regional office of the Department of Water and Sanitation (DWS) (requirement of National Water Act). Cleanup shall take place in consultation with the DWS.
28. No access, construction activities or stockpiling to occur within 80 m of the drainage line.

Targets

1. Approved Water Management Method Statement.
2. Government Gazette 665 of 6 September 2013 governing effluent quality.
3. No contamination of groundwater.
4. SABS 241 effluent discharge standard

Responsibility

Resident Engineer, Contractor

4.5.9 Solid and Liquid Waste Management

Objective

1. To limit the potential for groundwater and surface water pollution as well as the visible and malodorous accumulation of waste materials.
2. To prevent littering and associated environmental impacts.
3. Limit the amount of waste to be disposed of at a landfill.

Aspects

General construction and decommissioning activities

Procedure

1. All building rubble and other construction wastes must either be recycled (i.e. used on site in the building process or provided to a waste recycling company) or removed from site to a registered waste disposal site. Environmentally acceptable work practice methods to be built into the contractor's code of conduct that include the importance of good housekeeping on site. A suitably qualified company will conduct construction audits during which dumping will be strictly monitored
2. Good housekeeping to be undertaken at all times.
3. No illegal dumping or burning of waste allowed. Waste is not to be buried.
4. Awareness raising to be undertaken with the construction workers regarding health and environmental impacts from illegal dumping.
5. Toilet facilities must be made available to construction staff. If portable chemical toilets are used, these are to be secured to the ground and cleaned at least weekly. Water should be provided for washing and sanitary bins for women. Waste to be disposed of at a wastewater treatment works.
6. A system for identifying, classifying and disposing of solid waste must be devised.
7. Waste should be classified as domestic (including litter), hazardous, or recyclable.
8. Waste materials (e.g. paper and glass) must be sorted and sent for recycling, where the quantity allows this and if the facilities are available. Certain waste materials are valuable and could be sold to (local) entrepreneurs for further use.
9. No littering is permitted on site; litterbins with secured lids must be provided throughout the site. These litter bins must be predator and scavenger proof.
10. Centralised eating facilities must be provided for workers to facilitate litter control.
11. All non-hazardous solid waste must be removed on a regular basis and disposed of off-site at suitably permitted waste facilities. This includes any building rubble left after construction.
12. The Contractor may not utilise the municipal waste collection services for disposal of waste.
13. When hazardous wastes are already present at the site, the contractor or subcontractor who first discovers the material is responsible for notifying the Resident Engineer, developer, and / or land owner. The local authority, the provincial authority and the Department of Environmental Affairs must also be notified. Because the hazardous waste was present at the site prior to construction activities, the developer or owner

typically is responsible for ensuring that the hazardous wastes are handled and disposed of properly.

14. When hazardous wastes are produced at the site, the contractor or subcontractor who produces the hazardous waste typically is responsible for ensuring its proper handling and disposal. Hazardous waste (e.g. old oil) to be stored separately in impermeable (i.e. leak proof) containers, and sent for recycling.
15. Hazardous materials must only be disposed of at an approved hazardous waste disposal facility. No hazardous waste material to be disposed of as general waste.
16. A register of waste disposal (including waste manifests) and sorting records must be retained by the contractors and submitted to the Resident Engineer or his representative for auditing purposes.
17. Appropriate temporary disposal areas must be covered and be on an impermeable floor.
18. Excess soil and stone removed during the excavations should be used in site levelling.
19. Excess material not being reused, should be removed from the site and disposed of at a registered waste site.
20. Construction materials stored at the camp site must be secured – i.e. plastics must be covered to prevent being blown off site. Skips must be regularly emptied (weekly) and must be covered
21. Any hazardous materials that need to be stored on site must be done so under lock and key
22. A Waste Management Method Statement must be submitted by the appropriate contractor to the Resident Engineer or his representative for approval.
23. The requirements of the Waste Act (Act 59 of 2008), Health Act (Act 50 of 1992) and the National Environment Management Act (Act 107 of 1998) are applicable to waste management.

Targets

1. Approved Waste Management Method Statement.
2. National Environmental Management: Waste Act (Act 59 of 2008) restricting waste disposal to permitted sites.
3. National Water Act (Act 36 of 1998)
4. All waste material must be removed from the site and suitably disposed of; no solid wastes shall be stored on-site for more than one week (i.e. 7 days).
5. Most materials from building and construction sites can be recycled or reused. Table 7 demonstrates some reuse options, and is for guidance only.

Responsibility

Resident Engineer, Contractor

- **Table 7: Reuse and recycling potential of materials (For Guidance Only)**

Materials	Process	End use
Concrete	Crushed and recycled	Used as Fill, levelling, road base
	Surplus	Used as base for paths, minor slabs
Other timber	Cleaned and reused	Used as Formwork, bridging, propping
	Ground and recycled	Into Mulch, engineered timber products
Trees	Relocated and reused	Used in Landscaping on or off site
Greenwaste	Shredded and recycled	Used in Compost, mulch, fertilizer
Overburden	Screened and reused	Used as Topsoil
Metals	Scrap metals recycled	Into New metal products
Packaging	Shredded and recycled	Into New packaging

4.5.10 Fuel and Hazardous Materials Management

Hazardous materials and related waste includes the following materials:

a) Ignitable (flashpoint of less than 140 degrees), such as paint thinners, paints, paint and varnish strippers, epoxy resins, adhesives, degreasers, and spent cleaning solvents.

b) Corrosive (acids with a pH less than 2 or bases with a pH greater than 12.5), such as rust removers, cleaning fluids, and battery acids.

c) Reactive (explosive or violently reactive), such as cyanide, plating waste, bleaches, and waste oxidizers.

d) Toxic (meeting certain concentrations), such as materials containing metals (e.g., mercury, cadmium, or lead) or solvents (e.g., carbon tetrachloride or methyl ethyl ketone). Materials may include adhesives, paints, coatings, polishes, varnishes, thinners, or treated woods.

e) Batteries;

f) Pesticides (as defined by the Universal Waste definition); and

g) Any other hazardous waste or material.

Objective

To ensure that materials are appropriately stored in order to minimise the potential for pollution and accidents.

Aspects

Storage of fuels solvents, and other hazardous and toxic substances

Procedure

1. Fuel, solvents and other hazardous or toxic substances must be securely stored in a restricted, locked facility approved by the Resident Engineer or his representative.
2. Fuel and hazardous materials containers must be properly and boldly labelled.
3. Chemicals must be stored safely on site, on an impermeable lined surface and surrounded by lined bunds, as per SANS 10128. Chemical storage containers must be inspected daily so that any leaks are detected early.
4. Storage facilities must be maintained and fire-fighting equipment in proportion to the fire risk that is presented by the type of construction and other on-site activities and materials used on site is to be available and kept in good operating order at all times.
5. An emergency response plan (e.g. in case of fire) must be formulated, including steps taken to manage the capture and treatment of polluted water.
6. Generators and fuel supply needed for equipment during the construction phase must be placed on trays. This is to prevent any oil or fuel spills. The river sand (clean or contaminated) must be removed from the site once construction has been completed. All contaminated material must be disposed of at a registered hazardous waste disposal facility. Vehicles are also to be parked over drip trays.
7. No cement or concrete should be mixed on the soil surface or on plastic sheeting. Cement mixing is to undertaken in trays.
8. Cement mixers must be placed on large trays to prevent accidental spills onto the soil surface. Where cement or concrete is mixed on the soil, contaminated soils should be removed and disposed of at a registered waste disposal site.
9. The Resident Engineer must ensure that the contractors obtain material safety data sheets for all materials used on site. Where applicable, all site workers must be informed of the hazardous nature of the materials being used.
10. A Fuels and Hazardous Materials Storage Method Statement must be submitted by the appropriate contractor to the Resident Engineer or his representative for approval.
11. The provisions of the Fertilisers, Farm Feeds, Agricultural Remedies and Stock Remedies Act (Act 36 of 1947) and the Hazardous Substances Act (Act 15 of 1973) must be adhered to.

12. No stockpiling or storage within 80 m of a stream / drainage line.

Targets

1. Approved Fuels and Hazardous Materials Storage Method Statement.
2. Approved Emergency Response Procedure.
3. Fuels and hazardous liquids must be stored in an impervious, bunded and covered area with a capacity of 110% of the largest single storage tank.

Responsibility

Resident Engineer, Contractor

4.5.11 Traffic Management

Objective

Potential increases in traffic within the area, with resultant potential congestion, road damage, road safety, noise, etc. issues.

Aspects

1. Increased traffic on local roads, etc.
2. Traffic safety impact due to additional traffic.
3. Deterioration of public road network.

Procedure

1. Flagmen to be posted when construction works are being undertaken adjacent to main or secondary roads.
2. Signage is to be displayed regarding construction activities.
3. Construction vehicles are to keep to the speed limits (e.g. 60 km/hr on tar roads and 40 km/hr on gravel roads).
4. Vehicles transporting fine materials must be covered using tarps to prevent dust creation
5. The traffic department must be notified and involved when construction activities require any road closures
6. The public must be notified of any road closures ahead of time
7. Roads must be monitored for signs of erosion, especially after wet periods. If roads are damaged by construction vehicles, they must be rehabilitated immediately
8. The developer should be responsible for the condition of the road during construction phase within reasonable measures – i.e. any damage caused as a result of construction vehicles must be rectified by the developer

9. Access to businesses and residences must not be affected
10. A community liaison officer must be on site at all times to receive comments from residents. These must be recorded in a complaints register along with follow-up action for review by an external auditor

Targets

1. No accidents
2. No spillages of any material onto roads.

Responsibility

Resident Engineer, Contractor

4.5.12 Visual Management

Objective

The construction activities will change the visual nature of the site from open space looking over a densely-vegetated drainage area, to a construction site.

Aspects

Cleared areas of vegetation, the construction camp.

Procedure

1. Construction workers are not to be accommodated on-site.
2. Only shrubs are to be removed for the construction camp area and laydown areas.
3. Shrubs and trees located on the boundary of the site should be left intact.
4. Cleared areas not required for operational use to be re-vegetated with indigenous vegetation.

Targets

Minimise visual intrusion.

Responsibility

Resident Engineer, Contractor

4.5.13 Social and Economic

Objective

1. To ensure the health and safety of the construction workforce.

2. To ensure that activities associated with construction, particularly the presence of the workforce, do not create social problems or exacerbate any which may already exist.

Aspects

1. Staff and surrounding community welfare, health and safety.
2. Fire management

Procedure: Health, Safety and Security

1. Adequate ablution facilities and chemical toilet facilities must be erected and maintained in good order on the site for the duration of the construction and decommissioning phase. Toilets must be secured to the ground. Toilets should be removed from site when construction is completed. Waste must be disposed of at a registered waste site.
2. Adequate clean drinking water must be available to construction staff at all times during the construction period.
3. An area must be demarcated for staff to conduct all necessary cooking activities. The site must be selected to ensure that there is no risk of fires. It would be advisable to ensure that small gas cookers are available on site, if needed.
4. Work crews are not to be housed on site and where feasible should be accommodated in suitable residential areas in close proximity to the construction site.
5. Awareness raising to be undertaken with the construction workers regarding health and environmental impacts from illegal dumping.
6. HIV and STD awareness training with construction staff.
7. Security to be provided after hours to protect equipment in the construction camp.
8. Excavations to be demarcated with orange netting. Excavations are to be checked daily, prior to work commencing, for any animals.
9. Shoring of excavations to ensure the safe workings of site staff.
10. The construction area must be demarcated and access controlled for the duration of the construction period.
11. Signage is to be displayed regarding construction activities.
12. Construction vehicles must adhere to speed limits and must be made aware of people walking and living in close proximity to the site.
13. A health and safety method statement/program is essential.
14. General risks associated with the construction activities should be addressed through compliance with the relevant health and safety procedures and regulations.

15. Access to and from the construction site(s) should be closely monitored and contractors should be required to make the necessary arrangements for the transport of workers to and from the site on a daily basis.
16. Visitors to report to the Site Office, and appropriate Protective Personal Equipment to be worn by visitors.
17. Discuss the safety and security issues, as well as construction schedule with the local community and local SAPS.
18. Adjacent landowners are to be notified 14 days prior to construction commencement.
19. Fire-fighting equipment in proportion to the fire risk that is presented by the type of construction and other on-site activities and materials used on site is to be available and kept in good operating order at all times.
20. Any welding or other sources of heating of materials must be done in a controlled environment, under appropriate supervision, in such a manner as to minimise the risk of fires and/or injury to staff. No “hot work” is to be undertaken on days where the Fire Danger Index is “orange” or “red”.
21. Smoking will not be permitted in those areas where there is a fire hazard. These areas include the fuel storage areas and any area where the vegetation or other material may support the rapid spread of an initial flame. Where possible, these areas (e.g. at the chemical and hazardous substances storage area) are to be demarcated with no-smoking signs.
22. The existing play park area to be located outside of the construction area

Procedure: Employment

1. A policy of employing local people should be implemented wherever possible. This will ensure that benefits of the construction are provided to local communities and will prevent an influx of job seekers to the site. This policy must be finalised before the hiring of sub-contractors.
2. Local sub-contractors should be employed wherever possible to maximise the localised economic benefits of the project.
3. Materials should be sources from local suppliers
4. Transport should be provided for labour to-and-from site on a daily basis
5. Construction staff must not be housed on site
6. Access to the construction site must be strictly controlled.
7. A mechanism must be established to receive and address complaints from the staff.
8. For security reasons, cash wages should be paid off site.

Procedure: Existing Services and Infrastructure

1. A pre-construction survey must be conducted by the Contractor prior to the commencement of the construction works to locate existing services
2. Wayleaves to be obtained from the relevant departments, e.g. Ndlambe Sanitation, Road, Stormwater Divisions, prior to construction starting
3. Location of existing services and widths of existing servitudes to be demarcated to avoid damage and to ensure disruption to surrounding areas is avoided.

Targets

1. Approved Social, Health and Safety Method Statement.
2. Labour Relations Act, 1995 (Act 66 of 1995).
3. The Contractor shall ensure compliance with the Occupational Health and Safety Act (Act 85 of 1993) and the relevant regulations.

Responsibility

Resident Engineer, Contractor

4.6 Rehabilitation Management

The term 'rehabilitation' is used to encompass all of those measures, which seek to repair disturbed or degraded land, and to return such land to a stable and non-polluting state, which is suitable for the proposed future use of the land. The rehabilitation of the construction and surrounding area is an integral part of the development. Progressive rehabilitation refers to the rehabilitation of areas that are no longer required for the construction activities while the other operations continue. Progressive rehabilitation is an important component of any development and should be implemented where feasible.

The main aims of rehabilitation work are to:

a) Achieve long-term stabilisation of all disturbed areas to minimise ongoing erosion;

b) Re-vegetate all disturbed areas with suitable plant species;

c) Minimise visual impact of disturbed areas; and

d) Ensure that disturbed areas are safe for future uses.

Establishment of a self-sustaining cover of vegetation is the best low maintenance stabiliser of disturbed sites in the long term. Generally, the vegetation type, which existed before the disturbance, or a similar vegetation type will be most successful afterwards, following an initial re-establishment period.

Objective

1. To revegetate areas that has been disturbed during the construction phase.

2. To re-establish a native vegetation cover, which is similar in species composition to that, which existed before the disturbance and to prevent erosion on the site; and manage adverse visual impacts from critical viewpoints. The site should be left in a stable state that blends in with the surrounding area.

Aspects

1. Dismantling and removal of all construction infrastructure, re-vegetation and landscaping of disturbed areas on site, replacement of topsoil.
2. Ensuring that adequate erosion control measures are in place.

Procedure

1. All construction infrastructure, equipment, materials and wastes must be removed from the site upon completion of construction (or earlier, in a phased manner, if possible).
2. Rehabilitation of surplus tracks and turning areas, camp sites and stockpiles (i.e. areas not required to be clear of vegetation during operations).
3. Knobs and stockpiles should be levelled and waste rock / overburden pushed into hollows, i.e. soil erosion areas that have no vegetation in order to restore eroded areas.
4. All compacted and previously used construction areas shall be scarified / ripped to a depth of 150 mm prior to topsoil being replaced. Ripping will promote water infiltration and root penetration. Ripping should be carried out when the soil is relatively dry to increase soil break-up.
5. Stored topsoil must be replaced uniformly on disturbed areas to a depth of at least 150 mm. Re-spread soil should be left with a rough surface with many suitable locations for lodgement and germination of seeds. Avoid spreading soil when saturated or sticky, as compaction and other damage to the soil structure will occur.
6. These areas must be landscaped to improve the aesthetic appearance of the site; suitably landscaped berms of topsoil may be created as part of the erosion control programme.
7. Any excess topsoil (not used in landscaping) must be disposed of in an environmentally acceptable manner.
8. All disturbed areas must be re-vegetated with suitable indigenous (i.e. naturally occurring in the area) vegetation, e.g. grass species - *Eragrostis* spp.
9. A Site Rehabilitation Method Statement must be submitted by the contractors to the Resident Engineer or his representative for approval.
10. The soil erosion measures installed need to be checked weekly.

Targets

1. Approved Site Rehabilitation Method Statement.

2. Site rehabilitation to be completed within one month after the end of the construction period, or by an alternative date stipulated by the Resident Engineer or his representative.

Responsibility

Developer, Resident Engineer, Contractor

4.7 Operation

This section presents the environmental requirements during the operational phase.

4.7.1 Flora, Fauna and Avifauna Management

Objective

1. Limit the spread of alien vegetation.
2. Disturbance to fauna and avifauna from operational activities.

Aspects

1. Controlling the spread of alien vegetation.

Procedure

1. Alien and noxious plant regrowth to be monitored monthly by the Developer and area to be kept free of alien invasive and noxious plants.
2. Removal of alien vegetation either physically (preferred) or through chemical means.
3. Only indigenous vegetation that occurs naturally on site is to be planted in site rehabilitation and in landscaping activities.
4. The Alexandria CHC is to be fenced.
5. Planted specimens of *Podocarpus falcatus* (Outeniqua Yellowwood) are to remain on site, and are not to be disturbed in any way. The planted specimens of *Erythrina caffra* (Coral Tree) are also to remain on site

Targets

No alien or invasive species within the site area.

Responsibility

Developer

4.7.2 Air Quality Management

Objective

1. To minimise nuisance and potential health problems, and potential damage to flora, associated with dust and/or sand.
2. Air pollution from operational activities.

Aspects

1. Vehicle movement, and cleared areas.

Procedure

1. No materials shall be burnt.
2. Maintaining re-vegetated areas to limit exposed soils.
3. No waste may be buried.

Targets

1. Dust levels are not to exceed 1200mg/m^2/day (30 day average) for industrial and rural areas (non-residential areas). In residential areas, dust is not to exceed 600mg/m^2/day (30 day average).

Responsibility

Developer

4.7.3 Social and Economic

Objective

Health, safety, security and fire management

Aspects

1. To ensure the health and safety of the workforce.

Procedure: Health, Safety and Security (including Fire Management)

1. Maintenance to be undertaken by trained personnel only.
2. Fire-fighting equipment in proportion to the fire risk that is presented by the type of materials used on site is to be available and kept in good operating order at all times.

Procedure: Employment

1. Up skilling of local labour to skilled positions.
2. As far as practically possible, use must be made of local labour

3. Materials required for operational phase must be locally sourced, where possible

Procedure: Existing Services and Infrastructure

1. Provision of 500 litre rainwater tanks for harvesting of rainwater.
2. Installation of water saving measures, e.g. duel flush toilets, aerated taps
3. Immediate fixing of any leaks or broken pipes
4. Energy saving measures (e.g. energy saving lighting, solar geysers) to be provided
5. Community to be informed of additional grazing areas
6. Play park to be incorporated into the CHC area

Targets

1. All equipment maintained and operated per manufacturer's guide.
2. No fires.

Responsibility

Developer

4.7.4 Stormwater Management and Erosion Prevention

Objective

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

Aspects

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

Procedure

1. Erosion control measures must be maintained.
2. No access, maintenance activities or stockpiling to occur within 80 m of the drainage line or within steep terrain.
3. Anti-erosion measures to be included to disperse run-off so as to reduce the volume and velocity of surface water flow and vulnerable areas to be stabilised.
4. Sedimentation into drainage lines must be minimised through the effective stabilisation (e.g. gabions and Reno mattresses) and the re-vegetation of cleared areas.

Targets

1. Controlling and prevention of soil erosion.

2. Stormwater drainage.
3. Post-construction stormwater run-off not to exceed pre-construction stormwater run-off.

Responsibility

Developer

4.7.5 Solid and Liquid Waste Management

Objective

1. To limit the potential for groundwater and surface water pollution as well as the visible and malodorous accumulation of waste materials.
2. To prevent littering and associated environmental impacts.
3. Limit the amount of waste to be disposed of at a landfill.

Aspects

1. If waste is not disposed of correctly, there is a possibility that waste may be blown into the surrounding environment or being illegally disposed of

Procedure

1. Waste storage and collection must comply with the National Domestic Waste Collection Standards (21 January 2011) and Norms and Standards for the Storage of Waste, GN 926 of 29 November 2013.
2. Waste to be sorted and recycled where possible. A register of waste disposal (including waste manifests) and sorting records must be retained for auditing purposes.
3. Waste disposal manifests must be kept of all solid waste that is disposed of at a registered landfill site or sent for recycling
4. No hazardous waste material to be disposed of as general waste in dustbins or in drains.
5. No illegal dumping, burying or burning of waste allowed.
6. Oil-based liquids should be treated and disposed of as hazardous waste.

Targets

Compliance with the National Environmental Management: Waste Act (Act 59 of 2008) and associated regulations (e.g. Norms and Standards for the Storage of Waste, GN 926 of 29 November 2013)

Responsibility

Developer

4.7.6 Traffic Management

Objective

Potential increases in traffic within the area, with resultant potential congestion, road damage, road safety, noise, etc. issues.

Aspects

1. Increased traffic on local roads, etc.
2. Traffic safety impact due to additional vehicle and pedestrian traffic, and for pedestrians crossing the R72
3. Increased pedestrian traffic

Procedure

1. Vehicles are to keep to the speed limits.
2. It is recommended that the proposals from the Ndlambe Municipality's SDF be implemented, namely
    a. upgrade R72 and main road into KwaNonkqubela into activity corridors
    b. introduce traffic calming measures along R72 corridor to make it more effective
    c. create a pedestrian friendly environment along roads using street lighting and furniture
3. Traffic calming measures along the proposed Alexandria CHC access road (Winnie Madikizela Street) to be implemented and maintained
4. A demarcated pedestrian crossing at the KwaNonkqubela entrance from the R72

Targets

No accidents.

Responsibility

Developer

4.7.7 Visual Management

Objective

Change of the visual nature of the site from open space looking over a densely-vegetated drainage area, to built-up.

Aspects

Limit visual intrusion.

Procedure

1. The design of the facility must consider the sense of place and visual character of the area.
2. Lighting in and around the facility and along roadsides must be directed downwards (e.g. bollard lights) to prevent light pollution at night.
3. If fencing and walling are to be used, these must be visually permeable.
4. Entrances must include soft landscaping to prevent them from being hard and visually intrusive features

Targets

Minimise visual intrusion.

Responsibility

Developer

4.8 Environmental Management after the Completion of Construction on a Specific Site (Decommissioning)

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

1. All cleared areas are to be rehabilitated with indigenous vegetation suitable to the cleared area. There must be no signs of erosion.
2. All visible alien plants must be removed from disturbed sites and the disturbed site rehabilitated.
3. All recyclable rubble and waste, for example, scrap metal, bottles, cans and plastics are to collected and disposed of through a registered recycling company.
4. All non-recyclable rubble and solid waste be collected and disposed of at a registered waste disposal facility. A register of waste disposal (including waste manifests) and sorting records must be retained for auditing purposes.
5. All concrete waste is to be removed, and the rubble disposed of at a permitted facility.

6. All access tracks not required for operations are to be covered and re-vegetated with indigenous grass, to match the existing vegetation as far as possible. An erosion control procedure must be established to ensure that the tracks are rehabilitated to satisfaction and that erosion does not become a problem.

4.9 Response to Public Complaints

The Resident Engineer or his representative must respond to queries and complaints from the public regarding construction activities within 14 days. In responding to such queries and / or complaints the Resident Engineer 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. Refer to **Appendix 4** for a copy of the complaint form.

Chapter 5

Chapter 5: Environmental Management and Monitoring Requirements

5.1 Introduction

This chapter outlines the systems to ensure that the EMPr is effectively implemented, including 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 Resident Engineer or his representative is responsible for monitoring the procedures and targets applicable to each environmental management requirement.

Environmental compliance audits are to be undertaken at least once a month by the ECO.

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

5.2.1 Restriction of Access to Sites

The Environmental Officer to inspect the demarcated area on a daily basis and inform the contractors of any violations or areas where markings must be replaced.

5.2.2 Flora and Fauna Management

1. All animal mortalities must be recorded and reported to the Resident Engineer or his representative.
2. A list of plants that are relocated and used in rehabilitation must be kept and their survival success documented.
3. Alien and noxious plant regrowth to be monitored and area to be kept free of alien invasive and noxious plants.

5.2.3 Cultural Historic, Archaeology and Palaeontology

During earthmoving, excavation and site rehabilitation the Environmental Officer must monitor for potential cultural historic, archaeological and palaeontological sites daily, or more frequently at his discretion.

5.2.4 Soil Management

1. Daily checks, at the discretion of the Environmental Officer, need to be undertaken on the storage of the topsoil and the state of the vegetation or mulch covering the topsoil.
2. Checks on the erosion of the area must be carried out daily, and it must be ensured that the erosion minimisation measures installed are effective.

5.2.5 Air Quality

1. Dust must be visually monitored on a daily basis, or more frequently in conditions conducive to dust generation, as determined by the Environmental Officer.
2. The Environmental Officer must implement a formal dust monitoring programme and dust suppression techniques be revised, if persistent complaints are recorded.

5.2.6 Noise and Vibrations

1. The Environmental Officer must subjectively monitor noise and vibration levels on a frequent basis.
2. The Environmental Officer must implement a formal noise-monitoring programme if persistent complaints are recorded.

5.2.7 Water Consumption

Daily consumption of water must be monitored and recorded against the set water quota. Any excessive usage or peaks must be investigated.

5.2.8 Water Quality

1. The Environmental Officer must visually inspect runoff basins, drainage ditches and sediment traps on a daily basis to ensure that they are in an acceptable condition.
2. Other potential sources of surface and groundwater pollution must be inspected daily.

5.2.9 Waste Management and Site Housekeeping

1. The Environmental Officer must inspect on-site waste disposal facilities / temporary storage areas daily, to ensure that they are sufficient and that they are properly maintained.
2. During site inspections the Environmental Officer must check for waste material, which is inappropriately (temporarily) disposed of or stored.
3. A record must be kept of waste that is disposed of at the landfill site or sent for recycling.
4. The Environmental Officer must monitor the site for litter and other waste material.

5.2.10 Fuel and Hazardous Materials Management

1. The Environmental Officer must ensure that materials are stored in the designated area set aside for that purpose.
2. During daily site inspections the Environmental Officer must check storage facilities to ensure that they are in a proper state of repair.
3. A record must be kept of any spills and what follow-up action was taken.

5.2.11 Social Issues

The Environmental Officer must monitor the site regularly (as part of daily inspections) and be alert to potential social problems on and off site.

5.2.12 Site Rehabilitation

1. The Environmental Officer must monitor site landscaping, re-vegetation and alien plant regrowth, commencing after construction.
2. Monitor the erosion control measures.

5.3 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 subcontractors on site.

This system should:

a) Report non-compliance with procedures or targets identified during monitoring and inspections (on Incident Forms, **Appendix 4**).

b) Report other failures creating environmental problems.

c) Report imminent non-compliance and potential environmental problems.

d) Through the Resident Engineer or his representative delegate responsibility for corrective and preventive action.

e) Document the resolution of the reported non-compliance or environmental problem.

f) 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 appropriate documentation and submit copies of all documentation to the Resident Engineer or his representative at a frequency to be determined by the Resident Engineer or his representative. The Resident Engineer or his representative must report to the Developer on a monthly basis on the implementation of the EMPr.

5.4 Documentation

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

a) 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).

b) Noncompliance (time, offender), including a register of “offenders”.

c) Recommended corrective action.

d) Resolution of noncompliance problems.

e) Method Statements.

f) Logging complaints received in a complaints register.

g) Evaluating the environmental awareness training programme.

h) Evaluating the job-specific environmental training programmes.

i) Auditing of activities.

These records are to be made available for review by the Developer. The Resident Engineer 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.

5.5 Environmental Awareness Training

The Contractors and the Resident Engineer 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 programme, 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 (list is not intended to be exclusive or exhaustive):

1. Ability to recognise archaeological and palaeontological artefacts.
2. Awareness on the importance of site rehabilitation.
3. Management and minimising of waste, including waste separation. Instruction in temporary waste storage and disposal systems and facilities.
4. Water conservation and water quality protection.
5. Awareness of existing social problems in the area.
6. Incentives and rewards for good environmental practice.
7. Instruction in erosion control measures.
8. Acceptable behaviour with regard to flora and fauna.
9. Maintenance of equipment to prevent the accidental discharge or spill of fuel, oil, lubricants, and other chemicals.
10. Responsible handling of chemicals and spills.
11. Environmental emergency procedures and incident reporting.

In the event that new personnel are brought onto site by the Contractor during the project, these personnel are to undergo environmental awareness training prior to any work being undertaken. The Contractor is to include environmental awareness training in the toolbox talks on a monthly basis.

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

5.6 Environmental Administration Matters

5.6.1 Penalties

Transgressions relate to actions by the Contractor, Sub-contractor or Contractor team member whereby damage or harm is inflicted upon the environment or any feature of 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, appropriate 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 Resident Engineer or his representative. A first offence warning may be implemented.

5.6.2 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 Resident Engineer or his representative may issue an Environmental Performance Certificate to the individual or team which has earned such recognition.

Chapter 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 Control Officer	An independent person who is responsible for undertaking site inspections to audit and report on compliance with environmental specifications with the Environmental Management Programme.
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 Programme (EMPr)	A tool used to prescribe management mechanisms or methods for the prevention of undue or reasonably avoidable adverse environmental impacts and for the enhancement of the positive environmental benefits of a development.
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.

Term	Explanation
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

Chapter 7

Chapter 7: References

Department of Environment Affairs and Tourism. 1997. Guidelines for Comprehensive Environmental Impact Reports. Unpublished Memorandum.

Department of Environment Affairs. The integrated environmental management procedure. Guideline document 1, Department of Environment Affairs, Pretoria, 1992, p 19.

Draft Basic Assessment Report: Proposed Kwanonkqubela / Alexandria Community Health Centre on Erf 623, Alexandria, Ndlambe Local Municipality, Eastern Cape. January 2015. CEN IEM Unit

Environmental Management Plans, Integrated Environmental Management, Information Series 12, Department of Environmental Affairs (DEA), Pretoria.

National Environmental Management Act 107 of 1998 (NEMA).

Appendix 1: Declared Weeds and Invader Programmets

Extracts from GNR.1048 of 25 May 1984: Regulations (Department Of Agriculture) as amended Notice *Government Gazette* R.2687 10029 6 December 1985 and R.280 22166 30 March 2001

WEEDS AND INVADER PLANTS

15. Declaration of weeds and invader Plants

(1) Plants of the kinds specified in column 1of Table 3 as category 1 Plants are hereby declared weeds to the extent indicated in column 3 of the said Table opposite the names of the respective kinds of Plants.

(2) Plants of the kinds specified in column 1 of Table 3 as category 2 Plants and as category 3 Plants are hereby declared invader Plants to the extent indicated in column 3 of the said Table opposite the names of the respective kinds of Plants.

(Regulation 15 substituted by GNR.280 of 2001.)

15A Combating of category 1 Plants

(1) Category 1 Plants may not occur on any land or inland water surface other than in biological control reserves.

(2) A land user shall control any category 1 Plants that occur on any land or inland water surface in contravention of the provisions of sub-regulation (1) by means of the methods prescribed in regulation 15E.

(3) No person shall, except in or for purposes of a biological control reserve:

(*a*) establish, Programmet, maintain, multiply or propagate category 1 Plants;

(*b*) import or sell propagating material of category 1 Plants or any category 1 Plants;

(*c*) acquire propagating material of category 1 Plants or any category 1 Plants.

(4) The executive officer may, on good cause shown in writing by the land user, grant written exemption from compliance with the requirements of sub-regulation (1) on such conditions as the executive officer may determine in each case.

(Regulation 15A inserted by GNR.280 of 2001.)

15B Combating of category 2 Plants

(1) Category 2 Plants may not occur on any land or inland water surface other than a demarcated area or a biological control reserve.

(2)(a) The executive officer may on application in writing demarcate an area as an area where category 2 Plants may occur, be established and be maintained.

An area in respect of which a water use licence for stream flow reduction activities has been issued in terms of section 36 of the National Water Act, 1998 (Act No. 36 of 1998) shall be deemed to be a demarcated area.

(3) The executive officer shall demarcate an area for the occurrence, establishment and maintenance of category 2 Plants only if:

(a) the category 2 Plants in the area are cultivated under controlled circumstances; and

(b) the land user concerned has been authorised to use water in terms of the National Water Act, 1998 (Act No. 36 of 1998); and

(c) the category 2 Plants or products of category 2 Plants in the area are demonstrated to primarily serve a commercial purpose, use as a woodlot, shelter belt, building material, animal fodder, soil stabilisation, medicinal or other beneficial function that the executive officer may approve; and

(d) all reasonable steps are taken to curtail the spreading of propagating material of the category 2 Plants outside the demarcated areas.

(4) When an area is demarcated for the occurrence, establishment and maintenance of category 2 Plants the executive officer may impose such additional conditions as may reasonably be deemed necessary to keep the category 2 Plants in the area in check.

(5) No person shall sell propagating material of category 2 Plants or any category 2 Plants to another person unless such other person is a land user of a demarcated area or of a biological control reserve.

(6) No person shall acquire propagating material of category 2 Plants or any category 2 Plants unless such material or such Plants are intended for use in a demarcated area or in a biological control reserve.

(7) Propagating material of category 2 Plants or category 2 Plants shall only be imported or sold in accordance with the provisions of the Programmet Improvement Act, 1976 (Act No. 53 of 1976), the Agricultural Pests Act, 1983 (Act No. 36 of 1983) and the environment conservation regulations.

(8) A land user shall control any category 2 Plants that occur on any land or inland water surface in contravention of the provisions of sub-regulation (1) by means of the methods prescribed in regulation 15E.

(9) Unless authorised thereto in terms of the National Water Act, 1998 (Act No. 36 of 1998), no land user shall allow category 2 Plants to occur within 30 meters of the 1:50 year flood line of a river, stream, spring, natural channel in which water flows regularly or intermittently, lake, dam or wetland.

(10) The executive officer may, on good cause shown in writing by the land user, grant written exemption from compliance with one or more of the requirements of sub-regulations (1), (3), (5), (6), (8) and (9) on such conditions as the executive officer may determine in each case.

(Regulation 15B inserted by GNR.280 of 2001.)

15C Combating of category 3 Plants

(1) Category 3 Plants shall not occur on any land or inland water surface other than in a biological control reserve.

(2) Subject to the provisions of sub-regulation (3), the provisions of sub-regulation (1) shall not apply in respect of category 3 Plants already in existence at the time of the commencement of these regulations.

(3) (a) No land user shall allow category 3 Plants to occur within 30 meters of the 1:50 year flood line of a river, stream, spring, natural channel in which water flows regularly or intermittently, lake, dam or wetland.

(b) The executive officer may impose such additional conditions as may reasonably be deemed necessary with regard to category 3 Plants already in existence at the time of the commencement of these regulations.

(c) A land user must take all reasonable steps to curtail the spreading of propagating material of category 3 Plants.

(d) The executive officer may, after consultation with the land user, issue a direction in terms of section 7 of the Act that category 3 Plants in existence at the time of the commencement of these regulations must be controlled by means of the measures prescribed in regulation 15F.

(4) No person shall, except in or for purposes of a biological control reserve:

(a) Programmet, establish, maintain, multiply or propagate category 3 Plants;

(b) import or sell propagating material of category 3 Plants or any category 3 Plants;

(c) acquire propagating material of category 3 Plants or any category 3 Plants.

(5) The executive officer may, on good cause shown in writing by the land user, grant written exemption from compliance with one or more of the requirements of sub-

regulations (1), (3) and (4) on such conditions as the executive officer may determine in each case.

(Regulation 15C inserted by GNR.280 of 2001.)

15D Designation of biological control reserves

(1) The executive officer may on application in writing designate an area as a biological control reserve.
(2) The executive officer shall designate an area as a biological control reserve only if:
(a) the area concerned is used for the breeding of biological control agents by a biological control expert; and
(b) no other measures that may destroy or render the biological control ineffective are applied in that area; and
(c) the area concerned serves as a refuge from where biological control agents can move or be distributed to other infestations of category 1, 2 and 3 Plants.

(Regulation 15D inserted by GNR.280 of 2001.)
15E Methods of control

(1) Where category 1, 2 or 3 Plants occur contrary to the provisions of these regulations, a land user shall control such Plants by means of one or more of the following methods of control as is appropriate for the species concerned and the ecosystem in which it occurs:
(a) uprooting, felling, cutting or burning;
(b) treatment with a weed killer that is registered for use in connection with such Plants in accordance with the directions for the use of such a weed killer;
(c) biological control carried out in accordance with the stipulations of the Agricultural Pests Act, 1983 (Act No. 38 of 1983), the Environment Conservation Act, 1989 (Act No. 73 of 1989) and any other applicable legislation;
(d) any other method of treatment recognised by the executive officer that has as its object the control of the Plants concerned, subject to the provisions of sub-regulation (4);
(e) a combination of one or more of the methods prescribed in paragraphs (a), (b), (c), and (d), save that biological control reserves and areas where biological control agents are effective shall not be disturbed by other control methods to the extent that the agents are destroyed or become ineffective.

(2) The methods contemplated in sub-regulation (1) shall also be applied with regard to the propagating material and the re-growth of category 1, 2 and 3 Plants in order to prevent such Plants from forming seed or re-establishing in any manner.

(3) The performance of an act of control is not in itself proof that the objects of the control methods have been achieved and follow-up operations are mandatory to achieve the appropriate level of combating.

(4) Where uncertainty exists about the presence or efficacy of any biological control agent, a biological control expert shall be consulted.

(5) Any action taken to control category 1, 2 and 3 Plants shall be executed with caution and in a manner that will cause the least possible damage to the environment.

(Regulation 15D inserted by GNR.280 of 2001.)

15F Application of other laws

Nothing contained in this regulation shall derogate in any way from any obligation imposed on any land user in term of any other law.

16. Indicators of bush encroachment

(1) Indigenous Plants of the kinds specified in column 1 of Table 4 are regarded as indicator Plants indicating bush encroachment in the areas specified in column 2 of the said Table opposite the names of the respective kinds of Plants.

(2) A land user of an area in which natural vegetation occurs and that contains communities of indicator Plants shall follow practices to prevent the deterioration of natural resources and to combat bush encroachment where it occurs.

(3) One or more of the following practices shall be followed with regard to communities of indicator Plants contemplated in sub-regulation (2) in order to remove the cause of the deterioration of the natural resources and to improve and maintain the production potential of the natural pastoral land:

(a) uprooting, felling or cutting;

(b) treatment with a weed killer that is registered for use in connection with such Plants in accordance with the directions for the use of such a weed killer;

(c) the application of control measures regarding the utilisation and protection of veld in terms of regulation 9;

(d) the application of control measures regarding livestock reduction or removal of animals in terms of regulations 10 and 11;

(e) any other method or strategy that may be applicable and that is specified by the executive officer by means of a directive.

(Regulation 16 substituted by GNR.280 of 2001.)

➢ Table 8: Declared Weeds And Invader Plants

Soort plant / Kind of plant		**Tipe / Type**	**Kategorie/ Category**	**Spesiale voorwaardes / Special conditions**
Botaniese naam / Botanical name	***Gewone naam / Common name***			
Kolom 1 / Column 1		**Kolom 2 / Column 2**	**Kolom 3 / Column 3**	**Kolom 4 / Column 4**
Acacia baileyana F. Muell.	Bailey-se-wattel / Bailey's wattle	Indringer / Invader	3	Kyk / See subreg. 15.C(7)(c)
Acacia cyclops A. Cunn. ex G. Don	Rooikrans / Red eye	Indringer / Invader	2	Kyk / See subreg. 15.C(7)(c)
Acacia dealbata Link	Silwerwattel / Silver wattle	Indringer / Invader	2	Kategorie 1 plant in Wes-Kaap/ Category 1 plant in Western Cape Kyk / See subreg. 15.C(7)(c)
Acacia decurrens (J.C. Wendl.) Willd.	Groenwattel / Green wattle	Indringer / Invader	2	Kyk / See subreg. 15.C(7)(c)
Acacia elata A. Cunn. ex Benth. (*A. terminalis* misapplied in S.A.)	Peperboomwattel / Pepper tree wattle	Indringer / Invader	3	
Acacia implexa Benth.	Screw-pod wattle	Onkruid / Weed	1	
Acacia longifolia (Andr.) Willd.	Langblaarwattel / Long-leaved wattle	Onkruid / Weed	1	
Acacia mearnsii De Wild.	Swartwattel / Black wattle	Indringer / Invader	2	Kategorie 1 plant in Suid Afrika, behalwe KwaZulu-Natal en Mpumalanga waar dit kommersieël verbou word / Category 1 plant South Africa, except in KwaZulu-Natal and Mpumalanga where it is used commercially
Acacia melanoxylon R. Br.	Australiese swarthout /	Indringer /	2	Kyk / See subreg.

Soort plant / Kind of plant		**Tipe / Type**	**Kategorie/ Category**	**Spesiale voorwaardes / Special conditions**
Botaniese naam / Botanical name	***Gewone naam / Common name***			
	Australian blackwood	Invader		15.C(7)(c)
Acacia paradoxa DC. (=A. armata R. Br.)	Kangaroo wattle	Onkruid / Weed	1	
Acacia podalyriifolia A Cunn.	Vaalmimosa / Pearl acacia	Indringer / Invader	3	
Acacia pycnantha Benth.	Gouewattel / Golden wattle	Onkruid / Weeds	1	
Acacia saligna (Labill.) H.L. Wendl.	Port Jackson / Port Jackson willow	Onkruid / Weeds	1	
Agave sisalana Perrine	Garingboom / Sisal hemp, Sisal	Indringer / Invader	2	
Alhagi maurorum Medik. (=*A. camelorum* Fisch.)	Kameeldoringbos / Camel thorn bush	Onkruid / Weed	1	
Anredera cordifolia (Tenore) Steen. *{A. baselloides* (H.B.K.) Baill. Misapplied in South Africa}	Madeira vine, Bridal wreath	Onkruid / Weed	1	
Araujia sericifera Brot.	Motvanger / Moth catcher	Onkruid / Weed	1	
Argemone ochroleuca Sweet subsp *ochroleuca*	Witblom bloudissel / White flowered Mexican poppy	Onkruid / Weed	1	
Arundo donax L.	Spaanse riet / Giant reed, Spanish reed	Indringer / Invader	3	
Atriplex lindleyi Moq. subsp. *inflata* Wilson (Muell.)	Blasiesoutbos / Sponge-fruit saltbush	Indringer / Invader	3	
Atriplex nummularia Lindley subsp. *Nummularia*	Oumansoutbos / Old man saltbush	Indringer / Invader	2	
Azolla filiculoides Lam.	Rooiwatervaring / Azolla, Red water fern	Onkruid / Weeds	1	Kyk / See subreg. 15.C(7)(c)
Caesalpinia decapetala (Roth) Alston (= *C. sepiaria* Roxb.)	Kraaldoring / Mauritius thorn	Onkruid / Weed	1	
Campuloclinium macrocephalum (Less.) DC. (=Eupatorium		Onkruid / Weed	1	

Soort plant / Kind of plant		**Tipe / Type**	**Kategorie/ Category**	**Spesiale voorwaardes / Special conditions**
Botaniese naam / Botanical name	***Gewone naam / Common name***			
macrocephalum Less.)				
Cannabis sativa L.	Slegs hemp, nie dagga nie / Hemp only, not dagga	Indringer./ Invader	2	Beheerde aanplanting/ Controlled cultivation
Cardaria draba (L.) Desv.	Peperbos / Pepper-cress, Hoary cardaria, White top	Onkruid / Weed	1	
Cardiospermum grandiflorum Swartz	Blaasklimop / Balloon vine	Onkruid / Weed	1	
Casuarina cunninghamiana Miq.	Kasuarisboom / Beefwood	Indringer / Invader	2	Slegs vir gebruik as windbrekers en nie vir duin stabilisasie nie/ Only for use as windbreakers, not for dune stabilisation
Casuarina equisetifolia L.	Perdestertboom / Horsetail tree	Indringer / Invader	2	Slegs vir gebruik as windbrekers en nie vir duin stabilisasie nie / Only for use as windbreakers, not for dune stabilisation
Cereus jamacaru DC. (*C. peruvianus* misapplied in S.A)	Nagblom / Queen of the Night	Onkruid / Weed	1	
Cestrum aurantiacum Lindl.	Oranjesestrum / Yellow or Orange cestrum	Onkruid / Weed	1	
Cestrum laevigatum Schlechtd.	Inkbessie / Inkberry	Onkruid / Weed	1	
Cestrum parqui L'Hérit	Inkbessie / Chilean cestrum	Onkruid / Weed	1	
Chromolaena odorata (L.) R.M. King & H. Robinson (=*Eupatorium odoratum* L.)	Paraffienbos, Chromolaena / Triffid weed, Chromolaena	Onkruid / Weed	1	
Cirsium vulgare (Savi) Ten. (=*C. lanceolatum* Scop.)	Skotse dissel, Speerdissel / Scotch thistle, Spear thistle	Onkruid / Weed	1	
Convolvulus arvensis L.	Akkerwinde, Klimop / Field	Onkruid /	1	

Soort plant / Kind of plant		**Tipe / Type**	**Kategorie/ Category**	**Spesiale voorwaardes / Special conditions**
Botaniese naam / Botanical name	***Gewone naam / Common name***			
	bindweed, Wild morning-glory	Weed		
Cortaderia jubata (Lem.) Stapf	Pampasgras / Pampas grass	Onkruid / Weed	1	
Cortaderia selloana (Schult.) Aschers. & Graebn.	Pampasgras, Silwergras / Pampas grass	Onkruid / Weed	1	
Cotoneaster franchetii Bois.	Dwergmispel / Cotoneasters	Indringer / Invader	3	
Cotoneaster pannosus Franch.	Silwerdwergmispel / Silver-leaf cotoneaster	Indringer / Invader	3	
Cuscuta campestris Yunck.	Gewone dodder / Common dodder	Onkruid / Weed	1	
Cuscuta suaveolens Ser.	Luserndodder / Lucerne dodder	Onkruid / Weed	1	
Cytisus monspessulanus L. (=*C. candicans* (L.)DC., *Genista monspessulana* (L.) L. Johnson)	Montpellier broom	Onkruid / Weed	1	
Datura ferox L.	Grootstinkblaar / Large thorn apple	Onkruid / Weed	1	
Datura innoxia Mill.	Harige stinkblaar / Downy thorn apple	Onkruid / Weed	1	
Datura stramonium L.	Gewone stinkblaar / Common thorn apple	Onkruid / Weed	1	
Echinopsis spachiana (Lem.) Fiedr. & Rowley {=*Trichocereus spachianus* (Lem.) Riccob.}	Orrelkaktus /Torch cactus	Onkruid / Weed	1	
Echium plantagineum L. (= *E lycopsis* L.)	Pers echium / Patterson's curse	Onkruid / Weed	1	
Echium vulgare L.	Blou – echium / Blue echium	Onkruid / Weed	1	
Egeria densa Planch. (= *Elodea densa* (Planch.) Casp.	Waterpes / Ditch moss, Water thyme	Onkruid / Weed	1	
Eichhornia crassipes (Mart.) Solms-Laub.	Waterhiasint / Water Hyacinth	Onkruid / Weed	1	
Elodea canadensis Michaux	Canadian water weed	Onkruid / Weed	1	

Soort plant / Kind of plant		**Tipe / Type**	**Kategorie/ Category**	**Spesiale voorwaardes / Special conditions**
Botaniese naam / Botanical name	***Gewone naam / Common name***			
Eucalyptus camaldulensis Dehnh.	Rooibloekom / Red river gum	Indringer / Invader	2	Kyk / See subreg. 15.C(7)(c)
Eucalyptus cladocalyx F. Muell.	Suikerbloekom /Sugar gum	Indringer / Invader	2	Kyk / See subreg. 15.C(7)(c)
Eucalyptus grandis Hill ex Maid (*E. saligna* Sm. (p.p.))	Salignabloekom / Saligna gum, Rose gum	Indringer / Invader	2	Kyk / See subreg. 15.C(7)(c)
Eucalyptus lehmannii (Schauer) Benth.	Spinnekopbloekom / Spider gum	Indringer / Invader	3	
Eucalyptus paniculata Sm.	Grysysterbasbloekom / Grey ironbark	Indringer / Invader	2	Kyk / See subreg. 15.C(7)(c)
Eucalyptus sideroxylon A. Cunn. ex Woolls	Swartysterbasbloekom / Black ironbark, Red ronbark	Indringer / Invader	2	Kyk / See subreg. 15.C(7)(c)
Gleditsia triacanthos L.	Amerikaanse driedoring, Soetpeulboom / Honey locust, Sweet locust	Indringer / Invader	2	
Hakea drupacea (Gaertn.f) Roemer & Schultes (=*H. suaveolens* R. Br.)	Soethakea / Sweet hakea	Onkruid / Weed	1	
Hakea gibbosa (Sm.) Cav.	Harige hakea / Rock hakea	Onkruid / Weed	1	
Hakea sericea Schrad.	Syerige hakea / Silky hakea	Onkruid / Weed	1	
Harrisia martinii (Lab.) Britton	Toukaktus, Harrisia kaktus /Moon cactus, Harrisia cactus	Onkruid / Weed	1	
Hypericum perforatum L.	Johanneskruid / St. John's wort, Tipton weed	Indringer / Invader	2	Beheerde aanplanting/ Controlled cultivation
*Ipomoea indica (*Burm.f.) Merr. (=*I. Congesta* R. Br.)	Purperwinde / Morning glory	Indringer / Invader	3	
Ipomoea purpurea (L.) Roth	Purperwinde / Morning glory	Indringer / Invader	3	?
Jacaranda mimosifolia D. Don	Jakaranda / Jacaranda	Indringer / Invader	3	Kyk / See subreg. 15.C(7)(c)
Lantana camara L. en enige	Lantana / Lantana, Tickberry	Onkruid /	1	

Soort plant / Kind of plant		**Tipe / Type**	**Kategorie/ Category**	**Spesiale voorwaardes / Special conditions**
Botaniese naam / Botanical name	***Gewone naam / Common name***			
entiteit wat deels of geheel ontstaan het uit die *Lantana camara* kompleks deur verbastering of seleksie op natuurlike of kunsmatige wyse / and any entity which has partly or wholly been derived from the *Lantana camara* complex by means of hybridisation or selection under natural or artificial conditions		Weed		
Leptospermum laevigatum (Gaertn.) F. Muell.	Australiese mirt / Australian myrtle	Onkruid / Weed	1	
Leucaena leucocephala (Lam.) De Wit	Reuse wattel / Leucaena	Indringer / Invader	2	Kyk / See subreg. 15.C(7)(c)
Ligustrum japonicum Thunb.	Japanese liguster / Japanese wax – leaved privet	Indringer / Invader	3	
Ligustrum lucidum Ait.	Chinese liguster / Chinese wax – leaved privet	Indringer / Invader	3	
Ligustrum ovalifolium Hassk.	Kaliforniese liguster / Californian privet	Indringer / Invader	3	
Ligustrum sinense Lour.	Chinese liguster / Chinese privet	Indringer / Invader	3	
Ligustrum vulgare L.	Gewone liguster / Common privet	Indringer / Invader	3	
Litsea glutinosa (Lour.) C.B. Robinson (=*L. sebifera* Pers.)	Indiese lourier /Indian laurel	Onkruid / Weed	1	
Lythrum salicaria L.	Purple loosestrife	Onkruid / Weed	1	
Macfadyena unguis-cati (L.) A. Gentry	Katteklouranker /Cat's claw creeper	Onkruid / Weed	1	
Melia azedarach L.	Maksering, Bessieboom / "Syringa", Persian lilac	Indringer / Invader	3	Kyk / See subreg. 15.C(7)(c)
Metrosideros excelsa Soland. Ex. Gaertn. (=*M. tomentosa* A. Rich.)	Nieu-Seelandse perdestert / New Zealand bottle brush	Indringer / Invader	3	

Soort plant / Kind of plant		**Tipe / Type**	**Kategorie/ Category**	**Spesiale voorwaardes / Special conditions**
Botaniese naam / Botanical name	***Gewone naam / Common name***			
Mimosa pigra L.	Giant sensitive plant	Onkruid / Weed	1	
Morus alba L.	Witmoerbei, Gewone moerbei / White mulberry, Common mulberry	Indringer / Invader	3	Kyk / See subreg. 15.C(7)(c)
Myoporum tenuifolium Forst. F. (*M. acuminatum* misapplied in S.A.)	Manatoka	Indringer / Invader	2	
Myriophyllum aquaticum (Vell.) Verdc.	Waterduisendblaar / Parrot's feather	Onkruid / Weed	1	
Myriophyllum spicatum L.	Spiked water-milfoil	Onkruid / Weed	1	
Nassella tenuissima (Trin.) Barkworth (=*Stipa tenuissima* Trin.)	Witpolgras / White tussock	Onkruid / Weed	1	
Nassella trichotoma (Nees) Hack. ex Arech. (=*Stipa trichotoma* Nees)	Nassella polgras / Nassella tussock	Onkruid / Weed	1	
Nerium oleander L.	Selonsroos / Oleander	Onkruid / Weed	1	Steriele kultivars uitgesluit / Excluding sterile, double-flowered cultivars
Nicotiana glauca R.C. Grah.	Wildetabak / Wild tobacco	Onkruid / Weed	1	
Opuntia aurantiaca Lindl.	Litjieskaktus / Jointed cactus	Onkruid / Weed	1	
Opuntia exaltata Berger	Langdoringkaktus / Long spine cactus	Onkruid / Weed	1	
Opuntia ficus-indica (L.) Mill.	Boereturksvy, Grootdoringturksvy / Mission prickly pear, Sweet prickly pear	Onkruid / Weed	1	Uitgesonderd alle doringlose cultivars en seleksies / Excluding all spineless cultivars and selections
Opuntia humifusa (Raf.) Raf. (= *O. compressa* (Salisb.)	Large flowered prickly pear, Creeping prickly pear	Onkruid / Weed	1	

Soort plant / Kind of plant		**Tipe / Type**	**Kategorie/ Category**	**Spesiale voorwaardes / Special conditions**
Botaniese naam / Botanical name	***Gewone naam / Common name***			
(Macbride)				
Opuntia imbricata (Haw.) DC. {=*Cylindropuntia imbricata* (Haw.) Knuth}	Imbrikaatkaktus, Kabelturksvy / Imbricate cactus, Imbricate prickly pear	Onkruid / Weed	1	
Opuntia lindheimeri Engelm.	Klein rondeblaarturksvy / Small round-leaved prickly pear	Onkruid / Weed	1	
Opuntia monacantha Haw. (=*O vulgaris* Mill.)	Suurturksvy, Luisiesturksvy / Cochineal prickly pear, Drooping prickly pear	Onkruid / Weed	1	
Opuntia rosea DC.	Roseakaktus / Rosea cactus	Onkruid / Weed	1	
Opuntia spinulifera Salm-Dyck	Blouturksvy, Groot rondeblaar turksvy / Saucepan cactus, Large roundleaved prickly pear	Onkruid / Weed	1	
Opuntia stricta (Haw.) Haw.	Suurturksvy / Pest pear of Australia	Onkruid / Weed	1	
Orobanche minor Sutton	Klawerbesemraap, Bremraap / Lesser broomrape, Clover broomrape	Onkruid / Weed	1	
Paraserianthes lophantha (Willd.) Nielsen (=*Albizia lophantha* (Willd.) Benth.*)*	Australiese Albizia, stinkboon / Australian Albizia, Stink bean	Onkruid / Weed	1	
Parthenium hysterophorus L.	Parthenium	Onkruid / Weed	1	
Passiflora coerulea L.	Siergrenadella / Blue passion flower	Onkruid / Weed	1	
Passiflora edulis Sims	Grenadella / Purple granadilla, Passion fruit	Indringer / Invader	2	
Pennisetum setaceum (Forssk.) Chiov.	Pronkgras /Fountain grass	Onkruid / Weed	1	
Pennisetum villosum R. Br. ex Fresen.	Veergras / Feathertop	Onkruid / Weed	1	
Pereskia aculeata Mill.	Pereskia /Barbados gooseberry	Onkruid / Weed	1	
Pinus elliotti Engelm.	Basden / Slash pine	Indringer / Invader	2	Kyk / See subreg. 15.C(7)(c)
Pinus halepensis Mill.	Aleppoden / Aleppo pine	Indringer / Invader	3	Kyk / See subreg. 15.C(7)(c)
Pinus patula Schlechtd. & Cham.	Treurden / Patula pine	Indringer / Invader	2	Kyk / See subreg. 15.C(7)(c)
Pinus pinaster Ait.	Trosden / Cluster pine	Indringer / Invader	2	Kyk / See subreg. 15.C(7)(c)
Pinus radiata D.Don	Radiataden / Radiata pine	Indringer /	2	Kyk / See subreg.

Soort plant / Kind of plant		**Tipe / Type**	**Kategorie/ Category**	**Spesiale voorwaardes / Special conditions**
Botaniese naam / Botanical name	***Gewone naam / Common name***			
		Invader		15.C(7)(c)
Pinus taeda L.	Loblollyden / Loblolly pine	Indringer / Invader	2	Kyk / See subreg. 15.C(7)(c)
Pistia stratiotes L.	Waterslaai / Water lettuce	Onkruid / Weed	1	
Pittosporum undulatum Vent.	Australiese kasuur, Soet Pittosporum / Australian cheesewood, Sweet pittospormum	Onkruid / Weed	1	
Pontederia cordata L.	Pickerel weed	Indringer / Invader	3	Kategorie 1 in landelike gebiede / Category 1 in non-urban areas
Populus alba L.	Witpopulier / White poplar	Indringer / Invader	3	Kyk / See subreg. 15.C(7)(c)
Populus deltoides Bart. ex. Marsh	Vuurhoutjiepolpulier / Match poplar	Indringer / Invader	2	
Populus x canescens (Ait.) J. E. Sm.	Vaalpopulier / Grey poplar	Indringer / Invader	3	Kyk / See subreg. 15.C(7)(c)
Prosopis glandulosa Torr. var *torreyana* (Benson) Johnston and hybrids / en hibriedes	Heuningprosopis / Honey mesquite	Indringer / Invader	2	
Prosopis velutina Wooton and hybrids / en hibriedes	Fluweelprosopis / Velvet mesquite	Indringer / Invader	2	
Psidium guajava L. and hybrids / en hibriedes	Koejawel / Guava	Indringer / Invader	2	
Psidium guineense Swartz	Brasiliaanse koejawel / Brazilian guava	Indringer / Invader	3	
Psidium littorale Raddi var *longipes* (O. Berg)Fosb. (=*P. cattleianum* Sab.)	Aarbeikoejawel / Strawberry guava	Indringer / Invader	3	
Pueraria lobata (Willd.) Ohwi	Kudzuranker / Kudzu vine	Onkruid / Weed	1	
Pyracantha angustifolia (Franch.) C.K. Schneid.	Geelbranddoring / Yellow firethorn	Indringer / Invader	3	
Pyracantha crenulata (D. Don) M.J. Roem.	Rooivuurdoring / Himalayan firethorn	Indringer / Invader	3	
Ricinus communis L	Kasterolieboom / Castor-oil plant	Indringer / Invader	2	
Robinia pseudoacacia L.	Witakasia / Black locust	Indringer / Invader	3	Kyk / See subreg. 15.C(7)(c)
Rorippa nasturtium – aquaticum (L.) Hayek (=*Nasturtium officinale* R. Br.)	Bronkors / Watercress	Indringer / Invader	3	
Rosa rubiginosa L. (=*R. eglanteria* L.)	Wilderoos / Eglantine, Sweetbriar	Indringer / Invader	3	
Rubus cuneifolius Pursh. and hybrid *R x proteus* C.H. Stirton	Amerikaanse braam, / American bramble	Onkruid / Weed	1	
Rubus fruticosus L agg.	Braam / European blackberry	Indringer /	2	

Soort plant / Kind of plant		**Tipe / Type**	**Kategorie/ Category**	**Spesiale voorwaardes / Special conditions**
Botaniese naam / Botanical name	***Gewone naam / Common name***			
		Invader		
Salix babylonica L.	Treurwilger /Weeping willow	Indringer / Invader	3	
Salix fragilis L.	Crack or brittle willow	Onkruid / Weed	1	
Salvinia molesta D. S. Mitchell and other species of the Family Salviniaceae	Watervaring / Kariba weed	Onkruid / Weed	1	
Schinus terebinthifolius Raddi	Brasiliaanse peperboom / Brazilian pepper tree	Indringer / Invader	3	Kyk / See subreg. 15.C(7)(c)
Sesbania punicea (Cav.) Benth.	Rooi sesbania / Red sesbania	Onkruid / Weed	1	
Solanum elaeagnifolium Cav.	Satansbos / Silver-leaf bitter apple	Onkruid / Weed	1	
Solanum mauritianum Scop.	Luisboom / Bugweed	Onkruid / Weed	1	
Solanum seaforthianum Andr.	Aartappelranker / Potato creeper	Onkruid / Weed	1	
Solanum sisymbrifolium Lam.	Wildetamatie, Doringtamatie / Wild tomato, Dense-thorned bitter apple	Onkruid / Weed	1	
Spartium junceum L.	Spaanse besem / Spanish broom	Onkruid / Weed	1	
Tamarix ramosissima Ledeb.	Perstamarisk / Pink tamarisk	Indringer / Invader	3	
Tamarix chinenis Lour.	Chinese tamarisk / Chinese tamarisk	Indringer / Invader	3	
Tecoma stans (L.) H.B.K.	Geelklokkies / Yellow bells	Onkruid / Weed	1	
Tipuana tipa (Benth.) Kuntze	Tipoeboom / Tipu tree	Indringer / Invader	3	Kyk / See subreg. 15.C(7)(c)
Tithonia diversifolia (Hemsl.) A. Gray	Mexikaanse sonneblom / Mexican sunflower	Onkruid / Weed	1	
Tithonia rotundifolia (Mill.) S.F. Blake	Rooisonneblom / Red sunflower	Onkruid / Weed	1	
Toona ciliata M.J. Roem. (=*Cedrela toona* Roxb. ex Rottl. & Willd.)	Toonboom / Toon tree	Indringer / Invader	3	Kyk / See subreg. 15.C(7)(c)
Ulex europaeus L.	Gaspeldoring / European gorse	Onkruid / Weed	1	
Xanthium spinosum L.	Boetebos / Spiny cocklebur	Onkruid / Weed	1	
Xanthium strumarium L.	Kankerroos / Large cocklebur	Onkruid / Weed	1	

Appendix 2: Protected Trees

Extract from Government Notice 877, 22 November 2013:

Botanical Name	Common English Name
Acacia erioloba	Camel Thorn
Acacia haematoxylon	Grey Camel Thorn
Adansonia digitata	Baobab
Afzelia quanzensis	Pod Mahogany
Balanites [maughamii]	Torchwood
Barringtonia racemosa	Powder-puff Tree
Boscia albitrunca	Shepherd's Tree
Brachystegia spiciformis	Msasa
Breonadia salicina	Matumi
Bruguiera gymnorrhiza	Black Mangrove
Cassipourea swaziensis	Swazi Onionwood
Catha edulis	Bushman's Tea
Ceriops tagal	Indian Mangrove
Cleistanthus schlechteri [schlechteri]	False Tamboti
Colubrina nicholsonii	Pondo Weeping Thorn
Combretum imberbe	Leadwood
Curtisia dentata	Assegai
Elaeodendron transvaalensis	Bushveld Saffron
Erythrophysa transvaalensis	Bushveld Red Balloon
Euclea pseudebenus	Ebony Guarri
Ficus trichopoda	Swamp Fig
Leucadendron argenteum	Silver Tree
Lumnitzera racemosa [racemosa]	Tonga Mangrove
Lydenburgia abbottii	Pondo Bushman's Tea
Lydenburgia cassinoides	Sekhukhuni Bushman's Tea
Mimusops caffra	Coastal Red Milkwood
Newtonia hildebrandtii [hildebrandtii]	Lebombo Wattle
Ocotea bullata	Stinkwood
Ozoroa namaquensis	Gariep Resin Tree
Philenoptera violacea	Apple-leaf
Pittosporum viridiflorum	Cheesewood
Podocarpus elongatus	Breede River Yellowwood
Podocarpus falcatus	Outeniqua Yellowwood

Botanical Name	**Common English Name**
Podocarpus henkelii	Henkel's Yellowwood
Podocarpus latifolius	Real Yellowwood
Protea comptonii	Saddleback Sugarbush
Protea curvata	Serpentine Sugarbush
Prunus africana	Red Stinkwood
Pterocarpus angolensis	Wild Teak
Rhizophora mucronata	Red Mangrove
Sclerocarya birrea [caffra]	Marula
Securidaca longepedunculata	Violet Tree
Sideroxylon inerme [inerme]	White Milkwood
Tephrosia pondoensis	Pondo Poison Pea
Warburgia salutaris	Pepper-bark Tree
Widdringtonia cedarbergensis	Clanwilliam Cedar
Widdringtonia schwarzii	Willowmore Cedar

Appendix 3: Environmental Incident Log and Complaint Form

Environmental Log and Incident Report

Date	Environmental Incident	Notes- Include an exProgrammeation if possible for the condition / incident and persons responsible. Include photographic records and other material	Corrective Action Taken	Signature

Complaint Form

Complaint Record Sheet	**File No** **Reference**	**Date**
Complaint Lodged By:		
Capacity of Complainant		
Complaint Logged by		
Details of Complaint:		
Proposed Remedial Action		
Notes by ECO / Auditor		

ECO	**Date**	**Auditor**	**Date**
Resident Engineer	**Date**		

Document printed January 2015