



DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

PROPOSED PART 2 AMENDMENT OF AUTHORISATION REF DC22/0061/08 & DC22/AMEND/0061/2018 (AREA B OF THE HILTON MONDI DEVELOPMENT, UMGANI LOCAL MUNICIPALITY)

EDTEA REF: RE: DC22/0061/2008/AMEND/2018/2020

DECEMBER 2020
REVISION 0

Prepared by:
JG AFRIKA (PTY) LTD
Pietermaritzburg
6 Pin Oak Avenue, Hilton
3245
Telephone: 033 343 6700
Email: patakr@jgafrika.com



VERIFICATION PAGE	Qual-frm-026
	Rev 14

TITLE: DRAFT EMPr FOR THE PROPOSED PART 2 AMENDMENT OF AUTHORISATION REF DC22/0061/08 & DC22/AMEND/0061/2018 (AREA B OF THE HILTON MONDI DEVELOPMENT, UMNGENI LOCAL MUNICIPALITY)

JGA REF. NO. 5344	DATE: 14/12/2020	REPORT STATUS Final
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CARRIED OUT BY: JG AFRIKA (PTY) LTD Pietermaritzburg 6 Pin Oak Avenue Hilton 3245 Tel.: 033 343 6700 Fax: 033 343 6701 Email: patak@jgafrika.com	COMMISSIONED BY: MONZALI PROPERTY MANAGEMENT COMPANY (PTY) LTD PO Box 456 Hilton 3245 Tel. 033 343 0800 Fax. 033 343 0811 Email: property@voigts.co.za
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AUTHOR Ms R Patak	CLIENT Mr. A. Voigts
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SYNOPSIS

Draft EMPr for the Part 2 Amendment report for the proposed establishment of a school on Area B of the Hilton Mondi Development

KEY WORDS:




Environmental Management Programme, Part 2 Amendment, uMngeni Local Municipality

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QUALITY VERIFICATION

This report has been prepared under the controls established by a quality management system that meets the requirements of ISO 9001: 2015 which has been independently certified by DEKRA Certification.



Verification	Capacity	Name	Signature	Date
By Author	Environmental Scientist	R. Patak		14/12/2020
Checked by:	Senior Environmental Scientist	K. Brent		14/12/2020
Authorised by:	Executive Associate	Magnus van Rooyen		14/12/2020

File:	W:\Enviro\JGA\5344 - Small Environmental Projects (JR)\9. Kings School Part 2 Amendment (Junxion)\Report
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Report template version: 2017-10-30

**FINAL ENVIRONMENTAL MANAGEMENT PROGRAMME FOR THE
PROPOSED PART 2 AMENDMENT OF AUTHORISATION REF
DC22/0061/08 & DC22/AMEND/0061/2018 (AREA B OF THE
HILTON MONDI DEVELOPMENT, UMGENI LOCAL
MUNICIPALITY)**

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1 INTRODUCTION AND BACKGROUND

A Basic Assessment Process was completed for the proposed establishment of mixed use development known as the Hilton Mondi Development. The applicant obtained a positive Environmental Authorisation (EA) for the abovementioned project Ref: DC22/0061/08 (Appendix A.1) for the development of 5 areas. Monzali Property Management Company (Pty) Ltd purchased Areas B and C of the original authorisation and requested an amendment to the Environmental Authorisation due to the change in landowner. As a result, on 9 March 2018, DC22/Amend/0061/2018 was granted (Appendix A.2).

There are three components to this proposed amendment to the Environmental Authorisation, these being as follows:

- Amendment to the name of the Authorisation Holder from Monzali Property Management Company (Pty) Ltd to Edinvest Schools Operations (Pty) Ltd for Area B only.
- Amendment of the Environmental Authorisation to change the land use of Area B only, currently Business Park and Office Use, to a School use.
- Amendment of the Environmental Authorisation to permit the temporary use of a conservancy tank for effluent management on the site until such time as the uMngeni Water Hilton Waste Water Treatment Works is constructed and operational.

It must be noted that this amendment is specific to Area B only (Portion 368 (of 212) of the Farm Drie Fontein No. 952). Within the original Environmental Authorisation, DC22/0061/08, Area B was approved for 4.5 hectares of Business Park and Warehousing incorporating 3.7 hectares of Business Park and Warehousing and 0.8 hectares of open space.

As per GN R326 of the EIA Regulations, 2014 (as amended), a Part 2 Amendment Process must be undertaken accordingly by the Environmental Assessment Practitioner (EAP). Ultimately, the outcome of the Amendment Process is to provide the Competent Authority, the EDTEA, with sufficient information to provide a decision on the Amendment Application in terms of Environmental Authorisation (EA), in order to avoid or mitigate any detrimental impacts that the new activity may inflict on the receiving environment.

JG Afrika (Pty) Ltd has been appointed by Monzali Property Management Company (Pty) Ltd to undertake Part 2 Amendment Process. An application for a Part 2 amendment of the Environmental Authorisation was submitted to EDTEA on 9 November 2020 and an reference number of DC22/0061/2008/AMEND/2018/2020 was issued (Appendix A.3). As part of the Amendment Process, a site specific Environmental Management Programme (EMPr) was requested to be compiled for the project.

It must be emphasized that this EMPr has not been compiled to replace the originally approved EMPr (Attached as Annexure A). The EMPr has been generated to supplement the originally authorised EMPr by including additional mitigation measures identified within the Amendment process. i.e. Only additional impacts have been assessed within this report.

2 IMPACT AND MITIGATION MEASURES

Table 1: Impacts identified and associated mitigation measures

Impact	Description	Mitigation
Soil	<p>As the platform has already been established on site, no major impacts on soil is anticipated. Furthermore, the impact of buildings in the area has already been identified in the previous Assessment. Soil impacts and associated mitigation measures have been included in the previous Environmental Authorisation Process. Potential impact soil as a result of the conservancy tank have been included only.</p>	<p>Monitoring of leaks as per the requirements of the Wetland specialist.</p> <p>Construction Phase:</p> <ul style="list-style-type: none"> • Construction of the conservancy tank must be done with appropriate care and under supervision of the Project Engineer and an Environmental Control Officer. If the block-and-plaster method is used, then special care must be taken to ensure that the wall is firmly supported by the soil behind it so as to prevent cracking when the tank is full. • It is recommended that a low bund wall should be raised around the tank and should enclose a space with a volume of no less than 25% of the estimated daily flow input. The reasons for the wall are to contain accidental spillage and to provide some further margin of protection. This wall need be no more than 0.6m high and may be an earth wall covered by grass. The included space must be lined with an impervious sheeting which should be buried to protect it from sunlight and from accidental puncturing. If the contained space is ever contaminated, the soil within it must be collected and be removed for disposal at an appropriate municipal disposal site. <p>Operational Phase:</p> <ul style="list-style-type: none"> • During the temporary operational phase, the tank must be regularly inspected for any signs of leakage or other faults and the signal switches and telemetry must be routinely tested.
Vegetation and fauna	<p>No new impact is anticipated for the proposed school project other than what has previously been assessed for the area as part of the</p>	<p>None. Existing Environmental Management Programme examines this requirement.</p>

Impact	Description	Mitigation
Noise pollution Waste	previous Environmental Authorisation. These impacts and the associated mitigation measures remain unchanged. In addition, it should be noted that the area has already been cleared of vegetation and the platform established.	
Socio-Economic	<ul style="list-style-type: none"> • Creation of job opportunities for skilled personnel (e.g. engineers, specialists etc.) and non-skilled personnel (e.g. labourers); • Skills development of the local community through employment opportunities; • Social anxiety may arise should the surrounding community not be adequately notified of the proposed activity; and • Possible economic benefits to suppliers of building materials in the local area as goods and services may be purchased from these entities during the construction phase. 	<ul style="list-style-type: none"> • Inform the surrounding communities and general public of the proposed activity as soon as possible. This will serve to ease potential social anxiety. Such notification can be conducted through the Public Participation Process; • Local people should be employed where possible.
Safety and security	No new impact is anticipated for the proposed school project other than what has previously been assessed for the area as part of the previous Environmental Authorisation. These impacts and the associated mitigation measures remain unchanged.	None. Existing Environmental Management Programme examines this requirement.
Water Resources	<ul style="list-style-type: none"> • Contamination of ground and surface water and soil; • Drainage lines may be polluted due to accidental spillages from the conservancy tank. 	<ul style="list-style-type: none"> • All recommendations of the Engineering Letter and Wetland Risk assessment must be adhered to as per Appendix F and H. <p>Construction Phase:</p> <ul style="list-style-type: none"> • Construction of the conservancy tank must be done with appropriate care and under supervision of the Project Engineer and an Environmental Control Officer. If the block-and-plaster method is used, then special care must be taken to ensure that the

Impact	Description	Mitigation
		<p>wall is firmly supported by the soil behind it so as to prevent cracking when the tank is full.</p> <ul style="list-style-type: none"> It is recommended that a low bund wall should be raised around the tank and should enclose a space with a volume of no less than 25% of the estimated daily flow input. The reasons for the wall are to contain accidental spillage and to provide some further margin of protection. This wall need be no more than 0.6m high and may be an earth wall covered by grass. The included space must be lined with an impervious sheeting which should be buried to protect it from sunlight and from accidental puncturing. If the contained space is ever contaminated, the soil within it must be collected and be removed for disposal at an appropriate municipal disposal site. <p>Operational Phase:</p> <ul style="list-style-type: none"> During the temporary operational phase, the tank must be regularly inspected for any signs of leakage or other faults and the signal switches and telemetry must be routinely tested. On a bimonthly basis the water in the wetland both upstream and downstream of the college site must be tested for contamination. Suggested sampling sites are shown in the figure below. The sampling must be done with sterile bottles from an accredited laboratory which will also do the analyses. The samples should be analysed for nutrients and total and coliform bacterial cell counts. The results should ideally show no increases in contamination from the school area. <p>Although the 2 x 9500litre tanks have approximately 4 days storage capacity, it is suggested that as part of mitigation measures for an overflow, earth berms not exceeding 1m in height be constructed around the tanks. This</p>

Impact	Description	Mitigation
		<p>berm will prevent overflows into the nearby wetland area. It should however be noted that the risk of overflow is low, as effluent levels will be controlled and managed by two float switches, linked to the service provider and the maintenance manager at the school.</p> <p>As earth berms have been identified as a required mitigation measure by the Engineer and the Wetland Specialist, and 2 different heights have been proposed, it is the opinion of the Environmental Assessment Practitioner that a minimum height of 0.6m and a maximum height of 1m must be implemented.</p>
Traffic	<ul style="list-style-type: none"> Increased Traffic Volumes as a result of change in landuse. 	<ul style="list-style-type: none"> A Four way intersection to be formalised; Traffic control lights required by KZN DoT when operating at full capacity.
Visual	<ul style="list-style-type: none"> Increased visual impact as a result of change in landuse 	<ul style="list-style-type: none"> The site must be predominantly screened from the N3 on it's northern and western boundaries by the large existing berm, barring a long range approach view from the N3 west bound. From that view a driver must first see playing fields in the middle distance, a line of trees along it's southern and western embankment, and the school hall in the background. The buildings have been positioned as far back (south) on the site as possible so as to minimise their proximity to the road from a visual and a noise perspective. The buildings' main entrance must face the approach road (Rotunda Road) must incorporate a set of small boundary signage walls alongside a Grade R playground with single storey barn-style buildings. The development must not exceed two storeys and the buildings are dispersed in an orderly manner so as not to appear as a singular mass.

ANNEXURE A: ORIGINALLY AUTHORISED EMPR

ENVIRONMENTAL MANAGEMENT PLAN

APRIL 2010

KZN DAEARD REFERENCE: DC22/0061/08

**“HILTON-MONDI” DEVELOPMENT AND ASSOCIATED
INFRASTRUCTURE ON PORTIONS 669 (of 4) OF THE FARM GROENE
KLOOF NO. 900 AND PORTIONS 6 AND 212 (of 6) OF THE FARM DRIE
FONTEINEN NO 952, PROVINCE OF KWAZULU-NATAL, HILTON,
UMNGENI MUNICIPALITY.**

SUBMITTED TO:

**THE ASSISTANT MANAGER: KWAZULU-NATAL DEPARTMENT OF
AGRICULTURE, ENVIRONMENTAL AFFAIRS, AND RURAL
DEVELOPMENT: ENVIRONMENTAL MANAGEMENT DEPARTMENT**

Prepared for: Laurusco Developments (Pty) Ltd
P O Box 20443
Durban North
4016
Tel: 031 337 3460
Fax: 031 337 3412

Compiled by: Garth Glaum / Wolfgang Kanz
Afzelia Environmental Consultants cc
P O Box 95
Hilton
3245
Tel: 033 343 2031/2
Fax: 033 343 2033
Email: wolf@afzelia.co.za

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1. BACKGROUND:

1.1 Introduction

This Environmental Management Plan (EMP) deals with the environmental impacts associated with all aspects of this project and the mitigation measures required in order to prevent or minimize these impacts. The EMP can be regarded as a guideline document to be strictly adhered to during all phases of the project including the operational phase. The following objectives provide the framework for the environmental principles for environmental management of the project:

- As a minimum requirement, comply with all relevant local, provincial and national legislation.
- Manage and use land, raw materials and resources responsibly in order to minimise the disturbance of the prevailing ecology.
- Minimise the potential for deterioration of air quality during all project phases.
- Avoid “disturbing” noise levels.
- Prevent the contamination of surface and ground water as a result of the construction or maintenance activities.
- Ensure that an appropriate Emergency Procedure is in place to safeguard the environment, local community and employees.
- Enhance the creation of direct job opportunities for the surrounding community and contribution of the project to the local economy, especially during labour intensive phases.
- Reduce the disturbance of the surrounding community from site activities to a minimum.
- Maintain transparent relations with the Interested & Affected Parties (including surrounding community, authorities and employees).
- Ensure that the community and employees are not subjected to increased safety hazards.

An independent Environmental Control Officer (ECO) must be appointed to monitor and audit the various phases of the project. An acknowledgement form must be signed by the various parties and / or the Developers and the Contractor/s, and will form part of the contractual agreement between the developer and the contractor/s to ensure that all the conditions and requirements of the EMP are complied with.

Afzelia Environmental Consultants compiled the EMP; a comparative assessment was carried out of published EMPs, specific requirements of this project were included, and site-specific conditions and new information that has come to light were also incorporated. The aim of this EMP is to integrate environmental planning, design, construction, and operational activities to ensure that potential significant environmental issues are appropriately managed.

Compliance with the EMP must be monitored by an independent Environmental Control Officer, who will keep a record of the audits and any important information that can be produced on request.

1.2 The Environmental Context

Section 28 of NEMA (National Environmental Management Act, Act No. 107 of 1998) states that:

Duty of care and remediation of environmental damage

"(1) Every person who causes has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot be reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment"

The EMP ensures that environmental criteria are incorporated into the project process to enable the sustainable management of the development. In accordance with the Integrated Environmental Management Guidelines published by the Department of Environmental Affairs & Tourism (DEAT) in 1992, the purpose of an Environmental Management Plan (EMP) is "to describe how negative environmental impacts will be managed, rehabilitated or monitored and how positive impacts will be maximised". It is a detailed plan of action prepared to organise and coordinate environmental mitigation, rehabilitation and monitoring so that positive impacts are enhanced, and negative impacts and damage to the environment are avoided, minimised or rectified where required.

This EMP will be a practical document that precisely sets out both the goals and actions required in mitigation. Though the term "Mitigation" can be broad in definition, it means in this context to "allay, moderate, palliate or temper." Mitigation of a negative impact means that its significance is reduced. It is endeavoured to increase the significance of a positive impact.

It generally should include consideration of the following:

- Avoiding impacts by not undertaking certain actions;
- Minimising impacts by limiting aspects of an action;
- Rectifying impacts by rehabilitation or restoration of the affected environment;
- Compensating for impacts by providing substitute resources or environments;
- Minimising impacts by optimising industrial processes, structural elements and other design features.

The objectives of the EMP are to:

- Provide a pro-active, feasible and practical working tool to enable the measurement and monitoring of environmental performance on site.
- Ensure that the construction and operational phases of the project continue within the principles of Integrated Environmental Management.
- Detail specific actions deemed necessary to assist in mitigating the environmental impact of the project.
- Ensure that the recommendations provided in the impact assessment are complied with.

Some impacts may need ongoing monitoring or management. These requirements should be outlined, along with appropriate feedback procedures. Monitoring of impacts may include:

- A check that actions are in line with conditions of approval;
- A check that mitigation measures are being implemented during the construction phase;
- Monitoring of selected environmental variables;
- The duration for which monitoring must continue after the completion of construction, or during which phases such monitoring must take place;
- Details for monitoring actions;
- Delegation of responsibility for undertaking monitoring;
- Procedures to be followed if thresholds are exceeded or problems identified;
- The indication of the responsible authority.

This EMP, which forms an integral part of the contract documents, informs the project developer as to his duties in the fulfilment of the project objectives, with particular reference to the prevention and mitigation of environmental impacts caused by construction and operational activities associated with the project. This is to include any rehabilitation and landscape processes work which is needed post-construction and which would be carried out by the contractor or specialist subcontractor who he may appoint to do such rehabilitation work. The provisions of the EMP are binding on the Contractor and Proponent during the construction contract and operational phase. The EMP must be incorporated into any future management associations during the operational phase of the development. It is recommended that a copy of the operational EMP be included in all sale agreements.

Any environmental issues that are identified during or after construction must be addressed in consultation with the environmental consultant. As such it should be viewed as a dynamic document that may require updating or revision where necessary.

All activities and earthworks associated with construction and reticulation of services must be undertaken in accordance with SABS 1200 standards, which deal with guidelines for civil engineering and general construction works.

1.3 Legislation

Environmental legislation applicable to the formulation of an EMP includes but is not restricted to the following:

- The Constitution of the Republic of South Africa (Act No. 108 of 1996), including the Bill of Rights (Chapter 2, Section 24)
- National Environment Management Act (Act No. 107 of 1998)
- National Water Act (Act No. 36 of 1998)
- National Forests Act (Act No. 84 of 1998)
- National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004).
- The National Heritage Resources Act (Act No 25 of 1999 as amended)
- KwaZulu Natal Heritage Act (Act 10 of 1997)
- Forest and Veld Conservation Act (Act 13 of 1941)

- National Resources Development Act (Act No. 51 of 1947)
- Water Act (Act No. 54 of 1956)
- Animals Protection Act (Act No. 71 of 1962)
- Atmospheric Pollution Prevention Act (Act No. 45 of 1965)
- Environmental Planning Act (Act No. 88 of 1967)
- Soil Conservation Act (Act No. 76 of 1969)
- Hazardous Substances Act (Act No. 15 of 1973)
- Conservation of Agricultural Resources Act (Act No. 43 of 1983)
- Environment Conservation Act (Act No. 73 of 1989)
- Minerals Act (Act No. 50 of 1991)
- Occupational Health and safety Act (Act No. 85 of 1993)
- Development Facilitation Act 67 of 1995
- Integrated Environmental Management (IEM)

In terms of the above, all regulations framed there under and amendments there to, and the relevant Municipal bylaws.

1.4 Environmental Impact Statement

Afzelia Environmental Consultants cc (AECcc) has been appointed by Laurusco Developments (Pty) Ltd to undertake an environmental assessment in the form of a full Environmental Impact Assessment for the proposed “Hilton-Mondi” development. The development would comprise a variety of opportunities, including residential, as well as mixed use, office/business park warehousing and light industrial land use zones. The proposed development is identified as an activity that may have significant detrimental effects on the environment. The process, which is to be followed, is in compliance with the National Environmental Management Act, 1998 (Act No 107 of 1998), as amended, and the Environmental Impact Assessment Regulations as published in Government Notice No. R. 385 of 2006, considering Government Notice No. R. 386 and 387 of 2006, of application for environmental authorisation in terms of a Scoping process and full Environmental Impact Assessment. The application has been submitted to the Department of Agriculture and Environmental Affairs and registered under the reference: DC22/0061/08.

The property is located in the uMngeni Local Municipality (uMgungundlovu District Municipality), and is located adjacent to the N3, Hilton Avenue, and along Dennis Shepstone Drive. The SDF has identified the area on the northern and southern side of the N3 national road between the Hilton interchange and the Cedara interchange as General Mixed Use, which broadly permits a range of retail, office, business and light industrial activities, and residential. With regard to the proposed development of the portion of land on the western side of Dennis Shepstone Road for residential purposes, the site has been identified in the SDF for residential development. The portion of land along the eastern side of the Hilton College Road from the Hilton interchange to Wedgewood has also been identified as General Mixed Use which broadly permits a range of retail, office, business and light industrial activities. One area of conflict exists with the SDF, which comprises proposed Mixed Use / Business Park development in an area zoned for Residential. This aspect has been dealt with in the EIR.

Project Overview

- (i) Site A

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21.7 hectares of Warehousing and Light Industrial incorporating

- 20 hectares Warehousing and Light Industrial
- 1.7 hectares open space

Site A2

10.01 hectares of Warehousing and Light Industrial Land Uses

(ii) Site B

4.5 hectares of Business Park and Warehousing incorporating

- 3.7 hectares Business Park/Warehousing
- 0.8 hectares open Space

(iii) Site C

24 hectares of Business Park and Offices incorporating

- 12 hectares Business Park/Office
- 7 hectares Offices
- 5 hectares open space

Site C2

8.7 hectares of Business Park and Offices

(iv) Site D

22.1 hectares of Retail/Office/ Medium Density Residential Precinct.

(v) Site E

16.02 hectares of medium density residential development

(vi) Associated infrastructure and services, including roads

The purpose and need of the development proposal is the following:

- Take advantage of, and optimise, the sites' location and size in terms of the Spatial Development Framework;
- Take advantage of the sites' location in terms of accessibility to major transport routes (N3);
- To cater for the long term demand for residential, offices, business and light industrial opportunities at this location;
- Develop the properties to maximise socio-economic benefit to the community and municipality;
- Augment the attractiveness of Hilton as a destination for business opportunities and employment creation;
- Promote sustainable integrated development, including a variety of land uses in close proximity to each other and in support of each other and existing land uses;
- To promote appropriate local economic development;
- Provide middle income housing;
- Response to urban development pressures on the timber farming operations; and
- Minimise disruption on the timber farming operations by logical phasing of the developments.

The following strategic planning information was obtained from the town planner:

- The uMngeni Municipality has identified parcels of land in its SDF for the

growth of Hilton; the proposed development is aligned with the designation of the land in terms of the SDF

- If the land parcels proposed for development were owned by independent landowners, then development of these parcels of land would take place on an ad hoc basis. The proposed development looks at Hilton holistically, and provides for the organised development of Hilton.
- Development would take place over time in phases in line with market demands; the consideration of all of these parcels of land in one application reduces delays in uptake rate due to individual application processes.
- The proposed development is located within parts of the Hilton Focus Area.
- Expansion opportunities for Mixed Use development in Hilton are limited, especially adjacent to the N3 and the interchanges.
- Development has to expand onto agricultural lands if there is to be growth around Hilton. It is logical that such expansion should take place in the areas that are closest to existing built environment, which the proposed development achieves.
- The loss of the sites to forestry would likely affect only 20 jobs, which is an insignificant number when compared to the job opportunities that would be gained.

The need and desirability has been clearly established in the various studies provided, and the information obtained from the town planner. Although there are a number of alternative areas in the region for the development of Light Industry, Residential, Mixed Use, Offices and Business Parks, which will all be developed in time to come, the developer has considered market demands and considers the long term need for light industrial land to outweigh the available opportunities within areas closer to Howick and Merrivale. This is corroborated by the socio-economic study.

Through the Scoping process the layout underwent a number of iterations, and the final layout taken forward into the impact assessment phase was informed by the process, institutional requirements, and the environmental constraints of the property. Suitable engineering solutions and mitigatory measures were considered to eliminate or reduce to acceptable levels all potential sources of pollution (waste disposal, sewage, storm water, etc). The potential environmental impacts identified in the Scoping report were assessed in this Environmental Impact Report.

Risks and key issues were identified and addressed through a process of public consultation and participation, review of similar projects, guidance from government authorities, desktop study, input from specialists, and fieldwork.

All feasible and reasonable alternatives were considered, and reasons have been provided for any alternatives that were not considered in the EIR. Alternatives considered engineering options, layouts, densities, and land use options within reason.

The comparative assessment of land uses is detailed in the S.W.O.T. analysis, and in other parts of the impact assessment report. The proposed land uses have been included as preferred land uses on account of the following:

- Alignment with municipal planning and the Integrated Development Framework
- The proposed mitigation measures render all impacts within acceptable limits of change

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- The proposed development is in the public interest
- Environmental quality would be retained within the reasonable expectation of a general member of the public

Below is the abbreviated rationale for the preferred selection of the various types of land use for each parcel of land.

Site A – Light Industrial

- This parcel of land presents an ideal opportunity to diversify the manufacturing capacity of the uMngeni Municipality
- Create employment opportunities for directly adjacent communities; this land use has the greatest potential for skilled and unskilled employment opportunities in comparison to the other land uses considered
- In terms of the General Mixed Use zoning as per the SDF permitted land uses include light industrial
- This land parcel is distal to existing residential areas within the Hilton Node, with the N3 located in between.
- Topographic features mitigate visual impacts on the adjacent residential area
- The site has ready access without intruding on significant residential areas
- The site is the most accessible site out of all the identified development areas
- The site is readily accessible from the N3 Freeway and R103, obviating the potential impact of increased population pressures
- The site has marketing exposure to the N3
- The site is not ideal for residential development
- Whilst a Mixed Use / Business Park land use would also offer significant local economic development in this area, this would be to a lesser extent than the proposed light industrial land use.

Site B – Mixed Use / Business Park

- This parcel of land presents an ideal opportunity to diversify economic activities within the uMngeni Municipality
- Create employment opportunities for adjacent communities; this land use has a high potential for skilled and unskilled employment opportunities in comparison to pure office and residential development
- In terms of the General Mixed Use zoning as per the SDF permitted land uses include those proposed in this Site
- This land parcel is distal to existing residential areas within the Hilton Node, with the N3 located in between.
- Topographic features mitigate visual impacts on the adjacent residential area
- The site has ready access without intruding on significant residential areas; light industrial traffic is better suited to the other side of the N3 Freeway
- The site is readily accessible from the N3 Freeway and R103, obviating the potential impact of increased population pressures within 'village roads'
- The Rotunda Centre is adjacent to this node and would likely benefit from increased exposure to the facilities offered there.
- The site has marketing exposure to the N3
- The site is not ideal for residential development
- Whilst a Light Industrial land use would offer greater local economic development in this area, this would have significantly greater negative

impacts on the local communities in this area (related to the specific concerns that this sector of the community had).

Site C and C2 - Mixed Use / Business Park / Offices

- This parcel of land presents an ideal opportunity to diversify economic activities within the uMngeni Municipality
- Create employment opportunities for adjacent communities; this land use has a high potential for skilled and unskilled employment opportunities in comparison to pure office and residential development
- In terms of the General Mixed Use zoning as per the SDF permitted land uses include those proposed in this Site
- This land parcel is relatively distal to existing residential areas within the Hilton Node, with a large wetland located in between.
- The site has ready access without intruding on significant residential areas; light industrial traffic is better suited to the other side of the N3 Freeway
- The site is readily accessible from the N3 Freeway and R103, obviating the potential impact of increased population pressures within 'village roads'
- The Rotunda Centre is adjacent to the access to this node and would likely benefit from increased exposure to the facilities offered there.
- The site has marketing exposure to the N3
- The site is not ideal for residential development
- Whilst a Light Industrial land use would offer greater local economic development in this area, this would have significantly greater negative impacts on the local communities in this area (related to the specific concerns that this sector of the community had)
- Aesthetic impacts can be mitigated to within acceptable limits of change
- The impacts from the proposed Mixed Use / Business Park / Office development would not be dissimilar to the impacts of residential development in this zone, apart from traffic impacts.

Site D – Offices / Residential / Shopping Centre

- This site has been identified by the uMngeni Municipality for the purpose proposed in this development application
- Future residential areas have been identified along Hilton College Road, which would take advantage of the proposed retail and office facilities
- Retail opportunities close to the N3 access and the residential area surrounding this node present an opportunity to alleviate some of the pressure on the existing infrastructure in Hilton Village.
- This parcel of land presents an ideal opportunity to diversify economic activities within the uMngeni Municipality
- Create employment opportunities for adjacent communities; this land use has a high potential for skilled and unskilled employment opportunities in comparison to residential development
- In terms of the General Mixed Use zoning as per the SDF permitted land uses include those proposed in this Site
- This land parcel is relatively distal to existing residential areas within Hilton Gardens
- The site has ready access without intruding on significant residential areas; light industrial traffic is better suited to the Cedara interchange

- The site is readily accessible from the N3 Freeway, obviating the potential impact of increased population pressures within ‘village roads’; it is anticipated that residents within Hilton would continue to use The Quarry Centre shopping centre.
- The site has marketing exposure to the Hilton College Road
- The site would also be ideal for residential development, and Business Park / Mixed Use development. However, the strategic location of this site in terms of offering a shopping centre for current and future planned residential development (and recognition of this by the uMngeni Municipality), is the overarching reason for the proposed land use in this location. However, Residential and Office land uses have been included in the layout to mitigate impacts on adjacent landowners.
- Whilst a Light Industrial land use would offer greater local economic development in this area, this would have significantly greater negative impacts on the local communities in this area (related to the specific concerns that this sector of the community had).

Site E - Residential

- This parcel of land presents an ideal opportunity to create infill residential development within the Hilton area; in terms of the zoning as per the SDF permitted land uses, the proposed land use is totally aligned
- The site is not located on major transport routes such as the N3 or R103; however, it is located on the Dennis Shepstone Road, which is a significant local transport route. Residential development is better suited to this transport route than Mixed Use / Office/ Business Park / Light Industrial development
- Any traffic accessing a Mixed Use / Office/ Business Park development would have to travel through the centre of Hilton, which is deemed undesirable
- Topographic features militate against higher impact development such as Mixed Use / Office/ Business Park / Light Industrial development
- The site has ready access without intruding on significant residential areas
- The site does not require significant marketing exposure
- Surrounding land uses, particularly along Dennis Shepstone Drive are primarily residential and deviation from this land use would be incongruent with planning initiatives in the area.
- The site is ideal for residential development. Middle income has been proposed. Lower density housing would perpetuate the type of housing already existing within Hilton, and would not cater for the identified need for the middle income bracket.

Conclusions

Initial potential environmental impacts were identified in the Scoping report and no fatal flaws were encountered. The following issues were identified and investigated in the EIR, and impacts were found to be acceptable:

- Is the development sustainable in terms of service provision?

The provision of services and infrastructure and maintenance has been investigated; services agreements must be obtained for the development to be sustainable.

- Is the development economically sustainable?
The benefits of the proposed development on the surrounding communities, the contribution to municipal rates collection, and the established long term demand for development, render the development economically sustainable.
- What is the impact of the proposed development on water resources?
The proposed development is unlikely to be significantly detrimental to water resources.
- What is the impact of the proposed development on agriculture?
Impacts on agriculture are considered within acceptable limits of change.
- What is the impact of the proposed development on cultural heritage resources?
No heritage resource have been identified on the properties.
- What is the impact of the proposed development on biodiversity and the ecology of the study area?
The impact on biodiversity, ecosystem functioning and sensitive ecological areas is unlikely to be significant, and is considered acceptable in terms of Provincial conservation targets.
- What is the impact of construction on the social environment?
The construction phase would require intensive mitigation, which if adhered to, has the potential to render negative impacts on the social environment acceptable and offer positive social impacts on job seekers and local economic development.
- What is the impact of the operational phase on the social environment?
The operational phase would require intensive mitigation, which if adhered to, has the potential to render impacts on the social environment acceptable and offer positive socio-economic impacts
- What is the impact of the proposed development on employment and economic status?
The impact on employment and economic status would be highly beneficial, and would be in the public interest.
- What is the impact of the proposed development on sense of place?
The impact is considered acceptable based on short term mitigation during the construction phase, and medium to long term mitigation in the operational phase.

- What is the impact of the proposed development on traffic?

Traffic impacts would be acceptable provided all mitigation measures recommended by the traffic engineer are adhered to.

A plan of study was formulated to assess identified environmental impacts. The appropriateness of the proposed land use was assessed by means of a S.W.O.T. (Strengths Weaknesses Opportunities Threats) analysis, which led to the conclusion that the proposed development is within acceptable limits of change, would not significantly impact on environmental quality, and is in the public interest.. This took into account the social, economic and biophysical environment.

All relevant government and local municipal departments have been contacted and provided with the relevant information; their comment is awaited. No departments have objected to the proposed development.

It is the opinion of the environmental assessment practitioner that the proposed development would be sustainable provided that all relevant legislation and measures identified in this Environmental Impact Report and the Environmental Management Plan are adhered to. This is based on the following key decision-making factors:

1. A significant socio-economic environmental need in the region is the provision of employment opportunities and local economic development. The development has the potential to facilitate job creation and large scale economic development specifically suited to the needs and demographics of the majority of the people within the uMngeni Municipality and Umgungundlovu District. The safety and security concerns can be mitigated with a security management plan.
2. Aesthetic / sense of place issues can to a degree be mitigated; this impact is outweighed by the large scale positive socio-economic impacts which would be in the public interest.
3. The most important biophysical need on the sites is the management of water quality and quantity to ensure that the wetland and drainage lines are not negatively impacted upon. The proposed engineering design and rehabilitation and expansion of the natural asset on the property would be effective in mitigating this risk. Effective environmental management and cognisance of water quality and quantity concerns during the design, construction and operational phases of the project have the potential to mitigate the significance of the hydrological impacts to an acceptable level.
4. The proposed development is aligned with spatial planning guidelines.
5. The servicing of the property is feasible:
 - Eskom has confirmed that the required capacity for the development is available and that it will be provided on request
 - There are no sewage facilities on the property. Sewage disposal would be via a purpose designed sewage treatment plant with effluent being treated to Special Limit Values (SLV).
 - Solid waste would be collected from the site by the municipality. Should this service not be available, a services agreement with a private waste disposal company would have to be entered into.

- Potable water would be obtained from the district municipality.
 - Services agreements must be obtained for the development to be sustainable
6. In terms of cumulative impacts, this comprises reliance on municipal water provision and solid waste collection, energy provision, traffic impacts, stormwater flows and release of treated effluent. The following applies:
- (I) Treatment of effluent to SLV in conjunction with the proposed mitigation measures would render effluent of a standard that is unlikely to significantly contribute to cumulative impacts in this system.
 - (II) Adequate stormwater management would ensure that flows are not contaminated and do not result in significant indirect and cumulative hydrological impacts.
 - (III) The traffic engineer considered regional traffic issues, which would have taken into account cumulative impacts.
 - (IV) In terms of municipal water provision, solid waste collection, and energy provision, this would be acceptable provided the municipality enters into a services agreement.
7. The internal road network and the access points to the proposed development would be constructed to required standards.
8. Considering alternative activities, the proposed integrated development best meets the purpose and need of the proposed development.

The proposed development was found to be acceptable / neutral in terms of biodiversity impacts, hydrological functioning, ecological functioning, social impacts, and economic impacts, and it was considered to be appropriate in terms of planning guidelines. The proposed development was found to be potentially negative in terms of altering the aesthetic environment, some ecological functioning, transport and safety and security; these concerns were however deemed acceptable after mitigation.

On balance of impacts a net positive environmental impact is expected. Appropriate mitigatory measures described should render the development sustainable. Concerns raised by Interested and Affected Parties have been addressed and mitigated to an acceptable level.

Recommendations

It is recommended that:

- All proposed activities described in Section 7 (*'Project particulars'*) are authorised.
- The project layout plan is adopted.
- All mitigatory measures recommended in the Environmental Impact Report must be adopted as part of the Record of Decision.
- Activities within the development would have to be controlled by the Environmental Management Plan. The final Environmental Management Plan is to be approved by the Department of Agriculture, Environmental Affairs and Rural Development after issue of the Record of Decision.

- Monitoring must take place to ensure development impacts are managed and potential negative impacts are remedied. These measures must be included in the final Environmental Management Plan to be approved by the competent authority.
- The method of sewage disposal should be as proposed in the Environmental Impact Report. The quality of treated water must comply with Special Limit Values.
- The relevant municipal services agreements must be concluded prior to implementation of the project.
- The Environmental Management Plan must be read in conjunction with the Environmental Impact Report – all mitigatory options are in addition to those in the Environmental Impact Report.
- Energy saving measures as proposed must be implemented where applicable.
- The necessary upgrades to access points as per the requirements and recommendations of the traffic engineer must be implemented.
- Of critical importance would be the rehabilitation and continued management of the wetland and drainage line post approval. A comprehensive rehabilitation plan would have to be drawn up to deal with all aspects of the proposed development. The developer would fund the initial rehabilitation of the wetland, including reinstatement of buffers and the required vegetation mosaic as recommended by the herpetological specialist. This would be completed as that phase of the development is implemented. The long term maintenance of the wetland and its buffer zones would be managed by the landowner, Mondi, in conjunction with existing management programmes involving the Hilton / Mondi Conservancy. Should the land be ceded to the municipality, then the municipality would be responsible for ensuring correct management of the wetland areas.
- The areas proposed for development would have to be fenced prior to commencing construction processes. The purchasers of an proposed development area would have to employ a security company to manage security during the construction phase. In the operational phase, the management body/ies of the built development would have to employ a security company to manage security in the operational phase.
- In addition to the recommended mitigation measures in the EIR and EMP, all recommendations of the following specialist reports must be adhered to:
 - (i) Herpetological study
 - (ii) Snail study
 - (iii) Biodiversity Assessment Report
 - (iv) Geotechnical Report
 - (v) Heritage Impact Assessment
 - (vi) Wetland Delineation Report
 - (vii) Wetland Functional Assessment Report
 - (viii) Traffic Impact Assessment Report
 - (ix) Architectural Guidelines for Area C

Please note: The Environmental Impact Assessment Report must be read in conjunction with the planning report, which includes additional planning detail.

2. PARTIES INVOLVED

The EMP must be appended to tender documents and referred to in the tender documents as special conditions of tender. Responsibility for the implementation of the EMP lies with all parties involved in the project. This responsibility, in some instances may be delegated to contractors, but the implementing engineer and holder of the environmental authorisation will retain legal responsibility. In that capacity, the implementing engineer and holder of the environmental authorisation should delegate suitably qualified person(s) with the responsibility to ensure implementation of the EMPs, and will:

- Guide, advise and consult the developer and its contractors on environmental issues during construction.
- Revise the EMP as required and inform the relevant parties of the changes.
- Secure the protection and rehabilitation of the environment.
- Ensure that the EMP has been accepted and understood as a contractually binding document on all contractors.
- Conduct environmental awareness training for construction staff, concerning the prevention of accidental spillage of hazardous chemicals and oil, pollution of water resources (both surface and groundwater), air pollution and litter control and identification of archaeological artefacts.
- Manage the project to ensure that the training and capabilities of the Contractor's site staff are adequate to carry out the designated tasks.
- Ensure staff operating equipment (such as excavators, loaders, etc.) are adequately trained and sensitised to any potential hazards associated with their tasks.
- Ensure no operator is permitted to operate critical items of mechanical equipment without having been trained by the Contractor and certified competent by the Project Management.
- Educate staff as to the need to refrain from indiscriminate waste disposal and/or pollution of local soil and water resources and receive the necessary safety training.

The responsibilities of the service providers and contractors during the construction phase are to:

- Ensure that all requirements of the EMP and specific project details, communicated to, understood and followed by all persons working on the project who may have an impact on the environment.
- Ensure that a procedure exists for reporting incidents and resolving any problems rapidly.

The responsibilities of the operators during the operational phase are *inter alia* to ensure that:

- All requirements of the EMP are, communicated to, understood and followed by all persons working on the project who may have an impact on the environment.
- A procedure exists for reporting incidents and resolving any problems rapidly.

The management guidelines contained in this document must form part of the contractual agreements between the engineers and the implementing agents / contractors.

The following parties are applicable:

Project Manager / Engineer (PM / E)

The Project Manager / Engineer is the administrator of the project during construction. The engineer is responsible for all direct communication with the contractor.

Project Developer / Proponent (Pro)

The Developer / Proponent must be in overall charge of the contract, the Contractor/s and the adjudication of the EMP requirements. The Developer / Proponent can delegate the daily controls on site to a project manager or similar responsible person, when necessary.

The Proponent is ultimately responsible for the implementation and operation of the project. The Engineer must report to the proponent during construction. The proponent will be directly responsible for the ongoing adherence to the EMP during the operational phase.

Contractor (CT)

This refers to the main contractor(s) appointed by the client for the construction of the Project, or portion of the Project. The main contractor(s) are required to adhere to the EMP and are responsible to ensure that all sub-contractors, suppliers and staff appointed by them also adhere to the EMP.

The Contractors must comply at all times with the requirements of the EMP and must acknowledge in writing by signing the acknowledgement form that they will abide by the contents of EMP. Copies of the signed acknowledgement form are to be forwarded to the KZN DAEARD: Compliance and Monitoring Department.

All Staff

All workers employed by the contractor or developer, persons involved with activities related to the project, or persons present or visiting the construction area, including permanent, contract, or casual labour and informal traders.

Environmental Control Officer (ECO)

The Developer / Proponent must appoint an independent ECO for the purpose of ensuring that the environmental conditions as outlined in this EMP are implemented by the Contractor. The ECO is to have access to the site at all times, for the purpose of inspections to ensure that the environmental conditions of the EMP are being implemented and adhered to. The ECO must report on the environmental aspects of the contract to the responsible person / Project Manager at agreed intervals.

The Contractors must have access to the ECO via the Project Manager for advice on the environmental aspects of the contract and any other associated information. The need for any deviations or variations in the environmental conditions must be reported to the Project Manager and the ECO prior to these being undertaken.

An ECO is an individual nominated by the developer to oversee and audit the ongoing implementation of the EMP, and for liaison with the KZN DAEARD, Municipality, EKZNW and DWAF and the public and owners or managers of properties affected by construction.

KZN DAEARD

The Compliance Officer appointed by the KZN Department of Agriculture, Environmental Affairs, and Rural Development to this project.

Local Community

People residing or present in the region and near the construction activities, including the owners and/or managers of land affected by construction, workers on the land, and people in nearby towns and villages.

Public

Any individual or group concerned with or affected by the Project and its consequences, including the local community, local, regional, and national authorities, investors, workforce, customers, consumers, environmental interest groups, and the general public.

Please Note: An Environmental Control Officer (ECO) must be appointed in terms of Section 34 (b) and (d) of GN R. 385 of 21 April 2006, who will inspect this development on a regular basis during the construction and rehabilitation phases, and will advise KZN DAEARD and anyone acting in accordance with the Record of Decision (e.g. developers, contractors etc.). In addition, anyone acting in accordance with the Record of Decision (e.g. developers, contractors etc.) would have to comply with the EMP. Furthermore anyone acting in accordance with the Record of Decision (e.g. developers, contractors etc.) would need to sign an acknowledgement form, which will form part of the contractual agreements between individuals acting in accordance with the Record of Decision (e.g. developers) and the contractors to ensure compliance with the conditions and requirements of the EMP.

3. RECORD KEEPING

Copies of any Environmental Authorisation or EMP required for specific construction activities shall be kept on site and made available for inspection by visiting officials from the employer or relevant environmental authorities.

The Project Manager and appointed independent ECO must monitor the Contractor's adherence to the approved impact prevention procedures on a weekly basis and shall issue the Contractor a notice of non-compliance whenever transgressions are observed. The Contractor must document the nature and magnitude of any non-compliance in a designated register, the action taken to correct the non-conformance, the actions taken to mitigate its effects and the results of those actions. Any non-compliance shall be documented by the ECO and reported to the Project Manager and Competent Authority (KZN DAEARD) in Audit Reports as per the conditions set out in the Environmental Authorisation. Any emergency incidents during the project must be reported to the Competent Authority.

The Contractor must also record all complaints received regarding activities on the construction site pertaining to the environment, and the response noted with the date and the action taken. These records shall also be submitted to the Project Manager and Competent Authority (KZN DAEARD) in the Audit Reports.

On completion of any component of the project, a post construction environmental audit report must be submitted to the KZN DAEARD compliance and Monitoring Department.

4. COMPLIANCE AND PENALTIES

The EMP will be made binding on all contractors operating on the site and will be included within the Contractual Clauses. The overall responsibility for ensuring compliance with the EMP is with the implementing engineer and holder of the environmental authorisation, and any Contractor(s) they might employ. The abovementioned parties must ensure that all staff members, sub-contractors, suppliers and visitors understand and adhere to the EMP since it is a legally binding document. The duration over which the Contractor's controls shall be in place cover the construction period of the project as well as the limited time after the contract completion in the General Conditions of Contract, and the project specifications, as the defects liability period.

The duration over which the Contractor's is liable for the project shall be in place over the construction period of the project as well as the limited time after contract completion in the General Conditions of Contract, i.e. the defects liability period. Please note that the responsibility for ensuring compliance with the EMP and any other statutory requirement it ultimately that of the holder of the Environmental Authorisation or their appointed agents.

Any party is deemed not to have complied with the EMP if:

- Within the boundaries of the sites, site extensions and access roads there is evidence of contravention of clauses;
- Environmental damage occurs due to negligence;
- The contractor fails to comply with corrective or other instructions issued by the Project Manager or Engineer or Environmental Control Officer within a specified time frame;
- The contractor fails to respond adequately to complaints from the public or local community

The Contractor shall act immediately after a notice of non-compliance is received, and correct the cause for the issuing of the notice. Application of a penalty clause will apply for incidents of non-compliance. The penalties imposed per incident or violation will be to cater for corrective action to remedy any potential negative environmental impacts, and will at minimum¹ comprise the following:

Incident / Violation

Penalty

¹ Should the penalty not be sufficient to cater for remediation, then the penalty would have to be increased to cater for the costs of remediation.

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Failure to stockpile material correctly	R 1 000
Failure to correctly bund hazardous chemical storage areas	R 5 000
Pollution of water bodies	R 5 000
Failure to control stormwater runoff	R 2 500
Failure to provide adequate on-site sanitation	R 5 000
Unauthorised clearing / removal of vegetation	R 5 000
Failure to provide adequate waste disposal and services	R 15 000
Failure to reinstate disturbed areas within specified time period	R 5 000
Unauthorised disruption of regional transport facilities	R 5 000
Any other contravention of the environmental specification	R 1 000

The penalty associated with a chemical spill is not a set amount but will depend on the nature and extent of the spill. Rather than pay a set penalty the contractor/Proponent will need to pay for the cost of any soil and /or groundwater monitoring and any soil and / or groundwater remediation required by authorities.

The imposition of such a penalty shall not preclude the relevant provincial authority from applying an additional penalty in accordance with statutory powers.

Failure to redress the cause shall be reported to the relevant authority for them to deal with the transgression, as deemed fit. The polluter-pays principle applies.

The “polluter-pays” principle provides that “the costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimizing further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment. NEMA imposes a duty of care on every person who causes, has caused or may cause significant pollution or degradation of the environment is authorised by law or cannot reasonably be avoided, NEMA requires that the pollution must be minimised and rectified.

NEMA and its Regulations entitle environmental authorities to administer a fine not exceeding R 5 million or 10 years imprisonment and/or a fine and imprisonment for a person guilty of an unlawful activity. The Act makes allowance for the rectification of the unlawful activity but may charge up to R 1 million administration fees over and above the remediation costs.

Furthermore NEMA makes provision for damages to be awarded by the courts where loss or damage has occurred as a result of a contravention of certain environmental statutes. For example, offences under the National Water Act No. 36 of 1965 and the Environmental Conservation Act No. 73 of 1989 may result in penalties being imposed in terms of NEMA. Importantly, NEMA provides for the liability on conviction of employees, managers, agents and directors for any offences resulting from the failure to take all the reasonable steps that were necessary under the circumstances to prevent the commission of an offence.

The KZN DAEARD retains the right to inspect the project during all phases of its development.

An Environmental Control Officer (ECO) must be appointed to ensure environmental compliance with the EMP. Environmental monitoring must be undertaken by an independent EAP who will act as the Environmental Control Officer (ECO). The ECO is to be appointed by the applicant and should be responsible for ensuring that all aspects of the EMP are adhered to to the satisfaction of all parties. The ECO should do regular environmental audits to ensure compliance to the EMP and provide relevant instructions. The ECO is to complete monitoring reports, which are to be submitted to the relevant organs of state (i.e. KZN DAEARD and the Municipality). The ECO has the authority to instruct the Contractor to cease a particular operation causing or liable to cause significant environmental damage, and issue fines or penalties for non-compliance of the EMP. Monitoring should take place for the entire duration of the construction of the development, and in the operational phase.

In order to facilitate communication between the relevant parties, it is vital that a suitable chain of command is structured that will ensure that the ECO's recommendations have the full backing of the project team before being conveyed to the Contractor. In this way, penalties as a result of non-compliances with the EMP may be justified as failure to comply with instruction from the highest authority.

6. AMENDMENTS TO THE EMP

Any major issues not covered in the EMP as submitted, will be addressed and attached to this EMP as addenda. The EMP must be submitted to the KZN DAEARD. Any EMP amendments (relaxation or revision of any EMP Mitigation Measure) will have to be circulated to the relevant organs of state for approval.

The EMP is a living document and is subject to change from time to time in consultation with KZN DAEARD. Any amendments to the EMP will require approval from DAEARD. A confirmation letter from KZN DAEARD approving the amendments to the EMP must be attached to the revised document.

7. ENFORCING THE EMP

The holder of the environmental authorisation and the implementing engineers / project managers have a responsibility to ensure that all those people involved in the project are aware of and familiar with the environmental requirements for the project (this includes sub-contractors, casual labour, etc.). The EMP shall be part of the terms of reference for all contractors, sub-contractors and suppliers. All contractors, sub-contractors and suppliers have to give some assurance that they understand the EMP and that they will undertake to comply with the conditions therein. All senior and supervisory staff members shall familiarise themselves with the full contents of the EMP. They shall know and understand the specifications of the EMP and shall be able to assist other staff members in matters relating to the EMP. On completion of construction, the EMP shall be part of the terms of reference for the owner and shall be made available to all ongoing contractors entering the property.

All parties must sign an acknowledgement that they are familiar with the requirements of the EMP.

8. SIGNING OF THE EMP

The acknowledgement form at the back of the approved EMP is to be signed by the holder of the environmental authorisation, any Project Managers / Engineers, the ECO, and all the Contractors. All the Contractors employees, especially the machine and equipment operators, are to be made aware of the conditions as contained in the EMP and the contractual conditions relating to the environment, as contained in the contract document.

10. ENVIRONMENTAL MANAGEMENT PLAN

Please Note: It is the responsibility of the appointed Contractor(s) to ensure compliance of ALL requirements of this EMP and the “Responsibility” column is merely a guide and does not relieve the Contractor of his responsibilities in terms of overall compliance with the EMP. Overall responsibility does however rest with the holder of the Environmental and their appointed representatives

Table of abbreviations used below:

Abbreviation	Meaning
C	Contractor (As appointed by the Proponent)
PM	Project Manager / Engineer (As appointed by the Proponent)
Pro	Proponent (i.e. Laurusco Developments Pty Ltd, or successors in title)
ECO	Environmental Control Officer (As appointed by the Proponent)
EA	Environmental Authorisation

Please note: The EMP must be read in conjunction with the Environmental Impact Report; all mitigation measures provided in the Environmental Impact Report must be integrated into the EMP on receipt of the Environmental Authorisation, to produce a final consolidated EMP to be approved by the KZN DAEARD.

10.1 Pre-Construction Phase

The EMP must be incorporated into the tender/contract documents prepared for this project and the companies/persons tendering for the project must provide the Proponent with the additional costs (if any) of complying with any requirement of this Environmental Management Plan. The sum tendered shall therefore cover the cost of all material, plant and labour required to comply with the specifications of this EMP, including the provision of method statements and associated documentation.

Activity	Management / Mitigation	Responsibility	Frequency / Timing
A1 - Legislation, permits and agreements	a. In all instances the, Site Owner, Developer, Service Providers, Contractors and Project Managers must remain in compliance with all relevant local and national legislation. The supreme law of the land is “The Constitution of the Republic of South Africa” which states: “Every person shall have the right to an environment which is not detrimental to his or her health or well being”. Laws applicable to protection of the environment in terms of Environmental Management (and relating to construction activities) include but are not restricted to those listed in the EMP above.	All	At all times, during construction and operational phases.
	b. A copy of the EMP and RoD must be kept on site during the construction and operational phases of the project. These documents must be made available to any authorised official department, employee or agent who undertakes work on the site.	C & PM	At all times.
	c. The recommendations included in the Wetland Functional Assessment must be adhered to at all times, during both construction and operational phases.	PM	Before any construction activities commence.
	d. The location of all service infrastructure, including sewage, electrical and water infrastructure needs to be identified before construction activities commence on the site so as to reduce the risk of damage to this infrastructure which may result in the temporary disruption of services to residents and businesses in	PM	Before any construction activities commence.

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	the area.		
	e. Written details of the ECO must be forwarded to the KZN DAEARD on appointment.	Pro & ECO	Before any construction activities commence.
	f. Written notice must be given to KZN DAEARD prior to the commencement of construction and must include the following: <ul style="list-style-type: none"> • The reference number • Site preparation activities • Commencement date 	PM	Before construction commences.
	g. The KZN DAEARD needs to be formally notified about the intended transfer of responsibility for complying with the ROD from the Proponent to any other party. In this regard the KZN DAEARD Notice entitled “ <i>Notice of the Transfer of Rights and Obligations of an Environmental Authorisation</i> ” will need to be completed and submitted to KZN DAEARD. KZN DAEARD should then acknowledge the notice and give any requirements they may have to accept the notice.	Pro	Before construction commences.
	h. Any changes to, or deviations from, the project description set out in the application, Environmental Impact Report or Environmental Authorisation must be approved in writing by the KZN DAEARD before such changes or deviations may be affected.	PM & Pro	Before construction commences on any changes or amendments.
	i. The construction contract entered into between the holder of the environmental authorisation and any contractor is to state that preference must be given to the employment of local residents during construction. A prime recommendation is that local employment be maximised during construction. This would require an analysis of skills of adjoining communities, with the participation and	PM & Pro	During the tender process.

	<p>input of relevant representatives from the local municipality and any traditional authority in the area. The co-operation of contractors appointed to undertake construction, in carrying out training and capacity building programmes would be vital. Procedures of employment, training and BEE components should be formalised during the final design phase, assuming all components of this development will proceed, and included into contract tender documentation. Gender mainstreaming would be paramount in this municipality. Procedures and policies would need to be put in place to encourage Black Economic Empowerment and the advancement of historically disadvantaged communities. The following protocol would be implemented:</p> <ol style="list-style-type: none"> 1. Pre Contract Commencement – a community liaison officer will be sourced through the local councillor - he will be contracted to the contractor. 2. As part of the Contractors conditions of his Contract he will be obliged to utilize local labour and skills whenever possible and appropriate from the local community. All of this is co-ordinated through the appointed community liaison officer - who on request from the contractor will put out enquiries for whatever skills are required. The role of the community liaison officer is only to provide a database of what skills are available locally – the Ward Councillor would also assist in this exercise; the actual evaluation of skills levels and suitability for employment would be carried out by the relevant contractors / developers. 3. The Contractor will provide a certain amount of 		
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	<p>on-site training.</p> <ol style="list-style-type: none"> 4. Where skills at a sufficient competency are not available locally, the contractor will then source these elsewhere. 5. Monthly Community liaison meetings are held on site - the local councillor attends these. <p>Procedures of employment, training and BEE components should be formalized during the final design phase, assuming all components of this development will proceed, and included into contract tender documentation. Consideration needs to be given to:</p> <ul style="list-style-type: none"> • Internship programmes which could include women to attempt gender equity and to account for the greater proportion of women to men in the surrounding areas • Transport requirements • Procedures and policies may need to be put in place to encourage Black Economic Empowerment and the advancement of historically disadvantaged communities. This could include but not be restricted to procedures and guides to determine opportunities for: <ol style="list-style-type: none"> (i) Black Women Owned businesses (ii) SMME's (Small, Medium, Micro Enterprises) (iii) BEE's (Black Empowering Enterprises) <p>All future development of the site would be beholden to the approved method statement.</p> <p>This would need to be placed in the context of fair business practice, including the procurement of local goods and services – where available, and the development of mutually profitable business relationships with a diverse range of suppliers.</p>		
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	<p>j. The Contractor is to provide the ECO and Project Manager with the following written Method Statements for approval within 14 days of receiving the appointment letter from the Proponent/Tender Winner and prior to any construction commencing on site:</p> <ul style="list-style-type: none"> • Construction Method Statement detailing, but not limited to: Method of undertaking earthworks, including spoil management, erosion, dust and noise control measures to be implemented. The Method Statement must also include the materials and equipment to be utilised during construction and the management thereof, transportation access routes and proposed traffic safety measures which will be implemented. • A Method Statement detailing the proposed locality and management of stockpiles and storage areas which may fall out of the construction camp. The Method Statement must include the management of topsoil stockpiles and dust control measures to be implemented. • A Method Statement for the management of solid waste (refuse/building spoil) generated during construction, including but not limited to: Methods for the control and removal of waste from the site; the number, type and locality of rubbish bins/skips; proposed locality and methods for the temporary storage of waste on site; methods for recycling of waste (if any); the proposed landfill site which will be utilised, and details of the waste removal company to be sub-contracted (if any); 	<p>C</p>	<p>Within 14 days of being appointed / awarded the Construction Tender.</p>
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	<p>and the frequency that refuse will be removed from the site. The above applies to both hazardous and non-hazardous solid wastes.</p> <ul style="list-style-type: none"> • A Method Statement detailing the location and structure of any fuel storage site, and or any other hazardous materials. The statement must include the type of material to be stored, the volume of storage, and the design and capacity of the bund. • A Method Statement describing the location and layout of the construction camp in the form of a site plan indicating offices, storage areas for fuels and explosives (if any), parking areas, access points, equipment cleaning areas, and ablution facilities. • A Method Statement for responding to emergency situations, including but not limited to: spillages of hazardous substances (Spill Contingency Plan), accidental leaks, personal injuries sustained to staff on site, emergency evacuation of the construction site, and emergency procedures in case of fire. • Location, layout and preparation of cement/concrete batching facilities (if any), including the methods employed for the mixing of concrete and the management of runoff water from such areas. An indication must be given of how any concrete spoil will be minimised, cleared, and disposed of. • A Method Statement for the management of contaminated water, indicating potential sources and estimated volumes of contaminated water and how this 		
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	<p>will be disposed of.</p> <ul style="list-style-type: none"> • Motivation and method for the undertaking of any construction related activities within areas identified as “no-go” areas. Unless the need is clearly motivated and the proposed methods exhibit clear focus on environmentally sound construction practice no activity will be permitted within the defined “no-go” areas. <p>The abovementioned Method Statements must include the names of staff that are responsible for the implementation of these plans. The responsible staff members must be adequately trained according to their allocated responsibilities prior to construction commencing.</p>		
	<p>k. All projects, heights, and other building controls must be approved by the local authority prior to the commencement of any construction activities</p>	<p>PM & Pro</p>	<p>Prior to construction commencing.</p>
	<p>l. Only development parameters detailed in the Environmental Authorisation may be undertaken. Any changes or deviations from these development descriptions must be approved in writing by the KZN DAEARD prior to any construction activities taking place.</p>	<p>PM & Pro</p>	<p>Prior to construction commencing.</p>
	<p>m. A Storm Water Management Plan must be submitted and approved by DWAF and the local authority prior to construction. Any comments received from these departments must be included in the EMP as addenda.</p>	<p>PM & Pro</p>	<p>Prior to construction commencing.</p>
	<p>n. The services agreements with Umgungundlovu District Municipality must be in place prior to commencing any construction works. Proof of this must be submitted to the KZN DAEARD Compliance and Monitoring Department prior to construction.</p>	<p>PM & Pro</p>	<p>Prior to construction commencing.</p>

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	o. The services agreements with uMngeni Local Municipality must be in place prior to commencing any construction works. Proof of this must be submitted to the KZN DAEARD Compliance and Monitoring Department prior to construction.	PM & Pro	Prior to construction commencing.
	p. The services agreements with Eskom must be in place prior to commencing any construction works. Proof of this must be submitted to the KZN DAEARD Compliance and Monitoring Department prior to construction.	PM & Pro	Prior to construction commencing.
	q. The plans for the road upgrades must be approved by SANRAL, DOT and the municipality, where relevant, prior to commencing any construction works. Proof of this must be submitted to the KZN DAEARD Compliance and Monitoring Department prior to construction.	PM & Pro	Prior to construction commencing.
	r. The appointed ECO is to provide environmental awareness training to every person working on the site prior to the commencement of any construction activities.	PM & ECO	Prior to construction commencing.
	s. The Proponent must advise purchasers of sites within the development area of their obligation to determine whether or not their service/business requires further environmental authorisation. Should further environmental authorisation be required the purchaser will not be permitted to start construction activities before Environmental Authorisation has been obtained.	Pro	During the tender process and prior to construction commencing.
A2 - Access to site <i>Sound environmental principles must be followed.</i>	A2.1 Routing		
	a. Access to site must be via existing or planned roads only. The Contractor will have to ascertain the existing condition of access roads and repair accordingly should damage occur due to construction activities.	PM & C	Prior to moving onto site and during construction.
	b. Access routes must be clearly defined with white stakes/painted rocks and disturbance outside these areas is not permitted.	PM	Prior to moving onto site.
	c. The Engineer and Contractor must take into account any	PM	Prior to moving

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	limitations identified, and recommendations made during the environmental studies when deciding on an access route to the construction site.		onto site.
	d. The location of all underground services and servitudes must be identified and confirmed before construction commences.	PM	Prior to moving onto site.
	e. Choice of access routes must take into account minimum disturbance to residents and/or businesses neighbouring the site.	PM	Prior to moving onto site.
	f. A working corridor must be determined to avoid excess trampling and damage to the site.	PM & C	Prior to moving onto site.
	g. No construction activities must interfere with the day to day transportation schedules of any Railway services without prior permission from relevant representatives of Spoornet.	PM & C	During the entire construction period and during operation.
	h. Pedestrian activity surrounding the construction sites must be controlled and demarcated during construction activities. Pedestrian thoroughfares immediately surrounding / through the construction areas must be established and demarcated where necessary to avoid any injury or inconveniences to local residents.	PM & C	During the entire construction period and during operation.
	i. All recommendations and upgrades detailed in the TIA must be adhered to and must be completed prior to the operation of adjacent development proposals.	PM & Pro	Prior to construction commencing.
	A2.2 Haulage Roads		
	a. All roads for construction access must be planned and approved by the Engineer and ECO ahead of construction activities. They must not be created on an ad-hoc basis.	PM / ECO	Prior to moving onto site.
	b. Roads must be planned to follow natural contours wherever possible to reduce storm water runoff.	PM	Prior to moving onto site.
	c. Roads must have as little cut and fill as possible.	PM	Before transport movement onto site.
	d. Road widths and radii of curves are to be reduced to	PM	Before transport

	minimum requirements.		movement onto site.										
	e. No trees / shrubs / groundcover may be removed or vegetation stripped without prior permission of the Engineer or ECO.	PM & ECO	Prior to moving onto site.										
	f. Turning points will be marked out on the site / corridor for easy identification by contract workers. No turning manoeuvres other than at designated places shall be permitted.	PM & PM	Before transport movement onto site.										
	g. Contractors shall construct formal drainage on all temporary haulage roads in the form of side drains and mitre drains to prevent erosion and point source discharge runoff.	PM & C	Before transport movement onto site.										
	h. Scour check walls must be constructed in the side drains as follows: <table border="1" data-bbox="757 646 1220 874"> <thead> <tr> <th>Gradient of Road</th> <th>Scour Check Spacing</th> </tr> </thead> <tbody> <tr> <td><4%</td> <td>Not required</td> </tr> <tr> <td>5%</td> <td>20m</td> </tr> <tr> <td>8%</td> <td>10m</td> </tr> <tr> <td>10%</td> <td>5m</td> </tr> </tbody> </table> <p>Scour checks can be constructed from rocks available on site or using driven wooden pegs. Smaller rocks must be placed on the invert of side drain upstream and downstream of the scour checks.</p>	Gradient of Road	Scour Check Spacing	<4%	Not required	5%	20m	8%	10m	10%	5m	PM & C	Before transport movement onto site.
Gradient of Road	Scour Check Spacing												
<4%	Not required												
5%	20m												
8%	10m												
10%	5m												
	i. Haulage roads must allow for the natural flow of water where required. Road surfaces must be permeable to allow infiltration of rainwater. A gravel surface is recommended on all slopes < 10%, grass block on slopes > 10%. This must ameliorate edge effects and channelling of water and subsequent scouring along roadsides.	PM & C	Before transport movement onto site.										
	j. Any natural vegetation along the proposed access roads must be stripped to a soil depth of 150mm, and immediately translocated to a conservation area identified for rehabilitation.	C, ECO & PM	Prior to moving onto site.										

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	Material stripped from roads must be translocated five days post tillage.		
	k. Haulage roads must follow existing or proposed roads wherever possible. Routes must be clearly defined with white stake/painted rocks and disturbance outside these areas is not permitted.	PM & E	Before transport movement onto site.
	l. Temporary advance warning “construction traffic ahead” signs to be erected where construction access is to be taken, as well as in areas which may pose a hazard to motorists or pedestrians.	PM & C	Before transport movement onto site.
	A.2.3 Survey Points		
	a. Marking of survey points must be done with the Engineers approval.	PM	Prior to moving onto site.
	b. Vegetation clearing and disturbance must be kept to a minimum during the survey operations.	PM, & ECO	During surveys and preliminary investigations.
A3 – Setting up the construction camp <i>Careful planning of the construction camp can ensure that time and costs associated with environmental management and rehabilitation is reduced.</i>	A3.1 Layout & Location		
	a. Choice of site for the Contractor’s camp requires the engineer’s permission and must take into account the location of local residents and / or ecologically sensitive areas, including flood zones, wetlands and slip / unstable zones. A site plan must be submitted to the ECO for approval. The construction camp must preferably be positioned on previously disturbed area, with limited cut and fill.	C / PM / ECO	During surveys and preliminary investigations, prior to moving onto site.
	b. If the Contractor chooses to locate the camp site on private land, he must get prior permission from both the Engineer and the landowner.	C & PM	Prior to moving onto site.
	c. The size of the construction camp must be minimized (especially where natural vegetation has had to be cleared for its construction).	PM & C	During site establishment.
	d. The construction camp must be properly fenced and secured. It must be kept in a clean and orderly state at all times. This	C & PM	The site must be fenced during site

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	will deter rodents and other fauna from entering the camp.		establishment; the PM is to conduct ongoing weekly inspections of the construction camp.
	e. The construction camp must be located on a level area at least 100m from any watercourse or wetland. The position of the camp must be ratified by the Engineer and Environmental Control Officer.	E & ECO	Prior to moving onto site.
	f. The Contractor's camp may not be situated in a flood plain or on slopes greater than 1:3.	PM & C	Prior to moving onto site.
	g. The construction camp must be fenced with a 1.8m high bonnox (or similar type) fence and locked after construction hours.	C	During site establishment and ongoing.
	h. The Contractor must attend to the drainage of the campsite to avoid sheet erosion and / or standing water.	C & PM	During site establishment and ongoing; the PM is to conduct ongoing weekly inspections of the construction camp.
A3.2 Ablutions			
	a. Where water borne sewage is not available, temporary chemical toilets must be provided by a company approved by the Engineer. These toilets must be made available to all staff, and must be no closer than 100m from any watercourse and out of the 1:100 year flood line. Such facilities, which shall comply with local authority regulations, shall be maintained in a clean and hygienic condition. Their use shall be strictly enforced. They must be positioned in an appropriate place and within 100m of the work font.	PM, C & ECO	During set-up, with ongoing monitoring as the work progresses.
	b. The construction of a "long-drop" is forbidden.	PM & C	Ongoing.

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	c. There shall be a minimum of 1 toilet for every 20 workers and these must be situated no further than 100m from the work front.	C	Ongoing monitoring.
	d. Under no circumstances may open areas or the surrounding bush or degraded and built up areas be used as a toilet facility.	ECO & C	Ongoing monitoring.
	A3.3 Provision for Camp Waste Disposal		
	a. Bins and / or skips shall be provided at convenient intervals for the disposal of waste within the camp. The bins must be covered to prevent wind-blown rubbish and scavenging by people and animals.	PM & C	During site set-up and ongoing.
	b. Bins should have liner bags where possible for efficient and safe disposal of waste.	C	Ongoing.
	c. At least three rubbish bins must be located at the construction camp for the collection of waste.	C	Ongoing.
	d. Recycling and the provision of separate waste receptacles for different types of waste should be encouraged. Where possible, plastics, paper, glass and cans should be separated from other domestic waste for recycling. If waste is to be recycled, appropriately labelled waste receptacles must be made available.	C	Ongoing.
	e. Any potentially hazardous containers must be punctured or disabled prior to disposal.	C & ECO	Ongoing.
A4 – Establishing Equipment Lay-Down & Storage Areas <i>Storage areas can be hazardous, unsightly and can cause environmental pollution if not designed and managed carefully. Hazardous substances are those that are potentially poisonous, flammable, carcinogenic, or toxic. Some examples are: diesel, petrol,</i>	A4.1 – General Substances and Materials		
	a. Choice of location for equipment lay-down and storage areas must take into account prevailing winds, distances to water bodies, general on-site topography and water erosion potential of the soil. These areas must be located within previously disturbed areas where possible and outside the 1:100 year flood line. Impervious surfaces, bunded areas or drip trays must be provided where necessary i.e. refuelling points and hazardous chemical storage areas.	PM, C & ECO	During site set-up.
	b. Fire prevention and fire fighting facilities must be present at	PM, C & ECO	During site set-up

<i>oil, bitumen, cement, solvent based paints, lubricants, explosives, drilling fluids, pesticides, herbicides, LPG.</i>	all storage facilities. All staff to be educated in fire prevention and the contractor will be held responsible to avoid the risk of fire. No fires shall be lit on private property. If fires are lit, provision shall be made that no accidental fires are started, or the fire is allowed to spread. Demarcate an area within contractor's camp. No fire wood shall be collected in the veld. If activities that can cause a fire are carried out, fire extinguishers shall be available on site and in the construction camp.		and Ongoing.
	c. Storage areas must be secure so as to minimise the risk of crime. They must be safe from access by children and animals etc.	C & PM	Ongoing.
	d. Equipment lay-down and storage areas must be designated, demarcated, signed and fenced.	C	During site set-up.
	A4.2 – Hazardous Substances and Materials		
	a. It is very important that the proximity of other developments, neighbours etc are taken into account when deciding on storage areas for hazardous substances or materials. The areas must be suitably signed, fenced and access controlled.	PM, C & ECO	During site set-up.
	b. Proper storage facilities for the storage of oils, paints, grease, fuels, chemicals and any hazardous materials to be used must be provided to prevent the migration of any spillages into the ground and groundwater regime around the temporary storage area(s).	PM, C & ECO	During site set-up.
	c. Fuel tanks must meet relevant specifications and be bunded and elevated so that leaks are easily detected.	PM, C & ECO	During site set-up.
	d. Any residents living adjacent to the construction site must be notified of the existence of the hazardous storage area.	PM & C	Ongoing.

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	e. Chemical or Hazardous Materials storage facilities must be on an impermeable bunded surface that is protected from the ingress of storm water from surrounding areas in order to ensure that accidental spillage does not pollute local soil or water resources. Bunded areas must be able to contain 110% of the volume of liquids being stored. The Contractor shall submit a method statement to the Engineer and ECO for approval.	C	Prior to moving onto site.
	f. Material Safety Data Sheets (MSDSs) shall be readily available on site for all chemicals and hazardous substances to be used on site, this includes diesel. Where possible and available, MSDSs must additionally include information on ecological impacts and measures to minimize negative environmental impacts during accidental releases or escapes.	PM & C	Ongoing.
	g. Staff dealing with these materials / substances must be aware of their potential impacts and follow the appropriate safety measures. The Contractor must ensure that his staff is made aware of the health risks associated with any hazardous substances used and provide them with the appropriate protective clothing / equipment in case of spillages or accidents. All staff working with hazardous materials must have received the necessary training.	PM & C	During site set-up.
	h. Absorbent materials must be available at the construction site to clean any chemical, fuel or lubricant spills during construction. Spent absorbent material is to be treated as a hazardous waste and suitably disposed of. Empty packaging associated with the storage of hazardous chemicals, paints, solvents, lubricants (such as tins, 210 l drums) is to be returned to the supplier where possible or alternatively be recycled (e.g. to a drum recycling company). If neither of these options are feasible then the packaging should be disposed of to a suitable landfill (A H:h landfill should be suitable for most if not all packaging).	PM & C	During site set-up and ongoing thereafter.
A5 – Education of site staff on	A5.1 - Education		

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<p>general and environmental conduct <i>These points need to be made clear to all staff on site before the project begins</i></p>	<p>a. Ensure that all site personnel have a basic level of environmental awareness training. The Contractor must submit a proposal for this training to the ECO for approval. Topics to be covered must include:</p> <ul style="list-style-type: none"> • What is meant by “environment”; • Why the environment needs to be protected and conserved; • How construction activities can impact the environment; • What can be done to mitigate against such impacts; • Awareness of emergency and spills response provisions; • Social responsibility during construction e.g. being considerate to local residents. <p>It is the contractor’s responsibility to provide the site foreman with no less than 1 hour’s environmental training and to ensure that the foreman has sufficient understanding to pass this information onto the construction staff.</p>	<p>C & ECO</p>	<p>During staff induction and followed by ongoing monitoring.</p>
	<p>b. Staff operating equipment shall be adequately trained and sensitised to any potential hazards associated with their tasks. ECO to provide basic environmental awareness training during first site inspection.</p>	<p>PM & ECO</p>	<p>During staff induction, followed by ongoing monitoring.</p>
	<p>c. Translators are to be used where necessary during staff training.</p>	<p>C</p>	<p>During staff induction.</p>
	<p>d. The Engineer / ECO must be on hand to explain more difficult / technical issues and to answer questions which may be raised.</p>	<p>E & ECO</p>	<p>During staff induction.</p>
	<p>e. Construction workers must be made aware that they are not to make excessive noise e.g. shouting, hooting.</p>	<p>C & PM</p>	<p>Ongoing monitoring.</p>
	<p>f. The use of pictures and real-life examples is encouraged as these tend to be more easily remembered.</p>	<p>C</p>	<p>Ongoing.</p>
	<p>g. Use should be made of environmental awareness posters on</p>	<p>C & PM</p>	<p>Ongoing.</p>

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site.		
h. No operator shall be permitted to operate critical items of mechanical equipment without having been trained by the Contractor and certified competent by the Project Management.	C & PM	Ongoing.
i. All employees must undergo the necessary safety training and wear the necessary protective clothing at all times.	C & PM	Ongoing.
j. The need for a “clean site” policy also needs to be explained to the construction workers.	C & ECO	During staff induction, followed by ongoing monitoring.
A5.2 – Worker conduct on site		
a. A general regard for the social and ecological well being of the site and adjacent areas is expected of the site staff. Workers need to be made aware of the following rules:	PM & C	During staff induction, followed by ongoing monitoring.
b. No alcohol / drugs to be present on site; no vehicles or machinery are to be operated whilst under the influence of alcohol or drugs.	PM & C	During staff induction, followed by ongoing monitoring.
c. Prevent excessive noise to minimise disturbances to local residents and surrounding areas.	PM & C	During staff induction, followed by ongoing monitoring.
d. No firearms allowed on site or in vehicles transporting staff to / from the site (unless used by security personnel).	PM & C	During staff induction, followed by ongoing monitoring.
e. No unsocial behaviour will be permitted.	PM & C	During staff induction, followed by ongoing monitoring.
f. Bringing pets onto site is forbidden.	PM & C	During staff

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			induction, followed by ongoing monitoring.
	g. Construction staff are to make use of facilities provided for them, as opposed to ad-hoc alternatives (e.g. fires for cooking, the use of surrounding bush as a toilet facility is strictly forbidden)	PM, ECO & C	During staff induction, followed by ongoing monitoring.
	h. No fires to be permitted on site. Encourage the use of gas operated cookers for preparation of food on site	PM, ECO & C	During staff induction, followed by ongoing monitoring.
	i. Trespassing on private / commercial properties adjoining the site is forbidden	C & PM	During staff induction, followed by ongoing monitoring.
	j. Only pre-approved security staff and workers shall be permitted to live on the construction site.	PM	During staff induction, followed by ongoing monitoring.
	k. No worker may be forced to do work that is potentially dangerous or for what he / she is not trained to do.	PM & C	Ongoing.
	l. The staff conduct rules are described in a separate table of rules in the EMP. This is aimed at providing staff with the basic information regarding worker conduct on site)	PM & C	During staff induction, followed by ongoing monitoring.
A6 – Social Impacts	A6.1 Public Participation		
<i>It is important to take notice of the needs and wishes of those living or working adjacent to the site. Failure to do so can cause disruption to work and increase cost in the form of delays.</i>	a. A site notice (i.e. a public notice) must be erected on the construction site giving contact details of the Project Manager, the Contractor and the proponent before construction activities commence.	PM	Prior to moving onto the site.
	b. Open liaison channels must be established between the site owner, the developer, operator, the contractors and Interested	PM	Prior to moving onto site and

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	and Affected Parties (IAPs) such that any queries, complaints or suggestions can be dealt with quickly and by the appropriate person(s). The IAPs can be identified as those that live close by the site, work close to the site, will have their services / infrastructure affected by the project, have a general interest in the project, and / or the Ward Councillor in which the construction is taking place.		ongoing.
	c. Should construction staff be approached by members of the public or other stakeholders, they must assist them in locating the Project Manager / Contractor, or provide them with a number on which they may contact the Project Manager / Contractor.	C & PM	Ongoing.
	d. The conduct of the construction staff when dealing with the public or other stakeholders shall be in a manner that is polite and courteous at all times. Failure to adhere to this requirement may result in the removal of staff from the site by the Engineer or Project Manager.	C	During staff induction, followed by ongoing monitoring.
	e. Adequate designated parking must be provided for site staff and visitors.	PM & C	Prior to moving onto site.
	f. A complaints register must be kept on site. Details of complaints must be incorporated into the audits as part of the monitoring process. This must be in carbon copy format, with numbered pages.	PM & C	During site setup and ongoing.
	A6.2 Noise Impacts		
	a. Construction vehicles / machines are to be fitted with standard silencers prior to the beginning of construction.	C	Ongoing
	b. Construction workers must be made aware of not creating unnecessary noise such as hooting and shouting,	PM & C	During staff induction, followed by ongoing monitoring.
	c. Equipment that is fitted with noise reduction facilities (e.g. side flaps, silencers etc) will be used as per operating	C	Ongoing.

	instructions and maintained properly during site operations.		
	A.6.3 Visual Impacts		
	a. Storage facilities, elevated tanks and other temporary structures on site must be located such that they have as little visual impact on local residents as possible.	PM, C & ECO	During site setup.
	b. Lighting on the construction site must be pointed downwards and away from oncoming traffic and nearby houses.	C & ECO	During setup and ongoing monitoring.
	c. Special attention must be given to the screening of highly reflective materials on site.	PM, C & ECO	During site setup and ongoing monitoring.
A7 – Dust / Air / Light pollution <i>Establishment of the camp site, and related temporary works can reduce air quality</i>	a. Vehicles travelling along access roads must adhere to speed limits to avoid creating excessive dust.	PM & C	Throughout the duration of the project.
	b. Camp construction / haulage road construction – areas that have been stripped of vegetation must be dampened periodically to avoid excessive dust. This would apply particularly in instances of high wind speed or when dust is seen to be generated in significant quantities or is seen to be blowing towards residential areas	C & PM	Throughout the construction of the project.
	c. The Contractor must make alternative arrangements (other than fires) for cooking and / or heating requirements. LPG gas cookers may be used provided that all safety regulations are followed.	PM & C	During setup and ongoing monitoring.
A8 Soil Erosion <i>The stripping of vegetation during preliminary activities on site greatly increases the risk of soil erosion.</i>	A.8.1 Conservation of Soil Resources		
	a. The time that stripped areas are left open to exposure must be minimised wherever possible. Care must be taken to ensure that lead times are not excessive.	C, PM & ECO	Throughout the duration of the project.
	b. Wind screening and storm water control must be undertaken to prevent soil loss from the site. It is recommended that gabion mattresses are placed at culvert inlets and outlets as erosion control measures.	E, PM & ECO	During setup and throughout the duration of the project.

	c. Procedures that are in place to conserve topsoil during the construction phase of the project are to be applied to the setup phase, i.e. topsoil is to be conserved while providing access to the site and setting up the camp.	E, PM & C	During setup and throughout the duration of the project.
	d. Topsoil stripped from the construction camp and other construction areas must be stockpiled away from any potential disturbances.	PM, C & ECO	During setup and throughout the duration of the project.
A.9 Stormwater <i>Serious financial and environmental impacts can be caused by unmanaged storm water.</i>	A.9.1 Stormwater Damage Prevention		
	a. To prevent stormwater damage, the increase in storm water runoff resulting from the construction activities must be estimated and the drainage system assessed accordingly. A Stormwater Management plan must be submitted to the DWAF and the local authority prior to its implementation and commencement of the projects, for approval.	C & PM	Prior construction activities.
	b. During site establishment, stormwater culverts and drains are to be located and covered with metal grids to prevent blockages if deemed necessary by the Engineer.	PM & C	During site establishment
	c. Temporary cut off drains and berms may be required to capture storm water and promote infiltration.	PM	During site setup.
A.10 Water Quality <i>Incorrect disposal of substances and materials and polluted run-off can have serious negative effects on groundwater quality.</i>	A.10.1 Maintenance of Water Quality		
	a. Storage areas that contain hazardous substances must be bunded with an approved impermeable liner and have the capacity to contain 110% of the volume of materials being stored.	PM, C & ECO	During site setup.
	b. Spills in bunded areas must be cleaned up, removed and disposed of safely from the bunded area as soon after detection as possible to minimise pollution risk and reduced bunding capacity.	C, ECO & PM	Ongoing as events occur.
	c. A designated, bunded area is to be set aside for vehicle washing and maintenance. Materials caught in this bunded area must be disposed of to a suitable waste disposal site or as	C & PM	Ongoing, to be monitored on a weekly basis.

	directed by the Engineer.		
	d. Provision must be made during setup for all polluted runoff to be treated to the Engineers approval before being discharged into the storm water system. Any waste which cannot be treated to acceptable standards on site must be treated and disposed of by a licensed treatment company.	C & PM	During site setup and ongoing monitoring.
	e. All sewers are to be designed in accordance with the local and district authorities' design guidelines. All designs will need to be approved by the relevant departments prior to construction.	C & PM	During site setup and ongoing.
A.11 Conservation of the Natural Environment <i>Alien plant encroachment is particularly damaging to natural habitats and is often associated with disturbance to the soil during construction activities. Care must be taken to conserve existing plant and animal life on, and areas surrounding the site.</i>	A.11.1 Fauna and Flora		
	a. No natural vegetation may be cleared without prior permission from the ECO / Engineer.	E & ECO	During site setup, and ongoing.
	b. Care must be taken to avoid the introduction of alien plant species to the site and surrounding areas.	ECO & PM	Ongoing.
	c. Trees that are not to be cleared should be marked beforehand with danger tape.	ECO & PM	During site setup.
	d. Disturbance to birds, animals and reptiles and their habitats must be minimized wherever possible.	C, ECO & PM	Ongoing.
	e. Areas which are identified by the Engineer or the Environmental Control Officer as being ecologically sensitive (i.e. wetland areas) and which are adjacent to any construction work are to be suitably demarcated to prevent damage by plant and labour.	ECO & PM	During site setup, and ongoing monitoring.
A.12 Setup of Waste Management	A.12.1 Waste Management		
	a. The contractor is responsible for the internal collection of refuse and for transporting it to a registered landfill site once every week; unless a service agreement is entered into between the contractor and the municipality.	C	Ongoing.
	b. The excavation and use of rubbish pits is forbidden.	C & PM	Ongoing.

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	c. Burning of waste is forbidden ² .	PM & C	Ongoing and monitored weekly by the PM.
	d. A fenced area must be allocated for waste sorting and storage prior to removal.	PM & C	During site setup.
	e. Individual skips for different types of waste (e.g. 'household' type refuse, building rubble, etc.) must be provided.	C	During site setup and ongoing.
A.13 Cultural Environment	A.13.1 Protection of Cultural Environment		
	<p>Prior to the commencement of construction, all staff need to know what possible archaeological or historical objects of value may look like, and to notify the Engineer / Contractor should such an item be uncovered.</p> <p>If any artefacts or graves are uncovered during construction, all work on site is to cease and AMAFA as well as the ECO is to be notified for comment. Construction may only commence once approval by AMAFA is granted.</p>	PM & C	During staff induction.
A.14 Safety and Security	A.14.1 Fencing / Demarcation		
	a. Potentially hazardous areas such as excavated trenches or pits / storage areas are to be demarcated and made clearly visible.	PM & C	Ongoing.
	b. In areas which adjoin the railway servitude a buffer zone must be established and demarked with guidance from representatives of Spoornet. No site workers must be permitted to enter this buffer zone without prior approval of the Project Manager and the Project Manager must notify Spoornet at least five working days in advance of any construction activities taking place in the agreed buffer zone.	PM & C	During setup and ongoing.
	c. In areas which adjoin the N3 a buffer zone must be established and demarked with guidance from representatives of SANRAL. No site workers must be permitted to enter this	PM & C	During setup and ongoing.

² A possible exception to this may be that the alien invasive vegetation which is removed from the site should be burned to prevent the spread of the plants.

	buffer zone without prior approval of the Project Manager and the Project Manager must notify SANRAL at least five working days in advance of any construction activities taking place in the agreed buffer zone.		
	A.14.2 Lighting		
	a. Lighting on the construction campsite is to be set out to provide maximum security and to enable policing of the site, without creating a visual nuisance to local residents or businesses.	PM & C	During setup with ongoing monitoring.
	A.14.3 Risks Associated with Materials on Site		
	a. Material stockpiles or stacks, such as pipes must be stable and well secured to avoid collapse and possible injury to site workers / local residents.	PM & C	Ongoing.
	b. Flammable materials must be stored as far as possible from adjacent residents / businesses.	PM & C	During site setup and ongoing monitoring.
	c. Fire fighting equipment must be present on site at all times as per the Occupational Health and Safety Act of South Africa (OHSA).	C & PM	Ongoing.
	d. Obstruction to drivers' line of sight due to stockpiles and stacked materials must be avoided, especially at intersections and sharp corners.	C	Ongoing.
	e. No materials are to be stored in unstable or high-risk areas such as in floodplains or on steep slopes.	C, ECO & PM	During site setup and ongoing monitoring.
	f. Affected parties must be notified in advance of any known potential risks associated with the construction site and the activities on it (for example by distributing flyers in potentially affected residential/trading areas). Examples of these are stringing of power lines, blasting, earthworks / earthmoving machinery on steep slopes above houses / infrastructure, risk to residences along haulage roads / access routes.	PM	During site setup and ongoing.

	<p>A.14.3 General Security Measures to be Implemented</p>		
	<p>a. There must be 24 hr access control to the site at all times and no unauthorised person must be permitted to enter the construction site without prior permission of the Project manager or Contractor.</p>	<p>PM</p>	<p>During site setup and ongoing.</p>
	<p>b. After hours security must be arranged by the Project Manager/Contractor to patrol the site when no construction activities are taking place. This will prevent theft and criminal activities from occurring on the site.</p>	<p>PM</p>	<p>During site setup and ongoing.</p>
<p>A.15 EMP Auditing</p>	<p>The Client / Proponent to appoint an independent environmental control officer to conduct site inspections and produce audit reports during the construction phase, (including site establishment and post construction phase). Audit reports to be submitted to KZN DAEARD.</p> <p>Auditing must consist of site inspections and audit reports must as required by the competent authority (KZN DAEARD Compliance and Monitoring).</p>	<p>PM & ECO</p>	<p>Ongoing</p>

10.2 Construction Phase

This pertains to all environmental impacts associated with construction and is not limited to the land on which the Project is to be located. It includes the site footprint, construction campsites, access roads and tracks, as well as any other area affected or disturbed by construction activities. The EMP (particularly the specifications for rehabilitation) is relevant for all areas disturbed during construction. Furthermore, the EMP must take into account all secondary impacts on local communities and the general public.

Activity	Management / Mitigation	Responsibility	Frequency / Timing
B1 – Access to the site	B1.1 Maintenance of the access		
	a. The access to the site will need to be upgraded to an acceptable standard during construction (i.e. such that large amounts of dust are not generated and there is no unwarranted damage caused to construction vehicles).	PM	Initial setup and ongoing.
	b. Contractors shall ensure that access roads and the surrounding public roads are maintained in good condition by attending to potholes, corrugations and storm water damage caused by the construction activities as soon as these develop.	PM & C	Ongoing maintenance.
	c. There needs to be adequate drainage of water underneath the access roads (both during construction & in operation). This can be done through a culvert / water diversion system.	C & PM	Where necessary.
	d. During construction, any dirt access roads could potentially be surfaced with a compacted gravel layer (shale) in order to allow for the increase in vehicular traffic on these roads. A chemical stabilizer could be added to assist with the surface binding and reduce the dust produced by vehicular traffic on the road.	C & PM	When necessary.
	e. It is recommended that entry and exit points to the proposed development are clearly marked and designed in such a way as to allow for good line of sight and traffic viewing (allowing a 100m – 150m line of sight on both sides of the access). Convex mirrors should be placed where necessary on opposite sides of the entry/exit points to allow motorists exiting the development	C & PM	When necessary.

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	to see oncoming vehicles. These are intended to minimize potential incidents of vehicles collision.		
	f. Any large trees or foliage that blocks entry/exit visibility should be removed (with prior permission from the ECO) to increase traffic visibility.	C & ECO	During setup and where necessary.
	g. Unnecessary compaction of soil by heavy vehicles must be avoided; construction vehicles must be restricted to the demarcated access, haulage routes and turning areas.	C & PM	Ongoing, and specifically after heavy rains.
	h. Machine / vehicle operators must receive clear instructions to remain within demarcated access routes. Movement of heavy-duty vehicles and vehicles not connected with work in progress must be restricted to the construction zone in order to control related impacts such as damage in the construction zone, compaction of soil, damage to vegetation and noise pollution	C & PM	Ongoing, and specifically after heavy rains.
	i. Personnel and vehicle access must be restricted during construction so as to control access to otherwise potential dangerous excavations and materials.	PM & C	Ongoing.
	j. The construction activities must where ever possible not impede the traffic flow of the R103, Dennis Shepstone Drive, Hilton Avenue, and the Hilton Road and adjoining roads.	PM & C	Ongoing.
	B.1.2 Haulage Roads		
	a. Contractors shall ensure that all side and mitre drains as well V Drains and scour check walls on access and haul roads are functioning properly and are well maintained.	C & PM	Ongoing monitoring, and specifically after heavy rains.
B.2 Maintenance of Construction Camp	B.2.1 Surfaces		
	a. The Contractor must monitor and manage drainage of the camp site.	C	Weekly inspection by contractor.
	b. Run-off from the camp site must not discharge into neighbouring properties.	C	Ongoing.
	B.2.2 Ablutions		

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	a. Chemical toilets are to be maintained in a clean state on a regular basis and must be moved to ensure that they adequately service the work areas.	C & PM	Ongoing
	b. The Contractor is to ensure that open areas or the surrounding bush are not being used as a toilet facility.	C	Ongoing monitoring.
	B.2.3 Camp Waste Disposal		
	a. The Contractor shall ensure that all litter is collected from the work and camp areas daily. The construction area must be cleared of litter, debris (e.g. cement packets, bitumen residues etc) and other domestic waste on completion of the day's work.	C	Ongoing monitoring.
	b. Bins and / or skips must be emptied regularly and waste must be disposed of at a registered landfill site. Waybills for all such disposal are to be kept by the Contractor for review by the Project Manager / ECO.	PM, C & ECO	Daily or as needed.
	c. A registered chemical waste company is to be used to remove waste from chemical toilets on site. Documentation for this must be kept by the contractor for review by the ECO if requested.	C	Weekly or as needed
	B.2.4 Eating Areas		
	a. Eating areas must be regularly serviced and cleaned to ensure the highest possible standards of hygiene and cleanliness.	PM & C	Ongoing with weekly monitoring by the Contractor.
	b. All litter throughout the site must be picked up on a daily basis and placed in the bins provided.	C	Ongoing monitoring
	B.2.5 Housekeeping		
	a. The Contractor shall ensure that the camp and working areas are kept clean and tidy at all times.	C	Ongoing monitoring.
B.3 Staff Conduct	B.3.1 Environmental Education and Awareness		
	a. The Contractor must monitor the performance of the construction workers to ensure that the points relayed during their induction have been properly understood and are being followed. If necessary, the ECO and / or a translator should be called to the site to further explain aspects of environmental or	C & ECO	Ongoing monitoring.

	social behaviour that are unclear.		
	B.3.2 Worker Conduct on Site		
	a. The rules that are explained in the worker conduct section of the EMP must be followed at all times. Non compliance of these rules could result in the removal of workers by the Contractor or Engineer.	C & PM	Ongoing monitoring.
B4 – Dust / Air Pollution <i>Main causes of air pollution are dust particles from vehicle movements and stockpiles, vehicle emissions and fires.</i>	B.4.1. Dust & Air Pollution		
	a. Vehicles travelling to and from the construction site must adhere to the speed limits so as to avoid producing excessive dust. A speed limit of 30 km/h must be adhered to on the construction site.	PM & C	Ongoing monitoring.
	b. It must be ensured that loads of loose material (such as sand) on trucks are covered and dampened if necessary to prevent excessive dust.	PM & C	Ongoing monitoring.
	c. Limiting construction operational hours from 06h00 and 17h00 will reduce congestion and disturbance in surrounding areas and minimize road deterioration and consequent dust creation.	PM	As directed by Engineer.
	d. Access points, access roads, material stockpiles and other cleared surfaces must be dampened whenever necessary and especially in dry and windy conditions to avoid excessive dust.	PM & C	Ongoing and whenever necessary.
	e. Vehicles and machinery are to be kept in good working order and to meet the manufacturer's specifications for safety, fuel consumption etc. Should excessive emissions be observed, the Contractor is to have the equipment seen to as soon as possible.	C	Ongoing Monitoring of equipment with weekly inspections.
	f. Stockpiles may cause dust and so must be managed in accordance with the guidelines in Materials Management.	C & PM	Ongoing.
	g. If dust is unavoidable, screening will be required utilising wooden supports and shade cloth.	PM & C	Ongoing monitoring of stockpiles.
	h. Stockpiles not used in three (3) months after stripping must be seeded to prevent dust and erosion.	PM, C & ECO	Throughout the project.
	i. No fires or burning of waste is permitted on site.	PM & C	Throughout the

			project.
B5 – Soil Erosion	B.5.1 Topsoil Stripping and Stockpiling		
	a. Excavated soil must be deposited in a landfill site if not to be used as fill material. Soil disturbance will be minimized by establishing the extent of the construction site (pre-construction) and clearly demarcating this on the site layout plans. No construction personnel or vehicles may leave the demarcated areas except when authorised to do so by the Engineer.	C & PM	As each activity is completed.
	b. Erosion prevention measures must be implemented: Berms, sand bags and hessian sheets may be used to contain all sediment whilst energy dissipaters must be constructed at all outflow points. The site must be monitored weekly for any sign of off-site siltation. All exposed earth must be rehabilitated promptly with suitable vegetation to protect the soil.	PM, C & ECO	Ongoing
	c. Once an area has been cleared of vegetation, the top soil layer (normally 150mm) of soil should be removed and stockpiled in a designated area for use in rehabilitation once construction is completed.	PM, C & ECO	Ongoing.
	B.5.2 Exposed Surfaces		
	a. Side tipping of soil and excavated materials shall not be permitted – all spoil material shall be disposed of as directed by the Engineer.	PM	Ongoing and as directed by the Engineer.
	b. Storm water control and wind screening must be undertaken, if necessary, to prevent soil loss from the site.	PM & C	Ongoing as directed by the Engineer.
	c. There must be no offsite impacts of stormwater. A general rule is that the stormwater velocity eddies on the site must be the same as the predevelopment rates.	PM	Ongoing monitoring.
	d. In areas where steep slopes are excavated, erosion control measures need to be initiated and these may include the planting of indigenous vegetation at short intervals to prevent the formation of gullies.	PM & ECO	As directed by the Engineer and ECO.
	e. Appropriate cambers and v-drains must be constructed on the	PM & C	During site setup

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	access roads in order to dissipate surface water runoff and sheet erosion.		and as directed by the Engineer.
	f. The Storm Water Management Plan must be developed, provided and implemented by the engineer. Drainage must be controlled to ensure that runoff from the site will not lead to erosion and offsite pollution of any water resources. The storm water drainage system must not be contaminated by other waste sources generated during construction phases of the development. The temporary toilet facilities must not be allowed to enter the storm water drainage system. Waste from these facilities must be collected by the service provider and disposed of at a permitted waste disposal site. These facilities must be regularly serviced and would be managed according to the service plan developed by the Engineer.	PM, C & ECO	Ongoing monitoring and as directed by the Engineer.
	g. Battering of all banks shall be such that cut and fill embankments are no steeper than previous natural slopes unless otherwise permitted by the Engineer. Cut and fill embankments steeper than previous ground levels shall be re-vegetated immediately on completion of trimming or shall be protected against erosion using bio-engineered stabilisation measures.	PM & C	Ongoing and as directed by the Engineer
	h. If cut and fill earthworks are required, these must be limited to the minimum necessary for the proposed development. Cut and fill banks must not be sloped steeper than 1: 1.5. All fill must be well compacted in layers on placement and must not be loose end-tipped. All earthworks must be vegetated as soon after completion of construction as is practically possible with locally sourced indigenous vegetation where possible.	PM, C and ECO	As directed by the Engineer and ECO.
	i. All embankments, unless otherwise directed by the Engineer, shall be protected by a cut off drain to prevent water from cascading down the face of the embankment and causing erosion.	E & C	A directed by the Engineer.
B6 – Storm Water	B6.1 General Principles		
<i>Construction activities frequently</i>	a. The Contractor shall not in any way modify nor damage the	PM, C & ECO	Ongoing

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<p><i>result in diversion of natural water flow resulting in concentration of flow and an increase in the erosive potential of the water</i></p>	<p>banks or beds of streams, rivers, wetlands, other open water bodies and drainage lines adjacent to or within the designated area, unless required as part of the construction project specification and in line with the wetland functional assessment. Where such disturbance is unavoidable, modification of water bodies must be kept to a minimum in terms of: removal of riparian vegetation; and opening of the stream channel. Authorisation in this regard will be required from the Department of Water Affairs and forestry before construction activities commence if any new areas, not described included in the Environmental Authorisation, are to be affected.</p>		<p>Monitoring by the Engineer and ECO.</p>
	<p>b. Earth, stone and rubble is to be properly disposed of so as not to obstruct natural pathways over the site (i.e. these materials must not be placed in storm water channels, drainage lines or river.</p>	<p>E & C</p>	<p>Ongoing monitoring by the Engineer.</p>
	<p>c. The use of high velocity storm water pipelines must be avoided in favour of open, high friction, semi-permeable channels wherever feasible.</p>	<p>PM</p>	<p>Ongoing.</p>
	<p>d. Stormwater outfalls must be designed to reduce flow velocity and avoid stream bank and soil erosion. Stormwater must be attenuated and directed to nearby streams in a controlled manor.</p>	<p>PM</p>	<p>Before construction commences.</p>
	<p>e. A number of smaller storm water outfall points must be constructed rather than a few large outfall points.</p>	<p>PM</p>	<p>Ongoing.</p>
	<p>f. The provisions of the National Water Act 36 of 1998 shall be complied with at all times.</p>	<p>PM & C</p>	<p>Ongoing.</p>
	<p>g. The Contractor is to ensure that impediments to natural water flow is avoided during construction, or is temporarily diverted.</p>	<p>C</p>	<p>Ongoing monitoring.</p>
	<p>h. There must be a periodic checking of the site's drainage system to ensure that the water flow is unobstructed.</p>	<p>C & PM</p>	<p>Ongoing monitoring.</p>
	<p>B.6.2 Un-channelled Flow</p>		
	<p>a. During construction un-channelled flow must be controlled to avoid soil erosion.</p>	<p>PM & C</p>	<p>Ongoing monitoring</p>

	b. Where surface runoff is concentrated (e.g. along exposed tracks), flow must be slowed by contouring.	PM & C	Ongoing monitoring.
<p>B7 – Water <i>Water quality is affected by the incorrect handling of substances and materials. Soil erosion and sediment is also detrimental to water quality. Mismanagement of polluted run-off from vehicle and plant washing and wind dispersal of dry materials into rivers and watercourses are detrimental to water quality.</i></p>	B7.1 Water Quality		
	a. Contact numbers for the Department of Water Affairs and Forestry, the ECO, the Compliance, Monitoring and Enforcement Component of KZN DAEARD as well as other emergency contact numbers provided by the Municipality must be available and easily accessible on site. If spillages or contamination occur on site these departments (including the ECO) are to be contacted immediately in order to deal with the spillage or contamination. The Contractor is to compile a list of emergency contact numbers to refer to in order to deal with fire, spillages and contamination of land and aquatic environments.	C	During site setup, and ongoing during the project life cycle.
	b. Every effort must be made to ensure that any chemicals or hazardous substances do not contaminate the soil or ground water on site.	C, PM & ECO	Ongoing monitoring.
	c. Suitable absorbent material to be available on site to capture any spills. Any spent absorbent material to be regarded as a hazardous waste and disposed of accordingly.	C & PM	During site setup, and ongoing as needed.
	d. Care must be taken to ensure that runoff from vehicle or plant washing does not enter surface or ground water. Vehicles and machinery may only be cleaned at a designated place at the construction camp.	C & PM	Ongoing monitoring.
	e. Contaminated wastewater must be managed by the site manager to ensure existing water resources on the site are not contaminated. All wastewater from general activities in the camp shall be collected and removed from the site for appropriate disposal at a licensed commercial facility.	PM & C	Ongoing monitoring.
	f. Site staff shall not be permitted to use any watercourse or natural water source adjacent to or within the designated site for the purposes of bathing, washing of clothing or for any construction related activities. Municipal water (or another	C & PM	Ongoing monitoring.

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	source approved by the Engineer) should instead be used for all activities such as washing of equipment or disposal of any type of waste, dust suppression, compacting etc.		
	g. Dewatering of vessels, tanks, etc is to take place in a controlled manner. No uncontrolled release of water shall be allowed onto the site area. Water wastage must be kept to a minimum and where possible water must be recycled. In the event of a problem occurring during dewatering, it must be stopped immediately until rectification of the problem. All taps must be maintained in good working order. It is not acceptable to have dripping taps or taps left open.	C	Ongoing monitoring.
	h. Mixing/decanting of all chemicals and hazardous substances must take place either on a drip tray or on an impermeable surface to prevent soil and water pollution. Waste from these trays should then be disposed of at a suitable waste site.	PM & C	Ongoing monitoring.
	i. Portable construction equipment (e.g. generators) to be located on an impervious surface or alternatively, drip trays to be provided.	PM & C	During site setup, and ongoing during the project life cycle.
	j. No concrete batching or mixing is permitted within 50m from the edge of the delineated hydromorphic soils of any watercourse or wetland.	PM & C	During site setup, and ongoing during the project life cycle.
	B7.2 Water Supply		
	a. Use of natural fountains, springs, wetlands and adjoining river water for water provision is strictly prohibited.	PM, C & ECO	Throughout the project with ongoing monitoring.
	b. Ensure that any existing potable water source is maintained for domestic use during construction.	PM & C	Throughout the project with ongoing monitoring.

<p>B8 – Conservation of the Natural Environment</p> <p><i>Although the site is highly degraded in terms of its ecological functioning the following must still be taken into account during construction activities.</i></p>	<p>B8.1 Fauna and Flora</p>		
	<p>a. The Contractor is to check that vegetation clearing has the prior permission of the E / ECO. Indigenous vegetation that is removed is to be replanted and excavation is to be kept to a minimum.</p>	C	Ongoing monitoring / as the work progresses
	<p>b. Any natural vegetation that will be impacted by the stripping of construction areas and any other construction-related activity must be stripped to a soil depth of 75 mm, and immediately translocated onto areas identified for total³ rehabilitation.</p>	C & PM	Ongoing.
	<p>c. Development infrastructure must be screened wherever possible from ecologically sensitive areas to reduce the human disturbance factor.</p>	C & ECO	As needed.
	<p>d. Alien vegetation encroachment onto the site as a result of construction activities must be controlled during construction. Immediate re-vegetation of stripped areas once construction is completed and removal of aliens by weeding must take place .</p>	ECO, C & PM	Ongoing monitoring.
	<p>e. The hunting of birds and animals on site and in surrounding areas is forbidden.</p>	C	To be addressed at the staff induction with ongoing monitoring.
	<p>f. Gathering of firewood, fruit, muthi plants, crops or any other natural material on site or in areas adjacent to the site is prohibited.</p>	C	To be addressed at the staff induction with ongoing monitoring.
	<p>B8.2 Geology</p>		
<p>a. In the event of excavation, the material that is removed must be separated into topsoil and subsoil. The top 150mm would be considered topsoil and must be stockpiled separately. The soil must be placed back into any excavations in the same order it was removed.</p>	C & PM	Ongoing monitoring as work progresses.	

³ Total rehabilitation – areas where insignificant natural vegetation remains (transformation by alien invasive species >60% ground cover, species richness <3 indigenous grass species per m².)

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	b. In the event of infilling, replacement of subsoil must precede the topsoil replacement, and all material must be well compacted.	C & PM	Ongoing monitoring as work progresses.
	B8.3 Wetlands		
	a. All works to be conducted in wetland areas must follow the guidelines and recommendations as indicated in the Wetland Functional Assessment and the Wetland Rehabilitation Plan, to be completed post Environmental Authorisation.	C & PM	
	B. No wetlands, other than those identified in the Environmental Authorisation, are to be impacted upon without prior permission of DWAF.	C & PM	
B9 – Materials Management	B9.1 Stockpile Management		
	a. Stockpiles must not be situated such that they obstruct natural water pathways.	C & PM	Ongoing monitoring.
	b. Stockpiles must not exceed two (2) metres in height unless otherwise permitted by the Engineer or be left for longer than three (3) months.	C & PM	Ongoing monitoring.
	c. If stockpiles are exposed to windy conditions or heavy rains, they must be covered either by vegetation or cloth, depending on the duration of the project. Stockpiles may further be protected by the construction of berms or low brick walls around their bases or screened from wind.	C & PM	Ongoing monitoring.
	d. Stockpiles must be kept clear of weeds and alien vegetation growth by regular weeding.	C	Ongoing monitoring, with weeding as needed.
	B9.2 Handling of Hazardous Materials		
	a. Cement, bitumen and other potential environmental pollutants must be mixed on an impermeable surface with special provisions for storm water management.	PM & C	Ongoing monitoring.
	b. All empty containers must be removed from the site for appropriate disposal at a licensed commercial facility. Way bills must be available for review by the ECO.	PM & C	As needed.

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	c. No vehicles transporting concrete or bitumen or chemicals /fuel to the site may be washed on site.	PM & C	Ongoing monitoring.
	d. Lime and other powders must not be mixed during excessively windy conditions.	C	As required.
	e. All substances required for vehicle maintenance and repair must be stored in sealed containers until they can be disposed of / removed from the site.	C & PM	As required.
	f. Hazardous substances / materials are to be transported in sealed containers or bags.	C & PM	As required.
	g. Spraying of herbicides / pesticides must not take place under windy conditions and must comply with Occupational Health and Safety Act of South Africa (OHSA) specs and other chemical handling laws.	C & PM	As required.
	<p>h. The Contractor is to outline a method statement for the dealing of accidents / spillages of hazardous materials. This statement must be handed to the Engineer, ECO as well as to DWAF should the incident occur near to or in a water body.</p> <p>The following basic steps should be taken into account in the event of a spillage –</p> <ul style="list-style-type: none"> • Stop the source of the spill • Contain the spill • All significant spills must be reported to DWAF and relevant departments including the ECO and PM • Remove the spilled product for treatment or authorised disposal • Determine if there is any soil, groundwater or other environmental impact • If deemed necessary by the DWAF or the ECO, remedial action must be taken • The incident must be documented 	C	During site setup, and ongoing as needed.

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	<p>i. In the event of a significant spillage that cannot be contained and which poses a serious threat to the local environment, the following departments must be informed within 6 (six) hours of the incident and in accordance with the Section 30 of the National Environmental Management Act, Act 107 of 1998:</p> <ul style="list-style-type: none"> • The uMngeni Municipality • DWAF • Provincial Department of Agriculture, Environmental Affairs, and Rural Development (Pollution and Waste Management) • The Local Fire Department <p>Please note that an updated list of all of the above departments contact details must be kept on site at all times. (</p>	C & PM	In the event of such a spillage and ongoing updating of the contact details.
B9.3 Sourcing construction materials			
	a. Wherever possible, materials that have been produced locally must be used for the construction of the site camp (e.g. bricks, window frames, etc)	C	During site setup.
B10 – Waste Management			
<p><i>Definition; “Refuse” refers to all construction waste (such as rubble, cement, bags, timber, cans etc)</i></p>	B10.1 On-site Waste Management		
	a. The Contractor shall ensure that all refuse is collected from the camp and work areas on a weekly basis or as needed.	C, PM & ECO	Monitored weekly by the contractor.
	b. All material used for construction and maintenance must be removed from the site after construction or maintenance work.	PM, C & ECO	As it becomes necessary.
	c. Refuse must be placed in the designated skips / bins which must be regularly emptied. These must remain within demarcated areas and must be covered to prevent wind-blown rubbish and scavenging by people and animals.	C	Ongoing.
	d. In addition to the waste facilities within the construction camp, provision must be made for waste receptacles to be placed at intervals along the work front.	C	Ongoing.
e. Littering on site is forbidden and the site shall be cleared of	C	Ongoing	

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	litter at the end of each working day.		monitoring.
	f. Recycling is to be encouraged by providing separate receptacles for different types of waste and making sure that staff are aware of their uses.	PM & C	At staff induction meeting with ongoing monitoring.
	g. All waste generated during construction is to be disposed of at a facility registered in terms of section 20(b) of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008).	PM & C	Ongoing.
B.10.2 Waste Disposal			
<i>Non – hazardous waste</i>			
	a. All waste must be removed from the site and transported to a registered landfill site.	PM & C	On a weekly basis or as needed.
	b. Waybills proving disposal at each site shall be provided by the Engineers or Contractor.	PM & C	Ongoing.
	c. Any construction rubble shall be disposed of at registered disposal sites.	PM & C	Ongoing.
	d. Waste from chemical toilets must be disposed of regularly and in a responsible manner by a registered waste contractor. Care must be taken to avoid contamination of soils and water, pollution and nuisance to adjoining areas. Service agreements need to be entered into before construction commences.	PM & C	Before site setup with ongoing monitoring.
<i>Hazardous Waste</i>			
	a. Contaminated water associated with construction activities must be contained in separate bunded areas and must not be allowed to enter into the natural drainage system.	C & PM	Ongoing monitoring.
	c. Chemical waste must be stored in appropriate containers and disposed of at licensed hazardous waste disposal facilities. Spent absorbent material to be regarded as a hazardous waste. Empty chemical packaging (e.g. empty 210 l drums) associated with the storage of hazardous materials to be returned to supplier, if possible, sent to a drum reconditioning company or disposed of	C & PM	Ongoing monitoring.

	as a hazardous waste as a last resort.		
	d. Soil that is contaminated with, e.g. cement, bitumen, petrochemicals or paint must be disposed of at a registered hazardous landfill site.	C & PM	Ongoing monitoring.
	e. A sump must be created for any concrete waste. This is to be de-sludged regularly and the cement waste is to be removed to a tip site as approved by the local authority.	PM	As needed.
B.11 Social Impacts <i>Regular communication between the Contractor and the IAPs is important for the duration of the contract.</i>	B.11.1 Disruption of Infrastructure and Services		
	a. Contractors activities and movement of staff is to be restricted to designated construction areas.	ECO, C & PM	Ongoing monitoring.
	b. Should the construction staff be approached by members of the public or other stakeholders, they must assist them in locating the Engineer or Contractor, or provide a number on which they may contact the Engineer or Contractor.	C & PM	Staff to be made aware of this at the site induction meeting.
	c. The conduct of the construction staff when dealing with the public or stakeholders shall be in a manner that is polite and courteous at all times. Failure to adhere to this requirement may result in the removal of staff from the site by the Engineer or Contractor.	PM & C	Staff to be made aware of this at the site induction meeting.
	d. Disruption of access for local residents must be minimised and must have the consent of the Engineer. Any disruption to the railway transport services or the N3 must be communicated to, and approved by Spoornet and / or SANRAL prior to the activity which may cause disruption commencing.	PM & C	As needed.
	e. The Contractor is to inform neighbours in writing of disruptive activities at least 24 hrs beforehand. This can take place by way of distributing flyers to affected I&APs.	PM	As needed.
	f. Drivers of construction vehicles must exercise care when travelling to and from the site specifically when travelling through residential areas – a maximum speed limit of 40km/h must be adhered to. Drivers of construction vehicles must be considerate of other road users. They are to be especially	PM, ECO & C	Staff to be made aware of this at the site induction meeting.

	careful at narrow sections and water crossings.		
	B.11.2 Visual Impacts		
	a. Lighting on the construction site must be pointed downwards and away from oncoming traffic and nearby houses.	C, PM & ECO	During site setup and ongoing as required.
	b. The site must be kept clean to minimise the visual impact of the site.	C & PM	As required.
	c. If screening is being used, this must be moved and re-erected as the work front progresses.	C & PM	As required.
	B.11.3 Noise		
	a. Machinery and vehicles are to be kept in good working order for the duration of the project to minimise noise nuisance to neighbours.	C & PM	Ongoing monitoring.
	b. Notice of particularly noisy activities must be given to residents / businesses adjacent to the construction site. Examples of these include: noise generated by jackhammers; blasting; drilling; dewatering pumps.	C & PM	As required, at least 24hrs before the activity commences.
	c. Noisy activities must be restricted to normal weekday working hours.	C	Ongoing.
	d. The ambient noise levels relating to construction activities must not exceed 35dB adjacent to any residential areas.	C & PM	Ongoing monitoring.
	B.11.4 Communication with Interested and Affected Parties (IAPs)		
	a. The Engineer and Contractor are responsible for ongoing communication with those people that are interested / affected by the project.	C & PM	Ongoing for site setup.
	b. A complaints register must be housed at the site office. This must be in carbon copy format, with numbered pages. Any missing pages must be accounted for by the Contractor. This register is to be tabled during monthly site meetings.	C	Ongoing throughout the project lifecycle.
	c. IAPs need to be made aware of the existence of the	PM	Before construction

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	complaints book and the methods of communication available to them.		commences.
	d. Queries and complaints are to be handled by: - documenting details of such communications; - submitting these for inclusion in the complaints register; - bringing issues to the Engineers attention immediately; - taking remedial action as per Engineer’s instruction - informing the party who lodged the complaint of remedial action taken.	PM & ECO	As Required
	e. Selected staff are to be made available for formal consultation with IAPs (if required) in order to: explain the construction process; answer questions.	PM	Ongoing.
B12 – Cultural Environment	a. Should any archaeological sites or items of historical or archaeological value, including old stone foundations, tools, clay ware, jewellery, remains, fossils, graves etc be uncovered during construction, their existence must be reported to the ECO and AMAFA ,an archaeological study may be required.	C & PM	Ongoing.
	b. If any artefacts are uncovered the Research and Professional Services Division of AMAFA must be contacted and work must be stopped immediately. AMAFA’s head office is in Ulundi and a satellite office is located in Pietermaritzburg. Contact: Weziwe Tshabalala – tel: (033) 394 6543; fax :(033) 342 6097 or Barry Marshall fax: (035) 870 2054, PO Box 523, Ulundi, 3838.	PM & C	Ongoing if required.
B13 – Sewage and sanitation	a. During construction, portable sanitation facilities need to be erected. Use of these facilities must be enforced (these facilities must be kept clean so that they are a desired alternative to the surrounding bush). The sanitation facilities need to be monitored and serviced regularly as to prevent contamination of the ground water table. The placement of the toilets is to be undertaken in consultation with the landowner/occupant. The latrines must be sited taking into account the possibility of the prevailing wind unfavourably	C & PM	Ongoing monitoring.

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	<p>dispersing unpleasant odours and the location of water resources and must be placed at least 100 metres outside of any drainage lines and rivers.</p> <p>Washing and toilet facilities shall be provided on site and in the construction camp. The facilities shall comply with accepted norms and standards and shall have the approval of the land owner. No human excrement shall be left in the veld. If no toilet facilities are available such waste shall be buried immediately.</p>		
B14 - Security and Safety	B14.1 Signage		
	a. Any potentially hazardous areas such as excavated trenches/pits or chemical storage areas are to be demarcated and clearly signed in English and Zulu. Sidewall protection (e.g. shoring) to be erected for deep trenches as per the requirements of the Occupational Health and Safety Act of South Africa (OHSA).	C & PM	During site setup and as construction progresses.
	B14.2 Risks Associated with Materials on Site		
	a. Material stockpiles, such as pipes, must be stable and well secured to avoid collapse and possible injury to site workers / local residents.	C, ECO & PM	Ongoing.
	b. Fire fighting equipment must be present on site at all times.	C, ECO & PM	Ongoing.
	c. No materials are to be stored in unstable or high-risk areas such as in floodplains or on steep slopes.	C, ECO & PM	Ongoing with monitoring.
	B14.3 General Safety		
	a. The construction camp is to be securely fenced and locked when not in use. No unauthorised access is to be allowed to members of the public and people not associated with the construction process.	C & PM	Ongoing.
	b. After hours and weekend security is to be provided for the construction camp.	C	Ongoing.
c. Construction personnel to be issued with suitable PPE (e.g.	C & PM	Before any	

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	safety shoes, hard hats) free of charge and PPE for construction areas is be defined prior to the activity commencing.		construction or earthmoving activities occur and ongoing during construction.
	d. All procedures and equipment on site must be used in accordance with the occupational Health and Safety Act regulations of South Africa (OHSA), Act No. 85 of 1993).	C & PM	Ongoing.

10.3 Post-Construction Phase

Activity	Management / Mitigation	Responsibility	Frequency / Timing
C.1 - Construction Camp	C.1.1 Construction Camp Rehabilitation		
	a. All structures comprising the construction camp are to be removed from site.	PM & C	Project completion.
	b. The area that previously housed the construction camp is to be checked for spills of substances such as oil, paint and fuels, etc. and these must be cleaned up.	PM & C	Project completion.
	c. All hardened surfaces within the construction camp area must be ripped, all imported materials removed, and the area shall be top-soiled and re-grassed using the guidelines set out in the re-vegetation specification that is attached to this document.	PM & C	Project completion.
	d. The Contractor and Engineer must arrange the cancellation of all temporary services.	PM & C	Project completion.
C2 - Vegetation	C.2.1 Landscaping		
	a. All disturbed areas, or areas which have been engineered for the purpose of the development, are to be rehabilitated with indigenous vegetation which must be sourced from surrounding nurseries where possible. This will aid in preventing erosion within the site. A 100% indigenous planting plan must be adhered to in terms of all landscaping carried out on the site.	PM & C	Project Completion.

C3 – Land Rehabilitation	C.3.1 Land Rehabilitation		
	<p>a. Excavated soil and soil disturbance – excavated soil not used in the development must be disposed of in a registered landfill site. Soil disturbance will be minimized by establishing the extent of the construction site (pre-construction) and clearly demarcated in on-site layout plans. No construction personnel or vehicles may leave the demarcated areas except when authorized to do so by the Project Manager.</p> <p>Surfaces are to be checked for waste products from activities such as concreting etc. and cleared in a manner approved by the Engineer and ECO.</p>	PM, C & ECO	Project Completion.
	b. Rehabilitation must be executed in such a manner that surface runoff will not cause erosion of disturbed areas during and after rehabilitation.	PM	Project Completion.
	c. All areas to be vegetated that comprise surfaces hardened due to construction activities are to be ripped and imported material thereon removed.	C & PM	Project Completion.
	d. All rubble is to be removed from the site to an appropriate disposal site as approved by the Engineer. Burying of rubble on site is prohibited.	C & PM	Project Completion.
	e. The site is to be cleared of all litter.	C, PM & ECO	Project Completion.
	f. All embankments and open areas (areas to be landscaped) are to be trimmed, contoured, shaped and re-planted to the satisfaction of the Engineer. The engineer is to ensure that the rehabilitated areas allow free flow of runoff and will not result in ponding or saturated areas.	C & PM	Project Completion.
	g. All trimmed and / or compacted areas must be left rough to facilitate binding of topsoil and vegetation.	PM & C	Project Completion.
	h. The Contractor is to check that all watercourses are free from building rubble, spoils materials and waste materials.	PM, C & ECO	Project Completion.

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	i. All wetlands or aquatic systems affected by construction activities need to be rehabilitated as per the specification outlined in the Functional Assessment Report and Wetland Rehabilitation Plan to be completed post Environmental Authorisation.	PM & C	Project Completion.
	j. Monitoring and / or rehabilitation of impacted soils and / or groundwater may be required on areas where chemical spillages have occurred during construction. These requirements would be dependent on the comments received from the ECO and relevant Authorities when the spillage was reported. The costs of any post construction monitoring / rehabilitation of impacted soils / water resources will be borne by the contractor.	PM & C	Monitoring / rehabilitation may extend beyond project completion.
C4 – Materials and Infrastructure	C.4.1 Removal of Barriers, Remediation of Damage		
	a. All material used for building and maintenance must be removed from site after construction or maintenance.	PM & C	Project Completion.
	b. All leftover building materials must be removed from the site.	PM & C	Project Completion.
	c. The Contractor must repair any damage that the construction works has caused to adjacent areas.	PM & C	Project Completion.
	d. Fences, barriers and demarcations associated with the construction phase are to be removed from the site unless stipulated otherwise by the Engineer.	PM & C	Project Completion.
	e. All residual topsoil stockpiles must be removed to registered landfill sites or spread on site as directed by the Engineer.	PM & C	Project Completion.
	f. All areas where temporary services were installed are to be rehabilitated to the satisfaction of the Engineer and ECO.	PM & C	Project Completion.
C5 - General	C.5.1 General Remediation		
	a. Temporary road works must be closed and rehabilitated; access across these roads must be blocked.	PM & C	Project Completion.
	b. All areas where temporary services/infrastructure were installed are to be rehabilitated to the satisfaction of the Engineer and ECO.	C, PM & ECO	Project Completion.
	c. The areas proposed for development would have to be fenced	PM & C	Project Completion

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	<p>prior to commencing construction processes. The purchasers of an proposed development area would have to employ a security company to manage security during the construction phase. In the operational phase, the management body/ies of the built development would have to employ a security company to manage security in the operational phase.</p>		<p>and prior to operation.</p>
	<p>d. A Meeting is to be held on site between the Engineer, ECO, and the Contractor to approve all remediation activities and to ensure that the site has been restored to a condition approved by the Engineer and ECO. On completion of any phase, a post construction environmental audit report must be submitted to the KZN DAEARD compliance and Monitoring Department.</p> <p>The Audit Report Must:</p> <ul style="list-style-type: none"> • Be carried out by an independent auditor or ECO • Include the environmental status post construction • Include the rehabilitation plan carried out after construction • Include an audit on the extent of compliance with the conditions of the Environmental Authorisation and the Approved EMP • Include the notes taken during the weekly site inspection. 	<p>C, PM & ECO</p>	<p>Project Completion.</p>

10.4 Operational Phase

Activity	Management / Mitigation	Responsibility	Frequency / Timing
D1 – Vegetation / Landscape Management	a. All rehabilitated areas must be maintained and re-seeded if necessary. Encroachment of invasive alien plants in this regard will need to be monitored on a regular basis to prevent re-infestation. This would need to be undertaken by the Proponent or designated management authority	Pro	Ongoing
	b. Of critical importance would be the rehabilitation and continued management of the wetland and drainage line post approval. A comprehensive rehabilitation plan would have to be drawn up to deal with all aspects of the proposed development. The developer would fund the initial rehabilitation of the wetland, including reinstatement of buffers and the required vegetation mosaic as recommended by the herpetological specialist. This would be completed as that phase of the development is implemented. The long term maintenance of the wetland and its buffer zones would be managed by the landowner, Mondi, in conjunction with existing management programmes involving the Hilton / Mondi Conservancy. Should the land be ceded to the municipality, then the municipality would be responsible for ensuring correct management of the wetland areas.	Pro	Ongoing
D4 - Storm Water Management	a. The storm water management system for the development and associated access roads needs to be monitored and maintained on a regular basis as directed by the engineer.	Pro	Ongoing
	b. All storm water attenuation measures must be monitored on an annual basis through a general environmental audit of the development.	Pro	Ongoing
D5 - Solid Waste / Refuse Removal	a. The removal of waste generated through general operational activities and maintenance must be undertaken by the Local Municipality waste removal services or a suitable waste removal	Pro	Prior to operation and Ongoing

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	<p>company as and when required. All waste will need to be transported to an appropriate landfill site for disposal. The Proponent is required to develop a specific waste management plan for the internal collection of waste on the development site. All waste collected internally must be stored in scavenger proof receptacles within a securely fenced and designated area for collection by the Local Municipality/waste removal contractor. Recycling of waste must be considered whilst drafting the site specific waste management plan.</p>		
D6 - Sewage	<p>a. All the necessary sewage infrastructural upgrades to accommodate the various components of the development will need to be completed prior to operation of any given component. In this regard all service agreements and approvals will need to be obtained prior to construction of the project. Any commercial effluent would have to meet relevant standards outlined by DWAF before discharge; this comprises Special Limit Values in this instance.</p>	Pro	Prior to operation and Ongoing
D7 – Electrical Supply	<p>a. All the necessary electrical infrastructural upgrades to accommodate the various components of the development will need to be completed prior to operation of any given component. In this regard all service agreements and approvals will need to be obtained prior to operation.</p>	Pro	Prior to operation and Ongoing
D8 – Potable Water Supply and General Water Management	<p>a. All the necessary potable water infrastructural upgrades to accommodate the various components of the development will need to be completed prior to construction of any given component. In this regard all service agreements and approvals will need to be obtained prior to operation.</p>	Pro	Prior to operation and Ongoing
	<p>b. Rainwater harvesting must be implemented where ever possible for the watering of landscaped areas.</p>	Pro	Ongoing

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D9 - Soil Erosion	<p>a. The following measures need to form part of the management of the site:</p> <ul style="list-style-type: none"> • Monitoring storm water exit points. • Fill in and re-vegetated eroded areas. • Regularly maintain storm water structures to maintain effectiveness. 	Pro	Ongoing
D10 – Safety and Security	<p>a. All development areas are to be suitably fenced and secured to prevent unauthorised access and theft / tampering with the facilities and surrounds.</p>	Pro	Ongoing
	<p>b. A security management plan must be developed prior to operation and implemented during operation. This should include the employment of security guards for patrolling the development after normal business hours and must include the potential problem areas.</p>	Pro	Ongoing
D11 – Management of the Development	<p>a. A Management Authority is to be established to, enforce the requirements of the environmental authorisation, EIR (including all mitigation measures provided), enforce the Conditions of Establishment (as provided for in the planning approval), and to enforce the conditions in the Environmental Management Plan (forming part of the Record of Decision).</p>	Pro	Ongoing
D12 – Aesthetic Requirements	<p>a. The development and or any future upgrades must be constructed with non reflective materials and paints must have a matt finish.</p>	Pro	During Construction and Ongoing
	<p>b. Any external spotlights/security lights must be shielded and directed downwards such that the point source of the lights is not visible</p>	Pro	During Construction and Ongoing
	<p>c. Roofs are not permitted to be reflective; if metal sheeting is to be used then this will have to be painted with a matt non-reflective paint.</p>	Pro	During Construction and Ongoing
D13 – Fire fighting	<p>a. Fire extinguishers / fire fighting equipment are to be kept on site at all times. The local Fire Chief must inspect the development on completion, and prior to operation, to ensure all of the required fire fighting equipment is in accordance with</p>	Pro	Ongoing

	municipal bylaws and is suitable for the future operational use.		
D14 - Social Impacts	<p>a. The preferential procurement policy must also be adhered to in the operational phase. A prime recommendation is that local employment be maximised during operation. This would require an analysis of skills of adjoining communities, with the participation and input of relevant representatives from the local municipality and any traditional authority in the area. The co-operation of business owners, in carrying out training and capacity building programmes, would be vital. Procedures of employment, training and BEE components should be formalised post Environmental Authorisation, assuming all components of this development will proceed, and included into sale documentation. Gender mainstreaming would be paramount in this municipality. Procedures and policies would need to be put in place to encourage Black Economic Empowerment and the advancement of historically disadvantaged communities.</p> <p>This would need to be placed in the context of fair business practice, including the procurement of local goods and services – where available, and the development of mutually profitable business relationships with a diverse range of suppliers.</p>	Pro	Prior to operation and Ongoing
	<p>b. While it cannot be expected of the developers to take over the responsibility of relevant authorities, such as the municipality, with regard to security and service provision, some investment or support with a view to augmenting capacity in this regard could be considered as mitigation for the possible impacts of additional pressure arising in the area resulting from the development. Mitigation measures could include the following:</p> <p>(i) An awareness programme undertaken to advise on the type of jobs, and possibly the limited amount of jobs available to people in the surrounding areas.</p>	Pro	Prior to operation and Ongoing

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	<ul style="list-style-type: none"> (ii) Employment opportunities and the conditions for employment application need to be clearly defined and communicated to surrounding communities. (iii) Employment ‘hiring’ should not be undertaken at the sites of the proposed development i.e. the site “gates”, but rather through existing structures and community (iv) Procedures and policies may need to be put in place to encourage Black Economic Empowerment and the advancement of historically disadvantaged communities. (v) The above should be made a condition of contract for work on this development. (vi) Community facilities or structures could conceivably facilitate a collaboration between the local municipality, community leadership of the development’s surrounding areas and various developers to form a type of information bureau/agency with an inventory of work available at the various developments and the human capital/resources from the area who would be available for work. (vii) Security measures may need to be in place to minimize the adverse impacts of any abnormal influx of job seekers and the possible increase in vandalism and crime due to this influx. Developers in the area may need to co-operate with local authorities, including the police, the municipality, the community leadership and adjoining settlements to control or prevent uncontrolled establishment of informal settlements. 		
	c. Any known ties with existing tenure areas (e.g. grave sites,	Pro	Ongoing

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	rights of way, etc) require due consideration and protection.		
D15- Compliance with Record of Decision and other planning regulations and specifications	a. All conditions and designs stipulated by the Engineer and contained within the Record of Decision must be strictly adhered to by all members of the development during all phases of the development. National and Local regulations/bylaws pertaining to the development components must also be adhered to at all times.	Pro	Ongoing

10.5 Decommissioning Phase

The objective of providing guidelines during the decommissioning phase is to prevent structures from being left to deteriorate and look unsightly. It is imperative that non-functional structures be removed as soon as possible, and that the site is rehabilitated as soon as possible. If non-functional structures are not needed anymore, but are to remain on site, they must be maintained to prevent the environmental degradation of the site.

It is noted that the Proponent/Landowner is responsible for compliance with the provisions for duty of care and remediation of damage in accordance with Section 28 of National Environmental Management Act (NEMA), Act no. 107 of 1998. The determination of damage resides with the KZN DAEARD.

10.6. Staff Conduct Control and Information Sheet during Construction Activities

	<u>ALL STAFF MUST OBEY THE FOLLOWING RULES:</u>
1	DO NOT leave the construction site untidy and strewn with rubbish that will attract animal pests.
2	DO NOT bring your pets to the construction site.
3	DO NOT trespass on private properties not linked to the project.
4	DO NOT carry a weapon on the construction site or in the vehicles transporting workers to and from the construction site.
5	DO NOT set fires unnecessarily.
6	DO NOT cause any unnecessary disturbing noise at the construction camp/site or at any designated worker collection/drop off points.
7	DO NOT drive a construction-related vehicle under the influence of alcohol.
8	DO NOT exceed the national speed limits on public roads or exceed the recommended speed limits in this management plan (where applicable) whilst driving a construction vehicle.
9	DO NOT drive a vehicle that is generating excessive noise (noisy vehicles must be reported and repaired as soon as possible).
10	DO NOT litter along the roadsides, including both public and private roads.

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11	DO NOT remove or destroy vegetation at the construction camp/construction site without the prior consent of the Project Manager and Environmental Control Officer.
12	DO NOT tamper with, destroy or remove vegetation from any areas that have been fenced off or marked.
13	DO NOT pollute wetland areas or watercourses, whether flowing or not.
14	DO wear the stipulated PPE (e.g. hard hats, safety boots etc) required of you.

11. STORM WATER & SEDIMENT MANAGEMENT

During Construction

As far as possible, all storm water contaminated with silt and soil fines must be prevented from entering watercourses and wetland areas by the installation of diversion berms and containment bunds. Clean storm water must be diverted away from contaminated storm water at construction sites so that the mixing of the two does not take place. Trapped sediment resulting from the containment of storm water must be drummed for disposal at contaminated waste sites. No silt, soil fines, cement, bitumen, petroleum products domestic waste or any other waste products must be allowed to disperse into the surrounding areas adjacent to the construction camp or the construction sites.

To prevent storm water damage, the increase in storm water runoff resulting from the construction and operation must be estimated and the drainage system assessed accordingly. A drainage plan which includes all associated infrastructure and a detailed stormwater management layout plan must be developed and submitted to the Municipal Engineer and DWAF for approval.

During site establishment, storm water culverts and drains are to be located and covered with metal grids where needed to prevent blockages. Temporary cut off drains and berms may be required to capture storm water and promote infiltration. Appropriate drainage mechanisms also need to be constructed along the access servitudes to minimise damage to the servitudes and control storm water flow from the access roads.

It is envisaged that some temporary storage of hazardous chemicals will be required during construction (i.e. potentially paints, solvents, lubricants and fuel). Chemicals for construction must be stored in a temporary impervious bund/s. Rainwater in the temporary bund must not be disposed of directly to environment unless it has been established by chemical testing (e.g. COD analysis) that this water is definitely not contaminated. If possible temporary roofing above the temporary chemical bund/s should be installed to stop ingress of rain water into bund/s.

Additional measures

The establishment of a 30 m buffer zone is required along the properties bordering the wetlands, to effectively manage storm water and sources of pollution. The type of buffer to be implemented is critical in achieving protection of the wetland, and this should be in the form of a linear mosaic to provide an ecological transition between the wetland and the new development. These buffer zones should be constructed as linear mosaics, to include patches of reeds, rock piles, and shallow ponds, along with clumps of low indigenous vegetation. The essential features include patches of indigenous vegetation, small piles or rocks with mean diameters between 200 and 800 mm, reed beds planted in small depressions, and shallow depressions with diameters of 4 to 5 m, that will serve as ponds during the rainy season. The ponds should be linked by the reed bed depressions, to serve as bio-filters.

The attenuation dams and reed filter beds must be constructed in the initial phase of the development proposal to facilitate the control of stormwater and silt runoff which normally occurs during construction activities. Design criteria for the attenuation dams must ensure that post development flows are attenuated to pre development flows and take into account 1:10 and 1:50 year flood events.

Prior to the operation / occupation of any component of the development proposal the sewage treatment plant must be fully operational. Base line water quality samples must be taken prior to construction commencing. Following this samples should be taken every 3 months during construction, and annually over a 3 year period when the site becomes fully operational. Findings of the water quality sampling must be included in the quarterly audit reports which will be submitted to the KZN DAEARD and DWAF.

Post-construction

The storm water management system for the development and associated access roads needs to be monitored and maintained on a regular basis as directed by the Proponent/Management Authority. All storm water attenuation measures must be monitored on an annual basis through a general environmental audit of the site.

12. SPILL CONTINGENCY PLAN

During Construction

No concrete transport vehicles to be washed on site. Where concrete, is spilt, clean-up and rehabilitation must be executed. All concrete mixing that is to take place for the construction phase must be undertaken in a controlled environment and on a suitable surface to avoid the contamination of the soil surrounding the area where the concrete is to be used. Any spillage or concrete that has leaked off the designated mixing areas needs to be collected and dumped at a registered landfill site. Waybills from the registered landfill site will need to be provided on request to the ECO.

Construction phase chemicals (e.g. diesel, lubricating oils, paints and solvents) are to be stored in a temporary impervious bund. Absorbent material must be kept on site to clean any minor chemical spills into bund. Spent absorbent material is to be regarded as a hazardous waste. Rainwater in temporary bund to be regarded as potentially contaminated and must not be released to the environment unless it is established by chemical analysis (e.g. COD) that water is not contaminated. Portable construction equipment (e.g. generators) to be preferably parked on impervious surfaces. Alternatively drip trays need to be provided for portable construction equipment. Any chemical spills onto soil to be reported by contractor to PM and ECO. PM and / or ECO to evaluate extent of spill and required to report spill to KZN DAEARD and DWAF if the spill is regarded as significant. Monitoring and / or rehabilitation of impacted soils and /or groundwater may be required depending on authority requirements. The Contractor is to be responsible for cost of monitoring and / or rehabilitation of any soils / groundwater impacted by chemical spills from construction activities. Safe disposal certificates to be retained by contractor and / or project manager for any material associated with chemicals / chemical spills disposed to landfill.

Should any significant chemical spillages occur the following steps must be followed:

- Stop the source of the spill
- Contain the spill
- All significant spills must be reported to DWAF, KZN DAEARD, the ECO and PM
- Remove the spilled product for treatment or authorised disposal

- Determine in conjunction with the ECO if there is any soil, groundwater or other environmental impact
- If deemed necessary by DWAF or the ECO, remedial action must be taken
- The incident must be documented and reported to KZN DAEARD

During Operation

No activities which could result in spillages of hazardous materials are expected during operation. All individual businesses purchasing a site in the Business Park and Light Industrial zones would have to produce a spill contingency plan relevant to that business prior to occupation of a site. This would have to be provided to the municipality and DWAF for approval prior to commencement of the activity.

13. GENERAL WASTE MANAGEMENT PLAN

During Construction

Receptacles with suitable covers must be provided to prevent scavenging; these receptacles must be conveniently placed for the workforce. Any temporary waste storage facility should be roofed to prevent ingress from rainwater which could become contaminated from the waste. All the receptacles must be removed from the site for disposal at a licensed landfill facility on a weekly basis (minimum) or as required. They are then to be returned to their positions and must progress with the work front. Under no circumstances is waste to be buried or burned. Used oils, grease or hydraulic fluids must be placed in sealed containers within bunded areas and removed on a regular basis or as needed to a register hazardous waste landfill facility. Recycling is encouraged and separate receptacles should be provided for sorting of waste.

No waste is to be left on site whether it be biodegradable or not. Unutilised, construction materials are to be removed once construction has ended, e.g. crushed stone and building rubble may not be left or randomly strewn around the site. No waste must be left in the veld or on the line route. Waybills for all waste disposed of at registered landfill sites will need to be filed and presented to the ECO on request.

Waste from the temporary ablution facilities, which will be provided during the construction phase, will need to be disposed of by a licensed waste disposal company; a service agreement will be entered into between the contractor and the disposal company in this regard.

If possible, any chemicals spilled into the temporary impervious bund containing chemicals should be recycled. Any chemical spills into the temporary bund which cannot be recycled should be regarded as a hazardous waste. Absorbent material must be kept on site to clean any small chemical spills in the temporary bunded areas. Spent absorbent material is to be regarded as a hazardous waste. Any fuel captured by drip trays to be recycled if possible or alternatively regarded as a hazardous waste. Rainwater from temporary bunds which is contaminated is to be either transferred to a waste water treatment works (if of a suitable quality) or else regarded as a hazardous waste. Packaging for chemicals is to be disposed of as a hazardous waste if it cannot be reconditioned, recycled or returned to supplier. Safe disposal certificates are to be retained by the Project Manager for all hazardous waste disposals.

During Operation

Every component of the development will have specific requirements in terms of waste management during the operational phase. It is therefore recommended that any new business on an erf, prior to operation, has a waste management plan developed in accordance with its specific requirements. The waste management plan must be developed by the Proponent or Project Manager in consultation with the ECO and incorporate the following general aspects:

- The provision of receptacles with suitable covers to prevent scavenging.
- Positioning of a secure fenced area for containing the waste receptacles, this area should preferably have a roof.
- Recycling plan.
- Refuse collection frequency.
- Responsible persons for waste management.
- Details of internal refuse collection and frequency from all components of the Project (if needed)
- Details of the service agreement with the municipality or any other waste removal contractor.

14. WETLAND MITIGATION AND REHABILITATION PLAN

A comprehensive wetland rehabilitation and buffer establishment plan must be compiled post Record of Decision to ensure the effective implementation of the requirements in these areas adjacent to the proposed development areas. The following would form the framework of this plan:

- (i) Management and mitigation measures will need to be employed to ensure that the water resource is maintained in the desired future class. This would be based on the current status of the water resource (PES from Wet-Health assessment) and the importance and sensitivity (IS) of the wetland (DWAF, 2007).
- (ii) Indigenous wetland vegetation that will be destroyed during construction (development area “C” in particular) should be identified, removed and stockpiled prior to construction for use in wetland rehabilitation. This would pertain mainly to reeds and sedges. Where possible, cut vegetation to ground level rather than removing completely, leaving root systems to ensure rapid re-colonisation.
- (iii) Wetland species rescued should be used to rehabilitate existing wetland areas in order to meet the proposed management objective to maintain the present wetland condition.
- (iv) Commercial plantations and alien plants requiring removal should ideally be removed from the wetland and surrounding area during dry periods (winter months) when rainfall is low. Leaf litter should be allowed to remain on the ground as mulch so as to prevent erosion of bare soils. This will also serve to filter sediment from runoff.
- (v) Bare ground exposed after vegetation removal must be rehabilitated as soon as practically possible to reduce exposure to erosion and sedimentation.
- (vi) Storm flows from developed areas may be allowed to flow towards the wetland but an appropriate vegetated buffer zone should be in place to allow a reduction in flow velocity before reaching the wetland. The buffer will also serve to trap any sediment before flows reach the wetland proper.

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- (vii) An appropriate vegetated buffer zone should be created between the wetland boundary and wastewater treatment works. Treated effluent should be allowed to filter through the vegetated buffer before entering the wetland proper. Additional flows directed towards wetland areas should first be allowed to enter a vegetated buffer zone designed to reduce flow rates and encourage water infiltration.
- (viii) Any existing and additional erosion gullies found threatening wetland areas need to be filled and stabilised.
- (ix) Remove and effectively treat any alien plants. The use of herbicides will require an investigation into the necessity, type to be used, effectiveness and impacts of the agent on aquatic biota.
- (x) Rehabilitate wetland areas with suitable indigenous vegetation as part of the objective to maintain/improve the present condition of the wetlands.
- (xi) The establishment of a 30 m buffer zone along the properties bordering the wetland drainage, to effectively manage storm water and sources of pollution. The type of buffer to be implemented is critical in achieving protection of the wetland, and it is suggested that this be in the form of a linear mosaic to provide an ecological transition between the wetland and the new development. These buffer zones should be constructed as linear mosaics, to include patches of reeds, rock piles, and shallow ponds, along with clumps of low indigenous vegetation. The essential features include patches of indigenous vegetation, small piles or rocks with mean diameters between 200 and 800 mm, reed beds planted in small depressions, and shallow depressions with diameters of 4 to 5 m, that will serve as ponds during the rainy season. The ponds should be linked by the reed bed depressions, to serve as bio-filters.
- (xii) The terrestrial buffer (30m) adjacent to the wetlands would be cleared of commercial timber trees and planted with an appropriate grass seed mix; these areas would need to be stabilised to prevent erosion and allow the seeds to germinate, set root, and bind the soil.

16. ACKNOWLEDGEMENT FORM

Record of signatures providing acknowledgment of being aware of and committed to complying with the contents of this Environmental Management Plan (EMP) during all phases of the development, which relates to the environmental mitigation measures for the project outlined below, and the environmental conditions contained in the civil and other construction contract documents.

PROJECT NAME:

**KZN DAEARD REFERENCE: DC22/0061/08 – “HILTON-MONDI”
DEVELOPMENT AND ASSOCIATED INFRASTRUCTURE ON PORTIONS 669 (of
4) OF THE FARM GROENE KLOOF NO. 900 AND PORTIONS 6 AND 212 (of 6) OF
THE FARM DRIE FONTEINEN NO 952, PROVINCE OF KWAZULU-NATAL,
HILTON, UMNGENI MUNICIPALITY.**

DEVELOPER / PROPONENT:

Signed: Date:

PROJECT MANAGER:

Signed: Date:

ENVIRONMENTAL CONTROL OFFICER

Signed: Date:

CONTRACTOR:

Signed: Date:

CONTRACTOR:

Signed: Date:

CONTRACTOR:

Signed: Date:

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