



Eco Route

ENVIRONMENTAL CONSULTANCY
REGISTRATION NO. 1998/031976/23

DR. COLLEEN EBERSOHN

PhD Univ. Pretoria

Cell: 072 222 6013

e-mail: ebersohn@cyberperk.co.za

MS. JANET EBERSOHN

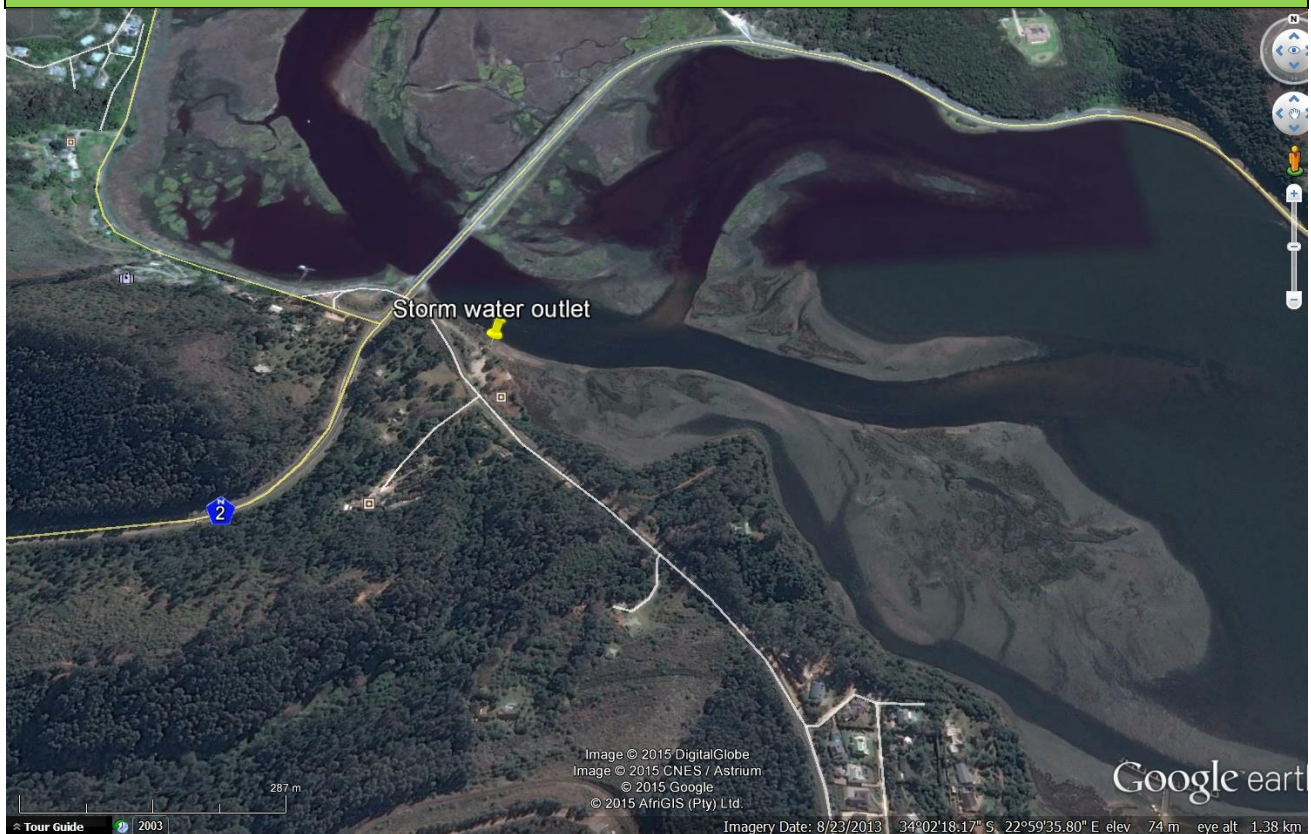
Bsc. Hons. Environmental Management

Cell: 082 557 7122

e-mail: janet@ecoroute.co.za

Proposed Crabs Creek Development Portion 29 of the Farm Uitzicht 216, Knysna

Environmental Management Programme



Compiled by:

Janet Ebersohn
Bsc. Hon. Environmental Management



Eco Route Environmental Consultancy

Tel: 064 691 4394

Fax: 086 402 9562

Cell: 082 557 7122

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1. INTRODUCTION

Environmental Management Programme Requirements

The National Environmental Management Act, 1998 (ACT NO. 107 OF 1998) regulation no.326 as amended, Appendix 4 stipulates the required information that must be incorporated within an Environmental Management Programme (EMPr). The checklist below serves as a summary of how these requirements were incorporated into this EMPr.

Content of environmental management programme (EMPr):

1. (1) An EMPr must comply with Section 24N of the Act and include –

<p>(a) details of –</p> <ul style="list-style-type: none"> i. The EAP who prepared the EMPr; and ii. The expertise of that EAP to prepare the EMPr, including a curriculum vitae; 	<p>This EMPr was prepared by Janet Ebersohn of Eco Route Environmental Consultancy. Janet Ebersohn has more than 10 years' experience as an Environmental Assessment Practitioner. Please see attached CV of the EAP.</p>
<p>(b) a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;</p>	<p>This EMPr covers all aspects involved in the proposed re-development of the Crabs Creek Restaurant, Farm Stall and new Residential Dwelling.</p> <p>Sections 2 – 4 provides details of the proposed Project</p>
<p>(c) a map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on environmental sensitivities of the preferred site, indicating any areas that should be avoided including buffers;</p>	<p>Section 5 has the Site Development Plan and the SDP is attached as Appendix B and accompanying GIS maps includes sensitive areas of the site.</p>
<p>(d) a description of the impact management <u>outcomes</u>, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including –</p> <ul style="list-style-type: none"> i. Planning and design ii. Pre-construction activities iii. Construction activities iv. Rehabilitation of the environment after construction and where applicable post closure; and v. Where relevant, operation activities 	<p>Addressed in Section 7</p>
<p>(f) a description of proposed impact management actions, identifying the manner in which the impact management outcomes contemplated in paragraph (d) will be achieved, and must, where applicable, include actions to –</p> <ul style="list-style-type: none"> i. Avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation; ii. Comply with any prescribed environmental management standards and practises; iii. Comply with any applicable provisions of the Act regarding closure, where applicable; and iv. Comply with any provisions of the Act regarding 	<p>Addressed throughout the EMPr, specifically Section 15</p>

financial provision for rehabilitation, where applicable;	
(g) the method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Addressed throughout the EMPr, specifically Section 15
(h) the frequency and monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 12.
(i) an indication of the persons who will be responsible for the implementation of the impact management actions;	Section 10-12.
(j) the time periods within which the impact management actions contemplated in paragraph (f) must be implemented;	Section 10-12, 15.
(k) the mechanism for monitoring compliance with the impact management contemplated in paragraph (f)	Section 15.
(l) a program for reporting on compliance, taking into account the requirements as prescribed by the regulations;	Section 15.
(m) an environmental awareness plan describing the manner in which – i. The applicant intends to inform his or her employees of any environmental risk which may result from their work; and ii. Risks must be dealt with in order to avoid pollution or the degradation of the environment; and	Section 14 & 15.
(n) any specific information that may be required by the competent authority	All required information has been addressed.

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 Programme (EMPr) is “to describe how negative environmental impacts will be managed, rehabilitated or monitored and how positive impacts will be maximised”.

National Environmental Management Act, (Act 107 of 1998)

(i) Section 28 of NEMA (National Environmental Management Act, Act 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 avoided or stopped, to minimise and rectify such pollution or degradation of the environment"

This EMPr must form an integral part of the contract documents, as it outlines the methodology & duties required so that the project objectives can be achieved in an environmentally sustainable manner; with particular reference to the prevention and mitigation of environmental impacts caused by construction activities associated with this project.

These requirements will have a financial impact on the projects costings.

This EMPr is a dynamic document that may need to evolve during its implementation period so that it recognises any new issues that may arise; or changes in the parameters of identified issues and can address these issues with the required/amended mitigation.

The Polluter-Pays Principle

This principle provides for “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.” The Polluter Pays Principle will be rigorously applied throughout the construction and operational phases of this project.

The EMPr will address the environmental impacts during the:

- i. Planning and design phase
- ii. Pre-construction activities
- iii. Construction activities
- iv. Rehabilitation of the environment after construction
- v. Where relevant, operation activities

The main objective of the EMPr is to ensure environmental protection throughout the life span of the project on the receiving environment.

The EMPr consists of various environmental specifications and recommendations in order to achieve the less negative environmental impacts on the receiving environment. The EMPr will indicate what measures need to be implemented to ensure appropriate restoration of areas affected by the proposed project and prevent long term environmental degradation.

The contractor must be made aware of the environmental obligations that are stipulated in the EMPr. The contractor must declare themselves to be conversant of all relevant environmental legislation, the conditions in the Environmental Authorisation (EA) and the EMPr.

2. PROJECT DETAILS

Portion 29 of the Farm Uitzicht 216 is situated within the Knysna Municipal Area and is located on the south western bank of the Knysna Estuary bordering SANParks.

The property is currently vacant but was previously used for tourist facilities that included a restaurant, gift shop and farm store.

The proposed development will consist of the following:

- a Restaurant 400m²
- Farm Stall 200m²
- Residential Dwelling 500m²
- Parking bays

The buildings are being setback from the original footprints of the demolished buildings to the +2.85 m MSL in order to take climate change and storm surges into consideration.

The following key findings of Laurie Barwell's Shoreline Stability Assessment and abiotic design parameters for the proposed development on portion 29 of farm Uitzicht 216, Belvidere Knysna will be included to prevent flooding and climate change:

- Floor levels will be raised to + 3,2 m MSL
- Service infrastructure (e.g. water, sewage and electricity cable lines) will be located above +2,85 m MSL
- Rehabilitation of the upper marsh area and Ecotone

3. LOCATION INFORMATION

Province:	Western Cape
District Municipality:	Eden Municipality
Local Municipality:	Knysna Municipality
Ward number(s):	Ward 5
Nearest town(s):	Knysna
Farm name(s) and number(s):	Farm Uitzicht No 216
Portion number(s):	Portion 29

4. PROPERTY INFORMATION

Farm Name	Portion 29 of the Farm Uitzicht NO 216
Surveyor General 21 digit code:	C03900010000021600029
Zoning:	Agriculture with consent use for a restaurant, farm stall
Urban Edge:	No
Applicant name:	Crabs Creek (Pty) Ltd
Registration number (if applicant is a company):	91/04384/07
Trading name (if any):	Crabs Creek (Pty) Ltd
Responsible person name:	Mr John M. Sayers
Applicant/ Responsible person ID number:	5208195024082
Responsible position, e.g. Director, CEO, etc.:	Developer
Physical address of applicant:	16 Olive Crest, 288 Quorn Drive, North Riding
Postal address:	P.O. Box 41041, Craighall Park, Gauteng
Postal code:	2024
Telephone:	(011) 794 8810
Fax:	086 605 9620
E-mail:	johnsayersmeyric@global.co.za
GPS point middle of property:	34°01.59'.76" S 22°59'32.62"E

5. SITE DEVELOPMENT PLAN

The below map indicates the proposed activity, its associated structures and infrastructure and environmental sensitive (no-go areas including a buffer area) areas of the site. A3 Maps is attached as appendix B to this document.



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e-mail: janet@ecoroute.co.za

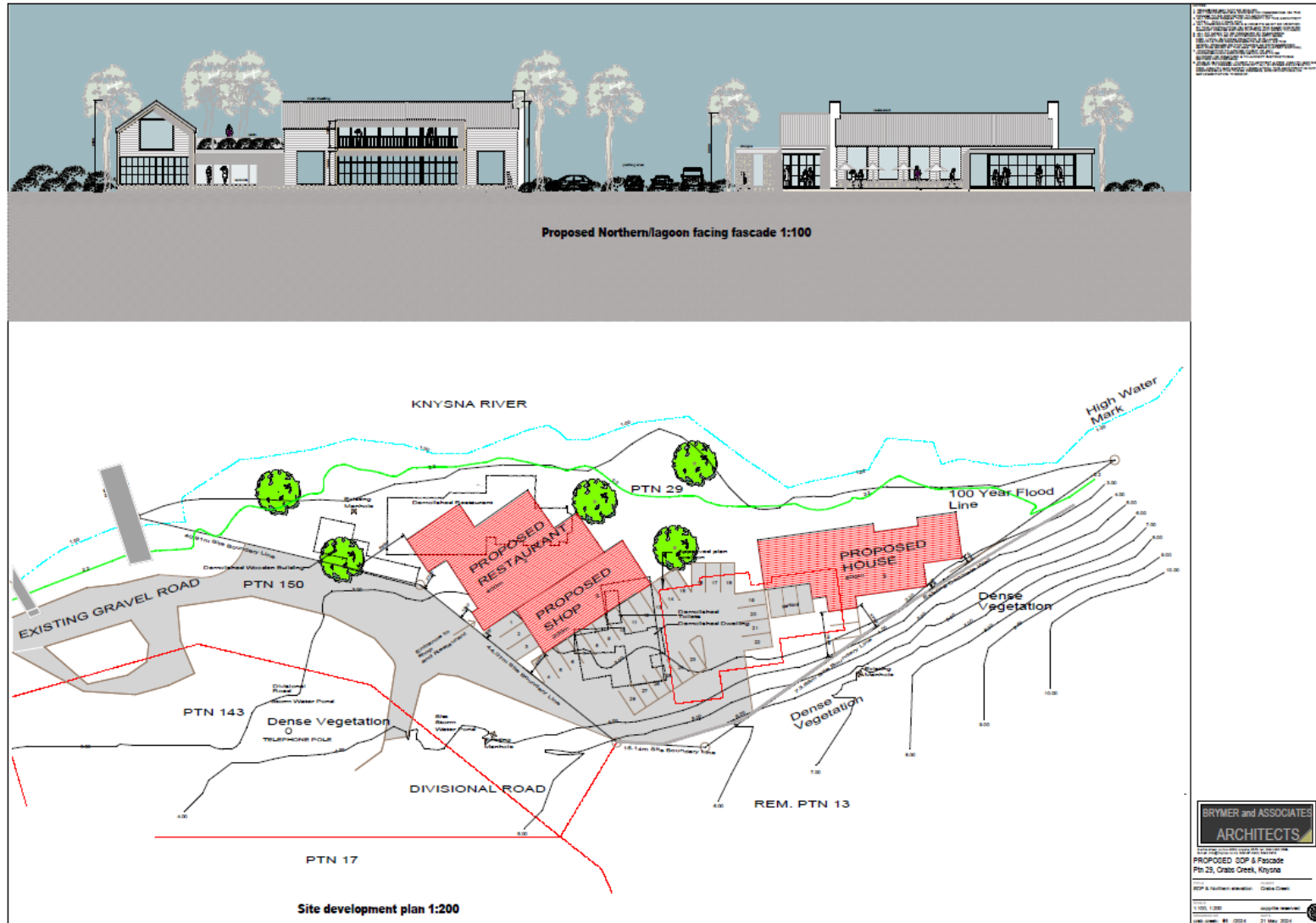


Figure 1: Site Development Plan

6. ENVIRONMENTAL SENSITIVITY MAPS



Figure 2: Critical Biodiversity Map (Aquatic) – no buildings will be within the CBA



Figure 3: Ecological Support Area (Restore)



Figure 4: Protected Area



7. MITIGATION AND MANAGEMENT MEASURES

Construction Phase:

Potential impacts on geographical and physical aspects:	
Nature of impact:	Climate Change and Storm Surges
Proposed mitigation:	<p>The reconstruction of the restaurant, farm stall and new residential dwelling has been moved back from the original footprint, to the +2.85m MSL. The floor levels will be raised to 3.2 MSL. The proposed development is also situated outside the 1:100 year flood line. Retreating and elevating (raise infrastructure above the hazard level) the restaurant, farm stall and residential dwelling is a sensible mitigation measure to climate change.</p> <p>Rehabilitation of the upper marsh area and Ecotone from +1.42m MSL to the +2.0 MSL will assist with mitigation of flooding during storm surges and high intensity rainfall.</p> <p>The construction of a retention pond/ artificial wetland will manage storm water runoff from the Brenton road and avoid ponding.</p>

Potential impacts on geographical and physical aspects:	
Nature of impact:	Soil compaction as a result of the proposed restaurant, farm stall and residential dwelling will have a footprint of 1100m ² with a coverage of 27.18%
Proposed mitigation:	Estuarine vegetation serves to bind the sand and mud's located along the estuary embankment. Currently there is an inappropriate stormwater outfall that discharges water from the Brenton road into the salt marsh. This concentrated water results in erosion, undermining of rigid structures and results in shoreline erosion.

	<p>Re-direct water of hardened structures into rain water tanks and natural vegetation.</p> <p>Vegetation within the tidal and upper marsh zones forms a natural buffer for storm water erosion. Setting the proposed development back to the 2.85m MSL and rehabilitating the degraded salt marsh will in all probability mitigate the effect of storm water erosion.</p> <p>Stormwater management plans must be established in conjunction with Knysna Municipality and SANParks to address the current storm water issues on the property, from the Belvidere/Brenton road</p>
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Potential impact on biological aspects:	
Nature of impact:	<p>Loss of indigenous vegetation (biodiversity) as a result of construction a restaurant, farm stall and residential dwelling.</p> <p>As per the specialist ecological analysis report:</p> <ul style="list-style-type: none"> • The largest area on the study site (71%) is categorised as ‘transformed’ and vegetation consist of the garden variety with major infestation by invasive exotic plant species. • A small percentage ($\pm 10\%$ cover) of the area consist of indigenous vegetation, mostly restricted to the Ecotone and salt marsh area, intercepted with dense stands of alien invasive Kikuyu lawn grass.
Proposed mitigation:	<p>It is imperative that impacts on the continuity of ecological processes and corridors be taken into consideration irrespective of the type of land use proposed or envisaged in the region as a whole.</p> <p>The proposed development should allow for a vegetated buffer strip, set back from the estuary banks. Stormwater erosion control measures need to be implemented regardless of development being authorised on the property.</p> <ol style="list-style-type: none"> 1. Removal of Alien Invasive Species during construction phase 2. Re-instatement of Salt marsh vegetation and coastal thicket in areas currently prone to invasion by Kikuyu lawn grass adjacent to the Salt Marsh Area.

Potential impact on biological aspects:	
Nature of impact:	Pollution of the salt marshes and wetlands as a result of fuels or hazardous chemicals leaching into the estuary.
Proposed mitigation:	<p>The pumping station for the sewage must be water proofed sealed to ensure that no water enters the systems or that no effluent leaches out of the system. All the pipes are according to SABS regulations. The pumping station system must have a capacity of 48 hours with a back up pump in place should the first pump break. A flashing light is connected to the pumps and will start flashing should a pump break to notify the manager in order that immediate action can be taken.</p> <p>Ground floor level of the houses and restaurant must be a minimum of 3.2m above mean sea level.</p> <p>All sewer and waste pipes, electrical, air-conditioning, ect. To be concealed in wall cavities or ducts within the wall plane and conform to NBR.</p> <p>This will ensure that no pipes are damaged during storm surges and astronomical tides, which will prevent pollution from entering the Knysna Estuary.</p> <p>Fuels, oils and any hazardous material should be stored on counters in the garages and NOT on the floor. This point must be incorporated in the Architectural Guidelines.</p>

Potential impact on biological aspects:	
Nature of impact:	Storm water drainage
Proposed mitigation:	<p>All storm water from the Brenton road is directed into a pipe and deposited in the Knysna Estuary. The construction of a retention pond at the entrance will slow storm water down. Further hardened surfaces from the units and restaurant will accumulate more storm water. Rainwater tanks must be implemented in order to catch storm water from roofs of the buildings. Storm water must redirected unto natural vegetation on site and not directly deposited into the Knysna Estuary.</p> <p>Vegetation within the tidal and upper marsh zones forms a natural buffer for storm water erosion. Setting the</p>

	<p>proposed development back to the 2.85m MSL and rehabilitating the degraded salt marsh will in all probability mitigate the effect of storm water erosion.</p> <p>Stormwater management plans must be established in conjunction with Knysna Municipality and SANParks to address the current storm water issues on the property.</p>
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Potential noise impacts:	
Nature of impact:	Impacts associated with general building construction noise
Proposed mitigation:	Construction work and noise generation only allowed during weekday working hours

Potential visual impacts:	
Nature of impact:	The proposed development will be visible from the N2.
Proposed mitigation:	<p>The design of the proposed Crabs Creek development must account for visual impacts. The restaurant must blend into the natural environment as much as possible – down lighting, earthy colours and strategic placement of satellite dishes is a sensible mitigation measure.</p> <p>During construction phase the proposed development will be screened off from the N2 using green shade cloth.</p>

Operational Phase:

Potential impacts on the geographical and physical aspects:	
Nature of impact:	Storm Water drainage
Proposed mitigation:	<p>All storm water drainage measures must be correctly installed and maintained through the project life cycle. Storm water outlets must be designed to capture all rain water in rain water tanks.</p> <p>The rehabilitation of the salt marsh and the alien vegetation removal is important throughout the lifespan of the project.</p> <p>No pollution of surface or ground water may occur. Storm water control and preventative measures must be implemented.</p>

	<p>No storm water to be discharged directly into lagoon shall be permitted.</p> <p>Storm water damage must be prevented during operational activities a storm water management plan should be approved for during the operational phase.</p>
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Potential impact biological aspects:	
Nature of impact:	<p>Disturbance of Vegetation and disturbance to Ecotone (area between Knysna Estuary and terrestrial land i.e. wetland / salt marsh).</p> <p>1. Re-invasion of Alien Invasive Plant species during operational phases</p>
Proposed mitigation:	<p>Continuous clearing during rehabilitation and landscaping of emerging invasives is required particularly surrounding the site.</p> <p>Invasive Kikuyu grass should be removed, Salt marsh area must be cordoned off and re-establishment of Salt marsh vegetation monitored.</p>

Potential noise impacts:	
Nature of impact:	Noise associated with restaurant activities
Proposed mitigation:	Noise to be limited to liquor licence requirements.

Potential visual impacts:	
Nature of impact:	The proposed development will be visible from the N2.
Proposed mitigation:	The proposed development should be painted in earthy colours to blend in with the receiving environment. Down and screened lighting to be used. An architectural guideline approved by the Knysna Municipality to be implemented to prevent visual pollution.

All impacts have been mitigated in Section 15 of this EMPr.

8. STORMWATER MANAGEMENT

As per the Stormwater Management Plan (attached as Appendix C of this EMP):

Proposed on-site stormwater configuration:

In order to achieve the attenuation on site for the 4848m² portion to be developed, it is intended to make use of a dry attenuation pond with an enhanced swale type infiltration bed for treatment purposes.

Rooftop runoff from the buildings will discharge through a gutter and downpipe system to the landscaping and continue in an underground pipe system leading to the pond.

The parking and road area will be formalised with kerbs and channels and will be designed to slope away from the buildings and drain overland to the attenuation pond, which will be at the low point of the development. The road and parking area will drain to a catchpit and 375mm Ø underground pipe system, sized to convey at least the 1:5 year RI peak runoff from the development to the attenuation pond.

The attenuation pond will have a controlled outlet structure discharging to a new 375mm stormwater outfall main, which will discharge to a gabion stilling chamber at the lagoon.

Proposed off-site (external) stormwater configuration:

External Catchments A3 and A4 can also contribute to the peak runoff from the site, and therefore it is important to include it in the model to ensure that overland flow can safely be conveyed through the site to the lagoon.

The divisional road is kerbed up to approximately 5m from the entrance to the site. The kerb and channel diverts to an existing open channel which discharges to a 375mm Ø stormwater pipe draining to the lagoon. Excess stormwater runoff from the road will accumulate in the low lying area to the west of the divisional road and from there may overtop the road to the north of the development.

It is proposed to construct a hump in the access road to prevent surface flow on the divisional road from flowing into the parking area on the site. A new 375mm Ø stormwater pipe will be installed from the catchpit to the of the pond stilling basin.

The parking area will be shaped to allow overland flow that might occur during major storm events to safely discharge to the lagoon should there be a blockage in the outlet pipe. See drawing MC410-C901.

Stormwater runoff from the external Sub-Catchment A4 situated between the Divisional Main Road and the site has a steep slope of 41% towards the site. There is an existing boundary wall at the toe of the embankment acting as a retaining wall. Stormwater runoff that might overtop from this area will be diverted to the parking area to the west and the landscaped area to the east by installing a W4 concrete channel below the retaining wall. Flow diverted to the landscaped area to the east will discharge to a Reno mattress to evenly spread flow to the landscape area.

9. SPECIALIST RECOMMENDATIONS

9.1 Vegetation

As per the Vegetation Sensitivity and Biodiversity Analysis (August 2016) -

- Knysna Sand Fynbos is a Critically Endangered Ecosystem according to the National Environmental Management: Biodiversity Act (NEM:BA), 2011.
- The property fall within a Critical Biodiversity Area according to the GRI Documents, 2010.
- All Invasive plant species should be removed from the site and follow up actions implemented.
- Continuous clearing during rehabilitation and landscaping of emerging invasives is required particularly surrounding the site.
- Appropriate soil erosion control measures should be taken in order to avoid and contain erosion.
- The re-establishment of salt Marsh vegetation should be encouraged and monitored.
- It is clear from the detailed studies carried out by Dr. Jan Vlok of Regalis Environmental Services on the Western Heads Area that portion 29 of the Farm Uitzicht No. 216 fall within the area delineated as "transformed" and designated for "Development".

Vegetation related impacts identified:

Two negative and two positive vegetation related impacts have been identified:

1. Removal of Alien Invasive Species during construction phase (+VE);
2. Re-instatement of Salt marsh vegetation in areas currently prone to invasion by Kikuyu lawn grass adjacent to the Salt Marsh Area.
3. Re-invasion of Alien Invasive Plant species during operational phases.
4. Impact on Salt Marsh due to construction activities.

9.2 The Shoreline Stability Assessment and Abiotic Design Parameters (September 2016)

The following key findings and consideration for the utilisation of Portion 29 of the Farm Uitzicht 216, Belvidere, Knysna are put forward:

- i. A development floor height needs to exceed the projected 2050 hazard level of +2.85m MSL and floor levels at a minimum of +3.2 m MSL.
- ii. Services and infrastructure (e.g. water, sewage and electricity cable lines) should be located above the +2.85 m MSL.
- iii. Provision should be considered for the 2100 projected hazard level of +3,50 m MSL.
- iv. As a priority, the rehabilitation of the upper marsh area and Ecotone³ here defined from the current Highest Astronomical Tide (HAT) level of +1,42m MSL up to the +2,0MSL contour. The establishment of a further rehabilitated upper marsh area up to 2050 hazard line to form a (future) surge inundation area should be incorporated into the landscape design.
- v. Rehabilitation of the Salt Marsh and Coastal Forest Thicket will ensure that the ecological corridor along the Knysna Estuary towards the Heads is extended.
- vi. Provision should be made to effectively manage stormwater run-off from the Belvidere Street Road reserve onto Portion 29 and 150 so-as to avoid ponding and uncontrolled stormwater run-off during high intensity rain.

vii. A development design should incorporate the elevated ground-water table on the south-eastern side of Portion 29 due to the possibility of groundwater seepage originating from the area in the road reserve behind the existing concrete wall.

10. LEGISLATIVE REQUIREMENTS

10.1 Signing of the EMPr

The acknowledgement form at the back of the approved EMPr is to be signed by the holder of the Environmental Authorisation (the Proponent), the Site Manager and the ECO; acknowledging that all parties are familiar with the requirements of the EMPr. All employees, especially the machine and equipment operators, are to be made aware of the conditions as contained in the EMPr as well as the contractual conditions relating to the environment as contained in the contract document.

10.2 Legislation

Of importance are all national, provincial and municipal by-laws and regulations. Statutes are amended periodically and it is the Proponent's responsibility to identify legislation relevant to the proposed activity.

LEGISLATION	ADMINISTERING AUTHORITY	TYPE
		Permit/ license/ authorization/comment
NATIONAL ENVIRONMENTAL MANAGEMENT ACT (ACT 107 OF 1998)	Department of Environmental Affairs	AUTHORIZATION
NATIONAL ENVIRONMENTAL MANAGEMENT AMENDMENT ACT (ACT 62 OF 2008)	Department of Environmental Affairs	AUTHORIZATION
NATIONAL ENVIRONMENTAL MANAGEMENT: BIODIVERSITY ACT (ACT NO 10 OF 2004)	SANParks, CapeNature and Department of Agriculture, Fisheries and Forestry	COMMENT
NATIONAL WATER ACT (ACT 36 OF 1998)	Department of Water Affairs	COMMENT
WESTERN CAPE NATURE CONSERVATION LAWS AMENDMENT ACT (ACT 3 OF 2000)	CapeNature	RELEVANT CONSIDERATION
CONSERVATION OF AGRICULTURAL		

RESOURCES ACT (ACT 43 OF 1983)	Department of Agriculture, Fisheries and Forestry	COMMENT
NATIONAL HERITAGE RESOURCES ACT (ACT 25 OF 1999)	Heritage Western Cape	RELEVANT CONSIDERATION
OCCUPATIONAL HEALTH AND SAFETY ACT (ACT 85 OF 1993)	Department of Health	RELEVANT CONSIDERATION

POLICY/ GUIDELINES	ADMINISTERING AUTHORITY
DEA (2010), Companion to the EIA regulations 2010, Integrated Environmental Management Guideline Series 5, Department of Environmental Affairs, (DEA), Pretoria, South Africa	Department of Environmental Affairs, Republic of South Africa. All provincial Departments that have been identified as Competent Authorities
DEA&DP (2010) Guideline on Public Participation, EIA Guideline and Information Document Series. Western Cape Department of Environmental Affairs and Development Planning (DEA&DP)	Western Cape Department of Environmental Affairs and Development Planning (DEA&DP)
Guideline for Involving Biodiversity Specialists in EIA Processes, June 2005	Western Cape Department of Environmental Affairs and Development Planning
Guideline for Environmental Management Plans, June 2005	Western Cape Department of Environmental Affairs and Development Planning
Ecosystem Guidelines for Environmental Assessment in The Western Cape	Fynbos Forum

10.3 Project Responsibilities

Responsibility for the implementation of the EMPr lies with the Proponent who must retain the services of a suitably experienced independent Environmental Control Officer (ECO) who will monitor the construction process and rehabilitation/mitigation measures periodically.

The ECO's responsibilities must include, *inter alia*:

- ❖ To keep record of all activities on site, problems identified, transgressions noted, and a task schedule of tasks undertaken by the ECO.
- ❖ Secure the protection and rehabilitation of the environment.
- ❖ Guide, advise and consult the relevant authority on environmental issues during construction.
- ❖ Guide, advise and consult any sub-contractors, suppliers etc. who will be involved in this project.

- ❖ Revise the EMPr as required and inform the relevant parties of the changes. An amended EMPr must be subject to a public participation process, which has been agreed to by the Department, prior to submission of the amended/updated EMPr to the Department for approval.
- ❖ Ensure that the EMPr has been accepted and understood as a contractually binding document on all parties involved with this project.
- ❖ Ensure that staff operating equipment are adequately trained, certified and sensitised to any potential hazards associated with their tasks.
- ❖ Educate staff as to the need to refrain from indiscriminate waste disposal and/or pollution of local soil and water resources, ensure that they (the staff) have received the necessary safety training, and are aware of the importance of a “clean-site policy.”
- ❖ The management guidelines contained in this document must form part of the contractual agreements between the Proponent, Site Manager and the ECO.

11. REPORTING PROCEDURES

11.1 Documentation

The following documentation must be kept on site in order to record compliance with the EMPr:

An Environmental File which includes:

- ❖ Copy of the Environmental Authorisation;
- ❖ Copy of the approved EMPr
- ❖ Copy of all other licences/permits;
- ❖ Environmental Method Statements;
- ❖ Non-conformance Reports;
- ❖ Environmental register, which shall include:
 - Communications Register – including records of complaints, minutes and attendance registers of all environmental meetings;
 - Monitoring Results – including environmental monitoring reports, register of audits, non-conformance reports; and
 - Incident book – including copies of notification of Emergencies and Incidents, this must be accompanied by a photographic record.
- ❖ Waste Documentation such as, but not necessarily limited to: Waste Manifest Documents, Safe Disposal Certificates (SDCs) and Sewerage Disposal Receipts;
- ❖ Material Safety Data Sheets (MSDSs) for all hazardous substances; and
- ❖ Written Corrective Action Instructions.

11.2 Environmental Register

The Proponent will put in place an Environmental Register and will ensure that the following information is recorded for all complaints / incidents:

- ❖ Nature of complaint / incident.
- ❖ Causes of complaint / incident.
- ❖ Party/parties responsible for causing complaint / incident.
- ❖ Immediate actions undertaken to stop / reduce / contain the causes of the complaint / incident.
- ❖ Additional corrective or remedial action taken and/or to be taken to address and to prevent reoccurrence of the complaint / incident.
- ❖ Timeframes and the parties responsible for the implementation of the corrective or remedial actions.
- ❖ Procedures to be undertaken and/or penalties to be applied if corrective or remedial actions are not implemented.
- ❖ Copies of all correspondence received regarding complaints/incidents.

11.3 Non-Conformance Report

A Non-Conformance Report (NCR) will be issued to the Proponent as a final step towards rectifying a failure in complying with a requirement of the EMPr. This will be issued by the ECO to the Proponent in writing. Preceding the issuing of a NCR, the Proponent must be given an opportunity to rectify the issue.

Should the ECO assess an incident or issue and find it to be significant (e.g. non-repairable damage to the environment), it will be reported to the relevant authorities and immediately escalated to the level of a NCR. The following information should be recorded in the NCR:

- ❖ Details of non-conformance;
- ❖ Any plant or equipment involved;
- ❖ Any chemicals or hazardous substances involved;
- ❖ Work procedures not followed;
- ❖ Any other physical aspects;
- ❖ Nature of the risk;
- ❖ Actions agreed to by all parties following consultation to adequately address the non-conformance in terms of specific control measures and should take the hierarchy of controls into account;
- ❖ Agreed timeframe by which the actions documented in the NCR must be carried out; and
- ❖ The ECO should verify that the agreed actions have taken place by the agreed completion date. When completed satisfactorily, the ECO and Proponent should sign the Close-Out portion of the Non-Conformance Form and file it with the contract documentation.

11.4 Environmental Emergency Response

The Proponents environmental emergency procedures must ensure appropriate responses to unexpected / accidental actions / incidents that could cause environmental impacts.

The Environmental Emergency Response Plan is separate to the Health and Safety Plan as it is aimed at responding specifically to environmental incidents and must ensure and include the following:

- ❖ Employees shall be adequately trained in terms of incidents and emergency situations;
- ❖ Details of the organisation (i.e. manpower) and responsibilities, accountability and liability of personnel;
- ❖ A list of key personnel and contact numbers;
- ❖ Details of emergency services (e.g. the fire department / on-site fire detail, spill clean-up services) shall be listed;
- ❖ Internal and external communication plans, including prescribed reporting procedures;
- ❖ Actions to be taken in the event of different types of emergencies;
- ❖ Incident recording, progress reporting and remediation measures to be implemented; and
- ❖ Information on any hazardous materials, including the potential impact associated with each, and measures to be taken in the event of accidental release.

12. COMPLIANCE WITH THE EMPr

12.1 Monitoring and Compliance

The monitoring and compliance of the development should take place as follows:

- ❖ The ECO has the authority to instruct the Proponent to cease a particular operation causing or liable to cause significant environmental damage, and issue fines or penalties for non-compliance of the Environmental Management Programme/ EMPr.
- ❖ An ECO must during **construction** activities monitor the site **weekly** and prepare an audit report **monthly**. Audit reports must be submitted to **Director: Compliance Monitoring** of the Department at Directorcompliance@environment.gov.za monthly.
- ❖ The ECO/holder of the Environmental Authorisation must, in addition, submit an environmental audit report to the Department within 30 days of completion of the construction phase (i.e., within 30 days of site handover) and a final environmental audit report within 30 days of completion of rehabilitation activities.
- ❖ All documentation e.g. audit/monitoring/compliance reports and notifications, required to be submitted to the Department in terms of the Environmental Authorisation, must be submitted to the **Director: Compliance Monitoring** of the Department at Directorcompliance@environment.gov.za.
- ❖ Environmental audit reports must be compiled in accordance with Appendix 7 of the EIA Regulations 2014, as amended and must indicate the date of the audit, the name of the auditor and the outcome of the audit in terms of compliance with the Environmental Authorisation conditions as well as the requirements of the approved EMPr.
- ❖ Operation of the activity – a written notification of operation must be given to the Department no later than **fourteen (14) days** prior to the commencement of the activity operational phase.

12.2 Auditing Process

The terms of reference for the audits must comprise the following:

- ❖ Develop a checklist against which the criteria can be referenced during the audit.
- ❖ During the audit process, key individuals involved with the management of the project are to be given the opportunity to comment on issues being audited and will be invited to accompany the auditor during the site inspection.

- ❖ Compile an audit report on the implementation of the EMPr and compliance to the Environmental Authorisation and submit this report to the competent authority (Department of Forestry, Fisheries and the Environment/ DFFE).

Compliance ratings against which the listed criteria are assessed are as follows:

Symbol	Rating	Interpretation
Y	Yes	Evidence of compliance
P	Partial	Evidence of partial compliance
N	No	Evidence of non-compliance
NR	Not Relevant	The condition or commitment is not relevant at this stage of the development or it is inappropriate
NA	Not Audited	Not audited

12.3 Non-Compliance

Definition

The non-compliance is defined as, and will be issued for:

- ❖ Any deviation by the Proponent from the environmental conditions and requirements as set out in the EA and EMPr - or;
- ❖ Any contravention by the Proponent of environmental legislation - or;
- ❖ Any unforeseen environmental impact resulting from direct or indirect actions or activities on site that would be considered as a significant impact. Significance will be determined by the Environmental Control Officer (ECO) but will be informed by geographic extent, duration, lasting effects of the impact and extent of remediation to the impact.

Types of non-compliances issued

Two types of non-compliances may be issued:

A. Stop Works Non-Compliance

Stop Works Non-Compliance will require that all works as described in the non-compliance will stop immediately and may only continue on a formal written permission from the ECO.

Stop Works Non-Compliance will be issued under the following conditions:

- ❖ Total disregard by the Proponent to the environmental conditions and requirements listed in the EA and EMPr;
- ❖ An activity that if left unattended will escalate the degree, severity or extent of the environmental impact.

B. General Non-Compliance

A general non-compliance will allow work and activity by the receiving party to continue while the corrective action takes place.

12.4 Issuing a Non-Compliance

Non-compliance may be issued to:

- ❖ The Proponent
- ❖ Any representative of the Proponent

12.5 Process of Issuing Non-Compliance

The appointed Environmental Control Officer (ECO) may issue a formal non-compliance to the Proponent. A copy of the non-compliance issued will be placed in the EMPr file. The Proponent will be responsible for returning a formally signed off corrective action (as per template) to the ECO to be placed in the EMPr file. The ECO will be required to sign-off on the corrective action, indicating that it has been completed within the timeframes and to the satisfaction of the ECO.

12.6 Failure to complete corrective actions

In the event that the Proponent fails or refuses to complete the corrective action, either at all or within the allocated timeframe, the ECO shall,

- ❖ Inform DFFE in writing that a condition of approval for the project is not being met.

The DFFE office is responsible for resolving the impasse with the Proponent.

The Proponent is deemed not to have complied with the EA and EMPr if:

- ❖ Within the boundaries of the site and site extensions there is evidence of contravention of clauses;
- ❖ Environmental damage occurs due to negligence; inappropriate actions taken by the Proponent or any of his staff.

On receiving a notice of non-compliance the Proponent is required to swiftly address the issue/s taking all corrective actions required to rectify the situation. Penalties will be applied for non-compliant situations. Penalties/fines are advocated to ensure corrective measures are successfully undertaken and the necessary standard of rehabilitation is achieved.

Penalties associated with a non-compliance is not a set amount but will depend on the nature and extent of the impact. The cost of any soil and /or groundwater monitoring and any soil and /or groundwater remediation required by authorities will be to the Proponent's account.

The imposition of such a penalties / fines shall not preclude the relevant competent 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.

12.7 Unlawful Activity/ies

Section 28 (15) of NEMA entitles authorities to administer a fine not exceeding R 1 million or to imprisonment for a period not exceeding 1 year or both such a fine and imprisonment.

Section 31N of NEMA entitles 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 unlawful activity and may charge up to R1 million administration fees over and above the remediation costs.

NEMA makes provision for damages to be awarded by the courts where loss or damage has occurred as a result of a contravention of other environmental statutes. Importantly, NEMA provides for the liability of 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.

13. AMENDMENTS TO THE EMPr

This EMPr outlines the environmental practices and mitigation measures to be adhered to during the construction, operational, and rehabilitation phases; in order to curtail and/or minimise potential negative impacts and promote sound environmental practises.

Any significant issues not covered in the EMPr as submitted, will be addressed as an addendum to this EMPr, and submitted for approval. The EMPr is a living document and is subject to change from time to time in consultation with the DFFE. Any amendments to the EMPr will require approval from the DFFE.

14. ENFORCING THE EMPr

The holder of the Environmental Authorisation (EA) has 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 casual labour, etc.). The EA and approved EMPr shall be part of the terms of reference for all stakeholders.

All senior and supervisory staff members shall familiarise themselves with the full contents of the EA and approved EMPr. They shall know and understand the specifications of the EA and approved EMPr and shall be able to assist other staff members in matters relating to the EA and approved EMPr.



15. ENVIRONMENTAL MANAGEMENT PROGRAMME

15.1 CONSTRUCTION PHASE

Activity	Management / Mitigation	Responsibility	Frequency / Timing
Authorisations, Licences and Permits	Environmental Authorisations		
	All necessary authorisations, permits and licences must be obtained by the Proponent prior to the commencement of construction.	Proponent	Once-off
Appointment of Construction Team	Appointment of Contractor		
	The Developer must ensure that this EMPr forms part of any contractual agreements with a Contractor(s) and sub-contractors for the execution of the proposed project. The Contractor must make adequate provision in their budgets for the implementation of the EMPr.	Developer & Contractor	Once-off
	The Principal Contractor (including sub-contractors and suppliers) must comply with the relevant provisions of the EMPr, applicable environmental legislations, by-laws and associated regulations promulgated in terms of these laws.		
	Local labourers should be used for such methods.		
	Appointment of Environmental Control Officer		
	An Independent ECO must be appointed at the Proponent's cost to monitor the implementation of the EMPr.	Proponent, Site Manager & ECO	Once-off
	The nomination of the ECO must be given to DFFE in writing 14 days prior to commencement. Commencement in this case includes site clearing. The notification must include contact details for the ECO, details pertaining to the ECO's relevant experience, the date on which it is anticipated that the activity will commence, as well as a reference number.		
Should the ECO for the development change at any time, this must be communicated, in writing, to DFFE, within fourteen (14) days of appointing the new ECO. The notification must include contact details for the ECO, details pertaining to the ECO's relevant experience and reasons for the change in ECO.	As required		
Preparation of Method	Method Statements		

Activity	Management / Mitigation	Responsibility	Frequency / Timing
Statements	Method Statements must be submitted by the Proponent to the ECO and must be adhered to by the Proponent. These relate to water and stormwater management requirements, solid waste management requirements, the storage of hazardous materials (if applicable), and standard emergency procedures.	Proponent	Once-off
	The ECO will monitor the implementation of the Statements.	ECO	On-going
Notifying Relevant I&APs	Notice of Environmental Authorisation (EA)		
	A written notice must be given to all relevant I&APs notifying them of the EA. The notice must include a date on which the EA was received and the reference number for the EA.	Proponent	Once-off – pre-construction
Education of Site Staff on General and Environmental Conduct <i>A general regard for the social and ecological wellbeing of the site and adjacent areas is expected of the site staff.</i>	Environmental Awareness and Training		
	Staff must be adequately educated by the ECO as to the provisions included in the EMPr, and in terms of general environmentally-friendly practice.	ECO & Site Manager	Once-off and as required
	The ECO & Site Manager must ensure that all staff, and if applicable, Contractors / Sub-contractors / Suppliers / Service Providers are trained on the environmental, occupational safety and/or legal responsibilities expected from them.		
	The training must take into account language and literacy requirements as well as measures to determine the effectiveness of the training.		
	Proof of training must be attached to the ECO's audit reports.		
Consideration of the implications of the EA and EMPr must form part of the formal site induction for all contractors, sub-contractors and casual labourers, preferably in their native language.			
The induction training will, as a minimum, include the following: <ul style="list-style-type: none"> ➤ The importance of conformance with all environmental policies; ➤ The environmental impacts, actual or potential, of their work activities; ➤ The environmental benefits of improved personal performance; ➤ Their roles and responsibilities in achieving conformance with the environmental policy and procedures and with the requirement of the Consultant's environmental management systems, including emergency preparedness and response requirements; and ➤ The mitigation measures required to be implemented when carrying out their work activities. 			

Activity	Management / Mitigation	Responsibility	Frequency / Timing
	All contractors, sub-contractors and casual labourers must acknowledge their understanding of the EMPr and environmental responsibilities by signing an induction attendance record.	ECO & Site Manager	Once-off
	Staff operating equipment shall be adequately trained and sensitised to any potential hazards associated with their tasks.	Proponent & Site Manager	During staff induction, followed by on-going monitoring
	Translators are to be used where necessary during staff training.	Site Manager	
	Use of environmental awareness posters on site is advocated.	Site Manager	On-going monitoring
	Staff must be made aware that they are not to make excessive noise e.g. shouting, hooting.		
	All employees must undergo the necessary safety training and wear the necessary protective clothing at all times.		
	No alcohol / drugs to be present on site; no vehicles or machinery are to be operated whilst under the influence of alcohol or drugs.		
	No firearms allowed on site or in vehicles transporting staff to / from the site (unless used by security personnel).		
	No unsocial behaviour will be permitted.		
	Bringing pets onto site is forbidden.		
	Staff must 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).		
	No fires are permitted on site.		
	Trespassing on private / commercial properties adjoining the site is forbidden.		
	No worker may be forced to do work that is potentially dangerous or for what he / she is not so trained		
	The Site Manager is to ensure that conditions of the EMPr are included in the Toolbox Talks.		
Site Management	Access		
	No vehicles may drive onto the adjacent properties and any other no-go areas.	Site Manager	On-going
	All no-go areas will be indicated during Toolbox Talks and/or indicated with warning signs in all relevant languages.		
	Site Management		
	Adequate drainage and erosion protection must be provided around the site and where necessary.	Site Manager	On-going

Activity	Management / Mitigation	Responsibility	Frequency / Timing
	Access points and other cleared surfaces must be dampened whenever necessary and especially in dry and windy conditions to avoid excessive dust. Alternatively, a binding product such as Dustex (supplied by Patch Industrial Supplies) could be used.		
Sewage and Sanitation	Ablutions		
	Toilets must be no closer than 32m from any watercourse. 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, also taking into consideration, gradient of the land.	Site Manager	Immediately & on-going
	The Site Manager must ensure that toilets are cleaned regularly.		On-going
	Unauthorised spilling of waste into the environment and burying of waste is strictly prohibited.		
Ablution facilities must not cause any pollution to any water resource and it must not be a health hazard to the general public.			
Social Impacts	Communication Between Site Manager, Site Staff and I&APs		
	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 3 copy carbon format, with numbered pages.	Site Manager	Immediately and on-going
	Should the staff be approached by members of the public or other stakeholders, they must assist them in locating the Site Manager, or provide a number on which they may contact the Proponent/ Site Manager.		On-going
	The conduct of the staff when dealing with the public or stakeholders shall be in a manner that is polite and courteous at all times.		
	Drivers of heavy-duty vehicles must exercise care when travelling to and from the site – and adhere to all legally enforceable requirements.		
Due to the concentration of a workforce in the area, the Site Manager must implement an HIV/AIDS Awareness Programme on site. The Site Manager must appoint an HIV/AIDS Awareness Officer for the duration of the construction period. Activities for HIV/AIDS awareness and prevention will be broad based, targeting both individuals and groups. They may consist of: <ul style="list-style-type: none"> ➤ Peer educators (reference people) drawn from the local labour force and trained in HIV/AIDS issues for discussions with colleagues (estimate 1 per 30 employees); ➤ Small focus group discussions and information covering key issues should be held; 	Immediately and as required		

Activity	Management / Mitigation	Responsibility	Frequency / Timing
	<ul style="list-style-type: none"> ➤ Inclusion of HIV/AIDS activities at site meetings and other discussions; and ➤ Voluntary Counselling and Testing. <p>Education will cover:</p> <ul style="list-style-type: none"> ➤ Stigma and discrimination issues; ➤ Preventative behaviours including on-site safety and awareness; and ➤ Referral to local health centres and services available. 		
Equipment lay-down and storage	Storage Areas		
	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. Impervious surfaces, bunded areas or drip trays must be provided where necessary.	Site Manager	On-going
Equipment lay-down and storage areas must be designated, demarcated and signed.			
Conservation of the Natural Environment	Erosion and Stormwater Control		
	Soil disturbance must be restricted to the current extent of the project, unless for the removal of alien invasive plants.	Site Manager & ECO	Throughout the duration of the project
	Storm water control must be undertaken to prevent soil loss from the site.		Immediately
	Erosion prevention and control measures must be implemented. These control measures must be advised by the ECO as control measures are unique to site, activity, and dependent on severity and extent.		On-going
	Provision shall be made for storm water management measures that will ensure effective run-off control and prevent erosion at run-off points and ponding.		
	Continuous monitoring for evidence of erosion must be undertaken around the site.		
	Earth, stone or rubble is to be properly disposed of so as not to obstruct natural water pathways over the site.		
	Stormwater management must ensure that flow from the development does not result in negative impacts.		On-going
	Fauna and Flora		
Areas which are identified by the Environmental Control Officer (ECO) as being ecologically sensitive and which are adjacent to the site are to be suitably demarcated to prevent damage during construction practices. These areas are to be recognised as “no-go” areas.	ECO & Site Manager		Immediately
No natural vegetation may be cleared without prior permission from the ECO and if		On-going	

Activity	Management / Mitigation	Responsibility	Frequency / Timing
	applicable from any relevant authority. Indigenous vegetation that is removed is to be replanted either back to the point from which it was taken or must be replaced by new relevant indigenous vegetation.		On-going
	The ECO must identify and make known to the team all Red Data listed vegetation species. All permits for the removal/ translocation of the identified protected vegetation species must be obtained prior to any ground clearance from the Department of Agriculture, Forestry and Fisheries (DAFF).		
	All alien invasive plant species must be continuously removed around the site. The best way to do this is to remove the plants from the roots by hand and leave the plants in the sun to dry out and die before disposal. Please refer to the appended Alien Plant Control Programme for specific methods of removal.	ECO & Site Manager	Immediate and On-going
	When removing alien invasive plants from the riparian area, caution must be taken to ensure that indigenous species are not being removed and all embankments are stable. Indigenous plants must be planted immediately to rehabilitate these areas.		
	Disturbance to birds, animals and reptiles and their habitats must be minimized wherever possible.	Site Manager	
Conservation of Water Resources	Water Sources		
	Under no circumstances may any materials or waste generated from the project be disposed of into the Knysna Estuary.	Site Manager	On-going
	The Knysna Estuary must be monitored for sedimentation levels. All banks need to be rehabilitated and bare soil must be vegetated in order to reduce sedimentation. Additional erosion protection methods may be identified by a qualified engineer.		
All parked vehicles/ trucks must have drip trays placed underneath the vehicle where potential leaks may occur.	Site Manager	On-going	
Waste Management	On-Site Waste Management		
	The excavation and use of rubbish pits is forbidden.		On-going and monitored weekly
	Burning of waste is forbidden. <i>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; however, permission to burn AIPs must first be obtained from the competent authority and other conservation boards. The transportation of Alien Invasive Plants is strictly forbidden in terms of the Conservation of Agricultural Resources Act (CARA), especially if in seed; unless stored in a completely sealed container.</i>		
	Littering on the site is forbidden and the site shall be cleared of litter at the end of each working day.		

Activity	Management / Mitigation	Responsibility	Frequency / Timing
	<p>An adequate number of general waste bins must be arranged around the site to collect all domestic refuse, and to minimise littering.</p> <p>Solid waste must be managed and separated into recyclable and non-recyclable materials and disposed of accordingly.</p> <p>All waste generated during operation 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).</p>		
Handling of Hazardous Materials (if necessary)	Hazardous Materials		
	Material Safety Data Sheets (MSDSs) shall be readily available on site for all chemicals and hazardous substances to be used on site. Where possible and available, MSDSs must additionally include information on ecological impacts and measures to minimize negative environmental impacts during accidental releases or escapes.	Site Manager	On-going
	Cement and other potential environmental pollutants must be stored within an impermeable bunded, roofed and sign posted area.		
	Cement and other potential environmental pollutants must be mixed on an impermeable surface that is bunded to prevent the leakage of pollutants onto the ground (if necessary).		
	All empty contaminated containers must be stored within a hazardous bunded area until collection by a reputable hazardous waste collection company. Waybills must be presented to the ECO for review and filing purposes.		
No vehicles transporting hazardous materials to the site may be washed on or near site. They must return to the supplier of such material to be cleaned out.			
Cultural Environment	Archaeology and Artefacts		
	No structures older than sixty years or parts thereof are allowed to be demolished altered or extended without a permit from Heritage Western Cape.	Site Manager	On-going
Safety and Security	Safety and Security On-Site		
	Material stockpiles or stacks must be stable and well secured to avoid collapse and possible injury to site workers / local residents.	Site Manager	On-going
	Firefighting equipment must be present on site at all times. All 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); staff must be trained in firefighting procedures.		
	No unauthorised person may be permitted to enter the site without prior permission of the site manager.		
Vehicle speeds shall not exceed 20km/h when traversing unconsolidated and non-			

Activity	Management / Mitigation	Responsibility	Frequency / Timing
	vegetated areas.		

15.2 REHABILITATION AND OPERATIONAL PHASE

Activity	Management / Mitigation	Responsibility	Frequency / Timing
Vegetation Rehabilitation – progressive rehabilitation must be carried out	Vegetation		
	All disturbed areas, or areas which have been disturbed for the purpose of the development, are to be re-vegetated. This will aid in preventing erosion within the site. A 100% indigenous planting plan must be adhered to in terms of all planting carried out on the site. Consultation must be made with a Botanical Specialist for a site-specific vegetation list.	Contractor & ECO	Project completion
	Erosion prevention and control measures must be implemented. Organic mulch or sand bags must be used to contain all sediment and prevent erosion during rehabilitation.	Contractor	Rehabilitation
	All rehabilitated areas must be maintained through weekly inspections until a 100% success rate has been achieved.	Contractor & ECO	Post Construction/ Maintenance Phase
	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 ECO or a designated specialist.	Developer, Contractor & ECO	Project completion and Maintenance
	Upper Salt Marsh and Coastal Thicket Corridor Rehabilitation		
A Biodiversity Specialist/ Wetland Specialist must be appointed to write a rehabilitation plan identifying indigenous plants to be planted during the rehabilitation phase. The appointed specialist needs to write a rehabilitation plan that must be approved by SANParks prior to commencement of rehabilitation. This report should also address the removal of alien vegetation encroaching on the upper salt marsh and monitoring of the rehabilitation over a period of 2 years.	Developer, Appointed Specialist	Rehabilitation	
Land Rehabilitation	Land		
	Rehabilitation must be executed in such a manner that surface runoff will not cause erosion of disturbed areas during and after rehabilitation.	Contractor & ECO	Project completion
	Any rubble is to be removed from site to an appropriate disposal site. Burying of rubble on site is prohibited.	Contractor	Project completion

Activity	Management / Mitigation	Responsibility	Frequency / Timing
	The site is to be cleared of all litter.	Developer & Contractor	Project completion and Maintenance
	The surface of all disturbed areas must be left rough to facilitate binding of topsoil and vegetation.	Contractor	Progressive rehabilitation and on Project completion
Removal and Repair of Materials and Infrastructure	Materials and Infrastructure		
	All material used for the construction of the restaurant must be removed from site after construction.	Contractor	Project completion
	The Contractor must repair any damage that the construction works may have caused to adjacent areas.	Contractor	Project completion
	Fences, barriers and demarcations associated with the construction phase are to be removed from the site unless stipulated otherwise by the ECO.	Contractor	Project completion
	All areas where temporary services were installed are to be rehabilitated to the satisfaction of the ECO.	Contractor	Project completion
Stormwater Management	Stormwater		
	Any negative stormwater effects, related to the construction phase, must be remediated.	Contractor	Project completion
	On-going monitoring and assessing of stormwater drainage must occur on site during the operational phase of the proposed project.	Developer	During Operational phase
Waste	Removal of Hazardous and Non-Hazardous Waste		
	All hazardous materials and containers must be collected by a reputable hazardous waste collection company and disposed of appropriately.	Contractor	Project completion
	Collection and disposal of non-hazardous waste to a registered landfill site must occur at least once a week.	Developer	During Operational phase

16. ALIEN PLANT CONTROL

Benefits of control

- Elimination of spread of these species into non-affected areas.
- Improvement of water quality and quantity.
- Legal compliance: landowners are required to eradicate or control declared weed and alien invader plants in terms of the Conservation of Agricultural Resources Act 43 of 1983 and the National Environmental Management: Biodiversity Act 10 of 2004.
- Improvement of biodiversity in conservation areas. Fast growing invader plants suppress indigenous flora, with a resultant loss in overall biodiversity.
- Commercial reasons: alien vegetation can spread from conservation areas into production land resulting in greater weed control costs.

Important factors influencing the effectiveness of a control programme

- Timely implementation of control operations is important for alien plants.
- Operations must be directed towards killing alien vegetation. This is best achieved by using an effective herbicide chosen by the ECO and applied by using the “cut-stump; frilling or ring barking methods. Under no circumstances may spraying with a “Rose” or multi- stream nozzle head be done.

Requirements for an effective alien vegetation control programme

- Identify the problem: extent, location and species of problem plant.
- Divide the problem areas into manageable units, taking budget and resource constraints into account.
- Identify any sensitive ecosystems, rare or endangered plants etc. which may be affected by a control programme. Identify the original ecosystem applicable to the area.
- Make provision for a number of follow up operations. The initial clearing operation is only part of the total programme. Failure to follow up will result in a failure of the entire programme.

While the importance of removing or clearing of alien or exotic vegetation is recognised, there should be control over the way in which this takes place. Often what generally appears to be covered by alien vegetation, actually contains pockets of sensitive vegetation or protected species. It is for this reason that clearing of such areas must be undertaken by hand (Guidelines for the Control and Management of Activities in Sensitive Coastal Areas, first edition, 1998).

It is important to note that all of the above must be performed with instruction by a suitably qualified Botanical Specialist, as well as in the presence of the specialist.

Plant species present on site:

Plant Species	Common name	NEMBA Category
Acacia mearnsii	black Wattle	2
Acacia melanoxylon	blackwood	2
Acacia salinga	port jackson willow	1b
Pinus pinaster	stone pine	3
Pinus radiata	Radiate pine	1b
Lantana camara (Verbenaceae)	Lantana	1b

Alien Vegetation Clearing can be broken down into the following PHASES:

PHASE 1: Removal by cutting, excavating, burning, ringbarking, hand pulling, herbicide spraying and biological measures.

PHASE 2: The removal of all biomass by either burning, chipping or removing usable material.

PHASE 3: (Follow up) which is critical to the success of the AIS clearing to achieve the following:

- Rehabilitation of the infested area to its natural or near natural state or
- To exercise the land rights as per the agricultural rights (horticultural or agricultural purposes).

PHASE 4: Implement a long term maintenance plan in order to combat further germination of AIS as a result of:

- The seedbank has been exposed and disturbed as a result of clearing, this will result in germination of the seeds from within the AIS seedbank in situ.
- The resulting germination rate and density will far higher than the original infestation.
- There will still be further germination of seeds disbursed by wind /birds from surrounding properties that are infested with AIS.

Types of Recommended Treatments for AIS

1. Felling and Herbicide Treatment:

- This method applies to AIS that can regenerate by coppicing (regrow from the cut stump). When felling. Always cut the AIS as horizontal and close to the ground as possible so as not to leave sharp points that could be a danger to others.
- A registered herbicide with the Department of Agriculture is then applied to the cut stump.
- A sticker agent may also be needed depending on the type of herbicide used plus the use of vegetable dye should be added to your herbicide mix to allow for tracking of what has and what has not been sprayed.
- Herbicide when used in this method is applied via solid cone nozzle the herbicide must be applied to the cut stump as soon as possible to allow the herbicide to be absorbed by the plant via the xylum phloem canals (a plants version of veins and arteries).
- These veins are found cambium layer which is the area between the bark and the wood, and this is where the herbicide must be applied. i.e the outer rim of the cut stump.
- Cut material (biomass) needs to be removed / stacked depending further use or burnt / chipped. When felling AIS don't to block riparian zones with cut material.

2. Felling:

- This applies to species of invasive plants that cannot regenerate by coppicing e.g. most pine species. As with treatment 1 cut as horizontally and close to the ground as possible.

- Cut material (biomass) needs to be removed / stacked depending further use or burnt / chipped. When felling AIS don't to block riparian zones with cut material.

3. Ringbarking:

- Used on AIS in areas where it is impossible to remove the biomass or where felling would damage the surrounding indigenous habitat.

- This involves simply cutting a ring half a meter up the trees trunk exposing cambium layer then painting the exposed cambium layer with approved herbicide from the Department of Agriculture.

4. Folio Spraying with Herbicide:

- This method is mainly restricted to follow up phases over areas where the seed bank has germinated on mass.

- When doing this wait till the newly germinated AIS have reached a height of 1 meters as at this point of growth this will result in killing the early and late germinating seedlings.

- This process will have to be repeated depending on the depth of the seedbank which correlates to the frequency of AIS germination.

5. Hoeing or pulling seedlings by hand:

- This method should be a way of life i.e. if AIS species is observed, hand pulling is recommended where possible. It is best to pull by hand after rainfall.

- This method also applies to areas that are sensitive, e.g. riparian zones where herbicide is not allowed or areas where the use of an herbicide could harm surrounding natural ecosystems or commercial crops.

Monitoring

Monitoring involves repeated observations or recording of data to be able to track progress and determine the efficacy of control methods. A very basic monitoring programme applies to private land.

WHAT	FREQUENCY	HOW	RESPONSE
How effective are the control measure	4-6months after every operation	Survey cleared areas and look for regrowth	Continue with methods or adapt to be more effective
Do the infestation levels decrease	Annually	Visual, photos	Continue clearing
How much herbicides were used	After every operation	Herbicides records	Keep track of cost and ensure no wastage
Does fynbos / forest recover in cleared area	Annually	Photos, surveys	If it does, look at clearing methods, clearing intervals or consult an expert.

Objectives

Objective 1: Prevention

To put measures into place for prevent the introduction of new NEMBA listed plants and animals onto the property, and invasive species from spreading from neighbouring properties.

Preventative action:

- No listed invasive and alien plant will be planted
- Areas bordering onto neighboring land will be prioritized for control to prevent existing invasive plants from spreading beyond the boundaries of the property
- No listed invade animal species will be introduced to property.
- These prevention measures will be communicated to all users of the property (where applicable)

Objective 2: Early detection and rapid response (EDRR)

To put measures into place whereby new and secondary invasive species are detected early and removed before establishing sustainable populations and start spreading.

Early detections and rapid response actions:

- Regularly survey property to detect any new or emerging invasive plant species.
- Report category 1a species immediately to the Department of Environmental Affairs and ask for assistance with control of the species.
- Do not allow new or emerging species to produce seeds or off-spring, or start growing vegetatively, act immediately by removing them.
- Update list by including these species and indicate where on the property they were located.
- Increase surveillance in the area where species occur to ensure the plant don't re-sprout or re-occur

Objective 3: Restrictive activity and duty of care

To adhere to the restrictive activity and duty of care as determined by NEMBA & Regulations concerning invasive and alien species

Action NEMBA Regulations (6a-g) restricted Activities:

- Prevent spreading or allowing spread of, any specimen of a listed invasive species.

While the importance of removing or clearing of alien or exotic vegetation is recognised, there should be control over the way in which this takes place. Often what generally appears to be covered by alien vegetation, actually contains pockets of sensitive vegetation or protected species. It is for this reason that clearing of such areas must be undertaken by hand (*Guidelines for the Control and Management of Activities in Sensitive Coastal Areas, first edition, 1998*).

It is important to note that all of the above must be performed with instruction by a suitably qualified Botanical Specialist, as well as in the presence of the specialist.



Eco Route

ENVIRONMENTAL CONSULTANCY

REGISTRATION NO. 1998/031976/23

DR. COLLEEN EBERSOHN

PhD Univ. Pretoria

Cell: 072 222 6013

e-mail: ebersohn@cyberperk.co.za

MS. JANET EBERSOHN

Bsc. Hons. Environmental Management

Cell: 082 557 7122

e-mail: janet@ecoroute.co.za

ACKNOWLEDGEMENT FORM

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

PROJECT NAME:

PROPOSED CRABS CREEK DEVELOPMENT PORTION 29 FARM UITZICHT 216, KNYSNA, WESTERN CAPE

PROPONENT:

Signed: Date:

SITE MANAGER:

Signed: Date:

ENVIRONMENTAL CONTROL OFFICER

Signed: Date:

APPENDIX A: CV OF EAP

APPENDIX B: SITE DEVELOPMENT PLAN

APPENDIX C: STORMWATER MANAGEMENT PLAN