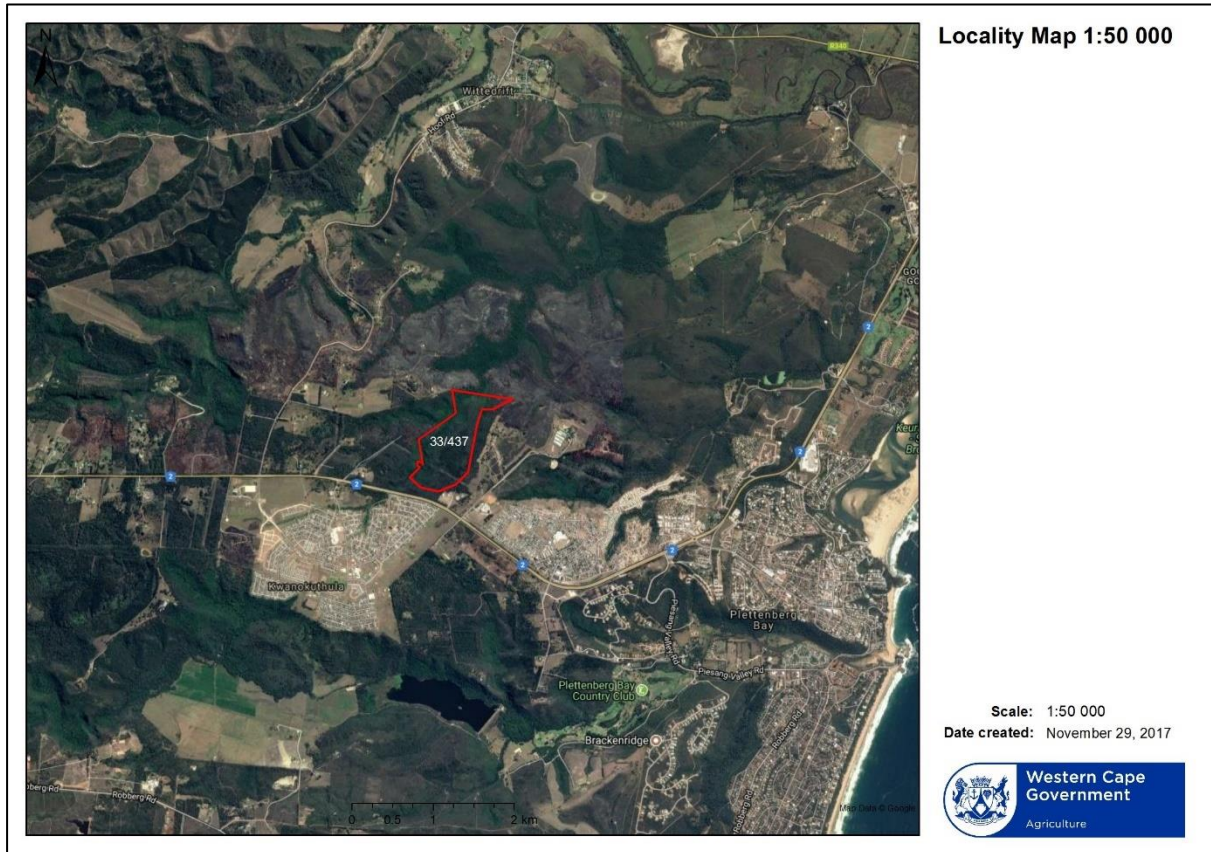




## Proposed New Regional Cemetery on Portion 33 of The Farm Hill View No. 437, Plettenberg Bay, Western Cape



Date: August 2024

Compiled by: Samantha Teeluckdhari (2023/6443)

DEA&DP Reference: 16/3/3/1/D1/14/0026/24

EAP Signature: *S. Teeluckdhari*

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## STATEMENT OF INDEPENDENCE

I, **Samantha Teeluckdhari** of Eco Route Environmental Consultancy, in terms of section 33 of the NEMA, 1998 (Act No. 107 of 1998), as amended, hereby declare that I provide services as an independent Environmental Assessment Practitioner (EAPASA Reg: **2023/6443**) and receive remuneration for services rendered for undertaking tasks required in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), and the Environmental Impact Assessment Regulations, 2014 (as amended). I have no financial or other vested interest in the project.

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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 –

(a) details of – i. The EAP who prepared the EMPr; and ii. The expertise of that EAP to prepare the EMPr, including a curriculum vitae;	This EMPr was prepared by Samantha Teeluckdhari of Eco Route Environmental Consultancy. Samantha has more than 9 years' experience as an Environmental Assessment Practitioner. Please see attached CV of the EAP.
(b) a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;	This EMPr covers all aspects involved in the proposed New Regional Cemetery on Portion 33 of The Farm Hill View No. 437, Plettenberg Bay, Western Cape  Sections 2 – 4 provides details of the proposed Project
(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;	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.
(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 – 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	Addressed in Section 7
(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 – 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 financial provision for rehabilitation, where applicable;	Addressed throughout the EMPr, specifically Section 14
(g) the method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Addressed throughout the EMPr, specifically Section 14
(h) the frequency and monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 11.
(i) an indication of the persons who will be responsible for the implementation of the impact management actions;	Section 9-11.
(j) the time periods within which the impact management actions contemplated in paragraph (f) must be	Section 9-11, 14.

implemented;	
(k) the mechanism for monitoring compliance with the impact management contemplated in paragraph (f)	Section 14.
(l) a program for reporting on compliance, taking into account the requirements as prescribed by the regulations;	Section 14.
(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 13 & 14.
(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 needs 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

Five properties were initially identified by the Bitou Municipality for the proposed development of a regional cemetery. After several specialist studies were conducted on each property, Portion 33 of the farm 437 Hillview was identified as the most viable option. Portion 33 of the farm Hillview 437 is located to the north of the Kwanokuthula suburb and west of Plettenberg Bay town. The site can be located at GPS coordinates 34° 2'28.31"S and 23°19'48.95"E.

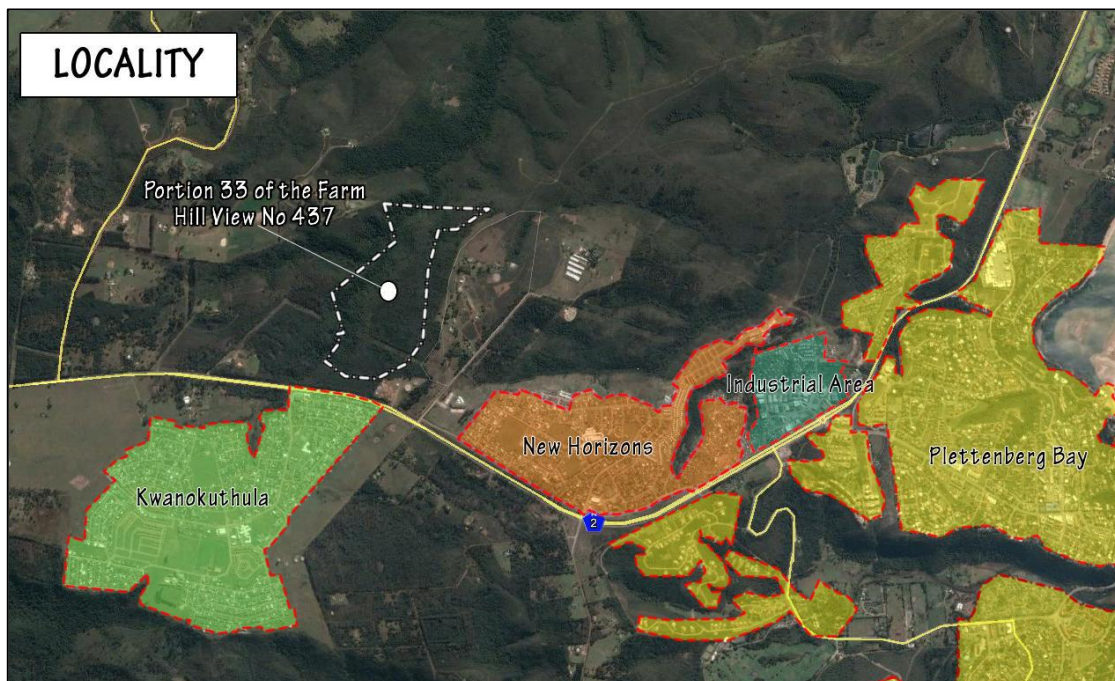


Figure 1 Locality Map (obtained from the "Portion 33 of the farm Hill View no 437 Specialist Planning Report" prepared by Marike Vreken Urban and Environmental Planners, October 2017)

Alternative 1 (Preferred Alternative) – 44.976ha total area; approximately 12ha development footprint:

The preferred alternative includes the following:

- Regional cemetery
- Memorial garden
- Chapel – 250m<sup>2</sup>
- 51 Public parking bays and 3 bus parking bays
- Ablution block – 30m<sup>2</sup>
- Caretakers dwelling – 75m<sup>2</sup>
- Access road
- Private Open Space – 33ha. \*Potential future plans - The private open space will be used for recreational purposes such as hiking and biking trails that can contribute to tourist development.

The cemetery will be split into a northern (approx. 3.67ha) and southern (approx. 6ha) section by the access road. The graves on the northern section will total 4239 (3619 adult graves and 620 children's graves) and the graves on the southern section will total 6142 - no children's graves will be located on the southern section of the cemetery. The adult graves will measure 2.2m x 0.9m with a spacing of 1.2m between each grave. Children's graves measure 1.5m x 0.7m with a spacing of 1.2m between each grave. A 22m electrical servitude traverses the southern part of the proposed cemetery and no graves will be located within this servitude.

### 3. LOCATION INFORMATION

<b>Province:</b>	Western Cape
<b>District Municipality:</b>	Garden Route Municipality
<b>Local Municipality:</b>	Bitou Municipality
<b>Ward number(s):</b>	Wards 4 and 5
<b>Nearest town(s):</b>	Plettenberg Bay
<b>Farm name(s) and number(s):</b>	Farm Hill View 437
<b>Portion number(s):</b>	Portion 33

### 4. PROPERTY INFORMATION

<b>Farm Name</b>	Portion 33 of the farm Hill View no.437
<b>Surveyor General 21 digit code:</b>	C03900000000043700033
<b>Zoning:</b>	Open Space Zone II
<b>Urban Edge:</b>	Yes
<b>Applicant name:</b>	Bitou Local Municipality
<b>Registration number (if applicant is a company):</b>	
<b>Trading name (if any):</b>	
<b>Responsible person name:</b>	Mr Ralph Links
<b>Applicant/ Responsible person ID number:</b>	7307305181085
<b>Responsible position, e.g. Director, CEO, etc.:</b>	Municipal Manager
<b>Physical address of applicant:</b>	
<b>Postal address:</b>	P/Bag X1002 Plettenberg Bay
<b>Postal code:</b>	6600
<b>Telephone:</b>	(044) 501 3324
<b>Fax:</b>	086 659 7954
<b>E-mail:</b>	rlinks@plett.gov.za
<b>GPS point middle of property:</b>	34° 2'28.31"S and 23°19'48.95"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. Maps are attached as appendix B to this document to view in detail.



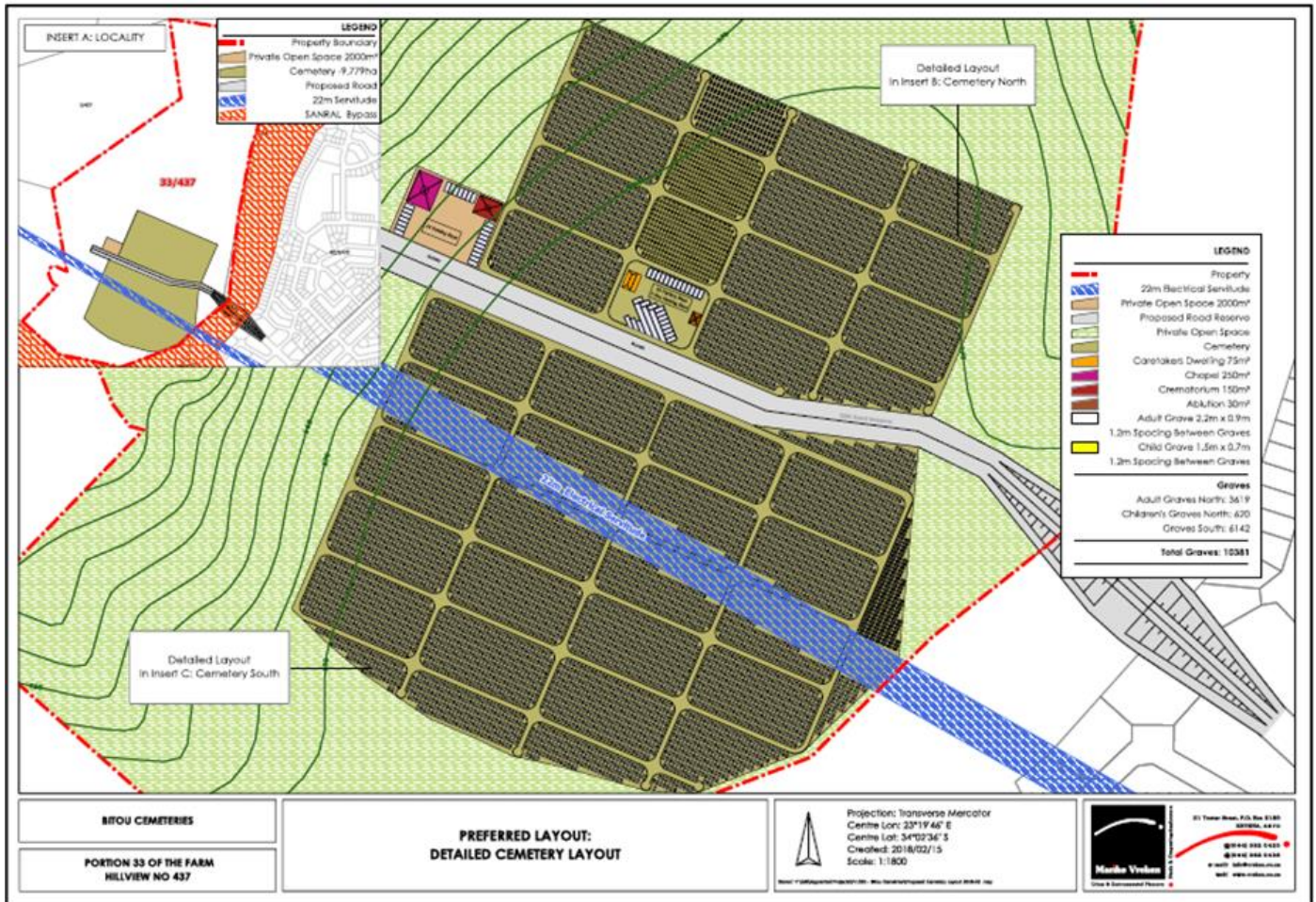


Figure 2 Preferred Alternative Layout

## 6. ENVIRONMENTAL SENSITIVITY MAPS

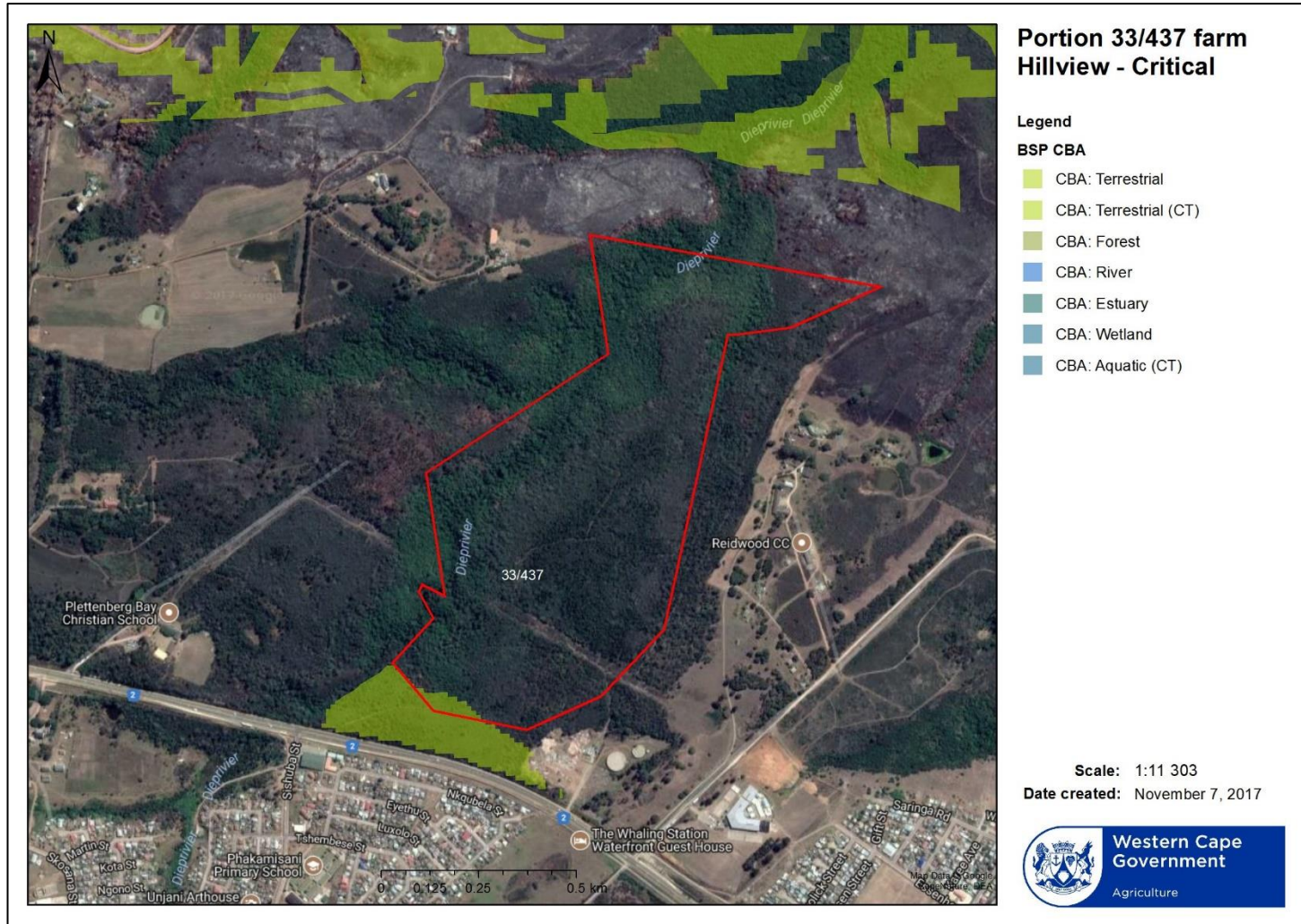


Figure 3: Critical Biodiversity Map – the cemetery will not be within the CBA

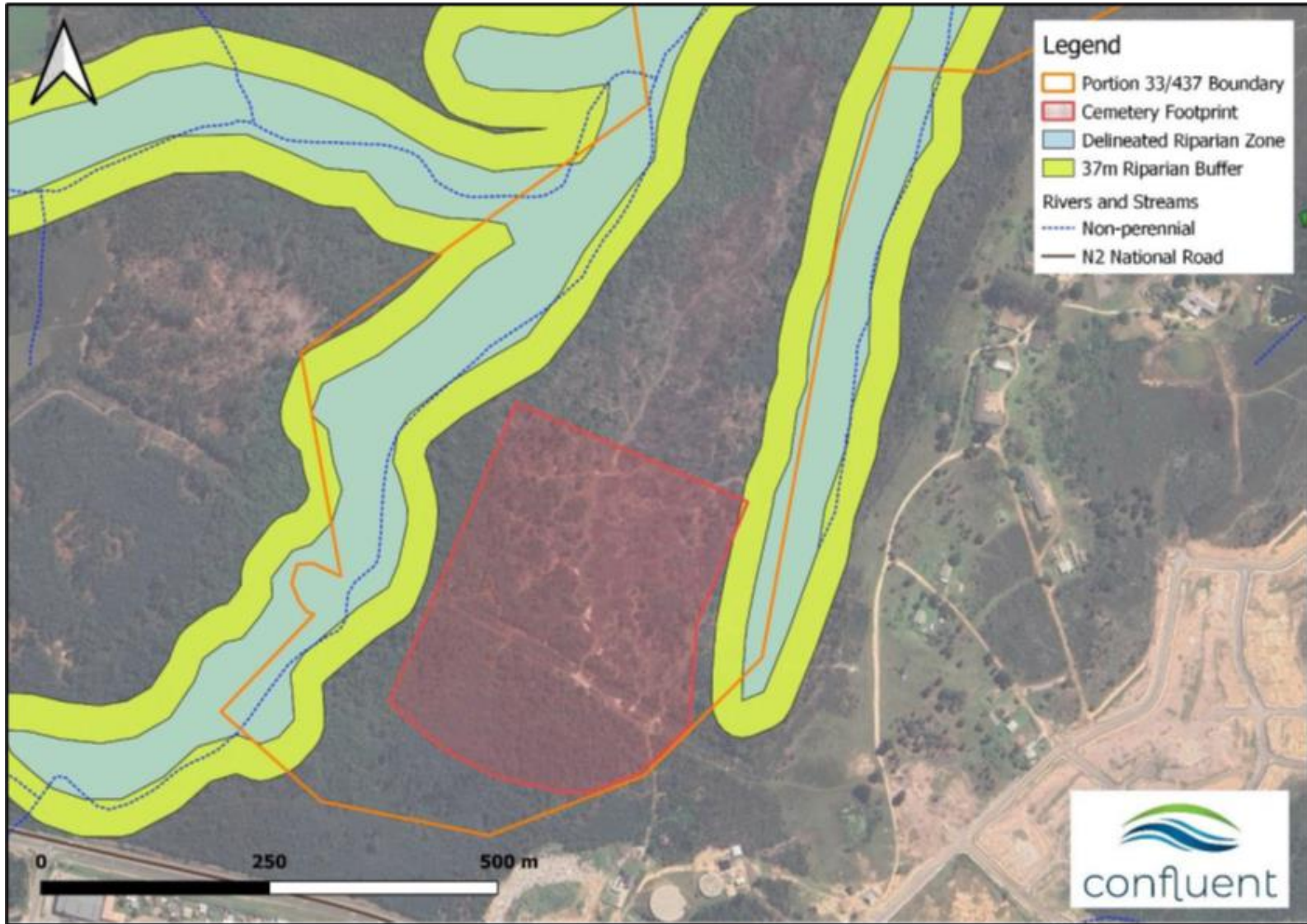
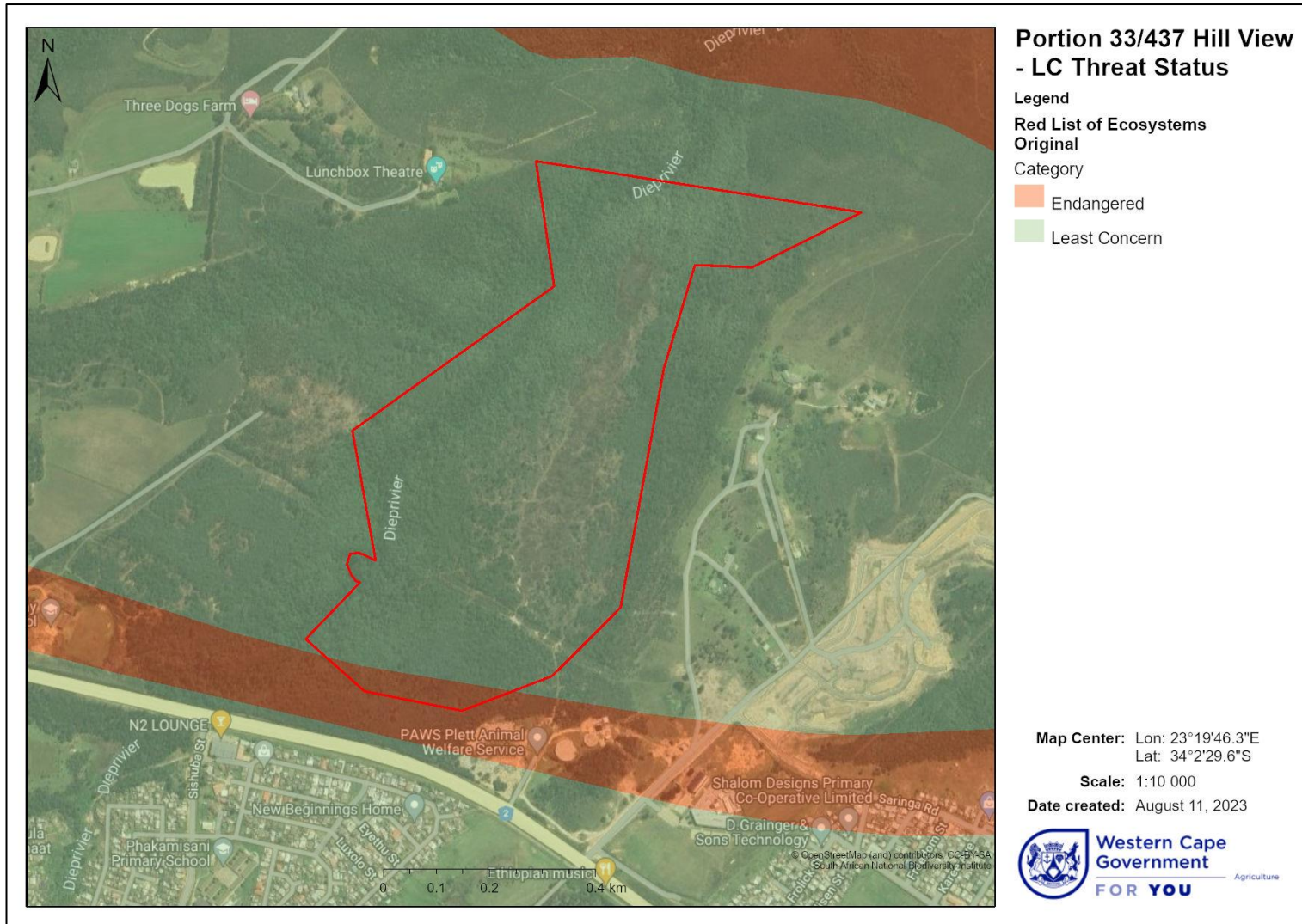


Figure 4: Delineated riparian zone and 37 m riparian buffer



**Figure 5: SANBI Red List of Ecosystems**

## 7. MITIGATION AND MANAGEMENT MEASURES

### Impacts foreseen during the construction phase:

<b>Impact 1 – Loss of natural vegetation</b>					
<p>The footprint of the proposed development is within areas mapped as "Aliens" (Low sensitivity / SEI), "Scrub Thicket" (Medium sensitivity / SEI), and "Mesic Thicket" (High sensitivity / SEI). The vegetation on site (within the proposed development footprint) is mostly in poor condition, and consists either of natural or invaded areas with a species composition that is not representative of the natural habitat. The No-Go option would result in the continuation of illegal dumping and settlements where rogue fires are started and spread throughout the property. In addition, this option allows for the overgrowth of alien invasive plants.</p>					
Impact	Preferred Alternative		Alternative 2		No-Go
	Without mitigation	With mitigation	Without mitigation	With mitigation	
<b>Duration</b>	Permanent	Permanent	Permanent	Permanent	On-going
<b>Extent</b>	Very limited	Very limited	Very limited	Very limited	Limited
<b>Intensity</b>	High	Negligible	High	Negligible	Moderate
<b>Probability</b>	Certain / definite	Highly unlikely / none	Likely	Highly unlikely / none	Likely
<b>Confidence</b>	High	High	High	High	High
<b>Reversibility</b>	Low	Medium	Low	Medium	Medium
<b>Resource irreplaceability</b>	Medium	Low	Medium	Low	Medium
<b>Significance</b>	Moderate - negative	Negligible - negative	Moderate - negative	Negligible - negative	Minor - negative
<b>Cumulative impacts</b>	Loss of natural vegetation could lead to the destruction of the forest environment in the valleys of the property should mitigation measures not be implemented during construction.				
<b>Mitigation:</b>					
<p>1. Forest habitats in the steeply-sloping valley parts of the site, have high biodiversity and conservation value, and are designated as sensitive. These areas must not be unnecessarily affected by the proposed development. Upslope of the forested valleys are scrub thicket areas that provide an important ecological buffer to the forested areas. This scrub thicket historically transitioned into fynbos. Where possible, these transitional areas should be retained on site as part of the forest buffer.</p> <p>2. Compile and implement a fire management plan for fynbos areas. This must take into account the required burning frequency, intensity and timing to promote ecosystem health within fire-prone ecosystems.</p> <p>3. Access to forested areas during construction must not be permitted by any construction personnel. These areas must be fenced off and no access allowed.</p> <p>4. Compile and implement an alien management plan, which highlights control priorities and areas and provides a programme for long-term control.</p>					

<b>Impact 2 – Loss of individuals of a protected tree species</b>					
<p>No plant species of concern were found on site, but the habitat on site is suitable for a variety of plant and animal SCC. There are also Cape Beech trees (<i>Rapanea melanophloeos</i>) on site that are protected under the National Forests Act.</p>					
Impact	Preferred Alternative		Alternative 2		No-Go
	Without mitigation	With mitigation	Without mitigation	With mitigation	
<b>Duration</b>	Permanent	Long term	Permanent	Long term	On-going
<b>Extent</b>	Very limited	Very limited	Very limited	Very limited	Limited

<b>Intensity</b>	Very high	Moderate	Very high	Moderate	Negligible
<b>Probability</b>	Almost certain / Highly probable	Almost certain / Highly probable	Almost certain / Highly probable	Almost certain / Highly probable	Rare / improbable
<b>Confidence</b>	High	High	High	High	Medium
<b>Reversibility</b>	Low	Medium	Low	Medium	Low
<b>Resource irreplaceability</b>	Medium	Low	Medium	Low	Medium
<b>Significance</b>	<b>Moderate - negative</b>	<b>Minor - negative</b>	<b>Moderate - negative</b>	<b>Minor - negative</b>	<b>Negligible - negative</b>
<b>Cumulative impacts</b>	Loss of protected tree species could lead to a loss of habitat that is suitable for plant and animal SCC – without mitigation.				
<b>Mitigation:</b>					
<ol style="list-style-type: none"> <li>1. Avoid areas of high concentrations of protected trees.</li> <li>2. Do not disturb natural woodland where there is a continuous canopy of forest trees, and protect forest margin areas so that forest interiors maintain existing microhabitat conditions and structural integrity.</li> <li>3. If any trees need to be removed or pruned then a permit is required, according to the National Forests Act.</li> </ol>					

### Impact 3 – Loss of habitat for listed threatened species

There is habitat on site that is suspected habitat for threatened plant and animal species. This includes all natural habitat on site, some of which is within the proposed development footprint and will therefore be affected by the proposed development.

The species that could potentially occur within this habitat are as follows:

- Knysna Warbler (Vulnerable) has a moderate probability of occurring in forest margin areas.
- Crowned Eagle (Near Threatened) - the forests on site may constitute part of the general foraging range but it is unlikely that they are resident on site, or are dependent on it.
- Small antelope (Vulnerable). There is a moderate to high probability of it occurring in the forests on site.
- A total of nine threatened, near threatened or rare plant species have a possibility of occurring on site. In some cases, it is not possible to know unless the fynbos is burnt to initiate post-fire emergence of dormant species.

Impact	Preferred Alternative		Alternative 2		No-Go
	Without mitigation	With mitigation	Without mitigation	With mitigation	
<b>Duration</b>	Permanent	Permanent	Permanent	Permanent	Medium term
<b>Extent</b>	Limited	Very limited	Limited	Very limited	Limited
<b>Intensity</b>	Low	Very low	Low	Very low	Very low
<b>Probability</b>	Unlikely	Rare / improbable	Unlikely	Rare / improbable	Rare / improbable
<b>Confidence</b>	High	High	High	High	High
<b>Reversibility</b>	Low	Low	Low	Low	Medium
<b>Resource irreplaceability</b>	Medium	Medium	Medium	Medium	Low
<b>Significance</b>	<b>Minor - negative</b>	<b>Negligible - negative</b>	<b>Minor - negative</b>	<b>Negligible - negative</b>	<b>Negligible - negative</b>
<b>Cumulative impacts</b>	It is possible that there may be spillover effects into surrounding areas, due mostly to secondary impacts, such as dust deposition, alien invasive species spread, etc.				
<b>Mitigation:</b>					
1. Protect natural vegetation adjacent to the proposed development site, as per the first impact.					

#### Impact 4 – Impact to the delineated riparian area

The proposed development footprint is located outside of the regulated area of both watercourses to the east and west as defined in GN509 (2016) of the National Water Act (Act No. 36 of 1998) and therefore no water use authorisation is required (General Authorisation or Water Use License). However, this conclusion would change if any sewage connections, built infrastructure, or construction activities were to be planned within the delineated riparian zone, as this is considered to be within the regulated area. This includes stormwater infrastructure.

Impact	Preferred Alternative		Alternative 2		No-Go
	Without mitigation	With mitigation	Without mitigation	With mitigation	
Duration	On-going	Brief	On-going	Brief	On-going
Extent	Limited	Limited	Limited	Limited	Limited
Intensity	High	Low	High	Low	High
Probability	Likely	Unlikely	Likely	Unlikely	Almost certain / Highly probable
Confidence	Medium	Medium	Medium	Medium	Medium
Reversibility	Medium	High	Medium	High	Medium
Resource irreplaceability	Medium	Low	Medium	Low	Medium
Significance	Minor - negative	Negligible - negative	Minor - negative	Negligible - negative	Moderate - negative
Cumulative impacts	Locating the cemetery or infrastructure within the delineated riparian zone or buffer area will likely negatively impact the ecological structure and function of watercourses in the catchment.				

#### Mitigation:

The cemetery and its associated infrastructure must be kept out of the delineated riparian zone and it is best to avoid the buffer zone as well.

#### Impact 5 – Pollution of groundwater

Groundwater quality, contamination from soil from waste areas, leachate from decaying bodies and increased infiltration due to poor stormwater management.

Impact	Preferred Alternative		Alternative 2		No-Go
	Without mitigation	With mitigation	Without mitigation	With mitigation	
Duration	On-going	On-going	On-going	On-going	-
Extent	Very limited	Very limited	Very limited	Very limited	-
Intensity	Very high	Low	Very high	Low	-
Probability	Almost certain / Highly probable	Almost certain / Highly probable	Almost certain / Highly probable	Almost certain / Highly probable	-
Confidence	High	High	High	High	-
Reversibility	Medium	Medium	Medium	Medium	-
Resource irreplaceability	Medium	Low	Medium	Low	-
Significance	Moderate - negative	Minor - negative	Moderate - negative	Minor - negative	N/A
Cumulative impacts	If no mitigation is implemented, contamination of groundwater could lead to contamination of water sources and eventually major health concerns for the local community.				

**Mitigation:**

Storm water management and management of excavation areas are standard mitigation options for surface water runoff, ponding and increased turbidity loads. Surface runoff and water ingress should be minimised by limiting excavation areas on a needs bases and implementing erosion control areas in graded areas.

Leachate generation can be minimised using concrete vaults in medium risk areas, particularly where the vadose zone is less defined in low lying areas. Infiltration of rainfall through grave sites can be minimised by appropriate earthworks techniques that promote runoff away from grave sites. Similar techniques can be implemented to promote the shallow groundwater seepage away from grave sites.

A mandatory exclusion zone should be applied to all existing and new boreholes. Should the existing borehole BH\_New\_Horizon not be considered for future production, then the borehole should be converted to a monitoring station for water level and background water quality. An additional on-site or downslope monitoring borehole should be considered to carry out routine monitoring of the groundwater beneath the site and compared to the background monitoring to establish the occurrence of pollution and extent thereof, if any.

**Impact 6 – Geotechnical Impacts****Potential impacts affecting structures:**

- **Collapsible & compressible soil - Soil horizons with a potentially collapsible or compressible fabric unsuitable for foundations.**
- **Differential settlement - Foundations placed in different soil types may settle differentially.**
- **Bearing capacity - Foundations placed on soils with low bearing capacity will display unsuitable settlement.**
- **Active soil - Heaving clays affecting foundation stability.**
- **Excavations - Boulders or rock affecting excavations; Unstable excavations requiring shoring.**
- **Slope stability - Geological instability causing damage to structures founded on slopes; Soil creep or erosion by storm water.**
- **Seismic activity - Structures at risk of damage due to seismicity.**
- **Sources of construction material - Distance to sources of construction material affecting costs.**

Impact	Preferred Alternative		Alternative 2		No-Go
	Without mitigation	With mitigation	Without mitigation	With mitigation	
<b>Duration</b>	On-going	Short term	On-going	Short term	-
<b>Extent</b>	Limited	Limited	Limited	Limited	-
<b>Intensity</b>	High	Low	High	Low	-
<b>Probability</b>	Almost certain / Highly probable	Unlikely	Almost certain / Highly probable	Unlikely	-
<b>Confidence</b>	High	High	High	High	-
<b>Reversibility</b>	Medium	Medium	Medium	Medium	-
<b>Resource irreplaceability</b>	Medium	Low	Medium	Low	-
<b>Significance</b>	<b>Moderate - negative</b>	<b>Negligible - negative</b>	<b>Moderate - negative</b>	<b>Negligible - negative</b>	N/A
<b>Cumulative impacts</b>	Failure to mitigate potential geotechnical impacts will lead to failed grave sites and severe erosion, especially during high rainfall events. This will result in negative geohydrological impacts.				

**Mitigation:**

- Collapsible & compressible soil - Moisture content of cohesive soil is important when placing foundations.
- Differential settlement - Uniform founding conditions and compaction is important. Engineer to



inspect foundations.

- Bearing capacity - Bearing capacity for light structures will not be a problem on stiff clay. Engineer to inspect all foundations.
- Active soil - Low to medium clay heave is expected. Foundations should be reinforced.
- Excavations - All excavations to 1.5m are soft. Sidewalls of temporary shallow excavations are generally stable. Engineer to assess stability of deep (>1.5m) excavations.
- Slope stability - The developable portions of the proposed sites are generally flat. Minor surficial erosion during storms is expected.
- Seismic activity - MMS of less than IV with a 10% chance of being exceeded in 50 years.
- Sources of construction material - The material excavated from foundation trenches is not considered suitable for re-use for backfilling purposes, but engineer to assess on site.

Although there are municipal production boreholes located close to both sites, the groundwater flow is in the opposite direction and the development of the sites is unlikely to have a significant impact on this source. However, this should be evaluated carefully and monitored.

Grave excavation will be slow and difficult by hand and the municipality should consider the use of a TLB in this regard. Backfilling of graves will also be challenging with the in situ clayey material which can be blocky and difficult to compact. It is recommended that the topsoil and clay are mixed for backfilling to reduce voids. Soil that is wet will not be suitable for backfilling and should be replaced with drier imported soil from any available source.

Site drainage is important to prevent ponding of surface water around the graveyard and deep v-channels are recommended throughout. This may also help increase the basal buffer zone between the corpse and the perched water table, and keep the surficial soil horizons in a drained state which will add stability to the grave sidewalls.

**Impacts foreseen during the operation phase:**

**Impact 1 – Pollution of groundwater**  
**Groundwater quality, contamination from soil from waste areas, leachate from decaying bodies and increased infiltration due to poor stormwater management.**

Impact	Preferred Alternative		Alternative 2		No-Go
	Without mitigation	With mitigation	Without mitigation	With mitigation	
<b>Duration</b>	On-going	On-going	On-going	On-going	-
<b>Extent</b>	Very limited	Very limited	Very limited	Very limited	-
<b>Intensity</b>	Very high	Low	Very high	Low	-
<b>Probability</b>	Almost certain / Highly probable	Almost certain / Highly probable	Almost certain / Highly probable	Almost certain / Highly probable	-
<b>Confidence</b>	High	High	High	High	-
<b>Reversibility</b>	Medium	Medium	Medium	Medium	-
<b>Resource irreplaceability</b>	Medium	Low	Medium	Low	-
<b>Significance</b>	<b>Moderate - negative</b>	<b>Minor - negative</b>	<b>Moderate - negative</b>	<b>Minor - negative</b>	N/A
<b>Cumulative impacts</b>	If no mitigation is implemented, contamination of groundwater could lead to contamination of water sources and eventually major health concerns for the local community.				

**Mitigation:**

Storm water management and management of excavation areas are standard mitigation options for surface water runoff, ponding and increased turbidity loads. Surface runoff and water ingress should be minimised by limiting excavation areas on a needs bases and implementing erosion control areas in graded areas.

Leachate generation can be minimised using concrete vaults in medium risk areas, particularly where the vadose zone is less defined in low lying areas. Infiltration of rainfall through grave sites can be minimised by

appropriate earthworks techniques that promote runoff away from grave sites. Similar techniques can be implemented to promote the shallow groundwater seepage away from grave sites.

A mandatory exclusion zone should be applied to all existing and new boreholes. Should the existing borehole BH\_New\_Horizon not be considered for future production, then the borehole should be converted to a monitoring station for water level and background water quality. An additional on-site or downslope monitoring borehole should be considered to carry out routine monitoring of the groundwater beneath the site and compared to the background monitoring to establish the occurrence of pollution and extent thereof, if any.

## Impact 2 – Geotechnical Impacts

### Potential impacts affecting structures:

- **Collapsible & compressible soil - Soil horizons with a potentially collapsible or compressible fabric unsuitable for foundations.**
- **Differential settlement - Foundations placed in different soil types may settle differentially.**
- **Bearing capacity - Foundations placed on soils with low bearing capacity will display unsuitable settlement.**
- **Active soil - Heaving clays affecting foundation stability.**
- **Excavations - Boulders or rock affecting excavations; Unstable excavations requiring shoring.**
- **Slope stability - Geological instability causing damage to structures founded on slopes; Soil creep or erosion by storm water.**
- **Seismic activity - Structures at risk of damage due to seismicity.**
- **Sources of construction material - Distance to sources of construction material affecting costs.**

Impact	Preferred Alternative		Alternative 2		No-Go
	Without mitigation	With mitigation	Without mitigation	With mitigation	
<b>Duration</b>	On-going	Short term	On-going	Short term	-
<b>Extent</b>	Limited	Limited	Limited	Limited	-
<b>Intensity</b>	High	Low	High	Low	-
<b>Probability</b>	Almost certain / Highly probable	Unlikely	Almost certain / Highly probable	Unlikely	-
<b>Confidence</b>	High	High	High	High	-
<b>Reversibility</b>	Medium	Medium	Medium	Medium	-
<b>Resource irreplaceability</b>	Medium	Low	Medium	Low	-
<b>Significance</b>	Moderate - negative	Negligible - negative	Moderate - negative	Negligible - negative	N/A
<b>Cumulative impacts</b>	Failure to mitigate potential geotechnical impacts will lead to failed grave sites and severe erosion, especially during high rainfall events. This will result in negative geohydrological impacts.				

### Mitigation:

- Collapsible & compressible soil - Moisture content of cohesive soil is important when placing foundations.
- Differential settlement - Uniform founding conditions and compaction is important. Engineer to inspect foundations.
- Bearing capacity - Bearing capacity for light structures will not be a problem on stiff clay. Engineer to inspect all foundations.
- Active soil - Low to medium clay heave is expected. Foundations should be reinforced.
- Excavations - All excavations to 1.5m are soft. Sidewalls of temporary shallow excavations are generally stable. Engineer to assess stability of deep (>1.5m) excavations.
- Slope stability - The developable portions of the proposed sites are generally flat. Minor surficial erosion during storms is expected.
- Seismic activity - MMS of less than IV with a 10% chance of being exceeded in 50 years.

- Sources of construction material - The material excavated from foundation trenches is not considered suitable for re-use for backfilling purposes, but engineer to assess on site.

Although there are municipal production boreholes located close to both sites, the groundwater flow is in the opposite direction and the development of the sites is unlikely to have a significant impact on this source. However, this should be evaluated carefully and monitored.

Grave excavation will be slow and difficult by hand and the municipality should consider the use of a TLB in this regard. Backfilling of graves will also be challenging with the in situ clayey material which can be blocky and difficult to compact. It is recommended that the topsoil and clay are mixed for backfilling to reduce voids. Soil that is wet will not be suitable for backfilling and should be replaced with drier imported soil from any available source.

Site drainage is important to prevent ponding of surface water around the graveyard and deep v-channels are recommended throughout. This may also help increase the basal buffer zone between the corpse and the perched water table, and keep the surficial soil horizons in a drained state which will add stability to the grave sidewalls.

### Impact 3 – Traffic Impacts

**Due to the nature of the development, it will only generate vehicular trips during off-peak periods. The existing demand on the road network during this period is significantly lower (50 percent) compared to the peak hours.**

Impact	Preferred Alternative		Alternative 2		No-Go
	Without mitigation	With mitigation	Without mitigation	With mitigation	
Duration	On-going	On-going	On-going	On-going	-
Extent	Local	Local	Local	Local	-
Intensity	Very low	Negligible	Very low	Negligible	-
Probability	Rare / improbable	Highly unlikely / none	Rare / improbable	Highly unlikely / none	-
Confidence	High	High	High	High	-
Reversibility	-	-	-	-	-
Resource irreplaceability	-	-	-	-	-
Significance	Negligible - negative	Negligible - negative	Negligible - negative	Negligible - negative	N/A
Cumulative impacts	Cumulative impacts are only expected once the housing developments planned for the area are constructed. This would lead to additional lanes being required to accommodate additional traffic.				

#### Mitigation:

The proposed cemetery will not generate trips during the peak hours of the surrounding road network and the operations at the study intersection will be acceptable during the off-peak periods, when the (cemetery) development could generated some additional trips on the road network.

The study intersection will operate acceptably with the development completed and no external road upgrades are required for the proposed development.

## 8. SPECIALIST RECOMMENDATIONS

### 8.1 Plants, Animals and Terrestrial Biodiversity Assessment (David Hoare Consulting (Pty) Ltd, 23 May 2024) –

1. The site consists of a combination of forest, mesic thicket, scrub thicket, fynbos and extensive areas of alien trees (existing and recently cleared). The forest, fynbos, scrub thicket, and mesic thicket are in a natural state whereas areas of alien trees are in a highly degraded state. (Note that the legal definition of "natural vegetation" includes the phrase, "...irrespective of the levels of alien invasion", therefore the areas of alien vegetation are legally defined as natural).

2. The proposed development is located primarily within areas of alien trees, but also affects a small area of scrub thicket and a sliver of mesic thicket. However, the edge of the proposed development extends partly down a steep slope, therefore downslope effects on forest and mesic thicket habitats is possible.
3. All natural areas on site occur in areas designated as Other Natural Area, or Ecological Support Area (drainage lines). No Critical Biodiversity Areas are affected or occur on site.
4. The site occurs mostly within South Outeniqua Sandstone Fynbos, which is not listed, and partially within Southern Afrotemperate Forest (not mapped as occurring on site but confirmed to occur there).
5. Following the procedures within the Species Environmental Assessment Guidelines, the Forest and Fynbos have been assessed as having Very High sensitivity / Site Ecological Importance, mesic thicket as having High sensitivity / Site Ecological Importance, Scrub Thicket as having Medium sensitivity / Site Ecological Importance, and areas of Aliens as having Low sensitivity / Site Ecological Importance.
6. No plant species of concern were found on site but based on the available habitat, it is considered possible that any of nine plant species flagged for the site could occur there. It is therefore verified that the site has MEDIUM sensitivity with respect to the Plant Species Theme, within areas of natural habitat.
7. The site is considered to be potential habitat for any of three of the animal species flagged for the site. The woodland habitats (forest, mesic thicket, scrub thicket) is likely habitat for three animal species, the Knysna Warbler (Vulnerable), a small antelope (Vulnerable), and the Crowned Eagle (Near Threatened). It is therefore verified that the Animal Species Theme has MEDIUM sensitivity for the site.
8. An impact assessment determined that the impact of the proposed development has Medium significance for loss of natural vegetation (Very Low, if proposed mitigation is applied - see Recommendations section below), Very Low significance for loss of protected trees, and Very Low significance for animal and plant species of concern (although this would change if any of the species were detected on site).
9. On the basis of the residual Very Low significance for loss of natural vegetation, no offsets are required, according to the NATIONAL BIODIVERSITY OFFSET GUIDELINE, published under the NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT NO. 107 OF 1998) on 23 June 2023.

#### **Management measures –**

- Forest habitats in the steeply-sloping valley parts of the site, have high biodiversity and conservation value, and are designated as sensitive. These areas must not be unnecessarily affected by the proposed development. Upslope of the forested valleys are scrub thicket areas that provide an important ecological buffer to the forested areas. This scrub thicket historically transitioned into fynbos. Where possible, these transitional areas should be retained on site as part of the forest buffer.
- An open space management system should be developed to formalize forest protection and the associated buffer areas.
- It is important for the maintenance of biodiversity and ecological patterns in the general landscape that ecological linkages are maintained in the landscape. This includes ecotones between the different major habitat types. The most important ecological corridor and linkage in the landscape associated with the current site is the forested valley system. These areas must be protected from impacts associated with the proposed project.
- Rehabilitation of disturbed areas, as well as previously invaded areas, should be undertaken in a way that promotes establishment of site-appropriate indigenous species.
- An alien invasive management programme should urgently be implemented on site. This will protect all remaining habitats on site, especially those downslope from degraded areas, and could potentially be the biggest contribution to maintaining and protecting biodiversity on site and in surrounding areas.
- A permit is required for any protected trees that may be affected by proposed development. Once a final layout has been determined, a survey of all protected trees within this footprint area is required in order to apply for any necessary permits. Protected trees observed on site included milkwoods (*Sideroxylon inerme*) and boekenhout / Cape beech (*Rapanea melanophloeos*).

## 8.2 Aquatic Biodiversity Compliance Statement (Dr. Jackie Dabrowski Confluent Environmental (Pty) Ltd, June 2023) –

No watercourses were observed during the site visit. Based on topography of the site, observations during the site visit, and inspection of aerial / satellite images, watercourses to the west and east of the cemetery site were delineated according to Ollis et al., (2013). Both watercourses were delineated as drainage lines grading to streams as the gradient increases. The extent of the riparian zone was delineated using satellite and historical imagery which indicates a distinct zone of vegetation associated with the watercourse.

Riparian means where the land meets a watercourse, and refers to the zone where these two habitats interface. Buffer areas are linear zones adjacent to watercourses managed with the intention of protecting water resources from diffuse pollution associated with adjacent land uses. In addition, they provide habitat for wildlife within, and act as corridors throughout fragmented landscapes. The width of buffer zones for watercourses was determined using the site-based model developed by Macfarlane & Bredin (2017) which is the more comprehensive of the two available models.

Buffers recommended for both watercourses were determined to be 37 m width measured from the edge of the delineated riparian zone. For buffer zones to effectively preserve the integrity of watercourses they need to remain in a natural condition with at least 90% vegetation cover and control of alien vegetation.

The Site Sensitivity in terms of Aquatic Biodiversity is confirmed as Low in contrast to the Very High sensitivity identified by the DFFE Screening Tool. Based on the information presented in this report during the desktop and field assessment, the following reasons support this finding:

- No definable watercourses were observed or are expected to occur within the footprint of the proposed cemetery.
- The Very High site sensitivity finding by the Screening Tool was due to the site being mapped as a Fish FEPA. The cemetery is located entirely outside of the delineated riparian zone of watercourses to the east and west, and almost entirely outside of the 37 m buffer zone. It is therefore very unlikely that it will negatively impact the ecological structure and function of watercourses in the catchment.
- The proposed development footprint is located outside of the regulated area of both watercourses to the east and west as defined in GN509 (2016) of the National Water Act (Act No. 36 of 1998) and therefore no water use authorisation is required (General Authorisation or Water Use License). However, this conclusion would change if any sewage connections, built infrastructure, or construction activities were to be planned within the delineated riparian zone, as this is considered to be within the regulated area. This includes stormwater infrastructure.

## 8.3. Heritage Statement (Dr. Peter Nilssen, 14 June 2023) –

The site inspection identified no heritage resources and it is not expected that the proposed development will have an impact on heritage resources or the heritage value of the area.

The proposed development site is not visible from the N2 (Figures 5 & 6). Nevertheless, there are no heritage resources on 33/437 that will be visually impacted by the proposed development. Consequently, from a heritage standpoint, the scenic route will not be negatively impacted by the proposed development.

Furthermore, since there are no significant heritage resources or features associated with 33/437 or the proposed development footprint, the proposed activity will have a negligible to no impact on the existing cultural landscape of the area.

The palaeontological sensitivity of the development footprint is low and even though Mr Pether recommends the inclusion of the Fossil Finds Procedure in the EMPr for the development, no palaeontological resources were identified during geotechnical test excavations (Nilssen 2014).

The proposed development footprint on 33/437 has been impacted by farming activities (ploughing, cultivation and grazing) during the colonial period, possibly from as early as the mid- to late-1700s. As a result, the context of pre-colonial heritage resources in surface sediments was damaged, disturbed or destroyed. No colonial period heritage resources were identified on the property.

Even though none were identified, if present on the property, then isolated Stone Age pieces like those identified on 3/437 are considered to be of low heritage value and are not conservation worthy (Nilssen 2014).

Due to the absence of significant heritage resources, the proposed activity will have negligible to no cumulative impacts on the archaeological or heritage value of the area.

This baseline investigation has shown that, if present, heritage resources on the affected part of the property would be of low significance and given a field rating of Not Conservation Worthy. Since there are no significant heritage resources associated with the proposed development footprint, it does not meaningfully contribute to the cultural landscape of the area.

For reasons given above and on heritage grounds, the proposed activity will have no negative impact on the aesthetic value of the area.

#### **8.4. Site Sensitivity Verification and Agricultural Compliance Statement (Johann Lanz, 27 September 2023) –**

The overall conclusion of this assessment is that the proposed development is acceptable because it leads to no loss of potential cropland and therefore minimal loss of future agricultural production potential.

The site is classified as high agricultural sensitivity by the screening tool. This has been disputed by this assessment, because of the agricultural production potential and current agricultural land use, and the entire site is rated by this assessment as being of medium agricultural sensitivity.

Although cropping may occur in the area, the cropping potential of the site is limited by soil constraints. The soils on site are constrained by shallow depth and poor drainage. The site is unlikely to be suitable for rain-fed crop production. Furthermore, factors other than climate, terrain, and soil capability also constrain the potential of the property to practically deliver agricultural produce and therefore influence its agricultural production potential. These factors include its location surrounded largely by non-agricultural land uses, the lack of any existing cropping infrastructure or inputs, and municipal ownership of the land, which would discourage the necessary investment to establish cropland. For these reasons, the site is highly unlikely to ever be viably utilised for crop production and its potential is therefore assessed here as low.

An agricultural impact is a change to the future agricultural production potential of land. This is primarily caused by the exclusion of agriculture from the footprint of the development. In this case, the entire development footprint is considered to be below the threshold for needing to be conserved as agricultural production land because of the limitations on its cropping potential. The production potential of the land is limited to only being suitable as grazing land, and there is no particular scarcity of such land in the country, in contrast to arable land, which is very scarce. The use of this land for non-agricultural purposes will cause minimal loss of agricultural production potential in terms of national food security.

From an agricultural impact point of view, it is recommended that the proposed development be approved. The conclusion of this assessment on the acceptability of the proposed development and the recommendation for its approval is not subject to any conditions.

#### **8.5. Preliminary Geohydrological Assessment for Cemetery Development In Plettenberg Bay (JG Afrika, November 2020) –**

The site is underlain by a fractured aquifer comprising quartzitic sandstone with interbedded shale of the TMG. No regional faulting is evident on and near the site. In accordance with DWS (1999), the aquifer is classified as a low to medium yielding aquifer, however, based on municipal borehole data, the aquifer is a high yielding, major aquifer. The inferred depth to groundwater in the immediate vicinity of the sites is greater than 100m, and due to this, saturated water bearing fractures are expected deeper than 100mbgl. The aquifer vulnerability is therefore low.

The quantitative environmental risk assessment identified contamination from soil from waste areas, leachate from decaying bodies and increased infiltration due to poor stormwater management scoring Moderate. These scores can generally be reduced with the application of appropriate mitigation measures.

Management measures-

- Mitigate erosion, runoff and ponding water during the lifespan of the cemetery development through appropriate storm water management and earthworks control
- Concrete vaults could be used in medium risk areas in proximity to geological structures.

- Exclusion zones around the existing boreholes including BH\_New\_Horizon should be enforced. This borehole should also be converted to a monitoring station if future abstraction is discontinued.
- An additional monitoring borehole should be installed in the northern half of the selected property as downslope monitoring points. The borehole would be utilised to profile the geology at depth, to confirm groundwater strikes and levels, and to provide a groundwater monitoring location. Suitable locations identified from the geophysical survey are station 150 on traverse T1 (Portion 33 of Farm 437).
- A groundwater and surface water monitoring plan should be implemented to include routine sampling and analysis of groundwater and surface water locations on or near the site. Analysis should include indicators of potential contamination from cemetery developments (ammonia, nitrate, nitrite, lithium, sulphide, orthophosphate, clostridium perfringens and pseudomonas aeruginosa) as well as standard physical, micro and macro determinants. Bi-annual monitoring is recommended. Base line water quality should be established prior to implementation of any graves.
- Careful site management and site operations are basic requirements to ensure the impact on groundwater quality in the area is minimised by the cemetery operations.

## 8.6. Traffic Impact Assessment (ITS, November 2023) –

### Parking:

The SDP makes provision for 53 formal parking bays plus 3 bus parking bays on site, which is sufficient. There is also space available on site to accommodate overflow parking if necessary.

### Pedestrians and Cyclists:

There are existing sidewalks along the N2 and Ebenezer Road in the site vicinity. It is recommended that sidewalks be provided along both sides of the access road between Ebenezer Road and the site.

### Public Transport:

There are existing public transport facilities available along the N2 and Ebenezer Road and no additional public transport facilities are recommended as part of the proposed development.

### Traffic Impact:

The peak traffic generation period of the cemetery will not coincide with the peak hours of the surrounding road network. Typically, a cemetery generates trips during the off-peak periods between 10:00 in the morning and 15:45 in the afternoon.

Due to the nature of the development, it will only generate vehicular trips during off-peak periods. The existing demand on the road network during this period is significantly lower (50 percent) compared to the peak hours and will easily accommodate the additional development trips.

The proposed cemetery will not generate trips during the peak hours of the surrounding road network and the operations at the study intersection will be acceptable during the off-peak periods, when the (cemetery) development could generate some additional trips on the road network.

The study intersection will operate acceptably with the development completed and no external road upgrades are required for the proposed development.

## 8.7. Geotechnical Report (Outeniqua Geotechnical Services, 2013, verified in 2023) –

Grave excavation will be slow and difficult by hand and the municipality should consider the use of a TLB in this regard. Backfilling of graves will also be challenging with the in situ clayey material which can be blocky and difficult to compact. It is recommended that the topsoil and clay are mixed for backfilling to reduce voids. Soil that is wet will not be suitable for backfilling and should be replaced with drier imported soil from any available source.

Site drainage is important to prevent ponding of surface water around the graveyard and deep v-channels are recommended throughout. This may also help increase the basal buffer zone between the corpse and the perched water table, and keep the surficial soil horizons in a drained state which will add stability to the grave sidewalls.

Foundations for structures:

The design of foundations for structures lies within the consulting engineer's responsibility and the following recommendations are based on limited subsurface information. The recommendations are provided as a guideline for conceptual design and more detailed investigations should be undertaken for detailed design purposes.

The stiff residual soil is most suitable to carry foundation loads but foundations can be cast at shallower depths on well compacted pedogenic (ferricrete) or transported horizons (topsoil). A preliminary design bearing capacity is 75kPa. The recommended foundation types is conventional reinforced concrete strip foundations or light rafts. All foundation trenches should be inspected and approved by the engineer before casting.

Access roads:

The topsoil subgrade generally has a poor CBR value (assume G9) and it is recommended

that an allowance is made for an imported 150mm G7 selected gravel layer below the subbase. The subgrade should be proof-rolled to identify wet or soft spots and wet material should be removed and replaced with suitably drier G7 fill material from commercial sources.

## 9. LEGISLATIVE REQUIREMENTS

### 9.1 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.

### 9.2 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
<b>NATIONAL ENVIRONMENTAL MANAGEMENT ACT (ACT 107 OF 1998)</b>	Department of Environmental Affairs	AUTHORIZATION
<b>NATIONAL ENVIRONMENTAL MANAGEMENT AMENDMENT ACT (ACT 62 OF 2008)</b>	Department of Environmental Affairs	AUTHORIZATION
<b>NATIONAL ENVIRONMENTAL MANAGEMENT: BIODIVERSITY ACT (ACT NO 10 OF 2004)</b>	SANParks, CapeNature and Department of Agriculture, Fisheries and Forestry	COMMENT
<b>NATIONAL WATER ACT (ACT 36 OF 1998)</b>	Department of Water Affairs	COMMENT



<b>WESTERN CAPE NATURE CONSERVATION LAWS AMENDMENT ACT (ACT 3 OF 2000)</b>	CapeNature	RELEVANT CONSIDERATION
<b>CONSERVATION OF AGRICULTURAL RESOURCES ACT (ACT 43 OF 1983)</b>	Department of Agriculture, Fisheries and Forestry	COMMENT
<b>NATIONAL HERITAGE RESOURCES ACT (ACT 25 OF 1999)</b>	Heritage Western Cape	RELEVANT CONSIDERATION
<b>OCCUPATIONAL HEALTH AND SAFETY ACT (ACT 85 OF 1993)</b>	Department of Health	RELEVANT CONSIDERATION

### Policies

National Policy Development Framework 2020
The National Environmental Management Act, 1998 (107 Of 1998)
Bitou Municipal Land Use Planning Bylaw, 2015
Spatial Planning and Land Use Management Act (16 Of 2013)
Western Cape Land Use Planning Act, 2014 (3 Of 2014)
Subdivision Of Agricultural Land Act, 1970 (Act 70 Of 1970)
National Heritage Resources Act, 1999 (Act 25 Of 1999)
National Health Act, 2003 (Act 61 Of 2003)

### 9.3 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.

## 10. REPORTING PROCEDURES

### 10.1 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.

### 10.2 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.

## 10.3 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.

## 10.4 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.

## 11. COMPLIANCE WITH THE EMPr

### 11.1 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 **monthly** and prepare an audit report **monthly**. Audit reports must be submitted to **Compliance Monitoring** of the Department 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 **Compliance Monitoring** of the Department.
- ❖ 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.

## 11.2 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 Environment Affairs and Development Planning/ DEA&DP).

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

## 11.3 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:

- 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.

### 11.4 Issuing a Non-Compliance

Non-compliance may be issued to:

- ❖ The Proponent
- ❖ Any representative of the Proponent

### 11.5 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.

### 11.6 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 DEA&DP in writing that a condition of approval for the project is not being met.

The DEA&DP 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.

## 11.7 Unlawful Activity/ies

Section 28 (15) of NEMA entitles authorities to administer a fine not exceeding R1 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.

## 12. 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 DEA&DP. Any amendments to the EMPr will require approval from the DEA&DP.

## 13. 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.



## 14. ENVIRONMENTAL MANAGEMENT PROGRAMME

### 14.1 CONSTRUCTION PHASE

Activity	Management / Mitigation	Responsibility	Frequency / Timing
<b>Authorisations, Licences and Permits</b>	<b>Environmental Authorisations</b>		
	All necessary authorisations, permits and licences must be obtained by the Proponent prior to the commencement of construction.	Proponent	Once-off
<b>Appointment of Construction Team</b>	<b>Appointment of Contractor</b>		
	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.		
	<b>Appointment of Environmental Control Officer</b>		
	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 DEA&DP 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 DEA&DP, 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		
<b>Preparation of Method Statements</b>	<b>Method Statements</b>		
	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), standard emergency procedures, and fire management.	Proponent	Once-off
	The ECO will monitor the implementation of the Statements.	ECO	On-going
<b>Notifying Relevant I&amp;APs</b>	<b>Notice of Environmental Authorisation (EA)</b>		
	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
<b>Education of Site Staff on General and Environmental Conduct</b> <i>A general regard for the social and ecological</i>	<b>Environmental Awareness and Training</b>		
	Staff must be adequately educated by the ECO as to the provisions included in the EMPr, and in terms of general environmentally-friendly practice. The ECO & Site Manager must ensure that all staff, and if applicable, Contractors / Sub-contractors / Suppliers / Service Providers are trained on the environmental,	ECO & Site Manager	Once-off and as required



Activity	Management / Mitigation	Responsibility	Frequency / Timing
<p><i>wellbeing of the site and adjacent areas is expected of the site staff.</i></p>	<p>occupational safety and/or legal responsibilities expected from them.</p> <p>The training must take into account language and literacy requirements as well as measures to determine the effectiveness of the training.</p> <p>Proof of training must be attached to the ECO's audit reports.</p>		
	<p>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.</p> <p>The induction training will, as a minimum, include the following:</p> <ul style="list-style-type: none"> <li>➤ The importance of conformance with all environmental policies;</li> <li>➤ The environmental impacts, actual or potential, of their work activities;</li> <li>➤ The environmental benefits of improved personal performance;</li> <li>➤ 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</li> <li>➤ The mitigation measures required to be implemented when carrying out their work activities.</li> </ul>		
	<p>All contractors, sub-contractors and casual labourers must acknowledge their understanding of the EMPr and environmental responsibilities by signing an induction attendance record.</p>		
	<p>Staff operating equipment shall be adequately trained and sensitised to any potential hazards associated with their tasks.</p>	Proponent & Site Manager	During staff induction, followed by on-going monitoring
	<p>Translators are to be used where necessary during staff training.</p>	Site Manager	
	<p>Use of environmental awareness posters on site is advocated.</p>	Site Manager	On-going monitoring
	<p>Staff must be made aware that they are not to make excessive noise e.g. shouting, hooting.</p>		
	<p>All employees must undergo the necessary safety training and wear the necessary protective clothing at all times.</p>		
	<p>No alcohol / drugs to be present on site; no vehicles or machinery are to be operated whilst under the influence of alcohol or drugs.</p>		
	<p>No firearms allowed on site or in vehicles transporting staff to / from the site (unless used by security personnel).</p>		
<p>No unsocial behaviour will be permitted.</p>			
<p>Bringing pets onto site is forbidden.</p>			
<p>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.</p>			

Activity	Management / Mitigation	Responsibility	Frequency / Timing
	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.		
<b>Site Management</b>	<b>Access</b>		
	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.		
	<b>Site Management</b>		
	Adequate drainage and erosion protection must be provided around the site and where necessary.	Site Manager	On-going
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.			
<b>Sewage and Sanitation</b>	<b>Ablutions</b>		
	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.		
<b>Social Impacts</b>	<b>Communication between Site Manager, Site Staff and I&amp;APs</b>		
	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:		
➤ Peer educators (reference people) drawn from the local labour force and			

Activity	Management / Mitigation	Responsibility	Frequency / Timing
	<p>trained in HIV/AIDS issues for discussions with colleagues (estimate 1 per 30 employees);</p> <ul style="list-style-type: none"> <li>➤ Small focus group discussions and information covering key issues should be held;</li> <li>➤ Inclusion of HIV/AIDS activities at site meetings and other discussions; and</li> <li>➤ Voluntary Counselling and Testing.</li> </ul> <p>Education will cover:</p> <ul style="list-style-type: none"> <li>➤ Stigma and discrimination issues;</li> <li>➤ Preventative behaviours including on-site safety and awareness; and</li> <li>➤ Referral to local health centres and services available.</li> </ul>		
<b>Equipment lay-down and storage</b>	<b>Storage Areas</b>		
	<p>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.</p> <p>Equipment lay-down and storage areas must be designated, demarcated and signed.</p>	Site Manager	On-going
<b>Conservation of the Natural Environment</b>	<b>Erosion and Stormwater Control</b>		
	Soil disturbance must be restricted to the current extent of the project, unless for the removal of alien invasive plants.		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.	Site Manager & ECO	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
	<b>Fauna and Flora</b>		
	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	On-going
No natural vegetation may be cleared without prior permission from the ECO and if 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	On-going		

Activity	Management / Mitigation	Responsibility	Frequency / Timing
	species must be obtained prior to any ground clearance from the Department of Forestry (DFFE).		
	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	
<b>Conservation of Water Resources</b>	<b>Water Sources</b>		
	Under no circumstances may any materials or waste generated from the project be disposed of into the adjacent riparian areas, including the buffer zone.	Site Manager	On-going
	All parked vehicles/ trucks must have drip trays placed underneath the vehicle where potential leaks may occur.	Site Manager	On-going
<b>Waste Management</b>	<b>On-Site Waste Management</b>		
	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.		On-going monitoring
	An adequate number of general waste bins must be arranged around the site to collect all domestic refuse, and to minimise littering.		
	Solid waste must be managed and separated into recyclable and non-recyclable materials and disposed of accordingly.		
	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).		
<b>Handling of Hazardous Materials (if necessary)</b>	<b>Hazardous Materials</b>		
	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).			

Activity	Management / Mitigation	Responsibility	Frequency / Timing
	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.		
<b>Cultural Environment</b>	<b>Archaeology and Artefacts</b>		
	No structures older than sixty years or parts thereof are allowed to be demolished altered or extended without a permit from Heritage Western Cape. The Fossil Finds Procedure (FFP) must be followed: If fossil bones are uncovered during excavations, stop work and report to Heritage Western Cape (HWC)	Site Manager	On-going
<b>Safety and Security</b>	<b>Safety and Security On-Site</b>		
	Material stockpiles or stacks must be stable and well secured to avoid collapse and possible injury to site workers / local residents. 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-vegetated areas.	Site Manager	On-going

## 14.2 REHABILITATION AND OPERATIONAL PHASE

Activity	Management / Mitigation	Responsibility	Frequency / Timing
<b>Vegetation Rehabilitation – progressive rehabilitation must be carried out</b>	<b>Vegetation</b>		
	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
<b>Land Rehabilitation</b>	<b>Land</b>		
	Rehabilitation must be executed in such a manner that surface runoff will not cause	Contractor &	

Activity	Management / Mitigation	Responsibility	Frequency / Timing
	erosion of disturbed areas during and after rehabilitation.	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
	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
<b>Removal and Repair of Materials and Infrastructure</b>	<b>Materials and Infrastructure</b>		
	All material used for construction 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
<b>Stormwater Management</b>	<b>Stormwater</b>		
	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
<b>Waste</b>	<b>Removal of Hazardous and Non-Hazardous Waste</b>		
	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
<b>Fire Management</b>	<b>Fire</b>		
	A Fire Management Plan must be implemented on the property. The landowner must register with the Southern Cape Fire Protection Agency/SCFPA to ensure that the property has addressed all necessary fire management protocols.	Landowner	During Operational phase

## 15. 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.

Alien Invasive Plant species present on site:

<b>Plant Species</b>	<b>NEMBA Category</b>
Catharanthus roseus	1b
Hakea sericea	1b
Lantana camara	1b
Paraserianthes lophantha	1b
Phytolacca octandra	1b
Senna septemtrionalis	1b
Solanum mauritianum	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 dispersed 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.**

**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 New Regional Cemetery on Portion 33 of The Farm Hill View No. 437, Plettenberg Bay, Western Cape**

**PROPONENT:**

Signed: ..... Date: .....

**SITE MANAGER:**

Signed: ..... Date: .....

**ENVIRONMENTAL CONTROL OFFICER**

Signed: ..... Date: .....

## APPENDIX A: CV OF EAP

## APPENDIX B: SITE DEVELOPMENT PLAN