

ECOLOGICAL BASELINE ASSESSMENT

LAINGVILLE CEMETERY EXPANSION

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Date: June 2018

PROJECT DETAILS

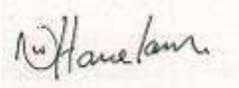
		Title: Ecological Baseline Assessment Laingville Cemetery Expansion		
Eco Impact No: Saldanha Bay Municipality LAINGVILLE CEMETERY 1/2018		Date: June 2018	Report Status: Final	
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1. Background & Competency

This ecological baseline assessment is presented by Eco Impact Legal Consulting (Pty) Ltd (“Eco Impact”).

Eco Impact has been appointed as the independent ecological impact assessment specialist for this project.

Eco Impact is independent and does not have any interest in the business nor receive any payment other than fair remuneration for services rendered as required in terms of the regulations.

Nicolaas Hanekom has 26 years’ experience working as an ecologist for nature conservation organizations. He has extensive field experience and botanical knowledge, knowledge of wetlands and freshwater ecology, is knowledgeable of the region in which they are working and exercises sound and unbiased scientific and professional judgment. He is a qualified Environmental Assessment Practitioner and a registered Professional Natural Scientist (Ecologist) with the SACNASP who holds a M. Tech, Nature Conservation from the Cape Peninsula University of Technology. This master’s thesis focussed on the impact of different land uses on the Phytodiversity (“Botany/ plants”) of the West Coast Strandveld in and around Rocherpan Nature Reserve.

Nicolaas has been responsible for many Ecological Baseline Assessment (including botanical since 2006 and Freshwater Ecology since 2010).

2. Conditions Relating to this Report

The findings, results, observations, conclusions and recommendations given in this report are based on the author’s best scientific and professional knowledge as well as available information. Eco Impact and its staff reserve the right to modify aspects of the report including the recommendations if and when new information may become available from on-going research or further work in this field, as pertaining to this investigation.

This report may not be altered or added to without the prior written consent of the author. This restraint also refers to electronic copies of this report which are supplied as sub portion of other reports, including main reports. Similarly, any recommendations, statements, or conclusions drawn from or based on this report must specifically refer to this report. If such comments form part of a main report for this investigation, the base line report must be included in its entirety as an appendix or separate section to the main report.

3. Scope and Terms of Reference for the Study

Eco Impact Legal Consulting (Pty) Ltd was appointed to conduct an ecological baseline assessment to identify and assess potential impacts that proposed activities may have on any significant terrestrial or aquatic ecosystems of the applicable site and surrounds.

The basic terms of reference (TOR) for this study were the Cape Nature recommended TOR for biodiversity specialists, and are as follows:

- Produce a baseline analysis of the botanical attributes of the study area as a whole.
- This report should clearly indicate any constraints that would need to be taken into account in considering the development proposals further.
- The baseline report must include a map of the identified sensitive areas as well as indications of important constraints on the property. It must also:
- Describe the broad ecological characteristics of the site and its surrounds in terms of any mapped spatial components of ecological processes and/or patchiness, patch size, relative isolation of patches, connectivity, corridors, disturbance regimes, ecotones, buffering viability etc.
- In terms of biodiversity pattern, identify or describe:

Community and ecosystem level

- The main vegetation type, its aerial extent and interaction with neighbouring types, soil or topography;
- The types of plant communities that occur in the vicinity of the site
- Threatened or vulnerable ecosystems (*cf. SA vegetation map/National Spatial Biodiversity Assessment, etc.*)

Species level

- Red Data Book species of conservation concern (RDBSCC) - (provide location)
- The viability of and estimated population size of the RDBSCC that are present (include degree of confidence in prediction based on availability of information and specialist knowledge, i.e. High = 70-100% confident, Medium 40-70% confident, Low 0-40% confident)
- The likelihood of other RDBSCC species occurring within the vicinity (include degree of confidence)
- Other pattern issues
- Any significant landscape features or rare or important vegetation associations such as seasonal wetlands, alluvium, seeps, quartz patches or salt marshes in the vicinity.
- The extent of alien plant cover of the site, and whether the infestation is the result of prior soil disturbance such as ploughing or quarrying
- The condition of the site in terms of current or previous land uses
- In terms of biodiversity process, identify or describe:
 - The key ecological “drivers” of ecosystems on the site and in the vicinity, such as fire.
 - Any mapped spatial component of an ecological process that may occur at the site or in the vicinity i.e. watercourses, biome boundaries, migration routes etc.
 - Any possible changes in key processes e.g. increase fire frequency or drainage/artificial recharge of aquatic systems.
- Describe what is the significance of the potential impact of the proposed project – with and without mitigation – on biodiversity pattern and process at the site, landscape, and regional

scales.

- Recommend actions that should be taken to prevent or mitigate impacts. Indicated how these should be scheduled to ensure long-term protection, management and restoration of affected ecosystems and biodiversity.
- Indicate limitations and assumptions, particularly in relation to seasonality.

4. Limitations, Assumptions and Methodology

The site was surveyed during the morning of 11 May 2018.

The natural vegetation areas and any other prominent environmental features such as watercourses i.e. wetlands, drainage lines etc. if present were delineated and prominent indigenous and alien invasive species were recorded.

Characteristic plant species (if present on the proposed development site) were recorded during the survey as well as any rare, threatened or species of conservation concern or habitats. The GIS based South African National Biodiversity Institute (SANBI) vegetation map for South Africa (Mucina and Rutherford 2010) was consulted, along with the available regional conservation plans (CAPE), and the Western Cape Biodiversity Spatial Plan (2017), and a conclusion was drawn based on this documentation and professional experience in the area. SANBI – Red List of South African Plants website was also referred to if required.

One of the primary assumptions of this study is that sufficient botanical and ecosystem characteristics information could be gathered during the visit to make accurate conclusions regarding the conservation value of the area and potential impact of the development as proposed. Habitats (type, quality, rarity, characteristics) rather than species are used to inform mapping and decision making in this case. If sufficient botanical and/or ecosystem characteristics information could not be gathered during the initial site visit recommendations will be made to ensure adequate assessments are undertaken.

Due to the time of year, small area and current state of the site it is believed that sufficient ecosystem characteristics information could be gathered during the survey to conduct the assessment.

5. Broad Ecological Characteristics of the Site and Surrounds

5.1 Topography

The study site is on a flat sand plain area next to the existing cemetery. A non-perennial water course and valley bottom wetland runs through the site in an east westerly direction.

5.2 Vegetation at a Regional and National Context

The study area is part of the fynbos biome, located within what is now known as the Core Region of the Greater Cape Floristic Region (GCFR; Manning & Goldblatt 2012). The GCFR is

one of only six Floristic Regions in the world, and is the only one largely confined to a single country (the Succulent Karoo component extends into southern Namibia). It is also by far the smallest floristic region, occupying only 0.2% of the world's land surface, and supporting about 11500 plant species, over half of all the plant species in South Africa (on 12% of the land area). At least 70% of all the species in the Cape region do not occur elsewhere, and many have very small home ranges (these are known as narrow endemics).

Many of the lowland habitats are under pressure from agriculture, urbanisation and alien plants, and thus many of the range restricted species are also under severe threat of extinction, as habitat is reduced to extremely small fragments. Data from the nationwide plant Red Listing project indicate that 67% of the threatened plant species in the country occur only in the southwestern Cape, and these total over 1800 species (Raimondo *et al* 2009). It should thus be clear that the Western Cape is a major national and global conservation priority, and is quite unlike anywhere else in the country in terms of the number of threatened plant species.

The Western Cape Biodiversity Spatial Plan (2017) indicates identified Critical Biodiversity Areas (CBAs) which aims to guide sustainable development by providing a synthesis of biodiversity information to decision makers. It serves as the common reference for all multi-sectoral planning procedures, advising which areas can be lost to development, and which areas of critical biodiversity value and their support zones should be protected against any impacts.



Map 1: Critical Biodiversity Areas, Ecological Support Areas and NFEPA Wetlands according to the WCBS (2017) mapping.

6. Observations and Findings Relative to the Terms of Reference

6.1 In terms of biodiversity pattern, identify or describe, at a community and ecosystem level-

6.1.1 The main vegetation type and plant communities that occur on, and in the vicinity of the site:

The National Vegetation Map of South Africa (2012) identifies the remnants of natural vegetation occurring within the area as Saldanha Flats Strandveld (VU).

Distribution Western Cape Province: Extensive coastal flats from St Helena Bay and the southern banks of the Great Berg River near its mouth in the north to Saldanha and Langebaan in the south, with the southernmost extension at the coast near Yzerfontein and Rietduin. Altitude 0–120 m.

Vegetation & Landscape Features Sclerophyllous shrublands built of a sparse emergent and moderately tall shrub layer, with an open succulent shrub layer forming the undergrowth. With conspicuous displays of geophytes and annual herbaceous flora in spring.

Geology & Soils The main geology is shallow calcareous sand over a fossiliferous Pleistocene limestone hardpan layer along an old marine terrace. The hardpan of the Sandveld Group is exposed in places while farmers often rip the hardpan and accumulate rock piles in cultivated fields. The Sandveld Group overlies the Cape Granites as well as the Malmesbury Group metasediments into which the granites intruded. Dominant land type Hb (almost 50%), followed by Db and Ha.

Climate Mainly cyclonic rainfall varying from approximately 250 mm in the north to 380 mm in the south (overall MAP: 300 mm), almost exclusively in winter. Mean daily maximum and minimum temperatures 26.6°C and 7.9°C for February and July, respectively. Mean monthly maximum and minimum temperatures for Langebaanweg 36.5°C and 2.2°C for January/February and July/August, respectively. Advection sea fog and dew contribute to the moisture balance in summer and autumn. Frost infrequent. Strong southeasterly winds typical of the summer period, northerly winds more frequent in the winter months, especially between May and August. See also climate diagram for FS 3 Saldanha Flats Strandveld (Figure 4.128).

Important Taxa Tall Shrubs: *Euclea racemosa* subsp. *racemosa* (d), *Nylandtia spinosa*, *Rhus glauca*. Low Shrubs: *Aspalathus lotoides* subsp. *lagopus*, *Clutia daphnoides*, *Euryops linifolius*, *Exomis microphylla*, *Hermannia pinnata*, *Lebeckia sericea*, *Leysera gnaphalodes*, *Nenax hirta* subsp. *calciphila*, *Pterocelastrus tricuspidatus*, *Pteronia divaricata*, *P. ovalifolia*, *P. uncinata*. Succulent Shrubs: *Euphorbia mauritanica*, *Ruschia macowanii*, *Tetragonia decumbens*, *T. fruticosa*, *Zygophyllum cordifolium*, *Z. morgsana*. Herbs: *Dimorphotheca pluvialis* (d), *Oncosiphon suffruticosum* (d), *Arctotheca calendula*, *Foveolina tenella*, *Hebenstretia repens*, *Helichrysum litorale*, *Nemesia versicolor*, *Senecio arenarius*, *Ursinia anthemoides* subsp. *anthemoides*. Geophytic Herbs: *Trachyandra ciliata*, *T. divaricata*. Succulent Herbs: *Dorotheanthus bellidiformis* (d), *Conicosia pugioniformis* subsp. *pugioniformis*, *Mesembryanthemum guerichianum*, *Senecio littoreus*. Graminoids: *Bromus pectinatus* (d), *Ehrharta calycina*, *E. villosa* var. *villosa*, *Schismus barbatus*, *Tribolium echinatum*.

Biogeographically Important Taxa (all West Coast endemics) Low Shrub: *Afrolimon capense* (d). Succulent Shrub: *Prenia pallens* subsp. *pallens*. Herbs: *Amellus asteroides*, *Grielum grandiflorum*. Geophytic Herb: *Ferraria densepunctulata*. Succulent Herb:

Tetragonia chenopodioides. Graminoids: *Cladoraphis cyperoides*, *Thamnochortus spicigerus*.

Endemic Taxa Geophytic Herbs: *Hessea mathewsii*, *Romulea elliptica*.

Conservation Endangered. Target 24%. Some 11% statutorily conserved in the West Coast National Park and Yzerfontein Nature Reserve and a very small portion also in private conservation areas such as Jakkalsfontein and West Point. More than a half has already been transformed for cultivation, road building or by urban development. Serious alien infestation is caused by trees such as *Acacia cyclops* and *A. saligna* and herbs including *Bromus diandrus* and *Medicago hispida*. Erosion generally very low.

References Boucher (1982, 1983, 1987, 1996c), Boucher & Rode (1996a, b, 1997a, b, c, d, 1999).

Observations and Findings within the Study Site:

The following indigenous vegetation species were recorded during the survey –

Euclea racemosa subsp. *racemosa* (d), *Nylandtia spinose*, *Euphorbia mauritanica*, *Ruschia macowanii*, *Tetragonia fruticosa*, *Zygophyllum morgsana*, *Bromus pectinatus*, *Sarcocornia* sp.

No species of Conservation Concern (SCC) were recorded on site.

Alien Trees, Weeds and Grasses-

- *Weeds and Grasses*

6.1.2 Threatened or vulnerable ecosystems:

CBA and ESA occur on site according to the 2017 Western Cape Biodiversity Spatial Plan.

The section identified for the expansion of the cemetery (area immediately south of the existing cemetery) is classified as a Terrestrial and Aquatic CBA and ESA. The vegetation on site is disturbed and degraded and can be described having a low ecological value. The water course is not pristine and a gravel weir blocks the water flow. The wetland is described as a Western Strandveld Channelled Valley Bottom Wetland.



Photo 1: View of proposed expansion area.



Photo 2: View of proposed expansion area.

The section not identified for the cemetery expansion to the south of the non-perennial water course vegetation is in a better ecological condition and classified as an Ecological Support Area (ESA1). The vegetation structure can be described as grassy and herb-rich areas consisting of a rich geophyte flora alternates with low to medium shrubland comprising of some succulent plant species. This area is assessed having a moderate ecological value. ESA areas are not essential for meeting biodiversity targets, but they

play an important role in supporting the functioning of PAs or CBAs, and are often vital for delivering ecosystem services. The non-perennial water course, wetland and buffer areas are assessed having a high conservation value.

6.1.3 The types of animal communities (fish, invertebrates, avifauna, mammals, reptiles):

Fish

No fish species are present on the site or within close proximity to the site.

Invertebrates

Observations and Findings:

It is expected that the area has a rich and diverse invertebrate life especially within the surrounding area. The proposed development, if restricted to recommended development area, will however not have a significant detrimental impact on the invertebrate species within the area.

Birds (Avifauna)

Approximately 188 species are known to occur in the bigger area (Hockey et al 2006).

Observations and Findings:

No bird SCC or their associated habitat was observed on site at the time of the survey.

If recommendations as provided in this report are adhered to it is not expected that the proposed development will have a significant detrimental impact on any bird species of conservation concern or their habitat due to extensive undeveloped areas that will remain adjacent to proposed development areas.

Mammals

As reported in Smithers (1983) small buck e.g. common duiker, steenbok and grysbok, rodents such as mole rats, field mice and hares, as well as carnivores such as genets, mongoose and caracal are likely to inhabit the area.

Some 68 mammal species are known to occur in the bigger area (Smithers 1983).

Observations and Findings:

No mammal SCC or their associated habitat was observed on site at the time of the survey.

If recommendations as provided in this report are adhered to it is not expected that the proposed development will have a significant detrimental impact on any mammal species of conservation concern or their habitat due to extensive undeveloped areas that will remain adjacent to proposed development areas.

Amphibians and Reptiles (Herpetofauna)

With respect to amphibians, Minter et al (2004) state that “habitat loss or modification as a result of agriculture and other forms of human activity remains the most important single threat to the survival of amphibian populations. The scale of these changes and their relative permanence are the major cause. At greatest risk are species that have limited distributions.”

As reported in Alexander et al (2007) 33 reptile species are likely to inhabit the area.

Observations and Findings:

No reptile or amphibian species were observed on site at the time of the survey.

Before and during clearing activities on site search and rescue of tortoises must be conducted. All tortoises collected must be released on the adjacent natural areas not to be developed upon.

If recommendations as provided in this report are adhered to it is not expected that the proposed development will have a significant detrimental impact on any reptile or amphibian species of conservation concern or their habitat due to extensive undeveloped areas that will remain adjacent to proposed development areas.

6.2 In terms of biodiversity pattern, identify or describe, at species level- (Show the degree of confidence in predictions based on the availability of information and specialist knowledge, i.e. High 70 -100% confident, Medium 40 - 70% confident, Low 0 - 40% confident. Assess the likelihood of other RDB species, or species of conservation concern, occurring in the vicinity. Reflect this in degree of confidence indicator).

6.2.1 The viability of, and estimated population size of the TOPS and RDB species of conservation concern that are present.

Red Data Listed or species listed under TOPS regulation (Vegetation)

No species of Conservation Concern (SCC) were recorded on site.

Red Data Listed or species listed under TOPS regulation (Reptiles and Amphibians)

No amphibian or reptile SCC is known to occur on the proposed development area and no rare or localized species were recorded at the time of the survey.

Red Data Listed or species listed under TOPS regulation (Mammals)

No mammal SCC is known to occur on the proposed development area and no rare or localized species were recorded at the time of the survey.

Red Data Listed or species listed under TOPS regulation (Avifauna)

No bird SCC is known to occur on the proposed development area and no rare or localized species were recorded at the time of the survey.

6.3 Other pattern issues-

Any significant landscape features or rare or important vegetation/faunal associations such as seasonal wetlands, alluvium, seeps, quartz patches or salt marshes in the vicinity:

CBA and ESA were recorded for the area. The botanical sensitivity allocated to the site is low, moderate and high. The water course is not pristine and a gravel weir blocks the water flow and the wetland is described as a Western Strandveld Channelled Valley Bottom Wetland. The water course and wetland as well as its buffer areas must not be impacted upon.

6.4 The extent of alien plant cover on the site:

Herb and grasses was recorded on some of the impacted areas.

6.5 The condition of the site/s in terms of current or previous land uses:

The vegetation on site closed to the cemetery is disturbed and degraded and can be described having a low ecological value. The water course is not pristine and a gravel weir blocks the water flow and the wetland is described as a Western Strandveld Channelled Valley Bottom Wetland.

The section not identified for the cemetery expansion to the south of the non-perennial water course vegetation is in a better ecological condition and classified as an Ecological Support Area (ESA1). The vegetation structure can be described as grassy and herb-rich areas consisting of a rich geophyte flora alternates with low to medium shrubland comprising of some succulent plant species. This area is assessed having a moderate ecological value. ESA areas are not essential for meeting biodiversity targets, but they play an important role in supporting the functioning of PAs or CBAs, and are often vital for delivering ecosystem services.

6.6 In terms of biodiversity process, identify or describe:

6.6.1. The key ecological “drivers” and/or environmental gradients of ecosystems on the site and in the vicinity.

Key ecological drivers identified on the site and surrounds are the protection of the wetland and water course.

6.6.2 Any possible changes in key processes e.g. increased fire frequency or drainage/artificial recharge of aquatic systems.

Yes. The expansion of the cemetery can impact on the wetland and water course.

6.6.3 The condition and functioning of rivers and wetlands (if present) in terms of possible changes to the channel, flow regime and naturally-occurring riparian vegetation.

Yes. The expansion of the cemetery can impact on the wetland and water course.

6.6.4 Would the conservation of the site lead to greater viability of the adjacent ecosystem by securing any of the functional factors listed?

No, not if the water course and its buffer areas are protected.

6.6.5 Does the site or neighbouring properties potentially contribute to meeting regional conservation targets for both biodiversity pattern and ecological processes?

No.

6.6.6 Is this a potential candidate site for conservation stewardship?

No.

7. Ecological Impact Assessment with Associated Mitigation and Rehabilitation Measures to be implemented

(See Appendix B attached for Impact Assessment Methodology used)

Construction and Operational Phases:

Nature of potential impact:	Impact of proposed activities on indigenous vegetation and associated fauna and avifauna habitat	
Discussion:	On the proposed development area the indigenous vegetation is of low conservation value and the site is not expected to be an important breeding site or habitat for any fauna or avifauna species of conservation concern.	
Cumulative impacts:	Loss of indigenous vegetation and associated fauna and avifauna habitat.	
Mitigation:	<ul style="list-style-type: none"> Clearly demarcate the proposed development footprint area and the recommended no-go/no-development area and undertake construction and operational activities (including construction camp) only in demarcated development footprint area. Demarcation method to be approved by an Environmental Control Officer (ECO). No construction related disturbance should be allowed outside the demarcated areas. Implement site specific erosion and storm water runoff management measures to prevent (or if prevention is not possible limit) any erosion from occurring on the development footprint area and surrounds. The landowner/s must adhere to his/her legal obligations to actively eradicate and manage alien vegetation infestations present on the applicable and surrounding properties. 	

Criteria	Without Mitigation	With Mitigation
Extent	2	1
Duration	5	5
Magnitude	10	2
Probability	5	2
Significance	85 - High	16 - Low
Status	High Negative Significance without Mitigation	Low Negative Significance with Mitigation
Reversibility	100% Reversible	100% Reversible
Irreplaceable	2-Partial loss of resources	2 – Partial loss of resources

loss of resources	but can be rehabilitated	
Degree to which impact can be mitigated	2 – Partly, some loss of indigenous vegetation will occur	

Nature of potential impact:
Impact of proposed development activities on surface- and groundwater resources

Discussion:

Construction activities can impact negatively upon the surface and groundwater resources on and adjacent to the site.

Possible chemicals found on site during construction as well as any hydrocarbon spillages will negatively affect the soil and surface or ground water interacting with it. Should the spills not be cleaned up and surface water infiltrate the ground, pollutants may even affect the groundwater resource.

Water pollution from the cemetery during operational phase can affect the water course and wetland quality and conservation and lead to health risks.

Cumulative impacts:

Loss of fresh water habitat and pollution of surface water resources.

Mitigation:

- All construction activities and personnel on site to stay within demarcated construction areas.
- Proper waste bins to be provided to construction staff and all waste to be regularly removed to municipal landfill site.
- If any fuel or hazardous materials is spilled on site it must be treated as according to EMP hazardous spill management requirements.
- The cement mixing area must be within the demarcated area and no seepage of site into the surrounding vegetation may occur.
- The water course and its buffer excluded from the cemetery expansion area and the necessary cut of and structures put in place to prevent seepage into the surrounding area and contamination of the water course.

Criteria		
	Without Mitigation	With Mitigation
Extent	2	1
Duration	5	1
Magnitude	10	2
Probability	5	2
Significance	85 - High	8 - Low
Status	High Negative Significance without Mitigation	Low Negative Significance with Mitigation
Reversibility	100%	100%
Irreplaceable loss of resources	2-Partial loss of resources but can be rehabilitated	1 – Resource will not be lost
Degree to which impact can be mitigated	1- Completely	

Nature of potential impact:
Potential erosion of the site and surrounds

Discussion: Vegetation clearance and hardening of surfaces could lead to an increase in storm water runoff and eventually lead to soil erosion which can occur due to wind (wind erosion cause dust pollution); and due to overland storm water flow should heavy rains fall.		
Cumulative impacts: Exposing soil may lead to erosion of site and surrounds if not mitigated.		
Mitigation: <ul style="list-style-type: none"> • Site specific construction and operational phase storm water management plan must be compiled and implemented to prevent any erosion or significant increase in storm water runoff from occurring and artificially recharging the remaining drainage lines. • Should any signs of erosion or artificial recharge be observed the municipality must implemented rectification and preventions measures immediately and consult with the appointed ECO before implementing these measures. 		
Criteria	Without Mitigation	With Mitigation
Extent	3	1
Duration	5	1
Magnitude	6	2
Probability	4	2
Significance	56 - Medium	8 - Low
Status	Medium Negative Significance without Mitigation	Low Negative Significance with Mitigation
Reversibility	100%	100%
Irreplaceable loss of resources	2-Partial loss of resources but can be rehabilitated	1 – Resource will not be lost
Degree to which impact can be mitigated	1 – Can be completely mitigated	

Decommissioning/Rehabilitation Phase:

Nature of potential impact: Potential erosion of the site and surrounds during rehabilitation phase		
Discussion: Rehabilitation (i.e. demolishing developed structures) could lead to soil erosion which can occur due to wind (wind erosion cause dust pollution); and due to overland storm water flow should heavy rains fall.		
Cumulative impacts: Exposing soil may lead to erosion of site and surrounds if not mitigated.		
Mitigation: <ul style="list-style-type: none"> • Decommissioned areas must be rehabilitated and planted with indigenous vegetation immediately after built structures have been removed. • Engineered contour structures reinstated and maintained. • Monitor rehabilitation of area on a 6 monthly basis until effective/successful rehabilitation has been obtained. • If erosion is detected implement erosion rectification and preventions measures as guided by an ECO 		
Criteria	Without Mitigation	With Mitigation
Extent	3	1

Duration	5	1
Magnitude	6	2
Probability	4	2
Significance	56 - Medium	8 - Low
Status	Medium Negative	Low Negative (Acceptable)
Reversibility	100%	100%
Irreplaceable loss of resources	2-Partial loss of resources but can be rehabilitated	1 – Resource will not be lost
Degree to which impact can be mitigated	1 – Can be completely mitigated	

8. Concluding Remarks and Summary of Impact Mitigation and Rehabilitation Measures Proposed before, during and after the Proposed Activities

The botanical sensitivity allocated to the site is low and moderate. The proposed cemetery is planned to be expanded through the non-perennial water course and wetland area.

It was concluded that from an ecological impact point of view that the proposed development will have an unacceptable significant negative impact on environmental features of the site and surrounds if the specialist recommendations in this report are not taken into consideration and effectively implemented.

The area immediately south of the existing cemetery can be used for the expansion, provided that a buffer between the expansion area and the non-perennial water course is in place and protected and that the necessary structures can be put in place to prevent seepage from the cemetery into these areas. It is however recommended that the area south of the non-perennial water course classified as an ESA area be considered for the expansion of the cemetery.

Summary of recommendations as listed in the report and additional recommendations to be implemented are listed below:

Construction, Operational and Rehabilitation phases -

- The project implementation process should be subject to standard Environmental Management Programme (EMP) prescripts and conditions and only proceed under supervision of a competent and diligent Environmental Control Officer, both during the construction, operational and decommission/rehabilitation phases.
- Undertake development activities only in identified and specifically demarcated areas as proposed.
 - Demarcate no-go areas before any land clearing occurs under the supervision of an ECO. Demarcation must be clearly visible and effective and no-go area must remain demarcated throughout construction phase.
 - Personnel should be restricted to the construction camp site and immediate construction areas only.
 - Remove and conserve topsoil layer and overburden material for rehabilitation after construction activities have ceased

- Implement site specific erosion and storm water runoff management measures as according to EMP requirements to prevent (or if prevention is not possible limit) any erosion from occurring on the development footprint area and surrounds.
- Proper waste bins to be provided during construction and operation and all waste to be regularly (at least once a week) removed to municipal landfill site.
- If any fuel or hazardous materials is spilled on site it must be treated as according to EMP requirements.
- The cement mixing area must be within a demarcated area and no cement mix runoff water escapes from cement mixing area.
- The landowner/s must adhere to his/her legal obligations to actively eradicate and manage alien tree infestations present on the applicable and surrounding properties.
- Site specific construction and operational phase storm water management plan must be compiled and implemented to prevent any erosion or significant increase in storm water runoff from occurring.
- Should any signs of erosion or artificial recharge be observed the municipality must implemented rectification and preventions measures immediately and consult with the appointed ECO before implementing these measures.
- Only use vegetation indigenous to the area to rehabilitate impacted/decommissioned areas and implement ongoing monitoring of the rehabilitated areas until successful rehabilitation has taken place.
- After topsoil has been replaced ongoing monitoring and removal of alien vegetation regrowth must be conducted to ensure effective rehabilitation of indigenous vegetation.
- Decommissioned areas must be rehabilitated and planted with indigenous vegetation immediately after built structures have been removed.
- Monitor rehabilitation of areas impacted outside of the proposed development areas or decommissioned areas on a 6 monthly basis until effective/successful rehabilitation has been obtained.
- If erosion is detected during or after rehabilitation implement erosion rectification and preventions measures as guided by an ECO

Eco Impact is of the opinion, and based on the survey and desk study done, that the proposed development activities; if designed and implemented according to the recommendations as provided in this report, will not have an unacceptable significantly negative impact on the environmental aspects of the site and surrounds as assessed in this report.

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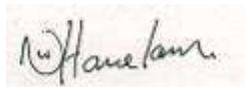
APPENDIX A: Declaration of Independence

THE SPECIALIST

Note: Duplicate this section where there is more than one specialist.

I **Nicolaas Willem Hanekom**, as the appointed specialist hereby declare/affirm the correctness of the information provided or to be provided as part of the application, and that I:

- in terms of the general requirement to be independent:
 - other than fair remuneration for work performed/to be performed in terms of this application, have no business, financial, personal or other interest in the activity or application and that there are no circumstances that may compromise my objectivity; or
 - am not independent, but another specialist that meets the general requirements set out in Regulation 13 of GN No. 326 have been appointed to review my work (Note: a declaration by the review specialist must be submitted);
- in terms of the remainder of the general requirements for a specialist, am fully aware of and meet all of the requirements and that failure to comply with any the requirements may result in disqualification;
- have disclosed/will disclose, to the Applicant, the Department and registered interested and affected parties, all material information that have or may have the potential to influence the decision of the Department or the objectivity of any report, plan or document prepared or to be prepared as part of the application;
- have ensured/will ensure that information containing all relevant facts in respect of the application was/will be distributed or was/will be made available to interested and affected parties and the public and that participation was/will be facilitated in such a manner that all interested and affected parties were/will be provided with a reasonable opportunity to participate and to provide comments;
- have ensured/will ensure that the comments of all interested and affected parties were/will be considered, recorded and submitted to the Department in respect of the application; and
- am aware that a false declaration is an offence in terms of Regulation 48 of the NEMA EIA Regulations, 2014 (as amended).



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Signature of the specialist:

Date:

Eco Impact Legal Consulting (Pty) Ltd

Name of company (if applicable):

APPENDIX B: Impact Assessment Methodology

Below is the assessment methodology utilized in determining the significance of the potential impacts on the biophysical environment, and where applicable the possible alternatives. The methodology is broadly consistent with that described in the Department of Environmental Affairs' Guideline Document on the EIA Regulations (1998).

For each potential impact, the significance is determined by specified factors as in Table 1. Significance is described prior to mitigation as well as with the most effective mitigation measure(s) in place.

The mitigation described in the document represents the full range of plausible and pragmatic measures that must be implemented.

Despite the attempts at providing a completely objective and impartial assessment of the environmental implications of proposed activities, the specialist can never completely escape the subjectivity inherent in attempting to define significance.

Recognising this, potential subjectivity in the current process is addressed as follows:

- Be clear about the difficulty of being completely objective in the determination of significance;
- Develop an explicit methodology for assigning significance to impacts and outlining this methodology in detail. Having an explicit methodology not only forces the assessor to come to terms with the various facets contributing toward determination of significance, thereby avoiding arbitrary assignment, but also provides the reader of the report with a clear summary of how the assessor derived the assigned significance; and
- Wherever possible, differentiating between the likely significance of potential environmental impacts as experienced by the various affected parties.

Although these measures may not totally eliminate subjectivity, they do provide an explicit context within which to review the assessment of impacts.

Table 1: Assessment criteria for the evaluation of impacts

Criteria		Description	
Nature	a description of what causes the effect, what will be affected, and how it will be affected.		
	Type	Score	Description
Extent (E)	None (No)	1	Footprint
	Site (S)	2	On site or within 100 m of the site
	Local (L)	3	Within a 20 km radius of the centre of the site
	Regional (R)	4	Beyond a 20 km radius of the site
	National (Na)	5	Crossing provincial boundaries or on a national / land wide scale
Duration (D)	Short term (S)	1	0 – 1 years
	Short to medium (S-M)	2	2 – 5 years
	Medium term (M)	3	5 – 15 years
	Long term (L)	4	> 15 years
	Permanent(P)	5	Will not cease
Magnitude (M)	Small (S)	0	will have no effect on the environment
	Minor (Mi)	2	will not result in an impact on processes
	Low (L)	4	will cause a slight impact on processes
	Moderate (Mo)	6	processes continuing but in a modified way
	High (H)	8	processes are altered to the extent that they temporarily cease
	Very high (VH)	10	results in complete destruction of patterns and permanent cessation of processes.
Probability (P) the likelihood of the impact actually occurring. Probability is estimated on a scale, and a score assigned	Very improbable (VP)	1	probably will not happen
	Improbable (I)	2	some possibility, but low likelihood
	Probable (P)	3	distinct possibility
	Highly probable (HP)	4	most likely
	Definite (D)	5	impact will occur regardless of any prevention measures
Significance (S)	Determined through a synthesis of the characteristics described above: S = (E+D+M) x P Significance can be assessed as low, medium or high		
Low: < 30 points:	The impact would not have a direct influence on the decision to develop in the area		
Medium: 30 – 60 points:	The impact could influence the decision to develop in the area unless it is effectively mitigated		
High: > 60 points:	The impact must have an influence on the decision process to develop in the area		
No significance	When no impact will occur or the impact will not affect the environment		
Status	Positive (+)		Negative (-)
The degree to which the impact can be reversed	Completely reversible (R)	90-100%	The impact can be mostly to completely reversed with the implementation of the correct mitigation and rehabilitation measures.
	Partly reversible (PR)	6-89%	The impact can be partly reversed providing that mitigation measures as stipulated in the EMP are implemented and rehabilitation measures are undertaken
	Irreversible (IR)	0-5%	The impact cannot be reversed, regardless of the mitigation or rehabilitation measures taking place
The degree to which the impact may cause irreplaceable loss of resources	Resource will not be lost (R)	1	The resource will not be lost or destroyed provided that mitigation and rehabilitation measures as stipulated in the EMP are implemented
	Resource may be partly destroyed (PR)	2	Partial loss or destruction of the resources will occur even though all management and mitigation measures as stipulated in the EMP are implemented
	Resource cannot be replaced (IR)	3	The resource cannot be replaced no matter which management or mitigation measures are implemented.
The degree to which the impact can be mitigated	Completely mitigatable (CM)	1	The impact can be completely mitigated providing that all management and mitigation measures as stipulated in the EMP are implemented
	Partly mitigatable (PM)	2	The impact cannot be completely mitigated even though all management and mitigation measures as stipulated in the EMP are implemented. Implementation of these measures will provide a measure of mitigatability
	Un-mitigatable (UM)	3	The impact cannot be mitigated no matter which management or mitigation measures are implemented.