ECOLOGICAL IMPACT ASSESSMENT

Melkhoutfontein Housing Project on Portion of Erf 480/111

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PROJECT DETAILS

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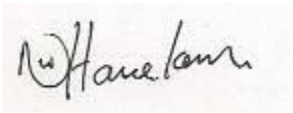
Reviewed	Director: Environmental Management; Principle EAP & Biodiversity Specialist	Nicolaas Hanekom		24/11/2017

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1. INTRODUCTION AND BACKGROUND

Eco Impact Legal Consulting (Pty) Ltd (Eco Impact) has been appointed by ASLA DEVCO on behalf of the Hessequa Municipality to assess the impacts of the proposed housing project on the ecology.

At a regional level the study area falls within the Southern Cape Coastal region of the Western Cape. Melkhoutfontein is a relatively small town lying approximately 7km west of Still Bay, the popular coastal holiday town. Still Bay is situated along the banks of the Goukou River estuary where it meets the Indian Ocean on the Southern Cape coast of South Africa.

The ± 18.26ha property surveyed is situated southwest of the town Melkhoutfontein, south of the main access road (Eden Country Rd).

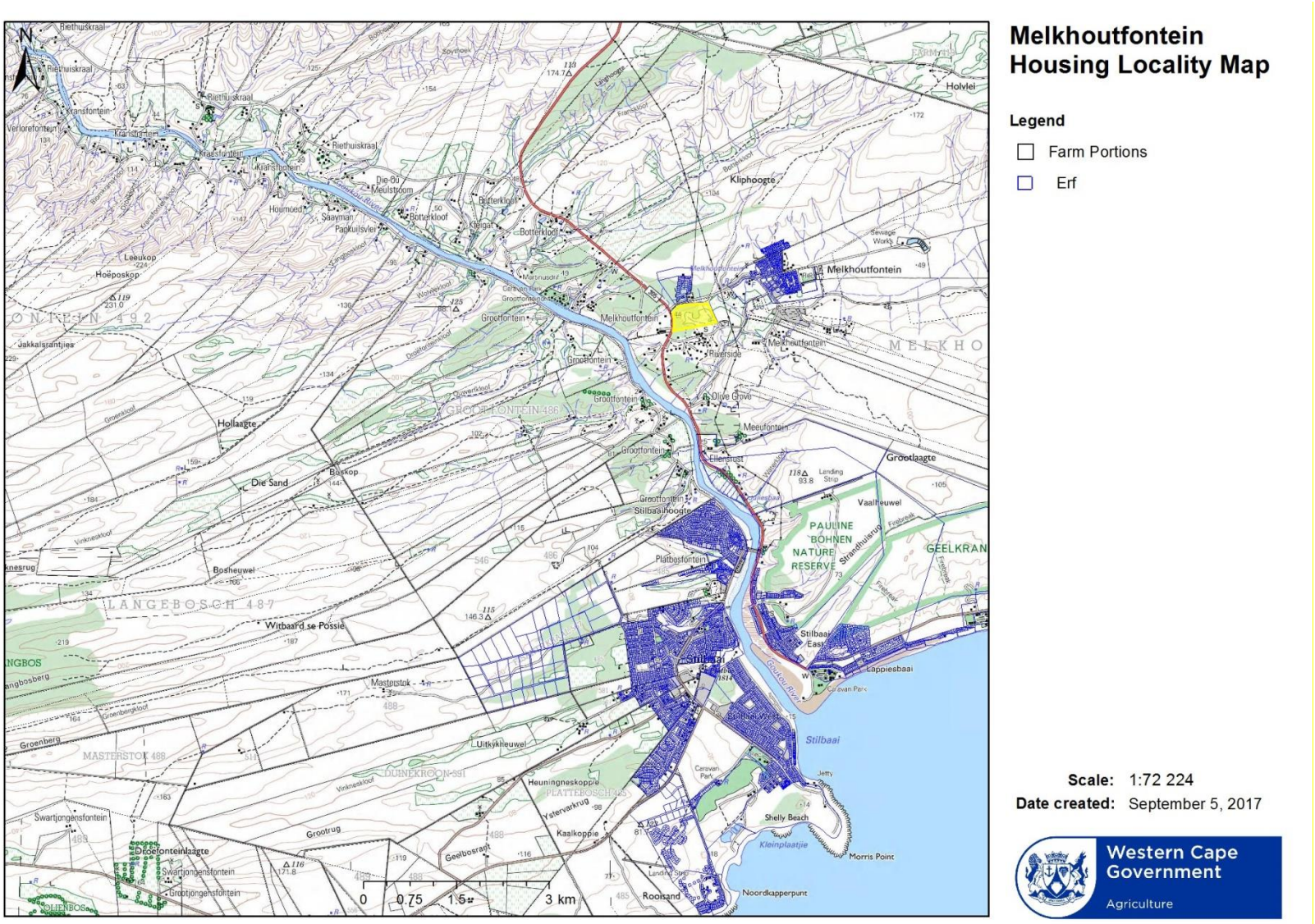


Figure 1: The 1 in 50 000 topographical map for the study area. Study area indicated in yellow.

2. METHODOLOGY, ASSUMPTIONS AND LIMITATIONS OF THE STUDY

Input into this report was informed by a combination of desktop assessments of existing freshwater ecosystem information for the study area and catchment, as well as by a more detailed assessment of the freshwater features at the site.

The site was visited in August 2017. During the field visit, the characterisation and integrity assessments of the ecological features were undertaken. Mapping of the features was undertaken using Google Maps with GPS tracker. The features were mapped while doing the field survey. The SANBI Biodiversity GIS website was also consulted to identify any constraints in terms of fine-scale biodiversity conservation mapping as well as possible freshwater features mapped in the Freshwater Ecosystem Priority Areas maps. This information/data was used to inform the resource protection related recommendations.

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.

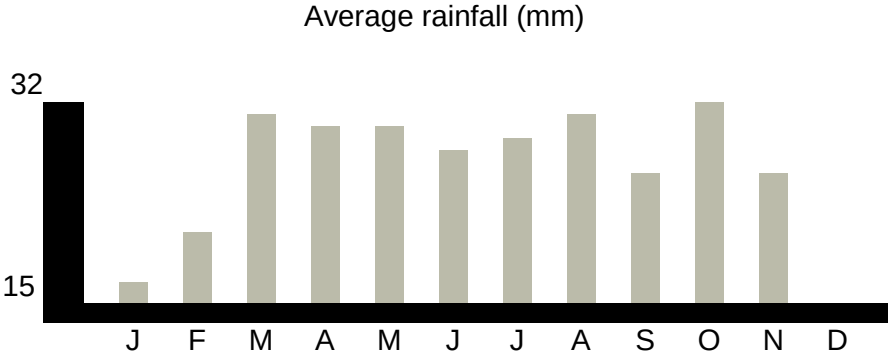
Limitations and uncertainties often exist within the various techniques adopted to assess the condition of ecosystems. The following techniques and methodologies were utilized to undertake this study:
- The ecological importance and sensitivity assessment was conducted according to the guidelines as developed by DWAF (1999).
- Recommendations are made with respect to the adoption of buffer zones within the development site, based on the wetlands functioning and site characteristics.

The level of aquatic assessment undertaken was considered to be adequate for this study.

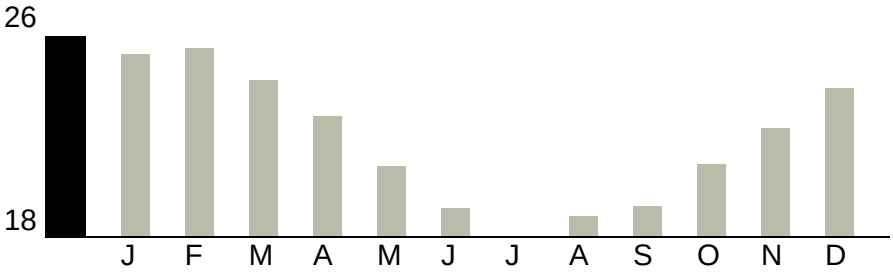
3. DESCRIPTION OF THE ECOLOGICAL FEATURES AND THE WIDER STUDY AREA

Topography
The study site is located within an undulating area on a gradient which slopes mainly towards the coast from north to south and west to east on this particular site. Two non-perennial drainage lines exist on the site that feed into the Goukou River Estuary system nearby. The elevation of the site varies between 38m to 28m above mean sea level.

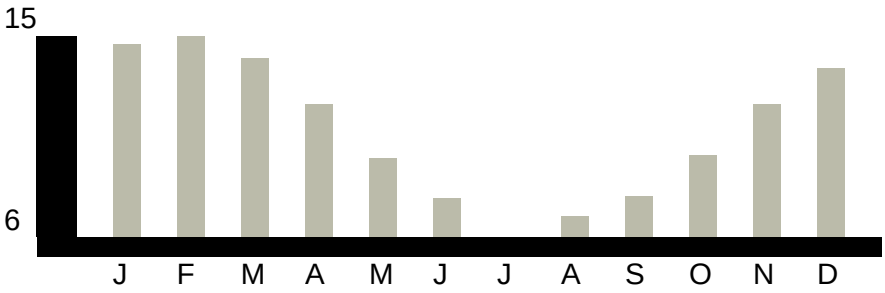
Climate
Still Bay normally receives about 315mm of rain per year, with rainfall occurring throughout the year. The chart below (lower left) shows the average rainfall values for Still Bay per month. It receives the lowest rainfall (15mm) in December and the highest (32mm) in October. The monthly distribution of average daily maximum temperatures (centre chart below) shows that the average midday temperatures for Still Bay range from 17.9°C in July to 25.5°C in February. The region is the coldest during July when the mercury drops to 6.2°C on average during the night. Consult the chart below (lower right) for an indication of the monthly variation of average minimum daily temperatures.



Average midday temperature (°C)



Average night-time temperature (°C)



Geology
The three major occurring substrata are limestone, substantial granite rocks and sand – all natural in origin.

Table 1: Key water resource information for the study area.

DESCRIPTOR	NAME/ DETAILS	NOTES
Water Management Area (WMA)	Breede-Gouritz WMA	
Catchment Area	Gouritz	
Quaternary Catchment	H90E	
Type of water resource	Seasonal.	Non-perennial drainage lines which form part of a tributary of the Goukou river cross the site. The one non-perennial drainage line catchment starts on the study site and the other one starts north of the R 305 to Melkhoutfontein road.
Water resource potentially impacted	The Goukou river is a small river draining the Langeberg Mountains and flows over the coastal plains, west of Mossel Bay.	
Site visit	Mr Nicolaas Hanekom and Ms Lauren Abrahams	August 2017

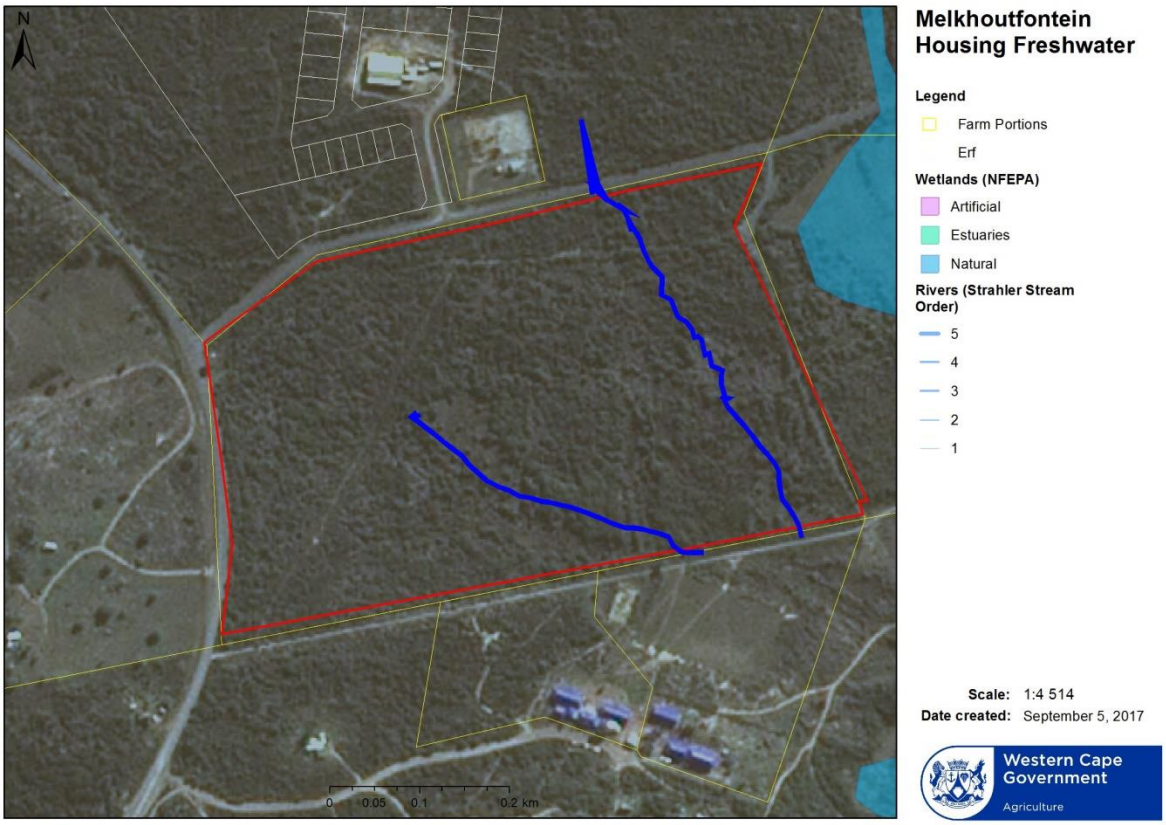


Figure 2: Water Uses location on property. Red polygon – Study Area

3.1. SITE CHARACTERISATION

In order to assess the condition and ecological importance and sensitivity of the non-perennial rivers, it is necessary to understand how the river might have appeared under un-impacted conditions. This is achieved through classifying the river according to its ecological characteristics, in order that it can be compared to ecologically similar rivers. River typing or classification involves the hierarchical grouping of rivers into ecologically similar units so that inter- and intra-river variation in factors that influence water chemistry, channel type, substratum composition and hydrology are best accounted for. Any comparative assessment of river condition should only be done between rivers that share similar physical and biological characteristics under natural conditions. Thus, the classification of rivers provides the basis for assessing river condition to allow comparison between similar river types. The primary classification of rivers is a division into Ecoregions. Rivers within an ecoregion are further divided into sub-regions.

Ecoregions: groups of rivers within South Africa, which share similar physiography, climate, geology, soils and potential natural vegetation. For the purposes of this study, the ecoregional classification presented in DWAF (1999), which divides the country's rivers into ecoregions, was used. The non-perennial drainage lines fall within the South Western Coastal Belt Ecoregion (Table 2).

Primary boundary determinants:
Plains with low to moderate relief are often distinctive, but significant areas with closed hills and mountains with moderate to high relief are present. Prominent escarpments occur in the north and northwest. Vegetation consists of a diversity of Nama Karoo, Succulent Karoo, Renosterveld and Thicket types, but the dominant types are Central Nama Karoo and Great Nama Karoo.

General:
Rivers such as the Doring, Upper tributaries of the Gouritz and Gamtoos flow through this region.
• Mean annual precipitation: Arid to low.
• Coefficient of variation of annual precipitation: High but very high in areas.
• Drainage density: Varies from low to medium to high.
• Stream frequency: Low/medium, medium/high to high.
• Slopes <5%: Varies from <20% to >80%.
• Median annual simulated runoff: Very low to low.
• Mean annual temperature: Moderate to moderately high.

Size = 63743.8 km^2

Table 2: Characteristics of the Ecoregion (**Dominant Types In Bold**)

Main Attributes	Characteristics
Terrain Morphology	**Plains; Low Relief**; Plains Moderate Relief; Lowlands; Hills and Mountains; Moderate and High Relief; Open Hills, Lowlands; Mountains; Moderate to High Relief; Closed Hills; Mountains; Moderate and High Relief; Table-Lands: Moderate and High Relief
Vegetation types	Valley Thicket (limited); Spekboom Succulent Thicket (limited); Central Nama Karoo; Eastern Mixed Nama Karoo (limited); Great Nama Karoo; Upper Nama Karoo; Bushmanland Nama Karoo (limited) Lowland Succulent Karoo; Upland Succulent Karoo; Little Succulent Karoo (limited) Escarpment Mountain Renosterveld; **Canca Limestone Fynbos, according to Mucina and Rutherland (2006) this vegetation type is classified as Least Threatened.**
Altitude (m a.m.s.l)	**100-300** (limited), 300-1700; 1700-1900 limited
MAP (mm)	100 to 1000
Rainfall Pattern	Summer and Winter
Mean Annual Runoff (mm)	20 to more than 250
Average daily rtemperature (^{0}C)	4 – 32

Sub-regions: sub-regions (or geomorphological zones) are groups of rivers or segments of rivers, within an ecoregion, which share similar geomorphological features, of which gradient is the most important. The use of geomorphological features is based on the assumption that these are a major factor in the determination of the distribution of the biota. The geomorphological and other physical characteristics associated with the watercourses within the study sites are given in Table 3.

Table 3: General Geomorphological and Physical features of the Watercourses

River	Two non-perennial drainage line that flow into a tributary of the Goukou river runs over the study area.
Geomorphological Zone	Plain
Lateral mobility	Moderately confined: channel course determined by macro-scale features, but some lateral migration is possible.
Channel form	Vegetated channels

Channel pattern	Single channel pattern
Channel type	Vegetated channel.
Channel modification	Low modification (Mostly natural. However impacted by *Acacia cyclops* infestation)
Hydrological type	Seasonal
Ecoregion	South Western Coastal Belt
DWS catchment	Goukou
Vegetation type	Canca Limestone Fynbos – Least Threatened
Rainfall region	Summer and Winter

3.2. DESCRIPTION OF THE NON PERENNIAL DRAINAGE LINES AT THE STUDY SITE

In order to assess the condition, ecological importance and sensitivity of the river segment being assessed, it is necessary to understand how the river habitat characteristics and stream flow was under natural conditions (prior to direct and induced human modifications). This is achieved through classifying rivers according to what its ecological characteristics are in situ and extrapolating these characteristics in comparison with data derived reference conditions, or via professional judgment using catchments of similar physical and biological characteristics. Thus, by deducing ecological reference conditions, impacts on the site can be measured and classed to channel condition, riparian zone integrity, stream quality, as well as factors impacting with reference to the catchment as a whole.

River typing or classification involves the hierarchical grouping of rivers into ecologically similar units so that inter- and intra-river variation in factors that influence water chemistry, channel type, substratum composition and hydrology are best accounted for. This tool provides a framework for reference conditions of streams under study by comparing these conditions to streams that are similar. Thus, the classification of rivers provides the basis for assessing river condition to allow comparison between similar rivers (as a reference) and the rivers under study. The primary classification of rivers is a division into Ecoregions. Rivers within an ecoregion are further divided into sub-regions.

The instream habitat integrity of the non-perennial drainage lines is largely natural to moderately modified, with the main impact being as a result of the upstream access road impacting on the one drainage line flow and a downstream access road that impact on both drainage lines. However, the drainage lines are mostly natural with the biggest impact is as a result of dense *Acacia cyclops* plant growth which impacting on the drainage line vegetation.

There are two conservation mapping initiatives of relevance to the project, the Freshwater Ecosystem Priority Areas (FEPA) map which is available for the entire South Africa and the Hessequa Municipality's mapping of Critical Biodiversity Areas (CBA). FEPAs are strategic spatial priorities for conserving freshwater ecosystems and associated biodiversity that were determined through a process of systematic biodiversity planning and were identified using a range of criteria for serving ecosystems and associated biodiversity of rivers, wetlands and estuaries. These rivers should be kept in their current condition, should not be degraded any further than its current moderately modified condition and it should be considered for rehabilitation. The non-perennial drainage lines through the property is mapped as a FEPA River Corridor that is considered to be moderately modified and should not be allowed to be degraded or modified further. There are no FEPA wetlands mapped within the study area.

The South African Scoring System version 5 ("SASS5") is a biological index which determines the health of a river based on the aquatic invertebrates (Macroinvertebrate sampling**).** It is used in conjunction with the water quality indices such as the ph, electrical conductivity, temperature and dissolved oxygen. The purpose of combining the two methods enables the assessor to determine both the water impairment and river health. In addition,

extra indices are added on SASS5 such as Invertebrate Habitat Assessment System version 2.2 (IHAS) and Macroinvertebrate Response Assessment Index (MIRAI) which as part of SASS5 aid in determining the various or sampled habitat quality and the present ecological state of the study catchment. All the above combined indices form part of the ongoing River Health Project an aquatic ecosystem assessment.

A SASS5 survey could not be conducted at the time of the field surveys due to the fact that the river was dry and not flowing. According to Rossouw *et al* (2005) invertebrates are not ideal indicators to be used in a rapid or desktop reserve determination in non-perennial rivers, mainly due to a lack of long-term data and understanding of the ecology of non-perennial systems and therefore at present any method used would be of a relatively low confidence rating.

The complexity of the non-perennial river system in terms of flow variability (rivers are dry or have very low flow during certain seasons) makes sampling of invertebrates difficult. SASS5 is not an ideal method to determine the presence of invertebrates in the river, as it was developed for use in perennial rivers where there is flow and a diverse habitat. Furthermore taxa in non-perennial rivers cannot be viewed to have the same sensitivity as taxa found in perennial rivers. As they may have adapted to these harsh conditions, and therefore not be sensitive to them.

3.3. HABITAT INTEGRITY OF THE FRESHWATER FEATURES

Assessment of habitat integrity of a river can be seen as a precursor of the assessment of biotic integrity and is a measure of the degree to which a river has been modified from its natural state. Habitat and biotic integrity together constitute ecological integrity (Kleynhans, 1996). A site-based approach was carried out at all sites, where it is based on ground level observations at each monitoring site, but also makes use of other sources of information (maps, local knowledge etc.). The objectives of the Index of Habitat Integrity (IHI) assessment are to put into perspective the significance of various factors in the degradation of the habitat integrity of a specific river (Kleynhans, 1996).

The methodology (Kleynhans, 1996) involves an assessment of the number and severity of anthropogenic impacts on a river and the damage they potentially inflict upon the system. These disturbances include both abiotic and biotic factors, which are regarded as the primary causes of degradation of a river. The severity of each impact is ranked using a six-point scale with 0 (no impact), 1 to 5 (small impact), 6 to 10 (moderate impact), 11 to 15 (large impact), 16 to 20 (serious impact) and 21 to 25 (critical impact).

The evaluation of Habitat Integrity (HI) provides a measure of the degree to which a river has been modified from its natural state. The methodology (DWAF, 1999) involves a qualitative assessment of the number and severity of anthropogenic perturbations on a river and the damage they potentially inflict upon the system. These disturbances include both abiotic and biotic factors, which are regarded as the primary causes of degradation of a river. The severity of each impact is ranked from 0 (no impact) to 25 (critical impact). The Habitat Integrity Assessment is based on assessment of the impacts of two components of the river, the riparian zone and the instream habitat (Table 4). Assessments are made separately for both components, but data for the riparian zone are interpreted primarily in terms of the potential impact on the instream component.

The estimated impact of each criterion is calculated as follows:

Rating for the criterion/maximum value (25) x weight (percent)

Table 4: Index of Habitat Integrity Assessment results and criteria assessed in the affected watercourse

Instream Criteria	Weight	Score	Riparian Zone Criteria	Weight	Score
Water Abstraction	14	0 (0%)	Water Abstraction	13	0 (0%)
Flow Modification	13	5 (2.6%)	Inundation	11	0 (0%)
Bed Modification	13	5 (2.6%)	Flow modification	12	5 (2.4%)
Channel Modification	13	5 (2.6%)	Water Quality	13	0 (0%)
Water Quality	14	0 (0%)	Indigenous vegetation removal	13	0 (0%)
Inundation	10	0 (2.8%)	Exotic vegetation encroachment	12	6 (2.88%)
Exotic Macrophytes	9	0 (0%)	Bank Erosion	14	0 (0%)
Exotic Fauna	8	0 (0%)	Channel Modification	12	0 (0%)
Solid waste disposal	6	0 (0%)			
Instream Habitat Integrity Score	100	15 (85%)	Riparian Zone Habitat Integrity Score		11 (89%)
Integrity Class		B	Integrity Class		B

Table 5: Intermediate Habitat Integrity categories (from Kleynhans, 1996)

Category	Description	Score (% of total)
A	Unmodified, natural.	90-100
B	Largely natural with few modifications. A small change in natural habitats and biota may have taken place but the ecosystem functions are essentially unchanged.	80-90
C	Moderately modified. A loss and change of natural habitat and biota have occurred but the basic ecosystem functions are still predominantly unchanged.	60-79
D	Largely modified. A large loss of natural habitat, biota and basic ecosystem functions has occurred.	40-59
E	The loss of natural habitat, biota and basic ecosystem functions is extensive.	20-39
F	Modifications have reached a critical level and the lotic system has been modified completely with almost complete loss of natural habitat and biota. In worst instances basic ecosystem functions have been destroyed and changes are irreversible.	0-19

The instream habitat integrity and riparian habitat of the two non-perennial drainage lines is largely natural with the main impact being as a result of the upstream and downstream road crossings and the encroachment of the *Acacia cyclops* into the stream habitat.

Photo 1: View of one of the non-perennial drainage lines. Photo taken downstream from the north towards the south

Photo 2: View of one of the non-perennial drainage lines

Photo 3: View of one of the non-perennial drainage lines

Photo 4: View of one of the non-perennial drainage lines

Photo 5: View of one of the non-perennial drainage lines

Photo 6: View of one of the eastern non-perennial drainage lines.
Source of the eastern non-perennial drainage line where the shadows are on the photo

Photo 7: View of one of the western non-perennial drainage lines.

3.4. ECOLOGICAL IMPORTANCE AND SENSITIVITY (EIS)

The EIS Assessment considers a number of biotic and habitat determinants summarised to indicate either importance or sensitivity.

Table 6: Definition of the four-point scale used to assess biotic and habitat determinants presumed to indicate either importance or sensitivity

Four point scale	Definition
1	One species/taxon judged as rare or endangered at a local scale.
2	More than one species/taxon judged to be rare or endangered on a local scale.
3	One or more species/taxon judged to be rare or endangered on a Provincial/regional scale.
4	One or more species/taxon judged as rare or endangered on a National scale (i.e. SA Red Data Books)

Table 7: Ecological importance and sensitivity categories (DWAF, 1999)

EISC	General description	Range of median
Very high	Quaternaries/delineations that are considered to be unique on a national and international level based on unique biodiversity (habitat diversity, species diversity, unique species, rare and endangered species). These rivers (in terms of biota and habitat) are usually very sensitive to flow modifications and have no or only a small capacity for use.	>3-4
High	Quaternaries/delineations that are considered to be unique on a national scale based on their biodiversity (habitat diversity, species diversity, unique species, rare and endangered species). These rivers (in terms of biota and habitat) may be sensitive to flow modifications but in some cases may have substantial capacity for use.	>2-≤3
Moderate	Quaternaries/delineations that are considered to be unique on a provincial or local scale due to biodiversity (habitat diversity, species diversity, unique species, rare and endangered species). These rivers (in terms of biota and habitat) are not usually very sensitive to flow modifications and often have substantial capacity for use.	>1-≤2

Low/marginal	Quaternaries/delineations which are not unique on any scale. These rivers (in terms of biota and habitat) are generally not very sensitive to flow modifications and usually have substantial capacity for use.	≤1

Table 8: Results of the EIS assessment for the affected watercourse

Biotic Determinants	**Score**
Rare and endangered biota	0
Unique biota	0
Intolerant biota	0
Species/taxon richness	0
Aquatic Habitat Determinants	
Diversity of aquatic habitat types of features	0
Refuge value and habitat type	0
Sensitivity of habitat to flow changes	0
Sensitivity of flow related water quality changes	0
Migration route/corridor for instream and riparian biota	0
National parks, wilderness areas, Nature Reserves, Natural Heritage sites, PNEs	0
EIS Category	Low/marginal

EIS considers a number of biotic and habitat determinants surmised to indicate either importance or sensitivity. The determinants are rated according to a four-point scale. The median of the resultant score is calculated to derive the EIS category.

The two non-perennial drainage lines are considered to be of low ecological importance and sensitivity. There is no known rare species occurring in this river reach. The non-perennial rivers are however classified as an Ecological Support Area in order to maintain ecological processes.

3.5. BIODIVERSITY CONSERVATION VALUE

There are two conservation mapping initiatives of relevance to the project, the Freshwater Ecosystem Priority Areas (FEPA) map which is available for the entire South Africa and the Hessequa Municipality's mapping of Critical Biodiversity Areas (CBA). Figure 3 shows the FEPA map for the area. FEPAs are strategic spatial priorities for conserving freshwater ecosystems and associated biodiversity that were determined through a process of systematic biodiversity planning and were identified using a range of criteria for serving ecosystems and associated biodiversity of rivers, wetlands and estuaries. These rivers should be kept in their current condition should not be degraded any further than its current moderately modified condition and it should be considered for rehabilitation. There are no FEPA wetlands mapped within the study area.

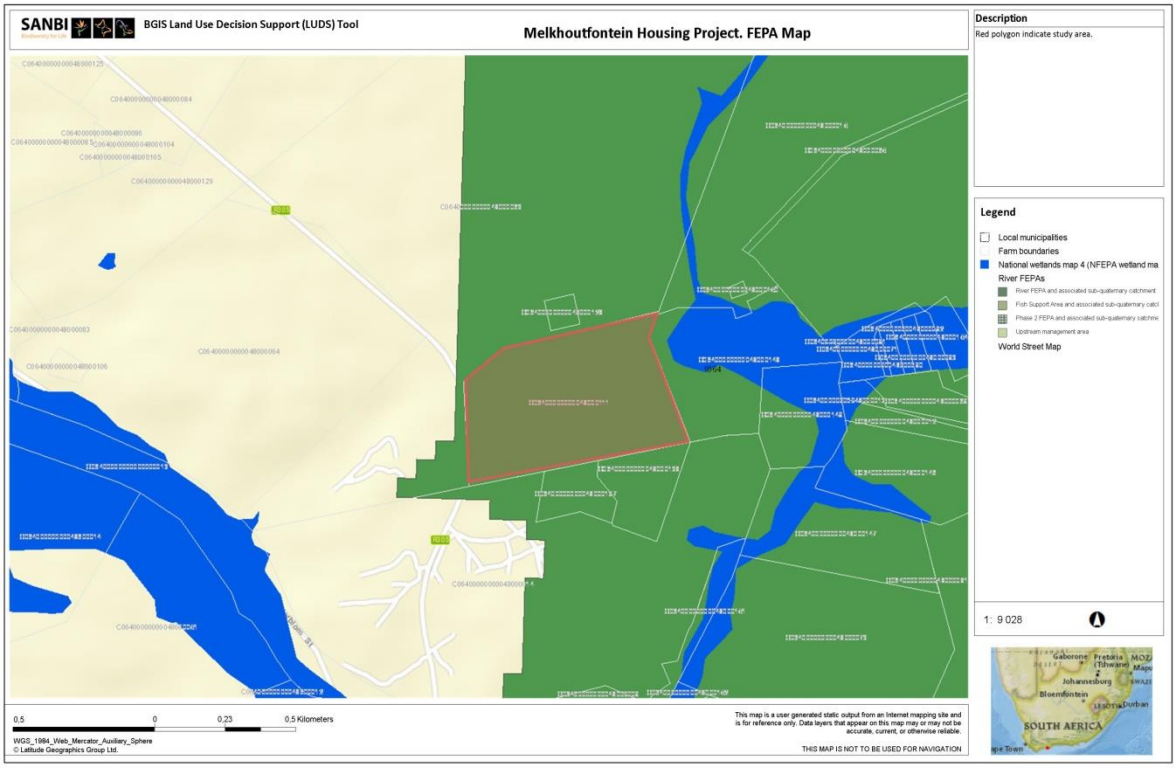


Figure 3: FEPA map of area

Approximately 80% of the property is classified as a terrestrial CBA. The non-perennial drainage lines are classified as Aquatic Ecological Support Areas.

The following CBA's were mapped for the study area in terms of the Hessequa Municipality's mapping of CBAs for the study area by SANBI[1]:

- **CBA: Terrestrial**

➢ ***Definition***

Areas in a natural condition that are required to meet biodiversity targets, for species, ecosystems or ecological processes and infrastructure.

➢ ***Management Objective***

Maintain in a natural or near-natural state, with no further loss of natural habitat. Degraded areas should be rehabilitated. Only low-impact, biodiversity-sensitive land uses are appropriate.

- **ESA: Aquatic**

➢ ***Definition***

Areas that are not essential for meeting biodiversity targets, but that play an important role in supporting the functioning of PAs or CBAs, and are often vital for delivering ecosystem services.

➢ ***Management Objective***

Restore and/or manage to minimize impact on ecological processes and ecological infrastructure functioning, especially soil and water-related services, and to allow for faunal movement.

[1] SANBI 2017 Western Cape Biodiversity Spatial Plan (WCBSP)

The study area is classified as Canca Limestone Fynbos vegetation. The vegetation is classified as least threatened by Mucina and Rutherford[2].

Indigenous vegetation species were recorded during the August survey and are listed below, however due to the dense vegetation growth access to the overall site was limited. Another survey was conducted on 10 October 2017 to record indigenous vegetation species after dense alien trees was cut for the land surveyors making the site more accessible.

Indigenous species recorded on site during August 2017:
Cynodon dactylon, Olea capensis, Erhartha villosa, Sideroxylon inerme – Protected Milkwood Tree, Restio sp, Aspalathus cf. crassisepala, Euclea racemose, Indigofera angustifolia, Leucadendron salignum, Passerina corymbosa, Searsia laevigata subsp. laevigata forma *cangoana, Brunsvigia orientalis, Thamnochortus insignis*

Additional indigenous species recorded on site during October 2017:
Rhus glauca, Carpobrotus edulis, Asparagus capensis, Senecio burchellii, Felicia aethiopica, Gnidia sp., Polygala myrtifolia, Helichrysum patulum, Massonia depressa, Aizoon rigidum, Agathosma capensis, Phyllobolus canaliculatus, Hermannia sp, Arctotheca calendula, Pelargonium sp., Gnidia squarrosa, Hermannia hyssopifolia, Ornithogalum imbricatum, Jamesbrittenia tenuifolia, Helichrysum teretifolium, Moraea tripetala, Aspalathus pinguis, Arctotis acaulis, Gladiolus sp., Heliophila africana, Delosperma litorale, Lobelia tomentosa

Alien vegetation and weed species:
Acacia cyclops
Stenotaphrum secundatum

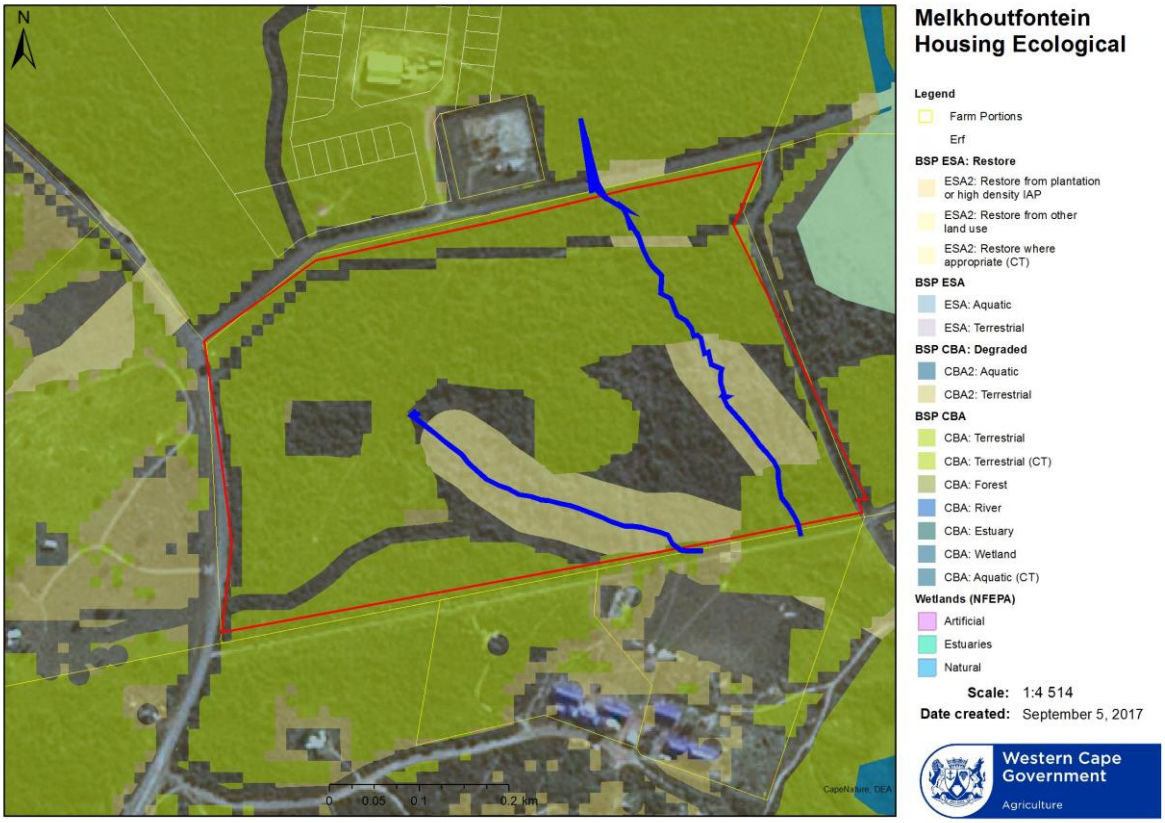


Figure 4: CBA map of area

[2] Mucina, L. and Rutherford, M.C. (Eds) 2006. The Vegetation of South Africa, Lesotho and Swaziland.SANBI, Pretoria

4. IMPACT ASSESSMENT OF THE ACTIVITIES

This section provides an assessment of the potential impacts to ecosystems that are likely to be associated with the proposed activities.

The site is within a CBA and the development results in considerable loss of 'limestone fynbos' and the impact would be unacceptably highly negative. A biodiversity offset area is the only mitigation measure that is suggested that would offset the highly negative impacts.

The site has been heavily disturbed by alien invasive species (*Acacia cyclops*). The species composition of the study area indicates typical limestone fynbos. However, the result of the intense disturbance is that the structure of the vegetation has been negatively impacted.

Botanically the study area would be important were it not for the disturbance that it has experienced. The invasion by aliens *Acacia cyclops* has resulted in the site becoming degraded with low botanical sensitivity.

The 'No Go' scenario would result in the status quo continuing into the foreseeable future with a highly negative impact. However, in the medium- to long-term the site is likely to become even more infested with woody alien invasive species if they are not controlled. A control programme should be implemented to eradicate the alien invasive species from this vegetation.

The mosaic nature and dense alien infestation of the vegetation type in the study area means that the component plant communities are not easily mapped.

Photo 8: View of a significant portion of the study area.

Photo 9: View of a portion of the study area.

Figure 5: Field survey notes recorded.

The impact assessment and recommended mitigation measures are provided below:

NATURE OF ESTABLISHING OF DEVELOPMENT IMPACT: Clearing of indigenous vegetation and levelling of area in order to develop infrastructure. The site has been heavily disturbed by alien invasive species (*Acacia cyclops*). The species composition of the study area indicates typical limestone fynbos. However, the result of the intense disturbance is that the structure of the vegetation has been negatively impacted.

Botanically the study area would be important were it not for the disturbance that it has experienced. The invasion by aliens *Acacia cyclops* has resulted in the site becoming degraded with low botanical sensitivity.

Significance of impacts without mitigation: The site is within a CBA and the development result in considerable loss of 'Canca limestone fynbos' and the impact would be unacceptably highly negative.

Proposed mitigation: A biodiversity offset area is the only mitigation measure that is suggested that would offset the highly negative impacts.

Significance of impacts after mitigation: A localised impact of low intensity that is expected to have a very low overall significance in terms of its impact on the identified ecosystems in the area during construction phase only.

NATURE OF ESTABLISHING OF DEVELOPMENT IMPACT: Impact on the freshwater ecological features on site. Two non-perennial drainage lines were recorded in the study area.

Significance of impacts without mitigation: The activities would be expected to have a very limited impact on the flow in the stream in terms of the extent and low flow of the drainage lines assessed. The riparian vegetation may be impacted if the 32m buffer area is not being maintained.

Proposed mitigation: A 32m wide buffer from the bank of the non-perennial drainage lines will be maintained in the development layout. Crossings must be limited to one only.

Significance of impacts after mitigation: A localised impact of low intensity that is expected to have a very low overall significance in terms of its impact on the identified aquatic ecosystems in the area during construction phase only.

The 'No Go' scenario would result in the status quo continuing into the foreseeable future with a highly negative impact. However, in the medium- to long-term the site is likely to become even more infested with woody alien invasive species if they are not controlled. A control programme should be implemented to eradicate the alien invasive species from this vegetation.

5. CUMULATIVE IMPACTS

Numerous developments of various sorts are planned for the Still Bay area e.g. the proposed Still Bay Arterial Road and various residential developments on the outskirts of Still Bay West. These developments together with ongoing agricultural activities all impact natural vegetation and more specifically Canca Limestone Fynbos (in the broad sense). The question therefore is how much the proposed development would contribute to cumulative loss of Canca Limestone Fynbos?

From the present study it is concluded that cumulative loss due to construction of the Canca Limestone Fynbos would be high.

6. RECOMMENDTIONS AND CONCLUDING REMARKS

The two non-perennial drainage lines and a 32m buffer area must be excluded from the development area and zoned as open space in order to protect the Ecological Support Area and to allow for ecological functioning to continue. It is recommended that road crossings over the drainage lines be avoided. Should it not be possible to avoid crossing the drainage lines, this crossing must be limited to one crossing and the crossing must be closed to the upper section (Eden Road) where the existing road crosses the drainage line.

Method statements for the construction of the crossing over the drainage line must be submitted to the freshwater ecologist for approval and an application must be submitted to the Breede Gouritz Water Catchment Management Agency for approval. All alien plants must be cleared and the drainage lines and its buffers maintained and allowed to rehabilitate.

The study site is heavily invaded by alien trees (*Acacia cyclops*) which has resulted in low indigenous species diversity for the area. The indigenous species will however recover once the aliens are cleared and follow up clearing occurs. Some alien clearing has been done on site. This is however not coordinated. Firewood is removed and the branches are left on site. Access to the site is difficult as a result of the branches that are spread over the site. The fire risk on site is high as a result.

The northern and western portions of the site are classified as a terrestrial Critical Biodiversity Area ("CBA"). Please take note that this area was not classified as a terrestrial Critical Biodiversity Area in the previous assessment[3]. The drainage lines were classified as an Ecological Support Area. *Sideroxylon inerme* (Protected Milkwood Tree), *Agathosma muirii* (Vulnerable) *and Cullumia carlinoides* (Near Threatened) are the possible conservation worthy species that may occur on site. *Sideroxylon inerme* (Protected Milkwood Tree) was the only specie that was recorded during the survey. Most of the *Sideroxylon inerme* (Protected Milkwood Tree) recorded are within the drainage lines and the 32m buffer areas.

However, some of them are not in these areas and may be impacted upon. They must be recorded during construction and protected as far as possible. Should any of the *Sideroxylon inerme* (Protected Milkwood Tree) need to be pruned or removed, a permit must be obtained.

There is no question that the receiving environment is botanically important and should be treated as such since it has numerous endemic species and is viewed as threatened habitat at a fine-scale planning level. However, this does not preclude scope for considering housing infrastructure on condition that the sensitivities of the environment are observed. On this basis it is concluded that from a botanical perspective the drainage lines and the buffer areas should be completely excluded from further consideration. The rest of the site should only be considered if strong mitigation measures such as ecological corridors and a biodiversity offset area can be assured and active woody alien invasive eradication is guaranteed. In this way an important area of 'limestone fynbos' could be conserved.

7. REFERENCES

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APPENDIX A: ABBREVIATED CURRICULUM VITAE AND DECLARATION OF INDEPENDENCE OF FRESHWATER SPECIALIST

BACKGROUND AND QUALIFICATIONS OF SPECIALIST CONSULTANT

Full Name: Nicolaas Hanekom
Year of Birth: 1967
Nationality: South African
Profession: Environmental Scientist and Environmental Assessment Practitioner
Years in Profession: Since 1989

This Freshwater Impact Assessment was conducted by Nicolaas Hanekom who has 26 years' experience working as an ecologist in the field of nature conservation. He has extensive field experience, knowledge of freshwater ecology, knows the region in which he is working and exercises sound and unbiased scientific and professional judgment. He has received training on the basics of freshwater ecosystems impact assessment during his career in nature conservation. He is a qualified Environmental Assessment Practitioner who holds a M. Tech, Nature Conservation from the Cape Peninsula University of Technology and a registered Professional Natural Scientist (Ecologist) with the South African Council for Natural Scientific Professions ("SACNASP").

Summary of Experience:

- Assistant Reserve Manager at Gariep Dam Nature Reserve (1993-1998)
- Reserve Manager, Conservation Services Manager for Western Cape Nature Conservation Board (1998-2001)
- Part time external Lecturer at Cape Peninsula University of Technology (2003-2005)
- Director: Environmental Management at Cape Lowlands Environmental Services (2006-2010)
- Environmental Impact Assessment Practitioner at Eco Impact (Pty) Ltd (2010 to date)
- Safety Health & Environmental System consulting

Mr Hanekom meets the legal requirements to act as a specialist on this project in terms of Regulation 13 of the Environmental Impact Assessment Regulations, 2014 that took effect on 8 December 2014, which regulates the general requirements for Environmental Assessment Practitioners ("EAP"s) and specialists. The regulation states that:

An EAP and a specialist, appointed in terms of regulation 12(1) or 12(2), must –

(1)(a) be independent;
(b) have expertise in conducting environmental impact assessments or undertaking specialist work as required, including knowledge of the Act, these Regulations and any guidelines that have relevance to the proposed activity;
(c) ensure compliance with these Regulations;
(d) perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the application;
(e) take into account, to the extent possible, the matters referred to in regulation 18 when preparing the application and any report, plan or document relating to the application; and
(f) disclose to the proponent or applicant, registered interested and affected parties and the competent authority all material information in the possession of the EAP and, where applicable, the specialist, that reasonably has or may have the potential of influencing-
(i) any decision to be taken with respect to the application by the competent authority in terms of these Regulations; or
(ii) the objectivity of any report, plan or document to be prepared by the EAP or specialist, in terms of these Regulations for submission to the competent authority;

unless access to that information is protected by law, in which case it must be indicated that such protected information exists and is only provided to the competent authority.

(2) In the event where the EAP or specialist does not comply with sub regulation (1)(a), the proponent or applicant must, prior to conducting public participation as contemplated in chapter 5 of these Regulations, appoint another EAP or specialist to externally review all work undertaken by the EAP or specialist, at the applicant's cost.

The independent PERSON WHO COMPILED A SPECIALIST REPORT OR UNDERTOOK A SPECIALIST PROCESS

I Nicolaas Willem Hanekom, as the appointed independent specialist hereby declare that I:

- act/ed as the independent specialist in this application;
- regard the information contained in this report as it relates to my specialist input/study to be true and correct, and
- do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the NEMA, the Environmental Impact Assessment Regulations, 2014 and any specific environmental management Act;
- have and will not have no vested interest in the proposed activity proceeding;
- have disclosed, to the applicant, EAP and competent authority, any material information that have or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the NEMA, the Environmental Impact Assessment Regulations, 2014 and any specific environmental management Act;
- am fully aware of and meet the responsibilities in terms of NEMA, the Environmental Impact Assessment Regulations, 2014 and any specific environmental management Act, and that failure to comply with these requirements may constitute and result in disqualification;
- have ensured that information containing all relevant facts in respect of the specialist input/study was distributed or made available to interested and affected parties and the public and that participation by interested and affected parties was facilitated in such a manner that all interested and affected parties were provided with a reasonable opportunity to participate and to provide comments on the specialist input/study;
- have ensured that the comments of all interested and affected parties on the specialist input/study were considered, recorded and submitted to the competent authority in respect of the application;
- have ensured that the names of all interested and affected parties that participated in terms of the specialist input/study were recorded in the register of interested and affected parties who participated in the public participation process;
- have provided the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not; and
- am aware that a false declaration is an offence in terms of of NEMA, the Environmental Impact Assessment Regulations, 2014.

Signature of the specialist

Eco Impact Legal Consulting (Pty) Ltd
Name of company

24 November 2017