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PRE-CONSTRUCTION, CONSTRUCTION AND POST-CONSTRUCTION PHASE

ENVIRONMENTAL MANAGEMENT PROGRAMME

FOR THE

THE PROPOSED DEVELOPMENT OF A RETIREMENT VILLAGE ON PORTION 103, 104 AND A SECTION OF ROTTERDAM STREET, WITTEDRIFT, BITOU LOCAL MUNCIPALITY, WESTERN CAPE.

APPLICANT:	The Home Market NPC 7 Upper Dickens Street, Central Port Elizabeth 6001
ENVIRONMENTAL CONSULTANT:	Sharples Environmental Services cc Primary Author: Lloyd Barnes
DEA & DP PROJECT REFERENCE:	16/3/3/6/7/1/D1/17/0195/19
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Sharples Environmental Services cc Since 1998, SES has been actively engaged in the fields of environmental planning, assessment and management. We advise private, corporate and public enterprises on a variety of differing land use applications ranging from large-scale residential estates and resorts to golf courses, municipal service infrastructure installations and the planning of major arterials. Our consultants have over 20+ years of combined experience and we operate in the Southern, Eastern and Western Cape regions.

AMEESHA SANKER (**Environmental Assessment Practitioner**) - Ameesha obtained her BSc. In Geological Science (Environmental and Engineering), from the University of KwaZulu-Natal and a BSc. (Hons) in Environmental Management from UNISA. Her experience encompasses almost 7 years' in environmental management, assessments and compliance monitoring, predominantly in the infrastructure, water and sanitation industry.

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JOHN SHARPLES (**Director**) - John started Sharples Environmental Services in 1998 and has overseen the company's growth and development since then. John also started the Cape Town office in 2010. John holds a Masters in Environmental Management from the University of the Free State as well as a Bachelor's degree in Conservation. He has consulted for 19 years running a team of highly trained and qualified consultants and prior to this gained 12 years of experience working for environmental organizations. John is registered with EAPASA as a certified Environmental Practitioner (No 1485).

1. Introduction

Sharples Environmental Services cc (SES) was appointed by *The Home Market NPC* (the proponent) to compile the Environmental Management Programme for the proposed development of a retirement village and associated infrastructure on Portion 103, 104 and a section of Rotterdam Street, Wittedrift, Plettenberg Bay, Western Cape.

The proposed development of Erf 103 and 104 with a portion of the Rotterdam Street and road reserve, requires the two erven and reserve portion to be consolidated into one Erf (this also includes the road reserve to be discarded). The consolidated area will then form the development site. The development of the retirement village will entail the following:

- 53 Retirement Units between 104 m^2 and 124 m^2 (Sectional title units)
- A community Centre with the following components:
    - Library
    - Kitchen
    - Utility/storeroom
    - Hair salon
    - Gym
    - Nurses Station
    - Office
    - Wheelchair friendly toilet facilities
    - Events Hall
    - Patio and braai
- An assisted living facility with the following components:
    - Six en-suite bedrooms for those requiring assistance
    - Assisted living quarters
    - Office
    - Kitchen
    - Laundry
    - Dining and lounge facility
    - Yard
- Open spaces:
    - The preservation of the seven mature oak trees that are found on the southern border
    - The northern section of the consolidated erf adjacent to the Bosfontein River, this will act as a buffer area.

2. About this EMPr

This document is intended to serve as a guideline to be used by *The Home Market NPC* (as the Implementing Agent) and any person/s acting on behalf of *The Home Market NPC*, during the pre-construction, construction, post-construction rehabilitation and operational (maintenance) phases of the proposed development. This document provides measures that must be implemented to ensure that any environmental degradation that may be associated with the development is avoided, or where such impacts cannot be avoided entirely, are minimised and mitigated appropriately.

This EMPr has been prepared in accordance with the requirements of an EMPr as specified in the Environmental Impact Assessment Regulations, 2014 (as amended), and with reference to the "Guidelines for Environmental Management Programmes" published by the Department of Environmental Affairs and Development Planning (2005).

It is important to note that not only is the EMPr designed to manage the physical establishment of the development *per se*, but also as a tool which can be used to manage the environmental *impacts* of the development.

The rehabilitation, mitigation, management and monitoring measures prescribed in this EMPr must be seen as binding to *The Home Market NPC*, and any person acting on its behalf, including but not limited to agents, employees, associates, guests or any person rendering a service to the development site.

2.1 Important caveat to the report

In the past, some developments have had a devastating impact on the environment even though they have had Environmental Management Programmes in place, while other developments have had a low impact even though no management plans have been compiled.

The Implementing Agent and the attitude of the construction team play an integral role in determining the impact that the development will have on the environment. The ECO needs to ensure that all the role-players are aware of the constraints that the EMPr , and associated Environmental Authorization, places on the development and construction team and are prepared to be actively involved in enforcing these constraints. In order to ensure that the development is sustainable and compliant, will depend on the cooperation, mutual respect and understanding of all parties involved.

3. How to use this document

It is essential that this EMPr be carefully studied, understood, implemented and adhered to as far as reasonably possible, throughout all phases of the proposed development. *The Home Market NPC* must retain a copy of this EMPr, and an additional copy must be kept on site at all times during the pre-construction, construction and post-construction rehabilitation phases of the development.

This EMPr must be included in all contracts compiled for contractors and subcontractors employed by *The Home Market NPC*, as this EMPr identifies and specifies the procedures to be followed by engineers and other contractors to ensure that the adverse impacts of construction and maintenance activities are either avoided or reduced. Appointed contractors must make adequate financial provision to implement the environmental management measures specified in this document.

This EMPr must be seen as a working document, which may be amended as and when needed, in order to accommodate changing circumstances on site or in the surrounding environment, or in order to accommodate requests/ conditions issued by the competent authority, the Department of Environmental Affairs & Development Planning (DEADP). Amendments to this EMPr must first be approved by the competent authority, in writing, before being implemented.

4. Description of the Activity

The Home Market NPC proposes to develop housing units and associated infrastructure for retirement village purposes. The proposed site chosen for this development lies within the semi-rural village of Wittedrift, Western Cape. The town falls within the Bitou Local Municipality and is approximately 6km north west from the popular town of Plettenberg bay (Figure 1).

Erven 103, 104 and a section of Rotterdam street is proposed to be consolidated into one portion, and is located near the centre of the semi-rural village, off of Main street (Figure 2). Wittedrift is connected to the N2 via the R340.

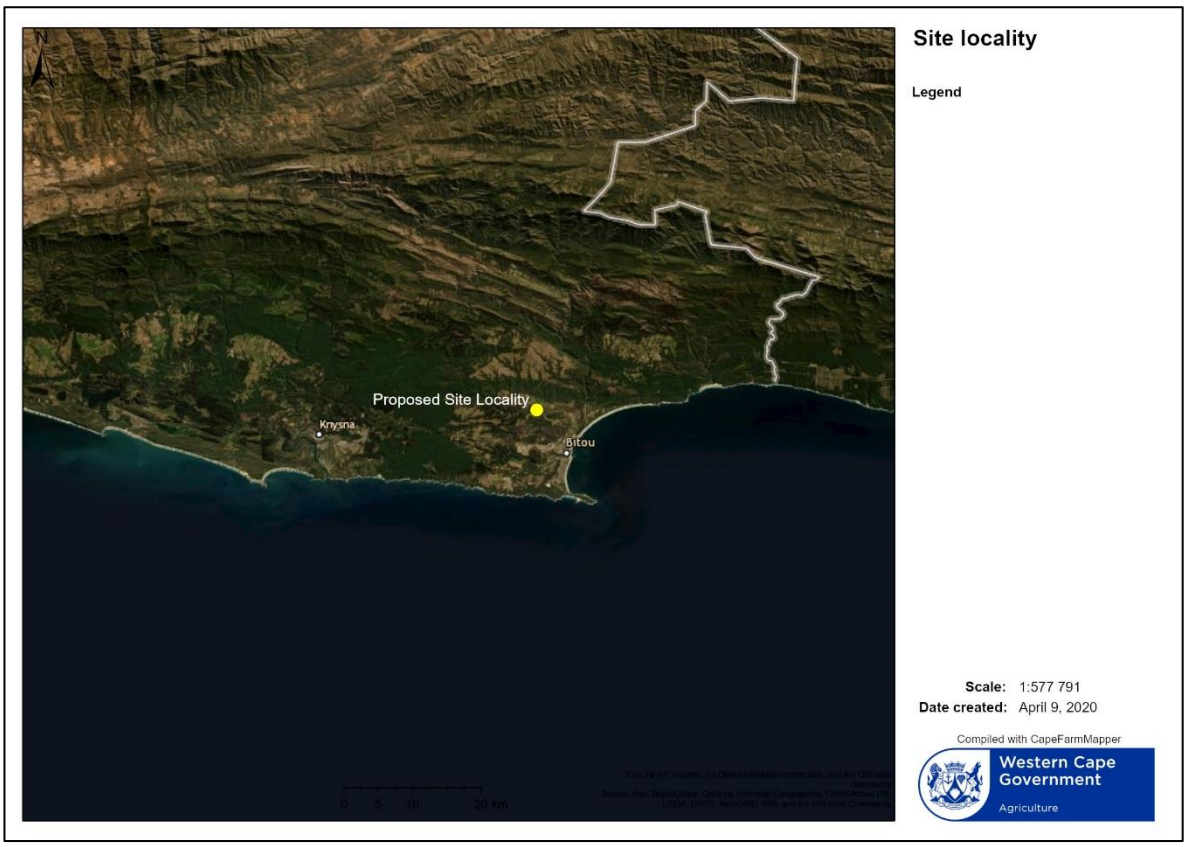

Figure 1: Locality of the proposed site

Figure 2: Site locality within Wittedrift

The extent of the subject portions is depicted in figure 3 below, and are as follows:

Table 1: Cadastral Details and Extent of Area

Erf 103 Wittedrift	1,7422ha
Erf 104 Wittedrift	1,3058ha
SUB TOTAL	**3,0480ha**
Portion of Rotterdam Street Reserve	0,2921ha
TOTAL	**3,3401ha**

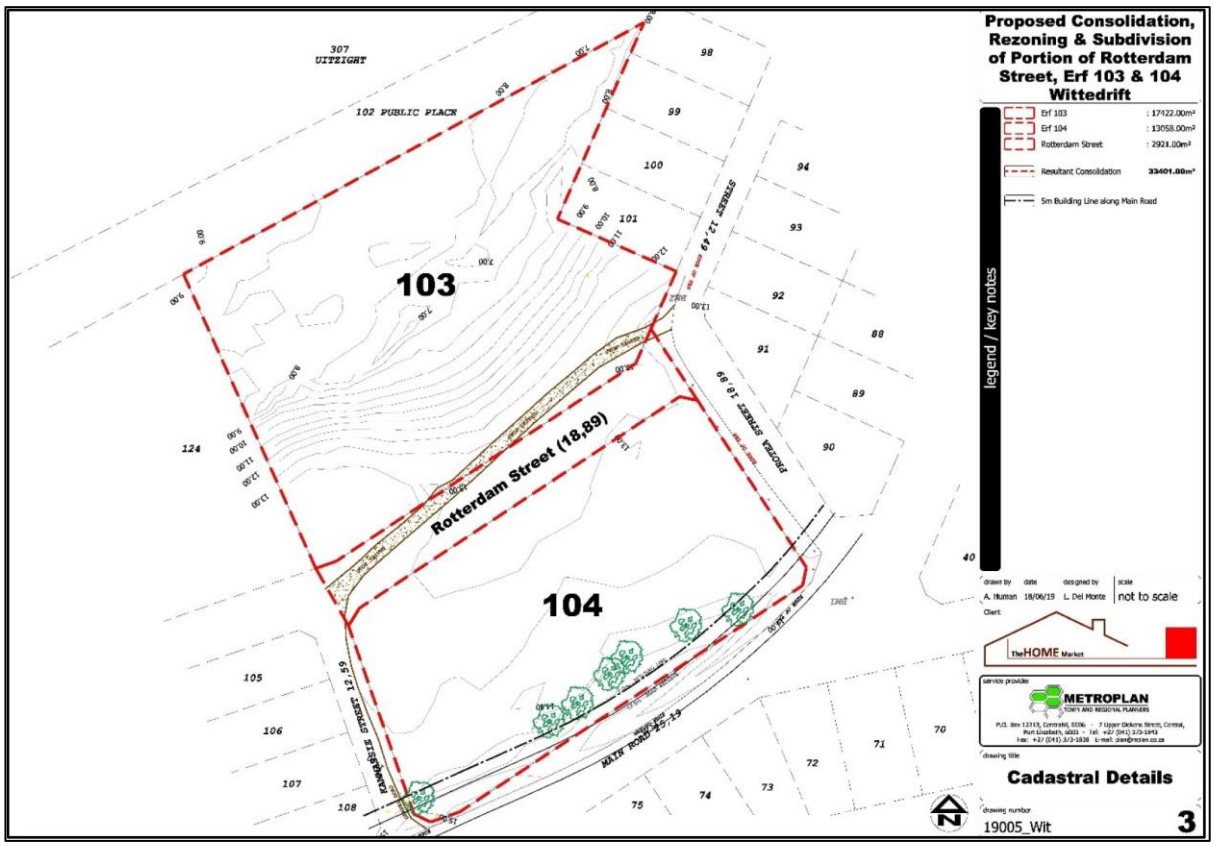

Figure 3: Proposed consolidation of Erf 103, Erf 104 and a Portion of Rotterdam Street

The proposed development will include 53 retirement units of between 104m² and 124m² (depending on whether they have single or double garages) in extent. These units are to be sold under Sectional Title to those retirees of over 55 years of age who wish to reside there and those under 55 years who purchase for a household member, or private individual who is 55 years and over and who would also reside there.

The proposed layout and associated infrastructure are depicted below.

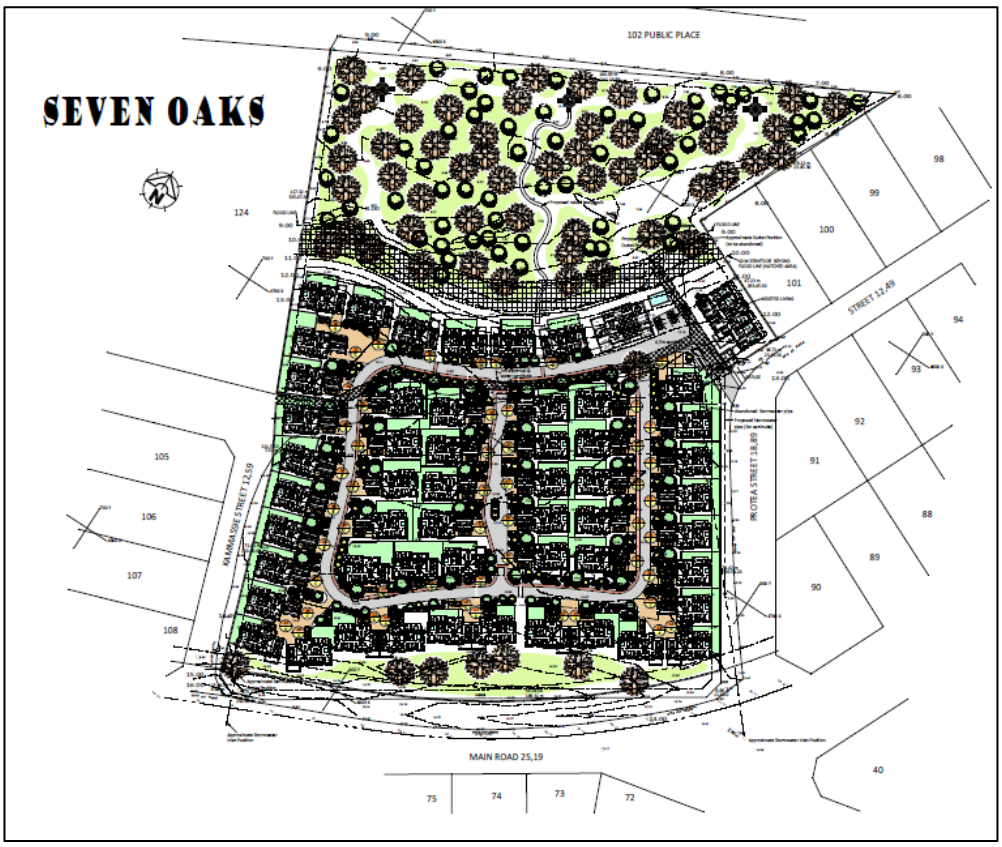

Figure 4: Proposed layout.

The associated infrastructure proposed includes the following:

Community Centre

A community centre is planned to be positioned, at the North East corner of the site, close to the entrance of the retirement village with public parking and northern views. The community centre will have the following components:

- Library
- Kitchen
- Utility/storeroom
- Hair salon
- Gym
- Nurses Station
- Office
- Wheelchair friendly toilet facilities
- Events Hall
- Patio and braai

The community centre building will be approximately 183m^2.

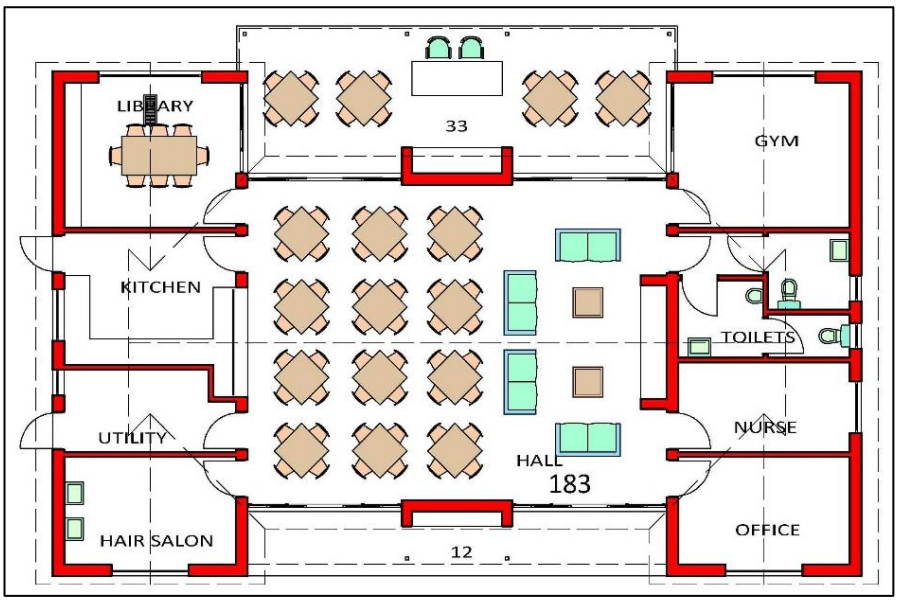

Figure 5: Community centre design

Assisted Living Facility

The assisted living facility will also be close to the entrance and will share visitor's parking with the community centre. An assisted living facility will have the following components:

- Six ensuite bedrooms for those requiring assistance
- Assisted living quarters
- Office
- Kitchen
- Laundry
- Dining and lounge facility
- Yard

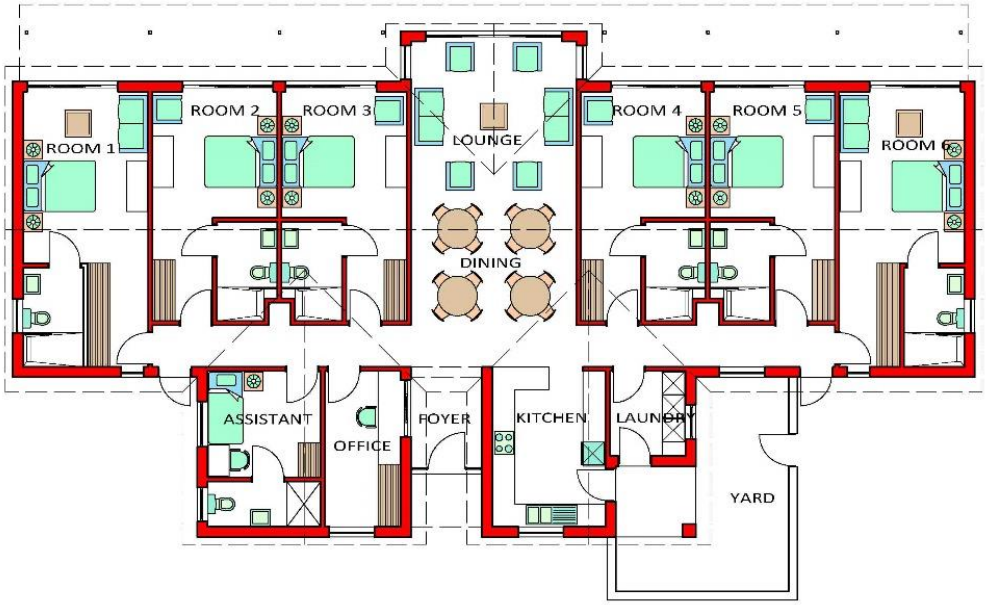

Figure 6: Assisted living facility design

Open Space

Mature Oak trees that occur on the site will be retained in an open space accessible to all the residents. Most of the Northern Section of the site, close to the Bosfontein River will also be kept as a public open space accessible to the inhabitants.

Engineering Services:

With regard to bulk infrastructure, the Engineering report does specify that the developer may be liable for the payment of a Development Contribution (as calculated by Bitou Municipality) for bulk infrastructure upgrades as per Council Policy.

Water

Bulk Infrastructure:

The existing water reticulation system has sufficient capacity to accommodate the domestic flow of the proposed development in order to comply with the pressure criteria as set out in the master plan. However, upgrading of the existing reticulation network and bulk supply system is required in order to comply with the fire flow criteria and bulk supply criteria as set out in the master plan.

This bulk system to the Wittedrift, Aventura and Matjiesfontein reservoirs does not have sufficient capacity and will have to be reinforced to accommodate the proposed development in the existing water system.

The following network upgrades are proposed in order to comply with the fire flow criteria as set out in the master plan:

Network upgrade

- 430 m x 160 mm Ø replace existing 75 mm Ø pipe.
- 390 m x 110 mm Ø replace existing 75 mm Ø pipe.

Bulk Water Supply Upgrades

- 25 m x 160 mm Ø inter-connection between existing 150mm & 300mm Ø pipes (will be verified by the Bitou Municipality).

The existing 75mm Ø bulk pipeline between Kammassie Street and Protea Street crosses through the proposed development and will need to be relocated to within the proposed road reserve and form part of the internal reticulation. The cost of isolating valves and re-routing of the pipeline will be to the Developer's account. GLS Consulting have recommended that a new 75mm Ø pipe be installed in Kammassie Street to improve the existing network west of the proposed development.

Internal Infrastructure:

A metered water supply will be provided for each site. The existing 75 mm Ø pipe is currently supplied under gravity via the Wittedrift reservoir at a Top Water Level (TWL) of 70.0 m.a.s.l. While the existing water reticulation system has sufficient capacity to accommodate the domestic flow of the proposed development, upgrading of the existing reticulation network is required to comply with the fire flow criteria.

The existing reservoir volume available at the Wittedrift reservoir is 90 hours of the total AADD and is therefore sufficient to accommodate the proposed development. A preliminary water reticulation layout is included as Dwg 1692-R-100 in Appendix L.2 of the Basic Assessment Report,

The proposed water reticulation network includes the following details:

- 50mm HDPe, ISO 4427, PE63, PN 10 /75mm Ø PVC-U SABS 966 class 9
- Approximate Length: +/- 625m

Wastewater

Bulk Infrastructure:

It has been determined that there is sufficient capacity in the existing sewer reticulation system to accommodate the proposed development. The existing Wittedrift pump station and rising main have sufficient capacity to accommodate the proposed development, however this should be verified by the Bitou Municipality.

The flow from Wittedrift pump station and multiple other pump stations are received at Aventura Pump Station. GLS Consulting have received information that the Aventura Pump Station has recently been upgraded to a pumping capacity of 78 L/s, but no upgrading have been performed to the existing Aventura PS rising main.

While the pumping capacity of 78 l/s at the Aventura PS will be sufficient to accommodate the proposed development at Wittedrift in the existing sewer system, the Engineers have recommended that the existing 200 mm Ø Aventura PS rising main is upgraded to a 355 mm Ø rising main (master plan item BPS34.2) to accommodate the ultimate planned Aventura PS capacity.

However, the capacity of the Aventura PS of 78 l/s and the diameter of the accompanying rising mains of 200 mm should be verified by the Bitou Municipality.

The following master plan item will be required to reinforce the existing system in order to accommodate the proposed development.

Network upgrade (Minimum requirement)

- 5 400 m x 355 mm Ø Upgrade existing Aventura pump station rising main.

Internal Infrastructure:

An existing 110mm Ø uPVC sewer extends down Protea Street which has been determined to be the most suitable sewer connection for the retirement village. While an existing 110mm Ø uPVC sewer extending from erf 104 into the sewer in Protea Street, which carries no flow and will be abandoned.

Various options were considered to provide sewerage infrastructure to the proposed development. Based on ground-based survey information, it was found that it is was not possible to provide a full gravity sewer system to serve the entire development based on existing ground levels.

This left two options, namely a pumped system (which would have to be maintained by the residents) or shaping of the site to suit drainage of the properties. This second alternative was considered the most suitable option, primarily requiring shaping of a portion of erf 103 back towards the proposed roadway. The preliminary sewer design included in Volume 2 is based on a gravity sewer system to serve the development.

A layout indicating the proposed sewer network for the entire development is included as Dwg 1692-R-200, of Appendix L.2 of the Basic Assessment Report. However, this will only be finalised during the detail design stage of the project. Typical sewer and erf connection details are included as Dwg 1692-R-201 of Appendix L.2 of the Basic Assessment Report.

The proposed sewer network will entail the following details:

- 110mm Ø PVC u, Type 1, SANS 1601, 400 kPa pipes.
- Approximate Length: +/- 525m.

Stormwater
A Stormwater Management Plan, prepared by Nadeson Consulting Engineers (Pty) Ltd and supplied by Bitou Municipality has been used as the basis for the required stormwater infrastructure to accommodate flows within the catchment leading to the proposed development.

The current drainage is observed along Rotterdam Street where it crosses Rotterdam Street with a 600mm [450mm Ø] diameter pipe which outlets into an open field and eventually down to Bosfontein River. It has been determined that the proposed pipe sizes have adequate capacity to accommodate the 2-year storm runoff with over 30% spare capacity (allowed for flash floods), and the drainage channels have adequate capacity to accommodate the 50-year storm runoff.
Preliminary designs based on using the proposed roadway cross sections, indicate that accommodating the internal stormwater will be possible.

Due to small area encompassing the proposed retirement village (2.1 hectares), there would be no need for on-site attenuation of stormwater. A 600mm diameter, 100D concrete stormwater pipe will convey stormwater generated on the site from the lowest point (near the community centre) to the main pipeline leading to the discharge point. An overland escape route will also be created to allow major storm flow to discharge into the valley below. The outlet will be suitably protected with gabions, reno mattresses or other suitable materials to prevent scour.

A layout plan indicating the stormwater catchment areas is included as Dwg 1692-R-401 of Appendix L.2 of the Basic Assessment Report. It is clear from inspection of these plans and the calculations tabulated in the report, that the effect of development produces a negligible increase in stormwater run-off which will be attenuated on site.

Floodline Analysis
A floodline analysis was carried out by Fraser Consulting Civil Engineers, which conclude that the 100 year recurrence interval storm it's at approximate level 8m MSL, which is at least 1,5m below the existing level of the lowest properties on erf 103 and 4,5m below the proposed levels of the lowest properties (after shaping). Their hydrological calculations show the 100 year RI peak flow rate to be 30m3/s.

Access
Entrance to and exit from the retirement village will be onto Protea Street, which carries minimal traffic, as it ends in a cul-de-sac serving 10 erven. During the worst peak hour, the development will generate approximately 16 trips compared to the 10 trips generated by the existing residential units along Protea Street. Bitou Municipality requested that Engineering Advice and Services apply to the District Roads Engineer (Oudtshoorn) for approval of the access onto Main Street, which is a District Road. All efforts to contact the DRE have been without success.

Roads
Table 2: A broad indication of the hierarchical functionality of the road network which is found in the proposed development.

Road Class	*Maximum Dwelling Units Served*	*Preferred Maximum Length*	*Proposed Road Reserve Widths*	*Proposed Roadway Widths*	*Proposed Bell Mouth Radii at Intersections*
Minor Collectors - Class 4	-	-	-	8.0 m	-

Local Distributors - Class 4	400 - 1500	n/a	16m	7.4 m	12m
Residential Access Collectors - Class 5a	200	500 m	12m	6.2 m	10m
Residential Access Loops - Class 5b	120	300 - 500 m	12m	6.0 m	8m
Access Cul-de-Sacs - Class 5c and 5d	< 60	150 m	8m	3.0 m	6m

The proposed road layout is indicated on the road layout plan (see Appendix L.2 of the Basic Assessment Report. Dwg 1692-R-300). Typical long sections for internal roads is included (see Appendix L.2 of the Basic Assessment Report. Dwgs 1692-R-301 through 1692-R-304) and incorporate the road reserve and road widths proposed in the following section of this report.

The Engineers have noted that road widths and reserves for this development, do not comply with the guidelines but the Client has indicated that these should not be changed. In addition, they have noted that the Bell Mouth radii for this development do not comply with the guidelines due to the reduced road widths.

All road markings and signage are to be in accordance with the requirements of the South African Development Community Road Traffic Signs Manual (SADCRTSM). An allowance has been made for 1m wide sidewalks along roads within the proposed development, while it should be noted that no public embayments are provided within the development.

Electrical services

An electrical LB Distribution Line and Electrical MV cable run in the Rotterdam Road reserve. With the planned closing of a portion of the road for the development, a servitude needs to be created within the erf with some re-routing. According to Telkom records, it has been confirmed that there are no existing servitudes, therefore a new underground route will be established by Openserve to make provision for the relocation of the overhead aerial route, that currently runs along the portion of Rotterdam Road that will be closed, to outside of the housing project's boundary.

Table 3: Summary Table: Site and Farm Details

Province	Western Cape	
District Municipality	Eden District Municipality	
Local Municipality	Bitou Local Municipality	
Ward number(s)	Ward No 7	
Nearest town(s)	Wittedrift (within)	
SG Code	Erf 103	C03900110000010300000
	Erf 104	C03900110000010400000
	Rotterdam street (ID: RE/245)	C03900110000024500000

Co-ordinates of the farm boundaries as shown in the adjacent table and figure:

Table 4: Site boundary coordinates

	Latitude	Longitude
A	34° 0' 29.3"	23° 19' 55.49"
B	34° 0' 26.48"	23° 20' 2.17"
C	34° 0' 28.83"	23° 20' 0.95"
D	34° 0' 29.47"	23° 20' 2.58"
E	34° 0' 33.04"	23° 20' 4.45"
F	34° 0' 35.94"	23° 19' 59.06"

Figure 7: Site boundary coordinates.

5. Description of Environmental Setting

5.1 Vegetation

5.1.1 Vegetation description

According to CapeFarmMapper (Accessed April 2020) the vegetation map of SA (Figure 7) indicates that the vegetation unit primarily affected by the proposed development is Garden Route Granite Fynbos which has an Endangered (EN) threat Status.

Figure 8: Vegetation Map of SA.

As part of the application for environmental authorisation, an Aquatic Habitat Impact Assessment was completed by Sharples Environmental Services CC in 2019. The Aquatic Habitat Impact Assessment stated that the study site has been subject to various anthropogenic impacts. The current terrestrial vegetation on site include few indigenous species. This is likely due to agriculture transforming the land through clearing and ploughing. The proposed development area has flat topography and is mainly covered in grass species (Figure 9A) such as kikuyu (*Pennisetum Clandestinum*) and *Eragrostis curvula*. A large group of poplar trees (*Populus alba*) are found on the western boundary of the study site (Figure 9B). Some individuals grow in-between the mature trees next to Main Road and just upslope of the aquatic habitat. Seven oak trees (*Quercus sp.*) line the southern boundary of the property, next to a grassed stormwater v-drain. A few young Milkwood trees grow close to the stormwater outlet at the south-western corner of the study site. The area proposed for development is on top of a fluvial terrace on site and covered in terrestrial vegetation with negligible natural habitat remaining.

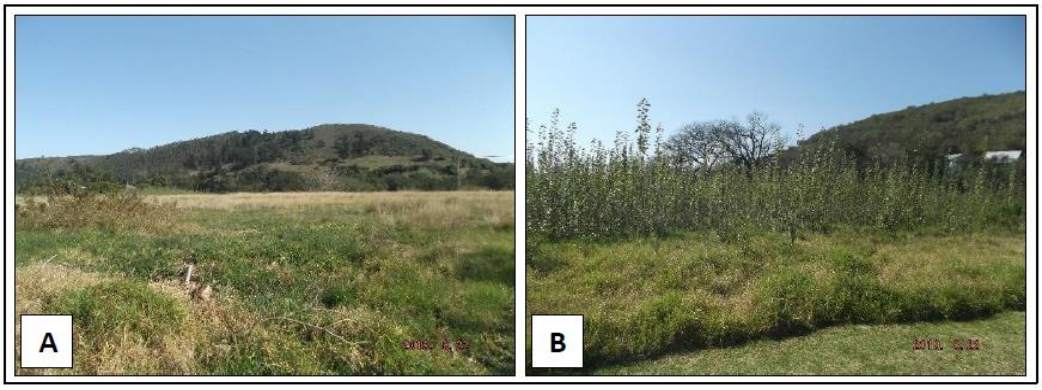

Figure 9: Vegetation found on site

Existing regular human use of the area can be seen by the footpaths through the site. A well-used path cuts diagonally through erf 104 and is scattered with solid domestic waste and garden refuse. There is also a trail leading from the gravel road to the active channel of the river in the northeast of the study site. This trail has denser vegetation cover and large volumes of domestic waste as well as human waste is scattered in the area. The study site overall seems to be used as a dump site for garden waste, building rubble and black bags with domestic waste. Garden waste include leaves, soil and grass cuttings and building rubble vary from pieces of brick to broken concrete and plastic.

According to CapeFarmMapper (Accessed in April 2020) in a more fine-scale study Vlok et al (2008) mapped Sedgefield Coastal Grassland as the dominant vegetation type. Groot Brak River Floodplain vegetation is present along the Bosfontein River Wetland north of the development. A small portion of Knysna Enon Fynbos is mapped in the southern region of the site. This vegetation type is dominant within the area (Figure 10).

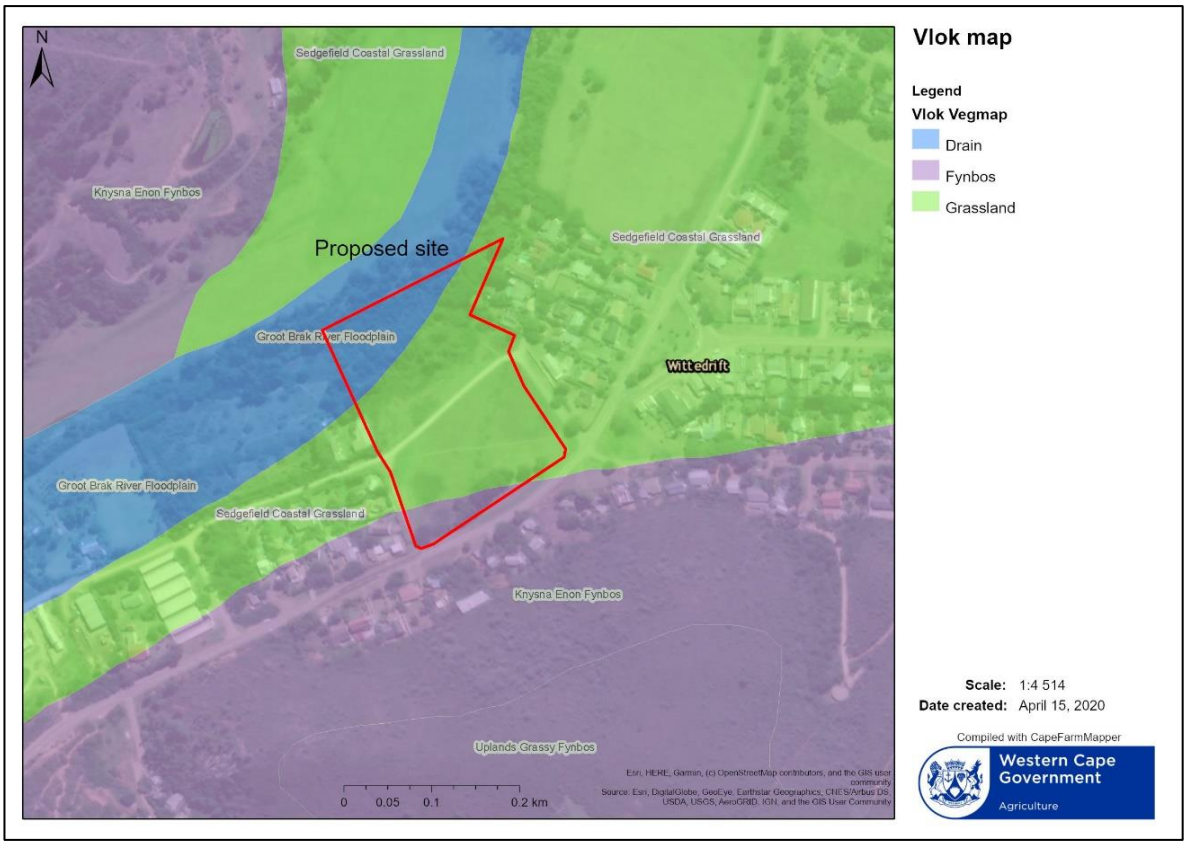

Figure 10: Vlok map.

5.1.2 Critical Biodiversity Areas

According to the CapeFarmMapper (Accessed April 2020), there are areas mapped as Ecological Support Areas (ESA) and Critical Biodiversity Areas (CBA) by the Western Cape Biodiversity Spatial Plan (2017) within the proposed site, as seen in Figure 11 below. The presence of the Bosfontein River and associated riverine habitat north west of the proposed property has resulted in the classification of the area as a Category 1 Terrestrial CBA. The remainder of the site is classified as a Category 1 Terrestrial ESA. However, the area mapped as the ESA has been completely degraded as a result of invasive alien vegetation as well as footpaths and occurrence of grass types such as Kikuyu.

Figure 11: CBA and ESA areas identified by the Western Cape Spatial Plan.

5.2 Freshwater features

5.2.1 The Aquatic Environment

According to the Aquatic Habitat Impact Assessment completed by Sharples Environmental Services CC in 2019, the study site is within quaternary catchment K60F (Figure 12) and falls under the jurisdiction of the Breede Gouritz Catchment Management Agency as the water use authority. The Bietou River is the largest system within this catchment and joins the Keurbooms River in the south to form the Keurbooms Estuary. The study site is located within the Bosfontein River valley that flows in a north easterly direction towards the Bietou River. This reach of the Bietou contains vast floodplain wetland habitat of national biodiversity importance. The broad floodplain wetland of the Bietou River is more than 600ha in size and is a valuable ecological resource. The Bietou wetland is essentially part of the greater Keurbooms Estuary and therefore impacts on the Bietou will in turn impact the Keurbooms system.

The Bosfontein River that flows past the study site merges with the Bietou River wetland. The Bietou River in turn contributes to the freshwater supply of the Keurbooms Estuary.

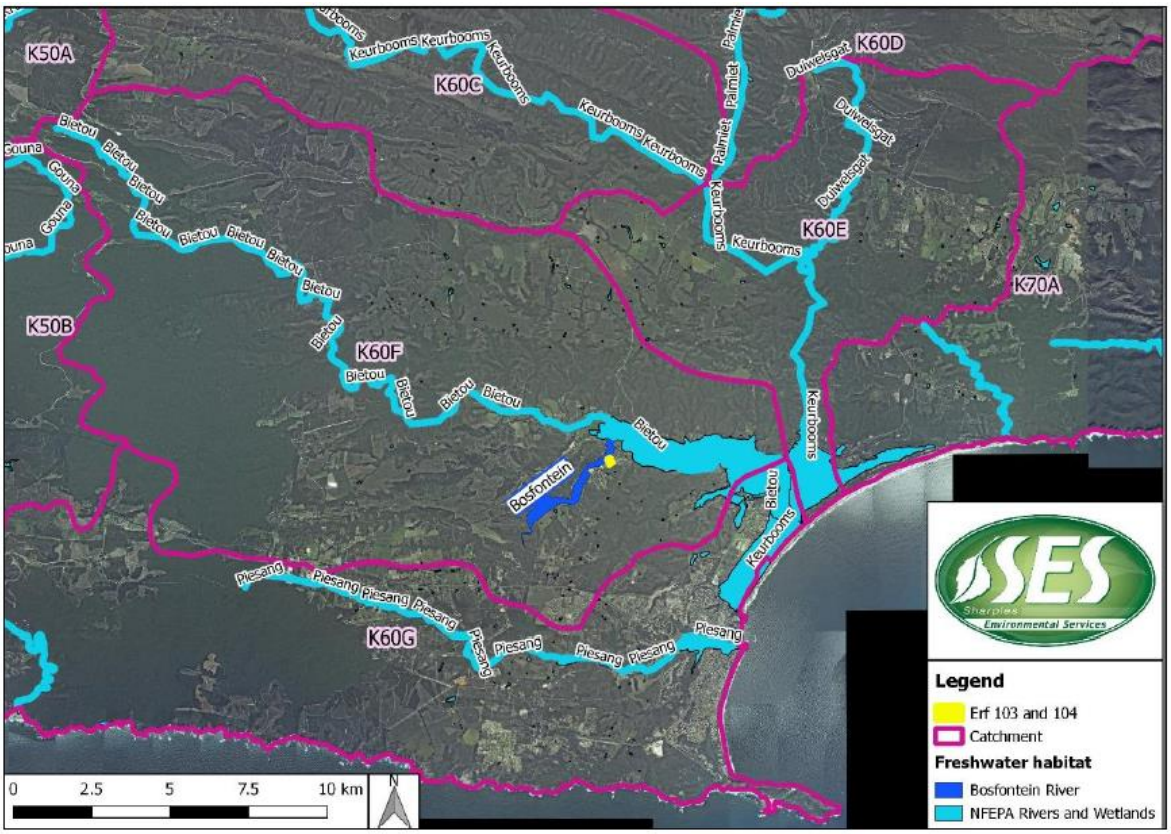

Figure 12: Map showing the study site in relation to quaternary catchments of the area.

Figure 13 below indicates that the area proposed for development is on top of a fluvial terrace. The area is covered in terrestrial vegetation with negligible natural habitat remaining and has been subject to various impacts such as from agriculture, forestry and urban development. The top of the fluvial terrace is covered in Kikuyu grass (*Pennisetum Clandestinum*) and *Eragrostis curvula*. The study site has well-used footpaths through it and is scattered with domestic waste, building rubble and garden waste. However, most of the disturbance are in the terrestrial area and the aquatic habitat on site is less impacted and viable.

The Aquatic Habitat Impact Assessment (2019) determined that the aquatic habitat that will be impacted by the development is the Bosfontein River wetland north of the development (Figure 13). This wetland is fed by the perennial river channel that runs through it, the Bosfontein River. Under natural conditions the channel was likely shallow and situated within more extensive wetland habitat. However, due to its current incised nature, the active channel and remnant wetland vegetation is predominantly disconnected.

Figure 13: Landscape features dictating aquatic habitat extent on site.

The wetland habitat has an overall 'D' Present Ecological State (PES) score, indicating a Poor system. However, this is an indication of the health of the whole reach of natural wetland. The fragment of wetland habitat remaining is in better health with dense vegetation cover and no signs of erosion. The wetland's functional importance is highlighted in its ability to attenuate floods, trap sediment and control erosion. These services will benefit the downstream Bietou River wetland by acting as buffer between this system and developments upstream.

5.2.2 Habitat Integrity, Ecological Importance & Sensitivity

The Ecological importance of the wetland can be classified into goods/products (directly harvested from wetlands), functions/ services (performed by wetlands), and ecosystem scale attributes. The WET-EcoServices assessment highlights these benefits and the extent of each benefit for the wetlands. The assessment indicates that the wetland habitat has a Low to Moderate functional importance. The functionality of the wetland has been compromised by degradation as a result of forestry, urbanization and agricultural activities in the catchment.

The wetland fulfils its function in contributing ecosystem services. The most important services include flood attenuation, sediment trapping and erosion control. These services will benefit the downstream Bietou River wetland by acting as buffer between this system and developments upstream. Increased stormwater inputs and altered runoff from the hardened surfaces of the proposed development will be mitigated by the wetland to prevent erosion and flooding downstream. The wetland's ability to trap pollutants are also beneficial considering the higher pollution load associated with the development's construction and operational phase.

The wetland has a Moderate overall Ecological Importance and Sensitivity (EIS) score. The biodiversity importance is moderate due to its sensitivity to changes in floods and water quality; the protection status

of the surrounding vegetation type and its ability to act as a migration route. The hydrological importance of the system is limited due to the size of the remnant wetland habitat.

5.2.3 National Freshwater Ecosystem Priority Areas

The National Freshwater Ecosystem Priority Area project (NFEPA) aims to provide strategic spatial priority areas for conserving South Africa's aquatic ecosystems and supporting sustainable use of water resources. These priority areas are called Freshwater Ecosystem Priority Areas (FEPAs) and the main output of the NFEPA project was the creation of FEPA maps. FEPAs were identified based on a range of criteria dealing with the maintenance of key ecological processes and the conservation of ecosystem types and species associated with rivers, wetlands and estuaries (Driver et al. 2011). The Freshwater Habitat Assessment Report (2019) states that the NFEPA data failed to identify and/or appropriately classify the aquatic habitat. Therefore, no FEPA habitat were identified within or adjacent to the study site by the NFEPA project

6. Legal Framework

6.1 The NEMA, Act No 107 of 1998, as Amended, and the EIA Regulations (2014)

The National Environmental Management Act (NEMA; No. 107 of 1998, as amended) gives effect to the Constitution of the Republic of South Africa by providing a framework for co-operative environmental governance and environmental principles that enable and facilitate decision-making on matters affecting the environment. NEMA requires that an environmental authorisation be issued by a competent authority (CA) before the commencement of an activity listed in Environmental Impact Assessment Regulations Listing Notices G.N. 324, 325, 326 & 327 published on the 7th April 2017.

Due to the fact that this development proposal is an activity listed in the EIA Regulations, a Basic Assessment Report is required and the respective reports must be submitted to the Department of Environmental Affairs and Development Planning (DEADP) before they issue *The Home Market NPC* with an Environmental Authorisation (either approval or rejection of the development proposal).

The following table indicates the amendments necessary for the new development proposal to be compliant with the latest NEMA Regulations:

Table 5: Listed Activities in terms of the NEMA Environmental Impact Assessment Regulations (2017), as amended, that are proposed to be triggered

Activity #	Listing notice 1. Description of Activity as per GN No. R 327
12	The development of— (i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or (ii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs— (a) within a watercourse; (b) in front of a development setback; or (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; — excluding— (aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour;

	(bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies; (cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies; (dd) where such development occurs within an urban area; (ee) where such development occurs within existing roads, road reserves or railway line reserves; or (ff) the development of temporary infrastructure or structures where such infrastructure or structures will be removed within 6 weeks of the commencement of development and where indigenous vegetation will not be cleared.
19	The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse; but excluding where such infilling, depositing, dredging, excavation, removal or moving— (a) will occur behind a development setback; (b) is for maintenance purposes undertaken in accordance with a maintenance management plan; (c) falls within the ambit of activity 21 in this Notice, in which case that activity applies; (d) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or (e) where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies.
27	The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for— (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.
Activity #	**Listing notice 3. Description of Activity as per GN No. R 324**
N/A	N/A
Activity #	**Listing notice 2. (GN No. R325): Scoping & Environmental Impact Reporting**
N/A	N/A

Therefore, in summary, the following activities will be applied for:

- Listing Notice 1: Activity No: 12, 19 and 27
- Listing Notice 2: None
- Listing Notice 3: None

6.2 Other applicable legislation

The Home Market NPC is responsible for ensuring that all contractors, labourers and any other appointed person/entity acting on the their behalf, remain compliant with the conditions of the received authorisations, as well as the provisions of all other applicable legislation, including *inter alia*:

- National Environmental Management Act (NEMA) (Act No 107 of 1998, as amended);
- National Environmental Management Biodiversity Act (Act 10 of 2004);
- National Environmental Management: Waste Act (Act 59 of 2008);
- National Water Act (Act 36 of 1998)
- National Forest Act (Act No 84 of 1998);
- National Heritage Resources Act (Act No 25 of 1999);
- Occupational Health and Safety Act (Act 85 of 1993);

The National Water Act (Act 36 of 1998) provides the framework for the sustainable management of South Africa's water resources. It aims to protect, use, develop, conserve, manage and control water resources as a whole, promoting integrated water resource management that involves participation of all stakeholders. The Act declares the national government to be the public trustee of the nation's water. The Act is administered by the national Department of Water Affairs (DWA) via regional offices.

The proposed development activities will trigger a water use licence in terms of Section 21 (c) and (i) of the National Water Act (Act 36 of 1998).

The above listed legislation has general applicability to most development applications, and it is *The Home Market NPC's* responsibility to ensure that all contractors and employees are aware of their obligations in terms of these Acts. This EMPr does not detract from any other legal requirements.

The proposed development activity will take place through various phases. Each phase has specific impacts or issues unique to that phase of the development activity. These phases of the development are listed below and the impacts associated with each phase as identified through the environmental impact assessment process are identified and given a brief description. Brief management statements are provided, as well as a description of the desirable impact management outcomes.

7. Scope of this EMPr

This EMPr describes the measures that must be implemented in order to avoid, minimise, manage and monitor the potential environmental impacts of the development, during all phases of the project life cycle, namely:

- Planning and Design Phase
- Pre-construction Phase
- Construction Phase
- Post-Construction Rehabilitation
- Operational Phase

General environmental management measures that must be applied throughout the project lifecycle (as and where applicable) are described in Chapter 8 below. Additional management measures that must be implemented to address specific impacts that may arise during each phase are provided in **Chapters 9-12** of this EMPr.

8. General Environmental Management

The following general management measures are intended to protect environmental resources from pollution and degradation during all phases of the project life cycle. These measures should be implemented as and where applicable, reasonable and practicable during the pre-construction,

construction and post-construction rehabilitation and operational (maintenance) phases of the proposed development.

Code of Conduct
The purpose of the Code of Conduct (CoC) is to minimise the impact of the activities associated with the construction phase on the environment. The rules and regulations prescribed in this CoC are intended to ensure that the impacts on the environment are not prejudiced by the construction activities. Failure to adhere to or any breach of this CoC will result in a fine being levied against the offending or defaulting party / individual.

Labourers during the construction phase should conserve the natural environment, endorsing the principles of sustainable use and minimum impact. They should also be sensitive to the impact of their operation on the environment within which they work and minimise any adverse impacts.

This EMPr forms an integral part of the activities during the construction phase and as such, is legally enforceable. In addition to the restrictions and controls provided for in this EMPr, the environmental controls comprise the following:

Engineers
- Unless otherwise stated by the holder, only a registered engineer must be appointed for the construction phase of the development.
- The engineer shall provide work or services of a quality and scope, and to a level, which are commensurate with accepted standards and practices.
- The engineer shall be impartial in decision-making, provision of advice and judgement.

Contractors and sub-contractors
- Unless otherwise determined, only appropriately registered contractors shall be appointed.
- It shall be the responsibility of the holder / engineer to ensure that the contractors abide by and comply with the rules and regulations of the Code of Conduct.
- Contractors shall at all times be responsible for their sub-contractors and employees whilst they are on the development property.

Rules and Regulations
It is of vital importance that engineers and contractors understand and acknowledge that they are working on an environmentally sensitive development and agree to conform to all environmental controls specified in this EMPr and any additional input by the ECO. In addition to the EMPr, the environmental controls comprise the following:

- **Building Plan Controls**
    - A copy of the approved and signed building plans must be available on site during the construction phase of the development.
    - Variations of the building plans must be approved by the engineer / holder prior to being implemented.
    - Prior to commencing building, the contractor must remove all topsoil and store it in a berm of not more the 2m high, away from construction activities.

- **Site tidiness**
    - The contractor must keep the appearance of his building site neat and tidy at all times. Building rubble must be removed from site at regular intervals, and litter must be removed

from the site on a daily basis. Refuse drums must be available on site which waste can be placed in. The drums must be emptied on a regular basis and the waste taken to a licenced local waste disposal facility.

- **Safety**
    - The contractor shall comply with the Health and Safety Act (Act No. 85 of 1993), as amended, together with such regulations promulgated thereunder.

8.1 Site access and traffic management

The site will be accessed from Protea Street.

All construction vehicles need to adhere to traffic laws and regulations, drivers must be sensitised to the fact that they are working in an area with a potentially high volume of foot and vehicle traffic. The speed of construction vehicles and other heavy vehicles must be strictly controlled to avoid dangerous conditions for other road users. As far as possible, care should be taken to ensure that the local traffic flow pattern is not significantly disrupted and vehicle operators therefore need to be educated in terms of "best-practice" operation in order to minimise unnecessary traffic congestion or dangers. These practices include, but are not limited to, not unnecessarily obstructing the access point or traffic lanes used to access the site; considering the load carrying capacity of road surfaces and adhering to all other prescriptive regulations regarding the use of public roads by construction vehicles.

Adequate signage that is both informative and cautionary to passing traffic should be erected to warn other road users(motorists and pedestrians) about the presence of construction vehicles, particularly at the point where construction vehicles enter/ exit the site from the N2 warning them of the construction. Signage would need to be clearly visible and include, amongst others, the following:

- Identifying working area as a construction site;
- Cautioning against relevant construction activities;
- Prohibiting access to construction site;
- Clearly specifying possible detour routes and / or delay periods;
- Possible indications of time frames attached to the construction activities, and;
- Listings of which contractors are working on the site.

Other mitigation measures include:

- No construction to take place over or during the December holiday period without prior permission from the relevant authorities.
- Construction vehicles must adhere to the load carrying capacity of road surfaces and adhere to all other prescriptive regulations regarding the use of public roads by construction vehicles.
- ECO to do awareness training with the contractor and labourers and to highlight the traffic related risks before construction commences.
- Where possible, construction traffic that may obstruct traffic flow on the surrounding roads should be scheduled for outside of peak traffic times.
- Ensure appropriate behaviour of operators of construction vehicles.
- If needed, appropriate traffic management measures and/ or points men (traffic marshals) should be utilized to assist vehicles entering/ exiting the site, particularly where vehicles must cross the path of oncoming traffic.

8.2 Site demarcation

The working areas should be clearly demarcated on site during the pre-construction or construction phases of the development, as appropriate.

8.2.1 Construction working area

Prior to the commencement of any land-clearing or construction activities, the outer boundary of the development area must be surveyed and pegged. If practical, the demarcation boundary should typically allow a working area of no more than 2.5m around the development footprint unless otherwise agreed with the ECO. This demarcation boundary is to ensure that land clearing and construction activities are restricted to only that area strictly required for the proposed development, and to prevent unnecessary disturbance of soil surfaces and vegetation outside of the development footprint.

If desired or deemed necessary by the ECO, the outer boundary of the working area can be enclosed with orange barrier netting fencing, shade netting, droppers & wire/ danger tape, or similar – as feasible and practical. The fencing should be retained and maintained for the duration of the construction period, it should not be removed until construction and reinstatement/rehabilitation concludes, unless changes are required, which will only apply with the approval of the appointed ECO and Site Engineer. Areas to be cleared must be demarcated before any clearing and grubbing commences.

8.2.2 No-go areas

Prior to the commencement of any land-clearing or construction activities, all sensitive areas (as identified by the ECO), must be demarcated and must not be disturbed during the construction phase. It is recommended that the No-Go areas be demarcated with a suitable material that can be easily identified and noticed. Danger tape flagging (pieces of danger tape tied to twine or rope) may be utilised, however the use of only danger tape is not recommended for long-term demarcation as this will easily become untidy and blown away by the wind resulting in pollution.

No-go areas could include areas with slopes of 1:4 and steeper, greenbelt / corridor areas, public open spaces, drainage lines, streams and/or other wetlands outside of the approved development area. No-go areas outside the approved development area must be off-limits to all construction workers, vehicles and machinery during all phases of the development. No vegetation may be cleared from within the no-go areas, and no dumping of any material (waste, topsoil, subsoil etc.) may occur in these areas. Construction workers must be informed of the no-go areas, and if necessary appropriate signage can be used to enforce the demarcation. Any interaction with no-go areas should be consulted between the contractor and ECO prior to any actions.

As described in the Freshwater Habitat Impact Assessment compiled by Sharples Environmental Services cc (2019), aquatic buffer zones are designed to act as barriers between human activities and sensitive water resources in order to protect them from adverse negative impacts. Buffer zones associated with water resources have been shown to perform a wide range of functions and have therefore been adopted as a standard measure to protect water resources and associated biodiversity. An aquatic impact buffer zone is defined as a zone of vegetated land designed and managed so that sediment and pollutant transport carried from source areas via diffuse surface runoff is reduced to acceptable levels (Macfarlane and Bredin 2016).

A buffer area surrounding the freshwater habitat needs to be established, demarcated and strictly adhered to. The specific size of the buffer zone was informed by a tool developed by Macfarlane and Bredin (2016) called Buffer zone guidelines for rivers, wetlands and estuaries. A buffer of 10 meters from the boundary of the delineated freshwater habitat was determined using the tool and is indicated in Figure 16 below. Key personnel need to be established by *The Home Market NPC* to clear alien vegetation in buffer zone, with an alien vegetation management plan, identifying alien and indigenous species. The inclusion of the stormwater control and slope stability measures/infrastructure, may encroach upon this area, therefore the positioning of these structure should be done under the supervision of the ECO and in compliance with the authorized layout plan. However, where possible encroachment should be avoided.

Figure 14: A map showing the recommended 10m buffer from aquatic habitat overlaid on the amended proposed layout.

8.2.3 Demarcation of the site camp

The area chosen for the site camp and associated facilities must be the minimum area reasonably required to accommodate the site camp facilities, and which will involve the least disturbance to the environment. It is recommended that easily accessible, transformed areas must be used for the site camp, at least 100m away from any no-go areas. Site selection must be done in consultation with the ECO.

8.3 Site camp and associated facilities

The following general management measures pertaining to the set-up, operation and closure of a site camp should be applied where appropriate, reasonable and practicable:

8.3.1 Fencing & Security

The site camp area must be secured to prevent any un-authorised individuals from entering the site camp and possibly getting injured or posing a safety and/or security risk. Adequate signage must be displayed, designating the site office / camp as a restricted area to non-personnel. If required, the site camp and associated areas may be fenced off along the demarcated boundaries of these areas, preferably with 2m high fence and shade netting or similar.

8.3.2 Fire Fighting Equipment

No less than 2 fire extinguishers must be present in the site camp. The extinguishers must be in a working condition and within their service period. A fire extinguisher must always be present wherever any "hot works" (e.g. welding, grinding etc.) are taking place. It is recommended that all construction workers receive basic training in fire prevention and basic fire-fighting techniques, and are informed of the emergency procedure to follow in the event of accidental fires. No open fires may be made on the construction site during any phase of the project. Construction workers may make small contained fires (e.g. for warming or cooking purposes), within the site camp provided the small fire is encircled by a

corrugated iron structure, drum or similar, to prevent wind-blown cinders from causing fires elsewhere. Such fires may not be left unattended and must be thoroughly extinguished after use. No smoking must be allowed on the construction site. In the case of accidental fires the contractor must (if required) alert the Local Authority's Fire Department as soon as a fire starts prior to the fire becoming uncontrollable.

8.3.3 Waste Storage Area

Sufficient bins for the temporary storage of construction related waste must be provided inside the site camp and/or at the working area and should be located in such a way that they will present as little visual impact to surrounding residents and road users as possible. Label each waste receptacle for waste separation, and ensure waste is contained either by use of lids or by ensuring waste receptacles are emptied prior to filling up, making them susceptible to wind dispersion. Sufficient signage and awareness should be created to ensure that these bins are properly used.

8.3.4 Hazardous Substances Storage Area

Fuels, chemicals, lubricants and other hazardous substances must be stored in a demarcated, secured and clearly sign-posted area within the site camp away from the watercourses on site. Sufficient signage and awareness should be created to ensure that these bins are properly used. Ensure that when substances are transferred, this is done on an impermeable and/or bunded surface, to contain any spillage. Spillage, should it occur, should be disposed of appropriately.

8.3.5 Potable Water

An adequate supply of potable water must be provided to construction workers at the site camp. It is the Contractors duty to ensure that the labour has adequate access to potable water throughout construction phase, and to monitor weather conditions, to ensure that labour has enough drinking water on hotter days, or construction activity must cease, until conditions are safe to continue.

8.3.6 Ablution Facilities

Chemical toilets should be maintained on the site camp for the duration of the construction phase and rehabilitation, on a level surface and secured from blowing over and located in such a way that the toilets will not cause any form of pollution. As per the SANS10400 requirement, one ablution facility for every 8 male workers and 2 ablution facilities for every 8 female workers will be provided.

The ablution facilities must not be linked to the river system in any way. Toilets must be serviced regularly and kept in an orderly state. The contractor must ensure that no spillage occurs when the toilets are cleaned, serviced or moved. The toilet facilities should be emptied on a weekly basis, by an appropriately registered service provider. Proof of this weekly servicing must be obtained, and filed in the Environmental File on site. Performing ablutions outside of the provided toilet facilities is strictly prohibited and the ECO would need to regularly inspect the state of the chemical toilets to ensure compliance.

- Ablution facilities provided for construction workers must be placed away from the terrace edge.
- Ablutions should be further than 10m from aquatic buffer area.

8.3.7 Eating Area & Rest Area

A dedicated area within which construction workers can rest and eat during breaks must be provided within the site camp. Seating and shade should be provided.

8.3.8 Vehicle & Equipment Maintenance Yard

Where possible, construction vehicles and equipment that require repair must be removed from site and taken to a workshop for servicing. If emergency repairs and/or basic maintenance of construction vehicles or equipment are necessary on site, such repair work must be undertaken within the designated maintenance yard area away from any watercourses. Repairs must be conducted on an impermeable

surface, and/or a tarpaulin and/or drip trays must be laid down prior to emergency repairs taking place, in order to prevent any fuel, oil, lubricant or other spillages from contaminating the surrounding environment.

8.3.9 House-keeping

The site camp and related site camp facilities must be kept neat and orderly at all times, in order to prevent potential safety risks and to reduce the visual impact of the site during construction.

8.4 Protection of fauna

Construction workers are to be sensitised to the fact that they may encounter fauna during the construction period. This should be included in the environmental awareness training completed with all site personal before any construction. No faunal species are to be trapped, kept or killed, if any fauna is encountered by construction workers, the ECO is to be notified. If the ECO is not on site, the site manager is to be informed. Rescued fauna should be released into a nearby area of similar habitat away from any construction.

8.5 Indigenous vegetation clearing and protection.

Where indigenous vegetation must be cleared for the development the following measures must be implemented:

- Blanket clearing of vegetation must be limited to the approved development footprint, and the area to be cleared must be demarcated before any clearing commences
- Where feasible vegetation must simply be trimmed to facilitate access/ construction, rather than being completely cleared or removed.
- Vegetation clearing/trimming must be cleared by hand (i.e. brush cut) and stockpiled for use as mulch/ brush-packing during rehabilitation of the site. Any alien vegetation that is cleared must be disposed of in consultation with the ECO and the Alien Vegetation Management Plan, unless the cleared alien vegetation does not contain seeds in which case it may be retained for use in site rehabilitation.
- Only the areas required to accommodate the construction and access to the construction site must be cleared/trimmed of vegetation.
- After any clearing is completed, an appropriate cover crop should be planted where any weeds or exotic species are removed from disturbed areas timeously.
- Vegetation outside of the construction footprint and within any no-go areas must not be cleared.
- Land clearing and earthmoving activities should not be undertaken during strong winds, where possible.
- Ensure the open space is kept clear of alien plant species through the adoption of an Alien Management plan.
- Trees located in areas where sidewalks, open areas or gardens are proposed, these trees are to be barricaded and not cleared.

The proposed development requires the clearance of vegetation, however the following measures should be implemented to protect the indigenous vegetation where possible.

- Great care will be taken if cement is to be mixed on site, especially in the proximity of vegetation. Cement is to be mixed on thick plastic sheets or in large buckets and not allowed to spill onto bare ground. Any spillage will be cleaned up immediately. Cement water is also to be contained in the above manner and allowed to dry out and then removed from site. Cement water, which is highly alkaline, poses a definite threat to the soil and seed banks.
- Blanket clearing of vegetation must be limited to the approved development footprint, and the area to be cleared must be demarcated before any clearing and grubbing commences.

- A monitoring programme shall be in place, not only to ensure compliance with the EMPr throughout the construction phase, but also to monitor any post-construction environmental issues and impacts such as increased surface runoff. The monitoring should be regular and additional visits must be taken when there is potential risk to the aquatic habitat.
- No clearing outside of development and infrastructure footprint area to take place.
- Rescued plants should be replanted into a nearby disturbed area of similar habitat or for open space rehabilitation.
- An Independent Environmental Control Officer will oversee compliance with all the prescribed environmental requirements and mitigation measures listed here and will be on site regularly.
- Provide provisions in the detailed design of the layout to accommodate protected trees.
- Barricade protected trees during construction.
- Key personnel need to be established by *The Home Market NPC* to clear alien vegetation in buffer zone, with an alien vegetation management plan, identifying alien and indigenous species.
- A rehabilitation plan must be compiled with the assistance of a botanist.

8.6 Topsoil and subsoil management

It is recommended that topsoil be removed from any area where physical disturbance of the surface will occur, including within the footprint of the development site (working area) and possibly within the site camp, ablution area, vehicle maintenance yard, refuelling area and temporary waste storage area. Topsoil removal and stockpiling must be undertaken only after consultation with the ECO.

- Excavated topsoil and subsoil must be stockpiled for the duration of the active construction period, and utilised for the final landscaping and rehabilitation of disturbed areas on site.
- Stockpiles must not be located within the buffer area.
- The topsoil berm may be a few meters wide but must ideally not be more than 2m high to allow light and air penetration.
- Excavated subsoil must be stockpiled separately from topsoil.
- The topsoil & subsoil storage area must be located on a level area outside of any surface drainage channels outside the riparian zone, and at a location where it can be protected from disturbance and river flow/floods during construction and where it will not interfere with construction activities.
- Topsoil and subsoil stockpiles must be adequately protected from being blown away or eroded by storm water. If necessary, shade cloth or other suitable measures must be used to stabilise and protect the stockpile from wind/water erosion. Topsoil stockpiles must not be covered with tarpaulin, as this may smother and decrease the virility of topsoil.
- Stockpiles must not be located within 50 metres of the edge of the wetland habitat.
- Handling of topsoil must be minimised as much as possible, and the location of the topsoil berm must be chosen carefully to avoid needing to relocate the topsoil berm at a later date.
- Ideally, topsoil is to be handled twice only, once to strip and stockpile, and once to replace, level, shape and scarify.
- If soil stockpiles will be stored for an extended period of time, the stockpiles must be kept clear of weeds and alien vegetation growth by regular weeding, (or application of herbicides if agreed with the ECO).
- Soil material that will not be re-utilised on site may be removed from site and taken to an appropriate site for re-use or disposal.
- Topsoil removed from fynbos areas to be reused in rehabilitation areas, e.g. open space areas. Where possible, topsoil from fynbos areas, containing indigenous plant seeds, should be transferred immediately to rehabilitation areas rather than being stockpiled, as stockpiling kills important fungi, microbes, seeds and soil fauna. Topsoil stockpiles of this kind must not exceed 0.5 m in height and must not be compacted.

- Note that the topsoil must be the final layer applied to a rehabilitated/ re-landscaped site, after subsoil/ spoil material has been placed and shaped on the site.
- Stockpiles must not be located within 50 metres of the edge of the wetland.
- Avoid stockpiling too close to the edge of the terrace.

8.7 Integrated waste management approach

It is recommended that an integrated waste management system is adopted on site. The system must be based on waste minimisation and must incorporate reduction, recycling, re-use and disposal where appropriate. Separate waste bins/skips that are weather and animal proof must be provided for recyclable waste, general waste and hazardous waste. Recovered builder's rubble & green waste may be stockpiled on the ground within the site camp, or in separate skips until removal. These bins/skips must be emptied and the waste taken to a registered recycling facility. The receipts from the facility must be kept on file and must be available on request.

The non-recyclable and non-reusable waste (e.g. builder's rubble, etc.) generated on site must be disposed of at a landfill site licensed in terms of the applicable legislation. The receipts from the facility must be kept on file and must be available on request.

Chemical toilets present a risk to the surrounding environment and must be managed accordingly. Chemical toilets must be kept within the site camp (not be linked to the storm water drainage system), on a level surface and secured from blowing over. Chemical toilets must be regularly emptied, and the waste disposed of at an appropriate wastewater disposal/ treatment site. Care must be taken to prevent spillages when moving or servicing chemical toilets. Ablutions should be further than 10m from aquatic buffer area.

Hazardous substances such as diesel, oil and detergents will be present on site throughout the construction phase of the proposed development. Hazardous substances pose a greater risk to the surrounding environment than general substances and therefore need to be managed accordingly. A designated storage area within the site camp that is clearly demarcated must be set aside for the storage of hazardous substances and is to be treated as a no-go zone to unauthorised personnel. Appropriate signage, Material Safety Data Sheets (MSDSs), recently serviced fire extinguishers and spill kits should accompany the hazardous substances. Appropriate storage of hazardous substances is important while drip trays should always be utilised when decanting of hazardous substances and when refilling chemical/ fuel storage tanks. If any spills do occur, the soild must be excavated and disposed of as hazardous waste.

Cement and concrete batching will be permitted on site, but may only take place on designated impermeable, bunded surfaces, as agreed with the ECO. Used cement bags should be disposed of as hazardous waste on site.

8.8 Erosion control and stormwater management

Appropriate measures must be implemented to control the flow of stormwater across the construction site, in order to prevent possible flooding, soil loss and dispersion of pollutants. To prevent excessive erosion activities, exposed earth surfaces must be protected from wind and water erosion.

The scale and nature of the erosion and stormwater control measures implemented on site must be appropriate to the conditions on site, and sufficient to achieve the desired outcomes (soil preservation, prevention of flooding, stormwater control) to the satisfaction of the ECO and consulting engineer.

The prevention of soil erosion can be initiated by designating specific areas for stockpiling of raw materials with consultation of the ECO. No stockpiling is to occur on or near slopes or water resources (must not be

located within the buffer area) and all stockpiling areas must be approved by the ECO before stockpiling occurs.

Stockpiles need to be effectively managed and maintained as they have the potential to contribute to runoff and erosion. In order to prevent this, the following management measures must be implemented.

- Stockpiles of topsoil & spoil material must be protected from wind & water erosion.
- Stockpiles of earth material may not be located within any storm-water drainage pathways and must be outside of the reach of potential flood waters.
- Any erosion runnels/ gulleys/ channels that form on site must be infilled with appropriate material, compacted, rehabilitated as needed and appropriate erosion control measures put in place to prevent recurrent erosion at that site. Rehabilitation of erosion channels should be ongoing during the construction phase and not left until the end of the construction period
- Stockpiles must not be located within 50 metres of the edge of the wetland

It may be necessary to implement small-scale erosion protection measures at the construction site, to prevent soil erosion. Such measures may include the use of shade netting, geo-fabric, brush-packing or similar barriers in areas susceptible to erosion and along exposed slopes. The storm water management plan should adhere to the principles of sound storm water management. The storm water management system must be implemented on site and must be properly maintained in order to ensure that contaminated run-off from the construction site is prevented from flowing into the watercourse.

Cleared areas and any other area susceptible to erosion should be provided with a suitable cover and stabilised as soon as possible via the implementation of appropriate erosion control measures. This may include use of cut-off drains, temporary/permanent drainage channels, brush-packing, mulching, planting or sodding, use of environmentally benign soil binders, use of geo-textile or other coverings. The appropriate measures should be selected by the contractor in consultation with the Engineer & ECO.

Areas must be rehabilitated, and a suitable cover crop planted once specific phases of construction is completed.

8.9 Construction near a watercourse

A demarcated buffer of 10m should be implemented as seen in figure 16 to protect the aquatic system and maintain the present ecological processes. This buffer area should be regarded as a no-go area. Ablutions should be further than 10m from aquatic buffer area and stockpiles cannot be located within 50m of the edge of the wetland. Erosion control measures may be required around stockpiles, while the use of grease traps/oil separators to prevent pollutants from entering the environment are recommended as no pollution of surface water or ground water resources may occur due to any activity on the site. A monitoring programme shall be in place to ensure compliance with this EMPr throughout the construction phase. Stockpiles must not be located within 50 metres of the edge of the wetland.

Once construction has been completed, the objective would be to promote the re-establishment of the ecological functioning of any area disturbed by construction activities and maintain a healthy system throughout operation. The buffer area regarded as a no-go area during construction will be zoned as open space during the operational phase of the development. During the post-construction and operational phase of the development, erosion features that have developed are required to be stabilised. This may also include the need to deactivate any erosion headcuts/rills/gullies that may have developed. The area must be maintained through alien invasive plant species removal in accordance with the Alien Vegetation Management Plan and the establishment of indigenous vegetation cover to filter run-off before it enters the freshwater habitat. Placement of signage near the boundary of the buffer zone should also be considered to help mark the boundary and educate the community about the

purpose and value of protecting buffer zones. Information can include a description and visual of alien invasive plant species.
All equipment and materia storage areas must (if practical, reasonable and feasible) be located at a minimum distance of 50m from the watercourse. The appointed ECO must be consulted in this regard.

8.10 Excavations and Earthworks

Any major earthworks with bulldozers and heavy machinery must be under constant supervision and operators are to be aware of all the environmental obligations, as there is always the potential to inflict damage to the sensitive areas. Any unnecessary or excessive heavy machinery movement must be kept to a minimum i.e. only what is absolutely necessary. Areas to be excavated must be clearly demarcated. Areas, which have already been excavated and entail fairly significant earthworks, must be similarly demarcated to avoid the spreading of construction activities into more sensitive areas.

All excavated material must be stored on a flat surface away from any drainage line or area susceptible to erosion. The location must be decided upon in consultation with the ECO. Stored material must be protected from wind and water erosion and this may entail covering the material with suitable shade cloth material or similar (if and when necessary). The shade cloth may need to be weighed down in such a manner that any stream flow is directed away from the stockpile, reducing the risk of erosion.

In the event that any heritage resources (human remains, grave stones, stone tools, artefacts, old coins and pottery, fossil shell middens, rock art and engravings, remains of old built structures etc.) are encountered during construction, the finding should be protected from further disturbance (ideally left in situ) and the ECO and relevant Heritage Authority should be notified. The finding should be handled and/or removed from site as per instructions issued by the Heritage Authority or delegated heritage specialist.

8.11 Visual Impact.

The proposed development has the potential to cause a visual impact during the construction and operational periods. In order to minimise the potential visual impact, all working areas, storage facilities, stockpiles, waste bins, elevated tanks and the site camp should be located in such a way that they will present as little visual impact to surrounding residents and road users as possible. Waste must be managed according to this EMPr. Good housekeeping practices on site must be maintained to ensure the site is kept neat and tidy. The site camp may require visual screening via shade cloth or other suitable material. The use of reflective materials and excessive lighting should be avoided and construction vehicles must enter and leave the site during working hours.

8.12 Noise management.

Additional noise is expected during the construction period due to construction activities. It is important that noise complaints register should be opened and that all excavations and earth-moving activities must be restricted to normal construction working hours (7:30 – 17:30) as far as possible. Work on site must be well-planned and should proceed efficiently so as to limit the duration of the disturbance. This is to be done by ensuring that all equipment is in good working condition and fitted with mufflers/exhaust silencers in necessary. Noise levels must comply with the relevant health & safety regulations and SANS codes and should be monitored by the Health & Safety Officer as necessary and appropriate and all affected parties must be informed of the excessive noise factors.

8.13 Dust management.

Although the generation of dust is synonymous with construction sites, care needs to be taken to prevent excessive dust from impacting the surrounding environment and community. Majority of the dust causing activities will take place during the construction period. Exposed surfaces, such as stockpiles and cleared

areas should be provided with a suitable cover as soon as possible or wetted down. Construction vehicles should maintain low speeds of 20-40km/h and must ensure that tarpaulins are used to cover any loads transported. Dust levels specified in the National Dust Control Regulations (GN 827 of November 2013) may not be exceeded. i.e. dust fall in residential areas may not exceed 600mg/m2/day, measured using reference method ASTM D1739.
A Complaints Register must be available at the site office for inspection by the ECO of dust complaints that may have been received.

8.14 Heritage Resources

Should any heritage resources, including evidence of graves and human burials, archaeological material and paleontological material be discovered during the execution of the activities, all works must be stopped immediately and Heritage Western Cape must be notified without delay.

Heritage Western Cape:
T: 021 483 5059
E: hwc.hwc@westerncape.gov.za

8.15 Site closure and rehabilitation

Upon completion of the construction phase, and after each maintenance event, all disturbed areas, including the working area (disturbance corridor), temporary access road, and all areas utilised for the site camp and associated site camp facilities will require rehabilitation as follows:

- On completion of the construction operations, the site camp area must be cleared of all site camp facilities, ablution facilities, fencing, signage, waste and surplus material.
- All areas within the working area and site camp that have become devoid of vegetation or where soils have been compacted due to construction activities must be scarified or ripped to improve filtration and reduce run-off.
- All demarcation fencing, including all droppers, wires, netting and barrier tape must be removed from site and taken to an appropriate site for re-use or disposal.
- Surfaces are to be checked for waste products from activities such as concreting or asphalting and cleared in a manner approved by the ECO. Any soil contaminated with hydrocarbons (oil, fuel, etc) or other hazardous substance must be collected and disposed of as hazardous waste to a licenced disposal facility.
- All construction waste is to be removed from the site and disposed of at an appropriate facility. Burying or burning of waste or rubble on site is strictly prohibited.
- Topsoil that was removed and stockpiled before construction, must be replaced by spreading it evenly over the areas from which it was removed. This topsoil (and the seedbank it contains) will facilitate the re-vegetation of the site.
- Disturbed areas, especially areas where excavations have taken place, must be shaped as appropriate (original topography must be restored where possible), and covered with a layer of stockpiled topsoil as soon as possible.
- Any topsoil, subsoil or other excavated material that cannot be utilised during site rehabilitation must be removed from the site and disposed of at an appropriate disposal site.
- The disturbed, newly rehabilitated surfaces (particularly steeper slopes and areas recently covered with topsoil) must be protected from wind & water erosion using mulch, brush packing or other appropriate erosion protection measures. Brush-packing/ mulching is done by covering the exposed surface with organic plant material such as branches, plant cuttings and leafy material. Ideally the vegetation removed from site at the start of the construction must be utilised. Brush-packing/ mulching plays a valuable role in erosion control, while also promoting re-vegetation of

the site by retaining moisture in the soil, introducing seeds and/or trapping wind-blown seeds and providing organic material (compost) to promote new plant growth.

- Rehabilitate the buffer area with indigenous vegetation.
- Final landscaping and rehabilitation of the site must be done to the satisfaction of the ECO, and must adhere to all conditions/ requirements of the Environmental Authorisation.

9. Environmental Impact Management: Planning and Design Phase

No direct environmental impacts are associated with the planning and design phase. However, poor planning or inappropriate design decisions in this phase may result in environmental impacts arising during subsequent phases of the project.

Planning and design activities must therefore take into account the environmental constraints and opportunities identified during the Environmental Impact Assessment process, in order to avoid or minimise the potential future impacts of the development. Proper planning is also essential to ensure that adequate provision is made to implement the environmental requirements of this EMPr, and to ensure that the development is compliant with an additional conditions which may be included in the Environmental Authorisation.

The environmental management objectives (goals) during this phase are to:

- Appoint an Independent Environmental Control Officer.
- Complete the detailed design of the structures and detailed site layout plan.
- Update the EMPr (if necessary).

These environmental management objectives, as well as the management actions that must be implemented in order to achieve the desired objective and avoid/minimise potential impacts are discussed in more detail below.

9.1 OBJECTIVE 1: APPOINTMENT OF AN INDEPENDENT ENVIRONMENTAL CONTROL OFFICER

***Impact Management Objective:* To appoint a suitably qualified and experienced Environmental Control Officer.**		
Potential impact to avoid	Failure to appoint an ECO will result in non-compliance with the requirements of the EMPr.	
Impact Management Outcome	The requirements of the EMPr are implemented and monitored during all phases of the development, which will promote sound environmental management on site.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
• A suitably qualified and experienced Environmental Control Officer must be appointed before any activities commence on site. • The appointed ECO must adhere to the requirements stated in Chapter 15 and any other requirements specified in the Environmental Authorisation. • The appointed ECO must be advised of the construction start date, at least two weeks in advance, prior to the commencement of any construction activities on site, so that the ECO can perform a pre-commencement inspection, ensure any pre-construction conditions of the environmental authorization are completed, and plan for environmental awareness training of construction workers.	The Home Market NPC	During design phase

• A rehabilitation plan must be compiled with the assistance of a botanist.		
Performance Indicator	A qualified ECO is appointed prior to the commencement of any construction activities (including pre-construction set-up activities) on site.	

9.2 OBJECTIVE 2: DETAILED DESIGN AND SITE LAYOUT PLAN

***Impact Management Objective:* To compile a detailed design and site layout plan that adheres to the recommendations of the BAR Report and any additional conditions which may be included in the Environmental Authorisation.**		
Potential impact to avoid	Substantial deviation from the conceptual layout plan may result in: • Non-compliance with the Environmental Authorisation during construction. • Triggering of additional listed activities not authorised in the Environmental Authorisation. • An increase in the severity of the impacts identified and assessed in the BAR or may result in new impacts not previously assessed and not provided for in the EMPr, resulting in environmental degradation. • Visual disturbance. • Damage to the aquatic ecosystem.	
Impact Management Outcome	Development is compliant with recommendations of the BAR and the EMPr.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
General • The final detailed design & layout must adhere to the conceptual layout assessed in the BAR process. • The final detailed design & layout must adhere to any conditions of the Environmental Authorisation (EA). • If the final detailed design differs significantly from that assessed during the BAR, the revised layout must be assessed by an Environmental Consultant and the received EA must be amended by the Competent Authority before proceeding. • Interested & Affected Parties may need to be provided with an opportunity to comment on any proposed amendment to the EA depending on the significance of the changes. • It is recommended that the stormwater management plan be developed with appropriate ecological input and be developed based on Sustainable Drainage Systems (SUDS). • Attention must be given to the 10m buffer, construction work and the site camp must be planned in accordance with measures relative to the buffer area (stockpiles, ablutions, etc.) • Provide provisions in the detailed design of the layout to accommodate protected trees.	The Home Market NPC / Consulting Engineer	During design phase

Performance Indicator	Detailed designs and site layout plans that adhere to the conditions of the EA and EMPr are finalised prior to the commencement of construction.

10. Environmental Impact Management: Pre-construction Phase

Proper set-up during the pre-construction phase can set the foundation for good environmental management during the active construction phase to follow, and can avoid potential impacts from arising at a later date.

The Impact Management Objectives for this phase of the project relate to:

- Identify and Demarcation of no-go areas and working areas.
- Establishment of site camp and associated site facilities.
- Pre-construction ECO visit.

10.1 OBJECTIVE 1: IDENTIFY & DEMARCATE NO-GO AND WORKING AREAS

Impact Management Objective: ***Identify and demarcate no-go areas, working areas and site facilities.***		
Potential impact to avoid	• No-Go areas include aquatic habitats and public open space to remain natural. • Insensitive location of working areas and site facilities may result in environmental impacts during the construction phase. • Failure to accurately demarcate working areas may result in an increased disturbance footprint. • Failure to demarcate no-go areas may result in disturbances to these areas during construction.	
Impact Management Outcome	Future construction activities will be restricted to within the designated areas & environmentally sensitive areas (no-go areas) will be protected from disturbance.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
• The environmentally sensitive areas must be identified and be designated as no-go areas. • Demarcation of working area and no-go areas must be done in accordance with Section 8.2 of this EMPr. • Site camp facilities must be situated as far away from the No-Go areas as possible.	Contractor	Pre-construction phase (prior to arrival of construction equipment, machinery, or workers on site)
Performance Indicator	No-go areas, working areas and areas for site camp facilities have been identified and appropriately demarcated to the satisfaction of the ECO, before construction activities commences on site.	

10.2 OBJECTIVE 2: ESTABLISH ENVIRONMENTALLY SENSITIVE SITE CAMP & SITE FACILITES

Impact Management Objective: ***To set up and equip the site camp and associated site facilities in a manner that will promote good environmental management.***			
Potential impact to avoid	• An inadequate location for the site camp facilities may result in impacts to sensitive resources. • Failure to properly demarcate and set up site facilities may result in disorganised construction activities and unnecessary disturbance to the site. • Failure to provide the necessary site facilities and/or failure to equip these facilities with the necessary equipment/materials may impede good environmental management & compromise ability to respond to emergencies.		
Impact Management Outcome	Site camp facilities do not impact significantly on environment. The equipment required to implement the provisions of the EMPr are provided on site.		
IMPACT MANAGEMENT ACTIONS			
Mitigation measure		Responsible party	Time period
• The site camp and associated site facilities must be set-up and managed in accordance with the general environmental management measures specified in Chapter 8 of this EMPr. • The site camp must be strategically set up, away from freshwater resources, in a manner that will promote good environmental management during construction/ demolition, and to respond to potential emergencies (including fires, spillage of hazardous substances etc.) that may arise. • The site camp, storage facilities, stockpiles, waste bins, and any other temporary structures on site should be located in such a way that they will present as little visual impact to surrounding residents and road users as possible. • Frequent stormwater outlets must be designed to prevent erosion at discharge points. • It is recommended that the stormwater management plan be developed with appropriate ecological input and be developed based on Sustainable Drainage Systems (SUDS).		Contractor / The Home Market NPC	Pre-construction phase (prior to start of construction activities)
Performance Indicator	Appropriate, well organised and properly equipped site facilities are available on site prior to commencement of construction activities. The location and set up of the facilities does not impact on the natural resources.		

10.3 OBJECTIVE 3: PRE-CONSTRUCTION ECO INSPECTION

It is essential that the appointed ECO be advised of the intended construction start date before construction activities commence on site, in order for the ECO to conduct an initial site inspection to assess the pre-commencement condition of the site. The ECO can also advise on the appropriate siting and demarcation of

the site facilities, and the identification and demarcation of the no-go areas. The ECO may also conduct the first round of environmental awareness training at this stage, if the construction workers are present on site.

Impact Management Objective: ***Environmental Control Officer to conduct an inspection prior to the commencement of construction activities on site.***			
Potential impact to avoid	• Failure to appoint ECO or to notify ECO of commencement prior to commencement may result in non-compliance with the EA. • If a pre-commencement ECO inspection is not performed, the Construction Contractor may be held liable for environmental degradation that took place prior to the Contractor commencing work on site.		
Impact Management Outcome	• Good environmental management is promoted and enforced by the ECO during the full pre-construction and construction phases. • Site facilities are appropriately located on site. • Construction workers receive environmental awareness training before commencing work on site.		
IMPACT MANAGEMENT ACTIONS			
Mitigation measure		Responsible party	Time period
• The appointed ECO must be advised of the construction start date, before any activities commence on site so that the ECO can perform a pre-commencement inspection and plan for environmental awareness training of construction workers.		Contractor	Start of construction phase
Performance Indicator	A pre-commencement site inspection is conducted by the appointed ECO before construction activities commence on site.		

11. Environmental Impact Management: Construction Phase

A number of potential environmental impacts may arise during the construction phase of the development. These impacts have been identified and assessed during the Environmental Impact Assessment process. Environmental Management objectives and actions that will prevent the identified potential impacts from arising – or where avoidance is not possible, that will minimise and mitigate the impacts – are provided in this section.

The environmental management actions and mitigation measures prescribed in this section must be implemented throughout the construction phase, and must be implemented in conjunction with the general management measures specified in Chapter 8 of this EMPr, as well as any other conditions which may be stated in the Environmental Authorisation. The Environmental Control Officer must monitor and enforce the implementation of the relevant environmental management measures, and may provide guidance on the implementation of these environmental management measures as and when required.

The environmental management objectives (goals) for the Construction phase are:

- Reduce sedimentation and erosion within the aquatic habitat
- Prevent pollution of the aquatic habitat
- Avoid excessive disturbance/loss of aquatic vegetation and habitat
- Prevent flow modification
- Maintain sense of place (noise, dust and lifestyle)
- Traffic safety
- Prevent the loss of terrestrial vegetation / habitat
- Creation of multiple job opportunities & capital expenditure
- Reduce the visual impact

The environmental management actions that must be implemented in order to achieve the desired objectives and avoid/minimise potential impacts are discussed in more detail in the sections below.

11.1 OBJECTIVE 1: REDUCE SEDIMENTATION AND EROSION WITHIN THE AQUATIC HABITAT

***Impact Management Objective:* To prevent soil loss on site and prevent increased turbidity / sediment load in watercourses.**			
Potential impact(s) to avoid	Vegetation clearing and exposure of bare soils adjacent to the wetland habitat during construction will decrease the soil binding capacity and cohesion of the upslope soils and thus increase the risk of erosion and sedimentation downslope. The majority of the site has a gentle slope. However, the terrace slope at the wetland habitat is steeper which will increase velocity of runoff into the wetland. Coupled with poor stormwater management can lead to: • Erosion and burying of aquatic habitat depending on the sediment load of runoff. • The wetland ceasing to function. • Soil erosion from confined flows. • The formation of rills and gullies from increased concentrated runoff can also be expected. • The volume and velocity of runoff increases the particle carrying capacity of the water flowing over the surface.		
Impact Management Outcome	Aquatic and Stormwater systems are not impacted significantly as a result of soil erosion.		
IMPACT MANAGEMENT ACTIONS			
Mitigation measure		Responsible party	Time period
<u>General</u> • Establish buffer zone /and a no-go area around the wetland, identify or demarcate with a physical barrier and signage, ie: danger tape/fencing, extent of development footprint closest to the sensitive aquatic vegetation. • It is advised that an Environmental Control Officer visit the construction site before construction occurs within any of the watercourses and possibly during construction within the watercourses.		Contractor	Construction phase

• The working area and site camp must be clearly demarcated during the pre-construction phase. Land clearing and construction activities must be restricted to within the demarcated working area to prevent unnecessary disturbance, exposure or compacting of surrounding areas. • Any erosion runnels/ gulley's/ channels that form on site must be infilled with appropriate material, compacted, rehabilitated as needed and appropriate erosion control measures put in place to prevent recurrent erosion at that site. Rehabilitation of erosion channels should be ongoing during the construction phase and not left until the end of the construction period. • Construction must be avoided during rainy days, to prevent excessive turbidity. • Manual labour must be favoured over mechanical methods. Heavy machinery may only be used as a last resort if manual methods are not feasible or practical. • Construction work must be well-planned and well-managed so that construction work proceeds quickly and efficiently, thus minimising the duration of disturbance. • Silt fences or similar measures must be erected between the construction site and the aquatic buffer, to prevent sediment laden storm water from entering the watercourse. • All equipment and materials storage areas must (if practical, reasonable and feasible) be located at a minimum distance of 50m from the watercourse. The appointed ECO must be consulted in this regard. • Avoid stockpiling too close to the edge pf the terrace. <u>Cleared surfaces</u> • Soil surfaces must not be left open for lengthy periods to prevent erosion. • If site development does not occur soon after preparation of the site, a suitable cover crop to be established as a temporary measure. • Only the area required to accommodate construction activities within the working area should be cleared of surface covering. Unnecessary clearing/ disturbance of land and exposure of soil must be avoided. • Land clearing, earth moving and construction activities should not take place during heavy rains, or windy conditions. • Cleared areas and any other area susceptible to erosion should be provided with a suitable cover and stabilised as soon as possible via the implementation of appropriate erosion control measures. This may include use of cut-off drains, temporary/permanent drainage channels, brush-packing, mulching, planting or sodding, use of environmentally benign soil binders, use of geo-textile or other		

coverings. The appropriate measures should be selected by the contractor in consultation with the Engineer & ECO. <u>Vegetation</u> • No aquatic vegetation or surrounding natural vegetation should be disturbed unnecessarily. If any vegetation is intended for removal that has not been covered in this assessment, it must be brought to the attention of the responsible ECO to address. • Establish key personnel to clear alien vegetation in buffer zone, with an alien vegetation management plan, identifying alien and indigenous species. <u>Stockpiles</u> • Designated areas for stockpiling of raw materials must be identified before material is brought onto site. No stockpiling is to occur on or near slopes or water resources (must not be located within the buffer area). All stockpiling areas must be approved by the ECO before stockpiling occurs. • Erosion control measures including silt fences, low soil berms and/or shutter boards must be put in place around the stockpiles to limit sediment runoff from stockpiles. Alternatively, the exposed slopes must drain into small temporary stormwater and silt traps/ponds. • Stockpiles of topsoil & spoil material must be protected from wind & water erosion. • Stockpiles of earth material may not be located within any storm-water drainage pathways and must be outside of the reach of potential flood waters. Stockpiles cannot be within the buffer area. • Stockpiles should not be excessively high, particularly stockpiles sediment, these should not exceed 2m's in height. • Stockpiles must not be located within 50 metres of the edge of the wetland. <u>Stormwater control</u> • The SuDS Stormwater management and drainage system should inform the stormwater design of developed areas. • The Storm Water Management Plan should adhere to the principles of sound storm water management. The storm water management system must be implemented on site and must be properly maintained. • Clean and contaminated storm water must be kept separate. Contaminated run-off from the construction site must be prevented from flowing into the streams. • Berms or similar measures must be implemented to slow down the speed of storm water flows into the watercourse.		

• Erosion control measures including silt fences, low soil berms and/or shutter boards must be put in place around the stockpiles to limit sediment runoff from stockpiles. Alternatively, the exposed slopes must drain into small temporary stormwater and silt traps/ponds.		
Performance Indicator	The water courses are not significantly impacted as a result of soil erosion.	

11.2 OBJECTIVE 2: PREVENT POLLUTION OF THE AQUATIC HABITAT.

***Impact Management Objective:* To prevent environmental pollution and contamination of soil and water resources**		
Potential impact(s) to avoid	• Fuel, oil, lubricant or other pollutants leaking from vehicles/ machinery and contaminate soil, surface water and/or ground water. • Leaking chemical toilets. • Contaminated run-off from site or site camp facilities entering soil or water resources. • Failure of on-site wastewater infrastructure leading to the pollution of watercourses • Waste (solid or liquid) from the construction site blown or washed into surrounding environment. • Alteration of aquatic parameters (pH, turbidity and nutrient levels) • Contamination of soil or water impacting the surrounding and downstream land/water users, biota and livestock.	
Impact Management Outcome	The environment (including soil, surface water and groundwater) is not contaminated.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
• It is recommended that the Stormwater Management Plan be developed with appropriate ecological input and be developed based on Sustainable Drainage Systems (SUDS). <u>General Pollution Management</u> • No pollution of surface water or ground water resources may occur due to any activity on the site. • No storm water runoff from any premises containing waste, or water containing waste emanating from construction activities may be discharged into the environment. Polluted stormwater must be contained on the site. • All equipment and materials storage areas must (if practical, reasonable and feasible) be located at a minimum distance of 50m from the watercourse. The appointed ECO must be consulted in this regard. • Cement batching / mixing may not take place directly on the soil surface, it must be done on an impervious lining that will prevent cement particles from contaminating the soil. • The proposed buffer zone around the watercourse needs to be strictly adhered to.	Contractor	Construction phase

• Establish buffer zone, identify or demarcate with a physical barrier, ie: danger tape/fencing, extent of development footprint closest to the sensitive aquatic vegetation. • Construction personnel, equipment and materials must be limited to the minimum practical working footprint. • Appropriate stormwater measures must be implemented. <u>General Waste Management</u> • Dedicated waste bins or skips must be provided on site and kept in a demarcated area on an impermeable surface. • Separate waste bins/skips must be provided for recyclable waste, general waste and hazardous waste. Recovered builder's rubble & green waste may be stockpiled on the ground within the site camp, or in separate skips until removal. • Waste must be placed in the appropriate waste bins/skips/ stockpiles. • Hazardous waste bins must be kept on an impermeable bunded surface capable of holding at least 110% of the volume of the bins. • Skips/ bins must be provided with secure lids or covering that will prevent scavenging and windblown waste or dust. • Waste bins/skips must be regularly emptied and must not be allowed to overflow. • Ensure that waste receptacles are weighted down, have weighted covers, are labelled appropriately, and are cleaned by a reputable waste disposal company. Obtain a disposal/cleaning slip for this waste, to file in the Environmental File. • Construction workers must be instructed not to litter and to place all waste in the appropriate waste bins provided on site. • The Contractor must ensure that all workers on site are familiar with the correct waste disposal procedures to be followed. • Waste generated on site must be classified and managed in accordance with the National Environmental Management: Waste Act – Waste Classification and Management Regulations (GN No. R. 634 of August 2013). • Disposal of waste to landfill must be undertaken in accordance with the National Environmental Management: Waste Act – National Norms and Standard for the Assessment of Waste for Landfill Disposal (GN No. R. 635 of August 2013). • All waste, hazardous as well as general, resulting from the proposed activities must be disposed of appropriately at a licensed Waste Disposal Facility (WDF).		

Pollution Management -Hydrocarbons (oil, fuel etc.) • Vehicles and machinery must be in good working order and must be regularly inspected for leaks. • If a vehicle or machinery is leaking pollutants it must, as soon as possible, be taken to an appropriate location for repair. The ECO has the authority to request that any vehicle or piece of equipment that is contaminating the environment be removed from the site until it has been satisfactorily repaired. • Repairs to vehicles/ machinery may take place on site, within a designated maintenance area at the site camp. Drip trays, tarpaulin or other impermeable layer must be laid down prior to undertaking repairs. • Refuelling of vehicles/ machinery may only take place at the site camp or vehicle maintenance yard. Where refuelling must occur, drip trays should be utilised to catch potential spills/ drips. • Drip trays must be utilised during decanting of hazardous substances and when refilling chemical/ fuel storage tanks. • Drip trays must be placed under generators (if used on site) water pumps and any other machinery on site that utilises fuel/ lubricant, or where there is risk of leakage/spillage. • Where feasible, fuel tanks should be elevated so that leaks are easily detected. • A spill kit to neutralise/treat spills of fuel/ oil/ lubricants must be available on site, and workers must be educated on how to utilise the spill kit. • Soil contaminated by hazardous substances must be excavated and disposed of as hazardous waste. Pollution Management – Ablution facilities • Chemical toilets must be kept at the site camp, on a level surface and secured from blowing over. • Toilets must be located well outside of any storm water drainage lines, and may not be linked to the storm water drainage system in any way. • Chemical toilets must be regularly emptied, and the waste disposed of at an appropriate waste water disposal/ treatment site. Care must be taken to prevent spillages when moving or servicing chemical toilets. • Toilet facilities must be supplied by the Contractor for the workers at a ratio of at least 1 toilet per 30 workers in areas approved by the ECO, separate toilets must be supplied as per gender. • Ablutions should be further a fair distance from the aquatic buffer area. • Temporary/ portable toilets must be secured to the ground to prevent them toppling due to wind or any other cause, to the satisfaction of the ECO.		

• Discharge into the environment and burial of waste is strictly prohibited. The Contractor must ensure that no spillage occurs when the toilets are cleaned or emptied and that the contents are removed from the site, disposal/cleaning slips must be filed in the Environmental File, to ensure that these are available for review. • Toilets shall be emptied before the Contractors' holidays or any other temporary site closure. • Ablution facilities provided for construction workers must be placed away from the terrace edge. • Ablutions should be further than 10m from aquatic buffer area. <u>Pollution Management – Hazardous Substances</u> • Any hazardous substances (materials, fuels, other chemicals etc.) that may be required on site must be stored according to the manufacturers' product-storage requirements, which may include a covered, waterproof bunded housing structure. • 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 should additionally include information on ecological impacts and measures to minimise negative environmental impacts during accidental releases. • Hazardous storage and refuelling areas must be bunded with an impermeable liner to protect groundwater quality. The bunding shall be capable of handling a volume 150% the volume of the container storing the substance. • Adequate hazmat spillage cleaning kits must be readily available in the event of oil and hydraulic spills. <u>Cement Batching</u> • Cement batching must take place on an impermeable surface large enough to retain any slurry or cement water run-off. If necessary, plastic/ bidem lined detention ponds (or similar) should be constructed to catch the run-off from batching areas. Once the water content of the cement water/ slurry has evaporated the dried cement should be scraped out of the detention pond and disposed of at an appropriate disposal facility authorised to deal with such waste • Cement batching should take place on already transformed areas within the footprint of the facility. • Unused cement bags must be stored in such a way that they will be protected from rain. Empty cement bags must not be left lying on the ground and must be disposed of in the appropriate waste bin. • Washing of excess cement/concrete into the ground is not allowed. All excess concrete/ cement must be removed from site and disposed of at an appropriate location.		

• Construction works must preferably take place in drier months of the year when runoff from the construction site will be minimal, to limit potential dispersal of pollutants.		
Performance Indicator	The site and aquatic system remains free of any pollutants (in accordance with any necessary tests) and any spills that occur are responsibly managed and recorded on file during monitoring.	

11.3 OBJECTIVE 3: AVOID DISTURBANCE/LOSS OF AQUATIC VEGETATION AND HABITAT.

Impact Management Objective: ***To ensure that the aquatic ecosystem is not significantly impacted on.***		
Potential impact(s) to avoid	• Physical disturbance to aquatic ecosystems during the construction phase. • Increase of sedimentation/turbidity in the watercourses, which may impact biota and instream habitats. • Establishment of alien invasive species. • Encroachment within the aquatic buffer. • Reduction in aquatic biodiversity. • Soil erosion within the aquatic ecosystem. • Soil compaction within the aquatic ecosystem.	
Impact Management Outcome	Construction activities do not significantly impact on the aquatic ecosystem.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
General • The 10m Buffer area around the watercourse is to be adhered to at all times and no construction activities to occur within this buffer. • Erosion control measures including silt fences, low soil berms and/or shutter boards must be put in place around the stockpiles to limit sediment runoff from stockpiles. Alternatively, the exposed slopes must drain into small temporary stormwater and silt traps/ponds. • All erosion protection measures (e.g. Reno-mattresses) must be established to reflect the natural slope of the surface and located at the natural ground level. • All equipment and materials storage areas must (if practical, reasonable and feasible) be located at a minimum distance of 50m from the buffer zone. The appointed ECO must be consulted in this regard. • Construction personnel, equipment and materials must be limited to the minimal practical working area. • Construction must be avoided during rainy days, to prevent excessive turbidity.	Contractor	Construction phase

• Construction work must be well-planned and well-managed so that construction work proceeds quickly and efficiently, thus minimising the duration of disturbance. <u>Vegetation</u> • No aquatic vegetation or surrounding natural vegetation should be disturbed unnecessarily. If any vegetation is intended for removal that has not been covered in this assessment, it must be brought to the attention of the responsible ECO to address. • Removal of alien invasive species within the buffer area is permitted to control the spread of the alien invasive species, however this activity must be restricted to a few personnel, and monitored. <u>Stormwater control</u> • Stockpiles must not be located within the buffer area. • The stormwater flows must enter the buffer area in a diffuse flow pattern without pollutants. • It is recommended that the stormwater management plan be developed with appropriate ecological input and be developed based on Sustainable Drainage Systems (SUDS). • Frequent stormwater outlets must be designed to prevent erosion at discharge points. • Stormwater exit points must include a best management practice approach to trap any additional suspended solids and pollutants originating from the proposed development. • The stormwater flows must enter the aquatic areas in a diffuse flow pattern without pollutants. • Contaminated run-off from the construction site must be prevented from flowing into the aquatic system. Please refer to the mitigation measures required to prevent the impact of "pollution and contamination". The same mitigation measures apply to reduce the risk of pollution and contamination of the watercourse(s). • Berms or similar measures must be implemented to slow down the speed of storm water flows into the watercourse. • All equipment and materials storage areas must (if practical, reasonable and feasible) be located at a minimum distance of 50m from the watercourse. The appointed ECO must be consulted in this regard.		
Performance Indicator	Aquatic ecosystem is free of alien invasive species and the ecosystem is in a healthy state.	

11.4 OBJECTIVE 4: PREVENT FLOW MODIFICATION.

<u>Impact Management Objective:</u> Maintain the hydrological integrity of the water resource.	
Potential impact(s) to avoid	• Increased surface runoff volume and velocity • Reduced infiltration rates

	• Potential rill/gully erosion. • Altered water inputs from upslope disturbances. • Modification of water distribution and retention patterns will ultimately affect the hydrological integrity of water resources
Impact Management Outcome	The hydrological integrity is maintained.

IMPACT MANAGEMENT ACTIONS

Mitigation measure	Responsible party	Time period
• Establishment of a buffer area /and a no-go area around the wetland where no construction activities are allowed. • Construction personnel, equipment and materials must be limited to the minimal practical working area. • Stormwater control measures must be implemented for the duration of the project. • Silt fence must be erected between the construction activities and the watercourse to prevent sediments-laden storm water from entering the watercourse. • Berms or similar measures must be implemented to slow down the speed of storm water flows into the watercourse. • All equipment and materials storage areas must (if practical, reasonable and feasible) be located at a minimum distance of 50m from the watercourse. The appointed ECO must be consulted in this regard. • Utilize impermeable surfaces, where drainage is not directed to the wetland/watercourse system, for machinery/vehicle maintenance. It is preferable to relocate this off site. • Designate an area for storage of materials, particularly fuels/hazardous waste, demarcate, erect signage, and bund any container containing these materials. Ensure there is a cover. • Ensure that hazardous waste bins are weighted down, have weighted covers, are labelled appropriately, and are cleaned by a reputable waste disposal company. Obtain a disposal/cleaning slip for this waste, to file in the Environmental File. • Soil contaminated by spilled oil/ fuel/ lubricant must be excavated and disposed of in the hazardous waste bin. • Cement mixing must be conducted on impermeable surfaces. Utilize shutter boards/tarp, that are appropriately bunded. • Avoid stockpiling too close to the edge of the terrace. • Ensure stockpiles are bunded, utilize sandbags.	Contractor	Construction phase

Performance Indicator	• No erosion channels • Hydrological integrity of the water resource remains intact

11.5 OBJECTIVE 5: MAINTAIN SENSE OF PLACE (NOISE, DUST AND LIFESTYLE)

***Impact Management Objective:* To maintain the sense of place associated with the town of Wittedrift.**		
Potential impact(s) to avoid	• Avoid unnecessary noise generated during the undertaking of construction activities, which may present a nuisance to surrounding community and negatively impact the Sense of place. • Dust may cause a nuisance to the surrounding residents. • Dust may smother surrounding vegetation. • Decreased visibility for labourers and operators. • Unsettled community.	
Impact Management Outcome	The construction of the proposed development does not alter the sense of place	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
Noise • A noise complaints register should be opened. • Strict operating hours for heavy vehicles and construction activities should be implemented so as to avoid times of day when noise impacts are more likely to affect adjacent landowners, ie: construction activities, including the movement of vehicle should be limited to between 07h30 and 17h30. • No construction related activities should be permitted over weekends. • Work on site must be well-planned and should proceed efficiently so as to limit the duration of the disturbance. • Vehicles and equipment must be kept in good working condition. If deemed necessary, machinery and equipment should be fitted with mufflers/ exhaust silencers. No unnecessary disturbances should be allowed to emanate from the construction site. • Due to the location of the proposed development site to residents, noise levels must be kept to a minimum at all times. If excessive noise is expected on the boundary of the residential erven bordering the site, the residents must be informed in advance of when the high noise levels will occur and for how long they will occur. • Workers should be educated on how to control noise-generating activities that have the potential to become disturbances, particularly over an extended period of time.	Contractor	Construction phase

• Noise levels must comply with the relevant health & safety regulations and SANS codes and should be monitored by the Health & Safety Officer as necessary and appropriate. • Affected parties must be informed of the excessive noise factors. <u>Dust</u> • Land clearing and earthmoving activities should not be undertaken during strong winds, where possible. • Cleared areas should be provided with a suitable cover as soon as possible, and not left exposed for extended periods of time. • Stockpiles of topsoil, spoil material and other material that may generate dust must be protected from wind erosion (e.g. covered with netting, tarpaulin or other appropriate measures. Note that topsoil should not be covered with tarpaulin as this may kill the seedbank). • The location of stockpiles must take into account the prevailing wind direction and should be situated so as to have the least possible dust impact to surrounding residents, road-users and other land-users. • Speed limits must be enforced in all areas, including public roads and private property to limit the levels of dust pollution. • The speed limit should be set at 20-40km/h. • Dust must be suppressed on access roads and the construction site during dry periods by the regular application of water or a biodegradable soil stabilisation agent. Water used for this purpose must be used in quantities that will not result in the generation of excessive run off. • Dust suppression measures such as the wetting down of sand heaps as well as exposed areas around the site must be implemented especially on windy days. • The use of straw worked into the sandy areas may also help and the ECO must advise when this is necessary. • If dust appears to be a continuous problem the option of using shade cloth to cover open areas may be necessary or the erecting of shade netting above the fenced off are may need to be explored. • All vehicles transporting sand need to have tarpaulins covering their loads which will assist in any windblown sand occurring off the trucks. • Work on site must be well-planned and should proceed efficiently so as to minimise the handling of dust generating material. • Material loads should be properly covered during transportation. • Wetting of soils must be considered, if dust dispersal is excessive.		

• Dust levels specified in the National Dust Control Regulations (GN 827 of November 2013) may not be exceeded. i.e. dust fall in residential areas may not exceed 600mg/m2/day, measured using reference method ASTM D1739; • A Complaints Register must be available at the site office for inspection by the ECO of dust complaints that may have been received.		
Performance Indicator	Noise and dust levels on site remain within acceptable standards. No complaints are received.	

11.6 OBJECTIVE 6: TRAFFIC SAFETY.

***Impact Management Objective:* To ensure continued community on the roads during construction.**		
Potential impact(s) to avoid	• The temporary disturbance to traffic in the area. • Reduced safety on surrounding roads. • Damage to the condition of the of the existing road network. • An increase in crime.	
Impact Management Outcome	The functioning of the surrounding road network remains efficient and the state of the infrastructure isn't hampered.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
• All construction vehicles must adhere to traffic laws when travelling to and from the site. • All drivers and machinery operators must be sensitised to the fact that they are working in an area with a potentially high volume of foot and vehicle traffic and must exercise due caution when entering/ exiting the site. • Appropriate signage should be erected to warn other road users about the presence of construction vehicles, particularly at the point where construction vehicles enter/ exit the site from the N2. • Speed of construction vehicles and other heavy vehicles must be strictly controlled to avoid dangerous conditions for other road users. • Where possible, heavy machinery should be parked within a secure demarcated area within the footprint of the site instead of moving the machinery to and from the site each day. • Construction vehicles must adhere to the load carrying capacity of road surfaces and adhere to all other prescriptive regulations regarding the use of public roads by construction vehicles. • The Contractor must ensure that any large or abnormal loads (including hazardous materials) that must be transported to/ from the site are routed appropriately, and that appropriate safety precautions are taken during transport to prevent road accidents.	Contractor	Construction phase

• Where possible, construction traffic that may obstruct traffic flow on the surrounding roads should be scheduled for outside of peak traffic times. • If needed, appropriate traffic management measures and/ or points men (traffic marshals) should be utilized to assist vehicles entering/ exiting the site, particularly where vehicles must cross the path of oncoming traffic. • Where possible, heavy machinery should be parked within a secure demarcated area within the footprint of the site instead of moving the machinery to and from the site each day.		
Performance Indicator	• The surrounding road networks infrastructure remains in its current state. • Limited congestion and traffic.	

11.7 OBJECTIVE 7: PREVENT THE LOSS OF TERRESTRIAL VEGETATION / HABITAT.

Impact Management Objective: ***Reduce the impacts caused by land disturbance and conserve the Indigenous Vegetation on site.***		
Potential impact(s) to avoid	• Permanent Loss of Indigenous Vegetation caused by construction activities. • Unsuccessful reinstatement of topsoil • Increased susceptibility to erosion caused by construction activities. • Negligence of indigenous vegetation or topsoil that require transplanting.	
Impact Management Outcome	The loss of indigenous vegetation on site is minimised and results in no erosion. Any species of conservation concern are conserved.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
• Strict adherence to buffer areas to preserve aquatic vegetation. • Barricade protected trees during construction. • Great care will be taken if cement is to be mixed on site, especially in the proximity of vegetation and watercourses. It will be mixed on thick plastic sheets or in large buckets and not allowed to spill onto bare ground. Any spillage will be cleaned up immediately. Cement water will also be contained in the above manner and allowed to dry out and then removed from site. Cement water, which is highly alkaline, poses a definite threat to the soil and seed banks. • Blanket clearing of vegetation must be limited to the approved development footprint, and the area to be cleared must be demarcated before any clearing and grubbing commences. • No clearing outside of development and infrastructure footprint area to take place. • Rescued plants should be replanted into a nearby disturbed area of similar habitat or for open space rehabilitation.	Contractor	Construction phase

• Ensure the open space is kept clear of alien plant species through the adoption of an Alien Management plan. • Trees located in areas where sidewalks, open areas or gardens are proposed are to be barricaded and not cleared. • An Environmental Control Officer will oversee compliance with all the prescribed environmental requirements and mitigation measures listed here and will be on site regularly. • Final siting of footprint should be undertaken in consultation with respective specialists, including a botanist. • Open Space to be incorporated in final plan to include ecological corridors and riparian as described in the report. • Removed topsoil should be used in rehabilitation of transformed areas that are within the open space areas.		
Performance Indicator	• Construction team limit disturbance to the indigenous vegetation as far as possible for the duration of the construction phase. • Indigenous vegetation transplanted successfully and remains in a healthy state. • There is no evidence of erosion.	

11.8 OBJECTIVE 8: CREATION OF MULTIPLE JOB OPPORTUNITIES AND CAPITAL EXPENDITURE.

***Impact Management Objective:* To create employment opportunities with potential for skills transfer, for members of the local community.**		
Potential impact(s) to be promoted.	• A number of job opportunities will be created during the construction phase of the development. • There transfer skills from more experienced workers to less experienced workers. • Increase in business for local businesses within the construction industry.	
Impact Management Outcome	The local community benefits from the employment opportunities created during the construction phase.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
• The Home Market NPC should establish a database of local construction companies in the area, specifically SMME's owned and run by HDI's and local individuals, prior to the commencement of the tender process for the development. These companies should be notified of the tender process and invited to bid for project related work. • The Home Market NPC in consultation with the appointed contractor/s should seek to ensure that a percentage of the labour required for the construction phase is sourced from local area in order to maximize opportunities for members from the local HD communities.	The Home Market NPC / Contractor	Construction phase

• Ensure specialist reports and input are available to the public and can be referenced/reviewed for future developments in the surrounding area. • The developer in consultation with the appointed contractor/s will look to employ a percentage of the labour required for the construction phase from local area in order to maximize opportunities for members from the local HD communities.		
Performance Indicator	The majority of the construction team is from the local community, with preference given to historically disadvantaged individuals. Skills transfer from experienced to less experienced workers is actively encouraged on site.	

11.9 OBJECTIVE 9: VISUAL IMPACT MANAGEMENT.

Impact Management Objective: ***To prevent the site from presenting an unnecessary visual impact to the surrounding public.***		
Potential impact(s) to avoid	• Temporary loss of the sense of place.	
Impact Management Outcome	The site does not present a significant visual impact and the sense of place is maintained during the construction period.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
• Consult with the ECO when determining the appropriate site for the site camp. • The site camp must be kept neat and tidy and free of litter at all times. • Waste must be managed according to this EMPr and the mitigation measures listed above in terms of waste management. Good housekeeping practices on site must be maintained to ensure the site is kept neat and tidy. • The site camp, storage facilities, stockpiles, waste bins, and any other temporary structures on site should be located in such a way that they will present as little visual impact to surrounding residents and road users as possible. • Work on site must be well-planned and well-managed so that work proceeds quickly and efficiently, thus minimizing the disturbance time. • The site camp, storage facilities, stockpiles, waste bins, elevated tanks and any other temporary structures on site should be located in such a way that they will present as little visual impact to surrounding residents and road users as possible. • The site camp may require visual screening via shade cloth or other suitable material. • Special attention should be given to the screening of highly reflective material. • Use of lighting (if required) should take into account surrounding residents and land users and should present little or no nuisance. Downward facing, spill-off type lighting is recommended. • Construction vehicles must enter and leave the site during working hours.	Contractor	Construction phase

• Working areas, storage facilities, stockpiles, waste bins, elevated tanks and any other temporary structures on site should be located in such a way that they will present as little visual impact to surrounding residents and road users as possible. • Ensure indigenous vegetation has been sourced, if not moved to site, to be established as soon as construction activity has concluded, and re-grassing of natural surfaces, ie: grassed road reserves, pathways, etc, commence as soon as possible. • Alien vegetation monitoring and clearance must be implemented daily.		
Performance Indicator	• Good "housekeeping" is evident on site. • The site does not pose a visual impact to surrounding community.	

12. Environmental Impact Management: Post Construction Rehabilitation Phase & Operational Phase

After all construction activities have ceased, the sites must be cleared of all construction related equipment, materials, facilities and waste. In addition, all disturbed surfaces – including disturbed areas around the structures and all areas utilised for site facilities – must be stabilised, rehabilitated and provided with a suitable cover. All temporary access roads constructed must be rehabilitated and access must be restricted from the public.

The environmental management objectives (goals) for this phase are:

- Rehabilitate & stabilise disturbed areas and ensure environmentally sensitive closure of the construction sites.
- Reduce loss of aquatic habitat.
- Reduce visual impact.
- Reduce traffic impact.
- Provision of affordable housing.
- Creation of Business and Employment Opportunities.
- Local economic revenue.
- Maintain sense of place.

12.1 OBJECTIVE 1: REHABILITATE & STABILISE DISTURBED AREAS

Impact Management Objective: ***To rehabilitate all areas disturbed by construction activities in an environmentally sensitive manner.***		
Potential impact(s) to avoid	• Failure to remove all construction related waste and materials may result in environmental pollution. • Failure to remove all construction related equipment, machinery and site facilities may pose an impact to the natural environment specifically the watercourses. • Failure to stabilise disturbed surfaces may result in soil erosion and increased storm water run-off, which may limit successful revegetation of the site.	
Impact Management Outcome	• The site is neat and tidy, all exposed surfaces are suitably covered/ stabilised. • There is no construction-related waste or pollution remaining on site.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
• On completion of the construction operations, the site camp area must be cleared of all site camp facilities, ablution facilities, fencing, signage, waste and surplus material. • A rehabilitation plan must be compiled with the assistance of a botanist. • Surfaces are to be checked for waste products from activities such as concreting or asphalting and cleared in a manner approved by the ECO.	Contractor	Construction phase

• Any contaminated soil must be collected and disposed of as hazardous waste. • All construction waste, litter and rubble are to be removed from the site and re-used elsewhere, or recycled/disposed of at an appropriate facility. • Burying or burning of waste or rubble on site is prohibited. • All areas within the working area and site camp that have become devoid of vegetation or where soils have been compacted due to construction activities should be scarified or ripped. • Topsoil removed during the establishment of the site camp and the working area must be spread evenly over the entire site camp area and all other disturbed/ exposed areas after those areas have been ripped, scarified, shaped and contoured (as required). • Where necessary seeding and planting of vegetation can take place after the replacement of the topsoil. Hardy, drought tolerant, non-invasive plant species must be selected. If needed, a layer of mulch can be applied to the newly shaped/ landscaped and topsoiled areas. The mulch will serve to limit erosion and will promote the re-vegetation of the site by retaining moisture in the soil and providing organic material (compost) for new plant growth. • All exposed soils and recently topsoiled areas are to be re-vegetated or stabilised to the satisfaction of the ECO, to protect these areas from wind and water erosion. No areas are to be left exposed to erosive forces. Erosion protection measures that can be applied include mulching (described above), the placement of geotextile, onion bags filled with wood chips, brush-packing or other similar measures. • Any topsoil, subsoil or other excavated material that cannot be utilised during site rehabilitation must be removed from the site and reused elsewhere on the property or disposed of at an appropriate disposal site. • Disturbed soils must be revegetated with the local indigenous vegetation such as that which occurs at the site, or provided with other suitable cover. • Erosion features that have developed due to construction within the aquatic habitat due to the project are required to be stabilised. • It is recommended that follow-up alien clearing be conducted 6 months after construction is complete and thereafter annually for 3 years (or longer is alien recruitment is still evident on site).		
Performance Indicator	• All construction-related materials, equipment, facilities, waste and contaminated soils have been removed from the site. • Compacted soils have been scarified/ ripped and stabilised. • All disturbed/exposed surfaces have been provided with a suitable covering and/or stabilised.	

	• No alien vegetation is evident on site.

12.2 OBJECTIVE 2: REDUCE LOSS OF AQUATIC HABITAT

***Impact Management Objective:* Reduce loss of Aquatic Habitat**		
Potential impact(s) to avoid	• Loss of aquatic habitat within the watercourse. • Establishment of alien invasive species within the riparian zone. • Erosion within the riparian habitat	
Impact Management Outcome	• Minimal loss of Aquatic Habitat and Associated Biota	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
• Engage with the community to explain the reasons why the buffer and the water resources are protected and what human activities are allowed. • Placement of signage near the boundary of the buffer zone should also be considered to help mark the boundary and educate the community about the purpose and value of protecting buffer zones. • Information can include a description and visual of alien invasive plant species. • Aquatic habitat area must be maintained through alien invasive plant species removal • The stormwater management infrastructure must be designed to ensure the runoff from the development is not highly concentrated before entering the buffer area. The volume and velocity of water must be reduced through discharging the surface flow at multiple locations surrounding the development, preventing erosion. • Any evidence of erosion from this stormwater system must be rehabilitated and the volume/velocity of the water reduced through further structures and/or energy dissipaters. These structures must be incorporated within the layout area. • The recommended use and maintenance of grease traps/oil separators to prevent pollutants from entering the environment from stormwater. • Appropriate wastewater infrastructure must be designed to prevent any such water from entering the surrounding environment. • Implement gabions at the base of the slope, to provide slope stability/support, as well as attenuation of surface runoff. • Maintenance of the aquatic habitat and buffer are must be implemented, preventing encroachment of any further infrastructure or vehicles.	Developer	Operational phase
Performance Indicator	• All disturbed/exposed surfaces have been provided with a suitable covering and/or stabilised.	

	• A healthy aquatic habitat • Minimal waste within the aquatic habitat • Minimal alien vegetation present

12.3 OBJECTIVE 3: REDUCE VISUAL IMPACT.

***Impact Management Objective*: Reduce the visual impact caused by the proposed development.**		
Potential impact(s) to be avoided.	• Change in the sense of place. • Community tension.	
Impact Management Outcome	• The proposed development once constructed blends in with the community.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
• Unnecessary use of lighting should be avoided. • The state of the onsite vegetation should be maintained and kept in a healthy state. • Collection of refuse must be maintained. • Colours should be kept natural. • The possible visual impact should be considered when painting the units. • Infrastructure should be maintained. • The introduction of the tree line in order to create a vegetated screen between Saasveld Road, and the development, must be maintained and kept free of alien vegetation. • Residential developments must utilize natural colours where possible, so as to not clash with the surrounding natural environment. • Green spaces/surfaces should be favoured over hardened surfaces, where possible. • Maintain oak and milkwood trees identified on site.	Developer	Operational phase
Performance Indicator	• The proposed development forms part of the community and the visual impact is dissipated.	

12.4 OBJECTIVE 4: REDUCE TRAFFIC IMPACT.

***Impact Management Objective*: Reduce the traffic impact caused by the proposed development.**		
Potential impact(s) to be avoided.	• Damage to road infrastructure. • Community tension.	
Impact Management Outcome	• Surrounding road networks remain safe to use and free of excessive congestion.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period

• Ensure that sufficient signage and road markings are incorporated into the internal road network. • Additional pedestrian crossings and speed bumps should be established. • Consideration should be given to establishing a bus stop for the local transport service provider, outside the development to encourage the use of public transport.	Developer	Operational phase
Performance Indicator	• The proposed development forms part of the community and the visual impact is dissipated.	

12.5 OBJECTIVE 5: PROVISION OF AFFORDABLE HOUSING.

***Impact Management Objective*: The proposed development will increase the amount of housing within the urban edge of the Bitou Municipality, and address the backlog identified in the Bitou Local Municipality draft SDF, 2019.**		
Potential impact(s) to be promoted.	• Improved quality of life. • An increase in the rates base for the municipality. • Provision of assisted facilities for the elderly	
Impact Management Outcome	• Improved quality of life.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
• Ensure that services are maintained. • Establish a community group who can engage with stakeholders and maintain an open line of communication to ensure that the community is functioning optimally.	Developer / Bitou Municipality	Operational phase
Performance Indicator	• A well-balanced community living in a safe and healthy environment.	

12.6 OBJECTIVE 6: LOCAL ECONOMIC REVENUE.

Impact Management Objective: Increased economic revenue for local businesses and industries.		
Potential impact(s) to be promoted.	• Increase in local economic revenue. • Decreased unemployment levels.	
Impact Management Outcome	• Creation of Business and Employment Opportunities.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
• Small medium and micro enterprises (SMME's) owned and run by historically disadvantaged individuals (HDI's) that are on the Bitou Municipality database should be notified of the development and invited to bid for project related work.	Developer / Bitou Municipality	Operational phase

Performance Indicator	• Increase in employment of local residents.

12.7 OBJECTIVE 7: MAINTAIN SENSE OF PLACE.

Impact Management Objective: ***Creation of Business and Employment Opportunities***		
Potential impact(s) to be promoted.	• Increase in local economic revenue. • Decreased unemployment levels.	
Impact Management Outcome	• Creation of Business and Employment Opportunities.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
• Appropriate signage to indicate speed limits, and establishment of speed bumps, to reduce noise from traffic. • Road network should be considered in municipalities future planning, for expansions, etc. • The development is predicted to have minimal nuisances in terms of sense of place, as the development will match the surrounding residential land uses.	Developer / Bitou Municipality	Operational phase
Performance Indicator	• Increase in employment of local residents.	

12.8 OBJECTIVE 8: CREATION OF BUSINESS AND EMPLOYMENT OPPORTUNITIES.

Impact Management Objective: ***Creation of Business and Employment Opportunities***		
Potential impact(s) to be promoted.	• Increase in local economic revenue. • Decreased unemployment levels.	
Impact Management Outcome	• Creation of Business and Employment Opportunities.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
• The developer should inform local community leaders, organisations and councillors of the potential job opportunities associated with the different components associated with the operational phase of the development. • Small medium and micro enterprises (SMME's) owned and run by historically disadvantaged individuals (HDI's) that are on the Bitou Municipality database should be notified of the development and invited to bid for project related work.	Developer / Bitou Municipality	Operational phase
Performance Indicator	• Increase in employment of local employees from the surrounding communities. • Increase in small businesses/services.	

13. Emergency Preparedness

13.1 Emergency response procedures

The potential environmental risks that may arise as a result of construction activities, or during the maintenance of the structures must be identified, and appropriate emergency response procedures must be compiled for each emergency scenario. Potential environmental emergencies that require an emergency response include, but are not limited to, unplanned fires, sewage spills, spills of hazardous chemicals, snake bites etc.

- The construction contractor is responsible for identifying potential significant environmental risks that may arise as a result of pre-construction, construction and rehabilitation activities, and the contractor must formulate emergency response procedures for these potential incidents.
- The ECO, the contractor and the Holder are responsible for ensuring that all construction workers are aware of the emergency procedures, and are properly trained on how to identify and respond to an emergency incident during construction.
- An emergency procedure must clearly indicate who will take charge during an emergency, and the roles and responsibilities of workers and authorities during an emergency.
- The construction contractor is responsible for ensuring that the requirements of the Occupational Health & Safety Act (OHSA) are adhered to during the construction phase. The Holder is responsible for ensuring compliance with the OHSA during the undertaking of maintenance activities.

13.2 Emergency preparedness

The following measures must be implemented, as appropriate, to ensure effective responses to emergencies:

- All workers on site during the construction and operational phase must be properly educated about possible emergency incidents that may arise, how to avoid such incidents and how to respond in the event of an incident. "Refresher" training sessions on emergency procedures must be held if needed.
- All workers must ideally be given basic fire-awareness training, as well as be advised on basic firefighting and safety techniques. Fire-fighting equipment must be available on-site during construction and maintenance activities (see section 8.3).
- All workers must be trained on how to respond in the event of a spill of a hazardous substance (fuel, chemicals etc.), if hazardous substances are to be used on site.
- A spill kit for containing and/or neutralising spills of hazardous substances (e.g. hydrocarbons) must be available on site at all times, when hazardous substances are present.
- Any incidents of pollution or spillage of hazardous materials during construction must be reported to the ECO as soon as possible. The ECO must then (depending on the nature of the spill) notify the relevant authorities, if needed. During the operational phase of the development, the Holder is responsible for notifying the relevant authorities of any pollution incidents that arise as a result of maintenance activities.
- A first aid kit must be available on site at all times.
- Emergency contact numbers (including the fire department, police and ambulance), must be prominently displayed on site at all times and regularly updated.
- All emergency incidents must be recorded in a site incident log. The cause of the incident, the measures taken in response to the incident and the efficacy of those measures must also be recorded. This information must be used to inform future emergency preparedness planning, and to avoid prevent similar incidents from arising again.

14. Method statements

The Competent Authority and/or the ECO may require the Holder or Construction Contractor to submit Method Statements for one or more construction-related activity, or any aspect of the management of the site, before the activity is undertaken or during the performance of the activity, if the activity is causing or may cause significant environmental damage, or pose a health and safety risk.

Method Statements need not be complex and lengthy, but must clearly state **how**, **when** and **where** the activity concerned will be undertaken, and must specify **who** will be responsible for undertaking each component of that activity. Method Statements must be prepared by the Construction Contractor and submitted to the ECO for approval before undertaking the activity concerned.

The ECO and / or Competent Authority have the authority to request method statements for activities, including but not limited to:

- Establishment of site camp and stockpile area.
- Cement/ concrete batching, disposal and emergency contingencies.
- Topsoil and sub-soil storage/ stockpiling.
- Storage of fuels and hazardous chemicals and emergency contingencies.
- Waste management system.
- Storm water management and control.
- Alien invasive plant species management.
- Fire Control & Fire Emergency Plan.
- Emergency preparedness plan / emergency response procedure (see Chapter 14).
- Post-construction rehabilitation.

The ECO has the authority to prevent activities from being undertaken until such time as a satisfactory Method Statement has been submitted to the ECO and approved by the ECO.

15. Roles and Responsibilities

This EMPr, once approved by the competent authority (DEA&DP), must be seen as binding to the Holder, and any person acting on the Holder's behalf, including but not limited to agents, employees, associates, contractors and service providers.

The Holder and all other persons who may be directly involved in the development are also bound by their general Duty of Care, as stated in Section 28 of the National Environmental Management Act, 1998:

> ***Duty of Care:***
> *"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 cannot reasonably be avoided or stopped, to minimize and rectify such pollution or degradation of the environment"*

15.1 Duties and Responsibilities of the Holder

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The Holder is ultimately responsible for ensuring that the environmental management measures specified in this EMPr, as well as any other conditions specified by the competent authority, are implemented and

adhered to during the construction and operational phase (maintenance activities) of the proposed development

The Holder or delegated party is responsible for monitoring and maintenance during the operational phase. The Holder must ensure that all appointed service providers, contractors and maintenance workers are capable of complying with all statutory requirements of this EMPr and the conditions of the Environmental Authorisation. The Holder is responsible for ensuring that this EMPr and the conditions of the Environmental Authorisation are implemented and adhered to during construction.

The Holder or appointed consultant is responsible for identifying emergency situations that may arise during operational and maintenance activities and must formulate appropriate emergency response procedures for these emergency scenarios.

15.2 Duties and Responsibilities of the Contractor

The "Construction Contractor" is the entity responsible for undertaking the physical construction of the residential development. The construction contractor is responsible for ensuring that all environmental management measures specified in this EMPr and in the EA are implemented during the pre-construction, construction and post-construction rehabilitation phases, unless agreed otherwise with the Holder. The contractor will be responsible for all costs incurred in the rehabilitation of the site and for ensuring effective environmental management during construction. The contractor must therefore make adequate financial provision for the implementation of all prescribed measures.

It is strongly recommended that the Construction Contractor appoint an Environmental Site Officer (ESO), who will act as the Contractor's representative to monitor and enforce compliance with the conditions of this EMPr, throughout all phases of construction.

In addition to the above, the Construction Contractor is responsible for the following:

- Identify emergency situations that may arise as a result of construction activities, and formulate appropriate emergency response procedures.
- Ensure that all construction workers, including sub-consultants and service providers, undergo environmental awareness training prior to commencing work on site, or as soon as possible thereafter.
- Compile the required method statements, which must be to the satisfaction of the ECO, before commencing with the activity to be governed by the method statement.
- Respond to concerns or issues identified by the ECO, as relates to environmental management, and implement the appropriate management or remediation measures, at the Contractor's own expense (unless agreed otherwise)
- Should third parties be called to the site to perform clean up and rehabilitation procedures, the Construction Contractor will be responsible for all associated costs.

Note that failure to comply with the requirements and conditions of this EMPr and the Environmental Authorisation may result in fines or other penalties being levied against the Construction Contractor by the Competent Authority.

15.3 Duties and Responsibilities of the ECO

The appointed Environmental Control Officer (ECO) is responsible for undertaking regular site visits to monitor and report on the implementation of the EMPr and adherence to the conditions of the Environmental Authorisation during the pre-construction, construction and post-construction rehabilitation phases. The ECO is not required to monitor the site during the operational (maintenance) phase of the development.

15.3.1 Competency of the ECO

The ECO must be independent of the Holder, Engineer, Construction Contractor and their service providers. The appointed ECO must be suitably qualified and experienced, and must be able to demonstrate that he / she is of sufficient competency to undertake the required task. The ECO must preferably be a resident in close proximity to the development area to ensure quick response if required. The ECO must work in close co-operation with the Construction Contractor, resident engineer or ESO (where applicable) and all contractors in order to identify potential problems before they occur, and provide suitable guidance as to how the identified problems (environmental impacts) can be avoided.

15.3.2 Duties of the ECO

The duties of the ECO include, but are not limited to:

- Conduct a pre-construction site inspection to ascertain the pre-commencement condition of the site (i.e. the status quo);
- Conduct environmental awareness training;
- Undertake regular site visits to monitor compliance with all mitigation, monitoring and management measures contained in the EMPr and the Environmental Authorisation, during the pre-construction, construction and rehabilitation phases of the development;
- Evaluate the achievement of the performance indicators associated with each impact management objective specified in this EMPr;
- Liaise with site contractors, engineers and other members of the development team with regard to the requirements of the EMPr;
- Provide guidance as and when required regarding the implementation of the environmental management measures contained in the EMPr and EA, so as to assist the Holder and contractor in remaining compliant with these measures;
- Assist in finding environmentally acceptable solutions to construction problems;
- Ensure that the working areas, site camp facilities, access roads and no-go areas are properly demarcated;
- Ensure that proper topsoil management practices are adhered to on site;
- Ensure that proper waste management & pollution prevention strategies are practised on site;
- Examine method statements, where required;
- Recommend additional environmental protection measures, should this be necessary;
- Furnish contractors with verbal warnings in case of contravention of the EMPr;
- Recommend that the competent authority furnish errant contractors with predetermined fines, when verbal and / or written warnings are ignored;
- Ensure satisfactory rehabilitation of disturbed areas on site, after construction is complete;
- Keep detailed records of all site activities that may pertain to the environment, and produce compliance-monitoring reports (ECO Reports) for submission to the Holder, and the Competent Authority at regular intervals during the construction phase;
- Submit a final post-construction inspection report, within 6 months of completion of the construction phase. The audit report must detail the rehabilitation measures undertaken, describe all major incidents or issues of non-compliance and any issues or aspects that require attention or follow-up.
- All ECO Reports and Inspection Reports must be submitted to the Holder and Competent Authority.

15.3.3 Frequency of ECO visits

The ECO must conduct weekly site visits during the construction phase, in addition to the start-up and closure inspections.

The ECO has the discretion to undertake additional visits if he / she feels this is justified due to the actions of the contractors, and to make *ad hoc* visits in order to ensure compliance.

The ECO must also undertake a final inspection (audit) 6 months of completion of construction activities. The purpose of this final inspection is to ensure that the rehabilitation measures applied at the conclusion of the construction phase have been sufficient to promote the successful rehabilitation of the site, and to identify any further issues that require attention or follow-up.

15.3.4 Authority of the ECO

The ECO has the authority to recommend to the authorities that they suspend all works (or part thereof) occurring on site, should any action being undertaken on site not comply with the environmental requirements, and where such actions pose a serious threat to any element of the surrounding environment.

The ECO has the authority to issue instructions to the Construction Contractor and/or Holder, regarding measures that must be implemented on site in order to ensure compliance with the EMPr and Environmental Authorisation, and/or to prevent environmental degradation or pollution from occurring.

The ECO has the authority to issue verbal and written warnings to contractors. Should verbal and written instructions and/or warnings be ignored, the ECO has the authority to request the Competent Authority to issue pre-determined fines or other penalties.

The ECO has the authority to report incidents of non-compliance to the Competent Authority at any time.

16. Environmental Awareness Plan

Environmental Awareness Training must be conducted prior to the commencement of construction activities. It is the holder's responsibility to familiarise himself/herself with the content and requirements of this EMPr. The holder is also responsible to ensure that the contractor and all labourers working on site during the construction phase are familiar with the content of this EMPr.

The following actions must be taken to ensure that all relevant parties are aware of their environmental role and duties:

1. This EMPr must be kept on site at all times.
2. The provisions of this EMPr and the conditions of the Environmental Authorisation must be explained in detail to all staff during Awareness Training.
3. Training booklets will be handed out to all labourers and must be explained to them.
4. Weekly checks to be done by the Holder's environmental representative who must be on site at all times.
5. The ECO to conduct frequent site visits.
6. Monthly monitoring reports to be compiled by the ECO. These reports will be circulated to all parties involved (including the holder, contractor and the competent authority).

The Construction Contractor must make allowance for all construction site staff, including all subcontractors that will be working at the site, to attend environmental awareness training sessions (undertaken by the ECO) before commencing any work on site. During this training, the ECO will explain the EMPr and the conditions contained therein. Attention will be given to the construction process and how the EMPr fits into this process. Other items relating to sound environmental management which must be discussed and explained during the environmental awareness training sessions include:

- The demarcated "No-Go" areas;
- General do's and don'ts of the site;
- Making of fires;
- Waste management, use of waste receptacles and littering;
- Use of the toilets provided;
- Use and control of construction materials and equipment etc.;
- Control, maintenance and refuelling of vehicles;
- Methods for cleaning up any spillage;
- Access and road safety;
- Emergency procedures (e.g. in case of fire, spillage etc.)
- General "best practice" principles, with regards to the protection of environmental resources.

Environmental awareness training and education must be ongoing throughout the construction phase, and must be undertaken regularly if deemed necessary (especially if it becomes apparent that there are repeat contraventions of the conditions of the EMPr), or as new workers come to site. Translators must be utilised where needed.

17. Monitoring, Record Keeping and Reporting

17.1 Environmental Auditing

In accordance with the requirements of the Environmental Impact Assessment Regulations, 2014 (as amended), the holder of the Environmental Authorisation must, for the period that the Environmental Authorisation is valid, appoint a suitably qualified independent person to conduct an environmental audit to audit compliance with the conditions of the Environmental Authorisation and the EMPr.

The holder is responsible for appointing, managing and remunerating the appointed auditor. The auditor may be the appointed Environmental Control Officer (ECO), provided the ECO is sufficiently qualified and experienced to fulfil the auditing requirements specified below.

The appointed auditor must undertake regular environmental audits according to the frequency specified in the Environmental Authorisation. Following each audit the environmental auditor must submit an audit report to the Competent Authority (in this instance the DEA&DP).

- Environmental auditing and environmental audit reports must adhere to the requirements of the amended 2014 Environmental Impact Assessment Regulations, in particular Section 34 (*Auditing of Compliance with Environmental Authorisation, Environmental Management Programme*) and Appendix 7 (*Objective and Content of Environmental Audit Report*)
- The audit report must provide verifiable findings on the level of compliance with the provisions/ conditions of the Environmental Authorisation and the EMPr, and must also comment on the ability of the measures contained in this EMPr to sufficiently avoid, manage and mitigate environmental impacts.

- Where the findings of the audit report indicate that the impact management measures stated in the EMPr are insufficient to adequately address environmental impacts, recommendations as to how the EMPr must be amended so as to address the identified shortcomings must be made and submitted to the competent authority together with the audit report.

17.2 Construction phase monitoring, reporting and record keeping

The appointed Environmental Control Officer (ECO) is responsible for monitoring the site at regular intervals during the construction phase, in order to ensure that the provisions of this EMPr and the Environmental Authorisation are adhered to and that sound environmental management is ensuing on site.

The ECO must compile a monthly ECO report detailing the ECO's observations on site, any instances of non-compliance and any issues or aspects that require attention, follow-up or remedial action. The ECO reports must be submitted to the Holder and to the Competent Authority is so requested by that authority. The ECO inspection reports must include both photographic and written records.

17.2.1 ECO Inspections - Photographic Records

The condition of the surrounding natural environment must be monitored regularly in order to ensure that construction and management activities are not impacting negatively on the condition of the landscape and any sensitive ecosystems. The most effective way to achieve this is by means of a detailed photographic record. In this way, a record of any shift in ecosystem condition can be maintained and potential impacts be detected at an early stage. It is thus recommended that fixed-point photo-monitoring sites could be set up, and photographs must be taken at these sites during each ECO inspection. Where necessary, the entire working area must be well documented and photographed.

17.2.2 ECO Inspections - Written Records

The following record-keeping during the pre-construction, construction and rehabilitation phases of the development is recommended:

- The ECO must complete an ECO Checklist after each ECO site visit.
- The ECO must compile an ECO monitoring report and submit this to the Holder, the Contractor and the Competent Authority (the latter only if required by the Competent Authority). The monthly reports must be a summary of the ECO inspections from the preceding month, and must highlight the key concerns/ issues on site, instances of non- compliance with the EA and EMPr, all instructions issued to the contractor, actions taken and aspects that still require attention.
- All ECO reports and ECO instructions must be retained on file at least for the duration of the construction period (retaining reports for a period of at least 5 years is recommended, in the event that the Competent Authority must request information).
- A record (minutes) of construction site meetings, liaison site meetings between the ECO and resident engineer or contractor, monitoring reports, ECO instructions and ECO observations must be clearly documented and filed on a master file off-site for safe keeping.
- It is recommended that a site register (incident register) be kept on site at the site office for the recording of any environmental incidents (e.g. fires, spills etc.), observations which are contrary to the stipulations within the EMPr and any other contravention deemed necessary for the attention of the resident engineer. Actions taken to remedy the incidents must also be recorded.
- A complaints register must be kept on site in which complaints by any member of the public must be logged.

- The ECO must compile a final post-construction audit report, within 6 months of completion of each construction phase. The audit report must detail the rehabilitation measures undertaken, describe all major incidents or issues of non-compliance and any issues or aspects that require attention or follow-up.

17.2.3 Construction Phase Record Keeping

A copy of the approved EMPr, the Environmental Authorisation and any relevant construction method statements must be kept on site at all times during pre-construction, construction and rehabilitation activities. The ECO Reports must be retained by the Holder for a period of at least 5 years, and must be provided to the Competent Authority upon request.

18. Penalties, Claims and Damages

The contractor will be responsible for all costs incurred in the rehabilitation of the site and for ensuring that all procedures required to rehabilitate the site are implemented. If third parties are called to the site to perform clean up and rehabilitation procedures, the contractor will be responsible for all costs. The competent authority may impose penalties on the Holder or any of the contractors if conditions contained in this EMPr are contravened. This would be based on an agreement or contract between the Holder and the contractor.

Penalties could be imposed in terms of Chapter 11 of the Western Cape Bill on Planning and Development as published in the Extraordinary Provincial Gazette No 5183, 3 October 1997, and would be applicable for any action which leads to damage to the natural environment. Please note that the payment of any fines in terms of the contract shall not absolve the offender from being liable from prosecution in terms of any law.

In cases where severe environmental damage occurs, the competent authority law enforcement division may take legal action against the responsible parties. The reasons for this could include, among others:

- Not implementing the conditions of the EMPr;
- Spillage that result in environmental damage;
- Incorrect handling and storage of construction materials and chemicals;
- Sensitive areas that are not clearly demarcated;
- Performing ablutions in areas other than facilities provided for such actions; and
- Occurrence of unattended and out of control fire.

The Contractor shall comply with the environmental specifications and requirements on an ongoing basis and any failure on his part to do so will entitle the ECO to issue the contractor with penalty / fine as described in the following section.

The following offences, level of severity and value of the financial fines have been drafted according to the sensitivities on the proposed site, the mitigation measures proposed, and the construction methods proposed. It must be noted that the level of severity is at the discretion of the ECO and any offences or fines will be recorded in the ECO's monitoring report. The fineable offences are not limited to the table below, additional offences may be applied by the ECO with prior agreement with the EA holder.

The following fine structure shall apply:

Table 6 Fines and offences.

Finable Transgression	Min Fine	Max Fine
Failure to notify the ECO of the commencement of construction or pre-construction activities, prior to the commencement of such activities.	R1 000	R2 000
Failure to comply with the provisions relating to the demarcation of the working area, site camp and associated facilities, and the maintenance of the demarcated boundaries.	R1 000	R5 000
Failure to demarcate the buffer area	R1000	R5 000
Failure to comply with the provisions relating to the demarcation of all "no-go" areas, and the maintenance of the demarcated boundaries.	R2 000	R5 000
Failure to provide secured ablution facilities (1:30 ratio) on site.	R500	R15 000
Failure to comply with the provisions relating to the clearance of vegetation on site.	R2 000	R5 000
Clearance of indigenous vegetation (regardless of the density of alien vegetation present) outside of the demarcated boundaries of the working area and site camp.	R2 500	R15 000
Failure to apply herbicide to alien vegetation when required to do so.	R500	R2 000
Failure to adhere to designated access routes and/or the driving of vehicles through undeveloped vegetation outside of the demarcated working area or site camp.	R1 000	R5 000
Movement of vehicles and/or construction workers in no-go areas;	R1 000	R10 000
Parking or storage of vehicles, machinery, tools and other materials or equipment related to the Contractors operations, within designated "no-go" areas.	R1 000	R10 000
Parking or storage of vehicles, machinery, tools and other materials or equipment related to the Contractors operations, outside of the areas demarcated for such parking/storage.	R500	R5 000
Failure to comply with the provisions relating to the management of topsoil and subsoil.	R1 000	R5 000
Excessive excavation of material in areas not depicted for such purpose / activity on the approved design plans.	R2 500	R10 000
Failure to comply with the provisions relating to waste management on site i.e. recycling of wastes.	R500	R5 000
Failure to comply with the provisions relating to the storage, use and management of hazardous substances and fuels on site and/or the spillage of hydrocarbons or hazardous substances on site leading to environmental damage.	R1 000	R10 000
Mixing cement or concrete on bare ground and/or failure to comply with any other provision regarding cement/ concrete batching.	R1 000	R5 000

Failure to provide adequate fire-fighting equipment (in working order) on site at all times and/or failure to comply with the provisions relating to fire prevention and/or the occurrence of unattended or out of control fires.	R500	R5 000
Refueling of vehicles, machinery or equipment outside of the designated refueling area.	R500	R2 000
Maintenance of vehicles, machinery or equipment outside of the designated maintenance yard, except in emergencies.	R500	R2 000
Failure to undertake refueling or repairs over a drip tray or other impermeable bunded surface to collect spilled hydrocarbons (fuels, lubricants, oils etc.) and other hazardous substances; failure to provide drip trays under fuel burning equipment (including pumps and generators) where there is a risk of hydrocarbon leakage.	R500	R2 000
Failure to produce a required method statement/s to the engineer's and ECO's satisfaction prior to undertaking the activity concerned and/or failure to adhere to an approved method statement.	R1 000	R5 000

The above does not absolve the transgressor from being prosecuted in terms of the ***National Environmental Management Act (Act 107 of 1998)*** which may result in further penalties and other actions by State Departments.

19. Conclusion

The recommendations and mitigation measures prescribed in this EMPr have been formulated with the intention of addressing potential pre-construction, construction and operational phase impacts on the environment. It is likely that if the conditions, requirements and recommendations of the above EMPr are implemented as described and the relevant stakeholders adhere to the various mitigation measures, then the project will be completed without unforeseen negative environmental impacts.

Familiarity with the contents of this EMPr by the contractors and other individuals involved in the development project will assist in achieving "environmental best-practice", which ultimately ensures that the project arrives at a sustainable outcome.