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PRE-CONSTRUCTION, CONSTRUCTION AND POST-CONSTRUCTION PHASE

ENVIRONMENTAL MANAGEMENT PROGRAMME

FOR THE

The Proposed Walvis Street Extension,
 Mossel Bay, Western Cape.

APPLICANT:	Mossel Bay Local Municipality. Contact: Pieter Myburgh
ENVIRONMENTAL CONSULTANT:	Sharples Environmental Services cc Primary Author: Mr Lloyd Barnes Reviewer: Ms Ameesha Sanker
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DOCUMENT DETAILS

Project Ref. No:	26
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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.

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1. Introduction

Sharples Environmental Services.cc have been appointed by Zutari, on behalf of Mossel Bay Local Municipality, to undertake the environmental assessment, in accordance with the National Environmental Management Act, 1998 (Act 107 of 1998), in terms of the Environmental Impact Assessment Regulations, 2014 (as amended 2017), for the Proposed Walvis Street Extension, Mossel Bay, Western Cape.

2. About this EMPr

This document is intended to serve as a guideline to be used by the *Mossel Bay local Municipality* (as the Implementing Agent) and any person/s acting on the *Mossel Bay local Municipality's* behalf, 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, 2017), 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 *Mossel Bay local Municipality*, 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 Environmental Control Officer (ECO) needs to ensure that all role-players are aware of the constraints that the EMPr places on the development and construction team and are prepared to be actively involved in implementing these constraints. The end result relies on cooperation and 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 *Mossel Bay local Municipality* 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 Mossel Bay local Municipality, 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

Mossel Bay Municipality has identified the need to extend the existing Walvis Street to link up with Louis Fourie Road (Trunk Road 33/1). The proposed extension is approximately 500-600 metres in length and situated on the southern side of Louis Fourie Road, Mossel Bay.

Mossel Bay is a harbour city located within the in the Garden Route District Municipality and is an important tourism and farming region in the Western Cape Province. Mossel Bay lies 400 kilometres east of Cape Town and 400 km west of Port Elizabeth-the largest city in the Eastern Cape Province. The older parts of the city occupy the north-facing side of the Cape St Blaize Peninsula, whilst the newer suburbs straddle the Peninsula and have spread eastwards along the sandy shore of the Bay.

The proposed site is situated north west of the Mossel Bay town centre, in the suburb of Isinyoka, south of the R102 (Figure 1).

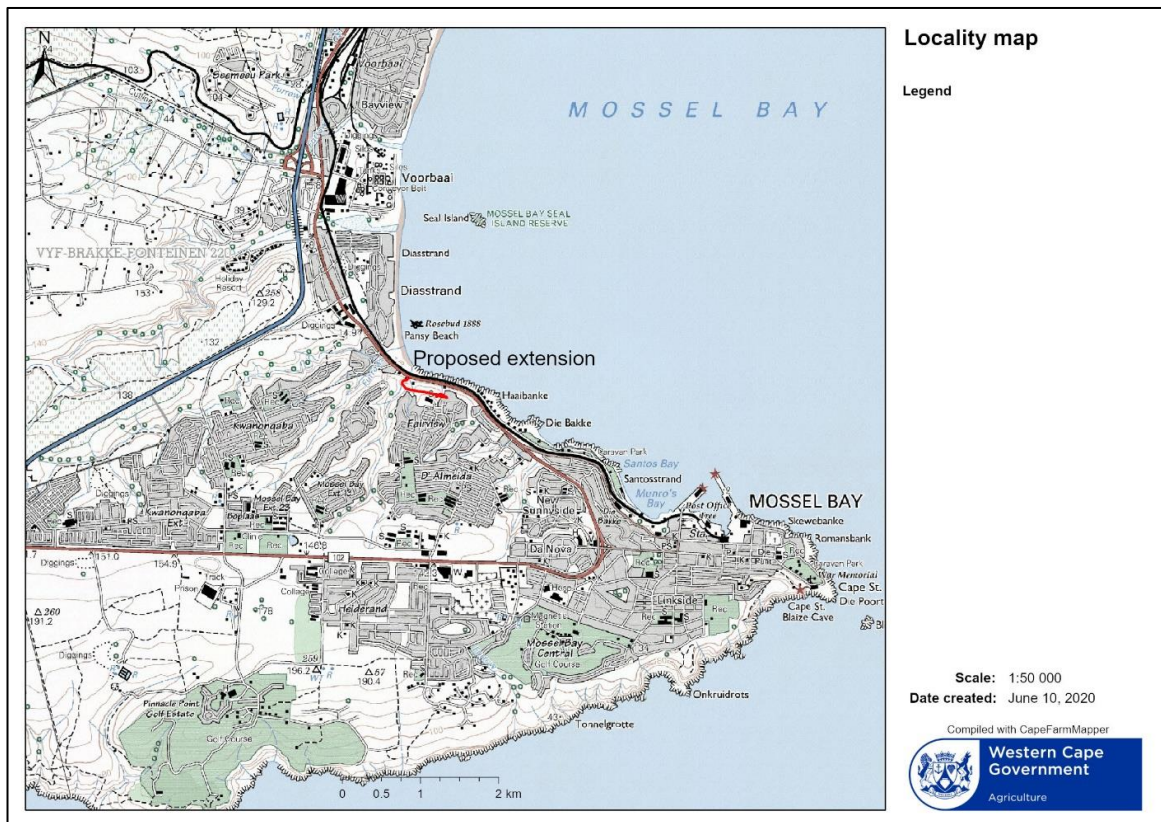


Figure 1: The proposed site for the road extension (red border).

The current proposed route layout is approximately 500 - 600 metres in length and situated on the southern side of Louis Fourie Road, Mossel Bay (Figure 1). As per the Zutari design, the scope of works will include the following details:

- Proposed length: approximately 500 - 600m (inclusive of the existing street parcel).
- Total road width: 6.4m (a cross section of 2 x 3.2m lanes)
- Sidewalks: 2 x 1.2m, gravel.

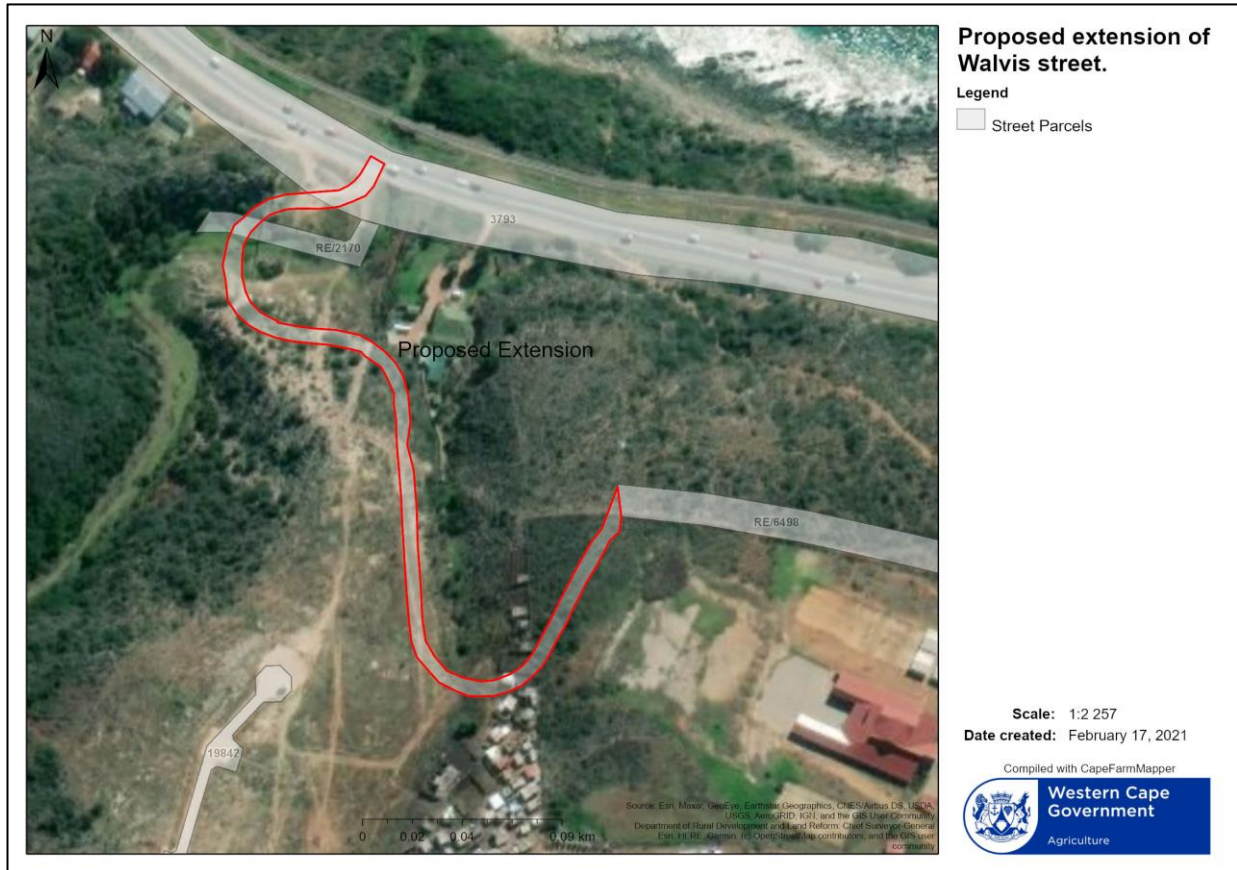


Figure 2: Proposed extension of Walvis Street (Red border)

The following is proposed to be developed as per the Site Layout Plans shown in Appendix B and in the table below:

Table 1: Summary Table: Site and Farm Details

Province	Western Cape
District Municipality	Garden Route District Municipality
Local Municipality	Mossel Bay Municipality
Ward number(s)	Ward No 12
Nearest town(s)	Mossel Bay – directly adjacent
SG Code	C05100070000649800000 C05100070000463100000 C05100070000217100000 C05100070000457100000 C05100070000435000000 C05100070000435100000 C05100070000217000000 C05100070000434900000

C05100070000379300000

Co-ordinates of the farm boundaries:

Waypoint				
A	Latitude (S)	34 °	9 '	57"
	Longitude (E)	22 °	6 '	42.57 "
B	Latitude (S)	34 °	9 '	59.6 "
	Longitude (E)	22 °	6 '	42.13 "
C	Latitude (S)	34 °	10 '	1.22 "
	Longitude (E)	22 °	6 '	43.19 "
D	Latitude (S)	34 °	10 '	4.65 "
	Longitude (E)	22 °	6 '	44.3 "
E	Latitude (S)	34 °	10 '	2.09 "
	Longitude (E)	22 °	6 '	46.86 "
F	Latitude (S)	34 °	10 '	3.13 "
	Longitude (E)	22 °	6 '	46.86 "

Table 2: Site coordinates



Figure 3: Site coordinates

5. Description of Environmental Setting

5.1 Vegetation

5.1.1 Vegetation description

According to the Vegetation Map of SA (2012) accessed from CapeFarmMapper (June 2020) there are three vegetation units primarily affected by the proposed extension, namely;

- Groot Brak Dune Strandveld
- North Langerberg Sandstone Fynbos
- Central Coastal Shale Band Vegetation

During the site survey it was found that the vegetation on site can best be described as a Southern Cape (= Gouritz) Valley Thicket remnant, with a strong renosterveld influence along the top part of the site (edge of the coastal plateau). The rockiness and north-facing aspect of the site provide an ideal habitat for valley thicket. Biogeographically important and endemic species recorded include *Aloe arborescens*, *Euphorbia mammillaris*, *Azima tetraacantha*, *Gasteria carinata* and *Haworthia chloracantha*. The latter is both a Southern Cape Valley Thicket and Mossel Bay Shale Renosterveld endemic. Southern Cape Valley Thicket is mainly found in the river valleys of the Goekoe River, with the largest patch in the Gouritz River Valley.

Unmapped patches are also found along the Groot Brak, Klein Brak and the Kaaimans River (easternmost limit) (Mucina & Rutherford 2006).

The Botanical Survey (2020) notes that the vegetation on the steep part of the site (directly above Louis Fourie Rd and largely below the proposed road extension) comprises thicket. The top (more level) parts show a strong renosterveld influence, suggesting that the thicket was bordered by renosterveld (extending westwards) before it was transformed by past agricultural activities and more recently, urban development. The thicket component is in a good condition, with a few footpaths crossing it. Impact of goat grazing is also visible. The top part of the site is degraded from pedestrian movement and grazing activities, especially the eastern (Walvis St) end and western end where the proposed road drops down a rocky ridge and crossing a watercourse before meeting Louis Fourie. Earthworks for municipal services are currently underway here. A notable presence of alien species was also noted in the valley bottom on western side. Structurally, the thicket can be described as a mid-high to tall (1-3 m) closed shrubland following Campbell's (1981) classification.

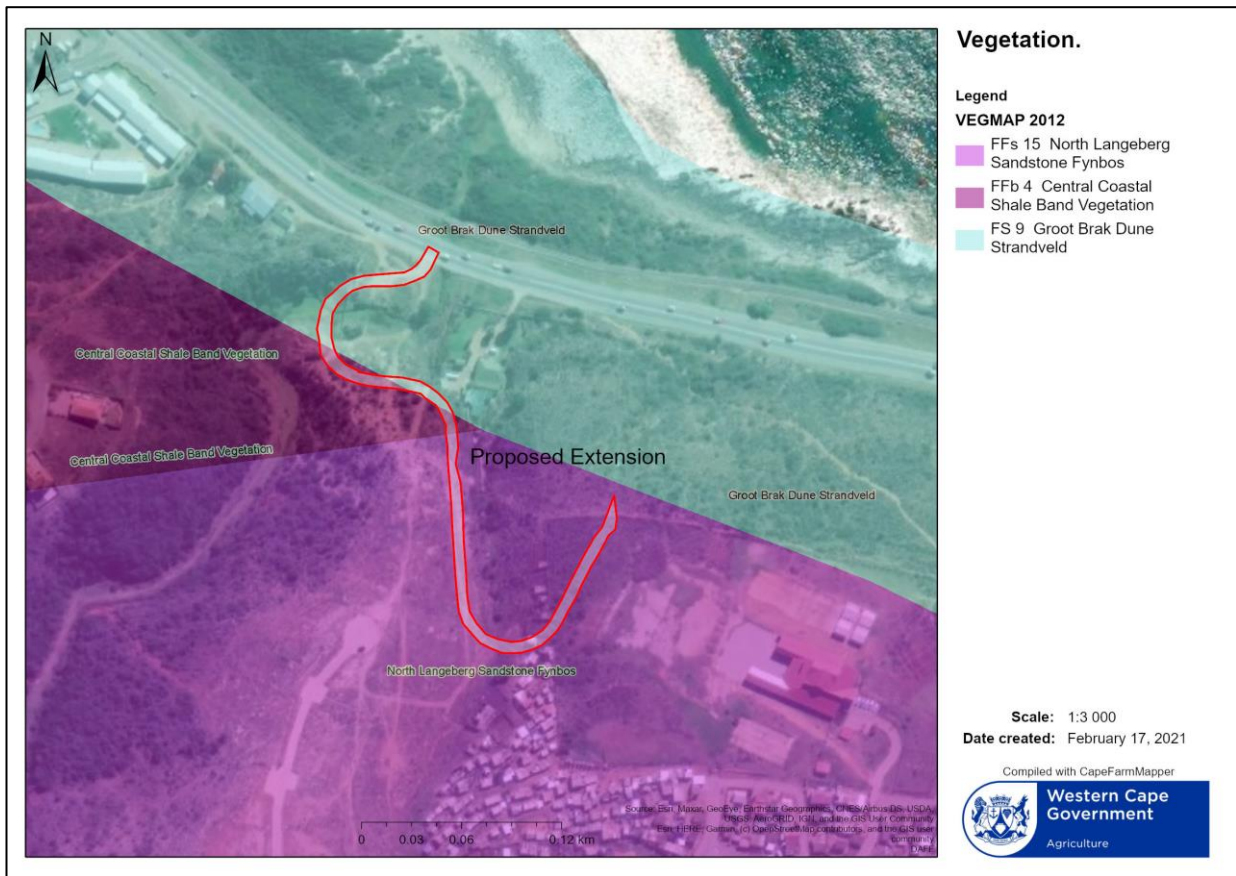


Figure 4: Vegetation Map of SA.

Four Species of Conservation Concern were recorded on site, namely *Polygala pubiflora* (Vu), *Hermannia lavandulifolia* (Vu), *Haworthia chloracantha* var. *denticulifera* (En) and *Ruschia leptocalyx* (En). *Polygala pubiflora* is a regional endemic, mostly found in renosterveld remnants. It is still frequently encountered (by the author and others) in the Mossel Bay area, but never in large numbers, usually only a few plants here and there. It is difficult to spot when not in flower. *Hermannia lavandulifolia* is still well represented in the Mossel Bay area and is frequently encountered. *Haworthia chloracantha* var. *denticulifera* is very rare and this is the first observation of the species by the author. According to the online Red List of South African Plants, "*Haworthia chloracantha* is threatened by ongoing habitat loss to road construction, quarrying and coastal development, particularly in the area between Mossel Bay and the Groot Brak River, with many subpopulations known through historical collections now extinct". It is also targeted by succulent collectors. *Ruschia leptocalyx*, another regional endemic, is still frequently encountered in vegetation remnants between the Hartenbos Heuwels and The Point.

A few Milkwoods (*Sideroxylon inerme*), a protected tree species in terms of the National Forests Act (Act 84 of 1998), were recorded on site, one in close proximity to the proposed route. The removal of these trees requires a permit from the Department of Forestry. It is suggested that if the trees are required to be removed, the transplantation of the tree to an appropriate area (consultation with the ECO and the Competent Authority) is preferred.

5.1.2 Botanical Sensitivity

Mossel Bay Shale Renosterveld is the most threatened vegetation type found on site and is listed as Endangered (DEA 2011). About 41% of Mossel Bay Shale Renosterveld is still left, while 0% is currently protected (DEA 2011). A large percentage of it has been transformed in the past for pastures and

croplands (Mucina & Rutherford 2006). This rating was reaffirmed in the Western Cape Biodiversity Spatial Plan Handbook (Pool-Stanvliet et al. 2017). With regards to Southern Cape Valley Thicket, 35% has been transformed by agriculture (Mucina & Rutherford 2006). Very little of it is conserved in the Pauline Bohnen Nature Reserve. Pool-Stanvliet et al. (2017) recommend that Southern Cape Valley Thicket be listed as Vulnerable.

5.1.3 Critical Biodiversity Areas

The proposed extension road runs along the edge of a terrestrial critical biodiversity area (CBA) and through three mapped aquatic CBA's and/or ecological support areas associated with the watercourses (see Map 6). The terrestrial CBA forms part of a minor coastal biodiversity corridor (albeit fragmented) that runs between the Hartenbos Heuwels and Cape St. Blaize. The reasons for its importance, along with the aquatic CBA's, include the presence of a threatened vegetation type (albeit the wrong type), its contribution to ecological processes, water resource protection and wetlands. Apart from providing a backbone to the local biodiversity network, the corridor serves as an important passage along which fauna can migrate between the vegetation remnants. The proposed road will contribute to the erosion of the corridor, but the significance thereof is difficult to assess given the urban context and encroaching township development.

CBA's are defined as areas in a natural condition that are required to meet biodiversity targets, for species, ecosystems or ecological processes and infrastructure (Pool-Stanvliet et al. 2017). These sites are selected for meeting national targets for species, habitats and ecological processes (Pool-Stanvliet et al. 2017). Many of these areas support known occurrences of threatened plant species, and/or may be essential elements of designated ecological corridors. Loss of designated CBA's is therefore not recommended. With the proposed road running alongside and through a CBA network one can expect an impact on its functionality despite its degraded state.

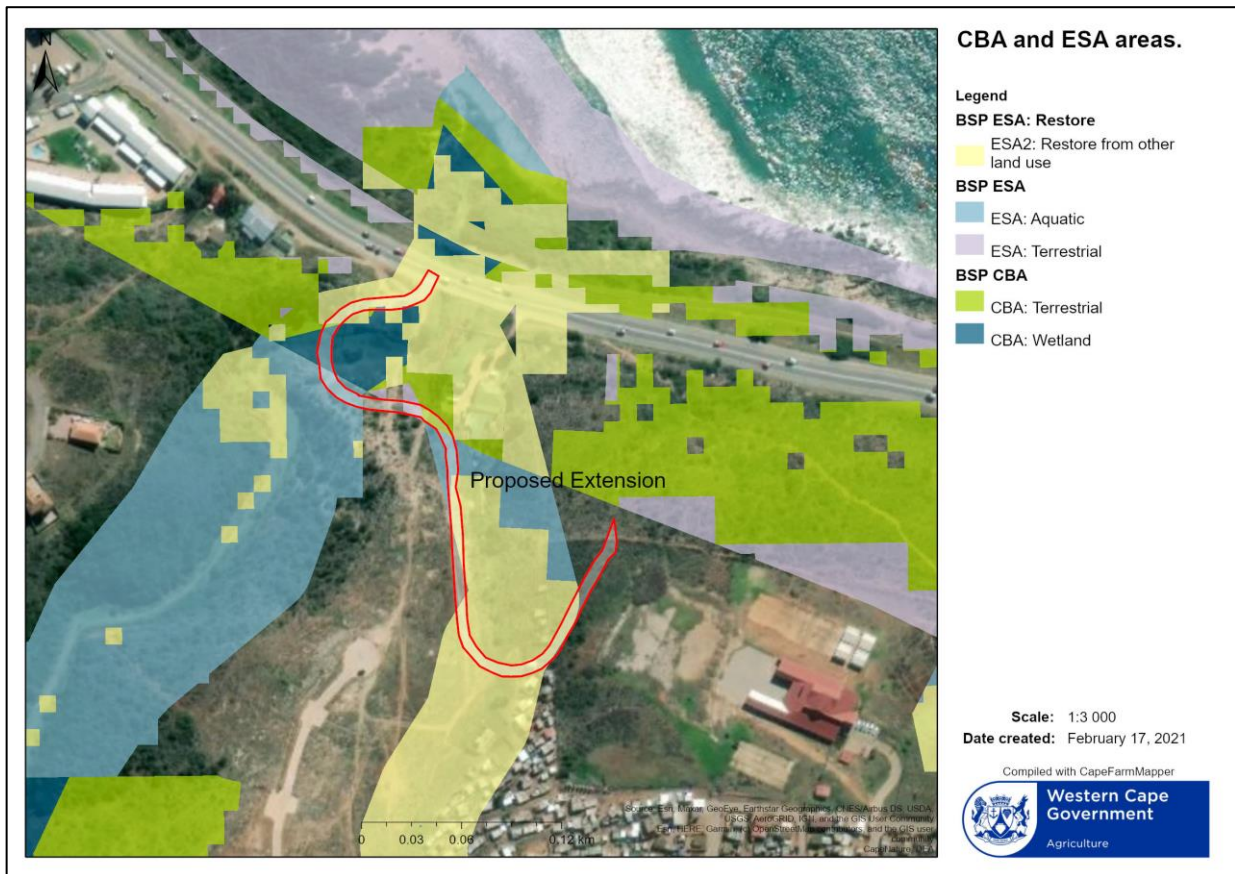


Figure 5: Site in relation to the Western Cape Biodiversity Spatial Plan 2017.

5.2 Freshwater features

5.2.1 The Aquatic Environment

The study area is located within the DWS Quaternary catchment K10A and falls within the Breede Gouritz Water Management Area. The Freshwater Habitat Impact Assessment completed by Sharples Environmental Services cc (2020) identified two watercourses along the proposed road route (Figure 6), namely HGM1 (the western stream) and HGM2 (the eastern stream).

HGM1 (the western stream)

The Freshwater Habitat Impact Assessment (2020) describes HGM1 as a lowland river. The reach of the system has a gentle gradient and relatively low flow velocity after abruptly losing confinement from the narrow valley upstream. It is located west of the HGM2 watercourse along the proposed road route. The road will be constructed within the lower reach, directly upslope of the existing road culvert, which directs flow under Louis Fourie Road into the ocean at Pansy Beach. The system has a perennial flow of low velocity which is confined to an incised channel.

HGM2 (the eastern stream)

The Freshwater Habitat Impact Assessment (2020) explains that the eastern drainage line contains a small ephemeral stream, which flows only during high rainfall events, in a northerly direction towards the coastline. However, the stream becomes captured by a stormwater diversion pipe (boxed in concrete) and routed around a house located on the alluvial fan.

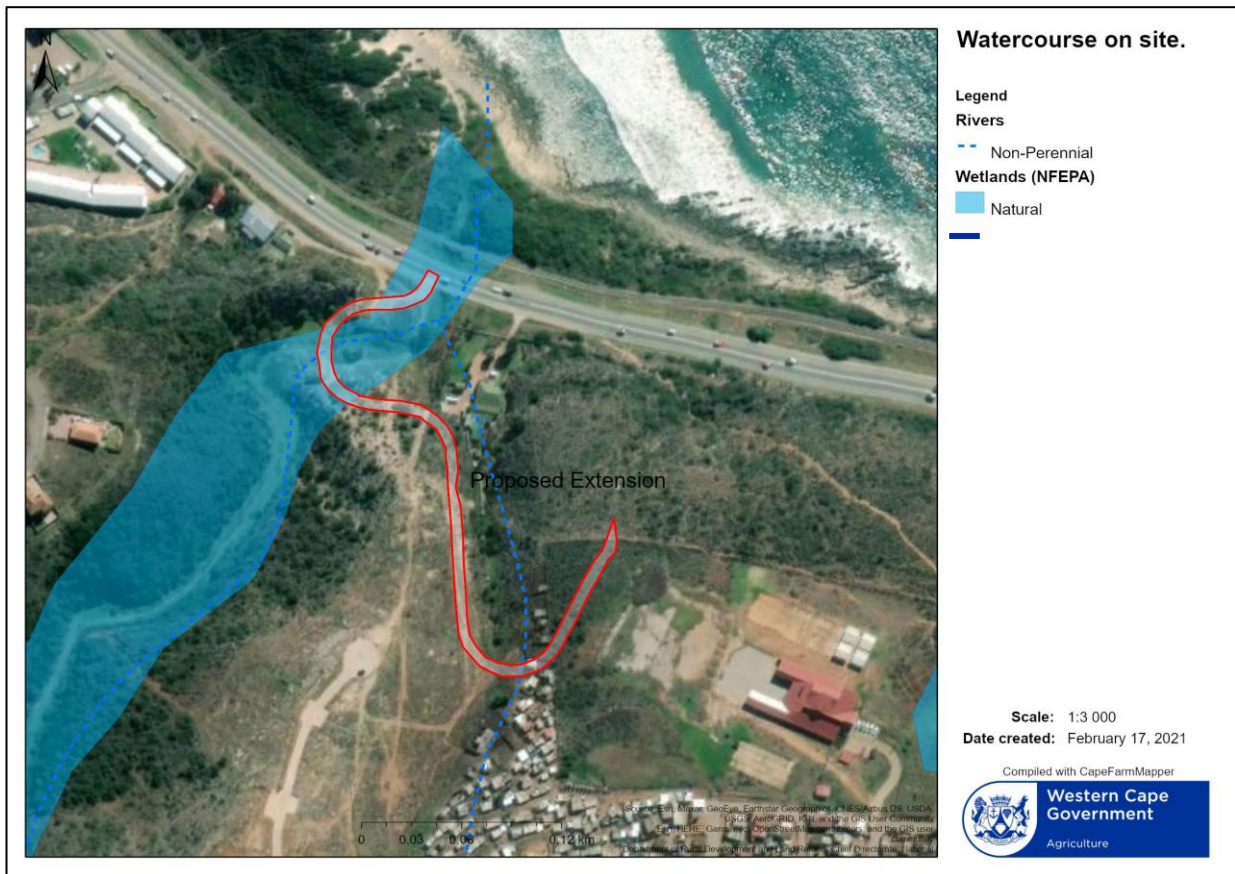


Figure 6: Freshwater ecosystems in relation to the proposed site.

5.2.2 Habitat Integrity, Ecological Importance & Sensitivity

The Present Ecological State (PES) was calculated by the Freshwater Habitat Impact Assessment (2020) which refers to the health or integrity of river systems and includes both instream habitat as well as riparian habitat adjacent to the main channel. The rapid Index of Habitat Integrity (IHI) tool (Kleynhans, 1996) was used to determine river PES by comparing the current state of the in-stream and riparian habitats (with existing impacts) relative to the estimated reference state without anthropogenic impacts.

The Ecological Importance and Sensitivity (EIS) of riparian areas was determined and is a representation of the importance of the aquatic resource for the maintenance of biological diversity and ecological functioning, whilst Ecological Sensitivity (or fragility) refers to a system's ability to resist disturbance and its capability to recover from disturbance (Kleynhans & Louw, 2007).

The recommended ecological category (REC) was also determined and is used to inform future management objective for an aquatic ecosystem. The REC can be determined by using the PES (Present Ecological State) and EIS (Ecological Importance and Sensitivity) scores of the system (see table below; DWAF 2007). However, it is also important to consider the feasibility to realistically either maintain or improve the current condition of the water resource.

HGM1 (the western stream)

The Freshwater Habitat Impact Assessment (2020) notes that due to the heavy impacts of riparian vegetation clearance, alien invasive plant species infestation, sewage spillages, and infrastructure within the stream, HGM1 is classified as largely modified having scored within the 'D' category for PES.

The EIS category of the HGM1 stream was determined as being 'Moderate' (C category). The stream has been significantly modified and although only disturbed habitat remains, it is sensitive to flow related water quality changes and still able to provide a riparian corridor for biota from the plateau to the sea.

The HGM1 stream assessed obtained a Poor 'D' PES and a Moderate 'C' EIS score which places it in the REC 'D' category which advocates the maintenance of the systems.

HGM2 (the eastern stream)

The Freshwater Habitat Impact Assessment (2020) explains that due to the extensive loss of habitat as a result of infrastructure within the watercourse, and the diversion of water from the HGM2 stream via a pipe, the river is seriously modified and scored within the 'E' category for PES.

The EIS category of the HGM2 stream was determined as being 'Low' (D category). The stream has been significantly modified and little natural habitat remains. Therefore, there are no rare/endangered, vulnerable, or sensitive species.

The HGM2 stream assessed obtained a Seriously Modified 'E' PES and a Low 'D' EIS score which places it in the REC 'D' category which advocates the maintenance of the systems.

5.2.3 Aquatic Critical Biodiversity Areas & the Western Cape Biodiversity Spatial Plan (WCBSP).

According to the WCBSP (WC: DEA&P 2017), the proposed route is within Critical Biodiversity Areas. The proposed road route is within habitat classified as CBA1 Wetland on the western drainage line where the intersection is proposed. The small portion of CBA wetland changes to ESA 2 River/Wetland surrounding the existing culvert and may be indirectly impacted upon by disturbance upstream. The eastern drainage line contains ESA1 Aquatic habitat, the reach of the drainage line to be crossed by the proposed route is classified as ESA2 Wetland habitat. Therefore, according to the BSP, any remaining wetland habitat should be conserved with no further loss, and the degraded areas must be maintained, and where possible restored, to provide essential ecological functions.

5.2.4 National Freshwater Ecosystem Priority Areas (NFEPA's)

The National Aquatic Ecosystem Priority Areas (NFEPA) map provides strategic spatial priorities for conserving South Africa's aquatic ecosystems and supporting sustainable use of water resources.

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 South African National Wetlands Map (NWM5) provides information on the location, spatial extent and ecosystem types of estuarine and inland aquatic ecosystems (Van Deventer et al., 2018). The Freshwater Habitat Impact Assessment (2020) notes that The NWM5 indicates a channeled valley bottom wetland of the Albany Thicket bioregion within the study site. This is the system referred to as the western watercourse within the report. The database shows a D/E/F PES category indicating a degraded system. However, the wetland has a Critically Endangered Ecosystem Threat Status and lacks any formal protection. The eastern watercourse identified within this report is not mapped by the NWM5.

6. Legal Framework

6.1 The NEMA, Act No 107 of 1998, as Amended, and the EIA Regulations (2014) , (as amended 2017)

The National Environmental Management Act, 1998 (Act No. 107 of 1998) as per EIA Regulations, 2014 (as amended 2017), 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 the Environmental Impact Assessment Regulations, 2014 (as amended 2017), in terms of the Listing Notices G.N. 324, 325, 326 & 327 published on the 7th April 2017.

Due to the fact that this development proposal consists of activities listed in the EIA Regulations, Listing Notice 1 and 3, a Basic Assessment Process was required and the respective reports (Basic Assessment Report and Appendices) were submitted to the Department of Environmental Affairs and Development Planning (DEA&DP), for assessment, before the environmental authorization was issued to the applicant, Mossel bay local Municipality.

Table 3: Listed Activities in terms of the NEMA Environmental Impact Assessment Regulations (2014), as amended, that are proposed to be triggered and therefore require an application for Environmental Authorisation to be submitted to the DEA & DP

Activity #	Listing notice 1. Description of Activity as per GN No. R 327
19	<p>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;</p> <p>but excluding where such infilling, depositing, dredging, excavation, removal or moving—</p> <ul style="list-style-type: none"> (i) will occur behind a development setback; (ii) is for maintenance purposes undertaken in accordance with a maintenance management plan; (iii) falls within the ambit of activity 21 in this Notice, in which case that activity applies; (iv) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or (v) 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.
Activity #	Listing notice 3. Description of Activity as per GN No. R 324
4	<p>The development of a road wider than 4 metres with a reserve less than 13,5 metres.</p> <ul style="list-style-type: none"> i. Western Cape <ul style="list-style-type: none"> i. Areas zoned for use as public open space or equivalent zoning; ii. Areas outside urban areas; <ul style="list-style-type: none"> (aa) Areas containing indigenous vegetation; (bb) Areas on the estuary side of the development setback line or in an estuarine functional zone where no such setback line has been determined; or iii. Inside urban areas: <ul style="list-style-type: none"> (aa) Areas zoned for conservation use; or (bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority.
12	<p>The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.</p> <ul style="list-style-type: none"> i. Western Cape <ul style="list-style-type: none"> i. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that

	<p>has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004;</p> <p>ii. Within critical biodiversity areas identified in bioregional plans;</p> <p>iii. Within the littoral active zone or 100 metres inland from high water mark of the sea or an estuarine functional zone, whichever distance is the greater, excluding where such removal will occur behind the development setback line on erven in urban areas;</p> <p>iv. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning; or</p> <p>v. On land designated for protection or conservation purposes in an Environmental Management Framework adopted in the prescribed manner, or a Spatial Development Framework adopted by the MEC or Minister.</p>
Activity #	Listing notice 2. (GN No. R325): Scoping & Environmental Impact Reporting
N/A	N/A

Therefore, in summary, the following activities were applied for:

- Listing Notice 1: Activity No: 19;
- Listing Notice 3: Activity No: 4 and 12.

6.2 Other applicable legislation

The Mossel Bay Local Municipality is responsible for ensuring that all contractors, labourers and any other appointed person/entity acting on 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 requires a Water Use License (WUL) in terms of Chapter 4 and Section 21 (c) and (i) of the National Water Act No. 36 of 1998 and this must be secured prior to the commencement of construction. The following water uses have been identified for the project:

- Section 21 (c): Impeding or diverting the flow of a watercourse
- Section 21 (i): Altering the bed, banks, course, or characteristics of a watercourse

The findings of the Aquatic Risk Matrix Assessment undertaken show that due to impact significance being calculated as 'Medium' (after mitigation) the project cannot be authorised in terms of the GA (General Authorisation) for Section 21 (c) and (i) water use under this scenario and requires a full license application.

The above listed legislation has general applicability to most development applications, and it is the *Mossel Bay Municipality'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, namely: Planning and Design Phase; Pre-construction Phase; Construction Phase; Post-Construction Rehabilitation and Operational Phase, however it is not a phased project. 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 must 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 must conserve the natural environment, endorsing the principles of sustainable use and minimum impact. They must 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 must provide work or services of a quality and scope, and to a level, which are commensurate with accepted standards and practices.
- The engineer must be impartial in decision-making, provision of advice and judgement.

Contractors and sub-contractors

- Unless otherwise determined, only appropriately registered contractors must 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 of 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 construction activities, the contractor must remove all topsoil and store it in a berm of not more the 2m high, away from construction activities and sensitive environmental features, such as the watercourse.
- **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 must 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

Access to the development is proposed via Walvis Street, located to the East of the proposed site.

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 must 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 must 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 Walvis Street 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 construction closure period in December – January 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 must be scheduled for outside of peak traffic times.
- Ensure appropriate behaviour of operators of construction vehicles.

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. 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. Signage is to be erected informing the public of a construction site a prohibiting access beyond the fence line.

If desired or deemed necessary by the ECO, the outer boundary of the working area should be enclosed with, shade netting/cloth, droppers & wire, or similar – as feasible and practical. The fencing should be retained and maintained for the duration of the construction period, and should not be moved during construction unless agreed otherwise with the ECO. Areas to be cleared must be demarcated before any clearing and grubbing commences.

The corridor barrier should be set up with the following considerations in mind:

- Reinforced to withstand strong winds.

- Should be easy to spot (visual considerations), and signage.
- Stop any loose material excavated within the working corridor from crossing the barrier, especially downslope which could impact on the watercourse, as well as compromise the safety of any person or infrastructure, downslope of the working area.

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 either suitable material of natural colours, i.e. green or brown biddum, along with brightly coloured appropriate signage restricting access, OR utilize material that is eye-catching such as danger tape flagging (pieces of danger tape tied to twine or rope), 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. Signage should be positioned close to this area, restricting access.

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.

During the assessment process, no specific no-go areas have been identified however, it has been recommended that the areas of the watercourse and terrestrial vegetation, that fall outside of the existing working corridor, be considered no-go areas.

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, establishment and associated facilities

The set up and organisation of the site camp is paramount to ensuring compliance. An environmental file is to be created by the contractor and be situated within the site camp throughout the construction phase and with the applicant thereafter. The environmental file is to include the following;

- A copy of the Environmental Authorisation
- A copy of Water Use License or any other relative permits;
- A copy of the approved EMPr;
- Updated Waste slips (at least monthly);
- Updated disposal slips or cleaning slips (ablution cleaning which should occur at least fortnightly);
- All EMR's (Environmental Monitoring Reports) and ECO instructions;
- Engineering instructions related to environmental compliance.
- Copies of Environmental induction register/s
- A Complaints Register
- Updated method statements (prior to the commencement of the activity that requires a method statement)

- Any and all emergency procedure/s applicable to site activities
- An Incident Register

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 should be established on a relatively flat surface, given the undulating topography of the site. Areas designated for positioning of ablution facilities and storage areas should never be positioned on a sloped area and should be protected against wind disturbance (ie. Collapse due to heavy winds). Regardless of the height of stored materials (should not exceed 2m's), stockpiles should be thoroughly secured, particularly if left over night, within the site camp.

The site camp area must be secured to prevent any unauthorised 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. It should be noted that the site is adjacent to private properties as well as a school, the construction team must be aware that public movement, particularly to and from school, to ensure no incidents occur. Limit entry/exit points into the site camp and construction site, particularly where materials are stored, so as to control the movement of personnel.

A site register is recommended to record any daily visitors and activities, for record keeping purposes. In addition, taking into account the COVID 19 pandemic and required health restrictions and protective measures, it is advised that all personnel wear masks, and are provided with sanitizer on entry to the site. A register should be taken at the entrance, for both labour and visitors, and should include the full name, contact details and temperature checks. The security should advise all visitors and labour of the requirements.

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. **It is the opinion of the environmental consultant, that open fires and smoking should be prohibited on site.** However, it is noted that despite this, incidents may arise where fires are created after hours by security, and labour may attempt to smoke on site. In these cases, measures should be taken to ensure that activities are managed appropriately. Therefore, guidance on management of these incidents include:

Should a fire be created on site after-hours, the following procedure must be followed:

- Ensure that the security is aware that creating fires within the site is prohibited.
- Should he choose to create one beyond the demarcated area, he is solely responsible for the management.
- He/she should ensure that:
 - They utilize a metal barrel and contain the fire within, outside of the proposed site.
 - It may not be positioned close to any vegetation, no-go area, natural areas or flammable material.
 - Do not leave fire unattended.
 - Monitor and extinguish any embers that may escape.

Should the contractor choose to designate a smoking area within the site camp, of which the contractor is solely responsible for the management of this activity on site, and any incidents that may occur. The area should contain the following features, at the very least:

- Appropriate signage.
- A barrel/bucket filled to 50% capacity with sand, for disposal of used cigarettes.
- An appropriately weighted lid, that cannot be easily displaced by volatile weather conditions.
- The bin and designated area must be positioned in such a manner that it is not directly affected by heavy winds.
- This bin must be emptied as is necessary and must not be allowed to reach 75% capacity.

In the case of accidental fires, the contractor must (if required/significant) 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 must be located in such a way that they will present as little visual impact to surrounding residents and road users as possible. Sufficient signage and awareness must 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, bunded and clearly sign-posted area within the site camp away from the watercourses on site. Sufficient signage and awareness must be created to ensure that these bins are properly used.

8.3.5 Potable Water

An adequate supply of potable water must be provided to construction workers at the site camp.

8.3.6 Ablution Facilities

Chemical toilets must be kept at the site camp, 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 abluion facility for every 8 male workers and 2 abluion facilities for every 8 female workers will be provided.

Toilets must be placed at least 30m from any watercourse. The abluion 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. Performing abluions 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.

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 must 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 Search and Rescue

The search and rescue of bulbs and cuttings of succulents for use in the rehabilitation of disturbed areas along the road edge must be considered before clearing.

Search and rescue affected succulent and bulb species inside the construction area, such as the *Aloe ferox* population below the school site. Ensure that the latter be rescued with the roots intact. The searched and rescued plants must be replanted in the adjacent disturbed areas after completion of construction activities.

Rescued plants must be replanted into a nearby disturbed area of similar habitat or for open space rehabilitation. Rescued plants must be provided with sufficient water and handled in accordance with the botanist and ECO.

Once site boundaries are demarcated, the area to be cleared of vegetation will be surveyed under the supervision of the ECO in order to identify and remove faunal species suitable for rescue and relocation. Rescued fauna must be released into a nearby area of similar habitat away from any construction.

8.4.1 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, and 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.

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.
- A suitable weed management strategy to be implemented in construction and operation phases to eradicate and control regeneration.
- 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, 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.
- Vegetation outside of the construction footprint and within any no-go areas must not be cleared.
- Land clearing and earthmoving activities must not be undertaken during strong winds, where possible.
- Remove topsoil from the renosterveld/thicket areas to be disturbed and use it for the rehabilitation of disturbed areas after construction has been completed.
- Fence off the construction area in the renosterveld/thicket areas. Contain disturbance to the fenced-off construction area.

- Consider search and rescue of bulbs and succulents inside the construction area for use in the rehabilitation of disturbed areas.
- Control aliens as a long-term management requirement.

Species of conservation concern

- Search and rescue affected succulent and bulb species inside the construction area, such as the *Aloe ferox* (Figure 7) population below the school site. Ensure that the latter be rescued with the roots intact.
- The searched and rescued plants must be replanted in the adjacent disturbed areas after completion of construction activities.
- Consideration must be given to the rehabilitation of all disturbed areas outside the road and sidewalks, at the end of the construction phase.
- Alien invasive control will be required along the road reserves as an ongoing management requirement, into operational phase.



Figure 7: Aloe Ferox

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

- 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 must be replanted into a nearby disturbed area of similar habitat or for open space rehabilitation.
- An Environmental Control Officer will oversee compliance with all the prescribed environmental requirements and mitigation measures listed here and will be on site regularly.

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.

- Removed 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 placed in vegetated areas that will not be cleared.
- Stockpiles must not be located within 50 metres of the riparian zone.

- The topsoil berm may be a few meters wide but must ideally not be more than 2m high to allow light and air penetration.
- Removed subsoil must be stockpiled separately from topsoil.
- The topsoil & subsoil storage area must be located on a level bunded 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.
- 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, must 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.

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, by a registered cleaning company 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 must be further than 30m from watercourses.

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 must accompany the hazardous substances. Appropriate storage of hazardous substances is important while drip trays must always be utilised when decanting of hazardous substances and when refilling chemical/fuel storage tanks. If any spills do occur, the soil must be excavated and disposed of as hazardous waste.

8.8 Erosion control and stormwater management

A stormwater management plan is to be developed (by the engineer) with appropriate ecological input and be developed based on Sustainable Drainage Systems (SUDS). The SUDS systems attempt to maintain or mimic the natural flow systems as well as prevent the wash-off of urban pollutants to receiving waters. Baffles in the stormwater conduits are effective.

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 50 metres of the watercourse) 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. 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 must be ongoing during the construction phase and not left until the end of the construction period.

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 must 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 must 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 must 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.

On the steeper sections of the housing and road networks, it is recommended that the frequency of stormwater outlets is increased to prevent erosion at discharge points.

Stormwater design must allow for unhindered longitudinal flow through the structures and erosion protection downslope with energy dissipaters.

The HGM 1 watercourse has a flat valley bottom within which the active channel would naturally meander over time. Constructing one box culvert will restrict the lateral movement of the channel. It is usually best to construct a wider culvert to accommodate this; however, directly downstream the system becomes confined to the road culvert. Therefore, it is only upstream where the lateral movement of the channel must remain unrestricted within the valley floor. There is potential in this area to re-establish some of the wetland habitat (which could assist with water purification) if the incised channel bed is raised by the culvert inlet. When developing a stormwater management plan for the site, it will be critical that due consideration is given to the collection and treatment of stormwater prior to discharge into the natural environment.

8.9 Construction near a watercourse

The contractor needs to be mindful of the nearby watercourse. Only when construction is necessary, may this area be entered. No stockpiles are to be located within 50 metres of the watercourse and 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.

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. 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 roadside area must be maintained through alien invasive plant species removal and the establishment of indigenous vegetation cover to filter run-off before it enters the terrestrial and aquatic habitat.

A demarcated site at least 20 m away from water/riparian edge will be used for cement mixing. Where possible, construction activities must be conducted during the drier months of the year to minimise the possibility of erosion, sedimentation and transport of suspended solids associated with disturbed areas and rainfall events. Planning for such a situation must be undertaken.

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 must be protected from further disturbance (ideally left in situ) and the ECO and relevant Heritage Authority must 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.

There will be a change from an undeveloped, to a developed site. Alteration of the site will support a positive visual impact, as the site will be cleared of alien invasive species, and align with the surrounding development.

To minimise the potential visual impact during the construction phase, all working areas, storage facilities, stockpiles, waste bins, elevated tanks and the site camp must 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 must 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 a noise complaints register must 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 must 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 if necessary.

Noise levels must comply with the relevant health & safety regulations and SANS codes and must 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 must be provided with a suitable cover as soon as possible or wetted down. Construction vehicles must maintain low speeds of 20-40km/h on site 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:

- It is recommended by the Aquatic Specialist, that the BGCMA or an independent aquatic specialist visit the site, after construction but prior to the contractor leaving site, to ensure the rehabilitation fulfils the requirements, as advised by the
- 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 asphaltting 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.
- 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 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 ENVIRONMENTAL CONTROL OFFICER AND ENVIRONMENTAL AUDITOR

Impact Management Objective: To appoint a suitably qualified and experienced ECO and Environmental Auditor.		
Potential impact to avoid	Failure to appoint an ECO and Environmental Auditor 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
<ul style="list-style-type: none"> • A suitably qualified and experienced Environmental Auditor must be appointed before any activities commence on site. • A suitably qualified and experienced ECO 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. 	Mossel Bay Municipality	During design phase

<ul style="list-style-type: none"> 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. 		
Performance Indicator	A qualified ECO and Environmental Auditor 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 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: <ul style="list-style-type: none"> 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 environmental impact assessment process or may result in new impacts not previously assessed and not provided for in the EMPr, resulting in environmental degradation. Disturbance to the school. Disturbance to neighbouring properties. Disgruntled residents.
Impact Management Outcome	Development is compliant with recommendations of the EIA and the EMPr.

IMPACT MANAGEMENT ACTIONS

Mitigation measure	Responsible party	Time period
<ul style="list-style-type: none"> The final detailed design & layout must adhere to the conceptual layout assessed in the Environmental Impact Assessment process. The final detailed design & layout must adhere to any conditions of the Environmental Authorisation (EA). Stormwater infrastructure design must allow for unhindered longitudinal flow through the structures and erosion protection downslope with energy dissipaters. If the final detailed design differs significantly from that assessed during the Environmental Impact Assessment, the revised layout must be assessed by an Environmental Consultant and the received EA must be amended by the Competent Authority before proceeding. On the steeper sections of the housing and road networks, it is recommended that the frequency of stormwater outlets is increased to prevent erosion at discharge points. 	Consulting Engineer	During design phase



<ul style="list-style-type: none"> • Inlet protection measures to capture solid waste and debris entrained in storm water entering the storm water management system (inlet protection devices) will be incorporated into the design of the system and could include the use of either curb inlet/inlet drain grates and/or debris baskets/bags. • It is also important to note that storm water infrastructure will likely require regular on-going maintenance in the form of silt, debris/litter clearing in order to ensure their optimal functioning. They will therefore be designed to cater for regular maintenance. • Energy dissipaters must be installed to prevent scour at any culvert outlet. • Crossings must be constructed perpendicular to the natural direction of flow. • The existing sewer line and pipe bridge must not be structurally compromised in any manner. The existing sewer spillage must be investigated by the municipality and remedied. • Where possible, construction activities must be conducted during the drier months of the year to minimise the possibility of erosion, sedimentation and transport of suspended solids associated with disturbed areas and rainfall events. Planning for such a situation must be undertaken. • Align the proposed road directly next to the school boundary in order to minimise disturbance to good quality vegetation. <p><u>Crushing and removal of rock.</u></p> <ul style="list-style-type: none"> • Plan and identify safety measures to protect downslope environment from potential rock falls, or erosional activities. • Ensure that at each point, a safe work planning meeting must be held with the construction team, to determine the best and safest way to navigate the area based on site-specific conditions. • Have a safety/emergency protocol in place, and alert labour of this. • Ensure safety checks are conducted daily. • Ensure the correct plant is chosen in advance for all works, where modifications need to be made, ensure this is done. • No blasting, the utilization of explosive devices or material, is permitted on site, rock may only be removed by use of machinery, and labour (where possible). <p><u>Design Considerations.</u></p> <ul style="list-style-type: none"> • Signalise the Walvis Street intersection subject to a dedicated right turn lane being possible eastbound along Louis Fourie Road (into Walvis Street), alternatively the intersection should be a left in/left out only. If the intersection will be a left in/left out ultimately it should also be a left 		
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<p>in/left out for the interim (Louis Fourie Road as a two-lane road) and a median island be provided.</p> <ul style="list-style-type: none"> • Louis Fourie Road should be dualled by 2020. • Minor accesses between Park Crescent and Hall Street should be closed and access obtained via the Walvis Street Extension. • The sidewalk along the proposed Walvis Street Extension should be 2,4 metres on at least one side and surfaced. • That the sidewalk proposed along Louis Fourie Road be 2,4 metres on at least one side, preferably the southern side in order to also cater for pedestrians/cyclists between Walvis Street and the Boland Park intersection. • Public transport embayment's should be included as recommended by HATCH, in addition an embayment should be provided along Louis Fourie Road on the westbound carriageway (outbound) at the Walvis Street intersection. • If Walvis Street intersection is signalised, embayment's should be provided outbound along Louis Fourie Road on both carriageways at the intersection and provision be made at the intersection for pedestrians. • Provision of a speed hump along the proposed Walvis Street Extension just before the down grade starts as well as just before the relocated accesses. 		
<p>Performance Indicator</p>	<p>Detailed designs and site layout plans that adhere to the conditions of the EA and EMPr are finalised prior to the commencement of construction.</p>	

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:

- 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 & DEMARCATÉ NO-GO AND WORKING AREAS

Impact Management Objective: Identify and demarcate no-go areas, working areas and site facilities.

Potential impact to avoid	<ul style="list-style-type: none"> Degradation of the no-go areas during construction and operation, which include the aquatic buffer and public open space. An unnecessary increase in disturbance footprint. 		
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	
<ul style="list-style-type: none"> 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. 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. Site boundary to be demarcated. Any damage to existing infrastructure must be noted by the contractor with photo evidence. Any damage identified throughout the operational phase of the proposed extension will be the contractors responsibility to repair. Any damage to the surrounding environment (site camp location and outskirts of working corridor) must be noted by the contractor with photo evidence. Any damage identified throughout the operational phase of the proposed extension will be the contractors responsibility to repair. 	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 FACILITIES

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	<ul style="list-style-type: none"> An inadequate location for the site camp facilities may result in impacts to sensitive resources (e.g. contaminated run-off from refuelling area may flow into watercourse). 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.
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- Construction workers receive environmental awareness training before commencing work on site.

IMPACT MANAGEMENT ACTIONS

Mitigation measure	Responsible party	Time period
<ul style="list-style-type: none"> • 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. • Ensure that all relevant landowners are consulted. • Ensure written agreement is obtained and available. • Ensure safety precautions are observed at all times, particularly upslope of existing housing. • Ensure erosion and sedimentation mitigation measures are implemented. • Ensure project timeline, as communicated to the public, is strictly followed and concluded on time, so as not to cause additional disturbance. • Ensure that when work is taking place within close proximity or directly upslope of a residence, the residents are alerted, and work is restricted to appropriate times. 	Contractor	Start of construction phase

Performance Indicator	A pre-commencement site inspection is conducted by the appointed ECO before construction activities commence on site.
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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:

- Prevent soil erosion & sedimentation.
- Protection of Riparian vegetation.
- Protection of indigenous vegetation.
- Minimise flow modification.
- Prevent water pollution.
- Noise impact management.
- Visual impact management.
- Dust impact management.
- Creation of business & employment opportunities.
- Minimisation of the traffic.
- Minimise theft/vandalism.
- Reduce social 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: PROTECTION OF RIPARIAN VEGETATION.

Impact Management Objective: To ensure that the riparian vegetation is not significantly impacted on.		
Potential impact(s) to avoid	<ul style="list-style-type: none"> • Loss of viable vegetation, and fauna, allowing for the success of alien vegetation. • Reduction in riparian ecosystem function. • Erosion and sedimentation. • Possible burial of aquatic habitat, flora and fauna. • Alien vegetation encroachment. 	
Impact Management Outcome	Construction activities do not significantly impact on the riparian ecosystem.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
<ul style="list-style-type: none"> • A demarcated site at least 20 m away from water/riparian edge will be used for cement mixing. • Alien/ invasive species shall not be stockpiled, they must be removed from site and dumped at an approved site. A disposal slip must be obtained for record keeping purposes. • Construction personnel, equipment and materials must be limited to the minimal practical working area. • Construction workers and vehicles must be prevented from entering the watercourse. • Stockpiles must not be located within 50 metres of 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 • Soil contaminated by spilled oil/ fuel/ lubricant must be excavated and disposed of in the hazardous waste bin. • Use the smallest possible working corridor. • Outside the working corridor, all watercourses are to be considered no go areas. Any unnecessary intrusion into these areas is prohibited. • Where intrusion is required, the working corridor must be kept to a minimum and identified and demarcated clearly before any construction commences to minimise the impact. • The edges of the construction servitude zone within the vicinity of the freshwater habitat must be clearly staked-out and demarcated using highly visible material (e.g. danger tape) prior to construction commencing (and removed post-construction). 	Contractor	Construction phase
Performance Indicator	Riparian habitat is free of alien invasive species and is in a healthy state.	



11.2 OBJECTIVE 2: PREVENT SOIL EROSION AND SEDIMENTATION.

Impact Management Objective: To prevent soil loss on site and prevent increased turbidity / sediment load in watercourses.		
Potential impact(s) to avoid	<ul style="list-style-type: none"> • Decrease in the soil binding capacity and cohesion of the soils. • Formation of rills and gullies. • Increased concentrated runoff. • Reduced infiltration and increased surface runoff. • Soil compaction. 	
Impact Management Outcome	Soil erosion within the watercourses is kept to a minimum and the aquatic systems are not impacted significantly as a result of soil erosion.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
<ul style="list-style-type: none"> • 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. • Ensure photos are taken of the aquatic zone, prior to commencement of activities, to ensure that should alterations occur during construction, the area can be rehabilitated, appropriately. • 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. • Soil surfaces must not be left open for lengthy periods to prevent erosion. • Utilize silt fencing along the base of the demarcated buffer zone, so as to limit any runoff from entering this zone. • 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. • Land clearing, earth moving and construction activities should not take place during heavy rains, or windy conditions. • 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 50 metres of the watercourse). All stockpiling areas must be approved by the ECO before stockpiling occurs. • Stockpiles of topsoil & spoil material must be protected from wind & water erosion. 	Contractor	Construction phase



<ul style="list-style-type: none"> • 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. • 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. • Frequent, multiple stormwater outlets must be designed to prevent erosion at discharge points. Outlets should be in the form of multiple smaller storm water outlets rather than a few large outlets in order spread out surface flow and avoid flow concentration and erosion as far as possible. • On the steeper sections of the housing and road networks, it is recommended that the frequency of stormwater outlets is increased to prevent erosion at discharge points. • The existing sewer line and pipe bridge must not be structurally compromised in any manner. The existing sewer spillage should be investigated by the municipality and remedied. • The longitudinal gradient must not be altered in a way that results in erosion downstream or impoundment of flows upstream. • A demarcated site at least 20 m away from water/riparian edge will be used for cement mixing. <p><u>Diversions</u></p> <ul style="list-style-type: none"> • Diversions must be temporary in nature and no permanent walls, berms or dams may be installed within a watercourse. • Sandbags used in any diversion or for any other activity within a watercourse must be in a good condition, so that they do not burst and empty sediment into the watercourse. • Upon completion of the construction at the site, the diversions shall be removed to restore natural flow patterns. • Under no circumstance shall a new channel or drainage canals be excavated to divert water away from construction activities. • Crossings must be constructed perpendicular to the natural direction of flow. <p><u>Working Corridors</u></p> <ul style="list-style-type: none"> • Use the smallest allowable working corridor. • Outside the working corridor, all watercourses are to be considered no go areas. Any unnecessary intrusion into these areas is prohibited. 		
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<ul style="list-style-type: none"> • Where intrusion is required, the working corridor must be kept to a minimum and identified and demarcated clearly before any construction commences to minimise the impact. • The edges of the construction servitude zone within the vicinity of the freshwater habitat must be clearly staked-out and demarcated using highly visible material (e.g. danger tape) prior to construction commencing (and removed post-construction). 		
Performance Indicator	The water courses are not significantly impacted as a result of soil erosion.	

11.3 OBJECTIVE 3: PROTECTION OF INDIGINOUS VEGETATION.

Impact Management Objective: Protect and conserve the Indigenous Vegetation on site.

Potential impact(s) to avoid	<ul style="list-style-type: none"> • Disturbance or loss of intact vegetation. • Increased erosion. • Alien species infestation. • Damage to Renosterveld. • Reduced functionality of the CBA. • Loss of species of conservation concern
Impact Management Outcome	The loss of indigenous vegetation on site is minimised and results in no erosion.

IMPACT MANAGEMENT ACTIONS

Mitigation measure	Responsible party	Time period
<ul style="list-style-type: none"> • Demarcate/fence off the construction area. • Erect signage prohibiting access beyond fence line. • The labour should be educated on indigenous and alien species within the site, and surrounding site, as well as the importance and maintenance of the temporary fencing. • No clearing outside of development and infrastructure footprint area to take place. • Establish waste receptacles for the disposal of waste during construction. • Identify separate waste receptacles for different waste, identify/label each receptacle. • Ensure these waste receptacles are emptied before overflow. • If the receptacles are not being emptied by the local municipal services, a disposal slip must be obtained and filed in the Environmental File. • Remove topsoil from the renosterveld/thicket areas to be disturbed and use it for the rehabilitation of disturbed areas after construction has been completed. • Fence off the construction area in the renosterveld/thicket areas. Contain disturbance to the fenced-off construction area. 	Contractor	Construction phase



<ul style="list-style-type: none"> • Ensure signage is erected, specifically where sensitive vegetation/areas are adjacent to the working area. • Consider search and rescue of bulbs and succulents inside the construction area for use in the rehabilitation of disturbed areas. • Control aliens as a long-term management requirement. • Search and rescue affected succulent and bulb species inside the construction area, such as the <i>Aloe ferox</i> population below the school site. Ensure that the latter be rescued with the roots intact. The searched and rescued plants must be replanted in the adjacent disturbed areas after completion of construction activities. <p><u>Species of conservation concern</u></p> <ul style="list-style-type: none"> • Give consideration to the protection of <i>Haworthia chloracantha var. denticulifera</i> (an endangered succulent) and other threatened species by moving the proposed road closer to the school boundary, especially at the north-western corner of school site. If this cannot be achieved the significance will remain high. • Search and rescue affected succulent and bulb species inside the construction area, such as the <i>Aloe ferox</i> population below the school site. Ensure that the latter be rescued with the roots intact. • The searched and rescued plants must be replanted in the adjacent disturbed areas after completion of construction activities. • Consideration should be given to the rehabilitation of all disturbed areas outside the road and sidewalks, at the end of the construction phase. • Alien invasive control will be required along the road reserves as an ongoing management requirement, into operational phase. 		
<p>Performance Indicator</p>	<ul style="list-style-type: none"> • 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. 	

11.4 OBJECTIVE 4: MINIMISE POLLUTION OF WATERCOURSE

<p><u>Impact Management Objective: Maintain the water quality parameters.</u></p>		
<p>Potential impact(s) to avoid</p>	<ul style="list-style-type: none"> • Alteration of water quality parameters such as turbidity, nutrient levels, chemical oxygen demand and pH. • Alteration to the species composition of the systems. 	
<p>Impact Management Outcome</p>	<p>Water quality of the onsite watercourses are maintained at an acceptable level.</p>	
<p>IMPACT MANAGEMENT ACTIONS</p>		
<p>Mitigation measure</p>	<p>Responsible party</p>	<p>Time period</p>



<ul style="list-style-type: none"> • Stormwater infrastructure is duly maintained. • Outside the working corridor, all watercourses are to be considered no go areas. Any unnecessary intrusion into these areas is prohibited. • Where intrusion is required, the working corridor must be kept to a minimum and identified and demarcated clearly before any construction commences to minimise the impact. • A demarcated site at least 20 m away from water/riparian edge will be used for cement mixing. • Ensure acceptable waste receptacles are positioned on site. • Ensure waste is separated, and receptacles are labelled correctly. • Ensure that disposal of the waste collected, is to a registered disposal site, and a disposal slip is obtained, unless the waste is collected and removed by the municipality. • Ensure all receptacles have appropriate lids, that are heavy, and will not easily be displaced. • Ensure that if main receptacles are within the site camp, the labour is informed to only dispose of waste at the site camp and may not discard it into the open area. • Smallest working corridor used. • On the steeper sections of the housing and road networks, it is recommended that the frequency of stormwater outlets is increased to prevent erosion at discharge points. <p><u>Working Corridors</u></p> <ul style="list-style-type: none"> • Use the smallest possible working corridor. • Outside the working corridor, all watercourses are to be considered no go areas. Any unnecessary intrusion into these areas is prohibited. • Where intrusion is required, the working corridor must be kept to a minimum and identified and demarcated clearly before any construction commences to minimise the impact. • The edges of the construction servitude zone within the vicinity of the freshwater habitat must be clearly staked-out and demarcated using highly visible material (e.g. danger tape) prior to construction commencing (and removed post-construction). 	<p>Contractor</p>	<p>Construction phase</p>
<p>Performance Indicator</p>	<ul style="list-style-type: none"> • Watercourse remains in a healthy state of functioning. • No evidence of pollution. 	

11.5 OBJECTIVE 5: MINIMISE FLOW MODIFICATION.

<p><i>Impact Management Objective: Maintain the hydrological integrity of the watercourse.</i></p>	
<p>Potential impact(s) to avoid</p>	<ul style="list-style-type: none"> • Reduction in infiltration rates. • Increase in surface runoff volume and velocity.



	<ul style="list-style-type: none"> • 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	Hydrological integrity of the watercourse remains in its current state.				
IMPACT MANAGEMENT ACTIONS					
Mitigation measure	<table border="1"> <thead> <tr> <th data-bbox="1433 384 1825 421">Responsible party</th> <th data-bbox="1825 384 2157 421">Time period</th> </tr> </thead> <tbody> <tr> <td data-bbox="1433 421 1825 1407">Contractor</td> <td data-bbox="1825 421 2157 1407">Construction phase</td> </tr> </tbody> </table>	Responsible party	Time period	Contractor	Construction phase
Responsible party	Time period				
Contractor	Construction phase				
<ul style="list-style-type: none"> • Stormwater plan to be implemented (designed by engineers) • Frequent, multiple stormwater outlets must be designed to prevent erosion at discharge points. Outlets should be in the form of multiple smaller storm water outlets rather than a few large outlets in order spread out surface flow and avoid flow concentration and erosion as far as possible. • Inlet protection measures to capture solid waste and debris entrained in storm water entering the storm water management system (inlet protection devices) will be incorporated into the design of the system and could include the use of either curb inlet/inlet drain grates and/or debris baskets/bags. • Construction personnel, equipment and materials must be limited to the minimal practical working area. • Outside the working corridor, all watercourses are to be considered no go areas. • Crossings must be constructed perpendicular to the natural direction of flow. • The existing sewer line and pipe bridge must not be structurally compromised in any manner. The existing sewer spillage should be investigated by the municipality and remedied. • Stockpile loose material appropriately and avoid spillage. • Stockpiles must not be located within 50 metres of the riparian zone. • The furthest threshold must be adhered to. • 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. • The edges of the construction servitude zone within the vicinity of the freshwater habitat must be clearly staked-out and demarcated using highly visible material (e.g. danger tape) prior to construction commencing (and removed post-construction). • A demarcated site at least 20 m away from water/riparian edge will be used for cement mixing. • Vegetation removal must be avoided as far as possible. • Bare areas must be covered with geotextiles or revegetated to prevent sediments eroding into the watercourses. 					



<ul style="list-style-type: none"> • Remove any alien plant species within the working corridor. • Where large gaps in the riparian areas have resulted (i.e. where indigenous vegetation has been replaced by dense alien plant infestations), it is recommended that cover components be reinstated appropriately. • Only indigenous species are to be considered. • Diversions must be temporary in nature and no permanent walls, berms or dams may be installed within a watercourse. • Sandbags used in any diversion or for any other activity within a watercourse must be in a good condition, so that they do not burst and empty sediment into the watercourse. • Upon completion of the construction at the site, the diversions must be removed to restore natural flow patterns. • Under no circumstances shall a new channel or drainage canals be excavated to divert water away from construction activities. • Stockpiles must not be located within 50 metres of the riparian zone. <p><u>Vegetation</u></p> <ul style="list-style-type: none"> • Vegetation removal must be avoided as far as possible. • Bare areas must be covered with geotextiles or revegetated to prevent sediments eroding into the watercourses. • Remove any alien plant species within the working corridor. • Where large gaps in the riparian areas have resulted (i.e. where indigenous vegetation has been replaced by dense alien plant infestations), it is recommended that cover components be reinstated appropriately. • Only indigenous species are to be considered. 		
<p>Performance Indicator</p>	<ul style="list-style-type: none"> • Watercourse remains in a healthy state of functioning. • No evidence of erosion. 	

11.6 OBJECTIVE 6: NOISE IMPACT MANAGEMENT.

<p><i>Impact Management Objective: To control avoidable noise impacts to the surrounding areas</i></p>	
<p>Potential impact(s) to avoid</p>	<ul style="list-style-type: none"> • 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
<p>Impact Management Outcome</p>	<p>Management of noise emissions to an acceptable level.</p>
<p>IMPACT MANAGEMENT ACTIONS</p>	



Mitigation measure	Responsible party	Time period
<ul style="list-style-type: none"> • A noise complaints register should be opened. • 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. • 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 they 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. • 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. 	Contractor	Construction phase
Performance Indicator	Noise levels on site remain within acceptable standards. No valid noise complaints are received.	

11.7 OBJECTIVE 7: 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	<ul style="list-style-type: none"> • 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
<ul style="list-style-type: none"> • 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. 	Contractor	Construction phase



<ul style="list-style-type: none"> • 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. • 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. 		
Performance Indicator	<ul style="list-style-type: none"> • Good "housekeeping" is evident on site. • The site does not pose a visual impact to surrounding community. 	

11.8 OBJECTIVE 8: DUST IMPACT MANAGEMENT.

Impact Management Objective: To prevent the generation of significant dust.		
Potential impact(s) to avoid	<ul style="list-style-type: none"> • Dust may cause a nuisance to the surrounding residents. • Dust may smother surrounding vegetation. • Decreased visibility for labourers and operators. 	
Impact Management Outcome	The surrounding environment, land users, residents do not experience significant dust-related impacts.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
<ul style="list-style-type: none"> • 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. 	Contractor	Construction phase



<ul style="list-style-type: none"> • 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 area 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. • 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. • No blasting, the utilization of explosive devices or material, is permitted on site, rock may only be removed by use of machinery, and labour (where possible). <p><u>Crushing of rock.</u></p> <ul style="list-style-type: none"> • Ensure that all personnel involved in activity, is able to communicate easily, and therefore can offer guidance and warnings if necessary. 		
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<ul style="list-style-type: none"> Utilize radios between labourers, obtain signage, and erect at appropriate areas, cautioning people on potential incidents. Be mindful of surrounding community, particularly close proximity to school and school schedule (movement of kids in and out of school) and reduce noise and dust levels where possible. Alert school of activities that are excessively loud etc. Stockpile on levelled surfaces, away from any sloped area. Ensure stockpiles are appropriately banded. Ensure no stockpiles, particularly of soil and rock material, are left unattended overnight. Monitor weather conditions and plan ahead, to avoid leaving stockpiles and loose materials in bad weather. 		
<p>Performance Indicator</p>	<ul style="list-style-type: none"> Excessive dust does not arise from the site. No dust complaints are received from any member of the public. There is no evidence that vegetation surrounding the site is being smothered by dust. 	

11.9 OBJECTIVE 9: CREATION OF BUSINESS & EMPLOYMENT OPPORTUNITIES.

<p>Impact Management Objective: To create employment opportunities with potential for skills transfer, for members of the local community.</p>		
<p>Potential impact(s) to be promoted.</p>	<ul style="list-style-type: none"> Labourers (skilled and unskilled), will be able to earn a living. Labourers (skilled and especially unskilled) can improve/build their skills. Improved quality of life for these labourers, by establishing an income. 	
<p>Impact Management Outcome</p>	<p>The local community benefits from the employment opportunities created during the construction phase.</p>	
<p>IMPACT MANAGEMENT ACTIONS</p>		
<p>Mitigation measure</p>	<p>Responsible party</p>	<p>Time period</p>
<ul style="list-style-type: none"> Mossel Bay municipality should inform local community leaders, organizations and councillors of the project and the potential job opportunities for local builders and contractors. 	<p>Mossel Bay municipality/ Contractor</p>	<p>Construction phase</p>
<p>Performance Indicator</p>	<p>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.</p>	

11.10 OBJECTIVE 10: MINIMISE THEFT/VANDALISM

<p>Impact Management Objective: To ensure continued safety on site during the construction phase.</p>	
<p>Potential impact(s) to avoid</p>	<ul style="list-style-type: none"> Loss of materials. Additional costs to replace stolen materials.



Impact Management Outcome	The functioning of the site remains efficient and the state of the infrastructure isn't hampered. The safety of surrounding land occupiers and construction site remains intact.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
<ul style="list-style-type: none"> • Ensure there is security positioned at the site, overnight. • Ensure that the site camp is fenced, and materials are demarcated in specific areas, the site camp should be limited to a single entry and exit, that can be locked overnight, and materials should not be left exposed overnight, outside of the site camp. • Ensure all demarcations are checked every day, so as to identify any issues immediately, and address them before incidents occur. • Report incidents of theft etc, to ECO. • Ensure that the labour stays vigilant during work and reports any unusual behaviour. • Ensure that there is open communication with the public, and the public liaisons contact details are available. • Ensure that labour is sourced from the local community. 	Contractor	Construction phase
Performance Indicator	<ul style="list-style-type: none"> • Site remains safe and theft is avoided. 	

11.11 OBJECTIVE 11: MINIMISATION OF THE TRAFFIC

<i>Impact Management Objective: To ensure continued safety on access roads during the construction phase.</i>		
Potential impact(s) to avoid	<ul style="list-style-type: none"> • Accidents may occur due to impatient or negligent drivers. • Congestion and delays. 	
Impact Management Outcome	The functioning of the surrounding road network remains efficient and the state of the infrastructure isn't hampered. The safety of surrounding land occupiers and construction site remains intact.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
<ul style="list-style-type: none"> • 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. • Speed of construction vehicles and other heavy vehicles must be strictly controlled to avoid dangerous conditions for other road users. • 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. 	Contractor	Construction phase



<ul style="list-style-type: none"> • 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. • Where possible, construction traffic that may obstruct traffic flow on the surrounding roads should be scheduled for outside of peak traffic times • Provision must be made to ensure children are able to cross Trekker Road safely, in the form of dedicated raised pedestrian crossings. • 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. 		
<p>Performance Indicator</p>	<ul style="list-style-type: none"> • The surrounding road networks infrastructure remains in its current state. • Limited congestion and traffic. 	



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.
- Prevention of flow modification.
- Reduced erosion & sedimentation.
- Reduce water pollution.
- Reduce visual impact.
- Reduced traffic.
- Creation of Business and Employment Opportunities.

12.1 OBJECTIVE 1: SITE CLOSURE & REHABILITATION

Impact Management Objective: To rehabilitate all areas disturbed by construction activities in an environmentally sensitive manner.		
Potential impact(s) to avoid	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • The site is neat and tidy and 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
<ul style="list-style-type: none"> • Construction must be immediately followed by rehabilitation. • 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. • Surfaces are to be checked for waste products from activities such as concreting or asphaltting and cleared in a manner approved by the ECO. • Any contaminated soil must be collected and disposed of as hazardous waste. 	Contractor	Construction phase

<ul style="list-style-type: none"> • 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. • The landscape profile must be restored, as closely as possible, to the original land form prior to construction. For example, the pre-construction gradient of the river must be reinstated as accurately as possible, without humping or hollowing over the construction right of way so as to limit erosion. • Erosion features that have developed due to construction within the aquatic habitat due to the project are required to be stabilised. • Control aliens on and around the site as a long-term management requirement. • Prohibit further waste dumping in the area. • Consider search and rescue of bulbs and cuttings of succulents for use in the rehabilitation of disturbed areas on the roadside edge. • Prior to rehabilitation the ECO should ensure that all identified invasive species, weeds, and foreign material (including waste), should be cleared from site and disposed of at a registered landfill site. 		
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<ul style="list-style-type: none"> • Where necessary weeds should be treated with an acceptable herbicide, with no residual effects (can be recommended by Specialist/ obtain from local nursery). • Site should be ripped/scarified (no more than 50mm apart) to approximately 50mm – 100mm depth. • Turf/seed mix, as recommended by Specialist or sourced from local nurseries under the guidance of the appointed ECO, should be mixed with topsoil and by means of manual labour, spread evenly across the exposed area. • The ECO must inspect the watercourse prior to closure of site, and ensure that alien invasive species are removed, and indigenous vegetation is successfully established. • Ensure the soil is kept moist immediately after application of the seed. • Monitoring of site for germination and regrowth is required. • Monitoring of establishment and manual removal of weeds should be undertaken. Where possible, an acceptable herbicide may be used. • The Contractor should implement an effective alien plant removal and control programme 14 days prior to close out. • Where large gaps in the riparian areas have resulted (i.e. where indigenous vegetation has been replaced by dense alien plant infestations), it is recommended that cover components be reinstated appropriately. • Only indigenous species are to be considered. • Any damage to existing infrastructure will be the contractors responsibility to repair. <p><u>Alien Invasive Establishment</u></p> <ul style="list-style-type: none"> • It is the applicant responsibility to continuously monitor the area for newly established alien species. • The riparian area must be maintained through alien invasive plant species removal and the establishment of indigenous vegetation cover to filter run-off before it enters the freshwater habitat. • Removal of indigenous vegetation must only be when essential for the continuation of the project. • Any use of herbicides in removing alien plant species is required to be investigated by the ECO before use, for the necessity, type proposed to be used, effectiveness and impacts of the product on aquatic biota. 		
<p>Performance Indicator</p>	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> Loss of aquatic habitat within the watercourse areas. Establishment of alien invasive species within the riparian zone. Erosion within the riparian habitat 	
Impact Management Outcome	<ul style="list-style-type: none"> Minimal loss of Aquatic Habitat and Associated Biota 	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
<ul style="list-style-type: none"> The riparian area must be maintained through alien invasive plant species removal and the establishment of indigenous vegetation cover to filter run-off before it enters the freshwater habitat. Any bypass roads or working areas must be fully rehabilitated to the preconstruction condition. Stormwater infrastructure must be monitored to ensure that it is functioning at optimal level, and there are no blockages etc. The riparian area must be maintained through alien invasive plant species removal and the establishment of indigenous vegetation cover to filter run-off before it enters the freshwater habitat. The landscape profile must be restored, as closely as possible, to the original land form prior to construction. For example, the pre-construction gradient of the river must be reinstated as accurately as possible, without humping or hollowing over the construction right of way so as to limit erosion. 	Developer	Operational phase
Performance Indicator	<ul style="list-style-type: none"> 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: PREVENTION OF FLOW MODIFICATION.

Impact Management Objective: No Impairment of Surface Water Quality		
Potential impact(s) to avoid	<ul style="list-style-type: none"> Deteriorated aquatic habitat. Increased erosion. Loss of ecosystem functioning. 	
Impact Management Outcome	<ul style="list-style-type: none"> No impairment of surface water quality as a result of the development. 	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
<ul style="list-style-type: none"> The stormwater management infrastructure must be designed to ensure the runoff from the 	Developer	Operational phase



<p>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.</p> <ul style="list-style-type: none"> 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. Vegetate the downslope side of the site, and potentially brushpacking of <i>Prosopis</i> on the slope between the river and fence, will assist with this. Utilize indigenous vegetation, particularly types of shrub, along the Eastern fence line of the site, to create a barrier that will allow runoff velocities to be reduced. This couples as an aesthetically appealing barrier for landscaping purposes. Stormwater will be collected and dispersed by means of a proposed stormwater berm towards the East of the site, channeling run-off to an existing low-lying disturbed area which the Engineers propose to be formalized into a stormwater detention area. 		
<p>Performance Indicator</p>	<ul style="list-style-type: none"> No visible signs of erosion. Aquatic ecosystem remains healthy and functioning. 	

12.4 OBJECTIVE 4: REDUCED EROSION & SEDIMENTATION.

<p><i>Impact Management Objective: Reduced impact on aquatic features caused by erosion & sedimentation.</i></p>		
<p>Potential impact(s) to avoid</p>	<ul style="list-style-type: none"> Increased sedimentation of downstream watercourses as a result of soil erosion problems and bank instability. Creation of preferential flow paths. 	
<p>Impact Management Outcome</p>	<ul style="list-style-type: none"> Prevention of excessive sediment entering the watercourse. 	
<p>IMPACT MANAGEMENT ACTIONS</p>		
<p>Mitigation measure</p>	<p>Responsible party</p>	<p>Time period</p>
<ul style="list-style-type: none"> 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. This may also include the need to deactivate any erosion headcuts/rills/gullies that may have developed. The landscape profile must be restored, as closely as possible, to the original land form prior to construction. For example, the pre-construction gradient of the river must be reinstated as accurately as possible, without humping or hollowing over the construction right of way so as to limit erosion. 	<p>Developer / consulting engineer</p>	<p>Operational phase</p>



Performance Indicator	<ul style="list-style-type: none"> There is no evidence of erosion and the watercourse remains healthy.
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12.5 OBJECTIVE 5: REDUCE VISUAL AND NOISE IMPACT.

Impact Management Objective: Reduce the visual impact caused by the proposed extension.

Potential impact(s) to be avoided.	<ul style="list-style-type: none"> Traffic noise become a nuisance for surrounding residents, particularly for the school, during peak hours. Roadside vegetation harvests alien vegetation and promotes growth establishment thereof. Road users litter waste contaminates the environment.
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Impact Management Outcome	<ul style="list-style-type: none"> Sense of place for the area is maintained. Environment remains in tact.
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IMPACT MANAGEMENT ACTIONS

Mitigation measure	Responsible party	Time period
<ul style="list-style-type: none"> The state of the roadside vegetation is to be in an orderly fashion, free of litter and well represented. Collection of litter must be maintained. Waste management programs with the local community to be encouraged to promote environmental awareness (litter collections) Infrastructure should be maintained (repair potholes and ensure road markings are maintained. Provide greenery by planting rescued plants along the outskirts of the road. Erect signage identifying the school location and discourage hooting and speeding. 	Mossel Bay Municipality.	Operational phase

Performance Indicator	<ul style="list-style-type: none"> The new road is well maintained, functional and respectful of its environment.
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12.6 OBJECTIVE 6: REDUCE WATER POLLUTION.

Impact Management Objective: Prevent road debris, litter, and contaminants, including sand, silt, and dirt particles, from entering storm water runoff and pollute the river.

Potential impact(s) to be avoided.	<ul style="list-style-type: none"> Road debris, litter, and contaminants, including sand, silt, and dirt particles, will enter storm water runoff and pollute the river.
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Impact Management Outcome	<ul style="list-style-type: none"> Watercourse remains in a healthy state with all parameters within the accepted standards.
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IMPACT MANAGEMENT ACTIONS

Mitigation measure	Responsible party	Time period
<ul style="list-style-type: none"> Erect signage detailing prohibited activities. Ensure that there is only one access point. The caretaker should have the contact information for emergency services, and enforcement, as well as the means to report any suspicious activities. 	Mossel Bay Municipality	Operational phase



<ul style="list-style-type: none"> Consider fitting boreholes established for water monitoring, with borehole monitoring caps, to secure them while on site. Use of unutilised areas within the extent as a green space. 		
Performance Indicator	<ul style="list-style-type: none"> No evidence of vandalism and no breaches of safety occur. 	

12.7 OBJECTIVE 7: REDUCE TRAFFIC PREVENT POSSIBLE ROAD DAMAGE

Impact Management Objective: Creation of Business and Employment Opportunities		
Potential impact(s) to be avoided.	<ul style="list-style-type: none"> Excessive traffic along Louis Fourie Road. Increased Carbon emissions. Reduced safety. Employees earn salaries that will contribute to their quality of life. Increased noise levels from traffic movement, at peak hours. 	
Impact Management Outcome	<ul style="list-style-type: none"> Creation of Business and Employment Opportunities. 	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
<ul style="list-style-type: none"> Ensure that sufficient signage and road markings are incorporated into road design, including speed limits, indication of school, speed humps and pedestrian crossings, etc. Adequate pedestrian crossings and speed humps should be established, considering the position of the road within an urban area and close to an existing school. Public transport embankments should be completed as per the Traffic Impact Assessment. Ensure that all resurfacing of disturbed areas, does occur, including all roads that may have been damaged to an extent where quality of road surface is compromised. 	Mossel Bay Municipality	Operational phase
Performance Indicator	<ul style="list-style-type: none"> Flow of traffic along Louis Fourie Road. Road surface in a good condition. Road is safe to walk along. 	



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, and 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 Construction Contractor or the Holder of the EA 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.
- 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 EA Holder.

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).
- Any damage to the surrounding environment (site camp location and outskirts of working corridor) must be noted by the contractor with photo evidence. Any damage identified throughout the operational phase of the proposed extension will be the contractor's responsibility to repair.

- 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 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 Environmental Auditor, 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 EO (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;
- Examine method statements, where required;
- Furnish contractors with verbal warnings through the Holder / Engineer 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;

- Keep detailed records of all site activities that may pertain to the environment, and produce compliance-monitoring reports / Environmental Monitoring Reports (EMR) for submission to the Holder, and the Competent Authority at regular intervals during the construction phase;
- All EMR Reports and Inspection Reports must be submitted to the Holder and Competent Authority, where required.

15.3.3 Frequency of ECO visits

The ECO must conduct weekly to fortnightly site visits during the construction phase, in addition to the start-up and closure inspections. It is recommended that monitoring be undertaken at least twice a week during any significant work in the rivers.

The ECO must conduct a site visit 3 months after practical completion of the construction period.

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.

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 report incidents of non-compliance to the Competent Authority at any time.

15.4 Environmental Auditor

An environmental auditor is to be appointed by the applicant. As per Section 34 of the EIA Regulations (GN R326 of 2017), the duty of an Environmental Auditor is to be independent and is responsible for:

- Ensuring compliance with the conditions of the environmental authorisation and the EMPr; and
- Submit an environmental audit report to the relevant competent authority, which provides verifiable findings, in a structured and systematic manner, as per Appendix 7 of GN R326.

The Environmental auditor must undertake an audit as per Appendix 7 of GN R326 at the following stages;

- At 50% completion of the project timeline.
- At practical completion of the construction period.
- 3 months after practical completion of the construction period.

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 where required).

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 **not** be the appointed ECO.

The appointed auditor is to be provided with the completed EMR's and Checklists, as well as any other crucial information that may be relevant or requested (incident report, waybills etc.) to effectively report on the level of compliance with the conditions of the environmental authorisation and the EMPr. The appointed auditor must undertake environmental audits at the following stages;

- At 50% completion of the project timeline.
- At practical completion of the construction period.
- 3 months after practical completion of the construction period.
- Once a year, for the following 5 years after practical completion of the construction period.
- Or 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 on practical completion of the project.

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 must comply with the environmental specifications and requirements on an ongoing basis and any failure on his part to do so will entitle the ECO recommend a penalty / fine as described in the following section.

The following fine structure shall apply:

Table 4: 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 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

Environmental Management Programme

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.

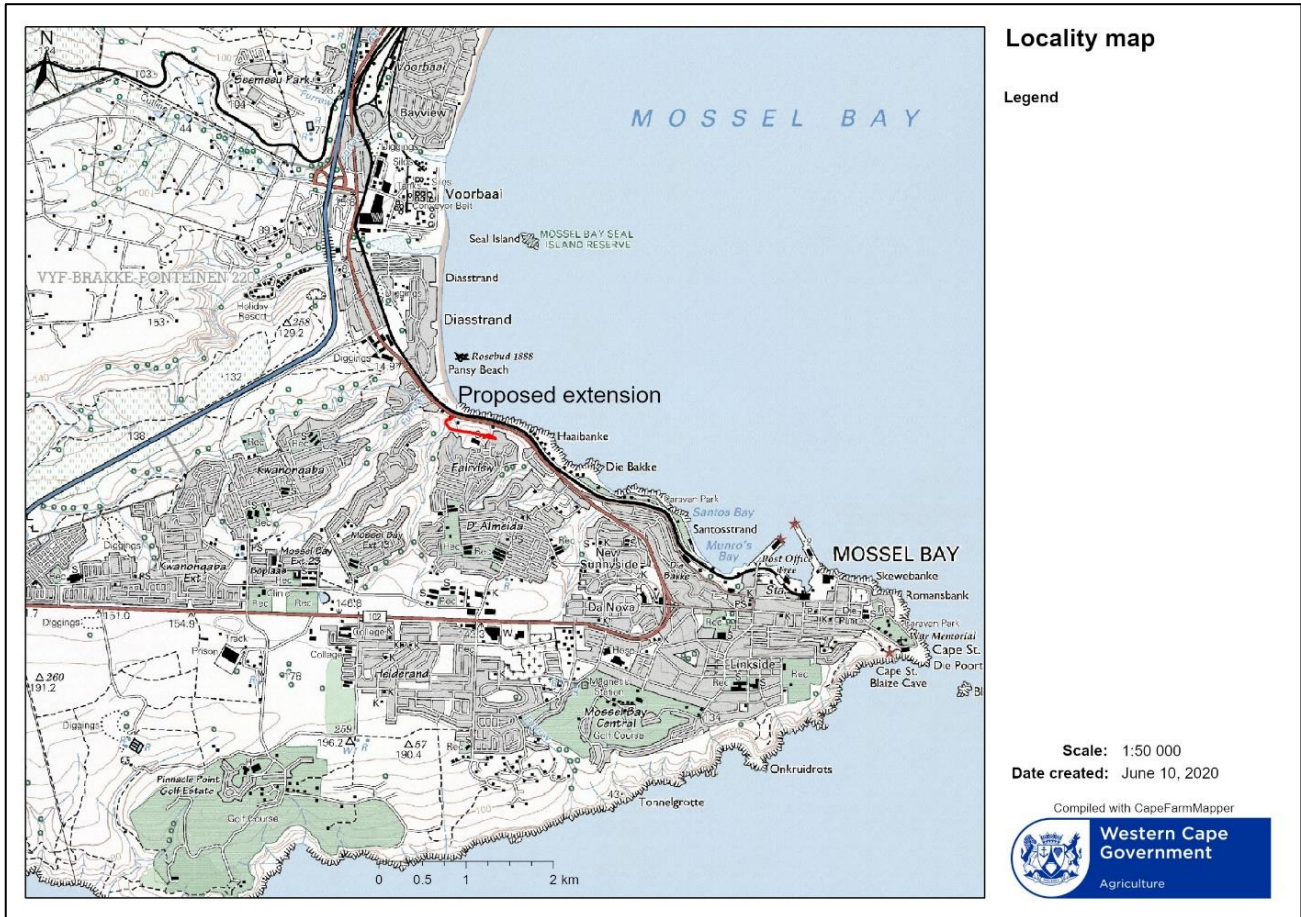
19. Conclusion

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.



Appendix A: Location Maps



Appendix B: Site layout plan



CURRICULUM VITAE

AMEESHA SANKER

PERSONAL

Profession: Environmental Assessment Practitioner, Sharples Environmental Services cc, Cape Town.

Nationality: South African

Date of Birth: 27 December 1990

Languages: English (read, write and speak) - Fluent

Marital Status: Single

Drivers' License: Code B

Health: Excellent

WORK EXPERIENCE

March 2020 – Present: Sharples Environmental Services cc, Cape Town, WC

Environmental Assessment Practitioner

- Basic Assessments Reports
- Amendment Applications
- Administration.

July 2014 – March 2020: Dartingo Consulting Engineers (Pty) Ltd, Durban, KZN

Part-time GIS Technician

- Management and compilation of GIS database.
- Layout/map creation.

June 2013– March 2020: EnAq Consulting.cc

Environmental Assessment Practitioner

- Basic Assessment Applications
- Water Use License Applications
- Environmental Monitoring/Auditing
- Stakeholder Engagement
- Reporting
- Environmental Management Plans
- Public /Contractor Awareness Training
- Biodiversity Offsets
- Rehabilitation and Protected Areas
- Project Management
- GIS management
- Administration

TERTIARY EDUCATION

2019: UNISA

- Bachelor of Science Honours Degree specialising in Environmental Management.

2014: University of Kwa-Zulu Natal

- Bachelor of Science Degree specialising in Geological Science (Engineering and Environmental).

PROJECTS

Sharples Environmental Services.cc

2020-George Groenkloof Ontwikkelings (Pty) Ltd

- Partial completion of the Amendment for the Proposed Development of a Retirement Village and Associated Infrastructure on Portion 3 of the Farm Kraaibosch 195, George, Western Cape.

2020-Wittedrift The Home Market NPC

- Completion of the Basic Assessment Report for the Proposed Retirement Village and Service Infrastructure on Erf 103, 104 and a Portion of Rotterdam Street, Wittedrift, Bitou Municipal Area, Western Cape.

2020-Mossel Bay Mossel Bay Local Municipality

- Basic Assessment Report for the Proposed Construction of Walvis Street, Western Cape.

2020-Beaufort West Beaufort West Local Municipality

- Basic Assessment Report for the Expansion of the Existing "Goue Akker" Cemetery in Beaufort West, Beaufort Local Municipality, Western Cape.

2020-Melkhoutfontein Hessequa Local Municipality

- Basic Assessment Report for the Expansion of the Existing Melkhoutfontein Cemetery on ERF 566 and portion 141/480, Hessequa Local Municipality, Western Cape.

2020-Umzimkhulu Leratong Victim Empowerment Co-operative Ltd.

- Basic Assessment Report for the Construction of a Roof Sheeting Factory, Umzimkhulu Local Municipality, KwaZulu-Natal.

Previous Employment (2013 – 2020)

Margate Ugu District Municipality

- BAR, WULA, GIS and ECO for the Proposed Southern Mains Bulk Water Upgrade: Gamalakhe to Margate, Ugu District Municipality, KZN.

Port Shepstone Ray Nkonyeni Local Municipality

- Project screening, assistance with BAR preparation, public participation, GIS and ECO for the proposed Acacia Road Storm Water Network Update, Ray Nkonyeni Local Municipality, KZN.

Ixopo Harry Gwala District Municipality
▪ Project screening, assistance with BAR preparation, and GIS for the Upgrade of Ixopo Sewer Network, Harry Gwala District Municipality, KZN.

KwaDukuza KwaDukuza Local Municipality
▪ Project screening, EMPr preparation and ECO for the KwaDukuza Beach Upgrades: Life-Guard and Ablution Facilities, KwaDukuza Local Municipality, KZN.

KwaDukuza KwaDukuza Local Municipality
▪ Project screening, EMPr preparation and ECO for the A/C Mains Replacements, KwaDukuza Local Municipality, KZN.

Mzumbe Mzumbe Local Municipality
▪ Project screening, BID and Public Participation for the Proposed Mzumbe Access Road Upgrades, Mzumbe Local Municipality, KZN.

uMtumvuna Ray Nkonyeni Local Municipality
▪ Project screening, Public Participation and BID for the Proposed uMtumvuna Water Treatment Works Upgrade, Ray Nkonyeni Local Municipality, KZN.

Mkholombe Ray Nkonyeni Local Municipality
▪ Project screening for the Proposed Upgrade of Mkholombe Sewer Network Upgrade, Ray Nkonyeni Local Municipality, KZN.

Phoenix Ethekewini Municipality
▪ Project screening, Assistance with the initiation of the Section 24G for the Viewhaven Housing Development, Ethekewini Municipality, KZN.

Margate Ugu District Municipality
▪ Project screening, and application for Amendment to the Margate Sewer Pipeline Replacement: Upgrade of Pump Station 3A and the Augmentation of Margate Effluent Main, Part 1 & 2, Ugu District Municipality, KZN.

Ballito Siza Water
▪ Project screening, initiation of BID and WULA for the Ballito Hills Water and Sanitation, KwaDukuza Local Municipality, KZN.

Mzumbe Umzumbe Local Municipality
▪ Project screening for the Proposed Construction of Ward 20 Community Hall, Umzumbe Local Municipality, KZN.
▪ Project screening for the Proposed Construction of R102 Bus Shelters, Umzumbe Local Municipality, KZN.
▪ Project screening for the Proposed Construction of Dweshula Community Hall, Umzumbe Local Municipality, KZN.

LLOYD BARNES

<p>PERSONAL</p> <p>Profession: Environmental Assessment Practitioner, Sharples Environmental Services cc, Cape Town.</p> <p>Nationality: South African</p> <p>Date of Birth: 10 November 1994</p> <p>Languages: English (read, write and speak) - Fluent</p> <p>Marital Status: Single</p> <p>Drivers License: Code B</p> <p>Health: Excellent</p>
<p>WORK Experience</p> <p>April 2019 – Present: Sharples Environmental Services cc Environmental Assessment Practitioner</p> <ul style="list-style-type: none"> ▪ EMPr's ▪ Basic Assessments Reports ▪ Amendment Applications ▪ Administration. <p>Jan-March 2017 & December 2018 – April 2019: NCC Environmental services -Environmental Control Officer and junior EAP</p> <ul style="list-style-type: none"> • Report writing. • Compilation of the Great Fish Nature Reserve Protected Area Management Plan. • Administration and operations of the Guttural toad and Mallard duck programs. <p>October 2018-December 2018: EOH Coastal and Environmental Services-Junior Environmental Assessment Practitioner.</p> <ul style="list-style-type: none"> • Map making (Arc GIS and QGIS), preparing proposals, BID's, PPP documents, scoping reports and NOI's. • ECO work, creating I&AP data bases, and Environmental Authorization applications. • I was included in a team of EAPs who travelled to Malawi for a month to complete a Socio-Economic Audit. October 2018-December 2018. <p>January 2018- October 2018: Junior Environmental Assessment Practitioner.</p> <ul style="list-style-type: none"> • Drafting Integratwed Waste Water Management Programmes's, EMP's, NID's and the compilation of WULA's. • Environmental Auditing. <p>Dust monitoring, map making, facilitating public participation and general project administration.</p>
<p>Tertiary Education</p> <p>2016: Cape Peninsula University of Technology</p> <ul style="list-style-type: none"> • Bachelor's Degree in technology in Environmental Management



2015: Cape Peninsula University of Technology

- National Diploma in Environmental Management

Projects

Sharples Environmental Services.cc

2020-George Groenkloof Ontwikkelings (Pty) Ltd

- Contribution towards the proposed Amendment for the Proposed Development of a Retirement Village and Associated Infrastructure on Portion 3 of the Farm Kraaibosch 195, George, Western Cape.

2020-Wittedrift The Home Market NPC

- Contribution towards the completion of the Basic Assessment Report for the Proposed Retirement Village and Service Infrastructure on Erf 103, 104 and a Portion of Rotterdam Street. Wittedrift, Bitou Municipal Area, Western Cape.

2020-Mossel Bay Mossel Bay Local Municipality

- Contribution towards the Basic Assessment Report for the Proposed Construction of Walvis Street, Western Cape.

2020-Beaufort West Beaufort West Local Municipality

- Contribution towards the Basic Assessment Report for the Expansion of the Existing "Goue Akker" Cemetery in Beaufort West, Beaufort Local Municipality, Western Cape.

2020-Sedgefield Knysna Local Municipality

- Compilation of NOI, EMPr and BAR

2020- Kranshoek Status Homes Property Developers

- Compilation of EMPr

2020- Knysna Knysna Local Municipality

- Maintenance Management Plan.

2019- Milnerton City of Cape Town

- ECO for the destruction of biofilters

2019- Mossel Bay Mossel Bay Municipality

- Notice of intent.

Previous Employment (2016 – 2019)

Harrismith quarry- KZN

- Water Use License Application

Ulundi quarry- KZN

- Water Use License Application

Multiple quarries-Gauteng

- Environmental Performance Assessment of over 20 quarries

Lilongwe, Malawi

- MCA Malawi Resettlement Action Plan Audit: Completion Audit Report- Auditor

Great Fish Nature Reserve- Eastern Cape

Update of the Great Fish River Protected Area Management Plan