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PRE-CONSTRUCTION, CONSTRUCTION AND POST-CONSTRUCTION PHASE

ENVIRONMENTAL MANAGEMENT PROGRAMME

FOR THE

The Proposed expansion of the existing "Goue Akker" cemetery on the remainder of Farm Nr.185 in Beaufort West, Western Cape.

APPLICANT:	Beaufort West local Municipality. Contact: Christopher Wright
ENVIRONMENTAL CONSULTANT:	Sharples Environmental Services cc Primary Author: Ameesha Sanker
DEA & DP PROJECT REFERENCE:	16/3/3/1/D5/11/0006/20
SES REFERENCE NUMBER:	22
DATE:	November 2020

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Project Ref. No:	**22**
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Sharples Environmental Services cc Since 1998, SES has been actively engaged in the fields of environmental planning, assessment and management. We advise private, corporate and public enterprises on a variety of differing land use applications ranging from large-scale residential estates and resorts to golf courses, municipal service infrastructure installations and the planning of major arterials. Our consultants have over 20+ years of combined experience and we operate in the Southern, Eastern and Western Cape regions.

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

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BETSY DITCHAM (Managing Director and Cape Town Office Manager)
Betsy has 10 years' experience as an EAP and has worked for a number of environmental companies in a variety of roles. She holds a BSc double major in Zoology and Ecology from the University of Cape Town and a BSc Honours in Wildlife Management from the University of Pretoria. As a consultant, she has experience in managing, compiling and drafting reports for various environmental applications, such as EIA's and EMP's and liaising with State Departments and other stakeholders, as well as providing advice, guidance and information to clients regarding the different applicable environmental processes. Betsy is a co-owner of SES and is Registered with EAPASA (Reg No. 1480).

1. Introduction

Sharples Environmental Services cc (SES) was appointed by *Zutari* on behalf of the *Beaufort West Local Municipality* (the proponent) to compile the Environmental Management Programme for the proposed expansion of the existing "Goue Akker" cemetery on the remainder of Farm Nr.185 in Beaufort West, Western Cape.

2. About this EMPr

This revised document is intended to serve as a guideline to be used by the *Beaufort West Local Municipality* (as the Implementing Agent) and any person/s acting on the *Beaufort West 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), 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 *Beaufort West 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.

Following the initial public participation process contemplated in Regulation 19 (1)(a) of the NEMA EIA Regulations, 2014 (GN. No. R 982 of 4 December 2014, as amended 7 April 2017), the following significant information was highlighted by the respective commenting authorities, resulting in significant changes to the EMPr. These changes are reflected below:

- Section 5.3: Sub-surface Environment, page 12.
- Appendix D, page 71.

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 the 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 enforcing 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 *Beaufort West 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 *Beaufort West 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

The Beaufort West Municipality proposes to expand the existing "Goue Akker" cemetery by approximately 82 569m^2 on the remainder of Farm Nr.185 to accommodate additional burial spaces for the next decade. The proposed expansion of the existing cemetery will entail the provision of approximately 7 410 – 10 545 new burial spaces separated into 18 - 26 blocks, segregated by internal gravel roads (figure 3). Reworking of the existing access road, as well as in-situ stormwater management is proposed within the internal road network has been proposed. Along with an outer stormwater berm and a detention pond. Furthermore, a caretaker and ablution facility (for equipment storage), as well as a cavcon palisade fence is proposed.

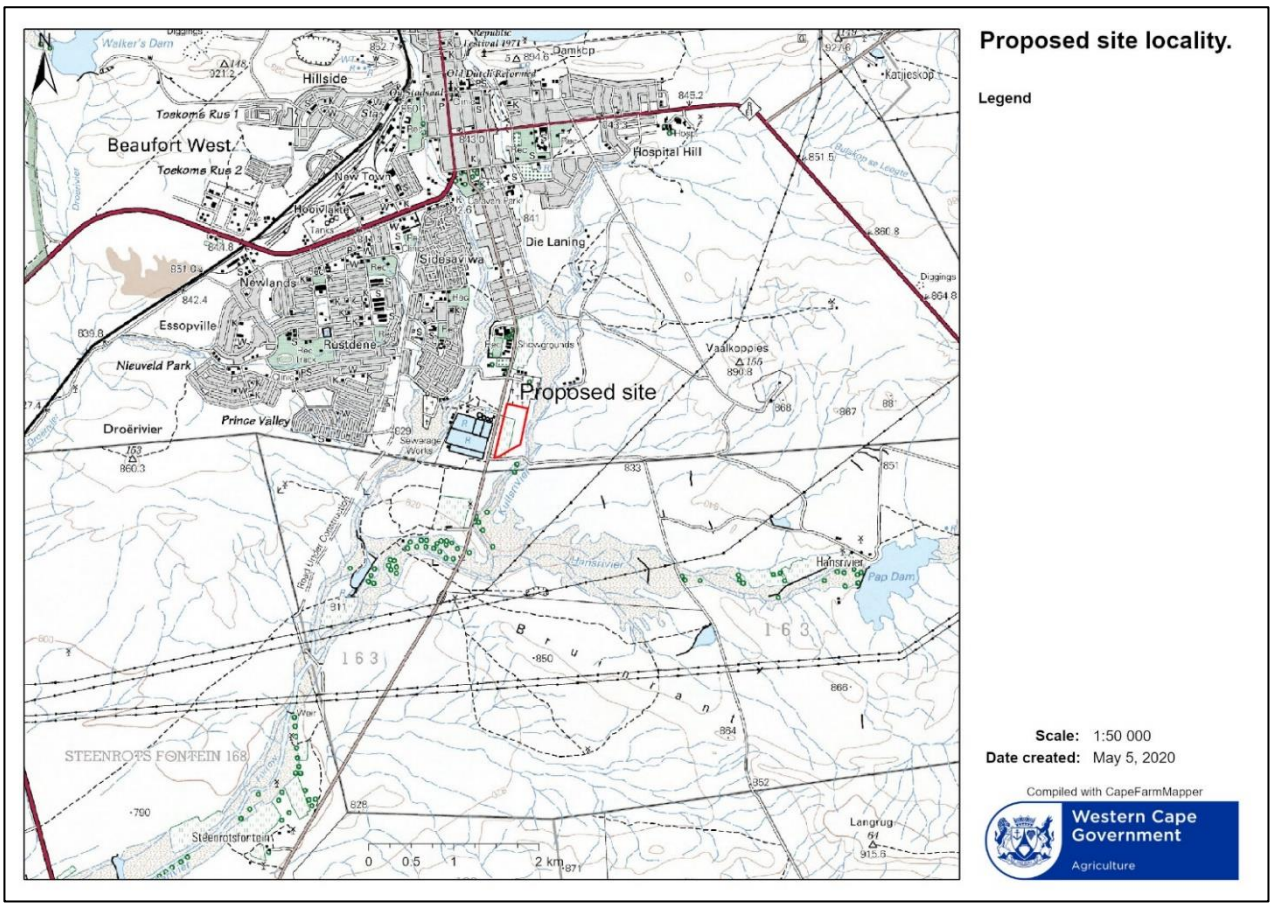


Figure 1: The proposed site for the cemetery extension (red border).

The town of Beaufort West is located within the in the Central Karoo District Municipality and is the largest town in the arid Great Karoo region. Beaufort West is at the centre of an agricultural district based mainly on sheep farming and is a significant town, accessible off of the N1 national road.

The remainder of Farm No. 185 is situated to the south of the Beaufort West town centre, on Blyth Street and outside of the delineated urban edge. The proposed site is classified as a Greenfield site as the proposed site has not been developed, although there is evidence of disturbance due to exotic species and dumping.

Beaufort West is a mainly indigent community consisting of a total population of 34,085 residents and some 13,086 households based on the 2011 Census statistics. There are currently five (5) existing cemetery sites in Town namely Beaufort West Eastern Cemetery, Beaufort West Central Cemetery, Botha Street Cemetery, "Goue Akker" North Cemetery and the "Goue Akker" Cemetery. The Municipality has identified an imminent shortage in future available burial space and that the existing cemeteries are near reaching their full capacity. It is estimated that the grave site at the "Goue Akker" cemetery currently has 691 burial spaces. The average monthly funerals are 41, leaving the "Goue Akker" cemetery with a capacity of approximately 16 months thus giving purpose to the urgent expansion of the cemetery. The Municipality have identified vacant land next to the existing "Goue Akker" cemetery for expansion purposes.

Figure 2: Proposed expansion of existing cemetery.

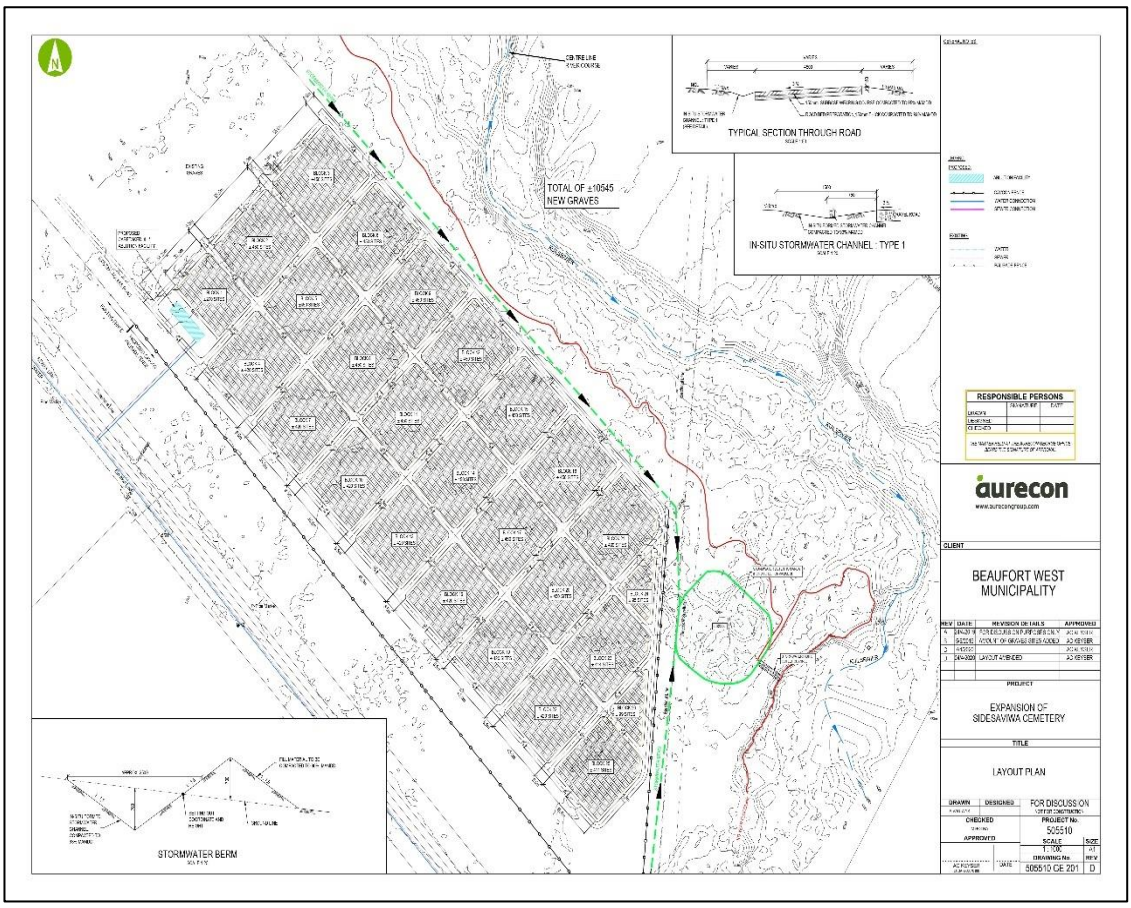


Figure 3: Proposed layout plan.

During the impact assessment it was determined that Operational Alternative 1 (Horizontal Burial) is the preferred alternative. While Operational Alternative 3 (Combination of Vertical & Horizontal Burial) can be considered for future developments, only if:

- The By-Law accommodates vertical burial, in terms of specifications etc.
- The technology and information are adopted by the local funeral services.
- The information becomes readily available in the community, and they are comfortable with this form of burial, therefore willingly request this be undertaken.
- The soil and underground conditions permit it.

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

Table 1: List of proposed development aspects.

Expansion Proposed	Size m²
Outdoor Cemetery	82 500
Caretakers facility and Ablutions	69
TOTAL DEVELOPMENT FOOTPRINT	**82 569**

Table 2: Summary Table - Site and Farm Details

Province	Western Cape
District Municipality	Central Karoo District Municipality
Local Municipality	Beaufort West Local Municipality
Ward number(s)	Ward No 4

Nearest town(s)	Beaufort West – directly adjacent (north of site)
SG Code	C0090000000018500000
Co-ordinates of the farm boundaries:	***Table 3:Site coordinates***

	Latitude	Longitude
A	32° 22' 41.18"	22° 35' 21.34"
B	32° 22' 42.75"	22° 35' 29.25"
C	32° 22' 54.29"	22° 35' 26.39"
D	32° 22' 58.59	22° 35' 16.43"

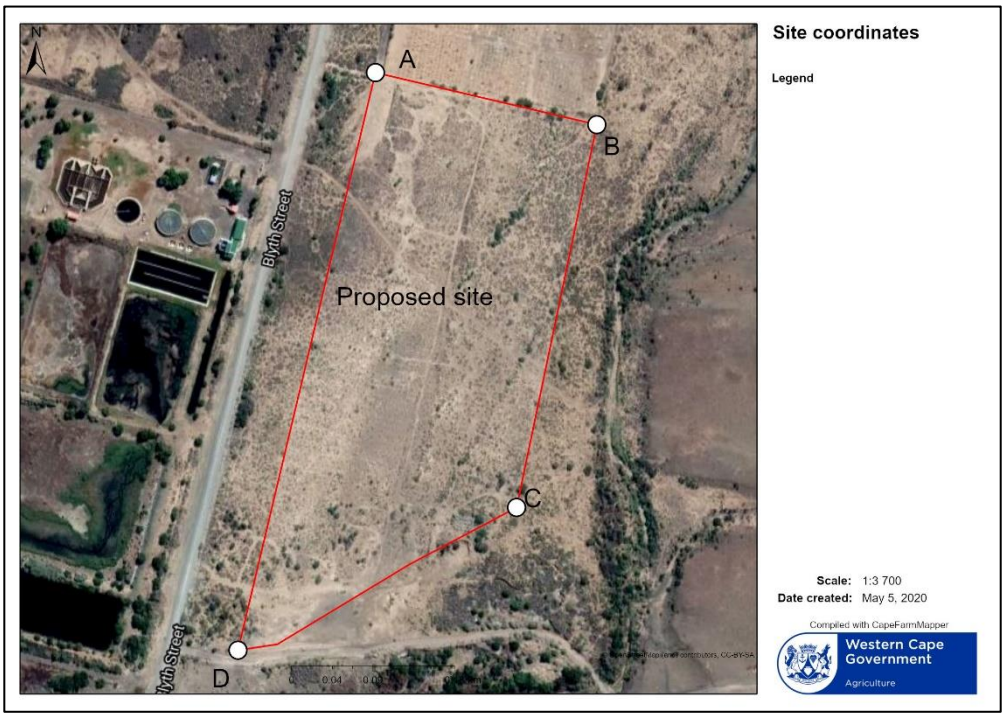


Figure 4: Site coordinates

5. Description of Environmental Setting

5.1 Vegetation

5.1.1 Vegetation description

According to the Vegetation Map of SA (2012) accessed from CapeFarmMapper (May 2020) the vegetation unit primarily affected by the proposed expansion is South Karoo Riviere (Figure 5) which has a Least Threatened Conservation Status.

The Botanical Survey completed by Mark Berry Environmental Consultants (2020) notes that the general condition of the Riviere vegetation is fair to good. Structurally, it can be described as a short (±0.6 m) closed (±40% cover) shrubland following Edward's (1983) classification of structural formations. *Vachellia karroo* (Karoo thorn) and *Prosopis glandulosa* (muskietboom) are prominent (2-4 m) emergent species in the area. Small clumps of the latter species were observed along the Kuilsrivier and in the south-western corner of the site. *Prosopis glandulosa* is a declared invasive thorn tree from north-east Mexico and the south-western parts of the USA (Henderson et al. 1987. Indigenous shrub species recorded include *Caroxylon aphyllum, Tetraena retrofracta, Sesamum capense* (common in riverbeds and disturbed

areas), *Vachellia karroo, Pentzia incana, Gazania krebsiana, Gomphocarpus filiformis, G. fruticosus, Malephora atipetala (dominant in places), Drosanthemum hispidum, Lampranthus uniflorus, Mesembryanthemum coriarium, M. cf. granulicaule, Trichodiadema pomeridianum* (recorded in Gamka Karoo vegetation on western side of Kuilsrivier), *Asparagus sp, Aptosimum indivisum, Lycium oxycarpum, L. horridum and L. cf. cinereum*. Grasses recorded include *Chloris virgata* and *Dactyloctenium cf. aegyptium*.

The Botanical Survey (2020) notes that considerable disturbance was present in the southern part (waste dumping), as well as in the north-western corner (vegetation stripped next to the existing cemetery). The site enjoys easy and unrestricted access from the town. A significant presence of invasive cacti and *Prosopis glandulosa* was noted, especially in and around the waste dumping area and along the Kuilsrivier. Invasive cacti (escaped from garden refuse) recorded include *Opuntia elata, Cylindropuntia fulgida var. mamillata* (boxing glove cactus), *Tephrocactus articulatus* and *Trichocereus spachianus*. Exotic weeds recorded include *Atriplex nummularia* (old man salt bush), *A. lindleyi subsp. inflata, A. semibaccata, Salsola kali, Tribulus terrestris, Argemone ochroleuca, Xanthium spinosum, Solanum elaeagnifolium* and *Portulaca oleracea*. Nearly all these species are listed invasive aliens in terms of the National Environmental Management: Biodiversity Act (Act 10 of 2004) Alien and Invasive Species List (2016).

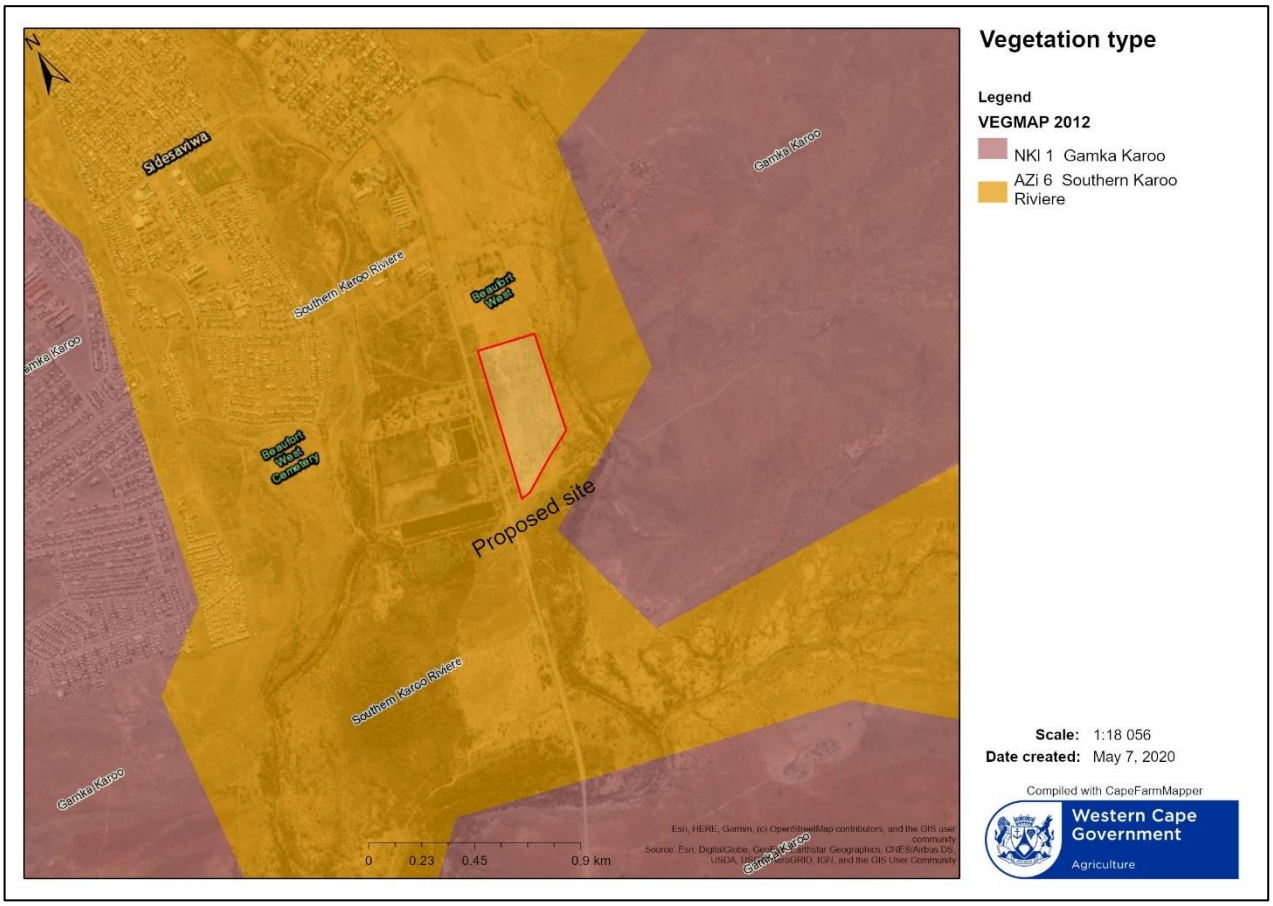


Figure 5: Vegetation Map of SA.

No Species of Conservation Concern, regional endemics or protected species were recorded. All the species recorded are widespread and common.

5.1.2 Botanical Sensitivity

The Botanical Survey completed by Mark Berry Environmental Consultants (2020) mentions that only about 1.5% of Southern Karoo Riviere is formally conserved in the Karoo National Park, and a few other nature reserves, including the Gamkapoort and Karoo Nature Reserves (Mucina & Rutherford 2006). About 88% of Southern Karoo Riviere still remains (Mucina & Rutherford 2006). The Karoo National Park is located just outside Beaufort West, 5 km northwest of the site. Gamka Karoo is found within the vicinity of the ptoposed site and is equally poorly conserved, with only 2% formally conserved in the Karoo National Park and very little (<1%) is transformed (Mucina & Rutherford 2006). It is therefore well represented in the larger area. Both veld types are currently not listed as threatened (DEA 2011).

5.1.3 Critical Biodiversity Areas

The site forms part of the Beaufort West biodiversity network (see Figure 6).The proposed expansion will marginally affect mapped ESA's (ecological support areas, indicated as wetland, watercourse or water recharge areas), which provide support for the large the CBA (critical biodiversity area) corridors associated with the Gamka River and its tributaries. In their biodiversity assessment of the Central Karoo District Municipality, Skowno et. al. (2009) identified areas of critical importance in order to facilitate the functioning of ecological processes (both currently and in the face of climate change) which are required to ensure that the biodiversity features persist in the long term. These areas include high priority unfragmented landscapes and riparian corridors, such as the Gamka River.

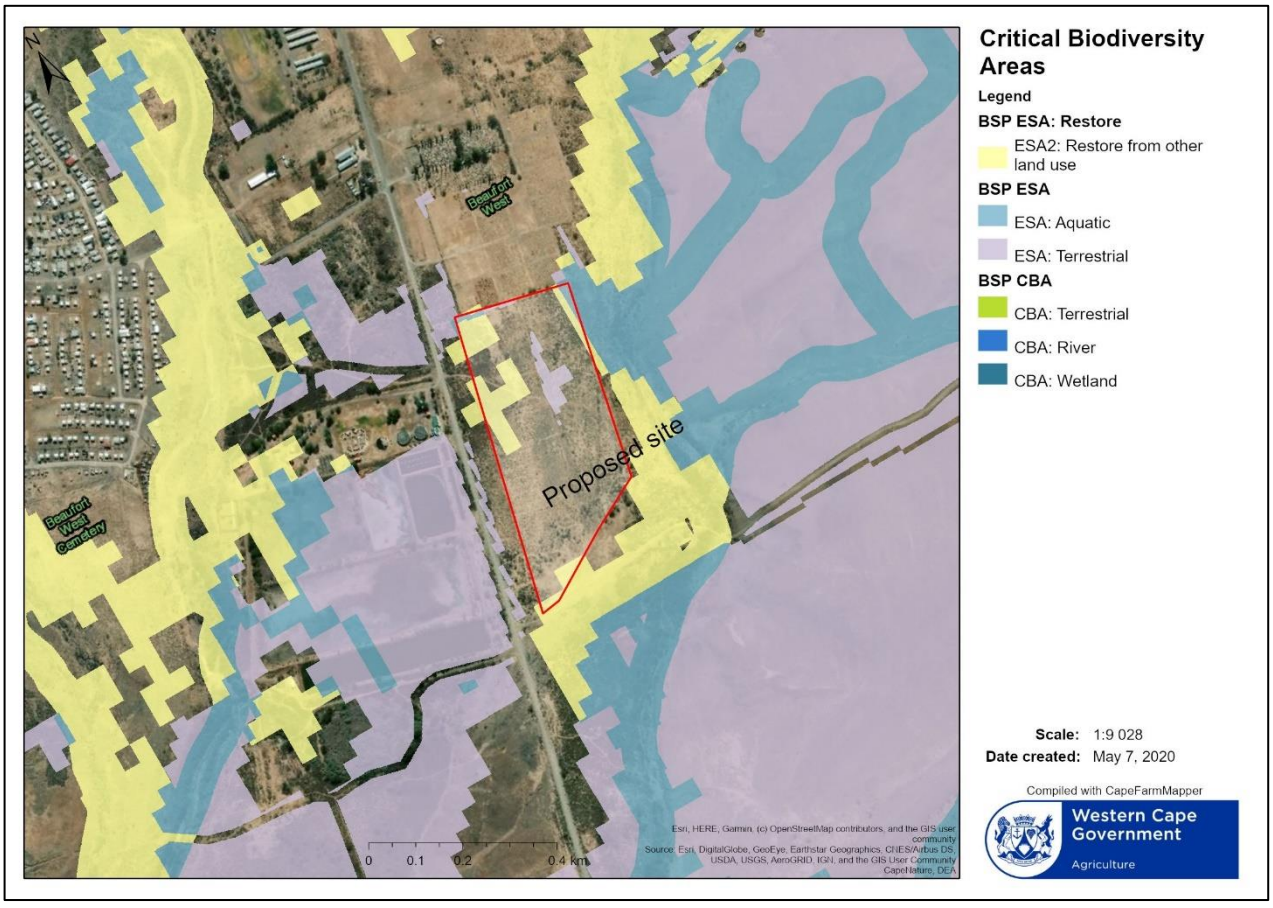


Figure 6: Site in relation to the Western Cape Biodiversity Spatial Plan 2017.

5.2 Freshwater features

5.2.1 The Aquatic Environment

The proposed site is located within the Quaternary Catchment J21A and falls within the Breede-Gouritz Water Management Area. The Freshwater Habitat Impact Assessment completed by Sharples

Environmental Services cc (2020) identified two rivers in the study area (Figure 7), namely the Gamka River and the Kuils River, as well as numerous tributary washes, that are characteristic of the arid landscape.

The Freshwater Habitat Impact Assessment (2020) notes that the two rivers are ephemeral rivers. They are both characteristic of Lower Foothills rivers with a very gentle gradient mixed bed alluvial channel. The systems are of similar ecological integrity as they share biophysical characteristics and have been similarly impacted by land use and cover changes. They have historically been impacted by land cover changes such as town infrastructure and overgrazing in their catchments. Large scale land degradation has resulted in substantial networks of rill and gully erosional features.

The rivers are approximately between 15 and 25m in width but both are less than 1.2m in depth. They have incised to bedrock and are disconnected from the floodplain. The channel has low surface roughness consisting of sand and gravel material between outcrops of planed bedrock. Sand waves and mid channel bars are present and vegetated during wet periods. The riparian vegetation is largely comprised of Acacia karroo, Prosopis sp. (alien), *Lycium ferocissimum, Pennisetum clandestimum* (alien), and *Cynodon dactylon.*

There is a drainage divide between the Gamka River and the site, which will prevent the Gamka system from being impacted upon by the project. However, the site is within the catchment of the Kuils River it may be impacted by site clearance, stormwater runoff and soil disturbance. Therefore, only the Kuils River underwent detailed impact assessment and the Gamka River was not studied further.

The Kuils river is a dryland river system but the Freshwater Habitat Impact Assessment (2020) notes that during the site visit the lower reach was uncharacteristically flowing after a large rainfall event. The channel substrate in this area was dominated by fine sand and silt sediments due to deposition from flood waters. Prior to this wet period the area experienced prolonged drought conditions and the riparian characteristics were different.

The Freshwater Habitat Impact Assessment (2020) determined that the Kuils River will potentially be impacted upon by the proposal as it is directly downslope of the site. The other watercourses have no risk of being impacted upon as they are located in separate drainage basins and not in proximity to the site. Therefore, these systems were not investigated further but a detailed assessment of the Kuils River was undertaken.

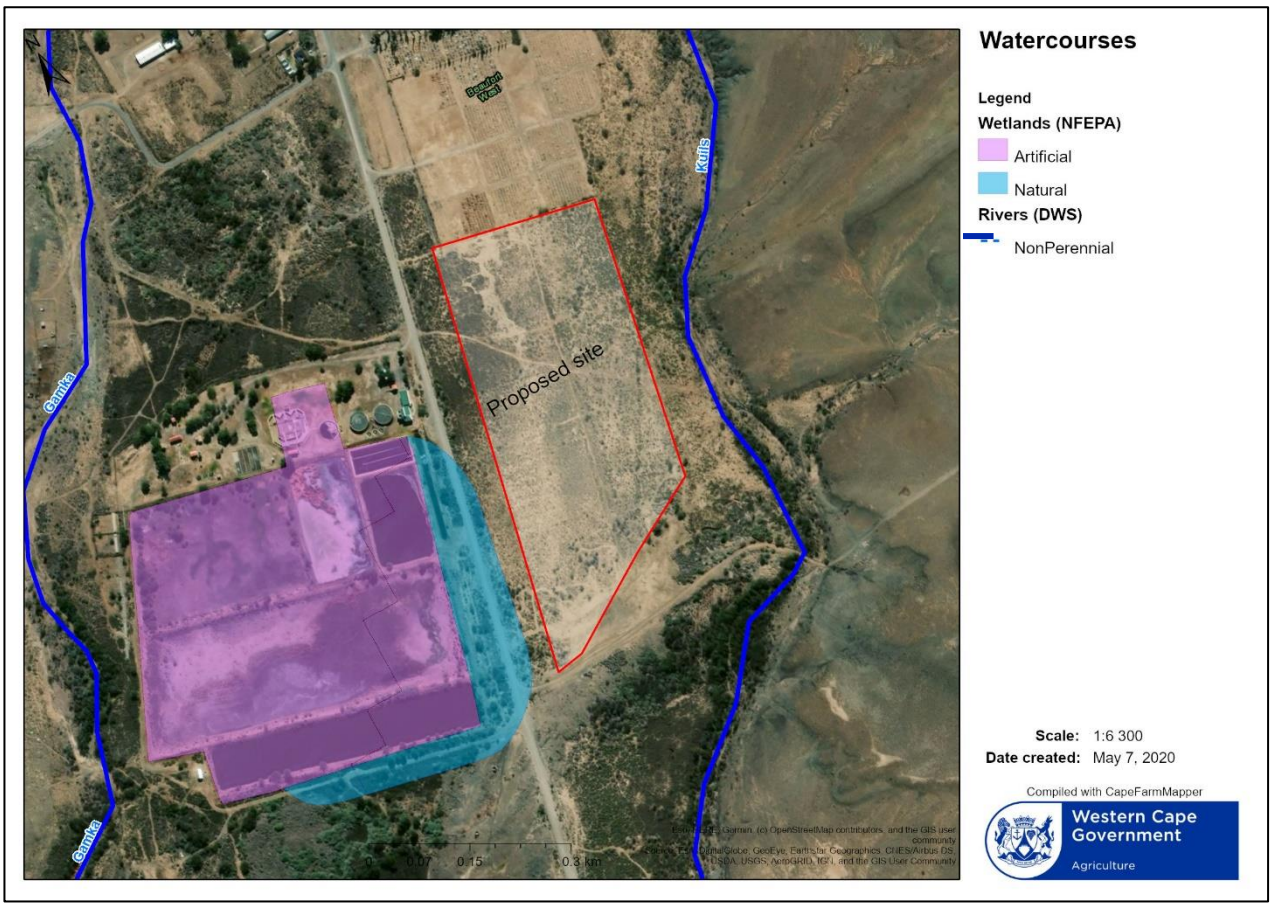


Figure 7: Freshwater ecosystems in relation to the proposed site. (Source: Bekker, 2019)

CapeFarmMapper (Accessed May 2020) identifies an Artificial and Natural wetland located to the west of the proposed expansion. However, the Freshwater Habitat Impact Assessment (2020) notes that the South African National Wetlands Map of 2019 (NWM), which provides information on the location, spatial extent and ecosystem types of estuarine and inland aquatic ecosystems (Van Deventer et al., 2018), did not identify any wetlands in proximity to the site. The sewage treatment works was however identified as an artificial wetland.

5.2.2 Habitat Integrity, Ecological Importance & Sensitivity

The Freshwater Habitat Impact Assessment (2020) notes that the ecological importance and sensitivity of this reach of the Kuils River was determined as being 'Moderate' (C category). The system does not have a high sensitivity as it is only intermittently inundated and has no significant diversity of habitat along the reach. However, it acts as an important ecological corridor.

The recommended ecological category (REC) is used to inform future management objective for an aquatic ecosystem. The Freshwater Habitat Impact Assessment (2020) explains that the REC can be determined by using the PES (Present Ecological State) and EIS (Ecological Importance and Sensitivity) scores of the system (DWAF 2007).The river assessed has a Fair 'C' PES and a Moderate 'C' EIS which places it in the REC 'C' category which advocates the maintenance of the system. Additionally, it is considered to be a realistic and feasible objective as the project must not cause any further degradation in the system.

5.2.3 Aquatic Critical Biodiversity Areas & the Western Cape Biodiversity Spatial Plan

According to CapeFarmMapper(Accessed May 2020) there are no areas mapped as Aquatic Critical Biodiversity Areas by the Western Cape Biodiversity Spatial Plan. There are however ESA1 and ESA2 areas identified within and adjacent to the study site. These areas were given the classification due to their proximity to watercourses and possible contribution to the health of these systems.

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 NFEPA project identified non-FEPA wetland southwest of the site. Upon closer investigation it was determined that this is the sewage treatment works. The Kuils River to the east and Gamka River to the west of the study site were classified as an Upstream FEPA rivers.

5.3 Subsurface environment.

5.3.1 Hydrogeology

According to the Geohydrological and Geotechnical Assessment conducted by GEOSS South Africa (Pty) Ltd(2020), the underlying aquifer at the site is classified by the Department of Water Affairs and Forestry (DWAF, 2002) as a fractured aquifer with an average yield potential of 5.0 L/s. A fractured aquifer describes an aquifer where groundwater only occurs in narrow fractures within the bedrock. Based on the DWAF (2002) mapping of the regional groundwater quality, as indicated by electrical conductivity (EC) the area is in the range of 70 – 300 mS/m. This is considered to be "good to moderate" quality for water, with respect to drinking water standards. It is important to note that a small stream/drainage channel flows along the eastern boundary of the property and should be considered as a potential receptor for contamination.

The Geohydrological and Geotechnical Assessment (2020) notes that the national scale groundwater vulnerability map, which was developed according to the DRASTIC methodology (DWAF,2005), indicates that the site has a "low to medium" vulnerability to surface-based contaminants. The number indicated in parenthesis at the end of each factor description is the weighting or relative importance of that factor. This "low-medium" rating is associated with the confined nature of the fractured aquifer. The site is underlain by mudstone that weathers to clay forming an impermeable layer above the fractured mudstone and sandstone that likely provide sufficient protection against point and non-point sources of contamination. The depth to groundwater provides further opportunity for natural attenuation in the vadose zone prior to reaching the groundwater.

5.3.2 Geologic and Hydrogeological Environment

The Geohydrological and Geotechnical Assessment (2020) explains that the site is underlain by mudstone and sandstone of the Teekloof Formation which forms part of the Beaufort Group and is locally covered by Quaternary age alluvium deposits towards the south. The area does host a number of dolerite dykes (intrusive igneous rocks).

During the site visit conducted as part of the Geohydrological and Geotechnical Assessment (2020), an excavation of 10 trial pits coupled with Dynamic Cone Penetrometer (DCP) testing to determine groundwater depth, quality and soil properties was completed. The positions of the trial pits and DCP's were chosen to provide a good spatial coverage of the study area (vegetation permitting). The trial pits were excavated using a tractor loader backhoe (TLB) to a maximum depth of 3 m. Following the excavation, each trial pit was logged and photographed. A site walk-over sought to identify and confirm

hydrological, hydrogeological, and geotechnical features of interest. A total of 10 trial pits were excavated and details are summarised in Table 3. None of the trial pits excavated intersected water. The location of the trial pits is shown in Map 8.

Based on the hydrogeological conceptualisation of the study area, groundwater will flow towards the stream east of the property and south towards the large dyke known as Hansrivier Dyke. The overall groundwater flow direction is thus interpreted as flowing south-east to south.

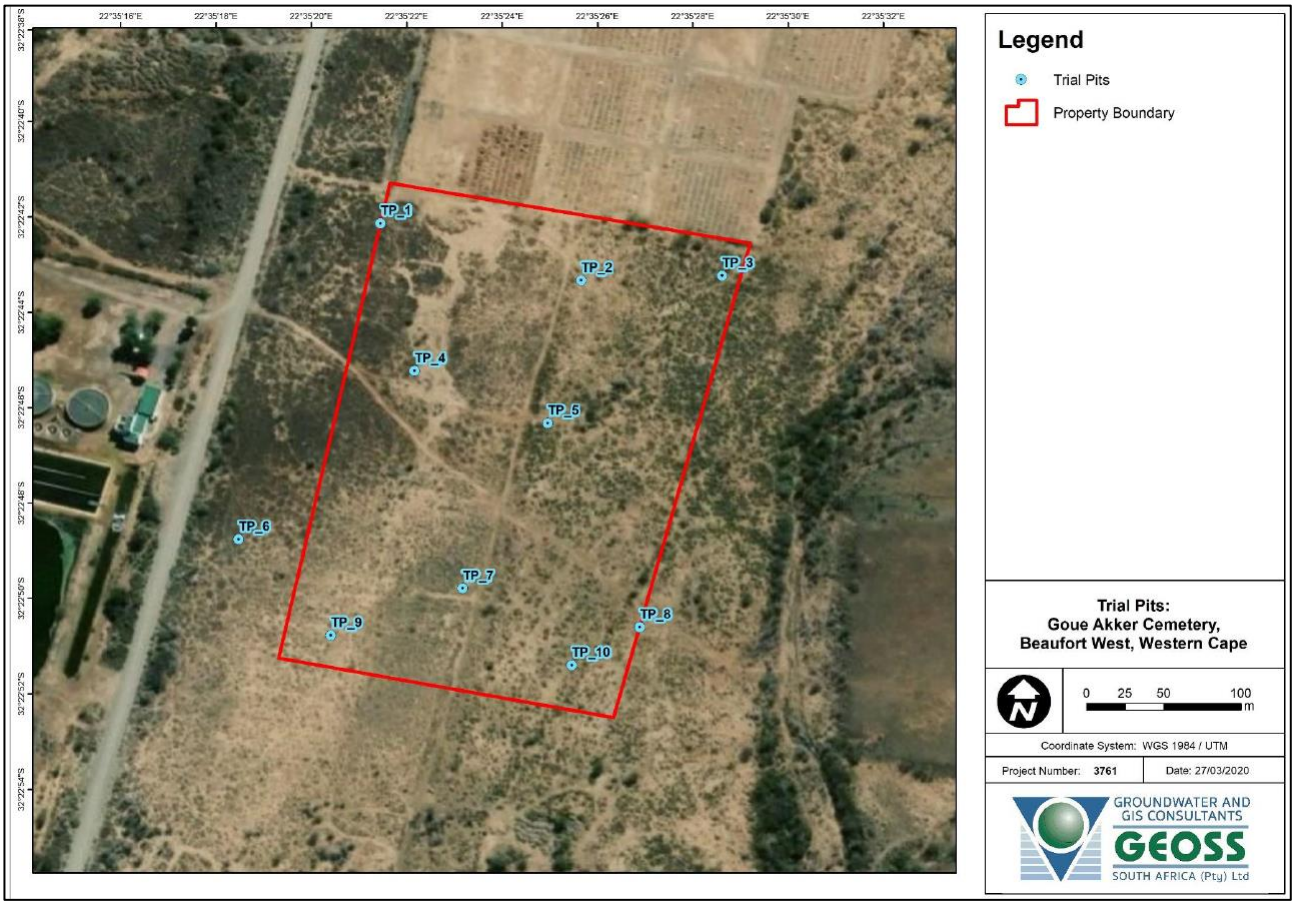


Figure 8: Trial pit locations.

A groundwater sample was collected from Flagship Borehole and submitted for inorganic chemistry analysis to a SANAS accredited laboratory (Bemlab) in the Western Cape on 10 March 2017 (GEOSS, 2017). It was selected as a representative sample as it is located upstream to the cemetery.

From the chemical results, the groundwater from this borehole can be described as being of marginal quality in terms of dissolved minerals and salts.

The Geohydrological and Geotechnical Assessment (2020) notes that the study site has been classified as having a groundwater vulnerability classification of "low to medium". And given the relatively deep-water table and shallow burial depths, the extension is deemed to have minimal impact on groundwater and proximal drainage channel.

The proposed expansion will need to conform to the standard industry mitigation measures for developing a cemetery in order to ensure no contamination occurs on site.

It was further concluded that this site is dominated by clayey sandy SILT to depth. The upper 20 cm is very dense. Just below this, the consistency is loose to medium dense to a depth of about 1.0 mbgl, after which the soil profile becomes very dense to depth. The northern third of the site comprises of SILT to depth while

CALCRETE and/or BOULDER lenses that are present within the southern two thirds of the site. These lenses are observed between 1.6 to +3.0 mbgl, this may create issues when establishing graves exceeding 1.6m's in depth, creating a particular difficulty when establishing graves for vertical burials. No groundwater was intersected in any of the trial pits, indicating a deep water table.

5.3.3 Heritage and Palaeontological sensitivity

A NID was completed and submitted, by Sharples Environmental Services cc, to Heritage Western Cape and they have requested:

With reference to Heritage Western Cape's response received on the 18th of August 2020, (Case no: 20072207SB0724E), the following request was made, "A field based palaeontological impact assessment. The required HIA must have an integrated set of recommendations. The comments of relevant registered conservation bodies, all interested and affected parties, and the relevant Municipality must be requested and included in the HIA where provided. Proof of these requests must be supplied".

An Integrated Heritage Impact Assessment (2020) was completed by Dr Lita Webley and a Palaeontological Study (2020) was completed by Dr John Almond. The Palaeontological Study (2020) notes that no Permian or Caeonozoic fossils were observed within the cemetery expansion study area itself. No fossil remains were recorded in good exposures of the Teekloof Fromation and overlying alluvial deposits in the beds and banks of the Kuils River which are all situated on the periphery of and outside the study area. The Palaeontological Study (2020) concluded that the palaeo-sensitivity of the site is in fact Low and the Impact Significance of the development is rated as LOW (-ve) without mitigation. It was also concluded that the archaeological sensitivity is low.

6. Legal Framework

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

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

Due to the fact that this development proposal is an activity listed in the EIA Regulations, a Basic Assessment Process is required and the respective reports (Basic Assessment Report and Appendices) must be submitted to the Department of Environmental Affairs and Development Planning (DEADP), for assessment, before they issue the Beaufort West Municipality with an Environmental Authorisation (either approval or rejection of the development proposal).

Table 4: 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
27	The clearance of an area or 1ha or more, but less than 20ha of indigenous vegetation, except where such clearance of indigenous vegetation is required for- (i) the undertaking of a linear activity

	(ii) maintenance purposes undertaken in accordance with a maintenance management plan.
44	The expansion of cemeteries by 2 500 square metres or more.
Activity #	**Listing notice 3. Description of Activity as per GN No. R 324**
4	The development of a road wider than 4 metres with a reserve less than 13.5 metres. Western Cape i. Areas zoned for use as public open space or equivalent zoning; ii. Areas outside urban areas; (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: (aa) Areas zoned for conservation use; or (bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority.
Activity #	**Listing notice 2. (GN No. R325): Scoping & Environmental Impact Reporting**
N/A	N/A

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

- Listing Notice 1: Activity No: 27 and 44;
- Listing Notice 3: Activity No: 4.

6.2 Other applicable legislation

The *Beaufort West 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);
- Spatial Planning Land Use Management Act 16 of 2013.
- National Health Act, 2003 (Act no.61 of 2003), Regulations Relating to Management of Human Remains (GN. R363 of 22 May 2013).

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.

This development proposal is within 500m of various watercourses. It was therefore required to apply for Water Use Authorisation in terms of section 21 (c) and (i) of the National Water Act (Act 36 of 1998).

The above listed legislation has general applicability to most development applications, and it is the *Beaufort West Municipality* 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, but 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 9 below. Additional management measures that must be implemented to address specific impacts that may arise during each phase are provided in **Chapters 9-12** of this EMPr.

8. General Environmental Management

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

Code of Conduct

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

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

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

Engineers

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

Contractors and sub-contractors

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

Rules and Regulations

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

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

- **Site tidiness**
  - The contractor must keep the appearance of his building site neat and tidy at all times. Building rubble must be removed from site at regular intervals, and litter must be removed from the site on a daily basis. Refuse drums must be available on site which waste can be placed in. The drums must be emptied on a regular basis and the waste taken to a licenced local waste disposal facility.
  - Ensure waste is separated appropriately and implement the integrated waste management approach that addresses waste avoidance, reduction, re-use, recycling, recovery, treatment, and safe disposal, as a last resort.

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

8.1 Site access and traffic management

Access to the proposed site will be via the existing access road, off of Blyth Street, located to the West of the proposed site. This road also acts as the current access for the existing cemetery site to the North 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 should be taken to ensure that the local traffic flow pattern is not significantly disrupted and vehicle operators therefore need to be educated in terms of "best-practice" operation in order to minimise unnecessary traffic congestion or dangers. These practices include, but are not limited to, not unnecessarily obstructing the access point or traffic lanes used to access the site; considering the load carrying capacity of road surfaces and adhering to all other prescriptive regulations regarding the use of public roads by construction vehicles.

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

Signage would need to be clearly visible and include, amongst other thngs, the following:

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

Other mitigation measures include:

- No construction to take place over or during the December holiday period without prior permission from the relevant authorities.
- Construction vehicles must adhere to the load carrying capacity of road surfaces and adhere to all other prescriptive regulations regarding the use of public roads by construction vehicles.
- ECO to do awareness training with the contractor and labourers and to highlight the traffic related risks before construction commences.
- Where possible, construction traffic that may obstruct traffic flow on the surrounding roads should be scheduled for outside of peak traffic times. Traffic control measures and signage should be implemented.
- 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. If practical, the demarcation boundary should typically allow a working area of no more than 2.5m around the development footprint unless otherwise agreed with the ECO. This demarcation boundary is to ensure that land clearing and construction activities are restricted to only that area strictly required for the proposed development, and to prevent

unnecessary disturbance of soil surfaces and vegetation outside of the development footprint. Signage is to be erected informing the public of the construction site, prohibiting access beyond the fence line.

If desired or deemed necessary by the ECO, the outer boundary of the working area can be enclosed with orange barrier net fencing, shade netting, droppers & wire/ danger tape, or similar – as feasible and practical. The fencing should be retained and maintained for the duration of the construction period, 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.

8.2.2 No-go areas

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

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

As described in the Freshwater Habitat Impact Assessment (2020) and depicted in figure 9 below, a 28m buffer area has been recommended by the Freshwater Specialist, it will extend from the boundary of the riparian habitat, and should be adopted and demarcated. This buffer area is to regarded as a no-go area during construction and operational phases, and should be established before any construction works take place. Vehicles may not be driven along the eastern boundary of the site, outside of the demarcated working area.

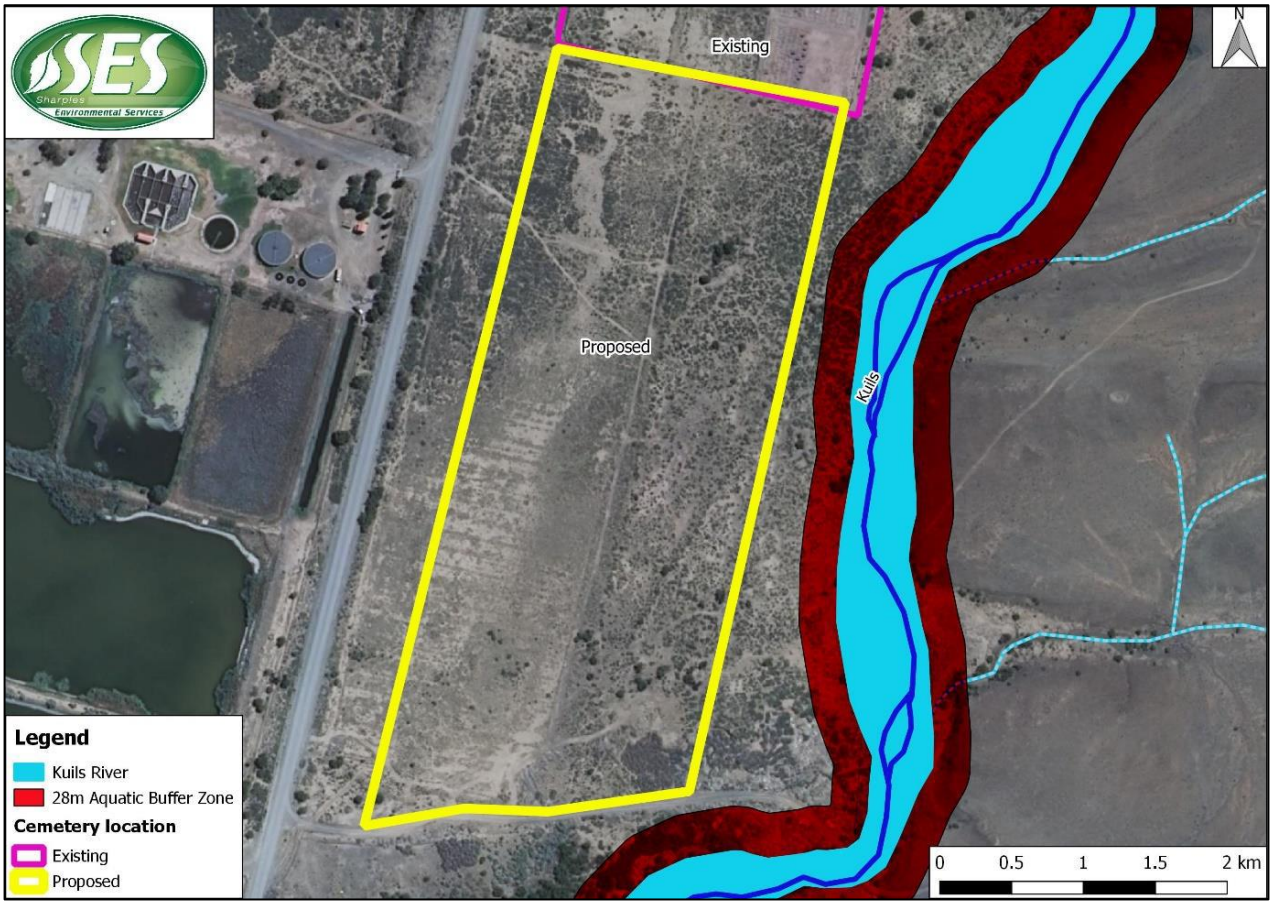


Figure 9: The proposed cemetery site in relation to the 28m recommended aquatic buffer zone

8.2.3 Demarcation of the site camp

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

8.3 Site camp and associated facilities

The 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;

- Environmental Authorisation
- Copy of General Authorisation or any other relative permits
- EMPr
- Waste slips
- Disposal slips or cleaning slips (ablution cleaning)
- All EMR reports and ECO instructions
- Environmental induction register
- Protocol for chance Palaeontological findings
- Complaints register
- Method statements
- An emergency procedure
- Incident report

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

8.3.1 Fencing & Security

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

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. 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, should a fire be created on site after hours, the following procedure should be followed:

- Ensure that the security is aware that creating fires within the site is prohibited.
- Should he choose to create one, he is solely responsible for the management.
- He/she should ensure that:
    - Utilize a metal barrel and contain fire within, at the entrance of the site (close to Blythe Street).
    - 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, he may designate a smoking area within his site camp, of which he is solely responsible for the management of this activity on site, and any incidents that may occur. It should contain the following features:

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

In the case of accidental fires, the contractor must (if required) alert the Local Authority's Fire Department as soon as a fire starts prior to the fire becoming uncontrollable.

8.3.3 Waste Storage Area

Sufficient bins for the temporary storage of construction related waste must be provided inside the site camp and/or at the working area and should be located in such a way that they will present as little visual impact to surrounding residents and road users as possible. Waste should be separated, and separate bins should be made available, appropriately labelled, within a designated area. Implement the integrated waste management approach that addresses waste avoidance, reduction, re-use, recycling,

recovery, treatment, and safe disposal (as a last option), refer to point 8.7. Sufficient signage and awareness should be created to ensure that these bins are properly used.

8.3.4 Hazardous Substances Storage Area

Fuels, chemicals, lubricants and other hazardous substances must be stored in a demarcated, secured and clearly sign-posted area within the site camp away from the watercourses on site. Sufficient signage and awareness should be created to ensure that these bins are properly used.

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 should 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 ablution facility for every 8 male workers and 2 ablution facilities for every 8 female workers should be provided. The ratio of 15 people per ablution facility must not be exceeded.

Toilets must be placed at least 50m from the No-Go aquatic zone. The ablution facilities must not be linked to the river system in any way. Toilets must be serviced regularly and kept in an orderly state. The contractor must ensure that no spillage occurs when the toilets are cleaned, serviced or moved, and this should be done by a registered company. Disposal slips or cleaning slips, should be requested from the registered company following each cleaning (at least weekly), this should be filed in the environmental file. Performing ablutions outside of the provided toilet facilities is strictly prohibited and the ECO would need to regularly inspect the state of the chemical toilets to ensure compliance.

8.3.7 Eating Area & Rest Area

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

8.3.8 Vehicle & Equipment Maintenance Yard

Where possible, construction vehicles and equipment that require repair must be removed from site and taken to a workshop for servicing. If emergency repairs and/or basic maintenance of construction vehicles or equipment are necessary on site, such repair work must be undertaken within the designated maintenance yard area away from any watercourses. Repairs must be conducted on an impermeable surface, and/or a tarpaulin and/or drip trays must be laid down prior to emergency repairs taking place, in order to prevent any fuel, oil, lubricant or other spillages from contaminating the surrounding environment.

8.3.9 House-Keeping

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

8.4 Search and Rescue

The search and rescue of bulbs and cuttings of succulents for use in the rehabilitation of disturbed areas outside the cemetery footprint should be undertaken prior to clearance.

Rescued plants should be replanted into a nearby disturbed area of similar habitat or for open space rehabilitation. Rescued plants should 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 should 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 activities commence. 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. Potential fauna may include, but are not limited to:

Scientific Name	***Common Name***
Reptilia-Chersobius boulengeri	Karoo Dwarf Tortoise
Mammalia-Bunolagus monticularis	Riverine Rabbit

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 should 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.
- After any clearing is completed, an appropriate cover crop should be planted where any weeds or exotic species are removed from disturbed areas timeously.
- Vegetation outside of the construction footprint and within any no-go areas must not be cleared.
- Land clearing and earthmoving activities should not be undertaken during strong winds, where possible.

The proposed development requires the clearance of vegetation, however the following measures should 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 should be replanted into a nearby disturbed area of similar habitat or for open space rehabilitation.
- An ECO will oversee compliance with all the prescribed environmental requirements and mitigation measures listed here and will be on site regularly.
- Alien invasive plant species should be identified using eco-friendly markers, prior to clearance.
- The Environmental Control Officer (ECO) should be present, during the clearing of alien plant species and vegetation to ensure the implementation of the proposed mitigation and

rehabilitation measures and to identify any harmful activities during the construction and operational phases.

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 should not be placed in vegetated areas that will not be cleared.
- Stockpiles must not be located within 50 metres of watercourses.
- 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, should be transferred immediately to rehabilitation areas rather than being stockpiled, as stockpiling kills important fungi, microbes, seeds and soil fauna. Topsoil stockpiles of this kind must not exceed 0.5 m in height and must not be compacted.
- Note that the topsoil must be the final layer applied to a rehabilitated/ re-landscaped site, after subsoil/ spoil material has been placed and shaped on the site.

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 within the environmental 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 the environmental file and must be available on request.

Chemical toilets present a risk to the surrounding environment and must be managed accordingly. Chemical toilets must be kept within the site camp (not be linked to the storm water drainage system), on a level surface and secured from blowing over. Chemical toilets must be regularly emptied, and the waste disposed of at an appropriate wastewater disposal/ treatment site. Care must be taken to prevent spillages when moving or servicing chemical toilets. Ablutions should be further than 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 should accompany the hazardous substances. Appropriate storage of hazardous substances is important while drip trays should always be utilised when decanting of hazardous substances and when refilling chemical/ fuel storage tanks. If any spills do occur, the soil must be excavated and disposed of as hazardous waste.

8.8 Erosion control and stormwater management

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

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

The prevention of soil erosion can be initiated by designating specific areas for stockpiling of raw materials with consultation of the ECO. No stockpiling is to occur on or near slopes or water resources (must not be located within 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. In order to prevent this, the following management measures must be implemented.

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

It may be necessary to implement small-scale erosion protection measures at the construction site, to prevent soil erosion. Such measures may include the use of shade netting, geo-fabric, brush-packing or similar barriers in areas susceptible to erosion and along exposed slopes. The storm water management plan should adhere to the principles of sound storm water management. The storm water management

system must be implemented on site and must be properly maintained in order to ensure that contaminated run-off from the construction site is prevented from flowing into the watercourse.

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

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

8.9 Construction near a watercourse

The contractor needs to be mindful of the nearby watercourse. A demarcated buffer of 28m should be implemented to protect the aquatic system and maintain the present ecological processes. This buffer area should be regarded as a no-go area. 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. The buffer area regarded as a no-go area during construction will be zoned as public open space during the operational phase of the development. During the post-construction and operational phase of the development, erosion features that have developed are required to be stabilised. This may also include the need to deactivate any erosion headcuts/rills/gullies that may have developed.

The area must be maintained through alien invasive plant species removal and the establishment of indigenous vegetation cover to filter run-off before it enters the freshwater habitat. Placement of signage near the boundary of the buffer zone should also be considered to help mark the boundary and educate the community about the purpose and value of protecting buffer zones. Information can include a description and visual of alien invasive plant species.

No bulk stormwater systems are required as the stormwater will be collected and dispersed by means of a proposed stormwater berm towards the East of the site channelling run-off to an existing low-lying disturbed area which we propose to be formalized into a stormwater detention area which the Engineers propose to be formalized into a stormwater detention area. Accumulated stormwater will be dispersed by means of an overflow channel to minimize the effect of peak runoff downstream. The proposed detention pond will act as energy dissipater. Engineers have proposed the use of excess soil and suitable rubble to construct the stormwater berm adjacent to the river, so waste will be minimised during construction, as well as the need to purchase extra material for the establishment of the berms.

8.10 Excavations and Earthworks

Any major earthworks with bulldozers and heavy machinery must be under constant supervision and operators are to be aware of all the environmental obligations, as there is always the potential to inflict damage to the sensitive areas. Any unnecessary or excessive heavy machinery movement must be kept to a minimum i.e. only what is absolutely necessary. Areas to be excavated must be clearly demarcated.

Areas, which have already been excavated and entail fairly significant earthworks, must be similarly demarcated to avoid the spreading of construction activities into more sensitive areas.

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

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

8.11 Visual Impact.

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, will boast a new ablution facility, an extended access road, a new fence, and will be maintained, in addition dumping located at various positions on site, will be removed.

In order to minimise the potential visual impact during the construction phase, all working areas, storage facilities, stockpiles, waste bins, elevated tanks and the site camp should be located in such a way that they will present as little visual impact to surrounding residents and road users as possible.

Waste must be managed according to this EMPr. Good housekeeping practices on site must be maintained to ensure the site is kept neat and tidy. The site camp may require visual screening via shade cloth or other suitable material. The use of reflective materials and excessive lighting should be avoided and construction vehicles must enter and leave the site during working hours.

8.12 Noise management.

Additional noise is expected during the construction period due to construction activities. It is important that a noise complaints register should be opened and that all excavations and earth-moving activities must be restricted to normal construction working hours (7:30 – 17:30) as far as possible. Work on site must be well-planned and should proceed efficiently so as to limit the duration of the disturbance. This is to be done by ensuring that all equipment is in good working condition and fitted with mufflers/exhaust silencers if necessary.

Noise levels must comply with the relevant health & safety regulations and SANS codes and should be monitored by the Health & Safety Officer as necessary and appropriate and all affected parties must be informed of the excessive noise factors.

8.13 Dust management.

Although the generation of dust is synonymous with construction sites, care needs to be taken to prevent excessive dust from impacting the surrounding environment and community. Majority of the dust causing activities will take place during the construction period. Exposed surfaces, such as stockpiles and cleared areas should be provided with a suitable cover as soon as possible or wetted down. Construction vehicles should maintain low speeds of 20-40km/h 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.

A Protocol for Chance Fossil Finds is included in Appendix D of the PIA report and should be utilised if any heritage resources, including evidence of graves and human burials, archaeological material and paleontological material are discovered during the execution of the activities.
Furthermore, Heritage Western Cape must be notified without delay.

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

8.15 Site closure and rehabilitation.

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

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

- 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 any additional conditions which may be included in the Environmental Authorisation.

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

- Appoint an ECO.
- 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 ECO 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
• 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.	Beaufort West Municipality	During design phase

• 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: • 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.	
Impact Management Outcome	Development is compliant with recommendations of the EIA and the EMPr.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
• 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). • 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. • Interested & Affected Parties may need to be provided with an opportunity to comment on any proposed amendment to the EA depending on the significance of the changes.	Beaufort West Municipality / Consulting Engineer	During design phase
Performance Indicator	Detailed designs and site layout plans that adhere to the conditions of the EA and EMPr are finalised prior to the commencement of construction.	

10. Environmental Impact Management: Pre-construction Phase

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

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

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

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

Impact Management Objective: ***Identify and demarcate no-go areas, working areas and site facilities.***		
Potential impact to avoid	• 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
• 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.	Contractor	Pre-construction phase (prior to arrival of construction equipment, machinery, or workers on site)
Performance Indicator	No-go areas, working areas and areas for site camp facilities have been identified and appropriately demarcated to the satisfaction of the ECO, before construction activities commences on site.	

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

Impact Management Objective: ***To set up and equip the site camp and associated site facilities in a manner that will promote good environmental management.***	
Potential impact to avoid	• An inadequate location for the site camp facilities may result in impacts to sensitive resources (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.
Impact Management Outcome	Site camp facilities do not impact significantly on environment. The equipment required to implement the provisions of the EMPr are provided on site.

IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
• The site camp and site facilities described in Section 8.3 of this EMPr must be provided on site. • The site camp and associated site facilities must be set-up and managed in accordance with the general environmental management measures specified in Chapter 8 of this EMPr. • The site camp must be strategically set up, away from freshwater resources, in a manner that will promote good environmental management during construction/ demolition, and to respond to potential emergencies (including fires, spillage of hazardous substances etc.) that may arise. • The site camp, storage facilities, stockpiles, waste bins, and any other temporary structures on site should be located in such a way that they will present as little visual impact to surrounding residents and road users as possible. • Stormwater outlet must be designed to prevent erosion at discharge points. • It is recommended that consideration be given to the stormwater management plan when establishing site camps and associated facilities.	Contractor / Developer	Pre-construction phase (prior to start of construction activities)
Performance Indicator	Appropriate, well organised and properly equipped site facilities are available on site prior to commencement of construction activities. The location and set up of the facilities does not impact on the natural resources.	

10.3 OBJECTIVE 3: PRE-CONSTRUCTION ECO INSPECTION

It is essential that the appointed ECO be advised of the intended construction start date before construction activities commence on site, in order for the ECO to conduct an initial site inspection to assess the pre-commencement condition of the site. The ECO can also advise on the appropriate siting and demarcation of the site facilities, and the identification and demarcation of the no-go areas. The ECO may also conduct the first round of environmental awareness training at this stage.

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

11. Environmental Impact Management: Construction Phase

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

The environmental management actions and mitigation measures prescribed in this section must be implemented throughout the construction phase, and must be implemented in conjunction with the general management measures specified in Chapter 8 of this EMPr, as well as any other conditions which may be stated in the Environmental Authorisation. The ECO 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.
- Noise impact management.
- Visual impact management.
- Dust impact management.
- Creation of business & employment opportunities.
- Minimisation of the traffic.

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: 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	• 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 at the water courses are 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
• It is advised that an ECO 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. • A 28 m aquatic buffer zone should be indicated between any proposed activities and the river edge. • Establish a no go-buffer zone, demarcate using high visibility markers, such as danger tape, particularly between the construction site and the aquatic zone. • If site development does not occur soon after preparation of the site, a suitable cover crop to be established as a temporary measure. • Only the area required to accommodate construction activities within the working area should be cleared of surface covering. Unnecessary clearing/ disturbance of land and exposure of soil must be avoided. • 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. • Clean and contaminated storm water must be kept separate. Contaminated run-off from the construction site must be prevented from flowing into the streams. • 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.	Contractor	Construction phase

• Stockpiles of topsoil & spoil material must be protected from wind & water erosion. • 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. • Apart from hard-line engineering solutions, consideration needs to be given to cover exposed surfaces with plants or geo-netting (on slopes). • Gravel surfaces may be needed where there is vehicular/pedestrian movement.		
Performance Indicator	The water courses are not significantly impacted as a result of soil erosion.	

11.2 OBJECTIVE 2: PROTECTION OF RIPARIAN VEGETATION.

***Impact Management Objective:* To ensure that the riparian vegetation is not significantly impacted on.**		
Potential impact(s) to avoid	• 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
• Establish the no-go aquatic buffer zone, demarcate using appropriate high visibility markers, such as danger tape, particularly between the construction site and the aquatic zone. • A 28 m aquatic buffer zone should be indicated between any proposed activities and the watercourse edge. • Erect signage indicating the buffer zone and restricting access to any unauthorized personnel. • A monitoring programme should be implemented to ensure maintenance of this buffer zone, and minimal disturbance from construction activities. • Removal of alien invasive species should be undertaken in a way which prevents any damage to the remaining indigenous species and inhibits the re-infestation of the cleaned areas.	Contractor	Construction phase

• 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.
• Alien/ invasive species shall not be stockpiled, they should be removed from site and dumped at an approved site. A disposal slip should 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.
• As per the Engineering report, stormwater management techniques recommended should be implemented:
  o Temporary cut-off channels and berms;
  o Routing of run-off towards the existing watercourse and drainage routes;
  o Erosion protection by means of Silt fences, Geofabric, Sand bags and/or any combination thereof;
  o Compliance with a site-specific Environmental Management Plan; and
• All equipment and material storage areas must (if practical, reasonable and feasible) be located at a minimum distance of 50m from the watercourse. The appointed ECO must be consulted in this regard.
• Bund stockpiles and ensure they do not exceed 2m's in height.
• Stockpiles must not be located within 50 metres of the watercourse.
• Soil contaminated by spilled oil/ fuel/ lubricant must be excavated and disposed of in the hazardous waste bin.
• It is encouraged that search and rescue of fauna be undertaken, throughout construction phase.
• Daily vigilance of faunal species (tortoise) should be implemented.
• Labour should be briefed on how to manage a situation where they are forced to interact with fauna. ECO to provide guidance.
• Contractor should have contact details for animal removal services, to assist in a difficult situation.
• Labour should be advised to avoid any interactions with fauna, if possible.		

Performance Indicator	Riparian habitat is free of alien invasive species and is in a healthy state.	

11.3 OBJECTIVE 3: PROTECTION OF INDIGINOUS FAUNA AND FLORA

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

Potential impact(s) to avoid	• Disturbance or loss of intact vegetation. • Increased erosion. • Alien species infestation. • Death of fauna. • Captured fauna.		
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
• Demarcate/fence off the construction area. • Erect signage prohibiting access beyond fence line. • Contractor is to create a photographic record of the vegetation to be cleared prior to clearance. • 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. • Consider search and rescue of bulbs and cuttings of succulents for use in the rehabilitation of disturbed areas outside the cemetery footprint. • Development setback buffers to be implemented to avoid watercourses that are also associated with botanical sensitivity. • Blanket clearing of vegetation must be limited to the approved development footprint, and the area to be cleared must be demarcated before any clearing and grubbing commences. • No clearing outside of development and infrastructure footprint area to take place. • Rescued plants should be replanted into a nearby disturbed area of similar habitat or for open space rehabilitation. • A suitable weed management strategy to be implemented in construction and operation phases to eradicate and control regeneration. • Inform labour of indigenous vegetation that needs to be rescued, and advise on acceptable methods of removal and management, for both alien invasive species and indigenous species. • Utilize eco-friendly markers to identify exotic/alien invasive species that need to be removed, as well as indigenous vegetation to be rescued. • Final siting of footprint should be undertaken in consultation with respective specialists, including a botanist.		Contractor	Construction phase

• Removed topsoil should be used in rehabilitation of transformed areas that are within the open space areas. • 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. • Vehicles may not be driven along the eastern boundary of the site, outside of the demarcated working area.		
Performance Indicator	• Construction team limit disturbance to the indigenous vegetation as far as possible for the duration of the construction phase. • Indigenous vegetation transplanted successfully and remains in a healthy state. • There is no evidence of erosion.	

11.4 OBJECTIVE 4: MINIMISE FLOW MODIFICATION.

Impact Management Objective: ***Maintain the hydrological integrity of the watercourse.***		
Potential impact(s) to avoid	• Reduction in infiltration rates. • Increase in surface runoff volume and velocity. • 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	Responsible party	Time period
• Establish working corridor, and 28m no-go aquatic buffer. • Construction personnel, equipment and materials must be limited to the minimal practical working area. • As per the Engineering report, stormwater management techniques recommended should be implemented: o Temporary cut-off channels and berms;	Contractor	Construction phase

○ Routing of run-off towards the existing watercourse and drainage routes; ○ Erosion protection by means of Silt fences, Geofabric, Sand bags and/or any combination thereof; ○ Compliance with a site-specific Environmental Management Plan; and • All equipment and material storage areas must (if practical, reasonable and feasible) be located at a minimum distance of 50m from the watercourse. The appointed ECO must be consulted in this regard. • Avoid stockpiling any excavated soils close to the demarcated aquatic buffer. • Stockpile loose material appropriately and avoid spillage.		
Performance Indicator	• Watercourse remains in a healthy state of functioning. • No evidence of erosion.	

11.5 OBJECTIVE 5: NOISE IMPACT MANAGEMENT.

***Impact Management Objective:* To control avoidable noise impacts to the surrounding areas**		
Potential impact(s) to avoid	• Avoid unnecessary noise generated during the undertaking of construction activities, which may present a nuisance to surrounding community and negatively impact the Sense of place	
Impact Management Outcome	Management of noise emissions to an acceptable level.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
• 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.	Contractor	Construction phase

• 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.		
Performance Indicator	Noise levels on site remain within acceptable standards. No valid noise complaints are received.	

11.6 OBJECTIVE 6: VISUAL IMPACT MANAGEMENT.

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

• Working areas, storage facilities, stockpiles, waste bins, elevated tanks and any other temporary structures on site should be located in such a way that they will present as little visual impact to surrounding residents and road users as possible.		
Performance Indicator	• Good "housekeeping" is evident on site. • The site does not pose a visual impact to surrounding community.	

11.7 OBJECTIVE 7: DUST IMPACT MANAGEMENT.

***Impact Management Objective:* To prevent the generation of significant dust.**		
Potential impact(s) to avoid	• 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
• Land clearing and earthmoving activities should not be undertaken during strong winds, where possible. • Cleared areas should be provided with a suitable cover as soon as possible, and not left exposed for extended periods of time. • Stockpiles of topsoil, spoil material and other material that may generate dust must be protected from wind erosion (e.g. covered with netting, tarpaulin or other appropriate measures. Note that topsoil should not be covered with tarpaulin as this may kill the seedbank). • The location of stockpiles must take into account the prevailing wind direction and should be situated so as to have the least possible dust impact to surrounding residents, road-users and other land-users. • Speed limits must be enforced in all areas, including public roads and private property to limit the levels of dust pollution. • The speed limit should be set at 20-40km/h. • Dust must be suppressed on access roads and the construction site during dry periods by the regular application of water or a biodegradable soil stabilisation agent. Water used for this purpose must be used in quantities that will not result in the generation of excessive run off. • Dust suppression measures such as the wetting down of sand heaps as well as exposed areas around the site must be implemented especially on windy days.	Contractor	Construction phase

• The use of straw worked into the sandy areas may also help and the ECO must advise when this is necessary. • If dust appears to be a continuous problem the option of using shade cloth to cover open areas may be necessary or the erecting of shade netting above the fenced off are may need to be explored. • All vehicles transporting sand need to have tarpaulins covering their loads which will assist in any windblown sand occurring off the trucks. • Work on site must be well-planned and should proceed efficiently so as to minimise the handling of dust generating material. • Material loads should be properly covered during transportation. • Dust levels specified in the National Dust Control Regulations (GN 827 of November 2013) may not be exceeded. i.e. dust fall in residential areas may not exceed 600mg/m2/day, measured using reference method ASTM D1739; • A Complaints Register must be available at the site office for inspection by the ECO of dust complaints that may have been received.		
Performance Indicator	• 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.	

11.8 OBJECTIVE 8: CREATION OF BUSINESS & EMPLOYMENT OPPORTUNITIES.

***Impact Management Objective:* To create employment opportunities with potential for skills transfer, for members of the local community.**		
Potential impact(s) to be promoted.	• 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.	
Impact Management Outcome	The local community benefits from the employment opportunities created during the construction phase.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
• Beaufort West municipality should inform local community leaders, organizations and councillors of the project and the potential job opportunities for local builders and contractors.	Beaufort West municipality/ Zutari/ Contractor	Construction phase
Performance Indicator	The majority of the construction team is from the local community, with preference given to historically disadvantaged individuals. Skills transfer from experienced to less experienced workers is actively encouraged on site.	

11.9 OBJECTIVE 9: MINIMISATION OF THE TRAFFIC

***Impact Management Objective:* To ensure continued safety on access roads during the construction phase.**		
Potential impact(s) to avoid	• 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
• All construction vehicles must adhere to traffic laws when travelling to and from the site. • All drivers and machinery operators must be sensitised to the fact that they are working in an area with a potentially high volume of foot and vehicle traffic and must exercise due caution when entering/ exiting the site. • Appropriate signage should be erected to warn other road users about the presence of construction vehicles, particularly at the point where construction vehicles enter/ exit the site from the N2. • Speed of construction vehicles and other heavy vehicles must be strictly controlled to avoid dangerous conditions for other road users. • Construction vehicles must adhere to the load carrying capacity of road surfaces and adhere to all other prescriptive regulations regarding the use of public roads by construction vehicles. • The Contractor must ensure that any large or abnormal loads (including hazardous materials) that must be transported to/ from the site are routed appropriately, and that appropriate safety precautions are taken during transport to prevent road accidents. • 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.	Contractor	Construction phase
Performance Indicator	• 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.
- Prevent contamination of groundwater.
- Prevent vandalism and maintain security.
- Reduce visual impact.
- Reduced traffic.
- Creation of Business and Employment Opportunities.
- Prevent propagation alien invasive species.

12.1 OBJECTIVE 1: SITE CLOSURE & REHABILITION

Impact Management Objective: ***To rehabilitate all areas disturbed by construction activities in an environmentally sensitive manner.***		
Potential impact(s) to avoid	• Failure to remove all construction related waste and materials may result in environmental pollution. • Failure to remove all construction related equipment, machinery and site facilities may pose an impact to the natural environment specifically the watercourses. • Failure to stabilise disturbed surfaces may result in soil erosion and increased storm water run-off, which may limit successful revegetation of the site. • Deterioration of ESA and biodiversity network.	
Impact Management Outcome	• 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
• 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.	Contractor	Construction phase

• Surfaces are to be checked for waste products from activities such as concreting or asphalting and cleared in a manner approved by the ECO. • Any contaminated soil must be collected and disposed of as hazardous waste. • All construction waste, litter and rubble are to be removed from the site and re-used elsewhere, or recycled/disposed of at an appropriate facility. • Burying or burning of waste or rubble on site is prohibited. • All areas within the working area and site camp that have become devoid of vegetation or where soils have been compacted due to construction activities should be scarified or ripped. • Topsoil removed during the establishment of the site camp and the working area must be spread evenly over the entire site camp area and all other disturbed/ exposed areas after those areas have been ripped, scarified, shaped and contoured (as required). • Where necessary seeding and planting of vegetation can take place after the replacement of the topsoil. Hardy, drought tolerant, non-invasive plant species must be selected. If needed, a layer of mulch can be applied to the newly shaped/ landscaped and topsoiled areas. The mulch will serve to limit erosion and will promote the re-vegetation of the site by retaining moisture in the soil and providing organic material (compost) for new plant growth. • All exposed soils and recently topsoiled areas are to be re-vegetated or stabilised to the satisfaction of the ECO, to protect these areas from wind and water erosion. No areas are to be left exposed to erosive forces. Erosion protection measures that can be applied include mulching (described above), the placement of geotextile, onion bags filled with wood chips, brush-packing or other similar measures. • Any topsoil, subsoil or other excavated material that cannot be utilised during site rehabilitation must be removed from the site and reused elsewhere on the property or disposed of at an appropriate disposal site. • Disturbed soils must be revegetated with the local indigenous vegetation such as that which occurs at the site, or provided with other suitable cover. • Erosion features that have developed due to construction within the aquatic habitat due to the project are required to be stabilised. • Rehabilitation should include the disturbed area and section of the Kuilsrivier on the southern side of the site where waste dumping occurred. • 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 outside the cemetery footprint. • 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. • 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. • 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. • A Protocol for Chance Fossil Finds is included in Appendix D of the PIA report and should be utilised if any heritage resources, including evidence of graves and human burials, archaeological material and paleontological material are discovered during the execution of the activities.		
Performance Indicator	• All construction-related materials, equipment, facilities, waste and contaminated soils have been removed from the site. • Compacted soils have been scarified/ ripped and stabilised. • All disturbed/exposed surfaces have been provided with a suitable covering and/or stabilised. • No alien vegetation is evident on site.	

12.2 OBJECTIVE 2: REDUCE LOSS OF AQUATIC HABITAT

***Impact Management Objective:* Reduce loss of Aquatic Habitat**	
Potential impact(s) to avoid	• Loss of aquatic habitat within the watercourse areas. • Establishment of alien invasive species within the riparian zone. • Erosion within the riparian habitat
Impact Management Outcome	• Minimal loss of Aquatic Habitat and Associated Biota
IMPACT MANAGEMENT ACTIONS	

Mitigation measure	Responsible party	Time period
• Although construction has concluded, the buffer area should still be considered valid, and any activities occurring hereafter, should consider this area as such. The caretaker should be informed of this, and any illegal dumping that may occur, etc, should be reported to the municipality immediately. • 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. • The stormwater management infrastructure must be designed to ensure the runoff from the development is not highly concentrated before entering the buffer area. The volume and velocity of water must be reduced through discharging the surface flow at multiple locations surrounding the development, preventing erosion. • Any evidence of erosion from this stormwater system must be rehabilitated and the volume/velocity of the water reduced through further structures and/or energy dissipaters. These structures must be incorporated within the layout area.	Developer	Operational phase
Performance Indicator	• All disturbed/exposed surfaces have been provided with a suitable covering and/or stabilised. • A healthy aquatic habitat • Minimal waste within the aquatic habitat • Minimal alien vegetation present	

12.3 OBJECTIVE 3: PREVENTION OF FLOW MODIFICATION.

***Impact Management Objective:* No Impairment of Surface Water Quality**		
Potential impact(s) to avoid	• Deteriorated aquatic habitat. • Increased erosion. • Loss of ecosystem functioning.	
Impact Management Outcome	• No impairment of surface water quality as a result of the development.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
• The stormwater management infrastructure must be designed to ensure the runoff from the development is not highly concentrated before entering the buffer area. The volume and velocity of water must be reduced through discharging the surface flow at multiple locations surrounding the development, preventing erosion.	Developer	Operational phase

• 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 *Prosopsis* 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.		
Performance Indicator	• No visible signs of erosion. • Aquatic ecosystem remains healthy and functioning.	

12.4 OBJECTIVE 4: REDUCED EROSION & SEDIMENTATION.

***Impact Management Objective:* Reduced impact on aquatic features caused by erosion & sedimentation.**		
Potential impact(s) to avoid	• Increased sedimentation of downstream watercourses as a result of soil erosion problems and bank instability. • Creation of preferential flow paths.	
Impact Management Outcome	• Prevention of excessive sediment entering the watercourse.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
• Stormwater will be collected and dispersed by means of a proposed stormwater berm towards the East of the site, channelling run-off to an existing low-lying disturbed area which the Engineers propose to be formalized into a stormwater detention area. • The volume and velocity of stormwater runoff must be reduced through the discharge of the surface flow at multiple locations, preventing erosion, therefore accumulated stormwater will be dispersed by means of an overflow channel to minimize the effect of peak runoff downstream. The proposed detention pond will act as energy dissipater. • 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. • In-situ stormwater management is proposed within the internal road network, and outer stormwater berms are proposed. Stormwater will be collected and dispersed by means of a proposed	Developer / consulting engineer	Operational phase

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. • Ensure stormwater berms are maintained along the outer edge of the proposed site. • Accumulated stormwater will be dispersed by means of an overflow channel to minimize the effect of peak runoff downstream. The proposed detention pond will act as energy dissipater.		
Performance Indicator	• There is no evidence of erosion and the watercourse remains healthy.	

12.5 OBJECTIVE 5: PREVENT CONTAMINATION OF GROUNDWATER.

***Impact Management Objective:* Avoid the contamination of groundwater caused by the decomposition of human remains, metal corrosion and compounds used during embalming.**		
Potential impact(s) to avoid	• Contaminated groundwater.	
Impact Management Outcome	• Groundwater remains uncontaminated.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
• Monitoring boreholes are required (minimum of 3) in order to detect any potential contamination as quickly as possible. Borehole monitoring plan should be followed. • Standardise coffin size with ordinary dimensions. • Coffin materials should primarily consist of wood or biodegradable materials. • Refrain from using excessive ornamental metals, plastics, paints varnishes, etc. • All jewellery, dentures, pacemakers, watches, batteries, excessive cosmetics, and other such materials should be removed prior to burial.	Developer	Operational phase
Performance Indicator	• Vegetation present on site remains in a healthy state.	

12.6 OBJECTIVE 6: REDUCE VISUAL IMPACT.

***Impact Management Objective*: Reduce the visual impact caused by the proposed expansion.**		
Potential impact(s) to be avoided.	• Change in the sense of place.	
Impact Management Outcome	• Sense of place for the area is maintained.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
• Unnecessary use of lighting should be avoided. • The state of the onsite vegetation should be maintained and kept in a healthy state.	Developer	Operational phase

• Collection of refuse must be maintained. • Infrastructure should be maintained. • Use of unutilised areas within the extent as a green space.		
Performance Indicator	• The proposed expansion contributes to the present sense of place.	

12.7 OBJECTIVE 7: REDUCED TRAFFIC.

***Impact Management Objective*: Minimise the impact of traffic and maintain a safe environment.**		
Potential impact(s) to be avoided.	• The increase of traffic in the area. • Reduced safety on surrounding roads. • Increased carbon emissions.	
Impact Management Outcome	• Surrounding road networks remain safe to use and free of excessive congestion.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
• Implement signage to identify the cemetery entrance off of Blyth Street. • To allocate preferred parking areas. • Ensure that sufficient signage and road markings are incorporated into the internal road network.	Beaufort West Municipality	Operational phase
Performance Indicator	• Traffic moves freely and road infrastructure remains in a safe condition.	

12.8 OBJECTIVE 8: PREVENT VANDALISM AND MAINTAIN SECURITY.

***Impact Management Objective*: PREVENT VANDALISM AND UNAUTHORISED ENTRY TO CEMETERY.**		
Potential impact(s) to be avoided.	• Possible criminal activity. • Visitors hesitate to visit cemetery. • Caretaker can be at risk.	
Impact Management Outcome	• Cemetery remains free of vandalism and a safe environment.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
• Erect signage detailing prohibited activities. • Ensure security is available at the entrance of the cemetery. • Ensure that there is only one access point. • Ensure the fence is maintained, any detection of vandalism should be reported immediately.	Beaufort West Municipality	Operational phase

• The caretaker should have the contact information for emergency services, and enforcement, as well as the means to report any suspicious activities. • 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. • A Protocol for Chance Fossil Finds is included in Appendix D of the PIA report and should be utilised if any heritage resources, including evidence of graves and human burials, archaeological material and paleontological material are discovered during the execution of the activities.		
Performance Indicator	• No evidence of vandalism and no breaches of safety occur.	

12.9 OBJECTIVE 9: PREVENT PROPAGATION ALIEN INVASIVE SPECIES

Impact Management Objective: Areas planned for future grave sites are not infested with alien vegetation.		
Potential impact(s) to be avoided.	• Encroachment and spread of alien vegetation	
Impact Management Outcome	• Areas planned for future grave sites remain free from alien vegetation.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
• A suitable cover crop is to be sourced from a local nursery. The cover crop is to be drought resistant and indigenous to the area. • It is recommended that periodic alien vegetation clearing is undertaken. • Use of unutilised areas within the extent as a green space. • Prevent illegal dumping.	Beaufort West Municipality	Operational phase
Performance Indicator	• Areas planned for future grave sites are not infested with alien vegetation.	

12.10 OBJECTIVE 10: CREATION OF BUSINESS AND EMPLOYMENT OPPORTUNITIES.

Impact Management Objective: Creation of Business and Employment Opportunities		
Potential impact(s) to be promoted.	• Long-term/temporary employment available to few members of the local community. • Employees earn salaries that will contribute to their quality of life. • Multiple opportunities will be created within the site and will ripple out to the surrounding community.	
Impact Management Outcome	• Creation of Business and Employment Opportunities.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period

• The Holder should inform local community leaders, organisations and councillors of the potential job opportunities associated with the different components associated with the operational phase of the development.	Beaufort West Municipality	Operational phase
Performance Indicator	• Increase in employment of local residents.	

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 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 Officer (EO), who will act as the Contractor's representative to monitor and enforce compliance with the conditions of this EMPr, throughout all phases of construction.

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

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

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;
- 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.

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.
- Once a year, for the following 5 years 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 ect) in order 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 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 EMR 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 EMR must be submitted to the Holder and to the Competent Authority is so requested by that authority. The EMR 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:

- A compliance checklist is to be compiled in line with the measures and conditions included within this EMPr and the EA.
- The ECO must complete a compliance Checklist after each ECO site visit.
- The ECO must compile an EMR 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 EMR 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 EMR Reports must be retained by the Holder for a period of at least 5 years and must be provided to the Competent Authority upon request.

18. Penalties, Claims and Damages

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

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

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

- Not implementing the conditions of the EMPr;
- Spillage that result in environmental damage;

- Incorrect handling and storage of construction materials and chemicals;
- Sensitive areas that are not clearly demarcated;
- Performing ablutions in areas other than facilities provided for such actions; and
- Occurrence of unattended and out of control fire.

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

The following fine structure shall apply:

Table 5: 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
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

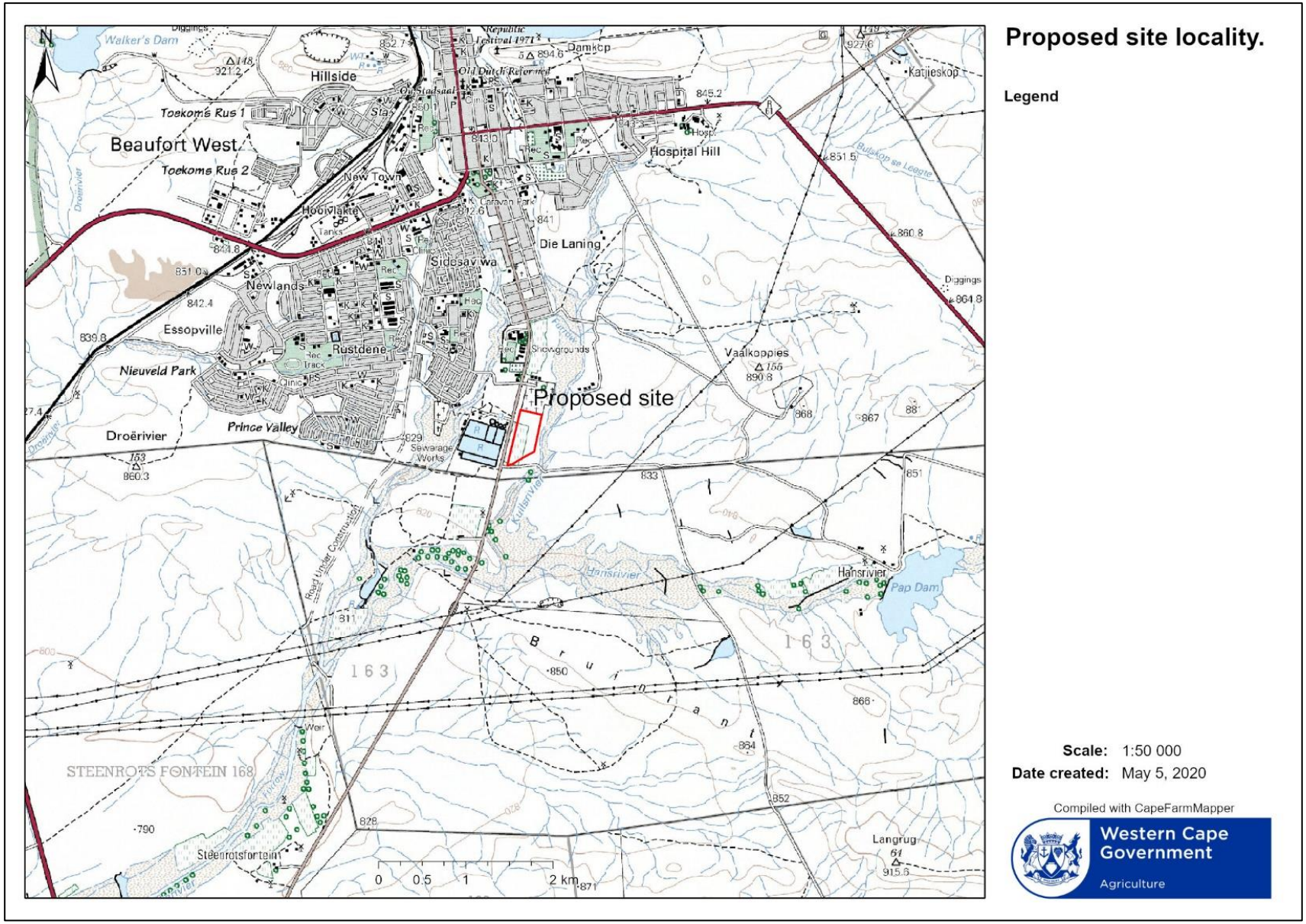
The above does not absolve the transgressor from being prosecuted in terms of the ***National Environmental Management Act (Act 107 of 1998)*** which may result in further penalties and other actions by State Departments.

19. Conclusion

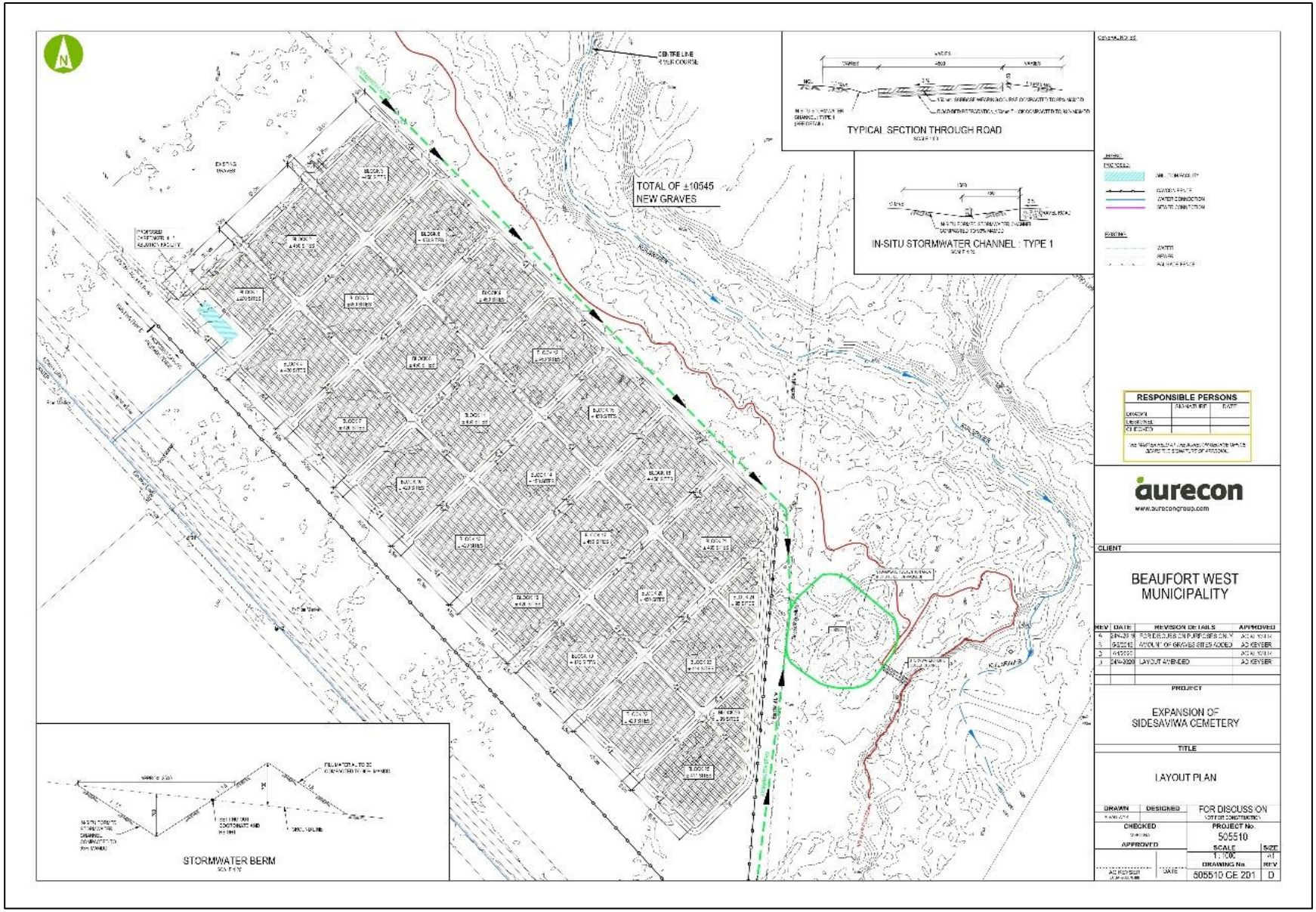
The recommendations and mitigation measures prescribed in this EMPr have been formulated with the intention of addressing potential pre-construction, construction and operational phase impacts on the environment. It is likely that if the conditions, requirements and recommendations of the above EMPr 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 plans



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 Muncipality, KZN.

uMtumvuna — Ray Nkonyeni Local Municipality
- Project screening, Public Participation and BID for the Proposed uMtamvuna 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 — Ethekwini Municipality
- Project screening, Assistance with the initiation of the Section 24G for the Viewhaven Housing Development, Ethekwini 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 Constrcution 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

PERSONAL

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

Nationality: South African

Date of Birth: 10 November 1994

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

Marital Status: Single

Drivers License: Code B

Health: Excellent

WORK EXPERIENCE

April 2019 – Present: Sharples Environmental Services cc
Environmental Assessment Practitioner

- EMPr's
- Basic Assessments Reports
- Amendment Applications
- Administration.

Jan-March 2017 & December 2018 – April 2019: NCC Environmental services -Environmental Control Officer and junior EAP

- Report writing.
- Compilation of the Great Fish Nature Reserve Protected Area Management Plan.
- Administration and operations of the Guttural toad and Mallard duck programs.

October 2018-December 2018: EOH Coastal and Environmental Services-Junior Environmental Assessment Practitioner.

- 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.

January 2018- October 2018: Junior Environmental Assessment Practitioner.

- Drafting Integratwed Waste Water Management Programmes's, EMP's, NID's and the compilation of WULA's.
- Environmental Auditing.
- Dust monitoring, map making, facilitating public participation and general project administration.

TERTIARY EDUCATION

2016: Cape Peninsula University of Technology

- 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

Appendix D: Protocol for Chance Fossil Finds

<table>
<tr><td colspan="3">Appendix 1: CHANCE FOSSIL FINDS PROCEDURE: Expansion of the Goue Akker Cemetery, Beaufort West</td></tr>
<tr><td>Province & region:</td><td colspan="2">Western Cape, Ward 4 of the Beaufort West Local Municipality (Central Karoo District Municipality)</td></tr>
<tr><td>Responsible Heritage Resources Agency</td><td colspan="2">HERITAGE WESTERN CAPE (Contact details: Protea Assurance Building, Green Market Square, Cape Town 8000. Private Bag X9067, Cape Town 8001. Tel: 086-142 142. Fax: 021-483 9842. Email: hwc@pgwc.gov.za)</td></tr>
<tr><td>Rock unit(s)</td><td colspan="2">Teekloof Formation (Lower Beaufort Group, Karoo Supergroup), Late Caenozoic alluvium.</td></tr>
<tr><td>Potential fossils</td><td colspan="2">In Beaufort Group bedrocks: tetrapod skeletal remains, vascular plants, petrified wood, trace fossil assemblages including vertebrate burrows . In alluvium: teeth, bones and horn cores of mammals, calcretised trace fossils (e.g. termitaria), freshwater molluscs, plant debris, reworked petrified wood.</td></tr>
<tr><td rowspan="4">ECO protocol</td><td colspan="2">1. Once alerted to fossil occurrence(s): alert site foreman, stop work in area immediately (N.B. safety first!), safeguard site with security tape / fence / sand bags if necessary.</td></tr>
<tr><td colspan="2">2. Record key data while fossil remains are still in situ:
● Accurate geographic location – describe and mark on site map / 1: 50 000 map / satellite image / aerial photo
● Context – describe position of fossils within stratigraphy (rock layering), depth below surface
● Photograph fossil(s) in situ with scale, from different angles, including images showing context (e.g. rock layering)</td></tr>
<tr><td>3. If feasible to leave fossils in situ:
● Alert Heritage Resources Agency and project palaeontologist (if any) who will advise on any necessary mitigation
● Ensure fossil site remains safeguarded until clearance is given by the Heritage Resources Agency for work to resume</td><td>3. If not feasible to leave fossils in situ (emergency procedure only):
● Carefully remove fossils, as far as possible still enclosed within the original sedimentary matrix (e.g. entire block of fossiliferous rock)
● Photograph fossils against a plain, level background, with scale
● Carefully wrap fossils in several layers of newspaper / tissue paper / plastic bags
● Safeguard fossils together with locality and collection data (including collector and date) in a box in a safe place for examination by a palaeontologist
● Alert Heritage Resources Agency and project palaeontologist (if any) who will advise on any necessary mitigation</td></tr>
<tr><td colspan="2">4. If required by Heritage Resources Agency, ensure that a suitably-qualified specialist palaeontologist is appointed as soon as possible by the developer.</td></tr>
</table>

	5. Implement any further mitigation measures proposed by the palaeontologist and Heritage Resources Agency
Specialist palaeontologist	Record, describe and judiciously sample fossil remains together with relevant contextual data (stratigraphy / sedimentology / taphonomy). Ensure that fossils are curated in an approved repository (*e.g.* museum / university / Council for Geoscience collection) together with full collection data. Submit Palaeontological Mitigation report to Heritage Resources Agency. Adhere to best international practice for palaeontological fieldwork and Heritage Resources Agency minimum standards.