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## SECTION 24 G

# DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME

## FOR THE

ALLEGED UNLAWFUL CONSTRUCTION OF A  
ROAD AND CLEARANCE OF VEGETATION  
ON THE REMAINDER OF FARM 91, HOLLE  
KLOOF AND PORTION 1 OF THE FARM 131,  
PLATTE KLOOF, FARM 296,  
WABOOMSKRAAL, GEORGE MUNICIPALITY

<b>APPLICANT:</b>	Octo Trading 377 cc – The Applicant
<b>ENVIRONMENTAL CONSULTANT:</b>	Sharples Environmental Services cc Primary Author: Michael Bennett
<b>24G CONSULTATION REF:</b>	14/2/4/1/D2/53/0003/21
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**DOCUMENT DETAILS**

<b>Project Ref. No:</b>	14/2/4/1/D2/53/0003/21
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**Sharples Environmental Services cc** Since 1998, SES has been actively engaged in the fields of environmental planning, assessment and management. We advise private, corporate and public enterprises on a variety of differing land use applications ranging from large-scale residential estates and resorts to golf courses, municipal service infrastructure installations and the planning of major arterials. Our consultants have over 20+ years of combined experience and we operate in the Southern, Eastern and Western Cape regions.

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## 1. Introduction

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*Sharpley Environmental Services cc (SES)* was appointed by the *The Applicant of Octo Trading 377* to undertake the Section 24 G rectification for the alleged unlawful construction of a road to Portion 1 of farm 131, Plattekloof via the remainder of Farm 91/ Holle Kloof and Farm 296, Waboomskraal and the clearance of vegetation to establish a house, in terms of the National Environmental Management Act, 1998 (Act 107 of 1998) ("NEMA").

It is now proposed to repair and rehabilitate damages to the partially constructed road and erosion gully as well as for the completion of the road and construction of a house on the already cleared and cut house platform. These activities will trigger listed activities in terms of the Amended Environmental Impact Assessment Regulations of 2014 (GN No. R.324 - 327 of 7 April 2017). Environmental Authorisation is therefore required from the competent authority (Western Cape Department of Environmental Affairs & Development Planning) before construction can commence.

## 2. About this EMPr

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This document is intended to serve as the Environmental Management Programme (EMPr) for the rehabilitation and Operational phase activities as well as the new Construction Phase activities.

This document provides measures that must be implemented to ensure that any environmental degradation that may be associated with the activities 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 *The Applicant*, and any person acting on his behalf, including but not limited to agents, employees, associates, guests or any person rendering a service to the development site.

### 2.1 Important caveat to the report

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

The Implementing Agent and the attitude of the construction team play an integral role in determining the impact that the development will have on the environment. The ECO needs to ensure that all 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

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It is essential that this EMPr be carefully studied, understood, implemented, and adhered to as far as reasonably possible, throughout all phases of the activities. *The applicant* 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 Applicant*, 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. Amendments to this EMPr must first be approved by the competent authority, in writing, before being implemented.

### 4. Background and Location of the Activity

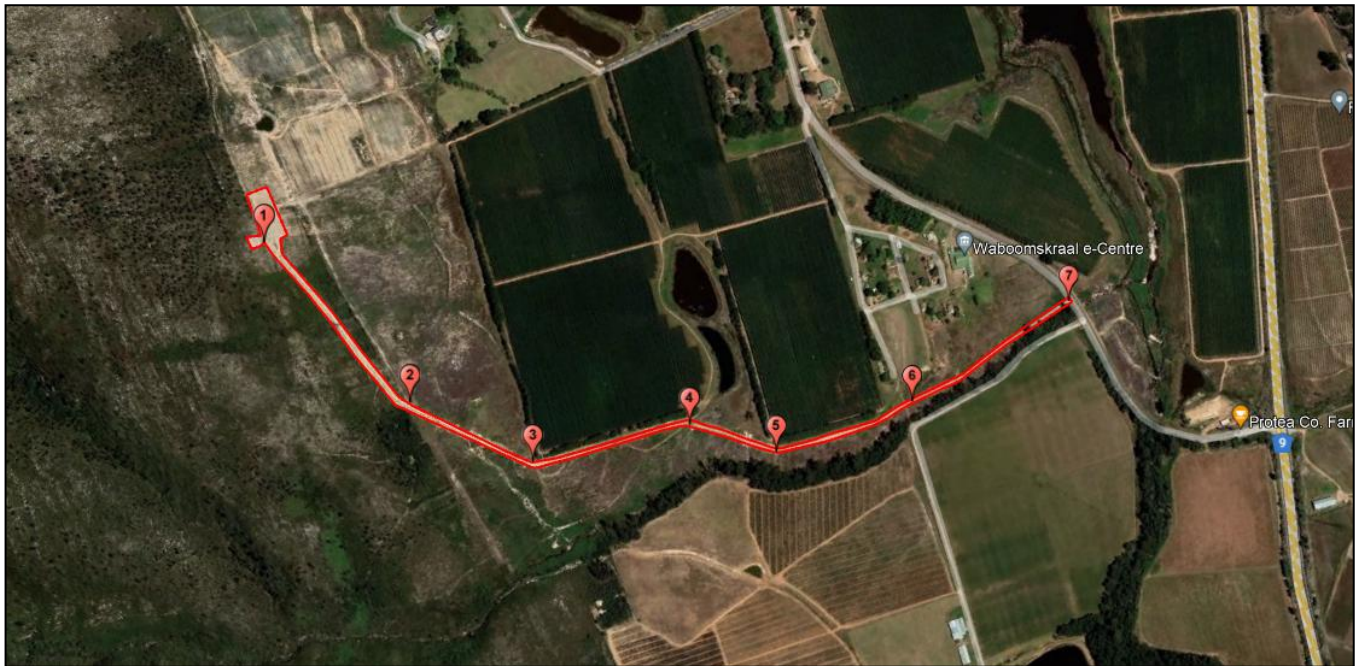
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When Octo trading 377 bought the farm in January 2021, there had been no farming activity for the previous five years and the access to farm 131/1 via the Holle Kloof farm RE/91 and Farm 296 was not maintained or used. This road/jeep track deteriorated over time, got overgrown and became unusable. The applicant therefore commenced with upgraded the access road, cleared vegetation and cut a platform for the location of a house. Construction was ceased on 11 November 2021 and a Section 24G process was started to obtain retrospective Environmental Authorisation.

The upper road conveys stormwater from the upper catchment to the lower catchment area. The stormwater drains and culverts from the upper road section was not completed and/or formalised when a flash flood occurred in the area on 22 November 2021. This led to major erosion, the formation of a donga/gulley in the gravel road and damage to an irrigation furrow on RE/91.

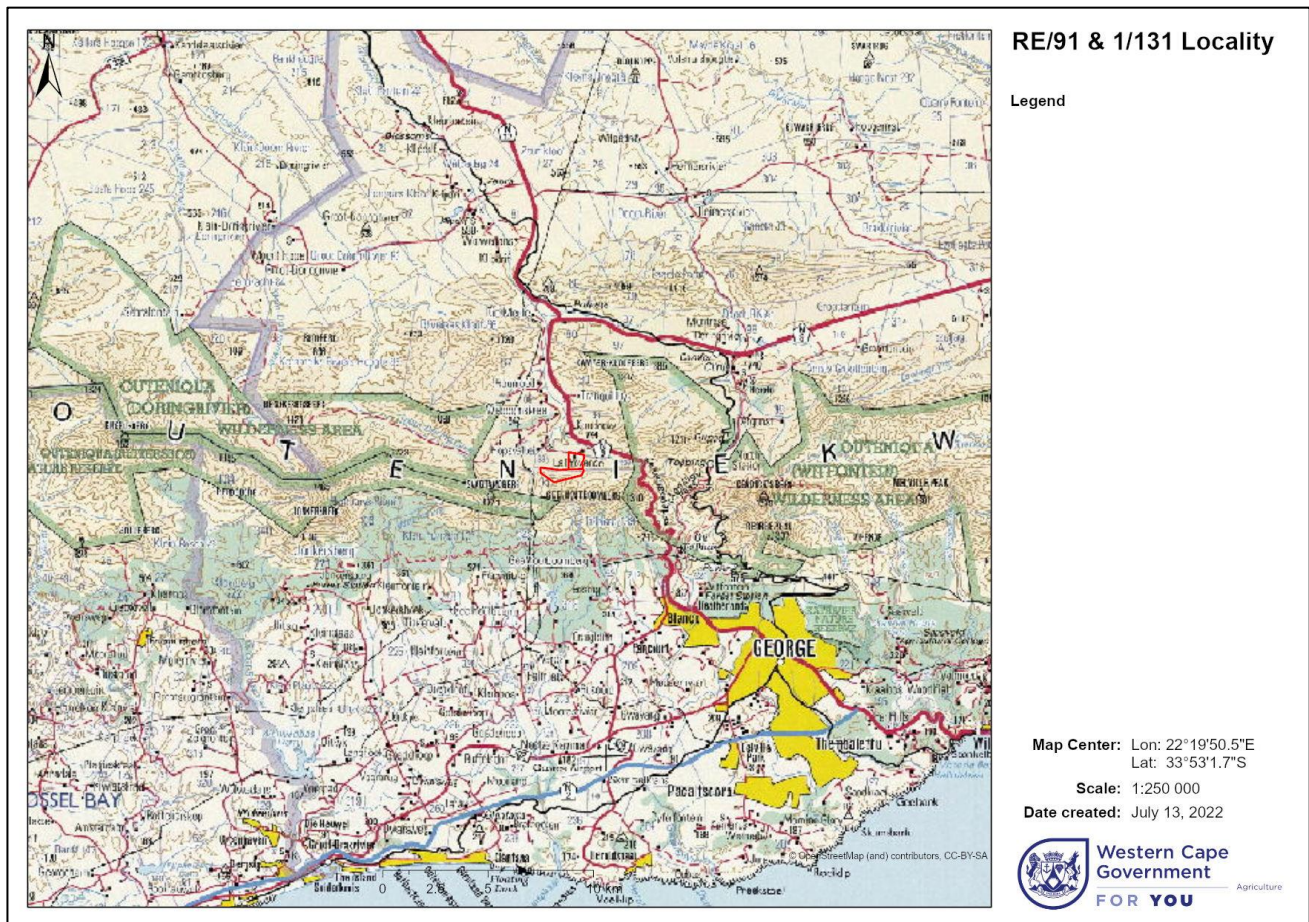
Due to the extent of the damage to RE/91 caused by the flash flood, Octo Trading 377 commissioned DMS Structures to investigate measures to reinstate the road, fill the donga and formalize the stormwater to protect the road and the surrounding environment.





*Figure 1: Cleared Area and Partially Upgraded Road*

The farms are part of the Waboomskraal Community on the north slopes of the Outeniqua Mountains, immediately below and north-west of Geelhoutboomberg and northwest of the Outeniqua Pass.



*Figure 2: Properties Locality*



*Table 1: Property Details and Co-ordinates*

Province	Western Cape			
District Municipality	Garden Route			
Local Municipality	George			
Ward number(s)	22			
Nearest town(s)	Waboomskraal, George			
SG Code(s)	C02700000000009100000 C027000000000013100001 C027000000000029600000			
Co-ordinates of the farm(s):	Property boundary: Please refer to the Figure 1 for the locality of the points below			
	Point	Property	Latitude (S)	Longitude (E)
	1	RE/91	33°52'36.89"S	22°21'39.60"E
	2		33°52'40.79"S	22°22'8.14"E
	3		33°53'2.08"S	22°22'5.73"E
	4		33°53'2.77"S	33°53'2.77"S
	5	1/131	33°52'59.99"S	22°20'47.89"E
	3		33°53'2.08"S	22°22'5.73"E
	6		33°53'12.08"S	22°22'3.20"E
	7		33°53'7.93"S	22°20'47.99"E
	8	296	33°52'31.82"S	22°21'9.25"E
	9		33°52'16.14"S	22°21'9.42"E
	10		33°52'28.21"S	22°22'15.82"E

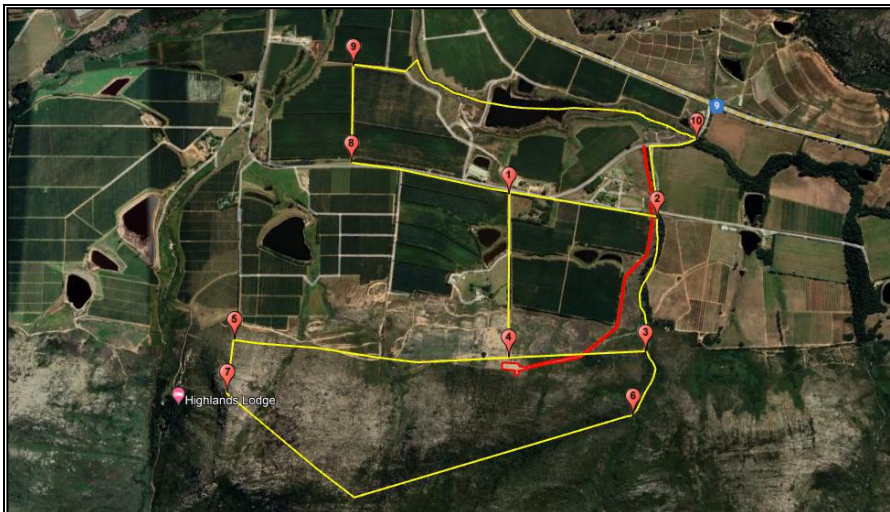


Figure 2: Property boundaries

## 5. Description of the Activity

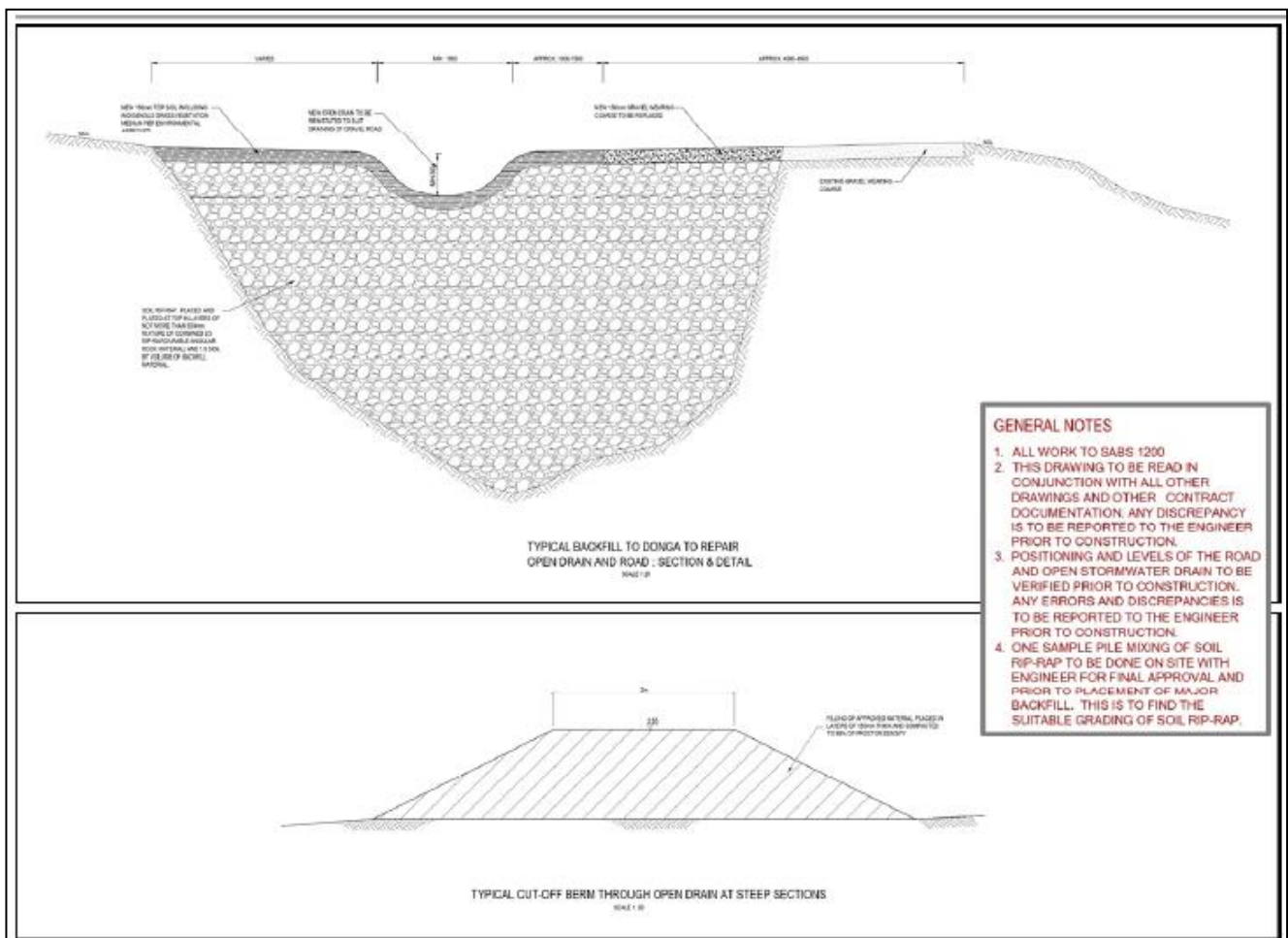
It was determined that the filling of the large donga with soil rip-rap, the construction of soil berms and additional stormwater culverts crossing the road would provide the best protection of the upgraded gravel road. The estimated soil rip-rap required for fill is above 1000 m<sup>3</sup> but expected to be less than 1500 m<sup>3</sup>.

The landowner also wishes to develop a house and additional infrastructure, i.e., shed, green houses, fruit trees and vegetables garden on the cleared area. This will also entail removal of alien and invasive plant species from the property.



Soil rip-rap will have the following benefits above any other conventional fill repair methods for this application. They are:

- In soil rip-rap voids between the rip-rap will be filled with soil, whereas conventional rip-rap will have voids/holes between the rip-rap. This is beneficial whereas the soil can be filled in these voids and the last layer on top of the soil rip-rap can also be finished with a layer of 150 mm topsoil. This will provide a very good growing medium for plants, grass etc. The combination of soil and plant roots creates an excellent filter for the underlying soil. This will also prevent “piping” of the underlying soil materials.
- Bedding material is not required before the placement of the soil rip-rap. This is extremely beneficial since the soil rip-rap can directly be placed in layers which only need to be pleated from the bottom of the donga up to the recreated side drain's invert level. With conventional filling methods over excavation of the donga will be required to fill the donga in layers compacted of not more than 200-300 mm. The over excavation of the donga will have further major impact on the current undisturbed areas on both properties. It is therefore not recommended to do conventional filling of the donga.
- Vegetation can be established on top of soil rip-rap which can't be done with other conventional rip-rap methods. The vegetation on top of soil-rip will create excellent protection layer on top of the stormwater drains and surrounding areas.
- Soil rip-rap in combination with natural vegetation will minimize the flow velocities at the bottom of the stormwater drains and will prevent erosion of the drains and soils.
- The soil rip-rap together with the natural vegetation will provide a natural and aesthetic look of the environment.



*Figure 3: Erosion gully back fill (top) and cut-off berm (bottom) details as provided by DMS Consulting Structural Engineering (March 2022).*



*Figure 4: The length of erosion gully proposed to be infilled with riprap, as per the engineering drawing relative to the Kleinbos River and the 100m GN509 ZoR.*



*Figure 5: Area to be rehabilitated by infilling the shallow gully/flow path with the deposited sediment and revegetating the area.*

## 6. Description of Environmental Setting

### 6.1 Vegetation

Dr David J. McDonald of Bergwind Botanical Surveys & Tours CC was appointed to compile the Vegetation Compliance Statement. According to the Statement:

The area of interest experienced an intense wildfire in October 2018. The fynbos on the north-facing slopes was completely burnt. Some of the invasive pine trees (*Pinus radiata*) on the slope above the 'house platform' were completely burnt whereas others were scorched but survived. Fire is necessary in fynbos ecosystems and has a rejuvenating effect. The fynbos vegetation in the area of interest is approaching four years of age and is in a vigorous post-burn phase of growth.

Despite being on the north-facing slopes of the Outeniqua Mountains, the vegetation of the area of interest is all classified as **South Outeniqua Sandstone Fynbos** (Mucina, Rutherford & Powrie 2005; Rebelo et al. 2006; SANBI, 2018).

The South Outeniqua Sandstone Fynbos that would have originally occurred on the 'house platform', upper platform and the access road, would have been a low to mid-high restioid—ericoid shrubland. The Proteaceae were represented by *Leucadendron uliginosum* subsp. *uliginosum* and *Mimetes cucullatus*. Rebelo et al. (2006) list a large number of species for this vegetation type, some of which are endemic. However, since this investigation is about the vegetation that was lost, only a small proportion of the possible plant species that could occur were noted in the area of undisturbed fynbos immediately upslope from the house platform. Species recorded include, *Acacia mearnsii*\*, *Brunia nudiflora*, *Elegia* cf. *fistulosa*, *Erica densifolia*, *Erica uberiflora*, *Hakea sericea*\*, *Hypodiscus albo-aristatus*, *Lanaria lanata*, *Leucadendron uliginosum* subsp. *uliginosum*, *Linum* sp., *Metalsia* cf. *trivialis*, *Metalsia densa*, *Mimetes cucullatus*, *Penaea cneorum* subsp. *cneorum*, *Pinus radiata*\*, *Psoralea pinnata*, *Pteridium aquilinum*, *Seriphium plumosum*, *Stoebe alopecuroides*, *Struthiola* cf. *eckloniana*, *Struthiola ciliata*, *Syncarpha paniculata*, *Tetraria ustulata* and *Thesium* sp. (\*= invasive alien plant species) (This list is not a complete inventory of species!).

The two main alien invasive species occurring in the vegetation around the house platform and along the sides of the access road are *Pinus radiata* (Monterey Pine) and *Acacia mearnsii* (Black Wattle). A third species, *Hakea sericea* (Silky Hakea), is also present but with lower abundance. These species have a serious negative impact on indigenous vegetation and must be cleared. The pine trees have been present for some time, judging by their size, and apart from being scorched by the fire four years ago, most of them have survived. The fire also stimulated the germination and growth of the silky hakea, black wattle and pine.

No Red List species (i.e., species of conservation concern [SCC]) (sensu Raimondo et al. 2009) were found on the site or in the surrounding vegetation.

According to the National List of Threatened Terrestrial Ecosystems (Government Gazette, 2011), South Outeniqua Sandstone Fynbos was classified with a conservation status of **Least Concern** (since it was not listed). That has not changed in the most recent appraisal in 2021 of what is now called Red List Ecosystems (RLE) (SANBI, 2021). The area of interest is in a habitat type with a low risk of loss and negative impacts due to anthropogenic activities, since it is well conserved in the mountain catchments of the Outeniqua Mountain Range. The 'disturbance footprint' falls in an Ecological Support Area 1.

## 6.2 Aquatic description

Christel du Preez of Fen Consulting was appointed to compile a Freshwater Assessment for the activities undertaken on the remainder of Farm 91, Holle Kloof and Portion 1 of the Farm 131, Platte kloof, Waboomskraal.

According to the report:

During the specialist's field verification, undertaken on the 8th of April 2022, no watercourses were identified to be traversed by the study area. As such, the study area can be considered of low aquatic biodiversity sensitivity although cognisance must be given to the position of the road in the landscape in relation to more sensitive drainage features. The Kleinbos River, located approximately 200 m east of the partially upgraded road, was identified to be the only watercourse impacted by the erosion gully that formed as a result of the road development. The detailed results of the field assessment are contained in Section 5 of the Freshwater Assessment.



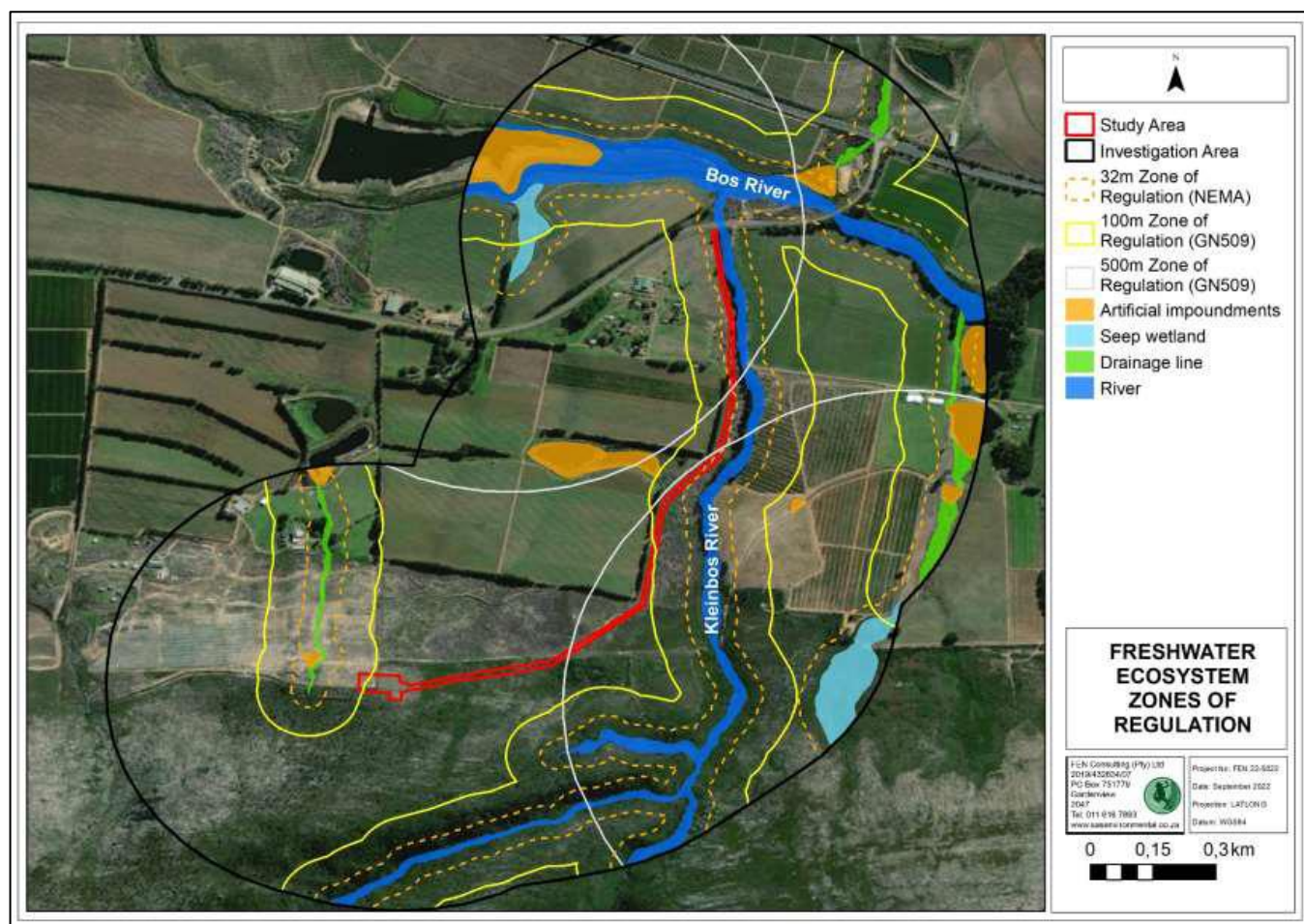


Figure 4: The NEMA and GN509 zones of regulation associated with the watercourses within the investigation area.

Table 2: Desktop data (from desktop databases only) relating to the characteristics of the associated with the study area

Aquatic ecoregion and sub-regions in which the study area is located		Detail of the study area in terms of the NFEPA, 2011 database	
Ecoregion	South Eastern Coastal Belt	<ul style="list-style-type: none"><li>FEPACODE</li></ul>	<ul style="list-style-type: none"><li>The study area is located within a sub-quaternary catchment considered of importance as an upstream management area, which are sub-quaternary catchments in which human activities needs to be managed to prevent degradation of downstream river FEPAs and FSAs (FEPA CODE = 4).</li></ul>
Catchment	Gourits		
Quaternary Catchment	J35B		
WMA	Gouritz		
subWMA	Olifants	<ul style="list-style-type: none"><li>NFEPA Wetlands (Figure 13)</li></ul>	<ul style="list-style-type: none"><li>According to the NFEPA database, no wetlands are associated with the study area. Two unchannelled valley bottom wetlands are identified by this dataset which are located in the investigation area, the wetland to the east is classified as a natural wetland and is considered to be in a moderately modified ecological condition (WETCON = C). The wetland to the north is classified as an artificial wetland and was verified as an artificial impoundment during</li></ul>
Dominant characteristics of the South Western Coastal Belt Ecoregion Levell II (20.02)(Kleynhans <i>et al.</i> ,2007)			
Level II Code	<ul style="list-style-type: none"><li>20.02</li></ul>		

			the site assessment.
Dominant primary terrain morphology	<ul style="list-style-type: none"><li>• Closed hills, moderate and high relief, Plains, moderate relief.</li></ul>	<ul style="list-style-type: none"><li>• Wetland Vegetation Type</li></ul>	<ul style="list-style-type: none"><li>• The study area and investigation area are situated within Eastern Fynbos-Renosterveld Sandstone Fynbos (Least Threatened) Wetland Vegetation Type. The threat status is provided by Mbona <i>et al.</i> (2015).</li></ul>
<ul style="list-style-type: none"><li>• Dominant primary vegetation types</li></ul>	<ul style="list-style-type: none"><li>• Mountain fynbos, Afromontane Forest, dune thicket, grasst fynbos, south and south-west coast renosterveld</li></ul>		
<ul style="list-style-type: none"><li>• Altitude (m a.m.s.l.)</li></ul>	<ul style="list-style-type: none"><li>• 0 - 1300</li></ul>	<ul style="list-style-type: none"><li>• NFEPA Rivers</li></ul>	<ul style="list-style-type: none"><li>• As per the NFEPA database, no rivers are associated with the study area or the investigation area.</li></ul>
<ul style="list-style-type: none"><li>• MAP (mm)</li></ul>	<ul style="list-style-type: none"><li>• 500 - 800</li></ul>		
<ul style="list-style-type: none"><li>• The coefficient of Variation (% of MAP)</li></ul>	<ul style="list-style-type: none"><li>• &lt;20 - 30</li></ul>	Importance of the study area according to the Western Cape Biodiversity Spatial Plan (2017) (Figure 14)	
<ul style="list-style-type: none"><li>• Rainfall concentration index</li></ul>	<ul style="list-style-type: none"><li>• &lt;15</li></ul>		
<ul style="list-style-type: none"><li>• Rainfall seasonality</li></ul>	<ul style="list-style-type: none"><li>• All year</li></ul>	<ul style="list-style-type: none"><li>• According to the Western Cape Biodiversity Spatial Plan (2017), a small area outside the eastern boundary of the study area is classified as a Critical Biodiversity Area (CBA) 1, of aquatic ecological importance. CBAs are areas in a natural condition that are required to meet biodiversity targets, for species, ecosystems or ecological processes and infrastructure, in this case specifically for riverine environments. The study area and the southern extent of the investigation area is considered to be an Ecological Support Area (ESA). These areas are important in supporting the functioning of CBAs and are often vital for delivering ecosystem services. These areas are classified as ESA 1, which area areas in a natural condition that are required to meet biodiversity targets, for species, ecosystems or ecological processes and infrastructure. The study area and the majority of the investigation area is associated with an ESA 1 of terrestrial importance. Small areas directly north and east of the study area are classified as ESA 1s of aquatic/watercourse importance. Areas along the northern and eastern boundary of the investigation areas are classified as ESA 2, which are areas that are not essential for meeting biodiversity targets, but that play an important role in supporting the functioning of protected areas (PAs) or CBAs and are often vital for delivering ecosystem services.</li></ul>	
<ul style="list-style-type: none"><li>• Mean annual temp. (°C)</li></ul>	<ul style="list-style-type: none"><li>• 14 - 18</li></ul>		
<ul style="list-style-type: none"><li>• Winter temperature (July)</li></ul>	<ul style="list-style-type: none"><li>• 6 - 18</li></ul>		
<ul style="list-style-type: none"><li>• Summer temperature (Feb)</li></ul>	<ul style="list-style-type: none"><li>• 14 - 28</li></ul>		
<ul style="list-style-type: none"><li>• Median annual simulated runoff (mm)</li></ul>	<ul style="list-style-type: none"><li>• 80 - &gt;250</li></ul>		
Detail National Biodiversity Assessment (2018): South African Inventory of Inland Aquatic Ecosystems (SAIIAE)			
<ul style="list-style-type: none"><li>• According to the NBA 2018: SAIIAE no wetlands or rivers are located in the study or investigation area.</li></ul>			
National web based environmental screening tool (2020)			
<ul style="list-style-type: none"><li>• The screening tool is intended for pre-screening of sensitivities in the landscape to be assessed within the EIA process. This assists with implementing the</li></ul>		<ul style="list-style-type: none"><li>• The study area is located in an area considered of very high aquatic biodiversity sensitivity. This is due to the study area located within a strategic water source area, and due to the presence of rivers and aquatic CBAs. According to the Strategic Water Source Area Database (2017), the study area is situated</li></ul>	



mitigation hierarchy by allowing developers to adjust their proposed development footprint to avoid sensitive areas.

within the Outeniqua Surface Water Area.

## 7. Legal Framework

### 7.1 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 & 327 published on the 7th of April 2017.

Some of the listed activities triggered has already been commenced with while the others are being applied for.

**Table 2: Listed Activities in terms of the NEMA Environmental Impact Assessment Regulations.**

Activity #	Listing notice 1. Description of Activity as per GN No. R 327
19	<p><b>The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse</b> but excluding where such infilling, depositing, dredging, excavation, removal or moving—</p> <p>(a) will occur behind a development setback; (b) is for maintenance purposes undertaken in accordance with a maintenance management plan; (c) falls within the ambit of activity 21 in this Notice, in which case that activity applies; (d) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or (e) where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies.</p>
24	<p><b>The development of a road—</b> (i) for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Government Notice 545 of 2010; or (ii) with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres; but excluding a road—</p> <p>(a) which is identified and included in activity 27 in Listing Notice 2 of 2014; (b) where the entire road falls within an urban area; or (c) which is 1 kilometre or shorter.</p>
27	<p><b>The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for—</b> (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.</p>
48	<p><b>The expansion of—</b> (i) <b>infrastructure or structures where the physical footprint is expanded by 100 square metres or more; or</b> (ii) <b>dams or weirs, where the dam or weir, including infrastructure and water surface area, is expanded by 100 square metres or more;</b> where such expansion occurs—</p> <p>(a) within a watercourse; (b) in front of a development setback; or (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; excluding—</p> <p>(aa) the expansion of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour; (bb) where such expansion activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies; (cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in</p>

	which case that activity applies; (dd) where such expansion occurs within an urban area; or (ee) where such expansion occurs within existing roads, road reserves or railway line reserves.
<b>Activity #</b>	<b>Listing notice 3. Description of Activity as per GN No. R 324</b>
4	<p><b>The development of a road wider than 4 metres with a reserve less than 13,5 metres.</b></p> <p><b>i. Western Cape</b></p> <p>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.</p>
12	<p><b>The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.</b></p> <p><b>Western Cape</b></p> <p>i. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004; ii. Within critical biodiversity areas identified in bioregional plans; iii. Within the littoral active zone or 100 metres inland from high water mark of the sea or an estuarine functional zone, whichever distance is the greater, excluding where such removal will occur behind the development setback line or even in urban areas; iv. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning; or v. On land designated for protection or conservation purposes in an Environmental Management Framework adopted in the prescribed manner, or a Spatial Development Framework adopted by the MEC or Minister.</p>
15	<p><b>The transformation of land bigger than 1000 square metres in size, to residential, retail, commercial, industrial or institutional use, where, such land was zoned open space, conservation or had an equivalent zoning, on or after 02 August 2010.</b></p> <p><b>Western Cape</b></p> <p>i. Outside urban areas, or ii. Inside urban areas: (aa) Areas zoned for conservation use or equivalent zoning, on or after 02 August 2010; (bb) A protected area identified in terms of NEMPAA, excluding conservancies; or (cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act as adopted by the competent authority.</p>

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

- Listing Notice 1: Activities: 19, 24, 27 & 48
- Listing Notice 3: Activity 4, 12, 15

## 7.2 Other applicable legislation

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

- National Water Act (Act 36 of 1998)
- National Heritage Resources Act (Act No 25 of 1999);

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

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

## 8. Scope of this EMPr

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

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

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

## 9. General Environmental Management

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

### Code of Conduct

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

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

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

### Contractors and sub-contractors

- Unless otherwise determined, only appropriately registered contractors shall be appointed.
- It shall be the responsibility of the holder / engineer to ensure that the contractors abide by and comply with the rules and regulations of the Code of Conduct.

- Contractors shall at all times be responsible for their sub-contractors and employees whilst they are on the development property.

## Rules and Regulations

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

- **Building Plan Controls**
  - A copy of the approved and signed building plans must be available on site during the construction phase of the development.
  - Variations of the building plans must be approved by the engineer / holder prior to being implemented.
  - Prior to commencing building, the contractor must remove all topsoil and store it in a berm of not more than 2 m high, away from construction activities.
- **Site tidiness**
  - The contractor must keep the appearance of his building site neat and tidy at all times. Building rubble must be removed from site at regular intervals, and litter must be removed from the site on a daily basis. Refuse drums must be available on site which waste can be placed in. The drums must be emptied on a regular basis and the waste taken to a licenced local waste disposal facility.
- **Safety**
  - The contractor shall comply with the Health and Safety Act (Act No. 85 of 1993), as amended, together with such regulations promulgated thereunder.

### 9.1 Site access and traffic management

Access to the development is from the Divisional Road (DR) 1645 via the remainder of Farm 91 Holle Kloof. It is currently not possible to reach the upper section of the road where the majority of the work is required. The upper section is only accessible from another 4 x 4 track situated on farm RE/91.

All construction vehicles need to adhere to traffic laws and regulations. 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. Delivery trucks should be appropriately covered to deter the spilling of material along the route to the site.

Adequate signage that is both informative and cautionary to passing traffic (motorists and pedestrians) warning them of the construction activities should be implemented. Signage would need to be clearly visible and include, amongst others, the following:

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

- Listings of which contractors are working on the site.

Other mitigation measures include:

- No construction to take place over or during the December holiday period without prior permission from the relevant authorities.
- ECO to do awareness training with the contractor and labourers and to highlight the traffic related risks before construction commences.
- Ensure appropriate behaviour of operators of construction vehicles
- All construction personnel or vehicle movement must be limited to the area between the road and the furrow to avoid the delineated extent of the Kleinbos River;
- No vehicles are permitted to enter the 100 m GN509 ZoR of the Kleinbos River to ensure successful establishment of vegetation within the disturbance footprints;
- No construction vehicles/machinery may enter the area below the furrow, and all rehabilitation activities must be undertaken by personnel only;

#### 9.1.1 Operational phase management measures

The necessary road markings, traffic signage, speed limits and early warning systems will need to be developed as per the requirements of the relevant roads-authority.

### 9.2 Site demarcation

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

#### 9.2.1 Construction working area

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

If desired or deemed necessary by the ECO, the outer boundary of the working area can be enclosed with orange barrier netting fencing, shade netting, droppers & wire/ danger tape, or similar – as feasible and practical. The fencing should be retained and maintained for the duration of the construction period and should not be moved during construction unless agreed otherwise with the ECO.

#### 9.2.2 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. Danger tape flagging (pieces of danger tape tied to twine or rope) may be utilised; however, the use of only danger tape is not recommended for long-term demarcation as this will easily become untidy and blown away by the wind resulting in pollution.

- No vehicles are permitted to enter the 100 m GN509 ZoR of the Kleinbos River to ensure successful establishment of vegetation within the disturbance footprints;
- No construction vehicles/machinery may enter the area below the furrow, and all rehabilitation activities must be undertaken by personnel only;

No-go areas could also 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, except for alien vegetation, 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.

### 9.2.3 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. Site selection must be done in consultation with the ECO.

## 9.3 Site camp and associated facilities

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

### 9.3.1 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 2 m high fence and shade netting or similar.

### 9.3.2 Fire Fighting Equipment

No less than 2 fire extinguishers must be present in the site camp. The extinguishers must be in a working condition and within their service period. A fire extinguisher must always be present wherever any "hot works" (e.g., welding, grinding etc.) are taking place. It is recommended that all construction workers receive basic training in fire prevention and basic fire-fighting techniques and are informed of the emergency procedure to follow in the event of accidental fires. No open fires may be made on the construction site during any phase of the project. Construction workers may make small, contained fires (e.g., for warming or cooking purposes), within the site camp provided the small fire is encircled by a corrugated iron structure, drum or similar, to prevent wind-blown cinders from causing fires elsewhere. Such fires may not be left unattended and must be thoroughly extinguished after use. No smoking must be allowed on the construction site. In the case of accidental fires, the contractor must (if required) alert the Local Authority's Fire Department as soon as a fire starts prior to the fire becoming uncontrollable.

### 9.3.3 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. Sufficient signage and awareness should be created to ensure that these bins are properly used.

### 9.3.4 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. Sufficient signage and awareness should be created to ensure that these bins are properly used.

### 9.3.5 Potable Water

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

### 9.3.6 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 will be provided.

Chemical toilets should be kept at the site camp, on a level surface and secured from blowing over. The chemical toilets must be regularly emptied and the waste disposed of at an appropriate waste water disposal/ treatment site. The ablution facilities must not be linked to a river system in any way. Toilets must be serviced regularly and kept in an orderly state. The contractor must ensure that no spillage occurs when the toilets are cleaned, serviced or moved. Performing ablutions outside of the provided toilet facilities is strictly prohibited.

### 9.3.7 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.

### 9.3.8 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. 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.

### 9.3.9 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.

## 9.4 Search and Rescue

No search and rescue will be required as the site was completely cleared of vegetation during the construction phase.

## 9.5 Indigenous vegetation clearing

The site was completely cleared of vegetation during the retrospective construction phase however if indigenous vegetation has re-established on the cleared and disturbed areas and needs to be cleared to undertake the rehabilitation and reshaping of the site the following measures must be implemented:

- Where feasible vegetation must simply be trimmed to facilitate access/ construction, rather than being completely cleared or removed.
- Vegetation clearing/trimming must be cleared by hand (i.e., brush cut) and stockpiled for use as mulch/ brush-packing during rehabilitation of the site. Any alien vegetation that is cleared must be disposed of in consultation with the ECO, 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.
- Clearing should take place in a phased approach, so that cleared areas are kept small and manageable.

## 9.6 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.
- The removed topsoil must be stockpiled in a berm, in a demarcated area as agreed with the ECO.
- The topsoil berm may be a few meters wide but must ideally not be more than 2 m 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 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.
- 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.

## 9.7 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. Weather and animal proof waste bins for the different categories of recyclable waste (i.e., paper, plastic, metal). These bins must be emptied, and the waste taken to a registered recycling facility. The receipts from the facility must be kept on file and must be available on request. A Waste Management Plan is to be developed in order to formalise waste control methods and to provide a structure for waste management.

The non-recyclable and non-reusable waste (e.g., builder's rubble, etc.) generated on site must be stored in animal and weather proof bins and disposed of at a landfill site licensed in terms of the applicable legislation.

## 9.8 Hazardous substances and fuels

If hazardous substances and fuels such as diesel, oil, lubricant, detergents etc. are to be stored on site for construction purposes, a designated area must be set aside for this within the site camp.

- All hazardous substances must be stored in the designated area within the site camp in animal and weather proof bins/ storage units.
- The area selected for storage of hazardous fuels must be located on a level area.
- The designated area must be clearly demarcated and secured by use of fencing and/or cages, to prevent access by un-authorised persons and/or animals.
- Soil contaminated by hazardous substances must be excavated and disposed of as hazardous waste.
- Access to the hazardous material storage area must be restricted to authorised personnel only and must be treated as a no-go zone to unauthorised personnel.
- Appropriate hazard signage indicating the nature of the stored materials shall be prominently displayed at the storage area.
- Spoil or waste material should not be dumped within 50 m of natural areas, it should be discarded at a licensed dump site.
- Those persons tasked with handling any hazardous substances must be equipped with the knowledge, equipment and safety gear necessary to handle the substance/s safely.
- Material Safety Data Sheets (MSDSs) must be available on site for all hazardous chemicals and hazardous substances to be used on site. Where possible and available, MSDSs must additionally include information on ecological impacts and measures to minimise negative environmental impacts during accidental releases or escapes.
- Storage vessels of hazardous substances must be situated in an impermeable bunded area large enough to accommodate at least 110% of the capacity of the vessel in question. If plastic sheeting is used to line the bunded area, care must be taken to ensure it is not punctured in any way during the course of the construction period.
- All waste, hazardous as well as general, which result from the proposed activities must be disposed of appropriately at a licensed Waste Disposal Facility (WDF).
- Fuel tanks must ideally be elevated so that leaks can easily be detected.
- No smoking may be permitted at or surrounding the area where fuels and hazardous substances are stored.
- Drip trays must be utilised during decanting of hazardous substances and when refilling chemical/ fuel storage tanks.
- Refuelling of vehicles/ machinery may only take place at the site camp or vehicle maintenance yard. Where refuelling must occur, drip trays should be utilised to catch potential spills/ drips.
- Drip trays must be placed under generators (if used on site) water pumps and any other machinery on site that utilises fuel/ lubricant, or where there is risk of leakage/spillage.
- Firefighting equipment must be located in close proximity to the storage area.

### 9.9 Cement and concrete batching

Cement and concrete batching will be permitted on site, but may only take place on designated impermeable, bunded surfaces, as agreed with the ECO.

- Cement/ concrete may not be mixed on bare ground.
- The impermeable/ bunded area must be established in such a way that cement slurry, runoff and cement water will be contained and will not flow into the surrounding environment.
- Cement run-off and excess cement slurry must be collected in the designated impermeable area, allowed to dry, and then disposed of at an appropriate facility. Alternately, the contaminated water can be collected in sealed tanks and transported to an appropriate disposal site.
- Unused cement bags must be stored in such a way that they will be protected from rain.
- Washing of excess cement/concrete into the ground is not allowed. All excess concrete/ cement must be removed from site and disposed of at an appropriate location.

- Empty cement bags must be disposed of in the hazardous waste bins on site.

### 9.10 Erosion control and stormwater management

The need for the berm is not a requirement for stormwater management, per se, but rather to manage erosion resulting from the concentration of stormwater flows from the high lying catchment area. The proposed berms will assist in protecting the gravel road's side drain against erosion and high flow velocities. This is particularly important as most of the damage to the road were in the stormwater drains next to the road.

The flooding of the drains originates from the upgraded road's crossfall as well as concentrated flows due to the steep slopes from the upper catchment area which end up in the road's stormwater drain. The crossfall upgrade was done to prevent ponding of water on the road's surface and to prevent sheet flow on top of the road's surface during a storm event.

Another option that would be of benefit in managing erosion during storm events is to fill the exposed incomplete stormwater drains with topsoil found from the local Waboomskraal area. The area of topsoil required is estimated in the order of 1300 m<sup>2</sup>. This will provide a very good growing medium for plants, grass etc. where indigenous grass and "fynbos" can be seeded, typically found from the local area. Additional stormwater culverts are required to be constructed at the high lying area of the gravel road as indicated. This will further assist with conveying the upper catchment's runoff to the lower catchment area similar to the flood routing as in the past. From here stormwater will evenly be distributed over the lower catchment area, where flatter slopes exist. Stormwater in these flatter areas can run as sheet flow where lower stormwater velocities will be achieved. This will further mitigate erosion on both the farm properties since the stormwater will evenly soak away in these flat slopes and flow to the old stormwater drainage streams and furrows as in the past.

### 9.11 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.

### 9.12 Heritage Resources

TBC

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

Heritage Western Cape:



T: 021 483 5059

E: hwc.hwc@westerncape.gov.za

### 9.13 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.
- Alien plants must be removed from the site as per NEMBA requirements.
- A suitable weed management strategy to be implemented in construction and operation phases to eradicate and control regeneration.
- All demarcation fencing, including all droppers, wires, netting and barrier tape must be removed from site and taken to an appropriate site for re-use or disposal.
- Surfaces are to be checked for waste products from activities such as concreting or asphaltting and cleared in a manner approved by the ECO. Any soil contaminated with hydrocarbons (oil, fuel, etc) or other hazardous substance must be collected and disposed of as hazardous waste to a licenced disposal facility.
- All construction waste is to be removed from the site and disposed of at an appropriate facility. Burying or burning of waste or rubble on site is strictly prohibited.
- Topsoil that was removed and stockpiled before construction, must be replaced by spreading it evenly over the areas from which it was removed. This topsoil (and the seedbank it contains) will facilitate the re-vegetation of the site.
- Disturbed areas, especially areas where excavations have taken place, must be shaped as appropriate (original topography must be restored where possible), and covered with a layer of stockpiled topsoil as soon as possible.
- Any topsoil, subsoil or other excavated material that cannot be utilised during site rehabilitation must be removed from the site and disposed of at an appropriate disposal site.
- The disturbed, newly rehabilitated surfaces (particularly steeper slopes and areas recently covered with topsoil) must be protected from wind & water erosion using mulch, brush packing or other appropriate erosion protection measures. Brush-packing/ mulching is done by covering the exposed surface with organic plant material such as branches, plant cuttings and leafy material. Ideally the vegetation removed from site at the start of the construction must be utilised. Brush-packing/ mulching plays a valuable role in erosion control, while also promoting re-vegetation of the site by retaining moisture in the soil, introducing seeds and/or trapping wind-blown seeds and providing organic material (compost) to promote new plant growth.
- Final landscaping and rehabilitation of the site must be done to the satisfaction of the ECO and must adhere to all conditions/ requirements of the Environmental Authorisation.

### 9.14 CapeNature Recommendations

CapeNature provided their comments on **xxxx**. The following was recommended:

## 10. 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 additional conditions which may be included in the Environmental Authorisation.

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

- Appoint an Environmental Control Officer.
- 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.

### 10.1 OBJECTIVE 1: APPOINTMENT OF AN ENVIRONMENTAL CONTROL OFFICER

Impact Management Objective: To appoint a suitably qualified and experienced Environmental Control Officer.		
Potential impact to avoid	Failure to appoint an ECO will result in non-compliance with the requirements of the EMPr.	
Impact Management Outcome	The requirements of the EMPr are implemented and monitored during all phases of the development, which will promote sound environmental management on site.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
<ul style="list-style-type: none"><li>• A suitably qualified and experienced Environmental Control Officer must be appointed before any activities commence on site.</li><li>• The appointed ECO must adhere to the requirements stated in Chapter 15 and any other requirements specified in the Environmental Authorisation.</li><li>• 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.</li></ul>	The Applicant.	During design phase
Performance Indicator	A qualified ECO is appointed prior to the commencement of any construction activities (including pre-construction set-up activities) on site.	

## 11. Environmental Impact Management: Pre-construction Phase

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

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

- Identify and demarcate no-go areas and working areas.
- Establish Environmentally sensitive site camp and site facilities.
- Pre-construction ECO visit.

### 11.1 OBJECTIVE 1: IDENTIFY & DEMARCATÉ NO-GO AND WORKING AREAS

<b><i>Impact Management Objective: Identify and demarcate no-go areas, working areas and site facilities.</i></b>			
Potential impact to avoid	<ul style="list-style-type: none"><li>• No-Go areas include public open space to remain natural.</li><li>• Insensitive location of working areas and site facilities may result in environmental impacts during the construction phase.</li><li>• Failure to accurately demarcate working areas may result in an increased disturbance footprint.</li><li>• Failure to demarcate no-go areas may result in disturbances to these areas during construction.</li></ul>		
Impact Management Outcome	Future construction activities will be restricted to within the designated areas & environmentally sensitive areas (no-go areas) will be protected from disturbance.		
IMPACT MANAGEMENT ACTIONS			
Mitigation measure		Responsible party	Time period
<ul style="list-style-type: none"><li>• The environmentally sensitive areas must be identified and be designated as no-go areas.</li><li>• Demarcation of working area and no-go areas must be done in accordance with Section 8.2 of this EMPr.</li><li>• Demarcate the protected trees on site.</li><li>• Site camp facilities must be situated as far away from the No-Go areas as possible.</li></ul>		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.		

## 11.2 OBJECTIVE 2: ESTABLISH ENVIRONMENTALLY SENSITIVE SITE CAMP & SITE FACILITIES

<b>Impact Management Objective: To set up and equip the site camp and associated site facilities in a manner that will promote good environmental management.</b>		
Potential impact to avoid	<ul style="list-style-type: none"><li>• Inappropriate siting of site camp facilities may result in impacts to sensitive resources and a negative visual impact.</li><li>• Failure to properly demarcate and set up site facilities may result in disorganised construction activities and unnecessary disturbance to the site.</li><li>• Failure to provide the necessary site facilities and/or failure to equip these facilities with the necessary equipment/materials may impede good environmental management &amp; compromise ability to respond to emergencies.</li></ul>	
Impact Management Outcome	Site camp facilities do not impact significantly on environment and present little visual disturbance. The equipment required to implement the provisions of the EMPr are provided on site.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
<ul style="list-style-type: none"><li>• The site camp and site facilities described in Section 8.3 of this EMPr must be provided on site.</li><li>• 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.</li><li>• The site camp must be strategically set up 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.</li><li>• The No-Go boundary must be demarcated, and no disturbance may occur past this point during any stage.</li><li>• 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.</li><li>• Frequent stormwater outlets must be designed to prevent erosion at discharge points.</li><li>• It is recommended that the stormwater management plan be developed with appropriate ecological input and be developed based on Sustainable Drainage Systems (SUDS).</li><li>• The contractor shall plan his activities so that materials excavated from borrow pits and cuttings, in so far as possible, can be transported direct to and placed at the point where it is to be used.</li><li>• Top soil and other top material such as boulders must be stored at a stockpile location agreed to by the ECO. Ensure the stockpile does not exceed the maximum height agreed upon.</li></ul>	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.
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### 11.3 OBJECTIVE 3: PRE-CONSTRUCTION ECO INSPECTION

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

<b><i>Impact Management Objective: Environmental Control Officer to conduct an inspection prior to the commencement of construction activities on site.</i></b>			
Potential impact to avoid	<ul style="list-style-type: none"><li>• Failure to appoint ECO or to notify ECO of commencement prior to commencement may result in non-compliance with the EA.</li><li>• 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.</li></ul>		
Impact Management Outcome	<ul style="list-style-type: none"><li>• Good environmental management is promoted and enforced by the ECO during the full pre-construction and construction phases.</li><li>• Site facilities are appropriately located on site.</li><li>• Construction workers receive environmental awareness training before commencing work on site.</li></ul>		
IMPACT MANAGEMENT ACTIONS			
Mitigation measure		Responsible party	Time period
<ul style="list-style-type: none"><li>• 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.</li></ul>		Contractor	Start of construction phase
Performance Indicator	A pre-commencement site inspection is conducted by the appointed ECO before construction activities commence on site.		



## 12. 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 EMP, as well as any other conditions which may be stated in the Environmental Authorisation. The Environmental Control Officer must monitor and enforce the implementation of the relevant environmental management measures and may provide guidance on the implementation of these environmental management measures as and when required.

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

- Continuation of access road construction & building infrastructure in the study area
- Prevent further soil erosion
- Infilling of the erosion gully along the access road and the section thereof in the 100 m GN509 ZoR of the Kleinbos River and the furrow
- Rehabilitation of the erosion gully between the furrow and the Kleinbos River.
- Prevent pollution and soil contamination
- Protection of terrestrial ecosystems (fauna and vegetation)
- Noise impact management
- Visual impact management
- Traffic and safety impact management
- Dust impact management

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.

### 12.1 OBJECTIVE 1: CONTINUATION OF ACCESS ROAD CONSTRUCTION & BUILDING INFRASTRUCTURE IN THE STUDY AREA

<b><i>Impact Management Objective: Complete the road and infrastructure</i></b>	
Potential impact to avoid	<ul style="list-style-type: none"> <li>• Potential increased dust generation, leading to potential smothering of riparian vegetation and potentially altering surface water quality within the river; and</li> <li>• Decreased ecoservice provision.</li> </ul>
Impact Management Outcome	
<b>IMPACT MANAGEMENT ACTIONS</b>	

Mitigation measure	Responsible party	Time period
<ul style="list-style-type: none"> <li>Drift fences be installed (such as hessian curtains) in the erosion gully, at intervals and downgradient of where the stormwater cut-off drains will be installed, to prevent any sediment run-off from entering the downgradient Kleinbos River.</li> <li>General good housekeeping control measures must be adhered to.</li> </ul>	Contractor	Construction phase
Performance Indicator	Disturbance is kept to a minimum, No new erosion is noted leaving the active areas.	

## 12.2 OBJECTIVE 2: PREVENT FURTHER SOIL EROSION

### ***Impact Management Objective: To prevent soil loss on site.***

Potential impact to avoid	<ul style="list-style-type: none"> <li>Areas disturbed and/or cleared of vegetation during construction may be vulnerable to increased water and wind erosion.</li> <li>Stockpiles of soil (topsoil/subsoil) at the site may be vulnerable to wind/water erosion.</li> </ul>
Impact Management Outcome	Soil erosion is kept to a minimum.

### **IMPACT MANAGEMENT ACTIONS**

Mitigation measure	Responsible party	Time period
<ul style="list-style-type: none"> <li>Stockpiles should not be placed in vegetated areas that will not be cleared</li> <li>The location of stockpiles must take into account the prevailing wind direction</li> <li>Stockpiles of topsoil &amp; spoil material must be protected from wind &amp; water erosion with the use of an appropriate netting, tarpaulin or other appropriate measures. Note that topsoil should not be covered with tarpaulin as this may kill the seedbank.</li> <li>Stockpiles should be located in such a way that they present as little visual impact as possible</li> <li>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. All stockpiling areas must be approved by the ECO before stockpiling occurs.</li> <li>Soil surfaces must not be left open for lengthy periods to prevent erosion.</li> <li>If site development does not occur soon after preparation of the site, a suitable cover crop to be established as a temporary measure.</li> <li>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.</li> <li>Drift fence/sediment traps must be installed in the erosion gully and its embankment to limit any</li> </ul>	Contractor	Construction phase

<p>sediment laden runoff from entering the downstream Kleinbos River;</p> <ul style="list-style-type: none"> <li>• The SuDS Stormwater management and drainage system should inform the stormwater design of developed areas.</li> <li>• Clean and contaminated storm water must be kept separate. Contaminated run-off from the construction site must be prevented from flowing into the Kleinbos River.</li> <li>• The working area and site camp must be clearly demarcated during the pre-construction phase. Land clearing and construction activities must be restricted to within the demarcated working area to prevent unnecessary disturbance, exposure or compacting of surrounding areas.</li> <li>• Erosion control measures including silt fences, low soil berms and/or shutter boards must be put in place around the sand dune embankment.</li> <li>• 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.</li> <li>• Land clearing, earth moving, and construction activities should not take place during heavy rains, or windy conditions.</li> <li>• 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 &amp; ECO.</li> <li>• 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.</li> </ul>		
Performance Indicator	Stockpiles and bare surfaces remain erosion free.	

### 12.3 OBJECTIVE 3: INFILLING OF EROSION GULLY ALONG ACCESS ROAD AND THE SECTION THEREOF IN THE 100 M GN509 ZOR OF THE KLEINBOS RIVER AND THE FURROW

<b>Impact Management Objective: To fill in and rehabilitate the site</b>	
Potential impact to avoid	<ul style="list-style-type: none"> <li>• Potential habitat disturbance and vegetation removal to access the erosion gully;</li> <li>• Soil compaction leading to preferential flow paths that transport sediment laden runoff into the Kleinbos River.</li> </ul>
Impact Management Outcome	A filled and rehabilitated gully without any additional disturbance of the area

IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
<p>It is considered imperative that a further downgradient section of the erosion gully (within the 100m GN509 ZoR) also be infilled to ensure that future surface runoff doesn't further erode the gully and to avoid latent impacts to the Kleinbos River. The DWS Risk Assessment was thus applied assuming that the full extent of the erosion gully in the 100m GN509 ZoR is infilled and that transverse gabion walls be installed in the erosion gully at 30m intervals.</p> <ul style="list-style-type: none"> <li>All construction personnel or vehicle movement must be limited to the area between the road and the furrow to avoid the delineated extent of the Kleinbos River;</li> <li>All stockpiles should not exceed 2 m in height. All exposed soil must be protected for the duration of the construction phase with a suitable geotextile (e.g. Geojute or hessian sheeting) to prevent erosion and sedimentation of the downgradient river;</li> <li>Drift fence/sediment traps must be installed in the erosion gully and its embankment to limit any sediment laden runoff from entering the downstream Kleinbos River;</li> <li>The fill material must be suitably mixed and compacted to ensure stability of the erosion gully and to withstand any concentrated flows to avoid the development of a new gully;</li> <li>All disturbed areas surrounding the gully and the gully itself must be rehabilitated, and where required, suitable vegetation to be planted to promote reestablishment of vegetation and increase the surface roughness of the disturbance footprint. All rehabilitation activities must be signed off by a suitably qualified freshwater ecologist.</li> </ul>	Contractor	Construction phase
Performance Indicator	No new disturbances are noted beyond the footprint and a reasonable working area around the footprint. No new erosion from the active areas.	

#### 12.4 OBJECTIVE 4: REHABILITATION OF THE EROSION GULLY BETWEEN THE FURROW AND KLEINBOS RIVER

Impact Management Objective: To rehabilitate the sites		
Potential impact to avoid	<ul style="list-style-type: none"><li>• Potential habitat disturbance and vegetation removal to access the erosion gully;</li><li>• Soil compaction leading to preferential flow paths that transport sediment laden runoff into the Kleinbos River.</li></ul>	
Impact Management Outcome	A rehabilitated gully without any additional disturbance of the area	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
<ul style="list-style-type: none"><li>• Disturbance areas downgradient of the furrow must be kept as small as possible to avoid impacts to the Kleinbos River and further disturbance of the vegetation in the area along the river;</li></ul>	Contractor	Construction phase

<ul style="list-style-type: none"> <li>No construction vehicles/machinery may enter the area below the furrow, and all rehabilitation activities must be undertaken by personnel only;</li> <li>Deposited sediment may be utilised to infill the erosion gully but no other material downgradient of the furrow may be used for these purposes. Should more material be required, suitable material must be imported;</li> <li>The entry point of the erosion gully into the active channel of the river must be suitably compacted and sloped to ensure stability. Should it be required the slope can be reinforced by the placement of rip-rap (or in situ rocks from the active channel) along the embankment, but no hard engineering infrastructure may be utilised;</li> <li>Drift fence/sediment traps must be installed in the erosion gully and its embankment to limit any sediment laden runoff from entering the downstream Kleinbos River;</li> <li>The fill material must be suitably compacted to ensure stability of the erosion gully and to withstand any concentrated flows to avoid the development of a new gully;</li> <li>All disturbed areas surrounding the gully and the gully itself must be rehabilitated, and suitable vegetation to be planted to promote reestablishment of vegetation and increase the surface roughness of the disturbance footprint. All rehabilitation activities must be signed off by a suitably qualified freshwater ecologist.</li> </ul>		
Performance Indicator	No signs of vehicles within the No-Go areas. No erosion noted from the active areas.	

## 12.5 OBJECTIVE 5: PREVENT POLLUTION AND SOIL CONTAMINATION

Impact Management Objective: To prevent environmental pollution and contamination of soil and subsurface water resources			
Potential impact to avoid	<ul style="list-style-type: none"><li>Fuel, oil, lubricant or other pollutants may leak from vehicles/ machinery and contaminate soil and/or ground water.</li><li>Spills of hazardous substances may contaminate environment.</li><li>Chemical toilets may leak.</li><li>Contamination of surrounding environment due to irresponsible bitumen usage.</li><li>Contaminated run-off from site or site camp facilities may pollute soil.</li><li>Waste (solid or liquid) from the construction site may be blown or washed into surrounding environment.</li></ul>		
Impact Management Outcome	The environment (including soil, surface and groundwater) is not contaminated.		
IMPACT MANAGEMENT ACTIONS			
Mitigation measure		Responsible party	Time period
<ul style="list-style-type: none"><li>All stormwater infrastructure, such as reno mattresses at pipe outlets, must be located within the development footprint and not encroach into the buffer areas.</li></ul>		Contractor	Construction phase

<ul style="list-style-type: none"> <li>Stormwater exit points must include a best management practice approach to trap any additional suspended solids and pollutants originating from the proposed development. Also include the placement of stormwater grates (or similar).</li> <li>Any Bitumen spills must be excavated and disposed of as hazardous waste.</li> <li>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.</li> </ul> <p><b>General Pollution Management:</b></p> <ul style="list-style-type: none"> <li>No pollution of ground water resources may occur due to any activity on the site.</li> <li>No storm water runoff from any premises containing waste, or water containing waste emanating from construction activities may be discharged into the environment. Polluted stormwater must be contained on the site.</li> <li>Stormwater managed by the development is to be discharged into porous channels / swales ('infiltration channels or basins') running near parallel or parallel to contours within and along the edge of the development</li> <li>Frequent stormwater outlets must be designed to prevent erosion at discharge points.</li> </ul> <p><b>General Waste Management:</b></p> <ul style="list-style-type: none"> <li>Dedicated waste bins or skips must be provided on site and kept in a demarcated area on an impermeable surface.</li> <li>Separate waste bins/skips must be provided for recyclable waste, general waste and hazardous waste. Recovered builder's rubble &amp; green waste may be stockpiled on the ground within the site camp, or in separate skips until removal.</li> <li>Waste must be placed in the appropriate waste bins/skips/ stockpiles.</li> <li>Hazardous waste bins must be kept on an impermeable bunded surface capable of holding at least 110% of the volume of the bins.</li> <li>Skips/ bins must be provided with secure lids or covering that will prevent scavenging and windblown waste or dust.</li> <li>Waste bins/skips must be regularly emptied and must not be allowed to overflow.</li> <li>Construction workers must be instructed not to litter and to place all waste in the appropriate waste bins provided on site.</li> <li>The Contractor must ensure that all workers on site are familiar with the correct waste disposal procedures to be followed.</li> <li>Waste generated on site must be classified and managed in accordance with the National Environmental Management: Waste Act – Waste Classification and Management Regulations (GN</li> </ul>		
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<p>No. R. 634 of August 2013).</p> <ul style="list-style-type: none"> <li>• Disposal of waste to landfill must be undertaken in accordance with the National Environmental Management: Waste Act – National Norms and Standard for the Assessment of Waste for Landfill Disposal (GN No. R. 635 of August 2013).</li> <li>• All waste, hazardous as well as general, resulting from the proposed activities must be disposed of appropriately at a licensed Waste Disposal Facility (WDF).</li> </ul> <p><b>Pollution Management – hydrocarbons (oil, fuel etc.)</b></p> <ul style="list-style-type: none"> <li>• Vehicles and machinery must be in good working order and must be regularly inspected for leaks.</li> <li>• If a vehicle or machinery is leaking pollutants it must, as soon as possible, be taken to an appropriate location for repair. The ECO has the authority to request that any vehicle or piece of equipment that is contaminating the environment be removed from the site until it has been satisfactorily repaired.</li> <li>• Repairs to vehicles/ machinery may take place on site, within a designated maintenance area at the site camp. Drip trays, tarpaulin or other impermeable layer must be laid down prior to undertaking repairs.</li> <li>• Refuelling of vehicles/ machinery may only take place at the site camp or vehicle maintenance yard. Where refuelling must occur, drip trays should be utilised to catch potential spills/ drips.</li> <li>• Drip trays must be utilised during decanting of hazardous substances and when refilling chemical/ fuel storage tanks.</li> <li>• Drip trays must be placed under generators (if used on site) water pumps and any other machinery on site that utilises fuel/ lubricant, or where there is risk of leakage/spillage.</li> <li>• Where feasible, fuel tanks should be elevated so that leaks are easily detected.</li> <li>• A spill kit to neutralise/treat spills of fuel/ oil/ lubricants must be available on site, and workers must be educated on how to utilise the spill kit.</li> <li>• Soil contaminated by hazardous substances must be excavated and disposed of as hazardous waste.</li> <li>• Spoil or waste material should not be dumped within 50 m of natural areas, it should be discarded at a licensed dump site.</li> </ul> <p><b>Pollution Management – Ablution facilities</b></p> <ul style="list-style-type: none"> <li>• Chemical toilets must be kept at the site camp, on a level surface and secured from blowing over.</li> <li>• Toilets must be located well outside of any storm water drainage lines ,and may not be linked to the storm water drainage system in any way.</li> <li>• Chemical toilets must be regularly emptied and the waste disposed of at an appropriate waste water disposal/ treatment site. Care must be taken to prevent spillages when moving or servicing</li> </ul>		
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chemical toilets.

#### **Pollution Management – Hazardous Substances**

- Any hazardous substances (materials, fuels, other chemicals etc.) that may be required on site must be stored according to the manufacturers' product-storage requirements, which may include a covered, waterproof bunded housing structure.
- Material Safety Data Sheets (MSDSs) shall be readily available on site for all chemicals and hazardous substances to be used on site. Where possible and available, MSDSs should additionally include information on ecological impacts and measures to minimise negative environmental impacts during accidental releases.
- Hazardous chemicals and fuels should be stored on bunded, impermeable surfaces with sufficient capacity to hold at least 110% of the capacity of the storage tanks.

#### **Cement Batching**

- Cement batching must take place on an impermeable surface large enough to retain any slurry or cement water run-off. If necessary, plastic/ bitem lined detention ponds (or similar) should be constructed to catch the run-off from batching areas. Once the water content of the cement water/ slurry has evaporated the dried cement should be scraped out of the detention pond and disposed of at an appropriate disposal facility authorised to deal with such waste
- Cement batching should take place on already transformed areas within the footprint of the facility.
- Unused cement bags must be stored in such a way that they will be protected from rain. Empty cement bags must not be left lying on the ground and must be disposed of in the appropriate waste bin.
- Washing of excess cement/concrete into the ground is not allowed. All excess concrete/ cement must be removed from site and disposed of at an appropriate location.

Performance Indicator	The site is free from any spills or evidence of irresponsible waste management practices. No signs of pollution or contamination.
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## **12.6 OBJECTIVE 6: PROTECTION OF TERRESTRIAL ECOSYSTEM (FAUNA AND VEGETATION)**

***Impact Management Objective: To ensure that the terrestrial ecosystem is not significantly impacted on.***

Potential impact to avoid	<ul style="list-style-type: none"> <li>• Potential disturbance to terrestrial fauna during land clearing/construction activities.</li> <li>• The clearing/trimming of vegetation will result in loss/ disturbance of indigenous vegetation and may reduce habitat heterogeneity.</li> </ul>
Impact Management Outcome	The terrestrial ecosystem is not significantly impacted on as a result of the construction activities.
<b>IMPACT MANAGEMENT ACTIONS</b>	

Mitigation measure	Responsible party	Time period
<ul style="list-style-type: none"> <li>• An awareness program is to be run by the ECO in order to prevent the labour force from intentionally killing any faunal species</li> <li>• Great care will be taken if cement is to be mixed on site, especially in the proximity of vegetation. It will be mixed on thick plastic sheets or in large buckets and not allowed to spill onto bare ground. Any spillage will be cleaned up immediately. Cement water will also be contained in the above manner and allowed to dry out and then removed from site. Cement water, which is highly alkaline, poses a definite threat to the soil and seed banks.</li> <li>• 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.</li> <li>• No clearing outside of development and infrastructure footprint area to take place.</li> <li>• Rescued plants should be replanted into a nearby disturbed area of similar habitat or for open space rehabilitation, if appropriate.</li> <li>• An Environmental Control Officer will oversee compliance with all the prescribed environmental requirements and mitigation measures listed here and will be on site regularly.</li> <li>• Construction workers must be sensitised to the fact that fauna (including mammals, snakes, birds, tortoises etc.) may be encountered on site, and they must exercise due caution to ensure that their actions/movements do not impact fauna.</li> <li>• Any fauna encountered on site must be allowed to passively vacate the area. Active relocation of fauna like snakes must be a last resort and must only be performed by a person skilled/ experienced enough to do so without endangering him/herself or the animal/bird.</li> <li>• If animals are discovered on site during site preparation, they are to be relocated or allowed to move off the area that is required to be disturbed without harm;</li> <li>• No wild animal may under any circumstance be handled, removed, or be interfered with by construction workers. No wild animal may under any circumstance be hunted, snared, captured, injured, or killed. This includes animals perceived to be vermin;</li> <li>• Construction workers may not feed, hunt, trap, poison or shoot fauna on site or in the immediately surrounding areas.</li> </ul>	Contractor	Construction phase
Performance Indicator	<ul style="list-style-type: none"> <li>• Construction team limit disturbance to the terrestrial ecosystem as far as possible for the duration of the construction phase.</li> <li>• There are no significant or long-term impacts to terrestrial vegetation or fauna.</li> </ul>	

**12.7 OBJECTIVE 7: ALIEN CLEARING**

Impact Management Objective: To create habitat free of alien vegetation		
Potential impact to avoid	<ul style="list-style-type: none"><li>The proliferation of alien vegetation once construction has been completed.</li><li>Presence of alien vegetation within the provisioned open space.</li></ul>	
Impact Management Outcome	The level of alien infestation decreases over time and there are no alien species inhabiting the open space.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
<ul style="list-style-type: none"><li>The ECO must be informed in advance of any vegetation that will be removed, irrespective of whether or not the vegetation is alien or indigenous.</li><li>Alien plants must be removed from the site as per NEMBA requirements.</li><li>Alien clearing must be done in such a way as not to cause damage to indigenous vegetation.</li><li>Regular follow-up clearing of aliens is required in order to achieve rehabilitation successfully. It is assumed that the responsibility of alien clearing will rest with the local authority. If not, an alien clearing contractor must be employed to conduct alien clearing.</li><li>After any clearing is completed, an appropriate cover crop should be planted where any weeds or exotic species are removed from disturbed areas timeously.</li><li>Alien clearing must be undertaken in accordance with the Alien Clearing Management Plan.</li></ul>	The Applicant.	Construction phase
Performance Indicator	No alien invasive species are observed in areas that have been disturbed.	

**12.8 OBJECTIVE 8: NOISE IMPACT MANAGEMENT**

Impact Management Objective: To control avoidable noise impacts to the surrounding areas		
Potential impact to avoid	Avoidable noise generated during the undertaking of construction activities, which may present a nuisance to surrounding community.	
Impact Management Outcome	Avoidable noise impacts are managed efficiently.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
<ul style="list-style-type: none"><li>• A noise complaints register should be opened.</li><li>• Excavations and earth-moving activities must be restricted to normal construction working hours (7:30 – 17:30) as far as possible.</li><li>• Work on site must be well-planned and should proceed efficiently so as to limit the duration of the disturbance.</li><li>• 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</li></ul>	Contractor	Construction phase

should be allowed to emanate from the construction site. <ul style="list-style-type: none"> <li>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.</li> <li>Noise levels must comply with the relevant health &amp; safety regulations and SANS codes and should be monitored by the Health &amp; Safety Officer as necessary and appropriate.</li> <li>The noise management and monitoring measures prescribed in the EMPr must be adhered to.</li> <li>The appointed Environmental Control Officer (ECO) must undertake a site inspection once per week, for the duration of the construction phase, and to produce a short monthly ECO monitoring audit report, auditing on the compliance of the property developer with the conditions of the Environmental Authorisation and the approved EMP.</li> </ul>				
Performance Indicator	Noise levels on site remain within acceptable standards. No valid noise complaints are received.			

## 12.9 OBJECTIVE 9: VISUAL IMPACT MANAGEMENT

<b>Impact Management Objective:</b> <i>To prevent the site from presenting an unnecessary visual impact to the surrounding public.</i>		
Potential impact to avoid	During construction the site may appear disturbed or disorganised and may present visual impact to observers of the site.	
Impact Management Outcome	The site does not present a significant visual impact and the sense of place is maintained.	
<b>IMPACT MANAGEMENT ACTIONS</b>		
Mitigation measure	Responsible party	Time period
<ul style="list-style-type: none"><li>Consult with the ECO when determining the appropriate site for the site camp.</li><li>The site camp must be kept neat and tidy and free of litter at all times.</li><li>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.</li><li>Work on site must be well-planned and well-managed so that work proceeds quickly and efficiently, thus minimizing the disturbance time.</li><li>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 landowners and road users as possible.</li><li>The site camp may require visual screening via shade cloth or other suitable material.</li><li>Special attention should be given to the screening of highly reflective material.</li><li>Construction vehicles must enter and leave the site during working hours.</li><li>Delivery trucks should be appropriately covered to deter the spilling of material along the route to the site.</li></ul>	Contractor	Construction phase

<ul style="list-style-type: none"> <li>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.</li> <li>No clearing of land to take place outside the demarcated footprint.</li> <li>Clearing should take place in a phased approach, so that cleared areas are kept small and manageable.</li> </ul>		
Performance Indicator	<ul style="list-style-type: none"> <li>Good “housekeeping” is evident on site.</li> <li>The site does not pose a visual impact to surrounding community.</li> </ul>	

## 12.10 OBJECTIVE 10: TRAFFIC & SAFETY IMPACT

### ***Impact Management Objective: Reduced negative impact caused by increased traffic***

Potential impact to avoid	<ul style="list-style-type: none"> <li>Traffic congestion on the existing road networks.</li> <li>An unsafe and non-user-friendly transport network.</li> <li>Damaged roads</li> </ul>
Impact Management Outcome	<ul style="list-style-type: none"> <li>Ensure the safety of vehicular and pedestrian traffic during the construction phase of the development.</li> </ul>

### **IMPACT MANAGEMENT ACTIONS**

Mitigation measure	Responsible party	Time period
<ul style="list-style-type: none"> <li>All construction vehicles need to adhere to traffic laws. 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.</li> <li>All vehicle operators need to be educated in terms of “best-practice” operations to minimise unnecessary traffic congestion or dangers. Construction vehicles should therefore, not unnecessarily obstruct the access point or traffic lanes used to access the site. Construction vehicles also need to consider the load carrying capacity of road surfaces and adhere to all other prescriptive regulations regarding the use of public roads by construction vehicles.</li> <li>Adequate signage, that is both informative and cautionary to passing traffic (motorists and pedestrians), warning them of the construction activities must be suitably located in the area where the construction is occurring and must be easily visible by all road users. Signage needs to be clearly visible and needs to include, among others, the following: <ul style="list-style-type: none"> <li>Identifying working area as a construction site;</li> <li>Cautioning against relevant construction activities;</li> </ul> </li> </ul>	Developer	Operational phase

<ul style="list-style-type: none"> <li>○ Prohibiting access to construction site;</li> <li>○ Clearly specifying possible detour routes and/or delay periods;</li> <li>○ Possible indications of time frames attached to the construction activities, and;</li> <li>○ Listings of which contractors and engineers are working on the site.</li> </ul> <ul style="list-style-type: none"> <li>• If needed, appropriate traffic management measures and/ or points men (traffic marshals) should be utilized to assist vehicles entering/ exiting the site, particularly where vehicles must cross the path of oncoming traffic.</li> <li>• Speed of construction vehicles and other heavy vehicles must be strictly controlled to avoid dangerous conditions for other road users.</li> <li>• 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.</li> </ul>		
Performance Indicator	<ul style="list-style-type: none"> <li>• Surrounding road network remains safe, free of excessive congestion and undamaged.</li> </ul>	

## 12.11 OBJECTIVE 11: DUST IMPACT MANAGEMENT

### ***Impact Management Objective: To prevent the generation of significant dust.***

Potential impact to avoid	<ul style="list-style-type: none"><li>• Dust and wind-blown sand may arise from site during earth-moving and other construction activities.</li><li>• Dust may be generated from cement batching activities.</li><li>• Dust may be generated from stockpiles of earth material.</li><li>• Dust may smother surrounding vegetation and may pose a nuisance to nearby land occupants or land users.</li></ul>		
Impact Management Outcome	The surrounding environment, land users, residents do not experience significant dust-related impacts.		
IMPACT MANAGEMENT ACTIONS			
Mitigation measure		Responsible party	Time period
<ul style="list-style-type: none"><li>• Land clearing and earthmoving activities should not be undertaken during strong winds, where possible.</li><li>• Cleared areas should be provided with a suitable cover as soon as possible, and not left exposed for extended periods of time.</li><li>• 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).</li><li>• 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.</li></ul>		Contractor	Construction phase



<ul style="list-style-type: none"> <li>• Speed limits must be enforced in all areas, including public roads and private property to limit the levels of dust pollution.</li> <li>• The speed limit should be set at 20-40km/h.</li> <li>• 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.</li> <li>• 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.</li> <li>• The use of straw worked into the sandy areas may also help and the ECO must advise when this is necessary.</li> <li>• If dust appears to be a continuous problem the option of using shade cloth to cover open areas may be necessary or the erecting of shade netting above the fenced off area may need to be explored.</li> <li>• All vehicles transporting sand need to have tarpaulins covering their loads which will assist in any windblown sand occurring off the trucks.</li> <li>• Work on site must be well-planned and should proceed efficiently so as to minimise the handling of dust generating material.</li> <li>• Material loads should be properly covered during transportation.</li> <li>• 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/m<sup>2</sup>/day, measured using reference method ASTM D1739;</li> <li>• A Complaints Register must be available at the site office for inspection by the ECO of dust complaints that may have been received.</li> </ul>		
Performance Indicator	<ul style="list-style-type: none"> <li>• Excessive dust does not arise from the site.</li> <li>• No dust complaints are received from any member of the public.</li> <li>• There is no evidence that vegetation surrounding the site is being smothered by dust.</li> </ul>	

### 13. 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.
- No establishment of alien vegetation on the site.
- Reduced erosion and scouring.

**13.1 OBJECTIVE 1: SITE CLOSURE & REHABILITATION**

Impact Management Objective: To rehabilitate all areas disturbed by construction activities in an environmentally sensitive manner.		
Potential impact to avoid	<ul style="list-style-type: none"><li>• Failure to remove all construction related waste and materials may result in environmental pollution.</li><li>• Failure to remove all construction related equipment, machinery and site facilities may pose an impact to the natural environment.</li><li>• Failure to stabilise disturbed surfaces may result in soil erosion and increased storm water run-off, which may limit successful revegetation of the site.</li></ul>	
Impact Management Outcome	<ul style="list-style-type: none"><li>• The site is neat and tidy and all exposed surfaces are suitably covered/ stabilised.</li><li>• There is no construction-related waste or pollution remaining on site.</li><li>• The open space remains in a natural state,</li></ul>	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
<ul style="list-style-type: none"><li>• 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.</li><li>• Surfaces are to be checked for waste products from activities such as concreting or asphaltting and cleared in a manner approved by the ECO.</li><li>• Any contaminated soil must be collected and disposed of as hazardous waste.</li><li>• 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.</li><li>• Burying or burning of waste or rubble on site is prohibited.</li><li>• 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.</li><li>• 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).</li><li>• 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</li></ul>	Contractor / The Applicant	Rehabilitation phase

<p>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.</p> <ul style="list-style-type: none"> <li>• All disturbed areas surrounding the gully and the gully itself must be rehabilitated, and where required, suitable vegetation to be planted to promote reestablishment of vegetation and increase the surface roughness of the disturbance footprint. All rehabilitation activities must be signed off by a suitably qualified freshwater ecologist.</li> <li>• 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.</li> <li>• 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.</li> <li>• Disturbed soils must be revegetated with the local indigenous vegetation such as that which occurs at the site or provided with other suitable cover.</li> <li>• It is recommended that follow-up alien clearing be conducted 6 months after construction is complete and thereafter annually for 3 years (or longer is alien recruitment is still evident on site).</li> </ul>		
Performance Indicator	<ul style="list-style-type: none"> <li>• All construction-related materials, equipment, facilities, waste and contaminated soils have been removed from the site.</li> <li>• Compacted soils have been scarified/ ripped and stabilised.</li> <li>• All disturbed/exposed surfaces have been provided with a suitable covering and/or stabilised.</li> <li>• No alien vegetation is evident on site.</li> </ul>	

### 13.2 OBJECTIVE 2: MAINTENANCE OF ENVIRONMENTAL INTEGRITY DURING THE OPERATIONAL PHASE

Impact Management Objective: To rehabilitate all areas disturbed by construction activities in an environmentally sensitive manner.		
Potential impact to avoid	<ul style="list-style-type: none"><li>Excessive alien vegetation growth.</li><li>Negative impacts on the environment.</li></ul>	
Impact Management Outcome	<ul style="list-style-type: none"><li>The integrity of the environment is maintained throughout the operational phase.</li></ul>	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
<ul style="list-style-type: none"><li>Cover crop that was planted where any weeds or exotic species were removed is to be maintained.</li><li>Regular follow-up clearing of aliens is required.</li></ul>	The Applicant.	Operational phase

<ul style="list-style-type: none"> <li>• Ensure that any greenery planted on the parameter of the development is maintained.</li> <li>• 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.</li> <li>• Alien plants must be removed from the site as per NEMBA requirements.</li> <li>• After any clearing is completed, an appropriate cover crop should be planted where any weeds or exotic species are removed from disturbed areas timeously.</li> </ul>		
Performance Indicator	<ul style="list-style-type: none"> <li>• The integrity and condition of the surrounding environment is maintained at an acceptable level.</li> <li>• All previously disturbed/exposed surfaces have been provided with a suitable covering and/or stabilised.</li> <li>• No alien vegetation is evident on site.</li> </ul>	

## 14. Emergency Preparedness

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### 14.1 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.

### 14.2 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.

## 15. Method statements

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

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

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

- Establishment of site camp and stockpile area.
- Cement/ concrete batching, disposal and emergency contingencies.
- Topsoil and sub-soil storage/ stockpiling.
- Storage of fuels and hazardous chemicals and emergency contingencies.
- Waste management system.
- Storm water management and control.
- 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.

## 16. Roles and Responsibilities

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This EMPr, once approved by the competent authority, 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"*

### 16.1 Duties and Responsibilities of the 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.

### **16.2 Duties and Responsibilities of the Contractor**

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

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

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

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

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

### **16.3 Duties and Responsibilities of the ECO**

The appointed Environmental Control Officer (ECO) is responsible for undertaking regular site visits to monitor and report on the implementation of the EMPr and adherence to the conditions of the Environmental Authorisation during the pre-construction, construction and post-construction

rehabilitation phases. The ECO is not required to monitor the site during the operational phase of the development.

#### 16.3.1 Competency of the ECO

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

#### 16.3.2 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 weekly site visits to monitor compliance with all mitigation, monitoring and management measures contained in the EMPr and the Environmental Authorisation, during the pre-construction, construction and rehabilitation phases of the development;
- Evaluate the achievement of the performance indicators associated with each impact management objective specified in this EMPr;
- Liaise with site contractors, engineers and other members of the development team with regard to the requirements of the EMPr;
- Provide guidance as and when required regarding the implementation of the environmental management measures contained in the EMPr and EA, so as to assist the Holder and contractor in remaining compliant with these measures;
- Assist in finding environmentally acceptable solutions to construction problems;
- Ensure that the working areas, site camp facilities, access roads and no-go areas are properly demarcated;
- Ensure that proper topsoil management practices are adhered to on site;
- Ensure that proper waste management & pollution prevention strategies are practised on site;
- Examine method statements, where required;
- Recommend additional environmental protection measures, should this be necessary;
- Furnish contractors with verbal warnings in case of contravention of the EMPr;
- Recommend that the competent authority furnish errant contractors with predetermined fines, when verbal and / or written warnings are ignored;
- Ensure satisfactory rehabilitation of disturbed areas on site, after construction is complete;
- Keep detailed records of all site activities that may pertain to the environment, and produce compliance-monitoring reports (ECO Reports) for submission to the Holder, and the Competent Authority at regular intervals during the construction phase;
- Submit a final post-construction inspection report, within 3 months of completion of the construction phase. The audit report must detail the rehabilitation measures undertaken, describe all major incidents or issues of non-compliance and any issues or aspects that require attention or follow-up.
- All ECO Reports and Inspection Reports must be submitted to the Holder and Competent Authority.

#### 16.3.3 Frequency of ECO visits

The ECO must conduct weekly site visits during the construction and rehabilitation phase of the road, in addition to the start-up and closure inspections. Once the activities are restricted to the construction of the house, the site visit frequency can be reduced to twice a month.

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

The ECO must also undertake a final inspection (audit) 3 months of completion of construction activities. The purpose of this final inspection is to ensure that the rehabilitation measures applied at the conclusion of the construction phase have been sufficient to promote the successful rehabilitation of the site, and to identify any further issues that require attention or follow-up.

#### 16.3.4 Authority of the ECO

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

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

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

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

### **17. Environmental Awareness Plan**

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

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

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

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

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

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

## **18. Monitoring, Record Keeping and Reporting**

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### **18.1 Environmental Auditing**

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

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

The appointed auditor must undertake regular environmental audits according to the frequency specified in the Environmental Authorisation. Following each audit, the environmental auditor must submit an audit report to the Competent Authority.

- 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.

## **18.2 Construction phase monitoring, reporting and record keeping**

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

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

### **18.2.1 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. Where necessary, the entire working area must be well documented and photographed.

### **18.2.2 ECO Inspections - Written Records**

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

- The ECO must complete an ECO Checklist after each ECO site visit.
- The ECO must compile an ECO monitoring report and submit this to the Holder, the Contractor and the Competent Authority (the latter only if required by the Competent Authority). The monthly reports must be a summary of the ECO inspections from the preceding month, and must highlight the key concerns/ issues on site, instances of non-compliance with the EA and EMPr, all instructions issued to the contractor, actions taken and aspects that still require attention.
- All ECO reports and ECO instructions must be retained on file at least for the duration of the construction period (retaining reports for a period of at least 5 years is recommended, in the event that the Competent Authority must request information).
- A record (minutes) of construction site meetings, liaison site meetings between the ECO and resident engineer or contractor, monitoring reports, ECO instructions and ECO observations must be clearly documented and filed on a master file off-site for safe keeping.
- It is recommended that a site register (incident register) be kept on site at the site office for the recording of any environmental incidents (e.g. fires, spills etc.), observations which are contrary to the stipulations within the EMPr and any other contravention deemed necessary for the attention of the resident engineer. Actions taken to remedy the incidents must also be recorded.
- A complaints register must be kept on site in which complaints by any member of the public must be logged.
- The ECO must compile a final post-construction audit report, within 3 months of completion of each construction phase. The audit report must detail the rehabilitation measures undertaken, describe all major incidents or issues of non-compliance and any issues or aspects that require attention or follow-up.

### 18.2.3 Construction Phase Record Keeping

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

## 19. 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 EMP 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 EMP;
- 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 will be responsible to pay the following penalties should indigenous trees or vegetation which are in no go areas or being protected by barrier or danger tape be damaged by anyone under his/her employ.

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

The following fine structure shall apply:

Any vehicles, plant, or thing related to the Contractors operations within the designated boundaries of a "no-go" area	<b>R 1,000.00</b>
Any vehicle being driven, and items of plant or materials being parked or store outside the demarcated boundaries of the site	<b>R 1,000.00</b>
Persons walking outside the demarcated boundaries of the site	<b>R 100.00</b>
Persistent and un-repaired oil leaks from machinery. The use of inappropriate methods of refuelling such as the use of a funnel rather than a pump	<b>R 1,000.00</b>
Littering of site by individuals	<b>R 250.00</b>
No on-site implementation of waste management system.	<b>R 1000.00</b>



Waste not collected and contained immediately.	<b>R 1000.00</b>
No recycling of waste.	<b>R 1000.00</b>
Burning, burying or disposing of waste other than as prescribed.	<b>R 1000.00</b>
Waste not disposed of at an approved landfill.	<b>R 1000.00</b>
Chemicals and / or waste spilled on ground.	<b>R 250.00</b>
Use of other areas for toilet purposes and / or disposal of chemicals / waste.	<b>R 250.00</b>
Stockpiling of soil in an unspecified area.	<b>R 2500.00</b>
Stockpiles not located and aligned so as to minimise impacts.	<b>R 2500.00</b>
Spilling of soil or construction material into water body or stream.	<b>R 1000.00</b>
Removal of protected trees without appropriate permit.	<b>R 2500.00 (per tree)</b>

**Table 3: Offences that may constitute a fine.**

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.

## **20. 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.