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PRE-CONSTRUCTION, CONSTRUCTION AND POST-CONSTRUCTION PHASE

ENVIRONMENTAL MANAGEMENT PROGRAMME

FOR THE

Proposed Development of Herolds Bay Country Estate on a Portion of Portion 7 Farm Buffelsfontein No. 204, Herolds Bay, Western Cape

APPLICANT:	Long Island Trading 44 (Pty) Ltd Contact: Mr Abraham Jacobus Cronje
ENVIRONMENTAL CONSULTANT:	Sharples Environmental Services cc Primary Author: Betsy Ditcham
DEA & DP PROJECT REFERENCE:	N/A
SES REFERENCE NUMBER:	CT04/06_DEMPr_01
DATE:	January 2020

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Project Ref. No:	CT04/06
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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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LLOYD BARNES (**Environmental Assessment Practitioner**)- Lloyd has recently obtained his National Diploma and Bachelor of Technology in Environmental Management from the Cape Peninsula University of Technology. He has gained experience in on-site compliance monitoring, sustainable development, conservation and report writing. In his time as a consultant, he has compiled multiple management plans.

JOHN SHARPLES (**Managing Director**) - John started Sharples Environmental Services in 1998 and has overseen the company's growth and development since then. John also started the Cape Town office in 2010. John holds a Masters in Environmental Management from the University of the Free State as well as a Bachelor's degree in Conservation. He has consulted for 19 years running a team of highly trained and qualified consultants and prior to this gained 12 years of experience working for environmental organizations. John is registered with EAPASA as a certified Environmental Practitioner.

1. Introduction

Sharples Environmental Services cc (SES) was appointed by *Long Island Trading 44 (Pty) Ltd* (the proponent) to compile the Environmental Management Programme for the proposed development of Herolds Bay Country Estate on a Portion of Portion 7 Farm Buffelsfontein No. 204, Herolds Bay, Western Cape.

2. About this EMPr

This document is intended to serve as a guideline to be used by *Long Island Trading 44 (Pty) Ltd* (as the Implementing Agent) and any person/s acting on *Long Island Trading 44 (Pty) Ltd's* behalf, during the pre-construction, construction, post-construction rehabilitation and operational (maintenance) phases of the proposed development. This document provides measures that must be implemented to ensure that any environmental degradation that may be associated with the development is avoided, or where such impacts cannot be avoided entirely, are minimised and mitigated appropriately.

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

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

The rehabilitation, mitigation, management and monitoring measures prescribed in this EMPr must be seen as binding to the *Long Island Trading 44 (Pty) Ltd*, and any person acting on its behalf, including but not limited to agents, employees, associates, guests or any person rendering a service to the development site.

2.1 Important caveat to the report

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

The Implementing Agent and the attitude of the construction team play an integral role in determining the impact that the development will have on the environment. The ECO needs to ensure that the all role-players are aware of the constraints that the EMPr places on the development and construction team and are prepared to be actively involved in enforcing these constraints. The end result relies on cooperation and mutual respect and understanding of all parties involved.

3. How to use this document

It is essential that this EMPr be carefully studied, understood, implemented and adhered to as far as reasonably possible, throughout all phases of the proposed development*. Long Island Trading 44 (Pty) Ltd* 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 *Long Island Trading 44 (Pty) Ltd*, as this EMPr identifies and specifies the procedures to be followed by engineers and other contractors to ensure that the adverse impacts of construction and maintenance

activities are either avoided or reduced. Appointed contractors must make adequate financial provision to implement the environmental management measures specified in this document.

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

4. Description of the Activity

Long Island Trading 44 (Pty) Ltd proposes to construct a mixed-use development which entails combining residential, recreational and agricultural land uses. It is proposed that the development will include single residential erven, group housing units, a filling station with convenience shop, an ancillary neighbourhood centre with commercial and office space and three package plants for onsite treatment of sewerage. The proposed developed will take place on a Portion of Portion 7 of Farm Buffelsfontein No. 204 situated in Herolds Bay, Western Cape.

Herolds Bay is a coastal village situated along the Garden Route and located approximately 12.5km south-west of George. The proposed site is located north of the town centre, and west of the popular Oubaai Golf Estate. The site is bounded to the north and west by farmland. The size of the total development footprint (land to be disturbed for the mixed-use development) is approximately 19.264Ha.

Figure 1: The proposed site for Herolds Bay Country Estate (blue border).

It is being proposed that 102 single residential erven, 68 group housing units, a filling station with convenience centre and restaurant and an office complex be developed. In addition, there will be private open space, an internal road networkand three on-site package plants for the treatment of sewerage. The residential portion of the proposed development is aimed towards holiday makers and

tourists to the area, the business zones are aimed towards small business and business professionals located in the region.

The total size of the development footprint for the mixed-use development is approximately 19.264Ha. Refer to the Figure 2 below which shows the proposed layout plan for the Portion of Portion 7 Farm Buffelsfontein No. 204, as well as Table 1 below which outlines the different types of developments proposed and their relative sizes.

Table 1: Size and number of each respective aspect proposed.

Zoning	Ptn No's	Land Use	Number	Area (ha)	%
Residential Zone I	1 - 102	Single Dwelling *	102	± 9,019 *	47
General Residentail Zone II	103, 104 & 105	Group Housing * *	3	± 3,613	19
Business Zone II Business Zone IV * * * *	106	Shop * * * Office (300 m² floor space) * * * *	1	± 0,958	5
Open Space II	107, 108 & 109	Private Open Space	3	± 1,334	7
Transport Zone III	110	Private Road	1	± 3,209	16
Transport Zone II	111	Public Street	1	± 1,283	6
Total			111	± 19,264	100

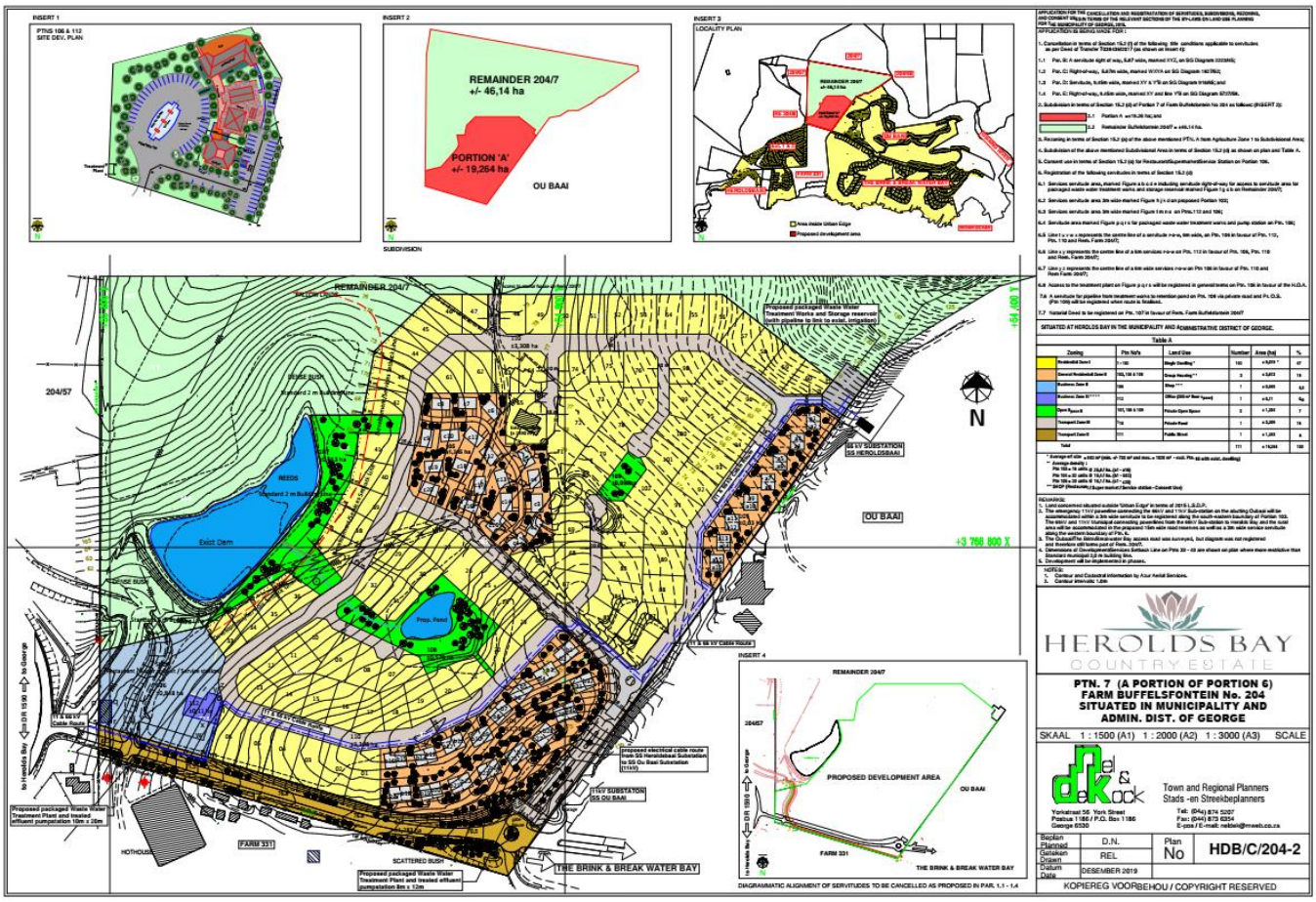

Figure 2:Conceptual Site Layout Plan for the Proposed Herolds Bay Country Estate in Heralds Bay.

Table 2: Summary Table: Site and Farm Details

Province	Western Cape
District Municipality	Garden Route
Local Municipality	George
Ward number(s)	Ward No 23
Nearest town(s)	Herolds Bay – directly adjacent south
SG Code	C02700000000020400008
Co-ordinates of the farm boundaries:	**A** 34° 2' 18.13"S 22° 24' 9.8"E **B** 34° 2' 46.29"S 22° 24' 8.87"E **C** 34° 2' 49.37"S 22° 24' 20.92"E **D** 34° 2' 34.26"S 22° 24' 34.67"E **E** 34° 2' 25.3"S 22° 24' 54.45"E

5. Description of Environmental Setting

5.1 Vegetation

5.1.1 Vegetation description

A Botanical survey of the Portion of the Farm Buffelsfontein 204/7 at Herolds Bay was completed Mark Berry Environmental Consultants (2019) to define the biophysical characteristics of the proposed site.

The proposed site is located in a coastal fynbos-forest environment on the Southern Cape coastal plain. The indigenous species recorded on site are typical forest and coastal thicket species, such as *Cassine peragua, Rapanea melanophloeos, Podocarpus cf. latifolius* and *Searsia lucida*. The Vegetation Map of South Africa (Mucina & Rutherford 2006) classifies the main vegetation type found in the area as Garden Route Granite Fynbos (see Figure 3). This vegetation unit occurs as three blocks from Botterberg (south of Robinson Pass) in the west to Hoogekraal Pass (west of Karatara) in the east (Mucina & Rutherford 2006). The site occurs in the largest block between Groot Brak and Wilderness. Due to its transformed state, Garden Route Granite Fynbos is listed as Endangered in the National List of Threatened Ecosystems, with

only 30% still left (DEA 2011). In CapeNature's 2016 threat status assessment its status has been elevated to Critically Endangered (Pool-Stanvliet et al. 2017).

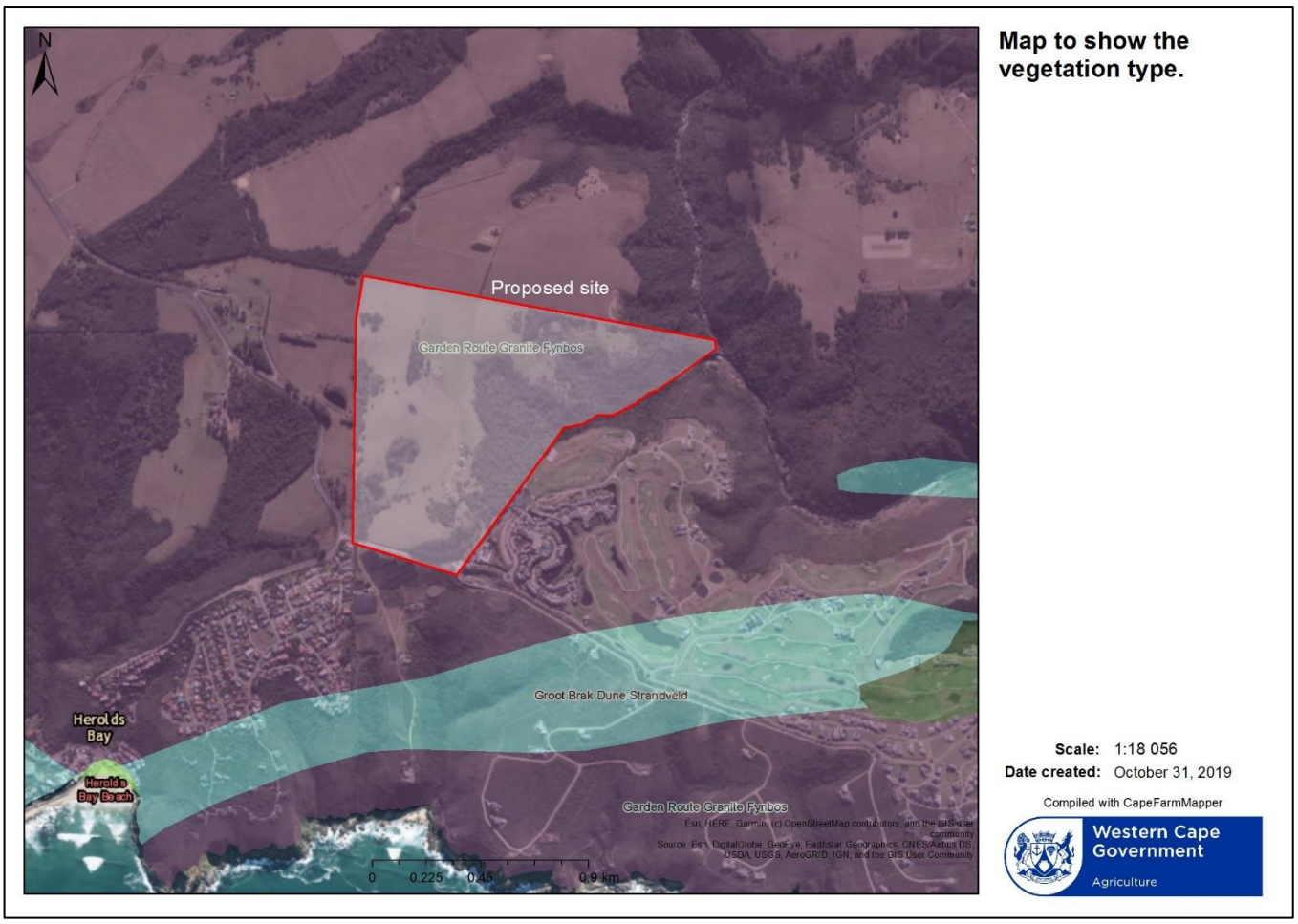

Figure 3: Map to show the vegetation type present on site (CapeFarmMapper accessed on 31/10/2019).

Figure 3 indicates that Southern Afrotemperate Forest (Green polygon to the east) and Groot Brak Dune Strandveld (light blue polygon to the south) are also found in the general area.

The Botanical survey noted that the former does in fact enter the property from the eastern side along the small valley. Southern Afrotemperate Forest typically comprises tall evergreen tree species, including Yellowwoods, Saffron, Candlewood, Ironwood, False Ironwood, etc. It is mainly found in the Western and Eastern Cape Provinces, with the largest complex found in the Southern Cape between Mossel Bay in the west and Humansdorp in the east (Mucina & Rutherford 2006). It grows on sheltered (fire-protected) slopes, plateaux, coastal scarps and valleys. Southern Afrotemperate Forest is still well represented in the larger area, with about 97% remaining (Mucina & Rutherford 2006).

5.1.2 Botanical Sensitivity

The Botanical survey completed by Mark Berry Environmental Consultants (2019) noted that the study site is largely transformed, with the proposed development footprints entirely transformed or invaded by woody aliens and therefore the recorded vegetation biodiversity presents no constraints to the proposed development (Figure 5).

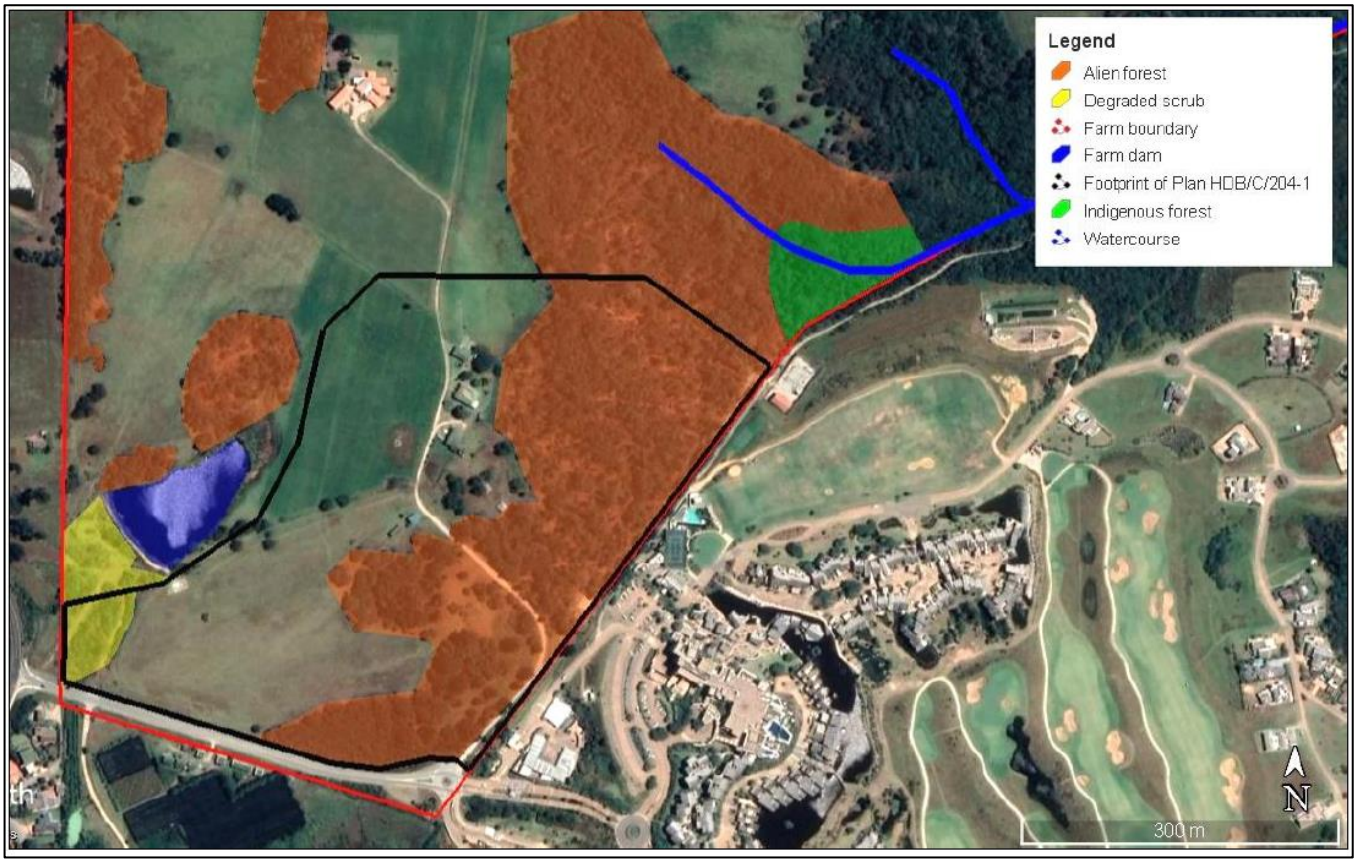

Figure 4: Satellite photo showing the botanical features of the site.

5.1.3 Critical Biodiversity Areas

Figure 5 below shows that the proposed development footprint intrudes into an area mapped as degraded CBA: Forest (north-eastern area of the proposed footprint). The Botanical survey completed Mark Berry Environmental Consultants (2019) noted that this area comprises an alien forest, dominated by black wattle and southern blue gum, and has virtually no merit to serve or function as a CBA. It is unlikely that this area was ever an indigenous forest or thicket.

The CBA's in the larger area appear to coincide with the forest areas (whether alien or not), the Gwaing River itself, and remaining tracts of fynbos next to the Oubaai Golf Estate. Ecological Support Areas (ESA's), which are associated with the main drainage courses, extend further along the drainage courses from the above CBA's. Only the tip of an ESA in the western corner of the site will be affected by the development. It must be noted that all the ESA's in the area are significantly degraded or transformed, but still possibly function as drainage corridors. With the recommendations above, the impact of the proposed development on the biodiversity network is expected to be minimal.

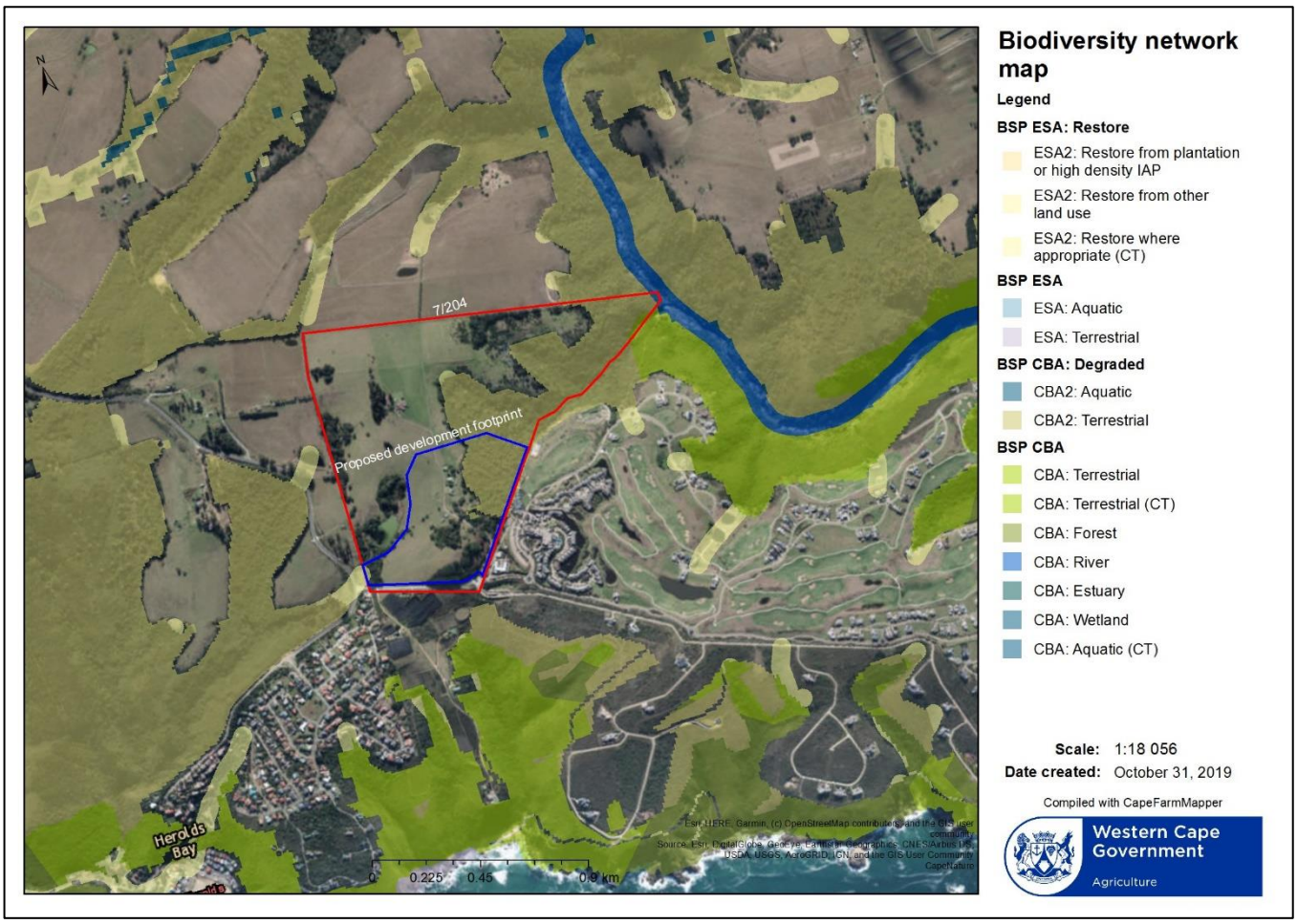

Figure 5: Biodiversity network on and around the proposed site (CapeFarmMapper accessed on 31/10/2019)

5.2 Freshwater features

5.2.1 The Aquatic Environment

The proposed Herolds Bay Country Estate Development site falls within the Quaternary catchment- K30B. The Freshwater Habitat Impact Assessment Completed by Sharples Environmental Services cc (2019) stated that several watercourses were identified within the regulated area, with three in close proximity or within the property (Figure 6). However, the watercourse located to the south of the site has been physically disconnected by a road. Therefore, it is only the watercourse in the west of the property (named Stream A for the purposes of this study) and the watercourse to the north east (named Stream B), that will be impacted by the development.

Stream A is a non-perennial stream (although flowing at the time of study) and originates within the property boundary, where it has been dammed, and then flows in a south westerly direction, past Herold's Bay town, and to the popular Herold's Bay beach itself. The reach assessed, above the tar road, is surrounded by irrigated pasture for livestock farming. Agriculture has encroached in the riparian area and there is limited thicket vegetation remaining. Historical imagery from 1957 shows that the agricultural activities in the area were already established. However, the dam had not yet been constructed. Downstream of the dam the stream has eroded slightly into a single, straight channel (with sandy substrate) and passes through a narrow road culvert into another, smaller dam.

Stream B originates near the north eastern corner of the proposed development boundary. It is a steeply sloped, small tributary to the Gwaiing River. It is currently dry and likely to flow only intermittently during high rainfall events. The channel bed is approximately 1.5 m in width and consists of sandy loam

sediments. The banks are stable, at 1 m in height, and there is no evidence of erosion in the system. The riparian zone is dominated by indigenous Southern Afrotemperate Forest with only a few black wattle (*Acacia mearnsii*) and blue gum (*Eucalyptus grandis*) individuals having encroached. However, beyond this area on the surrounding slopes where previous anthropogenic disturbance has occurred, the vegetation becomes entirely dominated by black wattle and soil instability is noticeable.

***Figure 6:* The proposed site and study area in relation to the identified aquatic habitat**

5.2.2 Habitat Integrity, Ecological Importance & Sensitivity

The Freshwater Habitat Impact Assessment Completed by Sharples Environmental Services CC (2019) discusses the Habitat Integrity, Ecological Importance and Sensitivity of stream A and stream B.

When analysing stream A, it was determined that due to large modifications to the hydrological regime, water quality, geomorphology, and vegetation the Present Ecological State (PES) of the stream is within the 'D' category (Poor health). It was found that a large loss of natural habitat, biota and basic ecosystem functions has occurred.

The ecological importance and sensitivity (EIS) category of Stream A was determined as being 'Low' (D category). It has been significantly modified and limited natural habitat remains. The longitudinal connectivity is interrupted in several locations along the system and the non-perennial nature results in less refuge for biota. It is likely these waters are already subjected to significant water quality changes from the natural condition that has resulted in the dominance of disturbance tolerate species and thus the species/taxon richness is not expected to be significant at any scale. The dam is likely to provide some refuge to certain biota during times of environmental stress, at a local scale. There are no rare/endangered, vulnerable or sensitive species expected and the area is not important for the

conservation of ecological diversity on any scale. However, the dam on the stream does provide significant direct benefits to society through its use for water storage and irrigation.

When analysing the Habitat Integrity, Ecological Importance and Sensitivity of stream B, it was determined that the stream is largely natural with few modifications. It obtained a 'B' habitat integrity PES category as a small change in natural habitats and biota may have taken place, but the ecosystem functions are essentially unchanged. The exposure of bare soils due to the farming and alien trees in the catchment may have increased sediment inputs but it was found that there is no discernible sedimentation within the stream. There are no road crossings or erosion causing any significant bed modification. Regarding the hydrology, the invasive trees will have altered the catchment hydrology however at the time of the assessment (March 2019), the hydrological regime of the stream is close to the perceived natural condition. Overall, the modification is limited to very few localities and the impact on habitat quality, diversity, size and variability are also very small.

The ecological importance and sensitivity (EIS) category of Stream B was determined as being 'Low' (D category). It does not provide significant diversity in habitat as it has a uniform substrate and flows intermittently. It is not overly sensitive to water quantity and quality changes and no biota will depend on it for their entire life cycle. It is highly unlikely to provide habitat for any rare or endangered species and is not conserved in any way. Additionally, it does not currently provide any direct services to society. It does however act as a small corridor to the Gwaiing River downstream, which is of High ecological importance and sensitivity, and thus must be managed accordingly.

4.1.3.3. Aquatic Critical Biodiversity Areas & the Western Cape Biodiversity Spatial Plan
Critical Biodiversity Areas are areas required to meet biodiversity targets for ecosystems, species and ecological processes, as identified in a systematic biodiversity plan. Ecological Support Areas are not essential for meeting biodiversity targets but play an important role in supporting the ecological functioning of Critical Biodiversity Areas and/or in delivering ecosystem services.

Cape Farm Mapper (accessed October 2019) shows that the nearest Aquatic Critical Biodiversity Area is located near the north-eastern corner of the property, approximately 700 meters away from the proposed development footprint. The Aquatic Critical Biodiversity Area identified represents the Gwaing river.

The Western Cape Biodiversity Spatial Plan Handbook (2017) mentions various land use guidelines that have been identified to promote the effective management of biodiversity as required in Section 41(a) of the NEM:BA and in terms of the NEMA. The guidelines provide advice on which land uses and activities are most compatible with maintaining the ecological integrity of CBAs and ESAs, and other parts of the landscape, based on the Desired Management Objectives for the land, and the anticipated impact of each land use activity on biodiversity patterns and ecological processes. Figure 6 shows that the only CBA and ESA areas present on site and within the proposed development footprint are;

- CBA2: Terrestrial
- ESA2: Restore from other land use

The Western Cape Biodiversity Spatial Plan Handbook (2017) states that the desired management objective would be to maintain the area in a functional, natural or near-natural state, with no further loss of natural habitat. These areas should be rehabilitated. However, the Botanical Survey completed Mark Berry Environmental Consultants (2019) notes that this area comprises an alien forest, dominated by black wattle and southern blue gum, and has virtually no merit to serve or function as a CBA. It is unlikely that this area was ever an indigenous forest or thicket.

The Western Cape Biodiversity Spatial Plan Handbook (2017) states that best practice should apply in areas where land uses other than conservation are present within a ESA2.

5.2.3 National Freshwater Ecosystem Priority Areas (NFEPA's)

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

FEPAs were identified based on a range of criteria dealing with the maintenance of key ecological processes and the conservation of ecosystem types and species associated with rivers, wetlands and estuaries (Driver et al. 2011). The NFEPA project did not identify any rivers or wetlands within this study area.

6. Legal Framework

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

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

Due to the fact that this development proposal is an activity listed in the EIA Regulations, a Full Scoping & EIA Process is required and the respective reports (Scoping and EIA) must be submitted to the Department of Environmental Affairs and Development Planning (DEADP) before they issue Long Island Trading 44 (Pty) Ltd with an Environmental Authorisation (either approval or rejection of the development proposal).

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

Activity #	Listing notice 1. Description of Activity as per GN No. R 327
12	The development of— (i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or (ii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs— (a) within a watercourse; (b) in front of a development setback; or (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; — excluding— (aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour; (bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies; (cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies; (dd) where such development occurs within an urban area; (ee) where such development occurs within existing roads, road reserves or railway line reserves; or (ff) the development of temporary infrastructure or structures where such infrastructure or structures will be removed within 6 weeks of the commencement of development and where indigenous vegetation will not be cleared.

19	The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse; but excluding where such infilling, depositing, dredging, excavation, removal or moving— (a) will occur behind a development setback; (b) is for maintenance purposes undertaken in accordance with a maintenance management plan; (c) falls within the ambit of activity 21 in this Notice, in which case that activity applies; (d) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or (e) where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies.
24	The development of a road— (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— (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.
28	Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development: (i) will occur inside an urban area, where the total land to be developed is bigger than 5 hectares; or (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare; excluding where such land has already been developed for residential, mixed, retail, commercial, industrial or institutional purposes.
Activity #	**Listing notice 3. Description of Activity as per GN No. R 324**
10	The development and related operation of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres. i. Western Cape i. Areas zoned for use as public open space or equivalent zoning; ii. All areas outside urban areas; or iii. Inside urban areas: (aa) Areas seawards of the development setback line or within 200 metres from the high-water mark of the sea if no such development setback line is determined; (bb) Areas on the watercourse side of the development setback line or within 100 metres from the edge of a watercourse where no such setback line has been determined; or (cc) Areas on the estuary side of the development setback line or in an estuarine functional zone where no such setback line has been determined.
Activity #	**Listing notice 2. (GN No. R325): Scoping & Environmental Impact Reporting**

	N/A

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

- Listing Notice 1: Activity No: 12, 19, 24 and 28;
- Listing Notice 2: None;
- Listing Notice 3: Activity No: 10

6.2 Other applicable legislation

Long Island Trading 44 (Pty) Ltd is responsible for ensuring that all contractors, labourers and any other appointed person/entity acting on their behalf, remain compliant with the conditions of the received authorisations, as well as the provisions of all other applicable legislation and guidelines, including *inter alia*:

- National Environmental Management Act (NEMA) (Act No 107 of 1998, as amended);
- National Environmental Management Biodiversity Act (Act 10 of 2004);
- National Environmental Management: Waste Act (Act 59 of 2008);
- National Water Act (Act 36 of 1998)
- National Forest Act (Act No 84 of 1998);
- National Heritage Resources Act (Act No 25 of 1999);
- Occupational Health and Safety Act (Act 85 of 1993);
- Subdivision of Agricultural Land (Act No. 70 of 1970)
- Guideline for emp's for state-subsidised housing: Considerations to be taken into account in preparation of EMPs for state-subsidised housing (February 2019)

The above listed legislation have general applicability to most development applications, and it is the responsibility of *Long Island Trading 44 (Pty) Ltd* to ensure that all contractors and employees are aware of their obligations in terms of these Acts. This EMPr does not detract from any other legal requirements.

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

7. Scope of this EMPr

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

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

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

8. General Environmental Management

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

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

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

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

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

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

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

In addition to the EMPr, the environmental controls comprise the following:

- **Building Plan Controls**
    - A copy of the approved and signed building plans must be available on site during the construction phase of the development.
    - Variations of the building plans must be approved by the engineer / holder prior to being implemented.

- Prior to commencing building, the contractor must remove all topsoil and store it in a berm of not more the 2m high, away from construction activities.

- **Site tidiness**
  - The contractor must keep the appearance of his building site neat and tidy at all times. Building rubble must be removed from site at regular intervals, and litter must be removed from the site on a daily basis. Refuse drums must be available on site which waste can be placed in. The drums must be emptied on a regular basis and the waste taken to a licenced local waste disposal facility.
- **Safety**
  - The contractor shall comply with the Health and Safety Act (Act No. 85 of 1993), as amended, together with such regulations promulgated thereunder.

8.1 Site access and traffic management

Access to the development is proposed along Oubaai Main Rd. The Oubaai Main Rd provides greater connectivity to the surrounding area and is connected to the R404, which leads to the N2.

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.

8.1.1 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. Paved sidewalks should be provided in support of the development that will generate high numbers of public transport commuters.

8.2 Site demarcation

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

8.2.1 Construction working area

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

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

8.2.2 No-go areas

Prior to the commencement of any land-clearing or construction activities, all sensitive areas (as identified by the ECO), must be demarcated and must not be disturbed during the construction phase. It is recommended that the No-Go areas be demarcated with a suitable material of natural colours, i.e. green or brown biddum, to ensure less visual impact during construction. 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.

Aquatic buffer zones are designed to act as barriers between human activities and sensitive water resources in order to protect them from adverse negative impacts. Buffer zones associated with water resources have been shown to perform a wide range of functions and have therefore been adopted as a standard measure to protect water resources and associated biodiversity.

The Freshwater Habitat Assessment Report compiled by Sharples Environmental Services (2019) recommends a 32 m buffer zone from the boundary of the riparian areas. An important component of these buffers is that they represent minimum setbacks from the riparian zone. Functions such as stormwater attenuation, sewage lines, water lines, roads and pathways must lie outside of this setback area. This buffer area has been mapped (see Appendix A) and should be adhered to by the contractor at all times during construction.

The Botanical survey completed by Mark Berry Environmental Consultants (2019) explains that the indigenous forest which is located lower down in the valley outside of the development area should be protected and suitably buffered from the development by means of a fire belt, with the surrounding aliens cleared. This fire belt would act as a buffer and should be demarcated and treated as a no-go area.

No-go areas could also include areas with slopes of 1:4 and steeper, greenbelt / corridor areas, public open spaces, pastures, drainage lines, streams and/or other wetlands outside of the approved development area. No-go areas outside the approved development area must be off-limits to all construction workers, vehicles and machinery during all phases of the development. No vegetation may be cleared from within the no-go areas, and no dumping of any material (waste, topsoil, subsoil etc.) may occur in these areas.

Construction workers must be informed of the no-go areas, and if necessary appropriate signage can be used to enforce the demarcation. Any interaction with no-go areas should be consulted between the contractor and ECO prior to any actions.

8.2.3 Demarcation of the site camp

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

8.3 Site camp and associated facilities

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

8.3.1 Fencing & Security

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

8.3.2 Fire Fighting Equipment

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

8.3.3 Waste Storage Area

Sufficient bins for the temporary storage of construction related waste must be provided inside the site camp and/or at the working area. Sufficient signage and awareness should be created to ensure that these bins are properly used.

8.3.4 Hazardous Substances Storage Area

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

8.3.5 Potable Water

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

8.3.6 Ablution Facilities

Chemical toilets should be kept at the site camp, on a level surface and secured from blowing over and located in such a way that the toilets will not cause any form of pollution . As per the SANS10400

requirement, one ablution facility for every 8 male workers and 2 ablution facilities for every 8 female workers 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 the river system in any way. Toilets must be serviced regularly and kept in an orderly state. The contractor must ensure that no spillage occurs when the toilets are cleaned, serviced or moved. Performing ablutions outside of the provided toilet facilities is strictly prohibited and the ECO would need to regularly inspect the state of the chemical toilets to ensure compliance.

8.3.7 Eating Area & Rest Area

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

8.3.8 Vehicle & Equipment Maintenance Yard

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

8.3.9 House-keeping

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

8.4 Indigenous vegetation clearing

Where indigenous vegetation must be cleared for the development 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.
- The indigenous forest which is located lower down in the valley should be protected and suitably buffered from the development by means of a fire belt, with the surrounding aliens cleared.

8.5 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 2m high to allow light and air penetration.
- Removed subsoil must be stockpiled separately from topsoil.
- The topsoil & subsoil storage area must be located on a level 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.
- Stockpiles must not be located within 50 metres of watercourses. The furthest threshold must be adhered to.
- If soil stockpiles will be stored for an extended period of time, the stockpiles must be kept clear of weeds and alien vegetation growth by regular weeding, (or application of herbicides if agreed with the ECO).
- Soil material that will not be re-utilised on site may be removed from site and taken to an appropriate site for re-use or disposal.
- Topsoil removed from fynbos areas to be reused in rehabilitation areas, e.g. open space areas. Where possible, topsoil from fynbos areas, containing indigenous plant seeds, should be transferred immediately to rehabilitation areas rather than being stockpiled, as stockpiling kills important fungi, microbes, seeds and soil fauna. Topsoil stockpiles of this kind must not exceed 0.5 m in height and must not be compacted.
- Note that the topsoil must be the final layer applied to a rehabilitated/ re-landscaped site, after subsoil/ spoil material has been placed and shaped on the site.

8.6 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. The receipts from the facility must be kept on file and must be available on request.

8.7 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, at least 100m from any water courses, water bodies or surface drainage channels.
- 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.

8.8 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, the river/ riparian zone or contaminate the soil.
- 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.

8.9 Erosion control and stormwater management

Appropriate measures must be implemented to control the flow of stormwater across the construction site, in order to prevent possible flooding, soil loss and dispersion of pollutants. All exposed earth surfaces must also be protected from wind and water erosion. Stripped areas must not remain uncovered for extended periods of time and must be provided with a suitable cover (vegetation, mulch, brush-packing) as soon as possible.

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

It may be necessary to implement small-scale erosion protection measures at the construction site, to prevent soil erosion. These measures must be established to reflect the natural slope of the surface and located at the natural ground level and must be located within the development footprint and not encroach into the buffer areas. Such measures may include the use of shade netting, grease traps/oil separators, geo-fabric, brush-packing or similar barriers in areas susceptible to erosion and along exposed slopes. 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. Areas must be rehabilitated and a suitable cover crop planted once specific phases of construction is completed.

8.10 Excavations and Earthworks

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

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

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

8.11 Heritage Resources

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

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

8.12 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 asphalting and cleared in a manner approved by the ECO. Any soil contaminated with hydrocarbons (oil, fuel, etc) or other hazardous substance must be collected and disposed of as hazardous waste to a licenced disposal facility.
- All construction waste is to be removed from the site and disposed of at an appropriate facility. Burying or burning of waste or rubble on site is strictly prohibited.
- Topsoil that was removed and stockpiled before construction, must be replaced by spreading it evenly over the areas from which it was removed. This topsoil (and the seedbank it contains) will facilitate the re-vegetation of the site.
- Disturbed areas, especially areas where excavations have taken place, must be shaped as appropriate (original topography must be restored where possible), and covered with a layer of stockpiled topsoil as soon as possible.
- Any topsoil, subsoil or other excavated material that cannot be utilised during site rehabilitation must be removed from the site and disposed of at an appropriate disposal site.
- The disturbed, newly rehabilitated surfaces (particularly steeper slopes and areas recently covered with topsoil) must be protected from wind & water erosion using mulch, brush packing or other appropriate erosion protection measures. Brush-packing/ mulching is done by covering the exposed surface with organic plant material such as branches, plant cuttings and leafy material. Ideally the vegetation removed from site at the start of the construction must be utilised. Brush-packing/ mulching plays a valuable role in erosion control, while also promoting re-vegetation of the site by retaining moisture in the soil, introducing seeds and/or trapping wind-blown seeds and providing organic material (compost) to promote new plant growth.
- Final landscaping and rehabilitation of the site must be done to the satisfaction of the ECO, and must adhere to all conditions/ requirements of the Environmental Authorisation.
- Erosion features that have developed due to construction within the aquatic habitat due to the project are required to be stabilised. This may also include the need to deactivate any erosion headcuts/rills/gullies that may have developed.

9. Environmental Impact Management: Planning and Design Phase

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

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

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

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

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

9.1 OBJECTIVE 1: APPOINTMENT OF AN ENVIRONMENTAL CONTROL OFFICER

Impact Management Objective: ***To appoint a suitably qualified and experienced Environmental Control Officer.***		
Potential impact to avoid	Failure to appoint an ECO will result in non-compliance with the requirements of the EMPr.	
Impact Management Outcome	The requirements of the EMPr are implemented and monitored during all phases of the development, which will promote sound environmental management on site.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
• A suitably qualified and experienced Environmental Control Officer must be appointed before any activities commence on site. • The appointed ECO must adhere to the requirements stated in Chapter 15 and any other requirements specified in the Environmental Authorisation. • The appointed ECO must be advised of the construction start date, 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.	Long Island Trading 44 (Pty) Ltd	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.

9.2 OBJECTIVE 2: DETAILED DESIGN AND SITE LAYOUT PLAN

Impact Management Objective: ***To compile a detailed design and site layout plan that adheres to the recommendations of the EIA Report and any additional conditions which may be included in the Environmental Authorisation.***		
Potential impact to avoid	Substantial deviation from the conceptual layout plan may result in: • Non-compliance with the Environmental Authorisation during construction. • Triggering of additional listed activities not authorised in the Environmental Authorisation. • An increase in the severity of the impacts identified and assessed in the EIA or may result in new impacts not previously assessed and not provided for in the EMPr, resulting in environmental degradation.	
Impact Management Outcome	Development is compliant with recommendations of the EIA and the EMPr.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
• The final detailed design & layout must adhere to the conceptual layout assessed in the Environmental Impact Assessment (EIA) process. • The final detailed design & layout must adhere to any conditions of the Environmental Authorisation (EA). • If the final detailed design differs significantly from that assessed during the EIA, the revised layout must be assessed by an Environmental Consultant and the received EA must be amended by the Competent Authority before proceeding. • Interested & Affected Parties may need to be provided with an opportunity to comment on any proposed amendment to the EA depending on the significance of the changes. • It is recommended that the stormwater management plan be developed with appropriate ecological input and be developed based on Sustainable Drainage Systems (SUDS). • All stormwater infrastructure, must be located within the development footprint and not encroach into the buffer areas. • The following mitigation measures recommended by the Freshwater Specialist should be considered during detailed design: • Soft infrastructure must be considered where practical. For example, permeable surfaces can be done via permeable concrete block pavers (such as Amorflex), brick pavers, stone chip, and gravel and may contribute to slowing surface flows (especially if maintained).	Long Island Trading 44 (Pty) Ltd / Consulting Engineer	During design phase

• Stormwater managed by the development could 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. This will provide for some filtration and removal of urban pollutants (e.g. oils and hydrocarbons), provide some attenuation by increasing the time runoff takes to reach low points, and reduce the energy of storm water flows within the stormwater system through increased roughness when compared with pipes and concrete V-drains. • Frequent stormwater outlets must be designed to prevent erosion at discharge points. All erosion protection measures (e.g. Reno-mattresses) must be established to reflect the natural slope of the surface and located at the natural ground level. All stormwater infrastructure, such as reno mattresses at pipe outlets, must be located within the development footprint and not encroach into the buffer areas. • 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). • The use of grease traps/oil separators to prevent pollutants from entering the environment from stormwater is mandatory. To ensure the efficiency of these, they must be regularly maintained. Key maintenance will include litter and sediment clearing and the servicing and maintenance of key collection points like catch pits, detention tanks etc. Such maintenance should be the responsibility of the relevant owners/estate associations and budgeted for.		
Performance Indicator	Detailed designs and site layout plans that adhere to the conditions of the EA and EMPr are finalised prior to the commencement of construction.	

10. Environmental Impact Management: Pre-construction Phase

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

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

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

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

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

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

Impact Management Objective: ***To set up and equip the site camp and associated site facilities in a manner that will promote good environmental management.***			
Potential impact to avoid	• Inappropriate siting of site camp facilities may result in impacts to sensitive resources • Failure to properly demarcate and set up site facilities may result in disorganised construction activities and unnecessary disturbance to the site. • Failure to provide the necessary site facilities and/or failure to equip these facilities with the necessary equipment/materials may impede good environmental management & compromise ability to respond to emergencies.		
Impact Management Outcome	Site camp facilities do not impact significantly on environment. The equipment required to implement the provisions of the EMPr are provided on site.		
IMPACT MANAGEMENT ACTIONS			
Mitigation measure		Responsible party	Time period

• The site camp and site facilities described in Section 8.3 of this EMPr must be provided on site. • The site camp and associated site facilities must be set-up and managed in accordance with the general environmental management measures specified in Chapter 8 of this EMPr. • The site camp must be strategically set up, away from freshwater resources, in a manner that will promote good environmental management during construction/ demolition, and to respond to potential emergencies (including fires, spillage of hazardous substances etc.) that may arise. • The No-Go boundary must be demarcated, and no disturbance may occur past this point during any stage. • The site camp, storage facilities, stockpiles, waste bins, and any other temporary structures on site should be located in such a way that they will present as little visual impact to surrounding residents and road users as possible. • Frequent stormwater outlets must be designed to prevent erosion at discharge points. • It is recommended that the stormwater management plan be developed with appropriate ecological input and be developed based on Sustainable Drainage Systems (SUDS). • 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. • Top soil and other top material such as boulders must be stored at a stockpile location agreed to by the ECO. Ensure the stock pile does not exceed the maximum height agreed upon.	Contractor / Developer	Pre-construction phase (prior to start of construction activities)
Performance Indicator	Appropriate, well organised and properly equipped site facilities are available on site prior to commencement of construction activities. The location and set up of the facilities does not impact on the natural resources.	

10.3 OBJECTIVE 3: PRE-CONSTRUCTION ECO INSPECTION

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

Impact Management Objective: ***Environmental Control Officer to conduct an inspection prior to the commencement of construction activities on site.***	
Potential impact to avoid	• Failure to appoint ECO or to notify ECO of commencement prior to commencement may result in non-compliance with the EA. • If a pre-commencement ECO inspection is not performed, the Construction Contractor may be held liable for environmental degradation that took place prior to the Contractor commencing work on site.
Impact Management Outcome	• Good environmental management is promoted and enforced by the ECO during the full pre-construction and construction phases. • Site facilities are appropriately located on site.

	• Construction workers receive environmental awareness training before commencing work on site.		
IMPACT MANAGEMENT ACTIONS			
Mitigation measure		Responsible party	Time period
• The appointed ECO must be advised of the construction start date, before any activities commence on site so that the ECO can perform a pre-commencement inspection and plan for environmental awareness training of construction workers.		Contractor	Start of construction phase
Performance Indicator	A pre-commencement site inspection is conducted by the appointed ECO before construction activities commence on site.		

11. Environmental Impact Management: Construction Phase

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

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

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

- Prevent soil erosion
- Minimise disruption to natural river flow
- Prevent alien invasive plant species establishment
- Prevent pollution and surface water contamination
- Protection of aquatic ecosystems
- Protection of terrestrial ecosystems (fauna and vegetation)
- Job creation
- Agricultural management
- Noise impact management
- Visual impact management
- Dust impact management
- Community Safety

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

11.1 OBJECTIVE 1: PREVENT SOIL EROSION

Impact Management Objective: ***To prevent soil loss on site and prevent increased turbidity / sediment load in watercourses.***	
Potential impact to avoid	• Areas disturbed and/or cleared of vegetation (work corridor) during construction may be vulnerable to increased water and wind erosion. • Stockpiles of soil (topsoil/subsoil) at the site may be vulnerable to wind/water erosion.
Impact Management Outcome	Soil erosion at the water courses are kept to a minimum and the aquatic systems are not impacted significantly as a result of soil erosion.

IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
• 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. • Stockpiles must not be located within 50 metres of watercourses. The furthest threshold must be adhered to. • Stockpiles should not be placed in vegetated areas that will not be cleared. • It is advised that an Environmental Control Officer visit the construction site before construction occurs within any of the watercourses and possibly during construction within the watercourses. • Soil surfaces must not be left open for lengthy periods to prevent erosion. • If site development does not occur soon after preparation of the site, a suitable cover crop to be established as a temporary measure. • 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. • The SuDS Stormwater management and drainage system should inform the stormwater design of developed areas. • The storm water management plan should adhere to the principles of sound storm water management. The storm water management system must be implemented on site and must be properly maintained. • The stormwater flows must enter the riparian buffer areas in a diffuse flow pattern without pollutants. • Clean and contaminated storm water must be kept separate. Contaminated run-off from the construction site must be prevented from flowing into the streams. • 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. • Only the area required to accommodate construction activities within the working area should be cleared of surface covering. Unnecessary clearing/ disturbance of land and exposure of soil must be avoided. • Land clearing, earth moving and construction activities should not take place during heavy rains, or windy conditions. • Cleared areas and any other area susceptible to erosion should be provided with a suitable cover and stabilised as soon as possible via the implementation of appropriate erosion control measures. This may include use of cut-off drains, temporary/permanent drainage channels, brush-packing,	Contractor	Construction phase

mulching, planting or sodding, use of environmentally benign soil binders, use of geo-textile or other coverings. The appropriate measures should be selected by the contractor in consultation with the Engineer & ECO. • Stockpiles of topsoil & spoil material must be protected from wind & water erosion. • Stockpiles of earth material may not be located within any storm-water drainage pathways and must be outside of the reach of potential flood waters. • Any erosion runnels/ gulleys/ channels that form on site must be infilled with appropriate material, compacted, rehabilitated as needed and appropriate erosion control measures put in place to prevent recurrent erosion at that site. Rehabilitation of erosion channels should be ongoing during the construction phase and not left until the end of the construction period.		
Performance Indicator	The water courses are not significantly impacted as a result of soil erosion.	

11.2 OBJECTIVE 2: PREVENT POLLUTION AND SOIL/ WATER CONTAMINATION

Impact Management Objective: ***To prevent environmental pollution and contamination of soil and water resources***		
Potential impact to avoid	• Fuel, oil, lubricant or other pollutants may leak from vehicles/ machinery and contaminate soil, surface water and/or ground water. • Spills of hazardous substances may contaminate environment. • Chemical toilets may leak. • Contaminated run-off from site or site camp facilities may pollute soil or water resources. • Waste (solid or liquid) from the construction site may be blown or washed into surrounding environment. • Contamination of soil or water may impact surrounding and downstream land/water users, biota and livestock.	
Impact Management Outcome	The environment (including soil, surface water and groundwater) is not contaminated.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
• It is recommended that the stormwater management plan be developed with appropriate ecological input and be developed based on Sustainable Drainage Systems (SUDS). • A Waste Management Plan is to be developed in order to formalise waste control methods and to provide a structure for waste management. • All erosion protection measures (e.g. Reno-mattresses) must be established to reflect the natural slope of the surface and located at the natural ground level. • All stormwater infrastructure, such as reno mattresses at pipe outlets, must be located within the development footprint and not encroach into the buffer areas.	Contractor	Construction phase

• 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). • 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. **General Pollution Management:** • No pollution of surface water or ground water resources may occur due to any activity on the site. • No storm water runoff from any premises containing waste, or water containing waste emanating from construction activities may be discharged into the environment. Polluted stormwater must be contained on the site. • 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 • Frequent stormwater outlets must be designed to prevent erosion at discharge points. **General Waste Management:** • Dedicated waste bins or skips must be provided on site and kept in a demarcated area on an impermeable surface. • Separate waste bins/skips must be provided for recyclable waste, general waste and hazardous waste. Recovered builder's rubble & green waste may be stockpiled on the ground within the site camp, or in separate skips until removal. • Waste must be placed in the appropriate waste bins/skips/ stockpiles. • Hazardous waste bins must be kept on an impermeable bunded surface capable of holding at least 110% of the volume of the bins. • Skips/ bins must be provided with secure lids or covering that will prevent scavenging and windblown waste or dust. • Waste bins/skips must be regularly emptied and must not be allowed to overflow. • Construction workers must be instructed not to litter and to place all waste in the appropriate waste bins provided on site. • The Contractor must ensure that all workers on site are familiar with the correct waste disposal procedures to be followed. • Waste generated on site must be classified and managed in accordance with the National Environmental Management: Waste Act – Waste Classification and Management Regulations (GN No. R. 634 of August 2013).		

• Disposal of waste to landfill must be undertaken in accordance with the National Environmental Management: Waste Act – National Norms and Standard for the Assessment of Waste for Landfill Disposal (GN No. R. 635 of August 2013). • All waste, hazardous as well as general, resulting from the proposed activities must be disposed of appropriately at a licensed Waste Disposal Facility (WDF). **Pollution Management – hydrocarbons (oil, fuel etc.)** • Vehicles and machinery must be in good working order and must be regularly inspected for leaks. • If a vehicle or machinery is leaking pollutants it must, as soon as possible, be taken to an appropriate location for repair. The ECO has the authority to request that any vehicle or piece of equipment that is contaminating the environment be removed from the site until it has been satisfactorily repaired. • Repairs to vehicles/ machinery may take place on site, within a designated maintenance area at the site camp. Drip trays, tarpaulin or other impermeable layer must be laid down prior to undertaking repairs. • Refuelling of vehicles/ machinery may only take place at the site camp or vehicle maintenance yard. Where refuelling must occur, drip trays should be utilised to catch potential spills/ drips. • Drip trays must be utilised during decanting of hazardous substances and when refilling chemical/ fuel storage tanks. • Drip trays must be placed under generators (if used on site) water pumps and any other machinery on site that utilises fuel/ lubricant, or where there is risk of leakage/spillage. • Where feasible, fuel tanks should be elevated so that leaks are easily detected. • A spill kit to neutralise/treat spills of fuel/ oil/ lubricants must be available on site, and workers must be educated on how to utilise the spill kit. • Soil contaminated by hazardous substances must be excavated and disposed of as hazardous waste. • Spoil or waste material should not be dumped within 50 m of natural areas, it should be discareded at a licensed dump site. • The use of grease traps/oil separators to prevent pollutants from entering the environment from stormwater is recommended. **Pollution Management – Ablution facilities** • Chemical toilets must be kept at the site camp, on a level surface and secured from blowing over. • Toilets must be located well outside of any storm water drainage lines ,and may not be linked to the storm water drainage system in any way.		

• Chemical toilets must be regularly emptied and the waste disposed of at an appropriate waste water disposal/ treatment site. Care must be taken to prevent spillages when moving or servicing chemical toilets. **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/ bidem lined detention ponds (or similar) should be constructed to catch the run-off from batching areas. Once the water content of the cement water/ slurry has evaporated the dried cement should be scraped out of the detention pond and disposed of at an appropriate disposal facility authorised to deal with such waste • Cement batching should take place on already transformed areas within the footprint of the facility. • Unused cement bags must be stored in such a way that they will be protected from rain. Empty cement bags must not be left lying on the ground and must be disposed of in the appropriate waste bin. • Washing of excess cement/concrete into the ground is not allowed. All excess concrete/ cement must be removed from site and disposed of at an appropriate location. • Construction works must preferably take place in drier months of the year when runoff from the construction site will be minimal, to limit potential dispersal of pollutants.		
Performance Indicator	The natural flows of the watercourses are not impeded during the construction phase.	

11.3 OBJECTIVE 4: 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	• Potential disturbance to terrestrial fauna during land clearing or construction activities. • The clearing/trimming of vegetation will result in loss/ disturbance of indigenous vegetation and may reduce habitat heterogeneity.

Impact Management Outcome	The terrestrial ecosystem is not significantly impacted on as a result of the construction activities.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
• An awareness program is to be run by the ECO in order to prevent the labour force from intentionally killing any faunal species • Great care will be taken if cement is to be mixed on site, especially in the proximity of vegetation and watercourses. It will be mixed on thick plastic sheets or in large buckets and not allowed to spill onto bare ground. Any spillage will be cleaned up immediately. Cement water will also be contained in the above manner and allowed to dry out and then removed from site. Cement water, which is highly alkaline, poses a definite threat to the soil and seed banks. • Blanket clearing of vegetation must be limited to the approved development footprint, and the area to be cleared must be demarcated before any clearing and grubbing commences. • No clearing outside of development and infrastructure footprint area to take place. • An Environmental Control Officer will oversee compliance with all the prescribed environmental requirements and mitigation measures listed here and will be on site regularly. • 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. • 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. • 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; • Construction workers may not feed, hunt, trap, poison or shoot fauna on site or in the immediately surrounding areas.	Contractor	Construction phase
Performance Indicator	• Construction team limit disturbance to the terrestrial ecosystem as far as possible for the duration of the construction phase. • There are no significant or long-term impacts to terrestrial vegetation or fauna.	

11.4 OBJECTIVE 5: ALIEN CLEARING

***Impact Management Objective:* To create habitat free of alien vegetation**	
Potential impact to avoid	• The proliferation of alien vegetation once construction has been completed.
Impact Management Outcome	The level of alien infestation decreases over time.
IMPACT MANAGEMENT ACTIONS	

Mitigation measure	Responsible party	Time period
• 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. • Alien vegetation on public open space should be eradicated. • Alien plants must be removed from the site as per NEMBA requirements. • The alien forests should be cleared of all alien trees. • The indigenous forest which is located lower down in the valley should be protected and suitably buffered from the development by means of a fire belt, with the surrounding aliens cleared. • Alien clearing must be done in such a way as not to cause damage to indigenous vegetation. • 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. • A suitable weed management strategy to be implemented in construction and operation phases to eradicate and control regeneration. • After any clearing is completed, an appropriate cover crop should be planted where any weeds or exotic species are removed from disturbed areas timeously.	Long Island Trading 44 (Pty) Ltd	Construction phase
Performance Indicator	No alien invasive species are observed in areas that have been disturbed.	

11.5 OBJECTIVE 6: JOB CREATION

***Impact Management Objective:* To create employment opportunities with potential for skills transfer, for members of the local community.**		
Potential impact to be promoted	• A number of job opportunities will be created during the construction phase of the development. • There may be opportunities to transfer skills from more experienced workers to less experienced workers.	
Impact Management Outcome	Job creation: It is expected that 543 man-years of labour will be generated directly on site during the construction of the project. The indirect impact on local business will see a further 1 027 man-years of labour being generated in the regional economy. The total impact on employment, when including direct, indirect, and induced impacts, is expected to be 2 029 man-years of labour. That is, 2 029 man-years of labour will be generated in the regional economy during the period of construction. The majority of work during the construction phase is likely to be undertaken by local contractors and builders. The proposed development will therefore represent a positive benefit for the local construction and building sector in the area. The majority of the building materials associated with the construction phase will be sourced from locally based suppliers from the greater Cape Town area.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
• No mitigation required for this positive benefit, however certain enhancements are recommended.	Long Island Trading 44 (Pty) Ltd / Contractor	Construction phase

• The Long Island Trading 44 (Pty) Ltd should inform local community leaders, organizations and councillors of the project and the potential job opportunities for local builders and contractors. • The Long Island Trading 44 (Pty) Ltd should establish a database of local construction companies in the area, specifically SMME's owned and run by HDI's, prior to the commencement of the tender process for the development. These companies should be notified of the tender process and invited to bid for project related work. • The Long Island Trading 44 (Pty) Ltd in consultation with the appointed contractor/s should seek to ensure that a percentage of the labour required for the construction phase is sourced from local area in order to maximize opportunities for members from the local HD communities. • The developer in consultation with the appointed contractor/s will look to employ a percentage of the labour required for the construction phase from local area in order to maximize opportunities for members from the local HD communities. • Ideally locally produced or occurring building materials will be identified and sourced		
Performance Indicator	The majority of the construction team is from the local community, with preference given to historically disadvantaged individuals. Skills transfer from experienced to less experienced workers is actively encouraged on site.	

11.6 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
• A noise complaints register should be opened. • Excavations and earth-moving activities must be restricted to normal construction working hours (7:30 – 17:30) as far as possible. • Work on site must be well-planned and should proceed efficiently so as to limit the duration of the disturbance. • Vehicles and equipment must be kept in good working condition. If deemed necessary, machinery and equipment should be fitted with mufflers/ exhaust silencers. No unnecessary disturbances should be allowed to emanate from the construction site. • Due to the location of the proposed development site to residents, noise levels must be kept to a minimum at all times. If excessive noise is expected on the boundary of the residential erven	Contractor	Construction phase

bordering the site they must be informed in advance of when the high noise levels will occur and for how long they will occur. • Workers should be educated on how to control noise-generating activities that have the potential to become disturbances, particularly over an extended period of time. • Noise levels must comply with the relevant health & safety regulations and SANS codes and should be monitored by the Health & Safety Officer as necessary and appropriate. • Affected parties must be informed of the excessive noise factors. • The noise management and monitoring measures prescribed in the EMPr must be adhered to. • 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.		
Performance Indicator	Noise levels on site remain within acceptable standards. No valid noise complaints are received.	

11.7 OBJECTIVE 9: VISUAL IMPACT MANAGEMENT

Impact Management Objective: ***To prevent the site from presenting an unnecessary visual impact to the surrounding public.***		
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.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
• Consult with the ECO when determining the appropriate site for the site camp. • The site camp must be kept neat and tidy and free of litter at all times. • Waste must be managed according to this EMPr and the mitigation measures listed above in terms of waste management. Good housekeeping practices on site must be maintained to ensure the site is kept neat and tidy. • The site camp, storage facilities, stockpiles, waste bins, and any other temporary structures on site should be located in such a way that they will present as little visual impact to surrounding residents and road users as possible. • Work on site must be well-planned and well-managed so that work proceeds quickly and efficiently, thus minimizing the disturbance time. • The site camp, storage facilities, stockpiles, waste bins, elevated tanks and any other temporary structures on site should be located in such a way that they will present as little visual impact to surrounding residents and road users as possible. • The site camp may require visual screening via shade cloth or other suitable material.	Contractor	Construction phase

• Special attention should be given to the screening of highly reflective material. • Use of lighting (if required) should take into account surrounding residents and land users and should present little or no nuisance. Downward facing, spill-off type lighting is recommended. • Construction vehicles must enter and leave the site during working hours. • Delivery trucks should be appropriately covered to deter the spilling of material along the route to the site. • 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. • No clearing of land to take place outside the demarcated footprint. • Clearing should take place in a phased approach, so that cleared areas are kept small and manageable. • No workers are allowed to be housed on the site.		
Performance Indicator	• Good "housekeeping" is evident on site. • The site does not pose a visual impact to surrounding community.	

11.8 OBJECTIVE 10: DUST IMPACT MANAGEMENT

***Impact Management Objective:* To prevent the generation of significant dust.**		
Potential impact to avoid	• Dust and wind-blown sand may arise from site during earth-moving and other construction activities. • Dust may be generated from cement batching activities. • Dust may be generated from stockpiles of earth material. • Dust may smother surrounding vegetation, and may pose a nuisance to nearby land occupants or land users.	
Impact Management Outcome	The surrounding environment, land users, residents do not experience significant dust-related impacts.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
• Land clearing and earthmoving activities should not be undertaken during strong winds, where possible. • Cleared areas should be provided with a suitable cover as soon as possible, and not left exposed for extended periods of time. • Stockpiles of topsoil, spoil material and other material that may generate dust must be protected from wind erosion (e.g. covered with netting, tarpaulin or other appropriate measures. Note that topsoil should not be covered with tarpaulin as this may kill the seedbank).	Contractor	Construction phase

• The location of stockpiles must take into account the prevailing wind direction and should be situated so as to have the least possible dust impact to surrounding residents, road-users and other land-users. • Speed limits must be enforced in all areas, including public roads and private property to limit the levels of dust pollution. • The speed limit should be set at 20-40km/h. • Dust must be suppressed on access roads and the construction site during dry periods by the regular application of water or a biodegradable soil stabilisation agent. Water used for this purpose must be used in quantities that will not result in the generation of excessive run off. • Dust suppression measures such as the wetting down of sand heaps as well as exposed areas around the site must be implemented especially on windy days. • The use of straw worked into the sandy areas may also help and the ECO must advise when this is necessary. • If dust appears to be a continuous problem the option of using shade cloth to cover open areas may be necessary or the erecting of shade netting above the fenced off are may need to be explored. • All vehicles transporting sand need to have tarpaulins covering their loads which will assist in any windblown sand occurring off the trucks. • Work on site must be well-planned and should proceed efficiently so as to minimise the handling of dust generating material. • Material loads should be properly covered during transportation. • Dust levels specified in the National Dust Control Regulations (GN 827 of November 2013) may not be exceeded. i.e. dust fall in residential areas may not exceed 600mg/m2/day, measured using reference method ASTM D1739; • A Complaints Register must be available at the site office for inspection by the ECO of dust complaints that may have been received.		
Performance Indicator	• Excessive dust does not arise from the site. • No dust complaints are received from any member of the public. • There is no evidence that vegetation surrounding the site is being smothered by dust.	

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

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

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

- Rehabilitate & stabilise disturbed areas, and ensure environmentally sensitive closure of the construction sites.
- No establishment of alien vegetation on the site.
- Minimal loss of Aquatic Habitat and Associated Biota
- No impairment of surface water quality as a result of the development.
- Reduced erosion and scouring.
- Creation of Business and Employment Opportunities.

12.1 OBJECTIVE 1: SITE CLOSURE & REHABILITION

Impact Management Objective: ***To rehabilitate all areas disturbed by construction activities in an environmentally sensitive manner.***		
Potential impact to avoid	• Failure to remove all construction related waste and materials may result in environmental pollution. • Failure to remove all construction related equipment, machinery and site facilities may pose an impact to the natural environment specifically the watercourses. • Failure to stabilise disturbed surfaces may result in soil erosion and increased storm water run-off, which may limit successful revegetation of the site.	
Impact Management Outcome	• The site is neat and tidy and all exposed surfaces are suitably covered/ stabilised. • There is no construction-related waste or pollution remaining on site.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
• On completion of the construction operations, the site camp area must be cleared of all site camp facilities, ablution facilities, fencing, signage, waste and surplus material. • Surfaces are to be checked for waste products from activities such as concreting or asphalting and cleared in a manner approved by the ECO. • Any contaminated soil must be collected and disposed of as hazardous waste. • All construction waste, litter and rubble are to be removed from the site and re-used elsewhere, or recycled/disposed of at an appropriate facility. • Burying or burning of waste or rubble on site is prohibited. • All areas within the working area and site camp that have become devoid of vegetation or where soils have been compacted due to construction activities should be scarified or ripped.	Contractor / Long Island Trading 44 (Pty) Ltd	Rehabilitation phase

• Topsoil removed during the establishment of the site camp and the working area must be spread evenly over the entire site camp area and all other disturbed/ exposed areas after those areas have been ripped, scarified, shaped and contoured (as required). • Where necessary seeding and planting of vegetation can take place after the replacement of the topsoil. Hardy, drought tolerant, non-invasive plant species must be selected. If needed, a layer of mulch can be applied to the newly shaped/ landscaped and topsoiled areas. The mulch will serve to limit erosion and will promote the re-vegetation of the site by retaining moisture in the soil and providing organic material (compost) for new plant growth. • Erosion features that have developed due to construction within the aquatic habitat due to the project are required to be stabilised. This may also include the need to deactivate any erosion headcuts/rills/gullies that may have developed. • All exposed soils and recently topsoiled areas are to be re-vegetated or stabilised to the satisfaction of the ECO, to protect these areas from wind and water erosion. No areas are to be left exposed to erosive forces. Erosion protection measures that can be applied include mulching (described above), the placement of geotextile, onion bags filled with wood chips, brush-packing or other similar measures. • Any topsoil, subsoil or other excavated material that cannot be utilised during site rehabilitation must be removed from the site and reused elsewhere on the property or disposed of at an appropriate disposal site. • Disturbed soils must be revegetated with the local indigenous vegetation such as that which occurs at the site ,or provided with other suitable cover. • Erosion features that have developed due to construction within the aquatic habitat due to the project are required to be stabilised. • It is recommended that follow-up alien clearing be conducted 6 months after construction is complete and thereafter annually for 3 years (or longer is alien recruitment is still evident on site). • The following mitigation measures proposed by the Freshwater Specialist should be implemented: o The area must be maintained through alien invasive plant species removal (which is the landowner's responsibility regardless of mitigation associated with this project) and the establishment of indigenous vegetation cover to filter run-off before it enters the freshwater habitat. o The solid domestic waste must be removed and disposed of offsite. All post-construction building material and waste must be cleared in accordance with the EMPr. o Removal of vegetation must only be when essential for the continuation of the project. Do not allow any disturbance to the adjoining natural vegetation cover or soils.		

o Erosion features that have developed due to construction within the aquatic habitat due to the project are required to be stabilised. This may also include the need to deactivate any erosion headcuts/rills/gullies that may have developed. o It is the contractor's responsibility to continuously monitor the area for newly established alien species during the contract and establishment period, which if present must be removed. Removal of these species shall be undertaken in a way which prevents any damage to the remaining indigenous species and inhibits the re-infestation of the cleaned areas. o Alien/ invasive species shall not be stockpiled, they should be removed from site and dumped at an approved site. o Any use of herbicides in removing alien plant species is required to be investigated by the ECO before use, for the necessity, type proposed to be used, effectiveness and impacts of the product on aquatic biota. o A monitoring programme shall be in place, not only to ensure compliance with the EMPr throughout the construction phase, but also to monitor any post-construction environmental issues and impacts such as increased surface runoff. The monitoring should be regular and additional visits must be taken when there is potential risk to watercourses. o The stormwater management infrastructure must be designed to ensure the runoff from the development is not highly concentrated before entering the buffer area. The volume and velocity of water must be reduced through discharging the surface flow at multiple locations surrounding the development, preventing erosion. o Any evidence of erosion from this stormwater system must be rehabilitated and the volume/velocity of the water reduced through further structures and/or energy dissipaters. These structures must be incorporated within the layout area. o The recommended use and maintenance of grease traps/oil separators to prevent pollutants from entering the environment from stormwater. o Appropriate waste water infrastructure must be designed to prevent any such water from entering the surrounding environment. o Maintenance of the freshwater habitat and buffer area must be implemented for it to remain effective. Apart from erosion control and alien invasive plant eradication, the encroachment of any further infrastructure or vehicles must be prevented.		

o Engage with the homeowners to explain the reasons why the buffer and the water resources are protected and what human activities are allowed. Encourage recreational activities within the buffer area that are not in conflict with water resource management. The community could be involved in the monitoring e.g. the packaging plant effluent.		
Performance Indicator	• All construction-related materials, equipment, facilities, waste and contaminated soils have been removed from the site. • Compacted soils have been scarified/ ripped and stabilised. • All disturbed/exposed surfaces have been provided with a suitable covering and/or stabilised. • No alien vegetation is evident on site.	

12.2 OBJECTIVE 2: MAINTENANCE OF ENVIRONMENTAL INTEGRITY DURING THE OPERATIONAL PHASE

<u>Impact Management Objective:</u> To rehabilitate all areas disturbed by construction activities in an environmentally sensitive manner.		
Potential impact to avoid	• Degradation of onsite watercourses. • Excessive alien vegetation growth • Negative impacts on the environ	
Impact Management Outcome	• The integrity of the environment is maintained throughout the operational phase. • The environmentally sensitive areas on site are maintained and conserved. • Environmental sensitivities and aspects become an attribute of the estate.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
• Storm water infrastructure must be serviced regularly. • Cover crop that was planted where any weeds or exotic species were removed is to be maintained. • Regular follow-up clearing of aliens is required. 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. • 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.	Long Island Trading 44 (Pty) Ltd	Operational phase
Performance Indicator	• The integrity and condition of the surrounding environment is maintained at an acceptable level. • All previously disturbed/exposed surfaces have been provided with a suitable covering and/or stabilised. • No alien vegetation is evident on site.	

12.3 OBJECTIVE 2: DISCOURAGE ALIEN VEGETATION

Impact Management Objective: Discourage establishment of alien vegetation & reduce fire risk (directly associated with alien vegetation)		
Potential impact to avoid	• Alien vegetation may establish as a result of land disturbance. • Of particular concern is the establishment of alien vegetation in the area disturbed for the route of the bulk services infrastructure within the stream channels.	
Impact Management Outcome	• No establishment of alien vegetation on the site.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
• An Environmental Control Officer will oversee compliance with all the prescribed environmental requirements and mitigation measures listed here, and will be on site regularly. • 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. • After any clearing is completed, an appropriate cover crop should be planted where any weeds or exotic species are removed from disturbed areas timeously.	Developer	Operational phase
Performance Indicator	• No alien vegetation is evident on site.	

12.4 OBJECTIVE 3: REDUCED LOSS OF ECOLOGICAL CONNECTIVITY

Impact Management Objective: Reduced Loss of Ecological Connectivity		
Potential impact to avoid	• The main impact is likely to be the fragmentation of the current ecological connectivity across the surrounding area.	
Impact Management Outcome	• Maintenance of ecological connectivity	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
• Alien vegetation on public open space should be eradicated. • Public Open spaces should remain as natural as possible if they are to be utilised as conservation areas. Where Public Open Spaces are not utilised as conservation areas, they should be used as multi-use areas. • Indigenous drought resistant vegetation should be used for landscaping purposes.	Developer / consulting engineer	Operational phase
Performance Indicator	• Minimal alien vegetation.	

12.5 OBJECTIVE 4: CREATION OF BUSINESS AND EMPLOYMENT OPPORTUNITIES

Impact Management Objective: Creation of Business and Employment Opportunities		
Potential impact to avoid	• The establishment of businesses will create employment opportunities in addition to those from the industrial and business facilities. • The housing component of the development may create employment opportunities for domestic workers. • The operational phase of the residential development will also create opportunities for local businesses, such as local maintenance and building companies, garden services, security and catering companies and the local taxi industry.	
Impact Management Outcome	• Creation of Business and Employment Opportunities.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
• The developer should inform local community leaders, organisations and councillors of the potential job opportunities associated with the different components associated with the operational phase of the development.	Developer	Operational phase
Performance Indicator	• Increase in employment of local residents.	

12.6 OBJECTIVE 5: TRAFFIC & SAFETY IMPACT

Impact Management Objective: Reduced negative impact caused by increased traffic		
Potential impact to avoid	• Traffic congestion on the existing road networks. • An unsafe and non-user-friendly transport network.	
Impact Management Outcome	• Ensure the safety of vehicular and pedestrian traffic during the operational phase of the development.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
• 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. • Paved sidewalks should be provided in support of the development that will generate high numbers of public transport commuters.	Developer	Operational phase
Performance Indicator	• Increase in employment of local residents.	

13. Emergency Preparedness

13.1 Emergency response procedures

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

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

13.2 Emergency preparedness

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

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

14. Method statements

The Competent Authority and/or the ECO may require the 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.

15. Roles and Responsibilities

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

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

> ***Duty of Care:***
> *"Every person who causes, has caused, or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm cannot reasonably be avoided or stopped, to minimize and rectify such pollution or degradation of the environment"*

15.1 Duties and Responsibilities of the Holder

The Holder is ultimately responsible for ensuring that the environmental management measures specified in this EMPr, as well as any other conditions specified by the competent authority, are implemented and adhered to during the construction and operational phase (maintenance activities) of the proposed development.

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

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

15.2 Duties and Responsibilities of the Contractor

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

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

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

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

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

15.3 Duties and Responsibilities of the ECO

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

15.3.1 Competency of the ECO

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

15.3.2 Duties of the ECO

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

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

15.3.3 Frequency of ECO visits

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

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

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

15.3.4 Authority of the ECO

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

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

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

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

16. Environmental Awareness Plan

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

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

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

The Construction Contractor must make allowance for all construction site staff, including all subcontractors that will be working at the site, to attend environmental awareness training sessions (undertaken by the ECO) before commencing any work on site. During this training, the ECO will explain the EMPr and the conditions contained therein. Attention will be given to the construction process and

how the EMPr fits into this process. Other items relating to sound environmental management which must be discussed and explained during the environmental awareness training sessions include:

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

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

17. Monitoring, Record Keeping and Reporting

17.1 Environmental Auditing

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

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

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

- Environmental auditing and environmental audit reports must adhere to the requirements of the amended 2014 Environmental Impact Assessment Regulations, in particular Section 34 (*Auditing of Compliance with Environmental Authorisation, Environmental Management Programme*) and Appendix 7 (*Objective and Content of Environmental Audit Report*)
- The audit report must provide verifiable findings on the level of compliance with the provisions/ conditions of the Environmental Authorisation and the EMPr, and must also comment on the ability of the measures contained in this EMPr to sufficiently avoid, manage and mitigate environmental impacts.
- Where the findings of the audit report indicate that the impact management measures stated in the EMPr are insufficient to adequately address environmental impacts, recommendations as to how the EMPr must be amended so as to address the identified shortcomings must be made and submitted to the competent authority together with the audit report.

17.2 Construction phase monitoring, reporting and record keeping

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

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

17.2.1 ECO Inspections - Photographic Records

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

17.2.2 ECO Inspections - Written Records

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

- The ECO must complete an ECO Checklist after each ECO site visit.
- The ECO must compile an ECO monitoring report and submit this to the Holder, the Contractor and the Competent Authority (the latter only if required by the Competent Authority). The monthly reports must be a summary of the ECO inspections from the preceding month, and must highlight the key concerns/ issues on site, instances of non- compliance with the EA and EMPr, all instructions issued to the contractor, actions taken and aspects that still require attention.
- All ECO reports and ECO instructions must be retained on file at least for the duration of the construction period (retaining reports for a period of at least 5 years is recommended, in the event that the Competent Authority must request information).
- A record (minutes) of construction site meetings, liaison site meetings between the ECO and resident engineer or contractor, monitoring reports, ECO instructions and ECO observations must be clearly documented and filed on a master file off-site for safe keeping.
- It is recommended that a site register (incident register) be kept on site at the site office for the recording of any environmental incidents (e.g. fires, spills etc.), observations which are contrary to the stipulations within the EMPr and any other contravention deemed necessary for the attention of the resident engineer. Actions taken to remedy the incidents must also be recorded.
- A complaints register must be kept on site in which complaints by any member of the public must be logged.
- The ECO must compile a final post-construction audit report, within 6 months of completion of each construction phase. The audit report must detail the rehabilitation measures undertaken, describe all major incidents or issues of non-compliance and any issues or aspects that require attention or follow-up.

17.2.3 Construction Phase Record Keeping

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

18. Penalties, Claims and Damages

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

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

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

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

With specific regard to the excavations through the forested area the following will apply. 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	**R 1,000.00**
Any vehicle being driven, and items of plant or materials being parked or store outside the demarcated boundaries of the site	**R 1,000.00**
Persons walking outside the demarcated boundaries of the site	**R 100.00**
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	**R 1,000.00**
Littering of site by individuals	**R 250.00**

Deliberate lighting of illegal fires on site	**R 1,000.00**
The eating of meals on site outside the defined eating area. Individual not making use of the site ablution facilities	**R 250.00**
No on-site implementation of waste management system.	**R 1000.00**
Waste not collected and contained immediately.	**R 1000.00**
No recycling of waste.	**R 1000.00**
Burning, burying or disposing of waste other than as prescribed.	**R 1000.00**
Waste not disposed of at an approved landfill.	**R 1000.00**
Chemicals and / or waste spilled on ground.	**R 250.00**
Use of other areas for toilet purposes and / or disposal of chemicals / waste.	**R 250.00**
Stockpiling of soil in an unspecified area.	**R 2500.00**
Stockpiles not located and aligned so as to minimise impacts.	**R 2500.00**
Spilling of soil or construction material into water body or stream.	**R 1000.00**

Table 4: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.

19. Conclusion

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

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