

**PROPOSED MOUNT VIEW RESIDENTIAL DEVELOPMENT ON THE
REMAINDER OF FARM 869, FARM 1262, REMAINDER OF FARM 866,
REMAINDER OF FARM 1054, PORTIONS 2 AND 3 OF FARM 1054 AND
PORTION 2 OF FARM 870, SIR LOWRY'S PASS, WESTERN CAPE.**

DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME

DEA&DP Ref: 16/3/3/1/A3/53/2005/22

**(INCLUDING THE WASTE, WATER USE AND ELECTRICITY CONSUMPTION
MINIMIZATION AND MANAGEMENT PLAN)**

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ABBREVIATIONS

DEA&DP	Department of Environmental Affairs and Development Planning
DEAT	Department of Environmental Affairs and Tourism
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
ECO	Environmental Control Officer
ESO	Environmental Site Officer
GNEC ..	Guillaume Nel Environmental Consulting
I&AP	Interested and Affected Parties

DEFINITIONS

Alien species - Plants and animals which do not arrive naturally in an area - they are brought in by humans. Alien plants often force indigenous species out of the area. Rooikrans is a good example of alien species in the Cape.

Alternative - A possible course of action, in place of another, that would meet the same purpose and need defined by the development proposal. Alternatives considered in the EIA process can include location and/or routing alternatives, layout alternatives, process and/or design alternatives, scheduling alternatives or input alternatives.

Aspect – Element of an organisation's activities, products or services that can interact with the environment.

Auditing - A systematic, documented, periodic and objective evaluation of how well the environmental management programme is performing with the aim of helping to safeguard the environment by: facilitating management control which would include meeting regulatory requirements. Results of the audit help the organisation to improve its environmental policies and management systems.

Biodiversity - The rich variety of plants and animals that live in their own environment. Fynbos is a good example of rich biodiversity in the Cape.

Built environment - Physical surroundings created by human activity, e.g. buildings, houses, roads, bridges and harbours.

Conservation - Protecting, using and saving resources wisely, especially the biodiversity found in an area.

Contamination - Polluting or making something impure.

Corrective (or remedial) action - Response required to address an environmental problem that is in conflict with the requirements of the EMPr. The need for corrective action may be determined through monitoring, audits or management review.

Degradation - The lowering of the quality of the environment through human activities, e.g. river degradation, soil degradation.

Ecology - The scientific study of the relationship between living things (animals, plants and humans) and their environment.

Ecosystem - The relationship and interaction between plants, animals and the non-living environment.

Environment - Our surroundings, including living and non-living elements, e.g. land, soil, plants, animals, air, water and humans. The environment also refers to our social and economic surroundings, and our effect on our surroundings.

Environmental Impact Assessment (EIA) - An Environmental Impact Assessment (EIA) refers to the process of identifying, predicting and assessing the potential positive and negative social, economic and biophysical impacts of a proposed development. The EIA includes an evaluation of alternatives; recommendations for appropriate management actions for minimising or avoiding negative impacts and for enhancing positive impacts; as well as proposed monitoring measures.

Environmental Management System (EMS) - Environmental Management Systems (EMS) provide guidance on how to manage the environmental impacts of activities, products and services. They detail the organisational structure, responsibilities, practices, procedures, processes and resources for environmental management. The ISO14001 EMS standard has been developed by the International Standards Organisation.

Environmental policy - Statement of intent and principles in relation to overall environmental performance, providing a framework for the setting of objectives and targets.

Fynbos - Low-growing and evergreen vegetation found only in the south Western Cape. Fynbos is known for its rich biodiversity.

Habitat - The physical environment that is home to plants and animals in an area, and where they live, feed and reproduce.

Hazardous waste – Waste, even in small amounts, that can cause damage to plants, animals, their habitat and the well-being of human beings, e.g. waste from factories, detergents, pesticides, hydrocarbons, etc.

Impact - A description of the potential effect or consequence of an aspect of the development on a specified component of the biophysical, social or economic environment within a defined time and space.

Indigenous species - Plants and animals that are naturally found in an area.

Infrastructure - The network of facilities and services that are needed for economic activities, e.g. roads, electricity, water, sewerage.

Integrated - Mixing or combining all useful information and factors into a joint or unified whole. See Integrated Environmental Management.

Integrated Environmental Management (IEM) - A way of managing the environment by including environmental factors in all stages of development. This includes thinking about physical, social, cultural and economic factors and consulting with all the people affected by the proposed developments. Also called "IEM".

Land use - The use of land for human activities, e.g. residential, commercial, industrial use.

Mitigation - Measures designed to avoid, reduce or remedy adverse impacts

Natural environment - Our physical surroundings, including plants and animals, when they are unspoiled by human activities.

Over-utilisation - Over-using resources - this affects their future use and the environment.

Policy - A set of aims, guidelines and procedures to help you make decisions and manage an organisation or structure. Policies are based on people's values and goals. See Integrated Metropolitan Environmental Policy.

Process - Development usually happens through a process - a number of planned steps or stages.

Proponent – Developer. Entity which applies for environmental approval and is ultimately accountable for compliance to conditions stipulated in the Environmental authorisation (EA) and requirements of the EMPr.

Recycling - Collecting, cleaning and re-using materials.

Resources - Parts of our natural environment that we use and protect, e.g. land, forests, water, wildlife, and minerals.

Scoping Report - A report presenting the findings of the scoping phase of the EIA. This report is primarily aimed at reaching closure on the issues and alternatives to be addressed in the EIA (in the case of a full EIA process).

Stakeholders - A subgroup of the public whose interests may be positively or negatively affected by a proposal or activity and/or who are concerned with a proposal or activity and its consequences. The term includes the proponent, authorities and all interested and affected parties.

Storm water management – Strategies implemented to control the surface flow of storm water such that erosion, sedimentation and pollution of surface and ground water resources in the immediate and surrounding environments are mitigated. This is specifically important during the construction and decommissioning phases of a project.

Sustainable development - Development that is planned to meet the needs of present and future generations, e.g. the need for basic environmental, social and economic services. Sustainable development includes using and maintaining resources responsibly.

Sustainability - Being able to meet the needs of present and future resources.

Waste Management – Classifying, recycling, treatment and disposal of waste generated during construction and decommissioning activities.

Wetlands - An area of land with water mostly at or near the surface, resulting in a waterlogged habitat containing characteristic vegetation species and soil types e.g. vleis, swamps.

Zoning - The control of land use by only allowing specific type development in fixed areas or zones

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SECTION 1 - INTRODUCTION AND BACKGROUND

1.1 INTRODUCTION AND BACKGROUND

Mount View (Pty) Ltd. as proponent of the proposed development will use this Planning, Construction and Operational Phase Environmental Management Programme (EMPr) as a tool in managing the impacts of the proposed Mount View residential development, after environmental approval from the Department of Environmental Affairs and Development Planning (DEA&DP) in terms of the **NEW** Environmental Impact Assessment Regulations (GN R. No. 983, GN R. No. 984 and GN R. No. 985 [4 December 2014, as amended 07 April 2017]) under the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA), is obtained.

This document is based on the EMPr Guideline provided by DEA&DP which was compiled in accordance with the Integrated Environmental Management (IEM) philosophy which aims to achieve a desirable balance between conservation and development (DEAT, 1992). IEM is a key instrument of the National Environmental Management Act [NEMA] (Act No. 107 of 1998). NEMA promotes the integrated environmental management of activities that may have a significant effect on the environment, while IEM prescribes a methodology for ensuring that environmental management principles are fully integrated into all stages of the development process. It advocates the use of several environmental and management tools that are appropriate for the various levels of decision-making. One such tool is an Environmental Management Programme (EMPr).

The IEM guidelines intend encouraging a pro-active approach to sourcing, collating and presenting information in a manner that can be interpreted at all levels. The basic principles underpinning IEM are that there be:

- informed decision-making;
- accountability for information on which decisions are taken;
- accountability for decisions taken;
- a broad meaning given to the term environment (i.e. one that includes physical, biological, social, economic, cultural, historical and political components);
- an open, participatory approach in the planning of proposals;
- consultation with interested and affected parties;
- due consideration of alternative options;
- an attempt to mitigate negative impacts and enhance positive aspects of proposals;
- an attempt to ensure that the 'social costs' of development proposals (those borne by society, rather than the developers) be outweighed by the 'social benefits' (benefits to society as a results of the actions of the developers);
- democratic regards for individual rights and obligations;
- compliance with these principles during all stages of the planning, implementation and decommissioning of the proposals (i.e. from 'cradle to grave'), and

- The opportunity for public and specialist input in the decision-making process.

These principles are in line with NEMA, which has repealed a number of the provisions of the Environment Conservation Act, 1989 [ECA] (Act No. 73 of 1989), and is focussed primarily on co-operative governance, public participation and sustainable development. The Environmental Impact Assessment Regulations that took effect in July 2006 regulate the procedures and criteria for the submission, processing, consideration and decision on applications for environmental authorisation of listed activities.

1.2 SCOPE AND TERMS OF REFERENCE

The general principles contained within this document apply to all **PRE-CONSTRUCTION, CONSTRUCTION AND OPERATIONAL** activities.

Principles of this EMPr

This EMPr is compiled using the following concepts and implementation requirements so that the higher principles of sustainable development are realised:

- **Continuous improvement.** The project proponent (or implementing organisation) must be committed to review and to continually improve environmental management, with the objective of improving overall environmental performance.
- **Broad level of commitment.** A broad level of commitment will be required from all levels of management as well as the workforce in order for the development and implementation of this EMPr to be successful and effective.
- **Flexible and responsive.** The implementation of the EMPr must be responsive to new and changing circumstances, i.e. rapid short-term responses to problems or incidents. The EMPr is a dynamic “living” document and thus regular planned review and revision of the EMPr must be carried out.
- **Integration across operations.** This EMPr is integrated across existing line functions and operational units such as health, safety and environmental departments in a company/project. This is done to change the redundant mindset of seeing environmental management as a single domain unit.
- **Legislation.** It is understood that any development project during its construction phase is a dynamic activity within a dynamic environment. The Developer, Engineer, Contractor and sub-contractor must therefore be aware that certain activities conducted during construction may require further licensing or environmental approval, e.g. river or stream diversions, bulk fuel storage, waste disposal, etc. The Contractor must consult the RE, EO and ECO on a regular basis in this regard.

SECTION 2 – SITE SPECIFIC INFORMATION

2.1 PROPOSED ACTIVITY AND LOCAL CONTEX

Background

Cape Town and its surrounds are currently experiencing tremendous growth with an influx of more permanent residents being the result. The increase in residents is also experienced in the Helderberg area, in particular also the Sir Lowry's Pass Village area. It is therefore proposed that efforts be made to increase the supply of housing available in order to satisfy the growing need. The development of the surrounding properties confirm that the housing need is also experienced in the Sir Lowry's Pass Village area.

The surrounding properties have been altered from its natural state, but is predominantly no longer used for agricultural activities. Instead, the properties are used as residential estates, small holdings and for recreational purposes. The proposed development will therefore be in line with the surrounding properties. The proposed development site is located adjacent to the Tre Donne Estate and High Riding Country Estate.

The proposed development site is located adjacent to Old Sir Lowry's Pass Road. Old Sir Lowry's Pass Road runs through the centre of the proposed development, as the development is located on both sides of the road. The proposed development will therefore be accessed from Old Sir Lowry's Pass Road.

Guillaume Nel Environmental Consultants (GNEC) have been appointed by PropInvest (Pty) Ltd. (applicant) to facilitate the Environmental Impact Assessment (EIA) process in terms of the National Environmental Management Act (NEMA) (Act No. 107 of 1998) and a Water Use License in terms of the National Water Act, 1998 (Act No. 36 of 1998), for the proposed Mount View residential development on the Remainder of Farm 869, Farm 1262, Remainder of Farm 866, Remainder of Farm 1054, Portions 2 and 3 of Farm 1054 and Portion 2 of Farm 870, Sir Lowry's Pass, Western Cape (hereafter referred to as the proposed development site/subject property).

Proposed Development

The proposed development will entail the construction of a residential development on the above-mentioned proposed development site.

The proposed development will consist of 383 residential erven, a clubhouse comprising of a deli / shop, coffee shop and / or restaurant and gym; as well as a crèche, sales offices, board room and security control room. Approximately 6.78 hectares (almost 29% of the proposed development) will be green space that will be landscaped or rehabilitated.

As mentioned, all portions of the proposed development will be accessed from Old Sir Lowry's Pass Road. The main access to the proposed development is proposed approximately 160 m west of the High Riding Estate Street and approximately 265 m east of the existing access road to Farm 1262. The existing access to Farm 1262 will be an

additional access for the development, however this access will only be used by some residents in the vicinity of the access to exit the development. There is a possibility for the construction of a pedestrian sidewalk along Old Sir Lowry's Pass Road from the entrance of Tre Donne to the entrance of the proposed development. The internal road network will consist of 6.3 m / 5.5 m wide brick paved roads with formal kerbs / edgings, roadside open stormwater channels and a stormwater drainage system consisting of an underground pipe / road edge culvert network.

An unnamed tributary of the Sir Lowry's Pass River was identified to bisect the property; while 5 channelled valley bottom (CVB) wetland fragments, which would have naturally been associated with the entire channel length of the unnamed tributary, were also identified on site. The pre- and post-development 1:100 year floodlines of the watercourse have been modelled. It was noted that the majority of the proposed development will be located above the post-development 1:100 year floodline; however some components of the proposed development will be located below the post development 1:100 year floodline (which are mentioned below).

Additionally, in light of the City of Cape Town (CoCT) Floodplain and River Corridor Management Policy requirements, a conservation buffer was applied to the unnamed tributary of the Sir Lowry's Pass River and CVB wetlands. The CoCT policy recommends a minimum conservation buffer of 10 metres; however a variable conservation buffer of varying width (minimum of 5 m from the delineated edge of the watercourses) was applied to accommodate the proposed development layout in some areas, with the provision that the buffer extent be increased in size to 15 m to compensate for the reduced buffer extent and to ensure that the conservation area extent is equal to the 10 m buffer and that the buffer area be suitably rehabilitated (FEN, 2021). The variable conservation buffer is supported by the freshwater ecologist, Freshwater Ecological Network (FEN) and the impacts of the variable buffer on the watercourse was identified as being Low. It should also be noted that no formal buildings will be constructed within the variable buffer. The rehabilitation of the conservation buffer will improve the ecological integrity of the receiving environment and is therefore seen as a major benefit of the proposed development. Please note that a Watercourse Rehabilitation Plan has been compiled by FEN; while a Rehabilitation Plan has also been compiled by Mr Christoff Dippenaar from Guillaume Nel Environmental Consultants (GNEC). The overall ecological functioning of the watercourse will improve significantly due to the rehabilitation measures which are proposed.

It should be noted that the activities proposed to take place below the post-development 1:100 year floodline, within the conservation buffer and located within close proximity to the watercourse include (FEN, 2021):

- Some activities as part of the lower development are located below the post-development 1:100 year floodline and within the delineated boundary of the watercourses. As part of the development, it is proposed that previously unauthorised infilled material below the 1:100 year floodline and within the delineated boundary of the wetland associated with the unnamed tributary of the Sir Lowry's Pass River (located as shown in Figure 1 below –

indicated by red circle) be removed to spoil on site and the infilled area subsequently reshaped and rehabilitated.

- Alteration of the modelled pre-development 1:100 year floodline to reduce the extent of the floodable area south east of Old Sir Lowry's Pass Road to accommodate portions of the proposed Mount View mixed-used development. This will entail:

- o An open stormwater channel proposed upgradient of Old Sir Lowry's Pass Road to channel flow to the existing culvert under the road within the unnamed tributary. The stormwater channel will be approximately 96 m in length and located as shown in Figure 1 below;

- o Enlargement of the existing pipe culvert below Old Sir Lowry's Pass Road to a 2.4 m wide and 1 m high portal culvert;

- o A flood management berm is proposed just downstream of the culvert and extends parallel to the road in a south eastern direction. The berm will be 1 m high above the natural ground level and will extend for approximately 50 m, located as shown in Figure 1; and

- o Landscaping of the adjusted floodline and culverts for erosion control.

- Internal Roads and Parking Areas

- o An internal roadway is proposed to traverse the unnamed tributary along the northern boundary of the study area, on an existing access road for the site and will require the installation of a rectangular portal culvert with 330 mm brick wing walls. This culvert will be sized to accommodate up to a 1:100 year flow in the watercourse and have renomattresses at the inlet and outlet to reduce erosion including riprap below the culvert outlet to dissipate flow and further reduce erosion; and

- o All internal roads/parking areas within development clusters will be designed to accommodate low heavy vehicle traffic (construction vehicles, furniture removal and refuse trucks). This road network will consist of 6.3 m / 5.5 m wide brick paved roads with formal kerbs/edgings, roadside open stormwater channels and a stormwater drainage system consisting of an underground pipe/road edge culvert network.

- Internal Stormwater Network

- o Three new stormwater attenuation facilities will be constructed above the post-development 1:100 year floodline as part of the development in addition to utilising the existing farm impoundment situated north of the main farm house (see Figure 1 below for the position and identification of these stormwater attenuation facilities);

- o The main purpose of these facilities will be to attenuate stormwater run-off and promote on-site infiltration. In order to achieve the required attenuation, the storage volume of the attenuation facility must be able to retain a 1:50 year post-development flood while only discharging a peak flow equal to the 1:10 year pre-development flow; and

- o Outlet structures will discharge stormwater into an open stormwater channel network, which will convey stormwater run-off into the watercourse. Gabion weirs will be constructed

within the stormwater channel to reduce stormwater velocity and erosion. The stormwater discharge points will be located below the post-development 1:100 year floodline but above the 1:50 year post-development floodline but some encroaching into the delineated watercourses. The estimated position of the stormwater discharge points is indicated in Figure 1 below – with purple triangles.

- Portions of private erven associated with the proposed lower and upper Mount View mixed-use development are located within the conservation buffer of the watercourses;
- Portions of in situ compacted walkways are located above the post-development 1:100 year floodline but within the conservation buffer as part of the lower and upper development;
- Wastewater Treatment Plant (WWTP)

o Two WWTPs are proposed for the Mount View mixed-use development, namely WWTP A and WWTP B. WWTP A will be situated in the most western corner of the proposed lower Mount View mixed-use development, above the modelled post-development 1:100 year floodline and outside the conservation buffer of the watercourses. The treated effluent will be used for irrigation purposes in order to minimise the load on the municipal water supply. Treated effluent from the WWTP will be pumped into irrigation storage tanks located next to the stormwater attenuation facilities. Storage tanks will have an emergency overflow which will discharge treated effluent into a bio-retention swale before discharging into the stormwater attenuation facility. It is recommended that a second WWTP (i.e. WWTP B) be installed should the Macassar Wastewater Treatment Works (WWTW) not be upgraded before the start of construction of the upper development. The Macassar WWTW is part of the existing municipal foul sewer network where all sewage generated from the proposed Mount View mixed-use development will ultimately feed to. The Macassar WWTW is currently undergoing upgrades proposed to be completed by 2027. The proposed WWTP B is located above the modelled post-development 1:100 year floodline and outside the conservation buffer of the watercourses, at the entrance of the upper development located upgradient of the Old Sir Lowry's Pass Road (see Figure 1 below). The WWTP B is proposed to be handled in the same manner as the WWTP A.

- Bulk Services
 - o The construction of bulk services infrastructure will cross the tributary of the Sir Lowry's Pass River as indicated in the Civil Services Engineering Report.
 - o The proposed lower Mount View mixed-use development will require the installation of a pump station in the most western corner of the study area, above the post-development 1:100 year floodline and outside the conservation buffer of the watercourses. This pump station will be situated next to the WWTP A and will pump treated effluent into irrigation storage tanks located next to the stormwater attenuation facilities where it will be used for irrigation supply.

Please refer to the figure below for an indication of the watercourse related activities. Please note that the stormwater ponds are numbered 1-4; the red circle indicates the

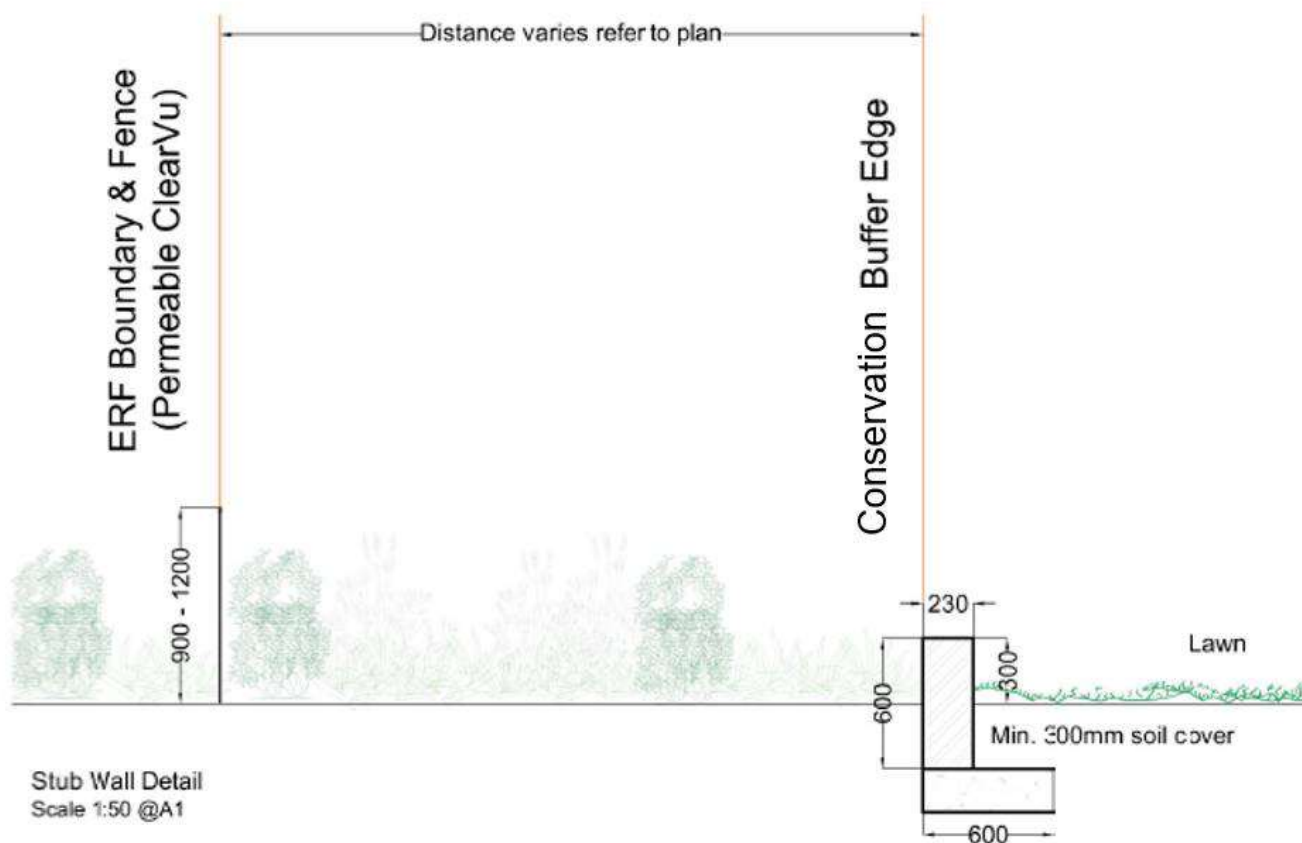


Figure 2 Schematic design of the proposed stub wall, as provided by Viridian Consulting (2021)

Please refer to Figure 4 below for a locality map of the proposed development site. A layout of the proposed development has been included as Figure 5.

Bulk Civil Services

A Civil Engineering Services Report was compiled by KLS Consulting Engineers. The below provides a summary of the bulk civil services.

Internal Roads

KLS Consulting Engineers noted the following regarding the internal roads of the proposed development:

“The design philosophy of the proposed internal road network will be similar to that of a typical urban road network, which includes a minimum 2.0% crossfall and 0.5% longitudinal slope. This road network will consist out of 6.3 m / 5.5 m wide brick paved roads with formal kerbs/edgings, roadside open stormwater channels and a stormwater drainage system consisting of an underground pipe/road edge culvert network”.

The total length of the internal roads will amount to approximately 4 017 metres in total. The total length of the 7 m road reserve amounts to approximately 62 metres; the 8 m road reserve amounts to approximately 306 metres, the 11 m road reserve amounts to

approximately 1 582 metres and the 13 m road reserve amounts to approximately 2 067 metres.

Stormwater Drainage

A flood line assessment was conducted during May 2018 and revised in February 2021 by Storey Eng. It should be noted that the proposed development is located outside the flood lines, however some of the portions of the proposed development downstream of Old Sir Lowry's Pass Road falls within the 1:50-year and 1:100-year flood line boundaries. It is proposed that the flood lines be altered in one area by diverting water back to the watercourse by increasing the size of the existing stormwater pipe culvert through Old Sir Lowry's Pass Road and the addition of stormwater channel / cut-off berms upstream of the lower development portion (KLS, 2021).

The following measures are proposed to improve the water conveyance capacity in the vicinity of Old Sir Lowry's Pass Road:

- Natural channel along the upstream side of the road to channel flow to the pipe culvert crossing Old Sir Lowry's Pass Road.
- Enlargement of the existing pipe culvert to a 2.4 m x 1 m portal culvert.
- A 1 m high berm just downstream of the culvert which extends parallel to the road in a south-easterly direction for approximately 50 metres.

The internal stormwater network will consist out of an underground gravity pipe network, roadside channels, inlet structures and a series of open swales that will drain the roads and other impermeable and semi-permeable surface areas. Provision will also be made for a subsoil drainage network beneath the roads and parking areas. This subsoil drainage infrastructure will consist of a 110 mm diameter perforated pipe network installed approximately 800 mm below the final road level.

The internal roads infrastructure will be designed in such a way that during rainfall events with a return period larger than 1:10-years, the proposed roads, walkways, parking areas and channels will act as overland flow routes which will channel and convey the surface run-off via predetermined escape routes towards the four attenuation facilities and existing watercourse. Outlet structures will discharge stormwater into open stormwater channels, which will convey stormwater run-off to the existing watercourse. Gabion weirs will be constructed within the stormwater channel to reduce stormwater velocity and reduce erosion.

Three new stormwater attenuation facilities will be constructed as part of the development in addition to utilizing the existing farm dam situated north of the main farm house. The existing farm dam located North of the watercourse will be registered within a servitude in favour of the development to accommodate above, as well as below ground stormwater run-off. Maintenance of the existing dam will be done as part of the shared Home Owners' Agreement between the estate and the remaining farm portion.

The total length of the stormwater pipelines will amount to approximately 3 340 metres in total. The 300 mm diameter pipelines will amount to approximately 250 metres in length; the 375 mm diameter pipeline amounts to approximately 2 210 metres; the 450 mm diameter pipelines amounts to approximately 700 metres; and the 525 mm diameter pipeline amounts to approximately 200 metres.

Sewerage

It was confirmed that there is no existing sewer reticulation system located within Old Sir Lowry's Pass Road adjacent to the two development portions. The nearest sewer reticulation system is located to the west of the entrance to Tre Donne estate. City of Cape Town Municipality: Water and Sanitation Department indicated that the development will have to connect to the existing municipal reticulation system situated west of the proposed development by means of a new sewer main constructed within the Old Sir Lowry's Pass Road reserve. The above will be subject to the necessary capacities being in place in the existing municipal infrastructure. All sewage generated by the proposed development will ultimately need to feed to the Macassar WWTW (which is currently being upgraded and should be completed by 2027). In the interim, the developer will make use of two private package plants due to the lack of spare treatment capacity at the Macassar WWTW.

The internal sewage infrastructure will consist of a 160 mm diameter uPVC Class 34 gravity pipe network and round precast fibre cement manholes in the road reserves and corridors between erven. Due to the location of the existing watercourse through the centre of both development portions, three separate 160 mm dia sewer connections will be required.

The development will generate the following estimated sewage flows:

- Annual Average Daily Sewage Yield: 182 m³ per day
- Peak Daily Wet Weather Sewage Yield: 5.5 l/s

Two Wastewater Treatment Plants (WWTP) are proposed. WWTP A will be situated in the most western corner of Portion 2 of Farm Goedeverwachting No. 870; while WWTP B will be situated next to the main entrance gate to the upper portion of the development. The WWTPs will have the following treatment capacities:

- WWTP A: 35 m³ per day (77 Erven Capacity)
- WWTP B: 45 m³ per day (88 Erven + Facilities Capacity)

The proposed container based WWTP will use a combination of conventional treatment (natural bacteria) and membrane technology (microfiltration) to treat the sewage effluent to comply with water limits within regulation stipulated by the Department of Water and Sanitation (DWS).

The treated effluent will be re-used for irrigation purposes. This will offset the demand for irrigation water and ultimately minimise the load on the municipal water supply. Treated effluent from the WWTPs will be pumped into irrigation storage tanks located next to the stormwater attenuation facilities. Storage tanks will have an emergency overflow which will

discharge surplus treated effluent during the rainfall season into a reedbed and swale system which will discharge into the combined storm water / treated sewer attenuation facility. Backup generators will be installed at the pump stations and WWTPs and a bund wall and sump to contain spills from the plant. Both WWTPs will have emergency connection to the municipal sewer connection located in Old Sir Lowry's Pass Road.

The development on the lower portion of the proposed development site will require the installation of a pump station in the most western corner. The pump station will be located at the WWTP and will pump effluent to the municipal sewer connection in Old Sir Lowry's Pass Road as an emergency overflow connection from the conservancy tank at the WWTP to the municipal system.

It is currently proposed that the WWTPs accommodate the first two phases of the proposed development (165 units + facilities); while the remainder of the proposed development will be connected to municipal reticulation once the Macassar WWTW has been upgraded.

The total length of the 160 mm diameter sewerage pipeline will amount to approximately 5 940 metres in total.

Water Reticulation

It was confirmed by the City of Cape Town Municipality that there is no existing municipal water main located within Old Sir Lowry's Pass Road reserve adjacent to the two development portions. The nearest underground municipal system is located to the west of Tre Donne and consists of a 200 mm dia water main which supplies Tre Donne. It is proposed that the existing 200 mm dia water main is extended to the entrance of the proposed development to allow for 3 separate 160 mm dia metered connections.

The proposed internal water reticulation network will consist of three separate 160 mm dia uPVC Class 12 potable water networks, with 110 mm diameter sub-branches to each housing cluster.

The estimated water demand from the development will be:

- Gross Annual Average Daily Demand: 237 m³/day
- Instantaneous Peak Demand: 3.56 l/s

The total length of the water pipelines will amount to approximately 3 846 metres in total. The 110 mm diameter pipeline will amount to approximately 2 455 metres and the 160 mm diameter pipeline will amount to approximately 1 391 metres.

Solid Waste Management

It is proposed that solid waste form part of the City of Cape Town (CoCT) Municipality waste collection. The Solid Waste Management (Collections) branch of the CoCT confirmed that there is sufficient unallocated capacity to accept, collect and dispose all types of waste to a designated licence landfill site.

Electricity

It was noted by KLS Consulting Engineers that the only electrical infrastructure currently installed to each of the erven are the existing 11 kV lines installed to each erf to supply the erf with electricity. These lines will be removed once the development starts. The removal of these lines will not impact any other erf as the lines are dedicated to these erven.

The new electrical demand for the proposed development is 1500 kVA based on the current unit design. It is proposed that the proposed development be provided with electricity from Eskom. It was indicated by Eskom that they would be able to supply the complete development with electricity. The existing 11 kV line does not have adequate capacity, therefore a 11 kV line will need to be installed from the Waterfall substation. The applicant acknowledges this upgrade and accepts the responsibility thereof.



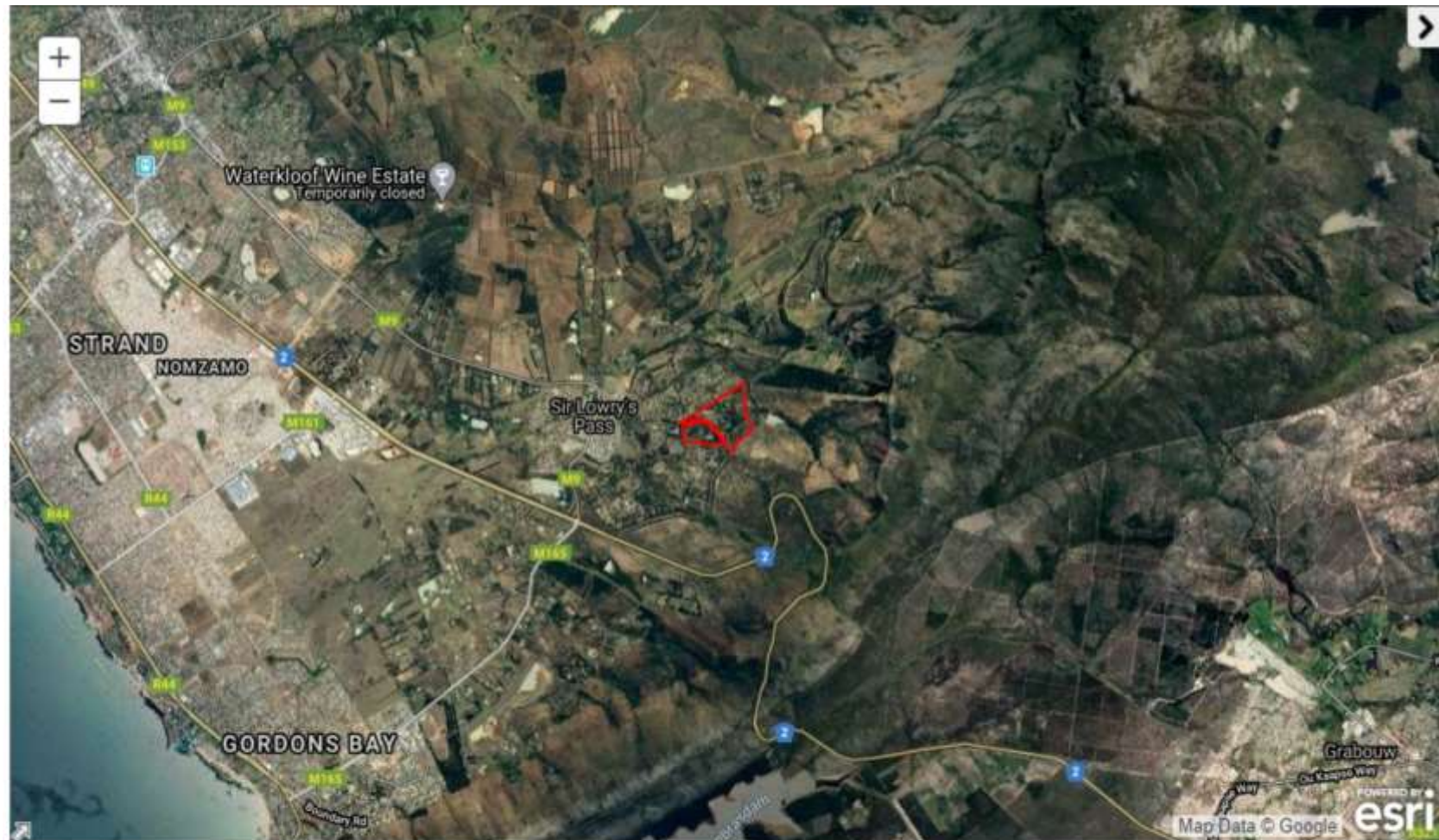
Figure 3 Proposed Alignment of the 11 kV feeder line

Please note that no listed activities in terms of the NEMA EIA Regulations (2014, as amended) will be triggered by the construction of the 11 kV line. The 11 kV line will be constructed within the existing road reserve of Onverwacht Road and Old Sir Lowry's Pass Road – please refer to the figure one for the alignment of the line.

The existing road reserve has been altered from its natural state and therefore does not support indigenous vegetation, except for one area of approximately 160 metres in length. The relevant area is indicated in red below, while the feeder line alignment is indicated in yellow. It can therefore be confirmed that the proposed construction of the feeder line will not result in more than 300 cubic metres of endangered or critically endangered vegetation being cleared. Activity 12 of Listing Notice 3 of the NEMA EIA Regulations, 2014 (as amended) will therefore not be triggered.

In addition, no excavation / removal / infilling of more than 10 cubic metres will take place within a watercourse as watercourses will be traversed via the trenchless technique.

Therefore, neither Activity 12 nor Activity 19 of Listing Notice 1 of the NEMA EIA Regulations, 2014 (as amended) will be triggered by the construction of the feeder line.



Locality Map of the the Proposed development site, Sir Lowry's Pass, Western Cape.				
Source: Cape Farm Mapper	Tel: (021) 870 1874	Fax: 086 6933 802	Cell: 072 1571 321	

Figure 4 Locality Map of the proposed Mount View residential development, Sir Lowry's Pass



Masterplan

Revision N-13 | 17.09.2021 | 1:3000 (A3)



MOUNT VIEW

URBANSTUDIO
architects & urban designers

Figure 5 Layout of the proposed Mount View residential development

2.1.1 SUMMARY OF IMPACTS ASSOCIATED WITH THE PROPOSED ACTIVITY

- Economic:

The proposed development will address unemployment rates within the surrounding communities through the creation of temporary and permanent employment opportunities.

- Freshwater Resources:

It should be noted that a watercourse bisects the entire development site. It should however be noted that the freshwater system has been degraded with numerous alien invasive species being present in the riparian area. Freshwater ecologists, FEN Consulting (Pty) Ltd. was appointed to assess the potential impact of the proposed development on the freshwater system. Overall, the proposed development will pose a Moderate risk to the integrity of the identified on-site watercourses. Ample mitigation measures have been incorporated in the EMPr and Maintenance Management Plan (MMP) to ensure that impacts are adequately mitigated.

It should also be noted that an application for a Water Use Authorisation in terms of Section 21 c, e, f, g and i of the National Water Act, 1998 (Act No. 36 of 1998) is being facilitated with the Department of Water and Sanitation. The WUL application is necessitated as a result of the proposed construction activities to take place within the watercourse (mentioned in the project description), as well as the reuse of treated water for irrigation purposes.

- Impact on flora:

Capensis Ecological Consulting (Pty) Ltd. was appointed to conduct a botanical impact assessment. It was confirmed that the proposed development occurs on properties that are mostly highly degraded to transformed. These areas are not botanically sensitive and can be developed without constraints. The only sensitive portion of the development has been identified on Portion 2 of Farm 870, with an endangered species being identified. Capensis (2020) noted that while the habitat is small, the threat status of *Monsonia speciosa* and Boland Granite Fynbos (vulnerable) means that the area has a Medium sensitivity. A meeting was facilitated with Mr Nicolson, GNEC and CapeNature on the 7th of June 2021. During the meeting CapeNature recommended that the area where the *monsonia speciosa* plant species were identified be considered a no-go area. Therefore, the layout has been amended to exclude this area from the proposed development footprint. Please note the relevant area is in the South Western corner of the site. CapeNature supports the specialist reports and the mitigation measures which are proposed to lower the potential impacts on the receiving environment.

The botanical impact related to the proposed development is therefore regarded as Low negative and therefore the development would be acceptable from a botanical perspective.

- Heritage impact:

A Notice of Intent to Develop (NID) was submitted to Heritage Western Cape (HWC) on the 16th of July 2019 in terms of Section 38 of the National Heritage Resources Act, 1999 (Act No. 25 of 1999). HWC provided a formal response on the 25th of July 2019 requesting that a Heritage Impact Assessment (HIA) be undertaken. As such Ms Cindy Postlethwayt was appointed as heritage consultant. Additionally, Ms Megan Anderson was appointed to conduct a Visual Impact Assessment (VIA) and Mr Tim Hart was appointed to conduct an Archaeological Impact Assessment (AIA). The mitigation measures recommended by the mentioned specialists have been included in the Environmental Management Programme (EMPr). The abovementioned HIA, VIA and AIA reports have been included in Appendix F.

Due to the large open spaces incorporated into the proposed development layout, landscaping of the open space will be an important aspect of the proposed development. As such, a Landscaping Plan has been compiled by Viridian Consulting (Pty) Ltd. and was taken into account in the Visual Impact Assessment.

A positive Record of Decision (RoD) was provided by Heritage Western Cape (HWC) on the 9th of December 2021.

- Visual impact:

As mentioned above, a Visual Impact Assessment has been conducted by Ms Megan Anderson. It should be noted that mitigation measures have been incorporated into the layout which incorporates buffers around the heritage and natural areas, allowing for landscaping in open spaces, boundary buffer areas, the watercourse area such that screening will be provided from sensitive receptors. Some of the large trees will also be retained. The recommendations made by Ms Anderson was also accepted by Heritage Western Cape (HWC) when the RoD was issued.

- Traffic Impact:

An increase in vehicles travelling to and from the proposed development site can be expected during both the construction and operational phases. Innovative Transport Solutions (ITS) (Pty) Ltd. conducted a Traffic Impact Assessment of the proposed development. It was found that the proposed development can be accommodated (with the implementation of the recommendations). It was recommended that taxi lay-bys be provided along both sides of Old Sir Lowry's Pass Road. ITS (Pty) Ltd. confirmed that with the implementation of the mentioned mitigation measure, the road network can accommodate the proposed development and it is recommended that the proposed development be approved from a transport impact perspective.

- Noise pollution:

The City of Cape Town Municipality requested a Noise Impact Assessment (NIA) to be conducted. As such, Safetech was appointed to undertake the mentioned assessment. Safetech conducted baseline monitoring of the ambient noise levels at and adjacent to the proposed development site. It was noted that noise levels at the proposed site are heavily influenced by the wind, rustling of trees in the wind,

community noise such as people talking / dogs barking and passing traffic (Safetech, 2021).

Safetech concluded that the results of the NIA indicate that the construction noise will be of short duration and low impact. The noise impact during the operational phase will be of medium significance to residents living along Old Sir Lowry's Pass Road, although this can be mitigated substantially through traffic calming measures. The noise may be experienced as a "disturbing noise" during both the morning and afternoon rush hours for those properties bordering the Old Sir Lowry's Pass Road. Safetech recommended that an environmental noise survey be conducted annually until the development is completed. It is recommended that this noise survey be conducted annually for a period of two years. This will enable the Developer to determine when, and if, traffic calming measures are required (Safetech, 2021). Should the noise levels be within acceptable levels during these surveys, no additional surveys are required.

2.1.2 Proposed development's upgrade environmental management policy and commitments

The proponent understands the importance of conserving the environment, and will endeavour to apply all necessary mitigation measures to conserve and maintain sensitive areas and prevent environmental degradation.

2.1.3 Interpretations

The implementation of the EMPr is not an additional or "add on" requirement. The EMPr is legally binding through NEMA and the relevant EA. This EMPr is to be used during the planning, construction and operational phases of the proposed project. The Environmental Control Office, appointed by the developer after environmental approval, must use this EMPr during the ECO audits to determine the developer's compliance to it.

Further on, the proponent is to ensure that through the project tender process the EMPr forms part of the Project Construction Contract Document to be incorporated in line with:

- General project specifications; and
- SANS 1200 A or SANS 1200 AA, as applicable.

The proponent is also to ensure that through any tender or appointment process, the operational EMPr forms part of the management contract with all service providers and contractors, for a period of time as stipulated by the DEA&DP during which the development will be audited for compliance to the operational EMPr. This EMPr is compiled in line with relevant legislation and general construction project specifications. However, to ensure sound environmental practice, the measures as described in the operational EMPr should be implemented for the full operational life of the development.

2.1.4 Project phase

The first part of this EMPr is specifically compiled for the ***period of time prior to commencement of and activities associated with construction of the above mentioned activity***, and for the ***operational phase*** of the proposed development.

If and when applicable, where specific activities of the proposed development fall outside of the general principles contained herein, the Department will attach further 'activity – specific' EMPr's as appendices to this document.

2.1.5 Role players and responsibility matrix

In order for the EMPr to be successfully implemented, all the role players involved in the project need to co-operate. For this to happen, role players must have a clear understanding of their roles and responsibilities in the project, must be professional, form respectful and transparent relationships, and maintain open lines of communication. The EMPr therefore clearly defines the role players involved and indicates their role in the implementation of the generic EMPr.

Typically, these role players or the project team may include the Authorities (A), Other Authority (OA), Developer/Proponent (D), Consulting Engineers (CE), Resident Engineer (RE), Environmental Officers (EO), Environmental Site Officer (ESO), Environmental Control Officer (ECO), Project Manager (PM), Contractors (C), Environmental Assessment Practitioner (EAP) and Property Owners Association (POA). Further; landowners, interested and affected parties and the relevant environmental and project specialists are also important role players.

Figure 6 below indicates the proposed reporting channels and highlights the relationships that need to be established between these role players to ensure that the EMPr is effectively implemented.

SECTION 3 – ENFORCEMENT, MONITORING AND AUDITING

3.1 PRE-CONSTRUCTION AND CONSTRUCTION PHASE

The applicant must appoint, at his own cost, an **ECO** and full time EO (as part of the construction team) who will oversee the implementation of the EMPr.

City of Cape Town Municipality as well as DEA&DP must be informed of the appointment of the ECO prior to construction activities. Please note that the responsibility of the particular ECO may end at the end of the construction period. In the event that an ECO is appointed during the operational phase, it must be noted that this ECO may be different from the original ECO and both DEA&DP as well as City of Cape Town Municipality must be notified of this appointment again.

The independent ECO is responsible for fortnightly audits on compliance to relevant environmental legislation, conditions of the Environmental Authorisation (EA), and the EMPr for the project. Where a particular aspect of the proposed development requires more detailed monitoring, more frequent inspections must be undertaken, as deemed necessary.

The ECO shall conduct fortnightly independent environmental audits, or more often as mentioned above. **Formal Monthly Audit reports** are to verify the projects compliance with the EMPr and conditions of the Environmental Authorisation (EA). Where a particular aspect of the proposed development requires more detailed monitoring, more frequent inspections must be undertaken, as deemed necessary. Fortnightly site visits are to be undertaken (or more often as mentioned above), with an **Informal Audit Report in the middle of each month and a Formal Audit Report at the end of each month.**

Before any construction activities commence, the ECO must compile, for the approval by the Department, an audit checklist based on the contents of this EMPr and conditions of the Environmental Authorisation (EA). The ECO shall at the request of the Department forward audit reports to the Department and City of Cape Town Municipality at a frequency determined by the Department which shall be stipulated in the Environmental Authorisation (EA).

Evidence of the following as **key performance indicators**, must be included in the audit reports:

- Complaints received from landowners and actions taken.
- Environmental incidents, such as oil spills, concrete spills, etc. and actions taken (litigation excluded).
- Incidents leading to litigation and legal contraventions.
- Environmental damage that needs rehabilitation measures to be taken.

A copy of all ESO and EO monitoring reports, contractor method statements and pro forma

documentation must be held by the ESO and/or the EO on site and be made available to the Department and or the ECO upon request.

3.2 OPERATIONAL PHASE

A suitably qualified independent person shall conduct, at a frequency as determined by the DEA&DP and stipulated in the relevant Environmental Authorisation (EA) for the project, conduct independent environmental audits. The audits are to verify the developments compliance with the operational EMPr and conditions of the Environmental Authorisation (EA).

The suitably qualified independent person must compile, for the approval by the DEA&DP, an audit checklist based on the contents of this EMPr and conditions of the Environmental Authorisation (EA). The suitably qualified independent person shall at the request of the DEA&DP forward audit reports to the Department at a frequency determined by the Department which shall be stipulated in the Environmental Authorisation (EA).

The following **Key Performance Indicators** must be included in the audit reports:

- Complaints received from landowners and actions taken.
- Environmental incidents, such as oil spills, fires etc. and actions taken.
- Incidents possibly leading to litigation and legal contraventions.
- Environmental damage that needs rehabilitation measures to be taken.

The minutes of site meetings, to which the suitably qualified independent person will have unrestricted access to, shall be the official record of environmental activities, complaints and communications. These minutes will be circulated to the entire project team. A copy of the standard site meeting agenda is available on request.

3.3 FORMAL ENVIRONMENTAL COMMUNICATION CHANNELS

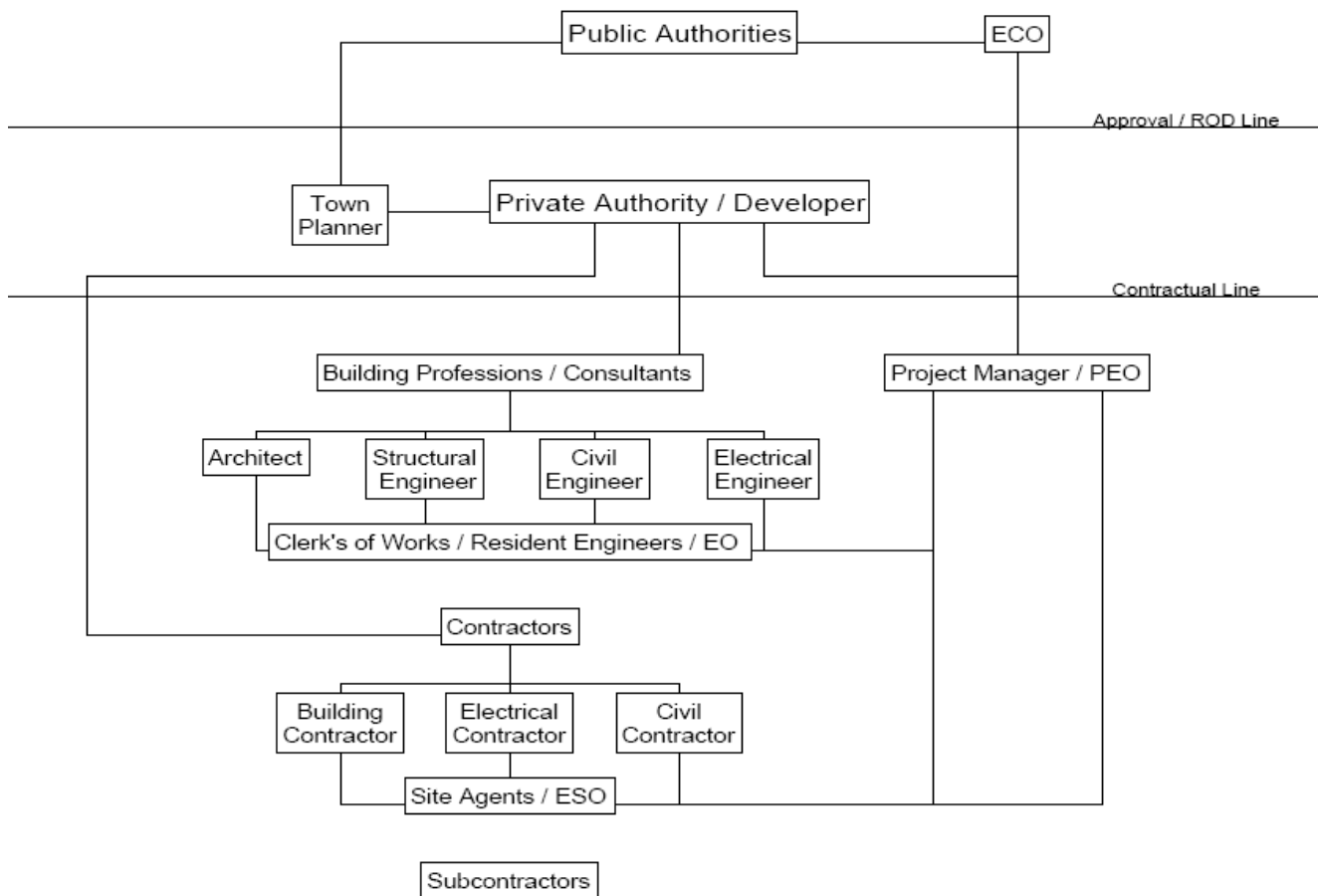


Figure 6: Reporting structure and role players involved in the development of the proposed Mount View residential development, Sir Lowry's Pass, Western Cape.

Please note that due to the timeline of the development as well as the coming and leaving of consultants and contractors, as well as the many crossed channels of communication in the DEAD&DP EMPr Guideline, it was decided by the project team to use the GACP-channels of communication whereby the Project Manager remains the central pivot between all the disciplines. All instructions and reports shall flow through the Project Manager (PM). In the environmental matters the PM becomes the Project Environmental Officer (PEO).

3.4 MEASUREMENT AND PAYMENT

It is understood that environmental requirements included in this EMPr will entail costs over and above those of the civil requirements. These include provision for: mitigation and enhancement actions; training and environmental awareness requirements; monitoring; auditing; and corrective actions. The proponent shall recognise this and make provision for it in the tender. Costing for management action should be done with inputs and advice from appropriate technical members of the project team and relevant EAP who have knowledge of the management actions being recommended as well as practical experience in implementing similar measures and techniques.

A lump sum must be allocated for the management of Environmental Specifications where it is not possible to cost requirements of the EMPr.

3.6 GENERAL GUIDELINES

Guidelines as per standardised construction documentation must be used.

3.7 AWARENESS (INDUCTION) TRAINING

3.7.1 Construction Phase

The EO or ESO, or ECO are responsible in ensuring everyone on site is given an environmental awareness induction session which not only clearly defines what the environment is and specifics detailing the local environment but outlines the requirements of the EMPr as a management tool to protect the environment. The environmental awareness training should also inform employees of any environmental risk which may result from their work; as well as how risks must be dealt with in order to avoid pollution or the degradation of the environment.

Refresher courses must be conducted as and when required. The EO or ESO must ensure daily toolbox talks include alerting the workforce to particular environmental concerns associated with the tasks for that day or the area/habitat in which they are working. Awareness posters and a hand out must be produced to create awareness throughout the site.

3.7.2 Operational Phase

During the operational phase, the Home Owners Association (HOA) will be the responsible party in ensuring that on-going maintenance and management of the environment within the development takes place.

3.8 SITE DOCUMENTATION

3.8.1 Construction Phase

The following is a list of documentation that must be held on site and must be made available to the ECO and/or DEA&DP on request.

- Access negotiations and physical access plan
- Site daily diary /instruction book
- Records of all remediation / rehabilitation activities
- Copies of EO reports (management and monitoring)
- Environmental Management Programme (EMPr)
- Copy of the Environmental Authorisation
- Stormwater Management Plan
- Rehabilitation and Landscaping Plans
- Method Statements
- Incident Reports
- Proof of Environmental Awareness Training
- Site Photographs (prior to establishment of site camp etc.)

- Complaints register

3.8.2 Operational Phase

The following is a list of documentation which must be held on sight and must be made available to the ECO and/or DEA&DP on request.

- Environmental monitoring reports (if required)
- Records of all remediation / rehabilitation activities (if required)
- Environmental Management Programme (EMPr)
- Complaints register

3.8.3 Pro forma documentation

3.8.3.1 Prior to the commencement of construction activities

The following attached pro forma documentation is to be filled out and is binding to the EMPr and project contract and includes, but not limited to, the following:

- Declaration of understanding by the Developer
- Declaration of understanding by the Contractor

3.8.3.2 During construction activities

The following attached pro forma documentation is to be filled out and maintained. These are binding to the EMPr and project contract. They include, but are not limited to, the following:

- Environmental incidents
- Records of all remediation / rehabilitation activities

3.8.3.2 During the Operational Phase

The following attached pro forma documentation is to be filled out and is binding to the EMPr and project contract and includes, but not limited to, the following:

- Declaration of understanding by the Proponent
- Environmental incidents

3.9 TOLERANCES AND NON-COMPLIANCE

The independent ECO is responsible for fortnightly audits on compliance to relevant environmental legislation, conditions of the Environmental Authorisation (EA), and the EMPr for the project. Where a particular aspect of the proposed development requires more detailed monitoring, more frequent inspections must be undertaken, as deemed necessary.

The ECO shall conduct fortnightly independent environmental audits (or more often as mentioned above). **Monthly Audit reports** are to verify the projects compliance with the EMPr and conditions of the Environmental Authorisation (EA). Should the contractor show repeated non-compliance in terms of the audits, a range of fines may be issued to the contractor. These fines are included as part of the Construction EMPr (Table 6).

The Engineer, in conjunction with the ECO, shall be the judge as to what constitutes a transgression in terms of this clause, subject to the General Conditions of Contract.

SECTION 4 - GENERIC CONSTRUCTION PHASE EMPR - IMPLEMENTATION

4.1 PREAMBLE

The point of departure for the proposed development EMPr is to empower a pro-active rather than re-active approach to environmental performance by addressing potential problems before they occur. This will limit corrective measures needed during the construction phase of the project. Therefore, the purpose of this EMPr is to provide management measures that must be implemented by the Mount View (Pty) Ltd. and all contractors and sub-contractors alike to ensure that the potential impacts of the proposed development are minimised. It must also be ensured that the EMPr is maintained and upheld as a dynamic document in order for the project team to add or improve on issues that might be considered left out or not relevant to the project. In such instances the DEA&DP may authorise the ECO to make such changes.

The following tables form the core mitigation measures appropriate to the pre-construction and construction phase. The tables present, the objectives to be achieved and the management actions that needs to be implemented in order to mitigate the negative impacts and enhance the benefits of the project. Associated responsibilities, criteria/targets and timeframes are clearly specified.

The **'pre-construction'** section of this generic EMPr, refers to the period of time leading up to and prior to commencement of construction activities, and is included to ensure pro-active environmental management measures with the goal of identifying avoidable environmental damage at the outset and sustain optimal environmental performance throughout the construction phase. Most impacts will occur during the construction phase and must be mitigated through the contingency plans identified in the pre-construction phase.

The bulk of environmental impacts will have immediate effect during the 'construction' phase (e.g. noise, dust, and water pollution). If the site is monitored on a continual basis during the construction phase, it is possible to identify these impacts as they occur. These impacts will then be mitigated through the measures outlined in this section, together with a commitment to sound environmental management from the project team.

The "construction" section refers to all construction and its operation-related activities that will occur within the approved area and access roads, until the project is completed. This "construction" section is divided into three functional areas, namely "materials"; "plant"; and "construction". Each of these functional areas within the EMPr contains specific generic mitigation requirements and requested contractor method statements stipulated where required.

Many potential environmental impacts will have immediate or long term effects during the 'operational' phase (e.g. noise, waste management, and water pollution). If the development is monitored on a continual basis during operations, it is possible to identify these impacts as they occur. These impacts will then be mitigated through the measures outlined in this section, together with a commitment to sound environmental management from the proponent and management team.

It must be noted that the responsible party for the majority of the mitigation measures is that of the Management body, unless otherwise stipulated. The names of the responsible parties must be made available to DEA&DP for record purposes.

The management body must ensure that a maintenance team is employed with the correct equipment and skill to maintain boardwalks, pathways, fences etc. The following tables will refer to the responsible party as "Management body: 'to be announced' and "maintenance crew".

4.2 STRUCTURE AND CONTENTS OF THE TABLES

The table consists of seven parts as follows:

"Phase of development" - This row will identify either pre-construction (planning) or actual construction phase.

"Impact / issue" - This row will identify the issue being addressed, e.g. Materials, site demarcation, heritage, etc.

Mitigation Measure - This column will include all the necessary mitigation measures for each impact/issue'.

Management objectives - This column will indicate what the management objectives to be achieved for each mitigation measure are.

Measurable targets - This column will indicate what evidence is to be used as an indication to whether or not the 'Management objectives' have been implemented and hence achieved.

Responsible party - This column will provide information as to which role player, e.g. ECO, RE, etc. is responsible for the implementation and or management of each mitigation measure.

Frequency of action - These columns provide time guidelines for the 'Responsible party' by which he/she is to action or manage the required mitigation.

4.2.1 SPECIALIST RECOMMENDATIONS

4.2.1.1 Pre-Construction and Construction Phases

The last part of the table provides space for the EAP to add specialist recommendations that need to be addressed during the pre-construction and construction phases.

4.2.1.2 Operational Phase

Additional requirements may need to be added to the table pending conditions required in the Environmental Authorisation (EA). The last part of the table provides space for such conditions, which must be added before the "declaration of understanding" is signed by the proponent and ECO.

Table 1: PROPOSED MOUNT VIEW RESIDENTIAL DEVELOPMENT, WESTERN CAPE PRE-CONSTRUCTION (PLANNING) PHASE EMPr

Phase of development	PRE-CONSTRUCTION (PLANNING)			
Impact / issue	GENERAL			
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
The following impacts and risks were identified during the pre-construction phase: • Visual • Traffic • Botanical • Freshwater • Heritage				
Visual & Heritage Impact The following mitigation measures were recommended by Ms Megan Anderson who conducted the Visual Impact Assessment: • Street and parking area lights must be minimised and must be on light poles not higher than 3m. Where possible these should be bollard lights. • The luminaires on poles and bollards must be top shielded so that light only shines downwards, thereby preventing pollution. • Light spillage should be contained. • No uplighting onto buildings. • No neon lights/signs allowed, including the Mixed Use area. • Signage, including at the Mixed Use area, are to be readable from within the	• Unnecessary visually visible impacts are avoided. • Ensure exact implementation of EMPr guidelines with regards to light and lighting.	• Contract records. • Signed declaration pro forma's.	Project team.	Design and implementation.

Phase of development	PRE-CONSTRUCTION (PLANNING)			
Impact / issue	GENERAL			
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
site, not from beyond the site, and of a character that is keeping with the rural surrounds. - Implementation of the Landscape Framework Plan. Heritage Western Cape (HWC) stipulated the following Conditions of Approval as part of the Record of Decision issued on 9 December 2021: - Within 6 months of approval of the proposed development, the owner of the proposed "Remainder Goedeverwachting Homestead Erf" is required to submit to HWC for approval, a Conservation Management Plan (CMP) for the homestead and its context. Such CMP must be prepared by a suitably qualified heritage practitioner and should include, inter alia, the requirement that trenching activity within 50 metres of the homestead area must be checked by an archaeologist. - Prior to any work in the vernacular cottage precinct, the proposed alterations (including a maintenance plan) for all structures to be retained in the precinct must be submitted to HWC for approval and must be accompanied by more detailed proposals for the precinct, including an appropriate maintenance and refurbishment plan, and plans for landscaping, boundary treatment, lighting and signage.				
Traffic Impact Access to the site will be obtained from Old Sir Lowry's Pass Road. Comply with City of Cape Town Municipality road rules and signs. Taxi lay-bys should be provided along both sides of Old Sir Lowry's Pass Road (as stipulated in the Traffic Impact Assessment). There is a possibility for the construction of a pedestrian sidewalk along Old Sir Lowry's Pass Road from the entrance of Tre Donne to the entrance of the proposed development.	To reduce possible traffic impact to expectable standards.	The existing level of traffic.	Project team.	Design and implementation.

Phase of development	PRE-CONSTRUCTION (PLANNING)			
Impact / issue	GENERAL			
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
Project contract and programme The EMPr must be included as part of the tender documentation thereby making it part of the enquiry document to make the recommendations and constraints, as set out in this document, enforceable under the general conditions of contract. A copy of this EMPr must be available on site. The Contractor shall ensure that all the personnel on site, sub-contractors, suppliers, etc. are familiar with and understand the specifications contained in the EMPr. It is imperative that all construction activities to be conducted with the watercourse be undertaken during the drier summer months to limit surface water contamination and the need for any surface water diversion during the construction works.	- Contingencies for minimising negative impacts anticipated to occur during the construction phase. - Ensure environmental awareness and formalise environmental responsibilities and implementation.	- Contract records. - Signed declaration pro forma's.	Project team.	-
Site demarcation and development The surveys for the overall project area and construction footprint as approved in the Environmental Authorisation (EA) must be clearly demarcated before the contractors set up their crew camps or begin construction. The watercourse area should be demarcated before construction activities commence. Activities within the watercourse area should only be allowed during construction taking place in the watercourse and / or rehabilitation of the watercourse. The development footprint in this area should be kept to a minimum. It is recommended that the variable conservation buffer be utilised as a conservation buffer from the delineated edge of the watercourses. This area should be demarcated a no-go area and no unauthorised activities are allowed within the	Contingencies for minimising negative impacts anticipated to occur during the construction phase.	- Demarcated areas. - Filled in section of this document.	EAP specialist, Engineer, contractor.	As and when required.

Phase of development	PRE-CONSTRUCTION (PLANNING)			
Impact / issue	GENERAL			
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
delineated extent of the watercourses. If a more permanent fencing is desired, a pole and electric wire fence is considered suitable as this will still allow movement of faunal species (Figure A).  Figure A: Example of a barrier fence used to demarcate the no-go area around the wetlands and associated conservation buffer area All relevant 'general' and 'specific' conditions contained in the Environmental Authorisation (EA) must be included in the space provided below and included as part of this EMPr when the "<i>declaration of understanding</i>" is signed by the proponent, the Engineer and the Contractor. The EO and ECO must be on site in order to make sure the correct areas are fully demarcated.				

Phase of development	PRE-CONSTRUCTION (PLANNING)			
Impact / issue	GENERAL			
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
Emergencies, non-compliance and communication The contractor must provide method statements on the protocols to be followed, and contingencies to be put in place for the following, before construction may begin: • Emergency spills procedures for the contamination of soils from spills and fire. • Handling & storage of oils and chemicals. • Cement and concrete batching, which includes the storage, washing & disposal of cement, packaging, tools and plant. • Diesel tanks and refuelling procedures. • Crew camps and construction lay down areas. • Workshop maintenance and cleaning of plant. Communication in emergencies must follow the suggested lines of communication as stipulated figure 6.	• Contingencies for minimising negative impacts anticipated to occur during the construction phase.	• Method statements.	Contractor, Engineer.	As and when required.

Phase of development	PRE-CONSTRUCTION (PLANNING)			
Impact / issue	GENERAL			
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
Flora Prior to commencement of any development activities, the area where the <i>Monsonia speciosa</i> plant species have been identified should be demarcated as a no-go area. Please note the relevant area is indicated in the layout of the proposed development. Appropriate fencing and signage should be placed around the no-go area restricting access to the area. The implementation of the rehabilitation plan compiled by GNEC is imperative.	• Regrowth of indigenous vegetation within the development footprint. • Minimising the overall negative impacts on any natural vegetation.	Minimise the loss of endemic species.	Qualified Horticulturist, Rehabilitation Specialist or Botanist.	Prior to commencement of any development activities.

Table 2: ADDITIONAL CONDITIONS FOR THE PROPOSED MOUNT VIEW RESIDENTIAL DEVELOPMENT DEVELOPMENT EMPr.

Phase of development	PLANNING	EA reference number	16/3/3/1/A3/53/2005/22		
Impact / issue	EA Conditions	Mount View (Pty) Ltd.			
MITIGATION MEASURE		MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION

Table 3: PROPOSED MOUNT VIEW RESIDENTIAL DEVELOPMENT CONSTRUCTION PHASE EMPr (Materials)

Phase of development	CONSTRUCTION				
Impact / issue	Materials				
MITIGATION MEASURE		MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
Handling					
The following impacts and risks were identified during the construction phase (which includes the rehabilitation phase): - Traffic - Botanical - Freshwater - Erosion / sedimentation - Soil compaction - Stormwater Management - Pollution (air, water, soil, noise and visual) - Fauna - Waste - Fire - Noise - Heritage					

Phase of development	CONSTRUCTION			
Impact / issue	Materials			
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
Crime, safety & security				
Stockpiles All stockpiled material must be easily accessible on site without any environmental damage of the surrounding properties. All temporarily stockpiled material must be stockpiled in such a way that the spread of materials is minimised. In the case of strong wind and/or rain all stockpiled material must be covered with a tarpaulin in order to prevent erosion. The stockpiles may only be placed within the demarcated areas, outside of delineated watercourses, the location of which must be approved by the RE, EO or ECO. Stockpiles may not exceed 2 metres in height and their footprint should be kept to a minimum. Stockpiling of removed materials may only be temporary and should be disposed of at a registered waste disposal facility. All exposed soils must be protected for the duration of the construction phase with a suitable geotextile (e.g. Geojute or hessian sheeting) in order to prevent erosion and sedimentation of the watercourses in close proximity to these stockpiles.	- Minimise scarring of the soil surface and land features. - Minimise disturbance and loss of soil. - Minimise construction footprint. - Minimise contamination of storm water run-off.	- No visible erosion scars once construction is completed. - The footprint has not exceeded the agreed site in terms of EA etc. - Minimal invasive weed and grass growth. - No signs of sedimentation and erosion.	Contractor	Daily

Phase of development	CONSTRUCTION			
Impact / issue	Materials			
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
Stormwater runoff from the stockpile sites and other related areas must be directed into the storm water system. Stockpiles are to be stabilised if signs of erosion are visible. Stockpiles must be established outside of the delineated watercourses and the applicable variable buffer.				
Topsoil Management All topsoil must be removed prior to the commencement of any development activities. Topsoil must be stockpiled. Stockpiled topsoil must be regarded as no-go areas. Stockpiled topsoil must be monitored for invasive exotic vegetation growth. Contractors must remediate as and when required in consultation with the EO, RE and ECO. No plant, workforce or any construction related activities may be allowed onto the windrowed topsoil. All topsoil must be replaced during the rehabilitation phase to ensure the re-establishment of natural vegetation. Handling of the topsoil should be minimised and should therefore only be handled before	• Maintain the integrity of topsoil for rehabilitation. • Containment of invasive plant growth by means of topsoil monitoring.	• No loss of topsoil.	Contractor	Daily

Phase of development	CONSTRUCTION				
Impact / issue	Materials				
MITIGATION MEASURE		MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
construction (to be windrowed) and after construction (topsoil to be replaced).					
Oil and chemicals The contractor must provide method statements for the “handling & storage of oils and chemicals”, “fire”, and “emergency spills procedures”. These substances must be confined to specific and secured areas within the contractor’s camp, and in a way that does not pose a danger of pollution even during times of high rainfall. Drip trays (minimum of 10cm deep) must be placed under all machinery and vehicles. The surface area of the drip trays will be dependent on the vehicle and must be large enough to catch any hydrocarbons that may leak from the vehicle while standing. The depth of the drip tray must be determined considering the total amount / volume of oil in the vehicle. The drip tray must be able to contain the volume of oil in the vehicle. Any spills larger than 100l should be reported to all local authorities. Spill kits must be available on site and in all		• Prevention of pollution of the environment. • Minimise chances of transgression of the acts controlling pollution.	• No pollution of the environment. • No litigation due to transgression of pollution control acts. • No complaints from I & AP’s. • Method statements.	Contractor.	Daily.

Phase of development	CONSTRUCTION				
Impact / issue	Materials				
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION	
vehicles that transport hydrocarbons for dispensing to other vehicles on the construction site. Spill kits must be made up of material/product that is in line with environmental best practice (sunsorb is a recommended product that is environmentally friendly). All spilled hazardous substances must be contained in impermeable containers for removal to a General & Hazardous Waste Landfill site, (this includes contaminated soils, and drenched spill kit material). Vehicles to be serviced at the contractor laydown area and all refuelling to take place outside of the watercourses and the applicable variable buffer.					
Cement It is suggested that ready-mix cement be used as far as possible to minimize the possible impact on the surrounding environment. Concrete and cement-related mortars can be toxic to aquatic life. Proper handling and disposal should minimize or eliminate discharges into watercourses. High alkalinity associated with cement can dramatically affect and contaminate both soil and ground water. The following recommendations must	- Minimise the possibility of cement residue entering into the surrounding environment. - Minimise pollution of soil, surface and ground water resources.	- No evidence of contaminated soil on the construction site. - No evidence of contaminated water resources. - Method statement.	Contractor.	Monitored daily.	

Phase of development		CONSTRUCTION			
Impact / issue		Materials			
MITIGATION MEASURE		MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
be adhered to: • Proper handling and disposal should minimise or eliminate discharges into watercourses. High alkalinity associated with cement, which can dramatically affect and contaminate both soil and ground water. The following recommendations must be adhered to: • Fresh concrete and cement mortar should not be mixed below the 1:100 year floodline of the unnamed tributary of Sir Lowry's Pass River and at least 10 m from the delineated extent of all watercourses. Mixing of cement may be done within the construction camp, may not be mixed on bare soil, and must be within a lined, bound or bunded portable mixer. Consideration must be taken to use ready mix concrete. • No mixed concrete shall be deposited directly onto the ground. A batter board or other suitable platform/mixing tray is to be provided onto which any mixed concrete can be deposited whilst it awaits placing. • Cement bags must be disposed of in the demarcated hazardous waste receptacles and the used bags must be suitably disposed of. • Spilled or excess concrete must be disposed of at a suitable landfill site. Cement batching areas must be located in consultation with the RE, EO or ECO to ensure residues are contained and that the proposed					

Phase of development	CONSTRUCTION				
Impact / issue	Materials				
MITIGATION MEASURE		MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
location does not fall within sensitive areas such as drainage lines, storm water channels, etc. The contractors must provide and maintain a method statement for “cement and concrete batching” which includes the storage, washing & disposal of cement, packaging, tools and plant. The mixing of concrete shall only be done at selected sites on mortar boards or similar structures to contain run-off into natural vegetation, soils and streams. Fresh concrete and cement mortar should not be mixed near the watercourses. Cleaning of cement mixing and handling equipment shall be done using proper cleaning trays. All empty containers must be stored in a dedicated area and later removed from the site for appropriate disposal at a Licensed Landfill site. All empty cement bags are to be picked up immediately to ensure that cement dust is not blown away. Empty cement bags are to be stored in a weather and scavenger proof bin, in order to prevent leaching and groundwater contamination. Cement dust is poisonous and will be detrimental to the environment.					

Phase of development	CONSTRUCTION			
Impact / issue	Materials			
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
Any spillage that may occur must be investigated and immediate remedial action shall be taken. The visible remains of concrete, either solid, or from washings, shall be physically removed immediately and disposed of as waste to a Licensed Landfill site. Washing of the remains into the ground is unacceptable. Should any cement silos be employed on site; they are to be fitted with appropriate air pollution control equipment to control dust during fill-up operations. No mixed concrete may be deposited outside of the designated construction footprint. A batter / dagga board mixing trays and impermeable sumps should be provided, onto which any mixed concrete can be deposited whilst it awaits placing.				

Phase of development	CONSTRUCTION				
Impact / issue	Materials				
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION	
DANGEROUS AND TOXIC MATERIALS Provision of storage facilities Materials such as fuel, oil, paint, herbicide and insecticides must be sealed and stored in bermed areas or under lock and key, as appropriate, in well-ventilated areas. Storage facilities should be bunded, roofed, secure, rain, wind and tamper proof. Storage areas shall display the required safety signs depicting “no smoking”, “No Naked lights” and “Danger” containers shall be clearly marked to indicate contents as well as safety requirements. Sufficient care must be taken when handling these materials to prevent pollution. Training on the handling of dangerous and toxic materials must be conducted for all staff prior to the commencement of construction. In the case of pollution of any surface or groundwater, the Regional Representative of the Department of Water and Sanitation (DWS) must be informed immediately. Empty containers shall be removed to a General	• Prevention of pollution of soil, surface and ground water resources in the immediate and surrounding environments. • Minimise chances of transgression of the acts controlling pollution.	• No visible signs of pollution. • No litigation due to transgression of pollution control acts.	Contractor.	Monitor daily.	

Phase of development	CONSTRUCTION				
Impact / issue	Materials				
MITIGATION MEASURE		MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
& Hazardous Waste Landfill site. Material Safety Data Sheets (MSDS) must be prepared for all hazardous substances on site and supplied by the supplier where relevant. MSDS's must be updated as required.					
Bulk storage of fuels and oils The contractors must provide and maintain a method statement for “Diesel tanks and refuelling procedures”. Bulk fuel storage tanks on the site shall be on an impervious surface that is bunded and able to contain at least 110% of the volume of the tanks. A Flammable Liquid License must be obtained for diesel volumes greater than 200 litres. As no application was lodged for this activity, it should be noted that Environmental Authorisation is required for the storage of Diesel and/or Petrol with volumes greater than 30 000 litres. Bulk fuel storage tanks shall be located in a portion of the construction camp where they do not pose a high risk in terms of water pollution.		• Prevention of pollution of soil, surface and ground water resources in the immediate and surrounding environments. • Minimise chances of transgression of the acts controlling pollution.	• No visible signs of pollution. • No litigation due to transgression of pollution control acts. • Method statement.	Contractor.	Once off, as required.

Phase of development	CONSTRUCTION			
Impact / issue	Materials			
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
Bulk fuel storage tanks shall be placed so that they are out of the way of traffic, so that the risk of the tanks being ruptured or damaged by vehicles is minimised. Bulk fuel storage should be covered during the rainy season.				
Use of dangerous and toxic materials The contractor shall keep the necessary materials and equipment on site to deal with spills/ fire of the materials present should they occur. The contractor shall set up a procedure for dealing with spills/ fire, which will include notifying the ECO and the relevant authorities prior to commencing with construction. These procedures must be developed in consultation and approval by the appointed EO. All staff should receive some form of fire training. Fire buckets and hoses shall be in good working order and easily accessible on site. A record must be kept of all spills and the corrective action taken.	• Prevention of pollution of soil, surface and ground water resources in the immediate and surrounding environments. • Minimise chances of transgression of the acts controlling pollution.	• No pollution of the environment. • No litigation due to transgression of pollution control acts.	Contractor.	As required.

Table 4: PROPOSED MOUNT VIEW RESIDENTIAL DEVELOPMENT CONSTRUCTION PHASE EMPr (Plant)

Phase of development	CONSTRUCTION			
Impact / issue	PLANT			
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
Eating areas and camp followers The contractors must provide and maintain a method statement for “Crew camps and construction lay down areas”. Contractor laydown areas and equipment storage are to remain outside of the 32 m NEMA ZoR associated with the watercourses. The Contractor shall, in conjunction with the EO, designate the restricted eating area for eating during normal working hours. Two refuse bins with lids must be provided and cleaned on a daily basis. The bins are to be secure, wind, weather and scavenger proof. Designated areas for smoking must be provided. No fires are to be lit outside of a facility designed to contain fires. The adequacy and positioning of these structures must be determined in consultation with the EO and ECO. No animals, domestic or otherwise are allowed on the premises. The feeding, or leaving of food, for stray or other animals in the area is strictly prohibited. Camp followers/informal traders must not be allowed to congregate on pavements or outside the construction site. However, at the contractors discretion facilities can be made available within the designated eating area. Litter (even if originating outside the camp) and concrete bags etc. must be picked up and put into suitably closed bins.	• Control potential influx of vermin and flies. • Neat work place and hygienic environment. • Minimise negative social impacts to local businesses and residences.	• No visual sign of vermin and flies. • No complaints from I & AP's.	Contractor, ECO & EO.	Once off, monitor daily.

Phase of development	CONSTRUCTION			
Impact / issue	PLANT			
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
Toilets and ablution facilities The contractor will be responsible for providing all sanitary arrangements for his and the sub-contractors team. A minimum of one chemical toilet shall be provided per 15 persons. Sanitary arrangements shall be to the satisfaction of the ECO and the local authority. The contractor shall keep the toilets in a clean, neat and hygienic condition. The contractor shall supply toilet paper at all toilets at all times. Toilet paper dispensers shall be provided in all toilets. Toilets provided by the contractor must be easily accessible and a maximum of 150m from the works area to ensure they are utilised. All toilets will be located within the contractor's camp. Should toilets be needed elsewhere, their location must first be approved by the RE, EO or ECO. The contractor (who must use reputable toilet-servicing company) shall be responsible for the cleaning, maintenance and servicing of the toilets. The contractor (using reputable toilet-servicing company) shall ensure that all toilets are cleaned and emptied before the builders' or other public holidays. Toilets out on site must be secured to the ground and have a sufficient locking mechanism operational at all times.	• Ensure proper sanitation is achieved which will encourage the workforce to utilise toilets provided and not the surrounding habitat. • Minimise potential of diseases on site. • Minimise potential to pollute soils, water resources and natural habitats.	• Workforce use toilets provided. • No complaints received from I & AP's as well as members of the workforce. • No visible or measurable signs of pollution of the environment (soils, ground and surface water).	Contractor, RE or EO.	As and when required.

Phase of development	CONSTRUCTION			
Impact / issue	PLANT			
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
Waste management Please refer to the waste minimization plan herewith attached.	• Sustainable management of waste by recycling. • To keep the site neat and tidy. • Minimise litigation and complaints by I&AP's. • Reduce visual impact. • Control potential influx of vermin and flies thereby minimising the potential of diseases on site and the surrounding environment. • Minimise potential to pollute soils, water resources and natural habitats.	• Disposal of rubble and refuse in an appropriate manner with no rubble and refuse lying on site. • Site is neat and tidy. • No complaints from surrounding industries and businesses. • Sufficient containers available on site. • No visible or measurable signs of pollution of the environment (soils, ground and surface water).	Contractor, ECO & EO	Daily

Phase of development	CONSTRUCTION			
Impact / issue	PLANT			
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
Dust Implementation of the Dust Management Plan compiled by Guillaume Nel Environmental Consultants is imperative. It is imperative that method statements regarding dust control be supplied to the ECO by the contractor prior to the commencement of any construction activities. Dust management and dust suppression during the construction phase is deemed very important. The method statement must provide information on the proposed source of water to be utilised and the details of the licenses acquired for such usage. Potable water may not be used as a means of dust suppression, alternative measures must be sourced. The use of 'grey' water must be investigated as an alternative. The contractor will be responsible to source this water and obtain the required approvals. Dust mitigation measures to include the use of chemical dust suppressants, such as Lignosulphonates; and the use of soil stabilisers such as straw for large open ground areas. The construction camp shall be treated with dust suppression during dry and windy conditions to control dust fallout. Dust production must be controlled by regular dust suppression of roads and works area, should the need arise. (NB: Concrete dust is toxic and damages soil properties. Therefore dust suppression to prevent dust spread must not be done where concrete dust has fallen or it will infiltrate into the soil. Concrete bags must not be allowed to blow around the site and spread cement dust.)	• Reduce dust fall out. • Reduce visual impact. • Minimise loss of valuable soil material.	• No visible signs of dust. • No complaints from Interested and Affected parties. • No incidences reported to ECO. • No visible evidence of dust contamination on the surrounding environment. • Method statement. • Baseline targets not exceeded during regular monitoring of dust counts.	RE, Contractor, ECO, EO	Monitored daily

Phase of development	CONSTRUCTION			
Impact / issue	PLANT			
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
At the end of construction, the site camp must be fully rehabilitated by removing the temporary surface, ripping the area to loosen the soil. All vehicles transporting material that can be blown off (e.g. soil, rubble etc.) must be covered with a tarpaulin, and speed limits of 20 km/h must be adhered to.				

Phase of development	CONSTRUCTION			
Impact / issue	PLANT			
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
Workshop equipment, maintenance and storage The contractors must provide and maintain a method statement for “workshop maintenance and cleaning of plant”. All maintenance and washing of vehicles and equipment shall be done off-site as far as possible. During servicing of vehicles or equipment, a suitable drip tray shall be used to prevent spills onto the soil. Leaking equipment shall be repaired immediately or be removed from site to facilitate repair. Workshop areas shall be monitored for oil and fuel spills and such spills shall be cleaned and remediate to the satisfaction of the EO or RE. Cleaning and remediation must be done with products that are in line with best environmental practice i.e. Sunisorb. The Contractor shall be in possession of an emergency spill kit that must be complete and available at all times on site. The Contractor must ensure that senior and the other relevant members of the workforce are trained in dealing with spills by using emergency spill kits. All spills of hazardous substances must be reported to the ESO, EO, RE or ECO. The contractor must comply with the regulations of the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) as well as specific specifications set forth by the health and safety agent.	• Prevent pollution of the environment. • Minimise chance of transgression of the acts controlling pollution. • Disposal of hazardous substances to a General & Hazardous Waste Landfill site.	• No pollution of the environment. • No litigation due to transgression of pollution control acts. • Method statement.	RE, Contractor, ECO, EO.	Monitor daily.

Phase of development	CONSTRUCTION			
Impact / issue	PLANT			
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
Noise All construction vehicles must be in a good working order to reduce possible noise pollution. Work hours during the construction phase shall be strictly enforced unless permission is given (07H00 – 18H00). Permission shall not be granted without consultation with the local industries and businesses by the EO. No work to be done on Sundays. Noise reduction is essential and Contractors shall endeavour to limit unnecessary noise, especially loud talking, shouting or whistling, radios, sirens or hooters, motor revving, etc. The use of silent compressors is a specific requirement. All machinery to be muffled where possible. Noisy activities shall take place only during working hours. The EO must inform the residents of houses and businesses adjacent to the development in writing 24 hours prior to any planned activities that will be unusually noisy or any other activities that could reasonably have an impact on the adjacent sites. These activities could include, but are not limited to use of pneumatic jack-hammers and compressors etc. No noise louder than 70dB from the ambient noise level. Machinery and equipment on site must be maintained so as to avoid any unnecessary noises.	• Maintain noise levels below “disturbing” as defined in the National Noise Regulations. • Minimise the nuisance factor of the development.	• No complaints from surrounding landowners or I&APs.	Contractor, ECO, EO.	As and when required.

Table 5: PROPOSED MOUNT VIEW RESIDENTIAL DEVELOPMENT CONSTRUCTION PHASE EMPr (Construction)

Phase of development	CONSTRUCTION			
Impact / issue	CONSTRUCTION			
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
Crew camps Accommodation for members of the workforce will not be permitted on site unless authorisation has been given in terms of the Environmental Authorisation issued for the site. If accommodation is to be provided for workers, details need to be provided as to the location and facilities to be provided for the workers. Dedicated wash areas must be situated away from surface water sources. The contractor's camp shall be monitored for dust fallout and dust suppression applied as required. This may include the laying of gravel, the use of grey water can be considered as an option if the required permits have been acquired. The contractor's camp, offices and storage facilities shall be located within the site boundaries. If this is not feasible an alternative should be designated in consultation with the ECO. The contractor shall provide labourers to clean up the contractor's camp and construction site on a daily basis. These areas shall then be inspected by the contractor or his/her ESO to ensure compliance with this requirement. Contractor laydown areas and equipment storage are to remain outside of the 32 m NEMA ZoR associated with the watercourses. The contractor shall be responsible for cleaning the contractor's camp and construction site of all structures, equipment, residual litter and building materials at the end of the construction period and, the topsoil restored in areas where landscaping is to take place.	- Minimise water pollution. - Minimise dust fallout. - Minimise unwarranted environmental damage outside the footprint. - Maintain a clean and healthy working environment. - Minimise visual impact to surrounding environment.	- No signs of water or soil pollution. - No complaints from surrounding landowners or I&APs. - No visible signs of litter. - Method statements.	Contractor, ECO, EO, ESO.	Monitor daily.

Visual Impact Survey and demarcate no-go areas to restrict earthworks and minimize disturbance and visual scarring. Only work in areas where construction is going to happen immediately. Limit extent of damage, keeping cut and fill to a minimum. Minimise disturbance through fencing off construction areas, thereby protecting and retaining grass and vegetation in the areas that will not be built on. Plant boundary windbreaks/trees as soon as construction starts, in all areas even those areas being developed in later phases. Similarly do required planting in buffer areas around the historic precinct on commencement of Phase 1 Construction/development. Vegetate road verges and parks immediately after construction, rehabilitate riverine area as soon as and continue maintenance eternally. The timelines stipulated in the Rehabilitation Plan compiled by Mr Christoff Dippenaar and the Watercourse Rehabilitation and Management Plan compiled by FEN Consulting however still takes preference. The site must be kept tidy at all times. Building material stockpiles must be protected from dispersion into the surrounding area by wind or water. A concerted effort must be made to minimise dust generation and its effect on the surrounding buildings and dwellings.	• Minimise visual impact.	• No unacceptable visual impacts.	Contractor, EO, ESO.	Monitor, daily
Fires The contractors must provide and maintain a method statement for “fires”, clearly indicating where and for what fires will be utilised plus details on the fuel to be utilised in creating the fire. Fire training and equipment to be nearby to put fires out. No wood is to be collected from private or public property. Fires must be within designated areas and must be in small scale. Absolutely no burning of waste is permitted. Fires will only be allowed in facilities especially constructed for this purpose	• Minimise risk of veldt fires. • Minimise destruction of natural fauna and flora. • Maintain safety on site.	• No veldt fires started by the contractor's workforce. • No claims from landowners for damages due to veldt fires.	Contractor, EO, ESO.	Monitor daily.

within fenced Contractor's camps. Wood and/or charcoal are the only fuels permitted to be used for fires. The contractor must provide sufficient wood (fuel) for this purpose. Fires in the designated areas must be small in scale so as to prevent excessive smoke being released into the atmosphere. Heavy smoke may not be released into the air. No felling of trees or wood collection is allowed from private or public property. The Contractor shall ensure that there is appropriate fire-fighting equipment available on site at all times. The construction should comply with SANS 10400 of 2011 and the Community Fire Safety By-Law, Provincial Gazette 5832 (as amended 29 June 2007 and 21 August 2015), with reference to: - Detailed fire protection plans should be submitted by a competent person – fire engineer for perusal of future building plan submissions; - Fire hydrants to be provided as per SANS 100400 T4.35; - No window, door or unprotected openings shall be closer than 3 m of an open space stair as per SANS 10400 T4.27.2; - Access for emergency vehicles as per Chapter 3 Section 12 of the Community Fire Safety By-law.		Method statement.		
Noise The City of Cape Town Noise Unit recommends that: - Construction may only take place within the recommended building hours as per the National Building Regulations. - Follow-up noise level surveys is recommended, should these surveys indicate a disturbing noise level during morning and afternoon peak hours, traffic calming measures are recommended. As mentioned, it is recommended that the noise surveys be conducted annually for a period of two years. - Machinery, equipment and plant need to be maintained and in good	Minimise potential noise pollution.	No excessive disturbance to surrounding land owners.	Contractor, EO, ESO.	Monitor Daily

state of repair for the duration of the construction phase. 4. Any proposed activity (shops, restaurant, gym and creche) developed within the boundary of the development need to be shared with the City's Noise Unit for consideration of the noise impact to the proposed residents of the development. 5. The implementation of the recommendations may be imposed as conditions of approval and compliance with the Western Cape Noise Control Regulations remain required. Additionally, Safetech recommended the following: As a precautionary measure, if needed, piling should not occur at night. Secondly, all staff on the construction project should receive training to mitigate the noise impacts. In summary, for the construction phase it is unlikely that the construction noise will impact on the noise sensitive areas. With the effective implementation of the above recommended mitigation measures, the residual noise impact associated with construction activities are predicted to be of low significance. It is recommended that the ambient noise around the project and at the closest receptors be monitored during the construction phase.				
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Erosion and sedimentation To reduce the loss of material by erosion, the contractor shall ensure that disturbance on site is kept to a minimum. The disturbance especially includes the movement of heavy vehicles. The contractor shall be responsible for rehabilitating all eroded areas in such a way that the erosion potential is minimised after construction has been completed. These areas are to be filled with mulch or funnels constructed to route the water. All disturbed areas that will not be rehabilitated within the construction phase, must be mulched to encourage vegetation re-growth. Mulch used must be free from alien seed. These areas must be cordoned off so that vehicles or construction personnel cannot gain access to these areas. In the case of strong wind and/or rain all stockpile material must be covered with a tarpaulin in order to prevent erosion.	• Minimise erosion damage. • Minimise scarring of the soil surface and land features. • Minimise disturbance and loss of topsoil. • Re-growth of disturbed areas.	• No erosion scars. • No loss of topsoil. • No interference with the natural flow of water. • No visible erosion scars once construction is completed. • The footprint has not exceeded the agreed boundaries. • All damaged areas successfully rehabilitated.	Contractor, ECO, EO, ESO.	As and when required.
Fauna <u>All activities on site must comply with:</u> The regulations of the Animal Protection Act, 1962 (Act No. 71 of 1962); and Marine Living Resources Act, 1998 (Act No. 18 of 1998). All construction workers must be informed that the intentional killing of any animal is not permitted as faunal species are a benefit to society. Poaching is illegal and it must be a condition of employment that any employee caught poaching will be dismissed. Employees must be trained on how to deal with fauna species as intentional killing will not be tolerated. In the case of a problem animal e.g. a large snake a specialist must be called in to safely	• Minimise disturbance to animals. • Minimise destruction of habitat.	• No complaints from Nature Conservation. • No litigation concerning applicable animal protection acts. • No measurable or visible signs	RE, Contractor, ECO, EO, ESO.	Monitor daily.

relocate the animal if the EO or ECO is not able to.		of habitat destruction.		
Flora Once construction is complete, rehabilitation of the watercourse must be undertaken in order to restore the aesthetic & ecological value of the area. Active re-vegetation must take place with locally indigenous vegetation under the supervision of the ECO. No open fires shall be allowed on site under any circumstances, fires will only be permitted in adequate facility within the crew camp, Forest Act, 1984 (Act No. 122 of 1984). Rehabilitation to take place in accordance with the Rehabilitation Plan compiled by GNEC. According to the Conservation of Agricultural Resources Act, 1983 (CARA) and the National Environmental Management: Biodiversity Act, 2004 (NEMBA) every landowner has the responsibility to control alien invasive plants on their property.	• Encourage natural habitat fauna. • Minimise scarring of the soil surface and land features. • Minimise disturbance and loss of topsoil. • Minimise risk of veldt fires. • Minimise risk of fauna and flora destruction.	• No visible erosion scars once construction is completed. • The footprint has not exceeded the agreed boundaries. • All damaged areas successfully rehabilitated. • No veldt fires started by contractor's work force. • No claims from landowners for damages due to veldt fires.	Contractor, ECO, ESO.	As and when required.

Heritage In terms of the National Heritage Act, 1999 (Act No. 25 of 1999), should any archaeological artefacts be exposed during construction activities, work on the area where the artefacts were found shall cease immediately and the ECO as well as the Local Council shall be notified within 24 hours. Finds of human remains must be treated as a crime scene. Upon receipt of such notification, the ECO will arrange for the excavation to be examined by an Archaeologist. Under no circumstances shall archaeological artefacts be removed, destroyed or interfered with. Any archaeological sites exposed during demolition or construction activities must not be disturbed prior to authorisation by the Heritage Western Cape and/or the South African Heritage Resources Agency or the appropriate provincial heritage resource agency. Trenching activities with 50m of the main house must be checked by an archaeologist. Indications are that development activity will be away from the homestead so further action may not be necessary. Any proposed alterations (including maintenance) for the vernacular cottage precinct will be required to be submitted to HWC for approval and must be accompanied by more detailed proposals for the precinct, including an appropriate maintenance and refurbishment plan, and plans for landscaping, boundary treatment and signage. There will most likely be lighting required at the entrance areas to the site off Old Sir Lowry's Pass Road that will need to meet City/Provincial requirements. These could light up the areas and adjacent historical silo precinct to a detrimental degree. Achievable lighting mitigation for such visually sensitive areas was implemented at Chapman's Peak Toll Plaza to the satisfaction of the authorities and must be implemented here.	• Limit the destruction of the country's heritage resources. • The preservation and appropriate management of new archaeological finds should these be discovered during construction.	• No destruction of or damage to known archaeological sites.	Contractor, EO, RE, ESO.	Monitor Daily.
No-go / sensitive areas	• Minimise the potential for the spread of the	• No sign of movement through "no go"	RE, Contractor, ESO, ECO.	Monitor daily.

It is recommended that the variable conservation buffer be utilised as a conservation buffer. This area should be demarcated a no-go area and no unauthorised activities are allowed within the delineated extent of the watercourses. Stockpiled topsoil should be demarcated with danger tape and seen as no-go areas. All construction activities must remain within the boundaries of the development area, as demarcated at the start of the construction phase. The construction footprint must be kept to a minimum by constructing boundaries and demarcation around areas not to be disturbed. These No-go areas must be demarcated with fencing / warning tape and signs before any construction activities commence. The EO and ECO must be on site in order to make sure the correct areas are fully demarcated.	construction footprint. • Reduce loss of fauna and flora habitat. • Minimise the potential for loss of protected and or endangered fauna and flora species.	areas. • Containment of footprint.		
Access route/haul roads Existing roads and services must be utilised thus reducing the infringement of the development on natural habitat. If new access roads have to be constructed the road should follow existing roads for as far as possible in order to minimize the area of disturbance. Any authorised clearing for access roads must be done under the supervision of the ECO. Access roads for earthmoving-equipment must be clearly designated and be positioned as close as possible to the proposed development site. No driving off from the marked roads is permitted and designated parking areas must be identified and demarcated with applicable signage. Neither the site nor its access roads must be allowed to be utilised for recreational activities, this includes but is not limited to quad bikes, 4x4's and dirt bikes. Security personnel ensure that this is enforced. No unauthorised access is permitted.	• Minimise loss of topsoil and enhancement of erosion. • Minimise fauna and flora displacement by destruction of natural habitats.	• No erosion on access roads after completion of construction. • No loss of topsoil due to runoff water on access roads.	Contractor, RE or ECO.	As required, monitor daily.

Crime, safety and security No site staff, other than security personnel and skeleton staff shall be housed on site unless otherwise stipulated in the Environmental authorisation. Security personnel and skeleton staff shall be supplied with adequate protective clothing, ablution facilities, water and refuse collection facilities. A boundary fence will serve to prevent public access to the site, for public safety and security reasons. The access to the site must be controlled so as to restrict unauthorised personnel from entering the site. The workers on site must retain some means of identification. The ESO and the contractor are responsible for ensuring that only authorised personnel are on site at all times. The site and crew are to be managed in strict accordance with the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) and the National Building Regulations. Site specific conditions and regulations as set forth by the health and safety agent should also be adhered to. The contractor shall ensure that all emergency procedures are in place prior to commencing work. Emergency procedures shall include (but not be limited to) fire, spills, contamination of the ground, accidents to employees, use of hazardous substances and materials, etc. The contractor shall ensure that lists of all emergency telephone numbers / contact persons are kept up to date and that all numbers and names are posted at relevant locations throughout the construction site. The nearest emergency service provider must be identified during all phases of the project as well as its capacity and the magnitude of accidents it will be able to handle. The contact details of this emergency centre, as well as the police and ambulance services must be available at prominent locations around the construction site and the construction crew camps.	• Reduce the risk of potential incidences. • Minimise the potential impact on the environment. • Reduce the risk of possibly fatal incidents occurring on site.	• No incidences reported.	RE, Contractor, ESO, ECO.	Monitor daily.
Visual impact Shade cloth must be utilised to conceal and minimise the visual impact of contractor camps, lay down and storage areas.	• Minimise visual impact.	• No complaints from I & AP's.	Contractor, landscape contractor, ESO.	Monitor daily.

Rubble and litter must be removed every two weeks or more often as the need arises and be disposed of at a registered landfill site as designated by the City of Cape Town Municipality Solid Waste removal department. Implementation of the following mitigation measures recommended by Ms Anderson: • Survey and demarcate no-go areas to restrict earthworks and minimize disturbance and visual scarring. Only work in areas where construction is going to happen immediately. • Limit extent of damage, keeping cut and fill to a minimum. Minimise disturbance through fencing off construction areas, thereby protecting and retaining grass and vegetation in the areas that will not be built on. • Plant boundary windbreaks/trees as soon as construction starts, in all areas even those areas being developed in later phases. • Similarly do required planting in buffer areas around the historic precinct on commencement of Phase 1 Construction/development. • Vegetate road verges and parks immediately after construction, rehabilitate riverine area as soon as and continue maintenance eternally. • The site must be kept tidy at all times. • Building material stockpiles must be protected from dispersion into the surrounding area by wind or water. • A concerted effort must be made to minimise dust generation and its effect on the surrounding buildings and dwellings.				
Hydrology All work within the watercourse area must be done during the dry season and consideration has not been given to any temporary water diversions. Areas which are to be cleared of vegetation, including contractor laydown areas, must remain as small as possible, in order to reduce the risk of proliferation of alien vegetation, and in order to retain a level of protection to the watercourses during construction (e.g. dust generation, sediment trapping,	• Minimise pollution of soil, surface and ground water resources in the immediate and surrounding environments.	• No visible signs of pollution. • No signs of siltation of water courses. • No visible erosion scarring	RE, Contractor, ECO.	As and when required, monitor daily.

slowing of stormwater runoff – specifically due to the study area being at a gradient sloping towards the watercourses). Contractor laydown areas and equipment storage are to remain outside of the 32 m NEMA ZoR associated with the watercourses. Clear areas for the proposed construction in a phased manner and retain as much indigenous vegetation as possible. No indiscriminate driving of construction equipment is allowed. All vehicles and machinery must utilise existing roads or pre-planned construction roads. Limit vehicle / machinery activity within the freshwater resources to what is absolutely essential. All footprint areas must remain as small as possible and vegetation clearing to be limited to what is absolutely essential. All vehicles are to remain within existing roads and no new roads should be developed to access this construction site. Only authorised construction / maintenance personnel may be permitted to enter the watercourse as part of the construction activities to prevent excessive compaction of soils within the watercourse. Excavated materials should not be contaminated, and it should be stored in the minimum surface area, however the stockpiles may not exceed 2 m in height. Ensure sediment control devices are in place prior to the start of excavation activities. Maintain sediment / erosion control devices to minimise risk of sedimentation of the downstream areas. Storm water, wherever possible, should be allowed to soak into the land in the area on which the water fell. In the event of pollution caused as a result of construction activities, the contractor, according to section 20 of the National Water Act, 1998 (Act No. 36 of 1998) shall be responsible for all costs incurred by organisations called to assist in pollution control and/or to clean up polluted areas and water courses.	• Minimise impeding the natural flow of water. • Minimise the impact on natural water flow dynamics. • Minimise scarring of the soil surface and land features.	once construction is completed. • Minimum loss of topsoil.		
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The contractor shall ensure that excessive quantities of sand, silt and silt-laden water do not enter the storm water system. Disturbances to the watercourses should be limited to what is essential for long term maintenance. Re-fuelling of vehicles must be undertaken at a suitable facility off site or on a non-permeable surface, associated with a construction camp outside of the 1:100 year floodline of the Unnamed tributary of Sir Lowry's Pass River. All wastes are to be removed from the site and disposed of at a registered facility. <u>Construction activities within the watercourses:</u> Use should be made of existing roads to gain access to the areas proposed to be excavated below the floodline. Due to the relative accessibility of the site, no unnecessary crossing of the unnamed tributary may be permitted. This will limit any further erosion of the tributary. The clearing of vegetation within the footprint area must be kept to a minimum to avoid unnecessary disturbance within the active channel of the tributary and channelled valley bottoms. The removed vegetation must be stockpiled outside of the delineated boundary of the wetlands. The footprint areas of these stockpiles should be kept to a minimum. Should the vegetation not be suitable for reinstatement after the construction phase or be alien/invasive vegetation species, all material must be disposed of at a registered garden refuse site and may not be burned or mulched on site. Limit construction equipment within the watercourses to what is essential. The proposed excavation activities for the removal of the unauthorised infilled material will potentially result in bank destabilisation, and an increase in bank incision and sedimentation of the watercourses. Therefore, sediment control devices must be constructed in situ prior to excavation activities and reshaping activities. <u>With regards to the diversion of flow in preparation for the removal of the unauthorised infilled material within the active channel of the unnamed</u>				
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tributary:

Should construction works not be finalised during the dry season, a coffer dam area can be created and dewatered around the construction area associated with any pillars by using sandbags and cobbles. Water must be diverted into the downstream reaches, around the coffer area (as indicated in Figure D below). Water must be allowed to flow to the downstream reaches at all times. And sediment traps must be installed.

- Sediment traps must be installed every 20 m downstream for any works for a length of 200 m. For example, see Figure E below.
- Ensure that the creation of the diversion (by means of sandbags) does not result in a significant water level difference upstream or downstream of the installation site.
- It is recommended that a suitably qualified freshwater specialist and Environmental Control Officer (ECO) should monitor any coffer dam areas created on site as well as sediment traps at least bimonthly during the construction period to monitor the CVB wetland and tributary conditions during construction and after the removal of the diversion.

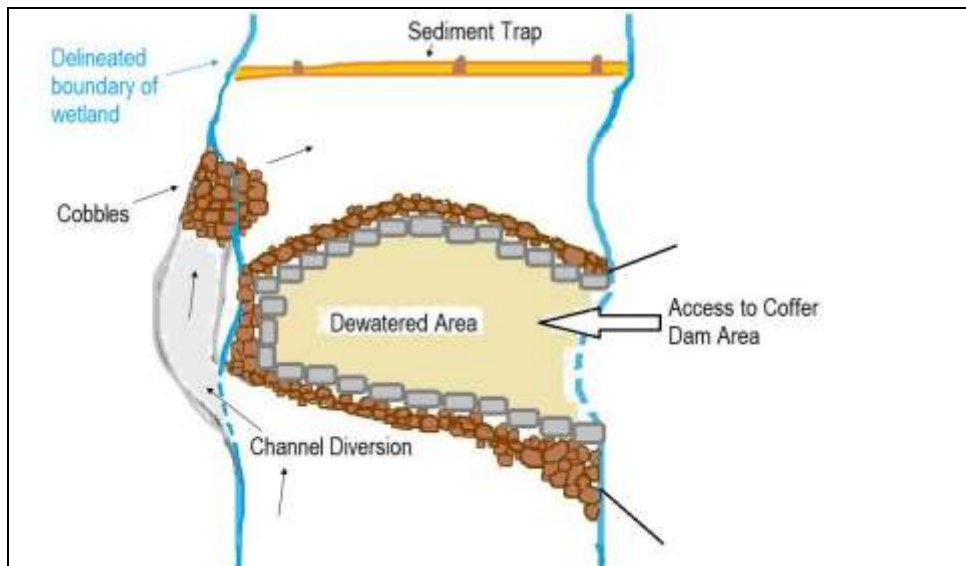


Figure D: Schematic drawing of a coffer dam and sediment trap recommended to be implemented around the construction area associated with activities within or in close proximity to the active channel.





Figure E: Examples of silt traps to be used during the construction phase, to limit additional sediment from entering the downstream reach of the unnamed tributary.

The area must be suitably compacted and reshaped to levels close to the surrounding wetland habitat to allow opportunities for the reinstatement of wetland habitat and to prevent any erosion or preferential flow paths from occurring.

All shaping must be done as natural as possible, and the area should be designed to have varying depths to facilitate microhabitat formation.

The excavated fill material can be spoiled on site. However, not within the watercourses or open spaces. All excavated material will be spoiled within the existing farm dam which will be used as a stormwater attenuation pond.

Excavated materials may not be contaminated, and it must be ensured that the minimum surface area is taken up, and the stockpiles may not exceed 2m in height. Stockpiling of removed materials may only be temporary (may only be stockpiled during the period of construction at a particular site) and should be disposed of at a registered waste disposal facility.

All exposed soils must be protected for the duration of the construction phase

with a suitable geotextile (e.g. Geojute or hessian sheeting) to prevent erosion and sedimentation of the tributary. Since portions of the unauthorised infilled material are located within the CVB wetland 3, the removal thereof will result in loss of wetland habitat. The wetland loss should ideally be reinstated within the fill area following removal of the infilled material to ensure no net to the CVB wetland. No hard infrastructure is allowed within the reshaped area and use of hard engineering structure (such as gabion retention structures or reno-mattresses) should be avoided as far as feasibly possible. Revegetation of re-profiled slopes of the infilled area, the excavated area below the 1:100 year floodline and any other areas (including the unnamed tributary) that may have potentially been impacted by the opposed infilling/excavation activities. Rehabilitation of the disturbed area must be undertaken, including re-vegetation with indigenous wetland vegetation and stabilisation of the embankments of the unnamed tributary in the affected area following a suitably developed watercourse management plan for the study area. Only indigenous vegetation species may be used as part of the landscaping of the development, and invasive plant species should be eradicated. A step-by-step approach related to the removal of the infill material, as well as the rehabilitation of the wetland area has been stipulated in the Watercourse Rehabilitation and Management Plan prepared by Freshwater Ecological Network (FEN) which should be followed. <u>Establishment of stormwater discharge points:</u> The use of Sustainable Drainage Systems (SuDs) to manage stormwater is considered critical for the mixed-use development as there will be an increase in hardened surfaces within close proximity to the watercourses. SuDs will assist in preventing significant impacts on the hydrological functioning of the watercourses, reduce the risk of flooding during high flow periods and reduce the risk of increased erosion. On review of the Civil Engineering Services Report prepared by KLS Consulting Engineers (2020), the proposed Mount View mixed-use				
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development will utilise open swales (considered to be SuDs) for the discharge of treated effluent before discharging into storage tanks. The following is deemed applicable for the construction of the SuDs:

- ☐ SuDs should be constructed through excavation of the in-situ material, sloped to a ratio not steeper than 3:1 and lined with rocks and cobbles to assist with energy dissipation and prevent sedimentation and erosion as well as improve the aesthetic appeal of the SuDs (Figure B); and
- ☐ SuDs should be vegetated with indigenous obligate and facultative species suitable for seasonal saturation. Wooden boardwalks could be developed over the swales for pedestrian walkways should the developer so desire.





Figure B: Examples of open swales, considered to be SuDs utilised as part of residential developments for conveyance of stormwater

Since some of the stormwater discharge points proposed may fall within the delineated extent of the CVB wetland, the design of the stormwater discharge points must incorporate energy dissipating structures to prevent erosion and incision. Figure C below provides an example of a stormwater outlet into a watercourse habitat.

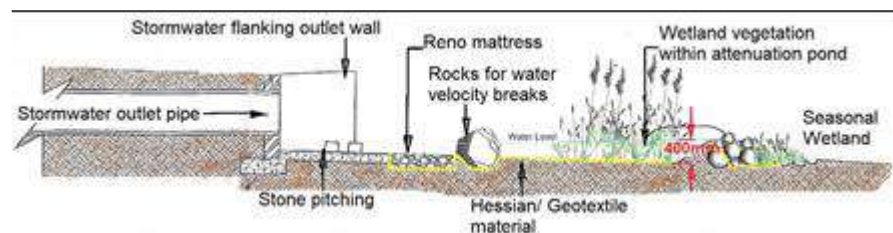


Figure C: Schematic of an outlet structure directly adjacent to a wetland.

- Cobbles should be placed in front of the stormwater discharge points and

below the reno mattress to further assist with energy dissipation. At no point should erosion or gully formation be allowed as this will have impact on the water dispersal into and across the watercourses, which could potentially reduce the extent and functionality of the wetland in the long-term. • All soils compacted within the watercourses as a result of construction equipment must be loosened prior to revegetation with suitable indigenous species. • No indiscriminate movement of vehicles or personnel is allowed within the watercourses or the 32 m NEMA ZoR where no activities are proposed. Careful planning of all construction equipment must be undertaken beforehand to ensure that the minimum impact on the watercourses occurs. • Litter traps should be installed at all the inspection chambers to prevent any litter from entering into the watercourses. <u>Installation of culvert crossing:</u> • The design of the culvert should ensure adequate flow connectivity between the upstream and downstream portions of the tributary. • The culvert structure must extend the width of the tributary to ensure recharge of the tributary downgradient of the crossing. • The crossing and the through-flow structures should be sized to accommodate a 1:100 year flood and must be placed to be level/flush with the tributary bed to ensure under scouring or erosion at the inlet side does not occur. • It is recommended that the construction associated with the culvert be undertaken during the dry summer months, when limited throughflow of water is experienced. However, should construction occur within the rainy season, a diversion for the drainage line should be excavated around the proposed culvert crossing location for the period of construction to ensure hydrological connectivity is maintained, however this should be considered at the time of construction on consultation with the ECO. <u>With regards to the diversion of flow in preparation for the installation of the culvert crossing:</u>				
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Please follow the same mitigation measures regarding the creation of a sump area and sediment traps as stipulated above under the section <i>"With regards to the diversion of flow in preparation for the removal of the unauthorised infilled material within the active channel of the unnamed tributary"</i>. • The duration of impacts within the tributary should be minimised as far as possible by ensuring that the duration of time in which flow alteration and sedimentation will take place is minimised; and • It is recommended that a freshwater specialist ECO should monitor the diversion site once a week during the diversion period to monitor the tributary conditions during construction and after the removal of the diversion. <u>With regards to excavation and soil compaction activities within the tributary associated with the culvert:</u> • During excavation activities, soil removed from the dewatered section should be stockpiled outside the delineated edge of the tributary. • Excavated materials should not be contaminated, and it should be ensured that the minimum surface area is taken up, and the stockpiles may not exceed 2m in height. Mixture of the lower and upper layers of the excavated soil should be kept to a minimum, so as for later usage as backfill material or as part of rehabilitation activities. • All exposed soils must be protected for the duration of the construction phase with a suitable geotextile (e.g. Geojute or hessian sheeting) to prevent erosion and sedimentation of the tributary. <u>With regards to trenching of pipes</u> • Soil can be stockpiled alongside the trench, with preference to the eastern side, furthest away from the watercourse. Stockpiles may not exceed 2 m in height (Figure F) and all trenches must be backfilled as soon as feasibly possible. • Protect exposed soil and stockpiles from wind, and limit the time in which soil are exposed, by covering with a suitable geotextile such as hessian sheeting during extremely windy conditions. • Trenches should be backfilled as soon as the pipes have been installed in				
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any given section in order to reduce potential erosion of exposed soil.

- Mixture of the lower and upper layers of the excavated soil should be kept to a minimum.
- Unused excavated soil/sediment should be utilised as part of the open space areas or be removed from site to a registered landfill.



Figure F: Excavation for pipe trenching with stockpiles alongside.

Rehabilitation on completion of construction:

- Care must be taken when constructing the culverts to ensure that the design accommodates a 1 in 100 year flood event and that the base levels are maintained so that no erosion or ponding of water occurs surrounding the crossing.
- Soil surrounding the wingwalls must be suitably backfilled and sloped (minimum of a 1:3 ratio) and concrete aprons as well as gabion mattresses should be installed both up and downstream for energy dissipation and sediment trapping.
- All soils within the tributary surrounding the culvert must be loosened on completion of works to allow for re-vegetation.
- All footprint areas must remain as small as possible and vegetation clearing

to be limited to what is absolutely essential. • All vehicles are to remain within existing roads and no new roads should be developed to access this construction site. • All stockpiles must be located at least 10 m from the delineated extent of the tributary should not exceed 2 m in height and should be covered with a suitable geotextile such as hessian sheeting to prevent excessive dust generation. <u>Construction activities within the variable conservation buffer:</u> All stockpiles must be located at least 10 m from the delineated extent of the tributary should not exceed 2 m in height and should be covered with a suitable geotextile such as hessian sheeting to prevent excessive dust generation. No formal paving should be used for the proposed walkway. In situ compaction of soil for the walkways as proposed is preferred. Revegetation of the areas surrounding the walkways with suitable indigenous species is recommended. These can be low growing species such as grasses, shrubs, or fynbos vegetation to allow access for access during fire emergencies. Once construction activities are done, the surrounding area to the construction footprint must be suitably rehabilitated. Only indigenous vegetation species may be used as part of the landscaping of the development, and invasive plant species should be eradicated. <u>Potential indiscriminate waste disposal and / or spillage from construction vehicles</u> No waste disposal is to be permitted below the 1:100 year floodline of the unnamed tributary of Sir Lowry's Pass River and associated CVB wetlands. Any solid waste or litter generated as part of the construction activities must be disposed of within suitable waste bins. Re-fuelling of vehicles must be undertaken at a suitable facility off site or on a non-permeable surface, associated with a construction camp outside of the				
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1:100 year floodline of the Unnamed tributary of Sir Lowry's Pass River. All wastes are to be removed from the site and disposed of at a registered facility.				
Soil Topsoil must be stripped from all areas that are to be utilized during the construction period and where permanent structures and access is required. These areas will include comprising the permanent works, pipeline trenches, stockpiles, access roads, construction camps and lay down areas. Topsoil must be deemed to be the top layer of soil containing organic material, nutrients and plant grass seed. For this reason it is an extremely valuable resource for the rehabilitation and vegetation of disturbed areas. At the beginning of the construction phase, topsoil removed for vegetation clearance must be stripped to a minimum depth of 300 mm and windrowed. All topsoil must be removed and stockpiled on the site. However, the use of topsoil for rehabilitation contaminated by the seed of alien vegetation must not be permitted unless a programme to germinate the seed and eradicate the seedlings is drawn up and approved, or some other mitigatory feature is found. This must be approved by the ECO. Single handling is recommended. Stock piles must not be higher than 2m to avoid compaction. The soils surrounding the wingwalls and concrete aprons must be suitable loosened on completion of construction activities. Dust suppression is necessary for stockpiles older than a month – with either water or a biodegradable chemical binding agent. Backfill will require contouring to ensure that it blends in with the surrounding environment.	• Minimise scaring of the soil surface and land features. • Minimise disturbance and loss of soil. • Minimise construction footprint. • Maintain the integrity of topsoil's for future rehabilitation. • Containment of invasive plant growth.	• No visible erosion scars once construction is completed. • The footprint has not exceeded the agreed site in terms of EA etc. • Minimal invasive weed growth. • No signs of sedimentation and erosion. • Method statement.	Contractor.	Daily.

Phase of development	CONSTRUCTION		
Impact / issue	TOLERANCES		
MITIGATION MEASURE		RESPONSIBLE PARTY	FREQUENCY OF ACTION
Fines Environmental management is concerned not only with the final results of the Contractor's operations, but also to the standard of the day-to-day operations required to complete the works. Penalties may be instituted for non-compliance. The penalty is over and above the cost of rectifying the problem and / or damage. Penalties will vary on a sliding scale from <u>R 1 000 to R 5 000</u> for non-serious issues as determined by the Engineer / RE / ECO. For each subsequent similar offence the fine shall be doubled in value to a maximum value of <u>R 20 000</u>. The Engineer together with the ECO will decide how the penalties, if any, are to be spent on measures improving the environment. Such fines will be issued in addition to any remedial costs incurred as a result of non-compliance with the environmental specifications. The Engineer will inform the Contractor of the contravention and the amount of the fine, the amount will be deducted from the monies due in payment certificates issued under the Contract. Maximum fines for the following contraventions by either the Contractor and / or his subcontractors may be imposed by the Engineer / ECO, as follows: a) Any persons, vehicles, plant, or material related to the Contractors operation within the designated boundaries of a "no-go" area. <u>R 5 000</u> b) Persistent failure to demarcate "no-go" areas. <u>R 2 000</u> c) Damage to trees not specified to be removed. <u>R 3 000</u> d) Persistent and unrepaired oil leaks from machinery / not using a drip tray to collect waste oil and other lubricants / not using specified absorbent material to encapsulate hydrocarbon spillage / using inappropriate methods of refuelling. <u>R 3 000</u> e) Litter on site associated with construction activities. <u>R 2 000</u> f) Deliberate lighting of illegal fires on site. <u>R 1 000</u> g) Burning of waste without a permit. <u>R 2 000</u> h) Any employee eating meals on site, outside of defined eating area. <u>R 500</u> i) Employees not making use of the site ablution facilities. <u>R 2 000</u> j) Failure to implement specified noise controls. <u>R 1 000</u>		Engineer	Monitor Daily

k) Failure to empty waste bins/skips/litter structures on a regular basis. <u>R 2 000</u> l) Inadequate dust control or failure to apply dust suppression. <u>R 2 000</u> m) Any water abstraction activities from a watercourse without approval. <u>R 5 000</u> n) Inadequate handling of bitumen. <u>R 3 000</u> o) Inadequate handling of concrete. <u>R 2 000</u> Any activity, that in the reasonable opinion of the Engineer, RE and ECO, constitutes a deliberate contravention of the requirements of the specifications relating to environmental matters. <u>R 4 000</u>	Engineer	Monitor daily
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Table 6: PROPOSED MOUNT VIEW RESIDENTIAL DEVELOPMENT OPERATIONAL PHASE EMPr (General)

Phase development of	OPERATIONAL				
Impact / issue	General				
MITIGATION MEASURE		MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
The following impacts and risks were identified during the operational phase: • Waste • Stormwater • Traffic • Botanical • Pollution (air, noise and visual) • Freshwater					
Waste management Please refer to the waste Minimization Plan Herewith attached.		• Sustainable management of waste by recycling. • To keep the development neat and tidy. • Minimise litigation and complaints by I&AP's. • Reduce visual	• Disposal of refuse in an appropriate manner with no refuse polluting the development. • Development is neat and tidy. • No complaints from surrounding	ECO.	6 Monthly.

Phase of development	OPERATIONAL				
Impact / issue	General				
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION	
	impact. Control potential influx of vermin and flies thereby minimising the potential of diseases at the site and the surrounding environment.	industries and businesses. - Sufficient containers available on site. - No visible or measurable signs of pollution of the environment (soils, ground and surface water).			
Stormwater Management Storm water, wherever possible, must be allowed to soak into the land in the area on which the water has been discharged. The storm water system and the discharge points must be inspected and damaged areas must be repaired if required. Discharge points should further be inspected for blockages of any kind; these must be removed timeously to ensure the efficient operation of the storm water management system. No waste or refuse must be allowed to access the storm water infrastructure. In the event that silt runoff occurs off the development site, the	- Minimise pollution of soil, surface and ground water resources. - Minimise the potential loss of topsoil. - Minimise the potential of flooding of the development, or its neighbouring properties.	- No evidence of pollution at the discharge points. - No evidence of silt build-up at the discharge points. - No complaints from I & AP's.	POA	As and when required. Monitor seasonally.	

Phase of development	OPERATIONAL				
Impact / issue	General				
MITIGATION MEASURE		MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
cause of this must be investigated and suitable mitigation measures employed. This may include the vegetation of bare areas, installing flow diversion channels in consultation with an engineer, installing velocity reducing structures etc. For all maintenance undertaken reference must be made to recommendations in the engineer's reports. All maintenance activities must be monitored to ensure that no environmental damage occurs. All damage must be mitigated immediately. <u>The following maintenance procedure (stipulated by KLS Consulting Engineers) should be implemented:</u> The stormwater infrastructure will be exposed to external elements such as vehicle oils, litter, windblown sands, etc. which will significantly influence the efficiency and operation of the system. It is therefore imperative that the stormwater infrastructure is maintained and cleaned at regular intervals to ensure that the system operates according to the design specifications and guidelines. To achieve this desired level of operation, regular inspections will be required to assess and survey the state of the stormwater infrastructure. The completed project will be handed over to the Homeowner's facilities manager, who will take responsibility of the maintenance and daily operation of the development.					

Phase of development	OPERATIONAL				
Impact / issue	General				
MITIGATION MEASURE		MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
Since the maintenance manager will only be established after the completion of the project, the project manager will accept responsibility of the maintenance procedures, as specified in this document, until such time as a maintenance manager is appointed. It is imperative that the personnel that carries out the routine inspections and maintenance procedures adhere to proper Health and Safety standards, as per the Occupational Health and Safety Act (Act 85 of 1993). Routine Cleaning Inspections The following routine inspections should be undertaken on a regular basis by a responsible person such as property management staff/caretaker: • Gully, grid & kerb inlets – all covers and grids to be in place and structures clean and free of any litter/leaves and sand build up. • Manholes – cover in place and free of any litter/leaves and sand build up. • Storm water pipes – blockages • Permeable Paving – rut marks, free draining, excessive oil spills or sedimentation. • Sand traps – level of sand build-up					

Phase of development	OPERATIONAL				
Impact / issue	General				
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION	
• Outlet structures – litter build-up and sedimentation in stilling basins • Open swale – free of blockages and vegetation must be kept • Water sample testing – ensure water samples are collected and sent for testing on a bi-weekly basis Any of the aforementioned items which are deemed to be not satisfactory must be attended to immediately. Cleaning works may be carried out by the maintenance team/personnel. It is recommended that the aforementioned inspections be carried out on a monthly basis as well as after a heavy rainfall event during the rainfall season. Engineering Inspections for Maintenance Engineering maintenance inspections should be undertaken by a qualified engineer to determine the following: • Assess the current condition of the stormwater infrastructure and identify repairs required. • Establish the level of sedimentation in the attenuation facilities • Assess the Routine Cleaning Inspection schedule and make recommendations. The findings and recommendations of the maintenance inspections must be submitted to the client. Any remedial works					

Phase of development	OPERATIONAL				
Impact / issue	General				
MITIGATION MEASURE		MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
should be carried out by a competent and certified contractor. It is recommended that the aforementioned inspections be carried out on a yearly basis (<i>preferably during autumn</i>) along with additional investigations when considered necessary. Water Quality Inspections The water quality of the attenuation dams and the run-off being discharged into the municipal network is of vital importance and should be tested on a bi-monthly basis by an independent laboratory. The water sample analysis should be submitted to the landowner and engineer for comments and recommendations. Financial Allowances for Maintenance and Repair Works Although specific risk components can be identified at this stage of the development, it is very difficult to accurately determine the future vulnerability of the stormwater network. In addition to this, the future maintenance and replacement costs will largely depend on a number of building-industry and economic factors which is difficult to predict. To avoid large future expenditure on replacement and maintenance, we would recommend that the developer make allowance for a yearly stormwater maintenance budget of at least 5% of the total capital cost for the installation of the stormwater network.					

Phase development of	OPERATIONAL				
Impact / issue	General				
MITIGATION MEASURE		MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
Health and Safety considerations The stormwater infrastructure must be operated and maintained in accordance with all provisions of the Occupational Health and Safety Act (<i>Act 85 of 1993</i>). In addition to the guidelines of the Occupational Health and Safety Act, we also recommend that maintenance staff always work in a safe manner – if something does not look safe it should be reported immediately. Appropriate personal protection equipment (PPE) must be worn when working on/maintaining the stormwater network, i.e., face shields/mask, protective gloves, long sleeve overalls, etc. Open manholes are tripping hazards and manhole covers must be correctly shut after maintenance procedures. Any open manholes must be cordoned off with appropriate hazard tape for the duration of time that the manhole is open.					
Dust Surface dust should be minimized during the operational phase of the development in order to prevent the dust from being blown to adjacent properties.		No dust blown from the development to adjacent properties.	No complaints from I&AP's.		
Wastewater Treatment Plant		No odour impacts as a	No complaints from I&AP's,	POA	Ongoing

Phase of development	OPERATIONAL				
Impact / issue	General				
MITIGATION MEASURE		MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
The Wastewater Treatment Plant proposed is the containerised type that is above ground. The plant will have a vent pipe at the top of the container that will release the H₂S gasses. The density of H₂S gas is less than oxygen and hence the H₂S gas will rise upwards. A minimum distance of 20 metres between the plant and residential properties will also be maintained to allow for the gas to disperse. The conservancy tank and pump station that will be installed below ground will have double sealed manhole lids and a vent pipe will be installed to release gasses on a high level. The treated effluent will be re-used for irrigation purposes. This will offset the demand for irrigation water and ultimately minimise the load on the municipal water supply. Treated effluent from the WWTPs will be pumped into irrigation storage tanks located next to the stormwater attenuation facilities. Storage tanks will have an emergency overflow which will discharge surplus treated effluent during the rainfall season into a reedbed and swale system which will discharge into the combined storm water / treated sewer attenuation facility. Backup generators will be installed at the pump stations and WWTPs and a bund wall and sump to contain spills from the plant. Both WWTPs will have emergency connection to the municipal sewer connection located in Old Sir Lowry's Pass		result of the Wastewater Treatment Plant. No pollution of ground- or surface water.			

Phase of development	OPERATIONAL					
Impact / issue	General					
MITIGATION MEASURE		MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION	
Road. The development on the lower portion of the proposed development site will require the installation of a pump station in the most western corner. The pump station will be located at the WWTP and will pump effluent to the municipal sewer connection in Old Sir Lowry's Pass Road as an emergency overflow connection from the conservancy tank at the WWTP to the municipal system.						

Phase of development	OPERATIONAL				
Impact / issue	General				
MITIGATION MEASURE		MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
Rehabilitation Rehabilitation must be conducted in line with the Rehabilitation Plan conducted by GNEC. Additionally, FEN compiled a Watercourse Rehabilitation Plan that focuses on the rehabilitation of the watercourse. The implementation thereof is imperative. The potential risks and impacts associated with the rehabilitation phase cannot be predicted at this point in time. However, the implementation of the EMP, MMP and Rehabilitation Plans will ensure that risks are adequately managed as ample mitigation measures have been included in the mentioned reports. Owing to the fact that there will be no irrigation to help the plants to settle and strengthen, the best time for planting would be at the beginning of the rainy season (May). This will help the plants to settle and establish before the following dry summer. All plants (even water-wise plants) need water in the establishment phase. Should planting be done during the summer months (not advised) the planted areas need to be watered at least once a week.		• Ensure re-establishment of natural vegetation. • Prohibit the loss of wetland habitat.	• Re-growth of natural vegetation		

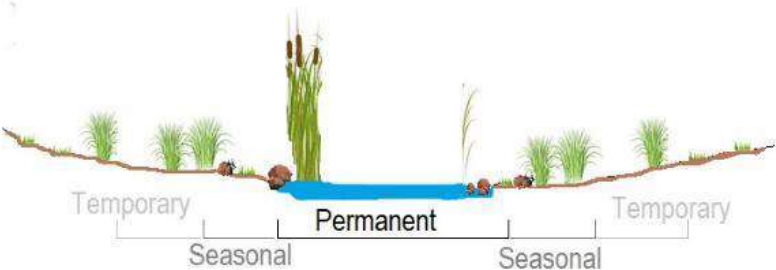
Phase of development	OPERATIONAL				
Impact / issue	General				
MITIGATION MEASURE		MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
Atmospheric pollution Air pollution All forms of dust/air pollution must be managed in terms of the Air Quality Act No. 39 of 2004 and Dust Regulations of 2013, this includes the control of noxious and offensive gases, smoke, dust and vehicular emissions Under no circumstances may heavy smoke be released into the air.		• Reduce visual impact. • Minimise chances of transgression of the acts controlling pollution.	• No visible signs of pollution. • No litigation due to transgression of pollution control acts. • No complaints from surrounding residents and businesses.	ECO.	Monitor daily.

Phase of development	of	OPERATIONAL			
Impact / issue		General			
MITIGATION MEASURE			MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY
Noise pollution Noise levels shall be kept within acceptable limits, these are determined in terms of the relevant local by laws. Operation activities will remain within normal working hours (07:00am – 18:00pm). Safetech confirmed that the noise impact during the operational phase will be of medium significance to residents living along Old Sir Lowry's Pass Road, however this can be mitigated substantially through traffic calming measures. The noise may be experienced as a "disturbing noise" during both the morning and afternoon rush hours for those properties bordering the Old Sir Lowry's Pass Road. Safetech recommended that an environmental noise survey be conducted annually until the development is completed. It is recommended that this noise survey be conducted annually for a period of two years. The two noise surveys should be conducted once the development is operational and construction is still ongoing, i.e. once residents are living on-site and further construction is still taking place. This will enable the Developer to determine when, and if, traffic calming measures are required (Safetech, 2021). Should the noise levels be within acceptable levels during these surveys, no additional surveys are required.					

Phase development of	OPERATIONAL				
Impact / issue	General				
MITIGATION MEASURE		MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
Visual Impact It is of importance that the Landscape and Building Guidelines are carried through into the operation phase of the development - responsibilities shift from Developer to Home Owners Association. To this end it must be ensured that the: • Home Owners Association (HOA) have an Operational Plan that clearly states their obligations in terms of ongoing maintenance of buildings and landscaping and that the maintenance actions comply with the architectural and landscaping guidelines. • HOA monitor the building and landscape guidelines for the individual erven and greater site. • HOA maintain buildings and landscaping to a high standard. • HOA continue minimising light pollution - restrict street light height to maximum 3 m, luminaires must be top covered, low spill type lights to minimize light spill and pollution, keep outdoor lighting as bollard lighting, external lighting on buildings must be minimised or completely omitted etc.					

Phase of development	OPERATIONAL				
Impact / issue	General				
MITIGATION MEASURE		MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
Traffic management All traffic management must be done in accordance with the National Road Traffic Act No. 93 of 1996 .		- Minimise chances of transgression of the acts controlling traffic. - Minimise traffic backlog.	- No litigation due to transgression of traffic control acts. - No complaints from surrounding industries and businesses.	ECO.	Monitored continually.
Infrastructure maintenance Ensure that the footprint area of cleared vegetation remains as small as possible. Limit clearing of indigenous vegetation. If deemed necessary, replant / re-seed with indigenous vegetation once maintenance activities have been completed.		Minimise pollution of soil, surface and ground water resources.	No pollution of the environment.	ECO.	As and when required.

Phase of development	OPERATIONAL				
Impact / issue	General				
MITIGATION MEASURE		MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
Hydrology On completion of works, the unnamed tributary and associated CVB wetland 3 must be reinstated. At no point should a straight channel be excavated, and no hard infrastructure is allowed (i.e., no gabion walls, concrete slabs etc). All rehabilitation actions should be implemented to reinstate the wetland as close as possible to the reference state (i.e., natural), not the state of the wetland prior to the proposed removal of unauthorised infilled material. The impacted wetland and tributary area must be re-instated, and soil-scaping must be undertaken in such a way as to reinstate the seasonal and temporary zones of the CVB wetland. Works should be undertaken during the dry season, (ideally during March/April just before the rainy season. A site-specific rehabilitation, maintenance and monitoring plan as initially compiled by FEN Consulting (Pty) Ltd (2021) must be updated to include specific rehabilitation measures for the reinstatement of riparian and wetland habitat.		Minimise impacts of monitoring on the watercourses.	No adverse impacts on the watercourses.		As and when required.

Phase of development	of	OPERATIONAL			
Impact / issue		General			
MITIGATION MEASURE		MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
 Figure F: Representation of the permanent, seasonal and temporary wetland zones to be associated with the rehabilitated CVB wetland 3 following construction activities. All disturbed soil must be ripped and loosened. Any existing erosion must be remediated. Following construction, a suitable alien invasive management plan must be implemented to ensure that alien invasive plant species do not become established within the areas disturbed by construction activities. Rehabilitation of the unnamed tributary and CVB wetlands must be undertaken, including clearing of woody alien invasive vegetation and reinstatement of indigenous wetland vegetation. A Residual Wetland Impact Compensation Plan may need to be compiled (should it be requested by the legislative authorities) by a suitably qualified freshwater ecologist as part of					

Phase of development	of	OPERATIONAL				
Impact / issue		General				
MITIGATION MEASURE			MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
investigating the functional habitat hectare equivalents that must be conserved by the proponent to account for the above-mentioned residual wetland and riparian habitat loss associated with the removal of the unauthorised infilled material, should the rehabilitation of the impacted areas not be sufficient. The variable conservation buffer should also be rehabilitated with terrestrial vegetation. It is considered advantageous if the area below the 1:100 year floodline be rehabilitated with indigenous terrestrial vegetation and that indigenous wetland vegetation be reinstated within the CVB wetland 3 to create an open space corridor and reinstate the ecological buffer to the wetland. Incorporate as much indigenous terrestrial, wetland and riparian vegetation into the landscape plan for all open space areas and stormwater, attenuation facilities. When activities do occur within the active channel of the tributary, silt traps specified under the Construction Hydrology section of this EMP, should be implemented. An alien vegetation management plan should be implemented and managed by the property managers or various Homeowner Association's for all open space areas as well as the watercourses. An alien clearing management plan has been incorporated in the Rehabilitation Report compiled by Mr						

Phase of development	OPERATIONAL				
Impact / issue	General				
MITIGATION MEASURE		MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
Christoff Dippenaar. No vehicles are permitted to enter into the watercourses. Any maintenance works must be undertaken by foot or the relevant authorisations obtained beforehand. As much indigenous terrestrial, wetland and riparian vegetation should be included into the landscape plan for the open space areas. Indigenous vegetation will reduce the irrigation requirements as well as fertilizers. Care must be taken when using herbicides and pesticides in gardens and open space areas, especially during the rainy season when stormwater runoff is high. These chemicals must be used in accordance with the prescribed quantities to prevent contamination of surface water in the nearby watercourse, especially since stormwater is released therein. All watercourses are to be considered "off limits" to any vehicular activity. Disturbances to the watercourses should be limited to what is essential for long-term maintenance in line with the mitigation measures presented herein. Existing access roads must be used for monitoring purposes. No indiscriminate movement of vehicles is allowed as this would result in the compaction of soils and potential loss of riparian and instream habitat.					

Phase of development	OPERATIONAL				
Impact / issue	General				
MITIGATION MEASURE		MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
Hot spots for the build-up of debris and excess sediment must be identified and when necessary, debris/excess sediment must be removed by hand to prevent future flooding and potential damage to infrastructure. In this regard, special mention is made of periods following high rainfall and subsequent high instream water volumes. Removal of debris must be undertaken in line with the above listed construction mitigation measures. The watercourses must be monitored for alien and invasive vegetation encroachment and all alien vegetation/weeds must be removed according to a suitable alien vegetation control plan. Annual follow up should be undertaken to all watercourses for at least 3 years post construction. Any erosion or gully formation must be identified on an ongoing basis and re-profiled and revegetated accordingly. The likelihood of erosion is reduced due to a higher surface roughness of the earth swale, allowing for water to enter the tributary at a lower velocity. The swales should be inspected regularly to ensure proper functioning, monitoring of erosion and clearing of any debris or litter in the swales. Any water potentially discharged into the watercourses (that is not used for irrigation purposes - from the storage tanks/attenuation facilities) must regularly be tested to monitor					

Phase of development	OPERATIONAL				
Impact / issue	General				
MITIGATION MEASURE		MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
the quality of the effluent and to be pro-active regarding potential spills or malfunctioning of the treatment plant. Regular inspection of the effluent pipe outlet structure should be undertaken to monitor the occurrence of erosion. If erosion has occurred, it should immediately be rehabilitated by means of revegetation. Control measures associated with the constructed wetland/retention pond, if implemented: • The constructed wetland/retention pond should be cleared of litter during regular maintenance activities. • The effluent outlet in the basin and the earth swale should be monitored for erosion. If erosion is noted, the area associated with the outlet should be rehabilitated with the use of cobbles, with guidance from a freshwater specialist. • The quality of the treated effluent used for irrigation purposes must be tested at regular intervals and must comply with the wastewater limit values applicable to irrigation of any land or property as stated by Government Notice 665 as published in the Government Gazette 36820 of 2013 as it relates to activity as stipulated in Section 21(e) of the National Water Act, 1998 (Act No. 36 of 1998).					

Table 7: PROPOSED MOUNT VIEW RESIDENTIAL DEVELOPMENT OPERATIONAL PHASE EMPr (EA conditions)

Phase of development	OPERATIONAL	GNEC-Guillaume Nel	16/3/31/A3/53/2005/22		
Impact / issue	EA Conditions				
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION	
	•	•			

**PROPOSED MOUNT VIEW RESIDENTIAL
DEVELOPMENT, SIR LOWRY'S PASS VILLAGE,
WESTERN CAPE**

DEA&DP Ref: 16/3/3/6/7/1/A3/43/2121/20

**(INCLUDING THE WASTE, WATER USE AND ELECTRICITY CONSUMPTION
MINIMIZATION AND MANAGMENT PLAN)**

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REFERENCES

City of Cape Town: Integrated Waste Management (IWM) (Policy Number 60829)

City of Cape Town: Integrated Waste Management By-Law, 2009

DEA&DP, 2003. A Waste Minimization Guideline Document for Environmental Impact Assessments (2003) by Common Ground in association with deVilliers Brownlie Associates.

National Environmental Management Act 107 of 1998 (NEMA)

National Environmental Management: Waste Act 59 of 2008 (NEM:WA)

Stellendale Village DRAFT Green Building Guidelines by Steadfast Greening, 2008

SUB SECTION 1 - INTRODUCTION

1.1 INTRODUCTION

Mount View (Pty) Ltd., proponent of the proposed development, will use this WASTE, WATER USE AND ELECTRICITY CONSUMPTION MINIMIZATION AND MANAGMENT PLAN to minimize and manage waste and wastage, electricity consumption and water use in the design, construction and operational phase of the proposed development as a tool in managing the impacts of the proposed development after environmental approval from the Department of Environmental Affairs and Development Planning (DEA&DP) in terms of the **NEW** Environmental Impact Assessment Regulations (GN R. No. 983, GN R. No. 984 and GN R. No. 985 [4 December 2014], as amended 07 April 2017) under the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA), is obtained.

This document is based on the Waste Minimization Guideline Document on the DEA&DP website (by Common Ground in association with deVilliers Brownlie Associates) and the Stellendale Village DRAFT Green Building Guidelines by Steadfast Greening. An overview of the relevant legislation and policies are also provided in Section 2 below.

The regulation of activities that have a significant impact on the environment as well as the protection of the environment itself, have improved significantly in the last decade and a half with the promulgation of the Constitution, and general environmental legislation, such as the National Environmental Management Act (NEMA) and the National Water Act. One of the main impacts of human activities on the environment is that of waste disposal (Common Ground & deVilliers Brownlie Associates, 2003).

Waste may be in solid, liquid or gaseous form. It may be benign, toxic, or hazardous. The management of hazardous waste, with associated negative impacts on the environment, is generally covered by legislation. The longer term, cumulative impacts of relatively benign waste disposal is poorly addressed by our laws (DEA&DP Waste Minimization Guideline, 2003).

“Waste” in this document is primarily interpreted as solid waste. Waste minimization per se is not specifically legislated in South Africa at present. Similarly, there are no legal instruments that can be used to enforce reduction in wastage of electricity and water although the National Water Act No 36 of 1998 prohibits wastage of water

without specifying what wastage means and how this section will be enforced. However, there are a number of laws and overarching policies that are aimed at sustainable development and sound environmental management, and which are relevant to waste and wastage minimisation.

Wastage is defined in the Oxford Dictionary as...“expend or employ to no purpose or for inadequate result, use extravagantly or ineffectually, squander”. Part of the obligation to protect the environment would be to limit wastage of resources. Thus limiting wastage of water would fall within this obligation. So too would be limiting the wastage of electricity that results in pollution at the site of electricity generation (Common Ground & deVilliers Brownlie Associates, 2003).

SUB SECTION 2 – LEGAL & POLICY REQUIREMENTS AND GUIDELINES

National legislation, as well as numerous local policies, govern waste management and it is therefore important to understand the requirements of these legal documents. The list of legislation relating to waste management in South Africa is listed below:

- The Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996)
- National Environmental Management: Waste Act (NEM:WA), 2008 (Act No. 59 of 2008)
- National Environmental Management: Waste Amendment Act, 2014 (Act 26 of 2014)
- National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998)
- National Water Act, 1998 (Act No. 36 of 1998)
- Hazardous Substances Act, 1973 (Act No. 5 of 1973)
- Health Act, 1977 (Act No. 63 of 1977)
- NEM:WA National Waste Management Strategy, 2012
- NEM:WA National Norms and Standards for the Storage of Waste, 2013
- City of Cape Town Integrated Waste Management By-Law, 2009
- City of Cape Town Integrated Waste Management Policy, as amended

On-site activities should, at all times, be compliant with the abovementioned legislation and policies. An overview of the NEM:WA, 2008 general duty principle is provided below.

2.1 NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE ACT, 2008 (ACT 59 OF 2008)

The National Environmental Management: Waste Act (NEM:WA), 2008 (Act No. 59 of 2008) was promulgated and enforced to reform the law that regulates waste management in order to protect health and the environment.

The general duty in respect of waste management is stipulated in NEM:WA (2009) as follows:

“A holder of waste must, within the holder’s power, take all reasonable measures to-

(a) avoid the generation of waste and where such generation cannot be avoided to minimise the toxicity and amounts of waste that are generated;

(b) reduce, re-use, recycle and recover waste;

(c) where waste must be disposed of, ensure that the waste is treated and disposed of in an environmentally sound manner;

(d) manage the waste in such a manner that it does not endanger health or the environment or cause a nuisance through noise, odour or visual impacts;

(e) prevent any employee or any person under his or her supervision from contravening this Act; and

(f) prevent the waste from being used for an unauthorised purpose”.

It is recommended that an integrated waste management approach be followed on site. This approach should be followed during all phases of the proposed development. Important objectives to keep in mind throughout the project life cycle is the reduce, re-use, recycling and recovery of waste.

SUB SECTION 3 – WASTE CATEGORISATION

The City of Cape Town (CoCT) Integrated Waste Management (IWM) Policy categorises different classes and categories of waste. The waste categories relevant to the proposed Mount View development are indicated in table 8 below.

Table 8 Waste Categorisation (CoCT IWM Policy)

Category	Class	Type	Waste Minimisation Mechanism Guidelines	Service Provider	Special Provisions or Comments
Residential	Residential Waste	General, non-hazardous	Waste separation by resident of recycled material.	The Council, or a community partnership, or an approved waste contractor to collect waste for disposal.	Includes recyclable and non-recyclable wastes.
	Residential Waste (special, bulky)	General, non-hazardous	Waste separation by resident of recyclable material.	The Council, or a community partnership, or an approved waste contractor to collect waste for disposal.	Includes recyclable and non-recyclable wastes too large for normal collection.
	Garden waste	General, non-hazardous	Resident may compost on own property under	Parks dept, resident or small contractor (e.g.	Includes vegetation or vegetable matter

			conditions and guidelines determined by the Council to protect environmental and human health. The Council will compost organic waste and biodegradable wastes as far as possible.	garden service companies, etc.) collects and transports this type of waste to specifically-provided drop-off sites. The Council processes organic waste at special composting sites, or disposes waste at a landfill site.	that is biodegradable. Special facilities are provided by the Council at pre-selected sites.
Non-Residential	Builder's Waste	General, non-hazardous	Builder or contractor collects and transports builder's rubble for further processing at a facility such as a crushing plant or to a landfill site.	Private contractor (e.g. builder or waste removal contractor) collects for disposal. The Council or contractor operates and maintains these facilities.	Not for general landfill disposal. Special facilities are provided by the Council at pre-selected sites. The Council does not provide this service.
	Builder's Waste	General, contaminated	Builder or contractor	Private contractor (e.g. builder or	Not for general landfill disposal.

			collects and transports contaminated builder's waste to a hazardous landfill site.	waste removal contractor) collects for disposal. The Council or contractor operates and maintains these facilities.	The Council does not provide this service.
	Commercial & Retail Waste	General, non-hazardous	Waste separation at source to divert recyclable materials prior to collection (On-site waste management)	The Council or a contracted private sector service provider.	Applicable to properties zoned for "business" use in a business district (non-industrial). Will apply to informal traders includes recyclable and non-recyclable wastes for normal collection and/or too large for normal collection.

SUB SECTION 4 – CLEARLY DEFINED WASTE STREAMS

The City of Cape Town Integrated Waste Management Policy (2020) provides clear guidelines for the separation of waste streams. The separation of waste streams at source is required as per National legislative requirements focused on waste minimisation. Separation of waste at source has also been linked to income generation and job creation and is therefore recommended to take place.

The following requirements relating to separation of waste at source is relevant to the proposed Mount View development (CoCT Integrated Waste Management Plan, 2020):

- a) *Waste generators, such as occupants of dwellings, managers of facilities or business entities or industrial generators must ensure that recyclable waste is separated prior to collection.*
- b) *Separated waste may not be mixed with waste that is destined to be landfilled.*
- c) *The provision of a kerbside recycling collection service by the City or its contracted accredited service providers will be per the directive of City and subject to budget provisions.*
- d) *Only in areas where the City does not provide a kerbside recycling collection service, may private accredited recycling service providers contract with residents, for the collection of sorted recyclables, as per arrangements between the resident and the service provider.*
- e) *Residents must ensure that contained recyclable waste are not put out for collection on the kerbside until the day of recyclable collection in order to avoid practices that may lead to littering and further cost to the City. Please note that this might not be the same day as general waste collection.*
- f) *Should residents be making use of a private accredited waste service provider for recyclables collection, the placement and collection of the separated recyclables should not interfere with the municipal waste collection services in the area.*
- g) *Special provisions for residential or business cluster developments and flat complexes:*
 - (i) Such complexes have the opportunity to apply for a reduction in their number of 240l general waste wheelie bins serviced by the City, with the accompanying monthly cost savings associated, up to a certain threshold, enabling savings which can fund recycling collection services;*
 - (ii) Further to this, such residential or business complexes may apply for consideration by the Waste Management Officer to establish a “Waste Minimisation Club”, which enables a further reduction of 240l wheelie bins*

serviced by the City, to enable additional savings to be allocated to recycling collection services;

(iii) A Waste Minimisation Club is subject to special requirements and tariffs and must apply to the City for a special dispensation in terms of an “Enhanced Service”, together with the submission of a waste management plan for approval.

h) Developers of high density buildings or complexes must ensure that adequate waste management and recycling facilities (e.g. waste rooms, containers) are included in plans submitted to the City for approval;

i) Commercial or industrial waste generators must transport their own recyclables or have these collected at own cost by an accredited service provider, to an appropriate recycling facility.

j) Alternatively, on-site recycling facilities may be established and managed on behalf of businesses by accredited private waste management specialists.

k) It is acknowledged that waste pickers also collect recyclable waste from residential properties, and this should be managed in such a way as to minimize the litter generated, as well as any other risks to the area.

SUB SECTION 5 – MONITORING MECHANISMS

The following mitigation measures have been identified in order to ensure that proper waste handling takes place on site.

5.1 GENERAL WASTE MITIGATION MEASURES

1. No waste may be burned on site and should instead be disposed of at a licensed landfill site. Cleared vegetation will also not be allowed to be burned on site. The site has been largely altered from its natural state and therefore cleared vegetation will largely consist of alien invasive species. A dedicated area should be identified on site where all cleared vegetation can be stored in order to prohibit the seeds of alien invasive species to disperse on site. This storage area should not be located within close proximity to the watercourse and wetlands area. The appointed ECO should be consulted in order for a suitable area to be identified.
2. Cement bags must be disposed of in the demarcated hazardous waste receptacles and the used bags must be suitably disposed of.
3. The visible remains of concrete, either solid, or from washings, shall be physically removed immediately and disposed of as waste to a Licensed Landfill site.
4. Rubble and litter must be removed every two weeks or more often as the need arises and be disposed of at a registered landfill site as designated by the City of Cape Town Municipality Solid Waste removal department.
5. Adequate waste collection bins must be provided on site. Separate bins must be provided for general and hazardous waste.
6. No waste disposal is to be permitted below the 1:100 year floodline of the unnamed tributary of the Sir Lowry's Pass River and associated CVB wetlands.
7. Any solid waste or litter generated as part of the construction activities must be disposed of within suitable waste bins.
8. No waste or refuse must be allowed to access the stormwater infrastructure.
9. Material Safety Data Sheets (MSDS) must be prepared for all hazardous substances on site and supplied by the supplier where relevant. MSDS's must be updated as required.
10. Waste must be collected by the local municipality or a municipal service provider that is authorised to collect waste.

5.2 STORAGE OF WASTE

The following mitigation measures apply to the storage of waste. The storage of waste on site must be in line with the general requirements for the storage of waste as stipulated in Section 21 of the NEM:WA, 2008 (Act No. 59 of 2008).

General requirements for the storage of waste (as specified in terms of NEM:WA, 2008):

“Any person who stores waste must at least take steps, unless otherwise provided by this Act, to ensure that-

- (a) the containers in which any waste is stored, are intact and not corroded or in any other way rendered unfit for the safe storage of waste;*
- (b) adequate measures are taken to prevent accidental spillage or leaking;*
- (c) the waste cannot be blown away;*
- (d) nuisances such as odour, visual impacts and breeding of vectors do not arise; and*
- (e) pollution of the environment and harm to health are prevented.”*

Storage of Waste (as specified in terms of NEM:WA, 2008)

“Any person who generates general waste that is collected by a municipality must place the waste in a container approved, designated or provided by the municipality for that purpose and in a location approved or authorised by the municipality.”

If the volumes of waste stored on site exceed 80 m³ for hazardous waste and/or 100 m³ for general waste, the NEM:WA National Norms and Standards for the Storage of Waste in terms of Government Notice (GN) No. 926 of 29 November 2013 must be adhered to.

SUB SECTION 6 - WASTE REDUCTION

6.1 BACKGROUND TO WASTE REDUCTION

A key element of environmentally friendly buildings is to promote awareness and change behaviour around all aspects of waste management.

Waste minimisation can therefore be assessed as a component of waste management that aims to reduce the amount of waste, which has to be disposed of. In this regard waste minimisation is aimed at tackling the causes and sources of waste rather than just trying to address and mitigate the symptoms (e.g. through treatment). Waste management can be depicted as a hierarchy, as shown in Figure 7 below. In the hierarchy, source reduction options are considered as a priority, followed by re-use and recycling options. Treatment options are considered only when acceptable waste minimisation techniques have been investigated. As a “last resort” disposal should be considered.

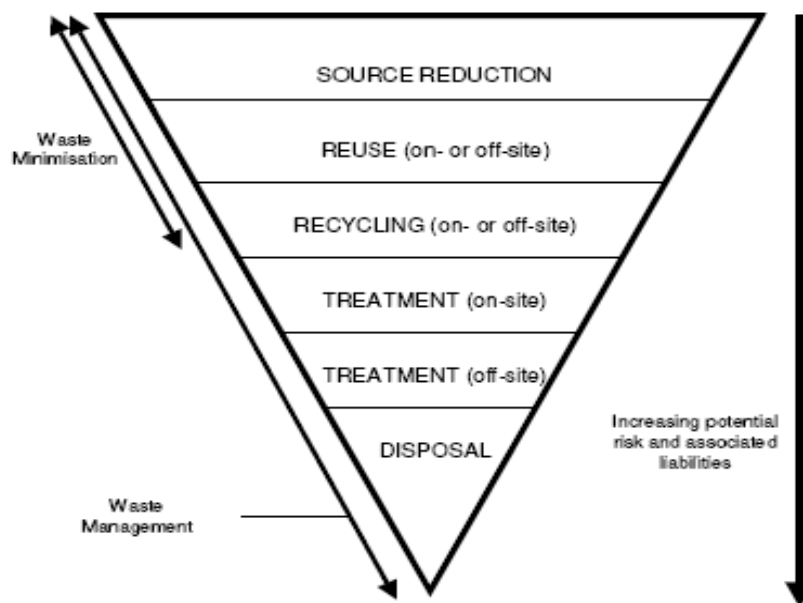


Figure 7 Waste Management Hierarchy (Common Ground & deVilliers Brownlie Associates, 2003)

Waste Management, therefore, involves interventions to minimize waste generation in the planning, operation, management and maintenance of the built environment, and includes waste prevention, waste reduction, waste re-use, and recycling.

A further aspect is minimizing the environmental and health impacts by reducing toxicity, and ensuring environmentally sound treatment and disposal of remaining waste. The ultimate is however to promote a zero waste concept where all the related materials can be used again over the longer term with life-cycle assessments, cradle to cradle.

Zero Waste is a goal, a process, a way of thinking that is different to the way we think about products and processes. Not only is Zero Waste about recycling and avoiding waste going to landfill, it also changes production and distribution systems to prevent waste from being manufactured in the first place. It is a way of changing how materials flow through society in such a way that, as in nature, they flow in a closed loop – resulting in efficient use of material and other resources, such as energy and water (Steadfast Greening, 2008).

Zero Waste therefore aims to:

- Prevent rather than manage waste.
- Turn resource that would normally be thrown away into economic value instead of loss.
- Support sustainable development.
- Follows natural processes where everything is recycled.
- Promote the efficient flow of energy and materials.

It is thus essential to ensure that waste avoidance is built into the process at a design phase, referring to the construction and maintenance of the building. This will be done through selection of the appropriate building materials and managing the construction process in a responsible manner.

Opportunities for the separation of waste at source must also be built into the design of the building to encourage people to recycle their waste.

6.2 BENEFITS OF WASTE REDUCTION

The benefits of waste reduction as described in the DEA&DP Waste Minimization Guideline (Common Ground & deVilliers Brownlie Associates, 2003) include the following benefits.

6.2.1 Financial benefits

- Reduced transportation costs for waste materials (less transportation because of less material wasted). This includes transportation to and from the site and disposal.

- Reduced disposal costs of waste materials (disposal costs are likely to rise significantly in the near future)
- Reduced purchase quantity and price of raw materials by waste minimisation.
- Reduced purchase price of new materials when considering reuse and recycling (depending on materials).
- Increased returns can be achieved by selling waste materials to be reused.

6.2.2 Environmental benefits

Some of the environmental benefits are:

- Reduced quantity of waste generated.
- Efficient use of waste generated.
- Minimised amounts of waste disposed of at landfills, which therefore extend the lifespan of landfills.
- Reduced environmental effects as a result of disposal, e.g. noise, pollution.
- Reduced transportation of waste to be disposed of (hence less noise, vehicle emission pollution, and energy used).

6.2.3 Social benefits

- Increased site safety.
- Increased work efficiency.
- Enhanced company image.
- Job creation through recycling initiatives.

6.3 GENERATED WASTE

6.3.1 Examples of waste generated during construction:

- Waste wood from cutting structural elements, broken structural elements and damaged elements from incorrect storage
- Damaged or off-cut steel components
- Off-cut electrical wiring and cabling
- Broken or off-cut tiles
- Packaging
- Off-cut and broken bricks
- Surplus material from cut and fill activities
- Spoil from cut and fill activities
- Off-cut, or broken conduit and plumbing
- Off-cut or damaged insulation elements
- Surplus paint and paint containers
- Broken or redundant plant and equipment

- Surplus concrete, cement and grouting
- General waste

SUB SECTION 7 - WASTE MINIMIZATION PLAN

7.1 WASTE MINIMIZATION DURING CONSTRUCTION

Issue	Minimization Plan
General Considerations	
Standardization of dimensions	The developer will for as far as it is economically feasible design the buildings to maximise the use of standard dimensions in order to minimize the amount of cutting waste during construction. They include but are not limited to: • The size of rooms and roofs to ensure minimal cutting of tiles; • The size of roofs to make use of standard roof trusses.
Material Selection	The developer will, for as far as it is economically feasible select: • materials for least waste generation during preparation and use during construction, • materials used in the construction which are durable in order to minimise maintenance or replacement, • standard materials to increase re-use/ recycling potential, • materials which are sourced locally.
Pre-Fabrication	The developer will, for as far as it is economically feasible make use of pre-fabricated components in order to minimise waste on site and permit re-use by the manufacturers of any waste generated during construction of the units.
Hazardous Substances	The developer will, for as far as it is economically feasible make use of non hazardous substances to replace hazardous substances such as replacing asbestos with fibre glass etc.
Maintenance	The developer will, for as far as it is economically feasible design the structure of buildings in such a way that it minimizes but facilitates maintenance, in order to prolong the life-span of the structure and reduce the amount of waste resulting from demolition. The developer will, for as far as it is economically feasible design the structure of buildings in such a way that maintenance does not require the use of hazardous or toxic substances. This will ensure that minimal waste will be un-recyclable due to contamination.

Ordering	The developer will strive to order materials “just-in-time” to avoid deterioration/ breakage during storage The developer will strive to (as far as reasonably possible) order materials only from suppliers which will take back any unused/ off-spec or broken materials favoured. The developer will strive to (as far as reasonably and economically possible) order materials in bulk to reduce packaging but without over-ordering resulting in waste generation. Suppliers which take back the packaging will be favoured by the developer.
Load and unloading of materials	The construction site staff will be trained to load and unload materials correctly to avoid breakage and wastage.
Storing of materials	Care will be taken to ensure that materials are stored appropriately according to supplier specifications to reduce the risk of damage or deterioration.
The use of temporary structures	The developer will attempt to keep temporary structures on site to a minimum. Where unavoidable the temporary structures used on this site, will be re-used on other sites.
General	The contractors must provide and maintain a method statement for “solid waste management”. The method statement must provide information on the proposed licensed facility to be utilised and details of proposed record keeping for auditing purposes. For the disposal of clean building rubble, a General & Hazardous Waste Landfill sites can be utilized. • Waste shall be separated into recyclable and non-recyclable waste, and shall be separated as follows: Hazardous waste: including (but not limited to) old oil, paint,etc, • General waste: including (but not limited to) construction rubble, • Reusable construction material. Recyclable waste shall preferably be deposited in separate bins. The contractor is advised that “Collect-a-Can” collect tins, including paint tins, chemical tins, etc. and “Consol” collect glass for recycling. Any illegal dumping of waste will not be tolerated. Proof of legal dumping must be able to be produced on request. Bins must be clearly marked for ease of management. All refuse bins must have a lid secured so that animals cannot

	gain access. Under no circumstances may any waste be burnt. All waste must be managed in accordance with the Minimum Requirements for waste disposal by landfill 2nd ed 1998. The minimum requirements for easy access by waste disposal service trucks will be met in order for vehicles to effectively access the waste. All waste must be disposed of at a registered site. It is the management bodies' responsibility to ensure that the contracted party responsible for waste disposal disposes of the waste at the correct facility. This facility refers to a General & Hazardous Waste Landfill site as referred to by the City of Cape Town Municipality Solid Waste management Department. These landfill sites are permitted by Department Water and Forestry with operating numbers in place.
	The use of building materials which result in least amount of waste generated (e.g. pre-fabrication as opposed to on-site construction/ fabrication) will be favoured by the developer as far as economically feasible. Materials will be re-used on site wherever possible. Off-cuts and equipment will be re-used on other jobs wherever possible.

7.2 WASTE MINIMIZATION DURING OPERATION

Issue	Minimization Plan
General Considerations	
General	Owners of properties will be encouraged to separate waste into recyclable and non-recyclable waste, and shall be separated as follows: • Hazardous waste: including (but not limited to) old oil, paint, etc, • General waste: including (but not limited to) domestic refuse, non- recyclable waste; • Recyclable waste shall preferably be deposited in separate bins. The owners will be advised that "Collect-a-Can" collect tins, including paint tins, chemical tins, etc. and "Consol" collect glass for recycling. Bins must be clearly marked for ease of management. All refuse bins must have a lid secured so that animals cannot

	gain access. Sufficient closed containers must be strategically located around the development to handle the amount of litter, wastes, rubbish, debris generated by the development. Under no circumstances must any waste be burnt. All waste must be managed in accordance with the Minimum Requirements for waste disposal by landfill 2nd ed 1998. The minimum requirements for easy access by waste disposal services must also be met in order for vehicles to effectively access the waste. All waste must be disposed of at a registered site. It is the management bodies' responsibility to ensure that the contracted party responsible for waste disposal disposes of the waste at the correct facility. This facility refers to a General & Hazardous Waste Landfill site as referred to by City of Cape Town Municipality Solid Waste Management Department. These landfill sites are permitted by Department Water and Sanitation with operating numbers in place.
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SUB SECTION 8 – WATER USE AND MANAGEMENT PLAN

8.1- WATER USE MINIMIZATION AND MANAGEMENT DURING CONSTRUCTION AND OPERATION

CONSTRUCTION PHASE	
Issue	Management Plan
General Considerations	
DUST SUPPRESSION	Potable water cannot (as far as possible) be used as a means of dust suppression, alternative measures must be sourced. The use of 'grey' water must be investigated as an alternative. The contractor will be responsible to source this water and obtain the required approvals.
ABLUTIONS	The developer will reuse as much of the water from wash basins on site as possible.
CONCRETE AND CEMENT PREPARATION	The developer/contractor will order concrete and cement from supplier for as far as possible. The mixing area should contain any liquids to prevent contamination of soil and storm water
GENERAL CLEANSING OPERATIONS	All hoses will be fitted with trigger gun spray nozzles to limit wastage. Dry sweeping will be used (for as far as possible) in preference to washing of areas and equipment. Wherever possible biodegradable and non-toxic detergents, soaps and degreasers will be used. Regular Maintenance of equipment will be conducted in order to prevent wastage.

OPERATIONAL PHASE	
WATER WISE LANDSCAPING	The developer will focus on the use of indigenous water wise planting and irrigation methods (if necessary), such as drip irrigation, which can drastically reduce garden water consumption. If biodegradable, non-toxic soaps, shampoos and detergents are used exclusively in the structure, these waste water streams can

	be directed to catch ponds for re-use as irrigation.
WATER SOURCES	The capture and use of rainwater from gutters and roofs will be promoted amongst owners of the new erven
ABLUTIONS	Washbasin taps should be fitted with flow reduction devices or aerators. Toilets will be fitted with dual flush systems.

SUB SECTION 9 – ELECTRICITY MANAGEMENT PLAN

9.1 ELECTRICITY CONSUMPTION REDUCTION OPERATION

Using energy efficient electrical installations is one of the cheapest and easiest ways to reduce energy costs and thus improve the economic and environmental performance of existing developments. Newer equipment is often more energy efficient than old equipment.

Choosing appliances such as energy efficient Geysers, stoves, Zero CFC based refrigerators; may initially be more expensive, although in the longer term it would reduce electrical costs and thus has a positive effect on the environment.

OPERATIONAL PHASE	
General Considerations	
AIRCONDITIONING	The buildings will as far as possible be positioned or orientated to optimise use of ambient weather and climate conditions for heating and cooling. Solar glazing or energy efficient windows to reduce need for air-conditioning will be promoted. Insulation to reduce the need for air-conditioning will be promoted. Natural air flow must be used in preference to air-conditioning wherever possible.
LIGHTING	Natural light will be used wherever possible during the day in preference to artificial light (trade off between using large windows for use of sunlight but this may require additional air-conditioning) Low voltage or compact fluorescent and/or High Pressure Sodium lights will be used in place of incandescent globes.
REFRIGERATION	Should it be used on the premises, consideration must be given to fit cold rooms and freezers with counter-weight doors to ensure that they cannot be left open unnecessarily.
HEATING	The use of solar heating will be investigated and utilized as far as economically feasible.

ANNEXURE 1 DECLARATION OF UNDERSTANDING BY THE DEVELOPER

I, _____

Representing _____

Declare that I have read and understood the contents of the Environmental Management Programme for:

Contract _____

I also declare that I understand my responsibilities in terms of enforcing and implementing the Environmental Specifications for the aforementioned Contract.

Signed: _____

Place: _____

Date: _____

Witness 1: _____

Witness 2: _____

ANNEXURE 2 DECLARATION OF UNDERSTANDING BY THE ENGINEER

I, _____

Representing _____

Declare that I have read and understood the contents of the Environmental Management Programme for:

Contract _____

I also declare that I understand my responsibilities in terms of enforcing and implementing the Environmental Specifications for the aforementioned Contract.

Signed: _____

Place: _____

Date: _____

Witness 1: _____

Witness 2: _____

ANNEXURE 3 DECLARATION OF UNDERSTANDING BY THE CONTRACTOR

I, _____

Representing _____

Declare that I have read and understood the contents of the Environmental Management Programme for:

Contract _____

I also declare that I understand my responsibilities in terms of enforcing and implementing the Environmental Specifications for the aforementioned Contract.

Signed: _____

Place: _____

Date: _____

Witness 1: _____

Witness 2: _____

ANNEXURE 4 INCIDENT AND ENVIRONMENTAL LOG

ENVIRONMENTAL INCIDENT LOG				
Date	Env. Condition	Comments <i>(Include any possible explanations for current condition and possible responsible parties. Include photographs, records etc. if available)</i>	Corrective Action Taken <i>(Give details and attach documentation as far as possible)</i>	<u>Signature</u>