

**ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr) FOR THE PROPOSED SOCIAL HOUSING DEVELOPMENT ON ERF 1359 QUEENSBURGH, 35-53 HUNTLEY ROAD, WITHIN ETHEKWINI MUNICIPALITY, KWAZULU-NATAL**



**MONDLI**  
CONSULTING

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Proposed Social Housing Development on Erf 1359  
Queensburgh, 35-53 Huntley Road, within eThekwini  
Municipality, KwaZulu-Natal

**ABSTRACT**

This is the draft Environmental Management Programme for the proposed development. It consists of recommended mitigation measures against the potential negative environmental impacts associated with the proposed development. Responsible parties and time frames for implementation of recommended measures are indicated within the EMPr.

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Prepared For

**Yethusodwa (Pty) Ltd**

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**A. ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP) WHO PREPARED THE ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr):**

1. An EMPr must comply with section 24N of the Act and include -

(a) Details of -

(i) the EAP who prepared the report:

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(ii) The expertise of the EAP (including curriculum vitae)

Name of representative of the EAP	Education qualifications	Professional affiliations	Experience at environmental assessments (yrs)
BM Mthembu	Diploma in Nature Conservation Master's Degree (Environmental Studies Dissertation, Geography) Bachelor of Laws (LLB)	EAPASA registered EAP: No. 2019/168 in accordance with the prescribed criteria of Regulation 15(1) of section 24 H Registration Authority Regulation  Society of South African Geographers (Membership No. 28/09).	Has been involved in environmental and conservation field for over 20 yrs.  Conducted EIAs for over 20 years including Strategic Env. Assessment.  Has been involved in the review and commenting on development projects impacting on the environment.
A Mhatu	Bachelor of Science Degree Ecology, Environment & Conservation and Geography	SACNASP Registered (Membership No. 125863).	Has over 9 years' experience in conducting EIAs and EIA related work.

**B. A DETAILED DESCRIPTION OF THE ASPECTS OF THE ACTIVITY THAT ARE COVERED BY THE EMPr AS IDENTIFIED BY THE PROJECT DESCRIPTION;**

Yethusodwa (Pty) Ltd is proposing the construction of 525 social housing units on Erf 1359 Queensburgh, 33 – 35 Huntley Road. This will include short internal roads, and provision of/connections for all required services. The proposed development will also include the development of a package plant system for domestic wastewater treatment as the Southern Wastewater Treatment works which services the project area does not have adequate capacity to accommodate wastewater from the proposed development. The facility itself was badly affected by the 2022 floods. The total capacity for the proposed package plant system is 1132.03125 cubic metres per day based on the number of proposed houses.

The total footprint of the proposed development is approximately 6128 square metres. The site where the development will take place is currently vacant and the vegetation on the site is predominantly degraded but consist of both indigenous plant species and alien invasive plant species (category 1b). A portion of the site is designated as part of the Durban Metro Open Space System (D'MOSS). The site overlaps with two vegetation types, predominantly Northern Coastal Forest and to a lesser extent KwaZulu-Natal Coastal Belt Grassland.

**C. A MAP AT AN APPROPRIATE SCALE WHICH SUPERIMPOSES THE PROPOSED ACTIVITY, ITS ASSOCIATED STRUCTURES, AND INFRASTRUCTRE ON THE ENVIRONMENTAL SENSITIVITIES OF THE PREFERRED SITE, INDICATING ANY AREAS THAT SHOULD BE AVOIDED, INCLUDING BUFFERES**

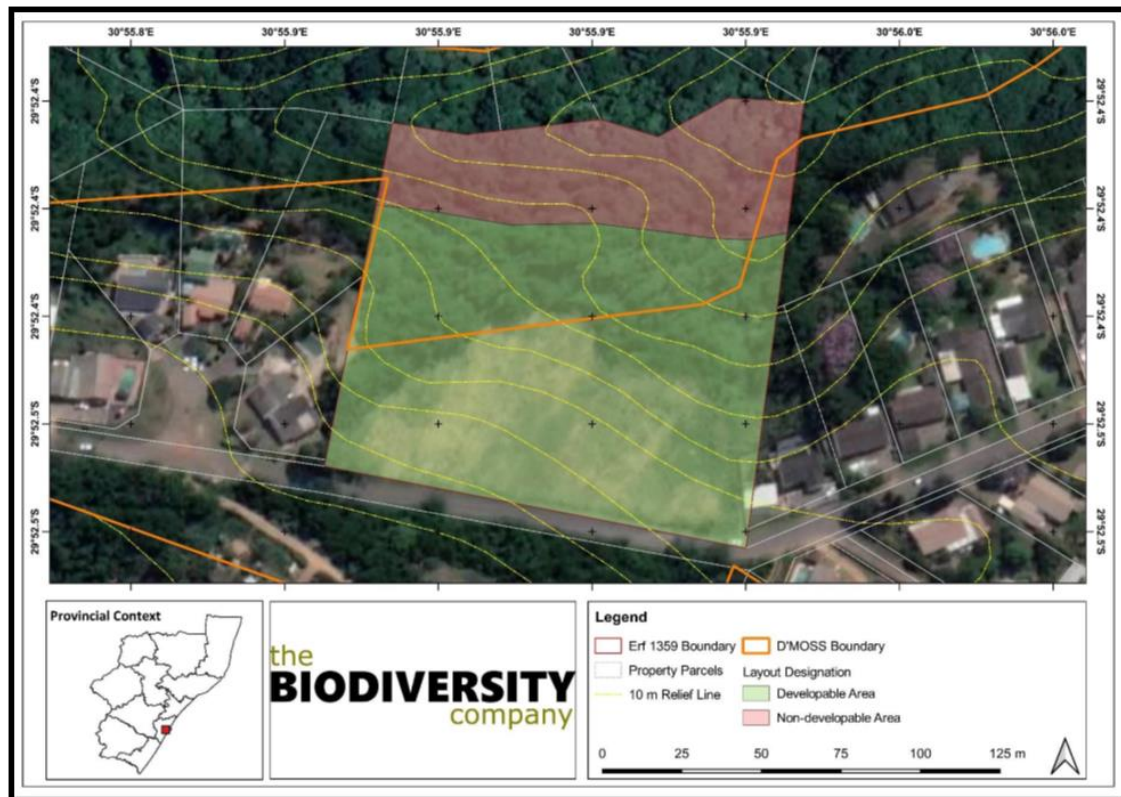


Figure 1: Map showing project property and developable and non-developable areas on the site.

**D. A DESCRIPTION OF THE IMPACT MANAGEMENT OBJECTIVES, INCLUDING MANAGEMENT STATEMENTS, IDENTIFYING THE IMPACTS AND RISKS THAT NEED TO BE AVOIDED, MANAGED AND MITIGATED AS IDENTIFIED THROUGH THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS FOR ALL PHASES OF THE DEVELOPMENT**

Impact management objectives include ensuring that the development takes place in line with the Environmental Management Programme (EMPr), EIA Regulations and National Environmental Management Act (NEMA) No. 107 of 1998 as amended for all phases of the project. Impact management provides for the avoidance, reduction and/or rectification of potential negative impacts on the environment to ensure that the project is environmentally sustainable and its implementation does not result in unacceptable levels of loss of ecological integrity and biodiversity of the affected area and surrounding environment.

Recommendations from the terrestrial biodiversity specialist and eThekweni Municipality comments have already been taken into consideration and the preferred location of the site within the property has been chosen with those considerations in mind. Impact management objectives for this project are to minimize impacts on the surrounding environment including Umbilo River. Based on the Aquatic Assessment conducted, although Umbilo River is located about 300m from the property of the proposed development, it is actually located about 405m from the proposed development footprint which in itself serves as a buffer for impacts that would otherwise occur if the project was located closer to the River.

The monitoring deals with conformance and non-conformance measured against the EMPr. Any non-compliance observed during the construction period will be followed by an immediate remedial intervention. The environmental audit and monitoring will primarily focus on evaluating the measure of compliance with statutory requirements within the project site. The Developer is primarily responsible for ensuring compliance to the EMPr and other requirements and standards applicable for the operational phase of the proposed development.

The identified impacts and risks that need to be avoided, managed and mitigated are listed below and grouped per stages of the development:

**(i) Planning and design and (ii) Pre-construction activities**

There are no significant impacts that are expected during this phase of the proposed development. However, the following aspects need to be applicable to the planning and design phase have the potential to hinder the success of the proposed development and compliance to applicable environmental and would result in negative impacts on the project and surrounding environment.

- **Insufficient consideration of all aspects that could influence the project**

If the findings of specialist studies such as the geotechnical investigation are not sufficiently considered in the design and construction of the proposed development, the stability of the proposed structures will be compromised.

Extreme weather has become an issue of concern resulting from climate change. Failure to consider impacts of extreme weather conditions, mainly heavy rain and associated flooding may compromise the stability and safety of the proposed housing units.

- **Failure to comply with environmental legislation/requirements of the EA**

There are conditions of the EA, when issued, that need to be implemented or planned for during the planning and design phase. If these are not considered, they may have the following implications:

- Environmental legislation and if issued, conditions of the EA are meant for safeguarding the environment on and around the project site. Failure to comply with these would lead to more significant impacts on the environment.
- Penalties/fines could be incurred by the Developer if they fail to adhere to conditions of the EA or legislation applicable to the project.
- The proposed construction activities would have to be ceased and remedial action implemented which would have financial implications for the Developer.
- Removal of vegetation without engaging the ECO or any other qualified person may lead to loss of species of conservation concern and other indigenous vegetation.
- Failure to implement impact mitigation measures

**(iii) Construction Activities**

- **Removal of Vegetation**

Impacts that can be associated with the removal of vegetation on the site of this development include:

- Loss of D'MOSS area.
- Vegetation clearance will result in direct habitat destruction and displacement of species.
- Invasion of Alien Invasive Plant Species. Areas exposed due to vegetation clearance will become susceptible to invasion by invasive alien plant species especially as there are many invasive plant species within the site.
- Reduction in species diversity.
- Habitat loss and fragmentation
- Removal of indigenous vegetation would have climate change related impacts which may be minor when looking only at the site and proposed development but are more significant on a cumulative impact perspective.

- **Stripping of topsoil and sub-soil for the construction of the different structures**

The following impacts can be associated with stripping of topsoil/earthworks on the site.

- Decreased topsoil quality resulting in lowered plant growth rate.
- Increased soil erosion.
- Sedimentation of stormwater and stormwater channels.
- Creation of dust within and around the site.
- Safety hazard due to open trenches within the site.

- **Use and storing of potentially hazardous substances**

If not properly handled or stored, hazardous substances may spill and result in:

- Contamination of soil within and around the site;
- Contamination of ground and surface water with seeping of contaminants into soil and pollution of runoff;
- Contamination of Umbilo River located close to the site.
- Contamination of vegetation around the site.
- Potential health and safety risks with possibility of fire and other occurrences that can affect staff and surrounding community.

- **Movement of plant and vehicles onto, off and around the site**

Associated impacts include:

- Reduced photosynthesis of nearby vegetation due to dust settling on leaves;
- Trampling of vegetation outside of the development footprint due to vehicle movements;
- Compaction of fertile soils leading to reduced plant growth and soil quality;
- Build-up of traffic due to influx of vehicles moving to and from the site especially with regards to movement of heavy vehicles which move slower and take up more space on the road thereby having a more significant impact on traffic.
- Threat to human life due to accident.

- **Use of Plant/Machinery and Working at Height**

- Safety risks associated with use of plant or machinery which would include:

- Injury to workers
- Injury to locals

- Injury risks where workers could fall from high levels

- **Waste Management**

Failure to manage, store and/or dispose of waste in an appropriate manner could have a number of negative on and/or off-site impacts including:

- Failure to store and dispose of waste accordingly will result in pollution of the surrounding environment.
- Burning or burning of waste on site would result in air emissions and groundwater contamination.
- Littering of waste around the site would have visual impacts on the area and negatively affect the appearance of the affected area.
- Dumping of waste within and around the site would also affect any animals that may occur within or close to the site.
- Failure to dispose of waste regularly may lead to odour and flies on and around the site.

- **Conduction of Construction Activities**

- There will be noise from construction vehicles, workers and construction works.
- Dust result from earthworks on the site and the movement of vehicles within and around the site.

- **Socio-Economic Aspects**

- Employment opportunities will be created for locals during the construction phase of the development.
- The inflow of people and regular movement of people around the site for the purpose of the proposed development may result in increased crime in the general project area.
- There may be complaints from the locals regarding the activities on the site, increased traffic due to construction vehicles and the appointment of locals to mention a few.

- **Riverine Impacts**

There is a watercourse which is located within the 500m radius from the site boundary which is Umbilo River. This river is located about 405m from the edge of the development footprint. The proposed development therefore has potential to affect this watercourse. Below are the impacts on Umbilo River which can be associated with the social housing development.

- Direct habitat disturbance due to riparian, instream and bank modifications from the placement of new stormwater infrastructure and discharge points.
- Soil erosion and downstream sedimentation as a result of in-effective stormwater management during the construction and operation phase of the development
- Pollution of the water resource during the construction phase from construction vehicles, concrete or bitumen.

**(iv) Rehabilitation/ post-construction**

There will be two main post-construction activities which are the decommissioning of the construction site camp and laydown area and rehabilitation of disturbed areas which have not been developed/paved. Impacts that can be associated with these activities are listed below.

- Spillages of oils fuels and chemicals causing the contamination of soils, surface and ground water;
- Hardened/ compacted soils reduce the vegetation growth;
- Reinstatement of sub-standard topsoil reduces the growth and success of indigenous vegetation;
- Proliferation of IAPS on site and into surrounding plant communities;
- Introduction of exotic species through uninformed re-vegetation efforts;
- Exposed, unsupported soil being eroded and causing erosion gullies;
- Poor stormwater runoff, leading to erosion on site.

**(v) Where relevant, operation activities;**

- **Operation of the Package Plant System**

Potential impacts that can be associated with the package plant include:



- Disposal of grey water from the proposed development to Umbilo River will have cumulative impacts on the river as it is already being impacted on by the existing Southern Wastewater Treatment Works and mining activities near the river.
  - In the case of the package malfunctioning, this would result in odour within the locality of the project site.
  - Although nutrients such as nitrogen and phosphorus are beneficial for plants, high concentrations can result in adverse effects.
  - In the event of flooding or breakdown of the package plant, raw sewerage can be released into the environment which will have negative impacts on surrounding area and potentially the Umbilo River.
- **Habitat fragmentation and ecological disturbance impacts**

Although the site for the proposed development has low sensitivity and biodiversity impact, the non-development area within the property has high sensitivity and is of high biodiversity value as a corridor for local fauna. Light and noise from the proposed development may affect fauna in this area and force it to migrate to other areas which will reduce the biodiversity value of the area.
  - **Stormwater Management**

Stormwater Management during the operation phase of the project has the potential to result in the impacts listed below.

    - Soil erosion and downstream sedimentation of Umbilo River as a result of in-effective stormwater management during the operation phase of the development.
    - During the operation phase of the development, any maintenance relating to the stormwater infrastructure in proximity to the riparian zone, will likely result in instream and riparian habitat as well as bank disturbance due to potential incursions within these sensitive environments.
    - During the operation phase of the proposed development areas previously vegetated will be hardened which will alter the natural hydrology of the catchment and potentially increase velocity of stormwater reaching the nearby riverine unit. Additionally, poor placement or design of stormwater infrastructure on the edge of the riparian zone unit could potentially cause increased erosion and sedimentation downstream over time.
  - **Waste Management**

Since the project is for housing development with a significant number of units, there will be a significant amount of domestic waste which will come from the housing units. Management of this waste or failure thereof, may have the following impacts:

    - If not well managed, waste will end up being released or disposed of into surrounding environment.
    - Waste accumulation on the site during the operation phase can lead to odour and pests and would affect the health of the residents on the property.
  - **Health and Safety Impacts**

Operation phase health and safety impacts could include the following:

- Electrical faults or other incident such as where tenants leave candles burning while they sleep will pose a fire risk which may have fatal implications.
- Should any flooding occur, this could threaten the safety and health of tenants.
- Poor maintenance of the properties can expose tenants to conditions that compromise their health and safety.
- The fact that the site is located close to an area where informal settlements have developed may be a security concern for the operation phase including crime concerns.
- Due to the steepness of the site, any flaws in the buildings, especially considering the height of 7 stories; which threaten the stability of the buildings will cause the threat of building collapse which would threaten the safety of the tenants. In addition to this, poor stormwater management and any other flaws may render the buildings susceptible to flood damage which can threaten lives.

- **Socio-Economic Impacts**

- A few employment opportunities will be created during the operation phase including security personnel for access control and care taker.
- People will benefit in having access to safe, secure and affordable rental housing.
- Surrounding neighbours will benefit through the proposed development discouraging the Development of informal settlements on the property which is likely to occur if the property is left vacant and would affect the value of their properties.

**E. A DESCRIPTION OF PROPOSED IMPACT MANAGEMENT ACTIONS, IDENTIFYING THE MANNER IN WHICH THE IMPACT MANAGEMENT OUTCOMES CONTEMPLATED IN PARAGRAPH (D) WILL BE ACHIVED, AND MUST, WHERE APPLICABLE, INCLUDE ACTIONS TO-**

***(i) Avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation***

The table below shows the recommended mitigation measures for the impacts listed in **D** above.

Activity	Resulting Impact	Proposed Mitigation
<b>Planning/ Pre-Construction Phase</b>		
Insufficient consideration of all aspects that could influence the project	<ul style="list-style-type: none"> <li>● If the findings of specialist studies such as the geotechnical investigation are not sufficiently considered in the design and construction of the proposed development, the stability of the proposed structures will be compromised.</li> <li>● Extreme weather has become an issue of concern resulting from climate change. Failure to consider</li> </ul>	<ul style="list-style-type: none"> <li>● All findings of the environmental assessment including specialist studies and recommendations from specialists and stakeholders must be factored into the design and layout of the proposed development.</li> <li>● As stated in the pre-application for the proposed development, the design of the stormwater system, sewer system and housing structures must consider flood events in light of floods that occurred in 2022 and the damage caused and lives lost.</li> </ul>

	impacts of extreme weather conditions, mainly heavy rain and associated flooding may compromise the stability and safety of the proposed housing units.	
Failure to comply with environmental legislation/requirements of the EA	<ul style="list-style-type: none"> <li>• Environmental legislation and if issued, conditions of the EA are meant for safeguarding the environment on and around the project site. Failure to comply with these would lead to more significant impacts on the environment.</li> <li>• Penalties/fines could be incurred by the Developer if they fail to adhere to conditions of the EA or legislation applicable to the project.</li> <li>• The proposed construction activities would have to be ceased and remedial action implemented which would have financial implications for the Developer.</li> <li>• Removal of vegetation without engaging the ECO or any other qualified person may lead to loss of species of conservation concern and other indigenous vegetation.</li> <li>• Failure to implement impact mitigation measures</li> </ul>	<ul style="list-style-type: none"> <li>• An Environmental Control Officer must be appointed at least 2 months prior to the intended date of the commencement of the proposed development.</li> <li>• Once appointed, the ECO must familiarize themselves with the EA, EMPr and any other accompanying documents and advise the Developer, Contractor and other members of the project team accordingly.</li> <li>• No form of on-site activity including site clearance may take place prior to notifying EDTEA of the commencement of the development.</li> <li>• A site walk through must be conducted with a suitably qualified expert in order to conduct and onsite inspection of vegetation to identify indigenous plant species that may occur within the development footprint and advise on best action concerning on the identified plant species based on their conservation status.</li> <li>• Implementation of mitigation measures must be considered prior to the commencement of the construction in order to ensure that sufficient resources are timeously allocated and acquired for the implementation of mitigation measures.</li> <li>• The EMPr must be kept on site at all times.</li> <li>• All members of the project team must be provided with adequate environmental training.</li> <li>• Any and all mitigation measures that must be set up prior construction must be implemented.</li> <li>• Monitoring and control programmes must be put in place to manage alien invasive plants.</li> <li>• The working area is to be clearly demarcated and all construction work is to be kept within the demarcated area.</li> </ul>
Construction Phase		
Activity	Resulting Impact	Proposed Mitigation
Removal of Vegetation	<ul style="list-style-type: none"> <li>• Loss of D'MOSS area.</li> <li>• Vegetation clearance will result in direct habitat destruction and displacement of species.</li> <li>• Invasion of Alien Invasive Plant Species. Areas exposed due to vegetation clearance will become susceptible to invasion by invasive</li> </ul>	<ul style="list-style-type: none"> <li>• D'MOSS area designated as non-developable must not under any circumstances be disturbed during any stage of the proposed development. This non-developable area must be assigned an appropriate zoning to ensure its protection for the lifetime of the proposed development.</li> <li>• A 25m buffer from the edge of the boundary of the proposed development to the non-</li> </ul>

	<p>alien plant species especially as there are many invasive plant species within the site.</p> <ul style="list-style-type: none"> <li>• Reduction in species diversity.</li> <li>• Habitat loss and fragmentation.</li> <li>• Removal of indigenous vegetation would have climate change related impacts which may be minor when looking only at the site and proposed development but are more significant on a cumulative impact perspective.</li> </ul>	<p>developable area must be maintained. This buffer area must not be hardened and can only be used for soft recreation areas and indigenous gardens.</p> <ul style="list-style-type: none"> <li>• All services, including stormwater, internal sewer and water reticulation must therefore consider the conditions for the 25m buffer and must be located outside this buffer.</li> <li>• The compiled Invasive Alien Plant Species Management Plan, once approved, must be implemented throughout the duration of the proposed development including operation phase to eradicate invasive alien plant species within the site.</li> <li>• No site clearance may take place prior to a site walkthrough being conducted by the appointed ECO.</li> <li>• The project footprint must be clearly demarcated and no vegetation removal may take place beyond the demarcated project area.</li> <li>• Vegetation removal must be minimized to what is necessary.</li> <li>• Indigenous trees are ecologically important from a Climate Change Mitigation point of view, regardless of their conservation status. Therefore; any indigenous trees to be removed from the developable footprint must be identified and accounted for, both within and/or outside the project area.</li> <li>• All areas cleared of vegetation which are not engineered, must be revegetated with indigenous plant species. This must include use of trees of the same indigenous tree species as those removed during site clearing. A list of recommended species for rehabilitation and landscaping has been provided as <b>Appendix A</b> of this report.</li> <li>• All areas which are not part of the project footprint and work area must be treated as no-go areas and demarcated as such.</li> <li>• Movement onto and off the site must only take place through designate access routes and there must be no haphazard movement of vehicles around the site.</li> <li>• The Alien and Invasive Species Regulations published in the Government Gazette No. 43726, 18 September 2020, call for the removal and / or control of alien invasive plant species (Category 1 species). There are Category 1b Invasive Alien Plant Species identified within</li> </ul>
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		<p>the site and according to the National Environmental Management: Biodiversity Act (Act 10 of 2004), Category 1b Invasive species require compulsory control as part of an invasive species control programme and must be remove and destroyed.</p>
<p>Stripping of topsoil and sub-soil for the construction of the different structures</p>	<ul style="list-style-type: none"> <li>• Decreased topsoil quality resulting in lowered plant growth rate.</li> <li>• Increased soil erosion.</li> <li>• Sedimentation of stormwater and stormwater channels.</li> <li>• Creation of dust within and around the site.</li> <li>• Safety hazard due to open trenches within the site.</li> <li>• Excavation activities on site may lead to disturbance of services such as water and electricity if underground services are disturbed or damaged. The Contractor/Developer would be liable to fix damage to services as a result of the Contractor’s activities on site.</li> </ul>	<ul style="list-style-type: none"> <li>• The location of all underground services and servitudes must be identified and confirmed before construction commences (IF ANY).</li> <li>• Topsoil must be sequentially removed in accordance with the requirements on site.</li> <li>• All topsoil must be adequately stored:             <ul style="list-style-type: none"> <li>○ On a Flat surface;</li> <li>○ Below two metres;</li> <li>○ Suitably covered if stored for prolonged periods of time.</li> <li>○ Separate from sub-soil and other stockpiles.</li> </ul> </li> <li>• All temporary embankments that are considered sensitive to erosion must be adequately retained and supported (sandbags, fascine work, retaining blocks etc.).</li> <li>• Where applicable/necessary measures to prevent silt from being washed offsite onto surrounding environment, must be implemented.</li> <li>• Dust suppression methods must be used on the site.</li> <li>• Open trenches must be demarcated with safety net and appropriate signage must be displayed to warn of deep excavations.</li> </ul>
<p>Use and storing of potentially hazardous substances</p>	<p>If not properly handled or stored, hazardous substances may spill and result in:</p> <ul style="list-style-type: none"> <li>• Contamination of soil within and around the site;</li> <li>• Contamination of ground and surface water with seeping of contaminants into soil and pollution of runoff;</li> <li>• Contamination of Umbilo River located close to the site.</li> <li>• Contamination of vegetation around the site.</li> <li>• Potential health and safety risks with possibility of fire and other occurrences that can affect staff and surrounding community.</li> </ul>	<ul style="list-style-type: none"> <li>• All storage of potentially hazardous substances including paint must be in line with the provisions of Hazardous Substances Act (Act 15 of 1973).</li> <li>• There must be action plans on site, and training for contactors and employees in the event of hazardous substance spills to the surrounding environment.</li> <li>• All hazardous substances must be stored on impermeable surfaces throughout the project life cycle.</li> <li>• Storage areas where flammable substances are kept must be equipped with serviced fire extinguisher.</li> <li>• Storage areas must not have direct sunlight.</li> <li>• Depending on the amount of fuel and other hazardous substances that are to be kept on</li> </ul>

		<p>site, the Contractor must establish a bunded area that has the capacity to contain the contents of the containers to be kept within the bunded area.</p> <ul style="list-style-type: none"> <li>• Mixing of concrete may only be done on impermeable surfaces. Plastic liners and mixing trays may be used for this purpose.</li> <li>• No smoking must be allowed within or close to storage areas where flammable substances are kept.</li> <li>• Material Safety Data Sheets must be kept for all potentially hazardous substances.</li> <li>• All workers who will handle potentially hazardous substances must undergo applicable training and be provided with relevant safety clothing.</li> <li>• Emergency procedures must be known to all workers and must be made part of site induction/training.</li> <li>• A spill kit must be provided on the site to clean up any minor spills on the site with all hazardous waste to be disposed of at a landfill/disposal site that is authorized to handle and dispose of such waste.</li> <li>• Significant spills must be reported to EDTEA DWS and eThekweni Municipality and an approved Contractor must be appointed to clean up such spills and dispose of contaminated materials.</li> </ul>
<p>Movement of plant and vehicles onto, off and around the site.</p>	<ul style="list-style-type: none"> <li>• Reduced photosynthesis of nearby vegetation due to dust settling on leaves;</li> <li>• Trampling of vegetation outside of the development footprint due to vehicle movements;</li> <li>• Compaction of fertile soils leading to reduced plant growth and soil quality;</li> <li>• Build-up of traffic due to influx of vehicles moving to and from the site especially with regards to movement of heavy vehicles which move slower and take up more space on the road thereby having a more significant impact on traffic.</li> <li>• Threat to human life due to accident.</li> </ul>	<ul style="list-style-type: none"> <li>• Traffic signs must be erected throughout the site, demarcating the following:             <ul style="list-style-type: none"> <li>○ Speed limits;</li> <li>○ Sensitive areas; and</li> <li>○ No-go areas</li> </ul> </li> <li>• Dust suppression must be implemented on all access roads. This practice must be carefully monitored by the ECO and all water usage must be recorded throughout the project lifespan.</li> <li>• All temporary roads must receive rehabilitation prior to the closure of the site (deep-rip, backfilling of topsoil).</li> <li>• Vehicles may only traverse designated areas and access roads.</li> <li>• Heavy duty machinery must be stored in allocated areas and not left out in open spaces.</li> <li>• All vehicles observed to have leaks must be serviced immediately. Where some time lapses between detection of the spill and servicing of the vehicle/machinery, such vehicle must be</li> </ul>

		<p>parked on hardened surface or have a drip tray placed under the vehicle.</p> <ul style="list-style-type: none"> <li>• Animal fatalities due to construction works must be recorded and reported accordingly. Where animal species are observed within the site, such animals must as far as possible be removed from the site.</li> <li>• Movement of construction vehicles around the site must be controlled with temporary traffic signage to be displayed accordingly. Delivery of materials through heavy vehicles must preferably be scheduled to take place outside peak traffic periods to reduce the impact of traffic build up.</li> </ul>
<p>Use of Plant/Machinery and Working at Height</p>	<ul style="list-style-type: none"> <li>• Safety risks associated with use of plant or machinery which would include: <ul style="list-style-type: none"> <li>○ Injury to workers</li> <li>○ Injury to locals</li> </ul> </li> <li>• Injury risks where workers could fall from high levels</li> <li>• Construction activities and vehicles could cause spillages of lubricants, fuels and waste material potentially negatively affecting the functioning of the surrounding ecosystem.</li> </ul>	<ul style="list-style-type: none"> <li>• A health and safety officer must be appointed for the proposed development to ensure that all safety standards are met from the onset.</li> <li>• A safety rep must always be present on site for day to day monitoring of compliance and implementation of necessary measures to ensure safety of workers.</li> <li>• The workers' training must include training on emergency procedures that should be followed in case of an emergency.</li> <li>• A safety harness and helmet must be used when working at a height.</li> <li>• Scaffolding must be erected and inspected by a suitably qualified person.</li> <li>• All workers on the site must have medical certification which shows they are medically fit for the tasks that their job description entails.</li> <li>• All vehicles and equipment must be routinely maintained.</li> </ul>
<p>Waste Management</p>	<ul style="list-style-type: none"> <li>• Failure to store and dispose of waste accordingly will result in pollution of the surrounding environment.</li> <li>• Burning or burning of waste on site would result in air emissions and groundwater contamination.</li> <li>• Littering of waste around the site would have visual impacts on the area and negatively affect the appearance of the affected area.</li> <li>• Dumping of waste within and around the site would also affect any animals that may occur within or close to the site.</li> </ul>	<ul style="list-style-type: none"> <li>• Wind and scavenger proof containers must be provided and used for on-site waste storage. This must include provision of waste bins with garbage bags and lids as well as a skip(s).</li> <li>• Worker induction must include informing workers of the appropriate waste disposal methods. Implementation of this must be monitored on a daily basis.</li> <li>• Waste must not be left to accumulate onsite and should be regularly disposed of at the nearest waste disposal site.</li> <li>• The waste disposal method for both general and hazardous waste must be confirmed with the appointed ECO prior to the commencement of construction activities.</li> </ul>

	<ul style="list-style-type: none"> <li>• Failure to dispose of waste regularly may lead to odour and flies on and around the site.</li> </ul>	<ul style="list-style-type: none"> <li>• Waste disposal certificates/waybills must be kept on file as proof of safe waste disposal.</li> <li>• Workers must be trained to exercise environmentally friendly practices including proper disposal of waste and not setting traps for animals on the site.</li> <li>• Littering on or around the site must be strictly forbidden.</li> <li>• Burning and burying of waste is strictly forbidden.</li> </ul>
<p style="text-align: center;">Conduction of Construction Activities</p>	<ul style="list-style-type: none"> <li>• There will be noise from construction vehicles, workers and construction works.</li> <li>• Dust result from earthworks on the site and the movement of vehicles within and around the site.</li> <li>• There are health and safety impacts which can be associated with activities on site including:             <ul style="list-style-type: none"> <li>○ Respiratory problems due to being exposed to dust.</li> <li>○ Injuries from heavy material falling on workers.</li> <li>○ Health and safety impacts of not having access to clean ablutions and safe drinking water.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Neighbours located in proximity of the site must be informed of the intended commencement of construction at least a week before it takes place. This can be done through the ward councilor for the area.</li> <li>• Construction works must be limited to working hours between 07:00am and 04:30pm during weekdays and preferably no works during the operation phase.</li> <li>• Workers may not make any excessive/unnecessary noise within the site.</li> <li>• There may be no playing of loud music from the construction vehicles.</li> <li>• Construction vehicles must be kept in good condition to avoid excessive exhaust emissions and noise.</li> <li>• All requirements of the Occupational Health and Safety Act (Act No. 85 of 1993) must be complied with.</li> <li>• All necessary signage must be displayed within and around the site.</li> <li>• All workers must be provided with the necessary Protective Clothing (PPE) for the tasks they are expected to complete and use of such PPE must be enforced.</li> <li>• Workers must at all times be provided with clean drinking water.</li> <li>• Clean and hygienic mobile toilets must be provided for workers throughout the construction phase. Such toilets must regularly be serviced by an approved service provider to ensure that they are clean and safe to use at all times.</li> <li>• Emergency procedures must be explained to all workers in case of incidents such as a fire breakout.</li> </ul>
<p>Socio-Economic Aspects</p>	<ul style="list-style-type: none"> <li>• Employment opportunities will be created for locals during the construction phase of the proposed development.</li> </ul>	<ul style="list-style-type: none"> <li>• Terms of employment must be clearly explained to all workers prior to finalization of their employment.</li> </ul>



	<ul style="list-style-type: none"> <li>• The inflow of people and regular movement of people around the site for the purpose of the proposed development may result in increased crime in the general project area.</li> <li>• There may be complaints from the locals regarding the activities on the site, increased traffic due to construction vehicles and the appointment of locals to mention a few.</li> </ul>	<ul style="list-style-type: none"> <li>• The Contractor and developer must avoid making promises to the community especially those that will be hard to keep.</li> <li>• The Contractor and Developer must consider giving some form of certification to workers for the skills they displayed during their employment period.</li> <li>• A community liaison officer must be appointed prior to the commencement of construction works to be the communication bridge between the Contractor and community.</li> <li>• Local suppliers must be allowed to quote for required material and services and must preferably be given preference where their services or material meet the requirements for use in construction of proposed structures.</li> <li>• No persons may be allowed to stay on the site except for security personnel.</li> <li>• There must be a complaints register on site which must be used to record complaints received and how they were resolved.</li> <li>• The local councilor and business forum (if available) must be engaged in the appointment of locals including the selection of suppliers of materials so as to allow local companies the opportunity to provide quotes for materials and/or services needed.</li> </ul>
<p><b>Riverine Unit Impacts: Site located close to Umbilo River and therefore activities on site may have impacts on this watercourse.</b></p>		
<p>Direct habitat disturbance due to riparian, instream and bank modifications from the placement of new stormwater infrastructure and discharge points.</p>	<ul style="list-style-type: none"> <li>• Clearing and destruction of riparian vegetation can take place both intentionally, for servitude clearing purposes, or unintentionally due to negligence of the active staff onsite.</li> <li>• Vegetation clearing for the development, maintenance of the electric line servitudes, and internal roads will have a minimum impact on the aquatic resources largely because of the distance between the development site and the river.</li> </ul>	<ul style="list-style-type: none"> <li>• A buffer of 32m is recommended from the edge of delineated riparian habitat and should be enforced for the duration of the project. These buffers should be clearly demarcated when/ or if work is to be undertaken nearby to ensure no unnecessary incursions by vehicles or clearing takes place within these sensitive areas.</li> <li>• Stormwater attenuation structures should not be placed within the riparian zones or associated 15m buffer. Stormwater outlet protection may be placed within these sensitive areas in order to negate, or at least minimise, potential erosion from the stormwater outlets.</li> <li>• The use of existing tracks and roads to gain access to the work area must be prioritised as far as practically possible.</li> <li>• There shall be no mining of soil, sand or rock required for construction purposes from the banks of riverine areas. Soil must be brought in, as/if needed, for construction purposes. The</li> </ul>

		<p>rock and soils stockpiles must be located at least 50m away from the riverine units.</p> <ul style="list-style-type: none"> <li>• Additional soil stockpiling related mitigation includes the following; <ul style="list-style-type: none"> <li>○ The soil stockpiles should be stored at a maximum height of 2m to avoid compaction and loss of micro-organisms.</li> <li>○ Soil stockpiles should also be kept free of weeds and potential alien plant invasion.</li> </ul> </li> <li>• In the case that soil is excavated for the sewer pipeline trench, the topsoil and subsoil must be separated. The pipeline should be buried at least 0.5m below the surface, where possible, as an insufficient burial depth may lead to unnecessary erosion.</li> <li>• During the replacement of soil within the trenches, replacement of subsoil must precede the topsoil replacement, and all material must be well compacted.</li> <li>• An Environmental Control Officer (ECO) must be appointed to monitor compliance with mitigation onsite.</li> <li>• A copy of the Environmental Management Programme (EMPr) should be available at the site camps or offices during the construction phase of the proposed development.</li> </ul>
<p>Soil erosion and downstream sedimentation as a result of in-effective stormwater management during the construction and operation phase of the development.</p>	<ul style="list-style-type: none"> <li>• Construction activities (i.e. excavations, vegetation clearing and depositing fill material) expose soil to environmental factors including rainfall and wind which can lead to the removal of topsoil resulting in soil erosion. Sedimentation caused by this loose soil can impact riverine systems through diminishing water quality by increasing turbidity which may affect local floral and faunal assemblages.</li> <li>• Compaction of soil will occur in the working areas due to heavy vehicle traffic during construction which will promote surface run-off and reduce infiltration which, in turn, will increase the volume and velocity of surface water entering the river system, thereby creating an erosion risk.</li> </ul>	<ul style="list-style-type: none"> <li>• Erosion control measures must be implemented in areas sensitive to erosion such as near water supply points, edges of slopes, near valley low points, drainage features and at the base of embankments and/or platforms. These measures include but are not limited to - the use of sand bags, geotextiles such as soil cells which are used in the protection of slopes, hessian sheets, silt fences and retention or replacement of vegetation. These erosion control measures must also be used during progressive rehabilitation of the site, where necessary, during and after construction activities.</li> <li>• Do not allow surface water or storm water to be concentrated, or to flow down cut or fill slopes without erosion protection measures being in place.</li> <li>• Install sediment barriers across the downslope extent of the construction area to prevent potential sedimentation of the riparian zones.</li> </ul>

		<ul style="list-style-type: none"> <li>• Any necessary temporary access roads must be aligned along the natural contour of the slopes and sufficient stormwater controls must be in place in order to avoid the road acting as a preferential flow path for water runoff.</li> <li>• Stormwater and any runoff must flow into energy dissipation structures prior to being discharged back into the natural watercourses (such as retention ponds or areas with rock riprap / grassed with indigenous vegetation to encourage the trapping of silt and attenuation of flows). Stormwater attenuation must take place outside the recommended buffer zones.</li> <li>• Permeable surfaces should be used, where possible, throughout the development in order to assist with rainwater infiltration which will reduce the intensity of and volume of stormwater runoff.</li> <li>• Soft or 'green' engineering practices should be employed, where viable, to allow for reduced run-off from the hardened surfaces associated with development. Recommended soft engineering practices include the reshaping and revegetation (i.e. landscaping) of disturbed areas as well as the construction of vegetated swales and infiltration trenches as opposed to concrete v-drains.</li> <li>• During the construction and operation phase it is recommended that potentially disturbed riparian / instream habitats and rehabilitated areas are monitored for potential erosion. This should initially take place monthly during construction, immediately after the cessation of construction and thereafter quarterly for two years.</li> <li>• A stormwater management plan must be compiled for the proposed development which must include site specific mitigation measures in addition to the mitigation presented above.</li> </ul>
<p>Pollution of the water resource during the construction phase from construction vehicles, concrete or bitumen.</p>	<p>Mismanagement of solid waste and pollutants during construction including hydrocarbons, cement, bitumen, oils and grease as well as other hazardous chemicals will result in these substances entering and polluting sensitive riverine environments either directly through surface runoff during rainfall events or subsurface water movement. The linked nature of</p>	<ul style="list-style-type: none"> <li>• All waste must be disposed of at an appropriate licensed facility and proper management and disposal of construction waste must occur throughout the construction phase.</li> <li>• All solid waste generated during construction is to be disposed of as per the EMPr.</li> <li>• Waste bins must be provided at the site camp for solid waste purposes. Note that refuse generated by workers and construction related waste should not be mixed.</li> </ul>

	<p>watercourses will result in the pollutants being carried downstream from the working site. An increase in pollutants will lead to a decline in the water quality of the riverine unit leading to overall habitat degradation and potential localised floral or faunal extinctions.</p>	<ul style="list-style-type: none"> <li>• No washing of paint brushes, containers, wheelbarrows, spades, picks or any other equipment adjacent to, or within, riparian or instream areas is permitted. Washing of implements should take place within a bunded area at least 50m away from the delineated boundary of the riverine unit.</li> <li>• No disposal of any substance, such as cement, oil or bitumen, within the nearby watercourses is permitted.</li> <li>• • Spillages of fuels, oils and other potentially harmful chemicals must be cleaned up immediately and contaminants properly drained and disposed of using suitable licensed solid/hazardous waste facilities (not to be disposed of within the natural environment). Any contaminated soil must be removed, and the affected area rehabilitated immediately. A spill response plan must be drafted and communicated to all onsite staff in this regard.</li> <li>• • The site camp, fuel depots and equipment lay-down areas are not to be located within delineated riparian or wetland areas. These areas should ideally be located at least 50m from the edge of the riparian zone on a relatively flat area, if possible. The proposed location of the site camp, fuel depots, equipment lay-down areas will need to be approved by the ECO before commencing with construction.</li> <li>• Bunded areas should be created and suitably maintained onsite. All refueling and storage of harmful chemicals, if necessary, should take place within these areas to ensure that no harmful run-off reaches the watercourses. It is also important for heavy machinery operating onsite to be routinely checked for fuel leaks or malfunctions to minimise the risk of a pollutant spill.</li> <li>• Portable toilets must be placed on impervious level surfaces that are bunded to prevent potential leakages. The portable toilets must be located at least 50 m away from the edge of the riparian zones.</li> <li>• The portable toilets must be serviced weekly by the contractor. The service records should be available for the ECO in this regard.</li> <li>• Education of workers is necessary to employ sound pollution prevention practices. Training programs must be provided and contain</li> </ul>
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		<p>information on the handling of hazardous materials, spill prevention and emergency spill response.</p> <ul style="list-style-type: none"> <li>• Any abstraction from the riverine units for construction purposes must be approved by the Department of Water and Sanitation (DWS).</li> <li>• During the construction phase it is recommended that aquatic biomonitoring is undertaken on a quarterly basis, with one assessment post-construction.</li> <li>• The contractor must utilise industry best-practice measures when implementing and maintaining the sewerage infrastructure onsite.</li> <li>• An environmental contingency plan is recommended for the proposed development to ensure that potential environmental incidents or emergencies, such as malfunctioning sewerage infrastructure, can be quickly and effectively resolved.</li> <li>• The applicant must ensure that the sewage treatment works receiving the additional sewage from the proposed housing development has sufficient capacity before allowing occupancy at the housing development.</li> </ul>
<b>Post-construction</b>		
<p>Decommissioning of the construction site camp and laydown area and rehabilitation</p>	<ul style="list-style-type: none"> <li>• Spillages of oils fuels and chemicals causing the contamination of soils, surface and ground water;</li> <li>• Hardened/ compacted soils reduce the vegetation growth;</li> <li>• Reinstatement of sub-standard topsoil reduces the growth and success of indigenous vegetation;</li> <li>• Proliferation of IAPS on site and into surrounding plant communities;</li> <li>• Introduction of exotic species through uninformed re-vegetation efforts;</li> <li>• Exposed, unsupported soil being eroded and causing erosion gullies;</li> <li>• Poor stormwater runoff, leading to erosion on site.</li> </ul>	<ul style="list-style-type: none"> <li>• Rehabilitation must be conducted on site, by adequately backfilling topsoil and reinstating indigenous vegetation.</li> <li>• All access roads must be deep-ripped and adequately rehabilitated.</li> <li>• Rehabilitation of the site must be monitored by an ECO.</li> <li>• Natural berms and contours must be reinstated by the Contractor prior to the closure of the site.</li> <li>• Spill kits must be available on site at all times and must be suitably equipped to deal with spills.</li> <li>• Stockpiles must be cleared of IAPS and this must be checked before backfilling.</li> <li>• No stockpiles must be left behind after the construction phase, but rather must backfill and/or removed from site.</li> <li>• Approved stormwater management plan must be implemented and maintained.</li> </ul>
<b>Operational Phase</b>		
<b>Activity</b>	<b>Resulting Impact</b>	<b>Proposed Mitigation</b>

<p>Operation of the Package Plant System</p>	<ul style="list-style-type: none"> <li>• Disposal of grey water from the proposed development to Umbilo River will have cumulative impacts on the river as it is already being impacted on by the existing Southern Wastewater Treatment Works and mining activities near the river.</li> <li>• In the case of the package malfunctioning, this would result in odour within the locality of the project site.</li> <li>• Although nutrients such as nitrogen and phosphorus are beneficial for plants, high concentrations can result in adverse effects.</li> <li>• In the event of flooding or breakdown of the package plant, raw sewerage can be released into the environment which will have negative impacts on surrounding area and potentially the Umbilo River.</li> </ul>	<ul style="list-style-type: none"> <li>• SANS 52566-3:2010; Small wastewater treatment systems for up to 50 PT- Part 3: Packaged and/or site assembled domestic wastewater treatment plants. Specifies to wastewater drainage systems which operate under gravity and is applicable to drainage systems inside dwellings and commercial, institutional and industrial buildings.</li> <li>• Time and effort must be invested in the proper maintenance of the package plant.</li> <li>• Disinfection is the final step in the treatment process and it is essential that the water is adequately treated prior to this step in order to ensure that the disinfection step is effective.</li> <li>• The Developer must ensure that there is a monitoring system for the package plant which must include monitoring of the quality of the water being discharged from the package plant and investigation of potential leaks.</li> <li>• It is important that the location and design of the package plant tank takes into consideration potential flooding and breakdown and how in these events, the release of raw sewerage can be avoided or quickly stopped and remedied.</li> </ul>
<p>Fragmentation and ecological disturbance impacts</p>	<ul style="list-style-type: none"> <li>• Although the site for the proposed development has low sensitivity and biodiversity impact, the non-development area within the property has high sensitivity and is of high biodiversity value as a corridor for local fauna. Light and noise from the proposed development may affect fauna in this area and force it to migrate to other areas which will reduce the biodiversity value of the area.</li> </ul>	<ul style="list-style-type: none"> <li>• Controlling both the direct and indirect impacts of the proposed development will be key in ensuring the sustainability of this development.</li> <li>• Mitigating noise and light impacts will be difficult to enforce during the operation of the site, however lighting design to avoid casting light onto areas beyond the site may be implemented. Edge impacts and alien plant infestation impacts can be quite easily controlled through maintenance activities.</li> <li>• Edge effects whilst unavoidable should be carefully controlled by applying mitigation techniques early, and loss of ecosystem function should be controlled by careful monitoring and avoidance of any activities from taking place outside of the proposed development footprint.</li> </ul>
<p>Stormwater Management</p>	<ul style="list-style-type: none"> <li>• Soil erosion and downstream sedimentation of Umbilo River as a result of in-effective stormwater management during the operation phase of the development.</li> <li>• During the operation phase of the proposed development, any maintenance relating to the</li> </ul>	<ul style="list-style-type: none"> <li>• Do not allow surface water or storm water to be concentrated, or to flow down cut or fill slopes without erosion protection measures being in place.</li> <li>• Stormwater and any runoff must flow into energy dissipation structures prior to being discharged back into the natural watercourses (such as retention ponds or areas with rock</li> </ul>

	<p>stormwater infrastructure in proximity to the riparian zone, will likely result in instream and riparian habitat as well as bank disturbance due to potential incursions within these sensitive environments.</p> <ul style="list-style-type: none"> <li>• During the operation phase of the proposed development areas previously vegetated will be hardened which will alter the natural hydrology of the catchment and potentially increase velocity of stormwater reaching the nearby riverine unit. Additionally, poor placement or design of stormwater infrastructure on the edge of the riparian zone unit could potentially cause increased erosion and sedimentation downstream over time.</li> </ul>	<p>riprap / grassed with indigenous vegetation to encourage the trapping.</p> <ul style="list-style-type: none"> <li>• Do not allow surface water or storm water to be concentrated, or to flow down cut or fill slopes without erosion protection measures being in place.</li> <li>• It is imperative that the design of the stormwater system is such that it is able to cope with the significant run off that a development of this nature can generate.</li> <li>• An environmental contingency plan is recommended for the proposed development to ensure that potential environmental incidents or emergencies, such as malfunctioning sewerage infrastructure, can be quickly and effectively resolved.</li> </ul>
<p>Waste Management</p>	<ul style="list-style-type: none"> <li>• As this is a housing development, a significant amount of waste will be generated from the operation phase. If not well managed, such waste will end up being released or disposed of into surrounding environment.</li> <li>• Waste accumulation on the site during the operation phase can lead to pests and would affect the health of the residents on the property.</li> </ul>	<ul style="list-style-type: none"> <li>• Large waste receptacles must be provided in a designated waste storage area.</li> <li>• A waste management plan must be compiled and implemented for the operation phase prior to moving in of tenants. This plan must include a time and date on which the waste receptacles must be taken to the waste collection truck's route.</li> <li>• The Developer must ensure that the interval at which waste is taken of site is sufficient to discourage waste accumulation. Should the collection of waste once a week by the Municipality not be sufficient, the Developer must make appropriate arrangements and ensure that all waste from the site is not disposed of in any natural environment near the site or on any other location.</li> </ul>
<p>Health and Safety Impacts</p>	<ul style="list-style-type: none"> <li>• Electrical faults or other incident such as where tenants leave candles burning while the sleep will pose a fire risk which may have fatal implications.</li> <li>• Should any flooding occur, this could threaten the safety and health of tenants.</li> <li>• Poor maintenance of the properties can expose tenants to conditions that compromise their health and safety.</li> </ul>	<ul style="list-style-type: none"> <li>• The electrical installations on the buildings must be done, inspected and approved by a qualified person.</li> <li>• The National Building Regulations and Building Standards Act 103 of 1977 must be complied with.</li> <li>• Procedures to be followed in the event of any emergency must be communicated with all tenants including the emergency evacuation procedure and location of assembly point.</li> <li>• The proposed buildings must be equipped with serviced fire extinguishers.</li> </ul>

	<ul style="list-style-type: none"> <li>• The fact that the site is located close to an area where informal settlements have developed may be a security concern for the operation phase including crime concerns.</li> <li>• Due to the steepness of the site, any flaws in the buildings, especially considering the height of 7 stories; which threaten the stability of the buildings will cause the threat of building collapse which would threaten the safety of the tenants. In addition to this, poor stormwater management and any other flaws may render the buildings susceptible to flood damage which can threaten lives.</li> </ul>	<ul style="list-style-type: none"> <li>• The buildings must be well maintained to avoid health and safety risks that can be associated with things like forming of mould, faulty lifts and broken windows, to mention a few.</li> <li>• All necessary security measures must be implemented including controlled access and appropriate fencing.</li> <li>• Stormwater structures must be monitored maintained during the operation phase.</li> <li>• The design of the stormwater system must take into consideration the possibility of flood events.</li> <li>• All tenants must be made aware of safety protocol to follow in the event of incidents such as floods and any other incidents which may require action such as evacuation.</li> <li>• All buildings must be in line with the National Building Regulations. In addition to this, all conditions of the site must be taken into consideration for the final designs and construction methods.</li> </ul>
<p>Socio-Economic Impacts</p>	<ul style="list-style-type: none"> <li>• A few employment opportunities will be created during the operation phase including security personnel for access control and care taker.</li> <li>• People will benefit in having access to safe, secure and affordable rental housing.</li> <li>• Surrounding neighbours will benefit through the proposed development discouraging the Development of informal settlements on the property which is likely to occur if the property is left vacant and would affect the value of their properties.</li> </ul>	<ul style="list-style-type: none"> <li>• The Labour Relations Act 66 of 1995 must be adhered for all those who employed.</li> <li>• A fair process must be followed for selection of people who will benefit from the proposed development.</li> <li>• Although the Developer will not be residing on the property, he or his representative/property manager, must maintain a good relationship with neighbours and have an open channel of communication for neighbours to communicate their complaints/concerns should they have any.</li> </ul>

### Fauna Protection

Although only avifauna was observed within the site for the proposed development, other fauna may be present or observed during the construction phase. The following mitigation measures should therefore be implemented as and when necessary.

- Any excavations or holes must be checked regularly for fauna that may have either occupied the area or may fall in accidentally. The design of deep excavations should consider nearby fauna (especially reptiles).
- Any lighting must not point outwards toward any natural habitat and should be focus downwards or towards the development.



- No killing of fauna must be tolerated.
- Should any fauna species of conservation concern be observed during the construction phase, the Competent Authority must be informed and construction works must cease until such a time that investigation is conducted and concluded.
- Any recorded mortalities of the aforementioned species should be report to the CA and construction should be halted pending an investigation.

## Heritage Impacts

There were also no heritage or cultural resources observed on or near the site of this development. However, in the case of a finding during construction and even operation phase, the following must be applied:

Where any heritage resources be uncovered during the construction phase, the measures below must be implemented.

- Amafa must be contacted if any heritage objects are identified during earthmoving activities, and all development must cease until further notice.
- Amafa must be contacted if any graves or heritage objects are identified during construction and the following procedure is to be followed:
  - Stop construction
  - Report finding to local police station
  - Report to Amafa to investigate

Sources of all-natural materials (including topsoil, sands, natural gravels, crushed stone, asphalt etc) must be obtained in a sustainable manner and in compliance with the heritage legislation.

## Worker Induction

Worker induction must include but not be limited to the following:

The Contractor must ensure that all site personnel have a basic level of environmental awareness training. Environmental awareness posters must be used on site. For this purpose, the Contractor will receive environmental awareness training from the ECO. Once inducted, the Contractor will have the duty to ensure that all their workers including subcontractor, receive the information shared in the induction. This may include engaging with the ECO to arrange date to induct workers and/or inclusion of relevant information in toolbox talks throughout the construction phase. Topics to be covered must include:

1. What is meant by “environment”;
2. Why the environment needs to be protected and conserved;
3. How construction activities can impact the environment;
4. What can be done to mitigate against such impacts;

5. Awareness of emergency and spills response provisions;
6. Social responsibility during construction e.g. being considerate to local residents.

It is the contractor's responsibility to provide the site foreman with environmental training and to ensure that the foreman has sufficient understanding to pass this information onto the construction staff.

Training of workers on site, over and above environmental awareness, must include general worker conduct including following rules:

- No alcohol / drugs to be present on site, no vehicles or machinery are to be operated whilst under the influence of alcohol or drugs.
- Prevent excessive noise to minimize disturbances to local residents.
- No firearms allowed on site or in vehicles transporting staff to / from the site (unless used by security personnel).
- Bringing pets onto site is forbidden.
- Construction staff are to make use of facilities provided for them, as opposed to ad-hoc alternatives (e.g. fires for cooking, the use of surrounding bush as a toilet facility is strictly forbidden). No fires to be permitted on site. The use of gas-operated cookers for preparation of food on site must be encouraged.
- Trespassing on private / commercial properties adjoining the site is forbidden.
- Only pre-approved security staff and workers shall be permitted to live on the construction site.
- No worker may be forced to do work that is potentially dangerous or for what he / she is not trained to do.

## **F. THE METHOD OF MONITORING THE IMPLEMENTATION OF THE IMPACT MANAGEMENT ACTIONS CONTEMPLATED IN PARAGRAPH (E)**

### **1. Planning, Design and Pre-Construction Phase**

During these phases, environmental issues will need to be considered for decision making and must therefore be reported on any planning/pre-construction meetings that are held in connection with the development. The EAP must make the Developer and project team aware of all legislation that need to be adhered to prior to the commencement of the construction phase and advise on mitigation measures that need to be implemented during construction which require pre-planning.

An Environmental Control Officer must be appointed prior to the commencement of construction activities.

The ECO will be responsible for monitoring compliance to pre-construction measures and liaising with EDTEA with regards to the conditions of the EA for the Development.

### **2. Construction Phase**

The appointed Environmental Control Officer must:-

- Conduct monthly site audits and monitor activities on site against what is set out in the EMPr and against conditions of the EA.
- Compile Environmental Compliance Reports which must be submitted to EDTEA.
- Findings of the audit conducted must be communicated with the project committee including the Contractor, Engineer and Developer. The ECO must within these reports highlight any non-compliances identified and actions to be taken to rectify the non-compliances and remedy the impacts of the non-compliance.

Monitoring must also be conducted by EDTEA who may visit the site whenever necessary to monitor compliance to the EMPr and EA.

The Contractor must appoint a person who will be responsible for the day to day monitoring of compliance to impact mitigation measures as contain within the EMPr. This is the person that will deal closely with the ECO and communicate any challenges faced in implementation of mitigation measures with the ECO.

The Contractor must obtain receipts/waybills for waste disposal and service of toilets. Such must be kept on file at all times for the ECO or officials to view upon request as proof of safe waste disposal and proof for safe and regular toilet servicing.

#### **G. THE FREQUENCY OF MONITORING THE IMPLEMNETATION OF THE IMPACT MANAGEMENT ACTIONS CONTEMPLATED IN PARAGRAPH (E)**

At least one pre-construction site visit will need to be undertaken by the ECO to ensure that all measures that need to be implemented pre-construction have been implemented. This will include a site walkthrough to identify any indigenous vegetation within the project footprint that will need to be removed or translocated prior to the site clearance taking place. The ECO must also ensure that the Developer has all the necessary permits for all activities that will take place on the site to avoid unlawful commencement and associated implications.

An on-site assessment/monitoring must be conducted every two weeks (twice a month) for the duration of the construction period. A single audit report for each month must be submitted to EDTEA as per contact details for their compliance and monitoring section.

Additionally, issues relating to environmental compliance must be discussed on the project meeting platform to ensure that the importance of compliance and environmental preservation is made clear to the team and that relevant parties are directed to take necessary action for on-site compliance.

## **H. AN INDICATION OF PERSONS WHO WILL BE RESPONSIBLE FOR THE IMPLEMENTATION OF THE IMPACT MANAGEMENT ACTIONS**

- Appointed ECO (Environmental Control Officer) – overall responsibility of environmental reporting, training and awareness and the overseer of the implementation of the whole EMPr and Specialists' recommendations.
- Contractor / Site Engineer or Builder – responsible for all engineering or building related work on site, and project implementation. The Contractor, under the guidance of the ECO must ensure that all his activities are in line with the environmental authorization and approved EMPr and is therefore the main party responsible for implementation of impact mitigation measures during the construction phase of the project.
- Yethusodwa (Pty) Ltd (Developer) – as the authorization holder, the Developer will be held liable for any non-compliances and related impacts of such non-compliances. Therefore, the Developer is responsible for ensuring that the Contractor appointed implements the impact management actions. For this purpose, the Developer will be provided with the monthly audit reports so they can monitor/keep track of the Contractor's compliance. The Developer is also responsible for implementation of impact management actions for pre-construction and operation phase of the development.
- EDTEA (Compliance Section) – As the competent authority for this Development, EDTEA must conduct occasional audits to monitor onsite compliance to the issued Environmental Authorization.

## **I. THE TIME PERIODS WITH WHICH THE IMPACT MANAGEMENT ACTIONS CONTEMPLATED IN PARAGRAPH (E) MUST BE IMPLEMENTED**

Unless otherwise stated, all the stipulated mitigation measures are relevant for compliance throughout the different phases.

For example: Mitigation measures for impacts related to construction activities must be implemented throughout the construction phase of the development.

## **J. CONCLUSION**

According to the National Environmental Management Act, 1998 everyone must take reasonable measures to ensure that they do not pollute the environment. In this regard the reasonable measures will include informing and educating employees about environmental risks of their activities and instill a sense of environmental consciousness.

It is therefore, crucial that all recommendations are adopted and effected to the letter during all phases of this development as part of the mitigation measures. It must also be kept in mind that the Environmental

Management Programme is a live document, that need adjustment as the need arise, as long as such changes are in the interest of the environment.

## APPENDIX A: Recommended Plant Species for Landscaping

<i>Acokanthera oppositifolia</i>	Common Poison-bush	Tree
<i>Adenia gummifera</i>	umPhindamshaya	Climber
<i>Albizia adianthifolia</i>	Flatcrown Tree	Tree
<i>Allophylus dregeana</i>	Forest False Currant	Tree
<i>Allophylus natalensis</i>	Dune Forest Currant	Tree
<i>Aloe barberiae</i>	Tree Aloe	Tree
<i>Anastrabe integerrima</i>	Pambati Tree	Tree
<i>Antidesma venosum</i>	Tassle Berry	Tree
<i>Apodytes dimidiata</i>	White Pear	Tree
<i>Baphia racemosa</i>	Natal Camwood	Tree
<i>Barringtonia racemosa</i>	Powder Puff Tree	Tree
<i>Bersama lucens</i>	Glossy Ash	Tree
<i>Bridelia micrantha</i>	Mitzeeri	Tree
<i>Calodendrum capense</i>	Cape Chestnut	Tree
<i>Calpurnia aurea</i>	Natal Laburnum	Tree
<i>Canthium inerme</i>	Common Turkey-berry	Tree
<i>Capparis tomentosa</i>	Wooly Caper Bush	Tree
<i>Chaetacme aristata</i>	Thorny Elm	Tree
<i>Chionanthus peglerae</i>	Giant Pock Ironwood	Tree
<i>Clerodendrum glabrum</i>	Cat's Whiskers	Tree
<i>Combretum kraussii</i>	Forest Bushwillow	Tree
<i>Cordia caffra</i>	Septee	Tree
<i>Croton sylvaticus</i>	Forest Feverberry	Tree
<i>Cussonia sphaerocephala</i>	Forest Cabbage Tree	Tree
<i>Cyphostemma hypoleucum</i>	Double Barrel-vine	Climber
<i>Deinbollia oblongifolia</i>	Dune Soap-berry	Tree
<i>Diospyros natalensis</i>	Small-leaved Jackal Berry	Tree
<i>Dovyalis longispina</i>	Natal Apricot	Tree
<i>Dovyalis rhamnoides</i>	Common sourberry	Tree
<i>Dracaena aletriformis</i>	Dragon Dracaena	Megaherb
<i>Drypetes natalensis</i>	Natal Iron Plum	Tree
<i>Ekebergia capensis</i>	Cape Ash	Tree
<i>Englerophytum natalense</i>	Natal Plum	Tree
<i>Eragrostis curvula</i>	Weeping Lovegrass	Graminoid
<i>Ficus polita</i>	Wild Rubber Fig	Tree
<i>Ficus sur</i>	Cape Fig	Tree
<i>Flagellaria guineensis</i>	Climbing Bamboov	Climber
<i>Gardenia thunbergii</i>	White Gardenia	Tree
<i>Grewia lasiocarpa</i>	Forest Raisin	Tree
<i>Gymnosporia nemorosa</i>	White Forest Spike Thorn	Tree
<i>Haemanthus albiflos</i>	White Paint Brush	Geophytic herb
<i>Halleria lucida</i>	Tree Fuschia	Tree
<i>Harpephyllum caffrum</i>	Wild Plum	Tree
<i>Hibiscus tiliaceus</i>	River Hibiscus	Tree
<i>Hippobromus pauciflorus</i>	False Horsewood	Tree
<i>Hypoestes aristata</i>	Ribbon Bush	Herbaceous shrub
<i>Hypoestes forskalii</i>	White Ribbon Bush	Herbaceous shrub
<i>Imperata cylindrica</i>	Cottonwool Grass	Graminoid
<i>Isoglossa woodii</i>	Buckweed	Herbaceous shru
<i>Jasminum multipartitum</i>	Wild Jasmine	Climber
<i>Keetia guenzii</i>	Climbing Turkey-berry	Climber
<i>Kraussia floribunda</i>	Rhino-coffee	Tree

<i>Lagenaria sphaerica</i>	Wild Melon	Climber
<i>Lagynias lasiantha</i>	Natal Medlar	Tree
<i>Melinis repens</i>	Natal Red-top Grass	Graminoid
<i>Mimusops obovata</i>	Forest Milkwood	Tree
<i>Momordica balsamina</i>	African cucumber	Climber
<i>Monanthes caffra</i>	Dwaba Berry	Climber
<i>Mondia whitei</i>	Dwaba-berry	Climber
<i>Nuxia floribunda</i>	Forest Elder	Tree
<i>Ochna arborea</i>	Cape Plane	Tree
<i>Ochna natalitia</i>	Natal Plane	Tree
<i>Ochna serrulata</i>	Small-leaved Plane	Tree
<i>Olea woodiana</i>	Forest Olive	Tree
<i>Oxyanthus pyriformis</i>	Wild Loquat	Tree
<i>Oxyanthus speciosus</i>	Forest Loquat	Tree
<i>Panicum maximum</i>	Guinea Grass	Graminoid
<i>Panicum natalense</i>	Natal Panicum	Graminoid
<i>Pittosporum viridiflorum</i>	Cheesewood	Tree
<i>Protorus longifolia</i>	Red Beech	Tree
<i>Psychotria capensis</i>	Black Bird Berry	Tree
<i>Psydrax obovata</i>	Quar	Tree
<i>Ptaeroxylon obliquum</i>	Sneezewood	Tree
<i>Putterlickia verrucosa</i>	False Forest Spike Thorn	Tree
<i>Rapanea melanophloeos</i>	Boekenhout	Tree
<i>Rauvolfia caffra</i>	Quinine Tree	Tree
<i>Rawsonia lucida</i>	Forest Peach	Tree
<i>Rhoicissus digitata</i>	Baboon Grape	Climber
<i>Rhoicissus rhomboidea</i>	Glossy Forest Grape	Climber
<i>Rhoicissus tomentosa</i>	Common Forest Grape	Climber
<i>Scolopia zeyheri</i>	Thorn Pear	Tree
<i>Scutia myrtina</i>	Cat Bush	Tree
<i>Scutia myrtina</i>	Cat-thorn	Climber
<i>Searsia chirindensis</i>	Red Currant	Tree
<i>Searsia nebulosa</i>	Sand Taaibos	Tree
<i>Searsia pentheri</i>	Common Crowberry	Tree
<i>Senecio brachypodus</i>	Forest Senecio	Climber
<i>Senecio tamoides</i>	Canary Creeper	Climber
<i>Sideroxylon inerme</i>	White Milkwood	Tree
<i>Setaria sphacelata var. torta</i>	Creeping Setaria	Graminoid
<i>Stenotaphrum secundatum</i>	Coastal Buffalo Grass	Graminoid
<i>Strelitzia nicolai</i>	Wild Banana	Tree
<i>Strychnos decussata</i>	Cape Teak	Tree
<i>Strychnos gerrardii</i>	Gula Gula	Tree
<i>Syzygium cordatum</i>	Umdoni	Tree
<i>Tabernaemontana ventricosa</i>	Toad Tree	Tree
<i>Teclea gerrardii</i>	Zulu Cherry-orange	Tree
<i>Turraea floribunda</i>	Wild Honeysuckle	Tree
<i>Uvaria caffra</i>	Small Cluster-pear	Tree
<i>Vachellia nilotica</i>	Scented Thorn	Tree
<i>Vachellia robusta</i>	Splendid Thorn	Tree
<i>Vangueria randii subsp chartacea.</i>	Natal Bush Medlar	Tree
<i>Vepris lanceolata</i>	White Ironwood	Tree
<i>Xylothea kraussiana</i>	African Dogrose	Tree
<i>Xymalos monospora</i>	Lemonwood	Tree
<i>Zanthoxylum capense</i>	Small Knobwood	Tree
<i>Ziziphus mucronata</i>	Buffalo Thorn	Tree