

PROJECT STATUS

Title	Environmental Management Plan for the: Township Establishment, creation of street and installation of bulk services for Kahenge Extensions 5, 6 and 7, Nkurenkuru, Kavango West Region		
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ABBREVIATIONS

AIDS	Acquired Immuno-Deficiency Syndrome
DR	Developer's Representative
EA	Environmental Assessment
ECC	Environmental Clearance Certificate
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMA	Environmental Management Act
EMP	Environmental Management Plan
GG	Government Gazette
GIS	Geographic Information System
GN	Government Notice
GPS	Global Positioning System
HIV	Human Immuno-deficiency Virus
I&APs	Interested and Affected Parties
NHCN	National Heritage Council of Namibia
Reg.	Regulation
S	Section
SPC	Stubenrauch Planning Consultants
TB	Tuberculosis

1 INTRODUCTION

The Nkurenkuru Town Council hereinafter referred to as the proponent intends to undertake the following activities:

- **Township Establishment of Kahenge Extension 5 on Portion 11 of the Remainder of the Farm Nkurenkuru Townlands No 1346, Nkurenkuru;**
- **Township Establishment of Kahenge Extension 6 Portion 12 of the Remainder of the Farm Nkurenkuru Townlands No 1346, Nkurenkuru;**
- **Township Establishment of Kahenge Informal Area on Portion 10 of the Remainder of the farm Nkurenkuru Townlands No 1346 to become known as Kahenge Extension 7, Nkurenkuru.**

The above development triggers listed activities in terms of the Environmental Management Act (No. 7 of 2007) and Environmental Impact Assessment Regulations (Government Notice No. 30 of 2012). As such the proponent appointed Stubenrauch Planning Consultants (SPC) to undertake an independent Environmental Assessment (EA) in order to obtain an Environmental Clearance Certificate (ECC) for the above activities. The competent authority is the Ministry of Environment, Forestry and Tourism: Department of Environmental Affairs (MEFT: DEA).

An Environmental Management Plan (EMP) is one of the most important outputs of the EIA process as it synthesises all of the proposed mitigation and monitoring actions, set to a timeline and with specific assigned responsibilities. This EMP details the mitigation and monitoring actions to be implemented during the following phases of these developments:

- Planning and Design – the period, prior to construction, during which preliminary legislative and administrative arrangements, necessary for the preparation of erven, are made and engineering designs are carried out. The preparation of construction tender documents forms part of this phase;
- Construction – the period during which the proponent, having dealt with the necessary legislative and administrative arrangements, appoints a contractor for the development of services infrastructure and any other construction process(s) within the development areas;
- Operation and Maintenance – the period during which the services infrastructure will be fully functional and maintained.

It should be noted that to date, no engineering designs have been carried out for the development of the infrastructure associated with this development.

The decommissioning of these developments is not envisaged; however in the event that this should be considered some recommendations have been outlined in **Table 4-5**.

2 PROPOSED DEVELOPMENT

Kahenge Extension 5 is to be formalized to the west of Kahenge Extension 4. Kahenge Extension 6 is to be formalized to the west of Kahenge Extension 3. The new urban area is located on the higher lying area to the north of the B10 (T1001) and stretches up to the “Royal Palace” boundary line. Please refer to **Figure 2-1** below for the locality of the proposed townships.

Kahenge Extension 7 is to be formalized to the south of the existing Kahenge urban area, adjacent west to Kahenge Extension 1. With the exception of the informal residential structures the area can be considered to be a green field site. Please see **Figure 2-2** below for locality of the proposed township.

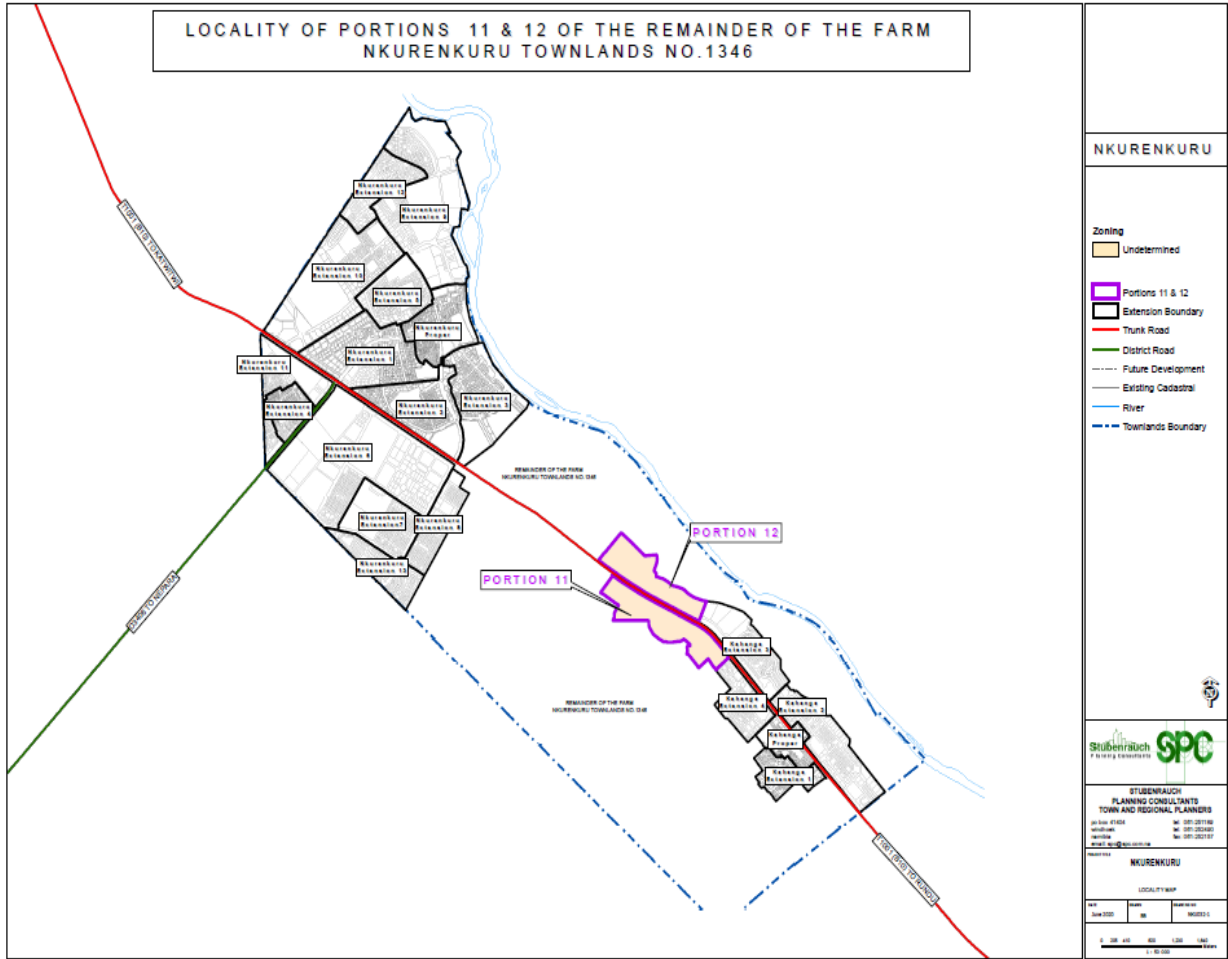


Figure 2-1: Locality of Proposed Kahenge Extension 5 and 6

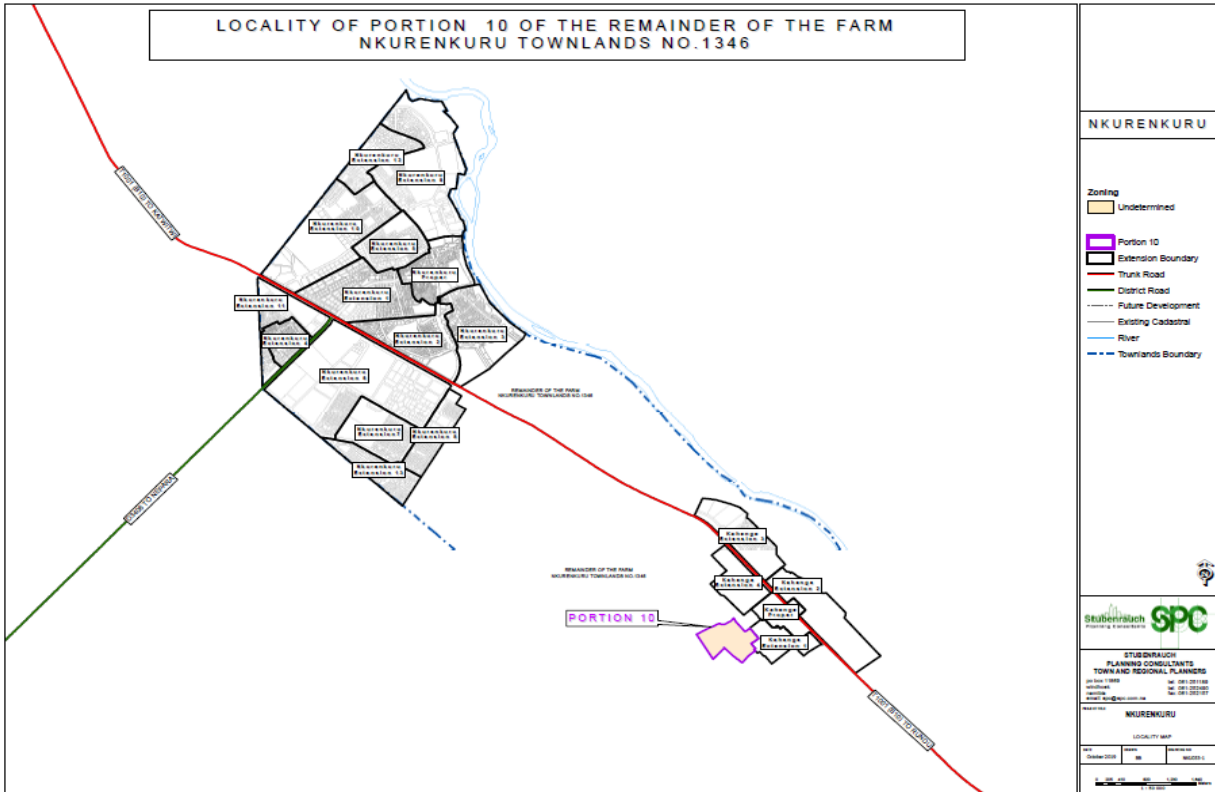


Figure 2-2: Locality of Proposed Kahenge Extension 7

The Nkurenkuru Town Council is desirous to formalize the areas along both sides of the B10 (T1001) leading from the planned Kahenge urban area to the boundary line of the area reserved for and by the ‘Royal Palace’.

The layout design of Kahenge Extensions 5 and 6 were undertaken with the intent that these two extensions are to complement and support one another.

- **Kahenge Extension 5** is located to the south of the B10 National Road. In addition to provide residential properties it is the aim to also provide a commercial heart at Kahenge which will have the aim to support the urban areas to be developed over time further south of Extension 5.
- **Kahenge Extension 6**, which is located to the north of the B10 National Road has the aim to provide a tourism destination and leisure area which capitalizes on the presence of the flood plain of the Kavango River while also providing opportunities for urban agriculture.

The layout of the proposed townships are depicted in **Figure 2-3 and 2-4** below.

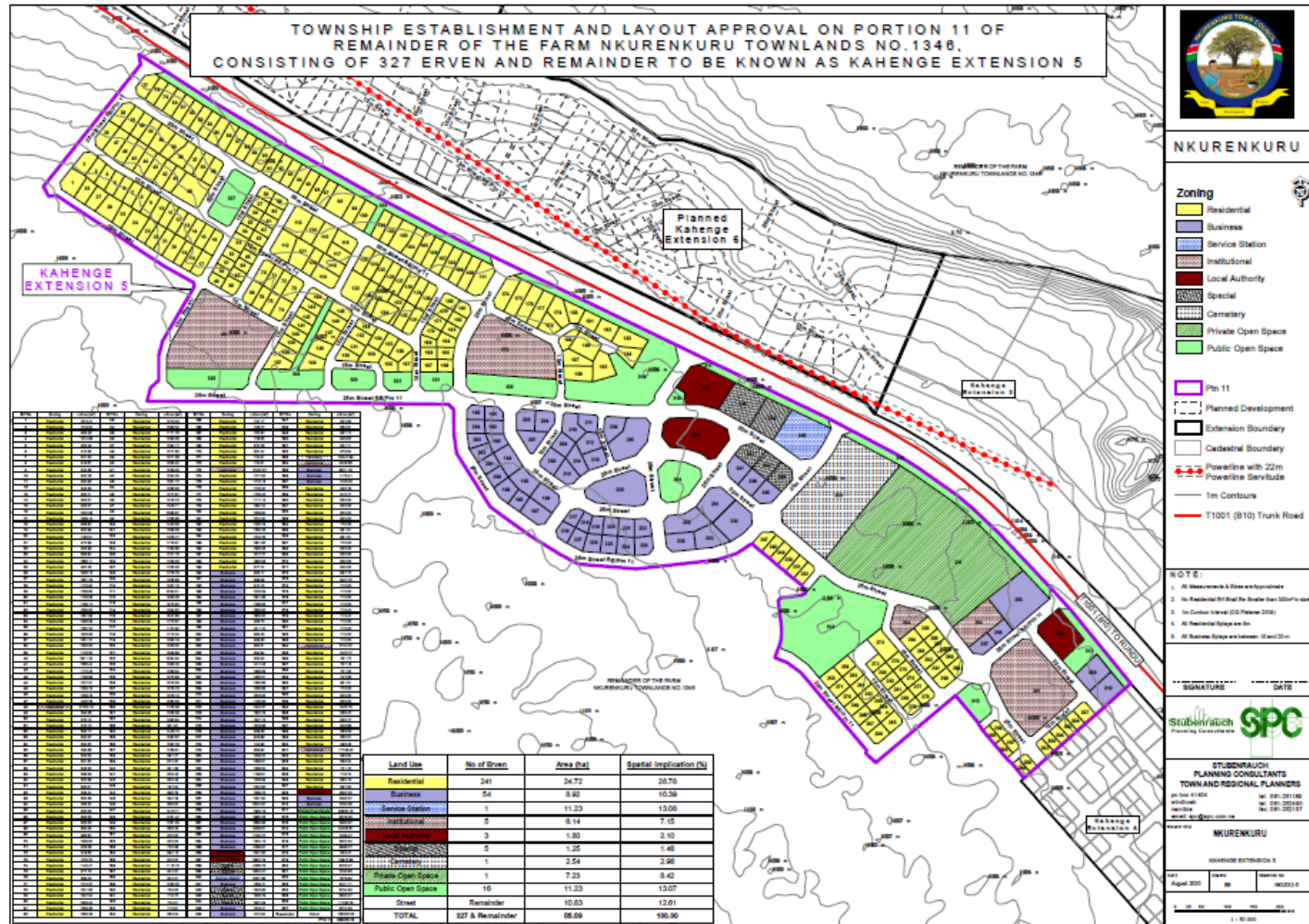


Figure 2-3: Layout Map for Proposed Kahenge Extension 5

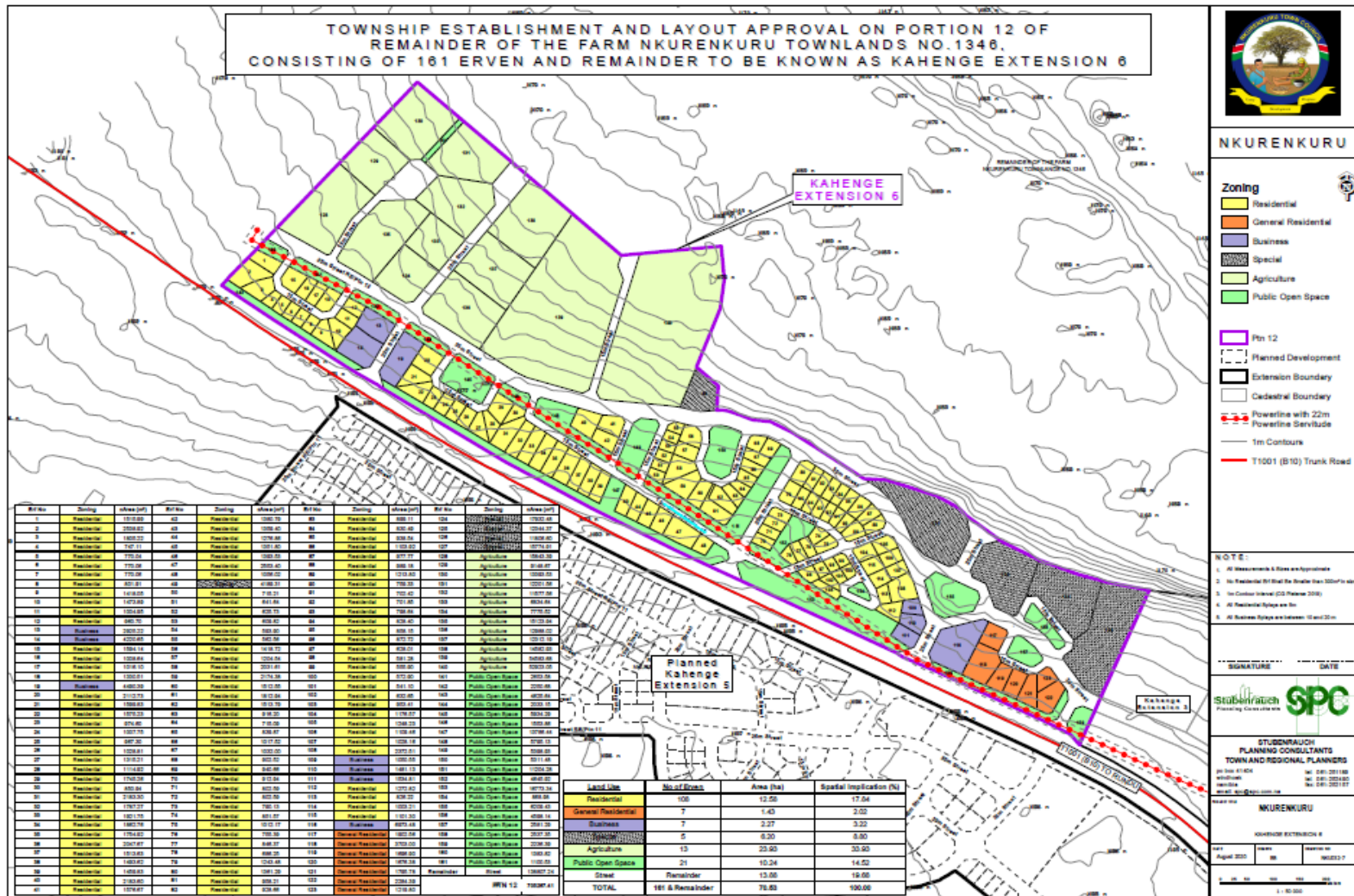


Figure 2-4: Layout Map for Proposed Kahenge Extension 6

The Nkurenkuru Town Council experienced an influx of households demanding space to erect informal housing units within proximity of the existing Kahenge urban area. It is now the intent of the Council to plan and formalize a new township extension which will have the purpose to cater for the influx of lower income households to Kahenge.

The Town Council identified an area to the west of Kahenge Extension 1 for the development of an informal area. Some 50 households have already been settled within the area on sites as pointed out and demarcated by the Council. These are to be formalized as part of the planning process.

The new extension is to be integrated into the existing urban network of Kahenge in terms of movement linkages (roads), land use and municipal service delivery.

The layout of the proposed township is depicted in **Figure 2-5** below.

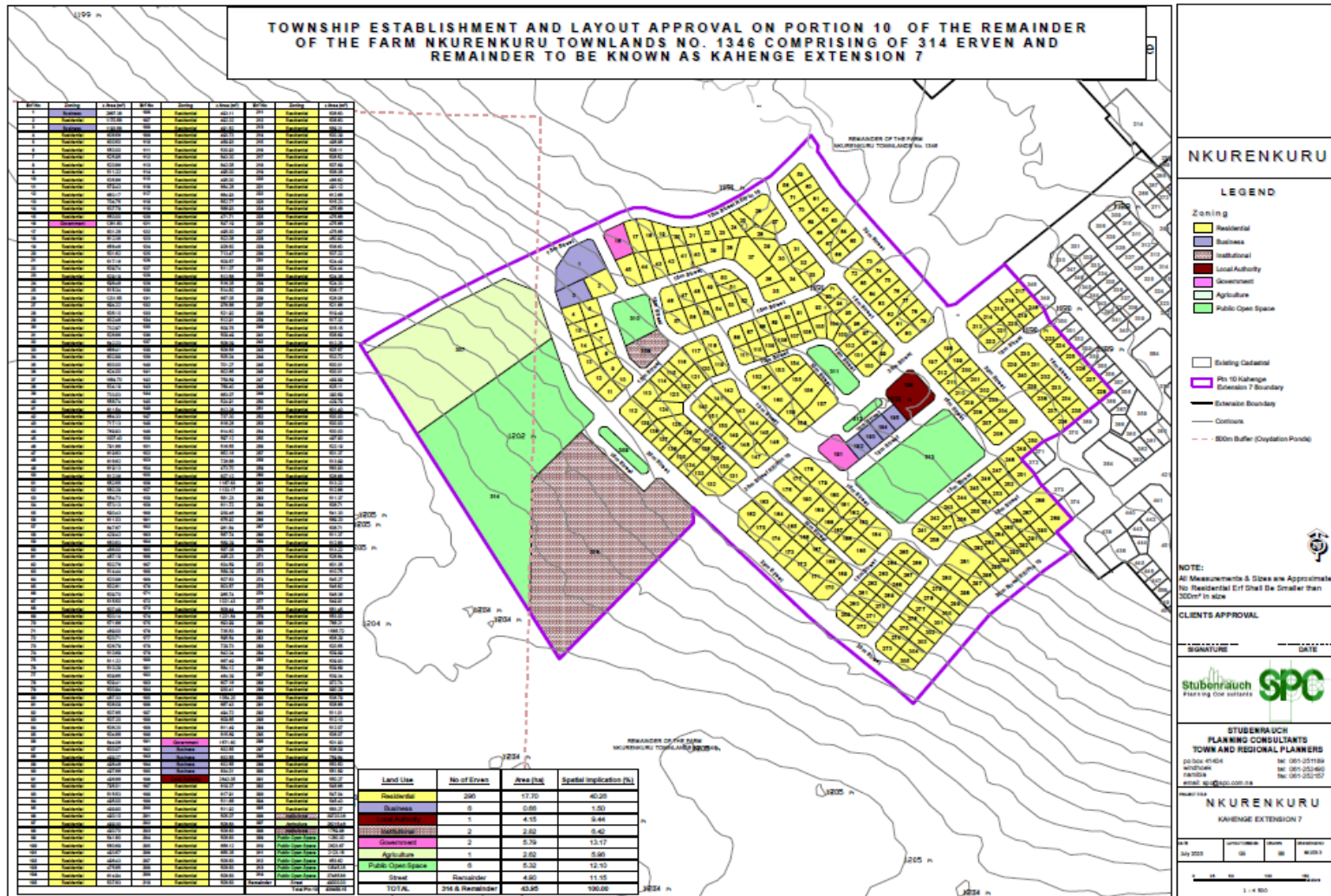


Figure 2-5: Layout Map for Proposed Kahenge Extension 7

3 ROLES AND RESPONSIBILITIES

The proponent (Nkurenkuru Town Council) is ultimately responsible for the implementation of the EMP, from the planning and design phase to the decommissioning phase (if these developments are in future decommissioned) of these developments. The proponent will delegate this responsibility as the project progresses through its life cycle. The delegated responsibility for the effective implementation of this EMP will rest on the following key individuals:

- Council's Representative;
- Environmental Control Officer; and
- Contractor (Construction and Operations and Maintenance).

3.1 COUNCIL'S REPRESENTATIVE

The Nkurenkuru Town Council should assign the responsibility of managing all aspects of these developments for all development phases (including all contracts for work outsourced) to a designated member of staff, referred to in this EMP as the Council's representative (CR). The Nkurenkuru Town Council may decide to assign this role to one person for the full duration of these developments, or may assign a different CR to each of the development phases – i.e. one for the planning and design phase, one for the construction phase and one for the operation and maintenance phase. The CR's responsibilities are as follows:

Table 3-1 Responsibilities of CR

Responsibility	Project Phase
Making sure that the necessary approvals and permissions laid out in Table 4-1 are obtained/adhered to.	<ul style="list-style-type: none"> • Throughout the lifecycle of these developments
Making sure that the relevant provisions detailed in Table 4-2 are addressed during planning and design phase.	<ul style="list-style-type: none"> • Planning and design phase
Monitoring the implementation of the EMP monthly.	<ul style="list-style-type: none"> • Construction • Operation and maintenance
Suspending/evicting individuals and/or equipment not complying with the EMP	<ul style="list-style-type: none"> • Construction • Operation and maintenance
Issuing fines for contravening EMP provisions	<ul style="list-style-type: none"> • Construction • Operation and maintenance

3.2 ENVIRONMENTAL CONTROL OFFICER

The CR should assign the responsibility of overseeing the implementation of the whole EMP on the ground during the construction and operation and maintenance phases to an independent external consultant, referred to in this EMP as the Environmental Control Officer (ECO). The CR/Nkurenkuru Town Council may decide to assign this role to one person for both phases, or may assign a different ECO for each phase. The ECO will have the following responsibilities during the construction and operation and maintenance phases of these developments:

- Management and facilitation of communication between the Nkurenkuru Town Council, CR, the contractors, and Interested and Affected Parties (I&APs) with regard to this EMP;
- Conducting site inspections (recommended minimum frequency is weekly) of all construction and/or infrastructure maintenance areas with respect to the implementation of this EMP (audit the implementation of the EMP);
- Assisting the Contractor in finding solutions with respect to matters pertaining to the implementation of this EMP;
- Advising the CR on the removal of person(s) and/or equipment not complying with the provisions of this EMP;
- Making recommendations to the CR with respect to the issuing of fines for contraventions of the EMP; and
- Undertaking an annual review and bi-annual audit of the EMP and recommending additions and/or changes to this document.

3.3 CONTRACTOR

Contractors appointed by the Nkurenkuru Town Council are automatically responsible for implementing all provisions contained within the relevant chapters of this EMP. Contractors will be responsible for the implementation of this EMP applicable to any work outsourced to subcontractors. **Table 4-3** applies to contractors appointed during the construction phase and **Table 4-4** to those appointed during the operation and maintenance phase. In order to ensure effective environmental management, the aforementioned chapters should be included in the applicable contracts for outsourced construction, operation and maintenance work.

The tables in the following chapter (**Chapter 4**) detail the management measures associated with the roles and responsibilities that have been laid out in this chapter.

4 MANAGEMENT ACTIONS

The aim of the management actions in this chapter of the EMP is to avoid potential impacts where possible. Where impacts cannot be avoided, measures are provided to reduce the significance of these impacts.

The following tables provide the management actions recommended to manage the potential impacts rated in the scoping-level EA conducted for these developments. These management actions have been organised temporally according to project phase:

- Applicable legislation (**Table 4-1**);
- Planning and design phase management actions (**Table 4-2**);
- Construction phase management actions (**Table 4-3**);
- Operation and maintenance phase management actions (**Table 4-4**); and
- Decommissioning phase management actions (**Table 4-5**).
- The proponent should assess these **commitments** in detail and should acknowledge their commitment to the specific management actions detailed in the tables below.

4.1 ASSUMPTIONS AND LIMITATIONS

This EMP has been drafted with the acknowledgment of the following assumptions and limitations:

- This EMP has been drafted based on the scoping-level Environmental Assessment (EA) conducted for the proposed development in Nkurenkuru as outlined in **Section 4** of the Draft Environmental Scoping Report. SPC will not be held responsible for the potential consequences that may result from any alterations to the above-mentioned layout.
- It is assumed that construction labourers will be sourced mostly from the Nkurenkuru townlands area and that migrant labourers (if applicable) will be housed in established accommodation facilities within Nkurenkuru.
- No engineering designs have been carried out for the development of the associated services infrastructure (roads, potable water, storm water, sewerage and electrical reticulations).

4.2 APPLICABLE LEGISLATION

Legal provisions that have relevance to various aspects of these developments are listed in **Table 4-1** below.

Table 4-1: Legislation/Guideline/Policy applicable to proposed development

LEGISLATION/ GUIDELINE/ POLICY	RELEVANT PROVISIONS	CONTACT PERSON/COMMENTS
Environmental Management Act (Act 7 of 2007) and Environmental Impact Assessment (EIA) Regulations (EIAR) (GG No. 4878)	<ul style="list-style-type: none"> - Activities listed in Government Notice (GN) No. 29 of GG No. 4878 require an Environmental Clearance Certificate (ECC). - The amendment, transfer or renewal of the ECC (EMA S39-42; EIAR Regs19 & 20). - Amendments to this EMP will require an amendment of the ECC for these developments. - The ECC needs to be renewed every 3 years. 	Mr Damian Nchindo Tel: 061 284 2701
Forestry Act (Act 27 of 2004) and Forest Regulations (2015)	<ul style="list-style-type: none"> - Provision for the protection of various plant species. - Permits required for removal of protected plant species (A period of three months should be allowed for obtaining this permit. Species and numbers/quantities involved will need to be specified.) 	Permit application forms can be obtained from the Forestry office in Nkurenkuru Markus Ndara Tel: 0812066106
Township and Division of Land Ordinance 11 of 1963	Regulates subdivisions of portions of land falling within a Local Authority area	Approval to be obtained for the Township Establishment from the Ministry and Rural and Urban Development.
Urban and Regional Planning Act No. 5 of 2018	Chapter 7 deals with the Subdivision or Consolidation of Land.	Approval to be obtained for the Township Establishment from the

		Ministry and Rural and Urban Development.
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4.3 PLANNING AND DESIGN PHASE

The CR should ensure that the management actions detailed below should be adhered to during the period before the construction of the services infrastructure starts.

Table 4-2: Planning and design management actions

Aspect	Management Actions
Visual Impacts	<ul style="list-style-type: none"> • It is recommended that more ‘green’ technologies be implemented within the architectural designs and building materials of the development where possible in order to minimise the visual prominence of such a development within the more natural surrounding landscape. • Natural colours and building materials such as wood and stone should be incorporated as well as the use of indigenous vegetation in order to help beautify the development. <ul style="list-style-type: none"> ○ Visual pollutants can further be prevented through mitigations (i.e. keep existing trees, introduce tall indigenous trees; keep structures unpainted and minimising large advertising billboards).
Stormwater	<ul style="list-style-type: none"> • Stormwater runoff should be accommodated within the street reserve to ensure that the natural flow of water is not disturbed.
Biodiversity	<ul style="list-style-type: none"> • A vegetation survey is to be conducted on the subject sites prior to any construction activities on site to identify the species present and clearly mark those species which may not be removed. • Permits for the removal of protected species as per the Forestry Act 12 of 2001 must be obtained at the nearest Forestry office prior to construction.

4.4 CONSTRUCTION PHASE

The management actions listed in **Table 4-3** apply during the construction phase. This table may be used as a guide when developing EMPs for other construction activities within these development areas.

Table 4-3: Construction phase management actions

Environmental Feature	Impact	Management Actions	Responsible Person
EMP training	Lack of EMP awareness and the implications thereof.	All construction workers are to undergo EMP training that should include as a minimum the following: <ul style="list-style-type: none"> • Explanation of the importance of complying with the EMP. • Discussion of the potential environmental impacts of construction activities. • Employees' roles and responsibilities, including emergency preparedness. • Explanation of the mitigation measures that must be implemented when particular work groups carry out their respective activities. 	Contractor, CR
Conservation of vegetation	Loss of biodiversity	<ul style="list-style-type: none"> • The layout and development design should incorporate existing trees¹. • The Contractor should compile a Plant Management Plan which should include the following as a minimum: <ul style="list-style-type: none"> ○ Trees to be preserved as identified in the Vegetation survey should be marked with paint (or other means to be readily visible) and protected; ○ Trees, which are impossible to conserve, need to be identified and; 	Contractor

¹a "tree" is defined as an indigenous woody perennial plant with a trunk diameter ≥ 150 mm.

Environmental Feature	Impact	Management Actions	Responsible Person
		<ul style="list-style-type: none"> ○ The Contractor should apply to the nearest Forestry office for a permit to remove these trees (prior to removing them). ○ Special protection should be accorded to the protected endemic species, which are to be found within the development area (As per the Forest Act 12 of 2001 and Forest Regulations of 2015- Annexure A). ○ Each tree that is removed needs to be replaced with an indigenous tree species after construction; ○ Some of these trees can be obtained at the National Botanical Research Institute (NBRI) or at a commercial nursery. ● Only a limited width +/- 5 m on the side of roads may be partially cleared of vegetation. ● Workers are prohibited from collecting wood or other plant products on or near work sites. ● No alien species may be planted on or near work areas. 	
Lay-down areas and materials camp	Loss of biodiversity	<p>Suitable locations for the contractors lay-down areas and materials camp should be identified with the assistance of the CR and the following should be considered in selecting these sites:</p> <ul style="list-style-type: none"> ● The areas designated for the services infrastructure should be used as far possible. ● Second option should be degraded land. 	Contractor and CR

Environmental Feature	Impact	Management Actions	Responsible Person
		<ul style="list-style-type: none"> • Avoid sensitive areas (e.g. rivers/drainage lines). 	
Hazardous waste	Contamination of surface and groundwater sources.	<ul style="list-style-type: none"> • All heavy construction vehicles and equipment on site should be provided with a drip tray. • All heavy construction vehicles should be maintained regularly to prevent oil leakages. • Maintenance and washing of construction vehicles should take place only at a designated workshop area. 	Contractor
Water, Sewage and grey water	Contamination of surface and groundwater sources and water wasting	<ul style="list-style-type: none"> • The wash water (grey water) collected from the cleaning of equipment on-site should not be left standing for long periods of time as this promotes parasite and bacterial proliferation. • Grey water should be recycled: <ul style="list-style-type: none"> ○ Used for dust suppression; ○ Used to water a vegetable garden, or to support a small nursery; ○ Used (reused) to clean equipment. • Grey water that is not recycled should be removed on a regular basis. • No dumping of waste products of any kind in or in close proximity to water bodies. • Heavy construction vehicles should be kept out of any water bodies and the movement of construction vehicles should be limited where possible to the existing roads and tracks. 	Contractor

Environmental Feature	Impact	Management Actions	Responsible Person
		<ul style="list-style-type: none"> • Ensure that oil/ fuel spillages from construction vehicles and machinery are minimised and that where these occur, that they are appropriately dealt with. • Drip trays must be placed underneath construction vehicles when not in use to contain all oil that might be leaking from these vehicles. • Contaminated runoff from the construction sites should be prevented from entering the surface and ground water bodies. • All materials on the construction site should be properly stored. • Disposal of waste from the sites should be properly managed and taken to the designated landfill site in Nkurenkuru. • Construction workers should be given ablution facilities at the construction sites that are located at least 30 m away from any surface water and ground water resources and should be regularly serviced. • Washing of personnel or any equipment should not be allowed on site. Should it be necessary to wash construction equipment these should be done at an area properly suited and prepared to receive and contain polluted waters. 	
General waste	Visual impact and soil contamination	<ul style="list-style-type: none"> • The construction site should be kept tidy at all times. 	Contractor

Environmental Feature	Impact	Management Actions	Responsible Person
		<ul style="list-style-type: none"> • All domestic and general construction waste produced on a daily basis should be cleaned and contained daily. • No waste may be buried or burned. • Waste containers (bins) should be emptied regularly and removed from site to a recognised (municipal) waste disposal site. • All recyclable waste needs to be taken to the nearest recycling depot where practical. • A sufficient number of separate bins for hazardous and domestic/general waste must be provided on site. These should be clearly marked as such. • Construction labourers should be sensitised to dispose of waste in a responsible manner and not to litter. • No waste may remain on site after the completion of the project. 	
Topsoil	Loss of topsoil and associated opportunity costs	<ul style="list-style-type: none"> • When excavations are carried out, topsoil² should be stockpiled in a demarcated area. • Stockpiled topsoil should be used to rehabilitate post-construction degraded areas and/or other nearby degraded areas if such an area is located a reasonable distance from the stockpile. 	Contractor

² Topsoil is defined here as the top 150mm of surface material, which accounts for the seedbank.

Environmental Feature	Impact	Management Actions	Responsible Person
Rehabilitation	Visual impact	<ul style="list-style-type: none"> • Upon completion of the construction phase consultations should be held with the local community/property owner(s) regarding the post-construction use of remaining excavated areas (if applicable). • In the event that no post-construction uses are requested, all excavated/degraded areas need to be rehabilitated as follows: <ul style="list-style-type: none"> ○ Excavated areas may only be backfilled with clean or inert fill. No material of hazardous nature (e.g. sand removed with an oil spill) may be dumped as backfill. ○ Rehabilitated excavated areas need to match the contours of the existing landscape. ○ The rehabilitated area should not be higher (or lower) than nearby drainage channels. This ensures the efficiency of revegetation and reduces the chances of potential erosion. ○ Topsoil is to be spread across excavated areas evenly. ○ Deep ripping of areas to be rehabilitated is required, not just simple scarification, so as to enable rip lines to hold water after heavy rainfall. ○ Ripping should be done along slopes, not up and down a slope, which could lead to enhanced erosion. 	Contractor, CR

Environmental Feature	Impact	Management Actions	Responsible Person
HIV/AIDS and TB training	Lack of awareness regarding implications of risky behaviour	The Contractor should approach the Ministry of Health and Social Services to co-opt a health officer to facilitate HIV/AIDS and TB education programmes periodically on site during the construction phase.	Contractor
Road safety	Injury or loss of life	<ul style="list-style-type: none"> • Demarcate roads to be used by construction vehicles clearly. • Off-road driving should not be allowed. • All vehicles that transport materials to and from the site must be roadworthy. • Drivers that transport materials should have a valid driver's license and should adhere to all traffic rules. • Loads upon vehicles should be properly secured to avoid items falling off the vehicle. 	Contractor
Safety around work sites	Injury or loss of life	<ul style="list-style-type: none"> • Excavations should be left open for the shortest time possible. • Excavate short lengths of trenches and box areas for services or foundations in a manner that will not leave the trench unattended for more than 24 hours. • Demarcate excavated areas and topsoil stockpiles with danger tape. • All building materials and equipment are to be stored only within set out and demarcated work areas. • Only road construction personnel will be allowed within these work areas. • Comply with all waste related management actions stated above in this table. 	Contractor

Environmental Feature	Impact	Management Actions	Responsible Person
Ablutions	Non-compliance with Health and Safety Regulations	<ul style="list-style-type: none"> • Separate toilets should be available for men and women and should clearly be indicated as such. • Portable toilets (i.e. easily transportable) should be available at every construction site: <ul style="list-style-type: none"> ○ 1 toilet for every 15 females. ○ 1 toilet for every 30 males. ○ Sewage needs to be removed on a regular basis to an approved (municipal) sewage disposal site in Nkurenkuru. ○ Alternatively, sewage may be pumped into sealable containers and stored until it can be removed. ○ Workers responsible for cleaning the toilets should be provided with environmentally friendly detergents, latex gloves and masks. 	Contractor
Open fires	Injury or loss of life	<ul style="list-style-type: none"> • No open fires may be made anywhere on site. 	Contractor
General health and safety	Injury or loss of life	<ul style="list-style-type: none"> • A fully stocked first aid kit should permanently be available on-site as well as an adequately trained member of staff capable of administering first aid. • All workers should have access to the relevant personal protective equipment (PPE). • Sufficient potable water reserves should be available to workers at all times. 	Contractor

Environmental Feature	Impact	Management Actions	Responsible Person
		<ul style="list-style-type: none"> • No person should be allowed to smoke close to fuel storage facilities or portable toilets (if toilets are chemical toilets – the chemicals are flammable). • No workers should be allowed to drink alcohol during work hours. • No workers should be allowed on site if under the influence of alcohol. • Building rubble and domestic waste should be stored in skips. • Condoms should be accessible/available to all construction workers. • Access to Antiretroviral medication should be facilitated. 	
Dust	Nuisance and health impacts	<ul style="list-style-type: none"> • A watering truck should be used on gravel roads with the heaviest vehicle movement especially during dry and windy conditions. However, due consideration should be given to water restrictions during times of drought. • The use of waterless dust suppression means (e.g. lignosulphonate products such as Dustex) should be considered. • Cover any stockpiles with plastic to minimise windblown dust. • Dust protection masks should be provided to workers if they complain about dust. 	Contractor

Environmental Feature	Impact	Management Actions	Responsible Person
Noise	Nuisance impacts	Work hours should be restricted to between 08h00 and 17h00 where construction involving the use of heavy equipment, power tools and the movement of heavy vehicles is less than 500 m from residential areas. If an exception to this provision is required, all residents within the 500 m radius should be given 1 week's written notice.	Contractor
Recruitment of labourers	Negative conflict regarding recruitment	<p>The Contractor should compile a formal recruitment process including the following provisions as a minimum:</p> <ul style="list-style-type: none"> • Adhere to the legal provisions in the Labour Act for the recruitment of labour (target percentages for gender balance, optimal use of local labour and SME's, etc.). • Recruitment should not take place at construction sites. • Ensure that all sub-contractors are aware of recommended recruitment procedures and discourage any recruitment of labour outside these agreed upon procedures. • Contractors should give preference in terms of recruitment of sub-contractors and individual labourers to those who are qualified and from the Nkurenkuru project area and only then look to surrounding towns. • Clearly explain to all jobseekers the terms and conditions of their respective employment contracts (e.g. period of employment etc.) – make use of interpreters where necessary. 	Contractor

Environmental Feature	Impact	Management Actions	Responsible Person
Communication plan	Negative conflict with I&APs	<p>The Contractor or proponent should draft a Communication Plan, which should outline as a minimum the following:</p> <ul style="list-style-type: none"> • How Interested and Affected Parties (I&APs), who require ongoing communication for the duration of the construction period, will be identified and recorded and who will manage and update these records. • How these I&APs will be consulted on an ongoing basis. • Make provision for grievance mechanisms – i.e. how concerns can be lodged/ recorded and how feedback will be delivered as well as further steps of arbitration in the event that feedback is deemed unsatisfactory. 	Contractor
General communication	Negative conflict with I&APs	<ul style="list-style-type: none"> • The CR must appoint an ECO to liaise between the Contractor, I&APs, Developer. • The Contractor shall at every monthly site meeting report on the status of the implementation of all provisions of the EMP. • The Contractor should implement the EMP awareness training as stipulated above in this table. • The Contractor must list the I&APs of the project and their contact details with whom ongoing communication would be required for the duration of the contract. This list, together with the Communication Plan must be agreed upon and given to the CR before construction commences. 	Contractor, ECO, CR

Environmental Feature	Impact	Management Actions	Responsible Person
		<ul style="list-style-type: none"> • The Communication Plan, once agreed upon by the Developer, shall be legally binding. • All communication with the I&APs must take place through the ECO. • A copy of the EMP must be available at the site office and should be accessible to all I&APs. • Key representatives from the above-mentioned list need to be invited to attend monthly site meetings to raise any concerns and issues regarding project progress. • The Contractor should liaise with the Developer regarding all issues related to community consultation and negotiation before construction commences. • A procedure should be put in place to ensure that concerns raised have been followed-up and addressed. • All people on the I&APs list should be informed about the availability of the complaints register and associated grievance mechanisms in writing by the CR prior to the commencement of construction activities. 	
Archaeology	Loss of heritage resources	<ul style="list-style-type: none"> • Should a heritage site or archaeological site be uncovered or discovered during the construction phase of the project, a “chance find” procedure should be applied in the order they appear below: <ul style="list-style-type: none"> ○ If operating machinery or equipment, stop work; ○ Demarcate the site with danger tape; 	Contractor

Environmental Feature	Impact	Management Actions	Responsible Person
		<ul style="list-style-type: none"> ○ Determine GPS position if possible; ○ Report findings to the construction foreman; ○ Report findings, site location and actions taken to superintendent; ○ Cease any works in immediate vicinity; ○ Visit site and determine whether work can proceed without damage to findings; ○ Determine and demarcate exclusion boundary; ○ Site location and details to be added to the project's Geographic Information System (GIS) for field confirmation by archaeologist; ○ Inspect site and confirm addition to project GIS; ○ Advise the National Heritage Council of Namibia (NHCN) and request written permission to remove findings from work area; and ○ Recovery, packaging and labelling of findings for transfer to National Museum. ● Should human remains be found, the following actions will be required: <ul style="list-style-type: none"> ○ Apply the chance find procedure as described above; ○ Schedule a field inspection with an archaeologist to confirm that remains are human; ○ Advise and liaise with the NHCN and Police; and 	

Environmenta l Feature	Impact	Management Actions	Responsibl e Person
		○ Remains will be recovered and removed either to the National Museum or the National Forensic Laboratory.	

4.5 OPERATION AND MAINTENANCE PHASE

The management actions included in **Table 4-4** below apply during the operation and maintenance phase of these developments.

Table 4-4: Operation and maintenance management actions

Environmental Feature	Impact	Management Actions	Person Responsible
EMP training	Lack of EMP awareness and the implications thereof	All contractors appointed for maintenance work on the respective street must ensure that all personnel are aware of necessary health, safety and environmental considerations applicable to their respective work.	Contractor
Water	Surface and groundwater contamination	Ensure that surface run-off water accumulating on-site are channeled and captured through a proper storm water management system to be treated in an appropriate manner before disposal into the environment.	Proponent, Contractor,
Aesthetics	Visual impacts	The proponent should consult with a view to incorporate the relevant local/national/international development guidelines which addresses the following: <ul style="list-style-type: none"> • The incorporation of indigenous vegetation into street development. • To mark the area with appropriate road warning signs (e.g. the road curves to the left/right) 	Proponent

4.6 DECOMMISSIONING PHASE

The decommissioning of these developments is not foreseen as the intended development is envisaged to be permanent. In the event that this development is decommissioned the following management actions should apply.

Table 4-5: Decommissioning phase management actions

Environmental Feature	Management Actions
Deconstruction activity	Many of the mitigation measures prescribed for construction activity for these developments (Table 4-3 above) would be applicable to some of the decommissioning activities. These should be adhered to where applicable.
Rehabilitation	In the event that decommissioning is deemed necessary, excavations need to be rehabilitated according to the management actions laid out in Table 4-3 above.

Annexure A: Forestry Act 12 of 2001 – Protected Plant Species List

ANNEXURE 2

MINISTRY OF AGRICULTURE, WATER AND FORESTRY

FOREST ACT, 2001 (ACT NO. 12 OF 2001)

PROTECTED PLANT SPECIES

(Sections 22/Regulation 13)

List of protected species:

Species name	Common names (English)	Reasons to be protected
<i>Acacia erioloba</i> E. Mey.	Camel-thorn	EU ¹ (Heavily utilized by humans and animals - medicinal, cash crop, unsustainable harvesting of fuel wood for export) slow growth rate, cultural value, economic value, ES (keystone species)
<i>Acacia nigrescens</i> Oliv.	Knob-thorn	EU (Used by humans and animals - wood used for construction, utensils, fuel, tanning, browsed by game), ES (retains river banks)
<i>Acanthosicyos horridus</i> Welw. ex Hook.f.	Nara	Cultural and economic value, ES (Dune stabiliser)
<i>Adansonia digitata</i> L.	baobab	ES ² (Keystone species) EU (heavily utilised by humans and animals)
<i>Adenia pechuelii</i> (Engl.) Harms	Elephants-foot	EU (unsustainable harvesting for horticultural trade), slow growth rate, Slow and/or episodic recruitment
<i>Adenium boehmanium</i> Schinz	Bushman poison	EU (unsustainable harvesting for horticultural trade)
<i>Azelia quanzensis</i> Welw.	Pod mahogany	EU (Extensively used by humans and animals- curios, medicinal, timber, potential as ornamental trees, browsed by animals), slow growth rate, Restricted range.
<i>Albizia anthelmintica</i> (A.Rich.) Brongn.	Worm-cure albizia	EU (Utilized by humans and animals - medicinal, utensils, browsed by livestock and game)
<i>Aloe dichotoma</i> Masson	Quiver tree	EU (unsustainable harvesting for horticultural trade), Slow growth rate, Cultural value, Slow and/or episodic recruitment
<i>Aloe pillansii</i> L. Guthrie	Giant quiver tree	Slow growth rate, Restricted range, Slow and/or episodic recruitment
<i>Aloe ramosissima</i> Pillans	Maiden's quiver tree	Slow growth rate, Restricted range, Slow and/or episodic recruitment
<i>Baikiaea plurijuga</i> Harms	Zambezi teak or Rhodesian teak	EU (heavily utilised for timber, implements, utensils, wood carvings)
<i>Berchemia discolor</i> (Klotzsch) Hemsl.	Bird-plum	EU (heavily utilised by humans and animals)
<i>Boscia albitrunca</i> (Burch.) Gilg & Gilg-Ben.	Shepherd's tree	EU (heavily utilised by humans and animals)
<i>Burkea africana</i> Hook.	Burkea	EU (heavily utilised by humans - timber, firewood, implements)

<i>Caesalpinia merxmeullerana</i> A. Schreib.	Orange-river caesalpinia	Restricted range
<i>Citropsis daweanana</i> Swingle & M. Kellerm.		EU (Wild crop relative - genetic resource), Restricted range
<i>Colophospermum mopane</i> (J. Kirk ex Benth.) J. Kirk ex J. Léonard	Mopane	EU (heavily utilised by humans and animals (browse and forage) - charcoal, timber, fuel wood, construction, medicine, host to important edible caterpillar), slow growth rate, cultural value
<i>Combretum imberbe</i> Wawra	Leadwood	EU (heavily utilised by humans and animals - fuel wood, construction material, implements, illegally harvested for charcoal, other purposes, browse, shade) Cultural value, Extremely slow growth rate.
<i>Commiphora capensis</i> (Sond.) Engl.	Namaqua corkwood	EU (illegally harvested for horticultural trade), Restricted range
<i>Commiphora cervifolia</i> J.J.A. van der Walt	Antler-leaved corkwood	EU (illegally harvested for horticultural trade), Restricted range
<i>Commiphora dinteri</i> Engl.	Namib corkwood	EU (illegally harvested for horticultural trade)
<i>Commiphora garipeensis</i> Swanepoel	Orange River corkwood	Restricted range
<i>Commiphora giessii</i> J. J. A. van der Walt	Brown-stemmed corkwood	Restricted range
<i>Commiphora gracilifrons</i> Dinter ex J. J. A. van der Walt	Karee corkwood	Restricted range, EU (illegally harvested for horticultural trade), Restricted range
<i>Commiphora krauseliana</i> Heine	Feather-leaved corkwood	EU (illegally harvested for horticultural trade), Restricted range
<i>Commiphora namaensis</i> Schinz	Nama corkwood	EU (illegally harvested for horticultural trade)
<i>Commiphora oblanceolata</i> Schinz	Swakopmund corkwood	Very small, widely scattered populations, Restricted range
<i>Commiphora saxicola</i> Engl.	Rock corkwood	EU (illegally harvested for horticultural trade)
<i>Commiphora virgata</i> Engl.	Slender corkwood	Value (cultural - host to edible caterpillar)
<i>Commiphora wildii</i> Merxm.	Oak-leaved corkwood	EU (resin for perfume), Value (cultural - perfume)
<i>Cyphostemma bainesii</i> (Hook. F.) Desc.	Gouty vine	EU (illegally harvested for horticultural trade), Restricted range
<i>Cyphostemma currorii</i> (Hook. F.) Desc.	Kobas	EU (illegally harvested for horticultural trade)
<i>Cyphostemma juttiae</i> (Dinter & Gilg) Desc.	Blue kobas	EU (illegally harvested for horticultural trade), Restricted range
<i>Cyphostemma uter</i> (Exell & Mendonça) Desc.	Kaoko kobas	Restricted range
<i>Dialium englerianum</i> Henriq.	Kalahari podberry	EU (Extensively used by humans - fruit an important part of diet of San and Kavango peoples, medicinal, timber, implements)

<i>Diospyros mespiliformis</i> Hochst. Ex A.DC.	Jackal-berry	EU (Heavily utilised by humans and animals - important fruit tree, timber, cash crop, utensils, watos, fuel wood, medicinal, fruit eaten by animals and frugivorous birds), slow growth rate.
<i>Elephantorrhiza rangei</i> Harms	Karas elephant-root	Restricted range and habitat
<i>Entandrophragma spicatum</i> (C.DC) Sprague	Owambo wooden-banana	Cultural value, slow growth rate, Restricted range
<i>Erythrina decora</i> Harms	Namib coral-tree	Small populations scattered over wide area, Cultural value, potential horticultural value
<i>Euclea asperrima</i> Friedr.-Holzh.	Mountain guarri	Restricted range
<i>Euclea pseudebenus</i> E. Mey. Ex A. Dc.	Wild ebony	ES (Keystone species, prevent erosion of water courses), Slow growth rate
<i>Faidherbia albida</i> (Delile) A.Chev.	Ana tree	ES (Important component of riparian fringe, prevents erosion of river beds, Keystone species), EU (heavily utilised by stock and game, important shade tree in arid west).
<i>Ficus burkei</i> (Miq.) Miq.	Strangler fig	EU (fruit for humans and animals), Restricted range
<i>Ficus cordata</i> Thunb.	Namaqua rock-fig	EU (fruit for humans and animals)
<i>Ficus sycomorus</i> L.	Sycamore fig	EU (fruit for humans and animals)
<i>Guibourtia coleosperma</i> (Benth.) J. Léonard	False mopane	EU (Heavily utilised by humans and animals - food, cash crops, very important shade tree, timber, watos, utensils)
<i>Hyphaene petersiana</i> Klotzsch ex Mart.	Makalani palm	EU (heavily utilised by humans and animals - utensils, basketry, thatching, fuel, ropes, palm wine, food)
<i>Kirkia dewinteri</i> Merxm. & Heine	Kaoko kirkia	Restricted range
<i>Lannea discolor</i> (Sond.) Engl.	Live-long	EU (used by humans and animals), Restricted range
<i>Maerua schinzii</i> Pax	Ringwood tree	EU (heavily used by humans and animals), slow growth rate
<i>Moringa ovalifolia</i> Dinter & A.Berger	Phantom tree	EU (heavily used by humans and animals - horticultural value, browse, tourism)
<i>Neoluederitzia sericeocarpa</i> Schinz	Silk-seed bush	Restricted range
<i>Ozoroa concolor</i> (C. Presl. Ex Sond.) De Winter	Green resin-bush	Restricted range, scattered distribution
<i>Ozoroa namaquensis</i> (Sprague) Von Teichman & A. E. vanWyk	Gariiep resin-tree	Restricted range
<i>Pachypodium lealii</i> Welw.	Bottle tree	Slow growth rate, EU (unsustainable harvesting for horticulture trade)
<i>Pachypodium namaquanum</i> (Wyley ex Harv.) Welw.	Elephant-trunk	Slow growth rate, EU (unsustainable harvesting for horticulture trade), Restricted range
<i>Pappea capensis</i> Eckl. & Zeyh.	Jacket-plum	ES (Keystone species, prevents erosion in rivers), EU (utilised by humans and animals - important shade tree, edible fruit, browsed)

<i>Philenoptera violacea</i> (Klotzsch) Schrire	Apple-leaf, rain tree	ES (important component of riparian and floodplain canopy) EU (utilised by humans and animals - fences, watos, medicines, browse, fodder)
<i>Protea gagedi</i> J. F. Gmel.	African white protea	Restricted range, EU (heavily utilised by humans - medicinal overharvesting of roots)
<i>Pterocarpus angolensis</i> DC.	African teak, kiaat	Value (economic), EU (heavily utilised for timber, implements, utensils, wood carvings)
<i>Salix mucronata subsp. capensis</i> (Thunb.) Immelman	Small-leaved willow, river willow	ES (stabilisation of river banks, shade), EU (Heavily utilised by humans - overharvesting for fuel wood, potentially threatened), Restricted range
<i>Schinziophyton rautanenii</i> (Schinz) Radcl.-Sm.	Manketti	EU (heavily utilised by humans and animals - utensils, curios, musical instruments, timber, shade, fruit a very important food and cash crop)
<i>Schotia afra</i> (L.) Thunb. var. <i>angustifolia</i> (E. Mey.) Harv.	Karoo schotia	EU (Utilised by humans for wood), Restricted range
<i>Sclerocarya birrea</i> (A. Rich.) Hochst.	Marula	EU (Heavily utilised by humans and animals for fruit, shade, browse, medicines, wood).
<i>Searsia lancea</i> (L. F.) F. A. Barkley	Karee	ES (Prevent erosion of river banks)
<i>Sesamothamnus benguellensis</i> Welw.	Kaoko sesame-bush	EU (Illegally harvested for the horticultural trade), slow growth rate, Restricted range
<i>Sesamothamnus guerichii</i> (Engl.) E. A. Bruce	Herero sesame-bush	EU (Illegally harvested for the horticultural trade), slow growth rate
<i>Sesamothamnus leistneri</i> Giess ex Ihlenf., ined.	Large-leaved sesame-bush	EU (Illegally harvested for the horticultural trade), slow growth rate, Restricted range
<i>Spirostachys africana</i> Sond.	Tamboti	EU (Heavily utilised by humans - timber)
<i>Sterculia africana</i> (Lour.) Fiori	African star-chestnut	Economic value (tourism and horticulture) EU (utilised by humans - medicinal and food)
<i>Sterculia quinqueloba</i> (Garcke) K. Schum.	Large-leaved sterculia	Economic value (tourism and horticulture), restricted habitat
<i>Strychnos cocculoides</i> Baker	Corky monkey-orange	Economic value (cash crop), EU (heavily utilised by humans and animals - fruit)
<i>Strychnos potatorum</i> L. F.	Black bitterberry	ES (Important component of river and flood plain vegetation) EU (utilised by humans (fish poison, shade) and animals (food and shade), Restricted range.
<i>Strychnos pungens</i> Soler.	Spine-leaved monkey-orange	Economic value (cash crop), EU (heavily utilised by humans and animals - fruit, medicinal)
<i>Strychnos spinosa</i> Lam.	Spiny monkey-orange	Economic value (cash crop), EU (heavily utilised by humans and animals - fruit and furniture), Restricted range

<i>Tamarix usneoides</i> E. Mey. ex Bunge	Wild tamarisk	ES (prevents erosion of river beds and river banks, important component of riparian vegetation), EU (browsed by game)
<i>Tylecodon paniculatus</i> (L. F.) Toelken	Southern botterboom	EU (unsustainable harvesting - horticultural trade), Restricted range
<i>Welwitschia mirabilis</i> Hook f.	Welwitschia	Cultural value, scientific value, economic value (tourism)
<i>Ziziphus mucronata</i> Willd.	Buffalo-thorn	ES (prevents erosion of river beds and river banks, important component of riparian vegetation) EU (Utilized by humans and animals - medicinal, construction, implements, fuel wood, browsed by livestock and game)

1: EU = Extend of use

2: ES = Ecosystem Services