

PROJECT STATUS

Title	Environmental Management Plan for the: Street Creation on Proposed Consolidated Portion V, of Lüderitz Town and Townlands No. 11//Karas Region		
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Proponent	Lüderitz Town Council PO Box 19, Lüderitz Contact Person: Jonas Mahalelo Email: properties@ltc.com.na		
Environmental Assessment Practitioner	Stubenrauch Planning Consultants P.O. Box 41404, Windhoek Contact Person: Bronwynn Basson Contact Number: +264 (61) 25 11 89 Fax Number: +264 (61) 25 11 89 Email: bronwynn@spc.com.na		
Report date	January 2026		
	Name	Signature	Date
Author	Bronwynn Basson		January 2026
Document Reviewer	Victoria Shikwaya		January 2026

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ABBREVIATIONS

AIDS	Acquired Immuno-Deficiency Syndrome
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
PR	Proponent's Representative
NHCN	National Heritage Council of Namibia
Reg.	Regulation
S	Section
SPC	Stubenrauch Planning Consultants
TB	Tuberculosis

1 INTRODUCTION

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

- **Subdivision of the Remainder of Portion B of Lüderitz Town and Townlands No. 11 into 19 Portions (proposed Portions A – S) and the Remainder;**
- **Subdivision of Portion N of the Lüderitz Town and Townlands No. 11 into proposed Portion T, U and the Remainder;**
- **Rezoning of proposed Portion T from “Parastatal” to “Undetermined”;**
- **Consolidation of proposed Portions R - T into Consolidated Portion V;**
- **Rezoning of proposed Portions A – N from “Undetermined” to “Light Industrial” with a bulk of 1.0;**
- **Reservations of proposed Portions O – Q as “Public Open Space”;**
- **Reservation of Consolidated proposed Portion V as a “Street”;**
- **Registration of a 22m wide powerline servitude over proposed Portions F – I, K, L, P and Consolidated Portion V in favor of the Local Authority;**
- **Registration of a 15m wide water pipeline servitude over the Remainder of Portion B of Lüderitz Town and Townlands No. 11 in favor of NamWater.**

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).

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 and construction activities for the development as well as any other construction process(s) within the development areas;
- Operation and Maintenance – the period during which the facility and associated infrastructure will be fully functional and maintained.

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

The proposed Portions A – Q and Consolidated Portion V are located towards the south-western part of the Lüderitz Townlands. Please refer to below locality map in **Figure 1**.

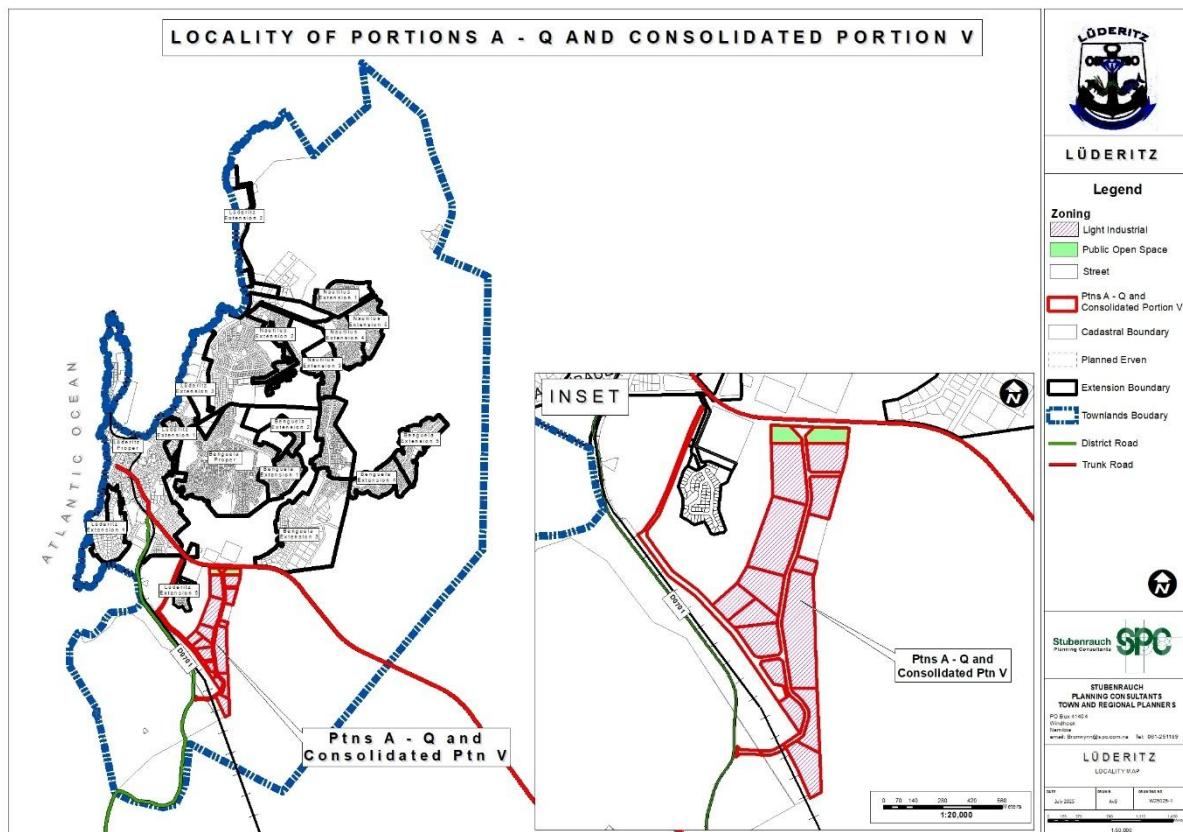


Figure 1: Locality of Portion A-Q and Consolidated Portion V

The Proponent is proposing an accelerated development of residential, commercial, and especially industrial land to support large-scale investments aligned with the Government of Namibia's Industrialization program. Lüderitz has been identified as a strategic hub for green hydrogen, oil, gas, and other industries in the //Kharas Region, requiring dedicated industrial erven to accommodate processing, storage, maintenance, logistics, and local manufacturing services.

The proposed industrial zone is located in the valley south of the B4 road and north of the Aus–Lüderitz railway, primarily on Portion 52 of Farm Lüderitz Town and Townlands No. 11. This area is favored due to its flat terrain, proximity to key transport routes including the B4, and existing infrastructure like overhead electricity lines. Land parcels have already been allocated to investors within this "Industrial Corridor."

A key component of the development is formalizing an existing informal road connecting the B4 to the railway line (near Portion N). While the railway company, Transnamib, does not support a road crossing through the wider railway property, they agree to a crossing at the southern end with provision for a future road-over-rail bridge to accommodate traffic growth. This new road will remain a municipal road and is critical to linking the industrial zone with the D0701 District Road, thus redirecting heavy vehicle traffic away from Lüderitz's urban center. This will improve traffic flow, road safety, and reduce urban wear and tear.

Environmental considerations include protecting a natural watercourse through designated public open spaces to support stormwater flow, integrating with the town's green spaces. The layout also respects the existing cemetery in the northwest and preserves servitude areas for a major overhead electricity line and water pipeline across multiple property portions.

Overall, this proposed development forms part of Lüderitz's Urban Densification and Infill initiative, aiming to create an efficient industrial corridor that will bolster economic diversification, attract investment, and generate employment, while ensuring infrastructure and connectivity support the town's anticipated industrial growth. The following table provides an overview of the land uses provided.

Table 1: Overview of the land uses

Portion No	Proposed Zoning
Portion A	Light Industrial
Portion B	Light Industrial
Portion C	Light Industrial
Portion D	Light Industrial
Portion E	Light Industrial
Portion F	Light Industrial
Portion G	Light Industrial
Portion H	Light Industrial
Portion I	Light Industrial
Portion J	Light Industrial
Portion K	Light Industrial
Portion L	Light Industrial
Portion M	Light Industrial
Portion N	Light Industrial
Portion O	Public Open Space
Portion P	Public Open Space
Portion Q	Public Open Space
Consolidated Portion V	Street

In order to implement the proposed industrial corridor initiative, the following must be followed and approved:

2.1 The Subdivision of the Remainder of Portion B of Lüderitz Town and Townlands No. 11

As discussed above and as depicted in **Figure 2 & 3**, it is the intention of the Lüderitz Town Council to subdivide the Remainder of Portion B of the Lüderitz Town and Townlands No. 11 into 19 portions (Portions A – S) and the remainder.

It should be noted that Portions R and S is the street portion that has been created to accommodate the existing informal street. **Table 2** below depicts the sizes of the newly created portions.

Table 2: Sizes of the newly created portions

Portion No.	± Area (m ²)
Portion A	25493
Portion B	20935
Portion C	76065
Portion D	7052
Portion E	24069
Portion F	26193
Portion G	42600
Portion H	62749
Portion I	29566
Portion J	17700
Portion K	18535
Portion L	25060
Portion M	10371
Portion N	10918
Portion O	680
Portion P	14531
Portion Q	10351
Portion R	81541
Portion S	2522

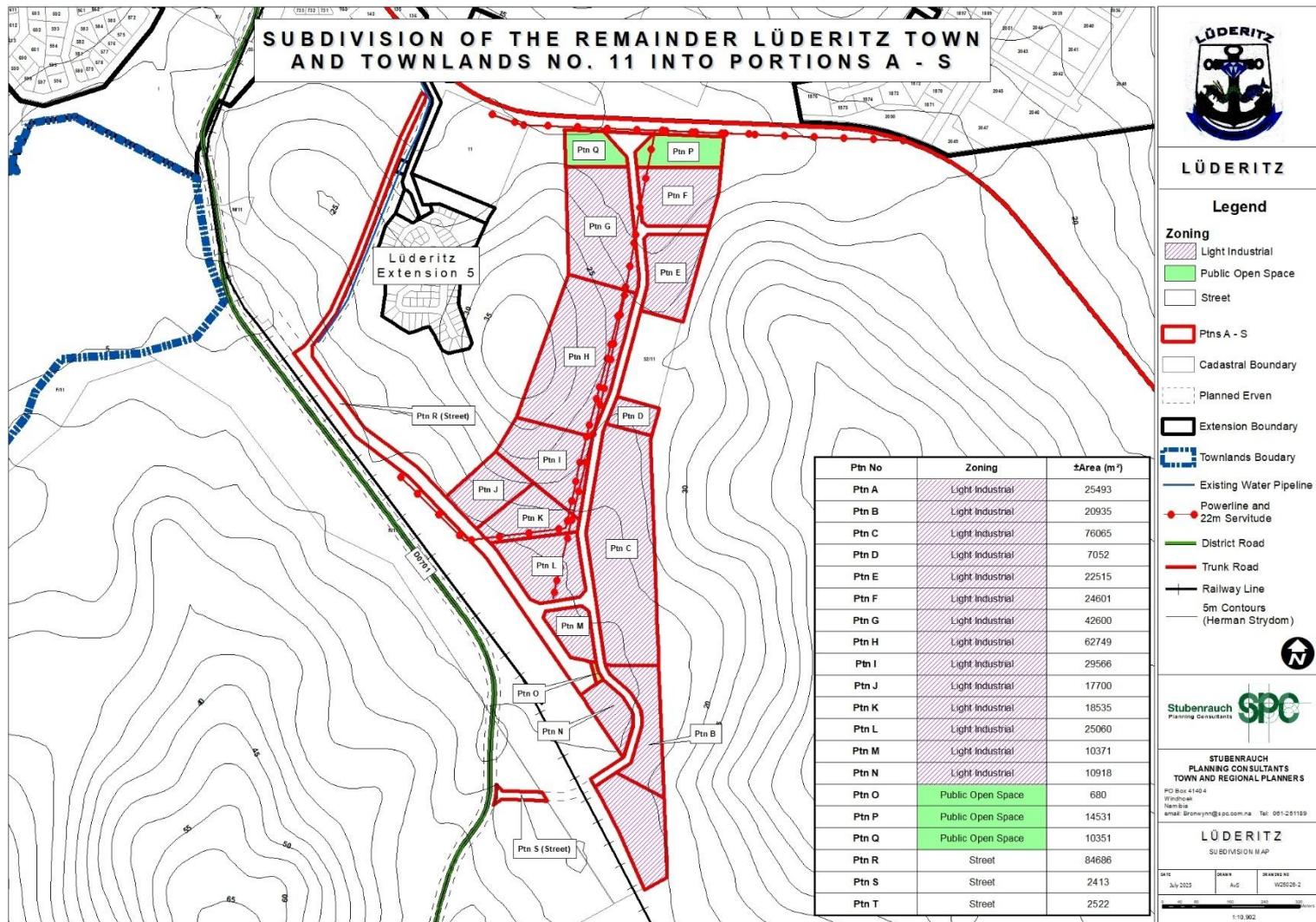


Figure 2: Subdivision of Remainder of Portion B of Lüderitz Town and Townlands No. 11

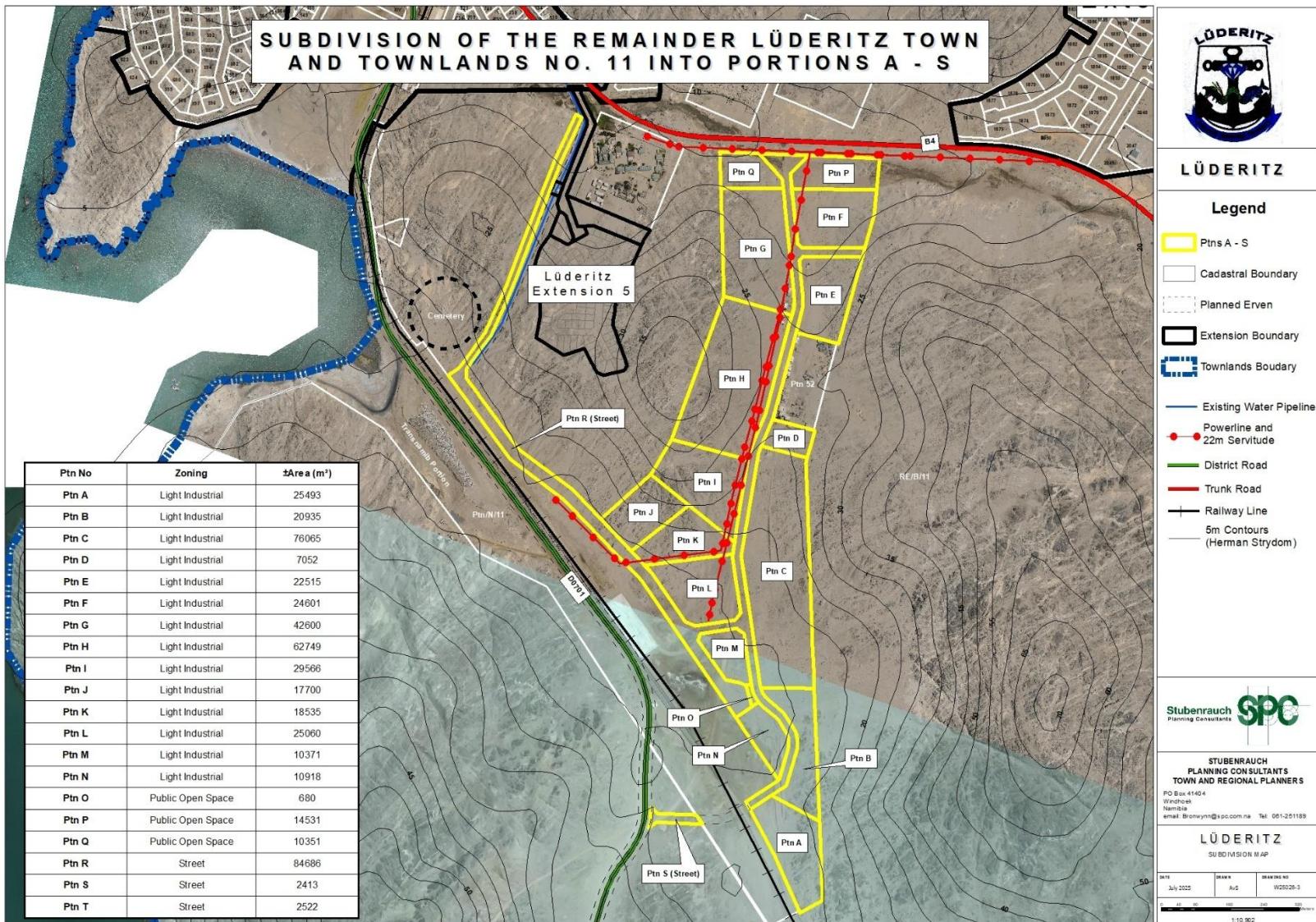


Figure 3: Aerial map of the Subdivision of Remainder of Portion B of Lüderitz Town and Townlands No. 11 into Portion A-S

2.2 Subdivision of Portion N of the Lüderitz Town and Townlands No. 11

A portion of the existing road runs over Portion N of the Lüderitz Town and Townlands No. 11, hence, to formalise the road, the portion needs to be subdivided into Portions Y, U and the remainder.

Kindly take note that Portion T is the street portion, while Portion U was created in order to avoid creating a split remainder. Please refer to **Figure 4** below. **Table 3** below depicts the sizes of the newly created portions.

Table 3: Subdivision Table

Portion No.	± Area (m ²)
Portion T	2413
Portion U	26088
Remainder	296416

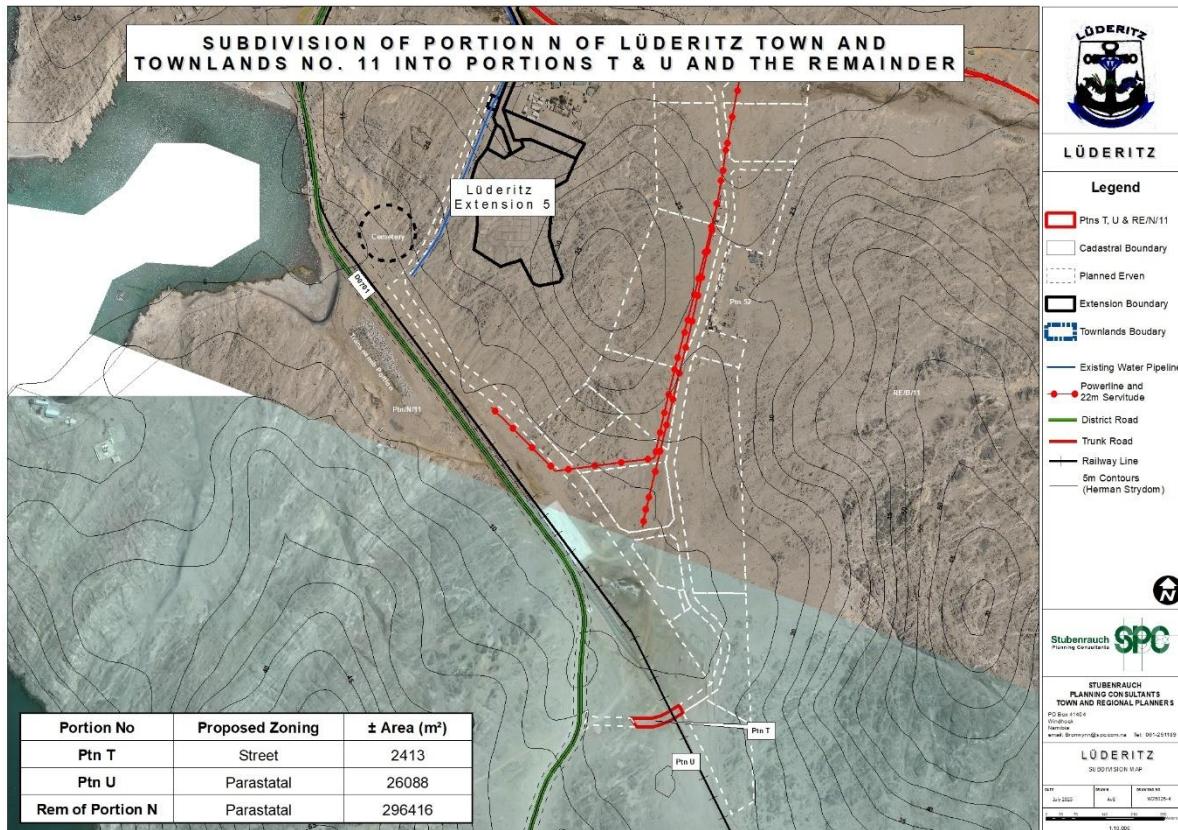


Figure 4: Subdivision of Portion N of the Lüderitz Town and Townlands No. 11 into Portion T & U and the Remainder

2.3 Rezoning of proposed Portion T

It is necessary to rezone proposed Portion T from “Parastatal” to “Undetermined” in order for proposed Portion T to be consolidated with proposed Portions R and S, since proposed Portion R and S currently has the zoning “Undetermined” as depicted in **Figure 5** below.

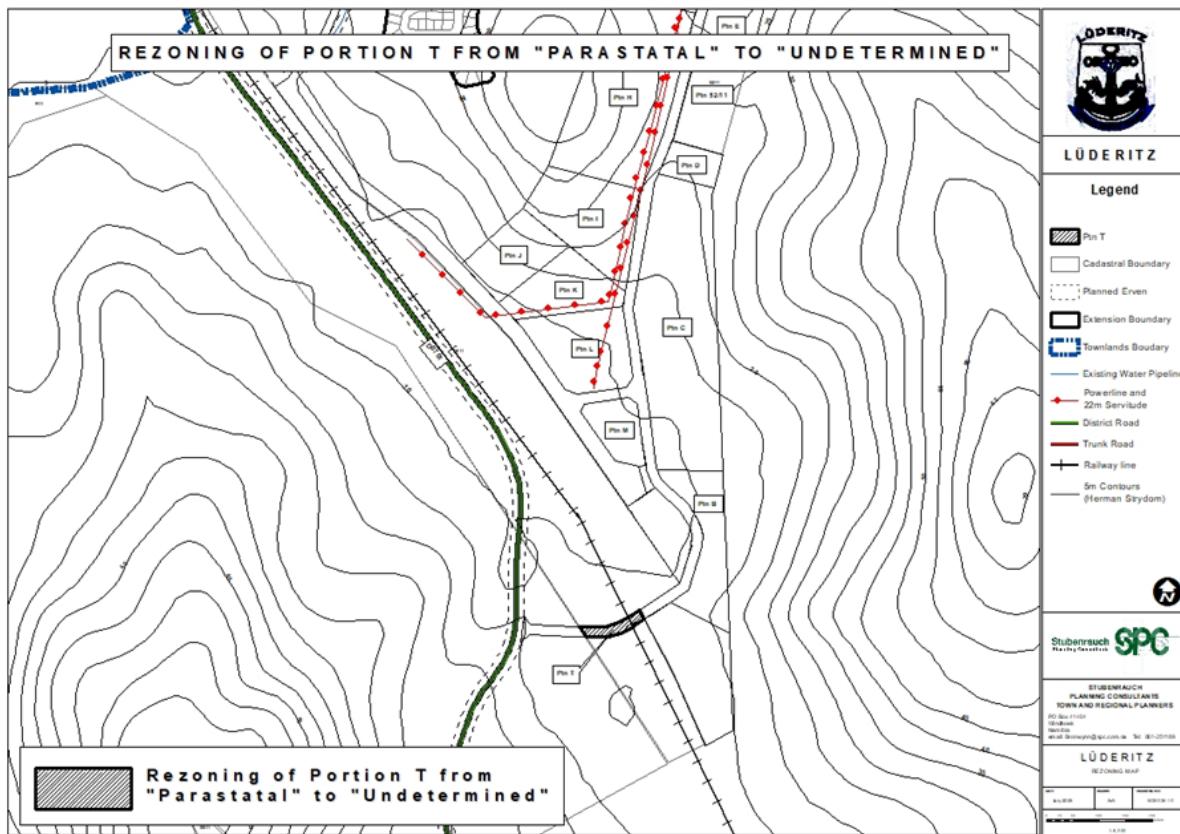


Figure 5: Rezoning of Portion T from parastatal to undetermined

2.4 Consolidation of Portions R - T

Proposed Portions R – T will be consolidated into proposed Portion V in order to create a single street portion rather than registering three separate street portions.

Table 4 and **Figure 6** below depicts the proposed consolidation of the street portions.

Table 4: Consolidation of Portions R – T

Portion No.	± Area (m ²)
Portion R	81541
Portion S	2522
Portion T	2413
Consolidated Portion V	86476

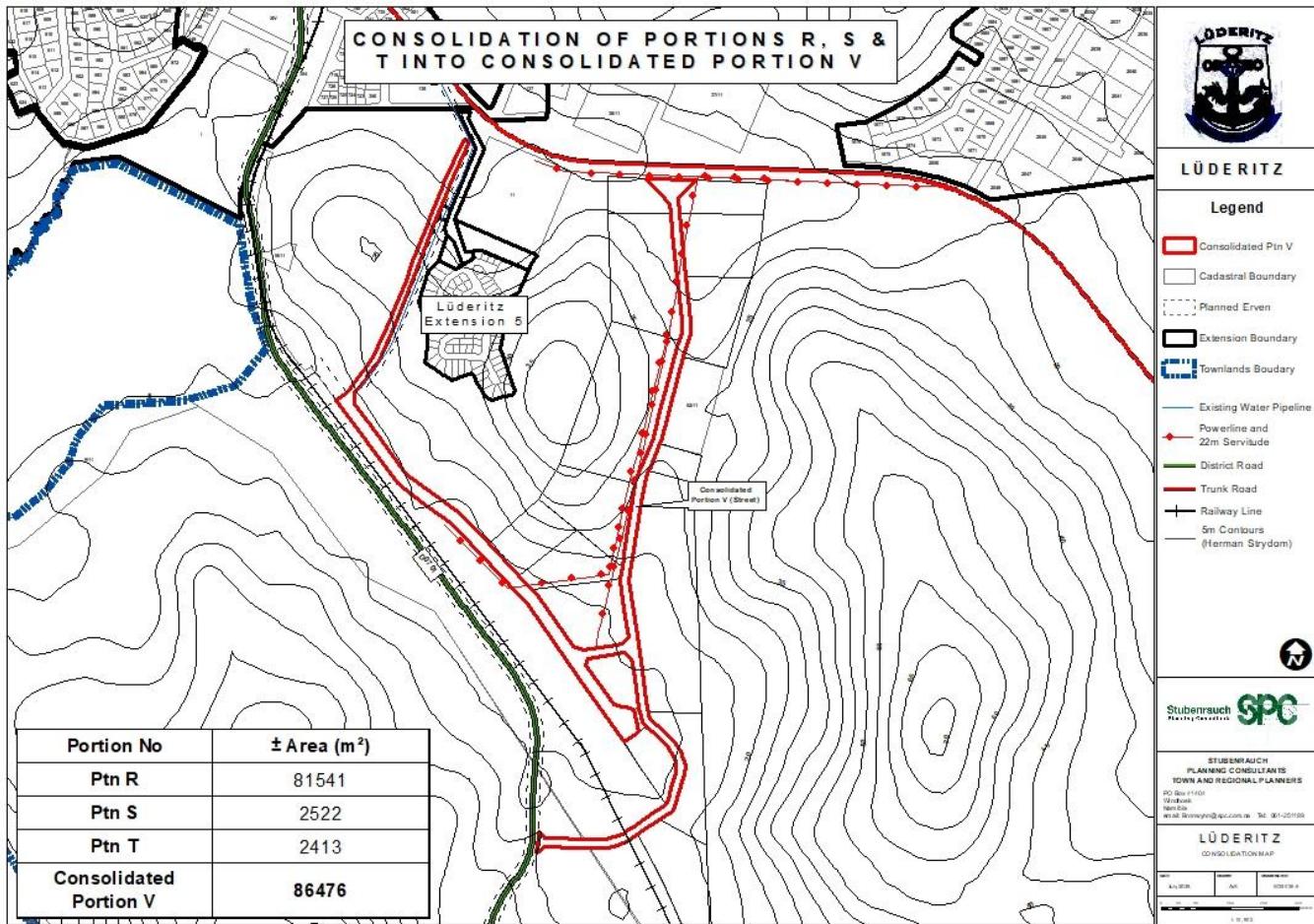


Figure 6: Consolidation of Portions R – T into consolidated Portion V

2.5 Rezoning of Portions A – N from “Undetermined” to “Light Industrial”

Proposed Portions A – N will be sold or leased out to developers for industrial purposes; hence it is necessary to rezone the portions from “Undetermined” to “Light Industrial” as outlined in **Figure 7** below.

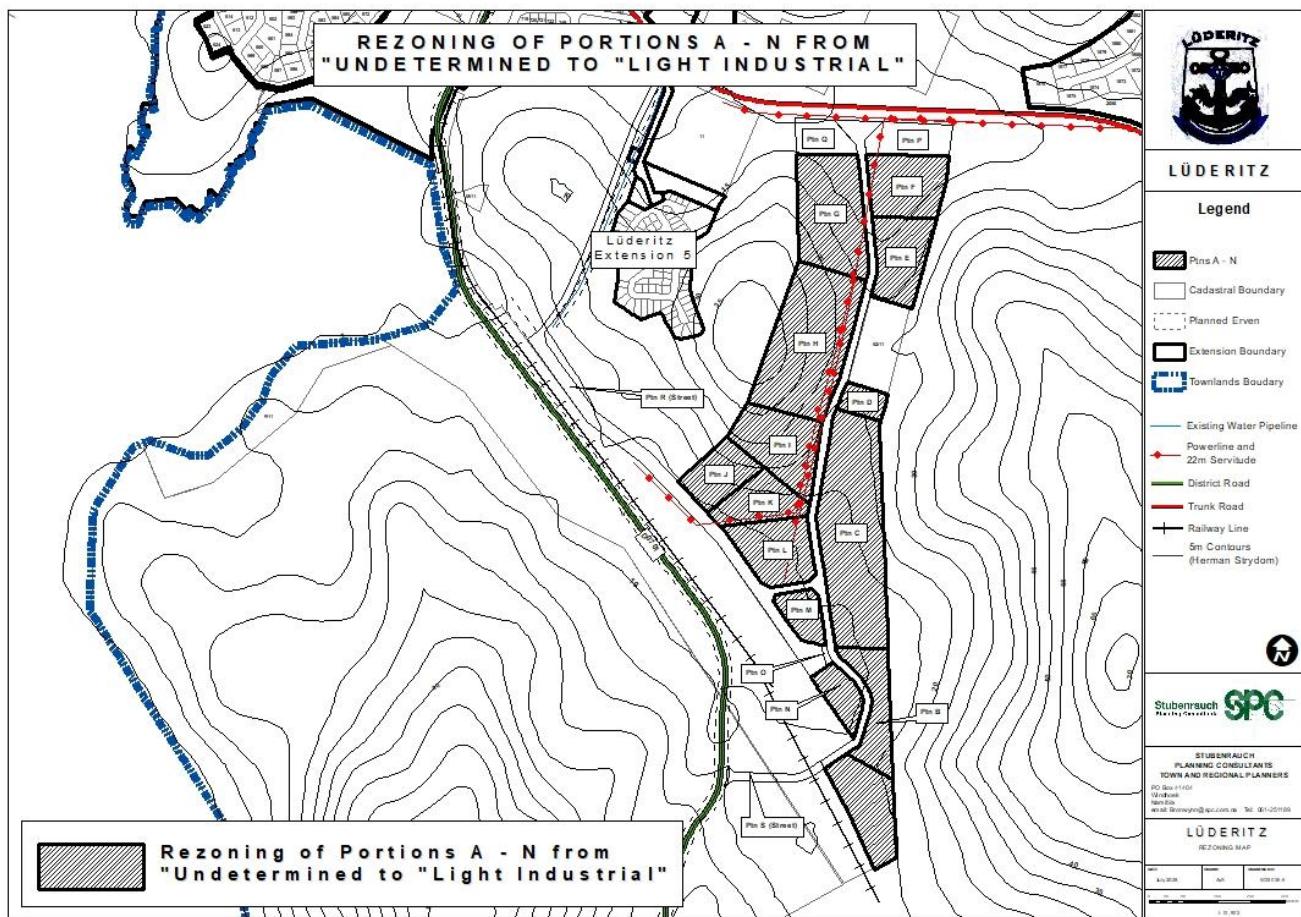


Figure 7: Rezoning of Portions A – N from Undetermined to Light Industrial

2.6 Reservations of Portions O – Q as “Public Open Space”

Proposed Portion O will be reserved to “Public Open Space” to improve the aesthetic value in the industrial area as well as to keep a safe distance between intersection on the internal street network as depicted in **Figure 8** below.

The natural watercourse north of the proposed development will be accommodated in the layout planning for the Industrial Corridor, hence Portions Q and P will be reserved for “Public Open Space” with will form part of the overall open space system for Lüderitz.

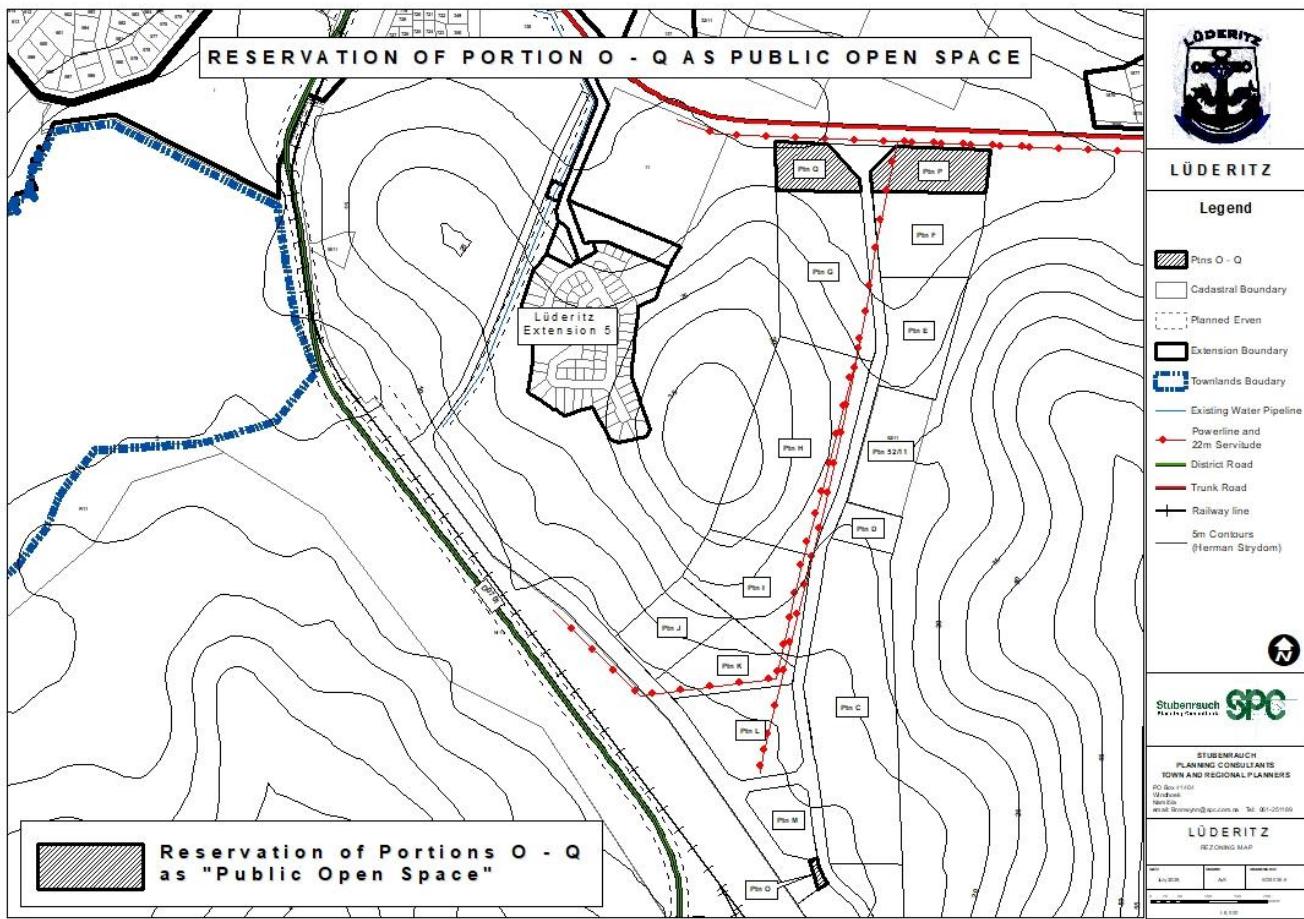


Figure 8: Reservation of Portions O – Q as a Public Open Space

2.7 Registration of a 22m wide powerline servitude

There is an existing powerline running over the Remainder of Portion B of Lüderitz Town and Townlands No. 11, however, this powerline is not endorsed on the Title Deed, nor indicated on the General Plan.

To respect and incorporate the powerline, powerline servitudes must be registered over Portions F – I, K, L, P and Consolidated Portion V.

2.8 Registration of a 15m wide water pipeline servitude

There is an existing water pipeline running over the Remainder of Portion B of Lüderitz Town and Townlands No. 11, however, this water pipeline is not endorsed on the Title Deed, nor indicated on the General Plan.

To respect and incorporate the water pipeline, a water pipeline servitude must be registered over the Remainder of Portion B of Lüderitz Town and Townlands No. 11 in favor of NamWater.

2.9 Engineering services and Access Provision

It is the responsibility of the Lüderitz Town Council to connect the newly created portions to the Municipal Engineering Services of Lüderitz, which includes water, electricity and sewer.

Should the developer wish to upgrade the services or then add additional services to the respective portion, it will be the responsibility of the developer and their own costs.

Access

Proposed Portions A – Q will gain access via newly created Consolidated Portion V which is to be reserved as a “Street” as depicted in Figure 14 below.

It should be noted that Consolidated Portion V will be connected to the D0701 District Road and the B4 Trunk Road. SPC is in the process of applying to Roads Authority for access onto proposed Consolidated Portion V from the D0701 District Road and the B4 Trunk Road.

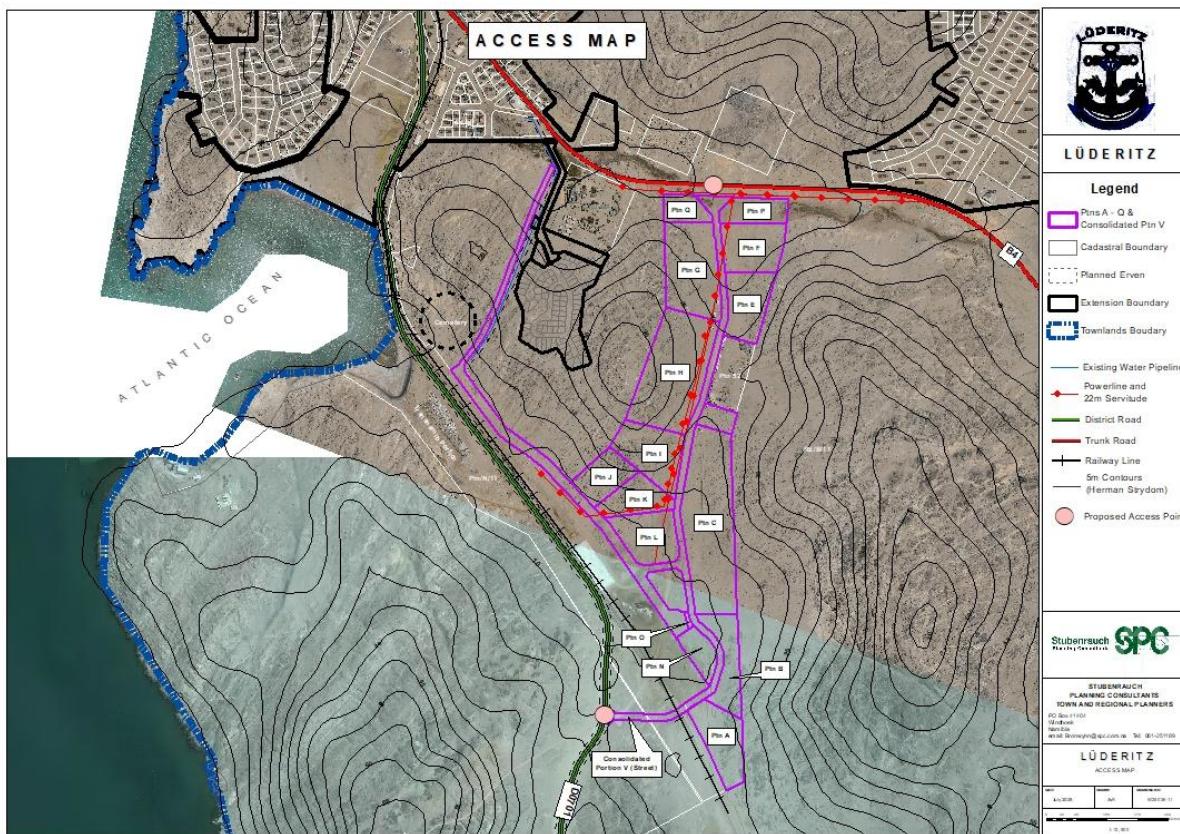


Figure 9: Access Map

3 ROLES AND RESPONSIBILITIES

The proponent (Lüderitz Town Council) hereinafter referred to as 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:

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

3.1 PROPONENTS'S REPRESENTATIVE

The proponent 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 Proponent's Representative (PR). The proponent may decide to assign this role to one person for the full duration of these developments, or may assign a different PR to each of the development phases – i.e. one for the construction phase and one for the operation and maintenance phase. The PR's responsibilities are as follows:

Table 3-1 Responsibilities of PR

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
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 PR 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 PR/ Proponent may decide to assign this role to one person for both phases and 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 proponent, PR, 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 PR on the removal of person(s) and/or equipment not complying with the provisions of this EMP;
- Making recommendations to the PR 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 proponent 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**);
- 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. 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 Lüderitz townlands area and that migrant labourers (if applicable) will be housed in established accommodation facilities within Lüderitz.

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 applicable to proposed development

LEGISLATION/POLICIES	RELEVANT PROVISIONS	RELEVANCE TO PROJECT
The Constitution of the Republic of Namibia as Amended	<p>Article 91 (c) provides for duty to guard against “the degradation and destruction of ecosystems and failure to protect the beauty and character of Namibia.”</p> <p>Article 95(l) deals with the “maintenance of ecosystems, essential ecological processes and biological diversity” and sustainable use of the country’s natural resources.</p>	Sustainable development should be at the forefront of this development.
Environmental Management Act No. 7 of 2007 (EMA)	<p>Section 2 outlines the objective of the Act and the means to achieve that.</p> <p>Section 3 details the principle of Environmental Management</p>	The development should be informed by the EMA.
EIA Regulations GN 28, 29, and 30 of EMA (2012)	<p>GN 29 Identifies and lists certain activities that cannot be undertaken without an environmental clearance certificate.</p> <p>GN 30 provides the regulations governing the environmental assessment (EA) process.</p>	<p>The following listed activities are triggered by the proposed development:</p> <p>Activity 5.1 (d) Land use and Development Activities</p> <p>Activity 10.1(a) (Infrastructure)</p> <p>Activity 10.1 (b) Infrastructure</p> <p>Activity 10.2 (a) Infrastructure</p>
Convention on Biological Diversity (1992)	Article 1 lists the conservation of biological diversity amongst the objectives of the convention.	The project should consider the impact it will have on the biodiversity of the area.
Draft Procedures and Guidelines for conducting EIAs and compiling EMPs (2008)	Part 1, Stage 8 of the guidelines states that if a proposal is likely to affect people, certain guidelines should be considered by the proponent in the scoping process.	The EA process should incorporate the aspects outlined in the guidelines.
Namibia Vision 2030	Vision 2030 states that the solitude, silence and natural beauty that many areas in Namibia provide are becoming sought after commodities and must be regarded as valuable natural assets.	Care should be taken that the development does not lead to the degradation of the natural beauty of the area.

LEGISLATION/POLICIES	RELEVANT PROVISIONS	RELEVANCE TO PROJECT
Water Act No. 54 of 1956	Section 23(1) deals with the prohibition of pollution of underground and surface water bodies.	The pollution of water resources should be avoided during construction and operation of the development.
The Ministry of Environment and Tourism (MET) Policy on HIV & AIDS	MET has recently developed a policy on HIV and AIDS. In addition, it has also initiated a programme aimed at mainstreaming HIV and gender issues into environmental impact assessments.	The proponent and its contractor must adhere to the guidelines provided to manage the aspects of HIV/AIDS. Experience with construction projects has shown that a significant risk is created when migrant construction workers interact with local communities.
Urban and Regional Planning Act No 5 of 2018	To consolidate the laws relating to urban and regional planning; to provide for a legal framework for spatial planning in Namibia; to provide for principles and standards of spatial planning; to establish the urban and regional planning board; to decentralise certain matters relating to spatial planning; to provide for the preparation, approval and review of the national spatial development framework, regional structure plans and urban structure plans; to provide for the preparation, approval, review and amendment of zoning schemes; to provide for the establishment of townships; to provide for the alteration of boundaries of approved townships, to provide for the disestablishment of approved townships; to provide for the change of name of approved townships; to provide for the subdivision and consolidation of land; to provide for the alteration, suspension and deletion of conditions relating to land; and to provide for incidental matters.	The proposed development must adhere to the provisions regarding the subdivision and rezoning of land.
Local Authorities Act No. 23 of 1992	The Local Authorities Act prescribes the manner in which a town or municipality should be managed by the Town or Municipal Council.	The development must comply with provisions of the Local Authorities Act.

LEGISLATION/POLICIES	RELEVANT PROVISIONS	RELEVANCE TO PROJECT
Labour Act no. 11 of 2007	<p>Chapter 2 details the fundamental rights and protections.</p> <p>Chapter 3 deals with the basic conditions of employment.</p>	Given the employment opportunities presented by the development, compliance with the labour law is essential.
National Heritage Act No. 27 of 2004	The Act is aimed at protecting, conserving and registering places and objects of heritage significance.	All protected heritage resources (e.g. human remains etc.) discovered, need to be reported immediately to the National Heritage Council (NHC) and require a permit from the NHC before they may be relocated.
Roads Ordinance 17 of 1972	<ul style="list-style-type: none"> • Section 3.1 deals with width of proclaimed roads and road reserve boundaries • Section 27.1 is concerned with the control of traffic on urban trunk and main roads • Section 36.1 regulates rails, tracks, bridges, wires, cables, subways or culverts across or under proclaimed roads • Section 37.1 deals with Infringements and obstructions on and interference with proclaimed roads. 	Adhere to all applicable provisions of the Roads Ordinance.
Public and Environmental Health Act of 2015	This Act (GG 5740) provides a framework for a structured uniform public and environmental health system in Namibia. It covers notification, prevention and control of diseases and sexually transmitted infections; maternal, ante-natal and neo-natal care; water and food supplies; infant nutrition; waste management; health nuisances; public and environmental health planning and reporting. It repeals the Public Health Act 36 of 1919 (SA GG 979).	Contractors and users of the proposed development are to comply with these legal requirements.

LEGISLATION/POLICIES	RELEVANT PROVISIONS	RELEVANCE TO PROJECT
Nature Conservation Ordinance no. 4 of 1975	Chapter 6 provides for legislation regarding the protection of indigenous plants	Indigenous and protected plants must be managed within the legal confines.
Water Quality Guidelines for Drinking Water and Wastewater Treatment	Details specific quantities in terms of water quality determinants, which wastewater should be treated to before being discharged into the environment	These guidelines are to be applied when dealing with water and waste treatment
Environmental Assessment Policy of Namibia (1995)	The Policy seeks to ensure that the environmental consequences of development projects and policies are considered, understood and incorporated into the planning process, and that the term ENVIRONMENT is broadly interpreted to include biophysical, social, economic, cultural, historical and political components.	This EIA considers this term of Environment.
Water Resources Management Act No. 11 of 2013	Part 12 deals with the control and protection of groundwater Part 13 deals with water pollution control	The pollution of water resources should be avoided during construction and operation of the development. Should water need to be abstracted, a water abstraction permit will be required from the Ministry of Water, Agriculture and Forestry.
Forest Act 12 of 2001 and Forest Regulations of 2015	To provide for the establishment of a Forestry Council and the appointment of certain officials; to consolidate the laws relating to the management and use of forests and forest produce; to provide for the protection of the environment and the control and management of forest fires; to repeal the Preservation of Bees and Honey Proclamation, 1923 (Proclamation No. 1 of 1923), Preservation of Trees and Forests Ordinance, 1952 (Ordinance No. 37 of 1952) and the Forest Act, 1968 (Act No. 72 of	Protected tree and plant species as per the Forest Act No 12 of 2001 and Forest Regulations of 2015 may not be removed without a permit from the Ministry of Agriculture, Water and Forestry.

LEGISLATION/POLICIES	RELEVANT PROVISIONS	RELEVANCE TO PROJECT
	1968); and to deal with incidental matters.	
Atmospheric Pollution Prevention Ordinance No 45 of 1965	Part II - control of noxious or offensive gases, Part III - atmospheric pollution by smoke, Part IV - dust control, and Part V - air pollution by fumes emitted by vehicles.	The development should consider the provisions outlined in the act. The proponent should apply for an Air Emissions permit from the Ministry of Health and Social Services (if needed).
Hazardous Substance Ordinance 14 of 1974	To provide for the control of substances which may cause injury or ill-health to or death of human beings by reason of their toxic, corrosive, irritant, strongly sensitizing or flammable nature or the generation of pressure thereby in certain circumstances; to provide for the division of such substances into groups in relation to the degree of danger; to provide for the prohibition and control of the importation, manufacture, sale, use, operation, application, modification, disposal or dumping of such substances; and to provide for matters connected therewith.	The handling, usage and storage of hazardous substances on site should be carefully controlled according to this Ordinance.
Soil Conservation Act No 76 of 1969	Act to consolidate and amend the law relating to the combating and prevention of soil erosion, the conservation, improvement and manner of use of the soil and vegetation and the protection of the water sources	The proposed activity should ensure that soil erosion and soil pollution is avoided during construction and operation.

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 for the proposed development 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).

4.4 CONSTRUCTION PHASE

The management actions listed in **Table 4-2** 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.	<p>All construction workers are to undergo EMP training that should include as a minimum the following:</p> <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. 	Contractor, PR

Environmental Feature	Impact	Management Actions	Responsible Person
		<ul style="list-style-type: none"> Explanation of the mitigation measures that must be implemented when particular work groups carry out their respective activities. 	
Conservation of vegetation	Loss of biodiversity	<ul style="list-style-type: none"> Prevent the destruction of protected and endemic plant species. Prevent contractors from collecting wood, veld food, etc. during the construction phase. Recommend the planting of local indigenous species of flora as part of the landscaping as these species would require less maintenance than exotic species. Prevent the introduction of potentially invasive alien ornamental plant species such as; <i>Lantana</i>, <i>Opuntia</i>, <i>Prosopis</i>, <i>Tecoma</i>, etc.; as part of the landscaping as these species could infest the area further over time. Protected trees and plants are not to be removed without a valid permit from the local Department of Forestry. 	Contractor
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 PR 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 PR

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 and should not take place on open soil. 	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 	Contractor

Environmental Feature	Impact	Management Actions	Responsible Person
		<p>possible to the existing roads and tracks.</p> <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 Lüderitz. • 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. 	

Environmental Feature	Impact	Management Actions	Responsible Person
General waste	Visual impact and soil contamination	<ul style="list-style-type: none"> The construction site should be kept tidy at all times. 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. 	Contractor
Topsoil	Loss of topsoil and associated opportunity costs	<ul style="list-style-type: none"> When excavations are carried out, topsoil¹ 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

¹ 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, PR
Road safety	Injury or loss of life	<ul style="list-style-type: none"> • Demarcate roads to be used by construction vehicles clearly. 	Contractor

Environmental Feature	Impact	Management Actions	Responsible Person
		<ul style="list-style-type: none"> 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. 	
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
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. 	Contractor

Environmental Feature	Impact	Management Actions	Responsible Person
		<ul style="list-style-type: none"> ○ 1 toilet for every 30 males. ○ Sewage needs to be removed on a regular basis to an approved (municipal) sewage disposal site in Lüderitz. ○ 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. 	
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. ● 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. 	Contractor

Environmental Feature	Impact	Management Actions	Responsible Person
		<ul style="list-style-type: none"> Building rubble and domestic waste should be stored in skips. 	
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
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 adhere to the below provision as a minimum for the recruitment of labour:</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. 	Contractor

Environmental Feature	Impact	Management Actions	Responsible Person
		<ul style="list-style-type: none"> • 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 Lüderitz 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. 	
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

Environmental Feature	Impact	Management Actions	Responsible Person
General communication	Negative conflict with I&APs	<ul style="list-style-type: none"> • The PR 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 PR before construction commences. • 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 relevant 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. 	Contractor, ECO, PR

Environmental Feature	Impact	Management Actions	Responsible Person
		<ul style="list-style-type: none"> • 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 PR 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; ○ 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; 	Contractor

Environmental Feature	Impact	Management Actions	Responsible Person
		<ul style="list-style-type: none"> ○ 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 ○ 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 4-3** 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 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 development. • To mark the area with appropriate road warning signs (e.g. the road curves to the left/right) 	Proponent
Waste	Pollution	<ul style="list-style-type: none"> • Waste is to be disposed of as per the municipal waste disposal management regulations. • No waste may be buried or burned on site. • The subject site is to be kept tidy at all times. 	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 infrastructure development is decommissioned the following management actions should apply.

Table 4-5: Decommissioning phase management actions

Environmental Feature	Management Actions
Decommissioning activity	Many of the mitigation measures prescribed for the construction activities for these developments (Table 4-3 above) would be applicable to some of the decommissioning activities. These should be adhered to where applicable.

5 CONCLUSION

The management actions included in this report aim to assist in the avoidance, management and/or mitigation of potential impacts on the environment that may result from the proposed activities.

Should the measures recommended in this EMP be implemented and monitored, SPC is confident that the risks identified in the FESR can be reduced to acceptable levels.