

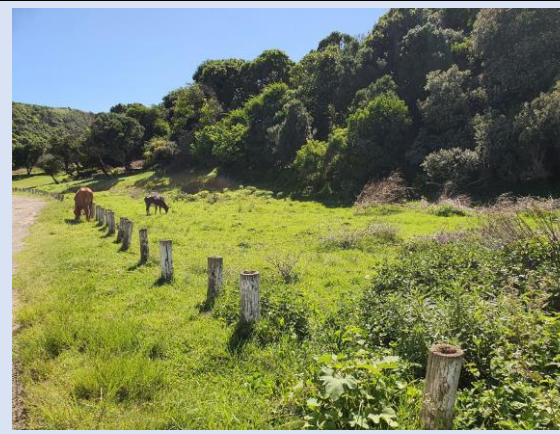
May 2021

DRAFT

AQUATIC IMPACT ASSESSMENT

for the

THE PROPOSED UPGRADE AND CONSTRUCTION OF COASTAL INFRASTRUCTURE WITHIN THE KING SABATA DALINDYEBO LOCAL MUNICIPALITY, COFFEE BAY & HOLE IN THE WALL, EASTERN CAPE.



Compiled for




Compiled by



PROJECT RESPONSIBILITIES

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ABBREVIATIONS AND ACRONYMS

BRU	Bioresource Unit
CARA	Conservation of Agricultural Resources Act (Act 43 of 1983)
CBA	Critical Biodiversity Area
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CREW	Custodians of Rare and Endangered Wildflowers
CSIR	Council for Scientific and Industrial Research
DAFF	Department of Agriculture, Forestry and Fisheries
DARD	Department of Agriculture & Rural Development
DEA	Department of Environmental Affairs
DFFE	Department of Forestry, Fisheries and the Environment
DHSWS	Department of Human Settlements, Water and Sanitation
DMRE	Department of Mineral Resources and Energy
DWA	Department of Water Affairs
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EFZ	Estuarine Functional Zone
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EMF	Environmental Management Framework
EMP	Environmental Management Plan
ESA	Ecological Support Areas
ESMP	uMhlathuze Environmental Services Management Plan
GIS	Geographical Information Systems
GN	Government Notice
GPS	Global Positioning System
IBA	Important Bird and Biodiversity Areas
IUCN	International Union for Conservation of Nature and Natural Resource
NEMA	National Environmental Management Act (Act 107 of 1998)
NEMBA	National Environmental Management: Biodiversity Act (Act 10 of 2004)
NEMPAA	National Environmental Management: Protected Areas Act (Act 57 of 2003)
NFA	National Forests Act (Act 84 of 1998)
NFEPA	National Freshwater Ecosystems Priority Areas
NPAES	National Protected Area Expansion Strategy
NWA	National Water Act (Act 36 of 1998)
NWM	National Wetland Map
PA	Primary Aquifers
PA's	Protected Areas in terms of NEMPAA
PFS	Prefeasibility study
PRECIS	National Herbarium Pretoria (PRE) Computerised Information System
SAIIAE	South African Inventory of Inland Aquatic Ecosystems
SANBI	South African National Biodiversity Institute
SARCA	South African Reptile Conservation Assessment
SDF	Spatial Development Framework
SIBIS	Integrated Biodiversity Information System
TOPS	NEMBA Threatened or Protected Species
VEGMAP	Vegetation Map of Southern Africa
WMA	Water Management Area

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EXECUTIVE SUMMARY

Exigent Engineering Consultants CC has been appointed by Acer Africa MBB Consulting Services (Eastern Cape), on behalf of the Department of Forestry, Fisheries and the Environment (DFFE), Planning and Monitoring of Infrastructure Projects – Working for the Coast (Eastern Cape), to facilitate the construction and upgrade of tourist facilities at Coffee Bay and Hole in the Wall, Eastern Cape. Exigent's scope is to conduct a specialist aquatic impact assessment for the proposed upgrade and construction of tourist facilities within Coffee Bay and Hole in the Wall, in the King Sabata Dalindyebo Local Municipality within OR Tambo District Municipality, Eastern Cape Province.

During site investigations conducted on 17 and 18 January 2021, the aquatic biodiversity was assessed and is presented in terms of sensitivity whilst considering the ecological value of the remaining ecosystem functions at the site and within the area. The biodiversity is also closely linked to the wetland areas, estuary and hydrological regime of the site.

The following key issues have been identified and assessed in this Aquatic impact assessment:

- **Critical Biodiversity Areas**
 - *Impact:* The Coffee Bay study area falls within a CBA 2 zone, however, this zone includes disturbed areas where infrastructure such as rural housing and roads are located. The Hole in the Wall study area is not located within a CBA.
 - *Mitigation:* The proposed coast infrastructure will be placed in already disturbed areas.
- **Ecological Support Areas**
 - *Impact:* The Coffee Bay beach cordon area is classified as an ESA1 area, which will be impacted by selected sections of the formalized walkways. Selected areas of the Hole in the Wall proposed coastal infrastructure is classified as an ESA1 area.
 - *Mitigation:* The proposed coast infrastructure will be placed in already disturbed areas. The three proposed viewing deck areas which will include formalized walkways to access viewing deck, the viewing deck, bins and bench seating, will be prioritised to already disturbed areas.
- **Protected Areas and Protected Areas Expansion;**

Based on the NPAES database (SANBI, 2010) no protected and expansion areas occur within the Coffee Bay or Hole in the Wall study area.
- **Strategic Water Source Areas;**

The study areas lie within the sub-nationally important surface water Pondoland Coast Strategic Water Source area. The Pondoland Coast Strategic Water Source area extends for an area of 13,461km² along the largest portion of Transkei coast. The proposed activities will not impact on the strategic water source as there will be limited infrastructure which will impact on the surface water flow such as compacted and hardened surfaces which could increase the velocity of water flow.

It is the opinion of the specialist that the proposed upgrading activities be considered for authorisation if an overarching Environmental Management and Monitoring Plan can be compiled and approved by the relevant Departments and regional conservation management agencies (such as Eastern Cape Parks and Tourism Agency) prior to and for inclusion in the BAR process and implementation thereof as a condition of the decision.

1. INTRODUCTION

Exigent Engineering Consultants CC has been appointed by Acer Africa MBB Consulting Services (Eastern Cape), on behalf of the Department of Forestry, Fisheries and the Environment (DFFE), Planning and Monitoring of Infrastructure Projects – Working for the Coast (Eastern Cape), to facilitate the construction and upgrade of tourist facilities at Coffee Bay and Hole in the Wall, Eastern Cape. Exigent’s scope is to conduct a specialist aquatic impact assessment for the proposed upgrade and construction of tourist facilities within Coffee Bay and Hole in the Wall, in the King Sabata Dalindyebo Local Municipality (KSDLM) within OR District Municipality, Eastern Cape Province.

Based on information provided by Acer Africa (2021), DEFF is proposing upgrade and construction of tourist facilities within Coffee Bay and Hole in the Wall in order to improve the existing tourism facilities and improve access within the area, and specifically also within the KSDLM.

Based on the Department of Environmental Affairs’ national web based environmental screening tool, the Coffee Bay and Hole in the Wall areas are both identified as being of “very high sensitivity” for terrestrial biodiversity, with an animal and plant sensitivity of “medium” and an aquatic sensitivity of “very high”.

Plant and animal species of special concern have been separated from ecosystem or landscape level data for the terrestrial and aquatic assessments in the Screening Tool due to significant complexities with the species Geographic Information Systems data. Generally, an ecosystem driven approach is adopted to conservation, built on the idea that protecting an ecosystem will guarantee that its associated species will be protected. However, species of special concern do not occur consistently throughout an ecosystem, with no direct relationship between the occurrence of species of special concern and the presence of threatened ecosystems. Therefore, the impact of a development may have negligible impacts on a particular ecosystem type but prove to have severe negative impacts on species of special concern.

This specific specialist report therefore entails an aquatic biodiversity impact assessment and considers and reports on the aquatic environmental impacts that the proposed coastal infrastructure may have on the aquatic biodiversity. The report will form part of the application for environmental authorisation in terms of the National Environmental Management Act, 1998 (NEMA) (Act No. 108 of 1998) and the 2014 Environmental Impact Assessment (EIA) Regulations, as amended in April 2017, together with the BAR application.

1.1. Project description

1.1.1. Coffee Bay

The proposed development in Coffee Bay will involve the upgrade and construction of coastal infrastructure along the Coffee Bay main beach as well as improvements to existing public facilities adjacent to the Nenga River. The exact position of these infrastructure components will be identified based on a combination of engineering, environmental and economic factors. The proposed upgrades will include the following components:

- Provision of a dedicated parking area (approximately 1500 m²)
- The introduction of three viewing decks (each deck is approximately 12 m² in size)
- Formalisation of the picnic and braai area adjacent to the Nenga River
- A new playground area will be introduced adjacent to the Nenga River
- The proposed construction of one new ablution blocks (455 m²)
- The provision of formalised walkways to access the viewing decks, picnic & braai areas and the demolition of the existing ablution blocks (approximately 1000 m² in size)
- Stabalisation of sensitive habitat adjacent to the Nenga River Lodge
- Replacement of the existing Lifeguard tower.
- Beach access (650 m² area coverage)



Figure 1-1. Coffee Bay proposed activities

1.1.2. Hole in the Wall

The proposed development near Hole in the Wall will involve infrastructure upgrades along the beach. The exact positions of the infrastructure components will be identified based on a combination of engineering, environmental and economic factors. However, the proposed general positioning will be located between the Hole in the Wall tourist destination and the Hole in the Wall Hotel. The upgrades will include the following infrastructure components:

- Provision of two dedicated parking areas (each approximately 1600 m² in size).
- Dedicated picnic and braai areas at various locations.
- A viewing deck (approximately 12m² in size).
- The use of existing tracks and footpaths near the Hole in the Wall feature and Boiling Pot.
- The upgrade of an existing road adjacent to the Hole in the Wall Hotel (approximately 65m² in size).
- The formalization of a boat launch adjacent to the Hole in the Wall Hotel (approximately 175m² in size).



Figure 1-2. Hole in the wall proposed activities

2. SCOPE OF WORK

This study conforms to the requirements as set out in Government Notice (GN) No. 648 of Government Gazette (GG) 45421, published on 10 May 2019, which provides the criteria for the assessment and reporting of impacts on aquatic biodiversity in terms of GN No. 1150 for the Procedures for the Assessment and minimum criteria for reporting on identified environmental themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act (NEMA, Act 107 of 1998), when applying for an Environmental Authorisation (EA), as released on the 30 October 2020.

3. ASSUMPTIONS AND LIMITATIONS

- The GPS Oregon 600 which was used is at best accurate to within five meters.
- In order to obtain a comprehensive understanding of the dynamics of the project site, as well as the status of endemic, rare or threatened species in any area, assessments should always consider investigations at different time scales (across seasons/years) and replication.
- The site visits took place on 17 and 18 January 2021, during the preferred sampling period (November-April).

4. METHODOLOGY

4.1. Desktop evaluation

Prior to conducting the site visit, an initial level 1 (desktop) survey was done using Google Earth's map timeline function to detect changes in visible vegetation gradients. Maps are available from 19854-2021. Possible ecological sensitive features were identified, and GPS coordinates were noted to assist with the study area visit.

4.2. Literature review and database survey

A literature survey and database review were conducted to assist with the study.

Additionally, the broad-scale national databases are used as reference point to the ecological processes within the study area with focus then gradually shifting to provincial databases and the available local databases. Where applicable, comparisons are drawn between national, provincial or local databases.

4.2.1. National databases

The Integrated Biodiversity Information System (SIBIS) database from the South African National Biodiversity Institute (SANBI) contains information from several SANBI databases, the following are relevant to the biodiversity of the study area:

- National Spatial Biodiversity Assessment (2018);
- Aquatic Ecosystem and Threat Status (NEMBA-listed);
- Coastal Ecosystems and Threat Status (2018); and

- Estuarine Ecosystems and Threat Status (2018);
- Acocks (plant species observations);
- Custodians of Rare and Endangered Wildflowers (CREW) (threatened plant species localities);
- Garden Accessions (plant collection records);
- MSB (plant seed collection records);
- National Herbarium Pretoria (PRE) Computerised Information System (PRECIS) (taxonomy and herbarium specimens);
- Species Status (NEMBA-listed species);
- TSP (threatened plant species);
- National Freshwater Ecosystems Priority Areas (NFEPA) – (Nel *et al.*, 2011);
- National Spatial Biodiversity Assessment (2018).

NFEPA database includes various water and water related layers, including wetland delineation and vegetation data, catchment data, areas of high groundwater recharge and water management areas.

National Spatial Biodiversity Assessment (2018) and Aquatic Ecosystem and Threat Status (2018)

This database has been described in Section 5.2.3.

Coastal and Estuarine database

Based on the Coastal and Estuarine database of the NBA classification, the Coffee Bay estuarine functional zone (EFZ), associated with the Nenga river, is a temporarily closed, sub-tropical small estuary listed as **Vulnerable**. The Nenga estuary floodplain is impacted by road and other infrastructural developments. On a national ranking system this estuary is classified as 168/275 and it is recommended that 75% of the estuary remains undeveloped (<https://saeis.saeon.ac.za/Info/223>, accessed 28/01/2021).

The Hole in the Wall Estuary is described as a Vulnerable temporarily open/closed estuary in a near pristine condition due to the limited anthropogenic impacts occurring within the estuary (<https://saeis.saeon.ac.za/Info/223>, accessed 28/01/2021). On a national ranking system this estuary is classified as 182/275 and it is recommended that 75% of the estuary remains undeveloped.

Protected Areas and the Protected Area Expansion Strategy

The National Protected Area Expansion Strategy first published in 2008 (NPAES 2008), presents a 20-year strategy for the expansion of protected areas in South Africa. The goal is to achieve cost effective protected area expansion for improved ecosystem representation, ecological sustainability and resilience to climate change. The NPAES highlights efficient and effective allocation of human and financial resources to protected area expansion. It sets protected area targets, maps priority areas for protected area expansion, and makes recommendations on mechanisms to achieve this (DEA, 2016). Based on the NPAES database (SANBI, 2010), no areas have been identified as part of the NPAES within, or within close proximity to the study area.

Important Bird and Biodiversity Areas

The Important Bird and Biodiversity Areas (IBA) Programme is a BirdLife International Programme to conserve habitats that are important for birds. These areas are defined according to a strict set of guidelines and criteria based on the species that occur in the area. An IBA is selected on the presence of the following bird species in a geographic area (SANBI BGIS Metadata, 2015):

- Bird species of global or regional conservation concern;
- Assemblages of restricted-range bird species;
- Assemblages of biome-restricted bird species; and
- Concentrations of numbers of congregatory bird species

No IBA's have been identified within, or within close proximity to the study area.

4.2.2. Provincial databases

Provincial classification of vegetation types

The Eastern Cape Biodiversity Conservation Plan (ECBCP) provides mapped areas of priority for conservation in the province, as well as assigning land use categories to the existing land depending on the state that it is in (Berliner et al. 2007). Critical Biodiversity Areas (CBAs) are defined by Berliner et al. (2007) as: "terrestrial and aquatic features in the landscape that are critical for conserving biodiversity and maintaining ecosystem functioning". These areas are classified as natural to near-natural landscapes. In addition to the CBA's the ECBCP also defines Other Natural Areas (ONA) as well as Transformed Areas. Biodiversity Land Management Classes (BLMCs) are also used in the plan: "Each BLMC sets out the desired ecological state that an area should be kept in to ensure biodiversity persistence.

The assessment of the two sites have been included in Section 6. These databases have classified these vegetation types at a broad scale through high level assessments. It is clear from aerial imagery, literature review and ground truthing that portions of the vegetation type have been impacted by impacts such as high stocking rates, roads, housing, clearing for agricultural activities.

4.2.3. Local databases

The Municipal Spatial Development Framework (MSDF) provides the municipality with a clear understanding of activities that need to be undertaken to protect and enhance the supply of environmental services in the area. Based on the final 2017-2022 MSDF, it is stated that the coastal area is derived as the Tourism Node of the Municipality and the area has coastal forests, dune and mangrove forests as well as a pristine wild coast. Coastal areas are however threatened by sea level rises, illegal sand mining, unmanaged fishing activities and wild fires. The Department of Environmental Affairs has funded a Coastal Management Programme through EPWP which covers education and awareness, protection and cleaning of the coastal area. The Municipality has developed the KwaTshezi Development Plan trying to curb the illegal developments along the coast.

4.2.4. Vegetation Assessment

Prior to the site investigation, the development site was stratified into relatively homogeneous vegetation/habitat units based on the morphology of the terrain and the growth-form of the vegetation. This was done with the help of 1:50 000 topographical maps and Google earth aerial photos of the development site. The actual site surveys were conducted on 17 and 18 January 2021, as required for species identification. Species lists were compiled during the site visits to ensure that representative species observed were captured. The species listed within the findings of the screening tool were also searched for during the site visit.

Fauna distribution data were obtained from various available databases, publications and field guides to ascertain the historical occurrence of species within 2832CC.

4.3. Calculating the Project Area Of Influence (PAOI)

The following steps were followed in calculating the PAOI:

1. The project activities interaction with the flora of the region assessed based on the following sources:
 - a. SA National Land Cover (BGIS 2014);
 - b. National Spatial Biodiversity Assessment (2018);
 - c. National Freshwater Ecosystems Priority Areas (NFEPA) – (Nel *et al.*, 2011);
 - d. South African Inventory of Inland Aquatic Ecosystems (SAIIAE, 2018); and
 - e. Previous specialist assessments for the project area.
2. Calculate how far the project activities could influence on the vegetation communities.

4.4. Evaluation of Site Ecological Importance

SANBI (2020) defines Site Ecological Importance (SEI) as a function of the *Biodiversity Importance (BI)* of the receptor, which is either defined as the species of conservation concern, or for instance a faunal community or habitat type present on the site), and its resilience to impacts, *Receptor Resilience (RR)*, and is then calculated as follows:

$$SEI = BI + RR$$

BI is the function of Conservation Importance (CI) and the Functional Integrity (FI) of the receptor and is calculated as follows:

$$BI = CI + FI$$

4.4.1. Conservation Importance

CI¹ is evaluated in line with the various internationally accepted principles and criteria for the determination of biodiversity-related value, including the IUCN Red List species, Red list of Ecosystems and the Key Biodiversity Areas (KBA) of the IUCN (IUCN 2016).

¹ Defined as the importance of a site for supporting biodiversity features of conservation concern present e.g. populations of IUCN Threatened and Near-Threatened species (CR, EN, VU & NT), Rare, range-restricted globally significant populations of congregatory species, areas of threatened ecosystem types, through predominantly natural processes.

This CI evaluation is based on the following criteria:

1. **IUCN Threatened and Near Threatened Species** (CR, EN, VU & NT) on a national or global scale as per the IUCN criteria (www.iucnredlist.org). The Guideline states that should the national and global assessment status differ for the same taxon, the most recent evaluation of status should be used in the SEI calculation.
2. **Rare species** as included on the South African National Red List as Rare or Critically Rare or Extremely Rare. These species are highly restricted even though not currently declining. Should a proposed development impact on a population of these species they will qualify under an IUCN category of threat.
3. **Range-restricted species** – the presence of fauna, flora with a global population Extent of Occurrence (EOO) of 10 000km² or less.
4. **Globally significant populations of congregatory species** - a roughly estimated proportion (%) of the global population of a fauna species that congregate for breeding/feeding/hibernation/ other reasons;
5. **Significant areas of threatened vegetation types** – function of both the size being considered in relation to the total extent of that vegetation type (i.e. proportion) and how threatened (CR, EN, VU) the vegetation types are;
6. **Natural processes** – natural unmanaged areas with low levels of ecological disturbance have largely intact natural processes such as pollination, seed dispersal and migration, and thus have greater intrinsic conservation importance than those modified through ecological disturbance.

In calculating the CI, the criteria as set out below in Table 4-1 has been implemented.

Table 4-1. Conservation Importance Criteria

Conservation Importance	Fulfilling Criteria
Very High	Confirmed or highly likely occurrence of CR, EN, VU, extremely rare ² , critically rare ³ , species that have a global EOO <10km ² Any area of natural habitat or a CR ecosystem or large area (>0.1% of the total ecosystem type extent) of natural habitat of EN ecosystem type Globally significant populations of congregatory species (>10% of the global population)
High	Confirmed or highly likely occurrence of CR, EN, VU, extremely rare, critically rare, species that have a global EOO >10km ² IUCN threatened species (CR, EN, VU) must be listed under any criterion other than A. If listed only under Criterion A, include if there are less than 10 locations or <10 000 mature individuals remaining. Small area (>0,01% but smaller than (>0.1% of the total ecosystem type extent) of natural habitat of EN ecosystem type or large area (>0,01%) of natural habitat of VY ecosystem type Presence of Rare species Globally significant populations of congregatory species (>1% but <10% of the global population)
Medium	Confirmed or highly likely occurrence of populations of NT species, threatened species (CR, EN, VU) listed under Criterion A only and which have more than 10 locations or more than 10 000 mature individuals. Any area of natural habitat of threatened ecosystem type with status of VU Presence of range-restricted species >50% of receptor contains natural habitat with potential to support SCC
Low	No confirmed or highly likely populations of SCC

² Applicable to butterflies (as per Mecenero *et al* 2013)

³ Applicable to plants (as per Raimondo *et al* 2009)

Conservation Importance	Fulfilling Criteria
	No confirmed or highly likely populations of range-restricted species <50% of receptor contains natural habitat with limited potential to support SCC
Very low	No confirmed and highly unlikely populations of SCC No confirmed and highly unlikely populations of range-restricted species No natural habitat remaining

4.4.2. Functional Integrity

Functional Integrity (FI) of the receptor⁴, used as the vegetation/faunal community or habitat type) is defined as the receptor's ability to maintain the structure and functions that define it, compared to its known or predicted state under ideal conditions. In calculating the FI, the criteria as set out below in Table 4-2 has been implemented.

Table 4-2. Functional Integrity Criteria

Functional Integrity	Fulfilling Criteria
Very High	Very large (>100ha) intact area for any conservation status of ecosystem type or >5ha for CR ecosystem types High connectivity serving as functional ecological corridors, limited road network between intact habitat patches No or minimal criteria negative ecological impacts with no signs of major past disturbances
High	Large (>20ha, but <100ha) intact area for any conservation status of ecosystem type or >10ha for EN ecosystem types Good habitat connectivity with potential functional ecological corridors and a regularly used road network between habitat intact patches Only minor current negative ecological impacts with no signs of major past disturbance (e.g. ploughing) and good rehabilitation potential
Medium	Medium (>5ha but <20ha) semi-intact area for any conservation status of ecosystem type or >20ha for VU ecosystem types Only narrow corridors of good habitat connectivity or larger areas of poor habitat connectivity and a busy used road network between intact habitat patches Mostly minor current negative ecological impacts with some major impacts (e.g. established population of alien and invasive flora) and a few signs of past disturbance with moderate rehabilitation potential
Low	Small (>1ha but <5ha) area Almost no habitat connectivity but migrations still possible across some transformed or degraded natural habitat and a very busy used road network surrounds the area. Low rehabilitation potential. Several minor and major current negative ecological impacts.
Very low	Very small <1ha area No habitat connectivity except for flying species or flora with wind dispersed seeds. Several major current negative ecological impacts.

⁴ Defined as the measure of ecological condition of the impact receptor as determined by its remaining intact and functional area, its connectivity to other natural areas and the degree of current persistent ecological impacts.

4.4.3. Biodiversity Importance

Based on the above criteria, the BI is then calculated as per the matrix below.

Biodiversity Importance		Conservation Importance				
		Very High	High	Medium	Low	Very Low
Functional Integrity	Very high	Very High	Very High	High	Medium	Low
	High	Very High	High	Medium	Medium	Low
	Medium	High	Medium	Medium	Low	Very low
	Low	Medium	Medium	Low	Low	Very low
	Very low	Medium	Low	Very low	Very low	Very low

4.4.4. Receptor Resilience

The Receptor Resilience (RR)⁵ is based on the estimated recovery time to restore an appreciable portion of the functionality of the receptor. These resilience aspects should be evaluated based on the specific conditions, such as large birds of prey having different resilience levels to noise disturbances based on the breeding cycle.

The RR is calculated based on the criteria as set out in Table 4-3.

Table 4-3. Receptor Resilience Criteria

Receptor Criteria	Resilience	Fulfilling Criteria
Very High		Habitat that can recover rapidly (less than 5 years) to restore >70% of the original species composition and functionality of the receptor functionality, or species that have a high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that might have a very high likelihood of returning to a site once the disturbance has been removed.
High		Habitat that can recover relatively quickly (5 -10 years) to restore >70% of the original species composition and functionality of the receptor functionality, or species that have a high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that might have a high likelihood of returning to a site once the disturbance has been removed.
Medium		Will recover slowly (more than 10 years) to restore >70% of the original species composition and functionality of the receptor functionality, or species that have a moderate likelihood of remaining at a site even when a disturbance or impact is occurring, or species that might have a moderate likelihood of returning to a site once the disturbance has been removed.
Low		Habitat that is unlikely to be able to recover fully after a long period: >15 years required to restore less than 50% of the original species composition and functionality of the receptor functionality, or species that have a low likelihood of remaining at a site even when a disturbance or impact is occurring, or species that might have a low likelihood of returning to a site once the disturbance has been removed.
Very low		Habitat that is unable to recover from major impacts, or species that are unlikely to remain at a site even when a disturbance or impact is occurring, or species that are likely to return to a site once a disturbance or impact has been removed.

Based on the above criteria, the SEI is then calculated as per the matrix below.

⁵ Intrinsic capacity of the receptor to resist major damage from disturbance and/or to recover to its original state with limited or no human intervention

Site Ecological Importance		Biodiversity Importance				
		Very High	High	Medium	Low	Very Low
Receptor resilience	Very high	Very High	Very High	High	Medium	Low
	High	Very High	High	Medium	Medium	Low
	Medium	High	Medium	Medium	Low	Very low
	Low	Medium	Medium	Low	Low	Very low
	Very low	Medium	Low	Very low	Very low	Very low

The SEI is then interpreted based on the guideline as set out in Table 4-4.

Table 4-4. Interpretation of Site Ecological Importance

Site Ecological Importance	Fulfilling Criteria
Very High	Avoidance mitigation - No destructive development activities should be considered. Offset mitigation not possible as this would be the last remaining species/good patches of habitat/unique species assemblages. Destructive impacts for species/ecosystems where persistence target remains.
High	Avoidance mitigation whenever possible - Minimization mitigation. Changes to project infrastructure design to limit the amount of habitat impacted. Limited development activities of low impact acceptable. Offset mitigation may be required for high impact activities.
Medium	Minimization and restoration mitigation - Development activities of medium impact acceptable followed by appropriate restoration activities.
Low	Minimization and restoration mitigation - Development activities of medium to high impact acceptable followed by appropriate restoration activities.
Very low	Minimization mitigation - Development activities of medium to high impact acceptable and restoration activities may not be required.

The combination of SEI for various taxon into a single SEI for the PAOI can be done by means of ad hoc combining the maximum SEI for each receptor, or via an evaluation of the SEI once per receptor for all necessary taxon, but in these instances the highest CI, FI and lowest RR ratings across all taxon should be applied.

4.5. Species of special concern

The available habitat on the development site was compared to the habitat requirements of Species of Special Concern (SOSC) potentially occurring in the study area as determined from the literature review. Based on this assessment, SOSC with a probability of occurring on the development site were identified.

4.6. Impact Assessment

The criteria used to determine impact consequence are presented in the table below.

Rating	Definition of Rating	Score
Extent – Physical extent or spatial scale of the impact		
Local	Confined to project or study area or part thereof (e.g. the development site and immediate surrounds)	1
Regional	The region (District Municipality or Quaternary catchment)	2
National	Nationally or beyond	3
Intensity – Impact would be destructive or benign		

Rating	Definition of Rating	Score
Low	Site-specific and wider natural and/or social functions and processes are negligibly altered	1
Medium	Site-specific and wider natural and/or social functions and processes continue albeit in a modified way	2
High	Site-specific and wider natural and/or social functions or processes are severely altered	3
Duration – Timeframe in which the impact would occur		
Short Term	Up to 2 years and reversible	1
Medium Term	2 to 15 years and reversible	2
Long Term	More than 15 years and irreversible	3

The combined score of these three criteria corresponds to a Consequence Rating, as follows:

Combined Score	3-4	5	6	7	8-9
Consequence Rating	Very Low	Low	Medium	High	Very High

Once the consequence is derived, the probability of the impact occurring is considered, using the probability classifications presented in the table below:

Probability – Likelihood of the impact occurring	
Improbable	< 40% chance of occurring
Possible	40% – 70% chance of occurring
Probable	>70% – 90% chance of occurring
Definite	> 90% chance of occurring

The overall significance of impacts is determined by considering consequence and probability using the rating system prescribed in the table below:

		Probability			
		Improbable	Possible	Probable	Definite
Consequence	Very low	Insignificant	Insignificant	Very low	Very low
	Low	Very low	Very low	Low	Low
	Medium	Low	Low	Medium	Medium
	High	Medium	Medium	High	High
	Very high	High	High	Very high	Very high

Finally, the impacts are also considered in terms of their status (positive or negative impact) and the confidence in the ascribed impact significance rating. The prescribed system for considering impacts status and confidence (in assessment) is laid out in the table below:

Status of impact	
Indication of whether the impact is adverse (negative) or beneficial (positive)	+ ve (positive – a 'benefit')
	- ve (negative – a 'cost')
Confidence of assessment	
The degree of confidence in predictions based on available information, Hatch's judgment and / or specialist knowledge	Low
	Medium
	High

The impact significance rating should be considered by authorities in their decision-making process based on the implications of ratings ascribed below:

- **Insignificant:** Potential impact is negligible and will not have an influence on the decision regarding the proposed activity / development.
- **Very low:** Potential impact is very small and should not have any meaningful influence on the decision regarding the proposed activity / development.
- **Low:** Potential impact may not have any meaningful influence on the decision regarding the proposed activity / development.
- **Medium:** Potential impact should influence the decision regarding the proposed activity / development.
- **High:** Potential impact will affect the decision regarding the proposed activity / development.
- **Very high:** Proposed activity should only be approved under special circumstances.

Practicable mitigation and optimisation measures are recommended and impacts are rated in the prescribed way, both without and with the assumed effective implementation of mitigation and optimisation measures. Mitigation and optimisation measures are either:

- **Essential:** Measures that must be implemented and are non-negotiable
- **Best Practice:** Recommended to comply with best practice, with adoption dependent on the proponent's risk profile and commitment to adhere to best practice, and which must be shown to have been considered and sound reasons provided by the proponent if not implemented.

The assessment of impacts adheres to the minimum requirements in the EIA Regulations and takes into account applicable official guidelines.

5. BASELINE DESCRIPTION OF RECEIVING ENVIRONMENT

5.1. Locality

5.1.1. Coffee Bay

The proposed study area is located on the northern bank of the Nenga River mouth, near the Nenga River and the Nenga River Lodge within the jurisdiction of the King Sabata Dalindyebo Local Municipality and the OR Tambo District Municipality in the Eastern Cape Province of South Africa. The Coffee Bay study area lies within the quarter degree grid cell 3129CC. Both study areas are situated within the quaternary catchment T80A (Figure 5-1).

The area is recognised by a rural character of a small town, with one main road passing through the town.

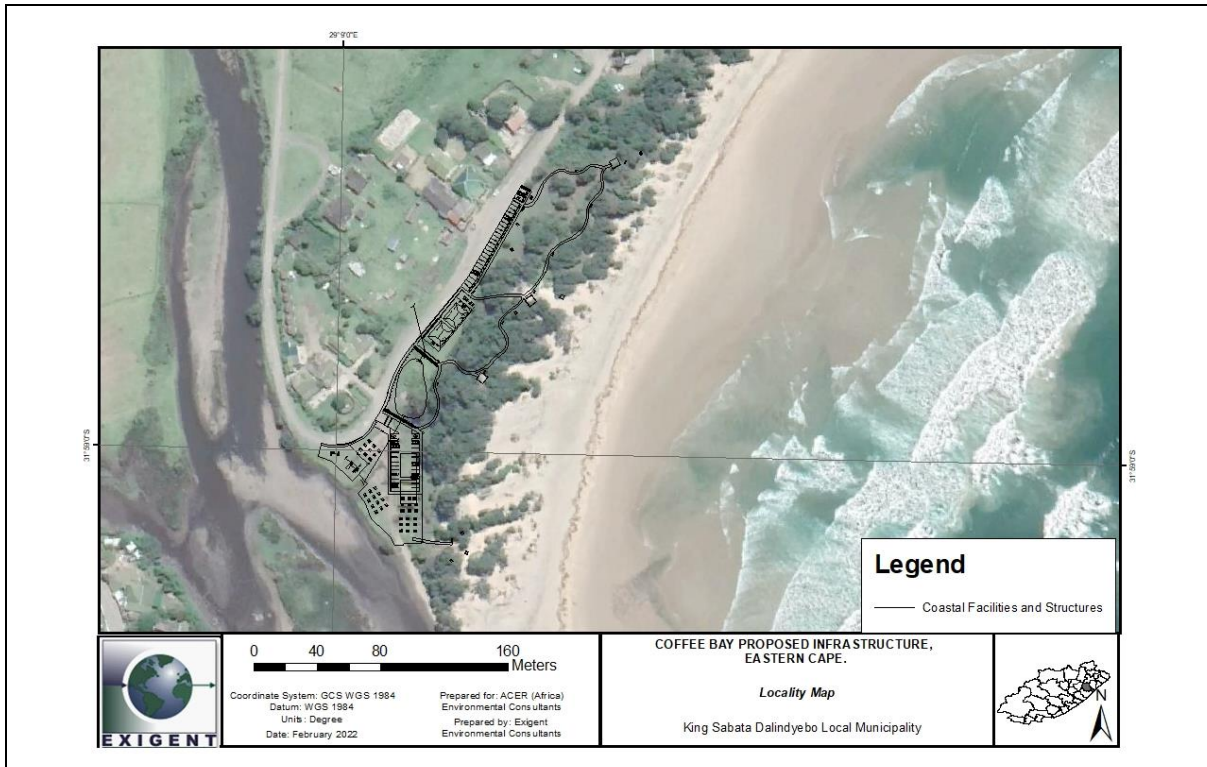


Figure 5-1. Locality map of the Coffee Bay study area.

5.1.2. Hole in the wall

The proposed study area is located on the northern bank of the Mpako River, between the Hole in the Wall tourist destination and the Hole in the Wall Hotel just off the Mtonjane Estuary, within the jurisdiction of the King Sabata Dalindyebo Local Municipality and the OR Tambo District Municipality in the Eastern Cape Province of South Africa. The study area is located within the Hole in the Wall 3229AA quarter degree grid cell and located within the quaternary catchment T80A (Figure 5-2).

The area is recognised by a rural character of a small town, with one main road passing through the town.

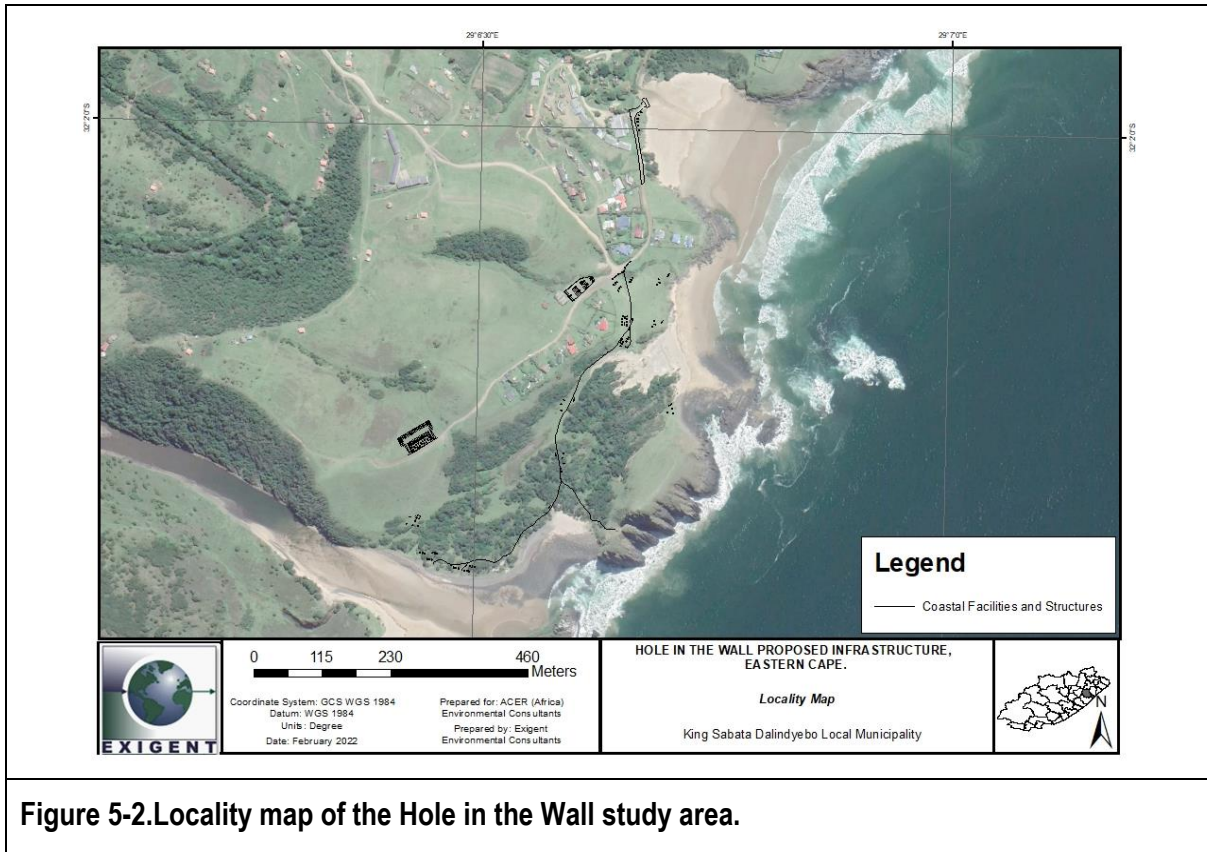


Figure 5-2. Locality map of the Hole in the Wall study area.

5.2. Biophysical description of the general area

5.2.1. Climate

The climate of Transkei Coastal Belt can be described as summer rainfall with some rain in winter (with up to 36.6% rainfall in winter at Bashee Lighthouse). On the Transkei coast, Cawe (1994) found that the proportion of winter rainfall is highest along the coastal belt closest to the sea; he refers to this as rainfall type D “High rainfall with high winter rainfall” and he found this climate type to be confined to Acocks Veld Type 1. The Transkei Coastal Belt (Indian Ocean Coastal Belt) experiences relatively high precipitation reaching mean annual precipitation values of approximately 1 120 mm at Cape Hermes (Port St Johns) and 1 128 mm at Bashee Lighthouse (near the mouth of the Mbashe River) (Mucina & Rutherford, 2006). Evaporation ranges between 1 490 mm and 1 594 mm/year within the project area (WR2012, 2015). The mean annual temperature ranges relatively narrowly from about 22 °C in the north to 19.9 °C at Cape Hermes (Port St Johns) and to 19.1 °C at the Bashee Lighthouse (near the mouth of the Mbashe River). Summers are hot to very hot, while winters are mild. No incidence of frost is recorded within the study area (Mucina & Rutherford, 2006).

The climate of the Subtropical Dune Thicket of the Azonal Vegetation Biome is characterised by relatively high MAP (1 028 mm) and a high probability of rain any time of the year (with pronounced higher rainfall in all seasons, except for the winter months of June and July (Mucina & Rutherford, 2006).

The climate of the Subtropical Seashore Vegetation type is characterised by rainfall which can occur any time during the year but with more in summer in the western part of the area (Kei Mouth region), with a pronounced summer precipitation peak along most of the northern coastal stretch. Overall MAP more than 1000 mm. MAT of 20.3 °C is indicative of subtropical thermal regime. No frost occurs in the region. Very intensive solar irradiation enhanced by reflected albedo from the white dunes and the sea (Mucina & Rutherford, 2006).

5.2.2. Geology, geography and soil

Most of the Transkei Coastal Belt is built of Karoo Supergroup sediments including sandstone and mudstone of the Adelaide Subgroup, shale, mudstone and sandstone of the Ecca Group as well as tillite of the Dwyka group. Intrusions of Jurassic Karoo Dolerite Suite occur in places. The dominating soil forms are Glenrosa and Mispah. Fa land type dominates the area. Right at the coast, sand dune cordons have been formed or are being formed – these are calcareous young Quaternary sands derived from rocks of Cretaceous and Cenozoic origin. The sand dunes are massive and very high in Maputaland and on the Zululand coast. They become rare in the southern part of the IOBC, where they are concentrated into small pockets at river mouths cutting through the steep coasts of Transkei.

Mucina & Rutherford (2006) describes die Soils and geology of the Subtropical Dune Thicket as recent dunes overlying calcretes as well as Maputaland Group calcareous sandstones and shallow marine deposits. The Subtropical Seashore Vegetation's soils and geology is described as recent coastal sandy sediments forming beaches and dunes, exposed to reworking by relentless wind and sea storms.

5.2.3. General description of the vegetation of the area

According to the National vegetation data (NBA, 2018) the study area is located within the Azonal Vegetation Biome, with the largest portion located in the Sub-tropical Dune Thicket vegetation type, with further inland of the proposed site, remnants of the Transkei Coastal Belt vegetation type. This database further identifies Estuarine functional zones within the estuary bordering on the western side of the study area. Based on this database, Transkei Coastal Belt vegetation is associated with the Nenga river mouth at the western section of the study area (Figure 5-3).

The National Biodiversity Assessment (NBA, 2018) lists the Ecosystem Threat Status of both the Sub-tropical Dune Thicket vegetation type and the Transkei Coastal Belt is rated as **Least concern** (Figure 5-5).

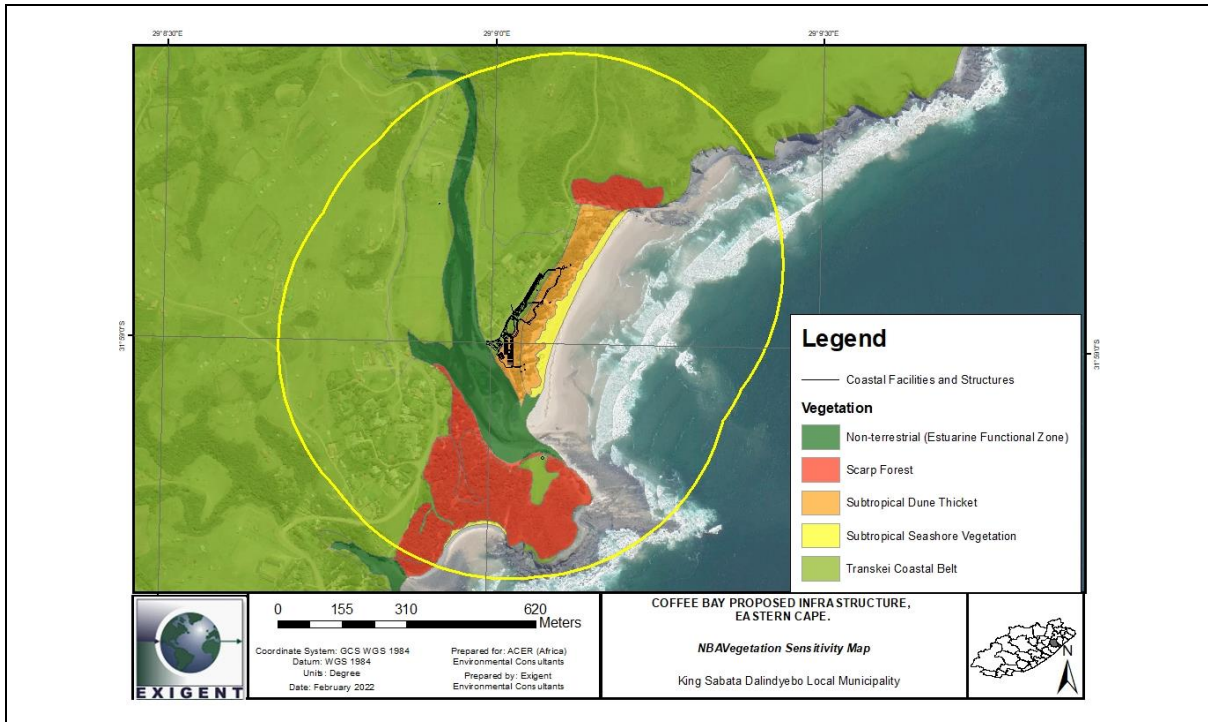


Figure 5-3. National classification of vegetation types in the Coffee Bay study area (NBA 2018).

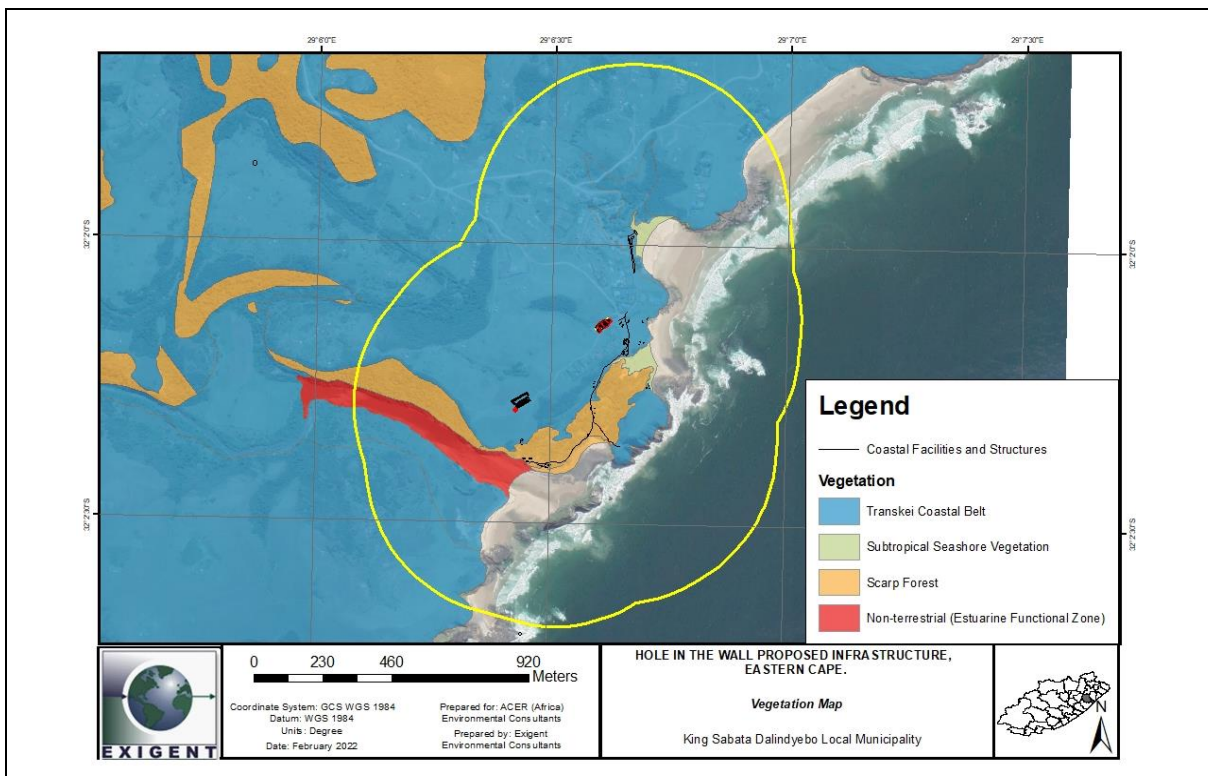


Figure 5-4. National classification of vegetation types in the Hole in the Wall study area (NBA 2018).

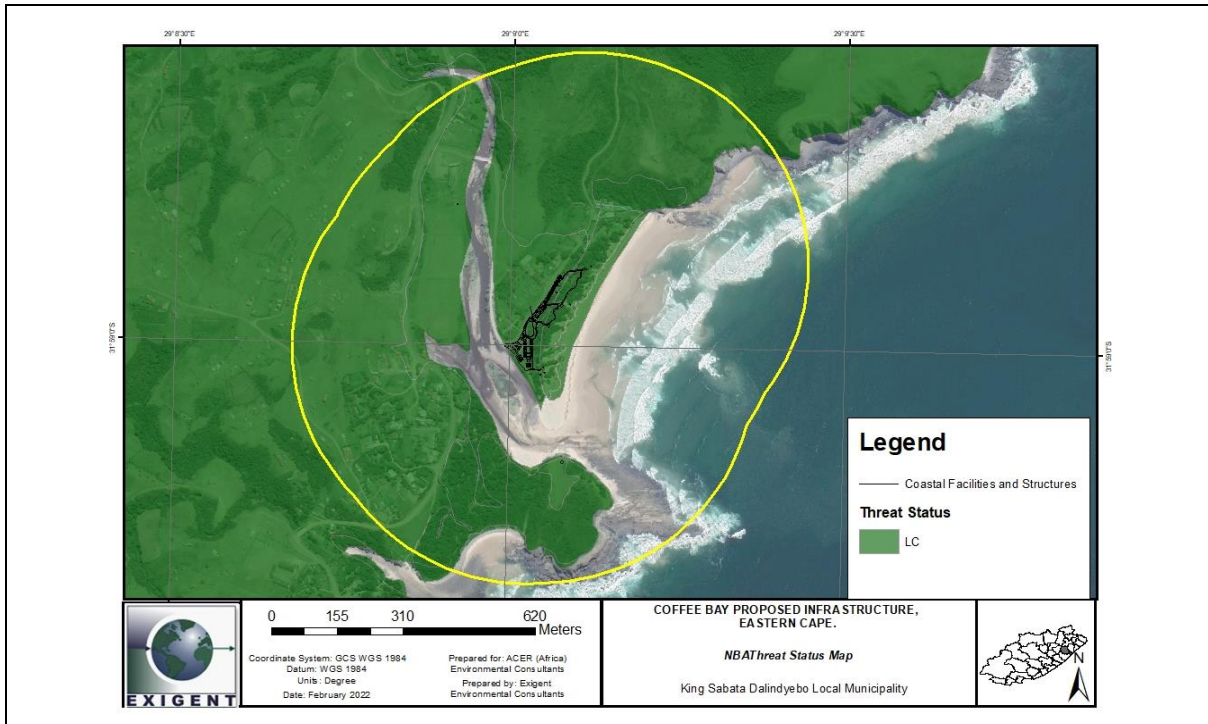


Figure 5-5. NBA Threat Status of the vegetation types present in the Coffee Bay study area (NBA 2018)

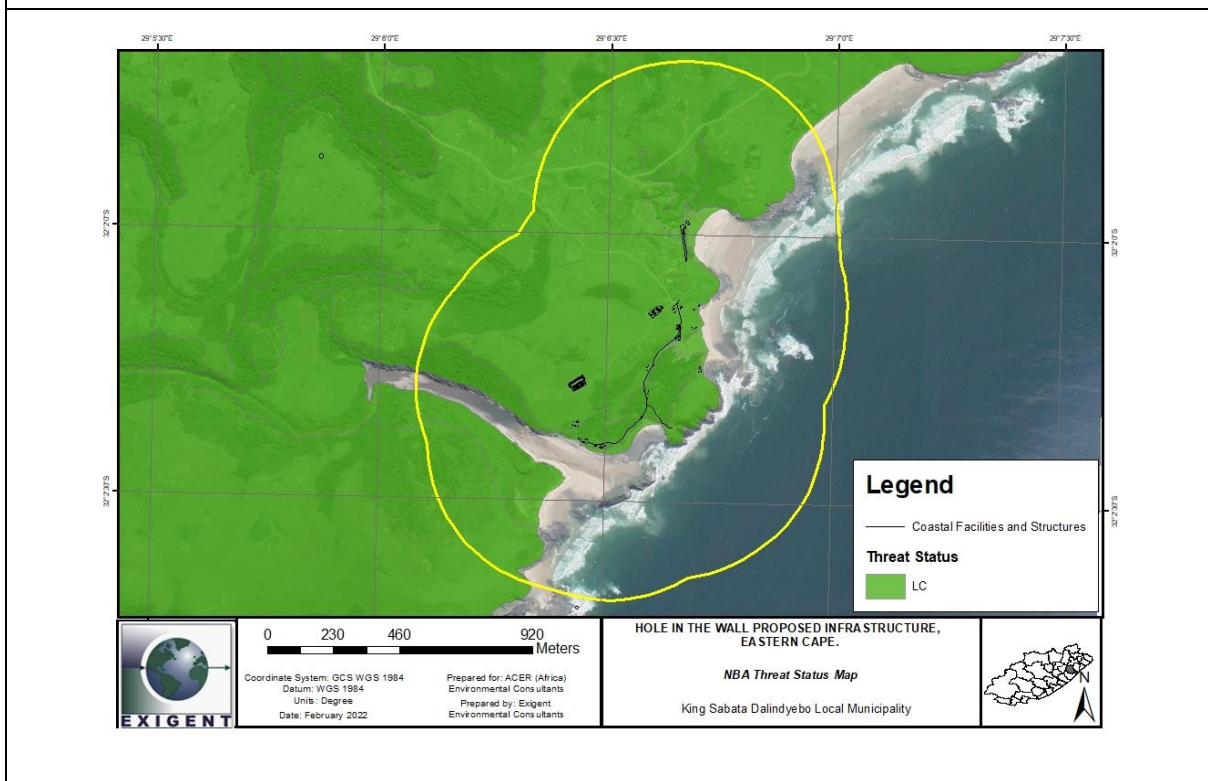


Figure 5-6. NBA Threat Status of the vegetation types present in the Hole in the Wall study area (NBA 2018)

The Coffee Bay activities impede into ESA and CBA areas (Figure 5-7)Figure 5-7, and limited activities will impede into the ESA area within the Hole in the Wall study area (Figure 5-8).

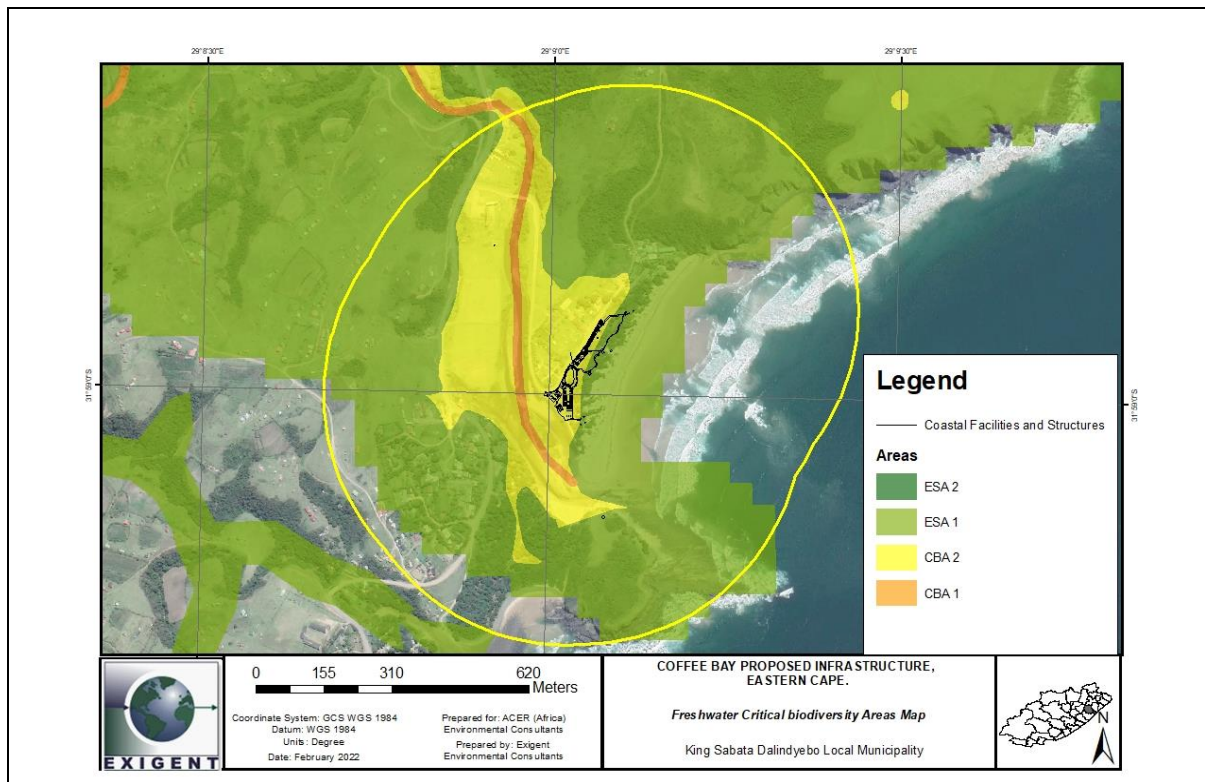


Figure 5-7. Freshwater Threat Status of the vegetation types present in the Coffee Bay study area (NBA 2018)

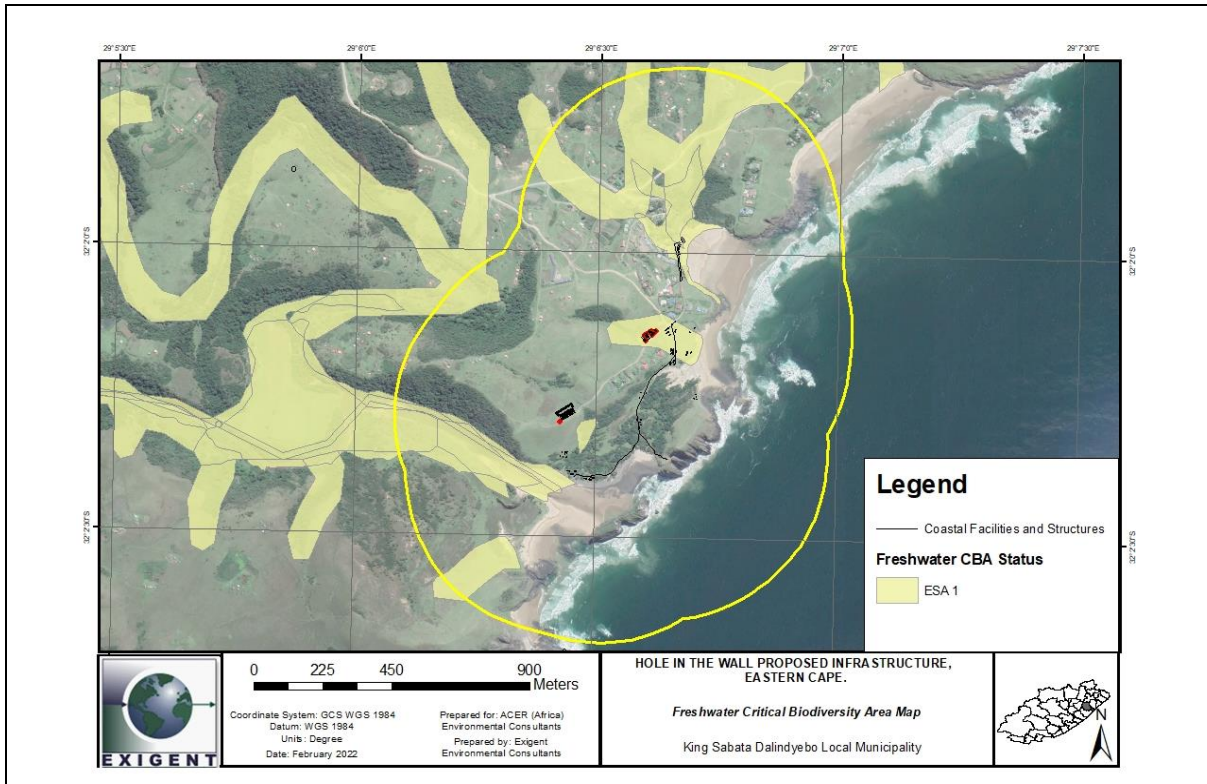


Figure 5-8. Freshwater Threat Status of the vegetation types present in the Hole in the Wall study area (NBA 2018)

Based on the NFEPA database, the study area lies within the Indian Ocean Coastal Belt Group 4 (Pondoland-Ugu Sandstone Coastal Sourveld). The remaining important ecology, as with the remnant coastal forest patches, are closely linked to the estuary areas and hydrological regime of the site. The Estuarine Threat Status is classified as 'Vulnerable'.

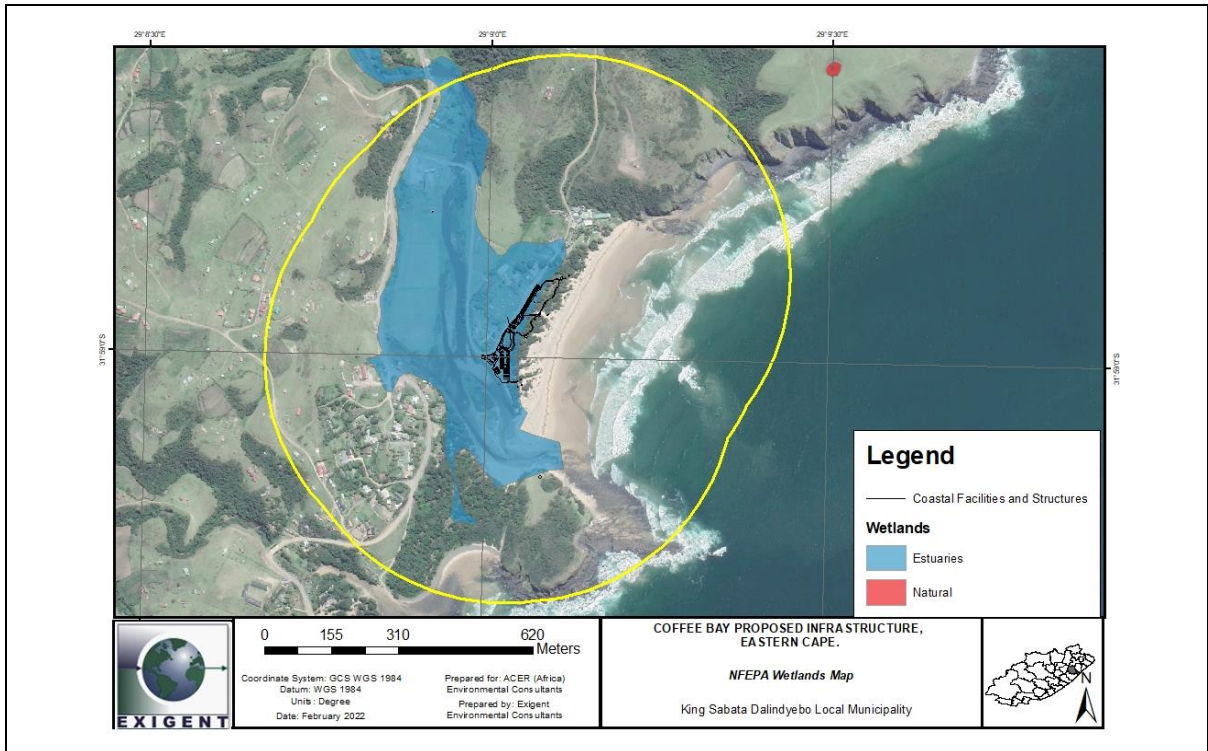


Figure 5-9. NFEPA Coffee Bay (NBA 2018)

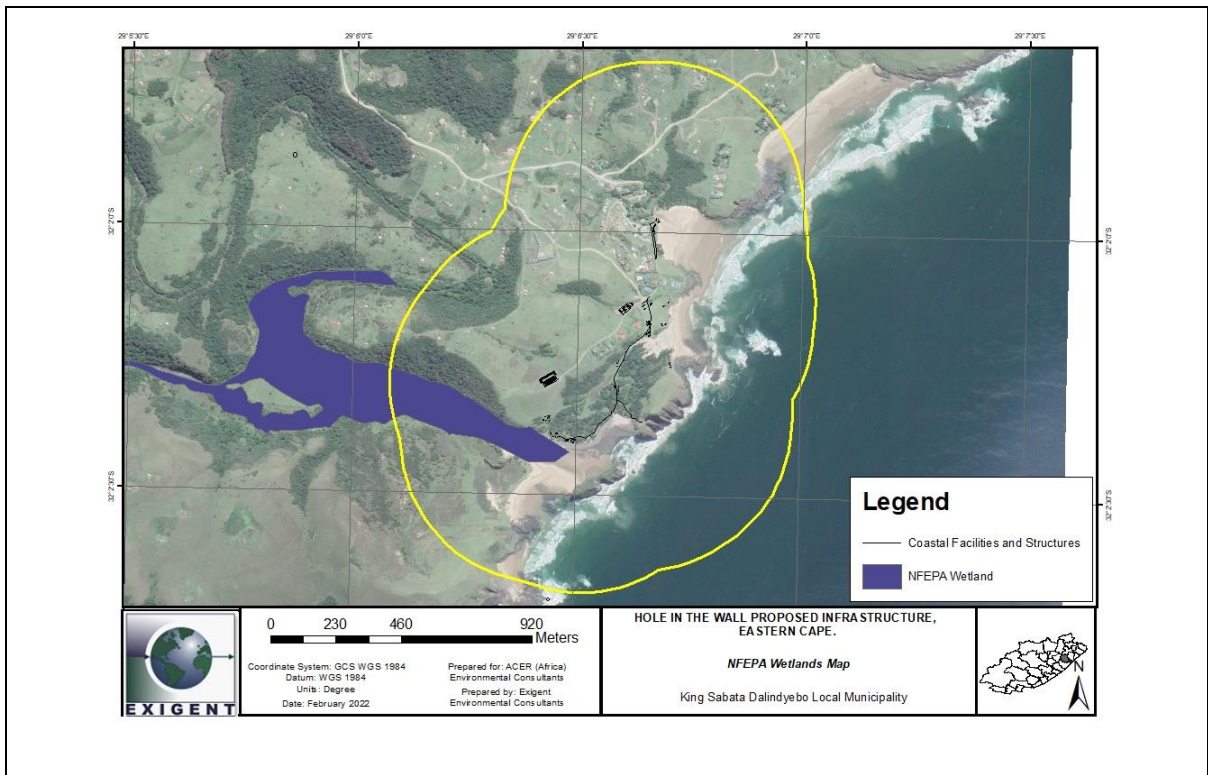


Figure 5-10. NFEPA Hole in the Wall (NBA 2018)

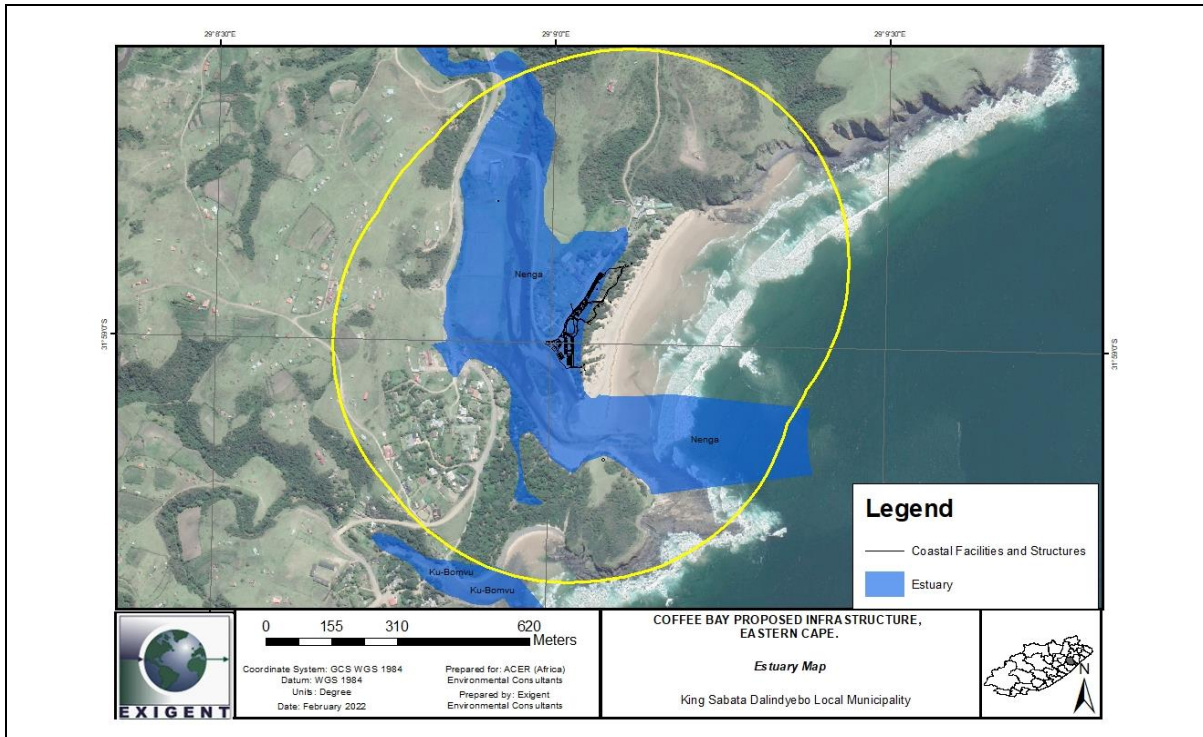


Figure 5-11. Estuaries present in the Coffee Bay (NBA 2018)

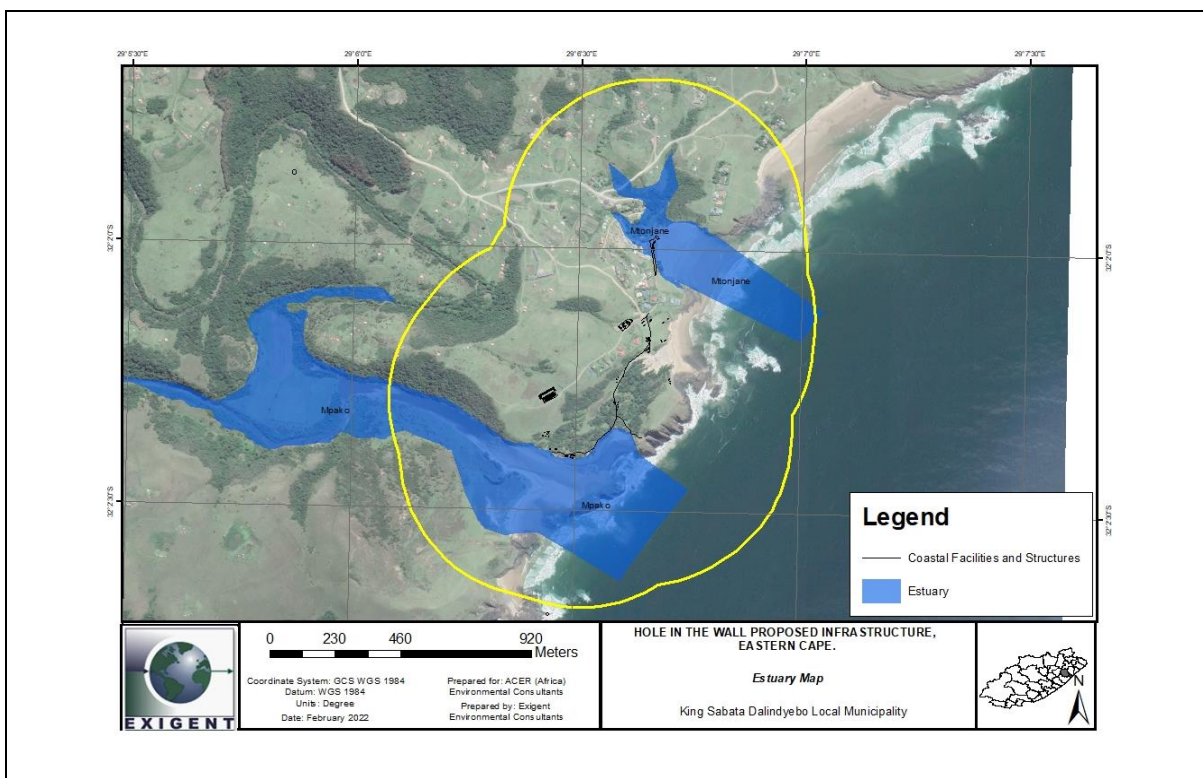


Figure 5-12. Estuaries present in the Hole in the Wall area (NBA 2018)

5.3. Environmental sensitivity summary

A summary of environmental sensitivity information provided above is listed in Table 5-1 below.

Table 5-1. Summary of environmental sensitivities in the project area.

Database	Importance	Criteria	Coffee Bay	Hole in the Wall
National vegetation types	Forests	Least concern	Second most common vegetation unit	Not in study site
	Azonal Vegetation	Least concern	Adjacent to the development area	Not in study site
	Indian Ocean Coastal Belt	Least concern	Majority of the study area	Majority of the study area
Provincial vegetation types	Scarp Forest	Least concern	Second most common vegetation unit	Not in study site
	Subtropical Dune Thicket	Least concern	Directly adjacent to the development area	Not in study site
	Transkei Coastal Belt	Least concern	Majority of the study area	Majority of the study area
	Subtropical Seashore Vegetation	Least concern	A small area closest to the sealine	Not in study site
NFEPA	Indian Ocean Coastal Belt Group 4	Flat	Majority of the study area	Not in study site
	Estuarine		Not in study site	Majority of the study area
PA Expansion Focus area	N/A	N/A	None close to site	None close to site
IBA	N/A	N/A	None close to site	None close to site
Provincial CBA	Vegetation types and protection of species	CBA 1	Most of the site is considered CBA 1.	The site area is not classified as CBA 1.
Provincial ESA	Vegetation types and protection of species	ESA 1	The wetlands and drainage lines within the site area fall within CBA 1 and ESA 1.	Majority of the area is considered ESA 1.
Threatened Ecosystems	Transkei Coastal Belt	Vulnerable	N/A	N/A
Landscape corridors	N/A	N/A	N/A	N/A

6. RESULTS

6.1. Sampling results - Aquatic Assessment

6.1.1. Coffee Bay

The Coffee Bay study area has been divided into 4 aquatic vegetation communities and the vegetation associated with the existing infrastructure, namely:

- a) Coastal Dune Forest and Dune slack;
- b) Nenga Estuary and floodplain;
- c) *Phoenix reclinata*- *Cyperus esculentus* floodplain; and
- d) *Artificial Wetland*

These vegetation communities are interlinked to the terrestrial communities, e.g., coastal dune forest and scarp forest, and *Stenotaphrum secundatum* grasslands.

Coastal Dune Forest and Dune slack

The Coastal Dune Forest occurs between the beach and the road leading to the northern areas and is dominated by *Mimusops caffra* and *Sideroxylon inerme*. In general, these are low forests. This area varies in disturbance, with in some places characteristic species only occurring in very low densities, and in selected patches these species still create a thick forest. The coastal forest extends to the lee and seaward side of the 1st beach dune with some areas of steep slopes leading towards the high point of the dune. There is a clear distinction between the dune vegetation on the seaward side and the lee side. The lee side of the dune is dominated by characteristic coastal dune forest species such as the White Milkwood (*Sideroxylon inerme*), Coastal Red Milkwood (*Mimusops caffra*) and numerous graminoids (*Stenotaphrum secundatum*; *Setaria nemfluensis*) and shrubs (*Chrysanthemoides monilifera*). The vegetation on the seaward side of the dune is limited to white milkwood (*Sideroxylon inerme*) and scandent cover dependent species such as *Sporobolus virginicus*.

As highlighted by SDP (2021), the slack is an important contributory factor to the sand sharing system, acting as the most proximal freshwater source for dune vegetation and thereby promoting the stabilization of the dune form.



Figure 6-1. Coastal Dune Forest and dune slack

Nenga Estuary and floodplain and wetland

The area between the dune slack and estuary is a low-lying area which shows evidence of the high and low flows of the estuary. It includes a small isolated wetland with wetland sedge species. The water flow to this wetland is impacted by the track from the road to the existing ablution block. The leeward side of the dune heel is dominated by species such as *Isoglossa woodii* and *Chrysanthemoides monilifera*. The Nenga estuary floodplain is impacted by road and other infrastructural developments further upstream.



Figure 6-2. Estuary/ leeward dune heel

Phoenix reclinata-Cyperus esculentus floodplain grassland

This vegetation community is dominated by Coastal Buffalo grass (*Stenotaphrum secundatum*), with selected areas of water flow, and or standing water. In the centre of the wetland, there is a man-made trench with obligate *Cyperus* spp species. It appears that the trench was dug in order to drain the wetland to utilise the adjacent land for agricultural purposes. This wetland is partially impacted by small-scale rotational crops. *Phoenix reclinata* occurs in patches in the upper reaches of the grassland.

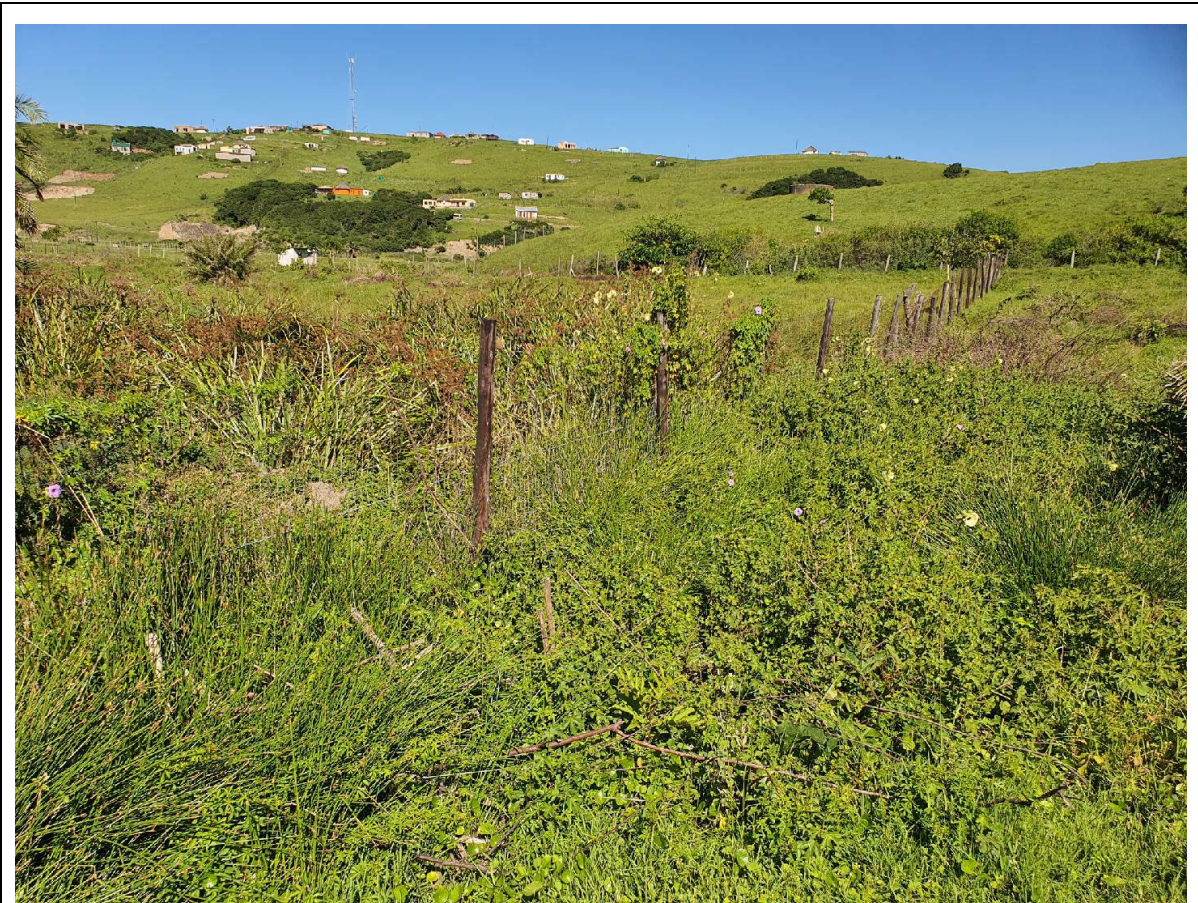


Figure 6-3. *Phoenix reclinata*-*Cyperus esculentus* floodplain grassland/wetland

Existing infrastructure

These areas include current houses, the Ocean View Hotel and related infrastructure, parking areas, cultivated crops, high stocking of domestic animals. Some of these areas contain hard surfaces, however areas in between the houses do show characteristics of the natural vegetation, evident in the few large trees still remaining. The species composition includes exotic weed species and typical graminoid species characteristic of the area, such as Coastal Buffalo grass (*Stenotaphrum secundatum*). This suggests that the grassland is either highly disturbed or secondary in nature. The gravel road intersects these areas and divides the infrastructure to some extent from the coastal dune forests occurring the beach dunes.



Figure 6-4. Existing infrastructure

The vegetation types of the proposed infrastructure within the Coffee Bay study area are indicated in Figure 6-6.

Artificial Wetland

The artificial wetland present on the study site is fed through an underground stormwater pipeline from the across the road. This area shows signs of permanent wetness, as would be expected from the permanent water source, being the underground stormwater pipeline. This wetland is confined to the area between the road and the dune heel. It is approximately 566 m² in extent.



Figure 6-5. Artificial Wetland

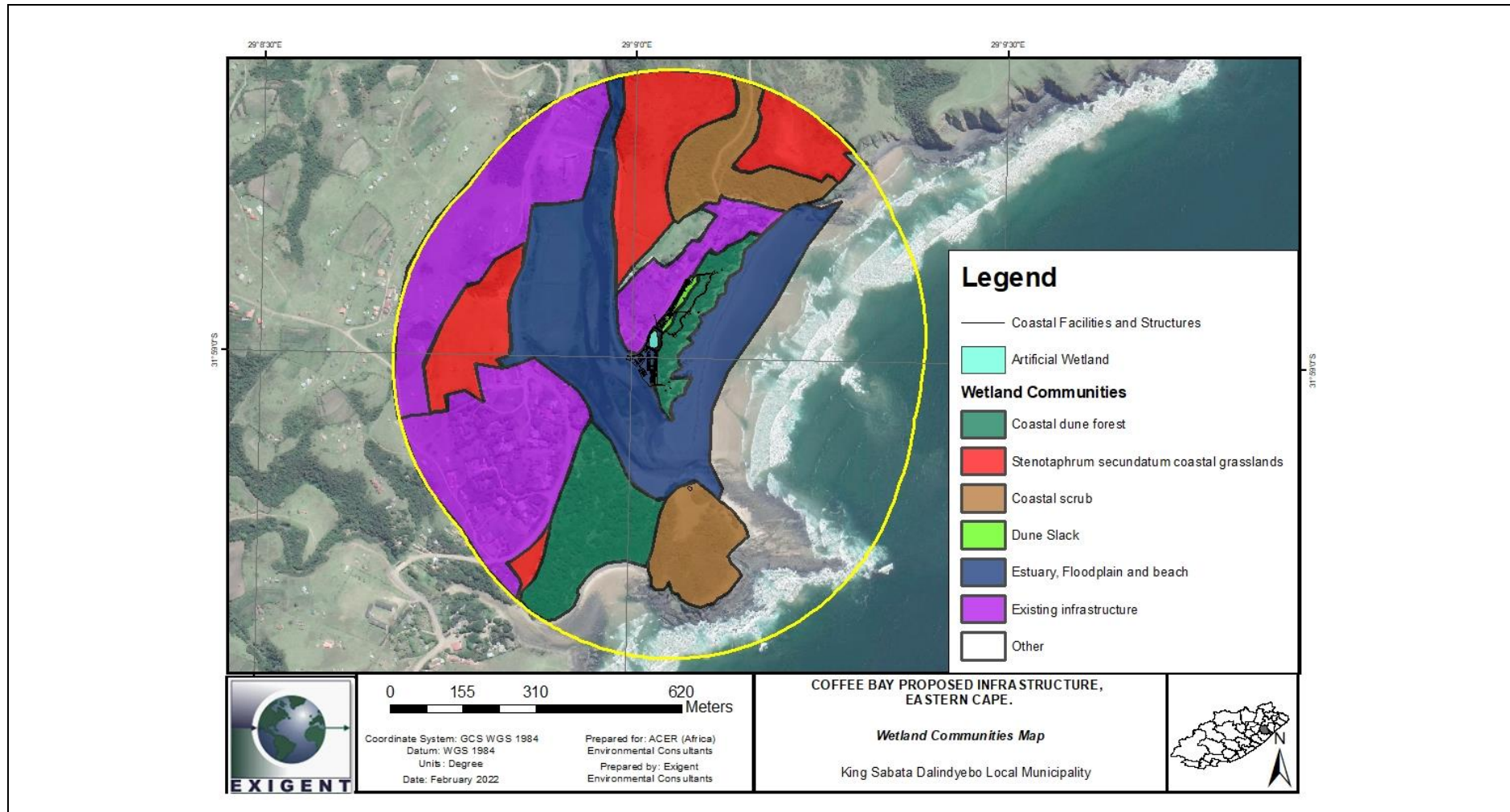


Figure 6-6. Coffee Bay wetland communities with proposed infrastructure

6.1.2. Hole in the Wall

The Hole in the Wall study area has been divided into 4 aquatic vegetation communities and the vegetation associated with the existing infrastructure, and the vegetation namely:

- a) *Stenotaphrum secundatum* - *Phoenix reclinata* coastal grasslands/wetlands;
- b) Mpako Estuary and floodplain grassland;
- c) Dune wetland, and
- d) Riverine Forest.

These wetland communities are interlinked to the terrestrial communities, e.g., the Mpako estuary, floodplain and riverine forest. The grassland species dominating the whole study area include *Stenotaphrum secundatum*, *Centella asiatica* and *Eragrostis plana*. These species composition differs between wetter drainage line areas and lower-lying flatter estuarine and floodplain areas.

***Stenotaphrum secundatum* - *Phoenix reclinata* coastal grasslands/wetlands**

The largest portion of the study area consist of coastal grasslands with varying species diversity as the location, slope and impacts change. The wetland species are confined to occurring within the narrow, isolated drainage lines extending from the hills towards the lower-lying beaches. In areas closer to the grassland wetland communities, the grassland species composition changes to higher densities of wetland species and lower densities of terrestrial grassland species. The species richness of these wetland areas within the grasslands are usually confined to 3 or 4 main species.

The main species composition of the terrestrial/wetland coastal grasslands includes *Stenotaphrum secundatum*, *Eragrostis plana*, *Centella asiatica*, *Cynodon dactylon*, *Centella asiatica*, *Monopsis decipiens*, *Helictotrichon turgidulum* and *Hypochoeris radicata*. Other commonly occurring species included *Kyllinga alata*, *Desmodium incanum*, *Cyperus esculentus*, *Aloe thraskii*, *Themeda triandra* and *Aristida junciformis*. The wetland areas were dominated by *Stenotaphrum secundatum* and *Cynodon dactylon* accompanied by *Centella asiatica*, *Eragrostis plana*, *Phoenix reclinata*, *Mariscus congestus* and, occasionally, *Miscanthus capensis*. As also confirmed by CES (2004), this species composition includes cosmopolitan and exotic weed species and grass species, indicating disturbance. The high stocking rate of cattle and tendency of shifting cultivation impacts on the grasslands. The gravel roads and buildings traversing the grasslands also impact on the disturbances.



Figure 6-7. *Stenotaphrum secundatum* - *Phoenix reclinata* coastal grasslands/wetlands

Mpako Estuary and floodplain grassland

This Estuary is described as a temporarily open/closed estuary in a near pristine condition due to the limited anthropogenic impacts occurring within the estuary (<https://saeis.saeon.ac.za/Info/223>, accessed 28/01/2021). On a national ranking system this estuary is classified as 182/275 and it is recommended that 75% of the estuary remains undeveloped.

Sediment transport along the beach environment is significant and this has given rise to ephemeral dune forms and the presence of cover dependent plant species, in particular *Passerina rigida*. Much of the closed canopy environment comprises of *Sideroxylon inerme* and *Mimusops caffra*, which are associated with coastal dune forests. Notably, there are several psammoserai or dune species, including *Eugenia capensis* and *Chrysanthemoides monilifera*, and there have been several interventions by those wishing to stem such movement through the planting of *Casuarina equisetifolia* has been planted in order to aim to stabilize It follows that activities in this area should be limited and that any infrastructure that is established should be informal or temporary in nature and not exacerbate the mobilization of sands.

Dune wetland

This dune wetland is located between two dunes, with the eastern dune being a low dune with coastal dune forest trees, and the western dune high slope. The wetland had standing water and several *Phenix reclinata* were observed on the outer edges of the wetland, with a distinct permanent, temporary and seasonal zone indicated by the species composition.

The existing pathway meanders to the eastern side of the wetland before it enters the coastal dune forest towards the beach.

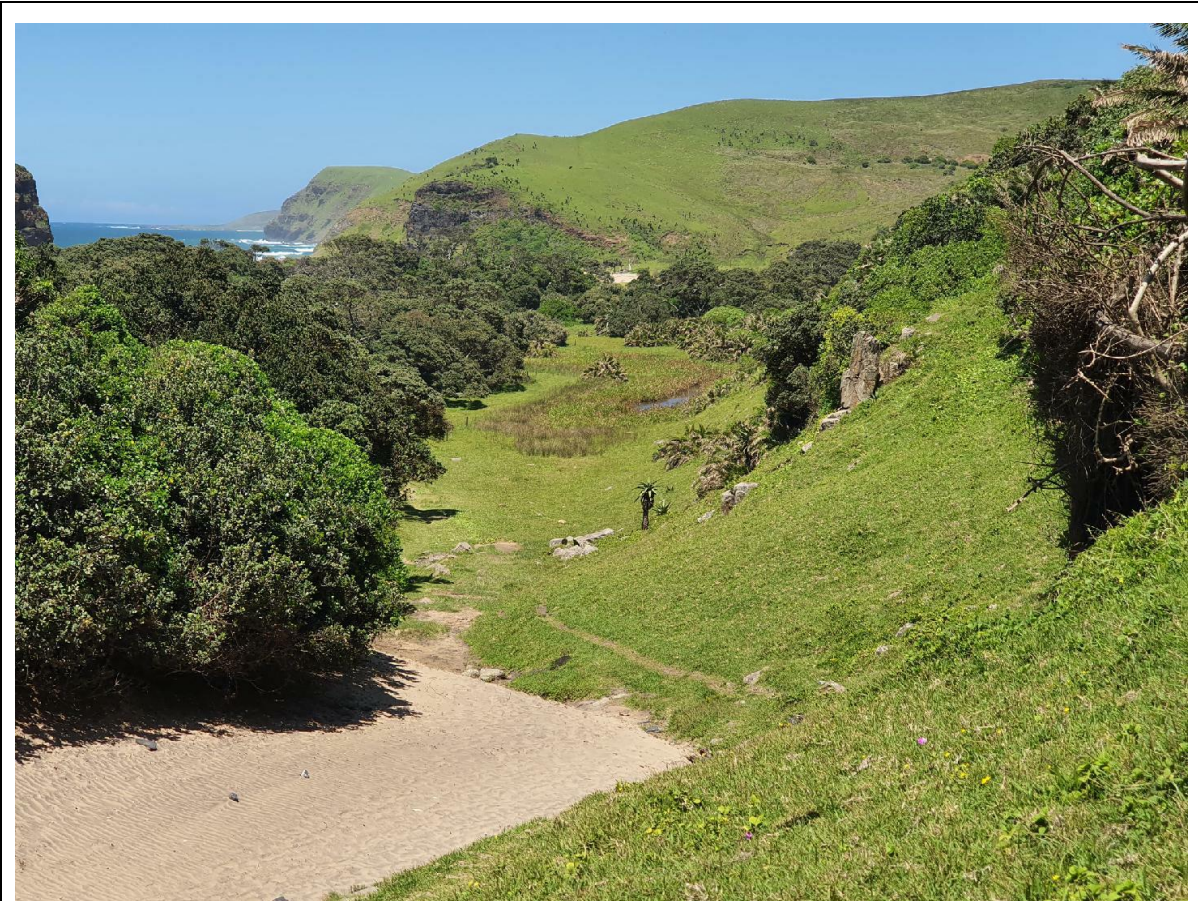


Figure 6-8. Dune wetland

Riverine forest

This forest is limited in distribution within the study area. The dominant species include *Rauvolfia caffra*, *Phoenix reclinata* and *Stenotaphrum secundatum*. This vegetation community is confined to the riverine area adjacent to the Hotel site. The riverine forest included a low tree cover and a high density of shrubs. Along the riverbank there were grasses as well as fern species. Furthermore, this vegetation type had high densities of alien species, including *Solanum* spp, and *Lantana camara*.



Figure 6-9. Riverine vegetation community occurring in the study area

It is also known that littoral strand vegetation (*Scaevola plumieri*, etc.), mangrove forest (*Bruguiera gymnorrhiza*, etc.) and salt marsh vegetation (*Sarcocornia* species) communities occur in the study area in limited habitats that are not affected by the current proposal. The escarpment within this study area was on lower slopes which mixed with the riverine forest at the lower lying areas. Species include *Euphorbia triangularis*, *Milletia grandis*.



Figure 6-10. Existing infrastructure occurring in the study area with riverine forest adjacent to scarp forest in the background

Existing infrastructure

These areas include houses, tourism accommodation facilities, restaurants, roads, the Hole in the Wall Hotel and related infrastructure, parking areas, cultivated crops and high stocking of domestic animals. Some of these areas contain hard surfaces, however areas in between the houses the habitat do show characteristics of the natural vegetation, evident in the few large trees remaining. The species composition includes exotic weed species and typical graminoid species characteristic of the area, such as Coastal Buffalo grass (*Stenotaphrum secundatum*). This suggests that the grassland is either highly disturbed or secondary in nature. The gravel road intersects these areas and divides the infrastructure to some extent from the coastal dune forests occurring the beach dunes. The main road traverses the drainage line wetland which could lead to erosion downstream, however this road has existing for many years and has to date not caused major downstream erosion problems.



Figure 6-11. Existing infrastructure occurring in the study area

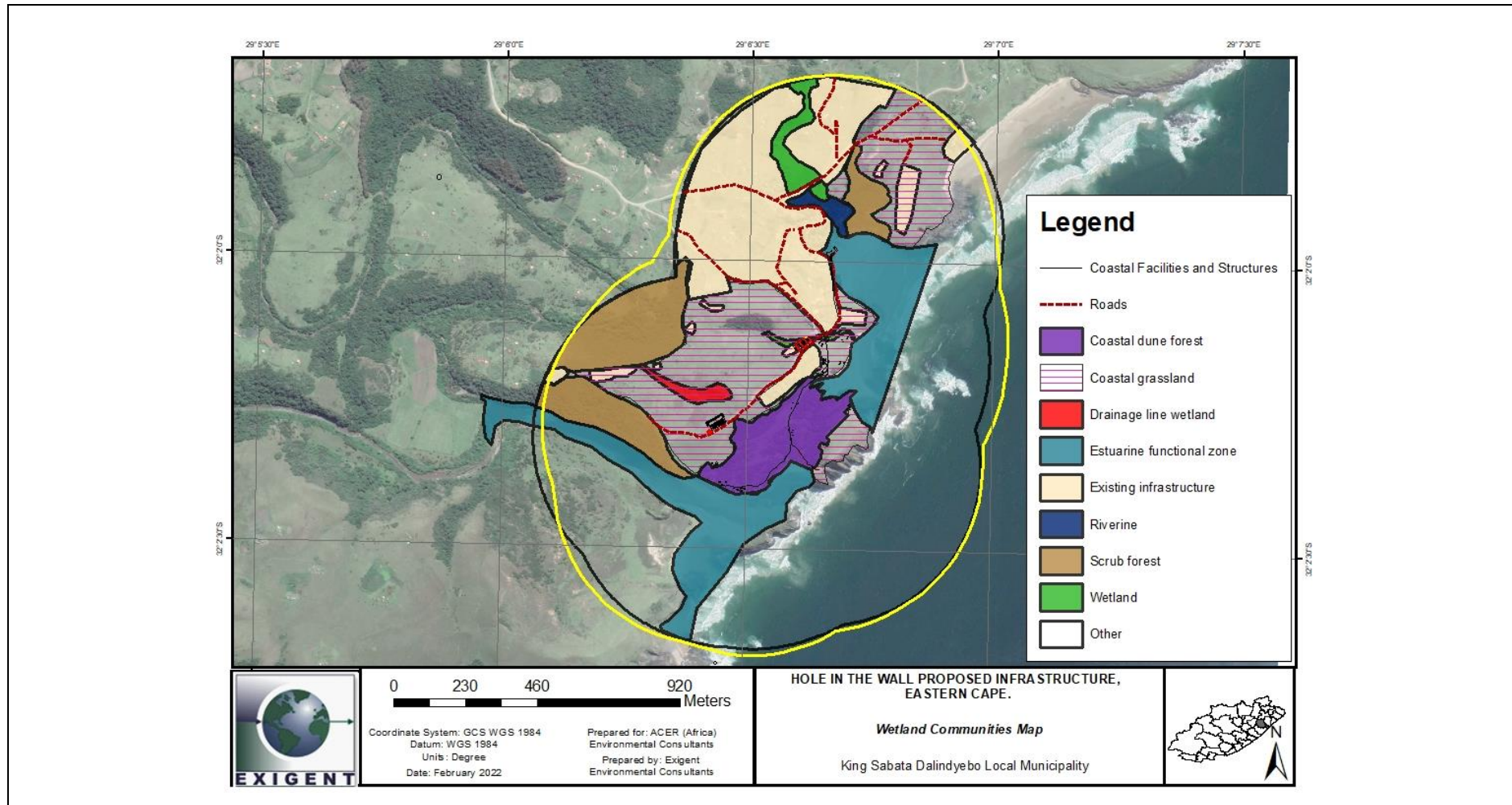


Figure 6-12. Hole in the Wall aquatic communities with proposed infrastructure

6.2. Project Area of Influence

The PAOI was calculated as per Table 6-1 below. The PAOI was calculated as the actual footprint of the proposed activities including the construction footprint.

Table 6-1. Area calculations for the PAOI (Coffee Bay)

PAOI	Area (ha)	Description	Probability
Primary	4,224	Actual infrastructure footprint including the proposed construction footprint area.	Definite
TOTAL	4,224		

Table 6-2. Area calculations for the PAOI (Hole in the Wall)

PAOI	Area (ha)	Description	Probability
Primary	1,852	Actual infrastructure footprint including the proposed construction footprint area.	Definite
TOTAL	1,852		

6.3. Site Ecological Importance

The study area was assessed based on the vegetation type observed during the site visits, and then into the overall SEI for the study area as set out in Table 6-5. The themes of importance has been included in the

Table 6-3. Coffee Bay Floral site sensitivity

COFFEE BAY			
Sensitivity	Taxon	Feature(s)	Potential of occurring within the study footprint
Aquatic Biodiversity Theme			
Very High	Aquatic	Freshwater ecosystem priority area quaternary catchments	The proposed upgrade activities will mostly occur within a disturbed footprint, with limited impact on the natural habitat. See detail assessment of proposed infrastructure in Figure 6-6.
Very High	Aquatic	Wetlands and Estuaries	

Table 6-4. Hole in the Wall floral site sensitivity

HOLE IN THE WALL			
Sensitivity	Taxon	Feature(s)	Potential of occurring within the study footprint
Aquatic Biodiversity Theme			
Very High	Aquatic	Wetlands and Estuaries	The proposed upgrade activities will mostly occur within a disturbed footprint, with limited impact on the natural habitat. See detail assessment of proposed infrastructure in Figure 6-11.
Very High	Aquatic	Freshwater ecosystem priority area quinary catchments	

Table 6-5. Combined SEI for the Coastal Infrastructure Assessment in Coffee Bay

Habitat	Conservation Importance	Functional Importance	Receptor Resilience	Biodiversity importance	Site Ecological Importance
Coastal Dune Forest and dune slack	Low	Low	Very High	Low	Medium
Nenga Estuarine Functional zone, including floodplain	Medium	Medium	Very High	Medium	High
<i>Phoenix reclinata</i> – <i>Cyperus esculentus</i> floodplain grassland/wetland	Low	Low	Very High	Low	Medium

Table 6-6. Combined SEI for the Coastal Infrastructure Assessment in Hole in the Wall

Habitat	Conservation Importance	Functional Importance	Receptor Resilience	Biodiversity importance	Site Ecological Importance
<i>Stenotaphrum secundatum</i> – <i>Phoenix reclinata</i> grassland/wetland	Low	Low	Very High	Low	Medium
Mpako Estuary and floodplain grassland	Medium	Medium	Very High	Medium	High
Dune wetland	Low	Low	Very High	Low	Medium
Riverine forest	Low	Low	Very High	Low	Medium

The recommended actions required to manage the impacts are reflected in the mitigation measures and impacts described in Section 7.1.

7. IMPACT ASSESSMENT

The methodology as stipulated by the Species Assessment Guidelines have been applied to assess the impacts for the proposed coastal facilities at the Coffee Bay and Hole in the Wall sites are described below.

The impact assessment will focus on the direct and indirect impacts associated with the project. All impacts will be analysed with regards to their extent, intensity, duration, probability, and significance.

The significance of potential impacts that may result from the proposed project will be determined to assist decision-makers (typically by a designated authority or state agency, but in some instances, the proponent).

The significance of an impact is defined as a combination of the consequence of the impact occurring and the probability that the impact will occur.

The criteria used to determine impact consequence are presented in the table below.

The combined score of these three criteria corresponds to a Consequence Rating, as follows:

Once the consequence is derived, the probability of the impact occurring is considered, using the probability classifications presented in the table below. The overall significance of impacts is determined by considering consequence and probability using the rating system prescribed in the table below:

		Probability			
		Improbable	Possible	Probable	Definite
Consequence	Very low	Insignificant	Insignificant	Very low	Very low
	Low	Very low	Very low	Low	Low
	Medium	Low	Low	Medium	Medium
	High	Medium	Medium	High	High
	Very high	High	High	Very high	Very high

Finally, the impacts are also considered in terms of their status (positive or negative impact) and the confidence in the ascribed impact significance rating. The prescribed system for considering impacts status and confidence (in assessment) is laid out in the table below:

Status of impact	
Indication of whether the impact is adverse (negative) or beneficial (positive)	+ ve (positive – a 'benefit')
	- ve (negative – a 'cost')
Confidence of assessment	
The degree of confidence in predictions based on available information, Hatch's judgment and / or specialist knowledge	Low
	Medium
	High

The impact significance rating should be considered by authorities in their decision-making process based on the implications of ratings ascribed below:

- **Insignificant:** Potential impact is negligible and will not have an influence on the decision regarding the proposed activity / development.
- **Very low:** Potential impact is very small and should not have any meaningful influence on the decision regarding the proposed activity / development.
- **Low:** Potential impact may not have any meaningful influence on the decision regarding the proposed activity / development.
- **Medium:** Potential impact should influence the decision regarding the proposed activity / development.
- **High:** Potential impact will affect the decision regarding the proposed activity / development.
- **Very high:** Proposed activity should only be approved under special circumstances.

Practicable mitigation and optimisation measures are recommended and impacts are rated in the prescribed way, both without and with the assumed effective implementation of mitigation and optimisation measures. Mitigation and optimisation measures are either:

- **Essential:** Measures that must be implemented and are non-negotiable
- **Best Practice:** Recommended to comply with best practice, with adoption dependent on the proponent's risk profile and commitment to adhere to best practice, and which must be shown to have been considered and sound reasons provided by the proponent if not implemented.

The assessment of impacts adheres to the minimum requirements in the EIA Regulations and takes into account applicable official guidelines.

7.1. Project Impact Assessment

The following key issues have been identified and assessed during this biodiversity impact assessment:

- Impact on Critical Biodiversity Areas with specific reference to species composition, diversity and structure, ecosystem status and species of special concern;
- Impact on Ecological Support Areas in terms of ecological processes, functionality and loss of corridors;
- Impact on Protected Areas extent and potential loss of expansion areas;
- Impact on habitat, water quantity and quality of Strategic Water Source Areas; and
- Impact on the extent and integrity of indigenous forests with reference to potential loss.

It should be noted that the proposed layout of infrastructure has been amended after discussions with key stakeholders and interested parties, as well as specialists to minimise the impacts. This impact assessment is therefore based on the preferred alternative layout option which minimises the impacts on the ecological features of the study area.

7.2. Coffee Bay

Due to the limited footprint of the proposed coastal infrastructure, the habitat disturbance is likely to be limited, however disturbed and exposed soil and exposed could lead to erosion and alien species

encroachment. Erosion would be most prominent on the steeper slopes and the dune interface, where the proposed walkways would be.

Standard management measures will be applicable during construction in terms of minimising the footprint, management of hazardous substances. Operational impacts could lead to pollution by means of waste management and sanitation.

7.2.1. Impact on Critical Biodiversity Areas

CBA's are areas considered critical for meeting biodiversity targets and thresholds, and which are required to ensure the persistence of viable populations of species and the functionality of ecosystems. The ECBSP data (2019) highlights the important vegetation types and species that require protection in the study area. The study area falls within a CBA 2 zone, however, as can be seen from Figure 5-9, this category includes the impacted areas where infrastructure such as rural housing and roads are located. Even though the largest portion of the proposed footprint of the activities are within a CBA zone, proposed activities will largely be located within areas with a species dominated by Coastal Buffalo grass. The three proposed viewing deck areas which will include formalized walkways to access viewing deck, the viewing deck, bins and bench seating, will be prioritised to already disturbed areas. The specific location of these viewing decks and formalized walkways will be proposed in the open areas where localised impacts has caused the vegetation to be disturbed.

The location of the new ablution block is proposed within the dune slack and will be formalised with hard surfaces. This will negatively impact on the water flow to the dune slack, however it is acknowledged that the proposed ablution will only impact on a portion of the water flow and not all waterflow. It should therefore be noted that the proposed ablution should not impact on of the ecological functioning of the dune slack. Therefore, we are of the opinion that even though the ablution facilities will be constructed 3m from the dune slack wetland, the wetland will remain functional.

The new ablution block is proposed to be located 3m of the dune slack area. This area is outside the 1:50 yr floodline. This structure will cause permanent impacts on the water flow to the dune slack. It has therefore been included in the final layout that strict mitigation be followed in formalising the ablution block to avoid any possible contamination.

	Without mitigation		With mitigation	
	Rating	Score	Rating	Score
Extent	Local	1	Local	1
Intensity	Very high/Disastrous	5	Medium/slightly harmful	3
Duration	Project life/permanent	5	High/Harmful	4
Consequence	Rare	2	Rare	2
Probability of occurrence	Probable		Improbable	
Significance	Medium		Low	
Status of impact	Adverse		Adverse	
Confidence in assessment	High		High	
Mitigation and optimization measures	Essential		Incorporated in layout	

Mitigation:

- *Strict management during construction phase to limit the extent of the footprint of the impact.*
- *No areas outside the final footprint may be cleared or impacted, especially within the dune slack. Management of construction related impacts such as eating areas, concrete mixing areas, storage yard should only be allowed in designated areas – outside the ESA and CBA zones.*
- *Operational management impacts of the ablution facilities should be managed very strictly in order to monitor potential pollution impacts from the ablution facilities into the wetland and groundwater.*

7.2.2. Impact on Ecological Support Areas.

ESAs protect the critical conservation areas from edge effects, as well as provide ecological support at the same time through forage areas and movement corridors. The beach cordon area is classified as an ESA1 area, which will be impacted by selected sections of the formalized walkways. The three proposed viewing deck areas which will include formalized walkways to access viewing deck, the viewing deck, bins and bench seating, will be prioritised to already disturbed areas. The specific location of these viewing decks and formalized walkways will be proposed in the open areas where localised impacts has caused the vegetation to be disturbed.

	Without mitigation		With mitigation	
	Rating	Score	Rating	Score
Extent	Local	1	Local	1
Intensity	Low	1	Low	1
Duration	Long term	3	Long term	3
Consequence	Very Low	4	Very Low	4
Probability of occurrence	Definite		Definite	
Significance	Very Low		Very low	
Status of impact	Adverse		Adverse	
Confidence in assessment	High		High	
Mitigation and optimization measures	Essential		Incorporated in layout	

Mitigation:

- *Strict management during construction phase to limit the extent of the footprint of the impact.*
- *No areas outside the final footprint may be cleared.*
- *Management of construction related impacts such as eating areas, concrete mixing areas, storage yard should only be allowed in designated areas – outside the ESA and CBA zones.*

7.2.3. Loss of Protected and Expansion Areas

Protected Area Expansion allow for improved ecosystem representation, ecological sustainability and resilience to climate change (DEA, 2016). Based on the NPAES database (SANBI, 2010) no protected and expansion areas occur within the study area. This impact will therefore not be assessed.

7.2.4. Strategic Water Source Areas

The study area lies within the sub-nationally important surface water Pondoland Coast Strategic Water Source area. The Pondoland Coast Strategic Water Source area extends for an area of 13,461km² along the largest portion of Transkei coast. The proposed activities will not impact on the strategic water source as there will be limited infrastructure which will impact on the surface water flow such as compacted and hardened surfaces which could increase the velocity of water flow.

	Without mitigation		With mitigation	
	Rating	Score	Rating	Rating
Extent	Local	1	Extent	Local
Intensity	Low	1	Intensity	Low
Duration	Long term	3	Duration	Long term
Consequence	Very Low	4	Consequence	Very Low
Probability of occurrence	Definite		Definite	
Significance	Very Low		Very low	
Status of impact	Adverse		Adverse	
Confidence in assessment	High		High	
Mitigation and optimization measures	Essential		Incorporated in layout	
Mitigation:				
<ul style="list-style-type: none"> • <i>The use and handling of all chemicals and potentially hazardous substances must take place on an impermeable surface and bunded areas to prevent chemicals and potentially hazardous substances from infiltrating the soil;</i> • <i>Contingency plans must be compiled for possible spillages of dangerous goods and include details for decontamination and process to be followed;</i> • <i>A spill kit must be available in the event of a hydrocarbon or chemical spill;</i> 				

7.3. Hole in the Wall

Due to the limited footprint, the habitat disturbance is likely to be limited, however disturbed and exposed soil and exposed could lead to erosion and alien species encroachment. Erosion would be most prominent on the steeper slopes, where the proposed higher picnic and parking areas would be.

The proposed walkway in the lower-lying coastal forest would be of limited impact as the route will remain on existing disturbed footprints as far as possible, and furthermore has the alignment has been optimised to be outside the dune wetland. Standard management measures will be applicable during construction in terms of minimising the footprint, management of hazardous substances. Operational impacts could lead to pollution by means of waste management and sanitation.

All drainage lines from the hills towards the beach are identified as sensitive and proposed activities should refrain from crossing these areas, however cognisance should be taken of existing impacts such as roads and infrastructure traversing these areas.

7.3.1. Impact on Critical Biodiversity Areas

CBA's are areas considered critical for meeting biodiversity targets and thresholds, and which are required to ensure the persistence of viable populations of species and the functionality of ecosystems. The ECBSP data (2019) highlights the important vegetation types and species that require protection in the study area. The study area is located outside any CBA.

This impact will thus not be assessed.

7.3.2. Impact on Ecological Support Areas.

ESAs protect the critical conservation areas from edge effects, as well as provide ecological support at the same time through forage areas and movement corridors. Selected areas of the grassland is classified as an ESA1 area. Although not observed during the site visit, there is potential for faunal species movement through these areas from the surrounding Scarp forest which provides more

protection from anthropogenic activities, such as hunting. The proposed infrastructure areas which will include formalized walkways to access viewing deck, the viewing deck, bins and bench seating, will be located within the ESA1 zone. The specific location of these viewing decks and formalized walkways will be proposed in the open areas where localised impacts has caused the vegetation to be disturbed.

The parking area is proposed to be located upstream of the drainage line wetland and should therefore not be formalised with hard surfaces as it will cause permanent impacts on the water flow to the wetland. It has therefore been included in the final layout that grass blocks be used for formalising the parking area. This will allow for continued waterflow to the wetland.

	Without mitigation		With mitigation	
	Rating	Score	Rating	Score
Extent	Local	1	Local	1
Intensity	Medium	2	Low	1
Duration	Long term	3	Long term	3
Consequence	Medium	6	Low	5
Probability of occurrence	Probable		Probable	
Significance	Medium		Low	
Status of impact	Adverse		Adverse	
Confidence in assessment	High		High	
Mitigation and optimization measures	Essential		Incorporated in layout	

Mitigation:

- *Intentional killing of any faunal species should be avoided by means of awareness programs and toolbox talks presented to construction labourers. Any person found deliberately harassing any animal in any way must face disciplinary measures;*
- *If any faunal species is recovered during the construction phase, this species must be relocated to the nearest natural open space with suitable habitat for the particular species to survive;*
- *Strict management during construction phase to limit the extent of the footprint of the impact.*
- *No areas outside the final footprint may be cleared.*
- *Management of construction related impacts such as eating areas, concrete mixing areas, storage yard should only be allowed in designated areas – outside the ESA and CBA zones.*
- *Formalisation of the parking area should be done with grass blocks to ensure continued water flow to the wetland.*

7.3.3. Loss of Protected and Expansion Areas

Protected Area Expansion allow for improved ecosystem representation, ecological sustainability and resilience to climate change (DEA, 2016). Based on the NPAES database (SANBI, 2010) no protected and expansion areas occur within the study area.

This impact will thus not be assessed.

7.3.4. Strategic Water Source Areas

Most of the study area lies within the sub-nationally important surface water Pondoland Coast Strategic Water Source area. The Pondoland Coast Strategic Water Source area extends for an area of 13,461km² along the largest portion of Transkei coast. The proposed activities will not impact on the strategic water

source as there will be limited infrastructure which will impact on the surface water flow such as compacted and hardened surfaces which could increase the velocity of water flow.

	Without mitigation		With mitigation	
	Rating	Score	Rating	Rating
Extent	Local	1	Local	1
Intensity	Medium	2	Low	1
Duration	Medium term	2	Medium term	2
Consequence	Low	5	Very low	4
Probability of occurrence	Possible		Improbable	
Significance	Very low		Insignificant	
Status of impact	Adverse		Adverse	
Confidence in assessment	High		High	
Mitigation and optimization measures	Essential		Essential	
Mitigation:				
<ul style="list-style-type: none"> • The use and handling of all chemicals and potentially hazardous substances must take place on an impermeable surface and bunded areas to prevent chemicals and potentially hazardous substances from infiltrating the soil; • Contingency plans must be compiled for possible spillages of dangerous goods and include details for decontamination and process to be followed; • A spill kit must be available in the event of a hydrocarbon or chemical spill; 				

8. Risk Matrix

The Risk Assessment took the consequence and likelihood of the impact into consideration to determine the risk. The risk assessment took place according to the DWS protocol (2014). The risk assessment is completed as per Notice of 509 of 2016 under the Department of Water and Sanitation with regards to General Authorisations for Section 21 (c) and (i) water uses. Scores were allocated as follows in Addendum 1 of this report.

9. CONCLUSION

This Aquatic Biodiversity Impact Assessment report considers and reports on the anticipated environmental impacts that the proposed coastal infrastructure may have and will form part of the application for environmental authorisation, in terms of the National Environmental Management Act, 1998 (Act No. 108 of 1998) and the 2014 Environmental Impact Assessment Regulations as amended in April 2017, together with the BAR application.

At both the sites, it is clear from aerial imagery, literature review and ground truthing that large portions of the study area have been impacted by anthropogenic activities including infrastructure and small-scale agricultural activities. Remaining terrestrial ecology and aquatic habitats are present as coastal dune grasslands intersected with drainage line wetlands, linked to forest habitats and the estuarine functional areas.

These indigenous habitats are sensitive and critical to maintain the ecological integrity and ecosystem diversity in the immediate area and to facilitate geneflow, ecological and climate change processes through corridors to the remaining indigenous habitats in the surrounding area. Construction activities

must be limited to minimise the ecological habitat and the management of these indigenous ecological habitats' areas must be managed to facilitate natural processes, provide habitat for faunal species and reduce edge effects.

It is the opinion of the specialist that the proposed footprint be considered for authorisation if an overarching Environmental Management and Monitoring Plan be compiled in consultation for inclusion in the EIA process and implementation thereof as a condition of the decision.

10. REFERENCES

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Addendum A: Risk Matrix

Addendum B: Curriculum Vitae

Addendum C: Declaration of Independence

DECLARATION OF INDEPENDENCE

I, Jacolette Adam (Exigent Engineering Consultants CC) declare that:

General declaration:

- I act as the independent specialist in this application;
- do not have and will not have any vested interest (either business, financial, personal or other) in the undertaking of the proposed activity, other than remuneration for work performed in terms of the Environmental Impact Assessment Regulations, 2014, as amended;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- all the particulars furnished by me in this form are true and correct; and
- I am aware that a person is guilty of an offence in terms of Regulation 48 (1) of the EIA Regulations, 2014, as amended, if that person provides incorrect or misleading information. A person who is convicted of an offence in terms of sub-regulation 48(1) (a)-(e) is liable to the penalties as contemplated in section 49B(1) of the National Environmental Management Act, 1998 (Act 107 of 1998).

J Adam

Date: May 2021

ADDENDUM 1

ASPECTS AND IMPACT REGISTER/RISK ASSESSMENT FOR WATERCOURSES INCLUDING RIVERS, PANS, WETLANDS, SPRINGS, DRAINAGE LINES (Based on DWS 2015 publication: Section 21 c and I water use Risk Assessment Protocol)																					
HOLE IN THE WALL RISK MATRIX																					
NAME and REGISTRATION No of SACNASP Professional member: Jacolette Adam Reg no. Pr. Sci. Nat.: 400088/02																					
Risk to be scored for construction and operational phases of the project. MUST BE COMPLETED BY SACNASP PROFESSIONAL MEMBER REGISTERED IN AN APPROPRIATE FIELD OF EXPERTISE.																					
Nr.	Phases	Activity	Aspect	Impact	Severity				Severity	Spatial scale	Duration	Consequence	Frequency of activity	Frequency of impact	Legal Issues	Detection	Likelihood	Significance	Risk Rating	Control Measures	Type Watercourse
					Flow Regime	Physico & Chemical (Water Quality)	Habitat (Geomorph+Vegetation)	Biota													
1	Construction	Impact on vegetation	Disturbance of the natural vegetation by the proposed activities may aid exotic species to further invade the area impacted upon. Estuarine Functional Zone - presence of <i>Passerina rigida</i> , and the closed canopy environment comprises of <i>Sideroxylon inerme</i> and <i>Mimusops caffra</i> .	Formalization of the the of existing boat launch. Formalisation of picnic facilities. May lead to the encroachment of alien invasive species.	1	1	1	1	1	1	1	3	1	1	5	1	8	24	L	<p>Compliance with the EMP</p> <ul style="list-style-type: none"> • Intentional killing of any faunal species should be avoided by means of awareness programs and toolbox talks presented to construction labourers. Any person found deliberately harassing any animal in any way must face disciplinary measures; 	Estuarine Functional Zone
2	Construction		Disturbance of the natural vegetation by the proposed activities may aid exotic species to further invade the area impacted upon. <i>Stenotaphrum secundatum</i> - <i>Phoenix reclinata</i> coastal grasslands/wetlands - Dominated by species such as <i>Stenotaphrum secundatum</i> , <i>Eragrostis plana</i> , <i>Centella asiatica</i> , <i>Cynodon dactylon</i> , <i>Centella asiatica</i> , <i>Monopsis decipiens</i> , <i>Helictotrichon turgidulum</i> and <i>Hypochoeris radicata</i> .	Introducing grass blocks to be used for formalising the parking area. The construction of the ablution block may lead to an encroachment of alien invasive species. Formalization of picnic areas Formalization of footpaths The loss of vegetation will be limited as	2	1	2	2	1.8	1	2	5	1	1	5	1	8	38	L	<ul style="list-style-type: none"> • If any faunal species is recovered during the construction phase, this species must be relocated to the nearest natural open space with suitable habitat for the particular species to survive; • Strict management during construction phase to limit the extent of the footprint of the impact. • No areas outside the final footprint may be cleared. • Management of construction related impacts such as eating 	<p><i>Stenotaphrum secundatum</i> - <i>Phoenix reclinata</i> coastal grasslands/wetlands</p>

5	Construction	Site clearing of Vegetation	The Estuary, Coastal Dune Forest will have vegetation cleared for the formalization of the footpath and selected picnic sites.	Potential physical disturbance of habitat where footpaths and picnic sites will be constructed	2	1	2	1	1.5	1	2	5	1	3	5	1	10	45	L	<p>Compliance with the EMP</p> <ul style="list-style-type: none"> • Prepare a programme to remove alien invasive plants on site during the construction period. • All alien invasive plants must be removed. The ECO must do regular follow-ups to ensure no alien invasive plants establish. • Successful re-vegetation is crucial in disturbed areas outside the project footprint to stabilise soils and limit infestation by invasive alien plant species and dominance by ruderal species. Rehabilitation must be undertaken on a progressive basis in such areas. • Registered herbicides must strictly be applied to alien invasive vegetation only. • Topsoil stockpiles must be monitored regularly to identify any alien plants. If any occurs, they must be removed before they germinate to prevent contamination of the indigenous seed bank. • Alien invasive grasses such as Pennisetum clandestinum (Kikuyu) must not be used. 	Esturine Functional Zone, Stenotaphrum secundatum - Phoenix reclinata coastal grasslands/wetlands, Coastal Dune forest.
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6	Construction		The Coastal grassland and wetland area will require partial vegetation clearing for the formalization of the grass blocked parking area.	Potential physical disturbance of habitat for the formalization of the grass blocked parking area	2	1	2	2	1.8	1	2	5	1	3	5	2	11	52.25	L	<p>Compliance with the EMP• Strict management during construction phase to limit the extent of the footprint of the impact. • No areas outside the final footprint may be cleared. • Management of construction related impacts such as eating areas, concrete mixing areas, storage yard should only be allowed in designated areas – outside the ESA and CBA zones. • Vegetation in parking area should not be removed and replaced with permanent hard surfaces which could alter the surface water flow however grass blocks are acceptable. . Formalisation of the parking area should be done with grass blocks to ensure continued water flow to the wetland.</p>	Stenotaphrum secundatum - Phoenix reclinata coastal grasslands/wetlands
7	Construction and Operation	Hydrological Impacts on the system	Increased stormwater run off volumes from storm water management systems.	Altering natural patterns of surface runoff; Impoundment and redirection of water; Altering patterns of diffuse surface and sub-surface flows by altering micro-topography and the permeability of soil profiles: Increased runoff velocities linked to concentrated flow paths	2	2	1	1	1.5	1	1	4	1	2	5	1	9	31.5	L	<p>Compliance with the EMP</p> <ul style="list-style-type: none"> • Silt traps must be installed on the development site boundary during construction; • Erosion control structures must be put in place where soil may be prone to erosion; • Multiple discharge points that are reasonably spread out across the working areas adjoining the wetland habitat to allow a diffuse spread of surface runoff, maximising the amount of infiltration; • Engineering structures (such as gabions or reno mattresses) for 	Esturine Functional Zone, Stenotaphrum secundatum - Phoenix reclinata coastal grasslands/wetlands , Coastal Dune forest.

9	Construction and Operation	Erosion	Should Stormwater management design of the engineers not be adequate, sedimentation problems could result.	Disturbance of soil profiles with a resultant risk of increased sediment potentially delivered to the downstream water courses (sedimentation)	2	1	1	2	1.5	1	1	4	2	1	5	1	9	31.5	L	<p>Compliance with the EMP</p> <ul style="list-style-type: none"> • The control of soil erosion and siltation associated with construction and operation is important at all locations on site, and particularly adjacent to the Estuary and Coastal Forest. Both temporary and permanent soil erosion control measures must be used during the construction and operation phases. • Any earth-worked areas, which may lay bare for extended periods, should be temporarily grassed by indigenous species; • Incorporate adequate erosion management measures to limit erosion and associated sedimentation of the water resource; • management measures must include berms, silt fences, hessian curtains and stormwater diversion away from areas susceptible to erosion. Care must however be taken to avoid additional disturbance during the implementation of these measures. • Both temporary and permanent soil erosion control measures must be used during the construction and operation phases. • Checks must be carried out at regular intervals to identify areas where erosion is occurring and remedial action must be taken. • Structurally sound surface for a permanent road must be maintained, by providing adequate 	Esturine Functional Zone, <i>Stenotaphrum secundatum</i> - <i>Phoenix reclinata</i> coastal grasslands/wetlands , Coastal Dune forest.
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ASPECTS AND IMPACT REGISTER/RISK ASSESSMENT FOR WATERCOURSES INCLUDING RIVERS, PANS, WETLANDS, SPRINGS, DRAINAGE LINES (Based on DWS 2015 publication: Section 21 c and I water use Risk Assessment Protocol)

COFFEE BAY RISK MATRIX

NAME and REGISTRATION No of SACNASP Professional member: Jacolette Adam Reg no. Pr. Sci. Nat.: 400088/02

Risk to be scored for construction and operational phases of the project. MUST BE COMPLETED BY SACNASP PROFESSIONAL MEMBER REGISTERED IN AN APPROPRIATE FIELD OF EXPERTISE.

Nr.	Phases	Activity	Aspect	Impact	Severity					Severity	Spatial scale	Duration	Consequence	Frequency of activity	Frequency of impact	Legal Issues	Detection	Likelihood	Significance	Risk Rating	Control Measures	Type Watercourse
					Flow Regime	Physico & Chemical (Water Quality)	Habitat (Geomorph+Ve getation)	Biota														
1	Construction:	Impact on vegetation	Disturbance of the natural vegetation by the proposed activities may aid exotic species to further invade the area impacted upon. Coastal Dune Forest - Dominated by <i>Mimusops caffra</i> and <i>Sideroxylon inerme</i> is located on the northern areas. The lee side of the forest is dominated by characteristic coastal dune forest species such as the White Milkwood (<i>Sideroxylon inerme</i>), Coastal Red Milkwood (<i>Mimusops caffra</i>) and numerous graminoids (<i>Stenotaphrum secundatum</i> ; <i>Setaria nemfluensis</i>) and shrubs (<i>Chrysanthemoides monilifera</i>). The dune slack- Allows for the sand sharing system, acting as the most proximal freshwater source for dune vegetation and thereby promoting the	Formalization of the walkway and picnic sites may lead to an encroachment of alien invasive species. The loss of vegetation will be limited as the proposed structures will be located within the disturbed footprints as far as possible.	1	1	1	1	1	1	1	3	1	1	5	1	8	24	L	<p>Compliance with the EMP</p> <ul style="list-style-type: none"> • Strict management during construction phase to limit the extent of the footprint of the impact. • No areas outside the final footprint may be cleared. • Management of construction related impacts such as eating areas, concrete mixing areas, storage yard should only be allowed in designated areas – outside the ESA and CBA zones. • Strict management during construction phase to limit the extent of the footprint of the impact. • No areas outside the final footprint may be cleared or impacted, especially within the dune slack. <p>Management of construction related impacts such as eating areas, concrete mixing areas, storage yard should only be allowed in designated areas – outside the ESA and CBA zones.</p>	Coastal Dune forest and Dune slack	

10	Construction and Operation	Erosion	Should Stormwater management design of the engineers not be adequate, sedimentation problems could result.	Disturbance of soil profiles with a resultant risk of increased sediment potentially delivered to the downstream water courses (sedimentation)	2	1	1	1	1.25	1	2	4.25	2	1	5	1	9	38.25	L	<p>Compliance with the EMP</p> <ul style="list-style-type: none"> • The control of soil erosion and siltation associated with construction and operation is important at all locations on site, and particularly adjacent to the Estuary and Coastal Forest. Both temporary and permanent soil erosion control measures must be used during the construction and operation phases. • Any earth-worked areas, which may lay bare for extended periods, should be temporarily grassed by indigenous species; • Incorporate adequate erosion management measures to limit erosion and associated sedimentation of the water resource; management measures must include berms, silt fences, hessian curtains and stormwater diversion away from areas susceptible to erosion. Care must however be taken to avoid additional disturbance during the implementation of these measures. • Both temporary and permanent soil erosion control measures must be used during the construction and operation phases. • Checks must be carried out at regular intervals to identify areas where erosion is occurring and remedial action must be taken. • Structurally sound surface for a permanent road must be maintained, by providing adequate drainage so that erosion, excessive dust and undue surface damage are avoided. • The careful position of runoff control, and planting of some vegetative cover after completion (indigenous groundcover, grasses etc.) must limit the extent of 	Coastal Dune Forest, Dune Slack, Estuary
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12	Construction and Operation	Pollution of the groundwater due to chemical, oil and spillages, sewage leaks	Contaminants will include mainly oil/grease, naphtha and petrol/ diesel. These pollutants may result from leakages from operating equipment, vehicles, oil changes during the servicing of equipment and vehicles or, or from spills as a result of incorrect handling of substances or equipment during construction. During the operational phase, the vehicles using the parking areas may have oil leaks and there is the potential for the ablution block to have overflows or leaks.	Pollution of the groundwater due to chemical, oil and spillages, and sewage leaks/overflows.	1	2	2	1	1.5	1	2	4.5	2	1	5	3	11	49.5	L	<p>Compliance with the EMPr</p> <ul style="list-style-type: none"> • The use and handling of all chemicals and potentially hazardous substances must take place on an impermeable surface and bunded areas to prevent chemicals and potentially hazardous substances from infiltrating the soil; • Contingency plans must be compiled for possible spillages of dangerous goods and include details for decontamination and process to be followed; • A spill kit must be available in the event of a hydrocarbon or chemical spill; <p>Proper maintenance of the ablution facilities is a critical requirement.</p>	Coastal Dune Forest, Dune Slack, Estuary
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