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FINAL BASIC ASSESSMENT REPORT RELOCATION OF THE RICHARDS BAY LIGHTHOUSE UMHLATHUZE LOCAL MUNICIPALITY TRANSNET NATIONAL PORTS AUTHORITY EIA REF NO: 14/12/16/3/3/1/2007

TRANSNET

EVP1134

This report was prepared by EnviroPro Environmental Consulting in terms of Appendix 1 to GNR 982

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Executive Summary

Transnet National Ports Authority propose to relocate the existing Richards Bay lighthouse within Ward 1 of the uMhlathuze Local Municipality, King Cetshwayo District Municipality, Kwazulu-Natal Province. The site is located in the north eastern undeveloped coastal area of the Meerensee neighbourhood, Richards Bay at the following point location, 28°46'15.21"S 32° 7'49.59"E. The site is located on Erf 5333 Richards. The site is located in the north eastern undeveloped coastal area of the Meerensee neighbourhood, Richards Bay. Due to this eminent danger of collapse the old lighthouse was demolished. As a short-term solution Transnet National Ports Authority has erected a temporary lattice lighthouse at the most landward side of the old site. However, in order to provide a long-term permanent structure to serve as an Aid to Navigation is being proposed.

The following key impacts and mitigation measures were assessed:

- **Clearance of coastal forest as part of the Kwambonambi Dune Forest:** Only the area of the site may be cleared all other areas must be designated as no-go areas.
- **Encroachment of alien vegetation into areas outside of the construction footprint:** Alien vegetation must not be allowed to encroach onto the site and must be continually removed during construction. Construction must not promote further alien plant disturbances in the surrounding area.
- **Damage to surrounding properties, services, and businesses:** The construction activities could disrupt the local community and existing services. All services must be identified prior to construction and all stakeholders must be notified prior to any service disruptions.
- **Improved maritime navigation:** The construction of the new lighthouse will have a positive impact on local maritime navigation which is a legislated requirement.

These impacts can be mitigated by following the recommendations in this report and EMPr. Construction activities will be monitored and controlled through the implementation of the Environmental Management Programme (EMPr).

Only one site alternative was considered for the application however a technology alternative was assessed. Ultimately the decision on selecting the preferred alternative was based on the function of cost as well as operational impacts.

Taking into consideration the above impacts and mitigation measures, it is the EAP's opinion that there are no significant environmental impacts associated with the proposal which cannot be mitigated. Therefore, it is recommended that the preferred alternative be authorised for the relocation of the Richards Bay Lighthouse.

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Table of Acronyms

BAR	Basic Assessment Report
C&R	Comments and Response
CBA	Critically Biodiversity Area
CR	Critically Endangered
DWS	Department of Water and Sanitation
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
I&AP	Interested and Affected Parties
IDP	Integrated Development Plan
NEMA	National Environmental Management Act

Section 1: Scope of Work and Location of Activity

1.1 Project Title

Relocation of the Richards Bay Lighthouse

1.2 A Description of the Activities to Be Undertaken Including Associated Structures and Infrastructure As per Section 3(d) (ii)

Transnet National Ports Authority propose to relocate the existing Richards Bay lighthouse within Ward 1 of the uMhlathuze Local Municipality, King Cetshwayo District Municipality, Kwazulu-Natal Province. The site is located in the north eastern undeveloped coastal area of the Meerensee neighbourhood, Richards Bay at the following point location, 28°46'15.21"S 32° 7'49.59"E. The site is located on Erf 5333 Richards Bay however the proposed site is in the process of being subdivided as the property is owned by the uMhlathuze Local Municipality. This portion measures a total of 1529m^2. The site is located in the north eastern undeveloped coastal area of the Meerensee neighbourhood, Richards Bay. The current zoning as per the City of Umhlathuze Zoning Scheme is Municipal Health and Government 2. This zone is intended for buildings erected and used for National, Provincial and Municipal administration and services. Current access to the site is off a dirt road connected to Anglers Road located on its north eastern boundary.

The old Richards Bay lighthouse, 500m south west of the proposed development (28°46'31.82"S 32° 7'40.55"E), was commissioned on 22 May 1979 to provide Aid to Navigation (Aton) to maritime travellers/shipping operations in around and around the KZN North Coast. It was a 11-meter square concrete tower with cylindrical top section, painted white, with white lantern house. This lighthouse was subject to large scale land-slip due to coastal erosion whereby there was a real danger that the structure would fall down the embankment onto the beach with further erosion. Due to this eminent danger of collapse the old lighthouse was demolished. As a short-term solution Transnet National Ports Authority has erected a temporary lattice lighthouse at the most landward side of the old site. However, in order to provide a long-term permanent structure to serve as an Aton was proposed. Please note the project to construct a new lighthouse was previously authorised (14/12/16/3/3/1/662) in August 2013 however the project was deferred by Transnet National Ports Authority due to cost reductions and this resulted in the EA lapsing. This EIA serves to re-authorise the construction of the lighthouse at the new site.

The specifications of the proposed lighthouse are as follows:

- The site will comprise of a 30m x 50m enclosed area measuring a total of 1529m^2.
- The lighthouse be a 27,99m high monopole.
- The monopole will be supported by strip concrete foundation as per the geotechnical report attached within Appendix B.
- The long-range beacon attached to the lighthouse will be powered by solar with municipal supply as back-up. These beacons will be mounted high up on a landing.
- There will a source of fresh water
- There will be no other facilities on site such as ablutions and meeting facilities.
- The project will also include the upgrading of existing 200m gravel road to a 4m wide road.. This road will intersect the Anglers Road running near the site.
- All stormwater from the site will be directed into the stormwater channels along the new upgraded portion of road. Stormwater channels will connect into the exiting stormwater system of Anglers Road.

The land use surrounding the project area include horse stables, sports fields and a dirt road heading towards the beach. The entire site has been classified as a critically endangered ecosystem type listed in terms of section 52 of the NEMBA, namely Kwambonambi Dune Forest. The entire site will be cleared to allow for the construction of the lighthouse and such a total area of 1529m^2 will be cleared within this ecosystem type. Therefore, an environmental authorisation is required prior to construction commencing on site. Please note as forest will be impacted on the Department of Agriculture, Forestry and Fisheries has been contacted whereby it will be determined by official from this Department if a permit is required to remove forest vegetation.

As per Section 78 of the National Ports Act (Act 12 of 2005), The Authority (Transnet National Ports Authority) must operate and maintain lighthouses and other navigational aids under its control in terms of standards determined by the South African Maritime Safety Authority in order to assist the navigation of vessels within port limits and along the coast of the Republic. Therefore, Transnet National Ports Authority is responsible for the provision, operation and maintenance of a lighthouse to service the Richards Bay port. Therefore, the construction of the new lighthouse will have a positive impact on local maritime navigation which is a legislated requirement.

1.2.1 Construction Methodology

The proposed construction methodology can be summarised as follows.

- Necessary clearing and grubbing of the site for construction of the works will be done. This will include the clearing and cleaning of any vegetation within the construction footprint of the site (1529m^2). Please note site access is already available.
- Please note all vegetation within the construction footprint will be cleared. The site camp will be located within the site boundary.
- Bulk earthwork will take place once the site has been prepared.
- The enclosure fence will be installed around the whole site with an access gate.
- Heavy machinery i.e. a TLB will be used to excavate the foundations. Bedding material will then be compacted into this excavation in preparation for the concrete to be cast.
- Ready-mixed concrete will be brought to site and used to cast the foundations.
- Stormwater infrastructure will be installed throughout the site. All stormwater will be directed towards the access road.
- Layer works associated with the road will take place.
- The monopole structure will be installed on top of the concrete foundation
- Finally, rehabilitation of all areas affected by the construction activities will be undertaken.

1.3 Description of Feasible Alternatives as Per Section 3(h)(i)

Site Alternatives

Only one feasible site alternative was considered for this application. Due to the costal erosion, the site needed to be located away from the danger zone but within the vicinity of the old lighthouse site for navigation purposes. The selected site is partially located within the coastal forest and is adjacent community fields, thus the forest in this area has been disturbed. The site also has access therefore a new road would not need to be constructed. Other potential sites will also need to be located within the vicinity of the old lighthouse site and thus would be located within the coastal forest. Locating the site completely within the forest would have a significant impact on the ecosystem as it would result in fragmentation. The land is also owned by the municipality thus a subdivision is taking place. The municipality requested that the subdivision take place on the edge of the sportsfield as to not obstruct any potential developments in the future as the land is zoned Municipal Health and Government 2. For the above reasons only one feasible site alternative was considered in this assessment.

Technology Alternatives

Preferred Alternative

The preferred technology alternative is to construct a new 27,99m high monopole lighthouse. The monopole tower will be supported by strip concrete foundation. The long-range beacons attached to the lighthouse will be powered by will be solar panels with municipal supply as back-up. These beacons will be mounted high up on a landing. There will be no other facilities on site such as ablutions and meeting facilities

Alternative 1

Alternative 1 would be to construct a new 27.99m high concrete tower lighthouse. The concrete tower will be supported by strip concrete foundation. The tower would have a lantern house on top. The lighthouse would also be fitted with a mess room and ablution facilities and an associated septic tank.

The No Go Alternative

The proposed construction the new Richards Bay Lighthouse will not take place. The temporary structure would remain and the old site. The site would never be secure as the site will continue to be subject to coastal erosion. On a temporary scale there would be not provision of local employment opportunities during construction.

1.4 All Listed and Specific Activities to Be Triggered and Being Applied for As Per Section 3(d) (i)

Table 1: All Listed and Specific Activities to Be Triggered and Being Applied.

GNR	Activity Number	Activity as per the legislation	Activity as it applies to the proposal
Listing Notice 3 of 2014 EIA Regs as amended.	12	*The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.* *d. KwaZulu-Natal* *iv. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004;*	The construction of the new Richards Bay Lighthouse will result in the clearance of 1529m^2 of vegetation within the critically endangered ecosystem, Kwambonambi Dune Forest, in terms of section 52 of the NEMBA.

1.5 Location of Activity as per Section 3 (b)(i)-(iii)

Table 2: Location of Activity

District Municipality		uMhlathuze Local Municipality,																			
Local Municipality		King Cetshwayo District Municipality																			
Wards		Wards 1																			
Area / Town / Village		Meerensee, Richards Bay																			
Co-ordinates:		**Latitude**										**Longitude**									
	Centre of Site:	28°46'15.21"S										32°07'49.59"E									
	Corner 1:	28°46'14.15"S										32°07'49.93"E									
	Corner 2:	28°46'14.88"S										32°07'50.65"E									
	Corner 3:	28°46'16.11"S										32°07'49.25"E									
	Corner 4:	28°46'15.37"S										32°07'48.57"E									
Property Description:		Remainder of Erf 5333 Richards Bay																			
21 Digit Surveyor General no.		N	0	G	V	0	4	2	1	0	0	0	0	5	3	3	3	0	0	0	0	0

Figure 1: 1:50 000 Map Indicating the location of the Richards Bay Lighthouse.

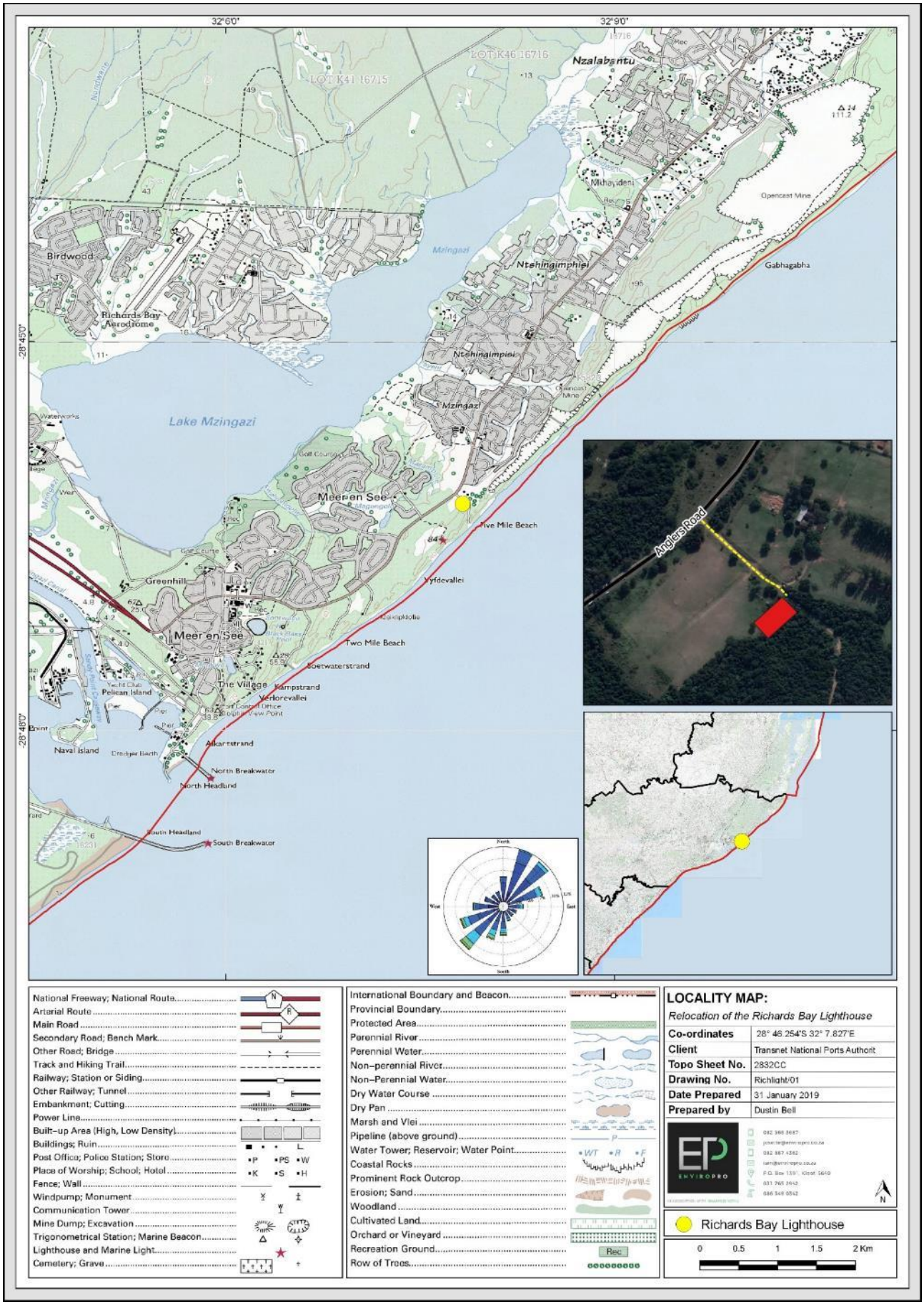


Figure 2: Aerial photograph showing an overview of the Richards Bay Lighthouse.

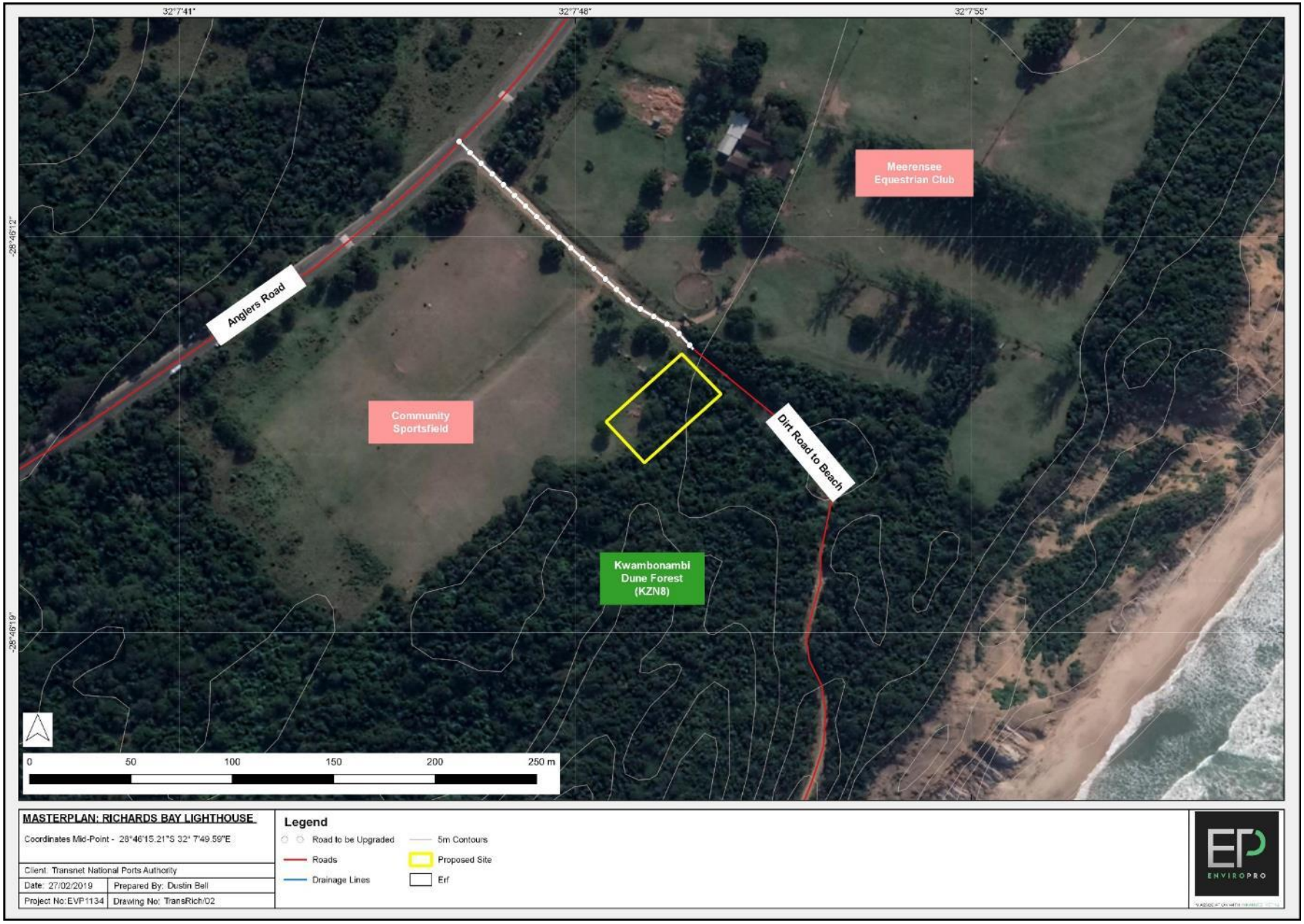


Figure 3: Aerial photograph showing the Richards Bay Lighthouse.

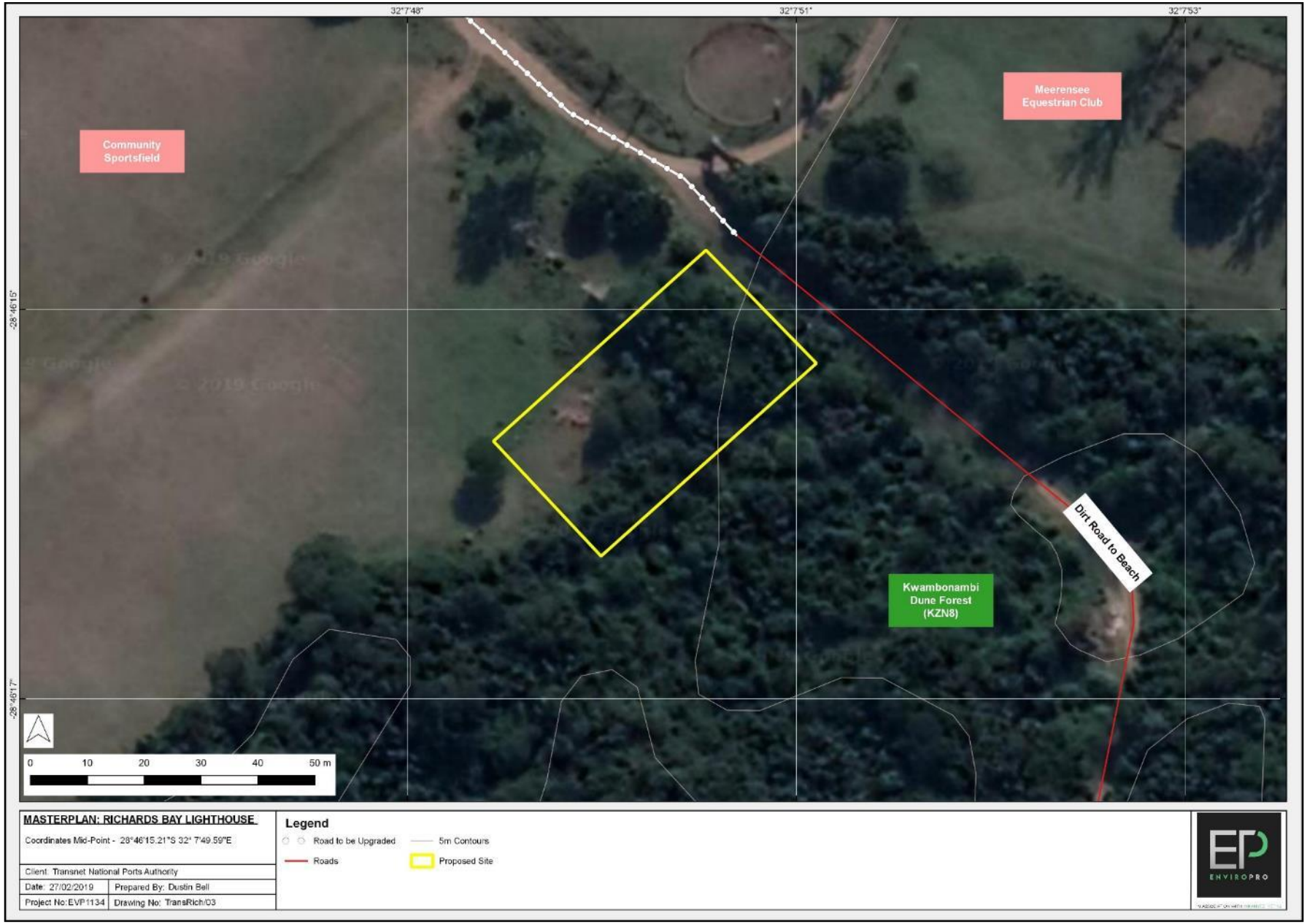
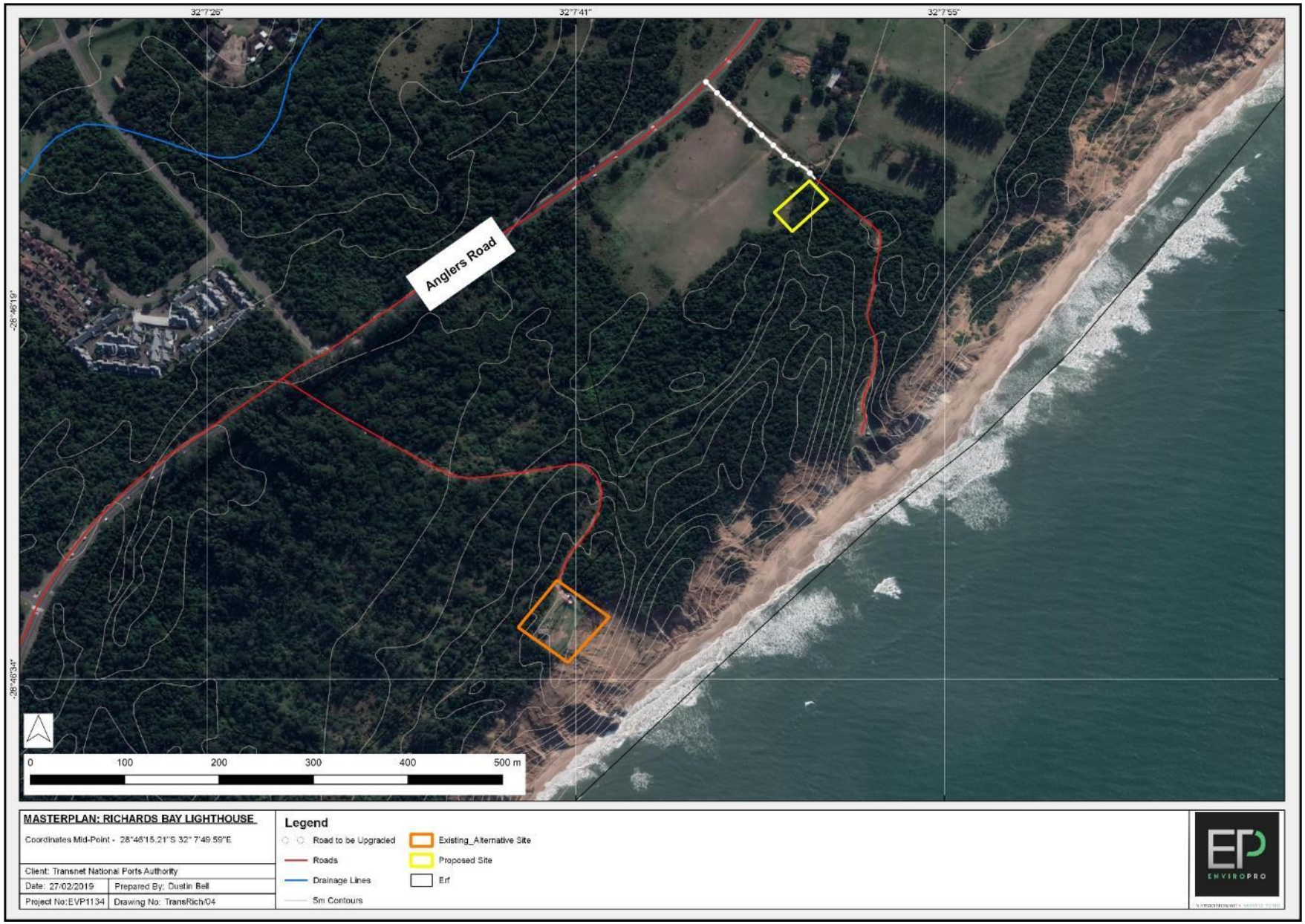


Figure 4: Aerial photograph showing the proposed Richards Bay Lighthouse in relation to the old site.



Section 2: Site Description and Surrounding Land Use as per section 3(h)(iv) and (k)

2.1 Topography and Physical Characteristics of Site

The following applies to the area surrounding the Richards Bay Lighthouse as per the Figures 1-4 above.

The gradient of the sites are as follows:

Table 3: Gradient

Gradient	Description
Flat	The site can be described as being flat
1:50 – 1:20	N/A
1:20 – 1:15	N/A
1:15 – 1:10	N/A
1:10 – 1:7,5	N/A
1:7,5 – 1:5	N/A
Steeper than 1:5	N/A

The topographical features and landforms of the site and surrounding area are as follows:

Table 4: Topographical features and landforms

Topographical Feature	Description
Ridgeline	N/A
Plateau	N/A
Side slope of hill/mountain	N/A
Closed valley	N/A
Open valley	N/A
Plain	The site is located on the edge of a community sportsfield
Undulating plain/low hills	N/A
Dune	N/A
Sea-front	N/A

2.2 Climate[1]

This region is characterised by summer rainfall with more rain occurring closer to the coast during winter months. This region receives high volumes of rainfall with a mean annual precipitation of approximately 1 200 mm which rapidly decreases to the interior of KwaZulu-Natal. This region has a high humidity and temperature with the mean maximum temperature being 35.5°C in January and the mean minimum temperature in July being 5.5°C.

2.3 Geotechnical Conditions[2]

Available geotechnical information of this area indicates that the site is underlain by Recent and Quaternary aged dune and beach sands of the Sibayi Formation/Maputaland Group. The deposits occur as unconsolidated fine to medium sands through to silty/clayey sands and can contain deposits of heavy minerals.

A general description of the various soil horizons in descending order is presented below based on the information retrieved in the test borehole, the investigation was terminated at a depth of 22.0m below existing ground surface and as a consequence, various deeper soil/rock types were not exposed:

Topsoil:

- This relative thin layer in the order of 0.1m thick covers the site and consists generally of a pale brown, very loose fine to medium sand with many roots.

[1] The Biodiversity Company (2019) Wetland Baseline & Impact Assessment for the proposed Lighthouse Facility.
[2] Transnet (2012) Geotechnical Investigation Report – Richards Bay proposed new lighthouse

Quaternary Dune Deposits:

- Below the Topsoil, the unconsolidated interstratified sands are fine to medium grained and occasionally silty/clayey in composition with overall consistencies that varies from loose through to very dense.

No ground water or signs of seepage were in the borehole at the time of the investigation.

2.4 Surface Water and Ground Water[3]

2.4.1 Drainage Lines

Please note no drainage lines were identified within 32m of the site. The closest drainage lines are located 280m north-east and 300m north-west of the proposed project area.

2.4.2 Wetlands

Please note no wetlands were identified within 32m of the site. The closest wetlands are located 280m north-east and 350m north-west of the proposed project area.

2.5 Fauna and Flora[4]

2.5.1 Desktop Assessment

The project area is situated within the Maputaland Coastal Belt and the Northern Coastal Forest vegetation types[5], see Figure 5 below.

Maputaland Coastal Belt (CB 1)

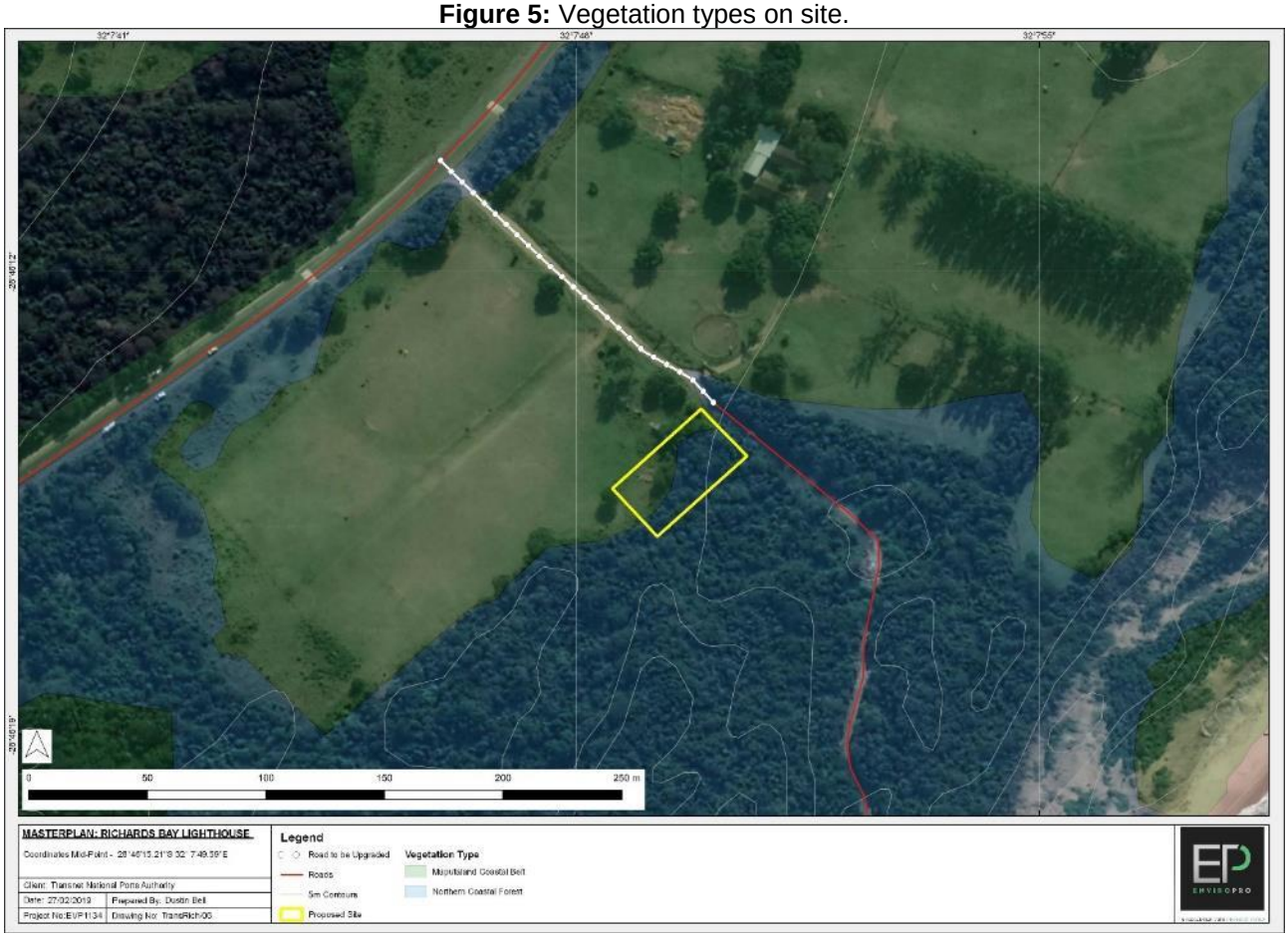
- The Maputaland Coastal Belt is composed of pockets of various forest types (separated into different vegetation units), thickets, primary and secondary grasslands, extensive timber plantations and cane fields. This vegetation type can be found mainly on yellowish and argillaceous redistributed sands, which are nutritionally very poor and well leached.
- This vegetation type is classified as Vulnerable, with its national conservation target being 25%. More than 30% has already been transformed by plantations and cultivation and by urban sprawl. Two alien species are found commonly throughout this vegetation type, they are *Chromolaena odorata* and *Lantana camara.*

Northern Coastal Forest (FOz 7)

- The Northern Coastal Forest is a species rich subtropical coastal forest that occur on coastal plains and stabilised coastal dunes of KwaZulu-Natal and to a small extend the Eastern Cape.
- This vegetation type is Least threatened in general, but still under threat on coastal dunes of KwaZulu-Natal (due to mining) with its national conservation target being 43%. About 68% statutorily conserved in KZN. The original extent of these forests has been diminished by agriculture (mainly sugar cane and fruit gardens), timber plantations, urban sprawl and tourism-oriented development on the KwaZulu-Natal coast. These subtropical forests are sensitive to alien plant invasion, and invaders such as *Chromolaena odorata*, species of *Pereskia* and *Acacia* are posing serious threats. Maputaland endemic *Encephalartos ferox* is listed as vulnerable.

[3] The Biodiversity Company (2019) Wetland Baseline & Impact Assessment for the proposed Lighthouse Facility.
[4] The Biodiversity Company (2018) Ecological Baseline & Impact Assessment for the proposed Lighthouse Facility.
[5] Mucina, L. and Rutherford, M.C. (Eds.) 2006. The vegetation of South Africa, Lesotho and Swaziland. Strelizia 19. South African National Biodiversity Institute, Pretoria South African.

Figure 5: Vegetation types on site.



The entire project area is situated within the Kwambonambi Dune Forest Ecosystem type which has been identified as critically endangered as in terms of section 52 of the NEMBA.

Kwambonambi Dune Forest (KZN 8)

- Ecosystem extends from Richards Bay in the south to the isiMangaliso Wetland Park in the north and includes the dune forest on the primary dunes in this region.
- Key biodiversity features include four millipede species including *Centrobolus fulgidus, Centrobolus richardi, Centrobolus rugulosus* and *Doratogonus zuluensis*; one plant species, *Kniphofia leucocephala*; and six vegetation types including KwaZulu-Natal Coastal Forest, KwaZulu-Natal Dune Forest, Mangrove Forest, Maputaland Wooded Grassland, Maputuland Coastal Belt and Swamp Forest.
- Less than 1% of the ecosystem is protected in the Nhlabane Nature Reserve and isiMangaliso Wetland Park.

Based on the South African Bird Atlas Project, Version 2 (SABAP2) database, 399 bird species are expected to occur in the vicinity of the project area. The full list of potential bird species is provided in the Ecological Baseline & Impact Assessment within Appendix B.

The IUCN Red List Spatial Data lists 88 mammal species that could be expected to occur within the project area, the full list of potential mammal species is provided in the Ecological Baseline & Impact Assessment within Appendix B. Please note, six species are medium to large conservation dependant species, such as Southern White Rhinoceros and Plains Zebra that, in South Africa, these are generally restricted to protected areas such as game reserves. These species are not expected to occur in the project area and are removed from the expected SCC list.

Based on the IUCN Red List Spatial Data as well as the Reptile Map and Amphibian Map database both provided by the Animal Demography Unit, 92 reptile species are expected to occur in the project area while 56 amphibian species are expected to occur in the project area. The full list of potential Herpetofauna species is provided in the Ecological Baseline & Impact Assessment within Appendix B.

2.5.2 Vegetation Assessment

The habitat of the site has been extensively disturbed. A portion of the site is being used as a sport field and was previously used as a horse polo field. This area is maintained thus the grass is kept short, which has now due to the constant disturbance created a monoculture of mainly *Stenotaphrum secundatum* and *Dactyloctenium australe*. The other portion of the site is characterized by a dense ensemble of trees and herbaceous plants that make up this habitat. The area has been impacted slightly by paths and littering but is still functional as a habitat for associated species. The state of the area varies from undisturbed to secondary, but the function of the area is still considered as critical as it is defined the Biodiversity Sector Plan.

A total of 39 tree, shrub and herbaceous plant species were recorded in the project area during the field assessment. Alien/Exotic/Invader plant species appear in blue text, NEMBA Category 1 Plants in green text. See Table 5 below.

Table 5: Trees, shrubs and weeds recorded at the proposed project area.

Scientific Name	Common Name	Threat Status (SANBI, 2017)	Endemism Status (SA)	Alien Category
Ageratum houstonianum	**Mexican Ageratum**			**NEMBA Category 1b**
Albizia adianthifolia	Flat-crown	LC	Not Endemic	
Aneilema aequinoctiale	Idangabane Elikhulu	LC	Not Endemic	
Asparagus falcatus	Thorny Creeper	LC	Not Endemic	
Asystasia gangetica	Creeping foxglove	LC	Not Endemic	
Bidens pilosa	**Blackjack**			**Naturalised Weed**
Brachylaena discolor	Coastal Silver-oak	LC	Not Endemic	
Carissa bispinosa	Num-num	LC	Not Endemic	
Carissa macrocarpa	Big Num-num	LC	Not Endemic	
Casuarina cunninghamiana	**Beefwood**			**NEMBA Category 2**
Catharanthus roseus	**Madagascar periwinkle**			**NEMBA Category 1b**
Commelina erecta	Blouselblommetjie	LC	Not Endemic	
Conyza bonariensis	**Hairy fleabane**			**Naturalised Weed**
Cynodon dactylon	**Bermuda Grass**			**NEMBA Category 1b**
Cyperus articulatus	Jointed Flatsedge	LC	Not Endemic	
Dactyloctenium australe	Durban Grass	LC	Not Endemic	
Dactyloctenium geminatum		LC	Not Endemic	
Desmodium incanum	Creeping Beggerweed			**Naturalised Weed**
Dichrostachys cinerea subsp. africana	Sickle bush	LC	Not Endemic	
Dracaena aletriformis	Large-leaved Dragon Tree	LC	Not Endemic	
Erythrina humeana	Dwarf Coral Tree	LC	Not Endemic	
Ficus sur	Cape Wild Fig	LC	Not Endemic	
Kraussia floribunda	Rhino-coffee	LC	Not Endemic	
Ledebouria humifusa		LC	Endemic	
Microsporum scolopendria	Monarch fern	LC	Not Endemic	
Oplismenus hirtellus	Bosgras	LC	Not Endemic	
Oxalis semiloba	Bolila	LC	Not Endemic	
Phoenix reclinata	Wild Date Palm	LC	Not Endemic	
Richardia brasiliensis	**Mexican clover**			**Naturalised Weed**
Ricinus communis	**Castor-Oil Plant**			**NEMBA Category 2**
Senna septemtrionalis	**Arsenic bush**			**NEMBA Category 1b**
Sporobolus africanus	Ratstail Dropseed	LC	Not Endemic	
Stenotaphrum secundatum	St. Augustine grass	LC	Not Endemic	
Strelitzia nicolai	Natal Wild Banana	LC	Not Endemic	
Thevetia peruviana	**Yellow oleander**			**NEMBA Category 1b**
Trema orientalis	Pigeonwood	LC	Not Endemic	
Trichilia emetica	Cape Mahogany	LC	Not Endemic	
Vachellia kosiensis	Dune Thorn	LC	Not Endemic	
Verbena bonariensis	**Tall Verbena**			**NEMBA Category 1b**

2.5.3 Fauna Assessment

Eighteen (18) bird species were recorded in the project area. One avifaunal SCC (Woolly-necked Stork) was recorded during the survey. See Table 6 below.

Table 6: A list of avifaunal species recorded for the project area.

Species	Common Name	Conservation Status	
		Regional (SANBI, 2016)	IUCN (2017)
Acridotheres tristis	Myna, Common	Unlisted	LC
Apalis thoracica	Apalis, Bar-throated	Unlisted	LC
Ardea melanocephala	Heron, Black-headed	Unlisted	LC
Centropus burchellii	Coucal, Burchell's	Unlisted	Unlisted
Cercomela familiaris	Chat, Familiar	Unlisted	LC
Ciconia episcopus	Stork, Woolly-necked	Unlisted	VU
Cossypha natalensis	Robin-chat, Red-capped	Unlisted	LC
Crithagra mozambicus	Canary, Yellow-fronted	Unlisted	LC
Cyanomitra veroxii	Sunbird, Grey	LC	Unlisted
Gallirex porphyreolophus	Turaco, Purple-crested	Unlisted	LC
Melaenornis pammelaina	Flycatcher, Southern Black	Unlisted	LC
Passer domesticus	Sparrow, House	Unlisted	LC
Ploceus capensis	Weaver, Cape	Unlisted	LC
Prinia subflava	Prinia, Tawny-flanked	Unlisted	LC
Pycnonotus tricolor	Bulbul, Dark-capped	Unlisted	Unlisted
Stactolaema leucotis	Barbet, White-eared	Unlisted	LC
Trachyphonus vaillantii	Barbet, Crested	Unlisted	LC
Zosterops virens	White-eye, Cape	Unlisted	LC

Overall, mammal diversity in the project area was low with only one species recoded based on direct observations and/or the presence of visual tracks & signs, Vervet Monkey (*Chlorocebus pygerythrus*). See Table 7 below.

Table 7: Mammal species recorded in the project area.

Species	Common Name	Conservation Status	
		Regional (SANBI, 2016)	IUCN (2017)
Chlorocebus pygerythrus	Vervet Monkey	LC	LC

Herpetofauna diversity was considered to be low with no reptile species or amphibian species bring observed or recorded in the project area. The low diversity is attributed to the large number of people entering the area and dumping both litter and building rubble.

Invertebrates were not actively surveyed but was recoded when incidentally observed. Some of the invertebrates noticed in the project area are as follows:

- Red Millipede (*Centrobolus sp.)*
- Citrus Swallowtail (*Papilio demodocus*)
- Elegant Grasshopper (*Zononcerus elegans*),
- Natal Acraea (*Acraea natalica*)
- Snail

2.5.4 Habitat Sensitivity Mapping

The eastern portions of the project area which falls within irreplaceable Critical Biodiversity Areas (CBA) was given a high sensitivity rating. A low score was given to the transformed area due to its ecological condition and the extent of the disturbance.

The state of the vegetation at the site is disturbed due to human activities. Necessary clearing and grubbing of the entire site for construction of the works will be required. This vegetation clearing will be restricted to only

the site. The location of the site camp must be approved by the Environmental Control Officer (ECO) and must either be on land that is previously disturbed i.e. sports field or within the site boundaries. As per the specialist during construction the following potential impacts were considered on terrestrial vegetation communities:

- Destruction of, and fragmentation of, the remaining vegetation community and an area classified as irreplaceable CBA as well as the ecosystem being Critically Endangered (CR) threatened.

The potential impacts on faunal communities include:

- Displacement of faunal community due to habitat loss, disturbance and/or direct mortalities.

During operation the following potential impacts were considered on terrestrial vegetation communities:

- Continued disturbance of the vegetation community due to maintenance activities and potential encroachment by alien invasive plant species.

The potential impacts on faunal communities include:

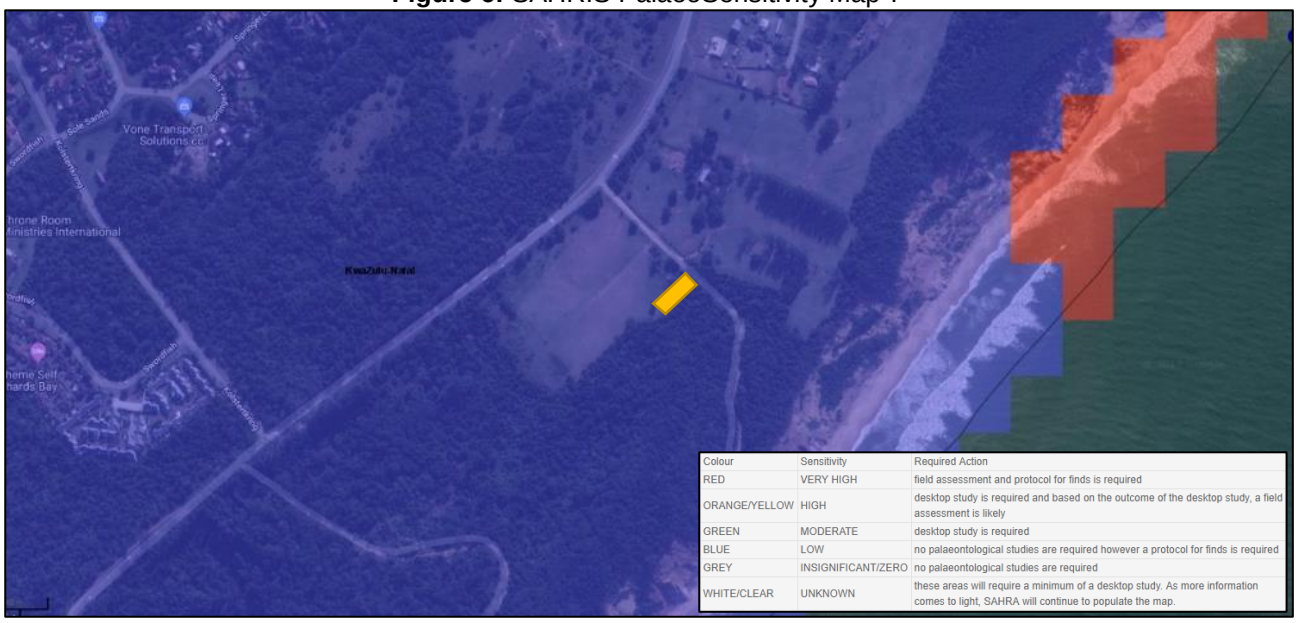
- Continued displacement and fragmentation of the faunal community due to ongoing anthropogenic disturbances.
- Habitat degradation by factors such as litter, road mortalities and/or poaching.

Please note although there will be the loss of vegetation within the Kwambonambi Dune Forest Ecosystem, the area to be impacted will be restricted to the site. However, as the site is located at the meeting point of the sports field and forest, the ecosystem is showing signs of disturbance (alien invasive plant, footpaths and littering). As the site will be located at the meeting point of the sportsfield and forest it is unlikely that the activities associated with the lighthouse will not promote fragmentation. Although there will be impacts as per the specialist during construction the significance of these impacts can be reduced provided that mitigation measures provided in this report and EMPr are followed. Construction impacts will be temporary and short lived, the level of construction required is also low. All vegetation clearing will take place under the supervision of the ECO and Engineer. Once construction has been completed and the site is in operation the level of impacts on this ecosystem will not be high. Impacts identified by the specialist can mostly be mitigated, as the site will virtually be inert i.e. there will be no day-to-day operations apart from infrequently maintenance. The most significant impact will be related to alien invasive species encroachment, which can be mitigated through the implementation of the alien plant control plan.

2.6 Heritage and Cultural Aspects

No items of archaeological were noted within the immediate area of the site associated with the site. Please note as per the National Heritage Resources Act (Act 25 of 1999) Section 38 Heritage resources management no activities will be taking place on site which will require a permit from the local heritage resources office. In addition, the site was investigated with reference to the SAHRIS Palaeo Sensitivity Map, see Figure 6 below. The site was classified as having a Low Sensitivity which states that no palaeontological studies are required however a protocol for finds is required. A protocol for finds has been included in the EMPr.

Figure 6: SAHRIS PalaeoSensitivity Map[6].



Construction workers will be cautioned to operate with care on the site and should any unidentified archaeologically or culturally sensitive aspects be discovered on site, construction activities are to stop immediately and the issue assessed and the authorities (AMAFA) notified if need be.

2.7 Socio Economic Environment

The site is located in the north eastern undeveloped coastal area of the Meerensee neighbourhood, Richards Bay. The current zoning as per the City of Umhlathuze Zoning Scheme is Municipal Health and Government 2. The proposed projects sole is to fulfil Section 78 of the National Ports Act (Act 12 of 2005) whereby providing a safe and secure permanent navigational aid. Should there be a need for the relocation of any infrastructure, an agreement must be made with the contractor and the relevant stakeholder.

2.8 Surrounding Environment and Land Uses

The land uses surrounding the site is as follows:

- Located within an urban area.
- The site is directly adjacent to a community sportsfield
- The land surrounding the site consists of:
  - Coastal forest.
  - Community sportsfield.
  - Meerensee Equestrian Club

The figures below provide photographs of the site.

Figure 7: (a): View of the site looking from the access road. **(b):** Vegetation currently on the site. **(c):** View of the two habitats on the site.

[6] SAHRIS (2012) Palaeontological Sensitivity Map, https://sahris.sahra.org.za/map/palaeo. [Accessed 28/02/2019]

Figure 8: (a): The area associated with the sportsfield. **(b):** a further view of area associated with the sportsfield looking towards the forest. **(c):** View of the site looking back towards the access road.

Figure 9: (a): Waste which has be dumped on site. **(b):** A *Strelitzia Nicolai* evident on the site. **(c):** View of the existing gravel road to be upgraded with the site on the left.

Section 3: Policy and Legislative Context

3.1 Identification of All Legislation, Policies, Plans, Guidelines, Spatial Tools, Municipal Development Planning Frameworks And Instruments As Per Section 3(e) (i) And Compliance Of Proposed Activity With Legislation And Policy 3(e) (ii)

Legislation	Compliance of Activity
National Environmental Management Act 1998	The National Environmental Management Act (Act 107 of 1998) (NEMA) is South Africa's overarching environmental legislation. It includes a set of principles that govern environmental management and against which all Environmental Management Programmes (EMPr) and actions are measured. These principles include and relate to sustainable development, protection of the natural environment, waste minimisation, public consultation, the right to an environment that is not harmful to one's health or wellbeing, and a general duty of care. The Environmental Impact Assessment (EIA) Regulations, 2014: GNR.982, R.983, and R.985 under Section 24 of the NEMA define the activities that require Environmental Authorisation and the processes to be followed to assess environmental impacts and obtain Environmental Authorisation. Environmental authorisation is required for the construction of the lighthouse due to the clearance of vegetation therefore this application is in line with the requirements of NEMA.
National Water Act 1998	As per communication received from Department of Water and Sanitation (DWS) a Water Use Authorisation as per the National Water Act will not be required.
National Waste Management Act 2008	Reforms the law regulating waste management to prevent pollution and ecological degradation. Section 19 allows the Minister to publish a list of activities, which require a Waste Management License. The most recent list is published in Government Gazette 37083 Notice No. 921 dated 29 November 2013. It is unlikely that any activities carried out by the development will trigger a Waste Management Activity.
Environmental Conservation Act 1996	Makes provisions for the application of general environmental principles for the protection of ecological processes, promotion of sustainable development and the protection of the environment. This Act has mostly been repealed by NEMA.
National Environmental Management Biodiversity Act 2004	To provide the framework, norms, and standards for the conservation, sustainable use and equitable benefit-sharing of South Africa's biological resources. Section 52 allows for the publication of a list of threatened ecosystems in need of protection. The list was published in Government Gazette No. 34809 Notice No. 1002, dated 9 November 2011. There will be the clearance of 1529m^2 vegetation within the critically endangered ecosystem, Kwambonambi Dune Forest.
National Heritage Resources Act 25 of 1999	For the protection of South African Heritage to nurture and conserve communities legacy. No archaeological significant artefacts will be disturbed during this project therefore; no permits will be required from the provincial heritage authority, AMAFA.
Mineral & Petroleum Resources Development 28 of 2002	To provide for the sustainable development of the nation's mineral and petroleum resources which includes activities carried out for the winning of any mineral on, in or under the earth (i.e. the use of borrow pits). Any raw materials must be obtained from a licensed source.
National Ports Act (Act 12 of 2005)	As per Section 78 of the National Ports Act (Act 12 of 2005), The Authority (Transnet National Ports Authority) must operate and maintain lighthouses and other navigational aids under its control in terms of standards determined by the South African Maritime Safety Authority in order to assist the navigation of vessels within port limits and along the coast of the Republic. Therefore, Transnet National Ports Authority is responsible for the provision, operation and maintenance of

	a lighthouse to service the Richards Bay port. Therefore, the construction of the new lighthouse fulfills the requirements of the Act.
Planning Frameworks	
uMhlathuze Local Municipality: IDP 2017/2018- 2021/2022	One of the aims of the uMhlathuze Local Municipality Integrated Development Plan (IDP) is to address economic growth. The proposed development will provide a service enabling the operation of the Richards Bay Port hence contributing to economic growth in the municipality. Therefore, the relocation of the Richards Bay Lighthouse is in line with the aims of the IDP.

Section 4: Motivation, Need and Desirability

4.1 Need and Desirability as Per Section 3(F)

The following motivation explains the need for the relocation of the Richards Bay Lighthouse:

- The need for the relocation of the Richards Bay Lighthouse was identified by Transnet National Ports Authority.
- The Richards Bay Lighthouse is an important Aid to Navigation for all vessels along the coast of Richards bay as well as vessels entering the port.
- The old lighthouse was subject to a large-scale land-slip due to coastal erosion whereby there was a real danger that the structure would fall down the embankment onto the beach with further erosion and such the lighthouse was demolished.
- As a short-term solution Transnet National Ports Authority has erected a temporary monopole lighthouse at the most landward side of the old site.
- In order to provide a long-term permanent structure to serve as a new lighthouse a new site is required.
- As per Section 78 of the National Ports Act (Act 12 of 2005) Transnet National Ports Authority is mandated to operate and maintain lighthouses and other navigational aids under its control in terms of standards determined by the South African Maritime Safety Authority.
- The construction of the new lighthouse will have a positive impact on local maritime navigation which is a legislated requirement.
- There may be temporary employment opportunities during the construction period.

4.2 Motivation for Preferred Site, Activity and Technology Alternative

4.2.1 Preferred Site Alternative

Only one feasible site alternative was considered for this application. Due to the costal erosion, the site needed to be located away from the danger zone but within the vicinity of the old lighthouse site for navigation purposes. The selected site is partially located within the coastal forest and is adjacent community fields, thus the forest in this area has been disturbed. The site also has access therefore a new road would not need to be constructed. Other potential sites will also need to be located within the vicinity of the old lighthouse site and thus would be located within the coastal forest. Locating the site completely within the forest would have a significant impact on the ecosystem as it would result in fragmentation. The land is also owned by the municipality thus a subdivision is taking place. The municipality requested that the subdivision take place on the edge of the sports field as to not obstruct any potential developments in the future as the land is zoned Municipal Health and Government 2. For the above reasons only one feasible site alternative was considered in this assessment.

4.2.2 Preferred Technology Alternative

The preferred technology alternative i.e. construct a new 27,99m high monopole lighthouse, is considered more suitable than constructing a 27.99m high concrete tower lighthouse.

- A monopole structure will cost less when compared to a concrete lighthouse as less material will be required.
- A monopole structure will require less operational assistance compared to a concrete lighthouse hence will have less impact on the surrounding area. The concrete tower lighthouse will require both a mess room and ablutions. These facilities will require a septic tank to be installed which will have an impact on the surrounding area.

Section 5: Public Participation

5.1 Notification of Interested and Affected Parties

1) *fixing a notice board at a place conspicuous to and accessible by the public at the boundary, on the fence or along the corridor of-*
   i. *the site where the activity to which the application or proposed application relates is or is to be undertaken; and*
   ii. *any alternative site;*

A noticeboard was placed at site on the 29th January 2019. The noticeboard detailed the Transnet National Ports Authority's proposed plan to relocate the Richards bay Lighthouse, subject to a basic assessment. See Appendix C – Proof of Placement of Notice Board.

2) *giving written notice, in any of the manners provided for in section 47D of the Act, to-*
   i. *the occupiers of the site and, if the proponent or applicant is not the owner or person in control of the site on which the activity is to be undertaken, the owner or person in control of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;*
   ii. *the municipal councillor of the ward in which the site or alternative site is situated and any organisation of ratepayers that represent the community in the area;*
   iii. *the municipality which has jurisdiction in the area;*
   iv. *any organ of state having jurisdiction in respect of any aspect of the activity, and;*
   v. *any other party as required by the competent authority;*

The following steps were followed during the public participation process.

- A noticeboard was placed at site on the 29th January 2019.
- A meeting was held with the Ward Councilor on the 29th January 2019.
- The Ward Councilor was provided with information, which provides detail about the proposed project.
- Site notices were distributed to all residents within the vicinity of the proposed site on the 29th January 2019.
- An isiZulu advert was placed in the Isolezwe newspaper on the 27th January 2019 while an English advert was placed in Zululand Observer on the 25th January 2019.
- A Background Information Document was provided to the Meerensee Equestrian Club.
- With regards to authority communications, all relevant authorities have been notified of the application and have been provided with copies of this Basic Assessment Report (BAR).

See Appendix D – Proof of Notification.

i. *owners, persons in control of, and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;*

Email notifications to all Interested and Affected Persons (I&APs) were sent out on the 31st January 2019. See Appendix D – Proof of Notification.

3) *placing an advertisement in-*
   i. *one local newspaper; or*
   ii. *any official Gazette that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations;*
4) *placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or district municipality in which it is or will be undertaken: Provided that this paragraph need not be complied with if an advertisement has been placed in an official Gazette referred to in paragraph (c)(ii);*

An isiZulu advert was placed in the Isolezwe newspaper on the 27th January 2019 while an English advert was placed in Zululand Observer on the 25th January 2019. Both adverts detailed the proposed project and provided contact details of EnviroPro should anyone wish to register as an I&AP. See Appendix E – Proof of Advert Placement.

5.2 Registered Interested and Affected Parties

42. A proponent or applicant must ensure the opening and maintenance of a register of interested and affected parties and submit such a register to the competent authority, which register must contain the names, contact details and addresses of-

(a) all persons who, as a consequence of the public participation process conducted in respect of that application, have submitted written comments or attended meetings with the proponent, applicant or EAP;

(b) all persons who have requested the proponent or applicant, in writing, for their names to be placed on the register; and

(c) all organs of state which have jurisdiction in respect of the activity to which the application relates.

The contact details of all I&APs that have registered have been provided in the Registered I&AP list in Appendix F.

5.3 Comments

Comments of interested and affected parties to be recorded in reports and plans 44.

1) The applicant must ensure that the comments of interested and affected parties are recorded in reports and plans and that such written comments, including responses to such comments and records of meetings, are attached to the reports and plans that are submitted to the competent authority in terms of these Regulations.

2) Where a person desires but is unable to access written comments as contemplated in subregulation (1) due to-

i. a lack of skills to read or write;

ii. disability; or

iii. any other disadvantage;

iv. reasonable alternative methods of recording comments must be provided for.

All comments received from I&APs have been recorded in the comments and response table. The original comments provided have been provided together with the Comments and Response (C&R) table. This report has been provided to the uMhlathuze Local Municipality and King Cetshwayo District Municipality for comment. See Appendix G – Comments and Response table and Comments Received.

Section 6: Impact Assessment

6.1 Methodology to Determine and Rank Significance and Consequences of Impacts Associated With All Alternative as Per Section 3(h) (vi)

Impacts are assessed qualitatively and quantitatively, looking at the duration / frequency of the activity and likely impacts associated with that activity during both construction and operation. If the activity happens frequently, the risk of the associated impact occurring is much higher than if the activity happens less frequently. The geographical extent of the impact is assessed i.e. will the impact be restricted to the point of occurrence or will have it have a local or regional effect. Impacts are also reviewed looking at severity levels and consequences should the impact occur i.e. will the severity be low, medium or high and then probability of the impact occurring is taken into account.

Whether or not the impact can be mitigated and the extent to which it can be avoided, managed, mitigated, or reversed is assessed i.e. the probability of occurrence after mitigation has been applied. This also takes into account likelihood of human error based on construction and operational auditing experience i.e. even though spills can be completely mitigated against and prevented, there is always a small chance that spills will still occur (residual risk). Based on all of these factors, the impact is then rated to determine its significance. For example an impact can have a regional affect with severe environmental implications, however the probability of it occurring is very low, and the implementation of the proposed mitigation measures means that the ultimate rating is medium or low.

Please see below a description of the scoring. The full impact scoring tables detailing how the significance rating was calculated can be found in Appendix H.

Scoring of Impacts	
Duration / Frequency of activity likely to cause impact	0 = No impact 1 = short term / once off 2 = medium term / during operation 3 = long term / permanent
Geographical Extent	0 = No impact 1 = point of impact / restricted to site 2 = local / surrounding area 3 = regional
Severity (level of damage caused) if impact were to occur	0 = No impact 1 = minor 3 = medium 5 = major
Probability of impact without mitigation	1 - 5 = low. 6 -10 = medium. 11 -14 = high.
Significance before application of Mitigation Measures	A score of between 1and 5 is rated as low. A score of between 6 and 10 is rated as medium. A score of between 11 and 14 is rated as high.
Will activity cause irreplaceable loss of resources?	10 = Yes 0 = No
Mitigation measures	0 = No impact - 5 = can be fully mitigated - 3 = can be partially mitigated -1 = unable to be mitigated
Probability of impact after mitigation	0 = No impact 1 = Low 2 = Medium 3 = High
Significance after application of Mitigation Measures	A score of between 1and 5 is rated as low. A score of between 6 and 10 is rated as medium. A score of between 11 and 14 is rated as high.

6.2 Preferred Site and Technology Alternative

Monopole Lighthouse (Site specific)

See Appendix H for the full impacts scoring matrix, which assesses the impacts on the above system. The below impacts relate to the site-specific preferred site and technology alternatives.

No.	Nature and Consequences of impact	Sig. rating of impacts[7]:	Proposed mitigation and Extent to which impact can be reversed / avoided, managed or mitigated:	Sig. rating of impacts after mitigation:
Construction				
Direct Impacts				
1.	The habitat for fauna living within the construction footprint will be lost due to the clearance of the site for the construction of the Richards Bay Lighthouse.	8 (Medium)	The following measures must be carried out to mitigate against excessive habitat destruction: • No more than two weeks in advance of vegetation clearance that will commence during the breeding season (1 September – 1 March). • A qualified ECO with a Zoologist background must conduct a pre-construction survey of all potential special-status bird nesting habitat in the vicinity of the project area, and on the project areas. • If active nests are found, avoidance procedures must be implemented on a case-by-case basis. Avoidance procedures may include the implementation of buffer zones, relocation of birds, or seasonal avoidance. If buffers are created, a no disturbance	6 (Medium)

[7] See Appendix H for more details.

No.	Nature and Consequences of impact	Sig. rating of impacts[7]:	Proposed mitigation and Extent to which impact can be reversed / avoided, managed or mitigated:	Sig. rating of impacts after mitigation:
			zone must be created around active nests during the breeding season by a suitably qualified-ECO • If any faunal species are recorded during construction, an appropriate specialist should be consulted to identify the correct course of action. These species must either be moved from the area or allowed time to move off; • During vegetation clearance, methods should be employed to minimize potential harm to fauna species. Clearing has to take place in a phased and slow manner, commencing from the interior of the site progressing outwards towards the boundary to maximize potential for mobile species to move to adjacent areas; • Prior and during vegetation clearance any larger fauna species noted should be given the opportunity to move away from the construction machinery; • Fauna species such as frogs and reptiles that have not moved away should be carefully and safely removed to a suitable location beyond the extent of the development footprint by a suitably qualified ECO trained in the handling and relocation of animals; • Fencing must be erected around the decided project area to prevent workers and members of the public from entering the surrounding areas. This fence should have small openings to allow wildlife to pass through; • The entire site and access roads must be secured, and all efforts must be made to prevent illegal access to the areas, especially the coastal forest; • Waste management must be a priority and all waste must be collected and stored adequately. It is recommended that all waste be removed from site on a weekly basis to prevent rodents and pests entering the site; • No trapping, killing or poisoning of any wildlife is to be allowed on site; • During the construction phase noise must be kept to a minimum to reduce the impact of the development on the fauna residing on the site; • Staff must be educated about the sensitivity of faunal species and measures should be put in place to deal with any species that are encountered during the construction process; • Construction activities and vehicles could cause spillages of lubricants, fuels and construction material which could then be	

No.	Nature and Consequences of impact	Sig. rating of impacts[7]:	Proposed mitigation and Extent to which impact can be reversed / avoided, managed or mitigated:	Sig. rating of impacts after mitigation:
			transported to the surrounding areas, impacting the functioning of the systems. All vehicles and equipment must be maintained, and all re-fuelling and servicing of equipment is to take place in demarcated areas outside of the wetland and buffer areas; and • The intentional killing of any animals including snakes, insects, lizards, birds or other animals must be strictly prohibited.	
2.	Vegetation within the Kwambonambi Dune Forest vegetation type will be lost due to the clearance of the site for the construction of the Richards Bay Lighthouse.	8 (Medium)	The following measures must be carried out to mitigate against excessive Vegetation clearing: • As far as possible, the proposed developments must be placed in areas that have already been disturbed. Areas to be developed must be specifically demarcated so that during the construction phase, only the demarcated areas be impacted upon (including fencing off the defined project area); • Areas of indigenous vegetation, even secondary communities must under no circumstances be fragmented or disturbed further or used as an area for dumping of waste; • Coastal forest areas outside the footprint must be declared as 'no-go' areas during the construction and operational phases and all efforts must be made to prevent access to this area from construction workers, machinery and the general public; • Where possible, existing access routes and walking paths must be made use of for vehicles and machinery, and new routes limited; • All laydown, storage areas etc should be restricted to within transformed areas and all access roads must be kept within this area or from existing access roads; • A qualified environmental control officer must be on site when construction begins to identify species that will be directly disturbed and to relocate fauna/flora that is found during construction (including all reptiles and amphibians); • Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood events. This will also reduce the likelihood of encroachment by alien invasive plant species; and • Compilation of and implementation of an alien vegetation management plan for the entire site.	6 (Medium)
3.	Removal of alien invasive vegetation found within the Richards Bay Lighthouse construction site.	0 (Positive)	This is a positive impact.	0 (Positive)

No.	Nature and Consequences of impact	Sig. rating of impacts[7]:	Proposed mitigation and Extent to which impact can be reversed / avoided, managed or mitigated:	Sig. rating of impacts after mitigation:
4.	Careless operation by the contractor within the identified coastal forest resulting in damage and/or loss to forest species.	5 (Medium)	The following measures must be carried out to mitigate against potential coastal forest loss during construction: • Areas not within the construction footprint must be demarcated as no-go areas; • Heavy vehicles must avoid working near the forest as far as possible; • Vehicles may not drive within the coastal forest; • The entire site must be fenced.	1 (low)
5.	Disturbance of the Richards Bay Lighthouse site due to construction activities resulting in the encroachment of alien vegetation into disturbed areas i.e. Castor Oil.	6 (Medium)	There is currently alien vegetation located on the surrounding area. • Alien vegetation must not be allowed to encroach onto the site and must be continually removed during construction. • Construction must not promote further alien plant disturbances in the surrounding area	2 (Low)
Indirect Impacts				
6.	Positive impacts for the community include potential for local employment.	0 (Positive)	This is a positive impact.	0 (Positive)
Operation				
Direct Impacts				
7.	Continued disturbance of the vegetation community due to maintenance activities and potential encroachment by alien invasive plant species.	8 (Medium)	The following measures must be carried out to mitigate against continued disturbance of the vegetation community: • All activities associated with the lighthouse must take place within the site boundary, under no circumstances may any work take place within the costal forest. • All stormwater generated from the site must enter the formal stormwater system of the access road and must not be allowed to enter the coastal forest. • An ongoing alien invasive plant control plan must be implemented on site.	4 (Low)
8.	Continued displacement and fragmentation of the faunal community due to ongoing anthropogenic disturbances (noise, traffic, dust and light).	8 (Medium)	The following measures must be carried out to mitigate against continued disturbance of the faunal community. The site will virtually be inert i.e. there will be no day-to-day operations apart from infrequently maintenance: • All activities associated with the lighthouse must take place within the site boundary, under no circumstances may any work take place within the costal forest. • All stormwater generated from the site must enter the formal stormwater system of the access road and must not be allowed to enter the coastal forest.	4 (Low)
9.	Habitat degradation by factors such as litter, road traffic and/or poaching.	8 (Medium)	The following measures must be carried out to avoid a habitat degradation: • Staff must be educated about the sensitivity of coastal forest prior to entering the site; • No waste must be stored on site. Any contractor working on site must remove all waste from the site on a daily basis.	4 (Low)
Indirect Impacts				

No.	Nature and Consequences of impact	Sig. rating of impacts[7]:	Proposed mitigation and Extent to which impact can be reversed / avoided, managed or mitigated:	Sig. rating of impacts after mitigation:
10.	The lighthouse will have a positive impact on local maritime navigation which is a legislated requirement.	0 (Positive)	This is a positive impact.	0 (Positive)
11.	Suitability of operation with respect to surrounding land use i.e. a visual impact.	9 (Medium)	This impact is unavoidable. However the lighthouse is not located directly adjacent to residential homes and therefore will not block any views. The monopole structure will also only shine out to sea to aid vessels.	9 (Medium)
Cumulative				
12.	The loss of coastal vegetation will put cumulative pressure on entire ecosystem.	8 (High)	This impact is unavoidable. However, the loss of coastal vegetation will be minor compared to the overall ecosystem.	6 (Medium)

Standard Construction Impacts

See Appendix H for the full impacts scoring matrix, which assesses the impacts on the above system. The below impacts relate to the preferred site and technology alternatives – Generic Impacts.

No.	Nature and Consequences of impact	Sig. rating of impacts[8]:	Proposed mitigation and Extent to which impact can be reversed / avoided, managed or mitigated:	Sig. rating of impacts after mitigation:
Construction				
Direct Impacts				
No generic direct impacts				
Indirect Impacts				
1.	The increased risk to pedestrians and livestock due to construction activities.	6 (Medium)	The construction activity will pose an increased risk to pedestrians and livestock. • Appropriate construction safety signage must be erected to notify of construction activities and potential hazards on site; • Appropriate barriers must be used to cordon off construction excavations, hazardous areas, and areas undergoing construction. • Flagmen must be in attendance to direct traffic where required.	1 (Low)
2.	On site erosion due to improper management of stormwater by the contractor during construction.	5 (Low)	Areas exposed to erosion must be protected. Stormwater must not be allowed to enter the costal forest. The following apply to erosion control on site: • Sand bags, berms, stone pitching must be used to control erosion from forming during construction. • Temporary stormwater measures should be implemented to ensure that material does not wash off the surface into costal forest during construction.	1 (Low)
3.	Dusty conditions generated during the construction activities.	5 (Low)	There will be increased dust generated during the construction phase; however, this will be on a temporary basis i.e. the site will be worked continuously for a few months until construction is completed. Further to this: • Vehicle speed limits must be reduced to 40km/hr to reduce the amount of dust raised along the gravel roads to and from the site.	1 (Low)

[8] See Appendix H for more details.

No.	Nature and Consequences of impact	Sig. rating of impacts[8]:	Proposed mitigation and Extent to which impact can be reversed / avoided, managed or mitigated:	Sig. rating of impacts after mitigation:
			• The material being transported to the site in the back of the trucks must be covered. • Water carts must be used on site should dust levels elevate to a nuisance level. • Shade cloth is must be utilised for stockpiled materials where required. • The applicant must comply with the National Dust Regulations (Government Notice R827, 2013) with regards to dust levels produced on site.	
4.	Increase in heavy truck traffic along the local roads as construction vehicles travel to the site for construction activities, impacting existing traffic conditions and pedestrians.	6 (Medium)	This cannot be avoided as traffic will increase during the construction phase temporarily (for a few months) until construction is completed. • All drivers associated with the construction must operate within the speed limits and due caution must be exercised especially when pedestrians are on the road. • All drivers must be appropriately licenced and trained.	1 (Low)
5.	Impact on any unidentified existing services on site.	8 (Medium)	No services identified on the site that will be impacted on: • As a standard construction practice the engineer and contractor must identify any potential existing services that may be affected prior to construction. • Any infrastructure that is removed must be replaced and any damage caused from construction must be repaired. • Should any new power lines be placed on site prior to construction, a 10m buffer must be placed between the existing power lines and the road.	4 (Low)
6.	Increase in heavy truck traffic along the local roads as construction vehicles travel to the site for construction activities, impacting existing traffic conditions and pedestrians.	6 (Medium)	The construction phase of the project will see the increase in vehicles moving through the area which will result in the increase of emissions into the atmosphere. • All construction vehicles operating on the site must not emit excessive noise.	3 (Low)
7.	Inappropriate disposal of toilet waste, general waste and construction waste resulting in the contamination of the environment.	6 (Medium)	The following mitigation measures must be adhered to: • All toilet facilities on site utilised by the construction personnel must be checked on a daily basis and emptied on a weekly basis by the contactor. • A registered waste removal contractor must remove sewage waste from site or sewage waste must be disposed of at a permitted Waste Water Treatment Site; • All general and construction waste must be stored in marked receptacles on site.A registered waste removal contractor must remove all general and construction waste waste from site or waste must be disposed of	1 (Low)

No.	Nature and Consequences of impact	Sig. rating of impacts[8]:	Proposed mitigation and Extent to which impact can be reversed / avoided, managed or mitigated:	Sig. rating of impacts after mitigation:
			at a permitted Waste Water Treatment Site; • Safe disposal slips for the disposal of effluent and solid waste must be obtained and kept on site as proof of safe disposal.	
8.	Generation of noise associated with the construction.	6 (Medium)	The construction phase of the project will see the increase in vehicles moving through the area which will result in the increase of noise. • All construction vehicles operating on site not emit excessive noise.	1 (Low)
9.	Damage to property, fences during construction.	7 (Medium)	The following mitigation measures must be adhered to: • All services must be identified prior to construction through notifying surrounding stakeholders prior to any potential traffic congestion; • The contractor must create alternative access routes to the properties where required; • The contractor must be aware of the stakeholders' movements and where possible, disruptive activities must be scheduled outside of peak traffic hours; • Surrounding land owners and stakeholders must be notified prior to disruptive activities during construction; • Any infrastructure that gets removed must be replaced and any damage caused from construction must be repaired.	3 (Low)
10.	Unsustainable sourcing of raw materials such as gravel, sand, water etc. which could result in the promotion of illegal mining operations which can cause significant damage to the environment.	10 (Medium)	The construction activities will require raw materials to be sourced and brought to site. • Contractors must provide proof of sustainable sourcing of materials i.e. permits for quarries and sand winning operations from which stone and sand have been obtained.	5 (Low)
Operation				
Direct Impacts				
No generic direct impacts				
Indirect Impacts				
No generic indirect impacts				
Cumulative				
No generic cumulative impacts				

6.3 Technology Alternative 1

Concrete Lighthouse (Site specific)

See Appendix H for the full impacts scoring matrix, which assesses the impacts on the above system. The impacts relating to the Preferred Alternative and Alterative 1 are very similar, therefore the impacts below include the impacts which differentiate the most between the two alternatives.

No.	Nature and Consequences of impact	Sig. rating of impacts[9]:	Proposed mitigation and Extent to which impact can be reversed / avoided, managed or mitigated:	Sig. rating of impacts after mitigation:
Construction				
Direct Impacts				
Direct impacts will remain as per the Preferred Alternative.				
Indirect Impacts				
Indirect impacts will remain as per the Preferred Alternative.				
Operation				
Direct Impacts				
1.	Due to higher operational requirements as well as a septic tank there is a higher risk that there will be the disturbance of the vegetation community and potential encroachment by alien invasive plant species.	9 (Medium)	The following measures must be carried out to mitigate against continued disturbance of the vegetation community: • All activities associated with the lighthouse must take place within the site boundary, under no circumstances may any work take place within the costal forest. • All stormwater generated from the site must enter the formal stormwater system of the access road and must not be allowed to enter the coastal forest. • An ongoing alien invasive plant control plan must be implemented on site. • The septic tank must be serviced regularly to ensure there is no contamination of the surrounding area.	9 (Medium)
2.	Due to higher operational requirements as well as a septic tank there is a higher risk of the displacement and fragmentation of the faunal community due to ongoing anthropogenic disturbances (noise, traffic, dust and light).	9 (Medium)	The following measures must be carried out to mitigate against continued disturbance of the faunal community. The site will virtually be inert i.e. there will be no day-to-day operations apart from infrequently maintenance: • All activities associated with the lighthouse must take place within the site boundary, under no circumstances may any work take place within the costal forest. • All stormwater generated from the site must enter the formal stormwater system of the access road and must not be allowed to enter the coastal forest. • The septic tank must be serviced regularly to ensure there is no contamination of the surrounding area.	9 (Medium)
3.	Higher risk of habitat degradation by factors such as litter, road traffic and/or poaching due to due to higher operational requirements.	9 (Medium)	The following measures must be carried out to avoid a habitat degradation: • Staff must be educated about the sensitivity of coastal forest prior to entering the site; No waste must be stored on site. Any contractor working on site must remove all waste from the site on a daily basis.	9 (Medium)
Indirect Impacts				
4.	Suitability of operation with respect to surrounding land use i.e. a visual impact.	10 (High)	This impact is unavoidable. However the lighthouse is not located directly adjacent to residential homes and therefore will	10 (High)

[9] See Appendix H for more details.

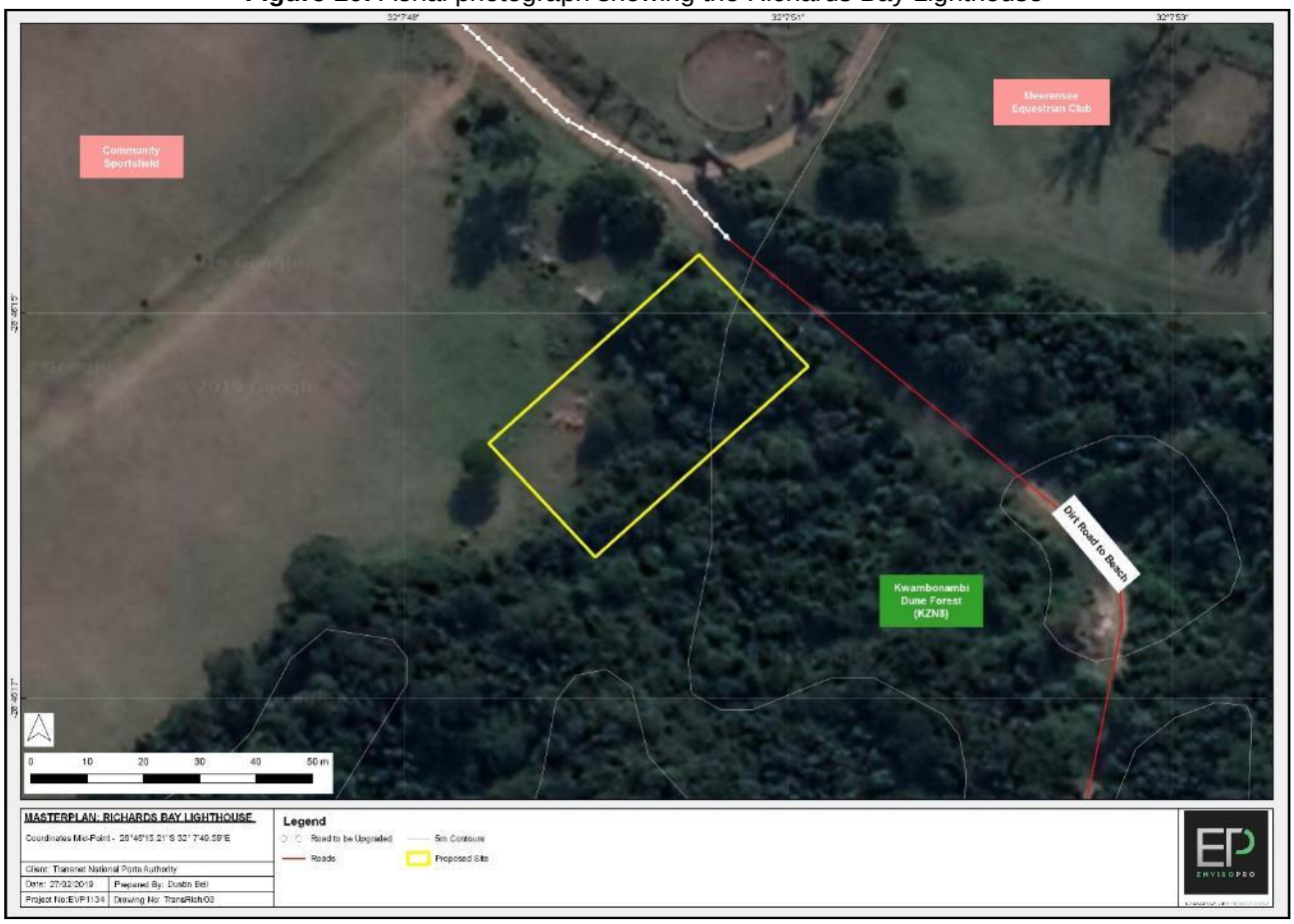
No.	Nature and Consequences of impact	Sig. rating of impacts[9]:	Proposed mitigation and Extent to which impact can be reversed / avoided, managed or mitigated:	Sig. rating of impacts after mitigation:
			not block any views. The monopole structure will also only shine out to sea to aid vessels.	
Cumulative				
Cumulative impacts will remain as per the Preferred Alternative.				

Standard Construction Impacts
Generic impacts for the Richards Bay Lighthouse will be same for both alternatives.

6.4 Environmental Impact Statement as per section (l)

The key impacts associated with the relocation of the Richards Bay Lighthouse relate to the clearance of the coastal forest associated with the Kwambonambi Dune Forest ecosystem type. The clearance of the coastal forest will take place during the construction phase. The site is located at the meeting point of the sports field and forest and therefore the ecosystem is in a disturbed condition, the proposed site will also not encourage fragmentation. Although there will be impacts, as indicated by the specialist, during construction the significance of these impacts can be reduced provided that mitigation measures provided in this report and EMPr are followed. Construction impacts will be temporary and short lived, the level of construction required is also low. All vegetation clearing will take place under the supervision of the ECO and Engineer. During operation the level of impacts on this ecosystem will be low. Impacts identified by the specialist can mostly be mitigated, as the site will virtually be inert i.e. there will be no day-to-day operations apart from infrequently maintenance. The most significant impact will be related to alien invasive species encroachment, which can be mitigated through the implementation of the alien plant control plan. A number of positive impacts may result from the project these relate to providing a safe and secure lighthouse which will aid local maritime navigation which is a legislated requirement. All construction activity must be confined to the proposed construction footprint area. Once construction is complete there should be no significant impacts related to the operation of the lighthouse on the site as depicted in Figure 10 below.

Figure 10: Aerial photograph showing the Richards Bay Lighthouse



6.5 Impact Management Objectives and Outcomes for the Development for Inclusion in the EMPr as Per Section 3(m)

The following objectives and outcomes must be considered for this project:

- Objectives:
  - For there to be no lasting negative impacts on the environment once construction is complete, specifically within the coastal forest.
  - To practice responsible construction, 'best practice' with regards to housekeeping on site during construction (outlined within the EMPr) and enforce the polluter pays principle. The applicant / contractor must be responsible for their actions on site during construction and the rehabilitation of the site post construction.
- Outcomes:
  - To promote sustainable development. Create infrastructure and an environment that is healthy and sustainable for future generations to come.

6.6 Assumptions, Uncertainties and Gaps in Knowledge Relating To the Assessment and Mitigation Measures Proposed As Per Section 3(o)

The information in this report is based on findings of the specialist reports attached under Appendix B as well as the project proposal provided to the EAP by the applicant.

6.7 Period for Which Authorization Is Required, Proposed Monitoring and Auditing and Post Construction Requirement's

Environmental authorisation is required for the relocation of the Richards Bay Lighthouse within 2019/2020 forTransnet National Ports Authority, therefore the authorization would need to be valid for a period of five years, within which time construction would need to commence.

Given the nature of this project, it is recommended that **monthly** ECO audits be carried out for the duration of the construction phase of this project. One post construction audit should be conducted once construction is complete.

The EMPr details the post construction, rehabilitation, and closure objectives which will be monitored by the ECO and compliance authorities.

6.8 Financial Provisions as Per Section 3(s)

The contractor is responsible for and must ensure that the site has been rehabilitated in full before leaving the site. No upfront financial provision is required for this project.

6.9 EAP Opinion on Whether Or Not to Authorize Activity and Recommendations and Conditions for Authorisation as Per Section 3(n) and (p)

With respect to alternatives, it is recommended that preferred site and technology alternatives be authorised. The following conditions are recommended for inclusion in the environmental authorisation:

Stakeholders, Properties & Services

- As standard construction practices the engineer and contractor should identify all existing services that may be affected prior to construction.
- The contractor should liaise with local community members regarding restriction of access during construction.

Traffic & Construction Pedestrians

- The contractor must take into consideration the potential movements of surrounding stakeholders.
- Appropriate signage and barriers must be used to cordon off construction areas.
- All construction vehicles must not emit excessive noise.
- Speed limits must be obeyed.

Housekeeping, waste management, storage, and materials handling

- Littering must not be permitted on site.
- All hazardous materials and substances should be stored within a secured area in the construction camp. The storage area should be a hard surfaced, bunded, and covered area.
- Cement mixing must be done on a hard surface that is protected from storm water runoff.
- Contractors should be required to dispose of construction rubble at an appropriate landfill site. Delivery notes and safe disposal certificates to prove appropriate disposal should be available.
- Appropriate and sufficient toilet facilities must be provided by the contractor.

- Toilet facilities must be provided by a registered company and all sewage must be disposed of at an appropriate facility. Safe disposal certificates must be kept on record.
- Toilet facilities must not be located within 32m of any watercourse.

Dust and erosion control

- A water cart should be used to dampen dusty surfaces and suppress dust.
- Exposed areas should be rehabilitated and re-vegetated as soon as possible during construction.
- Areas exposed to erosion must be protected through the use of sand bags, berms and efficient construction processes i.e.: limiting the extent (footprint) and duration period that areas are exposed. The contractor must ensure that any blockages created during construction are resolved.

Stormwater management

- Stormwater must be managed as per the Stormwater Management Plan
- The engineer/contractor must ensure that only clean storm water runoff enters the environment. Any contaminated run off must be collected and disposed of.
- Only the area within the construction footprint may be cleared and excavated. All other areas must be demarcated as 'no-go' areas.
- Stormwater may not be channelled directly into any costal forest it must be diverted towards the access road.

Protection of Heritage Resources

- Attention is drawn to the South African Heritage Resources Act, 1999 (Act No. 25 of 1999) and the KwaZulu-Natal Heritage Act (Act no 4 of 2008) which, requires that operations that expose archaeological or historical remains should cease immediately, pending evaluation by the provincial heritage agency.

Specific conditions

- The construction footprint of the site must be demarcated;
- Areas of indigenous vegetation, even secondary communities outside the construction footprint must under no circumstances be fragmented or disturbed further or used as an area for dumping of waste;
- A qualified environmental control officer must be on site when construction begins to identify species that will be directly disturbed and to relocate fauna/flora that is found during construction (including all reptiles and amphibians).
- Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood events. This will also reduce the likelihood of encroachment by alien invasive plant species.
- No more than two weeks in advance of vegetation clearance that will commence during the breeding season (1 September – 1 March) a qualified ECO with a Zoologist background must conduct a pre-construction survey of all potential special-status bird nesting habitat in the vicinity of the project area, and on the project areas.
- If active nests are found, avoidance procedures must be implemented on a case-by-case basis. Avoidance procedures may include the implementation of buffer zones, relocation of birds, or seasonal avoidance. If buffers are created, a no disturbance zone must be created around active nests during the breeding season by a suitably qualified ECO
- If any faunal species are recorded during construction, an appropriate specialist should be consulted to identify the correct course of action. These species must either be moved from the area or allowed time to move off;
- During vegetation clearance, methods should be employed to minimize potential harm to fauna species. Clearing has to take place in a phased and slow manner, commencing from the interior of the site progressing outwards towards the boundary to maximize potential for mobile species to move to adjacent areas;
- Prior and during vegetation clearance any larger fauna species noted should be given the opportunity to move away from the construction machinery;
- Fauna species such as frogs and reptiles that have not moved away should be carefully and safely removed to a suitable location beyond the extent of the development footprint by a suitably qualified ECO trained in the handling and relocation of animals.

Appendix A: Drawings and Maps

Appendix B: Specialist Reports

Appendix C: Noticeboard

Appendix D: Notification

Appendix E: Adverts

Appendix F: Registered I &Aps

Appendix G: Comments and Responses

Appendix H: Impacts Scoring Matrix

Appendix I: EAP Declaration

Appendix J: Environmental Management Programme and Stormwater Management Plan