

**SITE VERIFICATION REPORT: REHABILITATION OF THE OLD TUG JETTY SHEET PILE WALL AT THE PORT OF PORT ELIZABETH**

**PROJECT NAME:**

THE PROPOSED REHABILITATION OF THE OLD TUG JETTY SHEET PILE WALL AT THE PORT OF PORT ELIZABETH, WITHIN NELSON MANDELA BAY METROPOLITAN MUNICIPALITY IN THE EASTERN CAPE PROVINCE

**REFERENCE NUMBER:** TNPA/2021/12/0012/RFP

DFFE REFERENCE: 14/12/16/3/3/2/2326

**REPORT TITLE:**

SITE VERIFICATION REPORT

**DATE:** 19 APRIL 2023

**PREPARED BY:**

ABANTU ENVIRONMENTAL CONSULTANTS (PTY) LTD

**PREPARED FOR:**

TRANSNET SOC LTD



OFFICE	ADDRESS	CONTACT DETAILS
Gqeberha	Prince Alfred Road North End Gqeberha 6001	<b>Contact Person:</b> Mr Sive Mlamla (Pr.Sci.Nat)/ Reg.EAP (EAPASA) <b>Cell:</b> 078 207 8278 <b>Fax:</b> 086 685 9536 <b>Email:</b> <a href="mailto:info@abantuenvironmental.co.za">info@abantuenvironmental.co.za</a> <a href="mailto:PE-EIA@abantuenvironmental.co.za">PE-EIA@abantuenvironmental.co.za</a> <b>Website:</b> <a href="http://www.abantuenvironmental.co.za">www.abantuenvironmental.co.za</a>

## **TABLE OF CONTENTS**

<b>TABLE OF CONTENTS</b> .....	<b>2</b>
<b>LIST OF FIGURES</b> .....	<b>3</b>
<b>LIST OF TABLES</b> .....	<b>3</b>
<b>1. INTRODUCTION</b> .....	<b>4</b>
<b>1.1 PROJECT BACKGROUND</b> .....	<b>4</b>
<b>1.2 PROJECT DESCRIPTION</b> .....	<b>6</b>
<b>2. METHODOLOGY</b> .....	<b>9</b>
<b>2.1 SITE SENSITIVITIES IDENTIFIED (SCREENING TOOL)</b> .....	<b>10</b>
<b>2.2 SPECIALIST ASSESSMENTS IDENTIFIED</b> .....	<b>10</b>
<b>2.3 SITE SENSITIVITY VERIFICATION METHODOLOGY</b> .....	<b>12</b>
<b>2.4 DESKTOP ANALYSIS OF SITE</b> .....	<b>13</b>
2.4.1 Climate .....	13
2.4.2 Topography .....	14
2.4.3 Aquatic Ecology .....	15
2.4.4 Sediment and Water Quality .....	17
2.4.5 Soils and Geology .....	19
2.4.6 Critical Biodiversity Areas .....	20
2.4.7 Vegetation and Ecosystems .....	21
2.4.8 Faunal Species .....	22
2.4.9 Protected Areas .....	23
2.4.10 Palaeontology .....	25
2.4.11 Archaeology and Heritage Resources .....	26
<b>2.5 SITE ANALYSIS OF SITE</b> .....	<b>26</b>
<b>3. DISCUSSION OF IDENTIFIED SPECIALIST ASSESSMENTS</b> .....	<b>30</b>
<b>4. CONCLUSION OF SITE SENSITIVITY VERIFICATION REPORT</b> .....	<b>31</b>

**SITE VERIFICATION REPORT: REHABILITATION OF THE OLD TUG JETTY SHEET PILE WALL AT THE PORT OF PORT ELIZABETH**

**LIST OF FIGURES**

**Figure 1:** Locality map of the proposed Transnet Port Upgrade..... 5  
**Figure 2:** Close-up image indicating the extent of the sheet pile corrosion ..... 6  
**Figure 3:** Phase construction of preferred solution ..... 7  
**Figure 4:** Phase 1 typical section ..... 8  
**Figure 5:** Phase 2 typical section ..... 9  
**Figure 6:** Eastern Cape rainfall statistics between 1921-2021 (SAWS) ..... 13  
**Figure 7:** Topography of NMBMM ..... 15  
**Figure 8:** NFEPA Wetlands and Rivers..... 17  
**Figure 9:** Aquatic biodiversity sensitivity ..... 19  
**Figure 10:** Critical Biodiversity Areas ..... 21  
**Figure 11:** Animal Species sensitivity ..... 23  
**Figure 12:** Protected Areas ..... 24  
**Figure 13:** Marine Protected Area ..... 25  
**Figure 14:** Palaeontological sensitivity..... 25  
**Figure 15:** Old Tug Jetty Sheet Pile Wall Layout..... 27  
**Figure 16:** Old Tug Jetty Sheet Pile Wall ..... 27  
**Figure 17:** Northern side of the Old Tug Jetty sheet pile wall ..... 28  
**Figure 18:** Southern side of the Old Tug Jetty sheet pile wall ..... 28  
**Figure 19:** Closeup view of Old Tug Jetty sheet pile wall ..... 29

**LIST OF TABLES**

**Table 1.** Site Sensitivities identified (Screening Tool)..... 10  
**Table 2.** EAP response to specialist assessments identified in the screening tool report..... 11  
**Table 3:** Site Sensitivity Verification ..... 30

## **1. INTRODUCTION**

### **1.1 PROJECT BACKGROUND**

Transnet is proposing the rehabilitation of the Old Tug Jetty which is located within the Port of Port Elizabeth and within Ward 5 of Nelson Mandela Bay Metropolitan Municipality in the Eastern Cape Province (**Figure 1**).

The Jetty was constructed in the mid 1970's and comprises of steel interlocking 'U' steel sheet pile sections together with dead man anchors and a concrete capping beam. The extent of the site is 246 m with an advertised berth depth of -4 m CD (Chart Datum). Both structures extend into the seawaters by 6 m each, total extension of 12 m (width) from the existing structures and the site extents are 246 m (length), hence, the development footprint of the port or harbour will be increased or expanded by approximately 2952 square metres in total. The quay wall is currently being used for the berthing of fishing vessels and trawlers. The northern extent of the back of quay area is used for the transshipment of cargo and supplies, while the southern extent is used for boat maintenance.

#### **Motivation and alternatives**

The sheet piles have corroded significantly with large holes visible in the tidal zone. These holes have caused leaching of backfill material resulting in the subsidence of the back of quay area. Transnet National Port Authority (TNPA) has undertaken numerous repair campaigns involving filling holes with soilcrete. However, the continued deterioration of the sheet pile wall has resulted in an unsustainable maintenance regime.

#### **Preferred rehabilitation option (proposed upgrade)**

Based on the outcomes of the optioneering and multi-criteria analysis, a counterfort wall and deck on pile hybrid structure was selected as the preferred rehabilitation option for the Old Tug Jetty sheet pile wall. This option comprises of 2 phases. Phase 1 entails the construction of a counterfort wall with a berth depth of -5.2m CD. The Phase 2 expansion entails construction of an adjoining deck on pile structure partially supported by the counterfort wall with a design berth depth of -6.5m CD. Both structures extend into the existing seawaters by 6 m each resulting in a total extension of 12 m from the existing structures.

SITE VERIFICATION REPORT: REHABILITATION OF THE OLD TUG JETTY SHEET PILE WALL AT THE PORT OF PORT ELIZABETH

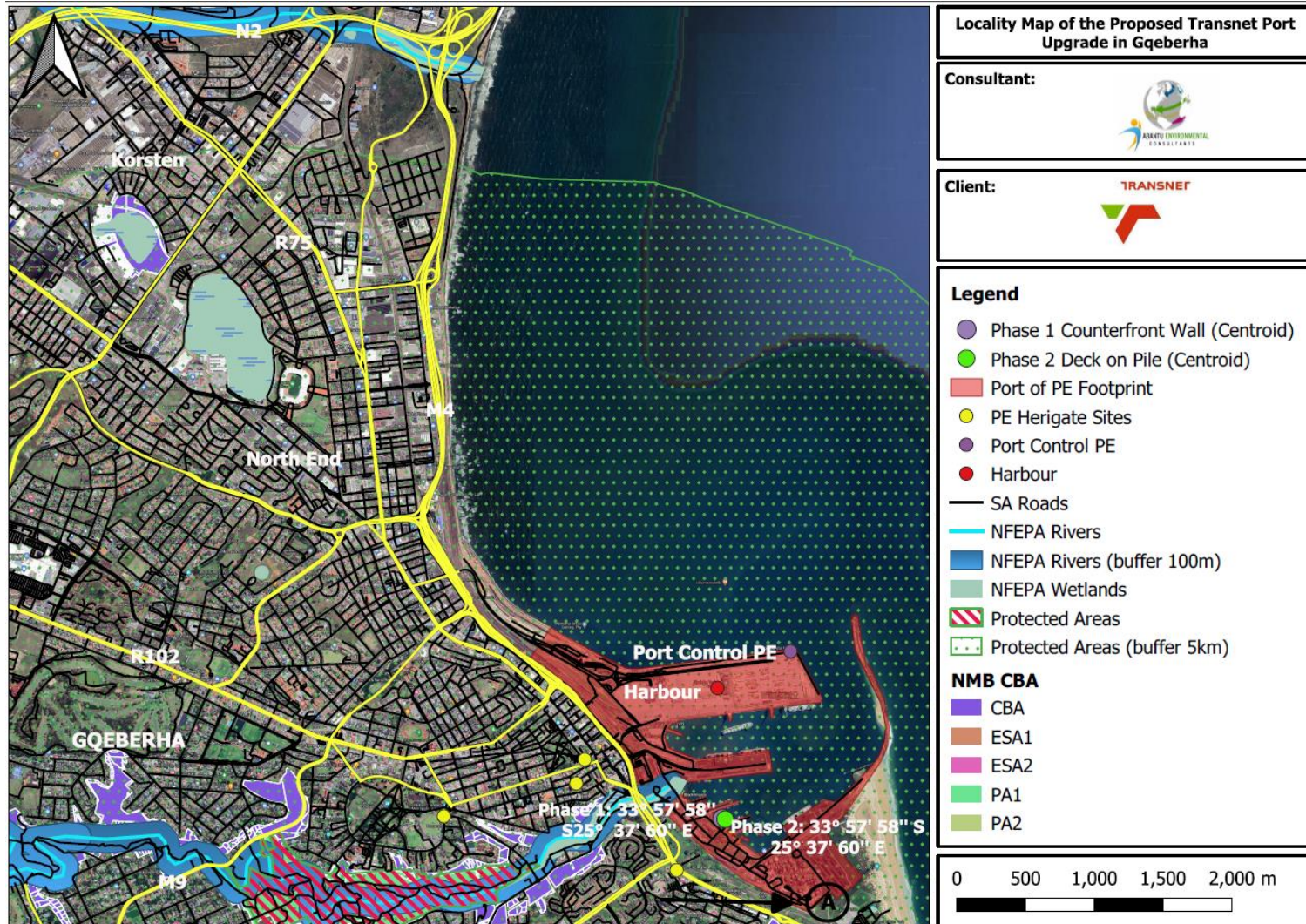


Figure 1: Locality map of the proposed Transnet Port Upgrade



# SITE VERIFICATION REPORT: REHABILITATION OF THE OLD TUG JETTY SHEET PILE WALL AT THE PORT OF PORT ELIZABETH

## 1.2 PROJECT DESCRIPTION

Transnet is proposing the rehabilitation of the Old Tug Jetty which is located within the Port of Port Elizabeth and within Ward 5 of Nelson Mandela Bay Metropolitan Municipality in the Eastern Cape Province. The property that will be affected by the proposed activity is Erf Humewood 1051.

The Jetty was constructed in the mid 1970's and comprises of steel interlocking 'U' steel sheet pile sections together with dead man anchors and a concrete capping beam. The extent of the site is 246 m with an advertised berth depth of -4 m CD (Chart Datum). Both structures extend into the seawaters by 6 m each, total extension of 12 m (width) from the existing structures and the site extents are 246 m (length), hence, the development footprint of the port or harbour will be increased or expanded by approximately 2952 square metres in total. The quay wall is currently being used for the berthing of fishing vessels and trawlers. The northern extent of the back of quay area is used for the transshipment of cargo and supplies, while the southern extent is used for boat maintenance.

### Motivation and alternatives

As illustrated in **Figure 2**, the sheet piles have corroded significantly with large holes visible in the tidal zone. These holes have caused leaching of backfill material resulting in the subsidence of the back of quay area. Transnet National Port Authority (TNPA) has undertaken numerous repair campaigns involving filling holes with soilcrete. However, the continued deterioration of the sheet pile wall has resulted in an unsustainable maintenance regime.



**Figure 2:** Close-up image indicating the extent of the sheet pile corrosion

## SITE VERIFICATION REPORT: REHABILITATION OF THE OLD TUG JETTY SHEET PILE WALL AT THE PORT OF PORT ELIZABETH

### Preferred rehabilitation option (proposed upgrade)

Based on the outcomes of the optioneering and multi-criteria analysis, a counterfort wall and deck on pile hybrid structure was selected as the preferred rehabilitation option for the Old Tug Jetty sheet pile wall. This option comprises of 2 phases as illustrated in **Figure 3**. Phase 1 entails the construction of a counterfort wall with a berth depth of - 5.2m CD. The Phase 2 expansion entails construction of an adjoining deck on pile structure partially supported by the counterfort wall with a design berth depth of -6.5m CD. Both structures extend into the existing seawaters by 6 m each resulting in a total extension of 12 m from the existing structures.



**Figure 3:** Phase construction of preferred solution

## SITE VERIFICATION REPORT: REHABILITATION OF THE OLD TUG JETTY SHEET PILE WALL AT THE PORT OF PORT ELIZABETH

The phase 1 counterfort wall is 259.3 m long with a maximum cope line offset of 6 m from the existing, tapering as it approaches the boat ramps at each end. The cope level is at +4 m CD with the berth depth varying from -5.2 m CD along the north western face sloping up and tying into the extents of the boat ramps.

The existing sheet pile wall will be abandoned and buried and the back of quay area will be remediated. The construction process consists of dredging marine sediment and the excavation of a thin layer of existing rock fill in front of the sheet pile wall. The risk of excavating in front of the existing sheet pile wall would need to be assessed as part of the next project phase. Thereafter, a filter fabric will be laid on top of the rock fill and along the vertical extents of the sheet pile wall. A stone bed is then placed on top of the filter fabric to create a level bed for the precast counterfort units. The counterfort wall is then seated on the stone bed and scour rock placed on top of its toe. Thereafter, the wall will be backfilled with quarry run and the concrete and civil work completed. Finally, the quay furniture will be installed. illustrates the typical cross section of the counterfort wall.

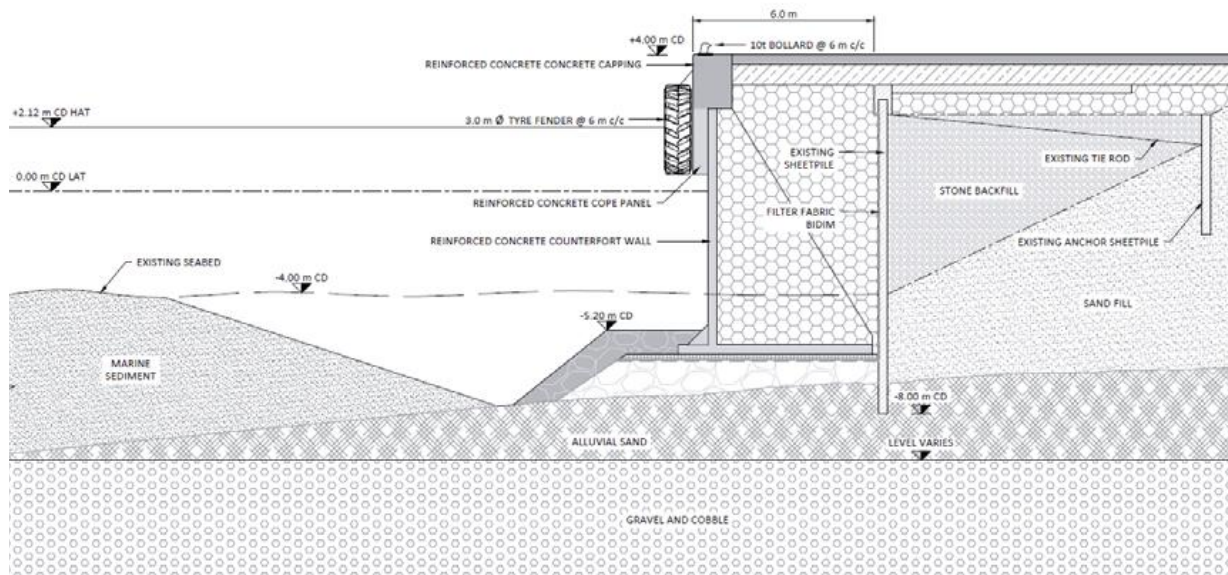


Figure 4: Phase 1 typical section

If there is sufficient demand for a deeper berth, the structure can be upgraded by implementing phase 2. Phase 2 of the project entails the construction of a deck on pile structure in front of the counterfort wall. The deck on pile jetty is 87.3 m long with further cope line offset of 5.8 m. The cope level is at +4 m CD with a berth depth of -6.5 m CD. The deck on pile length is limited to the extents illustrated in **Figure 3** because it is not possible to achieve the -6.5 m CD berth depth along the approaches to the slipways as the seabed needs to rise to suit the boat ramp geometry.



## SITE VERIFICATION REPORT: REHABILITATION OF THE OLD TUG JETTY SHEET PILE WALL AT THE PORT OF PORT ELIZABETH

The construction process would commence with the dredging of marine sediment. Then the existing quay furniture on the counterfort wall affected by the deck on pile structure would be removed. Thereafter, steel tubular pile casings would be driven at the toe of the existing rock fill, excavated out to toe level and then the reinforced concrete pile cast inside. Precast pile caps would then be seated on top of the pile. Abutments will be constructed into the counterfort units which will house the precast beams and provide lateral support to the deck on pile structure. After placing precast beams, cope panels and planks the elements are stitched together with in-situ reinforced concrete. Finally, the quay furniture would be installed. **Figure 4** illustrates the typical cross section of the counterfort wall and deck on pile structure.

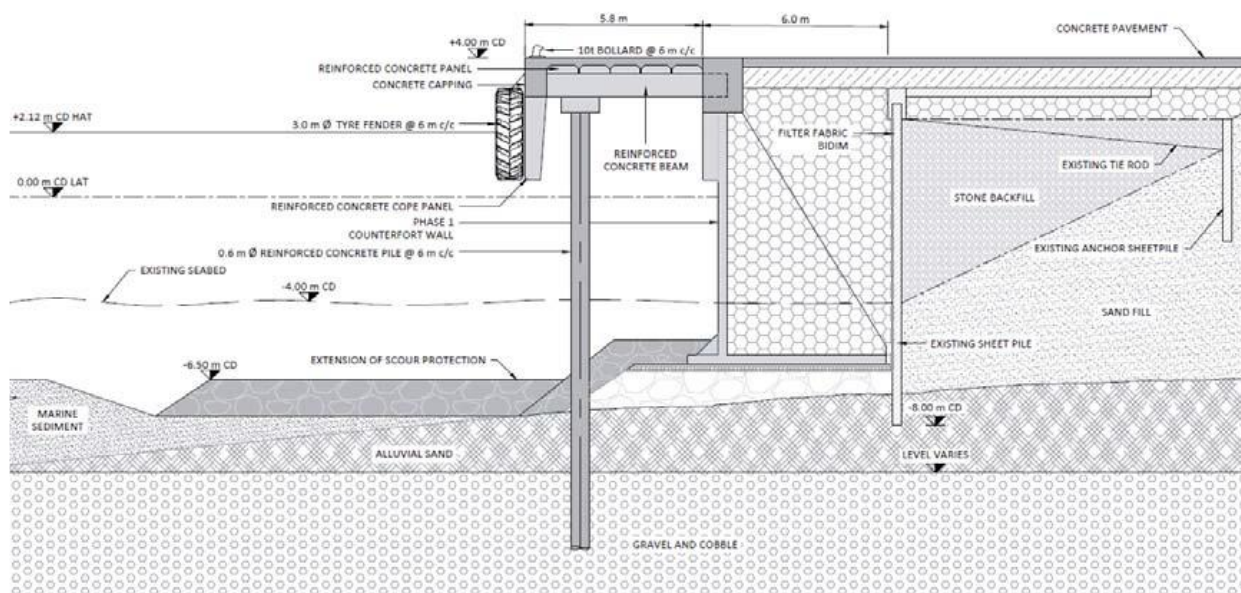


Figure 5: Phase 2 typical section

## 2. METHODOLOGY

On 20 March 2020 the Minister of Forestry, Fisheries and the Environmental published the general requirements for undertaking site sensitivity verification for environmental themes for activities requiring environmental authorization (Government Gazette No. 43110). In terms of these requirements, prior to commencing with a specialist assessment, the current land use and environmental sensitivity of the site under consideration by the screening tool must be confirmed by undertaking a site sensitivity verification.

## **SITE VERIFICATION REPORT: REHABILITATION OF THE OLD TUG JETTY SHEET PILE WALL AT THE PORT OF PORT ELIZABETH**

In accordance with the Notice of the requirement to submit a report generated by the national web-based environmental screening tool in terms of section 24(5)(h) of the NEMA, 1998 (Act No 107 of 1998) and regulation 16(1)(b)(v) of the EIA regulations, 2014, as amended, a screening tool was generated and identified specific site sensitivities and themes to be assessed for this specific project. The specialist themes in section 2.1 were identified

### **2.1 SITE SENSITIVITIES IDENTIFIED (SCREENING TOOL)**

This section entails the sensitivities and required specialists identified by the screening tool.

**Table 1.** Site Sensitivities identified (Screening Tool)

<b>Category</b>	<b>Screening Tool Sensitivity</b>
Animal Species Theme	Medium
Aquatic Biodiversity Theme	Low
Archaeological and Cultural Heritage Theme	Very High
Civil Aviation Theme	Very High
Defense Theme	Very High
Paleontology Theme	Very High
Plant Species Theme	Low
Terrestrial Biodiversity Theme	Low

### **2.2 SPECIALIST ASSESSMENTS IDENTIFIED**

Based on the above environmental sensitivities, as well as initial site investigations for the proposed development footprint, the following list of specialist assessments have been identified for inclusion in the assessment report by the screening tool.

- Landscape/Visual Impact Assessment
- Archaeological and Cultural Heritage Impact Assessment
- Palaeontology Impact Assessment
- Terrestrial Biodiversity Impact Assessment
- Aquatic Biodiversity Impact Assessment
- Marine Impact Assessment
- Avian Impact Assessment
- Geotechnical Assessment
- Socio-Economic Assessment
- Plant Species Assessment
- Animal Species Assessment

**SITE VERIFICATION REPORT: REHABILITATION OF THE OLD TUG JETTY SHEET PILE WALL AT THE PORT OF PORT ELIZABETH**

The specialist studies listed in **Table 2** are required for the selected project area. Motivation has been included in cases where the recommended specialist study will not be undertaken.

**Table 2.** EAP response to specialist assessments identified in the screening tool report

<b>Specialist Studies Required</b>	<b>Indication of Whether Studies Will Be Conducted or Not (Yes/No)</b>	<b>Motivation for any Studies That Will Not Be Undertaken</b>
Landscape/Visual Impact Assessment	Yes	Visual Assessment has undertaken by the EIA team as part of site verification
Archaeological and Cultural Heritage Impact Assessment	No	No heritage resources evident on site.
Palaeontology Impact Assessment	Yes	Specialist has been appointed and study is in progress
Terrestrial Biodiversity Impact Assessment	No	The project occurs in an aquatic environment and no plants will be affected by the project. The site verification confirmed that there is no terrestrial vegetation that will be cleared or affected by the proposed project. Thus, no botanical or terrestrial biodiversity specialist study will be undertaken in the EIA phase.
Aquatic Biodiversity Impact Assessment	Yes	Specialist has been appointed and study is in progress
Marine Impact Assessment	Yes	Specialist has been appointed and study is in progress
Avian Impact Assessment	Yes	Study will be undertaken as part of the Marine Ecology Impact Assessment. A few bird species were recorded on site during the site verification, it is likely that these species are present in the surrounding environment. Mitigation measures will be put in place to minimize impact on animal species during construction and impact on the surrounding habitat will be kept minimal, it is not foreseen that the low impact on faunal species will continue post construction phase
Geotechnical Assessment	Yes	To be undertaken by Transnet
Socio-Economic Assessment	Yes	Specialist has been appointed and study is in progress
Plant Species Assessment	No	The project occurs in an aquatic environment and no plants will be affected by the project. The site verification confirmed that there is no terrestrial vegetation that will be cleared or affected by the proposed project. Thus, no botanical or terrestrial biodiversity specialist study will be undertaken in the EIA phase.
Animal Species Assessment	Yes	Study will be undertaken as part of the Marine Ecology Impact Assessment.

## **SITE VERIFICATION REPORT: REHABILITATION OF THE OLD TUG JETTY SHEET PILE WALL AT THE PORT OF PORT ELIZABETH**

Therefore, this site sensitivity verification report is compiled to determine whether Specialist Assessments or Compliance Statements for the abovementioned specialist studies are required for the proposed project.

### **2.3 SITE SENSITIVITY VERIFICATION METHODOLOGY**

The site sensitivity verification report compiled by Abantu Environmental Consultants represented by:

- Dr Patrick Sithole - EAP
- Andisiwe Xuma and – Senior Environmental Scientist
- Mr Sive Mlamla – Project Manager & EAP

The assessment has been compiled based on:

- A site investigation undertaken on 04 August 2022
- A desktop investigation using biodiversity and land-use mapping tools such as inter alia ArcGIS and;
- Information recorded in Screening Report, Notice of Intent Report
- Information derived from available specialist assessment reports.



# SITE VERIFICATION REPORT: REHABILITATION OF THE OLD TUG JETTY SHEET PILE WALL AT THE PORT OF PORT ELIZABETH

## 2.4 DESKTOP ANALYSIS OF SITE

A desktop study which included the review of existing information such as specialist studies that were conducted at the port of Port Elizabeth, literature review of various reports related to the port of Port Elizabeth and consultation of a variety of databases was undertaken. A screening tool report was generated using the National Web Based Environmental Screening Tool, the report presents the sensitivities of the site which have been incorporated into this report. A copy of the screening tool report is attached as Appendix D of the FSR.

### 2.4.1 Climate

The climate of the Nelson Mandela Bay area is changes throughout the day as it lies at the confluence of several climatic regimes, the most important of which are temperate and subtropical (Stone 1988). Gqeberha is dominated by topographical or gradient winds for most of the year (Grobler, 2012). The area experiences westerly winds throughout the year, though in summer the percentage of easterly winds reached more than 40% (Schumann et al., 199). Maximum and minimum mean temperatures are experienced in February and July, respectively (McCallum 1981). Exceptionally high temperatures (~30°C) can occur during berg wind conditions that develop frequently in autumn and winter. The mean annual rainfall for the Port Elizabeth area is approximately 600 mm (Stone 1988). The strongest winds occur during October and November, with weakest winds during May and June (Schumann et al. 1991).

The annual rainfall in the area has decreased throughout the recent year (refer to **Figure 7**). The whole Eastern Cape province has been affected by the drought as a result of reduced rainfall. This has led to shortages of water in the Metro that are currently being felt throughout.

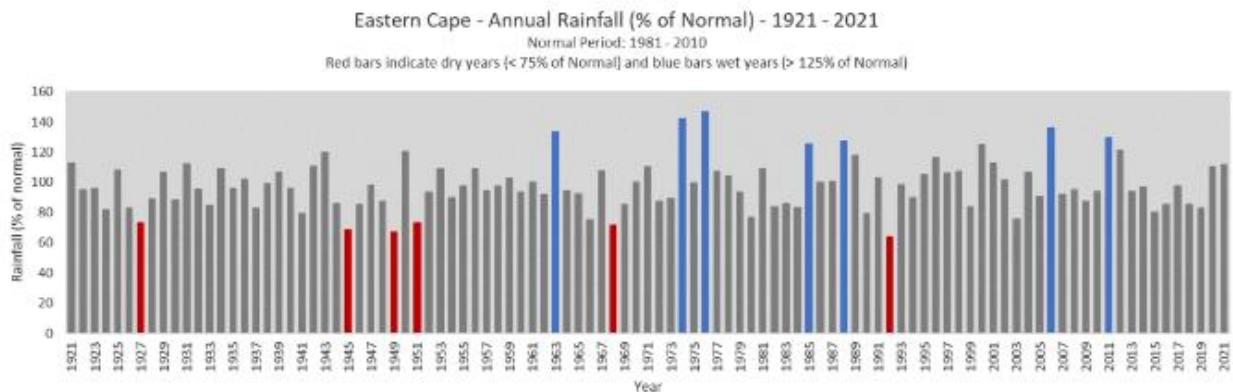


Figure 6. Eastern Cape rainfall statistics between 1921-2021 (SAWS)

## **SITE VERIFICATION REPORT: REHABILITATION OF THE OLD TUG JETTY SHEET PILE WALL AT THE PORT OF PORT ELIZABETH**

### **2.4.2 Topography**

The Nelson Mandela Bay Municipality lies at the southern tip of Africa in the south Eastern Cape at the shores of the Indian Ocean. The topography of the NMBM area is the result of soft marine strata filling a broad valley near the end of the east-west striking Cape Fold Belt. A combination of marine and continental erosion has reduced the topography of most of the study area to a flat, seaward sloping coastal plain averaging 75 m above mean sea level, drained by deeply incised rivers. High, rugged mountain terrain protrudes sharply in the northwestern part of the metro. Tall dunes are conspicuous features in the south.

The NMBM coastline extends for some 110 km of the Indian Ocean between the mouths of the Sundays and Van Stadens Rivers in the east and west, respectively. The NMBM straddles the two large, half-heart shaped bays of Algoa and St Francis that are separated by the headland of Cape Recife. Their surf-swept sandy beaches interspersed with rocky outcrops vary widely in physical form owing to the combined effects of coastal orientation relative to prevailing winds, deepwater swell and sheltering by headlands. Two island groups are part of the metro. They are National Parks and have no human settlements.

The Bird Islands, consisting of Bird, Seal, Stag and Black Rocks are located at the eastern end of Algoa Bay 8 km opposite Woody Cape and approximately 55 km east of the Port of Ngqura. The islands of St Croix, Brenton and Jahleel (collectively: The Islands of the Cross) occur a few kilometres offshore between the mouths of the Swartkops and Sundays Rivers, the two large, perennial rivers draining extensive catchment areas that flow into Algoa Bay. In contrast, the mouths of the Maitland and Van Stadens Rivers are seasonally closed and there are no islands in St Francis Bay.

## SITE VERIFICATION REPORT: REHABILITATION OF THE OLD TUG JETTY SHEET PILE WALL AT THE PORT OF PORT ELIZABETH

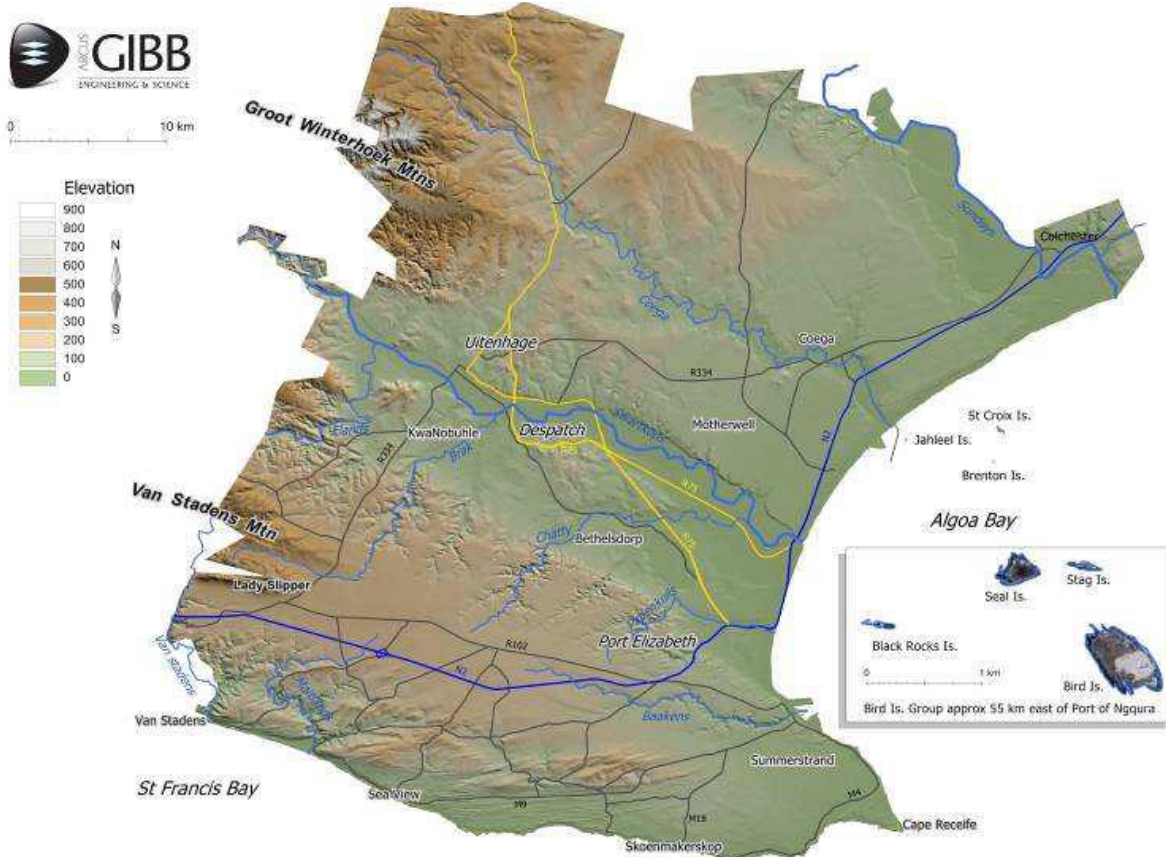


Figure 7: Topography of NMBMM

### 2.4.3 Aquatic Ecology

The coastal zone of Nelson Mandela Bay provides an array of recreational and sustainable resource utilisation opportunities and underpins a substantial segment of the municipality's economy. The Swartkops Estuary lies about 8 km north of the Port Elizabeth City Centre and is an important nursery for marine fish, including several angling species. The estuary forms the basis of an informal bait collecting industry and is ranked as South Africa's top temperate estuary in terms of subsistence value (Turpie & Clark, 2007). The bait collecting industry is also, however, responsible for destruction of the mudflats, leading to significant impacts on the functioning of the system (Baird et al., 1988). The functioning of the estuary is also threatened by pollution, enrichment, sand mining, overfishing, insufficient inflow of freshwater due to damming, and inappropriate development. Relevant sections of the Swartkops River and Estuary are currently proposed for declaration as either a Protected Environment or Nature Reserve in terms of the NEM: Protected Areas Act, 2003 (Act No. 57 of 2003). Declaration thereafter as a RAMSAR site is also being considered. Under the auspices of the Department of Water and Sanitation (DWS), a Catchment Management Forum has been

## **SITE VERIFICATION REPORT: REHABILITATION OF THE OLD TUG JETTY SHEET PILE WALL AT THE PORT OF PORT ELIZABETH**

formed with the objective of safeguarding the welfare of the Swartkops River and Estuary from source to sea (T Potts 2014, pers. comm., 30 Oct).

The foredune vegetation along the Nelson Mandela Bay coastline helps to buffer against the high energy influences of the tides, wind and waves. These systems are sensitive to disturbance and are susceptible to the formation of blow-outs. The coastal area is often targeted for development, primarily due to the desirability of ocean views. The protection of the coastal foredune system is important in order to safeguard the scenic attributes of the coastal zone and to provide protection against the natural coastal agents of change, particularly in light of the implications of global sea-level rise.

The Alexandria Dunefield has its beginnings at the north-eastern extent of the municipal area. The dunefield is considered to be one of the largest and most pristine active coastal dunefields in the world. Larger and more extensive dunefields are only found in desert areas. As such, it has been incorporated into the Addo Elephant National Park and was nominated by South African National Parks as a World Heritage Site (UNESCO, 2009).

The Maitlands Dunefield, between the resort villages of Beachview and Blue Horizon Bay on the southwestern part of the Nelson Mandela Bay coastline, supports what is believed to be the highest density of black oystercatcher in the country (Bornman & Klages, 2003). The black oystercatcher is Near Threatened and is highly susceptible to disturbance during its breeding cycle. The Maitland area, in general, is one of the most visually spectacular areas in the municipality and has significant value in terms of recreation and tourism. Although the prohibition of off-road vehicles on the dunefields has substantially reduced threats to these systems, they continue to be threatened principally by encroachment of invasive alien plants and are vulnerable to insensitive recreational use.

The receiving area of the proposed project is within the mouth of the Baakens River, which is one of the major freshwater ecosystems in the NMBMM. The Baakens River mouth is in the Port Elizabeth harbour adjacent to the central business district of the City.

A number of ecological corridors were identified as part of the NMBM conservation assessment. These corridors were designed to promote connectivity between natural areas in order for ecological processes (such as migration and seed dispersal) to continue. While all of the identified corridors are important, the Baakens River Valley, which forms an east-west corridor through the urban expanse of the Municipal area, deserves a special mention. It is the Municipality's most extensive corridor through fynbos habitats and is of



## SITE VERIFICATION REPORT: REHABILITATION OF THE OLD TUG JETTY SHEET PILE WALL AT THE PORT OF PORT ELIZABETH

critical importance for the continuation of ecological processes that sustain biodiversity. The area also provides numerous ecosystem services, playing an important role in flood attenuation, storm water management, environmental education and nature-based recreation.

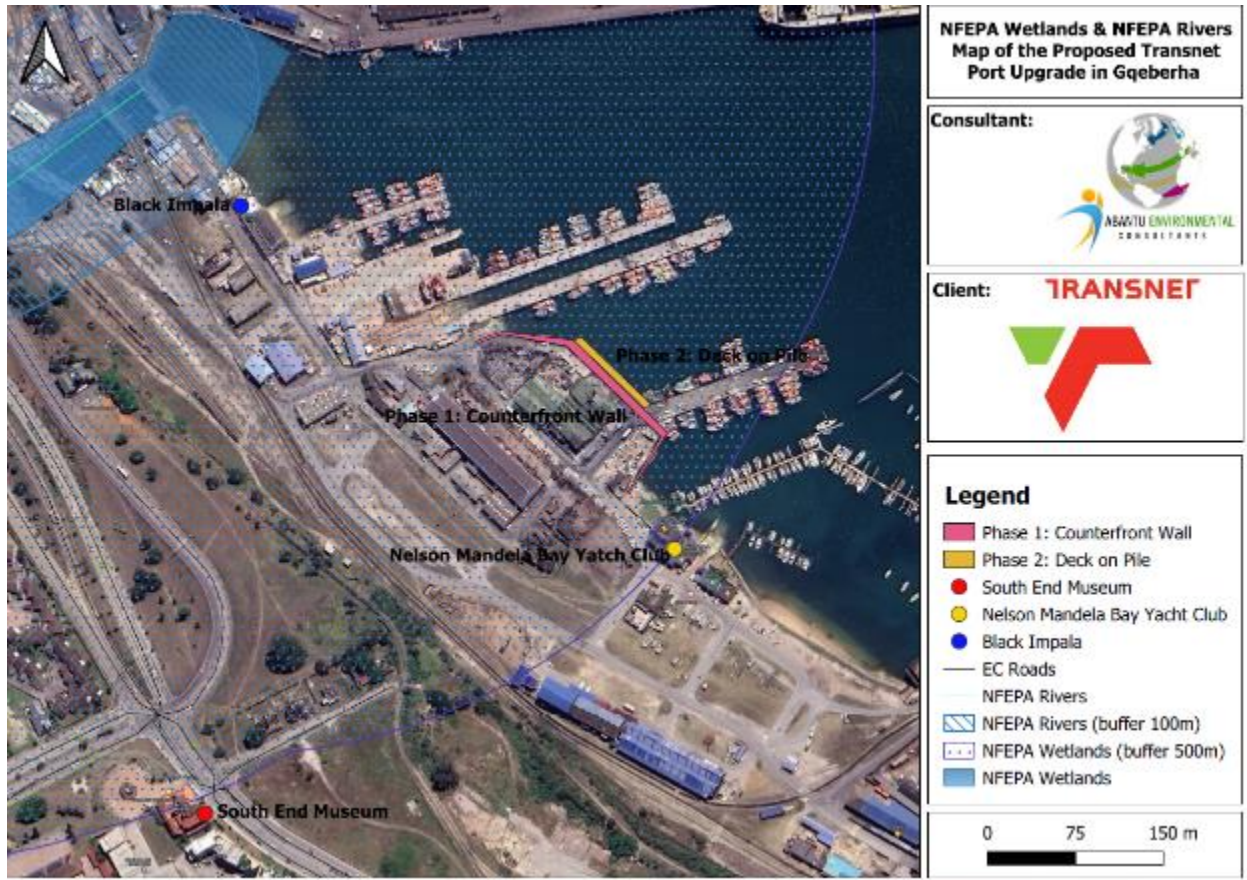


Figure 8: NFEPA Wetlands and Rivers

According to NWBEST, the aquatic biodiversity of the proposed site is low.

### 2.4.4 Sediment and Water Quality

Long Term Ecological Monitoring was undertaken by Newman et al between 2018 and 2020. A wide suite of physical, chemical and biological indicators of water quality were measured in the field and in surface water samples returned to the laboratory. The findings for most of these indicators were used in a water quality index to classify water quality at each station. According to the report, surface water quality across most of Port of Port Elizabeth for the winter survey in 2018 and summer survey in 2019 is classified good or excellent apart. The classifications bely the fact, however, that water quality in some parts of the port was classified fair or poor due to elevated faecal indicator bacteria counts, and total suspended solids, dissolved inorganic nitrogen and/or zinc concentrations. There is little doubt a cause of water quality impairment in the port

## **SITE VERIFICATION REPORT: REHABILITATION OF THE OLD TUG JETTY SHEET PILE WALL AT THE PORT OF PORT ELIZABETH**

reflects the introduction of contaminants via the Baakens River. However, water quality impairment was also evident at positions fairly distant from the inflow of this river, including near the Slipway and Dom Pedro quay, which probably reflects localised sources of contaminants.

wide suite of physical and chemical indicators of sediment quality were measured in sediment samples returned to the laboratory. Based on a sediment quality index that was calculated using the results for many of the indicators the quality of sediment sampled across the port in June 2018 is classified good or excellent part from near the vessel repair operation, where it is classified poor. The poor classification reflects the contamination of sediment in this part of the port by several metals, DDT, polychlorinated biphenyls and butyltins. The good or excellent sediment quality classification does not mean there was no contamination of sediment in other parts of the port, but rather that this was infrequent and/or of a low magnitude (CSIR, 2020).

The CSIR was commissioned to undertake an assessment of sediment quality in the Port of Port Elizabeth. The findings for the 2022 survey are broadly consistent with those of previous surveys. The fairly high mud fraction of sediment across a large part of the port reflects its depositional nature and indicates there is a propensity for the retention and accumulation in the sediment of particle reactive contaminants introduced in solution to the port.

The ultimate concern in any situation where sediment is found to be metal contaminated is whether the metals are at concentrations that are adversely impacting on biological receptors through toxicity, and in the specific context of dredging and dredged material disposal if the contaminants may pose a toxic risk to receptors at the dredging and dredged material disposal sites.

The most effective approaches to determining if contaminants in sediment are adversely affecting sediment-dwelling organisms is to test the toxicity of the sediment in the laboratory and/or to assess the health of communities of invertebrate organisms that live in and on sediment. When sediment toxicity testing and/or the analysis of benthic invertebrate communities is not possible most investigators estimate the risk posed by metals in sediment by comparing their concentrations to sediment quality guidelines. This is despite well-documented limitations of sediment quality guidelines, perhaps the most important being that they assume the entire concentration of metals in sediment is in a bioavailable form when this is not the case. The comparison of metal concentrations to sediment quality guidelines forms one tier of dredging decision-making frameworks in many countries. If metal concentrations exceed sediment quality guidelines this triggers subsequent tiers in the framework, which often require further testing (e.g. toxicity testing) to determine if the metals are toxic to pelagic and/or benthic organisms.

## SITE VERIFICATION REPORT: REHABILITATION OF THE OLD TUG JETTY SHEET PILE WALL AT THE PORT OF PORT ELIZABETH

The sediment at numerous stations sampled in the port of Port Elizabeth was metal contaminated in January 2022. The most significant metal contaminants were manganese, chromium, and copper. The toxic risk posed by metals in sediment to sediment-dwelling organisms was estimated by comparing their concentration to sediment quality guidelines used by the Department of Forestry, Fisheries and the Environment. The copper concentration in sediment at one station slightly exceeded the Warning Level. The metals thus appear to not be at concentrations presenting a significant toxic risk. Based on these findings it would appear the disposal of sediment dredged in the Port of Port Elizabeth is unlikely to pose a significant ecological risk when it is disposed at the open water dredged material disposal site in Algoa Bay (CSIR. 2022).

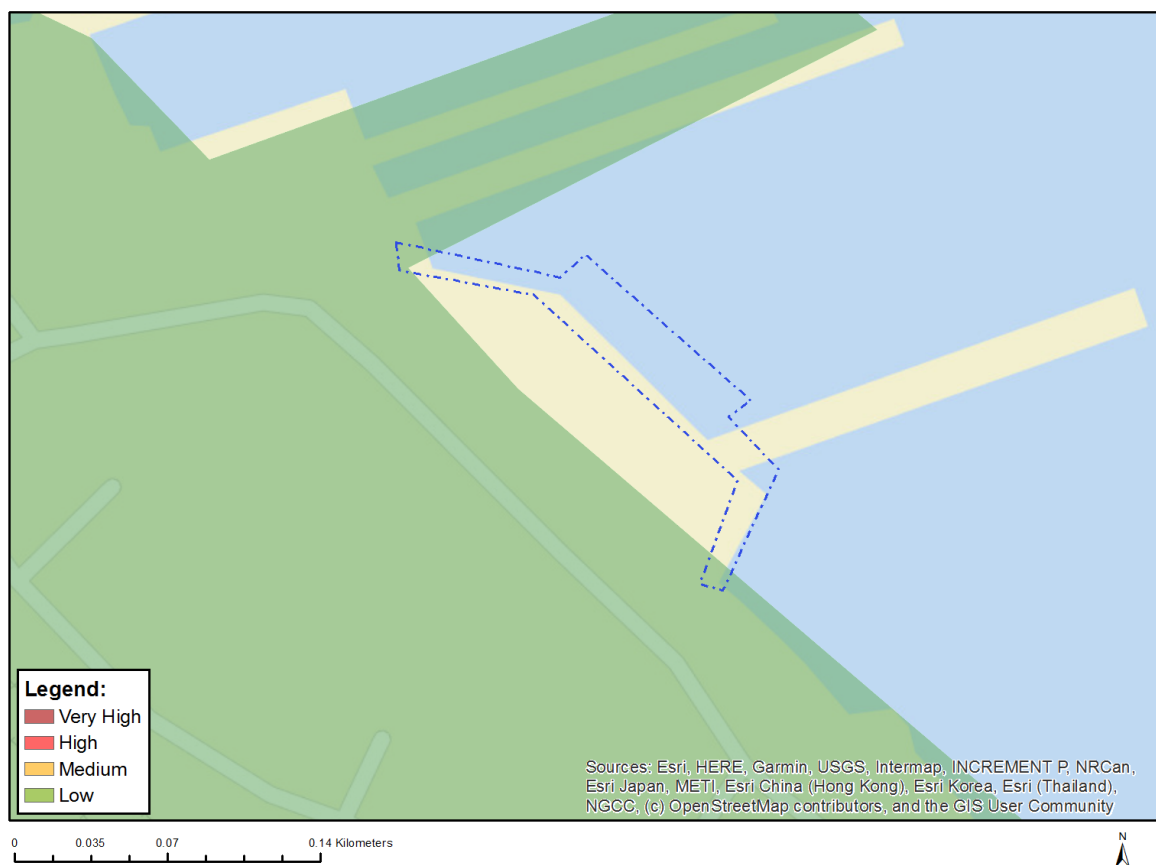


Figure 9: Aquatic biodiversity sensitivity

### 2.4.5 Soils and Geology

According to the 1:250 000 geological map (3324 PORT ELIZABETH) and 1:50 000 geological map (3325 DA & DD, 3425 BA) published by the Council of Geoscience, the investigation area is underlain by a combination of land-fill material and Quaternary alluvial sand, gravel, cobbles and boulders. This material is

## **SITE VERIFICATION REPORT: REHABILITATION OF THE OLD TUG JETTY SHEET PILE WALL AT THE PORT OF PORT ELIZABETH**

underlain, at depth, by the Peninsula Formation of the Table Mountain Group. The local geology underlying the area is presented in Figure x.

The land-fill material, which consists of building rubble, crushed stone and sand was used to reclaim large areas surrounding the Port Elizabeth Harbour, according to Le Roux (2000). The Port Elizabeth Harbour is situated in the mouth of the Baakens River, which serves as the source of deposition of alluvial material, along with the fringe of the Indian Ocean. According to Le Roux (2000), the Ordovician-aged Peninsula Formation consists of light grey, medium- to coarse-grained quartzite with minor lenticular shale layers. The quartzite is typically well bedded. Deposition of the Peninsula Formation is believed to have occurred on a shallow marine shelf.

No large faulting is known to occur in the proximity of investigation area. An unconformity is found between the older Peninsula Formation rocks and the younger alluvial deposits. According to the 1:500 000 hydrogeological map (3324 PORT ELIZABETH) published by the Department of Water Affairs and Forestry, the investigation area has historically received a mean annual precipitation of 800 to 1000mm, with boreholes in the area potentially yielding 0.5 - 2.0 litres/second.

According to the 1:6 000 000 Seismic Hazard Map of Southern Africa, the site falls within a level five area on the Modified Mercalli Scale (MMS). Peak horizontal ground acceleration of 50-100cm/s<sup>2</sup> has been recorded, with a 10% probability of this being exceeded at least once in a 50-year period (PRDW, 2019).

### **2.4.6 Critical Biodiversity Areas**

The site falls within a Critical Biodiversity Area (CBA 2). According to the NMBMM Bioregional Plan, CBAs include All Critically Endangered habitats, ecological process areas, ecological corridors, habitats for Species of Special Concern, and some Endangered, Vulnerable or Least Threatened habitats. Such areas must be managed for biodiversity conservation purposes and incorporated into the protected area system.



**SITE VERIFICATION REPORT: REHABILITATION OF THE OLD TUG JETTY SHEET PILE WALL AT THE PORT OF PORT ELIZABETH**

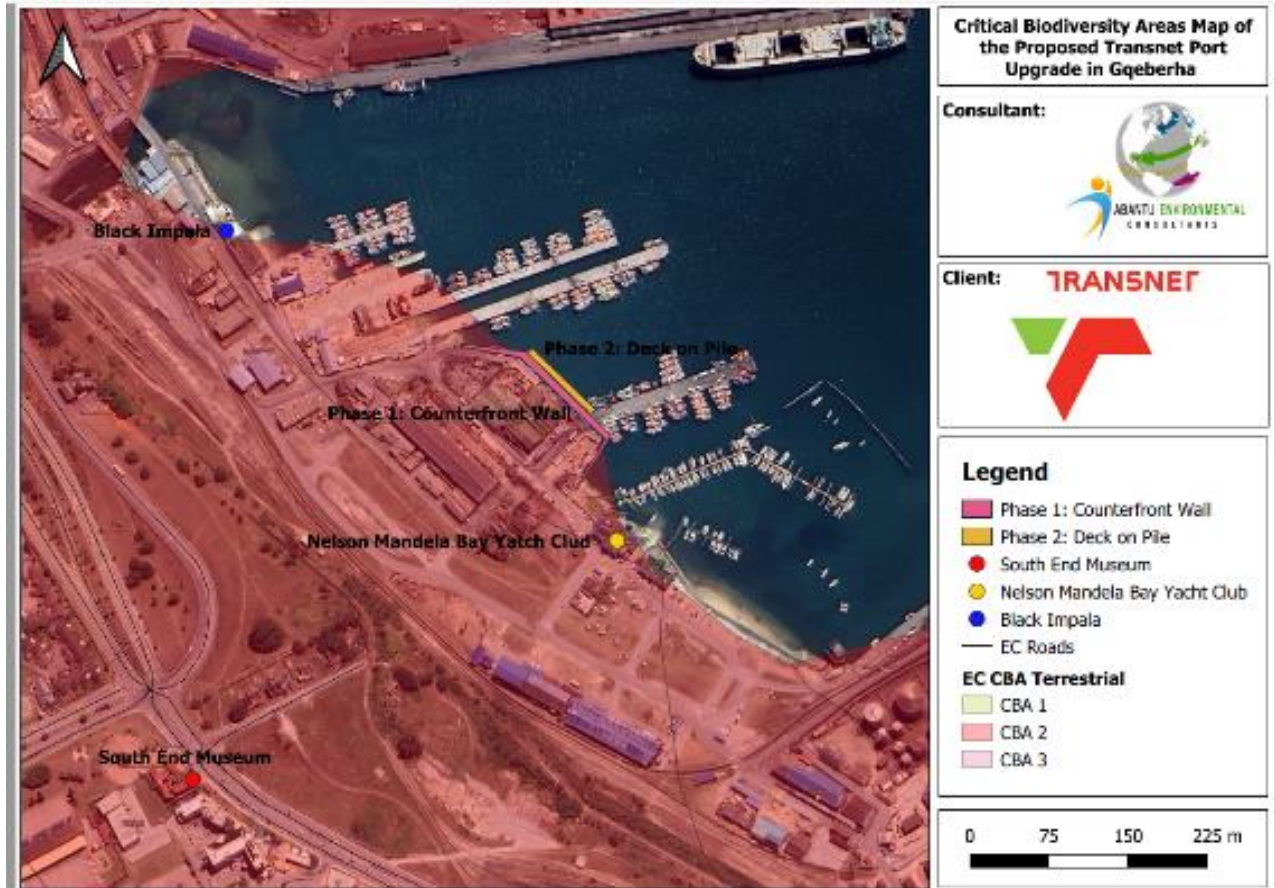


Figure 10: Critical Biodiversity Areas

**2.4.7 Vegetation and Ecosystems**

The rich diversity of the NMBM is partly attributed to the fact that it is an area of convergence of five of South Africa’s biomes: The Fynbos, Subtropical Thicket, Forest, Nama Karoo and Grassland biomes (Low & Rebelo, 1998). Such a juxtaposition of biomes within a Metropolitan Municipality is unparalleled in the world (Conservation International, 2009). There are no Critically Endangered Threatened Ecosystems in the municipality.

The NMBM Conservation Assessment identified a total of 58 vegetation types within the Municipal area. A high proportion of the vegetation types within the municipal area are threatened (twenty-three are Critically Endangered and a further ten are Endangered) and now face collapse unless efforts are made to ensure their persistence (Stewart et al., 2008).

The threatened status of these habitats is mirrored by the number of threatened species within the Municipal area – the Nelson Mandela Bay Municipality has the highest number of red listed species of all the Municipalities in the Eastern Cape (CSIR, 2004).

## SITE VERIFICATION REPORT: REHABILITATION OF THE OLD TUG JETTY SHEET PILE WALL AT THE PORT OF PORT ELIZABETH

The most threatened vegetation types within the NMBM area are Lowland Fynbos, Subtropical Thicket mosaic and Forest vegetation types. The Lowland Fynbos vegetation types in the NMBM area are predominantly grassy Fynbos systems. Due to the fact that much of the urban expanse of Port Elizabeth was developed on these ecosystems, they are also some of the most threatened vegetation types within the Municipal area. The most threatened Lowland Fynbos vegetation types within the municipal area are Critically Endangered Colleen Glen Grassy Fynbos, Lorraine Transitional Grassy Fynbos, Baakens Grassy Fynbos and Walmer Grassy Fynbos. Threatened plant species in these systems include South Africa's national flower, the king protea *Protea cynaroides* (Critically Endangered), *Cyclopia pubescens* (Critically Endangered) and *Brunsvigia litoralis* (Endangered). Pressures on the Lowland Fynbos within the NMBM area include invasion by alien vegetation, urban expansion, inappropriate fire regimes, habitat fragmentation and global climate change (Pierce-Cowling, 2009).

### 2.4.8 Faunal Species

Historically, the fauna of the study area matched the plant diversity. Large game, such as elephant, buffalo and lion, were all present. Leopard roamed the Baakens River valley until a century ago and hippopotamus frequented the major river systems. All the larger predator species have been exterminated and largest antelopes (kudu, bushbuck etc.) are now confined to nature conservation areas at the fringes of the metro. An exception to this trend is the continued occurrence of marine mammals along the coast. Nine species of whales, dolphins and seals are relatively common in the

area, albeit some only seasonally (Klages 2002). Most smaller mammals have persisted to this day, continuing in finding sufficient habitat on smallholdings and in the more rural parts of the NMBM. The metro boasts an impressive bird and reptile list, which is a reflection of the variety of vegetation types present.

The NMBM is situated at the eastern extreme of the Cape Floral Kingdom, which has been identified as one of the global biodiversity hotspots since it will be hit very hard by climate change. Drought, increased intensity and frequency of fire and climbing temperatures may well mean an untimely end to the fascinating diversity of flora and fauna in the municipal area.

The animal species sensitivity of the site is rated as medium sensitivity according to NWBEST as shown in **Figure 11**. Animals that are expected to occur in the area include:

- *Mammalia-Chlorotalpa duthieae*
- *Sensitive species 8*

## SITE VERIFICATION REPORT: REHABILITATION OF THE OLD TUG JETTY SHEET PILE WALL AT THE PORT OF PORT ELIZABETH

- *Invertebrate-Aneuryphymus montanus*

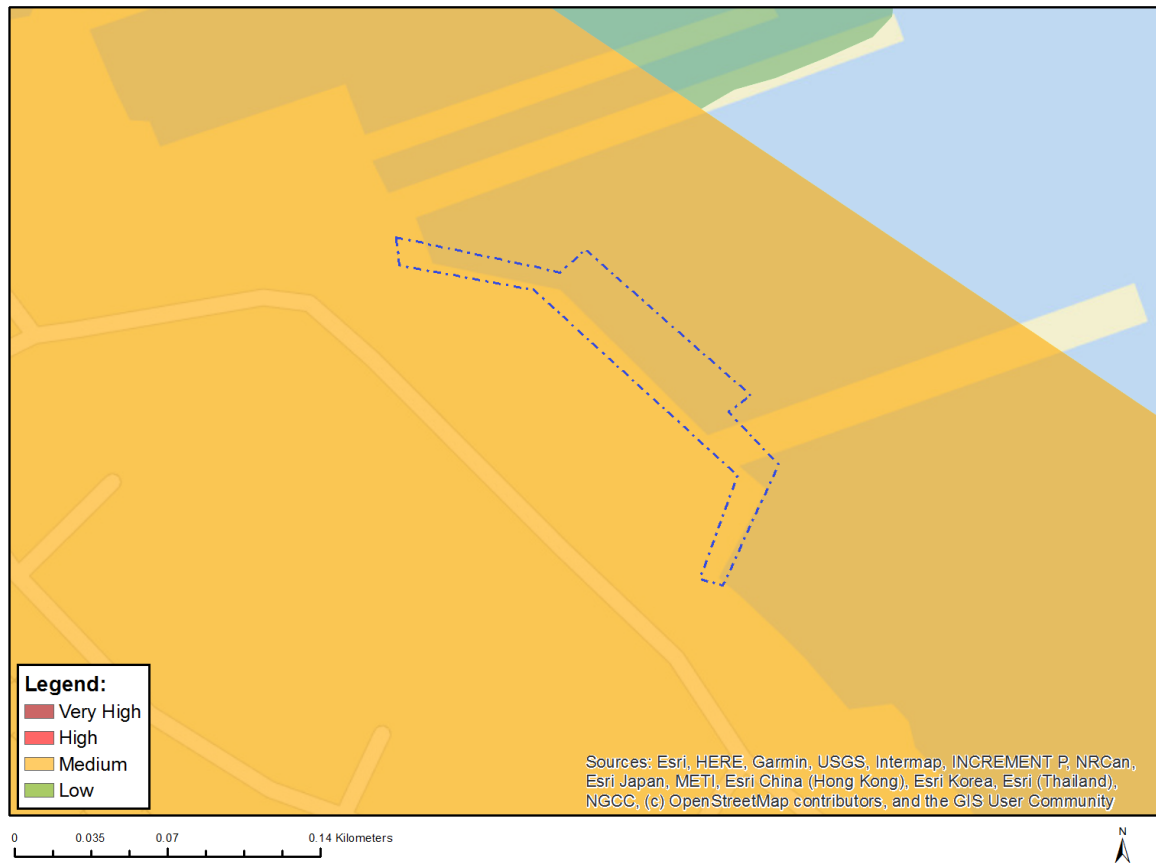


Figure 11: Animal Species sensitivity

### 2.4.9 Protected Areas

The existing network of conservation areas within the NMBM area totals approximately 10,500 ha, or approximately 5 % of the municipal area. Of this, 4,700 ha (2 % of the municipal area) is recognised as protected areas in terms of the National Environmental Management: Protected Areas Act 2003 (Act No. 57 of 2003). The remaining conservation areas (approximately 5,800 ha in extent) have weak legal protection and are not necessarily managed for biodiversity conservation purposes. The Protected Area system of the NMBM is supported by the proximity of mega reserves in the Kouga (Baviaans Wilderness Area) and Sundays River Valley (Greater Addo National Park) and the NMBM Moss plays a vital role in connectivity between the systems.

The current protected area system in the Municipal area is therefore highly deficient, particularly in terms of its limited size and connectivity, and urgently requires expansion in order to achieve biodiversity targets (SRK Consulting, 2010). Due to the extent of remaining natural habitat, the NMBM is unique amongst the



**SITE VERIFICATION REPORT: REHABILITATION OF THE OLD TUG JETTY SHEET PILE WALL AT THE PORT OF PORT ELIZABETH**

Metropolitan Municipalities in terms of opportunities for expanding the protected area network to the benefit of biodiversity as well as its people. As illustrated in **Figure 13**, the site is located within 5km of a formal protected area.

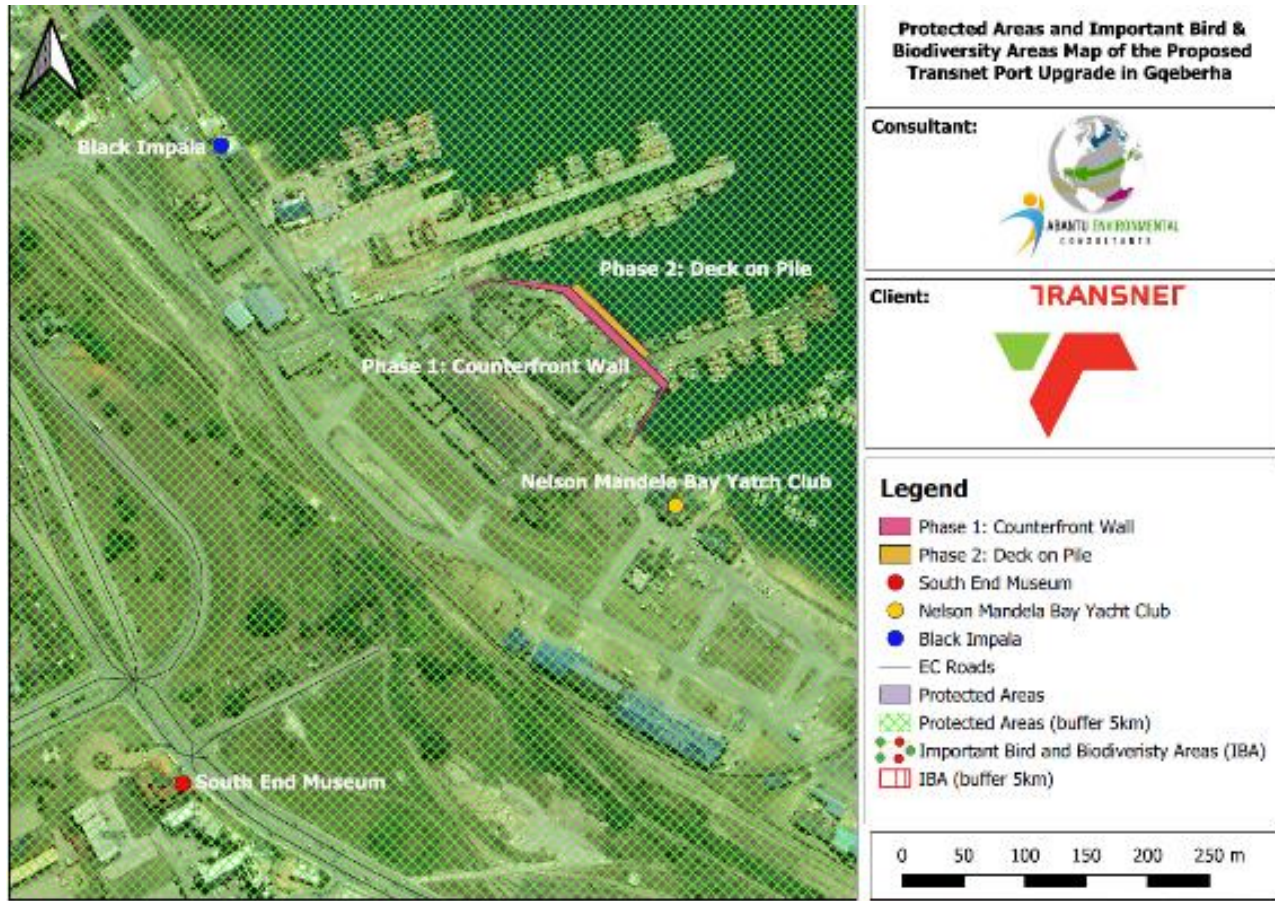


Figure 12: Protected Areas

**SITE VERIFICATION REPORT: REHABILITATION OF THE OLD TUG JETTY SHEET PILE WALL AT THE PORT OF PORT ELIZABETH**

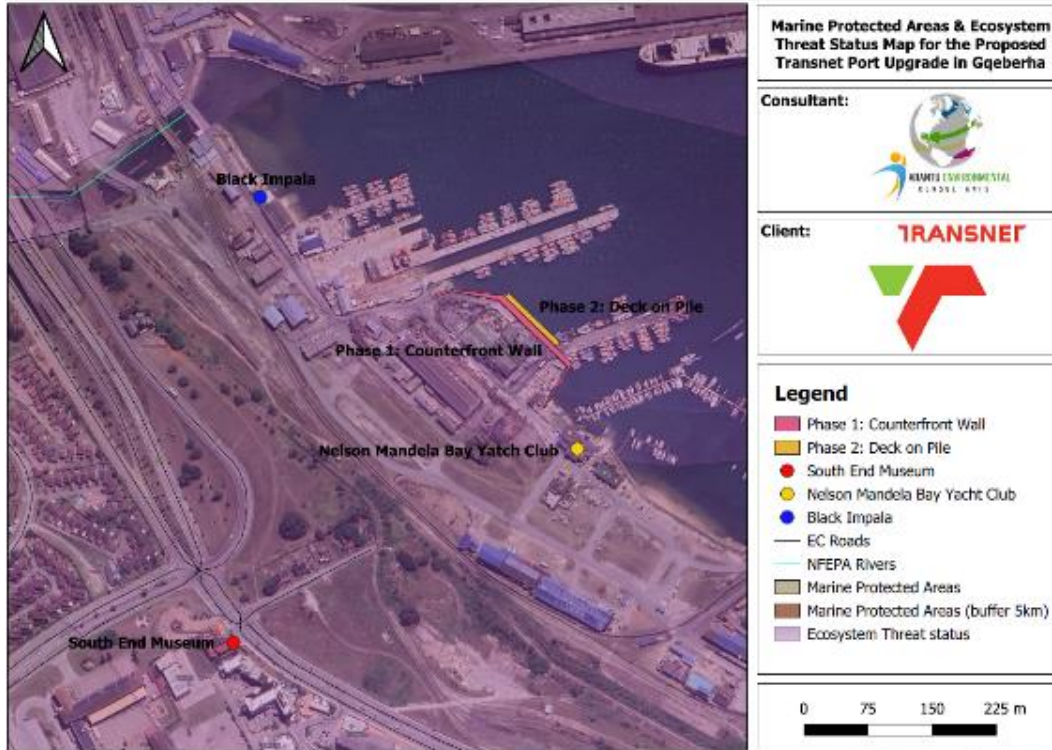


Figure 13: Marine Protected Area

2.4.10 Palaeontology

According to the SAHRIS Palaeontological sensitivity map, the site is located in a area of very high sensitivity (Figure 14) and requires a field assessment and a protocol for finds.



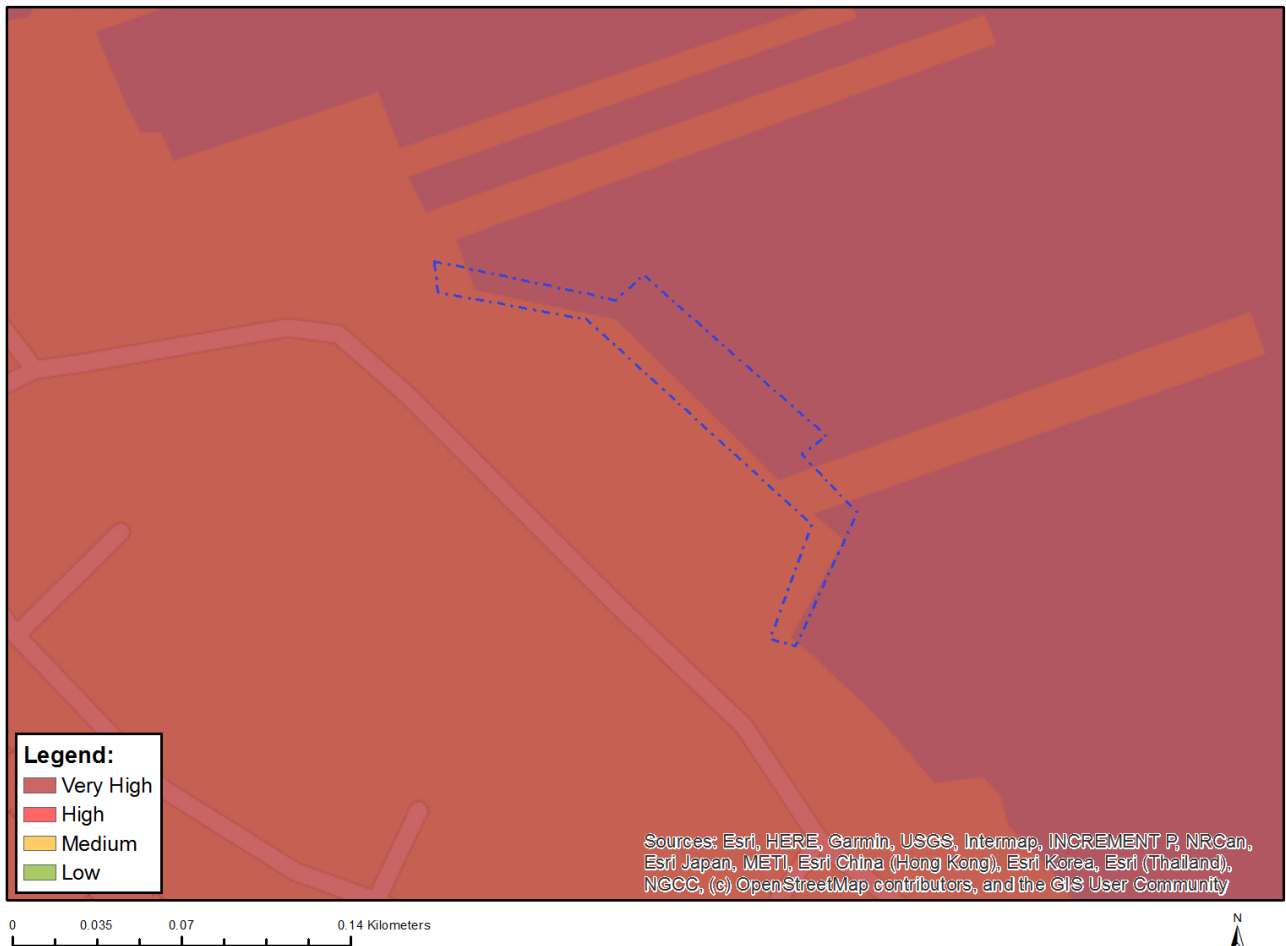
Figure 14: Palaeontological sensitivity



# SITE VERIFICATION REPORT: REHABILITATION OF THE OLD TUG JETTY SHEET PILE WALL AT THE PORT OF PORT ELIZABETH

## 2.4.11 Archaeology and Heritage Resources

According to the screening tool report generated from the National Web Based Environmental Screening Tool, the archaeological sensitivity of the site is very high because it is located within 2km of a Grade II Heritage Site.



## 2.5 SITE ANALYSIS OF SITE

An environmental scoping site visit was undertaken on 04 August 2022. The purpose of this site visit was to gather enough information to develop a complete, comprehensive understanding of the project. This preliminary assessment forms the basis against which the EIA will be conducted. From the site verification conducted, it is apparent that the site and the broader receiving environment is transformed due to existing developments and operational activities since the 1970s in the area thus it is not anticipated that the project

## SITE VERIFICATION REPORT: REHABILITATION OF THE OLD TUG JETTY SHEET PILE WALL AT THE PORT OF PORT ELIZABETH

will result with significant negative residual impacts after mitigation. Please refer to **Figure 15** to **Figure 19** for a detailed illustration of the proposed project area and associated landscape.



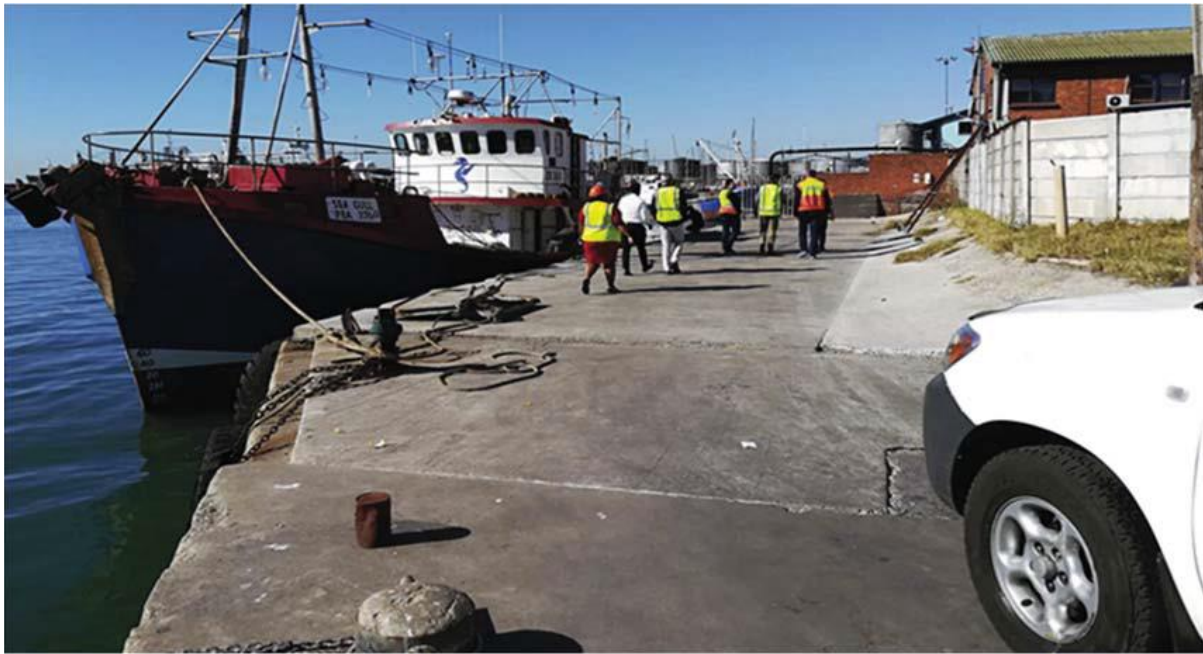
**Figure 15.** Old Tug Jetty Sheet Pile Wall Layout



**Figure 16:** Old Tug Jetty Sheet Pile Wall



**SITE VERIFICATION REPORT: REHABILITATION OF THE OLD TUG JETTY SHEET PILE WALL AT THE PORT OF PORT ELIZABETH**

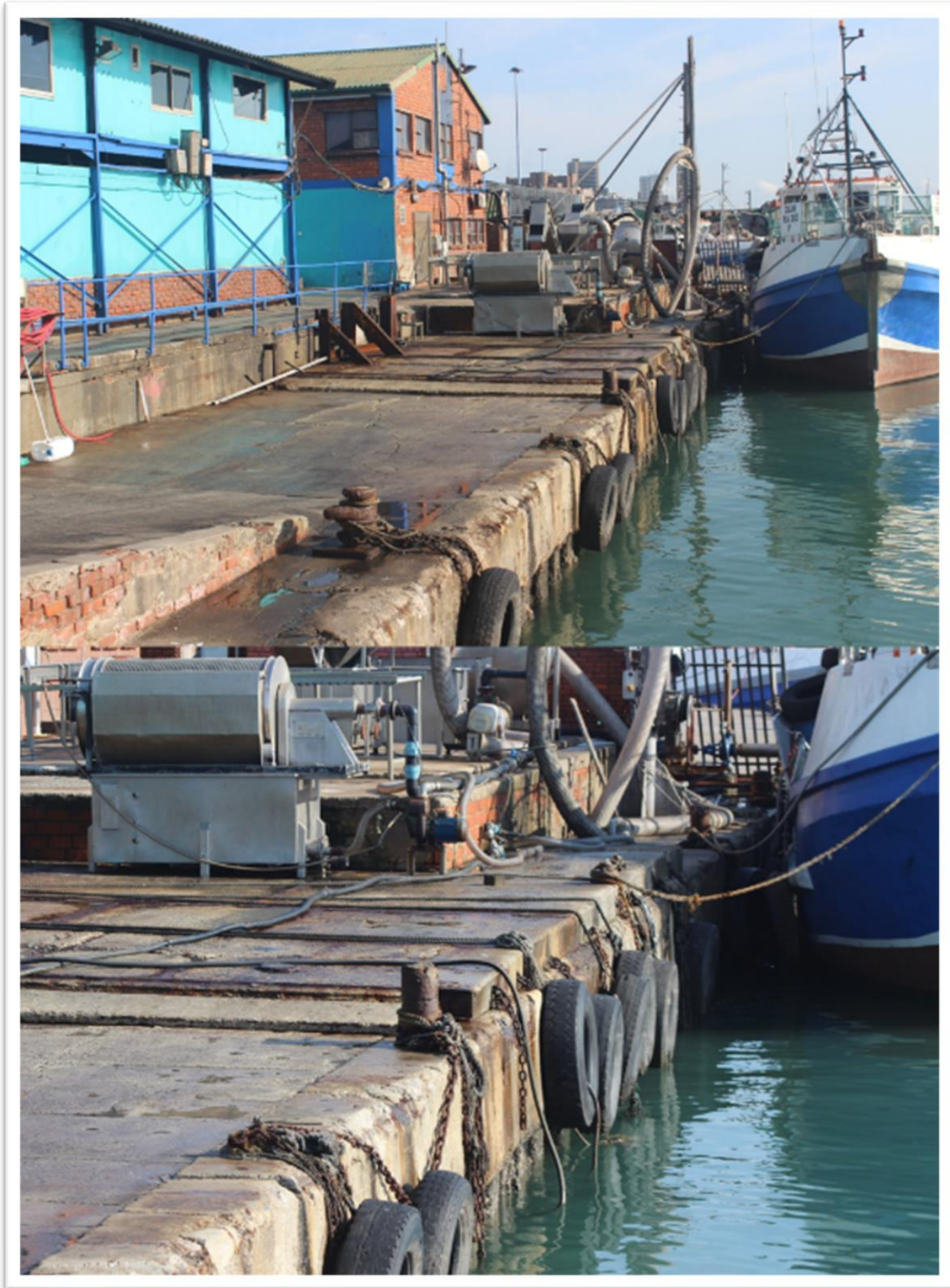


**Figure 17:** Northern side of the Old Tug Jetty sheet pile wall



**Figure 18:** Southern side of the Old Tug Jetty sheet pile wall

**SITE VERIFICATION REPORT: REHABILITATION OF THE OLD TUG JETTY SHEET PILE WALL AT THE PORT OF PORT ELIZABETH**



**Figure 19.** Closeup view of Old Tug Jetty sheet pile wall

Based on the observed conditions on site, provides a motivation of the verified or different use of land and environmental sensitivity.



### 3. DISCUSSION OF IDENTIFIED SPECIALIST ASSESSMENTS

This section entails the motivation for identified specialist assessments.

Table 3: Site Sensitivity Verification

Theme	Sensitivity	Motivation or verification of land use and environmental sensitivity
<b>Agriculture</b>		
<b><u>Agricultural theme:</u> No sensitivity rating assigned</b>	The National Web Based Environmental Screening Tool Report did not assign a sensitivity rating for the agricultural theme.	From what has been observed on site, it is confirmed that most of the application area has very low potential for cultivation of plants due to existing development that would hinder that land use. The site is currently used as a Port and is highly transformed.
<b>Biodiversity</b>		
<b><u>Animal species theme:</u> Medium sensitivity</b>	According to the National Web Based Environmental Screening Tool (NWBEST), the animal species sensitivity of the application area is rated as medium.	A few bird species were recorded on site during the site verification, it is likely that these species are present in the surrounding environment. Mitigation measures will be put in place to minimize impact on animal species during construction and impact on the surrounding habitat will be kept minimal, it is not foreseen that the low impact on faunal species will continue post construction phase. Due to the location of the proposed project in a marine environment, a Marine faunal impact assessment will be undertaken.
<b><u>Aquatic Biodiversity theme:</u> Low</b>	The NWBEST has characterised the aquatic sensitivity of the project area as "low".	During the site visit, it was confirmed that the project inherently takes place in the sea and within the regulated area of a watercourse. However, due to the highly transformed nature of the site, the low sensitivity in terms of aquatic biodiversity is confirmed.
<b><u>Plant Species &amp; Terrestrial Biodiversity theme:</u> Low sensitivity</b>	According to the Screening Tool, the sites have low sensitivity for plant species and terrestrial biodiversity.	The site verification confirmed that there is no terrestrial vegetation present in the project area. Thus, the sensitivity rating provided in the screening tool report is confirmed. No botanical or terrestrial biodiversity specialist study will be undertaken in the EIA phase.
<b>Heritage</b>		



**SITE VERIFICATION REPORT: REHABILITATION OF THE OLD TUG JETTY SHEET PILE WALL AT THE PORT OF PORT ELIZABETH**

<b>Theme</b>	<b>Sensitivity</b>	<b>Motivation or verification of land use and environmental sensitivity</b>
<b><u>Archaeological and Cultural Heritage Theme:</u></b> <b>Very High sensitivity.</b>	The NWBEST has characterised the archaeology and cultural heritage sensitivity of the site as <b>“Very High”</b>	Due to the presence of a Grade II Heritage site within 2 km of the site, the very high sensitivity rating shows. However, the site is very far from the heritage resource and the structure is less than 60 years hence exempt from any heritage impact assessment.
<b><u>Palaeontology theme:</u></b> <b>Very High sensitivity</b>	The NWBEST characterised the palaeontological sensitivity of the site and surrounding environment as <b>“Very High”</b>	This rating is consistent with the finding from the South African Heritage Resources Agency Palaeontology map for the area. A specialist has been appointed to conduct a Palaeontological Impact assessment.
<b>Other</b>		
<b><u>Civil aviation theme:</u></b> <b>Very High sensitivity</b>	According to the DFFE Screening Tool, the site has a very high sensitivity to civil aviation.	The proposed site falls between 8 and 15 km of other civil aviation aerodrome and within 5 km of an air traffic control or navigation site. However, it is not envisaged that the proposed works would extend beyond a 1km radius of the application area in terms of physical disturbance. No high-flying equipment such as drones will be operated during construction and therefore no specialist assessment for civil aviation is recommended.
<b><u>Defence theme:</u></b> <b>Very High</b>	According to the NWBEST, the site has assigned a very high sensitivity for defence.	It is noted that the site is located near Military and Defence Site. However, it is recommended that <b>no</b> assessment for defence is required for this application due to the fact that these land uses are already taking place in the Port without disturbance from the existing construction activities.

#### **4. CONCLUSION OF SITE SENSITIVITY VERIFICATION REPORT**

A number of potentially significant issues have been highlighted for further investigation in order to assess their significance, and to determine the need for the implementation of mitigation measures in order for the overall project to be environmentally sustainable. It is, therefore, recommended that additional, comprehensive studies be conducted for the proposed project in the EIA Phase with only the following specialist studies:

**SITE VERIFICATION REPORT: REHABILITATION OF THE OLD TUG JETTY SHEET PILE WALL AT THE PORT OF PORT ELIZABETH**

- Paleontology Impact Assessment
- Marine Biodiversity Impact Assessment
- Geotechnical Assessment
- Socio-Economic Assessment
- Marine Sediment Quality Assessment
- Marine Water Quality Assessment

Abantu Environmental Consultants recommends that the Scoping Report be approved by the competent authority, and that permission be granted to continue with the EIA Phase of the process.

The following specialist assessment have been deemed not necessary (either by motivation or as confirmed by the responsible authority):

- Archaeological and Cultural Heritage Impact Assessment
- Terrestrial Biodiversity Impact Assessment
- Plant Species Assessment