



CEN INTEGRATED ENVIRONMENTAL MANAGEMENT UNIT

Environmental and Rural Development Specialist

FINAL BASIC ASSESSMENT REPORT:

**Bayhead and Langeberg Road Upgrades,
Port of Durban,
eThekweni Metropolitan Municipality,
KwaZulu Natal**

**DFFE REFERENCE NO:
14/12/16/3/3/1/3289**

17 July 2026

Project Title:

FINAL Basic Assessment Report:

Bayhead and Langeberg Road Upgrades, Port of Durban,
eThekweni Metropolitan Municipality, KwaZulu Natal

Project Applicant:

Transnet SOC Limited

DFFE Reference Number:

14/12/16/3/3/1/3289

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Date of Report:

17 July 2026

REVISIONS TO THE BASIC ASSESSMENT REPORT

Version	Date	Comment
1	16-04-2026	Draft Basic Assessment Report for Public Participation
2	17-07-2026	FINAL Basic Assessment Report for Decision Making / Authority Review Additions and changes are indicated in red.

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LIST OF ABBREVIATIONS

Abbreviation	Definition
AOI	Area Of Impact
approx.	approximately
BA	Basic Assessment
BAR	Basic Assessment Report
BOP LAP	Back of Port Interface Local Area Plan
BRAOG	Bitumen Rubber Asphalt Open Grade
CA	Competent Authority
CBA	Critical Biodiversity Areas
CEN IEM Unit	CEN Integrated Environmental Management Unit
CR	Critically Endangered
D'MOSS	Durban Metropolitan Open Space System
DCT	Durban Container Terminal
DFFE	Department of Forestry, Fisheries and the Environment
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EFZ	Estuarine Functional Zone
EIA	Environmental Impact Assessment
EIS	Ecological Importance & Sensitivity
EMPr	Environmental Management Programme
EN	Endangered
ETA	eThekweni Transport Authority
GDP	Gross Domestic Product
GN	Government Notice
GVA	Gross Value Added
HIA	Heritage Impact Assessment
I&APs	Interested and Affected Parties
IDP	Integrated Development Plan
KBAs	Key Biodiversity Areas
km	kilometer
LCAs	Landscape Character Areas
m	meter
m ²	square meter
m ³	cubic meter
NEMA	National Environmental Management Act
NEMBA	National Environmental Management: Biodiversity Act
NFEPA	National Freshwater Ecosystem Priority Areas
NP	Not Protected
NWA	National Water Act
PES	Present Ecological State
SAHRIS	South African Heritage Resources Information System
SANBI	South African National Biodiversity Institute

SANS	South African National Standards
SCC	Species of Conservation Concern
SDF	Spatial Development Framework
SEI	Site Ecological Importance
SPB	Strategic Planning Branch
TNPA	Transnet National Ports Authority

EXECUTIVE SUMMARY

Introduction

Transnet SOC Limited (Transnet) is proposing to upgrade the Bayhead and Langeberg Roads located within the Port of Durban, within Ward 32 of the eThekweni Metropolitan Municipality, KwaZulu Natal. The project involves the upgrade and widening of Bayhead and Langeberg Roads to improve the accommodation of port vehicle traffic. As part of the overall upgrading of the two roads, modification to five bridges (rail and canals), stormwater management enhancements, and modification to the existing canal upstream of Bridge 3-6 were identified for upgrading.

The proposed activities (upgrading of roads, bridges and stormwater management infrastructure) trigger activities listed in the National Environmental Management Act (Act 107 of 1998) (NEMA), for which authorisation is required. In terms of the NEMA activities, a Basic Assessment (BA) process is required, as described in the NEMA Environmental Impact Assessment (EIA) Regulations, 2014 (as amended). The Department of Forestry, Fisheries and the Environment (DFFE) is the competent authority. CEN Integrated Environmental Management (CEN IEM) Unit has been appointed as the independent Environmental Assessment Practitioner (EAP), supported by a multidisciplinary specialist team.

An application for an Environmental Authorisation for the EIA listed activities (triggered in terms of NEMA) was submitted to the DFFE together with the Draft BA Report (BAR) on 17 April 2026. As a result no DFFE reference number was available at the Draft BAR review stage. The DFFE reference number is 14/12/16/3/3/1/3289.

Description of Proposed Project

Proposed Upgrades: The project involves the upgrade and widening of Bayhead and Langeberg Roads to improve the accommodation of port vehicle traffic, as follows:

- Widening existing carriageways by one lane in each direction. The following is being considered for the road widening:
 - to widen both sides of the roads by a minimum of 4m either side, or
 - use the centre median, or
 - a combination of centre median usage and widening to obtain the necessary traffic layout configuration.

- Modification to five bridges (rail and canals) for lane extension and structural integrity.
 - Proposed works include deck widening, cantilevered extensions, and vertical substructure adjustments to accommodate revised road geometry, traffic capacity, and integrated services, with substructures tied into existing foundations to maintain vertical and longitudinal stability.
- Stormwater management enhancements, including improved drainage systems and designated discharge points.
 - Stormwater pipe size will be 375mm diameter for drainage systems.
 - Upgrade of discharge stormwater pipe into Bayhead Canal with minimum 450mm diameter and fitted tidal valves.
 - Additional stormwater pipes may be included to service the widening sections.
- Modification and expansion of Bayhead Canal at the Bayhead Canal Bridge (Bridge 3-6):
 - Potential modification of the existing canal upstream of Bayhead Canal Bridge (Bridge 3-6), to splay the abutments and repair to erosion.
 - Expansion of the existing culvert with an additional 3.4m x 7m culvert and associated widening of upstream and downstream of canal.

Relocation of Sewer Rising Main: The route of the existing sewer rising main (0.45m diameter) along Bayhead Road would be relocated to the outgoing road verge over a length of approximately 1,655m. The proposed sewer rising main would remain at a 0.45m diameter pipeline.

Alternatives

The proposed activities are property and location specific with no feasible or reasonable site alternatives as the upgrades relate to the existing Bayhead and Langeberg Roads.

No feasible or reasonable activity alternatives were identified for consideration as the proposed activity for the road upgrades will not change the existing land use. The activity requires the upgrading of the existing Bayhead and Langeberg Roads located within the Port of Durban.

The road layout has taken into consideration the recommended no-go areas and these no-go areas would not be affected. The stormwater system has been designed in accordance with national and local guidelines, considering peak flow estimates, catchment characteristics, and allowable discharge criteria. Both hydrological and hydraulic analyses were undertaken to ensure efficient conveyance, minimise flooding risk, and protect downstream infrastructure. As a result, no additional alternatives for the stormwater system were identified for consideration.

No feasible or reasonable technology alternatives were identified for consideration. Construction and upgrading of the roads, bridges and associated infrastructure will be undertaken by the conventional methods and will be undertaken in situ.

No feasible or reasonable operational alternatives were identified for consideration. The roads, bridges and stormwater infrastructure would require long term maintenance and clearing of any waste or debris.

The “No-Go” Alternative entails that the proposed roads are not upgraded, i.e. the *status quo* remains. The existing roads require repairs that may potentially lead to road failures and would not be able to accommodate an increase in stormwater flow thereby the associated safety and transportation risks will remain.

Environmental Impact Statement and Reasoned Opinion

Overall the footprint for the upgrading of the Bayhead Langeberg Roads is considered to be of low sensitivity, however certain sections adjacent to the roads are considered to be of medium sensitivity. As a result, the following no-go areas have been recommended:

1. The impacts to the medium sensitivity faunal habitat be avoided and that impacts be confined to the road upgrade footprint only.
2. Any areas not yet infilled in the EFZ and the estuarine wetlands.

The assessment of the impacts indicated that the significance of potential impacts associated with the proposed upgrading of the roads are of a medium or low negative significance and these can be mitigated to low or very low negative significance if the mitigation measures identified and included in the EMP are implemented. No impacts were assessed as very high or high negative significance without mitigation. Positive impacts relate to visual impacts, traffic impacts, socio-economic impacts for transport and logistic efficiencies improvements into and from the Port, employment, income generation, and skills development, traffic safety and convenience improvement, economic multiplier impacts and climate change impacts.

The specialists collectively recommend that the project proceed, subject to the implementation of targeted mitigation and management measures.

The EAP is of the opinion that the proposed upgrading of the Bayhead and Langeberg Roads should be authorized, as per the Preferred Alternative.

Public Participation Process

The Draft BAR was available to I&APs, stakeholders and Organs of State / State Departments for a 30-day review period, from 20 April to 22 May 2026 (excluding public holidays).

Way Forward

The Draft Basic Assessment Report has been updated to the Final Basic Assessment Report, with inclusion of comments received during the public participation review period of the Draft Basic Assessment Report.

The Final Basic Assessment Report will be submitted to the DFFE for review for decision-making.

Chapter 1: INTRODUCTION

1.1 Background

Transnet SOC Limited (Transnet) is proposing to upgrade the Bayhead and Langeberg Roads located within the Port of Durban, within Ward 32 of the eThekweni Metropolitan Municipality, KwaZulu Natal. The project involves the upgrade and widening of Bayhead and Langeberg Roads to improve the accommodation of port vehicle traffic. As part of the overall upgrading of the two roads, modification to five bridges (rail and canals), stormwater management enhancements, and modification to the existing canal upstream of Bridge 3-6 were identified for upgrading.

The proposed activities (upgrading of roads, bridges and stormwater management infrastructure) trigger activities listed in the National Environmental Management Act (Act 107 of 1998) (NEMA), for which authorisation is required. In terms of the NEMA activities, a Basic Assessment (BA) process is required, as described in the NEMA Environmental Impact Assessment (EIA) Regulations, 2014 (as amended). The proposed activities are further unpacked in Chapter 2.

1.2 Environmental Authority

In terms of section 24C of NEMA, the relevant environmental authority is the National Department of Forestry, Fisheries and the Environment (DFFE) due to the applicant, Transnet, being a state-owned company.

A request for a pre-application meeting was submitted to the DFFE on 7 May 2025 to confirm EIA activities triggered, specialist studies required and to obtain initial comments from the competent authority (CA). A response was received on 12 May 2025 indicating that a pre-application meeting was not required and advising to proceed with the Environmental Authorisation (EA) application. Refer to **Appendix A** for correspondence by DFFE.

An application for an EA for the EIA listed activities (triggered in terms of NEMA) **was** submitted to the DFFE together with the Draft BA Report (BAR) **on 17 April 2026**. As a result no DFFE reference number **was** available at **the Draft BAR review** stage. The DFFE reference number **is 14/12/16/3/3/1/3289**.

1.3 Applicant

The Applicant is the Transnet SOC Limited (Transnet) and represented by Mr Johnny Mokheseng.

The Applicant (Transnet) is the landowner and the person in control of the land is represented by Nkumbuzi Ben-Mazwi.

1.4 Environmental Assessment Practitioner

CEN Integrated Environmental Management Unit (CEN IEM Unit) was appointed by LA Consulting Engineers on behalf of Transnet as the independent Environmental Assessment Practitioner (EAP) to undertake the EIA process for the proposed upgrading of Bayhead and Langeberg Roads. **Table 1-1** provides the EAP's details.

Table 1-1: EAP Details

EAP company:	CEN IEM Unit
Project EAP	Mrs Lucille Behrens
Professional Registration	Registered EAP with EAPASA, 2016/38
Years of Experience	20
Assisting Candidate EAP	Ms Jemma Abigail Booysen
Professional Registration	Candidate EAP with EAPASA, 2024/9015
Years of Experience	2

Refer to **Appendix B** for the EAP's *Curriculum Vitae* and declaration forms.

1.5 Specialists

Table 1-2 provides the specialists which formed part of the project team.

Table 1-2: Specialist Team

Specialist Study	Company	Specialist	Registration
Terrestrial Biodiversity including Plant & Animal Species	Verdant Environmental	Ryan Edwards	SACNASP Pr. Sci. Nat. No. 400089/13
		David Styles	SACNASP Pr. Sci. Nat. No. 120066
		James Harvey	SACNASP Pr. Sci. Nat. No. 118661/17
		Juliette Lagesse	SACNASP Cand. Sci. Nat. No. 122969
Aquatic Biodiversity	Verdant Environmental	Ryan Edwards	SACNASP Pr. Sci. Nat. No. 400089/13
		Juliette Lagesse	SACNASP Cand. Sci. Nat. No. 122969
		Darrin McIntyre	N/A
Heritage, Archaeology & Palaeontology	CTS Heritage	Mabeth Crafford Jenna Lavin	ASAPA N/A
	Architectural Heritage Consultant	Kirk White	SACAP Pr. 5687
Traffic	Fulcrum Development Consultants	Mohammed Kajee	N/A
Landscape / Visual	Afzelia Environmental Consultants & Environmental Planning and Design	Jonathan Marshall	SACLAP
Noise	Acoustech Consulting (Pty)	Oliver Knoppersen	AMIOA

Specialist Study	Company	Specialist	Registration
	Ltd	Duduzile Skhosana	N/A
Geotechnical	Drennan Maud (Pty) Ltd	K. Gordon	SACNASP Pr. Sci. Nat. No. 401430/83
Socio-economic	Social Risk Research (Pty) Ltd	Eugene de Beer	ESSA / SAPI

1.6 Purpose of this Report

The main purpose of this BAR is to:

- Describe the proposed activity and nature of the receiving environment in sufficient detail to allow the reader to make an informed decision on the suitability of the project proposal.
- Present a summary of the findings of the specialist studies.
- Consider and assess project alternatives in terms of environmental sensitivity, social and economic feasibility.
- Evaluate significant impacts that were identified.
- Obtain comments from Interested and Affected Parties (I&APs) on the proposed development.
- Provide recommendations on how the project can be implemented in a way that minimises the negative and maximises the positive impacts.

1.7 Structure of this Report

The BAR includes information as required in Appendix 1 of the EIA Regulations, 2014 as amended. The structure of the BAR is presented in **Table 1-3**.

Table 1-3: Structure of Report in terms of Appendix 1, EIA Regulations 2014 as amended

Content Requirement for Basic Assessment Reports (Appendix 1 of the EIA Regulations, 2014, as amended)	Relevant Section in this Basic Assessment Report
3 (1) A basic assessment report must contain the information that is necessary for the competent authority to consider and come to a decision on the application, and must include:	
(a) details of— (i) the EAP who prepared the report; and (ii) the expertise of the EAP, including a curriculum vitae	Chapter 1 & Appendix B
(b) the location of the activity, including (i) the 21 digit Surveyor General code of each cadastral land parcel; (ii) where available, the physical address and farm name; (iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties	Chapter 2
(c) a plan which locates the proposed activity or activities applied for as well as associated structures and infrastructure at an appropriate scale; (i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or (ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken	Chapter 2 & Appendix C
(d) a description of the scope of the proposed activity, including— (i) all listed and specified activities triggered and being applied for; and (ii) a description of the activities to be undertaken including associated structures and infrastructure	Chapter 2 & Chapter 3
(e) a description of the policy and legislative context within which the development	Chapter 3

Content Requirement for Basic Assessment Reports (Appendix 1 of the EIA Regulations, 2014, as amended)	Relevant Section in this Basic Assessment Report
is proposed including— (i) an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report; and (ii) how the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks, and instruments	
(f) a motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location	Chapter 2
(g) a motivation for the preferred site, activity and technology alternative	Chapter 4
(h) a full description of the process followed to reach the proposed preferred alternative within the site, including— (i) details of all the alternatives considered; (ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs; (iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them; (iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; (v) the impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts— (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated; (vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives; (vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; (viii) the possible mitigation measures that could be applied and level of residual risk; (ix) the outcome of the site selection matrix; (x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and (xi) a concluding statement indicating the preferred alternatives, including preferred location of the activity	Chapter 4, 5, 6, 8
(i) a full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity, including— (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process; and (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures	Chapter 5, 6, 7
(j) an assessment of each identified potentially significant impact and risk, including— (i) cumulative impacts; (ii) the nature, significance and consequences of the impact and risk; (iii) the extent and duration of the impact and risk;	Chapter 7

Content Requirement for Basic Assessment Reports (Appendix 1 of the EIA Regulations, 2014, as amended)	Relevant Section in this Basic Assessment Report
(iv) the probability of the impact and risk occurring; (v) the degree to which the impact and risk can be reversed; (vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and (vii) the degree to which the impact and risk can be avoided, managed or mitigated	
(k) where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final report;	Chapter 7
(l) an environmental impact statement which contains— (i) a summary of the key findings of the environmental impact assessment; (ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and (iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives	Chapter 9
(m) based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed impact management outcomes for the development for inclusion in the EMPr	Chapter 7, Appendix N
(n) any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation	Chapter 9
(o) a description of any assumptions, uncertainties, and gaps in knowledge which relate to the assessment and mitigation measures proposed	Chapter 5
(p) a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation	Chapter 9
(q) where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required, the date on which the activity will be concluded, and the post construction monitoring requirements finalised	Chapter 7, 9
(r) an undertaking under oath or affirmation by the EAP in relation to— (i) the correctness of the information provided in the reports; (ii) the inclusion of comments and inputs from stakeholders and I&APs; (iii) the inclusion of inputs and recommendations from the specialist reports where relevant; and (iv) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties; and	Chapter 5, Appendix B
(s) where applicable, details of any financial provision for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts	N/A

Chapter 2: DESCRIPTION OF PROPOSED PROJECT

2.1 Upgrading of Bayhead and Langeberg Roads

Transnet is proposing to upgrade the Bayhead and Langeberg Roads located within the Port of Durban. The roads are currently experiencing slow moving traffic and congestion of vehicles.

The Bayhead Road is approximately 3.1 kilometres (km) in length and accommodates two (2) lanes inbound and two (2) lanes outbound. The Bayhead Road forms part of the Road Over Rail Bridge (Bridge 2-5) at the intersection of Bayhead and South Coast Roads and falls outside of the Port of Durban's port limits (approximately 115 metres). In the vicinity of the Amanzimnyama Canal Bridge (Bridge 5-8), approximately 115 metres (m) of the proposed widening of the Bayhead Road will fall outside of the port limits but still within Transnet land. The remainder of the Bayhead Road is located within the port limits; and approximately 890m of the Bayhead Road is located adjacent to the port limits.

The Langeberg Road is approximately 1.75km in length and consists of four (4) lanes, two (2) outbound and two (2) inbound. The entire road is located within the port limits.

The proposed project involves the following:

Classification of Roads: The Bayhead and Langeberg Roads are classified as private roads and are managed by the Port of Durban under Transnet National Ports Authority (TNPA). The roads are not open to unrestricted public use but serve port operations and controlled traffic.

Proposed Upgrades: The project involves the upgrade and widening of Bayhead and Langeberg Roads to improve the accommodation of port vehicle traffic, as follows:

- Widening existing carriageways by one lane in each direction. The following is being considered for the road widening:
 - to widen both sides of the roads by a minimum of 4m either side, or
 - use the centre median, or
 - a combination of centre median usage and widening to obtain the necessary traffic layout configuration.
- Modification to five bridges (rail and canals) for lane extension and structural integrity.
 - Proposed works include deck widening, cantilevered extensions, and vertical substructure adjustments to accommodate revised road geometry, traffic capacity, and integrated services, with substructures tied into existing foundations to maintain vertical and longitudinal stability.
- Stormwater management enhancements, including improved drainage systems and designated discharge points.

- Stormwater pipe size will be 375mm diameter for drainage systems.
- Upgrade of discharge stormwater pipe into Bayhead Canal with minimum 450mm diameter and fitted tidal valves.
- Additional stormwater pipes may be included to service the widening sections.
- Modification and expansion of Bayhead Canal at the Bayhead Canal Bridge (Bridge 3-6):
 - Potential modification of the existing canal upstream of Bayhead Canal Bridge (Bridge 3-6), to splay the abutments and repair to erosion.
 - Expansion of the existing culvert with an additional 3.4m x 7m culvert and associated widening of upstream and downstream of canal.

Relocation of Sewer Rising Main: The route of the existing sewer rising main (0.45m diameter) along Bayhead Road would be relocated to the outgoing road verge over a length of approximately 1,655m. The proposed sewer rising main would remain at a 0.45m diameter pipeline.

2.2 Locality and Property Details

The Bayhead and Langeberg Roads are located in the Port of Durban, within Ward 32 of the eThekweni Metropolitan Municipality, KwaZulu Natal. Refer to **Figure 2-1** and **Figure 2-2** for the locality maps.

Table 2-1 presents the locality and property details of the site and **Table 2-2** presents the geographical co-ordinates of infrastructure upgrades.

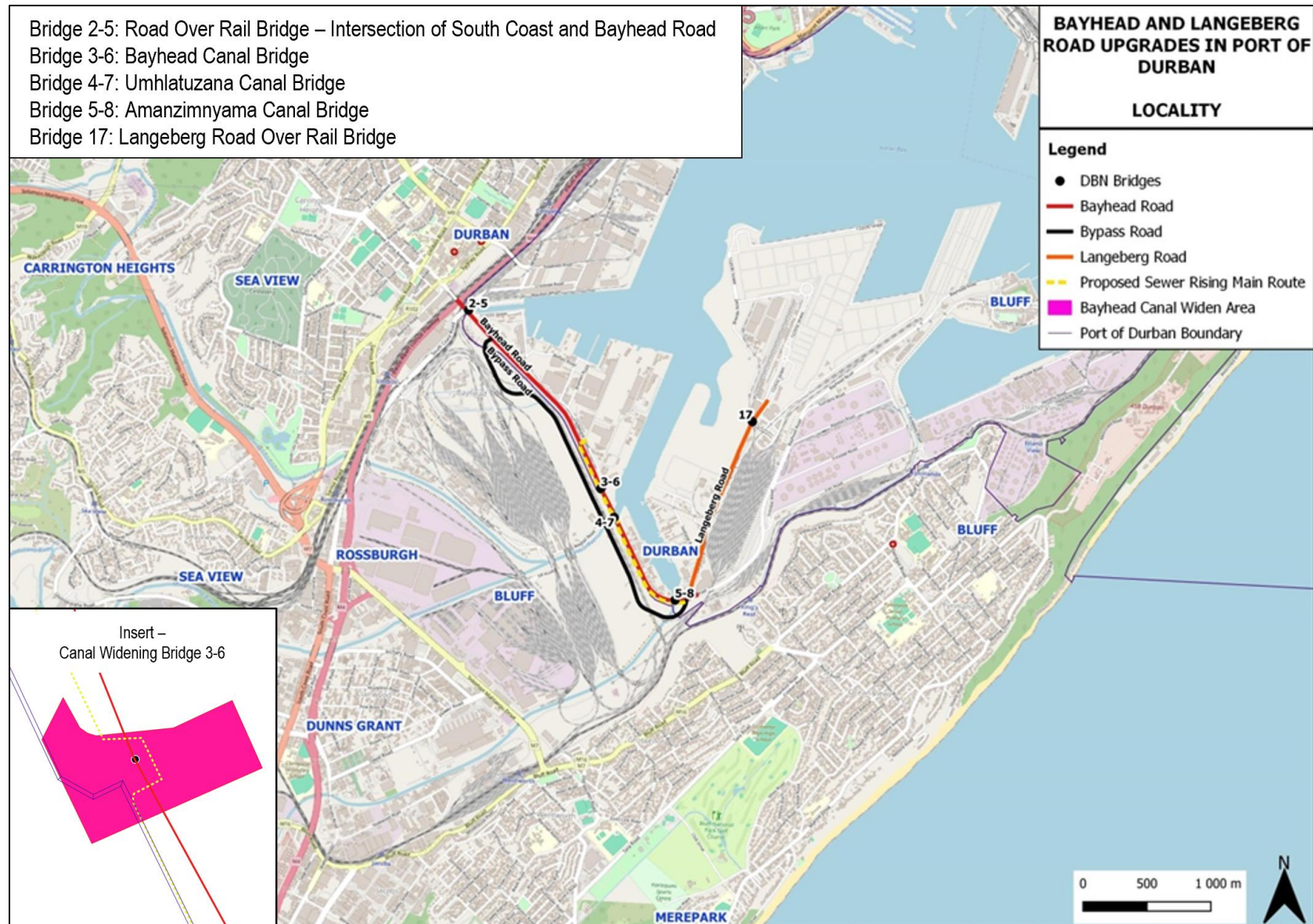


Figure 2-1: Locality

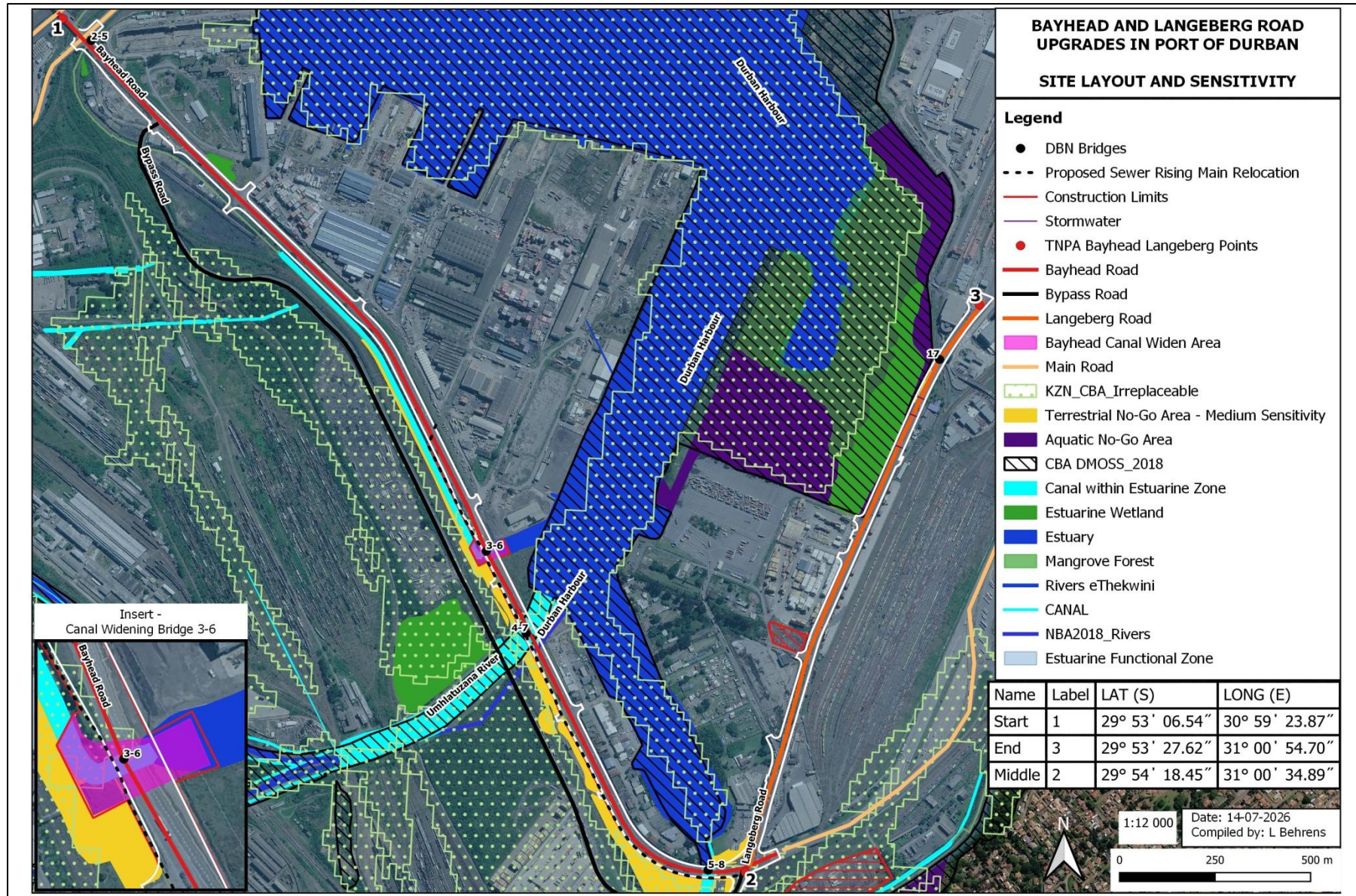


Figure 2-2: Final site layout and sensitive areas

Table 2-1: Locality and property details of the site

Province	KwaZulu Natal		
Municipality	eThekweni Metropolitan Municipality		
Ward number	32		
Nearest town	Durban		
Property details	Portion number/s, Erf number/s Farm name/s and number/s	SG 21 Digit Codes	
	1. Portion 175 of Erf 10004 of Durban	1. N0FU00850001000400175	
	2. Portion 56 of Erf 10004 of Durban	2. N0FU00850001000400056	
	3. Portion 203 of Erf 10004 of Durban	3. N0FU00850001000400203	
	4. Portion 1 of Erf 10019 of Durban	4. N0FU00850001001900001	
	5. Portion 0 of Erf 10013 of Durban	5. N0FU00850001001300000	
	6. Portion 0 of Erf 12356 of Durban	6. N0FU00850001235600000	
	7. Portion 0 of Erf 12355 of Durban	7. N0FU00850001235500000	
	8. Portion 0 of King Flats Farm No. 16344	8. N0FU000000001634400000	
	9. Portion 0 of King Royal Flats No. 16576	9. N0FU000000001657600000	
Geographical coordinates	Start Point	Central / Middle Point	End Point
	29° 53' 06.54" S; 30° 59' 23.87" E	29° 54' 16.65" S; 31° 00' 37.95" E	29° 53' 27.62" S; 31° 00' 54.70" E

Table 2-2: Geographical coordinates of infrastructure upgrades

Geographical coordinates	Start Point	Central / Middle Point	End Point
Bayhead Road	29° 53' 06.54" S 30° 59' 23.87" E	29° 53' 41.26" S 31° 00' 01.83" E	29° 54' 16.65" S 31° 00' 37.95" E
Bayhead Canal Widening	29° 53' 52.01" S 31° 00' 07.34" E	29° 53' 51.55" S 31° 00' 08.31" E	29° 53' 51.31" S 31° 00' 09.59" E
Bayhead Road Over Rail Bridge 2-5	-	29° 53' 08.47" S 30° 59' 26.05" E	-
Bayhead Canal Bridge 3-6	-	29° 53' 51.47" S 31° 00' 07.99" E	-
Umhlatuzana Canal Bridge 4-7	-	29° 53' 58.16" S 31° 00' 12.40" E	-
Amanzimnyama Canal Bridge 5-8	-	29° 54' 18.72" S 31° 00' 31.22" E	-
Langeberg Road	29° 54' 18.45" S 31° 00' 34.89" E	29° 53' 51.56" S 31° 00' 42.86" E	29° 53' 27.62" S 31° 00' 54.70" E
Langeberg Road Over Rail Bridge 17	-	29° 53' 32.59" S 31° 00' 51.08" E	-
Sewer Rising Main	29° 53' 39.71" S 31° 00' 02.67" E	29° 54' 02.33" S 31° 00' 14.40" E	29° 54' 18.36" S 31° 00' 35.58" E

2.3 Construction Process

It is anticipated that the construction timeframe for the upgrading of the Bayhead and Langeberg Roads will be approximately 24 months (excluding a 6 month mobilisation period). Access to leased properties will remain open for the duration of the project. However, delays can be expected due to construction activities in close proximity to the access. Alternate access will be arranged if main entrance will be closed for longer periods. Operations within the Port may be affected and steps will be taken to minimise the disruptions to the Port and Port activities through the development of a comprehensive traffic management plan. Construction will be undertaken in half-widths, whereby one or two lanes remain open to traffic whilst construction is being undertaken at the other lanes.

During construction, an existing Bypass Road will be utilised to access the Port and no major works are anticipated for the Bypass Road other than minor maintenance activities to ensure the ongoing operational level of service of the road. The existing bypass road is located to the south and runs parallel to the Bayhead Road.

An estimated size for the combined site camp and laydown areas is 7000-13000m² (0.7 – 1.3 hectares). This would comprise of the following:

- **Site camp area:** Portable office space for management, engineers and admin staff; approx. 500-1000m² in extent depending on the number of personnel and required facilities.
- **Worker facilities:** Ablution blocks, canteens and rest areas for workers; approx. 300-500m² in extent depending on the size of the workforce.
- **Material storage and laydown areas:** Storage for construction materials and machinery, e.g. asphalt, aggregates, steel, equipment, graders, rollers, pavers and cranes; approx. 5000-10000m² in extent depending on intensity and type of work.
- **Parking:** Designated parking for construction vehicles and machinery; approx. 1000-2000m² in extent.

It is anticipated that the site camp will be designated within the port boundary; in areas previously transformed and that no natural areas will be used or disturbed. The exact size required and final position is unknown at this stage as it will be determined and agreed upon during the project setup phase in consultation with the Port Authority and project stakeholders.

The process of relocating the sewer line involves the following: The sewer line will first be installed, flushed and tested. Once this is completed, the sewer line will then be connected to the existing line and commissioned.

Waste anticipated during construction is presented in **Table 2-3**.

Table 2-3: Anticipated construction waste for the project.

Type of Waste	Estimated Volumes	Disposal	Storage
General waste	Approx. 1 ton per month	Registered waste site or recycling facility	On-site storage at designated waste management area at site camp. Maximum of 7 days storage.
Hazardous waste	Approx. 0.5 tons per month	Certified waste disposal contractor Licensed hazardous waste facility	On-site storage at designated, secured, and labelled area compliant with hazardous materials regulations. Maximum of 30 days storage.
Spoil	Approx. 137500m ³	Specified disposal site, registered waste site, or reused in approved applications	On-site storage in designated areas. Maximum of 3 months (estimated).

2.4 Operational Process

The following activities are anticipated during the operational phase:

- Maintenance of the road infrastructure, bridges, erosion control measures and stormwater management infrastructure.
- Clearing of debris from stormwater management infrastructure and underneath or adjacent to the canal bridges.

2.5 Activity Motivation

2.5.1 Socio-Economic Information

The anticipated socio-economic values associated with the proposed Bayhead and Langeberg Road upgrades include a project capital of R900 million, 3,664 direct, indirect and induced construction jobs and sustained operational employment, contributing R2.77 billion in production value and R791 million in Gross Value Added (GVA) contributions (De Beer, 2025).

2.5.2 Need and Desirability

The Bayhead and Langeberg Roads are currently experiencing slow moving traffic and congestion of vehicles. The roads are not open to unrestricted public use but serve port operations and controlled traffic. The road upgrades will include widening, modifications to bridges, and stormwater management enhancements to improve the accommodation of port vehicle traffic.

Table 2-4 describes the need and desirability of the proposed activity, i.e. upgrading of the Bayhead and Langeberg Roads, in relation to aspects provided in the Guideline on Need and Desirability (DEA, 2017).

Table 2-4: Need and Desirability

ASPECTS RELATED TO SECURING ECOLOGICAL SUSTAINABLE DEVELOPMENT AND USE OF NATURAL RESOURCES

How will this development (and its separate elements/aspects) impact on the ecological integrity of the area, disturb or enhance ecosystems and/or result in the loss or protection of biological diversity?

The majority of the footprint falls within existing transformed areas with hardened surfaces, and lawn verges immediately adjacent to existing road infrastructure including localised patches of secondary grassland along the southern end of Bayhead Road (Faunal Habitat 2) and areas of dense alien vegetation (Faunal Habitat 1). A portion of the 32m buffer area extends into the Mangrove Forest area along Langeberg Road and comprises grassland with scattered indigenous trees (Faunal Habitat 3) and there are some localised areas in the southern section of Bayhead Road that comprise thickets of mixed indigenous and alien vegetation (Faunal Habitat 4). The majority of the footprint offers no or very low value to faunal communities, given its transformed or highly disturbed nature. However, Faunal Habitat 3 within the Mangrove Forest area and Faunal Habitat 4 (localised patches of mixed indigenous and alien thicket along the southern end of Bayhead Road) provide valuable habitat for the KwaZulu Dwarf Chameleon (*Bradypodion melanocephalum*). These two faunal habitats, as well as areas of secondary grassland and in some cases dense alien/indigenous thicket that is more degraded provide some value as linkages for the KwaZulu Dwarf Chameleon. These more degraded areas of secondary grassland and alien invaded thicket of very low value for most species have been grouped into a fifth faunal habitat to flag their importance as an ecological corridor for this species (Faunal Habitat 5 secondary grassland and mixed indigenous and alien thicket). Although much of the site has been disturbed and transformed in the past, Faunal Habitats 3, 4 and 5 are still of value as habitat for the KwaZulu Dwarf Chameleon, and therefore these faunal habitats are considered to be of 'Medium' Site Ecological Importance (SEI) with remaining two faunal habitats (Faunal Habitat 1 & 2) considered to be of 'Very Low' SEI (Edwards *et al.*, 2025).

In terms of terrestrial plants and biodiversity, Communities 1 and 2 are considered of 'Very Low' SEI due to the moderate to high cover of alien plant invasion observed, their high level of fragmentation and edge impacts that have resulted in a deterioration of both their biodiversity and their level of functioning. Community 4 is considered of 'Low' SEI, as although this community has also been highly impacted by direct loss and fragmentation it still comprises some diversity of indigenous vegetation and is considered in better condition in comparison to Community 1 and Community 2. Community 3 is considered of 'Medium'

SEI as this community occurs within the Mangrove Forest Area with indigenous vegetation comprising most of the cover, with low alien plant invasion observed. However, this community is also isolated and fragmented due to historical development in the area and therefore although it has a 'High' conservation importance rating (driven by the Critically Endangered (CR) threat status of the reference vegetation type at the provincial scale) its functional integrity has been compromised and has been rated as 'Medium' resulting in a 'Medium' biodiversity importance rating. The above was verified during two field surveys undertaken by the specialists on 18 March 2025 and 23 October 2025. No Red Listed, Orange Category or protected tree and plant species were encountered on site. The Bayhead and Langeberg Roads are not located within any remnant sections associated with KwaZulu-Natal Coastal Belt Grassland (Endangered) ecosystem. Portions of the footprint and adjacent areas along Bayhead Road are classified as falling within the edge of areas classified as Critical Biodiversity Areas (CBAs): Irreplaceable (EKZNW, 2016) which extend beyond the footprint to the north, south and east. The Mangrove Forest along Langeberg Road and the canals that pass underneath Bayhead Road are flagged as part of Durban Metropolitan Open Space System (D'MOSS) (2018) CBAs. The Mangrove Forest is located outside of the Langeberg Road footprint area. Bayhead Road will traverse over the canals that form part of the D'MOSS CBAs (Edwards *et al.*, 2025).

Aquatic ecosystem features within the project upgrade area are considered estuarine in nature, but are already highly modified and transformed. Given this context, and with the implementation of best-practice mitigation measures, the overall impact of the project is expected to be of low significance and low risk. The only notable concern is the project's proximity to intact estuarine systems, as cumulative impacts could pose long-term risks. However, due to the linear nature and small footprint of the planned activities, and the sufficient distance from the sensitive habitats, no measurable impact on the estuary's Present Ecological State (PES) is anticipated if mitigation is effectively applied (Edwards *et al.*, 2025).

In terms of no-go areas, it is recommended that the impacts to the medium sensitivity faunal habitat be avoided and that impacts be confined to the road upgrade footprint only. The road upgrade activities in close proximity to these medium sensitivity areas are to be limited to the narrow band of modified habitat of very low sensitivity adjoining the road (Edwards *et al.*, 2025).

The upgrading of the Bayhead and Langeberg Roads will not have a significant impact on the ecological integrity, ecosystems or biological diversity if construction is kept away from no-go areas as recommended by specialist. The risk to disturbing the ecological functioning is low. Refer to Chapter 7 for further discussion on the impact assessment.

What measures were explored to firstly avoid these negative impacts, and where these negative impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts?

The assessment approach is based on the principles of the mitigation hierarchy where impact avoidance has been considered first by identifying high sensitive areas that need to be avoided. Where areas cannot be avoided, mitigation measures have been considered to reduce the risks and impacts.

No high sensitive areas within the development area were identified for avoidance. A desktop assessment of the floral and faunal species of conservation concern that may occur within the development footprint based on available species records for the region was done by the specialists. A field survey was undertaken by the specialists as well to identify, describe, and map the flora and fauna species and habitats onsite.

No-go areas adjacent to the footprint areas have been identified. Negative impacts have been minimised with mitigation measures, such as site demarcation, erosion control, invasive alien species control. Refer to Chapter 7 for mitigation measures identified and the EMP (Appendix P).

ASPECTS RELATED TO INTRA- AND INTER-GENERATIONAL EQUITY IN THE CONTEXT OF SUSTAINABILITY

Does the proposed location, type and scale of development promote a reduced dependency on resources? For example, can the development be located more appropriately to reduce the dependency of resources needed for service infrastructure?

The proposed upgrading of the Bayhead and Langeberg Roads will contribute to the transportation infrastructure within the Port of Durban, as these existing roads are currently experiencing slow moving traffic and congestion of vehicles. The road upgrades will be located in transformed areas and/or previously *transformed* areas no new routes through undeveloped land are required thereby promoting a reduced dependency on resources.

The Bayhead and Langeberg Road upgrades integrate sustainable development principles throughout planning, design, and construction to deliver long-term environmental, social, and economic benefits. Key sustainability measures include resource efficiency through the reuse of pavement layers, kerbs, and street lighting poles, climate-resilient stormwater and drainage designs, and minimisation of impacts on sensitive ecosystems such as wetlands, estuaries, and tidal zones (Wright, 2025).

How will the ecological impacts resulting from this development impact on people's environmental right?

The road upgrades will not have a significant impact on the ecological integrity, ecosystems or biological diversity due to the upgrades being located within transformed areas (road) or degraded areas (road reserve). The ecological impacts, with mitigation, are considered to be low and would not impact on people's environmental rights.

Describe the linkages and dependencies between human wellbeing, livelihoods and ecosystem services applicable to the area in question and how the development's ecological impacts will result in socio-economic impacts (e.g. on livelihoods, loss of heritage site, opportunity costs, etc.)?

The road upgrades will be located within an urban area where no agriculture is undertaken. These areas are utilised to accommodate port traffic. The Bayhead and Langeberg Roads are classified as private roads and are managed by the Port of Durban under Transnet. The roads are not open to unrestricted public use but serve port operations and controlled traffic. If medium sensitivity areas are avoided as no-go areas, the risk to disturbing the ecological functioning is low and the road upgrades will contribute positively to the socio-economic environment (de Beer, 2025; Edwards *et al.*, 2025).

Based on all of the above, how will this development positively or negatively impact on ecological integrity objectives/targets/considerations of the area?

No significant negative impact on the ecological integrity is anticipated.

Describe the positive and negative cumulative ecological/biophysical impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and existing and other planned developments in the area?

Cumulative impacts are regarded as being low due to the transformed nature of the site and the localised impact of the proposed activity which is unlikely to pose significant risk to potential localised populations of Species of Conservation Concern (SCC). The proposed activity will result in transformation limited to the construction footprint. This loss will be highly localised, and the cumulative loss will be low.

ASPECTS RELATED TO PROMOTING JUSTIFIABLE ECONOMIC AND SOCIAL DEVELOPMENT

What is the socio-economic context of the area, based on, amongst other considerations, the following considerations: The IDP and any other strategic plans, frameworks of policies applicable to the area; spatial priorities and desired spatial patterns (e.g. need for integrated of segregated communities, need to upgrade informal settlements, need for densification, etc.), spatial characteristics (e.g. existing land uses, planned land uses, cultural landscapes, etc.), and Municipal Economic Development Strategy?

The proposed upgrades are aligned with the eThekweni Metropolitan Municipality's Spatial Development Framework (SDF) and Integrated Development Plan (IDP). Refer to Section 6.7 for a description of the socio-economic environment.

Considering the socio-economic context, what will the socio-economic impacts be of the development (and its separate elements/aspects), and specifically also on the socio-economic objectives of the area?

The Socio-Economic Impact Assessment identifies a range of socio-economic impacts across the project lifecycle. In the construction phase (two years), direct impacts encompass job creation (e.g., 900 full-time equivalents) for local semi-skilled workers, boosting household incomes in high-unemployment areas (26.8% in Area Of Impact (AOI)). Improved access will reduce commute times for port employees. Noise, dust, and traffic diversions pose minimal adverse social risks to nearby residents, commerce and industrial businesses (de Beer, 2025).

Indirect impacts arise from supply chain demands, creating opportunities for local suppliers in materials and services, while induced effects include increased spending by workers on retail (24% of AOI jobs), stimulating community services (22%). Construction impacts overlap with ongoing port expansions, amplifying economic benefits with limited social inconveniences to residents and, commercial and industrial businesses and road users (de Beer, 2025).

Operationally, direct benefits include decongested roads enhancing logistics efficiency, reducing costs and supporting GVA growth in finance (24.9%) and manufacturing (16.4%). Safer access improves resident mobility and health, lowering accident rates. Indirect operational impacts extend to regional trade, fostering business opportunities and employment retention although the number of employment opportunities created during operations is limited to the maintenance of the road infrastructure. No negative socio-economic impacts have been identified due to the operational phase of the project (de Beer, 2025).

How will this development disturb or enhance landscapes and/or sites that constitute the nation's cultural heritage? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?

Majority of the Bayhead and Langeberg Roads were constructed in the 1960s and 1970's, Bridge 2-5 (Road Over Rail Bridge – Intersection of South Coast and Bayhead Road) was constructed in 1952, and widened in 2000. As such, there is likely to be fabric older than 60 years existing within the bridge structure. The roads and bridges proposed for upgrade are unlikely to have any cultural value that require further assessment (Lavin, 2025 Appendix G). Based on the Heritage Significance Report regarding the Road Over Rail Bridge (Bridge 2-5), the railway line and associated rail infrastructure at Maydon Wharf are regarded as having low heritage significance however, these structures do warrant protection during the implementation of the proposed project. The Railway Tunnel, constructed in 1952 to standard South African Railways reinforced concrete specifications with an off-shutter finish, is representative of a common bridge typology widely constructed across South Africa during the mid-20th century. Owing to the high quality of workmanship and materials, the structure has weathered well and is recommended for consideration for protection under Section 37 of

the NHRA (White, 2025, Appendix G).

How will this development address the specific physical, psychological, developmental, cultural and social needs and interests of the relevant communities? Will the development result in equitable (intra- and inter-generational) impact distribution, in the short- and long-term? Will the impact be socially and economically sustainable in the short- and long-term?

The need for the upgrading of Bayhead and Langeberg Roads has long been identified. A point has been reached where all stakeholders at national (importers and exporters and transport and logistic companies) and local businesses and residents have been calling for the upgrading of the roads. Further delays in the upgrading of the roads will worsen the ability of exporters and importers to operate effectively and a loss of foreign earnings are likely to take place leading to negative national economic impacts. The levels of inconvenience and road safety have reached a point that further delays in the upgrading of the roads will lead to significant negative socio-economic disbenefits (de Beer, 2025).

The desirability of the road upgrades has been proven by the call for the upgrading from local residential communities, workers in the harbour, businesses and industries that make use of the roads and other stakeholders such as the Municipality and the Chambers of Commerce. There is both a strong need and desirability that the roads must be upgraded. The positive benefits of the proposed upgrading of the roads exceeds the negative socio-economic impacts during the construction and operational phases (de Beer, 2025).

How were a risk-averse and cautious approach applied in terms of socio-economic impacts? What is the level of risk (note: related to inequality, social fabric, livelihoods, vulnerable communities, critical resources, economic vulnerability and sustainability) associated with the limits of current knowledge? Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development (and its alternatives)?

No high sensitive areas were identified that required avoidance and no additional mitigation measures were identified.

How will the socio-economic impacts resulting from this development impact on people's environmental right?

The socio-economic impacts of the development are unlikely to result in a significant infringement of people's environmental rights and are more likely to enhance these rights in the long term. Refer to Chapter 7 for the impact assessment and Appendix L for the Socio-Economic Assessment Report.

Considering the linkages and dependencies between human wellbeing, livelihoods and ecosystem services, describe the linkages and dependencies applicable to the area in question and how the development's socio-economic impacts will result in ecological impacts (e.g. over utilisation of natural resources, etc.)?

Dust pollution as a socio-economic nuisance impact is not considered to be a significant impact to air quality and over utilisation of natural resources (e.g. water) is not anticipated during construction. Refer to Chapter 7 for the impact assessment and Appendix L for the Socio-Economic Assessment Report.

What measures were taken to pursue the selection of the “best practicable environmental option” in terms of socio-economic considerations? What measures were taken to pursue environmental justice so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons (who are the beneficiaries and is the development located appropriately)?

The proposed upgrading of the roads is located at existing roads which provide private access to the Port of Durban. BSM/EME-based pavement structure has been chosen as the most suitable design option due to reducing construction time, being the most environmental sustainable option, and allowing for easy future maintenance and rehabilitation (Wright, 2025).

Local to regional communities will benefit through various economic opportunities, although these would be limited to the construction phase.

The Bayhead and Langeberg Road Upgrades integrate sustainable development principles throughout planning, design, and construction to deliver long-term environmental, social, and economic benefits. Key sustainability measures include resource efficiency through the reuse of pavement layers, kerbs, and street lighting poles, climate-resilient stormwater and drainage designs, and minimisation of impacts on sensitive ecosystems such as wetlands, estuaries, and tidal zones. The project also enhances road-user safety, supports efficient freight movement, and promotes local employment and responsible procurement. Compliance with national legislation, EA, and port sustainability policies ensures the project aligns with best-practice standards (Wright, 2025).

Considering the need for social equity and justice, do the alternatives identified, allow the “best practicable environmental option” to be selected, or is there a need for other alternatives to be considered?

No additional alternatives were considered necessary as the preferred option is the best practicable environmental option for the upgrading of the roads.

What measures were taken to pursue equitable access to environmental resources, benefits and services to meet basic human needs and ensure human wellbeing, and what special measures were taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination?

The development would not impact on access to environmental resources, benefits or services.

Key sustainability measures to be applied include resource efficiency through the reuse of pavement layers, kerbs, and street lighting poles, climate-resilient stormwater and drainage designs, and minimisation of impacts on sensitive ecosystems such as wetlands, estuaries, and tidal zones (Wright, 2025).

What measures were taken to ensure that the responsibility for the environmental health and safety consequences of the development has been addressed throughout the development's life cycle?

Health, safety and security impacts were considered in the socio-economic assessment, refer to Chapter 7 and Appendix L.

What measures were taken to ensure that the interests, needs and values of all interested and affected parties were taken into account, and that adequate recognition were given to all forms of knowledge, including traditional and ordinary knowledge?

Public participation is being undertaken as required in the EIA Regulations, 2014 (as amended).

Considering the interests, needs and values of all the interested and affected parties, describe how the development will allow for opportunities for all the segments of the community (e.g. a mixture of low-, middle-, and high-income housing opportunities) that is consistent with the priority needs of the local area (or that is proportional to the needs of an area)?

The Bayhead and Langeberg Road upgrade will deliver substantial socio-economic benefits, significantly outweighing manageable adverse impacts. Key positives include 3,664 direct, indirect and induced construction jobs and sustained operational employment, contributing R2.77 billion in production value and R791 million in GVA, fostering inclusive growth in a region with high unemployment and a youthful demographic. Enhanced port efficiency will reduce logistics costs, support eThekweni's R5.1 billion capital budget, and align with national frameworks for resilient infrastructure. While construction disruptions pose medium-term risks to residents (De Beer, 2025).

Chapter 3: LEGISLATIVE AND POLICY CONTEXT

3.1 National Environmental Management Act

The National Environmental Management Act, 1998 (Act No. 107 of 1998) [NEMA], as amended, provides a framework for the integration of the environmental management activities of various spheres of government. Section 23 of NEMA requires that Integrated Environmental Management should be employed when any policies, programmes, plans or projects are drawn

up to minimise the impact on the environment. An application for development needs to conform to the requirements of the NEMA and the EIA Regulations promulgated in terms of Section 24 thereof.

In terms of the EIA Regulations, 2014 (as amended), made under Section 24(5) of NEMA, listed activities as per **Table 3-1** within Government Notice (GN) 983, GN984 and GN985 of 4 December 2014, as amended by GN 327, GN 325 and GN 324 (of 7 April 2017) are triggered by the proposed road upgrades, thereby requiring EA from the National DFFE. The DFFE is considered to be the CA as the proposed activities are being conducted by a state-owned company, Transnet.

The process to be followed in the application for an EA is a BA process as listed activities in Listing Notice 1 and 3 of the EIA Regulations, 2014 as amended, are triggered.

Table 3-1: NEMA EIA Listed Activities

Relevant Activity(ies) as set out in the EIA Regulations, 2014 as amended.	Description of the proposed project to which the applicable listed activity relates.
Listing Notice 1, GN 327, Activity 19A The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic metres from- (i) the seashore; (ii) the littoral active zone, an estuary or a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever distance is the greater; or (iii) the sea;- but excluding where such infilling, depositing, dredging, excavation, removal or moving- (f) will occur behind a development setback; (g) is for maintenance purposes undertaken in accordance with a maintenance management plan; (h) falls within the ambit of activity 21 in this Notice, in which case that activity applies; (i) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies.	The bridges of the Bayhead Road across the canals are situated within an estuary / 100m of an estuary and it is anticipated that approximately 3836m³ of material will be deposited and/or removed for the widening of the bridges. It is anticipated that bridge support structures would be required in the canal bed and along the banks/embankments/curbs of the canals; which would result in the removal of sections of the concrete canal bed, embankments/curbs and potentially the removal of the underlying soils and then refilling thereof.
Listing Notice 3, GN 324, Activity 12: The clearance of an area of 300m² 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	Clearance of approximately 3 Hectares of vegetation will occur. The roads are situated within an estuarine functional zone (EFZ). Sections of Bayhead Road are located on the edges of critical biodiversity areas, approximately 850m² of vegetation will be cleared along these areas.

Relevant Activity(ies) as set out in the EIA Regulations, 2014 as amended.	Description of the proposed project to which the applicable listed activity relates.
(iv) Within any critically endangered or endangered ecosystem listed in terms of section 52 of the National Environmental Management: Biodiversity Act (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; (v) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; (vi) Within the littoral active zone or 100 metres inland from high water mark of the sea or an estuarine functional zone, whichever distance is the greater, excluding where such removal will occur behind the development setback line on erven in urban areas; (xiii) In an estuarine functional zone.	
Listing Notice 3, GN 324, Activity 18: The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre (d) KwaZulu-Natal (v) In an estuarine functional zone; (viii) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;	The roads and bridges will be widened by 4m. Approximately 50m of Bayhead Road will be widened by 8.5m at the Rotterdam and Bayhead Road intersection. The roads and bridges are situated within an EFZ, and sections of the Bayhead Road are located on the edges of critical biodiversity areas.

3.2 National Water Act

The National Water Act, 1998 (Act No. 36 of 1998) (NWA) aims to regulate the use of water and activities, which may impact on water resources through the categorisation of 'listed water uses'. The NWA provides for tiered regulatory control over 11 water uses, as identified in Section 21 of the NWA. A person who wishes to use or who uses water in a manner that is not covered under Schedule 1, General Authorisations, or in a manner that is not regarded or declared as an existing lawful use, may only use that water under the authority of a Water Use Licence.

In terms of the NWA, provision has been made to allow for certain water uses to be authorised under Section 39 of the NWA (General Authorisations) without going through the water use licensing procedure, provided that the thresholds and conditions of the applicable General Authorisations are adhered to.

In terms of the General Authorisation for Section 21 water use activities (GN 509 of 29 August 2016 and subsequently GN 4167 of 8 December 2023), the following areas are included in the 'regulated area of a watercourse':

- (a) The outer edge of the 1 in 100-year flood line and /or delineated riparian habitat, whichever is the greatest distance, measured from the middle of the watercourse of a river, spring, natural channel, dams and lakes;
- (b) In the absence of a determined 1 in 100-year flood line or riparian area, the area within 100m from the edge of a watercourse where the edge of the watercourse (excluding flood plains) is the first identifiable annual bank fill flood bench (subject to compliance to section 144 of the Act); or
- (c) A 500m radius around the delineated boundary (extent) of any wetland (including pans).

The authority responsible for Water Use Licences or registrations for General Authorisations is the Department of Water and Sanitation (DWS), Proto-CMA: Pongola to uMzimkhulu. A pre-application meeting was held on the 8 April 2025 with the DWS to confirm triggered water use activities for the proposed projects (DWS reference number: WU41941). During the pre-application meeting, it was indicated that the water use activities (**Table 3-2**) require registration under a General Authorisation. **The application for registration under a General Authorisation is being undertaken.**

Table 3-2: NWA Section 21 Water Use Activities

Activity	Description
Section 21(c) Impeding or diverting the flow of water in a watercourse Section 21(i) Altering the bed, banks, course or characteristics of a watercourse (A watercourse means (a) a river or spring; (b) a natural channel in which water flows regularly or intermittently; (c) a wetland, lake or dam into which, or from which, water flows; and (d) any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse, and a reference to a watercourse includes, where relevant, its bed and banks)	The upgrading of the Bayhead and Langeberg roads, Bayhead Canal and relocation of the existing sewer line falls within 500m of modified estuarine wetlands which were identified in low lying areas on imported fill material. In respect of wetlands, the regulated area is a 500m radius around the delineated boundary (extent) of any wetland. Construction activities will require the removal of vegetation, soils and ground levelling within this 500m regulated area. The aquatic Risk Assessment Matrix identified the proposed activities as a Low Risk and as a result the activities will be registered under the General Authorisation for Section 21 (c) and (i) water uses.
Section 21(j) Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people.	During the construction of the proposed upgrading of Bayhead and Langeberg Roads within the Port of Durban, groundwater may be encountered in excavations. Where such groundwater accumulates, it will be pumped out as required. These dewatering activities will be temporary, intermittent and strictly limited to the construction period, depending on actual conditions encountered on site. Pumped water will be discharged into the existing downstream stormwater or canal infrastructure, with due care to ensure that the discharge does not impact upstream drainage or ongoing construction activities. In the event of persistent ingress, temporary

Activity	Description
	subsoil drainage systems may be installed to assist in the controlled redirection of groundwater. These systems will similarly discharge into downstream stormwater infrastructure, subject to existing capacity. At this stage, the volume and duration of any required dewatering is unknown, and no permanent discharge is anticipated. This will ensure the efficient continuation of construction activities and to maintain safety on site by maintaining workable dry conditions, preventing soil instability, and maintaining excavation integrity.

3.3 Legislation, Policies and Plans

Table 3-3 identifies legislation, policies and plans related to the proposed project.

Table 3-3: Summary of Applicable Legislation

Legislation, Policy or Plan	Applicability to the Project / Activities
National Environmental Management Act (No 107 of 1998) as amended; and regulations	The proposed road upgrades trigger Listed Activity 19A in Listing Notice 1, and Listed Activity 12 and 18 in Listing Notice 3 of the EIA Regulations, 2014 as amended; and requires an Environmental Authorisation before construction can commence. Refer to Section 3.1 for additional information relating to NEMA. The EIA process to be followed would be a Basic Assessment Process.
National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004), and regulations	No protected species were identified on site.
National Water Act (No 36 of 1998) and regulations	Section 21 (c), (i), and (j) water use activities are triggered which requires a General Authorisation by the DWS. Refer to Section 3.2 for additional information.
National Heritage Resources Act (No 25 of 1999)	A permit from AMAFA (KZN Heritage Resources Authority) would be required if any alterations will be undertaken on Bridge 2-5 (Bayhead-South Coast-Crabtree Rail Bridge) outbound carriageway as this was originally built in 1952.
National Environmental Management: Waste Act (No. 59 of 2008), regulations, Norms and Standards	Norms and Standards for the Storage of Waste – Registration would be required if the storage of spoil would be more than 100m ³ at any one time.
National Environmental Management: Protected Areas Act (No. 57 of 2003)	Not applicable.
National Forest Act (No 84 of 1998)	No protected trees were identified on site.
KwaZulu Natal Provincial Watercourse Infrastructure Standard and Associated Excluded Activities, including the Generic Environmental Management Programme (2024)	Not applicable to estuaries.

Legislation, Policy or Plan	Applicability to the Project / Activities
National Environmental Management: Integrated Coastal Management Act (No. 24 of 2008)	Coastal Use Permits (Section 65): These permits are required for activities that involve the use of coastal public property, such as access, recreation, or development.

3.4 Guideline Documents, Spatial Tools and Instruments

The following guideline documents have been considered during the process:

- Companion to the NEMA EIA Regulations of 2010, Integrated Environmental Management Guideline Series 5, 2010, Department of Environmental Affairs, Pretoria.
- Public Participation in the EIA Process, Integrated Environmental Management Guideline Series 7, 2010, Department of Environmental Affairs, Pretoria.
- Guideline on Need and Desirability, 2017, Department of Environmental Affairs, Pretoria.
- National Environmental Screening Tool and Screening Report
- Integrated Development Plan for eThekwin Municipality (2025)
- South African National Biodiversity Institute (SANBI) Biodiversity Geographic Information System (BGIS)
- Ezemvelo KZN Wildlife Biodiversity Sector Plan (2016)
- Durban Metropolitan Open Space System (D'MOSS, 2018)
- Durban Bay Estuarine Management Plan (2016)

Chapter 4: DESCRIPTION AND ASSESSMENT OF ALTERNATIVES

4.1 Introduction

The mitigation hierarchy is fundamental to the avoidance and mitigation of anticipated impacts and is largely applied by means of considering reasonable and feasible alternatives early in the assessment process. Where impacts and/or sensitive environments cannot altogether be avoided through alternatives (e.g. locality, design, etc.); mitigation measures are used to reduce the significance of predicted impacts on the receiving biophysical and socio-economic environment. After measures to avoid and minimise impacts have been incorporated into the project design, and where negative impacts remain, rehabilitation measures and/or offsets are applied.

4.2 Site (Property or Location) Alternatives

The proposed activities are property and location specific with no feasible or reasonable site alternatives as the upgrades relate to the existing Bayhead and Langeberg Roads. Refer to **Section 2.2** for locality and property details.

4.3 Activity Alternatives

No feasible or reasonable activity alternatives were identified for consideration.

The proposed activity for the road upgrades will not change the existing land use. The activity requires the upgrading of the existing Bayhead and Langeberg Roads located within the Port of Durban.

4.4 Design or Layout Alternatives

The road layout has taken into consideration the no-go areas and these no-go areas would not be affected.

The stormwater system has been designed in accordance with national and local guidelines, considering peak flow estimates, catchment characteristics, and allowable discharge criteria. Both hydrological and hydraulic analyses were undertaken to ensure efficient conveyance, minimise flooding risk, and protect downstream infrastructure. As a result, no additional alternatives for the stormwater system were identified for consideration.

The proposed road upgrade includes widening the existing carriageways by adding one lane in each direction. Various widening options were considered during the design process, including widening both sides of the roadway by a minimum of 4 m on either side, utilising the existing centre median, or implementing a combination of median utilisation and roadway widening to achieve the required traffic layout configuration. The preferred design solution incorporates a combination of centre median utilisation and carriageway widening to accommodate the additional lanes while optimising the available road reserve and meeting the traffic capacity requirements.

4.5 Technology Alternatives

No feasible or reasonable technology alternatives were identified for consideration.

Construction and upgrading of the roads, bridges and associated infrastructure will be undertaken by the conventional methods and will be undertaken in situ.

4.6 Operational Alternatives

No feasible or reasonable operational alternatives were identified for consideration.

The roads, bridges and stormwater infrastructure would require long term maintenance and clearing of any waste or debris.

4.7 No-Go Alternative

The “No-Go” approach entails that the proposed roads are not upgraded, i.e. the *status quo* remains. The existing roads require repairs that may potentially lead to road failures and would not be able to accommodate an increase in stormwater flow thereby the associated safety and transportation risks will remain.

4.8 Identification of Preferred Alternative

As no additional alternatives have been considered, the preferred alternative is as per the project description in Chapter 2.

The preferred alternative is the best practicable environmental option for the upgrading of the existing roads.

4.9 Assessment of Alternatives

Impacts identified are assessed with the Preferred Alternative and No-Go Alternative in Chapter 7. The following table indicates the alternatives considered by the specialists.

Table 4-1: Alternatives recommended by the specialists

Specialist Study	Preferred option/alternatives
Animal Species	The specialist considered the preferred alternative and supports the preferred alternative with mitigation measures being implemented. Refer to Chapter 7.
Aquatic Biodiversity	The specialist assessed and supports the preferred alternative, subject to the mitigation measures being undertaken. Refer to Chapter 7.
Heritage (Archaeology and Palaeontology)	The specialist considered the preferred alternative in relation to heritage resources and supports the preferred alternative. Refer to Chapter 7.
Plant Species	The specialist considered the preferred alternative and supports the preferred alternative with mitigation measures being implemented. Refer to Chapter 7.
Terrestrial Biodiversity	The specialist considered the preferred alternative and supports the preferred alternative with mitigation measures being implemented. Refer to Chapter 7.
Geotechnical	The specialist considered the proposed road upgrades with regards to subgrade and layerworks and found no areas of concern. The proposed road upgrades are as the preferred alternative.
Landscape/Visual	The specialist assessed and supports the preferred alternative, subject to the mitigation measures being undertaken. Refer to Chapter 7.



Specialist Study	Preferred option/alternatives
Noise	The specialist assessed and supports the preferred alternative, subject to the implementation of the recommendations outlined in the specialist report. Refer to Chapter 7.
Socio-Economic	The specialist assessed and supports the preferred alternative. Refer to Chapter 7.

Chapter 5: METHODOLOGY, ASSUMPTIONS, AFFIRMATION

5.1 Methodology for the Identification of Risks and Impacts

The identification of the potential risks and impacts of an activity on the environment should include risks and impacts that may occur during the construction, operation and termination of an activity. These potential risks and impacts were identified by the following means:

- Professional experience of the EAP, refer to **Appendix B**.
- Observations made during site visits: A site visit was undertaken by the EAP on 21 November 2024.
- Screening Tool Report and Site Verification Report, refer to **Appendix L and M**.
- Information provided by specialists (**Appendix E to G**)
- Analysis of spatial data and environmental planning guidelines.
- Issues raised by stakeholders, Interested and Affected Parties as well as specialists.
- Determination of current environmental conditions for a baseline against which impacts can be identified and measured.
- Determination of future changes to the environment that will occur if the proposed activity does not take place.
- Understanding the activity in order to understand its consequences and thereby also the identification of related significant impacts.

In addition to the above methods, the following aspects have been considered for the identification of risks and impacts:

- **Nature:** A description of the identified impact.
- **Significance:** The level of the impact, i.e. no impact or very low, low significance, medium significance or high significance.
- **Consequence:** Negative or positive consequence on the environment.

- **Extent:** The spatial scale of the impact, whether this is limited to the immediate areas or site of the development activity or will the impact occur on a local, sub-regional, regional and/or national scale.
- **Duration:** The anticipated time scale of the impact: Construction Phase and/or Operational Phase.
- **Probability:** The probability of the impact actually occurring as either improbable (low likelihood); probable (distinct possibility); highly probable (most likely) or definite (impact will occur regardless of preventative measures).
- **Mitigation:** Degree to which these impacts can be reversed, cause irreplaceable loss of resources and can be avoided, managed or mitigated.

5.2 Impact Assessment Methodology

The criteria used for the assessment of the potential impacts of the proposed project are described below. Cumulative impacts will be included as part of the impact assessment process. The predicted impacts are compared to the No-Go Alternative.

The “No-Go” Alternative entails that the proposed development is not undertaken, i.e. that no development as per the proposal is undertaken and the status quo remains.

The impacts assessed by the specialists were also rated using the information provided in their reports. The specialist information was considered in terms of a formal quantification of the impact as per facets of the specific field highlighted by the specialist.

NATURE		
The nature of the impact is the consideration of what the impact will be and how it will be affected. This description is qualitative and gives an overview of what is specifically being considered. That is, the nature considers ‘what is the cause, what is affected, and how is it affected?’		
STATUS		
+ / - Direct / Indirect	This describes whether the impact is positive (a benefit) or negative (a cost), and whether the impact is direct or indirect.	
EXTENT		
Whether the impact will occur on a scale limited to the immediate areas, footprint or site of the development activity or will the impact occur on a sub-regional (local), regional and/or national scale.		
Footprint / Site	The impact could affect the whole, or a significant portion of the site.	1
Local	Impact could affect the adjacent landowners and areas surrounding the site.	2
Regional	Impact could affect the wider area around the site, that is, from a few kilometres, up to the wider region.	3
National	Impact could have an effect that expands throughout a significant portion of South Africa – that is, as a minimum has an impact across provincial borders.	4
DURATION		
Whether the lifetime of the impact will be of a short duration (0-5 years); medium term (5-15 years); long-		

term (>15 years), with the impact ceasing after the operational life of the development); or considered permanent where mitigation either by natural process or by human intervention will not occur in such a way or in such a time span that the impact can be considered transient		
Short term	The impact will either disappear with mitigation or will be mitigated through a natural process, and will be relevant for 0 to 5 years.	1
Medium term	The impact will be relevant for 5 to 15 years.	2
Long term	The impact will continue or last for the entire operational lifetime of the development, but will be mitigated by direct human action or by natural processes thereafter (i.e. more than 15 years).	3
Permanent	This is the only class of impact that will be non-transitory. Mitigation either by man or natural process will not occur in such a way or in such a time span that the impact can be considered transient (i.e. impact will remain after the operational lifetime of the project).	4
INTENSITY/MAGNITUDE		
Whether the intensity (magnitude / size) of the impact is high, medium, low or negligible (very low / no impact). Where possible the intensity of impacts are quantified		
Very Low	The impact alters the affected environment in such a way that the natural processes or functions are not affected.	1
Low	The impact alters the affected environment in such a way that the natural processes or functions are slightly affected.	2
Medium	The affected environment is altered, but functions and processes continue, albeit in a modified way.	3
High	Function or process of the affected environment is disturbed to the extent where the function or process temporarily or permanently ceases.	4
REVERSIBILITY		
Reversibility is the ability of the affected environment to recover from the impact. Examining whether the impacted environment can be returned to its pre-impacted state once the cause of the impact has been removed. The degree to which the impact and risk can be reversed:		
Reversible	The impact is completely reversible	1
Low	The impact is reversible with mitigation measures implemented, over short term	2
Medium	The impact is reversible with additional mitigation measures, over medium term	3
Irreversible	Affected environment is unable to recover from the impact, i.e. permanently modified	4
REPLACEABLE		
Examining if an irreplaceable resource is impacted upon. Replaceable is an indication of the scarcity of the specific set of parameters that make up the affected environment. That is, if lost can the affected environment be (a) recreated, or (b) is it a common set of characteristics and thus if lost is not considered a significant loss. The degree to which the impact and risk may cause irreplaceable loss of resources:		
Replaceable	Affected environment is replaceable, i.e. an irreplaceable resource is not damaged or the resource is not irreplaceable / scarce, or no loss	1
Low	There would be a marginal loss of resources.	2
Medium	There would be a significant loss of resources	3
Irreplaceable	Affected environment is irreplaceable, i.e. complete loss of all resources	4



CUMULATIVE		
A cumulative impact is an impact, which in itself may not be significant but may become significant if added to other existing or potential impacts emanating from other similar or diverse activities as a result of the project activity in question.		
Very Low	Negligible to no cumulative effect / impact	1
Low	Low cumulative effect / impact	2
Medium	Medium cumulative effect / impact	3
High	Significant cumulative effects / impacts	4
PROBABILITY		
The probability of the impact actually occurring as either improbable (low likelihood); probable (distinct possibility); highly probable (most likely) or definite (impact will occur regardless of preventative measures)		
Improbable	The possibility of the impact occurring is none, due either to the circumstances, design or experience.	1
Probable	There is a possibility that the impact will occur to the extent that provisions must therefore be made.	2
Highly Probable	It is most likely that the impacts will occur at some stage of the Development. Plans must be drawn up before carrying out the activity.	3
Definite	The impact will take place regardless of any prevention plans, and only mitigation actions or contingency plans to contain the effect can be relied upon.	4
SIGNIFICANCE		
The significance of impacts of the proposed project are assessed with the mitigation measures which will be included in the Environmental Management Programme (EMPr) as well as with the additional mitigation measures recommended in this report being implemented. The significance of the identified impacts on the components of the affected environment (and where relevant, with respect to potential legal infringement) are described as: No Impact: Where the project action will not cause any adverse or beneficial changes to the natural (biophysical), and/or social environment. Impact of Low Significance: Where the project actions will result in minor short-term changes to the biophysical and/or socio-economic environment. The impacts will usually be restricted to the immediate area of the project action. The affected system should return to its natural or almost natural state in a short period of time (0 - 5 years). The impacts on human populations will be of a short duration and will not have any lasting consequences. Impact of Medium Significance: Where the project actions will result in moderate short-term or medium term changes to the biophysical and/or socio-economic environment. The effects of the impact could be experienced outside of the project action area and may be evident at a sub-regional or even a regional level. Minor indirect impacts may arise from the project action. The system should recover but it is unlikely that it will return to its natural state. Recovery would only take place in the medium term (5-15 years). Impacts on the human population will be felt after the project action is completed but are not severe and/or disruptive to their quality of life or economic wellbeing. Impacts of High to Very High Significance: Where the project actions will result in major long-term changes to the biophysical and/or socio-economic environment. The effects of the impact will be experienced outside of the project action area and may be evident at a regional, national and even at the international level. Secondary or indirect impacts may arise from the project action. The system may recover over the long-term (>15 years) but will not revert to its natural state. Impacts on human populations will be felt after the project action is completed. The impacts are of a long-term nature and are disruptive to the previous life style of the affected population. Determination of significance will be made on the assumption that any mitigation and / or management		

measure, which is recommended, will be implemented by the developer.

The level of significance is expressed as the sum of the area exposed to the risk (extent), the length of time that exposure may occur over in total (duration), the severity of the exposure (intensity/magnitude), reversibility, the irreplaceable loss of a resource (replaceable), the cumulative effect / impact and the likelihood of the event occurring (probability).

Significance value = (Extent + Duration + Intensity/Magnitude + Reversibility + Replaceable + Cumulative) x Probability.

A distinction is made for the significance rating without the implementation of mitigation measures and with the implementation of mitigation measures. The purpose of mitigation measures is to reduce the significance level of the anticipated impact. Therefore, the reduction in the significance level after mitigation is directly related to the scores used in the impact assessment criteria. The effect of potential mitigation measures to reduce the overall significance level is also to be considered in each issues table (i.e. values with or without mitigation are presented).

No / Very Low Impact	There is no impact or a very low impact.	6-16
Low	The impacts are less important, but some mitigation is required to reduce the negative impacts.	17-40
Medium	The impacts are important and require attention; mitigation is required to reduce the negative impacts.	41-60
High	The impacts are of high importance and mitigation is essential to reduce the negative impacts.	61-85
Very High	The impacts are of a very high importance and no mitigation is possible.	86-96

MITIGATING ENVIRONMENTAL EFFECTS

Mitigation measures are technically and economically feasible measures that will mitigate a project's likely environmental effects. Mitigation is the elimination, reduction, or control of a project's adverse environmental effects, including restitution for any damage to the environment caused by such effects through replacement, restoration, compensation, or any other means.

Mitigation is used to address all adverse environmental effects, whether or not subsequent analysis determines that the effects are significant. The development of the mitigation measures commenced during the scoping assessment and many have become part of the project design. Relevant mitigation measures should form part of any contract for the project.

DEGREE OF CONFIDENCE IN PREDICTIONS

The degree of confidence in the predictions, based on the availability of information and/or specialist knowledge

5.3 Assumptions, Uncertainties and Gaps in Knowledge

The following assumptions, uncertainties and gaps in knowledge were identified for this process to date:

The EIA process is multi-disciplinary, which was informed by the project team. It is thus necessary to presume that the information as provided to the project team to date by external sources is accurate, appropriate and correct.

Data shown in the maps was supplied by various sources and was used after it was reviewed and verified where considered necessary. Verification was, however, restricted to available sources of information only.

The findings and recommendations from the specialist studies have been considered as part of the impact assessment and mitigation measures respectively.

Every effort was made to contact and provide written notification to all stakeholders within the study area. Information presented by the stakeholders is presumed to be accurate and presented timeously with respect to the process at hand.

Assumptions, uncertainties and gaps in knowledge for the individual specialist studies have been provided in the respective specialist reports (**Appendix E to G**).

5.4 Affirmation by EAP

I, **LUCILLE BEHRENS** of **CEN IEM UNIT**, the independent Environmental Assessment Practitioner (EAP) responsible for compiling the BAR, hereby affirm the following in accordance with the requirements of the EIA Regulations, 2014 (as amended):

- a) To the best of my knowledge, the information on the proposed development as included in this BAR is correct.
- b) Comments and inputs from stakeholders and I&APs have been included and considered within this Basic Assessment Report.
- c) Inputs and recommendations from the specialist reports, where relevant; have been included within this BAR.
- d) Correspondence with the EAP and I&APs during the public participation process undertaken by CEN IEM Unit to date, is included in this BAR. This correspondence includes information provided to I&APs and any responses by the EAP to comments or inputs made by I&APs.

Refer to **Appendix B** for the EAP declaration and signed Oath.

Chapter 6: DESCRIPTION OF AFFECTED / BASELINE ENVIRONMENT

6.1 Climate

Rainfall occurs mainly in the summer months, with the heaviest rainfall experienced during the months of October and November. Relatively dry and cold months are from May to August. The mean annual rainfall experienced within the area is 600-700 mm per annum. The mean annual simulated runoff for the quaternary catchment is 150-250 mm. The elevation above mean sea level is 0-300 a.m.s.l. The potential evapotranspiration is 1646 mm per annum (Edwards *et al.*, 2025).

The maximum average temperature is 27°C occurring in January (summer) and the minimum average temperature is 9°C occurring in the winter months of June and July (Wright, 2025).

Based on SAAQIS (South African Air Quality Information System) monitoring data for 2026, air quality in South Durban is generally characterised by a variable but cumulatively impacted condition. Monitoring results from the eThekweni network indicate that ambient air quality typically fluctuates between “Good” to “Moderate” Air Quality Index (AQI) conditions during periods of adequate atmospheric dispersion, particularly when coastal winds assist in pollutant dispersion. However, air quality frequently deteriorates to “Poor” and occasionally “Unhealthy” conditions during episodes of atmospheric stability, most notably in winter when temperature inversions limit vertical mixing and trap pollutants near ground level.

Fine particulate matter (PM_{2.5}) is consistently identified as the dominant pollutant of concern, with PM₁₀ and nitrogen dioxide (NO₂) also contributing to overall air quality impacts in the area. Sulphur dioxide (SO₂) levels are generally lower on average but remain subject to localised short-term increases associated with industrial sources within the South Durban industrial basin. SAAQIS observations for 2026 therefore reflect a pattern of moderate baseline air quality with intermittent pollution spikes, particularly in proximity to industrial, port, and freight transport corridors. Overall, the South Durban area continues to be classified as a cumulatively impacted air shed, where air quality is strongly influenced by combined industrial emissions, dense road freight activity, and port-related operations, resulting in persistent spatial and temporal variability in pollutant concentrations.

6.2 Geology and Topography

With reference to the 1:250 000 Geological Series map of Durban (2930) the Durban Port and surrounding region is underlain by a thick sequence of in-situ unconsolidated Quaternary aged sediments, colloquially referred to as the ‘Harbour Bed’ sediments, which comprise alternating sequences of alluvial and estuarine sediments representing the variable deposition environments (Gordon, 2025).

These Harbour Bed sediments overlie Cretaceous aged sandstone/siltstone bedrock at considerable depth, generally in excess of 30m. During the development of the Durban Port and surrounds, the historically low-lying marshland was reclaimed by pumping in hydraulic reclamation fill to build up the land to its current elevation. As a result, the area is generally level with no significant gradient/change in topography throughout. The hydraulic reclamation fill was largely sourced from the dredging of the harbour and its mouth (Gordon, 2025).

6.3 Terrestrial Ecological Environment

6.3.1 Vegetation

The vegetation communities encountered on site were as follows and take into account the disturbance history on site (Edwards *et al.*, 2025):

Community 1: Alien dominated woodland/shrubland:

This community occurs along the old railway line and in areas not maintained as part of the road verges or road servitude within the study area and is primarily dominated by almost monotypic dense stands of *Tecoma stans* (Yellow Bells) in some areas with the margins of these dense stands adjoining maintained road verges comprising more of a mixture of other alien invasive species including *Ricinus communis* (Castor Oil), *Lantana camara* (Lantana), *Tithonia diversifolia* (Mexican Sunflower), *Chromolaena odorata* (Paraffin Bush), *Solanum mauritianum* (Bugweed), *Tagetes minuta* (Khaki Weed), *Bidens pilosa* (Black Jack), *Ipomoea purpurea* (Morning Glory) and *Cascabela thevetia* (Yellow Oleander).

Community 2: Road Verges with scattered trees and mowed lawn:

These areas primarily comprised shortly cropped grass cover with a mixture of ruderal grasses including *Sporobolus africanus* (Rat's Tail Grass), *Digitaria eriantha* (Common Finger Grass), *Sporobolus pyramidalis* (Catstail Grass), *Panicum maximum* (Guinea Grass), *Imperata cylindrica* (Cottonwool Grass) (in localised patches along Langeberg Road) and *Cynodon dactylon* (Couch Grass) with low scattered cover of *Senecio madagascariensis* (Fireweed) as well as *Plantago lanceolata* (Ribwort Plantain), *Heliotropium amplexicaule* (Blue Heliotrope), *Conyza sp* (Fleabane Species), *Tagetes minuta* (Khaki Weed) and *Bidens pilosa* (Black Jack) in some areas. Scattered clumps of trees which include a mixture of indigenous and planted exotic trees and shrubs are interspersed between more open areas of shortly cropped grass. Vegetation within these tree clumps include various indigenous *Ficus* (Fig) species, *Brachylaena discolor* (Coast Silver Oak), *Strelitzia nicolai* (Natal Wild Banana), *Phoenix reclinata* (Wild Date Palm), *Erythrina lysistemon* (Common Coral Tree) and *Vachellia xanthophloea* (Fever Tree) and exotic species including *Casuarina equisetifolia* (Horsetail Tree), *Plumeria sp* (Frangipani), and *Acalypha wilkesiana* (Copperleaf) with *Ipomoea purpurea* (Morning Glory) growing over this exotic hedge. More shaded areas underneath mature trees were dominated by *Asystasia gangetica* (Creeping Foxglove). Low scattered cover of alien shrubs such as *Ricinus communis* (Castor Oil), *Solanum mauritianum* (Bugweed) and *Chromolaena odorata* (Paraffin Bush) were also noted in some areas. It was noted during the site visit that cement barriers had been installed along the proposed alignment already and that construction rubble had been piled along the road verge in one instance.

Community 3: Hygrophilous Grassland and Scattered Indigenous Trees:

This vegetation community adjoins the road verge along Langeberg Road and occurs within the fenced off Mangrove Forest area. Along the fenceline, looking through the other side, the vegetation comprised a hygrophilous grassland dominated by *Imperata cylindrical* (Cottonwool Grass) with *Digitaria eriantha* (Common Finger Grass) also prevalent in some areas. Scattered tree cover along the fenceline but within the reserve included clumps of *Brachylaena discolor* (Coast Silver Oak), mixed with *Strelitzia nicolai* (Natal Wild Banana), *Phoenix reclinata* (Wild Date Palm) and *Clerodendrum glabrum* (Tinderwood).

Community 4: Mixed alien and indigenous woodland

A small patch on the south-eastern most end of Bayhead Road adjoining the Amanzimyana Stream (which has been canalised), appeared to exhibit a higher cover and diversity of indigenous species with alien invasives also represented, but not as extensively as in Community 1. Indigenous species represented within this patch of woodland/shrubland included moderate cover of *Trema orientalis* (Pigeon Wood), moderate cover of *Clerodendrum glabrum* (Tinderwood), high cover of *Brachylaena discolor* (Coast Silver Oak) and *Strelitzia nicolai* (Natal Wild Banana), low cover of *Apodytes dimidiata* (White Pear) and *Searsia chirindensis* (Red Currant). This was interspersed with invasive shrubs such as *Chromolaena odorata* (Paraffin Bush), *Ricinus communis* (Castor Oil) and *Lantana camara* (Lantana), *Euphorbia heterophylla* (Wild Poinsettia), *Tagetes minuta* (Khaki Weed), with the understorey characterised by a mixture of *Asystasia gangetica* (Creeping Foxglove), *Senecio tamoides* (Canary Creeper), *Rivina humilis* (Bloodberry), a low cover of *Smilax anceps* (Leg-ripper / Wild sarsaparilla) intertwined amongst other vegetation and a low cover of *Morus alba* (White Mulberry) and *Tecoma stans* (Yellow Bells). Along the canal, vegetation comprised a mixture of *Strelitzia nicolai* (Natal Wild Banana), *Brachylaena discolor* (Coast Silver Oak) and *Chrysanthemoides monilifera* (Bush-tick Berry) mixed with *Tecoma stans* (Yellow Bells), *Lantana camara* (Lantana) and *Chromolaena odorata* (Paraffin Bush) primarily.

Refer to **Figures 6-1 to 6-4** for the mapped vegetation communities, **Appendix D** for site photographs and **Appendix E** for the Terrestrial Biodiversity Report.

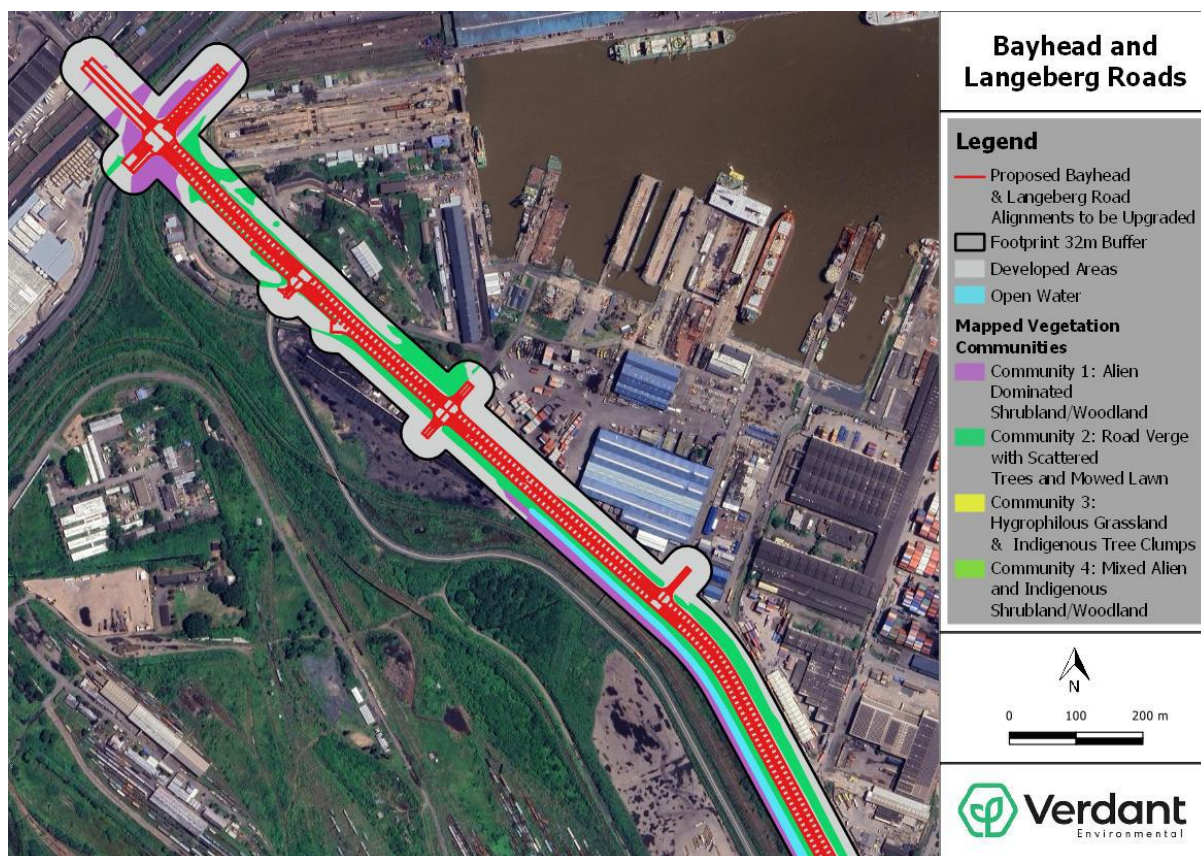


Figure 6-1: Vegetation Communities along north-western portion of Bayhead Road (Edwards *et al.*, 2025)

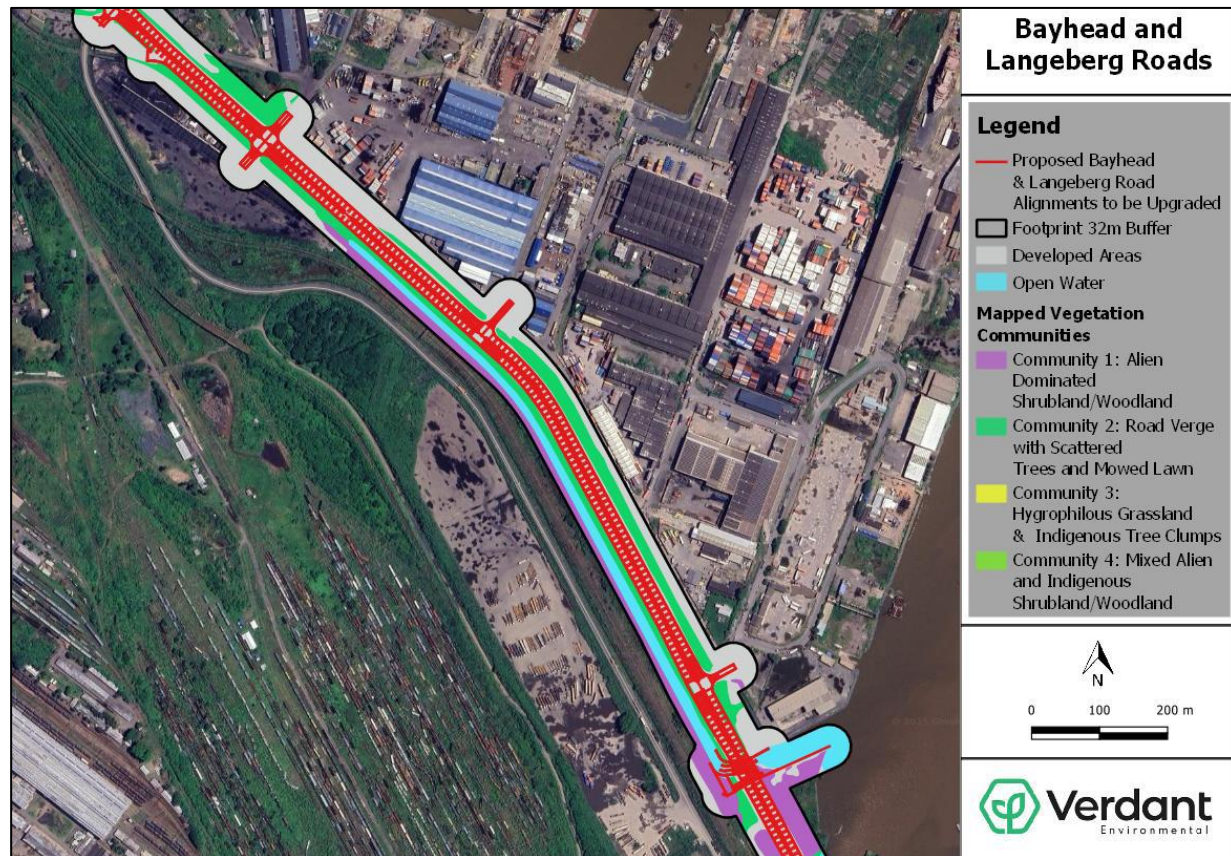


Figure 6-2: Vegetation Communities along mid-section of Bayhead Road (Edwards *et al.*, 2025)

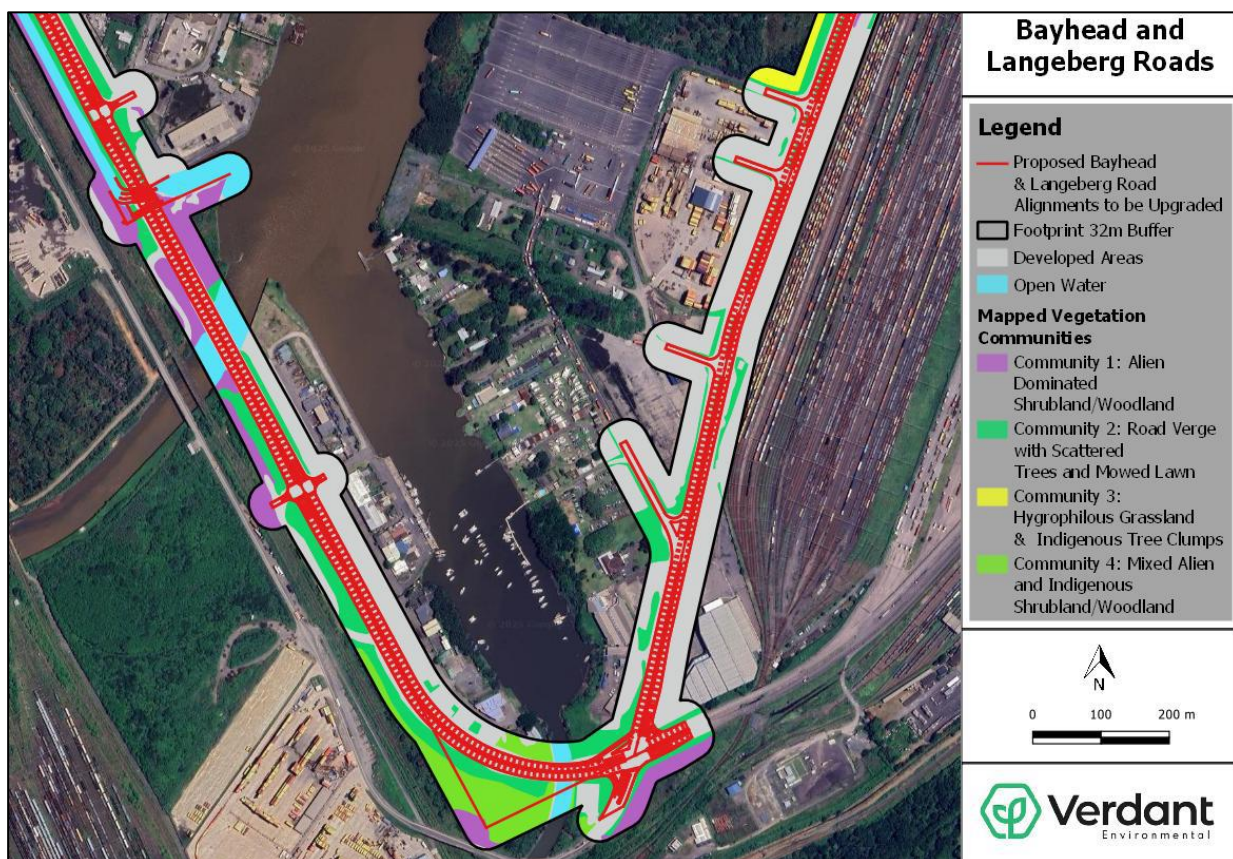


Figure 6-3: Vegetation Communities along south-eastern portion of Bayhead Road and south-western portion of Langeberg Road (Edwards et al., 2025)

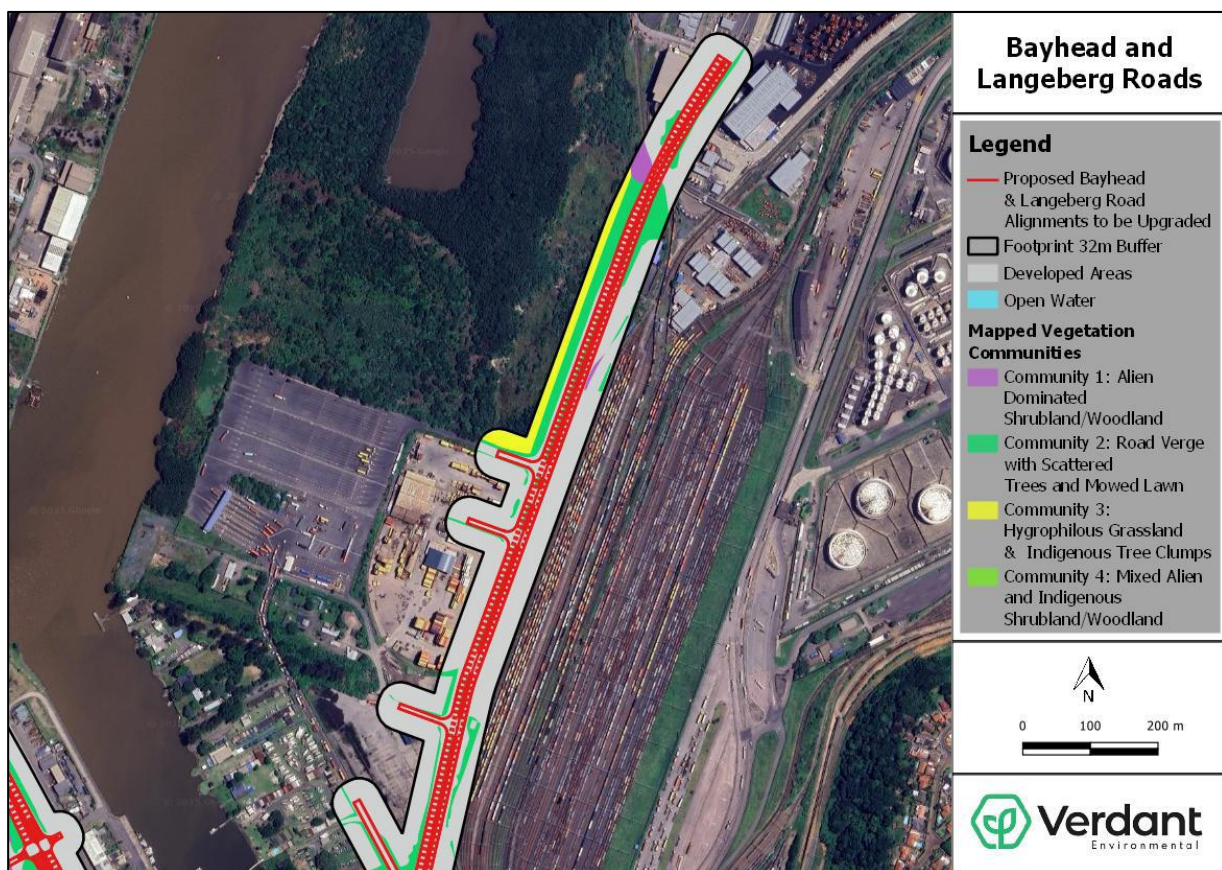


Figure 6-4: Vegetation communities along north-eastern section of Langeberg Road (Edwards et al., 2025)

6.3.2 Threatened Ecosystems

In terms of the 2021 Revised List of Threatened Ecosystems assessment (SANBI, 2021) the following ecosystems are located in the larger area (Edwards *et al.*, 2025):

- KwaZulu-Natal Coastal Belt Grassland (Endangered)
- Northern Coastal Forest (Least Concern)
- Mangrove Forest (Least Concern)

Figure 6-5 shows the original extent of ecosystems and **Figure 6-6** presents the remaining extent layer, and is based on the National Spatial Biodiversity Assessment, 2018.

The Bayhead and Langeberg Roads are not located within any remnant sections.

Refer to **Appendix E** for the Terrestrial Biodiversity Report.

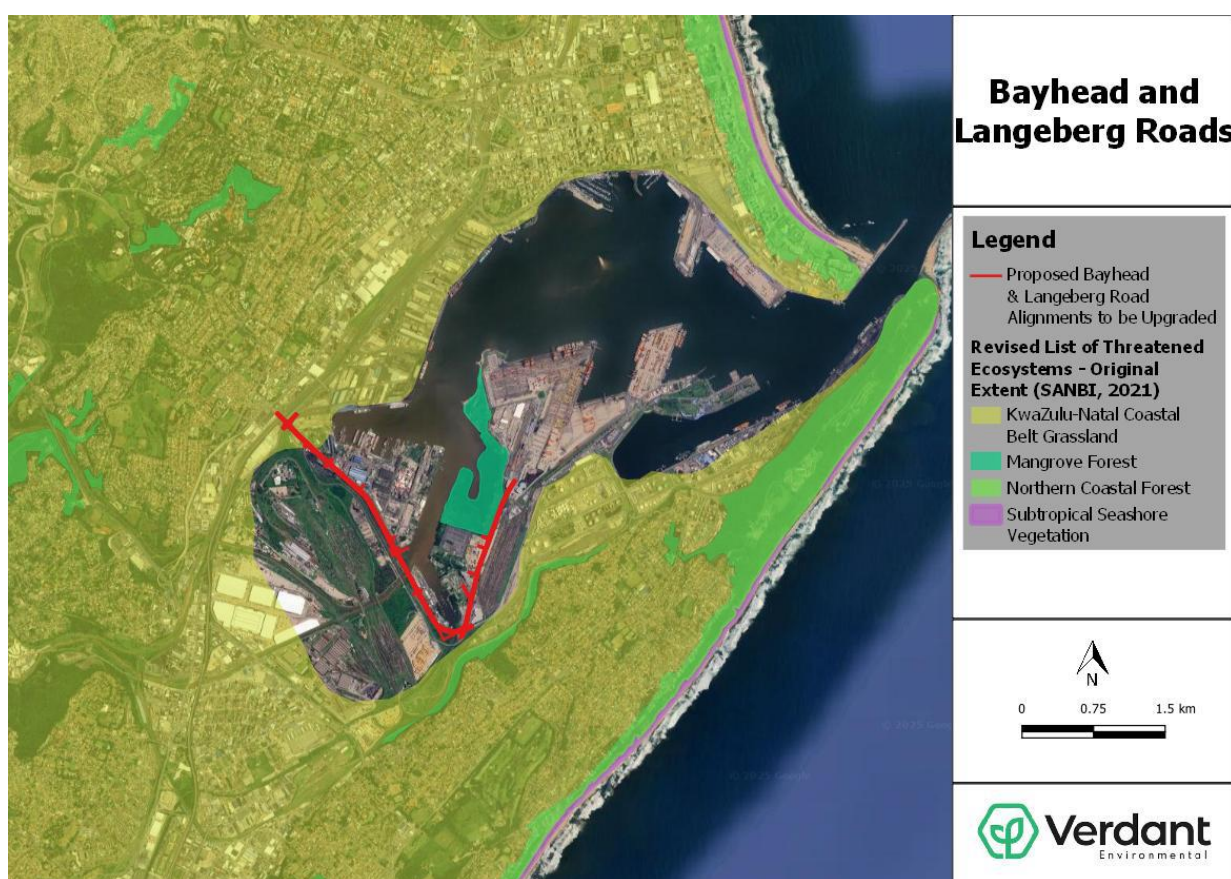


Figure 6-5: Original extent of threatened ecosystems (SANBI, 2021) in relation to the project area. (Edwards *et al.*, 2025).

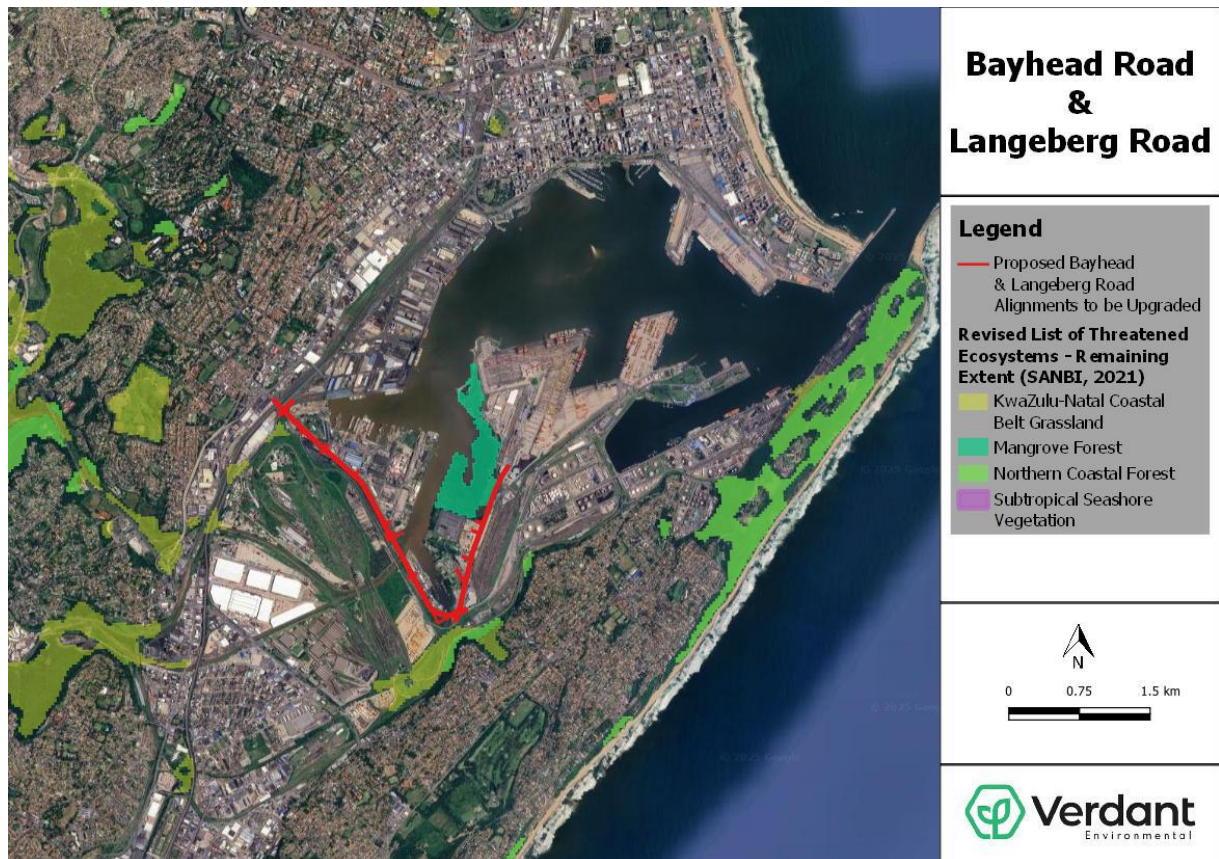


Figure 6-6: Remaining extent of threatened ecosystems (Edwards *et al.*, 2025)

6.3.3 Flora – Rare, Threatened and Protected Species

No Red Listed or Orange Category species were encountered on site (Edwards *et al.*, 2025).

No protected tree species in terms of the National Forests Act (Act No. 84 of 1998) were identified on site, although some species (e.g. *Ficus trichopoda* (Swamp fig), *Barringtonia racemose* (Powderpuff tree), *Sideroxylon inerme subsp. Inerme* (White Milkwood), *Bruguiera gymnorhiza* (Black mangrove) and *Rhizophora mucronata* (Red mangrove)) are likely to occur in the surrounding area (Edwards *et al.*, 2025).

No protected flora species in terms of the KwaZulu-Natal Provincial Conservation Ordinance were observed on the site visit, though some may occur nearby (Edwards *et al.*, 2025).

6.3.4 Floral Ecological Importance and Sensitivity

Communities 1 and 2 are considered of 'Very Low' SEI due to the moderate to high cover of alien plant invasion observed, the high level of fragmentation and edge impacts that have resulted in a deterioration of both biodiversity and level of functioning. Community 4 is considered of 'Low' SEI, although this community has also been highly impacted by direct loss and fragmentation it still comprises some diversity of indigenous vegetation and is considered in better condition in comparison to Community 1 and Community 2. Community 3 is considered of 'Medium' SEI as this community occurs within/adjacent to the Mangrove Forest area with

indigenous vegetation comprising most of the cover, with low alien plant invasion observed. However, this community is also isolated and fragmented due to historical development in the area and therefore although it has a 'High' conservation importance rating (driven by the Critically Endangered threat status of the reference vegetation type at the provincial scale), the area adjoining the road within 32m of the project site has likely been affected by edge impacts in the past and therefore the conservation importance rating has been revised to 'Medium' and likewise its functional integrity has been compromised and has been rated as 'Medium' resulting in a 'Medium' biodiversity importance rating (Edwards *et al.*, 2025).

Based on the SANBI (2020) general guidelines, the following SEI rating has been allocated for each community (Edwards *et al.*, 2025):

- Very Low SEI (for Community 1 & 2) - Minimization mitigation - Development activities of medium to high impact acceptable and restoration activities may not be required.
- Low SEI (for Community 4) – Minimisation and restoration mitigation – development of activities of medium to high impact acceptable followed by appropriate restoration activities.
- Medium (for Community 3) – Minimisation and restoration mitigation – development of activities of medium impact acceptable followed by appropriate restoration activities.

Refer to **Figures 6-7 to 6-10** for the EIS ratings and **Appendix E** for the Terrestrial Biodiversity Report.

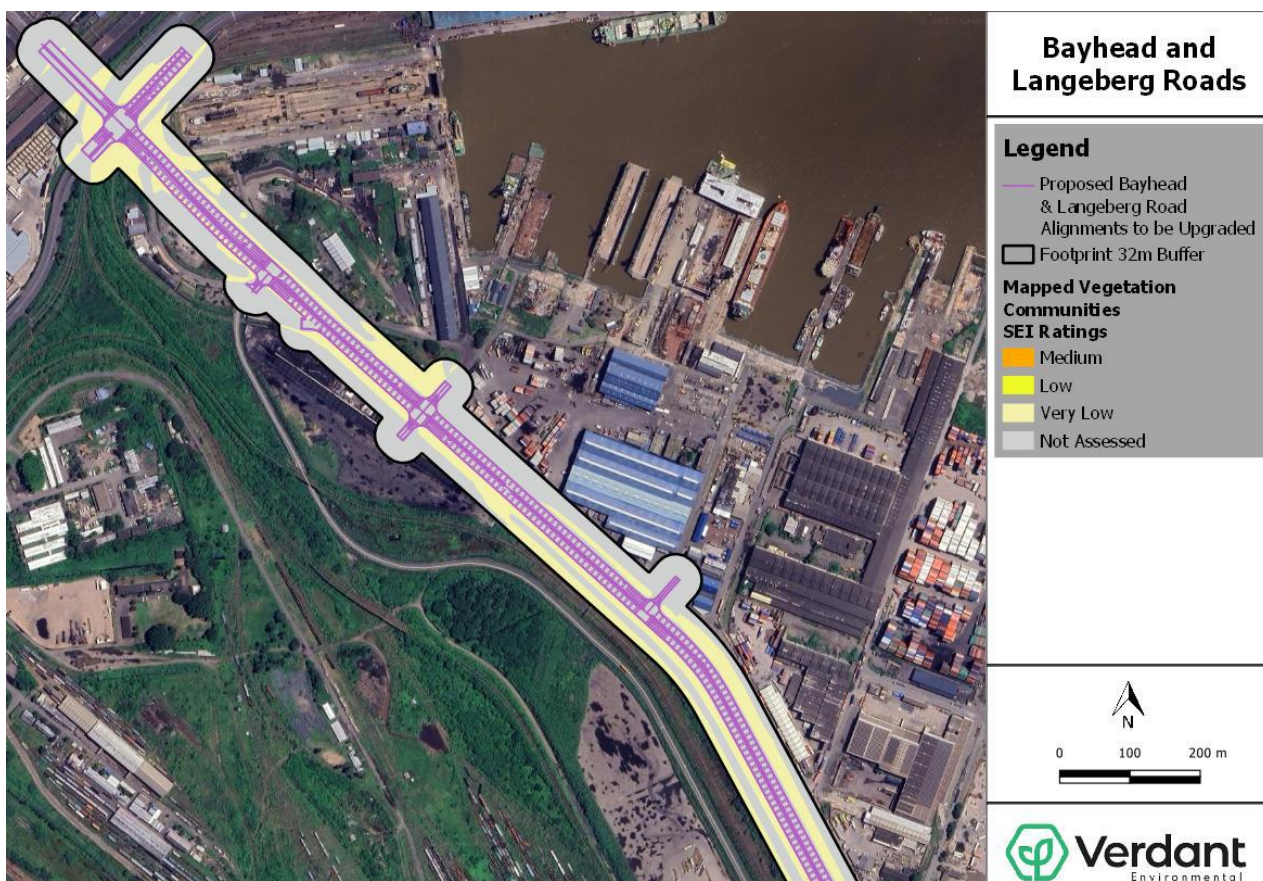


Figure 6-7: EIS ratings of mapped vegetation communities along the north-western portion of Bayhead Road (Edwards 2025)

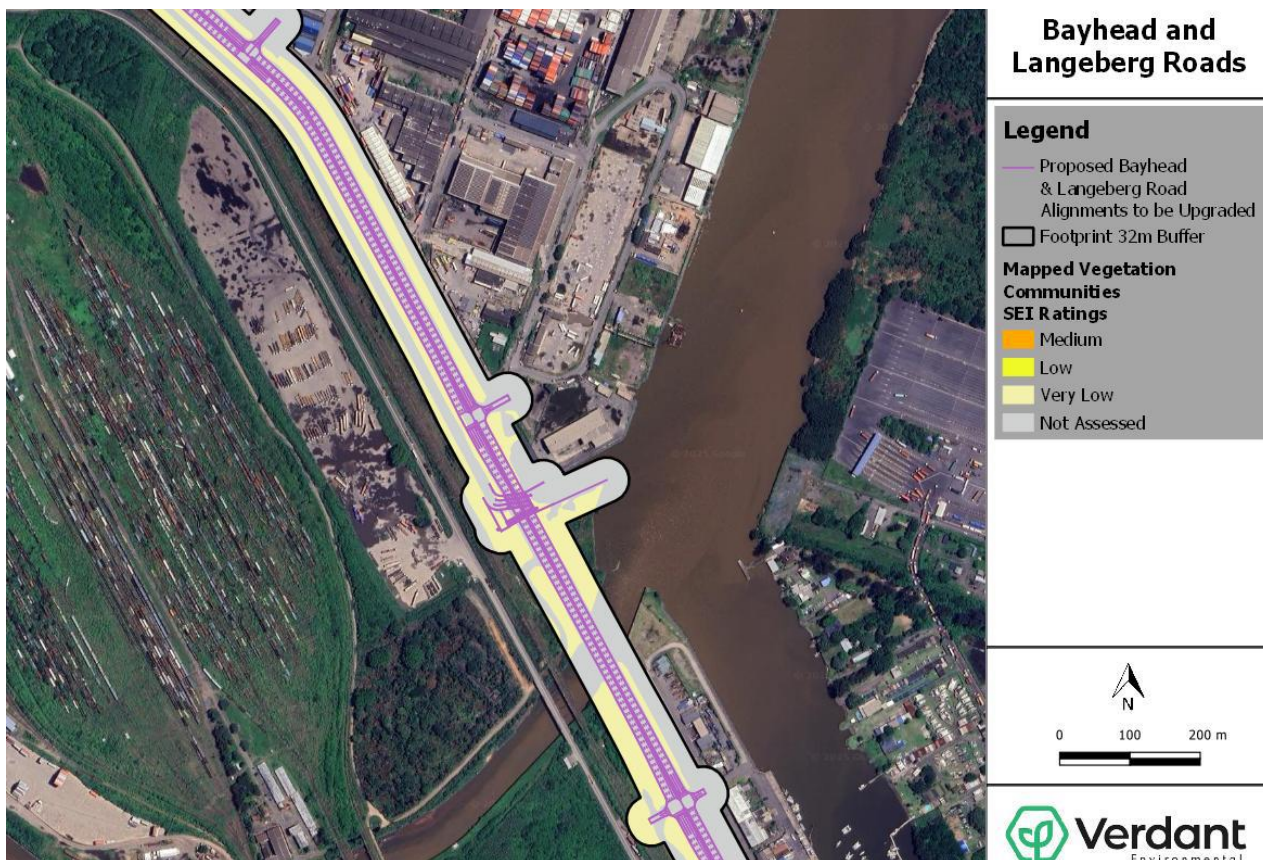


Figure 6-8: EIS ratings of mapped vegetation communities along the mid-section of Bayhead Road (Edwards 2025)

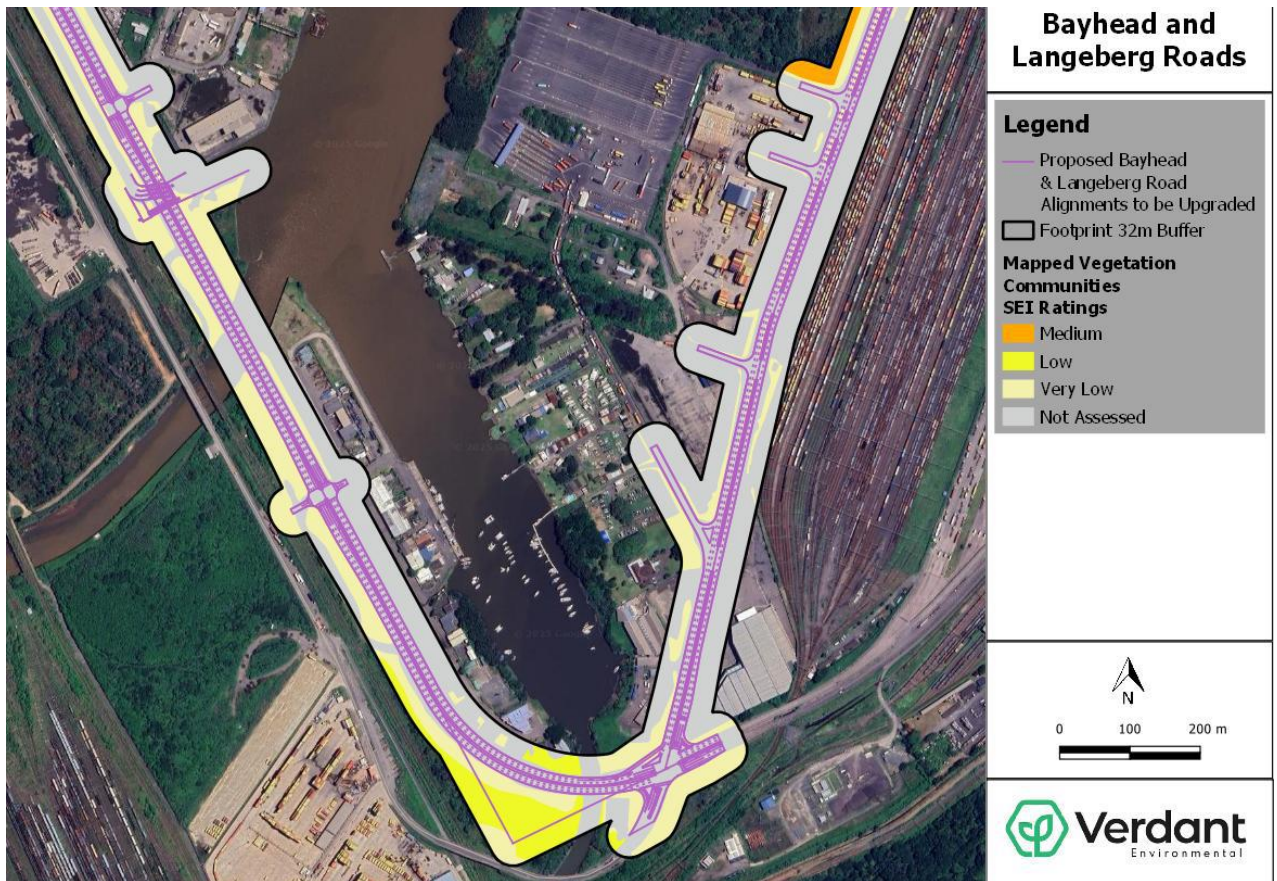


Figure 6-9: EIS ratings of mapped vegetation communities along the Bayhead and Langeberg Road Intersection (Edwards 2025)

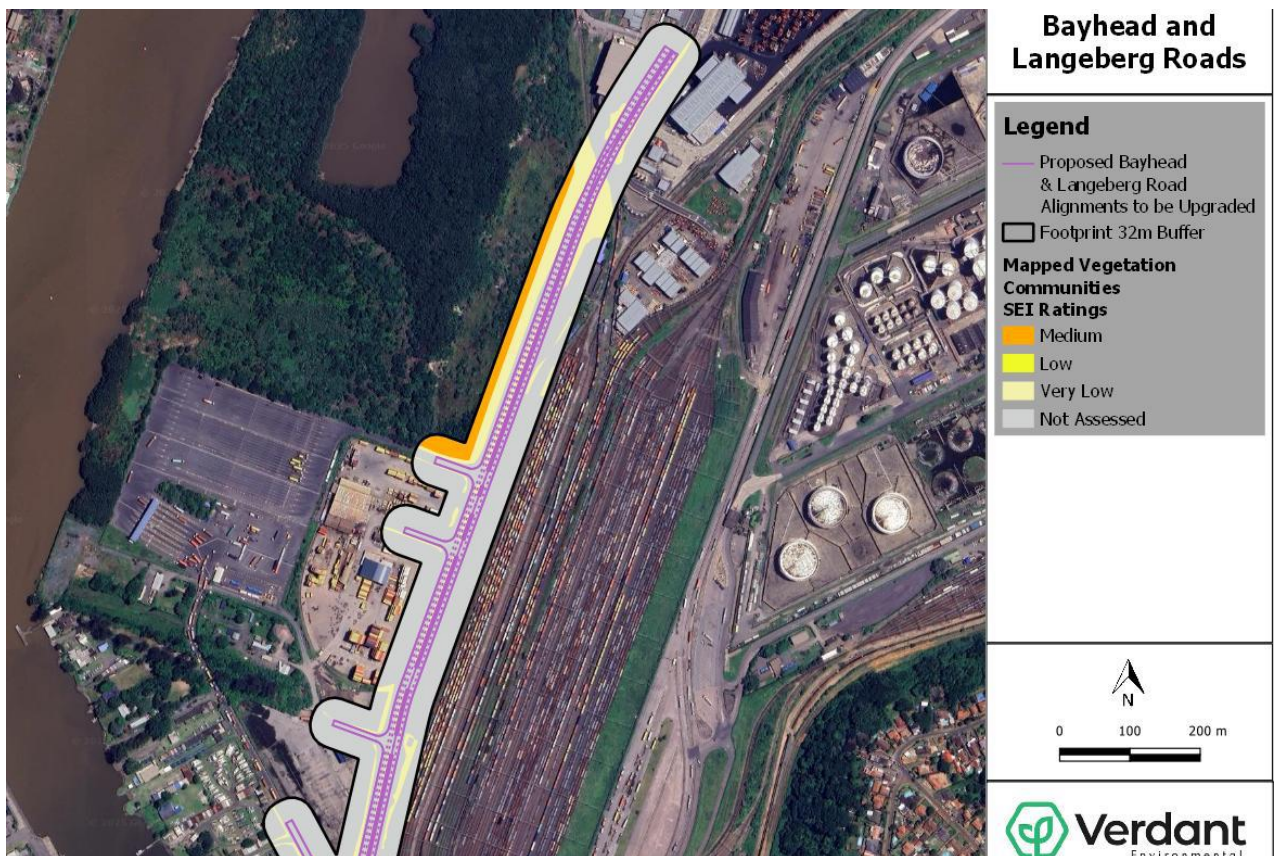


Figure 6-10: EIS ratings of mapped vegetation communities along the north-eastern section of Langeberg Road (Edwards 2025)

6.3.5 Faunal Habitat

The large majority of the footprint falls within existing transformed areas with hardened surfaces, and lawn verges immediately adjacent to existing road infrastructure including localised patches of secondary grassland along the southern end of Bayhead Road (Faunal Habitat 2) and areas of dense alien vegetation (Faunal Habitat 1). A portion of the 32m buffer area extends into the Mangrove Forest area along Langeberg Road and comprises grassland with scattered indigenous trees (Faunal Habitat 3) and there are some localised areas in the southern section of Bayhead Road that comprise thickets of mixed indigenous and alien vegetation (Faunal Habitat 4) (Edwards *et al.*, 2025).

The majority of the footprint offers no or very low value to faunal communities, given its transformed or highly disturbed nature. However, Faunal Habitat 3 within the Mangrove Forest area and Faunal Habitat 4 (localised patches of mixed indigenous and alien thicket along the southern end of Bayhead Road) provide valuable habitat for the KwaZulu Dwarf Chameleon (*Bradypodion melanocephalum*). These two faunal habitats, as well as areas of secondary grassland and in some cases dense alien/indigenous thicket that is more degraded provide some value as linkages for the KwaZulu Dwarf Chameleon. These more degraded areas of secondary grassland and alien invaded thicket of very low value for most species have been grouped into a fifth faunal habitat to flag their importance as an ecological corridor for this species (Faunal Habitat 5 secondary grassland and mixed indigenous and alien thicket) (Edwards *et al.*, 2025).

Faunal Habitats 1, 2, 4, and 5 are of low value for the majority of fauna, and faunal communities will be species-poor, and primarily consist of generalist, disturbance-tolerant species across all fauna groups (Edwards *et al.*, 2025).

Refer to **Figures 6-11 to 6-14** for the mapped faunal communities and **Appendix E** for the Terrestrial Biodiversity Report.

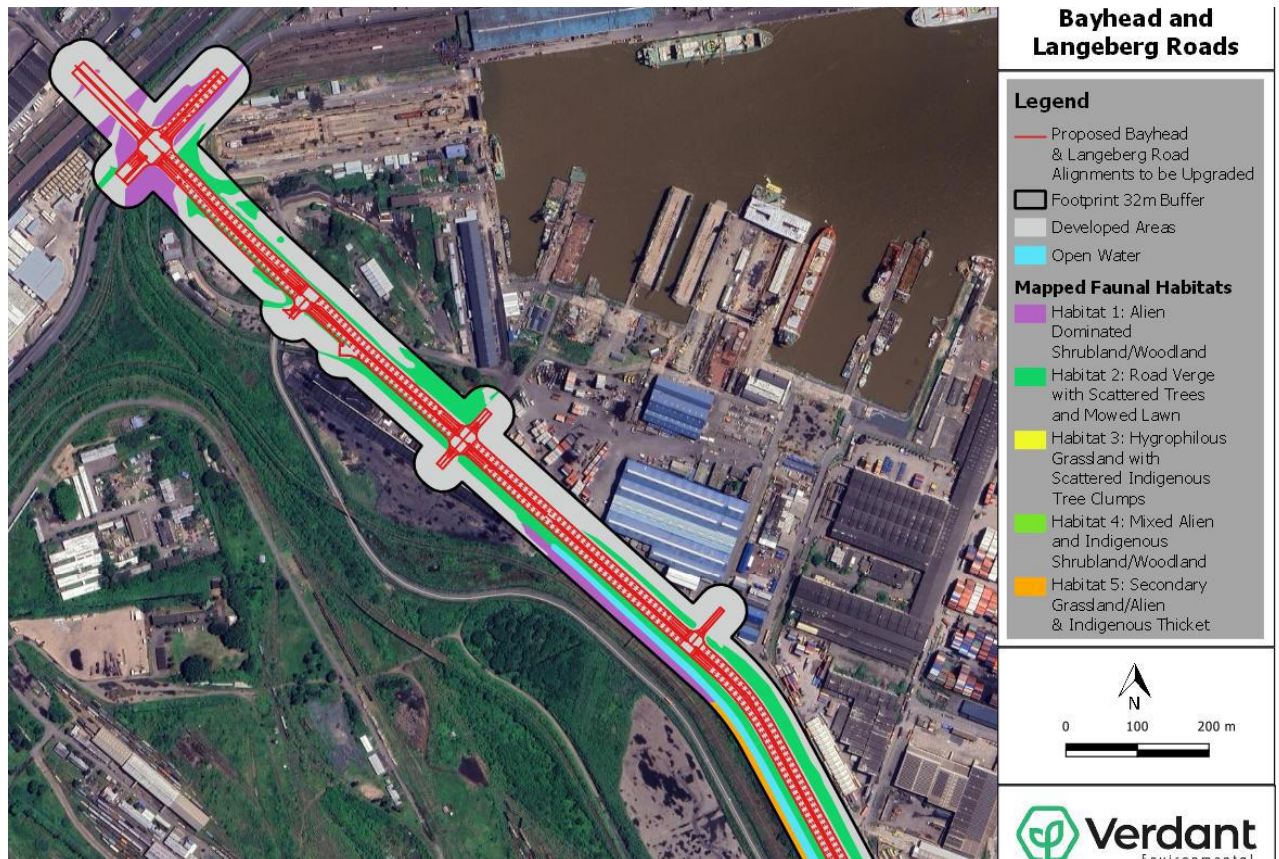


Figure 6-11: Mapped faunal habitats along the north-western portion of Bayhead Road (Edwards 2025)

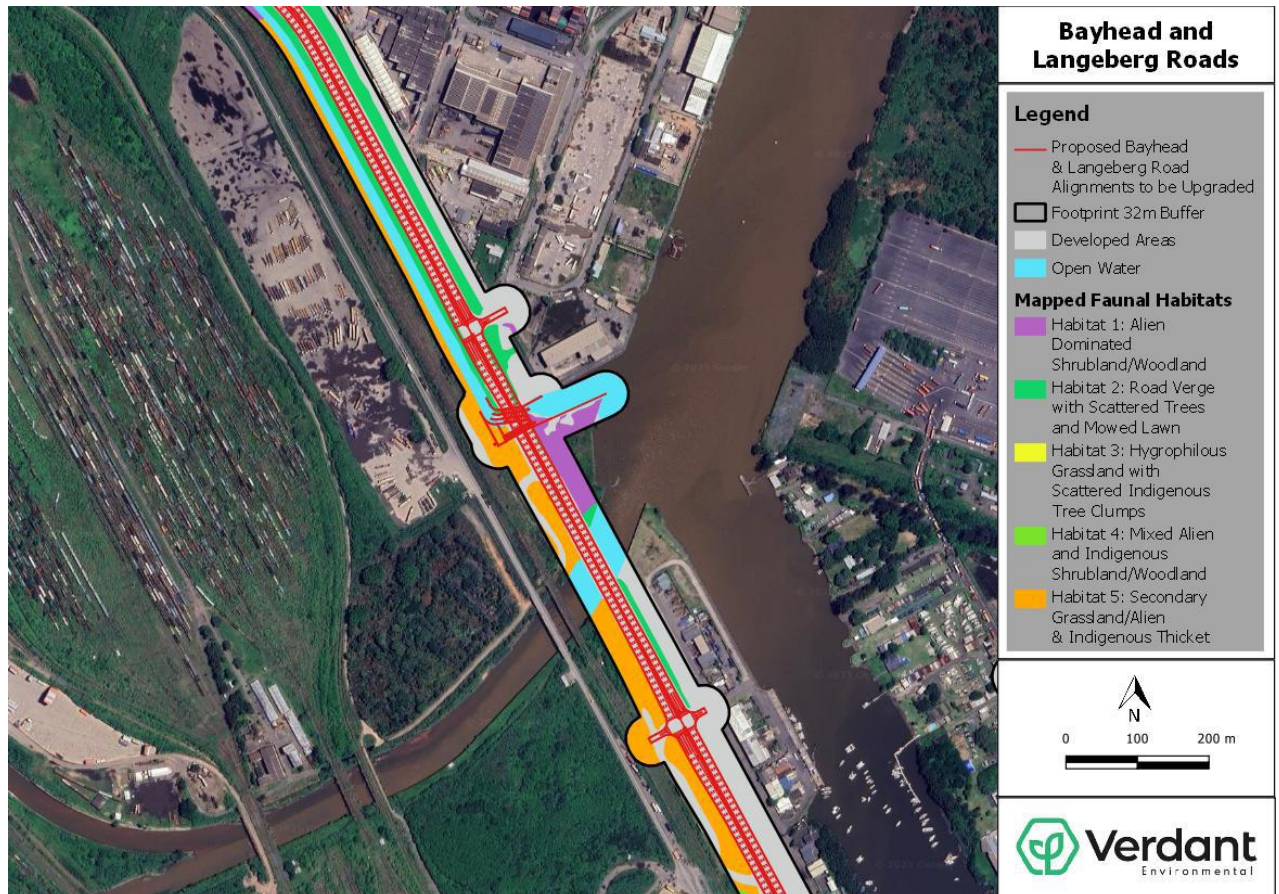


Figure 6-12: Mapped faunal habitats along the mid-section of Bayhead Road (Edwards 2025)

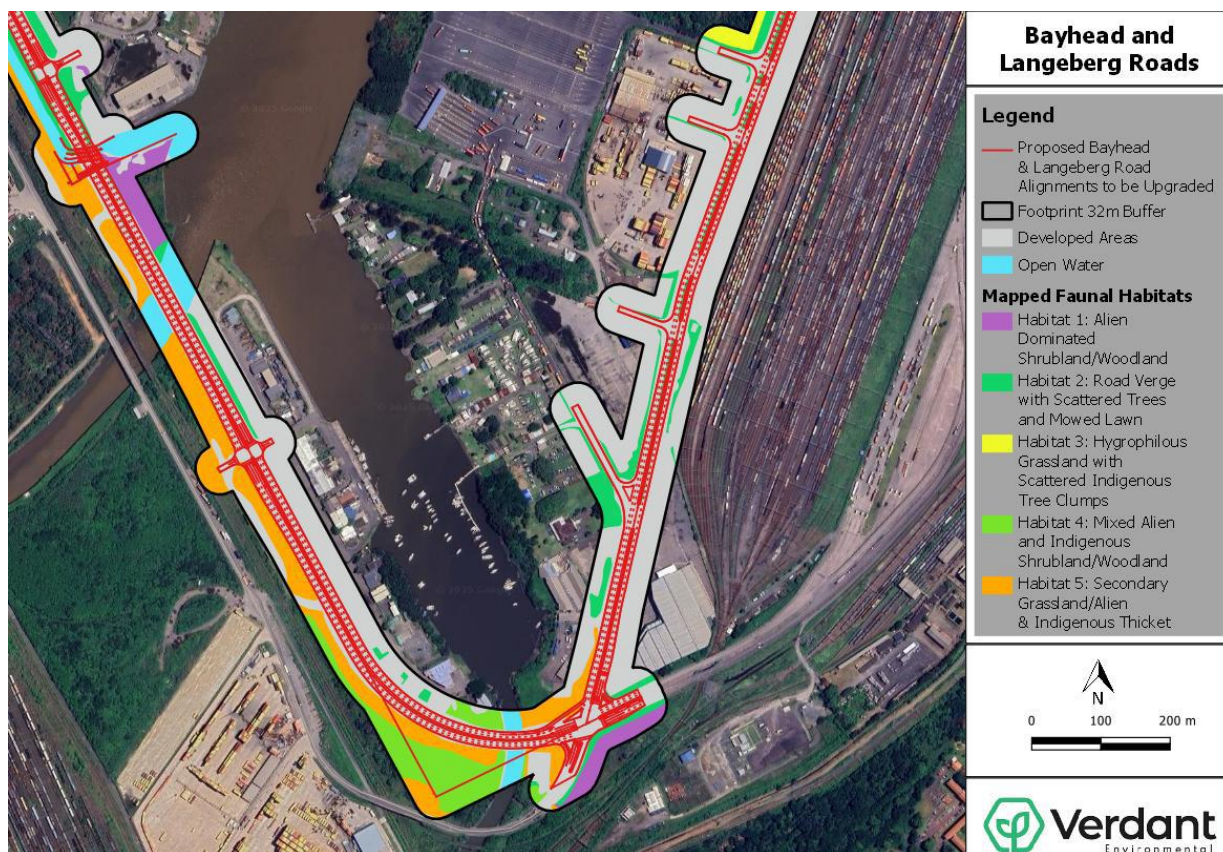


Figure 6-13: Mapped faunal habitats along the south-eastern end of Bayhead Road and the south-western end of Langeberg Road (Edwards 2025)

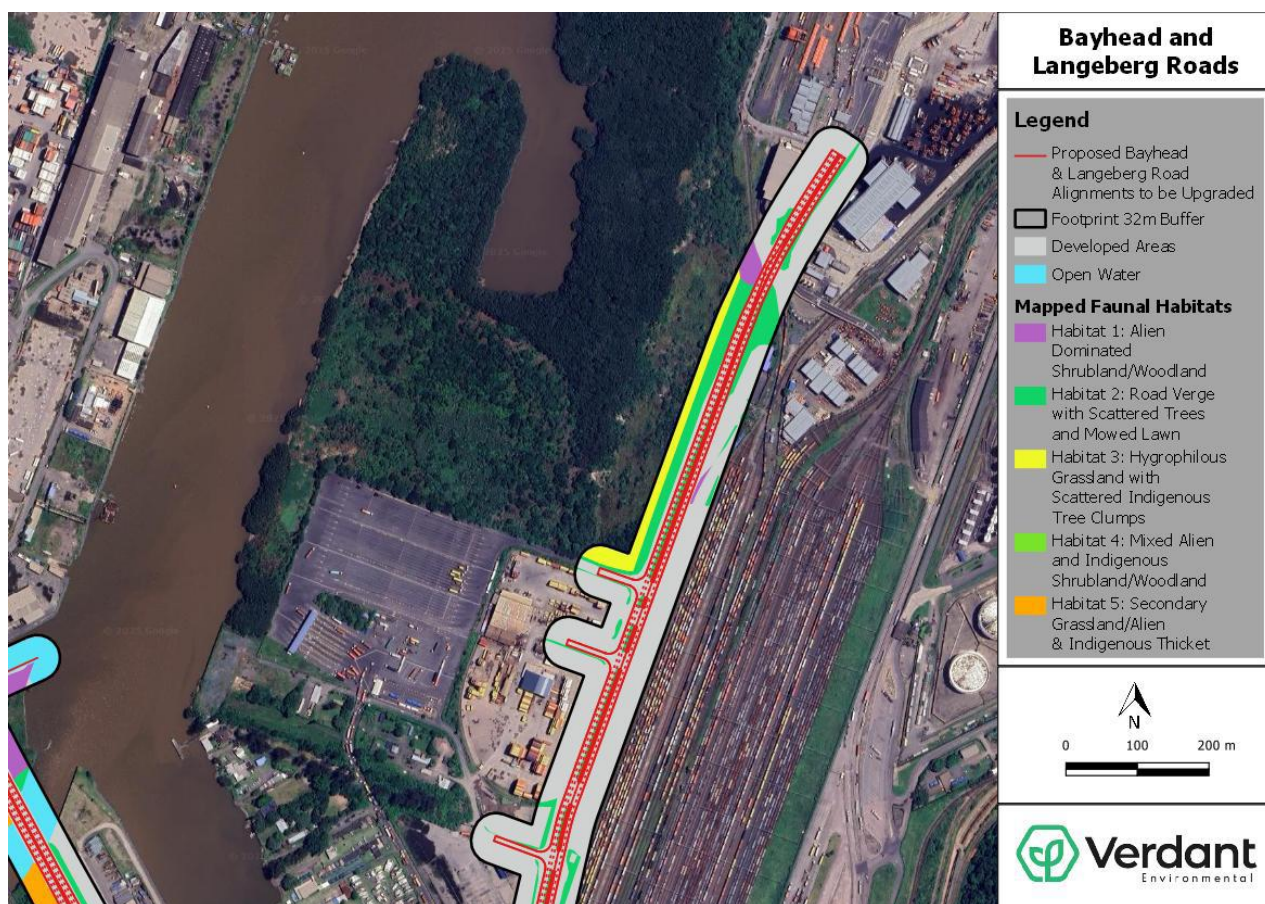


Figure 6-14: Mapped faunal habitats along the north-eastern end of Langeberg Road (Edwards 2025)

6.3.6 Faunal Potential Occurrence and Sensitive Species

The vast majority of Species of Conservation Concern (SCC) known from the broader area will not be present within or in close proximity to the proposed development. However, one sensitive species, the KwaZulu Dwarf Chameleon (*Bradypodion melanocephalum*), is known to occur in the broader area, and does use these vegetation patches described above, which function both as supporting habitat and as areas of connectivity for the species in the landscape (Harvey 2019, EKZN database records, iNaturalist). Given the limited remaining patches of vegetation in the broader area, and the tenuous connectivity they provide for this species, they need to be kept at the greatest extent and quality possible. These areas maintain connectivity between vegetated areas and chameleon subpopulations 1) west of the Bayhead Road, 2) the vegetated areas on the Bluff ridge, and 3) Mangrove Forest area. Although the chameleons will be absent from the majority of the footprint, they will utilise a block of vegetation in the southern portion of the footprint, south-west of the Bayhead-Langeberg Road intersection. They will also utilise grassy areas immediately adjacent to the proposed footprint in the southern third of the Bayhead Road section (Edwards *et al.*, 2025).

6.3.7 Faunal Ecological Importance and Sensitivity

Within the footprint, all areas can be considered to be of Very Low SEI, with the exception of the southern vegetation portion shown in **Figure 6-15 to 6-18**, which is considered Medium. For an SEI categorisation of Medium, the following guidance criteria are given (Edwards 2025):

- **Medium SEI** - Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities.

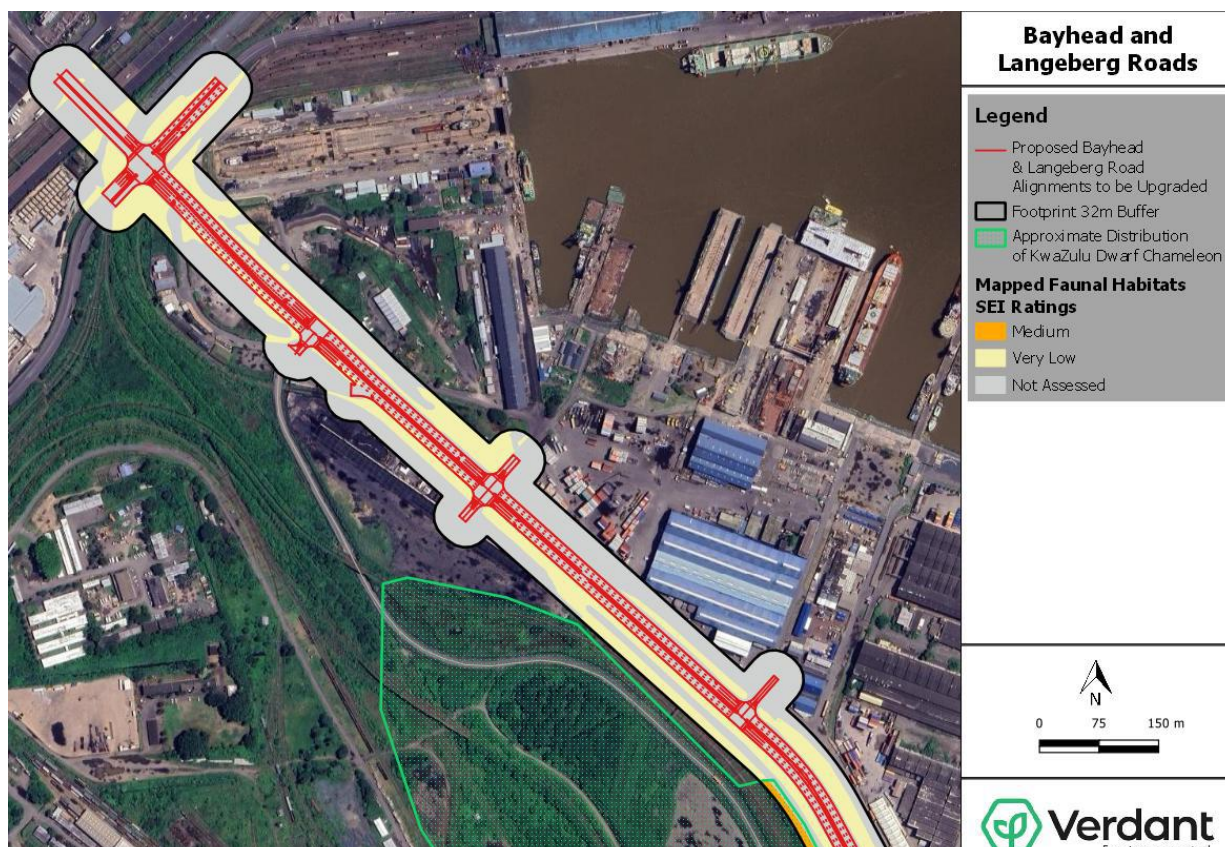


Figure 6-15: EIS ratings of faunal habitat value mapped along the north-western portion of Bayhead Road (Edwards et al., 2025).

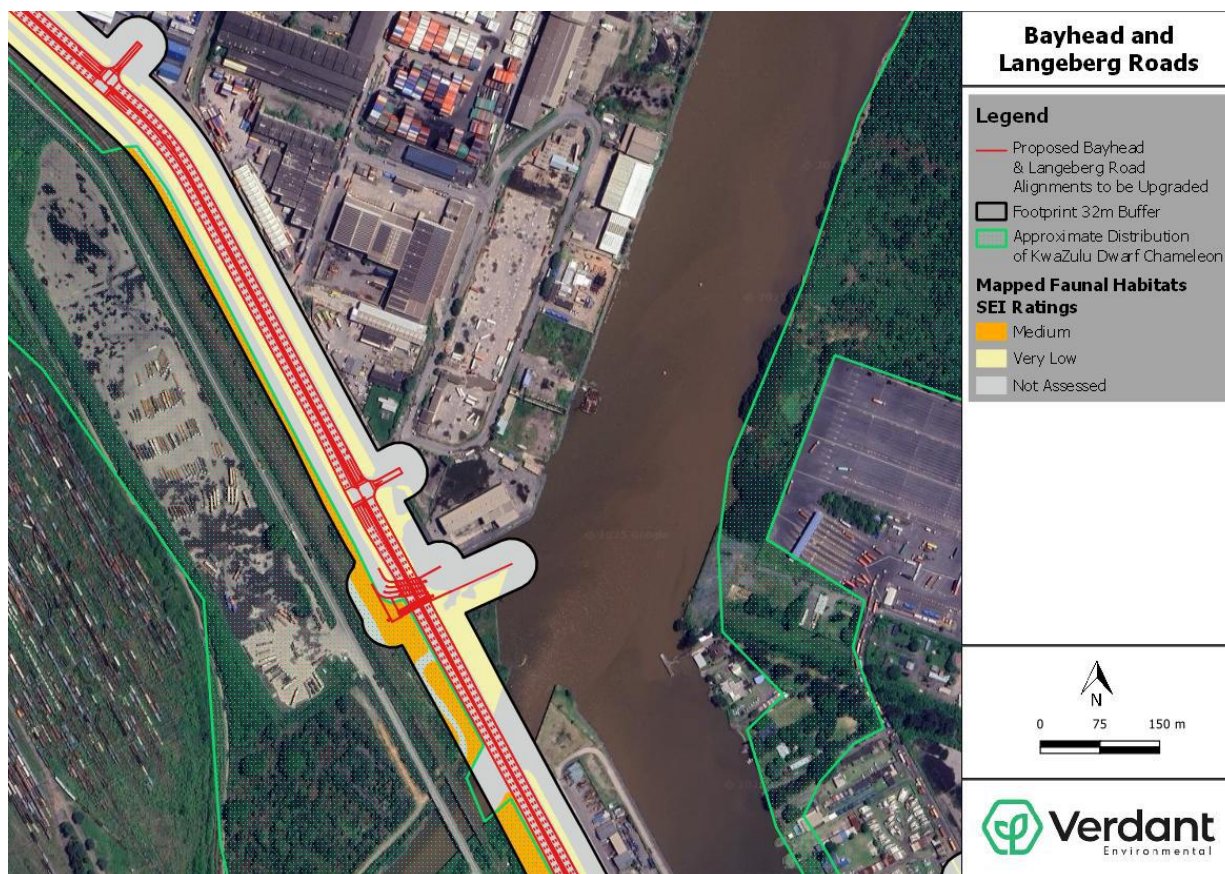


Figure 6-16: EIS ratings of faunal habitat value mapped along the mid-section of Bayhead Road (Edwards et al., 2025).

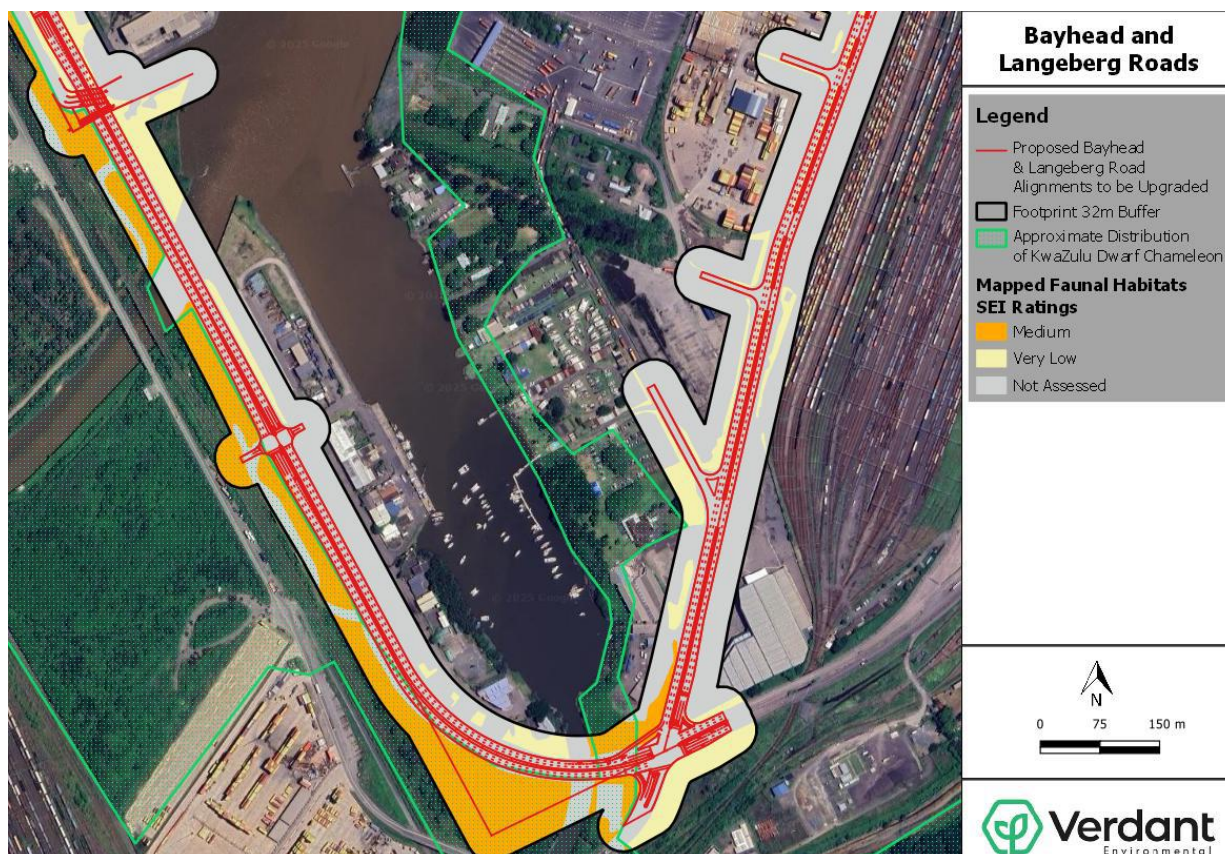


Figure 6-17: EIS ratings of faunal habitat value mapped along the south-eastern end of Bayhead Road and the south-western portion of Langeberg Road (Edwards et al., 2025).

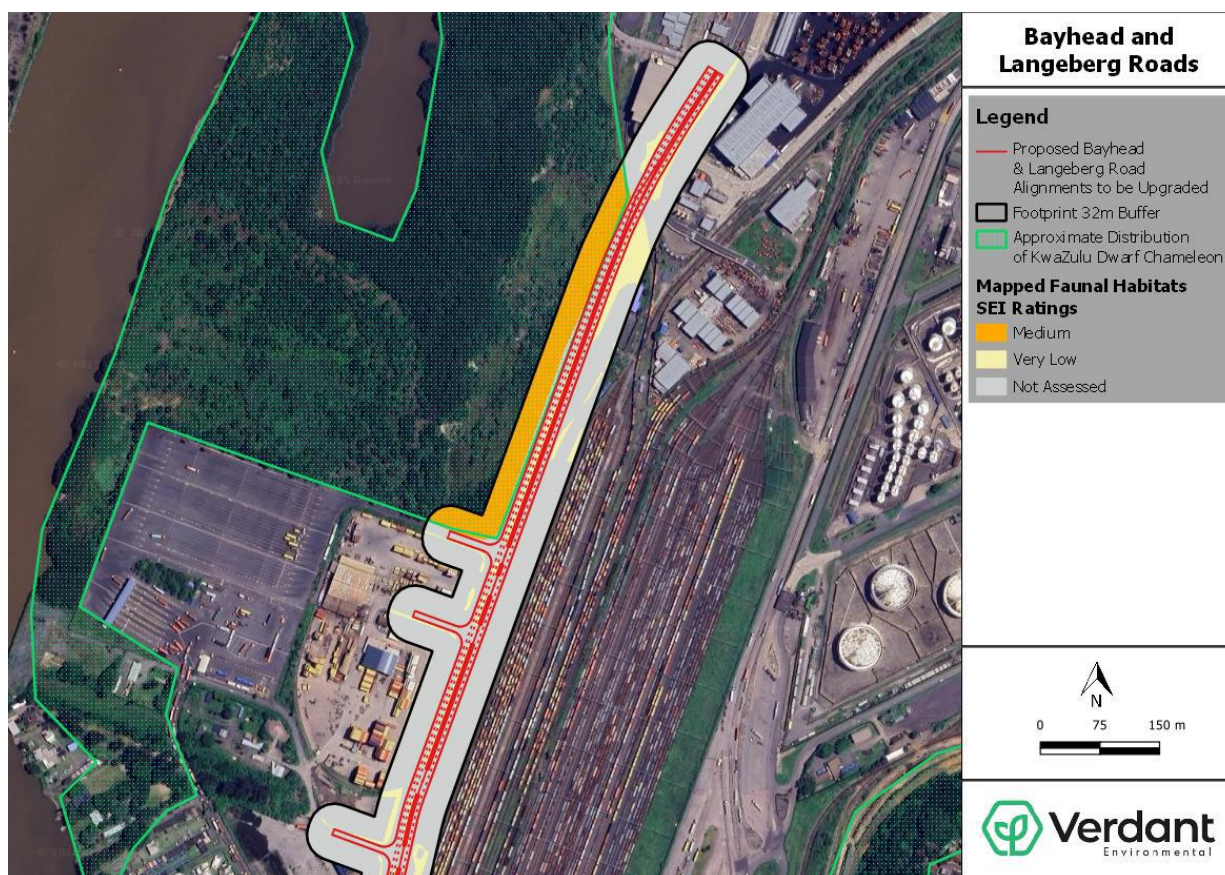


Figure 6-18: EIS ratings of faunal habitat value mapped along the north-eastern section of Langeberg Road (Edwards et al., 2025).

6.3.8 Conservation Context and Biodiversity Areas

A summary of the conservation planning and threat status of the ecological features in the terrestrial biodiversity specialist report is as follows (Edwards *et al.*, 2025; **Appendix E**):

- The proposed footprint does not fall within the Key Biodiversity Areas (KBAs) network, although three KBAs are located within a 2 – 3 km radius of the project site, namely: Paradise Valley (KBA No. 213) 1.8 km to the west, Mlazi (KBA No. 165) 2 km to the east and Mhlatuzana Valley (KBA No. 162) 2.5 km to the south. KBAs are ‘sites that contribute significantly to the global persistence of biodiversity’.
- Large portions of Bayhead Road and most of Langeberg Road is evaluated by the DFFE Screening Tool as Very High Sensitivity with the remainder of the footprint considered of Low Sensitivity for the Terrestrial Biodiversity Theme, Low to High Sensitivity for the Plant Species Theme, and Medium to High Sensitivity for the Animal Species Theme.
- The terrestrial vegetation types within the study area, i.e. Northern Coastal Forest, Mangrove Forest and KwaZulu-Natal Coastal Belt Grassland are currently listed as Least Concern, Least Concern and Endangered at the national level respectively in the latest National Biodiversity Assessment (SANBI, 2018).
- The terrestrial vegetation types at the provincial level namely KwaZulu-Natal Coastal Forests: Southern Moist Coastal Lowlands Forest, Mangrove Forest and KwaZulu-Natal Coastal Belt Grassland are all currently listed as Critically Endangered (Jewitt, 2018).
- The study area falls within the Zululand Coast Surface Water Strategic Water Source Area (WRC, WWF-SA & CSIR, 2017).
- KwaZulu-Natal Terrestrial Systematic Conservation Plan: Portions of the footprint and adjacent areas along Bayhead Road are classified as falling within the edge of areas classified as CBAs: Irreplaceable (EKZNW, 2016) which extend beyond the footprint to the north, south and east. Refer to **Figure 6-19**.
- Durban’s Metropolitan Open Space System (D’MOSS): The Mangrove Forest area (also referred to as the Bayhead Natural Heritage Site / Bayhead Mangrove Swamps) along Langeberg Road and the canals that pass underneath Bayhead Road are flagged as part of D’MOSS (2018). Refer to **Figure 6-20**.

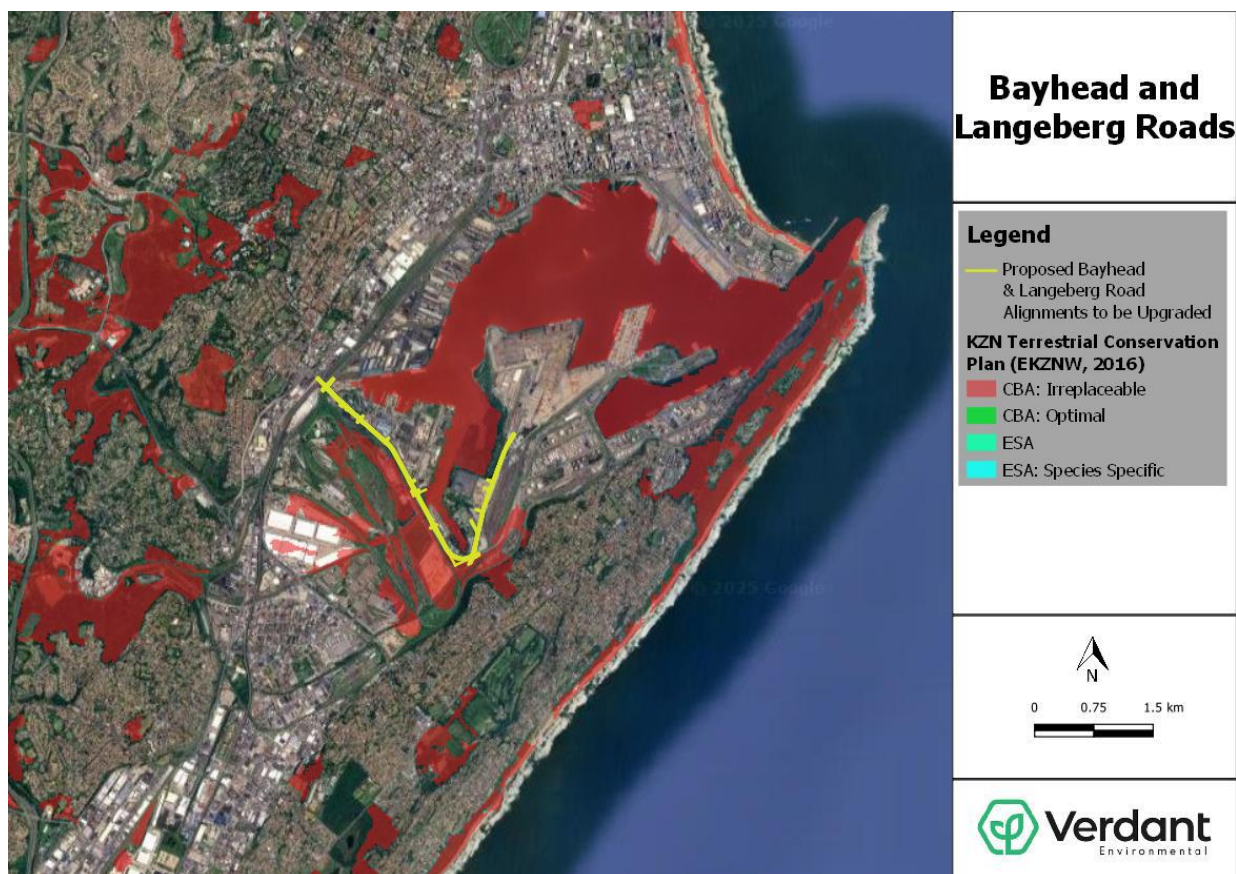


Figure 6-19: Study area in relation to Critical Biodiversity Areas and Ecological Support Areas (EKZNW, 2016; Edwards *et al.*, 2025).

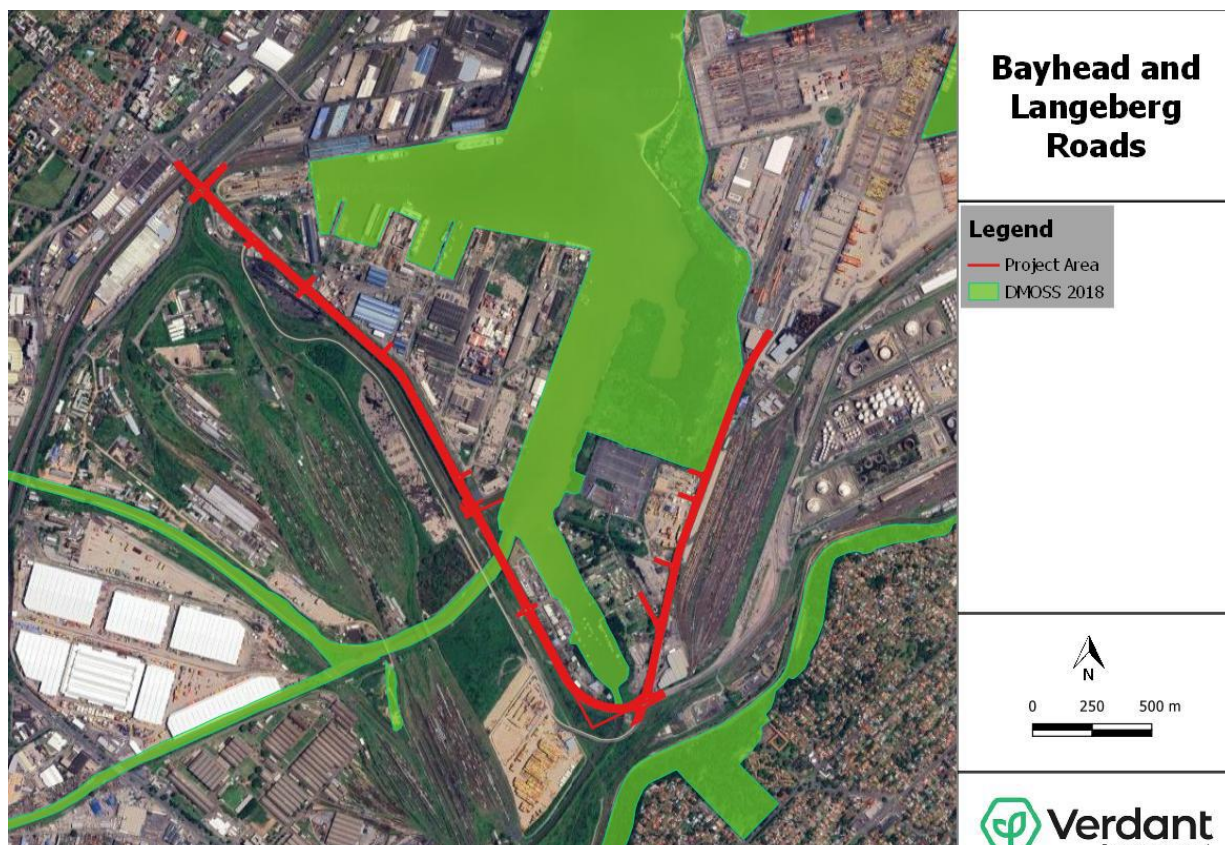


Figure 6-20: extent of D'MOSS coverage across the development footprint (Edwards 2025)

6.4 Water Resources / Aquatic Environment

6.4.1 Quaternary Catchment and Water Resources

The project site falls within quaternary catchment U60F. The project activities fall within the Estuarine Functional Zone (EFZ) of the Durban Bay Estuary.

The National Wetland Map (2018) indicates the Durban Bay Estuary is located within the DWS regulated 500m buffer study area. A Floodplain Wetland is modelled to occur to the south-east, and a few Seep Wetlands and Unchannelled Valley Bottom Wetlands are modelled to occur to the west and north of the study area. These wetlands are located outside of the project study area. Floodplain Wetlands and Unchannelled Valley Bottom Wetlands of the Indian Ocean Coastal Belt Bioregion are considered 'Critically Endangered' and 'Poorly Protected', while Seep Wetlands of the Indian Ocean Coastal Belt Bioregion are considered 'Critically Endangered' and 'Not Protected'. The Durban Bay Estuary is also considered 'Critically Endangered' and 'Not Protected' (Edwards *et al.*, 2025). Refer to **Figure 6-7**.

The study area falls within the Zululand Coast Surface Water Strategic Water Source Area (Edwards *et al.*, 2025).

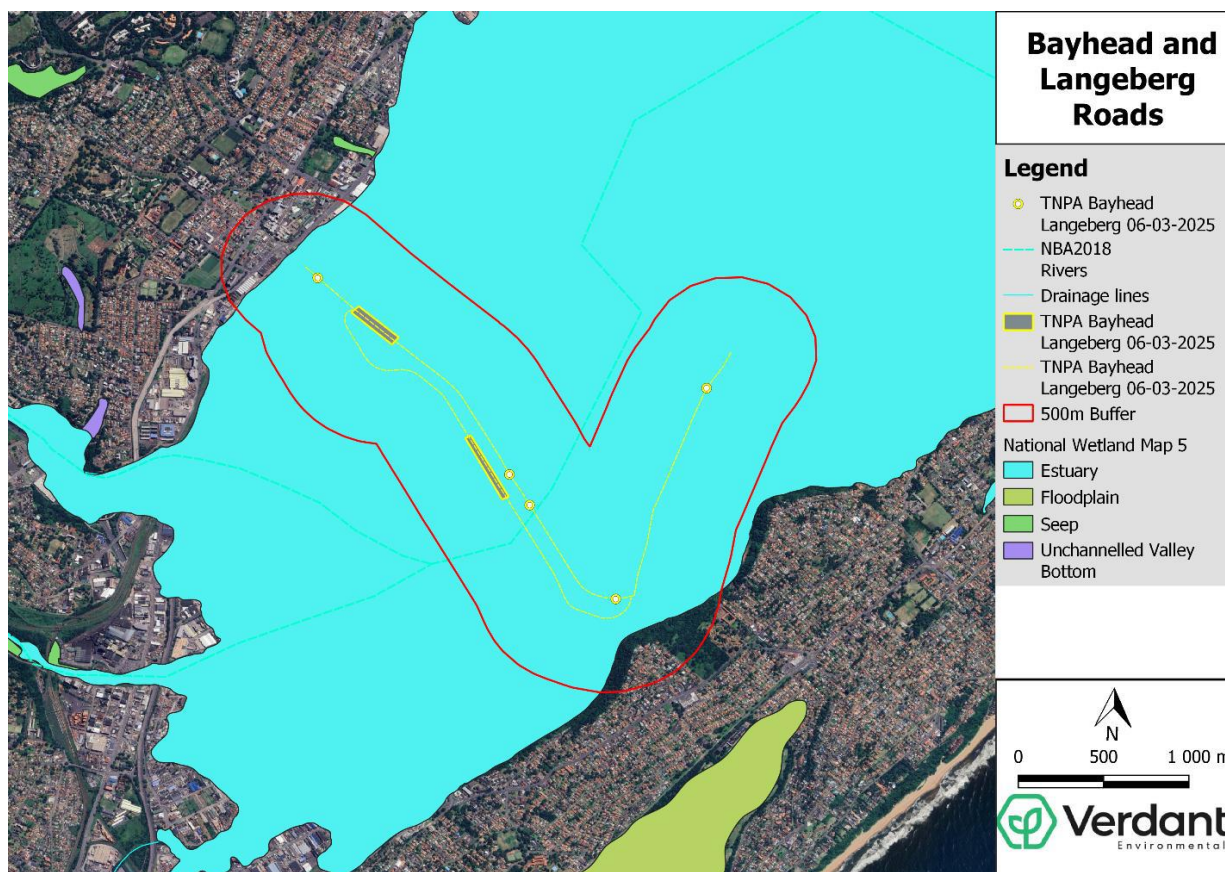


Figure 6-21: Estuary and Freshwater Wetlands (Edwards *et al.*, 2025).

6.4.2 Conservation Context

In terms of conservation context, the following is identified in the Aquatic Assessment (Edwards *et al.*, 2025; **Appendix F**):

- According to the KZN Freshwater Conservation Plan (EKZNW, 2007):
 - Most of the study area has been flagged as 'Available'.
 - Both the Durban Harbour Canal and the Amanzimnyana Stream Canal have been 'Earmarked'.
- According to the National Biodiversity Assessment (SANBI, 2018):
 - The Durban Bay Estuary is listed as Critically Endangered (CR) and Not Protected (NP).
 - The relevant reach of the Durban Harbour Canal is listed as Endangered (EN) and Poorly Protected (PP) at the national scale.
- According to the National Freshwater Ecosystem Priority Areas (NFEPA) project (CSIR, 2011):
 - The Durban Bay Estuary is considered a NFEPA Estuary.
 - No wetland NFEPAs are modelled to occur within the DWS regulated 500m Buffer.
 - The study area does not fall within a River FEPA area.

6.4.3 Estuary, Watercourses and Wetlands

The project footprint is located with the EFZ of the Durban Bay Estuary. Significant development associated with the harbour and various industries including the existing Bayhead Road, Langeberg Road, Railway Lines and Bypass Road have resulted in large portions of the estuary being drained and infilled (Edwards *et al.*, 2025).

The EFZ including the following features (Edwards *et al.*, 2025):

- Modified dryland areas on imported fill material, associated with the current road fill. This was the dominant feature occurring along the roads.
- Modified estuarine wetland areas in low lying areas on imported fill material.
- Intact and functional estuarine ecosystems were not encountered along and near the roads to be upgraded. The distances to modified but intact estuarine ecosystems are:
 - Subtidal zone: Located >39m from the project activities.
 - Mangroves: Located >85m from the project activities.
 - Inter-tidal mudflats / sandflats mudflats: Located >75m from the project activities.

Several canalised rivers feed into and traverse the estuary and cross the study area, namely (Edwards *et al.*, 2025):

- Durban Harbour Canal (below the confluence of the Mhlatuzana and uMbilu Rivers), and

- Amanzimyana Stream (canalised), located along the southern section of Bayhead Road which is approximately 100m from the intersection with Langeberg Road.
- Canal Three (C03), near to road, within 10m.
- Canal Four (C04), near to road, approximately 80m away.

The canals have tidal influence and are thus estuarine in nature.

The site assessment for these units is reflected in **Table 6-1** and **Figure 6-8**. Refer to **Appendix D** for site photographs and **Appendix F** for the Aquatic specialist study.

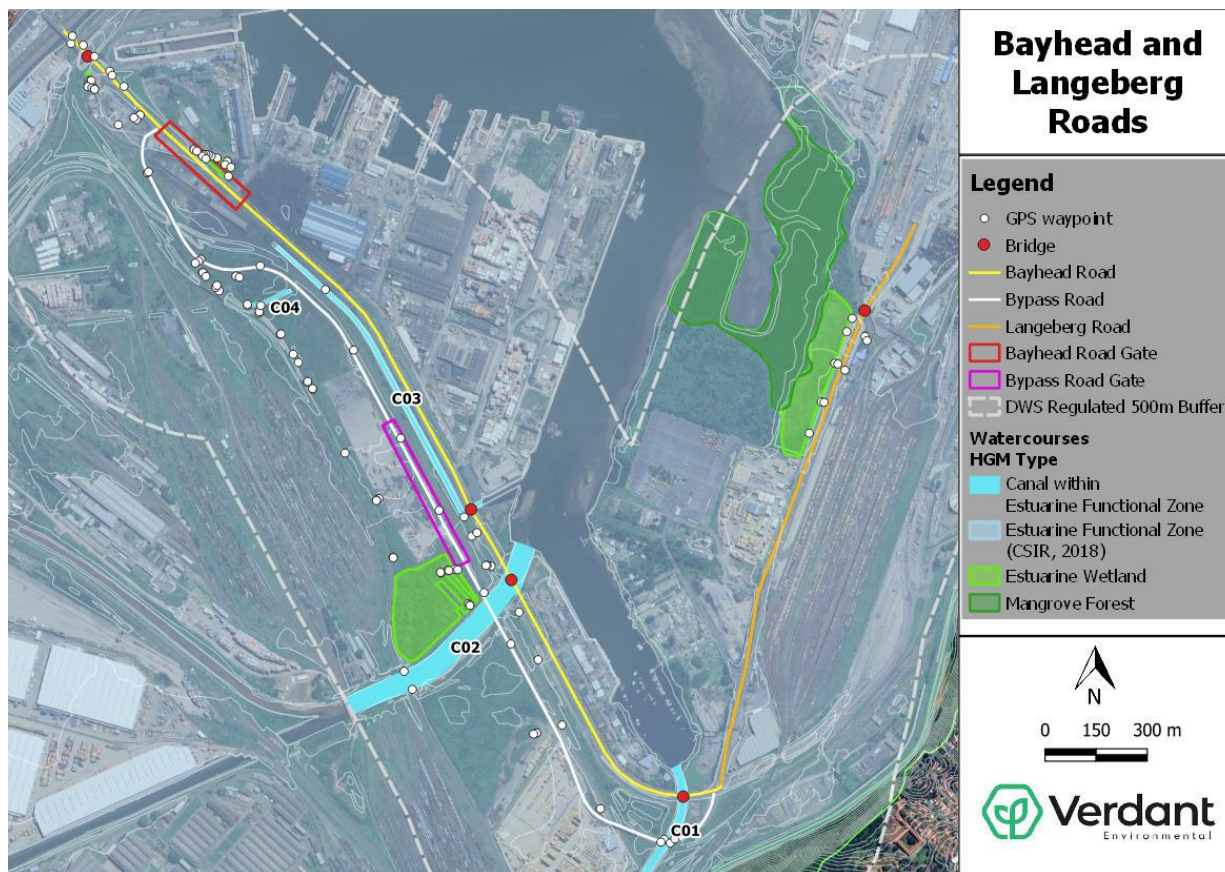


Figure 6-22: Estuarine wetlands and canals (Edwards et al., 2025).

Table 6-1: Description of Aquatic Units

	Unit EFZ01: Durban Bay Estuarine Functional Zone	Unit C01: Amanzimyana Stream	Unit C02: Durban Harbour Canal	Unit C03: Artificial Canal	Unit C04: Artificial Canal
Classification	Estuarine Functional Zone	Canal	Canal	Canal	Canal
Sampled soil characteristics	Temporary Wetland Soils above fill material Sample 1: 0 – 20 cm grey clay with a bit of silt (10YR 3/1) with distinct medium sized orange mottles at moderate levels of abundance - refusal at 20 cm fill material below. Temporary Wetland Soils Sample 2: 0 – 30 cm dark grey almost black (Gley 1 3/N or Gley 2.5/N) fine sandy loam, no mottles 30 – 40 cm dark grey almost black (Gley 1 3/N or Gley 2.5/N) fine sandy loam, distinct small orange mottles low abundance 40 – 50 cm pale-yellow brown (2.5Y 6/3) fine sand, distinct small orange mottles low abundance	-	-	-	-
Flows / Dominant Wetness Zone	-	Perennial flow	Perennial flow (from uMbilo and uMmhlatusana Rivers)	Perennial flow	Perennial flow
Vegetation	Vegetation along Bayhead Road, Bypass Road and Langeberg Road within the EFZ comprises primarily narrow bands of pioneer and opportunistic grasses including <i>Sporobolus pyramidalis</i> , <i>S. africanus</i> , <i>Panicum maximum</i> , <i>Sorghum bicolor</i> , <i>Paspalum urvillei</i> , <i>Melinis repens</i> and <i>Dactyloctenium australe</i> with low to moderate levels and alien and indigenous weeds (<i>Bidens pilosa</i> , <i>Conyza sp</i> , <i>Ipomoea cairica</i> , <i>Tagetes minuta</i> , <i>Ipomoea purpurea</i>) and alien trees and shrubs (<i>Lantana camara</i> , <i>Tecoma stans</i> , <i>Tithonia diversifolia</i> , <i>Ricinus communis</i> , <i>Chromolaena odorata</i>) often growing densely along road servitudes, railway embankments, and old concrete platforms alternating with mowed and maintain lawns within the various commercial/ properties that occur adjacent to the alignment and some	Vegetation along the canal downstream of the Bypass Road Bridge comprises a mixture of grass, tree, shrub and herb cover with moderately high cover of <i>Chrysanthemoides monilifera</i> , moderate cover of an <i>Ipomoea sp</i> growing amongst other vegetation, moderate scattered	The left bank of the canal was colonised by high cover of <i>Panicum maximum</i> and scattered clumps of <i>Strelitzia nicolai</i> at moderate levels of abundance, low cover of <i>Sorghum bicolor</i> noted amongst the dominant <i>Panicum maximum</i> , with a few <i>Ricinus</i>	The left bank of this canal was characterised by a shortly cropped lawn and scattered mature <i>Ficus trichopoda</i> trees and some planted exotic shrubs, the right bank comprised ruderal and alien vegetation growing along	The canal banks were colonised by a mixture of alien shrubs weeds and trees and some ruderal grasses which included moderate cover of <i>Chromolaena odorata</i> and <i>Tithonia diversifolia</i> high cover of <i>Tecoma stans</i> , scattered clumps of <i>Ricinus</i>

	Unit EFZ01: Durban Bay Estuarine Functional Zone	Unit C01: Amanzimyana Stream	Unit C02: Durban Harbour Canal	Unit C03: Artificial Canal	Unit C04: Artificial Canal
	occasional mature indigenous trees that have been left in scattered clumps (<i>Ficus natalensis</i>, <i>Ficus trichopoda</i>, <i>Strelitzia nicolai</i>, <i>Brachylaena discolor</i>, <i>Erythrina lysistemon</i>, <i>Phoenix reclinata</i>). Various drains along the margins of platformed areas have been colonised by <i>Arundo donax</i> and in some areas <i>Phragmites australis</i> (just beyond Bypass Road). One area along the left bank of the Durban Harbor Canal to the south of Bypass Road retains slightly higher mature indigenous tree cover (although alien and weedy species are still relatively prolific). Lastly beyond the existing maintained road servitude to the left of Langeberg Road in an area fenced off and mapped at the national scale as Mangrove Forests there is a hygrophilous grassland community dominated by <i>Imperata cylindrica</i>, with moderate <i>Digitaria eriantha</i> cover and some <i>Panicum maximum</i> noted on the margins with scattered indigenous trees species noted including <i>Phoenix reclinata</i>, <i>Clerodendrum glabrum</i>, <i>Stelitzia nicolai</i> and <i>Brachylaena discolor</i>, with some low <i>Schinus terebinthifolius</i> invasion.	cover of <i>Brachylaena discolor</i>, <i>Melinis repens</i>, <i>Panicum maximum</i>, scattered <i>Tecoma stans</i>, <i>Tagetes minuta</i>, <i>Lantana camara</i> and moderate to high cover of <i>Conyza sp</i> and scattered <i>Stelitzia nicolai</i>, with one <i>Ficus natalensis</i> noted as well at the sample point. Upstream of the bridge along the left bank, vegetation is similar to downstream. Upstream of the bridge along the right bank of the canal cover is dominated by <i>Tecoma stans</i> primarily with low <i>Schinus terebinthifolius</i> cover.	<i>communis</i> noted and low cover of other indigenous trees such as <i>Trema orientalis</i> and <i>Phoenix reclinata</i>. The right bank of the canal was colonised by a mowed lawn that transitioned into a dense <i>Tecoma stans</i> dominated alien woodland/shrubland with moderate cover of <i>Tithonia diversifolia</i>, <i>Ipomoea purpurea</i> and low cover of <i>Ricinus communis</i> and <i>Arundo donax</i>.	an existing railway line.	<i>communis</i> and low cover of grasses such as <i>Sporobolus pyramidalis</i>, <i>Sorghum bicolor</i> and <i>Panicum maximum</i>. One white mangrove (<i>Avicennia marina</i>) was visible growing within the canal at the sample point.
Comments	Most of the areas along Bayhead Road, Bypass Road and Langeberg Road visited during the site visit have been infilled by road and railway embankments and embankments for various commercial/industrial developments in the area.	Water in canal brown turbid with metallic sheen and chemical odour noted.	Water within the canal was brown and turbid.	Water within the canal was turbid brown.	This canal was sampled upstream of the road alignment due to fencing and dense cover.

6.4.4 Present Ecological State (PES)

The Durban Bay Estuary is currently classified as Severely to Critically Modified (PES Class E/F) according to the National Biodiversity Assessment 2018 and the Durban Bay Estuarine Management Plan indicates that the Estuary is Severely Modified PES Class E. Historically covering about 35 km², the estuary has been reduced to 13.5 km² due to extensive development and modification. Major changes include dredging, mouth widening, and the loss of key estuarine habitats like wetlands, reedbeds, mudflats, and mangroves—with only 15ha of the original 440ha of mangroves remaining. Sediment distribution has been significantly altered, especially in upper channels that now trap sediment from upstream. There has also been complete loss of seagrass beds and important habitats for juvenile species. Additionally, persistent water quality issues from upstream waste and port activities continue to harm the estuary's ecological health (Edwards *et al.*, 2025).

6.4.5 Ecological Importance & Sensitivity

According to the Durban Bay Estuarine Management Plan the estuary provides important ecosystem services which includes not only its value as a nursery ground for marine fish and invertebrates, water quality enhancement/ assimilation services, flood attenuation services during flood events but also the provisioning and cultural services afforded to residents and visitors through its use as a major port and economic hub, the various recreational opportunities it provides as well as aesthetic values and as a tool for environmental education purposes. The Durban Bay Estuary is currently considered to be of High Ecological Importance & Sensitivity (EIS) (Edwards *et al.*, 2025).

However, although falling within the Durban Bay EFZ, the modified and transformed ecosystems along the roads are assessed as having the following EIS (Edwards *et al.*, 2025):

- Modified dryland on fill material – Low EIS
- Modified estuarine wetlands on fill material – Moderate EIS
- Major canals – Moderate EIS
- Minor canals – Low EIS

6.5 Land Use, Physical Infrastructure and Services

The Bayhead precinct has access from Bayhead Road, which is classified as a Class 3 Minor Arterial Road in terms of the South African Road Classification and Access Management Manual. Bayhead Road connects the precinct to South Coast Road, the M4 and the R102 in the west and the Durban Container Terminal precinct (via Langeberg Road), Island View precinct and Bluff area (via Iran Road) in the east. South Coast Road, the M4 and the R102 connect to the N2 via the M7 to the southwest of the precinct (Wright, 2025).

The Bayhead and Langeberg Roads are located within an urban area. The roads are located within the Port of Durban, except for approximately 115m of the Bayhead Road that forms part of the Road Over Rail Bridge (Bridge 2-5) at the intersection of Bayhead and South Coast Roads. In the vicinity of the Amanzimnyama Canal Bridge (Bridge 5-8), approximately 115 m of the proposed widening of the Bayhead Road will fall outside of the port limits but still within Transnet land.

The Port of Durban handles the greatest volume of sea-going traffic on any port in southern Africa. Containers handled at Durban represent approximately 60% of the total number of containers handled at South African ports. The significant role of the Port of Durban in the South African economy makes it very important to ensure that the Port maintains high levels of operational efficiency and nominal disturbances in the value chain (Marshall, 2025).

The Bayhead and Langeberg Roads are classified as private roads and are managed by the Port of Durban (PoD) under Transnet National Ports Authority (TNPA). The roads are not open to unrestricted public use but serve port operations and controlled traffic.

Existing underground and above ground services within the project footprint include electrical, telecommunication, stormwater, water, sewer, fuel, and fibre-optic infrastructure (Wright, 2025).

The key existing land uses along Bayhead Road are (Wright, 2025):

- Maydon Wharf – Dry Bulk, Break Bulk / MPT, TNPA Other and Commercial Logistics
- Bayhead – Ship repair and engineering workshops
- Ambrose Park – TNPA Other and Commercial Logistics
- Grunter Gully – Commercial Logistics, TNPA Other and Containers
- Island View – liquid bulk
- Durban Container Terminal – Pier 1

Langeberg Road serves as the primary access to (Wright, 2025):

- Durban Container Terminal – Pier 2
- Mangrove Swamps / Forest – Open Space

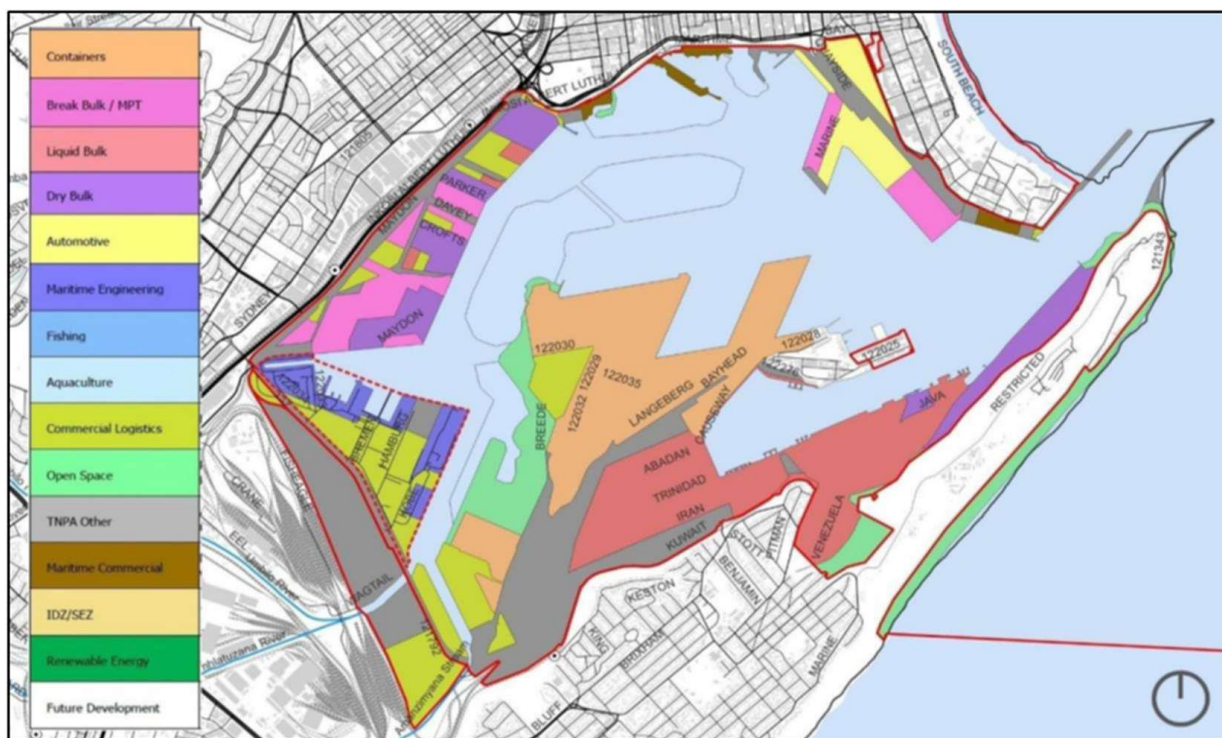


Figure 6-23: Existing Land Uses in the Port of Durban

Refer to **Appendix D** for site photographs.

6.6 Heritage Environment

Archaeological sites spanning the Earlier, Middle and Later Stone Age have been found in the region despite the extensive agricultural and industrial transformation of the area. In 2019, Van Schalkwyk (South African Heritage Resources Information System (SAHRIS) ID 521546) conducted a Heritage Impact Assessment (HIA) in Ambrose Park, which is located directly at the southern end of Bayhead Road and concluded that the landscape upon which Ambrose Park is located has been fundamentally transformed and no significant heritage resources were identified. This major landscape transformation is visible when comparing the current topographical map to the first edition topographical map. The two roads (Bayhead and Langeberg) are majorly underlain by areas that historically consisted of Mangrove Swamps and have since then been reclaimed to form part of the Durban Port. The chances of significant archaeological sites being impacted is highly unlikely, as the industrialisation development would most likely have disturbed all existing in-situ sites (Lavin, 2025).

Most of the nearby sites on the SAHRIS represent built environment resources, except for a prehistoric artefact scatter site. This site was identified by Schoute-Vanneck in 1958 in their research paper documenting coastal pottery and associated Iron Age Sites on the Durban Bluff (SAHRIS ID 49992). This site was identified in a road cutting and located further southwest of the proposed road upgrades. None of these SAHRIS sites were given a heritage grading. Due to the limited nature and scope of the proposed road upgrades and as the proposed road

upgrades are likely to stay within the current road reserve, no impact to any heritage resources is expected, as all of these resources are located more than 100m from the roads (Lavin, 2025).

The Bayhead Road was constructed approximately 60 years ago and was designed for public use. Bayhead Road was originally a two-way lane on a single carriageway road, but in the late 90's TNPA was experiencing an increase in traffic flow due to business growth. At this stage TNPA constructed a new outbound carriageway with two lanes. The original Bayhead Road was then turned into a freeway with an inbound and an outbound both constructed on two carriageways (Lavin, 2025).

Langeberg Road was constructed in the 1970's. Its initial geometric design was to have 2 carriageways with 2 lanes in each direction and an island in between the 2 carriageways. It has since been realigned to have 3 lanes in from Bayhead Road to Pier-2, Durban Container Terminal and a single lane out. Langeberg Road is one of the busiest roads in the Port of Durban as it services one of the largest container terminals in Southern Africa. The heavy traffic of container trucks coming in and out of Pier 2 container terminal result in the overall infrastructure of Langeberg Road to deteriorate before the end of its design life (Lavin, 2025).

While the majority of the Bayhead and Langeberg Roads were constructed in the 1960s and 1970's, Bridge 2-5 (Road Over Rail Bridge – Intersection of South Coast and Bayhead Road) was constructed in 1952, and widened in 2000. As such, there is likely to be fabric older than 60 years existing within the bridge structure. In terms of Section 34 of the National Heritage Resources Act (NHRA, Act 25 of 1999) and Section 37 of the AMAFA Institute Act, a permit is required for alterations to a structure older than 60 years. However, based on the findings of this assessment, the roads and bridges proposed for upgrade are unlikely to have any cultural value that require further assessment in an HIA (Lavin, 2025).

According to the SAHRIS Palaeosensitivity Map, the development sites are underlain by geological units of low fossil sensitivity, namely Qs: Quaternary Beach Sand. As a result, no impact to significant palaeontology is therefore expected and no further assessment of impacts to palaeontological heritage is recommended (Lavin, 2025).

Railway expansion played a pivotal role in shaping the back-port landscape. The Natal Government Railways commenced the South Coast Line in 1876, linking the city to Isipingo and skirting the bay through the Congella flats, with completion in 1880. The Umbilo Bridge formed part of this early infrastructure, later upgraded to accommodate heavier trains. Railway construction relied on imported labour from Mauritius and southern Mozambique, reflecting colonial economic strategies. Electrification began in 1936, and by 1957 extensive marshalling yards and branch lines had been established at Maydon Wharf and Bayhead, forming the backbone of the harbour's rail-based freight system and enabling industrialised cargo transfer between ship and rail (White, 2025).

Based on the Heritage Significance Report regarding the Road Over Rail Bridge (Bridge 2-5), the railway line and associated rail infrastructure at Maydon Wharf are regarded as having low heritage significance however, these structures do warrant protection during the implementation of the proposed project (White, 2025).

The Railway Tunnel, constructed in 1952 to standard South African Railways reinforced concrete specifications with an off-shutter finish, is representative of a common bridge typology widely constructed across South Africa during the mid-20th century. Owing to the high quality of workmanship and materials, the structure has weathered well and is recommended for consideration for protection under Section 37 of the NHRA (White, 2025).

Refer to **Appendix G** for the heritage screener and heritage report for the Road Over Rail Bridge (Bridge 2-5).

6.7 Landscape/ Visual Environment

6.7.1 Landscape Character Areas

Landscape Character Areas (LCAs) are defined as “single unique areas which are the discrete geographical areas of a particular landscape type”. The affected landscape can generally be divided into the following LCAs (Marshall, 2025):

- **The Industrial Transport Corridor LCA:** This area is comprised of the Bayhead Road, Langeberg Road and immediately surrounding areas. It is a heavily used and degraded landscape. Views of the entire upgrade area are visible as the motorist drives down the road. This corridor is used largely by logistics companies delivering and collecting containers from the port. A limited number of vehicles that use the road are also accessing social use areas along Seafarer’s Road.
- **The Bluff Headland LCA:** This area is comprised of the largely residential area on the upper slopes of the Bluff Headland and natural vegetation areas on the lower slopes. When inside this area views over the proposed upgrade sites are largely screened by existing development and vegetation, however, a limited number of properties do overlook and have clear views of the proposed upgrade sites.
- **The Industrial LCA:** Includes light industry as well as port related industry that is located immediately adjacent to the eastern edge of Bayhead Road. It is comprised of flat land much of which has direct access to the waterfront and is a mix of industrial warehousing, workshops and container storage. As with all roads in the area, solid preventative measures are in place to prevent the parking of trucks. Once inside this area, views of the proposed upgrade area are only possible from the internal road junctions with Bayhead Road.

- **The Social Use Area LCA:** Includes the Bluff Yacht Club, Sea Cadets site, Seafarers Mission and the Ski Boat Site. These uses are historic and enable public access to the water. However, access to and through this area has been badly affected by trucks that access a truck parking area at the end of the Seafarer Road. The trucks appear to block access along Seafarer Road and to the social use sites for long periods. Once inside any one of these social areas, views of the proposed upgrade area are not possible due to the extent of existing boundary and internal vegetation. Views of the proposed road upgrade sites are likely to be possible from the waterfronts of these social use sites.

The landscape quality in all identified LCAs is degraded and largely dominated by the prime logistics use of the area (Marshall, 2025).

6.7.2 Visual Receptors

Visual Receptors are defined as “individuals and / or groups of people who have the potential to be affected by the proposal” and certain areas may also be sensitive due to an existing use (e.g. areas associated with recreation, tourism and in areas where outlook is critical to land values). The following visual receptors were noted (Marshall, 2025):

Area receptors are places that cannot be defined by a point or a line and may include settlements or protected areas. Possible Area Receptors include (Marshall, 2025):

- The Bluff Residential Area overlooking the proposed site to the south; and
- Visitors and users of the Social Facilities along Seafarer’s Road.

Linear receptors generally include routes through the area, these include (Marshall, 2025):

- Motorists and Truck drivers on Bayhead Road, Langeberg Road and Seafarer’s Road. These routes are primarily used for access to the port however a small number of vehicles are likely to use the roads for access to the social uses on Seafarers Road.

6.7.3 Sensitivity of LCAs and Receptors

The sensitivity of landscape areas and receptors to likely landscape changes is partly subjective. **Table 6-2** indicates the manner in which sensitivities have been considered in the assessment (Marshall, 2025).

Table 6-2: Landscape and Receptor Sensitivity

SENSITIVITY	LCA	RECEPTORS
Low	Landscape value is not recognised or the landscape is very tolerant of change. These areas include:	Small number or low sensitivity of viewers assumed. Viewers’ attention not focused on landscape. These include:

SENSITIVITY	LCA	RECEPTORS
	- Industrial Transport Corridor LCA; and - Industrial LCA	Truck drivers using the routes for access to the Port and adjacent industrial areas.
Medium	Landscape value is recognised locally, but is not protected; the landscape is relatively intact, with a distinctive character; and the landscape is reasonably tolerant of change. - Social Use Area LCA, and - Bluff Headland LCA	Viewer's attention may be generally focused on the landscape. These include: - Residents of residential areas on the Bluff; and - Motorists using the routes for access to the Social Use Area LCA.
High	Landscape value recognised by existing or proposed national or regional designation. Sense of tranquillity or remoteness specifically noted in Landscape Character Assessment. High sensitivity to disturbance. The qualities for which the landscape is valued are in a good condition, with a clearly apparent distinctive character. This distinctive character is susceptible to relatively small changes. There are no Highly Sensitive LCAs.	Viewer's attention very likely to be focused on the landscape. e.g. users of public rights of way and access land, strategic recreational footpaths; people experiencing views from important landscape features of physical, cultural or historic interest, beauty spots and picnic areas. Large number of viewers and/or location in highly valued landscape could elevate viewer sensitivity to highest level. There are no Highly Sensitive Receptors.

Refer to **Appendix I** for Visual Compliance Report.

6.8 Social and Economic Environment

The Bayhead and Langeberg Roads at the Port of Durban serve as primary access points for port operations, with the upgrade aimed at alleviating congestion through widened lanes, improved intersections, and enhanced infrastructure resilience. Valued at R900 million, the initiative includes construction over an estimated two-year period, focusing on sustainable materials and minimal environmental disruption. It aligns with Transnet's strategic objectives to support the port's expansion, handling over 60 million tons of cargo annually and facilitating trade for South Africa's economy (De Beer, 2025).

The surrounding area is the Central Region of eThekweni Municipality, encompassing urban-industrial zones around the port, including residential, commercial, and logistics hubs. Spanning 87.20 km², it features high traffic volumes from heavy vehicles, impacting nearby communities like Bluff and Clairwood. The profile reveals a densely populated urban landscape with proximity to industrial activities, where port operations drive employment but also contribute to pollution and noise (De Beer, 2025).

The Socio-Economic Area of Impact (AOI) covers the Central Region, with a population of 1,410,845 across 404,038 households, at a density of 3,268 persons/km² and average household size of 3.5. Demographically youthful, 31.3% are aged 0-19, 62.5% working age (20-64), and 6.1% seniors, providing a strong labour pool. Functional literacy is 66.6% overall (81.2% for adults 20+), though varying by sub-region like Outer West at 61.2%, signalling needs for skills development (De Beer, 2025).

Labour participation is high at 76.2% (above KZN's 52.5%), with an employment-to-population ratio of 44.2%. Unemployment stands at 26.8% officially (42.0% broadly), affecting 198,955 individuals. Formal sector jobs (83.5% of 1,219,557 total) are semi-skilled (47.7%), skilled (31.1%), and low-skilled (21.3%), dominated by tertiary sectors: wholesale/retail (24%), community services (22%), and finance (20%), with manufacturing at 14%. Household incomes show 9.3% with no income but a growing middle class (30.6% earning R266,511-R533,021 annually). eThekweni's GVA contribution is R377,814 million, led by finance (24.9%), services (19.8%), and manufacturing (16.4%), with growth recovering to 1.8% post-2020 contraction (De Beer, 2025).

The upgrade is essential due to severe traffic congestion on Bayhead and Langeberg Roads, which serve as vital gateways to the Port of Durban, Africa's largest container port. Daily volumes exceed capacity, with heavy vehicles causing bottlenecks that delay cargo movement, increase logistics costs by up to 20%, and exacerbate emissions. This congestion hampers the port's efficiency, contributing to national supply chain disruptions amid rising trade demands from expansions like the Durban Container Terminal Pier 2 (De Beer, 2025).

Residents in surrounding areas may face reduced quality of life from noise, air pollution, and access restrictions, while economic losses mount—estimated at billions annually in delayed productivity. The eThekweni IDP identifies these roads as priority infrastructure, aligning with the National Ports Development Framework to support the Gross Domestic Product (GDP) growth. Post-COVID recovery has intensified pressures, with freight volumes rebounding but infrastructure lagging. Without intervention, congestion risks undermining the port's role in 60% of South Africa's container traffic, thereby threatening jobs and regional connectivity (De Beer, 2025).

Chapter 7: IMPACT IDENTIFICATION AND ASSESSMENT

7.1 Site Sensitivity

A site verification process was undertaken in relation to the DFFE Screening Tool Report. Refer to **Appendix L** for the Screening Tool Report, **Appendix M** for the Site Verification Report and **Appendix E to K** for specialist verifications / studies. **Table 7-1** presents a summary of the site sensitivity outcomes:

Table 7-1: Site Sensitivity

Screening Tool Report		Site Verification Outcomes		
Theme Specialist Study Protocol	Sensitivity	Verification Outcomes	Specialist Studies	Motivation
Agriculture Agriculture Impact Assessment General Agriculture Assessment Protocol	High	Low	No Agricultural assessment or compliance statement is considered to be required / was conducted.	No agricultural land or activities falls within the site boundaries for the proposed upgrading of Bayhead and Langeberg Roads, and the site is located within an existing transformed area.
Animal Species Animal Species Assessment Animal Species Assessment Protocol	High	Medium	Compliance statement undertaken, refer to Appendix E .	None of the SCC identified in the Screening Tool Report are expected to be present within or in close proximity to the proposed development footprint. This is primarily due to the transformed and highly disturbed nature of the study area, and lack of natural habitats that these species require. One Near Threatened SCC, i.e. KwaZulu Dwarf Chameleon (<i>Bradypodion melanocephalum</i>), occurs in the broader area and habitat for this SCC occurs on site. The Near Threatened status does not fall within the Critically Endangered, Endangered, Vulnerable or Rare SCC status categories, therefore a compliance statement is required.



Screening Tool Report		Site Verification Outcomes		
Theme Specialist Study Protocol	Sensitivity	Verification Outcomes	Specialist Studies	Motivation
Aquatic Biodiversity Aquatic Biodiversity Impact Assessment Aquatic Biodiversity Assessment Protocols	Very High	Very High	Specialist impact assessment undertaken, refer to Appendix F .	Specialist impact assessment undertaken, refer to Appendix F .
Archaeological & Cultural Heritage Archaeological & Cultural Heritage Impact Assessment General Requirement Assessment Protocol	Very High	Low	A heritage screener was undertaken (Appendix G) and no Heritage Impact Assessment is required.	No significant archaeological and heritage resources were identified within the site area. AMAFA has accepted the heritage screener and no further heritage assessment was required.
Civil Aviation No specialist study identified for Civil Aviation Civil Aviation Installation Assessment Protocol	High	Low	No assessment / compliance statement required.	The Bayhead and Langeberg Roads are existing road infrastructure that will not impact on civil aviation or radar equipment.
Defence No specialist study identified for Defence Defence Installation Assessment Protocol	Very High	Low	No assessment / compliance statement required.	The Bayhead and Langeberg Roads are existing road infrastructure that will not impact on defence installations or radar equipment.
Palaeontology Palaeontology Impact Assessment General Requirement Assessment Protocol	Medium	Low	A heritage screener (Appendix G) was undertaken and no Palaeontology Impact Assessment is required.	The development sites are underlain by geological units of low fossil sensitivity. AMAFA has accepted the heritage screener and no palaeontology assessment was required.
Plant Species Plant Species Assessment Plant Species Assessment Protocol	High	Medium	Compliance statement has been undertaken, refer to Appendix E .	None of the SCC identified in the Screening Tool Report and no protected tree or plant species were found on site and such an occurrence is not expected given the disturbed and transformed nature of the vegetation close to impact areas, or mismatch with known habitat. Two (2) SCC (<i>Cassipourea gummiflua</i> var. <i>verticillata</i> – Vulnerable and <i>Zeuxine</i>



Screening Tool Report		Site Verification Outcomes		
Theme Specialist Study Protocol	Sensitivity	Verification Outcomes	Specialist Studies	Motivation
				<i>Africana</i> – Endangered) may be present in close proximity to the site, it is unlikely these species will be present due to the disturbed and transformed nature of the vegetation close to the impact areas (site areas). Therefore a compliance statement is required.
Terrestrial Biodiversity Terrestrial Biodiversity Impact Assessment Terrestrial Biodiversity Assessment Protocol	Very High	Medium – Very Low	Compliance statement has been undertaken, refer to Appendix E .	The estuarine and terrestrial ecosystems within the study area have been modelled as a CBA due to the ecosystems being located within the Durban Bay EFZ, the Critically Endangered threat status of the reference vegetation types, and there being intact Mangrove Forest. The site assessment confirmed that much of the site has been disturbed and transformed and is considered of 'Very Low' Site Ecological importance (in the case of Vegetation Communities 1 & 2 and Faunal Habitats 1 & 2). However, vegetation within the Bayhead Nature Reserve mapped as Vegetation Community 3 & Faunal Habitat 3 as well as areas considered important for fauna, in particular the KwaZulu-Dwarf Chameleon i.e. Faunal Habitat 4 and Faunal Habitat 5 are considered of 'Medium' Site Ecological Importance under the Terrestrial Biodiversity Theme. A compliance statement was compiled.
Geotechnical General Requirement Assessment Protocol	N/A	N/A	Specialist study included in Appendix H .	Specialist report included as Appendix H .



Screening Tool Report		Site Verification Outcomes		
Theme Specialist Study Protocol	Sensitivity	Verification Outcomes	Specialist Studies	Motivation
Landscape/Visual Impact Assessment General Requirement Assessment Protocol	N/A	Low	Specialist assessment has been undertaken. Refer to Appendix I .	Specialist assessment included as Appendix I .
Noise Impact Assessment General Requirement Assessment Protocol	N/A	Low	Specialist assessment has been undertaken, Appendix J .	Specialist assessment included as Appendix J .

7.2 Issues raised by Interested and Affected Parties

The following presents a summary of the main issues that have been raised by I&APs to date. Please refer to **Appendix O6** for responses to comments provided.

7.2.1 Pre-application

A. The Mediterranean Shipping Company Pty Ltd:

- Ingress and egress to leased premises of business in the precinct for the duration of the project.
- Impacts on cargo handling and related logistics activities into/out of and at the Durban Container Terminal for the duration of the project.

B. EThekweni Municipality:

Biodiversity Management Department:

- Given the project's proximity to estuarine systems, canalized waterways, and CBAs within the D'MOSS, several potential environmental impacts are anticipated. These include, but are not limited to:
 - Disturbance and loss of aquatic and riparian habitat due to canal and bridge widening works within or adjacent to the estuarine functional zone,
 - Potential degradation of water quality from construction runoff, sedimentation, and possible contamination from machinery and materials,
 - Impacts on stormwater hydrology and potential alteration of existing drainage patterns,
 - Disturbance of ecological corridors and D'MOSS areas, particularly near mangrove and estuarine habitats, and
 - Cumulative impacts associated with existing and future port-related developments in

the Bayhead area.

- Given the sensitivity of the receiving environment, this Department expects that the forthcoming Draft BAR must:
 - Assess holistically all potential environmental and cumulative impacts associated with the proposed upgrades,
 - Identify and assess feasible alternatives and design options that minimize environmental disturbance, and
 - Propose reasonable and enforceable mitigation and rehabilitation measures to prevent or reduce negative impacts on the estuarine and surrounding ecological systems.

eThekwini Electricity (MV/LV Planning):

Existing electricity infrastructure will be affected by the proposed development. These services will need to be relocated at the applicant's expense.

The eThekwini Transport Authority (ETA):

The application is supported. A Traffic Impact is required in consultation with ETA.

Strategic Planning Branch (SPB):

In terms of the Spatial Development Framework (SDF 2025/2026), the Central Spatial Development Plan (CSDP 2014/2015) and the Back of Port Interface Local Area Plan (BOP LAP -2014), the subject area is broadly identified for Port Logistics purposes.

7.2.2 Post-application

A. The Mediterranean Shipping Company (MSC) Pty Ltd:

- MSC notes that the construction-phase impacts on traffic flow, terminal access, depot operations and cargo movement may present a higher operational risk than reflected in the DBAR and should be reassessed accordingly.

B. South Durban Community Environmental Alliance (SDCEA):

- SDCEA objects to the application and supports shifting freight transport from road to rail in line with national rail policy objectives.

Traffic Impact Assessment

- The assessment should consider traffic impacts beyond the Port, including truck congestion, road damage and safety impacts on neighbouring areas such as Bluff and Clairwood.
- Construction-related road closures and restricted access may increase traffic burdens on

surrounding communities and further deteriorate local road infrastructure.

- The road upgrades may encourage continued and increased road freight activity, contrary to national objectives promoting a shift from road to rail.
- The cumulative impacts of increased freight volumes, future road widening requirements and planned port expansion.
- The assessment should consider impacts on connected road networks, including the M7 and other routes affected by port-related freight traffic.

Air Quality Impacts

- The application should assess the air quality impacts of existing and increased vehicular emissions associated with road freight activity, including cumulative impacts on already polluted communities in South Durban.

Climate Change Impacts

- The assessment should recognise and evaluate the contribution of road freight activities to climate change and consider the cumulative climate impacts of increased truck traffic.

C. KZN Department; Economic Development, Tourism and Environmental Affairs (EDTEA):

- The climate change assessment must include detailed analysis of flood risk, sea-level rise, storm surges and increased rainfall intensity, and incorporate adaptation and resilience measures given recent regional flooding events.
- The traffic assessment must include more detailed mitigation measures, including approved traffic accommodation plans to manage construction impacts on freight movement, emergency access and safety.
- The EMPr must include geotechnical monitoring, slope stabilisation, groundwater control, and rehabilitation measures for disturbed embankments, with long-term monitoring for settlement and erosion.

D. Ezemvelo KZN Wildlife:

Ezemvelo has identified that the KwaZulu Dwarf Chameleon is of serious/significant concern. If the following recommendations are included into the conditions of authorisation (should Environmental Authorisation be granted), Ezemvelo would not object to the proposed application:

- The recommendations outlined in the Terrestrial Biodiversity Site Sensitivity Report are strictly adhered to, with specific reference to those made by James Harvey, and
- Should the vegetation of the corridor areas need to be disturbed during construction, it should be properly rehabilitated afterward by planting of appropriate grass species that are or were indigenous to the area, and long-term alien plant control initiated and

maintained. These actions should create a stable, healthy grassland habitat that serves as movement corridors for the dwarf chameleons and as habitat for their invertebrate prey.

E. DFFE Biodiversity Department

To ensure the continued persistence of ecosystems and that national conservation targets are achieved, it is essential that impacts on sensitive and highly localised habitats are minimized or avoided altogether. Furthermore, the following recommendations must be considered in the final report.

- Avoid the most sensitive estuarine vegetation units and Critical Biodiversity Areas (CBAs). Where a road must cross an estuary, prioritize bridging or elevated structures over solid infill berms to maintain natural water flow.
- Implement robust stormwater management infrastructure designed to slow, filter, and settle suspended solids and pollutants before discharge. Direct runoff away from fragile estuarine fringes.
- Care must be taken to avoid the re-introduction and spread of alien invasive species.
- Restrict the spatial extent of construction to the immediate developmental footprint. Utilize "soft starts" and alternative pile-driving techniques (like vibratory driving) to minimize acoustic disturbance to local fauna.
- Adhere strictly to the guidelines set out by the National Estuarine Management Protocol and the Integrated Coastal Management Act.
- Develop and enforce a specific Biodiversity Management Plan to actively rehabilitate any temporarily disturbed riparian buffers or construction laydown areas to a natural state.

7.3 Identified Impacts

Based on the site sensitivity verification, specialist input / assessment, experience of the EAP and issues raised by I&APs, **Table 7-2** presents the impacts identified for assessment.

Table 7-2: Identified Impacts

Aspect	Identified Impacts
Agriculture	No impacts identified
Animal Species, Plant Species and Terrestrial Biodiversity	Impacts to ecosystem conservation Impacts to species of conservation concern Impacts on biodiversity / ecological processes
Aquatic Biodiversity	Direct ecosystem destruction and modification impacts Indirect hydrological and geomorphological impacts Water quality impacts Fragmentation and ecological disturbance impacts
Heritage Resources: Archaeological & Cultural	Impact to significant heritage resources

Aspect	Identified Impacts
Heritage Palaeontology	
Civil Aviation	No impacts identified
Defence	No impacts identified
Landscape/Visual	Change in landscape character Impact on views from adjacent areas to the road Impacts on views from residential areas on the Bluff Impacts on views from other areas within the Approximate Limit of Visibility
Geotechnical	No impacts identified
Noise	Noise impacts from construction activities Noise impacts from operational phase / vehicle traffic
Socio-Economic	Transport and logistic efficiencies improvements into and from the port Employment, income generation and skills development Traffic safety and convenience improvement Economic multiplier impacts Inconveniences during construction Increase in crime, safety and security
Additional impacts considered	Traffic impacts Waste impacts Climate change impacts

7.4 Impact on Terrestrial Biodiversity

7.4.1 Summary of Specialist Findings and Recommendations

The Terrestrial Biodiversity Compliance Statement was compiled by Ryan Edwards, refer to **Appendix E**. The Terrestrial Biodiversity assessment includes the animal and plant species assessment. The following presents a summary of findings by the specialist team (David Styles, James Harvey, Juliette Lagesse and Ryan Edwards):

Four (4) vegetation communities and five (5) faunal habitats were identified on site (Community 1 – 4 being the same for both vegetation and fauna, and Community 5 for fauna only) (Edwards *et al.*, 2025):

- Vegetation Community / Faunal Habitat 1: Alien dominated woodland/shrubland
- Vegetation Community / Faunal Habitat 2: Road Verges with scattered trees and mowed lawn
- Vegetation Community / Faunal Habitat 3: Hygrophilous Grassland and Scattered Indigenous Trees
- Vegetation Community / Faunal Habitat 4: Mixed alien and indigenous woodland
- Faunal Habitat 5: Secondary Grassland and degraded mixed alien and indigenous woodland/shrubland

In terms of the Plant Species Theme; Communities 1 and 2 are considered a 'Very Low' SEI due to the moderate to high cover of alien plant invasion observed, the high level of fragmentation and edge impacts that have resulted in a deterioration of both biodiversity and level of functioning. Community 4 is considered a 'Low' SEI, as although this community has also been highly impacted by direct loss and fragmentation it still comprises some diversity of indigenous vegetation and is considered in better condition in comparison to Community 1 and Community 2. Community 3 is considered a 'Medium' SEI as this community occurs within the Mangrove Forest with indigenous vegetation comprising most of the cover, with low alien plant invasion observed. However, this community is also isolated and fragmented due to historical development in the area and therefore although it has a 'High' conservation importance rating (driven by the Critically Endangered threat status of the reference vegetation type at the provincial scale) its functional integrity has been compromised and has been rated as 'Medium' resulting in a 'Medium' biodiversity importance rating.

In terms of the Animal Species Theme although much of the site has been disturbed and transformed in the past, Faunal Habitats 3, 4 and 5 are still of value as habitat for the KwaZulu Dwarf Chameleon, and therefore these faunal habitats are considered to be of 'Medium' SEI with the remaining two faunal habitats (Faunal Habitat 1 & 2) considered to be of 'Very Low' SEI.

In terms of the terrestrial biodiversity theme, the estuarine and terrestrial ecosystems within the study area have been modelled as a CBA due to the ecosystems being located within the Durban Bay EFZ, the Critically Endangered threat status of the reference vegetation types, and there being intact Mangrove Forest. The site assessment confirmed that much of the site has been disturbed and transformed and is considered of 'Very Low' Site Ecological importance (in the case of Vegetation Communities 1 & 2 and Faunal Habitats 1 & 2). However, vegetation within the Bayhead Nature Reserve mapped as Vegetation Community 3 & Faunal Habitat 3 as well as areas considered important for fauna, in particular the KwaZulu-Dwarf Chameleon i.e. Faunal Habitat 4 and Faunal Habitat 5 are considered of 'Medium' Site Ecological Importance under the Terrestrial Biodiversity Theme.

The proposed road upgrade will have a small but intense impact on the vegetation communities and faunal habitats along the existing road reserve comprising degraded communities and habitats. The most serious impacts are the direct and indirect impacts to the small local KwaZulu Dwarf Chameleon population, a Near Threatened SCC and the larger associated ecological corridor. It is anticipated that the area to be impacted by the road upgrade will be a very small area to be impacted (provided mitigation measures in this report are strictly adhered to, particularly limiting construction and operation phases activities to the footprint provided and avoiding sensitive KwaZulu Dwarf Chameleon habitat beyond this footprint). However, there could be some localised fatalities of chameleons if indiscriminate and poorly planned construction practices occur, which is undesirable and should be avoided. Every effort must be

made to reduce the impacts to potential chameleon habitat and movement corridors through the strict implementation of mitigation measures.

Given that the proposed activity entails the upgrade of existing roads along its current alignment, large buffer zones around medium sensitivity habitats may not be feasible. In terms of no-go areas, it is recommended that the impacts to the medium sensitivity faunal habitat be avoided and that impacts be confined to the road upgrade footprint only. The road upgrade activities in close proximity to these medium sensitivity areas are to be limited to the narrow band of modified habitat of very low sensitivity adjoining the road (Edwards *et al.*, 2025). Refer to **Figure 7-1** below.

Provided all mitigation measures recommended are strictly adhered to, anticipated impacts will be of moderately low or low significance.



Figure 7-1: Areas to be avoided during construction (Edwards *et al.*, 2025).

7.4.2 Impacts to Ecosystem Conservation

Ecosystem conservation targets are determined at national, provincial or local scales for known reference ecosystem and vegetation types. Not meeting or hindering the ability to effectively

meet conservation targets represents a significant societal impact. This impact therefore focusses on the impacts of habitat loss on the ability to meet conservation targets for affected ecosystems (Edwards *et al.*, 2025).

Construction and Operational Phase: None of the impacts to ecosystem health and associated impacts to ecosystem conservation were assessed as being significant due to the vegetation communities and faunal habitats being already highly modified from historical development. The direct and indirect impacts of the project phases were all assessed as being of low significance.

No-Go Alternative: There is no impact associated with the No-Go Alternative as there would be no change in status as no activities would be undertaken.

7.4.3 Impacts to Species of Conservation Concern

Like ecosystem conservation targets, such targets are also determined for biota. This impact therefore reflects the impact that planned developments are likely to have on meeting conservation targets of SCC (Edwards *et al.*, 2025).

Construction and Operational Phases: In terms of impacts to threatened biota and associated impacts to SCC, no protected or threatened flora were noted during the site visit and faunal SCC, the KwaZulu Dwarf Chameleon *Bradypodion melanocephalum*, will be absent from the majority of the footprint. The SCC will utilise a block of vegetation in the southern portion of the footprint, south-west of the Bayhead-Langeberg Road intersection. They will also utilise grassy areas immediately adjacent to the proposed footprint in the southern third of the Bayhead Road section. All impacts are rated as being of low significance without and with mitigation for both the operational and construction phases.

No-Go Alternative: There is no impact associated with the No-Go Alternative as there would be no change in status as no activities would be undertaken.

7.4.4 Impacts on Biodiversity / Ecological Processes

The role of affected area in the bigger landscape with regard to maintaining the functions and processes that operate to maintain and generate biodiversity. Here, ecological corridors are particularly important in that they facilitate species movement that is critical to natural replenishment, evolutionary processes and the long-term persistence of species populations (Edwards *et al.*, 2025).

Construction and Operational Phases: In terms of the impacts to ecological processes, there will be a small increase in the extent and intensity of the impacts to ecological connectivity during the construction and operational phases due to the small footprint of the proposed

upgrades. The impacts are all assessed as being of low significance without and with mitigation due to the impacted nature of the local ecosystems and ecological connectivity and fragmentation impacts already being present.

No-Go Alternative: There is no impact associated with the No-Go Alternative as there would be no change in status as no activities would be undertaken.

7.4.5 Management and Mitigation Measures

The following mitigation, management and monitoring measures have been recommended by the specialist team to address the impacts identified and assessed (Edwards *et al.*, 2025):

Planning and Design Phase:	The following best practice planning and design measures should be investigated for inclusion into the project design:
No-Go Areas and Buffer Zone Determination	As the proposed project is a road upgrade project, buffer zones and no-go areas are not applicable. Rather the key measures are that the extent of the working and operational footprints be reduced as far as practically possible and that this footprint is confined to areas already modified and transformed. In particular, the impacts to the habitats in the southern periphery of the footprint, west of the Bayhead-Langeberg Road intersection, must be minimised and care must be taken not to disturb vegetation immediately adjacent to the footprint in this area, as this vegetation supports KwaZulu Dwarf Chameleons, and is already highly reduced in extent. In addition, strict mitigation measures will be needed to ensure that impacts are strictly confined to the approved development footprint only.
Road Upgrade Re-alignment Recommendations from Faunal Specialist	Overall, the vast majority of the site is of no – very low importance for fauna, given the very high degree of transformation and disturbance. However, restricted areas of vegetation in the southern third of the Bayhead Road section, and areas immediately adjacent to this do have some value, as they provide habitat and, importantly, maintain connectivity within the broader landscape for the Near Threatened KwaZulu Dwarf Chameleon. Given this, the following recommendations are made: - There are no faunal issues or constraints for the northern two-thirds of the Bayhead Road section, and most of the Langeberg Road section. - The layout should be amended to exclude transformation on the southern periphery of the footprint, west of the Bayhead-Langeberg Road intersection. Failure to do so will have a locally significant impact on the connectivity and thus longer-term viability of the KwaZulu Dwarf Chameleon population in the region. - Care must be taken not to disturb vegetation immediately adjacent to the footprint in the southern third of the Bayhead Road section, as this vegetation supports KwaZulu Dwarf Chameleons, and is already highly reduced in extent.
Road Stormwater Management	When revising stormwater infrastructure for the road, it will be important to incorporate the following best practice stormwater management design measures recommended based on our understanding of the soils, geology and sensitivity of the terrestrial ecosystems traversed by the road alignment: - Stormwater outlets should not be located at low points within the watercourses. - Stormwater generated by the upgraded road should be discharged at



Planning and Design Phase:	The following best practice planning and design measures should be investigated for inclusion into the project design: regular intervals and many small outlets should be favoured over few large. - All outlets must be designed to dissipate the energy of outgoing flows to levels that present a low erosion risk. In this regard, suitably designed energy dissipation and erosion protection structures (Reno-mattresses) will need to be installed at appropriate locations. Pre- and post-discharge velocities at each outlet should be calculated to inform the appropriate design of the energy dissipation and erosion protection measures. - All outlet erosion protection measures (e.g. Reno-mattresses) must be established to reflect the natural slope of the surface and located at the natural ground-level. - If subsoil drains are required, the following outlet design recommendations should be adhered to: As far as practically possible, conveyance from the road drains to the outlets should be via open drains with rough surfaces that are armoured with erosion protection.
Construction Phase	Mitigation and Management Measures
Demarcation of 'No-Go' areas and construction corridors	Prior to the commencement of any construction activities, the following features must be staked out by a surveyor and demarcated using brightly coloured shade cloth: The outer edges of the entire construction corridor / right-of-way. The construction servitude (working area / corridor) width must be minimised as far as practically possible All excavated soils and soil stockpiles must be stored / sited inside the demarcated working areas as defined above. All equipment laydown or storage areas must occur inside the demarcated working areas as defined above. The demarcation work must be signed off by the Environmental Control Officer (ECO) before any work commences. Demarcations are to remain until construction and rehabilitation is complete. All areas outside of this demarcated working servitude must be considered no-go areas for the entire construction phase. Any contractor found working within No-Go areas must be fined as per fining schedule/system setup for the project. Access to and from the project area should be either via existing roads or within the construction servitude. No equipment laydown or storage areas must be located within important or sensitive indigenous vegetation. All disturbed areas beyond the construction site that are intentionally or accidentally disturbed during the construction phase must be rehabilitated immediately to the satisfaction of the ECO.
Access and Haulage Roads	A construction phase access and haulage road plan must be developed prior to construction commencing and should consider the following: - All temporary and permanent construction access and haulage roads should follow the existing road network as far as practically possible. - Where the creation of new access / haulage roads is required, the following measures must be implemented: - The access road should comprise two parallel tyre tracks only and must



Construction Phase	Mitigation and Management Measures
	not involve vegetation clearing or soil stripping. ○ The access road should be minimised in length as far as practically possible and should bisect the most disturbed vegetation where possible. ○ The access road should not encroach upon any areas of medium or high sensitivity.
Threatened and Protected Plant Search and Rescue	Prior to construction commencing, the following must be undertaken: • The protected plants within and in the vicinity of the development footprint must be relocated to suitable areas by a person with suitable horticultural experience, and in particular experience in relocating indigenous plants within natural habitats. The translocation should occur in mid-summer to ensure that all individuals are picked up during the relocation. • Permits to translocate such species must be acquired and a search and rescue plan must be compiled and implemented. • All mature trees that are to remain in place must be cordoned off/marked so that all personnel involved during the construction phase are aware these trees need to be retained and damage to these individuals avoided.
Faunal Search and Rescue	Note: based on the faunal potential occurrence assessment undertaken the KwaZulu Dwarf Chameleon (<i>Bradypodion melanocephalum</i> – Near Threatened) may potentially occur within some of the vegetation communities on-site. It is assumed that these vegetation communities will be avoided entirely. However, as a precautionary measure: • A search and rescue exercise for the KwaZulu Dwarf Chameleon should be planned and performed immediately prior to clearance of any of the site's vegetation. • Any chameleons detected can be released to an intact area outside of the footprint, that forms part of the no-go area. • This would require appropriately trained specialists to perform.
Runoff, erosion and sediment control	Wherever possible, existing vegetation cover along the construction corridor should be maintained during the construction phase. The unnecessary removal of groundcover from slopes must be prevented, especially on steep slopes which will not be developed. Clearing activities must only be undertaken during agreed working times and permitted weather conditions. If heavy rains are expected, clearing activities should be put on hold. In this regard, the contractor must be aware of weather forecasts. All bare slopes and surfaces to be exposed to the elements during clearing and earthworks must be protected against erosion using rows of hay-bales, sandbags and/or silt fences aligned along the contours and spaced at regular intervals (e.g. every 1m) to break the energy of surface flows. Once shaped, all exposed/bare surfaces and embankments must be re-vegetated immediately. If re-vegetation of exposed surfaces cannot be established immediately due to phasing issues, temporary erosion and sediment control measures must be maintained until such a time that re-vegetation can commence. All temporary erosion and sediment control measures must be monitored for the duration of the construction phase and repaired immediately when damaged. All temporary erosion and sediment control structures must only be removed once vegetation cover has successfully re-colonised the affected

Construction Phase	Mitigation and Management Measures
	areas. After every rainfall event, the contractor must check the site for erosion damage and rehabilitate this damage immediately. Erosion rills and gullies must be filled-in with appropriate material and silt fences or fascine work must be established along the gulley for additional protection until vegetation has re-colonised the rehabilitated area.
Hazardous substances / materials management	The proper storage and handling of hazardous substances (e.g. fuel, oil, cement, etc.) needs to be administered. Mixing and/or decanting of all chemicals and hazardous substances must take place on a tray, shutter boards or on an impermeable surface and must be protected from the ingress and egress of stormwater. Drip trays should be utilised at all dispensing areas and under stationary vehicles and machinery. No refuelling, servicing or chemical storage should occur within 32m of any watercourse. No vehicles transporting concrete, asphalt or any other bituminous product may be washed on site. Vehicle maintenance should not take place on site unless a specific bunded area is constructed for such a purpose. Hazardous storage and refuelling areas must be bunded prior to their use on site during the construction period following the appropriate South African National Standards (SANS) codes. The bund wall should be high enough to contain at least 110% of any stored volume. The surface of the bunded surface should be graded to the centre so that spillage may be collected and satisfactorily disposed of. All necessary equipment for dealing with spills of fuels/chemicals must be available at the site. Spills must be reported to a Environmental Officer (EO) cleaned up immediately and contaminated soil/material disposed of appropriately at a registered site. Contaminated water containing fuel, oil or other hazardous substances must never be released into the environment. It must be disposed of at a registered hazardous landfill site.
Invasive Alien Plant control	All alien invasive vegetation that colonise the construction site must be removed, preferably by uprooting and hand pulling. Hand pulling / uprooting is recommended for herbs, saplings, shrubs. The contractor should consult the ECO regarding the method of removal. All bare surfaces across the construction site must be checked for alien invasive vegetation every two weeks and alien invasive vegetation removed by hand pulling/uprooting and adequately disposed. Herbicides should be utilised where hand pulling/uprooting is not possible. Only herbicides which have been certified safe for use in wetlands by independent testing authority are to be used. The ECO must be consulted in this regard.
Prohibitions related to animals	The handling and or killing of any animal species present is strictly prohibited and all staff/personnel must be notified. It must be noted that poaching/snaring is strictly prohibited. Any burrows or nests identified in the construction footprint should be reported immediately.

Construction Phase	Mitigation and Management Measures
Noise, dust and light pollution minimisation	Temporary noise pollution due to construction works should be minimized by ensuring the proper maintenance of equipment and vehicles and tuning of engines and mufflers as well as employing low noise equipment where possible. Water trucks will be required to suppress dust by spraying water on affected areas producing dust. This will likely be required daily in the drier months or during dry periods. No lights must be established within the construction area near the watercourses and buffer zones.
General rehabilitation guidelines	The area between the footprint boundary and any important or sensitive indigenous vegetation should be actively managed and rehabilitated through a management plan to improve the biodiversity value of this area. In addition, all land impacted by the proposed development must be rehabilitated by undertaking the following general tasks: • All foreign material must be removed from site. • Land must be regraded / reshaped and topsoil must be reinstated. • Compacted soils must be adequately ripped/loosened where compacted, as informed by the ECO. • Re-vegetation should take place via hydroseeding as advised by a botanist. Typically, a commercially available indigenous seed mixes are suitable as well as seeding with Bermuda Grass (<i>Cynodon dactylon</i>) or Buffalo Grass (<i>Stenotaphrum secundatum</i>). The re-vegetation should be timed to occur before the wet season (ideally at the onset of the wet season in early spring – August to October) so that watering requirements are minimized and plant growth is most vigorous. Watering should be gentle so that rill erosion is avoided and minimised. Any erosion damage resulting from watering/irrigation must be repaired immediately. Alien and weed vegetation that colonize the rehabilitation areas must be removed and eradicated immediately via hand pulling and should be adequately disposed of. It is assumed that in the short-term alien plants will include herbs, shrubs and saplings. Once the initial re-vegetation is completed, the planting contractor will need to conduct weekly site visits to remove alien plants (in accordance with the latest revised NEMBA requirements) and address any re-vegetation concerns until re-vegetation is considered successful (i.e. >90% indigenous cover). Thereafter, the rehabilitation must be signed off by the ECO.
Construction phase monitoring measures	Compliance monitoring will be the responsibility of a suitably qualified/trained ECO with any additional supporting EO's (Environmental Officers) having the required competency skills and experience to ensure that monitoring is undertaken effectively and appropriately. A photographic record of the state of the site and surroundings prior to the commencement of clearing/construction must be kept for reference and rehabilitation monitoring purposes. The ECO must undertake monthly compliance monitoring audits. Aspects that must be monitored include: • The condition of the demarcation fence.

Construction Phase	Mitigation and Management Measures
	• Evidence of any no-go area incursions. • The condition of the temporary runoff, erosion and sediment control measures and evidence of any failures. • Evidence of sedimentary deposits / plumes and elevated rates of sedimentation (i.e. vegetation smothering / burial). • Evidence of gully or bed/bank erosion. • The condition of waste bins and the presence of litter within the working area. • Evidence of solid waste within the no-go areas. • Evidence of hazardous materials spills and soil contamination. • Presence of alien invasive and weedy vegetation within the working area. • Rehabilitation and re-vegetation methods and success. Once the construction and rehabilitation has been completed, the ECO should conduct a close out site audit 1 month after the completion of rehabilitation.
Operational Phase	Mitigation and Management Measures
Maintenance and management	It is the applicant's responsibility to ensure the proper functioning of all road infrastructure that is likely to require regular on-going maintenance. A management plan, that includes: 1) an alien plant control programme and 2) allows for some grassy areas, away from the immediate verge, to grow to a height exceeding 60cms that allows for the chameleons to utilise this area, must be put in place for the areas highlighted as being important for KwaZulu Dwarf Chameleons. In terms of management, alien invasive plant control must be practiced on an on-going basis in line with the requirements of Section 2(2) and Section 3 (2) the NEMBA, which obligates the landowner/developer to control alien invasive vegetation.
Monitoring	It will be important that long-term monitoring of the potential ecosystem impacts be undertaken to proactively identify any environmental issues and impacts that may arise as a result of the operational phase of the project. The following key aspects should be monitored: • Erosion and/or sedimentation in the vicinity of the road. • Presence of alien invasive plants.

7.5 Impact on Aquatic Biodiversity

7.5.1 Summary of Specialist Findings and Recommendations

The Aquatic Biodiversity Impact Assessment was undertaken by Verdant Environmental, refer to **Appendix F**. The following presents a summary of findings by the specialist team (Edwards *et al.*, 2025):

The project footprint lies entirely within the EFZ of the Durban Bay Estuary, a sensitive ecological area. For the purposes of this assessment, the project areas within the EFZ were further subdivided into specific units. These include areas dominated by modified dryland created through imported fill material, mostly associated with existing road infrastructure, and modified wetland areas in lower-lying areas also located on fill material. Importantly, intact and functional estuarine ecosystems—such as subtidal zones, mangroves, and intertidal mudflats—were not present within or directly adjacent to the project upgrade areas. The nearest of these ecosystems lie at the following distances from project activities: subtidal zones are over 39 meters away, mangroves are over 85 meters away, and intertidal flats are more than 75 meters distant. The site also includes man-made canals, such as the Amanzimyana Stream Canal and Durban Harbour Canal which is crossed by Bayhead Road, and two additional unnamed canals (Canal Three and Canal Four), are located 10m and 80m from Bayhead Road.

Ecosystem features within the project upgrade area are considered estuarine in nature, but are already highly modified and transformed. Given this context, and with the implementation of best-practice mitigation measures, the overall impact of the project is expected to be of low significance and low risk. The only notable concern is the project's proximity to intact estuarine systems, as cumulative impacts could pose long-term risks. However, due to the linear nature and small footprint of the planned activities, and the sufficient distance from the sensitive habitats, no measurable impact on the estuary's PES is anticipated if mitigation is effectively applied.

The recommended mitigation, management, and monitoring measures for the proposed infrastructure upgrade focus on minimizing environmental impact throughout the planning, construction, and operational phases, with a strong emphasis on protecting estuarine and freshwater ecosystems. Being an existing road upgrade and widening exercise, buffer zones are not applicable. The Recommended No-Go Area for this project includes any areas not yet infilled in the EFZ and the estuarine wetlands (Edwards *et al.*, 2025).

During the planning and design phase, the project must avoid sensitive estuarine areas by clearly identifying and adhering to no-go zones. Upgraded culverts and road crossings should be designed to maintain natural water flow, reduce erosion, and minimize flow velocity, with features such as energy dissipation structures and appropriate sizing to handle major flood events. Sewer infrastructure should avoid wetlands and estuarine habitats, utilize protective casings, and include sealed manholes and backup systems to prevent leakage or overflow.

In the construction phase, strict environmental controls must be implemented, including the clear demarcation of no-go zones and construction corridors, erosion and sediment control, and careful management of runoff. Hazardous substances must be stored and handled properly, away from watercourses, with spill response measures in place. Invasive alien plant species

must be regularly removed, and noise, dust, and light pollution minimized. Wildlife handling is strictly prohibited, and rehabilitation of disturbed areas must begin immediately upon construction completion. Monitoring by an ECO will ensure compliance with environmental safeguards, and any non-compliance must be rectified immediately.

During the operational phase, infrastructure must be regularly maintained, and ongoing alien invasive plant control must be conducted in compliance with biodiversity legislation. Long-term environmental monitoring is critical to detect erosion, sedimentation, pollution, or the spread of invasive species. If any impacts are identified, such as habitat damage or water pollution, they must be reported to authorities, and appropriate remediation or rehabilitation must be implemented under expert guidance to restore ecological integrity.

7.5.2 Direct Ecosystem Destruction and Modification Impacts

Construction Phase: During the construction phase, Direct Ecosystem Destruction and Modification impacts relate to planned direct and accidental destruction and/ or modification of the EFZ and associated modified aquatic, wetland, and terrestrial ecosystems as a result of the road upgrades. This phase includes the following activities; site clearing, stripping and grubbing; earthworks and reshaping; runoff and sediment control, hazardous materials use, storage and management; flow diversion, dewatering, dust control, rehabilitation, and monitoring. The ecosystem features to be impacted in the vicinity of the project activities are already highly modified and transformed. In addition, the activities are linear in nature and have a relatively small footprint. The only aspect of the development that poses some risk is the proximity of the activities to intact and functional estuarine ecosystems because the activities are planned to occur within the EFZ, which is sensitive to further negative cumulative impacts (Edwards *et al.*, 2025). The direct ecosystem destruction impact was assessed as being of medium negative significance without mitigation and reduces to a low negative significance with mitigation as can be seen in **Table 7-3**.

Operational Phase: During the operational phase, Direct Ecosystem Destruction and Modification impacts relate to accidental direct impacts and modification of portions of the EFZ during infrastructure repair and maintenance activities. Activities include the following; stormwater management, sewage reticulation, maintenance and repair of infrastructure, vehicular use, rehabilitation, and monitoring. The unintended direct impacts to watercourses during uncontrolled operational maintenance and repair activities was assessed as being of low negative significance without mitigation and with mitigation as can be seen in **Table 7-3**.

No-Go Alternative: There is no impact associated with the No-Go Alternative as there would be no change in status as no activities would be undertaken.

Table 7-3: Aquatic – Direct ecosystem destruction and modification impacts

Direct ecosystem destruction and modification impacts			
Phase	Preferred Alternative		No Go Alternative
	Construction Phase	Operational Phase	
Nature	Direct ecosystem destruction and modification impacts	Direct ecosystem destruction and modification impacts	No change in status as no activities would be undertaken
Status	Negative (-), Direct	Negative (-), Direct	No change in status
Extent	Site - 1	Site - 1	
Duration	Permanent - 4	Permanent – 4	
Intensity	Low - 2	Low - 2	
Reversibility	Low – 2	Low - 2	
Replaceable	Low – 2	Low - 2	
Cumulative	Very Low - 1	Very Low - 1	
Probability	Definite - 4	Highly Probable - 3	
Level of significance	$(1+4+2+2+2+1)*4=48$ Medium -	$(1+4+2+2+2+1)*3=36$ Low -	No impact / Neutral
Level of significance with mitigation	Low -	Low -	No impact / Neutral
Confidence	Medium	Medium	High

7.5.3 Indirect hydrological and geomorphological impacts

Construction Phase: During construction indirect hydrological and geomorphological impacts relate to erosion and/or sedimentation of EFZ and associated modified aquatic, wetland and terrestrial ecosystems due to catchment soil and vegetation clearing and landcover disturbance during construction. This includes temporary alteration of flows within canals during instream construction works, with resultant erosion and sedimentation impacts. The indirect hydrological and geomorphological impact was assessed as being of low negative significance without mitigation and with mitigation as can be seen in **Table 7-4**.

Operational Phase: During the operational phase indirect hydrological and geomorphological impacts relate to erosion and/or sedimentation of EFZ and associated modified aquatic, wetland and terrestrial ecosystems due to point source discharge of stormwater at outlets, especially if poorly designed; small increase in surface water inputs to canals and low-lying areas of the EFZ as a result of road widening and increased stormwater generation (such increases are predicted to be negligible relative to entire catchment inputs); and impacts to flood peaks of canals are predicted to negligible as bridges are being upgraded and flow is not being concentrated. The indirect hydrological and geomorphological impacts during uncontrolled operational maintenance and repair activities was assessed as being of low negative significance without mitigation and with mitigation as can be seen in **Table 7-4**.

No-Go Alternative: There is no impact associated with the No-Go Alternative as there would be no change in status as no activities would be undertaken.

**Table 7-4: Aquatic – Indirect hydrological and geomorphological impacts**

Indirect hydrological and geomorphological impacts			
Phase	Preferred Alternative		No Go Alternative
	Construction Phase	Operational Phase	
Nature	Indirect hydrological and geomorphological impacts	Indirect hydrological and geomorphological impacts	No change in status as no activities would be undertaken
Status	Negative, Indirect	Negative, Indirect	No change in status
Extent	Local - 2	Local - 2	
Duration	Medium - 2	Permanent - 4	
Intensity	Low - 2	Low - 2	
Reversibility	Low - 2	Low - 2	
Replaceable	Low - 2	Low - 2	
Cumulative	Low - 2	Very Low - 1	
Probability	Highly Probable - 3	Highly Probable - 3	
Level of significance	(2+2+2+2+2+2)*3=36 Low -	(2+4+2+2+2+1)*3=39 Low -	No impact / Neutral
Level of significance with mitigation	Low -	Low -	No impact / Neutral
Confidence	Medium	Medium	High

7.5.4 Water quality impacts

Construction Phase: During construction water quality impacts relate to pollution of EFZ ecosystems due to the mishandling of hazardous substances and/or improper maintenance of machinery during construction (e.g. oil and diesel leaks and spills), any erosion leading to sedimentation of EFZ downstream could also lead to raised water turbidity and suspended solids concentrations, also affecting water quality; and pollution of the canals and EFZ due to accidental damage to and rupture of sewer pipes during decommission and reconnection activities in the construction phase. The water quality impact was assessed as being of low negative significance without mitigation and with mitigation as can be seen in **Table 7-5**.

Operational Phase: During the operational phase water quality impacts relate to pollution of downstream portions of the EFZ due to the mishandling of hazardous substances and/or improper maintenance of machinery during repair and maintenance activities (e.g. leaks from oil and diesel storage tanks / containers); pollution of downstream portions of the EFZ due to polluted stormwater discharge; any erosion leading to sedimentation of EFZ downstream could also lead to raised water turbidity and suspended solids concentrations, also affecting water quality; and potential accidental releases/spills from wastewater (sewer) pipelines and manholes through inadequate design, improper use of flush toilets (leading to blockages for example) or other unforeseen events (such as release of stormwater into sewer system, leading to potential overflow from manholes). The water quality impacts during uncontrolled operational maintenance and repair activities was assessed as being of low negative significance without and with mitigation as can be seen in **Table 7-5**.

No-Go Alternative: There is no impact associated with the No-Go Alternative as there would be no change in status as no activities would be undertaken.

Table 7-5: Aquatic – Water quality impacts

Water quality impacts			
Phase	Preferred Alternative		No Go Alternative
	Construction Phase	Operational Phase	
Nature	Water quality impacts	Water quality impacts	No change in status as no activities would be undertaken
Status	Negative, Indirect	Negative, Indirect	No change in status
Extent	Local - 2	Local - 2	
Duration	Short Term - 1	Permanent - 4	
Intensity	Low - 2	Low - 2	
Reversibility	Low -2	Low -2	
Replaceable	Low -2	Low -2	
Cumulative	Very Low - 1	Very Low - 1	
Probability	Probable - 2	Highly Probable - 3	
Level of significance	(2+1+2+2+2+1)*2=20 Low -	(2+4+2+1+1+1)*3=33 Low -	No impact / Neutral
Level of significance with mitigation	Low -	Low -	No impact / Neutral
Confidence	Medium	Medium	High

7.5.5 Fragmentation and ecological disturbance impacts

Construction Phase: During construction fragmentation and ecological disturbance impacts relate to temporary fragmentation of EFZ as a result of the construction activities across / near canals. As well as expanded / more intense edge impacts to the EFZ. Associated impacts include: (i) deterioration in vegetation quality and cover, (ii) potential for increased alien invasive plant invasion due to disturbance, (iii) noise pollution and vibrations associated with earthworks and the use of heavy machinery that could affect local wildlife; and (iv) light pollution associated with construction crews and the use of heavy machinery use at night which could affect locally occurring nocturnal EFZ species. The fragmentation and ecological disturbance impact during construction was assessed as being of low negative significance without and with mitigation as can be seen in **Table 7-6**.

Operational Phase: During the operational phase fragmentation and ecological disturbance impacts relate to expanded / more intense edge impacts to EFZ ecosystems as a result of development adjacent to the EFZ. Associated impacts include: (i) deterioration in vegetation quality and cover, (ii) potential for increased alien invasive plant invasion due to disturbance, (iii) noise pollution and vibrations associated with aircraft could affect local wildlife; and (iv) light pollution. The fragmentation and ecological disturbance impact during uncontrolled operational maintenance and repair activities was assessed as being of low negative significance without and with mitigation as can be seen in **Table 7-6**.

No-Go Alternative: There is no impact associated with the No-Go Alternative as there would be no change in status as no activities would be undertaken.

Table 7-6: Aquatic – Fragmentation and ecological disturbance impacts

Fragmentation and ecological disturbance impacts			
Phase	Preferred Alternative		No Go Alternative
	Construction Phase	Operational Phase	
Nature	Fragmentation and ecological disturbance impacts	Fragmentation and ecological disturbance impacts	No change in status as no activities would be undertaken
Status	Negative, Direct	Negative, Direct	No change in status
Extent	Local - 2	National - 4	
Duration	Short Term - 1	Permanent - 4	
Intensity	Low - 2	Low - 2	
Reversibility	Reversible - 1	Reversible - 1	
Replaceable	Replaceable - 1	Replaceable - 1	
Cumulative	Very Low - 1	Very Low - 1	
Probability	Highly Probable - 3	Probable - 2	
Level of significance	(2+1+2+1+1+1)*3=24 Low -	(4+4+2+1+1+1)*2=26 Low -	No impact / Neutral
Level of significance with mitigation	Low -	Low -	No impact / Neutral
Confidence	Medium	Medium	High

7.5.6 Management and Mitigation Measures

The following mitigation, management and monitoring measures have been recommended by the specialist team to address the impacts identified and assessed (Edwards *et al.*, 2025):

Planning and Design Phase:	The following best practice planning and design measures should be investigated for inclusion into the project design:
No-Go Areas and Buffer Zone Determination	Being an existing road upgrade and widening exercise, buffer zones are not applicable. The Recommended No-Go Area for this project includes any areas not yet infilled in the EFZ and the estuarine wetlands.
Culvert / Bridge Upgrade Recommendations	The proposed upgrades will improve the current situation in terms of having better capacity to convey flows and reducing velocities of water discharged by culverts. Nevertheless, the following best practice planning and design measures should be investigated for inclusion into the project design: • For all crossing types and designs, flow through road crossings should not be unnecessarily concentrated (or impeded) and flow velocity should not be increased. In this regard, estuarine and canal crossings should be via bridges or box / portal culverts established across the entire width of the channel to avoid flow narrowing and concentration. • The bridges and/or box culverts should be sized to transport not only water, but the other materials that might be mobilized (i.e. debris). • Erosion protection and energy dissipation measures should be established at

Planning and Design Phase:	The following best practice planning and design measures should be investigated for inclusion into the project design: all road crossing outlets e.g. stilling basins and reno-mattresses. • The culvert concrete base must be at bed level. All culvert inlets and outlets and associated outlet erosion protection structures must not be raised above the estuarine/riparian surface and/or stream/river/canal bed and must be established to reflect the natural downstream slope of the estuarine / riparian surface and/or stream / river/canal bed. • If any additional road fill is utilised at estuarine crossings, a porous layer should be established within the road fill at the appropriate elevation to ensure that estuarine interflow and overland flow is able to pass through the road fill. • The culverts must be sized to convey major storm events, ideally the 1:100yr flood. • Every effort must be made to minimise the upgraded footprint of the existing roads at watercourse crossings.
Sewer Alignments and Pipeline Designs	• Where crossings of canals are required, crossings should be via pipe bridges. • No sewer pipelines must be located within 30m of intact estuarine ecosystems / habitats. • Avoid crossing and disturbing wetlands. For any sewer pipelines planned: • Buried sewer pipelines will need to be protected to minimize the risk of damage or leakage. This means typically encasing the pipe in concrete or other suitable resistant material. • All sewer manholes within 30m of intact estuarine ecosystems and/or canals, and/or wetlands must be sufficiently sealed to ensure that surcharge events do not occur if there is a blockage, damage or leakage.
Sewer Pump Station Design (if applicable)	The following design recommendations for sewer pump stations apply: • All sewer infrastructure, including pump station and sewer pipelines, must be designed according to best-practice environmental principles and requirements. • Pump stations must be fenced off to prevent unauthorized access by humans/wildlife which could cause damage to infrastructure and cause accidental malfunction and/or spillage of untreated wastewater. • Reasonable measures must be taken to provide back-up for mechanical, electrical, operational or process failure and malfunction at pump stations. At a minimum there should be an alarm system to warn of an electrical failure and sufficient standby equipment to provide for reasonable assurance that the pump station can be functional within 24 hours. • The pump station must be placed within a lined, impermeable concrete bunded area with the capacity to hold untreated wastewater in an emergency and provide for sufficient time for maintenance staff to address any faults/problems. This is to limit the risk of untreated wastewater overflowing in the event of any leakage or accidental spillage at the pump station. • Signage should be provided at a visible location at pump stations to inform staff and guests in the area of the purpose of the pump station. Emergency telephone contact details should also be provided on the signs so that pump station failure, leakage or electrical power outages affecting the system can be easily reported to relevant management personnel.
Construction Phase	Mitigation and Management Measures



Construction Phase	Mitigation and Management Measures
Demarcation of 'No-Go' Areas and Construction Corridors	Prior to the commencement of any construction activities, the following must be staked out by a surveyor and demarcated using brightly coloured shade cloth: • The outer edge of any no-go areas. • The outer edge of the construction footprint. Prior to the commencement of any construction activities, the following must be staked out by a surveyor and signage with depths must be provided: • The alignment of all underground sewer pipelines within 15m of project activities. • The alignment of all underground water pipelines within 15m of project activities. • The alignment of all underground gas / hydrocarbon pipelines within 15m of project activities. All areas demarcated as no-go areas should remain demarcated for the entire construction phase. Any contractor found working within No-Go areas must be fined as per fining schedule/system setup for the project. The demarcation work must be signed off by the ECO before any work commences. The demarcations are to remain until construction and rehabilitation is complete.
Method Statement for Pipeline Decommission and Reconnection	A detailed method statement must be developed by the project / resident engineer, ECO and contractor to provide detailed and clear steps to follow during the temporary disconnection, pipeline removal / decommissioning and establishment of a new pipeline and connection.
Runoff, erosion and sediment control	Wherever possible, existing vegetation cover along the development site should be maintained during the construction phase. The unnecessary removal of groundcover from slopes must be prevented, especially on steep slopes which will not be developed. Clearing activities must only be undertaken during agreed working times and permitted weather conditions. If heavy rains are expected, clearing activities should be put on hold. In this regard, the contractor must be aware of weather forecasts. Sediment barriers (e.g.: silt fences/sandbags/hay bales) must be installed immediately downstream of active work areas (including soil stockpiles) as necessary to trap any excessive sediments generated during construction. All bare slopes and surfaces to be exposed to the elements during clearing and earthworks must be protected against erosion using rows of hay-bales, sandbags and/or silt fences aligned along the contours and spaced at regular intervals (e.g. every 2m) to break the energy of surface flows. Once shaped, all exposed/bare surfaces and embankments must be re-vegetated immediately. If re-vegetation of exposed surfaces cannot be established immediately due to phasing issues, temporary erosion and sediment control measures must be maintained until such a time that re-vegetation can commence. All temporary erosion and sediment control measures must be monitored for the duration of the construction phase and repaired immediately when damaged. All temporary erosion and sediment control structures must only be removed once vegetation cover has successfully recolonised the affected areas.

Construction Phase	Mitigation and Management Measures
	After every rainfall event, the contractor must check the site for erosion damage and rehabilitate this damage immediately. Erosion rills and gullies must be filled-in with appropriate material and silt fences or fascine work must be established along the gulley for additional protection until vegetation has re-colonised the rehabilitated area.
Hazardous substances / materials management	The proper storage and handling of hazardous substances (e.g. fuel, oil, cement, etc.) needs to be administered. Mixing and/or decanting of all chemicals and hazardous substances must take place on a tray, shutter boards or on an impermeable surface and must be protected from the ingress and egress of stormwater. Drip trays should be utilised at all dispensing areas. No refuelling, servicing or chemical storage should occur within 32m of any watercourse. No vehicles transporting concrete, asphalt or any other bituminous product may be washed on site. Vehicle maintenance should not take place on site unless a specific bunded area is constructed for such a purpose. Hazardous storage and refuelling areas must be bunded prior to their use on site during the construction period following the appropriate SANS codes. The bund wall should be high enough to contain at least 110% of any stored volume. The surface of the bunded surface should be graded to the centre so that spillage may be collected and satisfactorily disposed of. All necessary equipment for dealing with spills of fuels/chemicals must be available at the site. Spills must be cleaned up immediately and contaminated soil/material disposed of appropriately at a registered site. Contaminated water containing fuel, oil or other hazardous substances must never be released into the environment. It must be disposed of at a registered hazardous landfill site. Spills must be cleaned up immediately and contaminated soil/material disposed of appropriately at a registered site.
Invasive Alien Plant (IAPs) control	All alien invasive vegetation that colonise the construction site must be removed, preferably by uprooting. The contractor should consult the ECO regarding the method of removal. All bare surfaces across the construction site must be checked for IAPs every two weeks and IAPs removed by hand pulling/uprooting and adequately disposed. Herbicides should be utilised where hand pulling/uprooting is not possible. ONLY herbicides which have been certified safe for use in wetlands by independent testing authority are to be used. The ECO must be consulted in this regard. The herbicide contractor must be certified to apply/utilise the herbicide in question.
Noise, dust and light pollution minimisation	Temporary noise pollution due to construction works should be minimized by ensuring the proper maintenance of equipment and vehicles and tuning of engines and mufflers as well as employing low noise equipment where possible. Water trucks will be required to suppress dust by spraying water on affected areas producing dust. This will likely be required daily in the drier months or during dry periods. No lights must be established within the construction area near the

Construction Phase	Mitigation and Management Measures
	watercourses.
Prohibitions related to animals	The handling and/or killing of any animal species present is strictly prohibited and all staff/personnel must be notified of such incidents. Fauna (e.g. snakes, frogs, small mammals) that are encountered during the construction phase must be relocated to other parts of the wetland under the guidance of the EO or ECO. Poaching/snaring is strictly prohibited.
General rehabilitation guidelines	All disturbed areas beyond the construction site that are intentionally or accidentally disturbed during the construction phase must be rehabilitated immediately to the satisfaction of the EC). All land impacted by the proposed development must be rehabilitated by undertaking the following general tasks: • All foreign material must be removed from site. • Land must be regraded / reshaped and topsoil must be reinstated. • Compacted soils must be adequately ripped/loosened where compacted, as informed by the ECO. • Re-vegetation should take place: • For temporary and dryland areas - via hydroseeding using an appropriate indigenous seed mix as advised by a qualified ecologist.
Construction phase monitoring measures	Compliance monitoring will be the responsibility of a suitably qualified/trained ECO with any additional supporting EO's (Environmental Officers) having the required competency skills and experience to ensure that monitoring is undertaken effectively and appropriately. A photographic record of the state of the site and surrounds prior to the commencement of clearing/construction must be kept for reference and rehabilitation monitoring purposes. The ECO must undertake bi-monthly compliance monitoring audits. Freshwater ecosystem aspects that must be monitored related to monitoring freshwater ecosystem impacts include: • The condition of the demarcation fence. • Evidence of any no-go area incursions. • The condition of the temporary runoff, erosion and sediment control measures and evidence of any failures. • Evidence of sedimentary deposits / plumes and elevated rates of sedimentation (i.e. vegetation smothering / burial). • Evidence of elevated river / stream turbidity levels. • Evidence of gully or bed/bank erosion. • Visual assessment of stormwater quality and instream water quality. • The condition of waste bins and the presence of litter within the working area. • Evidence of solid waste within the no-go areas. • Evidence of hazardous materials spills and soil contamination. • Presence of alien invasive and weedy vegetation within the working

Construction Phase	Mitigation and Management Measures
	area. Rehabilitation and re-vegetation methods and success. Once the construction and rehabilitation has been completed, the ECO should conduct a close out site audit 1 month after the completion of rehabilitation.
Operational Phase	Mitigation and Management Measures
Maintenance and management	It is the applicant's responsibility to ensure the proper functioning of infrastructure that is likely to require regular on-going maintenance. This includes the stormwater management infrastructure, sewerage infrastructure and road infrastructure. It is important that the location and extent of the watercourses in the vicinity of project activities be incorporated into all formal maintenance and repair plans for the project.
Alien Invasive Plant Management and Maintenance	In terms of management, alien invasive plant control must be practiced on an on-going basis in line with the requirements of Section 2(2) and Section 3 (2) the NEMBA, which obligates the landowner/developer to control IAPs on their property.
Monitoring	It will be important that long-term monitoring of the potential freshwater ecosystem impacts be undertaken to proactively identify any environmental issues and impacts that may arise as a result of the operational phase of the project. The following key aspects should be monitored: - Erosion and/or sedimentation in the onsite and downstream streams / rivers and wetlands. - Presence of alien invasive plants. - Water quality and evidence of pollution.
Remediation / Rehabilitation	Where appreciable direct vegetation/habitat impacts, water quality impacts (i.e. due to spills) or erosion/sedimentation impacts resulting from storm water releases to watercourses result, these must be reported immediately to the relevant environmental authorities, and an independent freshwater ecologist appointed to conduct a site inspection to assess the residual impacts and determine the need for any onsite remediation or rehabilitation requirements. Following this assessment, an implementable remediation and/or rehabilitation plan may need to be compiled and implemented to the satisfaction of KZN EDTEA and DWS.

7.6 Heritage Impacts

A Heritage Screener was compiled by Jenna Lavin and Mabeth Crafford from CTS Heritage, refer to **Appendix G**. The heritage screener flagged the railway tunnel under Bridge 2-5 for consideration as a heritage resource which initiated an additional heritage report on the structures older than 60 years. This additional heritage report was conducted by Kirk White from Architectural Heritage Consultant. The report is located after the heritage screener in **Appendix G**.

The railway line and associated rail infrastructure at Maydon Wharf are regarded as having low heritage significance. The heritage assessment recommends that the Maydon Wharf railway line be protected throughout project implementation, with no dismantling, damage, or unauthorised alteration permitted in terms of the National Heritage Resources Act (Act 25 of 1999), including prevention of demolition through neglect. The 1952 Railway Tunnel should be considered for formal protection under Section 37 of the Act due to its engineering significance and good condition. While the proposed partial demolition associated with the lengthening of the tunnel at Bayhead Road (Bridge B/2/5) is supported—particularly to address the severely deteriorated northern sidewalk parapet—such works must remain compliant with heritage requirements. Furthermore, construction activities must ensure that the existing branch railway line to Maydon Wharf remains intact and is not adversely affected (White, 2025).

Construction and Operation Phase: All available evidence indicates that significant heritage resources are absent within the project footprint. Direct impacts to heritage resources during construction are considered highly unlikely. There is a very low chance of encountering isolated or residual artefacts during deep excavations, although such material would likely be out of context due to prior disturbance. Once construction is complete, no further ground disturbance is anticipated beyond routine road maintenance. The upgraded roads will continue to function within their existing alignments and disturbed footprints. The heritage related impact during the construction phase is considered to be of a no to very low negative significance with mitigation to negligible without mitigation. The operation phase is considered to have no impacts. Refer to **Table 7-7**.

No-Go Alternative: There is no impact associated with the No-Go Alternative as there would be no change in status to the site.

Table 7-7: Heritage Impacts

Heritage Impacts			
Phase	Preferred Alternative		No Go Alternative
	Construction Phase	Operational Phase	
Nature	Destruction of significant heritage resources	No impact	No change in status as no activities would be undertaken
Status	Negative, Direct	N/A	No change in status
Extent	Local - 2	N/A	
Duration	Short Term - 1	N/A	
Intensity	Very Low - 1	N/A	
Reversibility	Irreversible - 4	N/A	
Replaceable	Irreplaceable - 4	N/A	
Cumulative	Very Low - 1	N/A	
Probability	Improbable - 1	N/A	
Level of significance	(2+1+1+4+4+1)*1=14	N/A	No impact / Neutral
	No / Very Low -	No impact / Neutral	
Level of significance with mitigation	No / Very Low -	No impact / Neutral	No impact / Neutral
Confidence	Medium	High	High

7.7 Landscape/Visual Impact Statement

7.7.1 Summary of Specialist Findings and Recommendations

The project occurs within an already high-activity industrial–logistics environment, where existing noise levels are influenced primarily by road freight, port operations, and associated industrial activity. Baseline measurements confirm that the current acoustic climate is elevated but typical for a heavy logistics zone, with residential receptors located at varying distances from Bayhead Road and Langeberg Road (Marshall, 2025).

The proposed project could result in landscape and visual impacts of low negative significance during construction. However, during the operational period and due to the potential for reducing roadside disturbance within the area, landscape and visual impacts are likely to be positive (Marshall, 2025).

It is noted that there are numerous road improvements and upgrades being undertaken across the municipality and significant upgrades being undertaken to National Roads in the region. There are no other significant road projects that could be visible in the same view as the subject project. However, given the significant disruption that can occur due to road upgrade projects, the proposed upgrade could be seen as increasing disruption to local road corridors. Given the nature of the road this cumulative effect is most likely to affect truck drivers. It is noted that visual effects are not likely to be the main consideration (Marshall, 2025).

The key mitigation measure is the use of appropriate detailing and street furniture to control truck access to areas outside the appropriate road lanes. This is necessary to prevent damage to other areas of the road reserve and adjacent natural areas.

Subject to mitigation measures being undertaken, from a Landscape and Visual Impact perspective, there is no reason why the proposed development should not be authorised (Marshall, 2025).

7.7.2 Change in Landscape Character

The road and adjacent areas have been degraded by the pressure of use and the general lack of positive management. Management currently appears to be reactive, hence, the large concrete blocks and placing of multiple California road barriers in an attempt to control the use of road verges. This has resulted in localised erosion and disturbance of areas adjacent to the road. In the short, and during the construction period, it is likely that the view from the road and immediately adjacent areas will be of a construction site.

The Bayhead and Langeberg Roads are primarily a functional access to adjacent industry and the port and it is not intended to develop a parkland roadside landscape. However, in the long term, it is possible that the creation of an additional road lane could at least partially address current problems. Mitigation should include the use of roadside detailing and furniture to be installed that will physically prevent trucks disturbing areas adjacent to the road which could result in a visual improvement of the roadside landscape and protect adjacent areas that are

important for biodiversity. Therefore, in the medium to long term and with the right detailing, there is a possibility that the proposed upgrades will result in a general landscape improvement (Marshall, 2025).

No-Go Alternative: There is no impact associated with the No-Go Alternative as there would be no change in status to the site.

7.7.3 Impact on Views from Adjacent Areas to the Road

The proposed project is likely to result in a short term negative impact during the construction phase but has the potential, with **mitigation including** the correct detailing and furniture that prevents roadside damage due to the weight of trucks using the corridor to result in a significant visual benefit during the operational phase (Marshall, 2025).

No-Go Alternative: There is no impact associated with the No-Go Alternative as there would be no change in status to the site.

7.7.4 Impacts on Views from Residential Areas on the Bluff

Potential views from residential area of the Bluff are likely to be limited to a small number of properties as dense vegetation screens views over the road from the majority of properties. The section of the road closest to the Bluff being the southern end of Bayhead Road is likely to be the most visually obvious. Properties on Luca Crescent, Lucas Place and Sheffield Grove are closest to the proposed road upgrade and could be most affected. The closest of these properties is approximately 500m from the proposed project. Views from the affected properties are likely to be oblique aerial in nature. Affected properties are likely to have views of the complete length of the affected road (Marshall, 2025).

It is likely that during construction, views over the road works and possible traffic disruption will be seen. It is possible that dust rising from the site could exacerbate impacts. The extent of the possible impact can be managed by limiting the extent of landscape disturbance and effectively managing dust during the construction phase (Marshall, 2025).

It is likely that these receptors have views over disturbed areas closest to the southern end of Bayhead Road due to impacts associated with truck parking and access beside the road although sections of disturbance further north may not be obvious. During the operational phase and with appropriate roadside detailing and furniture to contain trucks and other vehicles on the road, it is likely that disturbed areas will be minimised. It also seems likely that the proposed additional traffic lane will increase road capacity which may result in less traffic congestion on the road. Whilst currently disturbed areas over much of the road are not likely to be highly obvious and views over traffic congestion may not be a significant concern, the proposed project is likely to have a marginally beneficial impact on views from this area (Marshall, 2025).

No-Go Alternative: There is no impact associated with the No-Go Alternative as there would be no change in status to the site.

7.7.5 Impacts on Views from Other Areas within the Approximate Limit of Visibility

It is possible that views of the proposed site may be possible between buildings and through visual corridors along harbour extensions such as the Silt Canal which extends from the main body of the harbour towards the bluff. The most likely places that these narrow views towards the proposed project may be possible are the industrial areas immediately east of Bayhead Road, open water areas of the harbour and the Social Use Areas of the Harbour. From most areas it is unlikely that these views will be significant and it is likely that views of the proposed project will not be highly visually obvious. It is possible that through the wider view corridors such as the one leading from the Silt Canal limited construction activities could be partially visible. However, impacts are likely to be limited in duration and during the operational period no impact is likely to be experienced (Marshall 2025).

No-Go Alternative: There is no impact associated with the No-Go Alternative as there would be no change in status to the site.

7.8 Geotechnical Impacts

In terms of the Geotechnical Assessment report (Refer to **Appendix H**), the Bayhead and Langeberg Road is positioned at a fairly low elevation in a reclaimed zone of the Durban Port. Although the low-lying area is characterised by a relatively shallow groundwater table, no considerable groundwater seepage was observed within the 1m deep inspection pits. Previous investigations in the surrounding area generally reveals a groundwater table depth in the order of 1.5 to 2.0m, which may fluctuate with tidal influence. As such, groundwater seepage is not expected within the required road upgrade works barring stormwater associated inflow during construction or leaking services.

The proposed road grade (i.e. lowering or raising relative to existing road levels) is still to be determined. However, a general assessment of the excavatability along the route revealed that, excluding the asphalt surfaced and stabilised layer works, soft excavation (after SANS 1200D) to at least 2.0m depth, or intersection of the groundwater table, should be achievable across the various roads (Gordon, 2025).

Construction Phase: Construction activities will include the following. Firstly, earthworks will be undertaken to facilitate road widening and possible regrading. Following excavation, filling, and layer works. The grading of the road platform graded to ensure proper drainage. Lastly, management of potential water inflows, especially stormwater. Furthermore, these can result in groundwater pollution and soil erosion due to improper construction methods. The geotechnical impact during the construction phase is considered to be of a **Low negative** significance without and Very Low negative significance with mitigation as can be seen in **Table 7-8**.

Operation Phase: No geotechnical impacts are anticipated directly from the roads during the operational phase.

No-Go Alternative: There is no impact associated with the No-Go Alternative as there would be no change in status to the site.

Construction Mitigation and Management Measures:

- In the unlikely event that seepage is encountered, it may need to be dealt with by either raising the road level, or subsoil-cut-off drains may be installed to prevent seepage from affecting layer works. Constructing a drainage pioneer layer prior to placing layer works may also be of benefit.
- A materials compaction of 95% Mod AASHTO density is comfortably achievable for the reclamation fill and existing road layer works.
- Road platforms should be graded to ensure they are free draining, and side drainage installed as per the Engineers specifications.
- In order to accommodate the Langeberg Road widening on the outbound lane, a fill-retaining structure is required along the existing road/rail-line crossing embankment, which visually achieves a height in the order of 6m. While the retaining structure type has not been finalised at the time of our investigation, it is anticipated that the Mechanically Stabilised Earth wall to be the likely solution, this based on the embankment geometry.
- It is recommended that the design Engineer take into consideration the temporary lateral support of the current roadway, the global stability of the final solution as well as settlement of the retaining structure when designing the final retaining solution. In this regard, cognisance should be given to the very loose consistencies encountered to depths generally in the order of 1 to 2m, but locally as deep as 5m in the DPL Dynamic Cone Penetrometer testing with the associated lower bearing pressures and settlement implications.

Table 7-8: Geotechnical Impacts

Geotechnical Impacts			
Phase	Preferred Alternative		No Go Alternative
	Construction Phase	Operational Phase	
Nature	Dust generated from construction activities	No impact	No change in status as no activities would be undertaken
Status	Negative (-), Direct	N/A	No change in status
Extent	Local - 2	N/A	
Duration	Short term - 1	N/A	
Intensity	Low - 2	N/A	
Reversibility	Low - 2	N/A	
Replaceable	Replaceable - 1	N/A	
Cumulative	Low - 2	N/A	
Probability	Probable - 2	N/A	
Level of significance	$(2+1+2+2+1+2)*2=20$	N/A	No impact / Neutral
	Low -	No impact / Neutral	
Level of significance with mitigation	Very Low -	No impact / Neutral	No impact / Neutral
Confidence	Moderate	High	High

7.9 Impact on Traffic

In the Traffic Impact Assessment, the base year 2025 analysis shows that presently delays are experienced at Intersection 1 – South Coast Road and Bridge Port Access Road, Intersection 11 – Bayhead Road, South Coast Road and Maydon Road intersection, Intersection 12 – Bayhead Road and Bypass Road intersection and Intersection 16 – Bayhead Road and Langeberg Road (Kajee, 2025).

To accommodate for *Scenario 1 – 2032 Low Rail Share with Transnet's Entrance Gates (3,0m TEUs at Durban Container Terminal (DCT)) without Bayhead Road or South Coast Road Upgrades*, traffic signal adjustments and lane marking adjustments are needed along selected intersections on Umbilo Road and Sydney Road. The Bayhead Road and Bypass Road Intersection will require signalization and other localized road widenings. The signal timings at Bayhead Road and Langeberg Road Intersection will need to be adjusted and Bayhead Road and Iran Road Intersection will need to be signalised. Whilst localized road widening proposals may be considered for Bayhead Road, South Coast Road and Maydon Road Intersection it is recommended that these be deferred in favour of the Bayhead Road widening project and South Coast Road upgrades as this will address the issues as shown in Scenario 3 (Kajee, 2025).

The upgrades required to support *Scenario 2 – 2032 Low Rail Share without Transnet's Entrance Gates (3,0m TEUs at DCT) without Bayhead Road or South Coast Road Upgrades* are the same as Scenario 1. The only difference is Bayhead Road and Bypass Road Intersection will require signalization only and no localized road widening (Kajee, 2025).

Scenario 3 – 2036 Low Rail Share with Transnet's Entrance Gates (4,2m TEUs at DCT) with Bayhead Road or South Coast Road Upgrades: The construction of an additional lane on Bayhead Road, between South Coast Road and Langeberg Road, to create a 3+3 cross section and the upgrade of South Coast to a 2+2 cross-section between Bayhead Road and Edwin Swales Drive will accommodate Scenario 3 traffic demand volumes. Additional localized road widenings will be required at the Bayhead Road and Bypass Road Intersection and Bayhead Road and Langeberg Road Intersection. Some localized widening is required at Umbilo Road / Farimond Road intersection as per the Gibb Maydon Wharf Study. In addition, traffic signal adjustments and lane marking adjustments are needed along selected intersections on Umbilo Road and Sydney Road . Beyond 2036 (4,2m TEUs at DCT) it is recommended that the 2nd Port Access is implemented as Bayhead Road, South Coast Road and Maydon Road Intersection and Bayhead Road and Bypass Road Intersection will be operating close to capacity (Kajee, 2025). Refer to **Appendix K**.

The Bayhead and Langeberg Roads are currently experiencing slow moving traffic and congestion of vehicles. The proposed upgrades to Bayhead and Langeberg Roads will cater for the existing traffic volumes and to improve the accommodation of port traffic.

Construction Phase: Potential traffic impacts relate primarily to the anticipated increase in vehicle usage of roads and to the possible deterioration of the pavement conditions of these roads, by heavy vehicles. This includes material delivery vehicles and vehicles that will travel

daily to and from the site. During the construction phase a higher number of vehicles are anticipated to use the surrounding road network; however, it is not expected that the traffic volumes will significantly increase over this period. The roads are not open to unrestricted public use but serve port operations. Construction trucks and vehicles are not expected to significantly impact the pavement conditions, taking into consideration that the proposed roads are being upgraded. **Disruptions to port traffic will occur during the construction phase and access to port areas will be accommodated during construction. Construction will be undertaken in half-widths, whereby one or two lanes remain open to traffic whilst construction is being undertaken at the other lanes.**

During construction, an existing Bypass Road will be utilised to access the Port and no major works are anticipated for the Bypass Road other than minor maintenance activities to ensure the ongoing operational level of service of the road.

The related traffic impacts would be temporary, i.e. limited to the construction phase. The impact would be of Low negative significance as can be seen in **Table 7-9**.

Operation Phase: The upgrading of the roads will reduce any road failures that may occur and will limit disruption to traffic along these roads. The traffic related impact during the operational phase is considered to be of a low positive significance with and without mitigation as can be seen in **Table 7-9**. **Refer to Section 7.11 for transport socio-economic related impacts.**

No-Go Alternative: The existing roads require repairs that may potentially lead to road failures and would not be able to accommodate an increase in stormwater flow thereby the risk of flooding will remain. This may result in an increase in traffic on alternative routes which may not be able to cater for higher volumes of traffic. The impact relating to traffic will remain at a low negative significance.

Construction Mitigation and Management Measures:

- Construction vehicles must adhere to the speed limits.
- Signage is to be displayed regarding construction activities and detour routes.
- **A detailed Traffic and Logistics Management Plan must be developed, preferably in consultation with affected port users, terminal operators, depots and transport stakeholders before construction commences.**
- **Road closures, lane restrictions, bridge works and diversions should be carefully phased and sequenced to minimise disruption to terminal and depot access.**
- **Construction activities should take into account peak container seasons and high-volume periods, so that the most disruptive works are avoided or reduced during critical operational windows.**
- **Continuous access to Pier 1, Pier 2, depots, transport staging areas, emergency routes and other support facilities must be maintained throughout construction.**
- **A formal stakeholder coordination forum or communication mechanism should be established for the duration of construction to provide advance notice of disruptions and allow operational planning.**

- Stormwater, canal and bridge works must be planned to avoid unintended impacts on adjacent logistics infrastructure, particularly during heavy rainfall or severe weather events.
- Emergency access, abnormal cargo movements and critical port operations should be specifically provided.
- Traffic control and monitoring to be undertaken in accordance with the traffic plan.

Table 7-9: Traffic Impacts

Traffic Impact			
Phase	Preferred Alternative		No Go Alternative
	Construction Phase	Operational Phase	
Nature	Additional traffic volumes, deterioration of pavement conditions, disruption to Port traffic	Reduced risk of traffic disruption or road / culvert failures	Increase in traffic on alternative routes due to potential road / culvert failures
Status	Negative (-), Direct	Positive (+), Direct	Negative (-), Direct
Extent	Local - 2	Local - 2	Local - 2
Duration	Short term - 1	Long term - 3	Long term - 3
Intensity	High - 4	Medium - 3	Medium - 3
Reversibility	Low - 2	Reversible - 1	Reversible - 1
Replaceable	Low - 2	Replaceable - 1	Replaceable - 1
Cumulative	Low - 2	Very Low - 1	Very Low - 1
Probability	Highly Probable - 3	Probable - 2	Probable - 2
Level of significance	$(2+1+4+2+2+2)*3=39$	$(2+3+3+1+1+1)*2=22$	$(2+3+3+1+1+1)*2=22$
	Low -	Low +	Low -
Level of significance with mitigation	Low -	Low +	Low -
Confidence	Medium	Medium	Medium

7.10 Noise Impacts

7.10.1 Summary of Specialist Findings and Recommendations

The project occurs within an already high-activity industrial–logistics environment, where existing noise levels are influenced primarily by road freight, port operations, and associated industrial activity. Baseline measurements confirm that the current acoustic climate is elevated but typical for a heavy logistics zone, with residential receptors located at varying distances from Bayhead Road and Langeberg Road (Skhosana, 2025).

The proposed TNPA Port of Durban Road Upgrades can be authorised from an environmental noise perspective, subject to the implementation of the recommended construction management practices (Skhosana, 2025).

The project does not pose unacceptable noise-related risks to nearby receptors, and the overall environmental significance can be maintained as Low to Medium, which is acceptable within the NEMA framework (Skhosana, 2025).

7.10.2 Noise Impacts

Construction Phase: Noise creation from construction workers and vehicles may impact on surrounding landowners during the construction phase. This includes noise emanating from construction machinery, power tools and compressors, construction vehicles and general construction activity. The continuous typical construction site noise will not exceed the baseline noise measurements at the noise sensitive receptors NR1 & NR2; thus, no noise nuisance is expected. The noise level is expected to be close to the baseline noise levels at NR2. This means that construction activities on the proposed site may be audible during some periods of the day and night but will not be considered a noise disturbance as it will not exceed 7 dB above the baseline noise levels as defined in the Environmental Conservation Act, 1989 (Act No 73 of 1989). The construction phase is temporary and is typically completed within two years. Noise impacts from construction activities are considered to be of a **Low negative** significance without and with mitigation as can be seen in **Table 7-10** (Skhosana, 2025).

Operation Phase: The 21% traffic growth scenario for 2032 is predicted to increase road-traffic noise levels at NR1 and NR2 by 7.9–10.7 dBA above baseline conditions. The 64% traffic growth scenario for 2036 results in predicted noise levels that exceed baseline conditions by 8.5–10.8 dBA. Noise impacts from operation activities are considered to be of a **Low negative** significance as can be seen in **Table 7-10** (Skhosana, 2025).

No-Go Alternative: There is no impact associated with the No-Go Alternative as there would be no change in status to the site.

Construction Mitigation and Management Measures (Skhosana, 2025):

1. Construction times must be restricted to daytime hours, the Noise Management plan will provide detailed information regarding these activities.
2. A Noise Management Plan for the construction phase must be provided and include the following:
 - Construction activities must be restricted to daytime hours and must comply with the National Building Regulations (SANS 10400-F: Site Operations, Regulation F6):
 - Monday to Friday: 06:00 – 18:00
 - Saturday: 06:00 – 17:00
 - Sundays and public holidays: No construction activities allowed
 If additional work is required outside of these hours, an application for exemption must be submitted to the local authority, for approval prior to commencement, in order to prevent unreasonable disturbance to the surrounding area.
 - A correspondence noise complaint channel to receive and address any noise nuisance complaints timeously. Where a complaint has been received, a measurement should be performed by a qualified consultant or health officer at the complainant's property to

verify the complaint. The project manager will then need to facilitate with adequate noise abatement measures if the noise levels are shown to be non-compliant.

- Construction areas should be closed off with temporary noise barriers or earth berms if noise complaints are received.
- All construction vehicles must be well maintained and in good condition.
- Noise generating equipment such as generators, air compressors, etc. should be enclosed in soundproof enclosures. Many manufacturers of the specialised equipment will offer 'soundproof' enclosures that are purpose built for such equipment.
- Construction staff working in areas where the 8-hour ambient noise is equal to or exceeds 85dBA, should be provided with ear protection equipment.
- Noise intensive operations must be scheduled appropriately and conducted once having notified sensitive receptors in advance.

Operational Mitigation and Management Measures (Skhosana, 2025):

For the operational phase of the proposed road upgrade, noise mitigation was initially proposed through the use of Bitumen Rubber Asphalt Open-Grade (BRAOG) surfacing. BRAOG is a rubber-modified, open-graded asphalt known to reduce tyre road interaction noise, achieving reductions of 2–4 dB(A) compared to dense-graded asphalt and 5–8 dB(A) compared to chip-seal surfacing, particularly at speeds above 60 km/h.

Following discussions with the Transnet, it was decided that the road will be constructed using an AP-1 modified binder due to port operational requirements. The AP-1 binder provides higher strength and enhanced chemical resistance suitable for the Port environment. However, it does not have any measurable noise reducing properties, and therefore no quantifiable reduction in operational noise is expected.

No noise mitigation measures are proposed for the operational phase.

Table 7-10: Noise Impacts

Noise Impacts			
Phase	Preferred Alternative		No Go Alternative
	Construction Phase	Operational Phase	
Nature	Noise impacts from construction activities	Noise impacts from operational activities	No change in status as no activities would be undertaken
Status	Negative, Direct	Negative, Direct	No change in status
Extent	Local – 2	Local – 2	
Duration	Short Term – 1	Long Term – 3	
Intensity	Low – 2	Low – 2	
Reversibility	Reversible - 1	Reversible - 1	
Replaceable	Replaceable - 1	Replaceable - 1	
Cumulative	Low - 2	Low - 2	
Probability	Highly Probable - 3	Probable - 2	No impact / Neutral
Level of significance	$(2+1+2+1+1+2)*3=27$ Low -	$(2+3+2+1+1+2)*2=22$ Low -	
Level of significance with mitigation	Low -	Low -	No impact / Neutral

Noise Impacts			
Phase	Preferred Alternative		No Go Alternative
	Construction Phase	Operational Phase	
Confidence	High	High	High

7.11 Socio-Economic Impacts

7.11.1 Summary of Specialist Findings and Recommendations

No fatal socio-economic flaws have been identified related to the proposed upgrading project. To the contrary, a further delay in the upgrading of the roads will lead to social and economic negative effects. The need for and desirability of the upgrading of the roads are high and the assessed negative impacts are low and only for the duration of the construction period (De Beer 2025).

No mitigations for the socio-economic impacts are identified other than that the prescribed legislative and regulatory stipulations for the upgrading of the roads must be adhered to (De Beer 2025).

The specialist recommends that the project proceed with implementation, prioritizing local procurement and skills programs for semi-skilled workers and to establish a community liaison forum for ongoing consultations (De Beer 2025).

7.11.2 Economic: Transport and Logistic Efficiencies Improvements into and from the Port

Construction Phase: No transport and logistic impacts are anticipated directly from the roads during the construction phase. **Refer to Section 7.9 for related traffic impacts during construction.**

Operation Phase: Severe congestion caused by heavy truck traffic accessing key port precincts like the Durban Container Terminal and Island View will be alleviated. By widening roads, improving pavement, and enhancing infrastructure, the project will enable smoother import/export flows, reduce delays, and lower logistics costs. The very high magnitude and extent indicate broad regional and national benefits, such as boosted trade efficiency and economic connectivity for KwaZulu-Natal and beyond. Its continuous frequency and permanent duration emphasize long-term sustainability, with definite probability due to the project's design alignment with port expansion plans (e.g., increasing container throughput to 8.5 million TEUs by 2051). Mitigation is easy, involving standard traffic management, making this a flagship positive outcome that justifies the project's urgency (de Beer, 2025). This impact is considered to be of a **Very High positive** significance without and with mitigation as can be seen in **Table 7-11**.

No-Go Alternative: There is no impact associated with the No-Go Alternative as there would be no change in status to the site.

Table 7-11: Socio-Economic Impacts – Transport and Logistic Efficiencies Improvements

Socio-Economic Impacts – Transport and Logistic Efficiencies Improvements			
Phase	Preferred Alternative		No Go Alternative
	Construction Phase	Operational Phase	
Nature	No impact	Transport and Logistic Efficiencies Improvements	No change in status as no activities would be undertaken
Status	N/A	Positive, Direct	No change in status
Extent	N/A	National - 4	
Duration	N/A	Permanent - 4	
Intensity	N/A	High - 4	
Reversibility	N/A	Low - 1	
Replaceable	N/A	Irreplaceable - 4	
Cumulative	N/A	Low - 2	
Probability	N/A	Definite - 4	
Level of significance	N/A	$(4+4+4+1+4+2)*4 = 76$	No impact / Neutral
	No impact / Neutral	Very High +	
Level of significance with mitigation	No impact / Neutral	Very High +	No impact / Neutral
Confidence	High	High	High

7.11.3 Economic: Employment, Income Generation, and Skills Development

Construction Phase: This highlights temporary but reliable job creation during the 24-month construction period, including direct roles for local semi-skilled workers (e.g., labour targets at 6% of contract value, equating to about 115 full-time workers monthly) and opportunities for SMMEs (small, medium, and micro enterprises). The moderate rating stems from its limited magnitude and extent, primarily local to the Area of Influence with a population of 985,273 and high unemployment, short duration, but high frequency and definite probability. Easy mitigation through targeted training programs could enhance skills transfer, contributing to reduced unemployment in a youthful, working-age demographic (71.1% aged 15-64) (de Beer, 2025). These are considered to be of a **Low positive** significance without and with mitigation as can be seen in **Table 7-12**.

Operation Phase: No employment impacts are anticipated directly from the roads during the operational phase.

No-Go Alternative: Employment opportunities any related knock on opportunities (e.g. suppliers) will not be created. The impact remains at a **Medium negative** significance.

Table 7-12: Socio-Economic Impacts – Employment, Income Generation, and Skills Development.

Socio-Economic Impacts – Employment, Income Generation, and Skills Development			
Phase	Preferred Alternative		No Go Alternative
	Construction Phase	Operational Phase	
Nature	Employment opportunities	No impact	Employment opportunities
Status	Positive, Indirect	N/A	Negative, Indirect
Extent	Local - 2	N/A	Regional - 3
Duration	Short Term - 1	N/A	Long term - 3
Intensity	Low - 2	N/A	Low - 2

Socio-Economic Impacts – Employment, Income Generation, and Skills Development			
Phase	Preferred Alternative		No Go Alternative
	Construction Phase	Operational Phase	
Reversibility	Reversible - 1	N/A	Reversible - 1
Replaceable	Replaceable - 1	N/A	Replaceable - 1
Cumulative	Low - 2	N/A	Low - 2
Probability	Definite - 4	N/A	Definite - 4
Level of significance	$(2+1+2+1+1+2)*4=36$	N/A	$(3+3+2+1+1+2)*4=48$
	Low +	No impact / Neutral	Medium -
Level of significance with mitigation	Low +	No impact / Neutral	Medium -
Confidence	High	High	High

7.11.4 Social: Traffic Safety and Convenience Improvement

Construction Phase: No traffic safety impacts are anticipated directly from the roads during the construction phase. **Refer to Section 7.9 for related traffic impacts during construction.**

Operational Phases: Features like bridge widening, pedestrian facilities, and a potential 3-in/3-out lane configuration will reduce accident risks and frustrations from current queues, benefiting port users, logistics operators, and nearby residents in areas like Umbilo and The Bluff. The high magnitude and regional extent reflect improvements in quality of life and operational efficiency, with frequent and long-term effects that are virtually certain to occur. Easy mitigation via ongoing maintenance ensures sustained benefits (de Beer, 2025). This impact is considered to be of a **medium positive** significance as can be seen in **Table 7-13**.

No-Go Alternative: Continual road degradation can lead to road failure and injuries. The impact remains at a **Medium negative** significance.

Table 7-13: Socio-Economic Impacts - Traffic Safety and Convenience Improvement

Socio-Economic Impacts - Traffic Safety and Convenience Improvement			
Phase	Preferred Alternative		No Go Alternative
	Construction Phase	Operational Phase	
Nature	No impact	Traffic Safety and Convenience Improvement	Traffic Safety and Convenience Improvement
Status	N/A	Positive, Direct	Negative, Direct
Extent	N/A	Regional - 3	Regional - 3
Duration	N/A	Long term - 3	Long term - 3
Intensity	N/A	High - 4	Low - 2
Reversibility	N/A	Reversible - 1	Reversible - 1
Replaceable	N/A	Replaceable - 1	Replaceable - 1
Cumulative	N/A	Medium - 2	Low - 2
Probability	N/A	Definite - 4	Definite - 4
Level of significance	N/A	$(3+3+4+1+1+2)*4=56$	$(3+3+2+1+1+2)*4=48$
	No impact / Neutral	Medium +	Medium -
Level of significance with mitigation	No impact / Neutral	Medium +	Medium -

Socio-Economic Impacts - Traffic Safety and Convenience Improvement			
Phase	Preferred Alternative		No Go Alternative
	Construction Phase	Operational Phase	
Confidence	High	High	High

7.11.5 Economic: Economic Multiplier Impacts

Construction Phase: This captures indirect and induced effects from the project's capital injection, such as increased business for suppliers of materials, equipment, and services, leading to broader income generation and GDP contributions. Using a Social Accounting Matrix model, these multipliers (e.g., on production, taxes, and household income) extend regionally, with moderate frequency and duration tied to the construction timeline. The definite probability underscores reliable economic ripple effects, easily mitigated through local procurement preferences (de Beer, 2025). This impact is considered to be of a **medium positive** significance as can be seen in **Table 7-14**.

Operation Phase: No economic multiplier impacts are anticipated directly from the roads during the operational phase.

No-Go Alternative: There is no impact associated with the No-Go Alternative as there would be no change in status to the site.

Table 7-14: Socio-Economic Impacts – Economic Multiplier Impacts

Socio-Economic Impacts - Economic Multiplier Impacts			
Phase	Preferred Alternative		No Go Alternative
	Construction Phase	Operational Phase	
Nature	Economic Multiplier Impacts	No impact	No change in status as no activities would be undertaken
Status	Negative, Indirect	N/A	No change in status
Extent	Regional - 3	N/A	
Duration	Medium Term - 2	N/A	
Intensity	Low - 2	N/A	
Reversibility	Low - 2	N/A	
Replaceable	Low - 2	N/A	
Cumulative	Low - 2	N/A	
Probability	Definite - 4	N/A	No impact / Neutral
Level of significance	$(3+2+2+2+2+2)*4=52$ Medium +	No impact / Neutral	
Level of significance with mitigation	Medium +	No impact / Neutral	No impact / Neutral
Confidence	Medium	Medium	High

7.11.6 Social: Inconveniences During Construction

Construction Phase: This encompasses temporary disruptions like additional congestion, noise, and dust, affecting primarily port and industrial users rather than distant residential suburbs (e.g., Clairwood or Congella, separated by rail yards). The low magnitude, site-specific

extent, rare frequency, and short duration minimize overall effects, though the definite probability calls for proactive traffic management. Easy mitigation, such as scheduling work during off-peak hours and dust suppression, ensures these inconveniences are short-lived and outweighed by post-construction gains (de Beer, 2025). The socio-economic impact relating to economic contributions during construction is considered to be of a **low negative** significance as can be seen in **Table 7-15**.

Operation Phase: No social inconvenience impacts are anticipated directly from the roads during the operational phase.

No-Go Alternative: There is no impact associated with the No-Go Alternative as there would be no change in status to the site.

Table 7-15: Socio-Economic Impacts – Inconveniences During Construction

Socio-Economic Impacts - Inconveniences During Construction			
Phase	Preferred Alternative		No Go Alternative
	Construction Phase	Operational Phase	
Nature	Social Inconveniences	No impact	No change in status as no activities would be undertaken
Status	Negative, Direct	N/A	No change in status
Extent	Site - 1	N/A	
Duration	Short Term - 1	N/A	
Intensity	Very Low - 1	N/A	
Reversibility	Low - 2	N/A	
Replaceable	Low - 2	N/A	
Cumulative	Low - 2	N/A	
Probability	Definite - 4	N/A	
Level of significance	(1+1+1+2+2+2)*4=36 Low -	No impact / Neutral	No impact / Neutral
Level of significance with mitigation	Low -	No impact / Neutral	No impact / Neutral
Confidence	Medium	Medium	High

7.11.7 Social: Increase in Crime, Safety, and Security

Construction Phase: This anticipates minor risks from increased site activity, such as petty theft or safety incidents, but scores reflect very low severity and localized, infrequent occurrence over the short term. The high (but not definite) probability accounts for urban port dynamics, with moderate mitigation difficulty suggesting needs for enhanced security measures like fencing or patrols. In the AOI context of existing industrial pressures, this impact is negligible and ceases post-construction (de Beer, 2025). This impact is considered to be of a **low negative** significance as can be seen in **Table 7-16**.

Operation Phase: No crime and safety impacts are anticipated directly from the roads during the operational phase.

No-Go Alternative: There is no impact associated with the No-Go Alternative as there would be no change in status to the site.

Table 7-16: Socio-Economic Impacts – Increase in Crime, Safety, and Security

Socio-Economic Impacts - Increase in Crime, Safety, and Security			
Phase	Preferred Alternative		No Go Alternative
	Construction Phase	Operational Phase	
Nature	Increase in Crime, Safety, and Security	No impact	No change in status as no activities would be undertaken
Status	Negative, Direct	N/A	No change in status
Extent	Site - 1	N/A	
Duration	Short Term - 1	N/A	
Intensity	Very Low - 1	N/A	
Reversibility	Low - 2	N/A	
Replaceable	Low - 2	N/A	
Cumulative	Low - 2	N/A	
Probability	Highly Probable - 3	N/A	
Level of significance	(1+1+1+2+2+2)*3=27 Low -	No impact / Neutral	No impact / Neutral
Level of significance with mitigation	Low -	No impact / Neutral	No impact / Neutral
Confidence	Medium	Medium	High

7.12 Waste Impacts

Construction Phase: Impacts relating to ineffective waste management procedures may lead to the dumping of building rubble, littering and pollution of the surrounding areas as well as unsanitary (toilet) conditions. Construction waste will increase the amount of waste disposed to landfill. Temporary chemical toilet facilities will be provided at construction areas, and if not secured or maintained may result in pollution of the surrounding area. The waste related impacts during construction is considered to be of a **Low negative** significance without mitigation and changes to a **Very Low negative** significance with mitigation as can be seen in **Table 7-17**.

Operation Phase: No solid waste is anticipated directly from the roads during the operational phase.

No-Go Alternative: There is no impact associated with the No-Go Alternative as there would be no change in status to the site.

Construction Mitigation and Management Measures:

- Cleared vegetation to be mulched or disposed of at a licensed landfill site. Stockpiles of vegetation not to be left on site.
- Excavated material that will not be used in the construction works, should be used as fill material before the option of disposing the material to landfill is undertaken.

- Good housekeeping to be undertaken at all times.
- No illegal dumping or burning of waste allowed. Waste is not to be buried.
- Awareness raising to be undertaken with the construction workers regarding health and environmental impacts from illegal dumping.
- Waste bins are to be located at the construction camp. Bins are to have secured lids to prevent waste from being blown into the surrounding area and to prevent animals scavenging in the bins.
- Waste containers to be provided at the construction sites and to be collected on a daily basis.
- Domestic and general construction waste to be disposed of at a licensed landfill site, unless this waste can be recycled or reused. Proof of disposal must be kept at the site office by the Contractor.
- Portable chemical toilet facilities provided at construction areas to be secured to the ground, cleaned at least weekly.
- No hazardous waste material to be disposed of as general waste. Hazardous waste to be stored separately in impermeable (i.e. leak proof) containers, and if possible, sent for recycling.

Table 7-17: Waste Impacts

Waste Impacts			
Phase	Preferred Alternative		No Go Alternative
	Construction Phase	Operational Phase	
Nature	Waste management	No impact	No change in status as no activities would be undertaken
Status	Negative, Direct	N/A	No change in status
Extent	Local - 2	N/A	
Duration	Short Term - 1	N/A	
Intensity	Medium - 3	N/A	
Reversibility	Low - 2	N/A	
Replaceable	Low - 2	N/A	
Cumulative	Low - 2	N/A	
Probability	Highly Probable - 3	N/A	
Level of significance	$(2+1+3+2+2+2)*3=36$	N/A	No impact / Neutral
	Low -	No impact / Neutral	
Level of significance with mitigation	Very Low -	No impact / Neutral	No impact / Neutral
Confidence	High	High	High

7.13 Climate Change Impacts

Climate change considerations indicate that extreme weather events are increasing, with heat waves, dry spell durations lengthening and rainfall intensity increasing. Rainfall intensity increasing would relate to more frequent heavy rainfall events occurring, meaning more rain is experienced at one time that can result in flooding. **Additional projected climate trends include**

more frequent severe storm events, sea-level rise, and elevated risks associated with storm surges and coastal flooding. Due to the low-lying coastal location of portions of the Port of Durban, sections of the Bayhead and Langeberg Road corridors are vulnerable to flooding and associated disruptions during extreme weather events.

Heavier rainfall events may lead to the flooding of the road sections thereby restricting movement on the Bayhead and Langeberg Roads, impacting freight logistics, emergency access, and overall port services. The proposed road upgrades in itself will not release any greenhouse gases. There will not be any clearing of vegetation which impacts carbon capture.

In addition to flooding risks, projected sea-level rise and storm surge events may increase the long-term vulnerability of port infrastructure and adjacent transport networks. These risks may be compounded by inadequate stormwater capacity, debris blockages, and deteriorating drainage infrastructure during extreme weather events.

The design of the Bayhead and Langeberg Road Upgrades include key sustainability measures, i.e. climate-resilient stormwater and drainage designs, and minimisation of impacts on sensitive ecosystems such as wetlands, estuaries, and tidal zones.

Climate change impacts include air quality in relation to dust emissions during construction as well as vehicle emissions during construction and operations.

Construction Phase: Construction activities associated with the proposed road upgrades may contribute to greenhouse gas (GHG) emissions generated by diesel-powered construction machinery, heavy vehicles, material transportation, and energy-intensive construction processes. Potential short-term impacts may also include temporary increases in surface runoff and sediment mobilisation during heavy rainfall events if construction areas are not adequately managed. However, the proposed upgrades are not expected to result in significant vegetation clearing or permanent loss of carbon sequestration capacity. Construction activities associated with the proposed road upgrades are likely to negatively influence local air quality through the generation of dust and exhaust emissions. Earthworks, excavation, demolition, material stockpiling, and the movement of heavy vehicles on unpaved surfaces may result in increased particulate matter concentrations, while diesel-powered construction machinery and trucks will emit pollutants and diesel particulate matter. These impacts may be exacerbated by prevailing wind conditions and could contribute cumulatively to the already degraded air quality conditions experienced within the South Durban airshed. The climate change impacts during construction are considered to be of a low negative significance with and without mitigation as can be seen in **Table 7-18**.

Operation Phase: The proposed upgrades would assist in mitigating against the anticipated risks of flooding during heavy rainfall events, and is not seen as a risk or impact to climate change but rather as a measure to reduce climate change risks to the surrounding community. The proposed upgrades are expected to improve the resilience of the road network to flooding and heavy rainfall events through improved stormwater management, drainage capacity, and road infrastructure design. These measures will assist in reducing the likelihood of road closures

and disruptions to port operations during severe weather events. During the operational phase, the upgraded road infrastructure is likely to alleviate slow moving traffic and congestion of vehicles within the Port, which may result in lower volumes of associated vehicular emissions as congestion will be reduced. The climate change impact is considered to be of a low positive significance with and without mitigation as can be seen in **Table 7-18**.

No-Go Alternative: The associated risk from climate change, i.e. heavier rainfall events potentially resulting in flooding or road failures of the road upgrades will remain. This would be a negative impact to the port services as access on the Bayhead and Langeberg Roads would be restricted during these rainfall events. The impact from climate change is considered to be of a low negative significance.

Operational Mitigation and Management Measures:

- Regular maintenance to be undertaken regarding removal of sedimentation, waste or debris collected during high storm events.
- Ensure that all stormwater structures are monitored and maintained to ensure that they are functioning correctly and that proper flows are maintained across the road.

Table 7-18: Climate Change Impacts

Climate Change Impacts			
Phase	Preferred Alternative		No Go Alternative
	Construction Phase	Operational Phase	
Nature	Risk of flooding of road / culvert sections, increase in GHG emissions, dust	Reduced risk of flooding of road / culvert sections, increase in GHG emissions, air quality	Risk of flooding of road / culvert sections and current GHG emissions, air quality remain the same
Status	Negative, Direct	Negative, Direct	Negative, Direct
Extent	Local - 2	Local - 2	Local - 2
Duration	Long Term - 3	Long Term - 3	Long Term - 3
Intensity	Medium - 3	Medium - 3	Medium - 3
Reversibility	Low - 2	Low - 2	Low - 2
Replaceable	Low - 2	Low - 2	Low - 2
Cumulative	Very Low - 1	Very Low - 1	Very Low - 1
Probability	Highly Probable - 3	Highly Probable - 3	Highly Probable - 3
Level of significance	(2+3+3+2+2+1)*3=39	(2+3+3+2+2+1)*3=39	(2+3+3+2+2+1)*3=39
	Low -	Low +	Low -
Level of significance with mitigation	Low -	Low +	Low -
Confidence	Medium	Medium	Medium

Chapter 8: PUBLIC PARTICIPATION PROCESS

8.1 Pre-Application Notifications

The Pre-Application Public Participation notifications announcing the EIA application and Water Use Registration were undertaken in the same notification and were distributed via the following means:

- Four A2-sized site notices (2x English & Zulu and 2x English & Afrikaans) were placed on 27 October 2025, at the following areas: Shell Garage on Bayhead Road, Bayhead and Rotterdam Roads intersection, Bayhead and Langeberg intersection, and at Pier 2 entrance on Langeberg Road. Refer to **Appendix O1**.
- Newspaper advertisements appeared in The Mercury (in English) and Isolezwe (in Zulu) on 27 October 2025, refer to **Appendix O2**.
- Written notifications were distributed to identified stakeholders, including the landowners and adjacent landowners / tenants and State Departments on 27 October 2025. Refer to **Appendix O3**.

A 30-day registration and comment period was provided from 27 October to 26 November 2025.

8.2 Draft Report Review and Comment Period

The objective of the public comment period is for I&APs to raise issues about the information presented in the report and for them to raise any other issues related to the proposed upgrading of the Bayhead and Langeberg Roads.

All registered I&APs, relevant authorities and stakeholders were given a 30 day period to review the Draft BAR and submit comments. Comments received during this period have been incorporated into the Final BAR. Additionally comments were received after the closure period by the following I&APs: KZN Department of Economic Development, Tourism and Environmental Affairs (EDTEA), Ezemvelo KZN Wildlife and the DFFE Biodiversity Conservation Directorate. These comments have been included and addressed in the Final BAR.

The Draft BAR was available to I&APs, stakeholders and Organs of State / State Departments for a 30 day review period, from **20 April to 22 May 2026** (excluding public holidays).

The Draft BAR was available on the website of CEN IEM Unit, <http://www.environmentcen.co.za>. Direct download links were provided to I&APs that requested a consolidated download for the Draft BAR. No requests for hard / printed copies were made.

Notifications relating to the availability of the Draft BAR were distributed on 20 April 2026. A reminder was sent on 20 May 2026 to all I&APs informing the comment period on the Draft BAR was closing on 22 May 2026. Refer to **Appendix O4**.

Refer to **Appendix O** for Public Participation.

8.3 Interested and Affected Parties Database

A database of I&APs has been compiled, including Organs of State and/or State Departments, and **has been** updated throughout the EIA process should additional stakeholders or I&APs be identified or request registration. Refer to **Appendix O6** for I&APs database.

Please note that contact details for I&APs are not reflected in the I&AP database due to the Protection of Personal Information Act, (No. 2 of 2013). This information is available to relevant authorities and will not be distributed in the public domain.

8.4 Comments and Response Register

The comments and response register / report is provided in **Appendix O7** and presents comments received, by whom, method of communication and response.

Refer to **Appendix O5** for correspondence with I&APs.

8.5 Stakeholder Meeting

A stakeholder site visit and meeting was undertaken with the South Durban Community Environmental Alliance (SDCEA). A site visit was scheduled with SDCEA for 7 July 2026 and then rescheduled for 15 July 2026 at SDCEA's request. Refer to **Appendix O8** for the meeting minutes / notes.

Chapter 9: ENVIRONMENTAL IMPACT STATEMENT AND REASONED OPINION

9.1 Environmental Impact Statement

Transnet is proposing to upgrade the Bayhead and Langeberg Roads located within the Port of Durban, within Ward 32 of the eThekweni Metropolitan Municipality, KwaZulu Natal. The proposed upgrades are planned to alleviate traffic congestion and improve traffic flow. As part of the overall upgrading of the two roads, modification to five bridges (rail and canals), stormwater management enhancements, modification and expansion of Bayhead Canal at the Bayhead

Canal Bridge (Bridge 3-6) and relocation of the existing sewer rising main within the Bayhead Road reserve. The upgrading of the roads would improve the road conditions and thereby decrease the associated safety and transportation risks.

Overall the footprint for the upgrading of the Bayhead Langeberg Roads is considered to be of low sensitivity, however certain sections adjacent to the roads are considered to be of medium sensitivity. As a result, the following no-go areas have been recommended and are indicated in **Figure 9-1**:

1. The impacts to the medium sensitivity faunal habitat be avoided and that impacts be confined to the road upgrade footprint only.
2. Any areas not yet infilled in the EFZ and the estuarine wetlands.

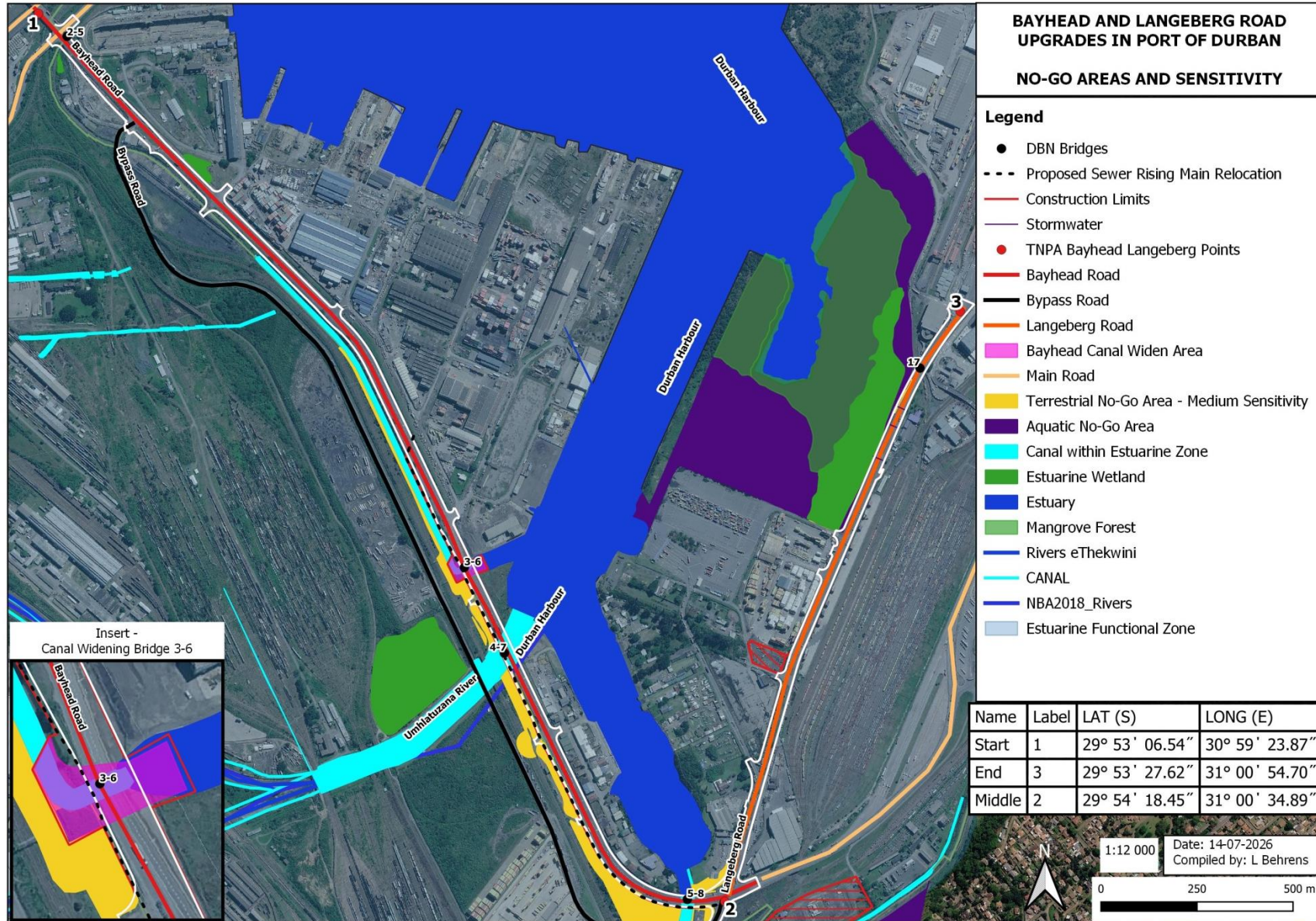


Figure 9-1: Updated Recommended No-Go Areas

The summary of impacts is presented in **Table 9-1**.

Table 9-1: Summary of Impacts

Impacts	Preferred Alternative		Operational Phase		No Go Alternative Significance
	Construction Phase Significance Without Mitigation	Significance With Mitigation	Significance Without Mitigation	Significance With Mitigation	
Impacts to Terrestrial Ecosystem Conservation	Low -	Low -	Low -	Low -	No impact
Impacts to Terrestrial Species of Conservation Concern	Low -	Low -	Low -	Low -	No impact
Direct Impacts to Terrestrial Biodiversity/ Ecological Processes	Low -	Low -	Low -	Low -	No impact
Aquatic - Direct ecosystem destruction and modification	Medium -	Low -	Low -	Low -	No impact
Aquatic - Indirect hydrological & geomorphological impacts	Low -	Low -	Low -	Low -	No impact
Aquatic - Water quality	Low -	Low -	Low -	Low -	No impact
Aquatic - Fragmentation and ecological disturbance	Low -	Low -	Low -	Low -	No impact
Heritage Impact	No/Very Low -	No/Very Low -	No impact	No impact	No impact
Landscape/Visual Impacts	Low -	Low -	Low +	Low +	No impact
Geotechnical Impact	Low -	Very Low -	No impact	No impact	No impact
Traffic Impact	Low -	Low -	Low +	Low +	Low -
Noise Impact	Low -	Low -	Low -	Low -	No impact
Economic: Transport and Logistic Efficiencies Improvements into and from the Port	No impact	No impact	Very High +	Very High +	No impact
Economic: Employment, Income Generation, and Skills Development	Low +	Low +	No impact	No impact	Medium -
Traffic Safety and Convenience Improvement	No impact	No impact	Medium +	Medium +	Medium -
Economic: Economic Multiplier Impacts	Medium +	Medium +	No impact	No impact	No impact
Social: Inconveniences During Construction	Low -	Low -	No impact	No impact	No impact
Social: Increase in Crime, Safety, and Security	Low -	Low -	No impact	No impact	No impact
Waste Impacts	Low -	Very Low -	No impact	No impact	No impact
Climate Change Impacts	Low -	Low -	Low +	Low +	Low -

9.2 Reasoned Opinion

The EAP is of the opinion that the EIA process and associated public participation for the proposed upgrading of the Bayhead and Langeberg Roads fulfil the process requirements of the NEMA, specifically the EIA Regulations of 2014, as amended, and the principles of Section 2 of the NEMA.

The assessment of the impacts indicated that the significance of potential impacts associated with the proposed upgrading of the roads are of a medium or low negative significance and these can be mitigated to low or very low negative significance if the mitigation measures identified and included in the EMPr (attached in **Appendix P**) are implemented.

No impacts were assessed as very high or high negative significance without mitigation.

Positive impacts relate to visual impacts, traffic impacts, socio-economic impacts for transport and logistic efficiencies improvements into and from the Port, employment, income generation, and skills development, traffic safety and convenience improvement, economic multiplier impacts and climate change impacts.

9.3 Recommendation

The specialists collectively recommend that the project proceed, subject to the implementation of targeted mitigation and management measures.

The EAP is of the opinion that the proposed upgrading of the Bayhead and Langeberg Roads should be authorized, as per the Preferred Alternative.

Conditions of the EA should include the following:

- Implementation of mitigation measures in the Site-Specific EMPr,
- The appointment of an ECO to monitor compliance with the EA and EMPr.
- Construction to commence within 7 (seven) years from date of authorisation.
- Completion of the construction to be within 36 months (3 years).

9.4 Conclusion and Way Forward

Based on the findings of the EIA and the collective specialist inputs, it is concluded that the proposed upgrading of Bayhead and Langeberg Roads within the Port of Durban should proceed in accordance with the Preferred Alternative, subject to the conditions of Environmental Authorisation.

The Draft Basic Assessment Report **has been** updated to the Final Basic Assessment Report, with inclusion of comments received during the public participation review period of the Draft Basic Assessment Report.

The Final Basic Assessment Report **is** submitted to the DFFE for review for decision-making.

The DFFE has 107 days (excluding public holidays) to issue an environmental decision. Once a decision is made by the DFFE, I&APs will be notified of the decision and appeal procedures.

Chapter 10: LIST OF REFERENCES

De Beer, E. (2025). *Social impact assessment report: Proposed Port of Durban road upgrades project*. Social Risk Research.

Edwards, R., Lagesse, J., & McIntyre, D. (2025). *Proposed upgrade of Bayhead and Langeberg Roads in the Port of Durban, eThekweni Municipality, KwaZulu-Natal: Aquatic and wetland assessment report (Report No. VE25-06-02, Version 2.0)*. Verdant Environmental.

Edwards, R., Styles, D., Harvey, J., and Lagesse, J. (2025). *Proposed upgrade of Bayhead and Langeberg Roads in the Port of Durban, eThekweni Municipality, KwaZulu-Natal: Terrestrial biodiversity site sensitivity verification report (Report No. VE25-38-01, Version 1.0)*. Verdant Environmental.

Gordon, K. (2025). *Layerworks investigation for the proposed upgrade of Bayhead Road and Langeberg Road at the Durban Port (Report No. 34348.01)*. Drennan Maud.

Kajee, M. (2025). *Traffic impact assessment for the proposed upgrade of Bayhead and Langeberg Roads, Port of Durban, eThekweni Municipality, KwaZulu-Natal (Version 4)*. Fulcrum Development Consultants.

Lavin, J. (2025). *Final heritage impact assessment and palaeontological impact assessment: Proposed Bayhead and Langeberg Road combination within the Port of Durban, KwaZulu-Natal*. CTS Heritage.

Marshall, J. (2025). *Proposed Bayhead and Langeberg Road upgrade, Durban, KwaZulu-Natal Province: Landscape & visual impact assessment report*. Afzelia Environmental Consultants.

Skhosana, D. (2025). *TNPA Port of Durban road upgrades: Noise impact assessment*. Acoustech Consulting.

White, K. (2025). *AMAFa Application Form A submission: Road & Infrastructure Upgrade at Bayhead Rd / South Coast Rd intersection, Maydon Wharf, Durban*. Architectural Heritage Consultant.

Wright, A. (2025). *Comprehensive design report: Provision of professional service for the feasibility and detailed design including procurement support and supervision for Bayhead and*

Langeberg Road upgrade, at the Port of Durban (Contract No. TNPA/2024/01/0002/53232; Rev. 0). LA Consulting Engineers

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