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BASIC ASSESSMENT REPORT

INFILLING AND EXCAVATION OF MATERIAL AND CLEARANCE OF INDIGENOUS VEGETATION WITHIN 100M OF THE HIGH-WATER MARK OF THE SEA AT 57 NORTH BEACH ROAD, WESTBROOK

ETHEKWINI MUNICIPALITY

DM/0003/2022

07th FEBRUARY 2022

Ref: C020

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This Basic Assessment Report was compiled by *Stephanie Denison* from Confluence Strategic Development (Pty) Ltd. A full curriculum vitae of the author is provided under Appendix A as well as a Declaration of Independence. Contact details for the Environmental Assessment Practitioner (EAP) are provided in the table below:

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The EAP confirms that:

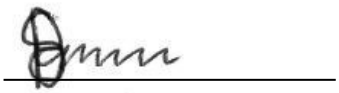
a) All information contained in the Basic Assessment Report is, to the best of my knowledge, accurate and correct.

b) Comments and input from stakeholders and registered Interested and Affected Parties have been included in the Basic Assessment Report.

c) Input and relevant recommendations contained in the attached specialist reports have been included in the Basic Assessment Report and Environmental Management Programme.

d) All relevant, available information has been provided to registered Interested and Affected Parties; and

e) Responses to comments or inputs made by registered Interested and Affected Parties has been included under Appendix D.



Stephanie Denison

17th January 2022

EXECUTIVE SUMMARY

Tyrone Bedessy proposes to construct a new residential dwelling on Portion 291 of Farm Lot 44 No. 1570, located at 57 North Beach Road, Westbrook. The development consists of a two-storey house with garages underneath, a swimming pool, landscaped area at the back of the house and driveway. Construction will take place within 100m of the high-water mark of the sea. The excavation of material on site during construction as well as the clearance of indigenous vegetation requires Environmental Authorisation from the Department of Economic Development, Tourism and Environmental Affairs (EDTEA).

A preferred layout alternative has been formulated which responds to the sensitive vegetation type and geological environment associated with the site. The property, which is 1 700m^2 in extent, is located within the eThekwini Durban Metropolitan Open Space System (DMOSS). Relaxation of 445m^2 of DMOSS is required from eThekwini Environmental Planning and Climate Protection Department (EPCPD) to accommodate the development footprint. Recommendations made in the Geotechnical Investigation, Palaeontological Impact Assessment and Ecological Assessment, have been included in the Environmental Management Programme (EMPr).

The following provides a summary of the key findings of the Environmental Impact Assessment:

1. The clearance of 675m^2 of indigenous coastal vegetation during construction. This impact cannot be avoided however the dwelling has been positioned outside of natural forest and avoids the clearance of protected tree species. The Ecological Assessment provides mitigation measures to restrict the clearance of vegetation during construction. The development footprint must be cordoned off to prevent unnecessary clearance outside of the authorised construction area.
2. Encroachment into the remaining Northern Coastal Forest habitat / DMOSS during construction. The residential dwelling has been strategically positioned to retain the remaining Northern Coastal habitat in the western portion of the site. The undeveloped portion of the property (1 025m^2) will be retained as DMOSS. Mitigation measures to be implemented during the pre-construction and construction phases have been included in the EMPr. The significance of the impact, after mitigation, has been reduced from "*high*" to "*low*".
3. Erosion of banks / dune movement during the earthworks / foundation phase. The preferred layout and technology alternative minimises the extent of the earthworks required (Layout Alternative 2; Technology Alternative 2). The preferred technology alternative is aligned with the recommendations made in the Geotechnical Investigation. Recommendations for sound stormwater management measures have also been included in the EMPr to reduce surface run off and promote percolation of water in the long-term (preferred Stormwater Alternative).
4. Construction taking place within 100m of the high-water mark of the sea potentially impacting the sand sharing system. The property is located leeward of North Beach Road. The marine specialist has confirmed that all construction work will take place outside of the sand sharing system and therefore has a low vulnerability risk to the coastal environment.
5. Transformation of previously undeveloped land restricting faunal movement. The placement of the structures outside of Northern Coastal Forest habitat and in line with the adjacent proposed development at 57A North Beach Road (EIA Ref No. DM/0034/2021), has reduced the severity and significance of this impact. Additional impact management measures have been incorporated into the EMPr to ensure that the Northern Coastal Forest habitat and associated faunal communities are not negatively impacted in the long-term.
6. General construction-related impacts (i.e. dust, noise, waste management, site camp etc.) will be managed in accordance with the EMPr attached under Appendix E.
7. The long-term / operational phase of House Bedessy poses a low risk to the surrounding environment. The retention and management of the remainder of the property as part of the eThekwini DMOSS was identified as a positive impact.

All impacts identified in the Environmental Impact Assessment can be mitigated to an acceptable level of risk provided that the measures included in the attached EMPr are adhered to. The Environmental Assessment Practitioner is therefore of the opinion that the Infilling and Excavation of Material and Clearance of Indigenous Vegetation within 100m of the High-Water Mark of the Sea at 57 North Beach Road, Westbrook, be authorised by EDTEA.

TABLE OF CONTENTS

APPENDICES

1.0 INTRODUCTION

1.1 DESCRIPTION OF ACTIVTY TO BE UNDERTAKEN

Tyrone Bedessy, recently purchased Portion 291 of Lot 44 No. 1570, located at 57 North Beach Road in Westbrook (Figure 1). The property is currently undeveloped. Mr Bedessy intends to develop a private residential dwelling on the property. The proposed development is comprised of the following:

- Two storey development with garages underneath the house and swimming pool (180m^2),
- Garden / Landscaped area (270m^2),
- Driveway and parking area (175m^2), and
- Vertical Retaining Wall (19.83m long x 2.4m wide x 3.23m high)

The total development footprint is 675m^2. There are existing municipal bulk services available to provide the house with an electrical connection, potable water and waterborne sewage disposal.

Almost the entire property, which is 1 700m^2 in extent, is located within the eThekwini Durban Metropolitan Open Space System (DMOSS). Relaxation of 445m^2 of DMOSS is therefore required from eThekwini Environmental Planning and Climate Protection Department (EPCPD) to accommodate the development footprint. The rest of the site, 1 025m^2, will remain undeveloped and be retained as DMOSS.

The development of House Bedessy will take place within 100m of the high-water mark of the sea. The excavation / infilling of material during construction triggers Activity 19A of Listing Notice 1. Indigenous vegetation within the development footprint will be cleared to accommodate the new residential infrastructure. Clearance of indigenous vegetation will take place within the critically endangered Northern Coastal Grasslands Ecosystem (KZN16) and within 100m of the high-water mark of the sea triggering Activity 12 in Listing Notice 3. All listed activities being applied for are provided in Table 1 below.

Table 1: Listed and Specified Activities Triggered and Being Applied for.

Activity #	Relevant Listing Notice	Description of Listed Activity as Per the Project Description
19A	Listing Notice 1 (GNR327) 04th December 2014 as amended.	During the construction of House Bedessy, a significant volume of material will be excavated on site (± 3 000m^3). Material will be excavated within 100m of the high-water mark of the sea.
12(d)(iv) & (vi)	Listing Notice 3 (GNR324) 04th December 2014 as amended.	During construction of House Bedessy, 675m^2 of indigenous vegetation will be cleared to accommodate the new infrastructure on site. The clearance of indigenous vegetation will take place within the critically endangered Northern Coastal Grasslands Ecosystem (KZN16), and within 100m of the high-water mark of the sea.

1.2 LOCATION OF ACTIVITY

House Bedessy will be located at 57 North Beach Road in Westbrook. The property is in Ward 58 of eThekwini Municipality (centre of site: 29°35'10.17"S; 31°10'28.09"E). Please refer to Figure 1 for the Locality Map.

21 Digit Surveyor General code	N0FU02990000015700291
Property Description	Portion 291 of Lot 44 No. 1570

Figure 1: Locality Map with the Site Indicated by the Red Circle.

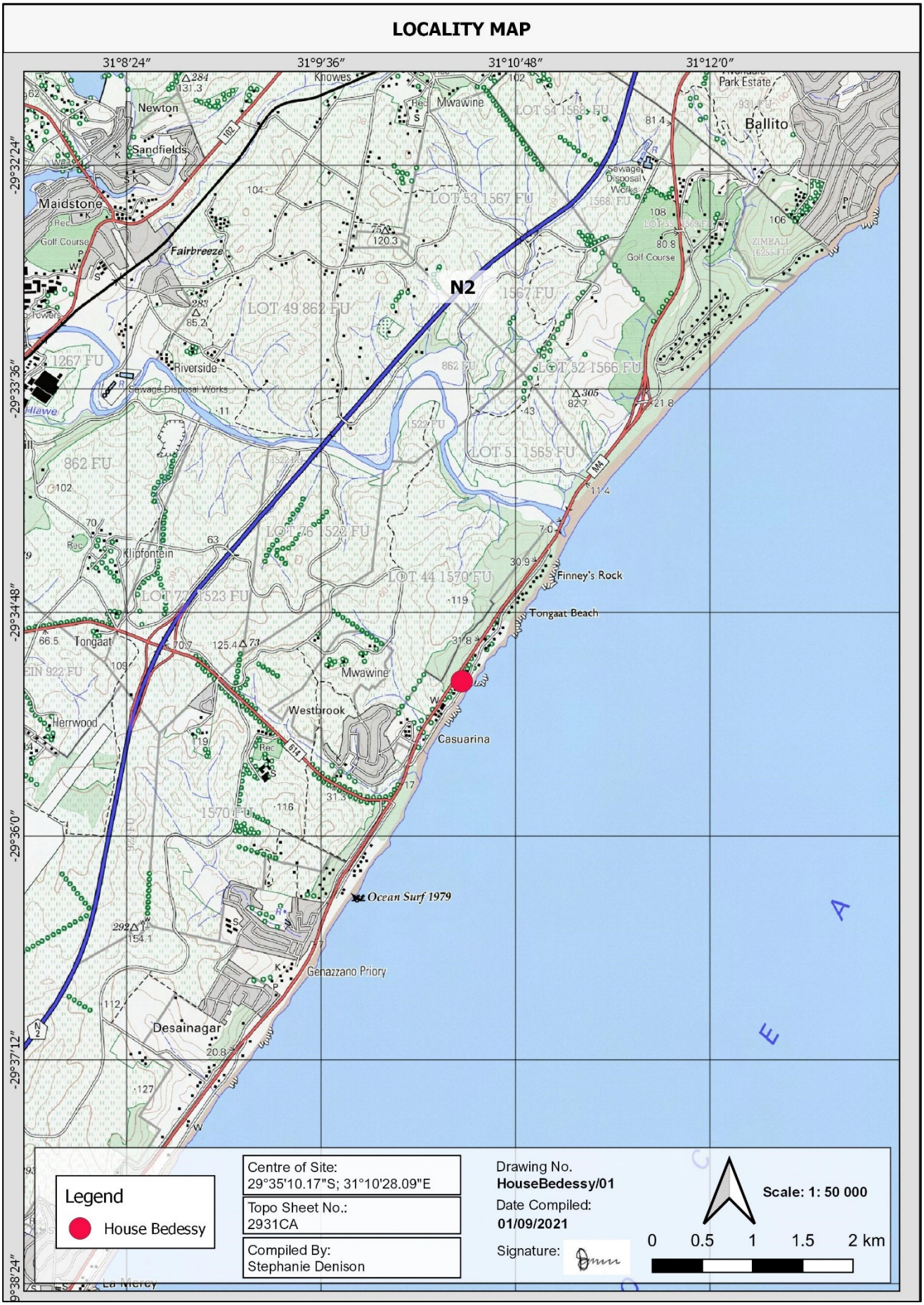
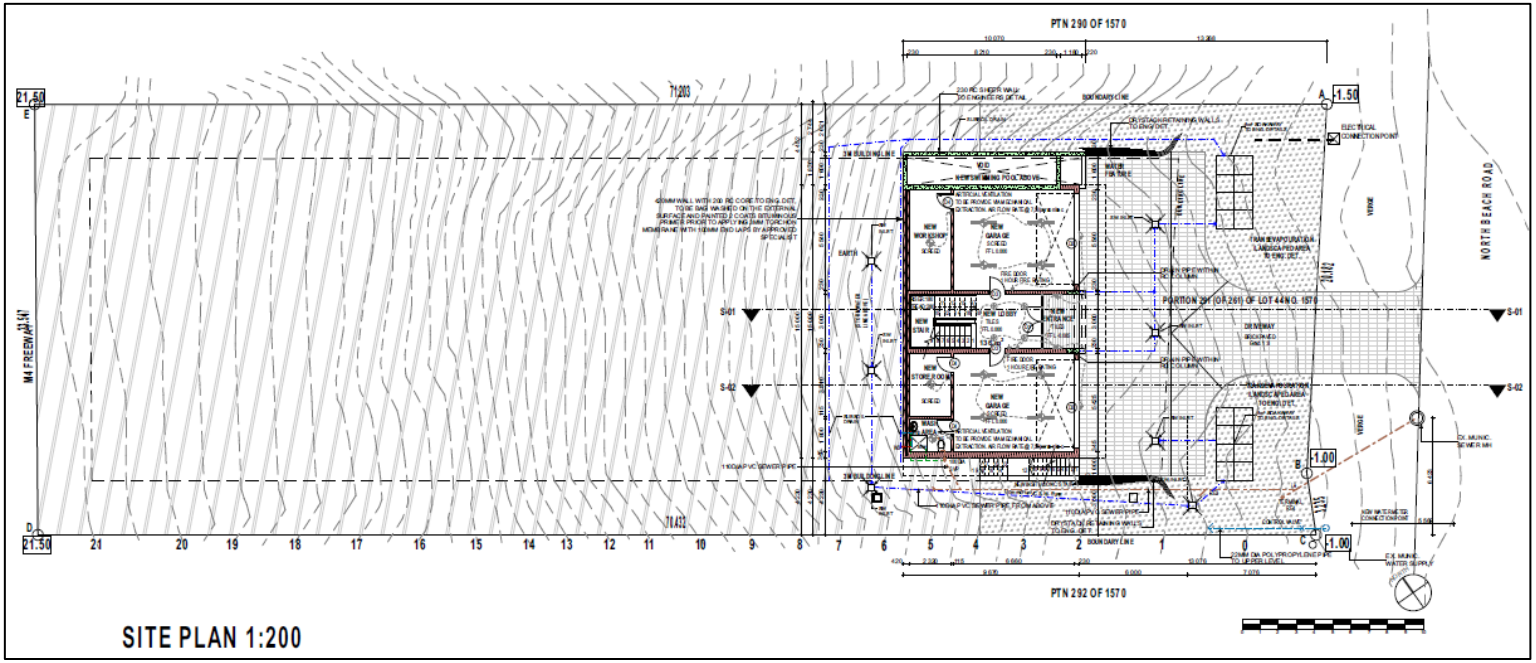


Figure 2: Site Development Plan Showing the Preferred Layout of the Proposed Infrastructure for House Bedessy and Building Cross Sections Showing the Preferred Technology Alternative for a Vertical Retaining Wall (Source: NSA, 2022).



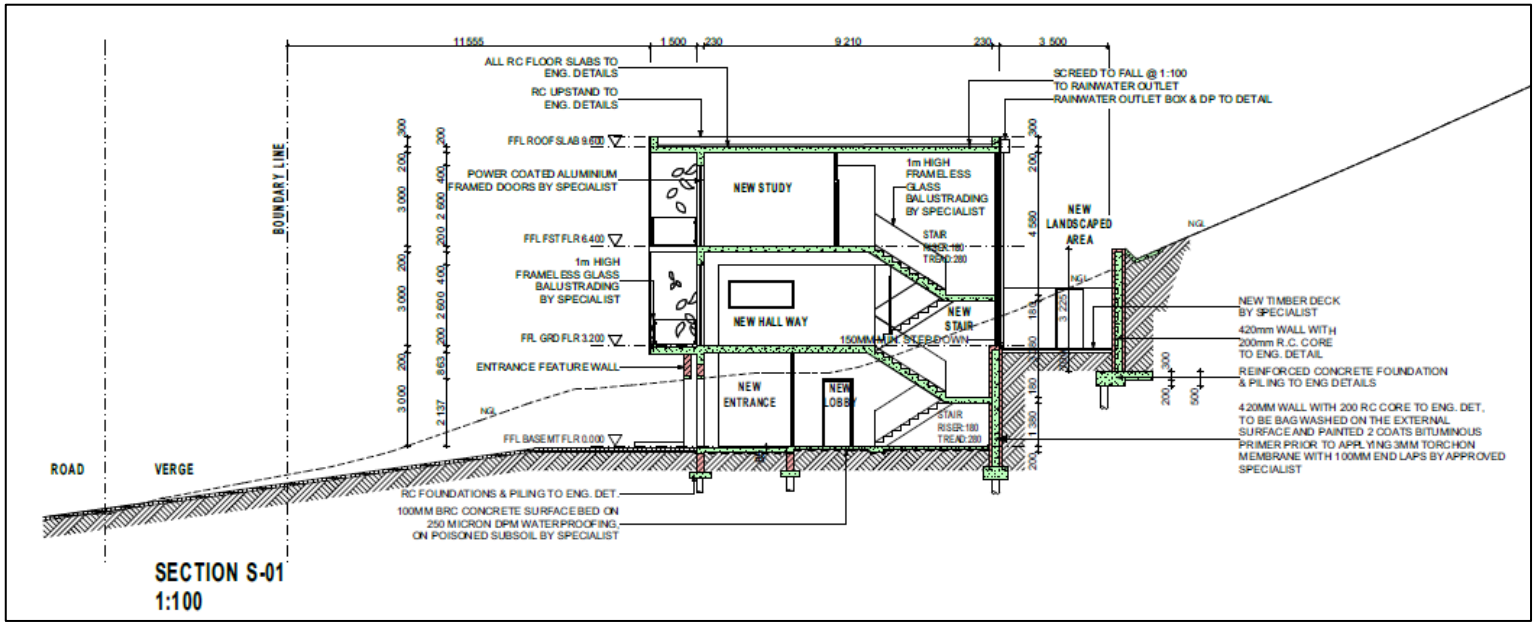


Figure 3: Map Superimposing the Proposed Activity and Associated Infrastructure on the Environmentally Sensitivities of the Site.

2.0 ALTERNATIVES

2.1 DETAILS OF ALTERNATIVES CONSIDERED

"*Alternatives*" are defined as "*different means of meeting the general purpose and requirements of the activity*"[1]. Alternatives considered must be feasible and reasonable. The general purpose and requirement for this project is for the development of a private residential dwelling for the Bedessy family.

2.1.1 Site Alternatives and Outcome of the Site Selection Matrix

The proposed application is specific to Portion 291 of Lot 44 No. 1570. The property was purchased by the applicant for the purpose of constructing a residential dwelling. The site was selected for development because of its prime location in the sought-after town of Westbrook and its uninterrupted beach access. No other feasible site alternatives have therefore been considered.

2.1.2 Activity

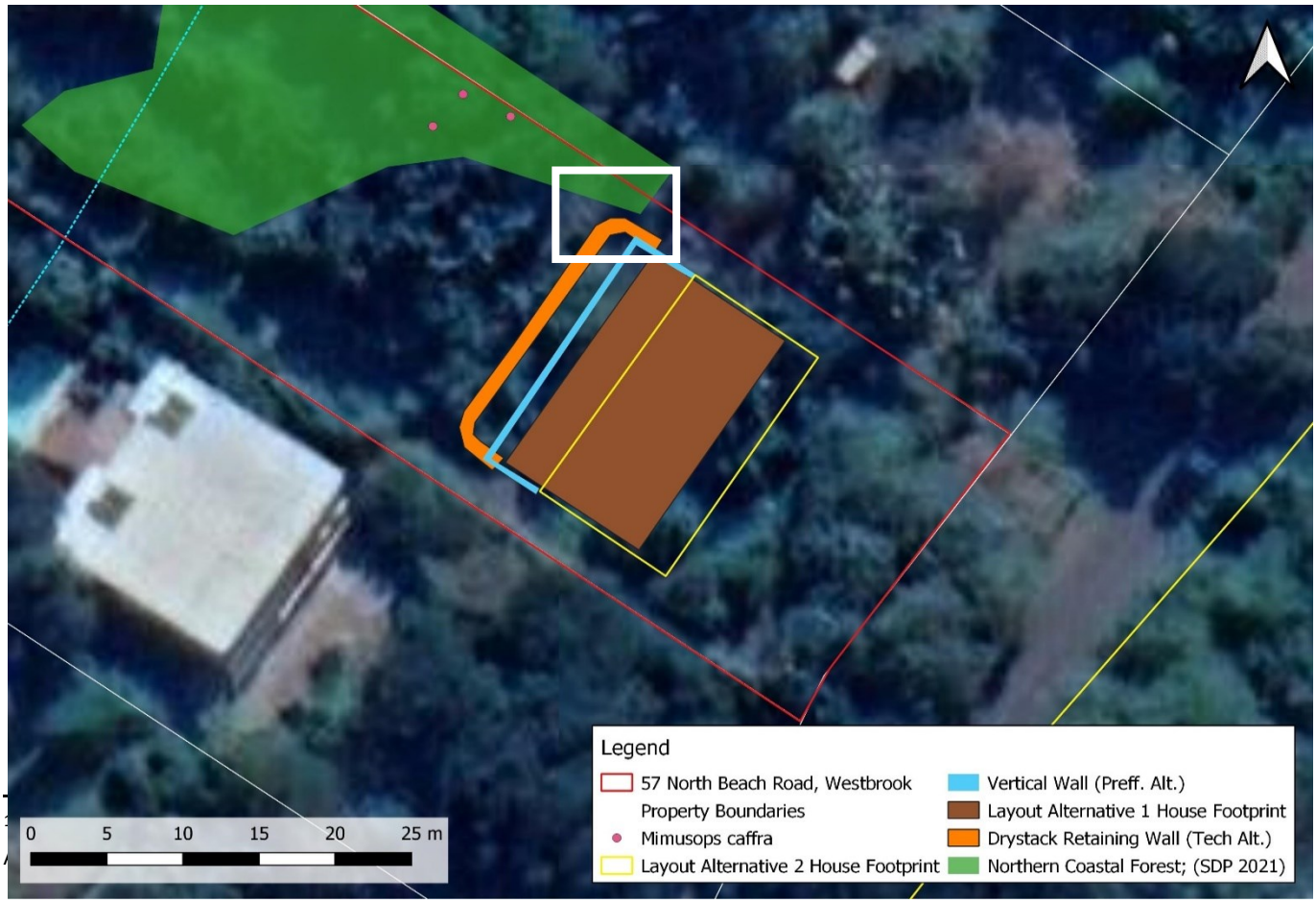
As described above, the purpose of this project is to provide the Bedessy family with a private residential house. No other feasible activities have therefore been considered.

2.1.3 Layout

Although the layout of the proposed development has not changed significantly throughout the EIA process, the position of the dwelling on the property was shifted seaward in the preferred layout alternative (Layout Alternative 2). The final position of the dwelling was recommended by the engineers, taking into consideration the natural ground level and the steep increase in gradient behind the proposed dwelling. By moving the house forward, the extent of excavation required behind the structure to accommodate a retaining structure, was significantly reduced (refer to section 2.1.4 for more details on the technology alternatives considered for the retaining structure). Figure 4 provides a comparison of the position of the dwelling and associated retaining structures required for Layout Alternative 1 and Layout Alternative 2 (preferred).

Both the Alternative (Layout Alternative 1) and the Preferred (Layout Alternative 2) are provided under Appendix C.

Figure 4: Image Comparing the Alternative and Preferred Position of the Dwelling and Associated Retaining Wall on the Property.



2.1.4 Technology

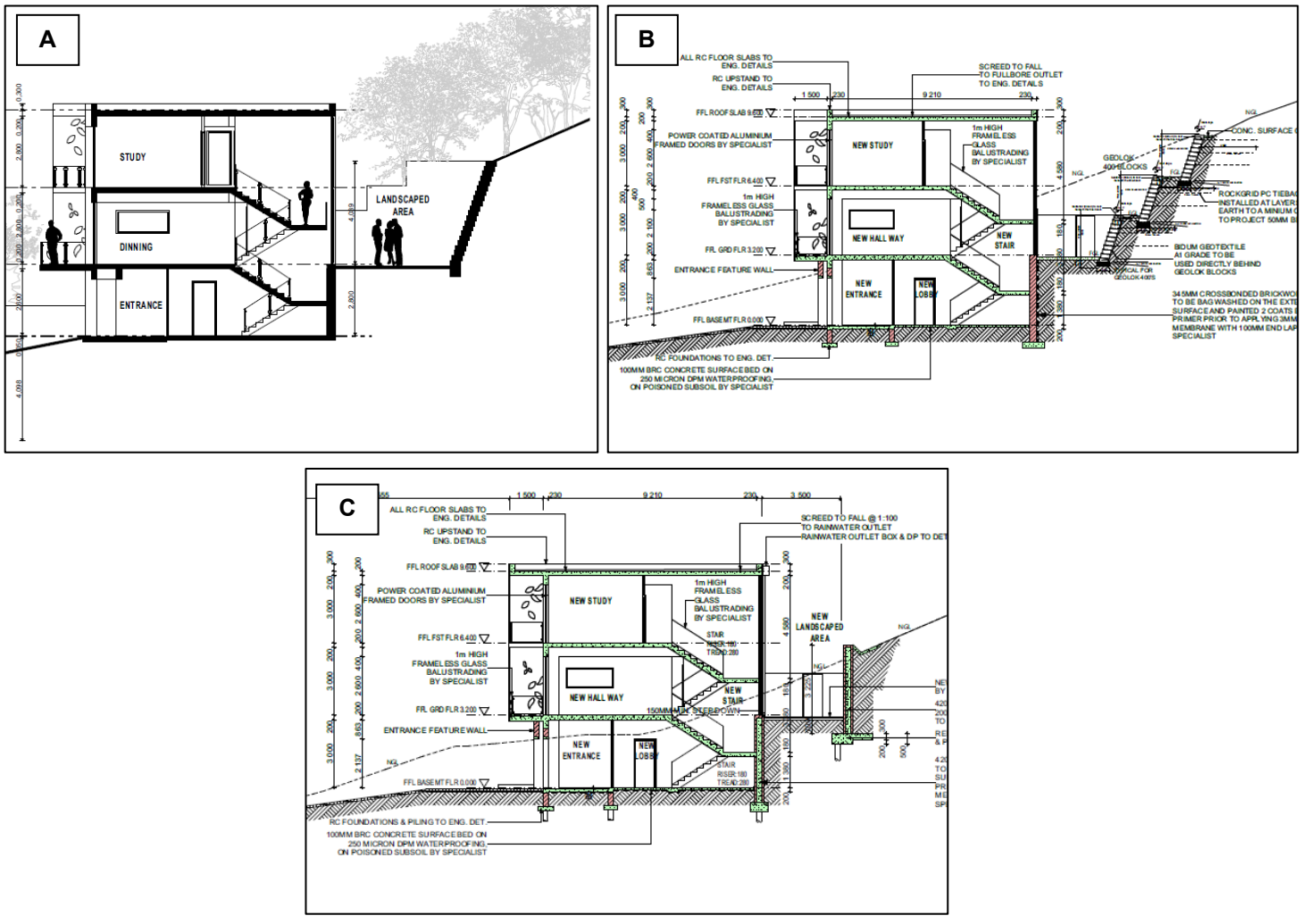
2.1.4.1. Retaining Wall Alternatives

Due to the sensitive geological environment of the site; subsoils consistency ranging between loose and very loose, the structural design of the retaining wall behind the dwelling was changed during the EIA process to reduce the extent of earthworks required. One high retaining wall, (approximately 4.04m) was originally proposed by the architect (Figure 5a). Taking into considering the recommendations made in the Geotechnical Report, one vertical retaining wall was not considered feasible by the engineers as the slope behind the vertical wall could be susceptible to slipping especially during heavy rain events.

The vertical retaining wall was therefore divided up into three, stepped retaining walls (Technology Alternative 1; Figure 5b). The stepped retaining wall results in a larger excavation footprint behind the dwelling resulting in potential encroachment into the closed canopy Northern Coastal Forest north-western of the dwelling. Since the gradient becomes gentler closer to the sea, it was therefore agreed that the house would be shifted forward. The extent of excavations to create the platform for the dwelling was accordingly reduced. The engineers have confirmed that one, shorter vertical wall (3.2m) is feasible (Figure 5c) and is therefore the preferred technology alternative for the retaining wall structure (Technology Alternative 2).

Both the Alternative and Preferred Retaining Wall Designs are attached under Appendix C.

Figure 5: Design of the Retaining Wall Behind Proposed House Bedessy (a) One, High Vertical Wall was Originally Proposed by the Architect; (b) The Engineer Detailed the Retaining Wall based on the Site Geology. A Gentler, Stepped Retaining Wall was Proposed but Encroached Into the Environmentally Sensitive Area; and (c) The Preferred Technology Alternative where the House was Shifted Seaward to Reduce the Height of a Vertical Retaining Wall, Which is Now Feasible from an Engineering Perspective.



2.1.4.2. Stormwater Management Alternatives

The alternative Stormwater Management Plan (SWMP) directed all stormwater generated on the property into one large attenuation tank located at the bottom of the property (i.e. underneath the proposed driveway). When full, the attenuation tank discharged stormwater, in a controlled manner, onto North Beach Road. Based on recommendations provided by the coastal specialist (section 6.3 of the SDP Ecological Report attached under Appendix B), the SWMP was amended. The preferred SWMP promotes groundwater percolation. Two attenuation tanks are proposed which includes a soakaway system. In this way stormwater will percolate into the surrounding ground, which is the preferred method of stormwater management for the site.

Both the Alternative and Preferred SWMP are attached under Appendix C.

2.1.5 No-Go Alternative

The development of House Bedessy will not take place and the property will remain vacant. There would be no negative environmental impacts that may have resulted from the construction phase. The ecologist concluded that the development is likely to result in "a *low to moderate level of ecological impact or change upon the receiving environment. To this end, a number of ecological interventions have been discussed and are recommended to be carried out on site in order to limit such impacts*"[2]. Since the property is vacant, there is currently no management of alien vegetation or the DMOSS area in general. With the development of House Bedessy, the applicant will be responsible for the long-term conservation and management of the Northern Coastal Forest habitat on the remainder of the property. This is a positive impact associated with the proposed development.

2.2 CONCLUDING STATEMENT INDICATING PREFERRED ALTERNATIVES

Since the property was purchased by the applicant for the purpose of constructing a residential dwelling, no other feasible site or activity alternatives have been assessed. The preferred layout alternative is Layout Alternative 2, where the main house has been shifted seaward to reduce the level of excavation required for the retaining feature behind the house. Technology Alternative 2 is preferred for the retaining wall structure. This is for the development of a 3.2m vertical wall behind the dwelling. SWMP 2 is the preferred SWMP which allows for stormwater to percolate into the surrounding ground rather than discharging directly onto North Beach Road.

2.3 MOTIVATION FOR PREFERRED ALTERNATIVE

The following provides a summary motivating the preferred alternatives:

- The development footprint is restricted to the eastern extent of the property, outside of the closed canopy Northern Coastal Forest habitat, which is mainly located in the upper portions of the site;
- The preferred layout has avoided the protected *Mimusops caffra* trees with primarily "*thicket"* vegetation being cleared.
- The proposed dwelling has taken into consideration the steep, potentially unstable nature of the dune slope (Layout Alternative 2).
- The preferred technology alternative for the retaining wall behind the dwelling is a vertical wall to reduce the overall disturbance area, that would otherwise be required for a stepped geolok retaining wall (Technology Alternative 1). The volume of material to be excavated and infilled on site has been reduced in these preferred Layout and Technology Alternatives and therefore the risk of erosion is reduced.
- Recommendations made by the coastal specialist to manage stormwater on site have been included in the preferred SWMP, which allows for improved groundwater percolation in line with the Best Practices for Coastal Development in KwaZulu-Natal Guidelines[3].
- The overall development footprint for House Bedessy is well aligned with the proposed development footprint and associated Non-User Conservation Servitude on the adjacent property (57A North Beach Road; EIA Ref. DM/0034/2021). Figure 6 shows the linkages of open space between the two properties.

[2] Section 9 of the of the SDP Ecological Assessment (November 2021).

[3] Bundy, S., Goble, B., Parak, O. and Bodasing, M. (2021). Best prac□ces for coastal development in KwaZulu-Natal. KwaZulu-Natal Department of Economic Development, Tourism and Environmental Affairs, Pietermaritzburg, 102 pp.

Figure 6: Image Showing the Proposed Development of House Du Plessis on the Adjacent Property (57A North Beach Road) and the Linkage of Open Space Between the Two Properties.

3.0 PLANNING CONTEXT

3.1 ENVIRONMENTAL POLICY AND LEGISLATIVE CONTEXT

The table below provides a list of legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments relevant to House Bedessy. The table includes comment on how the proposed development complies with and responds to the listed legislation.

Table 2: Legislation, Policies, Plans, Guidelines, Spatial Tools, Municipal Development Planning Frameworks, And Instruments Relevant to House Bedessy.

Legislation	Acronym	Comment
National Environmental Management Act (Act No. 107 of 1998 as amended).	NEMA	NEMA provides environmental management principles that are applicable across South Africa to fulfil section 24 of the Constitution, which is the right to "*an environment that is not harmful to their health or wellbeing*". Section 24 of NEMA defines the activities requiring Environmental Authorisation and the processes to be followed to obtain Environmental Authorisation (published in the Environmental Impact Assessment Regulations, 2014 as amended). This application triggers activities listed in Listing Notice 1 and 3 of the Environmental Impact Assessment Regulations, 2014 as amended. A Basic Assessment process is therefore underway to obtain Environmental Authorisation prior to any activities commencing.

DEA (2017), Public Participation guideline in terms of NEMA EIA Regulations, DEA, Pretoria, South Africa.	-	To give effect to section 2 (4)(f) and (o) of NEMA, adequate and appropriate opportunity for public participation in decisions that may affect the environment is required. NEMA requires that any person conducting public participation take into account any relevant guidelines applicable to the public participation process as contemplated in section 24J of NEMA. The public participation conducted as part of the Basic Assessment process complies with the NEMA EIA Regulations and has considered the relevant guidelines.
DEA (2017), Guideline on Need and Desirability, DEA, Pretoria, South Africa.	-	This guideline contains information on best practice and how to meet the requirements prescribed by NEMA when considering the need and desirability of a development. The need and desirability of the project has considered the list of questions outlined in the Need & Desirability Guidelines.
National Environmental Management: Waste Act (Act No. 59 of 2008 as amended).	NEM: WA	NEM: WA provides measures to protect health and the environment of South Africa by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development. There are no activities proposed that will trigger a Waste Management License however measures have been provided in the EMPr to ensure that waste management is compliant with the requirements of NEM: WA.
National Environmental Management Biodiversity Act (Act No. 10 of 2004).	NEM: BA	To manage and conserve South Africa's Biodiversity and protect species and ecosystems that warrant national protection. The proposed development does not require any specific permissions in terms of NEM:BA however the landowner must comply with the requirements of the Alien and Invasive Species Regulations (2020) which have been published in terms of section 97(1) of NEM:BA. These regulations categorise invasive species and outlines the way these species must be controlled by landowners. Section 52 of NEMBA allows for the publication of a national list of ecosystems that are threatened and in need of protection. The property is located within the Northern Coastal Grasslands Ecosystem which has been identified as "*critically endangered"* by the South African National Biodiversity Institute (SANBI).
National Environmental Management: Air Quality Act (Act No. 39 of 2004).	NEM: AQA	Regulates air quality to protect the environment by providing measures to prevent pollution and ecological degradation and for securing ecologically sustainable development. There are no activities on site that will trigger an Air Emissions License however measures have been provided in the EMPr to ensure that air quality is managed in line with the requirements of NEM: AQA.
National Water Act (Act No. 36 of 1998) (as amended).	NWA	Provides for fundamental reform of the law relating to water resources. There are no watercourses within the property itself or within 32m of the site. There are no watercourses on the site or within 32m of the property boundary. A Water Use Authorisation is not required for this application.
National Forests Act (Act No. 84 of 1998).	NFA	To conserve and protect natural forests and woodlands as well as ensuring development with principles of sustainable management. The Department of Forestry Fisheries and Environment (DFFE) governs the removal, disturbance, cutting or damaging of protected tree species and natural forests. The residential dwelling has been strategically placed outside of the closed canopy Northern Coastal Forest delineated by the coastal specialist. The vegetation to be cleared is secondary in nature but does still fall within the definition of a "*natural forest*"[4]. A permit from DFFE will therefore be submitted for the clearance of natural forest.

[4] As per the definitions in the National Forest Act, a "*Natural Forest*" means "A *group of indigenous trees whose crowns are largely contiguous*".

Integrated Coastal Management Amendment Act (Act No. 36 of 2014).	ICMAA	Establishes an integrated coastal and estuarine management system to promote the conservation of coastal environment and maintain natural attributes of coastal landscapes and seascapes. Sound coastal management principles are presented in the ICMAA which are applicable to this application. The Coastal Vulnerability Index shows the site to have a "*moderate*" vulnerability. All infrastructure proposed falls within 100m of the high-water mark of the sea and therefore the layout needs to be "*economically justifiable and ecologically sustainable*", which is a requirement of the ICMAA.
National Heritage Resources Act (Act No. 25 of 1999).	NHRA	For the management of national heritage resources and to nurture and conserve heritage resources so that they may be bequeathed to future generations. There is no existing infrastructure on site and therefore no structures with heritage or archaeological value. No graves are located on site. The property falls within a "*high*" palaeontological (i.e. fossils) sensitive area. A Palaeontological Impact Assessment was therefore carried out and is attached under Appendix B. The findings of the report are summarised in section 4.0 below.
eThekwini Spatial Development Plan (2020 – 2021).	SDF	The SDF as well as other lower order plans provide developers with detailed spatial guidance on land use and densities for an area in conjunction with the strategic intentions of the SDF. The site is located within an urban area with access to municipal services. The property is zoned for residential use. The proposed development is similar to the surrounding residential developments and is therefore in line with the municipal SDF.
eThekwini North Spatial Development Plan (adopted 2013-2014)	-	The proposed development is compliant with the spatial plan for the area which describes the land use intentions of the northern coastal corridor east of the N2 as "*a mixed use and mixed density residential, recreation, entertainment and tourist-oriented corridor*".
Ohlanga-Tongati Local Area Plan	-	The proposed development must consider the architectural considerations provided in this plan as was as the Coastal Management Plan. The aim of the architectural guidelines is that "*development in the coastal area should strive to blend in with and reflect the unique nature of the coastal environment*". A number of specific measures are provided which must be incorporated into the design of the building (i.e. use of natural coastal colours).
Coastal Management Plan (adopted 2010)	-	

3.2 MOTIVATION FOR THE NEED AND DESIRABILITY

The need and desirability of a project is based on the principle of obtaining a sustainable development in that the proposal must be "*ecologically sustainable and socially and economically justifiable*"[5]. Proposed House Bedessy is strategically located in the coastal town of Westbrook. The property is zoned for residential use with other properties along North Beach Road accommodating existing residential dwellings. The proposed residential development is therefore in line with the surrounding land uses. The site and proposed activity are therefore considered to be desirable in terms of the municipal planning scheme for the area. As per the Need & Desirability Guideline, the broader community's needs and interests, as reflected in the municipal planning tools, need to be considered as these planning tools provide strategies to support economic growth. The proposed development is in line with the relevant municipal plans and framework (i.e. eThekwini SDF and North Spatial Development Plan) and therefore will ultimately benefit the broader societies needs and interest.

The preferred layout alternative is ecologically sustainable with approximately 40% of the property being earmarked for development. The remaining 60% must be clearly demarcated and fenced off during construction so that it can be retained as Northern Coastal Forest habitat in the long-term. The preferred layout alternative avoids the clearance of closed canopy woody vegetation in the upper portions of the property where the protected tree species are prevalent.

[5] DEA (2017), Guideline on Need and Desirability, Department of Environmental Affairs (DEA), Pretoria, South Africa.

The proposed development is therefore strategical located in an existing residential area. The activity will not significantly impact on the broader societal needs or the public interest. The preferred layout ensures an ecologically sustainable development proposal.

4.0 ENVIRONMENTAL ATTRIBUTES

A report was generated by the national web-based environmental screening tool in terms of section 24(5)(h) of NEMA and Regulation 16(1)(b)(v) of the EIA Regulations, 2014 as amended. The Department of Environment, Forestry and Fisheries (DEFF) Screening Tool is attached under Appendix B. The Screening Tool identifies potential specialist assessments which may be required for the application. It is the responsibility of the EAP to confirm this list and to motivate the reason for not including any of the identified specialist studies.

Table 3: List of Specialist Assessments identified in the Department of Environment, Forestry and Fisheries Screening Tool Report.

Specialist Assessment	Included in Appendix B	Motivation for Not Conducting Assessment
Landscape / Visual Impact Assessment	No	The proposed development is similar to surrounding land uses. Properties north and south of the study area have been developed in a similar manner and therefore a Visual Impact Assessment was not considered necessary.
Archaeological and Cultural Heritage Impact Assessment	No	The site is undeveloped with no structures of archaeological significance. The site has no cultural value and therefore this assessment was not undertaken.
Palaeontology Impact Assessment	Yes	According to the SAHRIS PalaeoSensitivity Map, the study area falls within a "*high*" palaeontological sensitive area. A Palaeontological Impact Assessment was therefore carried out by Marion Brown and is attached to Appendix B. The findings of the report are summarised in section 4.5.
Terrestrial Biodiversity Impact Assessment	Yes	SDP Ecological and Environmental Services carried out an Ecological Assessment of the site which assesses the impact of the proposed development on fauna and flora. The findings of the report are summarised in the sections below.
Aquatic Biodiversity Impact Assessment	No	There are no watercourses on site or within 32m of the site. No watercourses will be impacted by the proposed development and no Water Use Authorisation is required.
Marine Impact Assessment	Yes	The Ecological Assessment undertaken by SDP Ecological and Environmental Services includes a Marine Impact Assessment / Coastal Vulnerability Assessment. The findings of the report are summarised in the sections below.
Avian Impact Assessment	No	The small development footprint in the southern portion of the site will not significantly impact any bird communities. Areas of woody canopy have been avoided in the preferred layout. The undeveloped areas on site (60%) will remain Northern Coastal Dune Forest.
Geotechnical Assessment	Yes	A Geotechnical Investigation was carried out by Monoblock and is attached under Appendix B. The findings of the report are summarised under section 4.2.
Socio-Economic Assessment	No	As per section 3.2 above, the proposed development is in line with the municipal planning framework for the area. There will be no significant socio-economic impact on the Westbrook area and therefore a Socio-Economic Assessment was not considered necessary.
Plant Species Assessment	Yes	A plant species list is included in Table 2 of the Ecological Assessment attached under Appendix B.
Animal Species Assessment	No	The SDP Ecological Assessment includes comment on the loss of faunal refugia and alteration of faunal ethos anticipated with the proposed development.

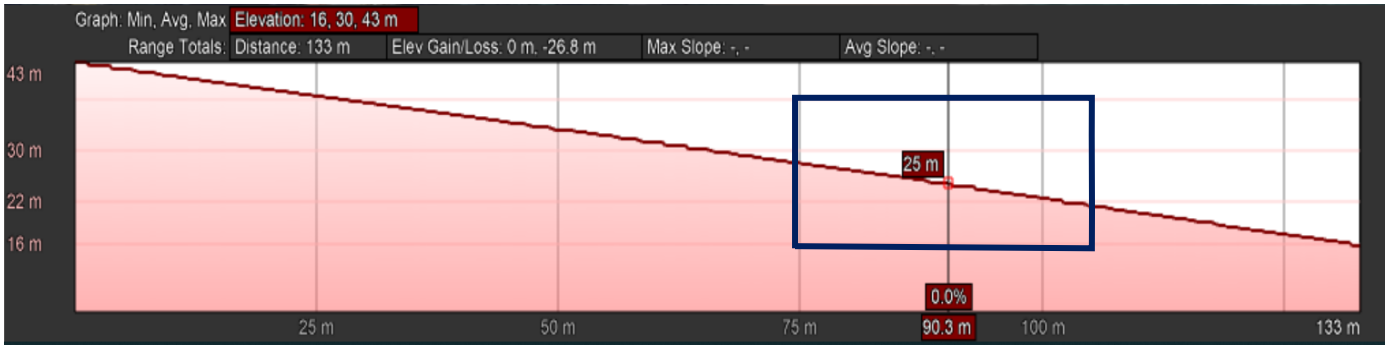
Information provided in the specialist assessments has been used to describe the receiving environment. All mitigation measures and recommendations provided by the specialists has been incorporated into the Assessment of Impacts Table under section 6.0. and the EMPr provided under Appendix E. All specialist assessments are attached under Appendix B.

4.1 PHYSICAL CHARACTERISTICS OF THE SITE

Portion 291 of Lot 44 No. 1570 is positioned in the centre of Westbrook, a residential suburb within eThekwini Municipality. North Beach Road forms the properties eastern boundary with the M4 highway forming the western boundary. The eastern boundary of the property is approximately 40m inland from the high-water mark of the sea.

North Beach Road, which is used to access the site, separates the property from the fore dune. As shown in Figure 7, the gradient rises steeply from the coastal terrace. Section 9.0 of the Geotechnical Report describes the gradient of the site follows *"the natural ground leans on a steep slope of approximately 18 °in the northwesterly to southeasterly direction over much of the site*".

Figure 7: Elevation Profile of the Application Area. Proposed Location of the Main Dwelling for House Bedessy Indicated by the Blue Rectangle (West to East; Google Earth Pro, 2022).



4.2 GEOGRAPHICAL ATTRIBUTES AND GEOLOGY

A Geotechnical Report was completed by Monoblock in August 2021 and is attached under Appendix B. The field investigations show that "*the site is underlain by topsoil, fill materials, the transported sediments and the Berea Formation soils"*. Dynamic Cone Penetrometer Tests show that loose consistency in the Berea Formation soils extends up to depths of 2.7 – 4.5m below ground level, thereafter, becoming medium dense with isolated very loose or loose zones up to either the DPL refusal logged as depths ranging from 7.5 – 9m or to the full completion of the DPL rods recorded at 9.6m.

The uppermost soils (1.2 – 2.1m) are characteristic of very loose soils which are considered to be unstable. Care must be taken during construction to prevent slope instability during the earthworks phase. The steep topography and underlying geology of the site is itself, is a significantly sensitive environmental feature of the site. Any arbitrary excavation on site may de-stabilise the dune slope above creating a safety as well as an environmental risk. Recommendations provided in the Geotechnical Report for foundations and for the maintenance of slope stability, have therefore been included as mitigation measures under section 6.0 of the Basic Assessment Report and incorporated into the EMPr. The preferred technology alternative, for the construction of one, lower vertical wall, takes into consideration the geology and geotechnical recommendations.

4.3 FAUNA AND FLORA

The study area falls within the Northern Coastal Grassland (KZN 16) ecosystem. This ecosystem has been classified as "*critically endangered*" by SANBI. The vegetation on Portion 291 of Lot 44 No. 1570 is characteristic of Northern Coastal Forest. This biome is considered "*Least Threatened*" and is described as a species rich, subtropical coastal forest that is distributed along coastal rolling plains[6].

The vegetation is described by the specialist under section 7.0 of the Ecological Assessment. Much of the site is largely uniform with common species being *Dracaena aletriformis, Strelitzia nicolai, Mimusops caffra, Flagellaria indica, Isoglossa woodi* and *Brachylaena discolor.* The vegetation associated with the eastern portion of the site, where development is proposed, does not have a distinct tree canopy and understory, and therefore aligns with a thicket habitat rather than Northern Coastal Forest, which is restricted to the northern portion of the site. The

[6] Section 6.0 of the SDP Ecological Assessment (November 2021).

proposed residential dwelling has been strategically placed to retain the natural forest habitat in the northern portion of the site (indicated in Figure 3). The site shows a moderate level of alien invasive specie invasion.

Three protected species have been located on the property; *Mimusops caffra (Milkwood) and Elaeodendron croceum (Forest Saffron*) are protected under section 15 of the National Forest Act (1998) and *Dioscorea cotinfolia*, which is a vine protected under the Nature Conservation Ordinance (1974). The development avoids the disturbance or removal of any protected species, which are shown in Figure 3.

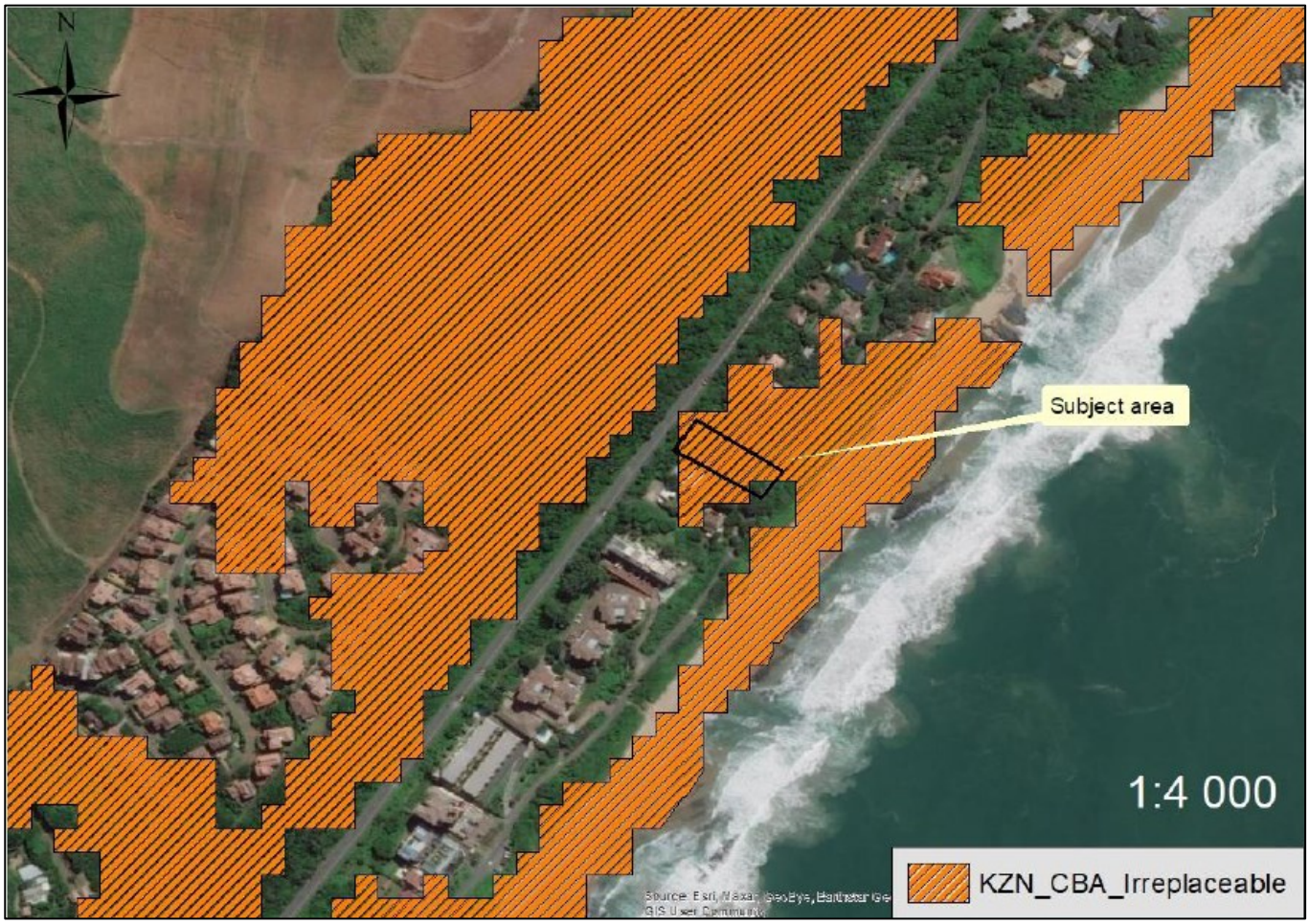
As shown in Figure 8, the undeveloped properties along this section of North Beach Road have been designated as DMOSS. DMOSS is a system of green open space corridors that have been strategically positioned throughout eThekwini Municipality. DMOSS aims to protect biodiversity and associated ecosystem services provided by the open space (e.g. stormwater attenuation, pollination, biodiversity, water supply etc.). Any development within DMOSS needs to be carefully designed and managed to ensure that ecosystem services are maintained in this area.

The property falls within the Ezemvelo KZN Wildlife Critical Biodiversity Area (CBA, Figure 9). The area has been identified by the provincial conservation authority as having sound ecological conditions which are irreplaceable in respect of provincial biodiversity conservation targets. Any development within a CBA needs to be sustainable and must not have a significant impact on the biodiversity of the area.

The findings and recommendations made in the Ecological Assessment have been included as mitigation measures under section 6.0 of the Basic Assessment Report.

Figure 8: Portion 291 of Lot 44 No. 1570 Outlined in Red, Located with DMOSS (source: eThekwini PublicViewer GIS),

Figure 9: Location of the EKZNW Critical Biodiversity Area (Irreplaceable), Shaded in Orange (Source: SDP Ecological Assessment, Nov 2021).



4.4 COASTAL VULNERABILITY

The Coastal Vulnerability Index suggests that the study area has a "*moderate*" vulnerability (indicated in Figure 3). This vulnerability index refers to the level of vulnerability that may arise on built structures as a result of both sea level rise, storm forced erosion and tidal inundation, or a combination of both. The site was considered to have a moderate vulnerability due to the geological stability of the area, aspect, a wide beach and a wide and stable dune form.

Westbrook is a recently developed, urban settlement with its first formal structures being established in the 1900s. The terrestrial components of the sand sharing system are therefore highly transformed. Portion 291 of Lot 44. No 1570 is located west of North Beach Road and does not fall within the sand sharing system[7]. The study site falls out of the long-term (100 year) risk category (short term risk line indicated in Figure 3).

4.5 WATERCOURSES

There are no watercourses on the property or within 32m of the property boundary. The nearest watercourse is the small drainage line associated with the Tongati River and is approximately 790m south of the study area. No watercourses will be impacted by the proposed development.

4.6 CULTURAL AND HERITAGE

The property is undeveloped and therefore no infrastructure with archaeological value is located on site. There is no known cultural significance associated with the area and no graves noted. The underlying geology is that of the Vryheid Formation, which is very highly sensitive, with this type of geology having the potential to preserve fossils of the *Glossopteris* flora. A Palaeontological Impact Assessment was therefore undertaken by Professor Marion Bamford (Appendix B).

[7] Section 7.2 of the SDP Ecological Assessment (November 2021).

Due to the site's proximity to the beach, it has been exposed to windblown sand and destructive seas. The site is also in the extreme eastern extent of the main Karoo Basin and would have been under the sea during the Early Permian. Such conditions are not conducive to the growth of terrestrial plants. The specialist concluded that it is extremely unlikely that any fossils occur in the development footprint however a Fossil Chance Find Protocol has been included in the EMPr (Appendix E)[8].

The findings and recommendations made in the Palaeontological Impact Assessment have been included as mitigation measures under section 6.0 of the Basic Assessment Report.

4.7 SOCIO-ECONOMIC PROFILE

The study area falls in the Ward 58 of eThekwini Municipality. Westbrook is a small, coastal suburb within the eThekwini Municipality which stretches for approximately 2.4km along the coastline. The area consists of a mixture of large, free-standing homes, mainly located on the northern side of the town and sectional title apartments, mostly in the southern side of Westbrook. There is limited retail and commercial developments in the town. The proposed House Bedessy is well aligned with the socio-economic environment of the area.

4.8 SURROUNDING LAND USES

The table below shows the existing land uses surrounding the study area. The property directly north of the site is currently undeveloped but a residential development is proposed and is undergoing the Environmental Impact Assessment process (EIA ref. no. DM/0034/2021; House Du Plessis). The property immediately south of the study site, is an existing residential development. The Indian Ocean is directly east, and the M4 highway is directly west of the property.

Table 4: Land Uses Surrounding 57 North Beach Road, Westbrook.

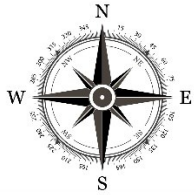
	M4	Northern Coastal Forest & Proposed House Du Plessis	Northern Coastal Forest
	Northern Coastal Forest & M4	**Application Area**	North Beach Road, Fore Dune & Indian Ocean
	Residential Dwelling	Northern Coastal Forest	North Beach Road, Fore Dune & Indian Ocean

Figure 10: Photographs Showing the Characteristics of the Site Taken on the 25th November 2021: (a) Entrance to the Site off North Beach Road. Photographer Facing South; and (b) Closed Canopy Woody Vegetation Associated with the Upper Portions of the Site.

[8] Section 6.0 of the Prof Marion Bamford "*Palaeontological Impact Assessment*" (September 2021).

Figure 10 (cont.): Photographs Showing the Characteristics of the Site Taken on the 25th November 2021: (c) View from the Centre of the Property Facing East Towards the Sea. Thicket Vegetation is Visible; (d) Aerial Image of the Site Showing the Estimated Development Footprint Outlined in Red and the Start of the Natural Forest Indicated by the White Arrow (Photo Courtesy of SDP); and (e) Historic Image of the Site Taken in 2009 Showing the Characteristics of the Vegetation in the Lower Portion of the Site where Development is Proposed, Indicated by the Red Arrow (Source: Google Earth Pro, 2022).

5.0 PUBLIC PARTICIPATION PROCESS

5.1 DETAILS OF PROCESS UNDERTAKEN IN TERMS OF REGULATION 41 OF THE EIA REGULATIONS

Please refer to the Public Participation Report attached under Appendix D for all details on the public participation process followed and proof of communications. Notification of all potentially Interested and Affected Parties (I & APs) took place using the following methods:

(a) Noticeboard on the boundary of the site;
(b) Written notification to adjacent landowners, adjacent occupiers, the relevant municipal ward councillor, the municipality and all other responsible organs of state; and
(c) Advertisement placed in the local newspaper.

A copy of the Draft Basic Assessment Report was provided to all I & APs for a 30-day comment period. Once all comments have been responded to, the Basic Assessment Report will be updated and submitted to EDTEA for assessment. I & APs will also be provided an opportunity to comment on the Final Basic Assessment Report. EDTEA have a legislated period of 107 days to assess the application. Registered I & APs will be notified of the outcome of the application.

5.2 SUMMARY OF ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

Preliminary comments have been received on the application and are included in the Comments and Response Table attached to the Public Participation Report. This section of the report will be updated prior to the submission of the Final Basic Assessment Report to EDTEA.

6.0 IMPACT ASSESSMENT

The aspects and impacts listed in the table below have been identified by reviewing the receiving environmental characteristics of the site (geographical, physical, biological, social, economic, heritage and cultural), having an understanding of the environmental impacts caused by similar activities as well as input from the specialist team.

The significance of the impact (before and after mitigation) has been calculated using the recognised quantified methods described in the Department of Environment, Forestry and Fisheries Integrated Environmental Management Information Series (Series 5 on Impact Significance). The following criteria has been used to assess the significance of the impacts identified:

Table 5: Criteria Used to Assess the Significance of Impacts Identified.

Criteria	Rating
Extent of Impact *Size of area that will be affected by the impact*	▪ Site ▪ Local (<10km from site) ▪ Regional (>10km from site)
Duration of the Impact *Timeframe during which the impact will be experienced*	▪ Short / once off ▪ Medium / during operation ▪ Long-term / permanent
Severity of the Impact *Anticipated consequence of impact*	▪ Slight ▪ Moderate ▪ Substantial ▪ Severe ▪ Extreme
Probability *Probability of the impact occurring*	▪ Very likely ▪ Likely ▪ Unlikely ▪ Very unlikely ▪ Extremely unlikely
Irreplaceability *Degree of which the impact causes irreplaceable loss of resources.*	▪ High (activity will destroy resources that cannot be replaced) ▪ Moderate ▪ Low

Degree of Certainty *Confidence of impact rating based on available information*	▪ High ▪ Moderate ▪ Low
Significance of Impact *(Severity x Probability calculated as per the figure below)*	▪ Very low (very minor alterations of the environment and can be easily avoided by implementing mitigation measures) ▪ Low (minor alterations of the environment and can be easily avoided by implementing mitigation measures) ▪ Moderate (moderate alteration of the environment and can be reduced/avoided by implementing mitigation measures) ▪ High (major alteration to the environment even with the implementation of mitigation measures) ▪ Very high (Very major alteration to the environment even with the implementation of mitigation measures. The impact will have an influence on decision-making)
Ranking of residual impacts *Ranking of impact remaining after mitigation*	▪ 5 (very low) ▪ 4 (low) ▪ 3 (moderate) ▪ 2 (high) ▪ 1 (very high)

The significance of the impacts has been assessed both with and without mitigation actions. Describing the impacts in terms of the above criteria aims to provide a consistent and systematic approach for authorities to rate the effectiveness of the mitigation measures provided and assist with the assessment of the application. The *Significance of Impact* rating is calculated according to the guide below.

Figure 11: Guide to Calculating the Significance of an Impact Based on the Severity and Probability of the Impact Occurring.

Probability	Significance of Impact = Severity x Probability					
	Very Likely	Very Low	Low	Moderate	High	Very High
	Likely	Very Low	Low	Moderate	High	High
	Unlikely	Very Low	Low	Moderate	Moderate	Moderate
	Very Unlikely	Very Low	Low	Low	Low	Low
	Extremely Unlikely	Very Low	Very Low	Very Low	Very Low	Very Low
		Slight	Moderate	Substantial	Severe	Extreme
		Severity				

Table 6: Assessment of Impacts Associated with the Preferred Layout and Technology Alternatives for House Bedessy (Layout Alternative 2; Vertical Wall Technology Alternative 2, SWMP 2).

Aspect	Impact	Extent	Duration	Severity	Probability	Irreplaceability	Mitigation	Significance of Impact (Severity x Probability)		Ranking of residual impacts	Degree of Certainty
								Without mitigation	With Mitigation (residual impact)		
CONSTRUCTION											
1. Earthworks for foundation piling.	**a. Clearance of 675m^2 of indigenous vegetation from within the critically endangered Northern Coastal Grasslands ecosystem (SDP, 2021).**	Local	Long-term	Substantial	Very Likely	Moderate	The total area of indigenous vegetation cleared from the site will be 675m^2. The vegetation that will be cleared is described by the specialist as "*thicket habitat*" with no distinct canopy or understorey layer. There is approximately 375m^2 of natural forest in the upper portions of the site which will remain. No protected species are located within the development footprint. The clearance of indigenous vegetation cannot be fully mitigated however the impact has been minimised by strategically placing the proposed residential dwelling in the eastern portion of the site, outside the natural forest. Impact management measures provided below must be put in place to ensure minimal disturbance to the remaining Northern Coastal Forest on site and also limit destabilization of the slope around the development footprint. • Prior to construction, the development footprint and associated access ways must be determined and cordoned from the balance of the site. • A distinct fence, using shade cloth must be established leeward of the working area to designate the development footprint (position of shade cloth fences illustrated in Figure 11). • Excavation and clearance activities must be carried out exclusively within the extent of the property.	Moderate	Low	4	High

							• A phased approach to the removal of vegetation would be advantageous and must be considered by the Contractor. • Unnecessary clearance and excavation within the property must be prohibited. • Prior to any work commencing on site, an independent Environmental Control Officer (ECO) must be appointed and conduct Environmental Awareness training as per section 5.0 of the EMPr (Appendix E). • The induction training must include: - An indication of the location of the environmentally sensitive areas, which includes the closed canopy forest, Milkwood trees, fore dune in front of the property and surrounding DMOSS area. - The importance of the environmentally sensitive areas. - Restrictions associated with the environmentally sensitive areas (i.e. No Go areas). - Contingency measures if the environmentally sensitive areas are disturbed. • No vegetation may be cleared from outside of the authorised developable area. • The forest located in the northern extent of the property must be retained. • Where possible, all construction activities and material storage must avoid the unnecessary clearance of trees. • An "Application for a License Regarding Trees in Natural Forest" must be submitted to DFFE prior to any disturbance of indigenous trees in a natural forest. • A Non-User Conservation Servitude must be registered across the remainder of the property (refer to Figure 6). This is to ensure the natural forest remaining on site is not developed in the long-term.				

							• Once construction is complete, a Vegetation Report must be compiled by the ECO and submitted to eThekwini EPCPD commenting on the extent of vegetation cleared and the impact on surrounding vegetation outside of the development footprint.				
	b. Erosion of banks / dune movement during site excavations impacting Northern Coastal Forest.	Local	Short-term	Severe	Likely	Moderate	• The preferred position of the dwelling must be complied with to reduce the extent of earthworks required leeward of the dwelling (i.e. Layout Alternative 2). • A vertical retaining wall is preferred to reduce the area of disturbance associated with a stepped retaining wall (i.e. Technology Alternative 2). • The Method Statement prepared by Bramin Consulting Engineers dated 25 January 2022 and attached under Appendix C of the BAR, must be adhered to. • No construction vehicles, machinery or personnel are permitted leeward of the proposed retaining wall structure. • Earthworks to commence from the verge of North Beach Road and move in a westerly direction towards the dune slope. • The embankment must be shored (60° slope) during the construction of the basement wall. • Any excavation exposing highly erodible soils must take place during the dry season (i.e. March – Aug). • Any large vehicle access ramps must have hardstanding material to prevent erosion from plant moving machinery. • Vegetation must remain in place wherever possible and for as long as possible during earthworks. • Sound management of surface water runoff must be put in place early in the construction phase. This must include the placement of sandbags and bidim to create berms to control stormwater runoff during earthworks.	High	Low	4	Moderate

							• Should an area of erosion be noticed on site, this must be addressed immediately, and the area stabilised to prevent further erosion. • Should disturbance of the interface between the development and the northern forest area arise, rehabilitation interventions must be employed. These interventions must include: - Sculpting and stabilization of the dune using geofabrics; - Sowing an appropriate commercial seed mix (ECO to confirm); - Any emergence and spread of exotic species in this disturbed area must be addressed through the implementation of the Alien Invasive Plants Eradication Management Plan (section 5.4.2. of the EMPr). • Recommendations made in the Geotechnical Investigation must be adhered to. These are as follows: - Cut embankment must be restricted to a slope batter of 1: 2 (26°). - Any trench excavations or temporary cut embankments deeper than 1.20m must be suitably battered back or shored to prevent the collapse of sides under adverse conditions. - Cut embankment must be protected against surface erosion by the planting of vegetation immediately after construction. - Conventional reinforced strip foundations should not be placed within the very loose or loose clayey sands which are potentially compressible and collapsible. - The house and the swimming pool must be founded on ground beams spanning between piles. - Continuous Flight Augured (CFA) piles, rather than conventional open hole				

							auger piles must be used and the piles should be designed to act as friction piles to resist the external forces.				
	c. Change in edaphic form and structure (SDP, 2021).	Local	Long-term	Moderate	Likely	Moderate	Excavation and removal of dune material during the earthworks phase of the project will alter the sub-surface form and structure of the dune[9]. This impact is unavoidable where the development footprint is proposed. The extent of change in the edaphic form and structure has been reduced by strategically locating the development in the eastern portion of the property and retaining the better quality vegetation in the western portion of the site. The following is applicable: • The change in structure of the dune must be confined to the development footprint. • Vegetation immediately leeward of the site must be maintained to avoid the slip of the dune and mobilization of sand on the upper slopes. • No further change in edaphic form and structure is permitted within the remaining DMOSS area in the long-term.	Low	Very Low	4	High
	d. Negative impact on local fauna residing, foraging and /or moving through the site.	Local	Long-term	Moderate	Likely	Low	Once there is construction activity on site, animal species will vacate the site as a consequence of the noise and disturbance. The following is applicable during construction: • Should an animal be trapped within the construction site, trained personnel must be engaged where capture and release if required. • Staff are not permitted to harm, poach or trap animal species on site or within the adjacent areas. No snares are permitted. • Feeding of monkeys is not permitted. • All food brought to site by staff must be kept away from monkeys.	Low	Very Low	4	High

[9] Section 8.0 of the SDP Ecological Assessment (Nov, 2021).

	e. Excavations destroying fossils impacting on palaeontology.	Regional	Long-term	Substantial	Extremely Unlikely	High	The palaeontologist concluded that it is extremely unlikely that any fossils occur in the development footprint however, given the potentially very high sensitivity of the rocks underlying the site, a Fossil Chance Find Protocol has been provided under section 4.3 of the EMPr. • During earthworks, should any objects with historical, archaeological or cultural significance be uncovered, all work in this area must cease and the heritage authority, AMAFA, notified.	Very Low	Very Low	5	Moderate
2. General construction-related impacts.	**a. Dust & emissions becoming a nuisance to surrounding residents and coating the adjacent dune forest, reducing functionality.**	Site	Short-term	Moderate	Unlikely	Low	This impact is unlikely considering the geology of the site, which is comprised on unconsolidated sand. Some dust may be generated during the construction of the house and therefore the following mitigation measures apply: • During high winds, dust suppression must take place using water carts / hose to prevent excessive dust on site. • Any fine materials stockpiled on site must be covered to prevent dust from being blown around. • Material transported to site on the back of trucks must be covered, • A complaints register must be maintained on site and any complaints received addressed timeously. • A shade cloth fence / other screening techniques must be used to reduce dust from entering other properties. • All construction vehicles and equipment must be well maintained to reduce emissions generated on site.	Moderate	Very Low	5	High
	b. Noise form construction machinery, equipment and staff becoming a nuisance to surrounding residents.	Site	Short-term	Moderate	Likely	Low	The following measures are included in the EMPr to manage noise during construction: • All construction vehicles and equipment must be well maintained to reduce noise on site. • All construction vehicles and equipment must be fitted with standard silencers.	Low	Very Low	5	High

							• No construction vehicles or machinery to operate outside of construction working hours (07:00 – 17:00). • Neighbours to be advised prior to work being done outside the above times. • A complaints register must be maintained on site and any complaints received addressed timeously.				
	c. Littering and improper storage / disposal of waste accumulating on site, within neighbouring residential properties or within environmentally sensitive areas (Northern Coastal Forest and/or beach).	Site	Short-term	Moderate	Likely	Low	The following measures are included in the EMPr to manage waste during construction so that it is contained within the development footprint and correctly disposed of: • All waste generated on site must be disposed of in the designated waste management area to ensure that it is not blown around the site into the environmentally sensitive areas or adjacent residential properties. • The waste management area must not be located leeward of the main dwelling as this is directly adjacent to the closed canopy forest area. • All waste must be stored under cover to prevent rain ingress and/or waste from being blown around site. • No waste must be buried or burnt on site. • Potentially hazardous substances [10] to be stored in a fenced off area that is undercover to prevent contamination of rainwater. • All potentially hazardous substances must be stored, in a bunded area (110% capacity of largest container) with an impermeable surface to prevent soil contamination during handling. • The use of hydrocarbons and other potentially hazardous liquids on site must be managed in accordance with section 4.3 of the EMPr attached under Appendix E.	Low	Very Low	5	High

[10] Hazardous substances refer to substances scheduled in the Hazardous Substances Act (1973) and Hazardous Chemical Substances Regulations (1995) and include paint, oils, fuels, solvents, pesticides.

							• No bulk storage of fuel is permitted on site (>30m^3). • A full inventory of all hazardous materials must be retained on site with the respective Material Safety Data Sheets. • All construction activities must remain within the property boundaries (i.e. leeward side of North Beach Road and not encroach on the fore dune in front of the house). This is to be strictly monitored by the ECO. • All solid waste must be disposed of at an appropriate landfill site and records of such disposal must be retained on site for auditing purposes.				
	d. Improper placement and management of toilet facilities becoming a nuisance to surrounding residents and negatively impacting environmentally sensitive areas (Northern Coastal Forest and/or beach).	Site	Short-term	Moderate	Unlikely	Low	Sufficient toilet facilities must be provided on site to prevent construction staff from utilising the surrounding areas. • Toilets must be located within the site camp within the property boundaries (i.e. not on the fore dune in front of the house). • Staff must use the toilets provided and must not use any other areas on site as toilet facilities. • On-site toilets will be provided for domestic purposes during construction phase (chemical or connected to municipal sewerage pipeline). • Toilets should be screened from the neighbours as far as is practically possible. • Ablution facilities must be checked regularly and kept in a clean state.	Low	Very Low	5	High
	e. Incorrect placement of the site camp indirectly impacting environmentally sensitive areas (Northern Coastal Forest and/or beach).	Local	Short-term	Substantial	Likely	Low	• The site camp must not be located above the main dwelling / underneath the forest canopy. • The site camp must be located on a flat portion of land and must include a parking area for vehicles. • Signage is to be erected outside site camp indicating relevant contact details of responsible person in case of complaints or emergencies after hours.	Moderate	Very Low	5	High

3. Construction of House Bedessy.	**a. Uncontrolled stormwater runoff eroding the site and fore dune in front of the property.**	Local	Short-term	Substantial	Likely	Low	The alteration of natural ground levels and compaction of soil will result in silt running off the site towards North Beach Road, especially during heavy rainfall. To reduce the volume of silt washing onto North Beach Road and the nearby beach environment, the following must be implemented: • Sound management of surface water runoff must be put in place early in the construction phase. This must include the placement of sandbags and bidim to create berms to control stormwater runoff during earthworks. • Berms and silt fences must be erected along the lower extent of the site during construction to attenuate stormwater runoff and trap mobile silt before it washes onto the road / into the municipal stormwater system. The location of the silt fences is indicated in Figure 11). • Use of attenuators and spreaders must be undertaken to retain surface water on site and promote percolation of stormwater into the surrounding ground. • Stormwater must be managed on site and directed into the formal municipal stormwater network and not allowed to discharge directly onto the fore dune environment in front of the property.	Moderate	Low	4	High
	b. Greywater / hydrocarbons / chemicals washing into the formal stormwater network and polluting the associated beach environment.	Local	Short-term	Moderate	Unlikely	Low	During construction, minor spills of material, particularly hydrocarbons, may occur. This will pose a localised threat the immediate environment. This impact can be prevented by ensuring the mitigation measures provided above for waste management are adhered to. If a spill does occur, every effort must be made to prevent the spill from entering the municipal stormwater network / washing off site. • Any spills on site must be cleaned up immediately using the Spill Response	Low	Very Low	5	Moderate

							Procedure provided in section 5.4.1 of the EMPr. • The seven step Spill Response Procedure must be included in the ECO's environmental toolbox talk. • No vehicles or equipment must be washed on site unless at a designated wash bay where dirty water must drain into a sump where hydrocarbons / contaminated material is separated out before the water is discharged into the surrounding environment. • Drip trays must be available near the hazardous storage area and where hazardous materials are being used on the site. • A Spill Kit / similar must be available near the hazardous storage area.				
	c. Encroachment into and/or disturbance of Northern Coastal Forest / DMOSS area outside of the authorised development footprint by staff or construction activities.	Site	Short-term	Severe	Unlikely	Moderate	Through careful planning and design modifications, the risk of construction activities disturbing the closed canopy forest and associated DMOSS area has been reduced. The following must be retained in the design to prevent this impact from occurring: • The authorised development footprint must be strictly adhered to. • A shade cloth fence must be erected between construction activities and the adjacent forest / DMOSS area (drawn in green in Figure 11). • The areas beyond the shade cloth fence are No Go areas. Staff and or construction material / equipment are not permitted in these sensitive areas. • Prior to any work commencing on site, the ECO must conduct Environmental Awareness training with all site personnel as per section 5.0 of the EMPr (Appendix E). • Should staff personnel enter the No-Go area beyond the shade cloth fences or dispose of any waste or construction material into the No	Moderate	Low	4	High

							Go areas, that staff member must be given a disciplinary warning. • Once construction is complete and the shade cloth fence removed, the Contractor must inspect the area behind the fence and ensure there is no litter or construction material in this area prior to vacating the site.				
	d. Proliferation of exotic species within the development footprint and adjacent environmentally sensitive areas (SDP, 2021).	Local	Medium-term	Substantial	Very Likely	Low	Construction activities, primarily vegetation clearance, typically provides an opportunity for the proliferation of exotic species within the disturbed area. The establishment and spread of alien invasive species within the disturbance footprint must be managed throughout the construction phase by the Contractor. • The "*Eradication of Alien Invasive Plant*" Management Plan must be implemented on site during construction (section 5.4.2 of the EMPr). This Management Plan includes a list of common alien invasive plant species anticipated on site, identification photographs and eradication measures. • Alien invasive species must not be permitted to establish on site.	Moderate	Very Low	4	High
OPERATION											
4. General residential activities at 57 North Beach Road.	**a. Loss of faunal refugia and alteration of faunal ethos within a CBA and DMOSS area (SDP, 2021).**	Local	Long-term	Substantial	Likely	Low	Since the site is currently undeveloped, the habitat does offers some refugia to localised fauna. The removal of habitat will result in the ousting of fauna at this point due to nuisance factors (light pollution, noise, human activity). More adaptive species presently within and adjacent to the site will not be affected. The impact has been avoided to some extent by the placement of the house within the thicket area. The forest area retained in the northern portion of the property is connected to the adjacent properties (Figure 6). The following mitigation measures must be implemented during the planning and operational phases to ensure the Northern Coastal Forest	Moderate	Low	4	Moderate

							habitat and associated faunal communities are not negatively impacted in the long-term: • The architect must ensure minimal exposure of artificial light into the nearby Northern Coastal Forest during the design of House Bedessy (specifically behind the main dwelling). • External lighting must not be obtrusive or a nuisance. All lighting must be ambient type (yellow rather than white), downlighting. • No lights must be directed into the DMOSS area at the office pod. • Should a fence be erected around the property, the type of fence used must allow small mammals / faunal species to traverse through the site. • The applicant is responsible for the long-term conservation and management of the forest across the remainder of the site. This area will be retained as part of DMOSS. • No infrastructure is permitted to be constructed within the remaining DMOSS area. • An Alien Invasive Plant Management Plan has been included under section 5.4.2 of the EMPr (Appendix E) and must be adhered to by the applicant. • Landscaping must not encroach into the closed canopy / woody habitat behind the retaining wall (shaded in green in Figure 11). • Species used in landscaping must be species found in coastal dune habitat (to be advised by ECO). • No invasive species are to be planted on site as part of the landscaping.				
	b. Structure at risk of sea level risk, storm forced erosion and / or tidal inundation.	Local	Long-term	Severe	Extremely Unlikely	Low	The portion of coastline adjacent to House Bedessy is considered to be of "low" coastal vulnerability. All infrastructure is located leeward of North Beach Road and outside of the sand sharing system. Other residential developments	Very Low	Very Low	5	High

							along this stretch of North Beach Road were not impacted by the 2007 storm event (return period of 1:35 years) and therefore the coastal specialist concluded that the site is "*generally well protected from such event in the short to medium term*"[11]. No further mitigation was provided.				
	c. Increase in hard surfaces altering localised hydrology (reduced infiltration rate and increased stormwater runoff). These changes may influence the immediate floral community and reduce ground water recharge (SDP, 2021).	Local	Long-term	Substantial	Likely	Low	Once constructed, significant runoff from rooftop and other hardpan surfaces will arise. The coastal specialist highlights the importance of effective stormwater management to promote percolation of stormwater. The preferred Stormwater Management Plan (SWMP 2) is to be implemented (Appendix C). The preferred SWMP includes the following • Use of attenuators and spreaders must be undertaken to retain surface water on site and promote percolation of stormwater into the surrounding ground. • Where possible, porous or permeable attenuation chambers that promote percolation of waters into the surrounding soils must be established at points. Such systems would allow for the onsite discharge of waters into surrounding soils and accommodate smaller rainfall episodes. • Larger rainfall events, such as those > 1 : 2 year events should be discharged into the municipal stormwater system associated with North Beach Road. • Harvesting of rainwater must be implemented on site. • The driveway must make use of permeable paving / grass blocks to allow for some stormwater infiltration and prevent overland flow.	Moderate	Low	5	High

[11] Section 5.2 of the SDP Ecological Assessment (October 2021).

CUMULATIVE										
5. Development of House Bedessy along the coastal strip in Westbrook.	**a. Cumulative transformation of the Northern Coastal Forest habitat in Westbrook and reduction in area of open space used by local faunal species (i.e. reduction in DMOSS).**	Local	Long-term	Substantial	Likely	Moderate	The development of House Bedessy will contribute to the overall transformation of Northern Coastal Forest habitat in the Westbrook area[12]. As above, the total area of vegetation cleared is 675m^2. The preferred layout and technology alternatives reduce the level of habitat transformation at 57 North Beach Road. No closed canopy / natural forest will be cleared with the structures being placed within thicket vegetation. No protected tree species will be removed or disturbed during construction. The remaining Northern Coastal Forest habitat will be retained as DMOSS by the applicant and registered as a Non-User Conservation Servitude, to ensure the long-term conservation of the forest. The Non-User Conservation Servitude is aligned with the proposed development footprint and associated Non-User Conservation Servitude on the adjacent property (57A North Beach Road; EIA Ref. DM/0034/2021; Figure 6). The proposed development is in line with the zoning and therefore the municipal spatial development framework for the area.	Moderate	Low	4	High
	b. Pressure on municipal services (traffic, bulk potable water supply and sewerage disposal network) and electricity demand.	Local	Long-term	Slight	Unlikely	Low	The property is zoned for residential development within existing municipal services available at the property boundary. The development will connect to the available waterborne sewerage network as well as the municipal water network. • To reduce demand on the potable water supply, rainwater harvesting must be included in the design. • To reduce the electrical demand, gas or solar powered geysers and/or lights must be considered by the applicant.	Very Low	Very Low	5	High

[12] Section 6.0 of the SDP Ecological Assessment (October 2021).

							• Since the development is a private residential development, no upgrades are required for the existing road network.				

Table 7: Assessment of Impacts Associated with the Alternative Layout and Technology Alternatives for House Bedessy (Layout Alternative 1; Vertical Wall Technology Alternative 1, SWMP 1).

Aspect	Impact	Extent	Duration	Severity	Probability	Irreplaceability	Mitigation	Significance of Impact (Severity x Probability)		Ranking of residual impacts	Degree of Certainty
								Without mitigation	With Mitigation (residual impact)		
CONSTRUCTION											
1. Earthworks for foundation piling.	a. **Clearance of 775m^2 of indigenous vegetation from within the critically endangered Northern Coastal Grasslands ecosystem (SDP, 2021).**	Local	Long-term	Severe	Very Likely	Moderate	The total area of indigenous vegetation cleared from the site will be 775m^2. This is an additional 100m^2 of indigenous vegetation cleared compared to the preferred layout and technology alternatives. The stepped geoblok retaining wall (i.e. Technology Alternative 1) also has the potential to encroach into the lowest section of Northern Coastal Forest (north-west of the development footprint). Layout Alternative 1 will therefore result in the clearance of more vegetation as well as the loss of closed canopy forest habitat. This impact therefore has a greater severity and a higher significance rating compared to the preferred Layout & Technology Alternatives. The same mitigation measures provided in Table 6 for the preferred alternative would be applicable.	High	Moderate	2	Moderate
	b. Erosion of banks / dune movement during site excavations impacting surrounding Northern Coastal Forest.	Local	Short-term	Severe	Very Likely	Moderate	Technology Alternative 1 is still feasible from a slope stability perspective and therefore the significance of the impact after mitigation remains low. It is the greater extent of excavation that is required to accommodate the stepped retaining wall that gives this impact a higher probability rating making Technology Alternative 1 the alternate retaining wall design. The same mitigation measures provided in Table 6 for the preferred alternative would be applicable.	High	Low	3	High

	c. Change in edaphic form and structure (SDP, 2021).	This impact, mitigation measures and significance of impact provided above for the preferred Layout and Technology Alternative remains the same for Layout Alt 1 and Technology Alternative 1.									
	d. Negative impact on local fauna residing, foraging and /or moving through the site.	This impact, mitigation measures and significance of impact provided above for the preferred Layout and Technology Alternative remains the same for Layout Alt 1 and Technology Alternative 1.									
	e. Excavations destroying fossils impacting on palaeontology.	This impact, mitigation measures and significance of impact provided above for the preferred Layout and Technology Alternative remains the same for Layout Alt 1 and Technology Alternative 1.									
2. General construction-related impacts.	This aspect of the project, associated impacts, mitigation measures and significance of impacts provided above for the preferred Layout and Technology Alternative remains the same for Layout Alt 1and Technology Alternative 1.										
3. Construction of House Bedessy.	**a. Uncontrolled stormwater runoff eroding the site and fore dune in front of the property.**	These impacts, mitigation measures and significance of impacts provided above for the preferred Layout and Technology Alternative remains the same for Layout Alt 1 and Technology Alternative 1.									
	b. Greywater / hydrocarbons / chemicals washing into the formal stormwater network and polluting the associated beach environment.										
	c. Encroachment into and/or disturbance of Northern Coastal Forest / DMOSS area outside of the authorised development footprint by staff or construction activities.	Site	Short-term	Severe	Very Likely	Moderate	As stated above, the stepped geoblok retaining wall (i.e. Technology Alternative 1) also has the potential to encroach into the lowest section of Northern Coastal Forest (north-west of the development footprint). Layout Alternative 1 may therefore result in the clearance of closed canopy forest habitat and the loss of approximately 100m^2 more of DMOSS area. The installation of shade cloth fences to demarcate the forest no go areas will not be entirely feasible as construction would need to take place underneath the forest canopy. The probability of this impact occurring has therefore increased. The impact can be partially mitigated through strict management of the construction activities and staff. The same mitigation measures apply as those listed above the preferred alternative and technology layouts, but additional precaution and monitoring would need to take place at the construction interface between the proposed retaining wall structure and the natural forest:	High	Moderate	2	High

							• Any significant disturbance / damage to the closed canopy forest environment, outside of the authorised development footprint, must be demarcated and rehabilitated. The significance of this impact is moderate, after mitigation, as the severity of this impact occurring remains "substantial" due to the proximity of the retaining wall to the forest habitat.				
	d. Proliferation of exotic species within the development footprint and adjacent environmentally sensitive areas (SDP, 2021).	This impact, mitigation measures and significance of impact provided above for the preferred Layout and Technology Alternative remains the same for Layout Alt 1and Technology Alternative 1.									
OPERATION											
4. General residential activities at 57 North Beach Road.	**a. Loss of faunal refugia and alteration of faunal ethos within a CBA and DMOSS area (SDP, 2021).**	These impacts, mitigation measures and significance of impacts provided above for the preferred Layout and Technology Alternative remains the same for Layout Alt 1and Technology Alternative 1.									
	b. Structure at risk of sea level risk, storm forced erosion and / or tidal inundation.										
	c. Increase in hard surfaces altering localised hydrology (reduced infiltration rate and increased stormwater runoff). These changes may influence the immediate floral community and reduce ground water recharge (SDP, 2021).	Local	Long-term	Substantial	Very Likely	Low	Stormwater Management Plan 1 is feasible however is not in line with what is promoted in the Best Practice Guidelines for Coastal Development. SWMP 1 is for the capturing and discharging of stormwater directly onto North Beach Road. The municipal stormwater along North Beach Road discharges directly onto the adjacent beach and has already caused notable erosion on the dune. The probability of the impact therefore remains "very likely" after mitigation resulting in the impact being of moderate significance, after mitigation.	Moderate	Moderate	5	High
CUMULATIVE											
5. Development of House Bedessy along the coastal strip, Westbrook.	This aspect of the project, associated impacts, mitigation measures and significance of impacts provided above for the preferred Layout and Technology Alternative remains the same for Layout Alt 1 and Technology Alternative 1.										

7.0 ENVIRONMENTAL IMPACT STATEMENT

7.1 SUMMARY OF KEY FINDINGS (POSITIVE AND NEGATIVE IMPACTS)

Proposed House Bedessy, located at 57 North Beach Road in Westbrook, is located within 100m of the high-water mark of the Indian Ocean. Due to the elevation of the site and the presence of North Beach Road between the property and the fore dune, the specialist concluded that the property does not fall within the local sand sharing system and is considered to have low vulnerability in terms of coastal erosion events (CoastKZN).

The geology of the site is comprised of loose subsoils giving rise to a sensitive and dynamic dune environment susceptible to minor changes in slope and vegetation clearance. The position of the dwelling (i.e. preferred layout) and the design of the retaining wall behind the dwelling (i.e. preferred technology alternative) have reduced the severity and significance of impacts on the sensitive Northern Coastal Forest environment delineated in the western portion of the property. The preferred SWMP has been designed according to the coastal specialists recommendations to promote groundwater percolation prior to discharge into the municipal stormwater system associated with North Beach Road.

Despite the relatively small footprint of 675m^2, all development must be managed carefully in accordance with specialist recommendations contained in the attached EMPr to avoid the project having a significant environmental impact on the characteristics of the dune and associated Northern Coastal Forest / CBA / DMOSS area. The following provides a summary of the key findings of the assessment:

- All development will take place within 100m of the high-water mark however the property falls outside of the local sand sharing system and is therefore considered low vulnerability from coastal erosion events.
- The vegetation on site is comprised of Northern Coastal Forest habitat which has been moderately disturbed. The preferred layout excludes development within the woody / forest habitat with clearance being limited to the thicket vegetation in the eastern portion of the property.
- No protected tree species will be disturbed or removed by the development.
- The overall development footprint for House Bedessy is well aligned with the proposed development footprint and associated Non-User Conservation Servitude on the adjacent property (57A North Beach Road; EIA Ref. DM/0034/2021; Figure 6). This provides open space linkages between the two properties providing some faunal refugia. The development is therefore considered reasonable, despite its location within a CBA and within DMOSS.
- Due to the unstable geological conditions of the site, stormwater management was highlighted as an important component by the specialist. The preferred SWMP allows for stormwater to percolate into the ground rather than discharged directly into the municipal stormwater system.
- The interface between construction activities and the surrounding Northern Coastal Forest / DMOSS area must be clearly demarcated prior to any construction activity on site. A knowledgeable ECO with the necessary experience and skills to accurately demarcate and manage the interface must be appointed.
- The long-term / operational phase of House Bedessy poses a low risk to the surrounding environment. The remainder of the property will be retained as an ecological corridor, connecting other open space areas on the adjacent properties.

7.2 ASSUMPTIONS, UNCERTAINTIES AND GAPS IN KNOWLEDGE

The information in this report has been extracted from the various specialist reports attached under Appendix B. The assessment assumes that information received from the specialist team, architect, engineer and applicant is accurate. Assumptions and limitations of the specialist reports are listed under section 3.0 of the SDP Ecological Assessment and section 5.0 of the Palaeontological Impact Assessment.

7.3 IMPACT MANAGEMENT OUTCOMES

Through the assessment process, impact management outcomes have been identified and are provided in the table below. Impact management measures and recommendations identified during the assessment have been included in the EMPr attached under Appendix E to ensure that the impact management outcome is achieved.

Table 8: Impact Management Outcomes Associated with House Bedessy.

Primary Impact Management Outcome: *To create a sustainable development by constraining the development footprint to avoid natural forest on site and prevent the destabilisation of the dune slope.*		
#	**Impact Management Outcome**	**Measures in Place to Achieve Outcome**
1	To avoid unnecessary clearing of Northern Coastal Forest outside of the authorised development footprint.	An independent ECO must clearly demarcate the Northern Coastal Forest which falls outside of the authorised developable area. These aeras are to be treated as No Go areas. Measures to manage the clearance of vegetation have been included under section 4.3 of the EMPr.
2	Staff to be aware of the sensitive Northern Coastal Forest outside of the authorised development footprint and the restrictions associated with it.	Prior to any work commencing on site, an independent ECO must be appointed and conduct Environmental Awareness training as per section 5.0 of the EMPr. Should staff personnel enter the No Go areas beyond the shade cloth fences or dispose of any waste or construction material into these areas, that staff member must be given a disciplinary warning.
3	To avoid any disturbance (direct or indirect) to the fore dune and beach environment in front of the property.	The fore dune in front of the property is a No-Go area. Measures to prevent and manage any indirect impacts on the surrounding environment (i.e. stormwater management) have been included under section 4.3 of the EMPr.
5	The long-term, ongoing preservation of the open space system associated with the Northern Coastal Forest on the remainder of the property.	The remaining, undeveloped areas of the property must be retained and managed as part of the eThekwini DMOSS with no further development of infrastructure under the forest canopies. Management measures have been included in the EMPr to manage light pollution and alien vegetation during the operational phase.

7.4 PERIOD FOR WHICH THE ENVIRONMENTAL AUTHORISATION IS REQUIRED

Construction of House Bedessy is likely to commence within the next 5 years and therefore the EA must be valid until 2027. A post-construction audit must be undertaken by an independent Environmental Control Officer (ECO) and the report submitted to EDTEA: Compliance and Enforcement.

7.5 MONITORING REQUIRMENTS

An independent ECO must be appointed by the applicant to monitor the development in accordance with the EMPr attached under Appendix E.

- The ECO must, prior to any work commencing on site, conduct Environmental Awareness training with site personnel (as per section 5.0 of the EMPr). The No Go areas must be demarcated by the ECO in collaboration with the Contractor.
- The ECO must audit construction once a month and produce one monthly report summarising the findings of the audits.
- The audit report must be submitted to the applicant, Contractor and EDTEA: Compliance and Enforcement.
- One post-construction audit must be undertaken when construction is complete.

7.6 REASONED OPINION AS TO WHETHER THE PROPOSED ACTIVITY SHOULD BE AUTHORISED AND CONDITIONS OF AUTHORISATION

Based on the outcome of this assessment, it is recommended that the construction of House Bedessy, as per the preferred layout and technology alternatives, be authorised by EDTEA (Layout Alt 2; Technology Alt 2; SWMP 2). The Preferred Layout Alternative, attached under Appendix C, must be strictly adhered to. No infrastructure or construction related activities must take place in the western portion of the property disturbing the remaining Northern Coastal Forest / DMOSS area. It is important that all staff working on site are aware of the sensitive environmental areas at the onset of construction. After mitigation, the significance of all impacts associated with the layout have "*low*" to "*very low*" significance.

Measures have been included in the attached EMPr to ensure that the impact management outcomes listed in the table above are achieved. It is therefore the reasoned opinion of the EAP that House Bedessy be authorised as shown in Figure 11.

The following conditions are recommended for inclusion in the Environmental Authorisation:

- The Preferred Layout Alternative, attached under Appendix C, must be strictly adhered to. No-Go areas, indicated in Figure 11, must be avoided by all construction staff and equipment.
- The EMPr attached under Appendix E must be adhered to during all phases of the project.
- A knowledgeable ECO with the necessary experience and skills to accurately demarcate and manage the construction interface with sensitive environmental areas must be appointed by the applicant to ensure compliance with the EMPr.
- The authorised development footprint must be clearly demarcated by the Contractor, in conjunction with the ECO, to avoid unnecessary clearing of indigenous vegetation.
- Any excavations exposing highly erodible sand must take place during the dry season (i.e. March – Aug).
- A permit from DEFF must be obtained prior to any disturbance of indigenous trees in a natural forest.
- A Non-User Conservation Servitude must be registered across the remainder of the site (Figure 6). This is to ensure the natural forest remaining on site is not developed in the long-term.
- Sound management of surface water runoff from the construction area must be put in place early in the construction phase. The following must be incorporated into the Stormwater Management Plan:
    - Berms and silt fences must be established along the lower extent of the site during the construction phase. These features must function to attenuate stormwater runoff and trap mobile silt from accumulating on North Beach Road.
    - Foundational works must avoid the wet season of KwaZulu-Natal.
    - Attenuators and spreaders must be used to retain surface water on site and promote percolation of stormwater into the surrounding ground.
    - Rainwater harvesting must be incorporated into the design.
    - Existing stormwater infrastructure must be utilized within North Beach Road.
- The applicant is responsible for the long-term conservation and management of the remainder of the property as part of the eThekwini DMOSS area. This includes the implementation of the "*Eradication of Alien Invasive Plant*" Management Plan (section 5.4.2 of the EMPr).

Figure 11: Location of House Bedessy at 57 North beach Road, Westbrook Showing Sensitive Environmental Areas to be Avoided During Construction.