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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 57A NORTH BEACH ROAD, WESTBROOK

ETHEKWINI MUNICIPALITY

DM/0034/2021

12th NOVEMBER 2021

Ref: C016

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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:

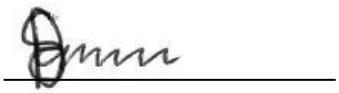
a) All information contained in the Basic Assessment Report is, to the best of my knowledge, accurate and correct.

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

08th November 2021

EXECUTIVE SUMMARY

Siebren Du Plessis proposes to construct a new residential dwelling on Portion 290 of Farm Lot 44 No. 1570, located at 57A North Beach Road, Westbrook. The development consists of a main dwelling and associated deck area, garden flat, office pod, swimming pool and garages. 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 entire property, which is 1 700m^2 in extent, is located within the eThekwini Durban Metropolitan Open Space System (DMOSS). Relaxation of 465m^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 465m^2 of indigenous coastal vegetation during construction. This impact cannot be avoided however the Ecological Assessment provides mitigation measures to restrict the clearance of vegetation. The development footprint must be cordoned off to prevent unnecessary clearance outside of the authorised construction area. A permit from the Department of Environment, Forestry and Fisheries (DEFF) is required if the Milkwood tree in the centre of the site requires trimming / removal.
2. Encroachment into the remaining Northern Coastal Forest habitat / DMOSS during construction. The preferred layout alternative has been designed to reduce the risk of construction activities disturbing the adjacent forest / DMOSS area. 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 main dwelling and garden flat must be constructed on stilts to minimise excavation activities on site (preferred Technology Alternative). Recommendations for sound stormwater management measures have been included in the EMPr to reduce surface run off and promote percolation of water.
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 and outside of the sand sharing system and therefore is a low vulnerability risk to the coastal environment.
5. Transformation of previously undeveloped land restricting faunal movement. The placement of the structures (i.e. preferred layout) and the design of the main dwelling and garden flat (i.e. preferred technology alternative) have 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 Du Plessis 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 57A North Beach Road, Westbrook, be authorised by EDTEA.

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APPENDICES

1.0 INTRODUCTION

1.1 DESCRIPTION OF ACTIVTY TO BE UNDERTAKEN

Siebren Du Plessis, recently purchased Portion 290 of Lot 44 No. 1570, located at 57A North Beach Road in Westbrook (Figure 1). The property is currently undeveloped. Mr Du Plessis intends to develop a private residential dwelling on the property. The proposed development is comprised of the following:

- Main dwelling and associated deck area (200m^2),
- Garden flat (115m^2),
- Office pod (22m^2),
- Swimming pool (8m^2); and
- Driveway and parking area (120m^2).

The total development footprint is therefore 465m^2. The preferred layout and design conforms to the topography of the site to minimise excavation. There are existing municipal bulk services available to provide the house with an electrical connection, potable water and waterborne sewage disposal.

The entire property, 1 700m^2 in extent, is located within the eThekwini Durban Metropolitan Open Space System (DMOSS). Relaxation of 465m^2 of DMOSS is required from eThekwini Environmental Planning and Climate Protection Department (EPCPD) to accommodate the development footprint. The rest of the site, 1 235m^2, will remain undeveloped and be retained as DMOSS.

Environmental Authorisation (EA) was previously granted on this property for the development of a single residential dwelling with an estimated footprint of 800m^2. The EA was granted on the 10th December 2009 (reference No. DM/0090/08) and was valid for three years. Construction of the single residential dwelling never commenced and therefore a new application for EA is required.

The development of House Du Plessis 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 Du Plessis, a significant volume of material will be excavated on site (± 300m^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 Du Plessis, 465m^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 Du Plessis will be located at 57A North Beach Road in Westbrook. The property is in Ward 58 of eThekwini Municipality (centre of site: 29°35'09.25"S; 31°10'28.07"E). Please refer to Figure 1 for the Locality Map.

21 Digit Surveyor General code	N0FU02990000015700290
Property Description	Portion 290 of Lot 44 No. 1570

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

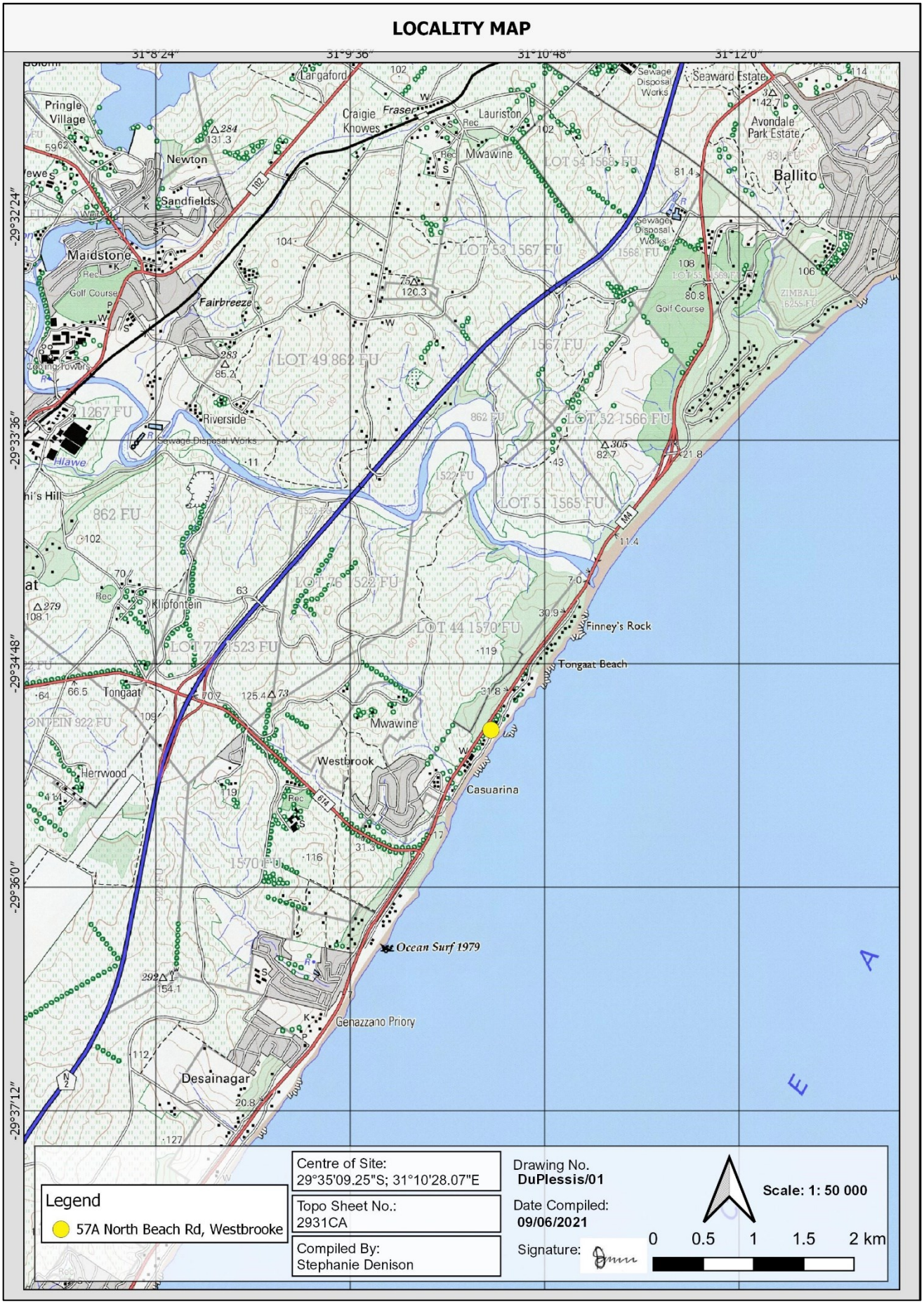
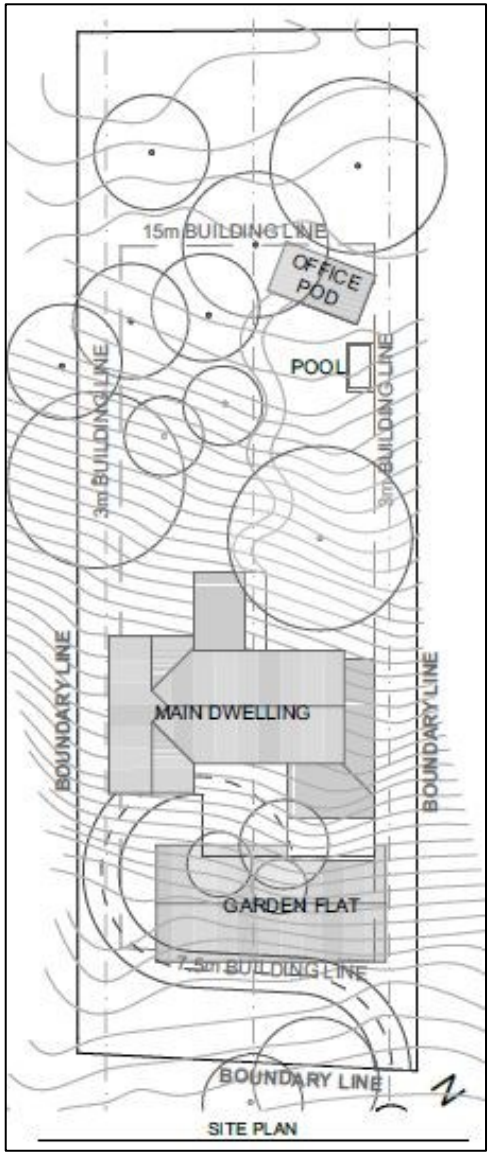


Figure 2: Site Development Plan Showing the Preferred Layout of the Proposed Infrastructure for House Du Plessis and Building Cross Sections of the Main Dwelling and Garden Flat (Source: Maker Architects, 2021).



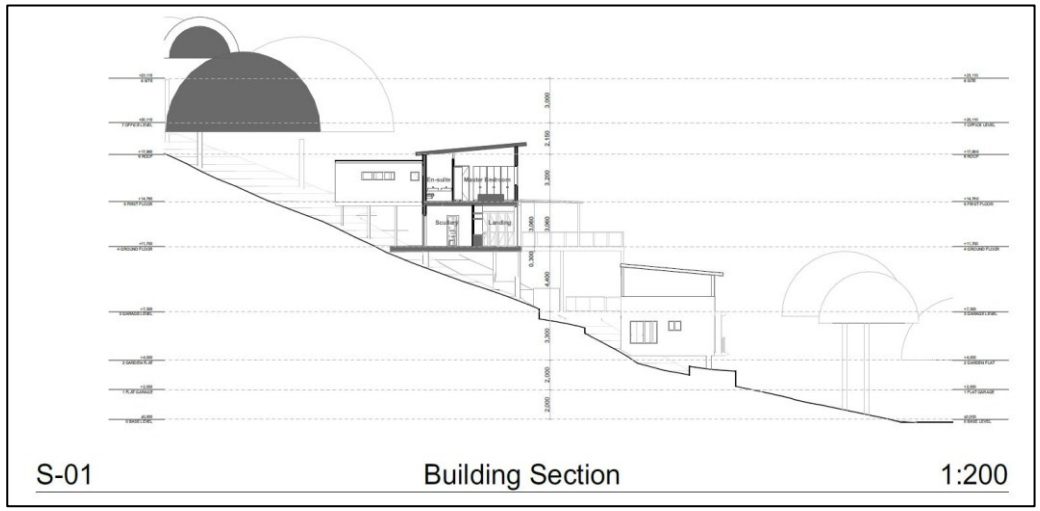


Figure 3: Map Superimposing the Proposed Activity and Associated Infrastructure on the Environmentally Sensitivities of the Site.

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 Du Plessis family.

2.1.1 Site Alternatives and Outcome of the Site Selection Matrix

The proposed application is specific to Portion 290 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 Du Plessis family with a private residential house. No other feasible activities have therefore been considered.

2.1.3 Layout

The previous Environmental Authorisation allowed for the construction of one large, double storey house and semi-basement garage. The dwelling had an estimated footprint of 800m^2 and required significant cut and fill to accommodate the house on different levels. A new development concept is proposed by the applicant. Two layout alternatives have been assessed (both alternative layouts are attached under Appendix C).

Layout Alternative 1 was originally proposed and was for the construction of two residential houses (approximately 200m^2 each), shared garages and two BnB units (approximately 30m^2 each) in the upper portion of the site (Figure 4a). The total development footprint of Layout Alternative 1 was approximately 600m^2. SDP Ecological and Environmental Services conducted a site visit in May 2021 to provide input on the developable areas. Layout Alternative 2 (preferred) has been designed in accordance with the recommendations made by the specialist and is therefore considered to be the preferred layout from an environmental perspective (Figure 4b). Layout Alternative 2 has a development footprint of 465m^2 and avoids the closed canopy, woody habitat found in the upper portion of the property.

Figure 4: Comparison of the Layout Alternatives Considered for House Du Plessis (a) Layout Alternative 1.

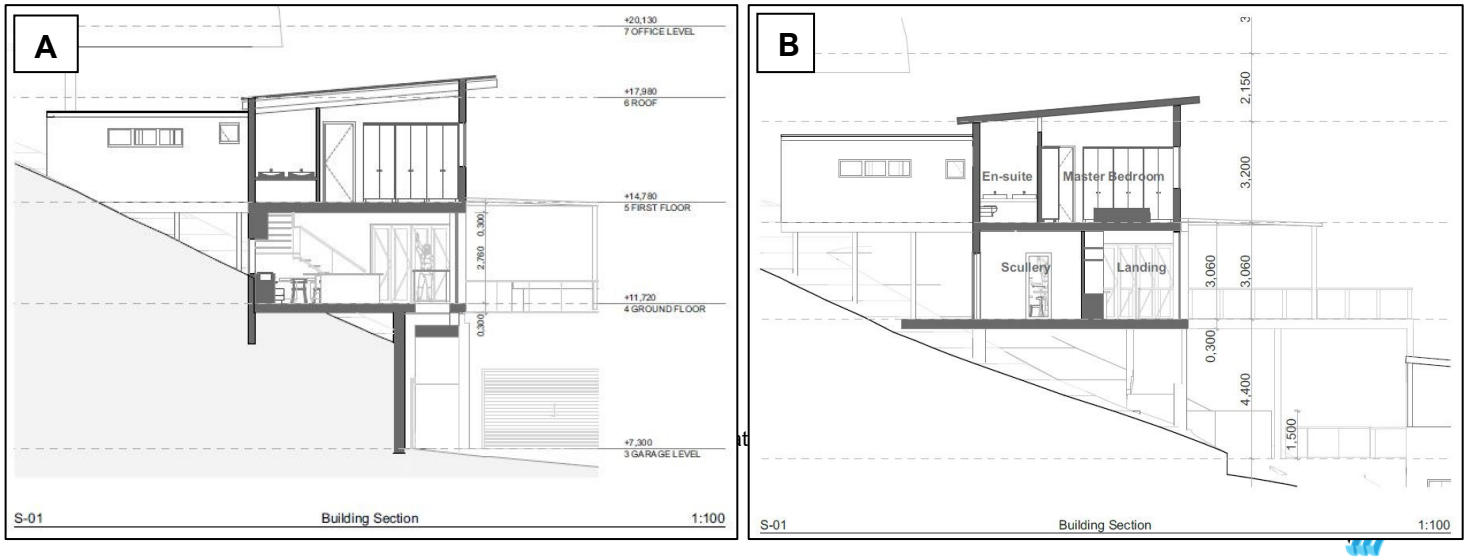
Figure 4 (cont.): Comparison of the Layout Alternatives Considered for House Du Plessis (b) Layout Alternative 2 (Preferred).

2.1.4 Technology

Due to the sensitive geological environment of the site, subsoils consistency ranging between loose and very loose, the structural design of the dwellings has been amended to reduce the extent of earthworks required. Technology Alternative 1 required the construction of retaining walls on at least two of the proposed platforms to accommodate the structures. Although feasible, the geotechnical engineer recommended that the excavation of the cut banks be done with caution to ensure the overall stability of the slope Lateral support as well as anchored contiguous piling would likely be required[2].

The structural design of the main dwelling and garden flat was therefore amended to accommodate the structures on stilts. The preferred technology alternative, Technology Alternative 2, is therefore for a raised structure which requires less cut and fill as well as reducing the development footprint. Figure 5 provides a comparison of the two technology alternatives with visual renditions provided under Appendix C.

Figure 5: Comparison of the Technology Alternatives (A) Technology Alternative 1; and (B) Technology Alternative2 (Preferred).



2.1.5 No-Go Alternative

The development of House Du Plessis 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 will have 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*"[3]. Since the property is vacant, there is currently no management of alien vegetation or the DMOSS area in general. With the development of House Du Plessis, 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, which has a reduced development footprint and takes into consideration the extent of the natural forest portions on the site. Technology Alternative 2 is preferred, which is for the development to be constructed on stilts, above ground. This significantly reduces the extent of earthworks required during construction.

2.3 MOTIVATION FOR PREFERRED ALTERNATIVE

The following provides a summary motivating the preferred alternatives:

- The preferred layout shows a retreat of infrastructure outside of the closed canopy forest habitat, which is mainly located in the upper portions of the site;
- The preferred layout has largely avoided the protected *Mimusops caffra* trees with primarily "*brush"* vegetation being cleared.
- The position of the main dwelling and garden flat has taken into consideration the steeper, more unstable areas of the site and will be constructed on stilts (Technology Alternative 2).
- The preferred technology alternative is for the structures to be placed above ground, on stilts. The volume of material to be excavated and infilled on site is greatly reduced in this preferred alternative and therefore the risk of erosion is reduced.
- The placement of the structure on stilts is more ecologically sustainable in the long-term allowing for some faunal refugia to remain within the development footprint.
- Recommendations made by the coastal specialist to manage stormwater on site have been included in the EMPr attached under Appendix E.

[3] Executive Summary of the SDP Ecological Assessment (October 2021).

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 Du Plessis. 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 Du Plessis.

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 preferred layout incorporates the large woody specimens, in particular *M.caffra* into the overall design and therefore no permit is required from DFFE.
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*"[4]. Proposed House Du Plessis 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 27% of the property being earmarked for development. The remaining 73% 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 and lower portions of the property.

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

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 /

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

		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 (74%) will remain Northern Coastal Dune Forest.
Geotechnical Assessment	Yes	A Geotechnical Investigation was carried out by Damon Clark Associates 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.

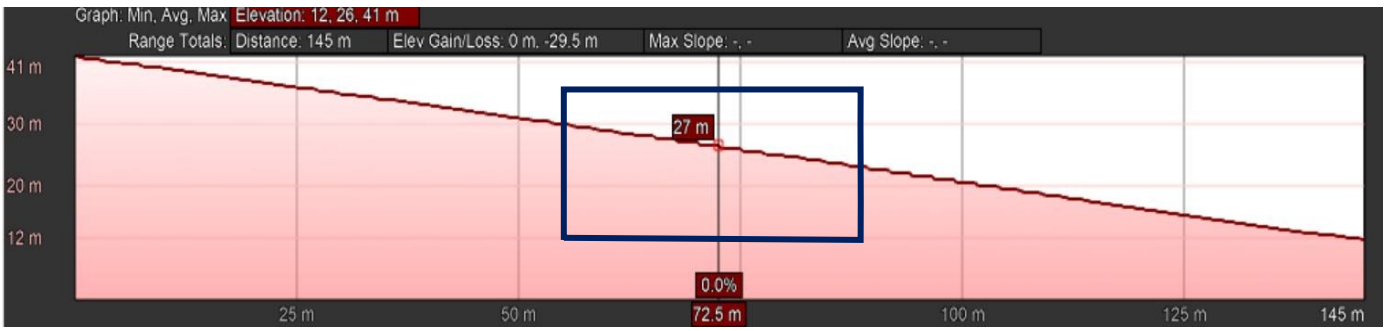
Information provided in the specialist assessments has been used to describe the receiving environment. All mitigation measures and recommendations provided by the specialists has been incorporated into the Assessment of Impacts Table under section 6.0. and the EMPr provided under Appendix E. All specialist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

4.1 PHYSICAL CHARACTERISTICS OF THE SITE

Portion 290 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 6, the gradient rises steeply from the coastal terrace. Section 3.0 of the Geotechnical Investigation Report describes the gradient as follows: "*over the initial roughly 28m the average slope is approximately 1 vertical to 6 horizontal, then over the following roughly 36m the slope steepens to approximately 1 vertical to 2.25 horizontal before flattening again to about 1 vertical to 5 horizontal over the final 20m to its North Beach Road frontage*".

Figure 6: Elevation Profile of the Application Area. Proposed Location of the Main Dwelling for House Du Plessis Indicated by the Blue Rectangle (West to East; Google Earth Pro, 2021).



4.2 GEOGRAPHICAL ATTRIBUTES AND GEOLOGY

A Geotechnical Investigation was completed for the previous EIA in 2007 by Damon Clark Associates. The geotechnical engineer has updated the report to make recommendations on the revised layout. The report is attached under Appendix B. The field investigation showed that "*the site is underlain by a considerable depth of silty and clayey, uniformly grained aeolian sand*". Dynamic Cone Penetrometer Tests show that the consistency of the subsoils is variable ranging from loose to very loose. At a depth of approximately 2.7m, the subsoils are generally medium dense down to approximately 5.7m. The depth to the bedrock increases as one moves up the slope. The uppermost sands are described by the specialist as "cohesionless" and therefore extremely erodible.

The geology of the site is itself 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 Investigation 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.

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 290 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[5].

Despite the disturbance generated by North Beach Road, forming the eastern property boundary and the M4 highway on the western boundary, the vegetation on site is aligned with Northern Coastal Forest habitat with only moderate levels of exotic invasion. Species diversity is largely uniform with the more common species being *Dracaena aletriformis, Strelitzia nicolai, Mimusops caffra, Flagellaria indica, Isoglossa woodi* and *Brachylaena discolor.* Except for portions of the site supporting *Mimusops caffra*, the remaining habitat does not have a clear botanical disjunct within the property. One *Mimusops caffra* (Milkwood) specimen, near the centre of the site, has collapsed naturally. Milkwood trees are listed as a protected tree under the National Forest Act of 1998 and therefore require a permit from DFFE prior to the cutting, removal or disturbance to these trees. The protected trees are shown in Figure 3.

A map indicating the mix of large, woody species (closed canopy forest) and thicket vegetation (F*. burtt davyi, F. indica, I. woodi* and *C. odorata*) has been provided as Figure 14 in the SDP Ecological Assessment. The preferred layout focusses on retaining the forest habitat while the thicket vegetation provides greater opportunity for clearance and development.

As shown in Figure 7, all undeveloped properties along 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 entire property falls within the Ezemvelo KZN Wildlife Critical Biodiversity Area (CBA, Figure 8). 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.

[5] Section 4.0 of the SDP Ecological Assessment (October 2021).

Figure 7: Portion 290 of Lot 44 No. 1570 Outlined in Red, Located with DMOSS (source: eThekwini PublicViewer GIS),

Figure 8: Location of the EKZNW Critical Biodiversity Area (Irreplaceable), Shaded in Pink (Source: SDP Ecological Assessment, Oct 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 290 of Lot 44. No 1570 is located west of North Beach Road and does not fall within the sand sharing system[6]. 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 825m 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).

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)[7].

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.

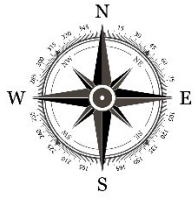
4.7 SOCIO-ECONOMIC PROFILE

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 Du Plessis 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 properties directly north and south are currently undeveloped however there are existing residential developments in close proximity along North Beach Road. The Indian Ocean is directly east, and the M4 highway is directly west of the property.

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

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

[6] Section 4.0 of the SDP Ecological Assessment (October 2021).

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

Figure 9: Photographs Showing the Characteristics of the Site Taken on the 22nd April and 04th June 2021: (a) Entrance to the Site off North Beach Road. Photographer Facing North; (b) Closed Canopy Woody Vegetation Associated with the Lower Portions of the Site; (c) View from the Centre of the Property Facing East Towards the Sea. Thicket / Brush Vegetation is Visible; and (d) Condition of the Woody / Closed Canopy Forest Vegetation on Site.

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

No comments have yet been received on the application. 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 10: 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 Du Plessis (Layout Alternative 2; Technology Alternative 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 465m^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 465m^2. The vegetation that will be cleared includes primarily "brush" or thicket vegetation such as *B. discolor*. Two protected *Mimusops caffra* (Milkwood) species are located within the development footprint; one of which is a collapsed Milkwood tree. The other Milkwood tree may need to be trimmed or removed to accommodate the garden flat. The clearance of indigenous vegetation cannot be fully mitigated however the measures provided below are essential to not only ensure minimal disturbance to the remaining Northern Coastal Forest on site but also to limit destabilization of the slope around the development footprint. • The preferred layout has avoided the larger, woody forest habitat and concentrated development in the eastern portion of the property. The forest canopy has therefore been maintained in the preferred layout. • During 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).	Moderate	Low	4	High

							• Excavation and clearance activities must be carried out exclusively within the extent of the property. • 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 along the northern extent of the property must be retained in order to serve as a visual and noise buffer to the M4. • Where possible, all construction activities and material storage must avoid the unnecessary clearance of trees. • An "*Application for a License Regarding Protected Trees*" must be submitted to DEFF prior to the trimming / clearing of the *Mimusops caffra* tree species behind the garden flat.				

							• 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 surrounding Northern Coastal Forest.	Local	Short-term	Severe	Likely	Moderate	• The main dwelling and garden flat must be constructed on stilts to minimise excavation activities on site (i.e. Technology Alternative 2). • 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. • No earthworks or construction activity is permitted near the drainage feature, located along the southern boundary. • 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	High	Low	4	Moderate

							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: - Placement of fill over the very steep portions of the site should be avoided. - One must not add fill to slopes that are already close to the natural angle of repose of the subsoils (i.e. 28 degrees). - Fills must be benched into the existing slope with minimum bench widths of 3m. - Cut and fill slopes must be formed at angles no steeper than 1 : 1.75 and preferably at no steeper than 1: 2. - In the short term a cut slope of 1 : 1.5 may be used provided the maximum depth of cut is less than 3.m. - The minimum compaction of the fills should be 93% ModAASHTO density,				
	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[8]. This impact is unavoidable but has been the extent of edaphic form and structure change has been reduced using the preferred technology alternative. Technology Alternative 2 accommodates the structures on stilts, reducing the extent of earthworks and therefore change in edaphic form and structure. 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	Low	Very Low	4	High

[8] Section 6.0 of the SDP Ecological Assessment (Oct, 2021).

							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.				
	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
	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.	Moderate	Very Low	5	High

							• 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.				
	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. • 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.	Low	Very Low	5	High
	c. Littering and improper storage / disposal of waste accumulating on site, within neighbouring residential properties or within environmentally sensitive areas (Northern Coastal Forest, drainage feature 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	Low	Very Low	5	High

							is directly adjacent to the large, 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 [9] 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. • 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.				
	d. Improper placement and management of toilet facilities becoming a nuisance to surrounding residents and negatively impacting environmentally sensitive areas (Northern Coastal Forest, drainage feature 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.	Low	Very Low	5	High

[9] 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.

							• 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.				
	e. Incorrect placement of the site camp indirectly impacting environmentally sensitive areas (Northern Coastal Forest, drainage feature and/or beach).	Local	Short-term	Substantial	Likely	Low	• The site camp must not be located above the main dwelling / underneath the large 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 Du Plessis.	**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	Moderate	Low	4	High

							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. • Recommendations provided in the Geotechnical Investigation must be adhered to. These are as follows: - Short- and long-term stormwater control berms must be formed at the tops of banks to prevent concentrated stormwater - Appreciable uncontrolled volumes of stormwater should not be allowed to concentrate at any point on the site. - Strategically positioned rows of sandbags and silt control fences to reduce potential scour during construction. - To minimise the risks of severe scour all banks should be vegetated as soon as is practicable. The type of vegetation utilised on the banks should be deep rooted (to be further advised by the ECO).				
	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 Procedure provided in section 5.4.1 of the EMPr.	Low	Very Low	5	Moderate

							• 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	Likely	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 preferred layout footprint must be strictly adhered to. • Access to the office pod and swimming pool area must be gained underneath the forest canopy (i.e. no clearing of trees). • During the establishment of the office pod and construction of the swimming pool, only small machinery is permitted (i.e. bobcat, mini excavator etc.). Minor excavations should preferably be carried out by hand where practical. • A shade cloth fence must be erected between construction activities and the adjacent forest / DMOSS areas (drawn in yellow 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.	High	Low	4	High

							• 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 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 57A 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 preferred layout alternative however the following mitigation measures must be	Moderate	Low	4	Moderate

							implemented during the planning and operational phases to ensure the Northern Coastal Forest 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 Du Plessis (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 (i.e. palisade fence is preferred compared to a ClearVu fence). • 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. • Should there be any landscaping carried out on site, this must not encroach into the closed canopy / woody habitat (shaded in green in Figure 11). Species used in landscaping must be species found in coastal dune habitat. • 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 Du Plessis 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 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*"[10]. No further mitigation was provided.	Very Low	Very Low	5	High
	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 following measures must be incorporated into the Stormwater Management Plan: • 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. • Stormwater must not be directed into the drainage feature which runs along the southern boundary.	Moderate	Low	5	High

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

CUMULATIVE										
5. Development of House Du Plessis 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 Du Plessis will contribute to the overall transformation of Northern Coastal Forest habitat in the Westbrook area[11]. As above, the total area of vegetation cleared is 465m^2. The preferred layout and technology alternatives reduce the level of habitat transformation at 57A North Beach Road. No closed canopy / natural forest will be cleared with the structures being placed within thicket / brush vegetation or underneath the forest canopy. Trimming of some trees may be necessary during construction. One Milkwood tree may be cleared to accommodate the driveway / garden flat. The remaining Northern Coastal Forest habitat will be retained as DMOSS by the applicant. 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. • Since the development is a private residential development, no upgrades are required for the existing road network.	Very Low	Very Low	5	High

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

Table 7: Assessment of Impacts Associated with the Alternative Layout and Technology Alternatives for House Du Plessis (Layout Alternative 1; Technology Alternative 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 800m² 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 800m². This is an additional 335m² of vegetation compared to the preferred layout alternative. The two BnB units are placed within the closed forest canopy, in the western portion of the property. Layout Alternative 2 will therefore result in the clearance of more vegetation as well as the fragmentation of forest habitat. Infrastructure is spread across the site and not confined to thicket / brush vegetation, as per the preferred Layout Alternative. This impact therefore has a greater severity and a higher significance rating compared to the preferred Layout Alternative. In addition to the mitigation measures provided in Table 6 for the preferred alternative, the following would be required: • An "*Application for a License Regarding Natural Forest*" must be submitted to DEFF prior to the clearance of closed canopy forest to accommodate the BnB units.	High	Moderate	2	Moderate
	b. Erosion of banks / dune movement during site excavations impacting surrounding Northern Coastal Forest.	Site	Short-term	Severe	Very Likely	Moderate	Technology Alternative 1 requires significantly more cut and fill to accommodate the main dwelling and garden flat on platforms compared to the cantilevered structure, which is the preferred technology alternative. Similar mitigation measures provided in Table 6 above would need to be implemented however the probability of this impact occurring is increased. The significance rating, after mitigation, remains moderate for Technology Alternative 1.	High	Moderate	3	High

	c. Change in edaphic form and structure (SDP, 2021).	Local	Long-term	Substantial	Very Likely	Moderate	As above, Technology Alternative 1 requires more substantial earthworks to create the platforms to accommodate the main dwelling and garden flat. Proposed infrastructure is also more spread out across the site During construction, there will therefore be a more significant change in edaphic form and structure. The severity and probability of the impact occurring has increased. Mitigation measures provided in the Table 6 are still applicable.	Moderate	Moderate	3	High
	d. Negative impact on local fauna residing, foraging and /or moving through the site.	Local	Long-term	Moderate	Very Likely	Low	In the long-term, Technology Alternative 1 will provide less refugia for local faunal species as the structures will be constructed on the ground. The stilted design is preferred as it "*alleviates direct impact onto the receiving environment and allows for some faunal refugia*"[12]. This impact therefore has a higher probability of occurring and a more significant risk rating. Mitigation measures provided in the Table 6 are still applicable during construction.	Low	Low	3	High
	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 1 and Technology Alternative 1.										
3. Construction of House Du Plessis.	**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.										

[12] Executive Summary of the SDP Ecological Assessment (October 2021).

	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	The BnB units are located within the large, closed canopy forest in the western portion of the site. There will therefore be unavoidable encroachment and disturbance to the Northern Coastal Forest and DMOSS area. The installation of shade cloth fences to demarcate the forest no go areas will not be feasible and only a portion of the forest would become a No-Go area. 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 auditing frequency must be increased to once a week, with one monthly report submitted to the competent authority. • Any significant disturbance / damage to the surrounding forest environment, outside of the authorised development footprint, must be demarcated and rehabilitated. The significance of this impact remains high risk, after mitigation, as the probability of this impact occurring is "very likely" due to the positioning of the structures within the forest habitat (Layout Alt 2).	High	High	2	High
	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 1 and Technology Alternative 1.									
OPERATION											
4. General residential activities at 57A North Beach Road.	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.										
CUMULATIVE											
5. Development of House Du Plessis along the coastal strip in 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 2 and Technology Alternative 2 & 3.										

7.0 ENVIRONMENTAL IMPACT STATEMENT

7.1 SUMMARY OF KEY FINDINGS (POSITIVE AND NEGATIVE IMPACTS)

Proposed House Du Plessis, located at 57A 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 to very loose subsoils giving rise to a sensitive and dynamic dune environment susceptible to minor changes in slope and vegetation clearance. The placement of the structures (i.e. preferred layout) and the design of the main dwelling and garden flat (i.e. preferred technology alternative) have reduced the severity and significance of impacts on the sensitive Northern Coastal Forest environment which is prevalent across the site.

Despite the relatively small footprint of 465m^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 largely limited to the thicket vegetation. The main dwelling and garden flat are cantilevered, which reduces the physical impact on the receiving environment (preferred Technology Alternative).
- The preferred layout and technology alternatives allow for the retention of protected tree species and natural forest area as well as 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. Stormwater runoff must be attenuated on site and allowed 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.
- One protected tree species may need to be trimmed or cleared to accommodate the driveway and garden flat. A permit from DEFF must be obtained prior to the trimming or clearance taking place.
- The long-term / operational phase of House Du Plessis 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 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 Du Plessis.

Primary Impact Management Outcome: *To create a sustainable development by constraining the development footprint to avoid woody vegetation with closed canopies.*		
#	**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. Should access be required during construction, vehicles and staff must traverse underneath the forest canopy with no clearing of trees permitted. 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 Du Plessis 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 Du Plessis, as per the preferred layout and technology alternative, be authorised by EDTEA (Layout Alt 1; Technology Alt 1). The Preferred Layout Alternative, attached under Appendix C, must be strictly adhered to. No infrastructure or construction related activities must take place within 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 Du Plessis 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.
- Should access through the woody forest habitat be required during construction, vehicles and staff must traverse underneath the forest canopy with no clearing of trees permitted (i.e. from the main dwelling to the office pod).
- 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 the clearance of the protected Milkwood trees on site. The remaining Milkwood trees must be identified and marked prior to construction commencing.
- 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.
    - Where feasible, porous or permeable attenuation chambers that promote percolation of water into the surrounding soils must be established. This system must allow for onsite discharge of waters into surrounding soils and accommodate smaller rainfall episodes. Larger events, such as those > 1 : 2 year events must be discharged into the municipal stormwater system associated with the roadway.
- 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 Du Plessis at 57A North beach Road, Westbrook Showing Sensitive Environmental Areas to be Avoided During Construction.