HERITAGE IMPACT ASSESSMENT

PROPOSED REZONING AND RESIDENTIAL DEVELOPMENT ON ERF 155 KEURBOOMSTRAND, PLETTENBERG BAY

Submitted to
Eco Route Environmental Consultancy

Prepared by

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7 November 2025

HWC CASE REFERENCE: 21060110AM0615E

EXECUTIVE SUMMARY

Hearth Heritage was appointed to prepare a Heritage Impact Assessment (HIA) for the proposed development at Keurboomstrand, Bitou Municipality, Western Cape. The proposal is to subdivide and rezone Erf 155 from Open Space Zone II to Residential Zone II to enable the development of private dwelling houses. This HIA is an assessment of a new iteration of the proposed development which is responding to the previous 2022 comment and recommendations from HWC and other decision-making authorities.

1. Site description

An eastern portion of the Open Space zoned Erf 155, Keurboomstrand situated adjacent to the beach road approximately 10km north-east of Plettenberg Bay in the Bitou Municipality, Western Cape Province and neighbouring public place Erf 391.

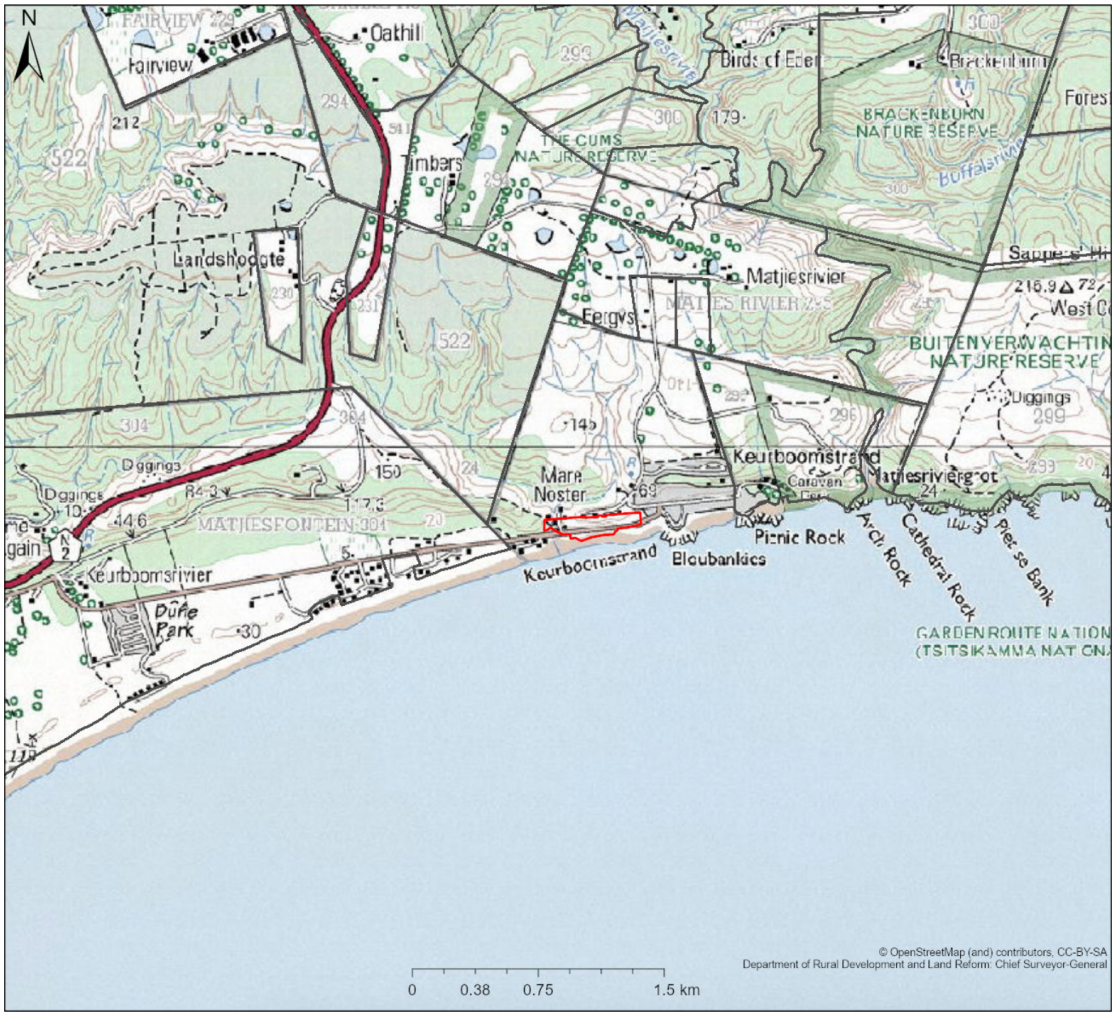


Figure 1: Locality Re/155 Keurboomstrand

Figure 2: Location of eastern portion (yellow) of Erf 155, Keurboomstrand (purple), identified for development.

2. Description of proposed development

The proposed development (Keurboomstrand Residential Housing Development on Erf 155 in Keurboomstrand) involves the subdivision of Erf 155 and rezoning of a portion thereof for the construction of three separate dwelling houses in a sectional title development. The subject site to be rezoned and developed measures 56 615,4m² in extent.

The proposed subject site's property boundary is flanked by residential erven (Erven 15, 20 and 565) and shares property boundaries with public place (Erf 391), undeveloped publicly accessible land (Erf 152) and the Main Road 394 road reserve. The current zoning of Erf 155 is Residential Zone II, while the portion of the property relevant to this NID is zoned as Open Space Zone II (private open space). The planning application is made in terms of the Bitou Municipal Land Use Planning Bylaw (Western Cape Government, 2015) Section 15 (2)(a) for a rezoning to Residential Zone II; and Section 15 (2)(d) for subdivision, and to register a servitude right of way access over public place Erf 391 alongside (to connect the proposed development via a driveway to Main Street north of the site).

The most recent iteration of the proposed development (developed by Slee, 2025) is the Preferred Alternative that will be assessed in this report. For comparison to the previous alternative, refer to the 2022 HIA.

Figure 3: 2025 Preferred alternative site plan and section (Slee, 2025)

3. Heritage Resources Identified

Archaeology

From an archaeological heritage perspective, there is no evidence of historic or prehistoric occupation of the site. The Provincial Heritage Site of Matjies River Rock Shelter occurs in the wider area (https://sahris.sahra.org.za/) but will not be affected in any way by the proposed development.

Palaeontology

Published geological maps indicate that the project area is underlain by Early Devonian marine to coastal sediments of the Baviaanskloof Formation (uppermost Table Mountain Group). Elsewhere along the Southern Cape coast dark, organic-rich mudrocks within this formation contain important, largely unstudied fossils of primitive land plants while a small range of shelly invertebrate and trace fossils occur within sandstone facies in parts of the Western Cape. A recent site visit shows that the bedrocks beneath the development footprint in fact belong to the slightly younger Early Devonian Gydo Formation (lowermost Bokkeveld Group) which has yielded a range of marine shelly invertebrate fossils from the Keurboomstrand area in the past (Oosthuizen 1984). However, the Gydo Formation bedrocks in and around the project area are tectonically deformed (pervasive cleavage, folded). Sparse shelly fossils recorded near-surface here (brachiopods, bivalves, corals, crinoids etc) are poorly preserved due to deformation and secondary mineralisation; their conservation value is accordingly low. The overlying Late Caenozoic superficial sediments (colluvium, coversands, soils etc) are largely or entirely unfossiliferous.

Visual impact on Cultural Landscape

The overall landscape character of the receiving environment is predominantly coastal, with a diverse mix of landscape types both natural (river, estuary, forest, dunes, rocky headlands and vegetated foot slopes) and transformed (urban areas, agricultural land, rural settlements and resorts).

The landscape character of Keurboomstrand is dual, encompassing both (a) the sparsely developed dune slack/floodplain area with an open, rural character between the vegetated foothill and the crenulate bay dune system; and (b) the compact, densely vegetated Keurboomstrand town proper situated on the steep foothill slopes with a distinctive resort-town character.

The sense of place is derived (especially at a local scale) from the scenic resources of the coastline, which are based on natural features. These include the sandy (blue flag) beaches, rocky promontories, vegetated primary dunes and dune slack areas, and the steep forested foothills that meet the rocky coastline.

The study area and receiving environment can be described as having a strong landscape character and a distinctive sense of place (albeit dual and localised). The greater receiving environment contains recognizable landmarks, landscape features and vistas as part of the Garden Route. The local receiving environment is unique and distinctive within the coastal belt, based on both the local townscape character and the value of the natural and scenic resources.

The landscape contains some intrusions or discordant structures and activities, and the Keurboomstrand town itself contributes to the erosion of landscape integrity. The intactness of the landscape in the study area increases as its integrity and quality increase toward the east, where the landscape has formal protection under conservation areas. The townscape character is generally eroded by buildings exceeding two storeys, with large footprints, excessive glazing, fencing, impermeable boundary walls and large unarticulated facades, as well as buildings that do not “nestle” into the landscape. The townscape character can accommodate buildings visible above the line of vegetation, but generally not exceeding one storey.

Landscape Quality in the receiving environment is high; and the Landscape integrity is moderate to high.

The Aesthetic value of the Visual Resource is Moderate to High, as the receiving environment exhibits:
● A positive character with valued features that combine to give the experience of unity, richness and harmony (high aesthetic value);
● As well as evidence of alteration to /degradation/erosion of features resulting in areas of more mixed character (moderate aesthetic value).

4. Anticipated impacts on heritage resources

Archaeology
The findings of the Archaeological impact Assessment (Nilssen, site is regarded to be of low to negligible sensitivity from an archaeological perspective. Even though the well known archaeological and Provincial Heritage Site of Matjies River Rock Shelter occurs in the wider area (https://sahris.sahra.org.za/), it will not be impacted in any way by development on Erven 155 and 391.

Palaeontology
It is concluded that the palaeosensitivity of the bedrocks and cover sediments is low overall, while the impact significance of the proposed small housing development is also LOW.

Visual Impact on Landscape Character
The findings of the Visual Impact assessment (Filia, 2025) indicate that the proposed development will have a LOW to MEDIUM overall impact for the 2025 preferred alternative.

The current 2025 tabled proposal is the most similar to the previously assessed Alternative 1, which was expected to have the lowest visual impact of the alternatives under consideration at the time, according to the 2022 VIA.

5. Recommendations

Archaeology and palaeontology

According to the specialist reports, there is no evidence of historic or prehistoric occupation of the site. Consequently, the site is regarded to be of low to negligible sensitivity from an archaeological and palaeontological heritage perspective and there are no objections to the proposed residential development on Erf 155 on condition that:

1. Due to the dense vegetation and limited archaeological visibility, a suitably qualified archaeologist should do a foot survey of the site intermittently during clearing of vegetation and once vegetation has been finally cleared before any earthworks are to commence.
2. Although unlikely, there may be buried or currently hidden archaeological material, including human remains, present on site and should these be uncovered or exposed during excavations or vegetation clearing, HWC should be notified immediately and all development work on site (preconstruction included) should be halted until these finds are investigated by HWC (Att: Ms Waseefa Dhansay 021 483 9685).
3. No negative impact to significant palaeontological heritage is anticipated as the palaeontological sensitivity of the geology of the development area is considered to be very low and there are no

objections on palaeontological heritage grounds. In the event of important fossil material being identified during excavations, the HWC Fossil Finds Procedure must be implemented.

Visual and landscape character

Due to the high value and sensitivity of the receiving environment, landscape character and the visual receptors, it is extremely important that a responsible and enforceable design approach be taken for the planning, construction and operational phases of each dwelling unit and the development as a whole, taking care to minimize the visual impact wherever possible. The Site Development Plan (SDP) and building plans must demonstrate adherence to the recommendations of this report in order for visual impact to be managed successfully.

As a condition of approval for the Rezoning and Subdivision Land use planning approval (this approval), the following visual sensitivity parameters must be strictly adhered to. Adherence to these limitations must be evident in all plans, sections, elevations, axonometric drawings and Site plans submitted for this and future levels of approval:

1. A 35m scenic route setback line measured from the centre line of the MR394 road reserve must be clearly indicated on all plans and technical drawings;
2. Additional 5m setback from the eastern botanical and slope sensitivity no-go areas must be clearly indicated on all plans and technical drawings;
3. The "Developable Area" must be clearly indicated on all plans and technical drawings (Site plans, SDP, building plans etc.);
4. Height restriction of 8m must be clearly indicated in relevant drawings (e.g.; sections, elevations).

As a condition of approval for the Rezoning and Subdivision Land use planning approval (this approval), this VIA recommends that the following documents and plans be submitted along with SDP and building plans to the local municipality for approval:

5. A **Landscape Plan and Landscape Guidelines (including vegetation protection methodology)** by a suitably experienced and qualified professional, registered with SACLAP (refer to Item 7.2.4 for detailed requirements);
6. An **Environmental Management Programme (EMPr)** by a suitably experienced and qualified professional (refer to Item 7.2.4 for detailed requirements).
7. **Architectural Guidelines** by a suitably experienced and qualified professional, registered with SACAP.

The project documentation describing the proposed development at this time is limited to a hand-drawn site plan and section, supported by a Plan view and two simulations. The visual specialist cannot vouch for the accuracy of the simulations in the absence of a 3D model or more detailed architectural drawings.

The following **additional information** must be displayed on plans and/or provided for this submission:

8. Please ensure that the layouts and details of the proposed development on the "site plan" and "plan view" are in agreement.
9. The site plan should include the following details:
    a) The location and footprint of the new sewer conservancy tank, including area to be cleared for its construction;
    b) The sewer line (including footprint and area that will be disturbed for its construction);
    c) The connection to the water main (including the vegetation clearance required to establish this line);

d) The adjoining erf 391 must be shown on the site plan, as well as the design and layout of the new private road that will be installed across public land to the north of the proposed dwellings.

Key conditions and mitigation measures that should be noted (in summary) include:

10. No structures, including a swimming pool, may be sited and constructed within the no-go areas, within the 35m scenic route setback line or the 5m botanical/slope sensitivity setback line. Except for the absolutely necessary linear infrastructure, no areas outside of the approximately 1448m² "developable area" may be disturbed.
11. The building envelope, including chimneys, must not protrude above the 8m height restriction (this VIA recommends that the existing ground level (NGL) is the base level from which maximum height permitted is measured so that the height restriction slopes parallel to the existing ground level);
12. The colour palette for materiality and finishes must draw on the colouring of the natural environment, preferencing mid-tone to darker colouring to blend with forest vegetation. If natural material such as stone is used, the stone must be locally sourced and match the colouring (and, if possible, the geological origins) of the site and receiving environment. Materials and finishes may not consist of bright colours, highly reflective surfaces or gratuitous use of glass. Curtain walls, windows, skylights and other glazing features must be shaded/set back under overhangs or similar to prevent glare, especially in the direction of sensitive receptors identified. The use of exposed metal must be kept to a bare minimum, and any potentially shiny or reflective surfaces must be avoided altogether, or covered with matte, non-reflective finishes.
13. All construction activities must be limited to the approved building footprint and a 2m offset buffer zone all around the building footprint.
    a) Limited and appropriate soft landscaping may extend further than the 2m offset around the buildings within the Moderate and Low sensitivity areas (refer to the Sensitivity map), but should avoid the protected forest and fynbos vegetation areas (High and Very high sensitivity).
14. The Landscape Plan must include a Vegetation protection methodology to manage Construction phase impacts on vegetation (before, during and after), including guidelines on the re-establishment, replacement and/or rehabilitation of vegetation per vegetation type in the case of disturbance.
15. No fence or wall should be permitted adjacent to and/or within view of the Scenic route, or within the 35m setback area as indicated on the Visual Sensitivity map. All fencing must be visually permeable and no post top lighting, flood lights, peripheral/boundary security lights or uncovered luminaires of any kind should be allowed.
16. All exterior lighting shall be located and controlled so as to avoid direct illumination, glare or reflection onto any adjoining property or the scenic drive; provide precisely directed illumination to reduce light "spillage" beyond the immediate surrounds of the light source, and should preferably be movement activated.
17. The Landscape plan at SDP stage must show screening and softening of the building edges on the southern side of the buildings. The aim is to visually screen the first storey of the proposed development from the Scenic route views up the slope (the expectation is not that the building will be hidden, but rather that the screening vegetation allows the buildings to blend into the visual context more easily by reducing the starkness of new built features; especially where these meet the surrounding landscape).
18. Prior to the beginning of the Construction phase, sensitive vegetation must be marked clearly and the rootzones of protected species and areas must be demarcated and made off limits to prevent compaction of soil and damage to the root zones.
19. Please refer to Item 7.2.5 for mitigation measures to be included in the EMPr.

Should the conceptual architectural proposal undergo significant change (especially in terms of height, siting, building envelope and massing, fencing, lighting and perimeter treatment or any feature that would

constitute a change to the visual impact of the proposed development), a Visual statement must be prepared by a suitably qualified visual specialist to determine if the findings of this study remain unchanged.

This 2025 revision of the VIA finds that the Preferred Alternative can be endorsed from a visual impact management point of view, but only conditionally. Additional information is needed, and the proposed development must demonstrate complete compliance with the visual sensitivity setbacks as well as the mitigation measures and recommendations set out in Chapter 7 of this VIA either at this time, or at the appropriate time within future application processes (i.e. SDP approval and building plan approval stage).

Conclusion

DEA&DP recommended that all future development in Keurboomstrand have low Visual impacts. The VIA has determined that visual impacts of Low to Moderate Significance will result from the development of the proposed Erf 155 Keurboomstrand project, without mitigation.

The assessment of various iterations of the proposed development has indicated that the proposal cannot meet the requirements of DEA&DP for low visual impacts overall. However, the VIA found that the proposed development may be supported in principle at this level of development approval (EIA and Land Use planning), if additional information is provided for this application, and if the recommendations and mitigation measures of the VIA (and the visual sensitivity setbacks provided) are strictly adhered to.

If a final submission of the application ensures that the above conditions are met (and various other recommendations are meaningfully responded to at the appropriate time), the following additional mitigation measure shall apply:

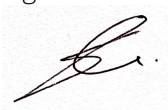
i. The SDP planning phase must allow for a brief desktop review of the final application by a suitably qualified visual specialist before submission at SDP stage to re-assess visual impact and check the proposal against the recommendations contained in this VIA, when more detailed information is available.

Should the architectural proposal undergo significant change during further design processes, a visual impact statement must be issued by a suitably qualified specialist to re-assess the potential visual impact and determine if the findings of this study remain unchanged.

Author Declaration of Independence

I, Emmylou Bailey, hereby declare that I act as an independent, objective specialist in this assessment and that I do not and will not have any financial interest in the undertaking of the proposed activity, other than remuneration for my work performed according to the National Heritage Resources Act (25 of 1999).

Signature E Rabe Bailey



June 2022 / Updated November 2025

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1. INTRODUCTION

1.1 HERITAGE PROCESS TO DATE

This HIA is an assessment of the 2025 preferred alternative development proposal (Slee, 2025) based on the conclusions and recommendations from the 2022 HIA (Hearth Heritage) which were supported and endorsed by HWC IACom and APM committees in their final comment (22 July 2022) as well as the updated VIA (Filia, 2025).

A NID for a previous proposed development was submitted to Heritage Western Cape's Archaeology, Palaeontology and Meteorites Committee on 16 July 2021 and resulted in the Record of Decision request for an Heritage Impact Assessment that included specifically a desktop Archaeological Impact Assessment, Palaeontological Impact Assessment and Visual Impact Assessment. An HIA was prepared to fulfill the request from HWC APM Committee and consisted of an integrated desktop HIA compiling the information from the AIA by Peter Nilssen (2021), PIA by John Almond (2021) and VIA prepared by Filia (Feb 2022). The HIA (June 2022) was submitted to HWC IACom and APM Committees for comment which was received from HWC on 22 July 2022 with the following final comment:

> HWC FINAL COMMENT (July 2022)
> The IACom Committee notes that heritage resources are not impacted negatively by the proposal. The IACom Committee endorses the APM Committee comments as follows; the APM Committee endorsed the recommendations for mitigation of archaeology and palaeontology on page 43 of the HIA (Hearth Heritage dated June 2022):
> 1. Due to the dense vegetation and limited archaeological visibility, a suitably qualified archaeologist should do a foot survey of the site intermittently during clearing of vegetation and once vegetation has been finally cleared before any earthworks are to commence.
> 2. Although unlikely, there may be buried or currently hidden archaeological material including human remains, present on site and should these be uncovered or exposed during excavations or vegetation clearing, HWC should be notified immediately an all- development work on site (preconstruction included) should be halted until these finds are investigated by HWC (Att: Ms Waseefa Dhansay 021 483 9685).
> 3. No negative impact to significant palaeontological heritage is anticipated as the palaeontological sensitivity of the geology of the development area is considered to be very low and there are no objections on palaeontological heritage grounds. In the event of important fossil material being identified during excavations, the HWC Fossil Finds Procedure must be implemented.
>
> The IACom Committee endorses the HIA prepared by Hearth Heritage and dated June 2022 as meeting requirement of S.38(3) of the NHRA and supports recommendations that:
> To augment the botanical and geotechnical sensitivity mapping, the following visual sensitivity parameters have been established and should be adhered to in the final proposal for all alternatives:
> a) A 35m Scenic route setback(offset) that delineates a no-go area for development on the site from the part of the receiving environment with the highest exposure and sensitivity;
> b) Additional 5m offset from the eastern ecological and slope sensitivity exclusion area, to ensure that the dense forest vegetation screening views of the proposed development from the east remains unaffected by development.
> c) Adherence to the key parameters of the Architectural Guidelines (Pg 118, Smit VIA, 2022).

Due to the high value and sensitivity of the receiving environment, landscape character and the visual receptors, it is extremely important that a responsible and enforceable design approach be taken for the planning, construction and operational phases of each dwelling unit and the development as a whole, taking care to minimize the visual impact wherever possible.

Given that none of the Alternatives are compliant with the visual sensitivity parameters, the proposal should be revised to avoid biodiversity and visual impacts, by proposing buildings within the developable area only (indicated by the Botanical, Geotechnical and Visual sensitivity offsets and no-go areas).

1.2 BACKGROUND TO DEVELOPMENT PROPOSAL

The proposed development (Keurboomstrand Residential Housing Development on Erf 155 in Keurboomstrand) involves the subdivision of Erf 155 and rezoning of a portion thereof for the construction of three separate dwelling houses in a sectional title development. The subject site to be rezoned and developed measures 56 615,4m² in extent.

Figure 4: Location of eastern portion (yellow) of Erf 155, Keurboomstrand (purple), identified for development

The proposed subject site's property boundary is flanked by residential erven (Erven 15, 20 and 565) and shares property boundaries with public place (Erf 391), undeveloped publicly accessible land (Erf 152) and the Main Road 394 road reserve. The current zoning of Erf 155 is Residential Zone II, while the portion of the property relevant to this NID is zoned as Open Space Zone II (private open space). The planning

application is made in terms of the Bitou Municipal Land Use Planning Bylaw (Western Cape Government, 2015) Section 15 (2)(a) for a rezoning to Residential Zone II; and Section 15 (2)(d) for subdivision, and to register a servitude right of way access over public place Erf 391 alongside (to connect the proposed development via a driveway to Main Street north of the site).

The most recent iteration of the proposed development (developed by Slee, 2025) is the Preferred Alternative that will be assessed in this report. For comparison to the previous alternative, refer to the 2022 HIA.

Figure 5: 2025 Preferred alternative site development plan and section (Slee, 2025)

1.3 DESCRIPTION OF PROPERTY

The project is located within Plettenberg Bay, which is part of the Bitou Local Municipal area in the Eden District of the Western Cape. Plettenberg bay is typical of the crenulate bays along the Eden District Municipality coast, with exposed western rock headlands, long, sheltered sandy beaches extending eastward from the headlands and an estuary at the western side of the bay. The Cape Fold Mountains (the Outeniqua range) are a ubiquitous presence in the region, their marches delineating the extent of the famous Garden Route between the mountains and the coast. Major and minor river valleys extend across the inland plateau where the mountainous topography (generally covered by natural and commercial forest) gives way to a coastal corridor of undulating coastal plains, rocky headlands, flood plains, estuaries and sandy beaches at the coast.

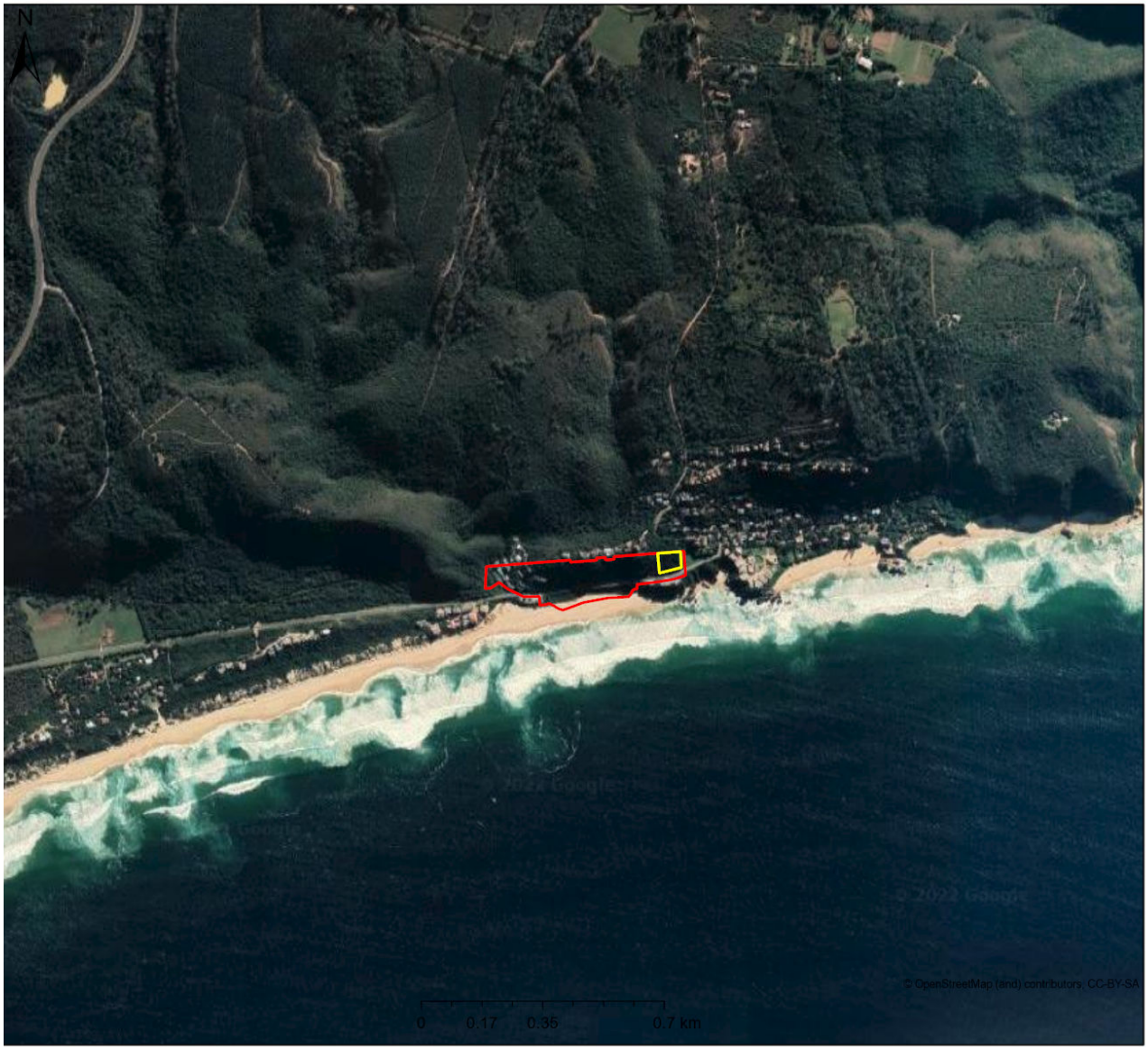


Figure 6: Surrounding landscape of RE/ 155 Keurboomstrand, proposed for subdivision, shown in red with Portion A, proposed for rezoning and development, shown in yellow. (Scale 1:18 056)

The subject site is undeveloped, containing no existing buildings, services or infrastructure (with one exception being some decommissioned water pipelines and associated infrastructure). It is offset from the nearest road (Main Street) by the 27m width of the adjoining public place (Erf 391), which shares its northern boundary. Its southern boundary is delineated by the 25m wide road servitude set out for Main Road 394, which is the main access and entrance road for the whole of the Keurboomstrand town. The eastern and western boundaries are shared with Erf 152 and Erf 155, respectively.

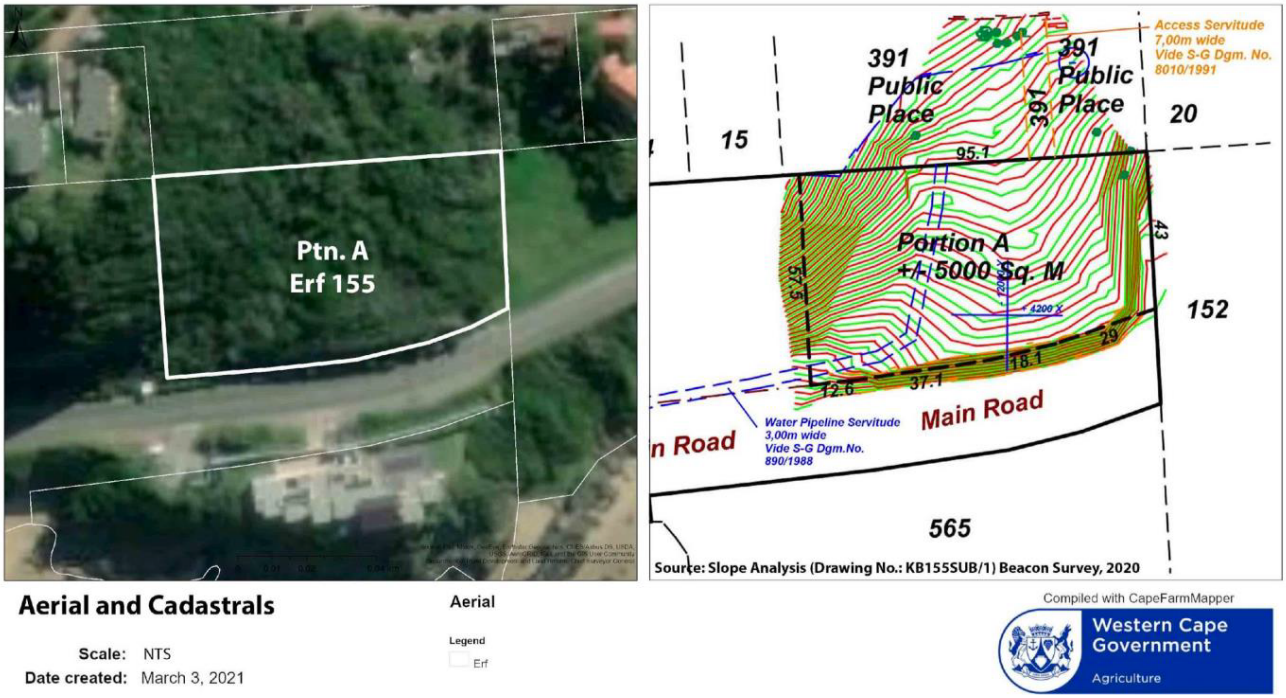


Figure 7: Aerial image of site alongside site survey (Smit, 2021)

Existing residential buildings are located up-slope to the north east (Erven 15, 14, 13 etc.) and north west (Erven 20, 21, 22 etc.) of the site, with the majority of the town being located to the east. The recently developed Erf 565 is located 25m downslope of the site. The adjoining public place (Erf 391) is not utilised as a public space despite its zoning, houses a water reservoir and associated infrastructure, and does not appear to be part of an integrated corridor or network of public places. Erf 152 contains an open grassed area that appears to have some local amenity, and is one of a string of open areas at the foot of the coastal dune ridge that are accessible by the wide pedestrian pathway that runs along the entire length of the Main Road 394. A bus stop is located at the south-western corner of the site, along the pedestrian route, and across from a small viewing area across the road, and west of Erf 565.

2. METHODOLOGY

2.1 PURPOSE of HIA

This HIA is an assessment of the 2025 preferred alternative development proposal (Slee, 2025) based on the conclusions and recommendations from the 2022 HIA (Hearth Heritage) which were supported and endorsed by HWC IACom and APM committees in their final comment (22 July 2022) as well as the updated VIA (Filia, 2025).

A Notification of Intent to Develop (NID) for the previous proposed development was submitted to HWC's APM Committee on 16 July 2021 and resulted in the ROD request for an Heritage Impact Assessment that included specifically a desktop Archaeological Impact Assessment (AIA), Palaeontological Impact Assessment (PIA) and Visual Impact Assessment (VIA). An HIA was prepared by Hearth Heritage (June 2022) to fulfill the request from HWC APM Committee and consisted of an integrated desktop HIA compiling the information from the AIA by Peter Nilssen (2021), PIA by John Almond (2021) and VIA prepared by Filia (Feb 2022) to satisfy the requirements of section 38(8), and therefore section 38(3) of the National Heritage Resources Act (25 of 1999). The HIA (June 2022) was submitted to HWC IACom and APM Committees for comment which was received from HWC on 22 July 2022.

2.2 SUMMARY OF STEPS FOLLOWED

AIA, PIA (2021 and 2022) and VIA (2021, 2022, 2025) specialist impact assessment reports for the development were reviewed. The specialists had independently conducted site surveys and the information was used to inform this HIA. The identified heritage resources were assessed for significance taking into account the information received from the specialists in terms of the grading as set out in Section 3 of the NHRA. An integrated desktop HIA was compiled using the information from the specialist reports with the addition of historical background information and a review of other relevant impact assessments in the broader area as available on SAHRIS.

2.3 CONSTRAINTS AND LIMITATIONS

The author of this desktop HIA did not conduct an independent field survey and, other than the historical background and desktop review of other impact assessment reports, the information contained in this HIA largely relies on the information from the specialist reports as requested by the clients, Virdus Works (2022) and Eco Route Environmental Consultancy (2025).

From the Keurboomstrand AIA (Nilssen, 2021) and other AIA's in the area, it seems that dense vegetation in the area severely limited foot accessibility to much of the site as well as archaeological visibility.

3. HISTORY AND EVOLUTION OF SITE AND CONTEXT

3.1 HISTORAL BACKGROUND OF THE AREA

Historical information on the study area is scant, focusing largely on the origins and development of Plettenberg Bay.

Nelson Bay Cave on the Robberg Peninsula and Matjes River Cave on Keurbooms, both near Plettenberg Bay, attest to the Middle and Late Stone Age occupation of the Bitou area that dates from a few hundred to 125 000 years ago[1]. As with other coastal sites along the southern Cape, the cultural material at Matjes River rock shelter, some 1km east of the Keurbooms River includes bone tools, shell ornaments, OES and a painted burial stone. The shelter contains shell deposits over 10 metres deep and appear to have been accumulated as a result of human occupation over the last 12 000 years[2]. There are many other archaeological sites in the Tsitsikamma mountains and it is common knowledge that there are numerous rock shelters and caves with evidence of human occupation.

Occupation of the area by hunter-gatherer and, later, herder groups would have continued well into the recent past when European explorers such as Bartholomew Dias arrived, often unplanned, on the south-eastern Cape shores during the 15th and 16th centuries while chartering the shorelines and bays. Portuguese explorers from the *Sao Gonçalo* were ship-wrecked nearby in 1630 for eight months which was the first European settlement in South Africa.

Baron Joachim Ammena van Plettenberg was the governor of the Cape of Good Hope from 11 August 1771 to 14 February 1785. On 18 May 1774 he was permanently appointed as governor. He himself made several tours to determine the borders of the Cape-Colony and visited 47 outposts. Among others he let erect a column for the Dutch East India Company (VOC) on 6 November 1778, the so-called Van Plettenberg Beacon. Since then the place where it was erected is called Plettenberg Bay. The town of Plettenberg Bay was named after him in 1779. In 1763 the first white settlers in the Bay were stock farmers, hunters and frontiersmen from the Western Cape.

"Infamous historical figures [associated with the area] include the leader of the Griquas, Andrew Abraham Stockenström le Fleur, who by his people, was looked upon as a new Messiah. The name of Le Fleur is intimately associated with the history of the Griqua people in this area and his grave can be seen in the village of Kranshoek on the Robberg/Airport Road. "The griquas, a proud and deeply religious people, are spread all over South Africa. Their largest settlement is at Kranshoek, 13 kms west of Plett town. Kranshoek's central board is registered as the Griqua National Council and, together with other groups at Kurland (to the north of Plett) and Bloulelies (to the east of Storms River), its people supply a substantial part of the town's craft skills and wider labour force. The Griqua population is unique. Descended from the Khoisan people, the griquas were, after the arrival of the Europeans, driven again and again from any part of the country in which they sought to settle, including the widely-separated regions still popularly known as East Griqualand and Griqualand West. The desire for some piece of land they could call their own has been

[1] Peeling Away the Past: The Display of Excavations at Nelson Bay Cave, by Janette Deacon and Michael Brett © 1993 South African Archaeological Society

[2] Webley, 2004.

unwavering and was what led a large number of them, after centuries of wandering, towards a land where there would be springs and green grass... It also gave rise to angry confrontations with authority and even litigation at the beginning of the 20th century"[3].

A woodcutter's post was established in 1787 and Johann Jacob Jerling, an early inhabitant, was commissioned by the Dutch East India Co. to build a storehouse for house timber, which was to be exported. In the 1800's the growing timber trade led to Thomas Bain building Prince Alfred Pass (1868) and the 90km forest road through the Tsitsikamma to Humansdorp. Three major passes had to be constructed: Groot Rivier, Blauwkrantz and Storms River. The Great Fire of the 1868 claimed to have made Thomas Bain's task of building the coastal road considerably easier. Bain started construction of the Groot River Pass in 1880, completing the work in 1883 with present road differing little from Bain's original.

"William Henry Newdigate, [another prominent figure in the history of the area] moved from Piesang Valley to The Crags where he bought 1620 hectares of forest land and transferred his energies to dealing in timber. He built Forest Hall...which today is a Provincial Heritage Site (declared a National Monument in 1992)." The Newdigates also built the Church of St Michael and All Angels in Kirbywood, The Crags, on their own land and in 1850-51 built St Andrews Chapel, Redbourn, Plett, the oldest ecclesiastical building in the George-Knysna-Plett area which was declared a National Monument in 1963,[4].

In 1910 a Captain Sinclair set up the whaling station on Beacon Island to harvest the placid Southern Right whales but this ceased operation in 1916. The first hotel was erected by Hugh Owen Grant in 1940 and replaced in 1972 by the current well-known landmark on Beacon Island.

The Keurboomstrand village dates back to 1927 when a township plan consisting of 127 allotments on the farm Matjiesriver was drawn up in favour of Hendrik Petrus Read. The sale of individual plots commenced in 1929. Keurboomstrand has since evolved as a holiday village/resort town as further subdivisions took place in and around the village.

The history of the Keurbooms River node, primarily relates to agricultural use and the establishment of limited amenities such as a shop, post office and hotel. The site originally formed part of the indigenous forest belt of the area with an adjacent wetland system that was linked to the Keurbooms River.

Since early 1800s deforestation took place for both usable timber and agricultural. Agriculture primarily related to grazing and subsistence farming until markets were established in the early 1900's. Of the original forests that once grew between George and Port Elizabeth only 1% or 50000 hectares are left due to the timber industry and urban development.

Between 1966 and 1977, rapid tourism development took place in the form of caravan parks and holiday dwellings on the coastline. The old road closed completely and was no longer utilised as a through road. Settlement patterns (such as labour dwelling infrastructure) was broken down as the agricultural functions changed. Further subdivisions brought about a change in character and land use from an agricultural node

[3] Storrar, P. 2001. "Plettenberg Bay and the Paradise Coast", TMG Publishers: South Africa pg.153

[4] Storrar, P. 2001. "Plettenberg Bay and the Paradise Coast", TMG Publishers: South Africa pg.159

to a tourism node with built infrastructure converted to farmstalls, restaurants, a pub etc. [5]

Figure 8: Excerpt from Burchell's 1822 map of the Cape Colony showing approximate location of Keurboomstrand development site in pink.

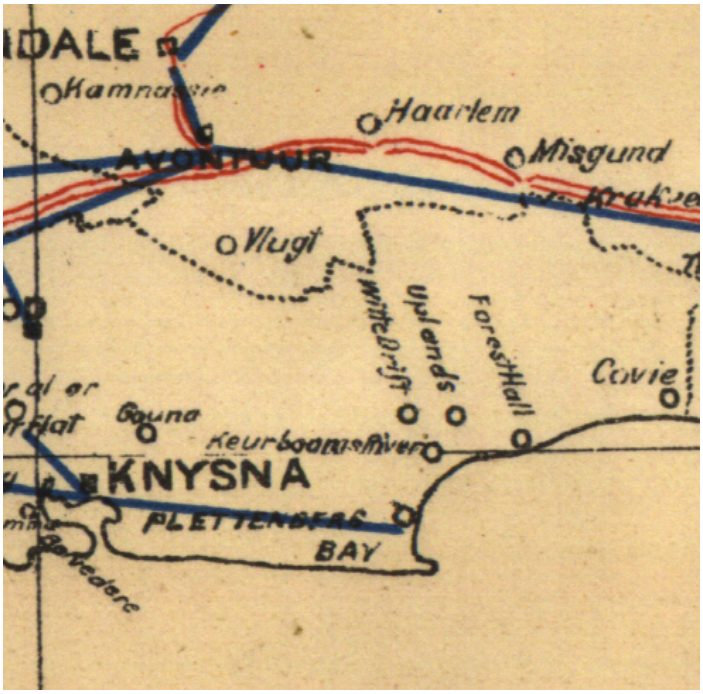


Figure 9: Excerpt from 1900-1911 Imperial Maps showing Keurboomstrand area.

[5] PHS Consulting, 2014. HERITAGE IMPACT ASSESSMENT WITH INTEGRATED SET OF RECOMMENDATIONS Proposed Residential Development of Nature's Path Lifestyle Village Portions 9 and 10 of the Farm Matjiesfontein No. 304, Keurboomstrand, Plettenberg Bay

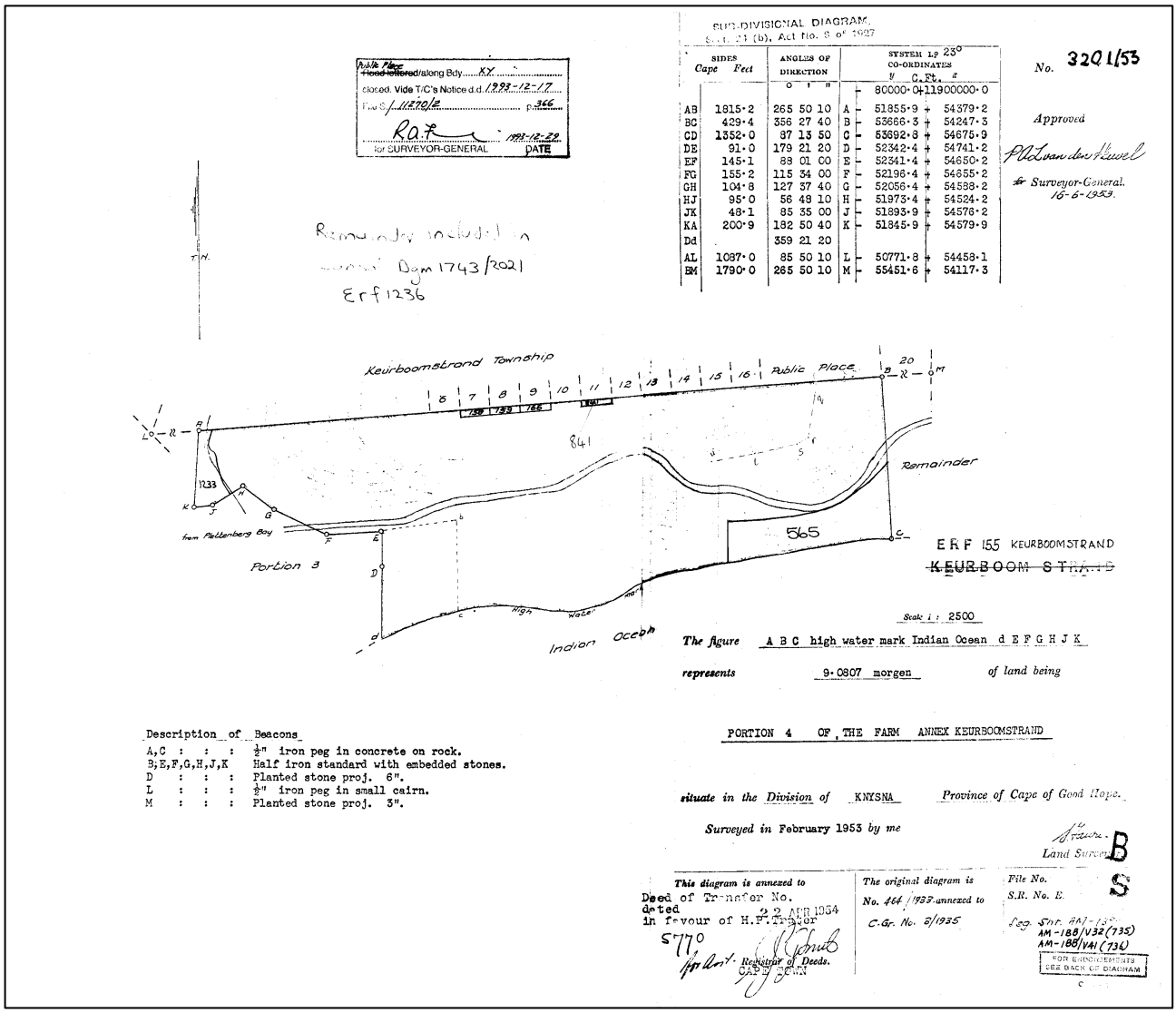


Figure 10: 1953 SG Diagram of Ptn 4 of Farm Annex Keurboomstrand, now Erf 155, showing the historic road running past the site to Plettenberg Bay (Cape Farm Mapper, June 2022).

3.2 PREVIOUS IMPACT ASSESSMENTS CONDUCTED

The coast round Plettenberg Bay is not only famous for its beautiful scenery and its interesting historical relics but this region is also remarkably rich in archaeological remains left by the prehistoric occupants of the country. The study of such material has enabled scientists to make a considerable contribution to the archaeology of South Africa.[6]

A number of archaeological and heritage impact assessments have been conducted in the area with few archaeological resources identified, possibly due to the very dense vegetation which limits accessibility and archaeological visibility. Nevertheless, some very significant sites also exist in the area, notably the Matjes River Rock Shelter within close proximity of the project site.

[6] https://sahris.sahra.org.za/node/43507/sitereport-archaeology-pdf

Webley's 2001 Phase 1 AIA of Ptns 1/15, 92 and R16 of Farm Matjiesfontein, No 304 Keurboomstrand found two possible areas of archaeological settlement sites, neither substantial in size or remains. Site 1 represented a very diffuse scatter of shell in the disturbed soil around the recently constructed brick utilities building. Site 2 had some large undiagnostic quartzite stone tools scattered around the forest at the base of a footpath, which are imported from elsewhere and probably not in context. The recommendations were for care to be taken by developer to avoid destroying archaeological sites which may be buried beneath the soil surface with the following features to be aware of: 1 dense accumulations of marine shell, concentrations of shell associated with pieces of bone, pottery and stone artefacts, concentrations of fossilized bone and human remains.

Webley's 2004 Phase 1 AIA of of Ptns 1 and 2 of Arch Rock 296, Plettenberg Bay observed no archaeological sites during the foot survey of the area above the cliff face, however the extremely dense vegetation is mentioned as a limitation in the survey process. The report recommended that development may proceed but that the following archeological material/ sites may still be uncovere during levelling of the soil: 1) concentrations of stone tools, 2) shell middens, 3) human remains, including burials and 4) remains of earlier stone structures.

ACRM's 1999 AIA for the Sanderlings development located one archaeological site comprising of low density scatter of fragmented shellfish remains, weathered OES and stone flakes on a high, partially vegetated sand dune on the eastern boundary of the study area. The site was given a low conservation rating. A few quartzite chunks were located on the south facing barrier dunes and a number of stone tools alongside the gravel roads, none of which were considered significant. This site was also 'severely vegetated' resulting in low archaeological visibility. The report recommended that the site was suitable for development, however some archaeological monitoring may be required if development should take place in the vegetated frontal dunes and that human burial remains may be uncovered during development.

Deacon's 2001 Phase 1 AIA at Farm Arch Rock 296, Keurboomstrand identified a 'conservation-worthy' MSA site at the top of the cliff above the Matjes River Rock Shelter with associated quartzite and silcrete flakes dated to around 100 000yrs old. It's value is on a landscape scale as a record of where MSA occupations took place. No other archaeological materials were noted. It was recommended that the development avoid the MSA site with a 50m buffer around the site.

ACRM's 2001 HIA for Ptn 10 of the Farm Matjiesfontein No 304, Keurboomstrand identified "no significant archaeological or heritage remains". A few small, discreet patches of shellfish remains, OES and two stone flakes were located in open patches on the steep north facing slopes of the large barrier dunes which probably represent small food parcels consumed by prehistoric people during visits to the beach. No cultural material was found associated with the shell and no archaeological remains were located in the frontal dunes. Kaplan mentions the very limited archaeological visibility in the area between the barrier dunes and the escarpment. The report recommended that 1) an archaeologist assess the site after vegetation clearing and 2) sampling if any identified significant sites. The possible uncovering of human remains was also mentioned.

Figure 11: Map showing portions of the area surveyed for previous AIA reports (SAHRIS database) as discussed (green), Keurbooms 155 (pink) and proposed development site (yellow). The orange polygons represent identified archaeological sites as per the reviewed reports. The green polygon furthest east includes the site of Matjes River Rock Shelter.

3.3 ENVIRONMENTAL CONTEXT

Plettenberg bay is typical of the crenulate bays in the Eden District, with exposed rock headlands, long sandy beaches and estuaries. The Cape Fold Mountains are a ubiquitous presence, delineating the northern extents of the famous Garden Route, where river valleys incise the inland plateau and give way to a coastal corridor of undulating coastal plains, flood plains, estuaries and sandy beaches at the coast. The series of estuaries, lakes and forests of the Garden Route are considered to have high scenic value.

The N2 freeway, which is a major structuring element and mobility route through the area has given rise over time to numerous settlements along the coastline. Plettenberg Bay's southern bay coastal area is heavily developed containing the town of Plettenberg Bay, whereas the northern part of the bay is largely undeveloped apart from several hotel complexes and the village of Keurboomstrand at its northern end. The coastline within the receiving environment has a number of important archaeological sites, two such heritage and scenic resources with formal protection being the Robberg Peninsula and Matjies River Cave (both Provincial Heritage sites (PHS)). Large parts of the Bitou Municipality are also under conservation, and the UNESCO Garden Route Biosphere reserve contains some of the most pristine parks in South Africa.

Figure 12: Site photograph of the N2 freeway just before the Keurboomstrand access road turnoff (left), demonstrating the typical inland topography and vegetation cover (Smit, 2021)

Land use and economic activity in the study area is diverse, with its roots in agriculture and forestry. All policy documents consulted during the Desktop study identified the bio-physical environment and diverse natural resource base of the region as either a key element of, or the very basis of the economy. The Bitou Municipality can be described as being rich in culture and an often-visited tourism destination in the Western Cape for local and international visitors. The coastline, in particular, draws tourists by the millions, and attracts development and economic activities. Coastal areas are particularly valued for whale-watching, wide open ocean views, hiking and other outdoor lifestyle, leisure and recreation activities.

Distinct landscape types in the study area include:

- Long sandy beaches of the crenulate bay and small coves;
- The Keurbooms river valley and estuary;
- The vegetated coastal dune systems and the dune slack area directly inland;
- Urban development areas (medium to high density settlement);
- The inland coastal plateau containing minor and major river valleys (forested – _commercial and indigenous);
- Rural settlements within the inland coastal plateau;
- Vegetated foothills at the coast, which give way to hard rock cliffed coasts with rock shore platforms (interrupted by small sandy river mouths).

Figure 13: Site photograph illustrating topographical and landform features: mountain backdrop, deeply incised forested river valleys on the inland plateau; estuaries, lagoons and either dune systems or rocky headlands at the coast (Smit, 2021)

It is necessary to describe the subject site's localized receiving environment due to the heterogeneity of the greater receiving environment, and the uniqueness of its local context. The local receiving environment is found within a relatively narrow strip of land referred to as a 'Coastal Corridor', between the sea and the rural hinterland, and at the intersection of three landscape types. Keurboomstrand as a township is divided into two distinct areas: the western portion situated in the floodplain of the estuary, on the dunes and within the dune slack area, and the eastern portion situated on the steep slopes of the vegetated foothills (Keurboomstrand town/east) where the subject site is located.

The town of Keurboomstrand (Keurboomstrand east) is described as a popular destination for tourists, a retirement town and a beach resort town., which has been developed over time in response to environmental conditions, historic patterns of subdivision, and built forms. The town proper is nestled in a sheltered cove, the topography and settlement of the town creating an amphitheater around its picturesque blue flag beaches. The MR 394, a scenic route, gives access to the town and is flanked by a paved pedestrian route that appears to be valued by locals and tourists for walking, cycling and other recreation and leisure pursuits. The town is compact, established and contains mostly single residential buildings on erven with the notable exceptions of two gated communities, both with distinctive architectural styles.

The local vegetation is generally forest and coastal scrub forest, (intensified by the garden trees of the town itself), and the local settlement patterns tend to retain as much of the existing vegetation as possible, resulting in an urban environment that is generally verdant and lush. This results in a notable feature of the townscape character of the local receiving environment: buildings are generally hidden by surrounding vegetation up to at least the ground floor where site vegetation is not disturbed. In these cases, only the roof of the building or the first floor and roof are visible. The town is also situated next to a wilderness area which extends to Nature's Valley and further east as part of the Garden Route and Tsitsikamma National Parks.

4. IDENTIFICATION OF HERITAGE RESOURCES

4.1 SUMMARY OF SPECIALIST FINDINGS

Archaeology

The inspection was conducted independently and on foot on 21 October 2020 by Peter Nilssen for the AIA (2020). The affected area is vegetated with coastal thicket, scrub and bush and therefore some parts were difficult to access on foot and ground surfaces are commonly strewn with leaf and vegetation litter. Nevertheless, sufficient ground surfaces, disturbed areas and exposed sediments were open for archaeological inspection for the purpose of this basic assessment.

Apart from existing development activities, disturbances and modern rubbish on Erf 391, there is no evidence of historic or prehistoric occupation of Erf 391 or Erf 155. Existing developments include a water reservoir, pipelines, levelling and trenching for pipelines, small excavations or disturbances and a small electrical "sub-station". The litter on site is mostly on Erf 391 and includes plastic, glass, piping, a vehicle tyre, and so on. No refuse of historic or prehistoric interest or significance was seen on site.

Although the DEFF Screening Tool rates the site of High sensitivity from an archaeological and cultural heritage perspective, there is no evidence of historic or prehistoric occupation of the site with the exception of the existing modern development activities mentioned above. Consequently, the site is regarded to be of low to negligible sensitivity from an archaeological and cultural heritage perspective. Even though the well known archaeological and Provincial Heritage Site of Matjes River Rock Shelter occurs in the wider area, it will not be impacted in any way by development on Erven 155 and 391.

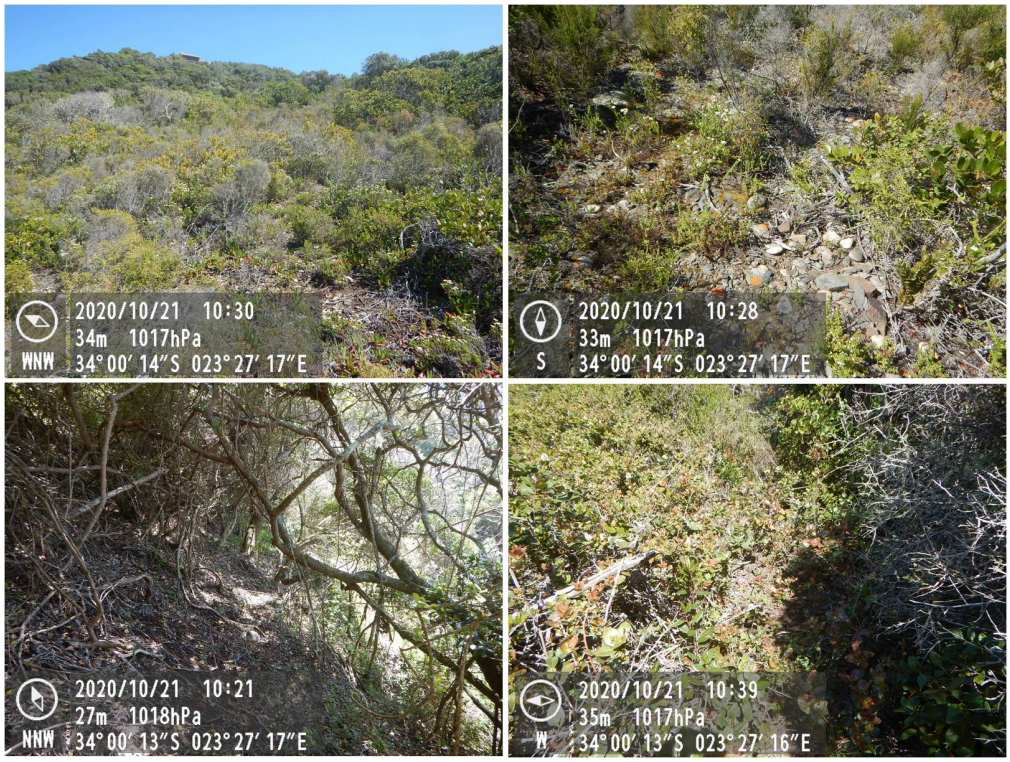


Figure 14: Examples of the affected environment showing topography, vegetation cover and exposed surfaces

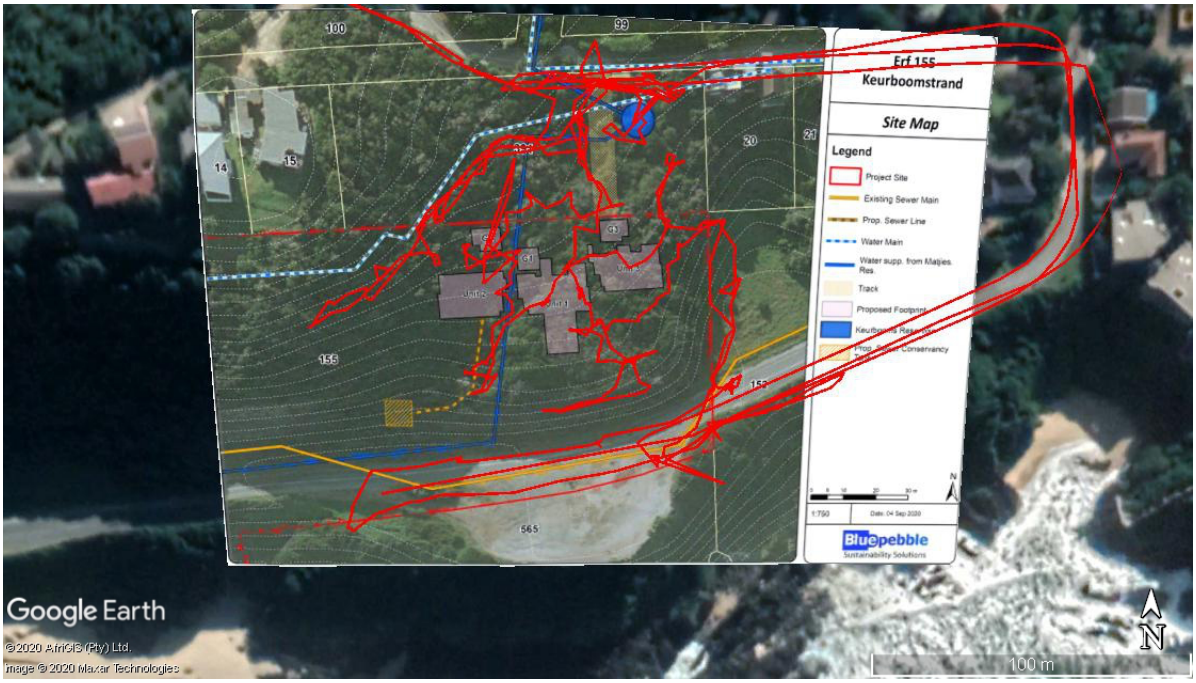
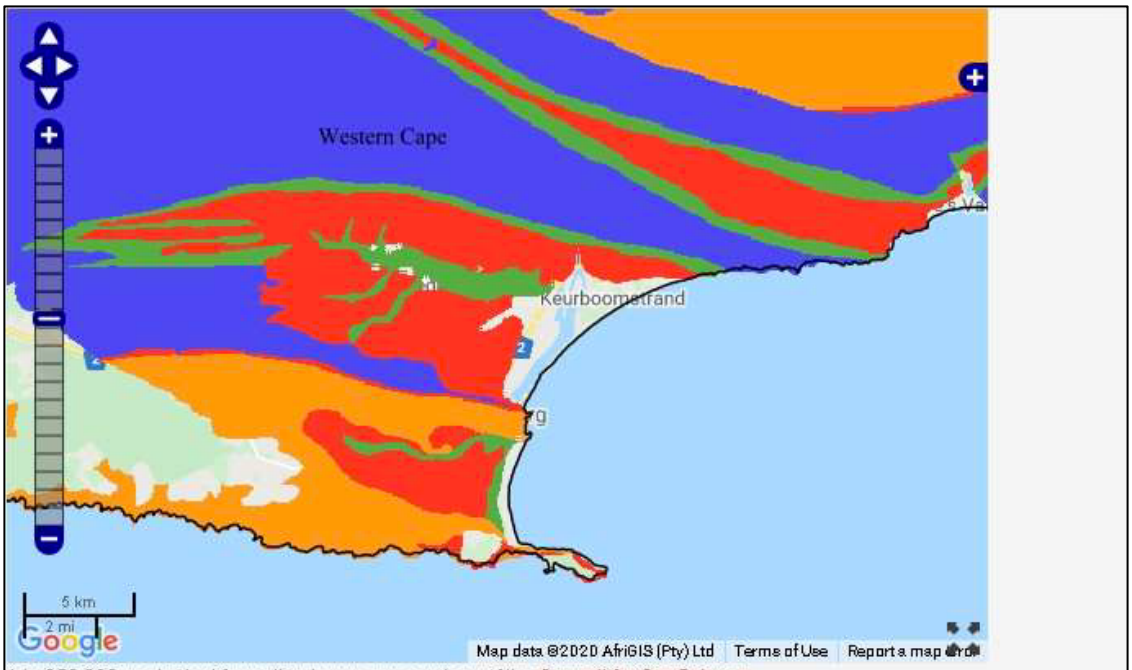


Figure 15: GPS fixed tracks (red lines) of the site inspection overlaid on the conceptual site development plan for the eastern extent of Erf 155 and Erf 391, Keurboomstrand. Courtesy of Bluepebble (Mr Jonathan Kingwill) and Google Earth 2020.

Paleontology

According to the specialist PIA by John Almond, 2021, published geological maps indicate that the project area for the proposed residential development on a Portion of Remainder of Erf 155, Keurboomstrand, is underlain by Early Devonian marine to coastal sediments of the Baviaanskloof Formation (uppermost Table Mountain Group). Elsewherealong the Southern Cape coast dark, organic-rich mudrocks within this formation contain important, largely unstudied fossils of primitive land plants while a small range of shelly invertebrate and tracefossils occur within sandstone facies in parts of the Western Cape. A recent site visit shows that the bedrocks beneath the development footprint in fact belong to the slightly younger Early Devonian Gydo Formation (lowermost Bokkeveld Group), which has yielded a range of marine shelly invertebrate fossils from the Keurboomstrand area in the past (Oosthuizen 1984). However, the Gydo Formation bedrocks in and around the project area are tectonically deformed (pervasive cleavage, folded). Sparse shelly fossils recorded near-surface here (brachiopods, bivalves, corals,crinoids etc) are poorly preserved due to deformation and secondary mineralisation; their conservation value is accordingly low. The overlying Late Caenozoic superficial sediments (colluvium, coversands, soils etc) are probably largely or entirely unfossiliferous. It is concluded that their palaeosensitivity of the bedrocks and cover sediments is low overall, while the impact significance of the proposed small housing development is also LOW.

There are therefore no objections on palaeontological heritage grounds to authorisation of the housing development, and no specialist palaeontological monitoring or mitigation measures are proposed here, pending the potential discovery of new fossil finds during the construction phase.



1 in 250 000 geological formation layers are courtesy of the Council for GeoScience
For more information, go to How to Use the Palaeontological (fossil) Sensitivity Map

Colour	Sensitivity	Required Action
RED	VERY HIGH	field assessment and protocol for finds is required
ORANGE/YELLOW	HIGH	desktop study is required and based on the outcome of the desktop study, a field assessment is likely
GREEN	MODERATE	desktop study is required
BLUE	LOW	no palaeontological studies are required however a protocol for finds is required
GREY	INSIGNIFICANT/ZERO	no palaeontological studies are required
WHITE/CLEAR	UNKNOWN	these areas will require a minimum of a desktop study. As more information comes to light, SAHRA will continue to populate the map.

Figure 16: Extract from the SAHRIS Palaeosensitivity Map on the SAHRIS Website showing the Medium Sensitivity assigned to bedrocks in the Keurboomstrand residential development project area on the south coast near Plettenberg Bay (yellow circle). The Gydo Formation (Bokkeveld Group) bedrocks here are normally assigned a High palaeosensitivity. The site visit indicates that their palaeosensitivity is LOW, however. (Almond, 2021)

Visual

According to the Visual Impact Assessment conducted by Smit for Filia (2025), the overall landscape character of the receiving environment of the project site, Keurboomstrand Erf 155, is predominantly coastal, with a diverse mix of landscape types both natural (river, estuary, forest, dunes, rocky headlands and vegetated foot slopes) and transformed (urban areas, agricultural land, rural settlements and resorts).

The landscape character of Keurboomstrand is dual, encompassing both (a) the sparsely developed dune slack/floodplain area with an open, rural character between the vegetated foothill and the crenulate bay dune system; and (b) the compact, densely vegetated Keurboomstrand town proper situated on the steep foothill slopes with a distinctive resort-town character.

The sense of place is derived (especially at a local scale) from the scenic resources of the coastline, which are based on natural features. These include the sandy (blue flag) beaches, rocky promontories, vegetated primary dunes and dune slack areas, and the steep forested foothills that meet the rocky coastline.

The study area and receiving environment can be described as having a strong landscape character and a distinctive sense of place (albeit dual and localised). The greater receiving environment contains recognizable landmarks, landscape features and vistas as part of the Garden Route. The local receiving environment is unique and distinctive within the coastal belt, based on both the local townscape character and the value of the natural and scenic resources.

The landscape contains some intrusions or discordant structures and activities, and the Keurboomstrand town itself contributes to the erosion of landscape integrity. The intactness of the landscape in the study area increases as its integrity and quality increase toward the east, where the landscape has formal protection under conservation areas. The townscape character is generally eroded by buildings exceeding two storeys, with large footprints, excessive glazing, fencing, impermeable boundary walls and large unarticulated facades, as well as buildings that do not "nestle" into the landscape. The townscape character can accommodate buildings visible above the line of vegetation, but generally not exceeding one storey.

Landscape Quality in the receiving environment is high; and the Landscape integrity is moderate to high. (Refer to Section 3.4.2 of the VIA for further detail).

The Aesthetic value of the Visual Resource is Moderate to High, as the receiving environment exhibits:

- A positive character with valued features that combine to give the experience of unity, richness and harmony (high aesthetic value);
- As well as evidence of alteration to /degradation/erosion of features resulting in areas of more mixed character (moderate aesthetic value).

Zone of Potential Visual Influence

The Zone of Potential Visual Influence of the proposed development is approximately 800m.

Landscape Character Sensitivity

The sensitivity of the Landscape Character (i.e.: the degree to which the RE can respond to accommodate change arising from the proposed development without detrimental effects on its character) is Moderate to High.

Local sensitive receptors and View corridors

Confirmed local sensitive receptors and view corridors in the ZoVI include:
i. The users of beaches and estuaries (as ecological resources and tourism/recreation destinations), including associated infrastructure;
ii. The Annex Arch Rock Nature Reserve and protected areas eastward;
iii. Locals and tourists engaged in outdoor recreation and tourism activities (on the paved pedestrian pathway, timber boardwalks and staircases, whale watching, scenic route driving etc.)
iv. Scenic Route: Keurboomstrand access road (Main Road M394)
v. Local Keurboomstrand residents, workers and neighbouring properties;
vi. The local commercial node including Enrico's restaurant
vii. (View corridor) Views from the beaches (northward) toward the ridge of the foothills within the study area and ZoVI;
viii. (View corridor) The scenic route view corridor created by the long, straight MR394, terminating at the entrance to Keurboomstrand;
ix. *(View corridor) Views from the east towards Plettenberg Bay and the Keurboomstrand east area, looking westward.*

Potential Sensitivity of Visual Receptors
The Sensitivity of Visual Receptors is High.

Visibility
The proposed project has one instance of moderate visibility only within the Immediate Foreground. The overall visibility is however Moderate to Low, considering that:

- The proposed development is visible from less than half the ZoVI (moderate visibility);
- Views are partially obstructed (Moderate visibility);
- And few viewers are affected (Low visibility).

Visual Exposure
For this project, Visual Exposure is Low overall.

- High for Immediate Foreground views specifically, the +-150m stretch of the MR394 scenic route;
- Moderate for a minority of Foreground views;
- Low for majority of Foreground views;
- Insignificant for views from 800m away or more (the entire Middle ground and Background distance zones).

Visual Absorption Capacity
The VAC assessment for this proposed development is High to Moderate (please note that a higher VAC is desirable).

Relative Compatibility
The proposed development can be described as having Medium compatibility relative to the RE, with aspects of Low compatibility relative to the qualities of the existing landscape, sense of place and land use context.

4.2 HERITAGE RESOURCES IDENTIFIED

According to the specialist reports, no significant archaeological or palaeontological heritage resources were identified within the development area. The archaeological resources identified in the wider region can be graded from NCW/ IIIC for low density stone age material scatters to II for the Matjes River Rock Shelter.

The predominant heritage resources identified were through the Visual Impact Assessment (Smit, 2022, 2025), which identified view sheds, scenic routes and natural elements of the landscape which create a sense of place and landscape character which relies on scenic qualities. The grading of the site in terms of heritage significance in relation to the wider cultural landscape is largely in terms of the significant endemic and screening vegetation as well as its proximity to scenic routes and public spaces and can be classified as IIIC.

4.3 MAPPING OF HERITAGE RESOURCES

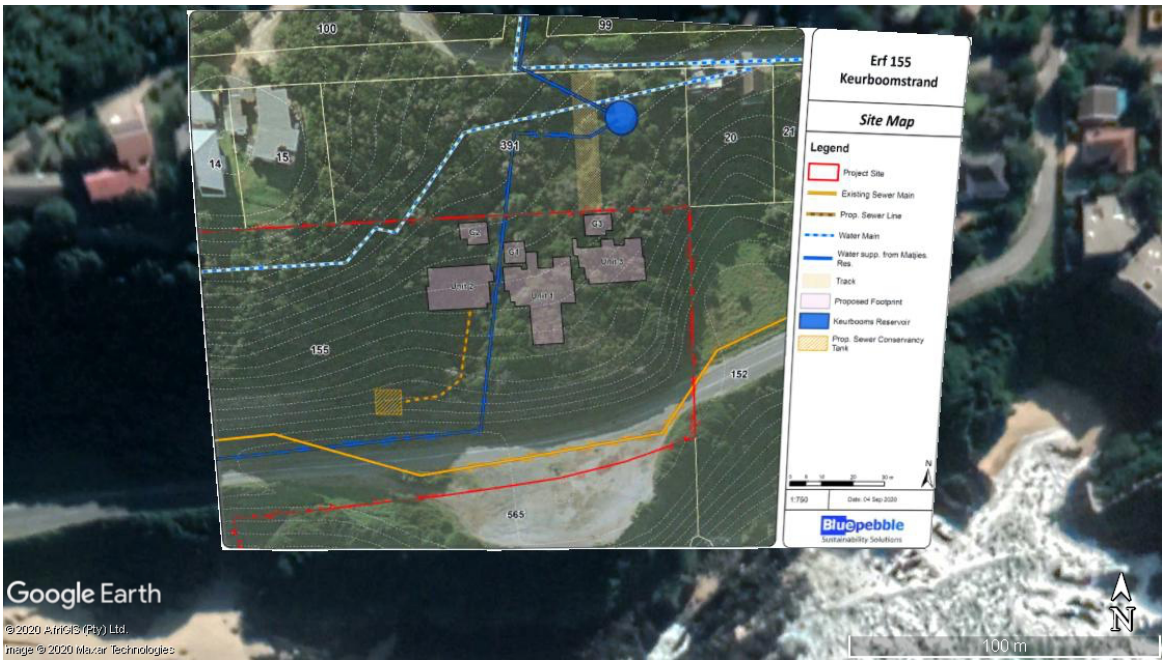


Figure 17: Conceptual site development plan overlaid on the eastern extent of Erf 155 and Erf 391, Keurboomstrand. Courtesy of Bluepebble (Mr Jonathan Kingwill) and Google Earth 2020 (Nilssen, 2020).

Figure 18: Map showing portions of the area surveyed for previous AIA reports (SAHRIS database) as discussed (green), Keurbooms 155 (pink) and proposed development site (yellow). The orange polygons represent identified archaeological sites as per the reviewed reports. The green polygon furthest east includes the site of Matjes River Rock Shelter.

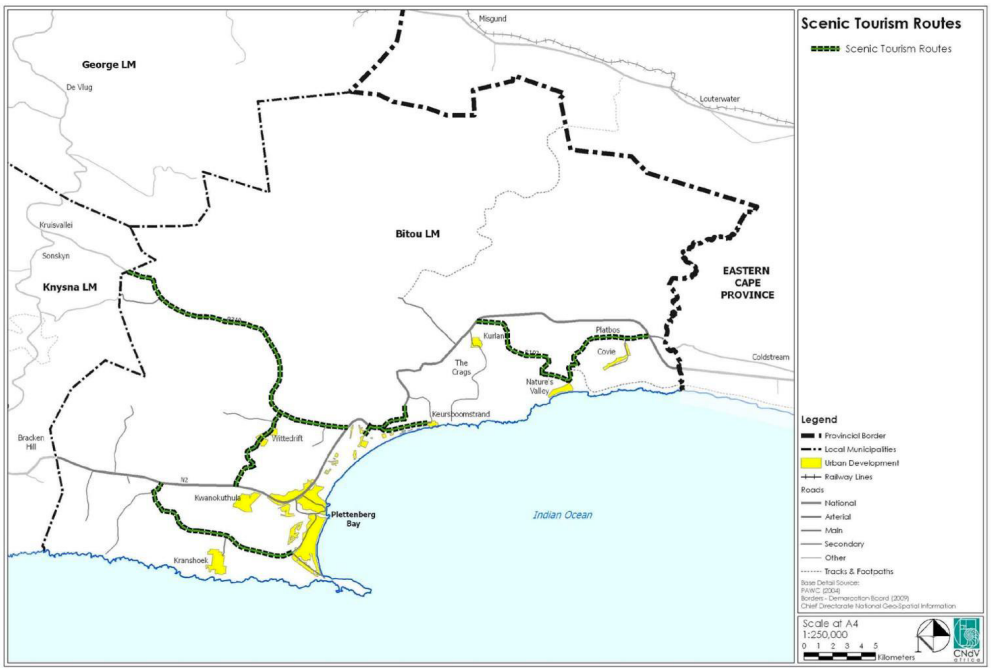


Figure 19: Map of scenic tourism routes in for Bitou area (Smit, 2021).

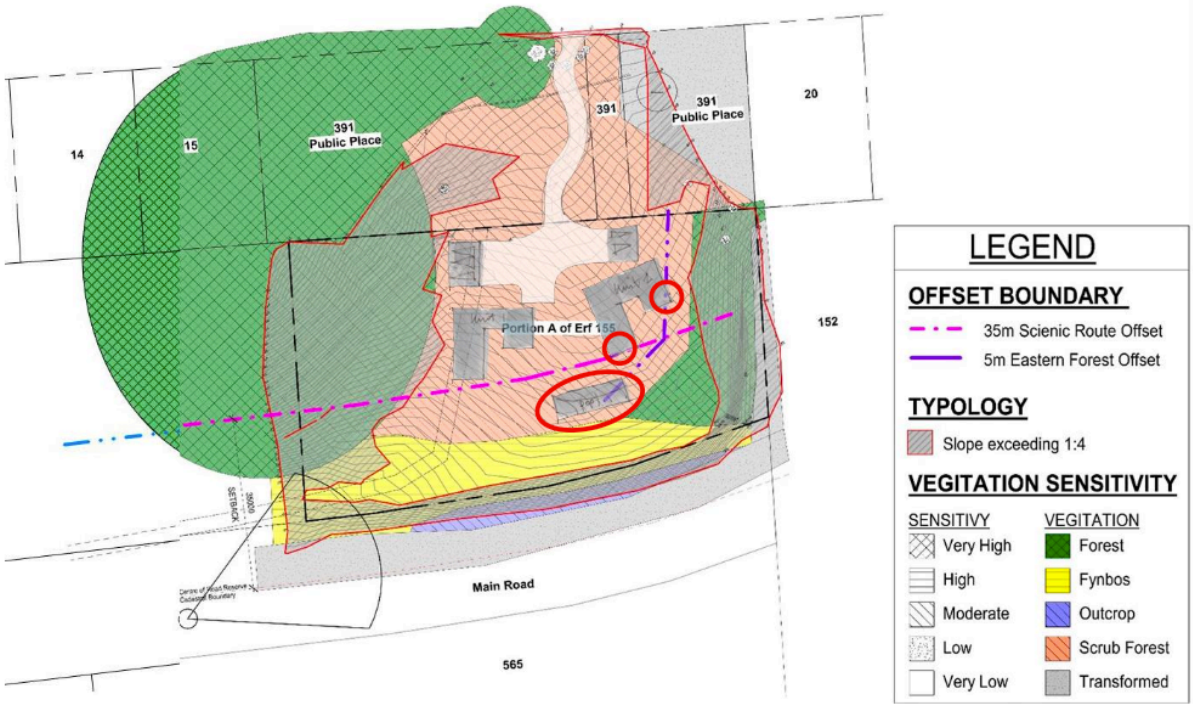


Figure 20: Site Plan of proposed development showing botanical sensitivity, geotechnical and visual sensitivity no-go areas and setbacks/offsets over site contours. (Filia Visual, 2025)

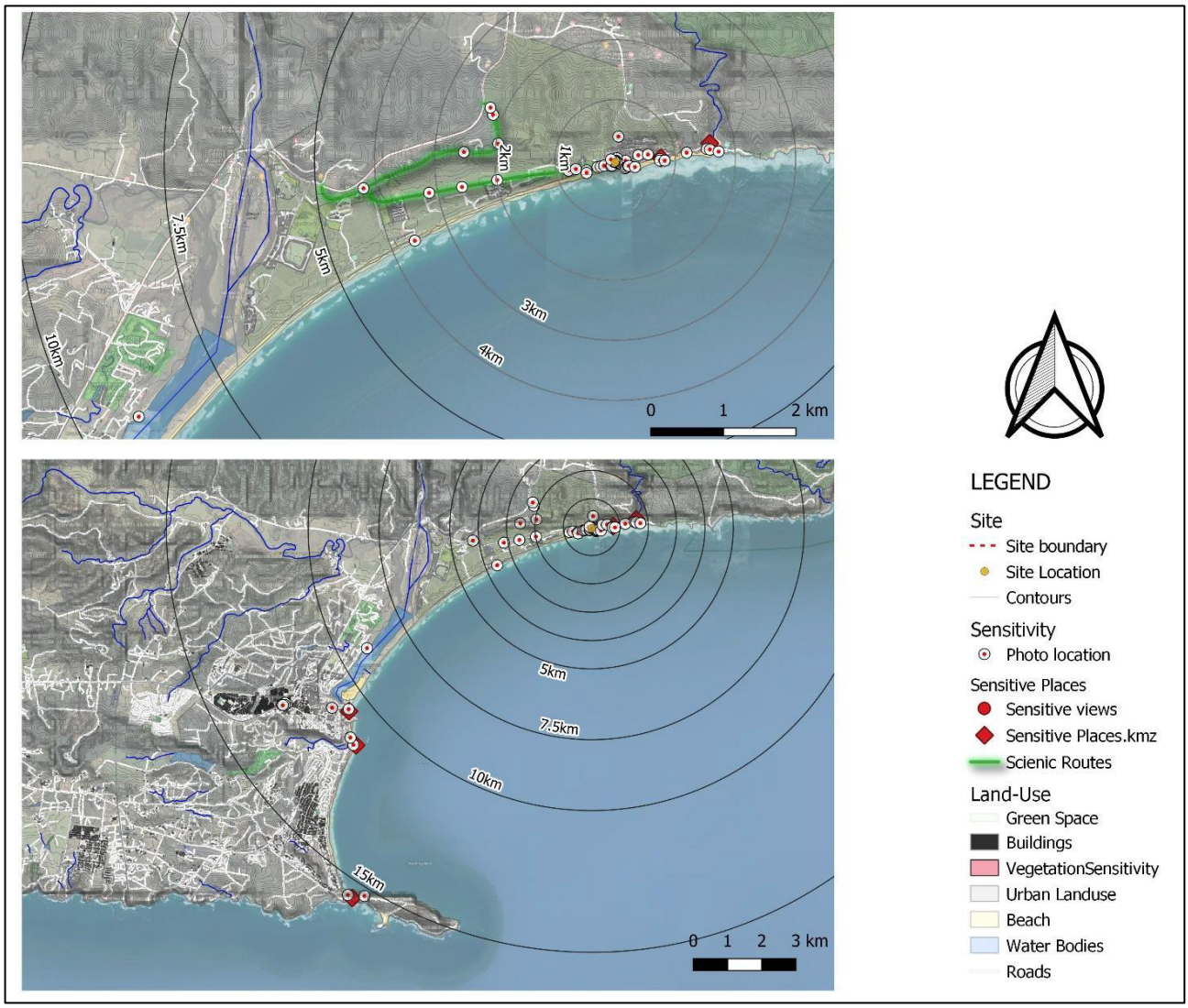


Figure 21: Graphic illustrating the location of photographs taken during fieldwork in the study area (up to 15km) to test visibility (van der Merwe, 2021)

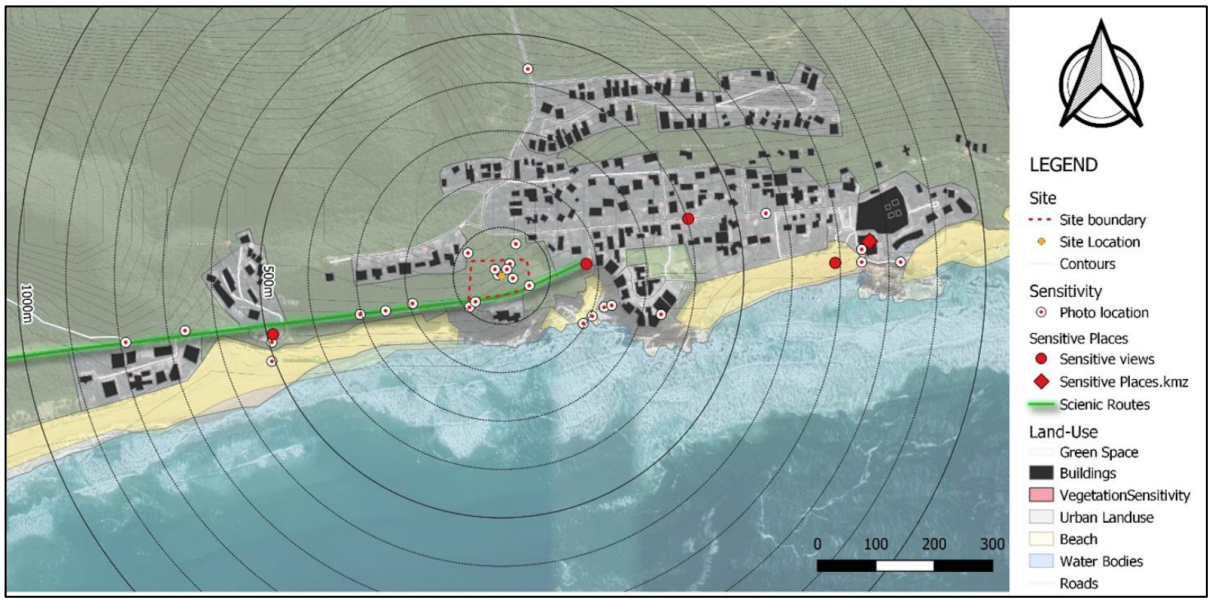


Figure 22: Graphic illustrating the location of photographs taken during fieldwork in the study area (up to 100m) to test visibility (van der Merwe, 2021)

4.4. SELECT PHOTOGRAPHIC RECORD

Figure 23: Photograph of the site taken from the parking area of the lookout point on the ocean side of the MR 394 scenic route. Note the steep cutting and density of vegetation covering the site (Smit, 2021)

Figure 24: Site photograph taken from the junction of Game and Main Streets, approximately 50m from the subject property boundary. The vegetation in the foreground is growing on Erf391 upslope to the north (Smit, 2021)

Figure 25: Site photograph (looking west) along the MR349, showing the roadway and the paved pedestrian route alongside. Note also the height of the vegetation alongside, typical of this stretch of road (Smit, 2021).

Figure 26: Site photograph overlooking the 5km long Keurboomstrand beach, looking toward Keurboomstrand west and Plettenberg Bay in the distance (van der Merwe, 2021)

Figure 27: Site photograph taken from the pedestrian walkway alongside the MR394 scenic route at 150m from the project site, looking east (Smit, 2021)

Figure 28: Site photograph taken from the publicly accessible private staircase across the small cove beach from the site, at 180m, looking west (Smit, 2021)

Figure 29: Site photograph from the Scrub-forest vegetation type looking west toward the Forest vegetation type area containing Milkwood trees (Smit, 2021)

Figure 30: Examples of the affected environment showing topography, vegetation cover and existing developments in the immediate surroundings. Except top left, all views are from Erf 155. (AIA, Nilssen, 2020)

Figure 31: Site photograph illustrating topographical and landform features: mountain backdrop, deeply incised forested river valleys on the inland plateau; estuaries, lagoons and either dune systems or rocky headlands at the coast (Smit, 2021)

Figure 32: Site photograph taken from the old N2 (a scenic route), showing a view of the study area as the road winds its way down the outside of the hill slope overlooking the floodplain and estuary. These dramatic views are not enjoyed by the "new" N2 route which passes through a cutting further inland (van der Merwe, 2021)

5. ASSESSMENT OF IMPACT OF DEVELOPMENT

Archaeology and Palaeontology

The proposed development will not have a negative impact on archaeological and palaeontological heritage resources within the Keurbooms 155 development site or on identified heritage resources in the surrounding area.

There is no evidence of historic or prehistoric occupation of the site; consequently the site is regarded to be of low to negligible sensitivity from an archaeological heritage perspective. There are no further concerns or objections to the proposed development on Erf 155. The archaeological observations noted all corroborate existing information about the archaeological sensitivity identified in reports from the wider area, noting that archaeological visibility is notoriously limited in the area due to the dense vegetation.

As indicated above, no negative impact to significant palaeontological heritage is anticipated as the palaeontological sensitivity of the geology of the development area is considered to be very low. In the event of important fossil material being identified during excavations, the HWC Fossil Finds Procedure must be implemented.

Visual Landscape Character (VIA, Smit, 2025)

The VIA has determined that visual impacts will result from the development of the proposed Erf 155 Keurboomstrand project.

The Department of Environmental Affairs and Development Planning have made their position on this matter clear, stating in their comments on the Local Area Spatial Plan that future development in Keurboomstrand must have low visual impact (Keurbooms and Environs Local Area Spatial Plan, 2013, p. 154). The Department makes specific reference to development proposals on slopes of 1:4 or steeper, where development would be highly visible.

The findings of the impact assessment are as follows:

The Preferred Alternative is expected to have Low to Medium visual impact overall, with Low to Medium visual impact on the scenic route specifically.
• Impact on sensitive receptors: Low to Medium neutral.

• Impact on important views and view corridors: Low to Medium negative.
• Effect on protected landscapes & scenic resources (scenic route): Low to Medium negative
• Effect on the visual character and sense of place: Low negative
• Construction phase impacts: Medium negative

The proposed development, when considered together with the existing Erf 565 development, is expected to generate cumulative impacts on the scenic route, landscape character, and townscape character at a key threshold and entrance to Keurboomstrand. This portion of the MR394 marks the primary pedestrian and vehicular entry point, where the natural, vegetated foothill of Erf 155 terminates. On the seaward side, the exposed and walled edge of Erf 565 already creates an urbanised interface with the public realm. Introducing further built form on the up- slope side risks interrupting the visual continuity between ocean and landscape and would compound the cumulative effect of altering this sensitive threshold space. Such changes would be inconsistent with principles applied in scenic drive management, where development is generally restricted to protect views along thresholds, ridges, and coastal slopes.

More broadly, the proposal contributes to the ongoing cumulative visual effect of densification within Keurboomstrand, particularly in views from the east looking westwards. While the existing built form provides some absorption of new development, this is only acceptable where buildings remain visually recessive, with roofs or upper storeys limited to protruding above vegetation. Incremental intensification that exceeds these parameters risks eroding the distinctive townscape and scenic qualities that underpin the settlement's character and sense of place.

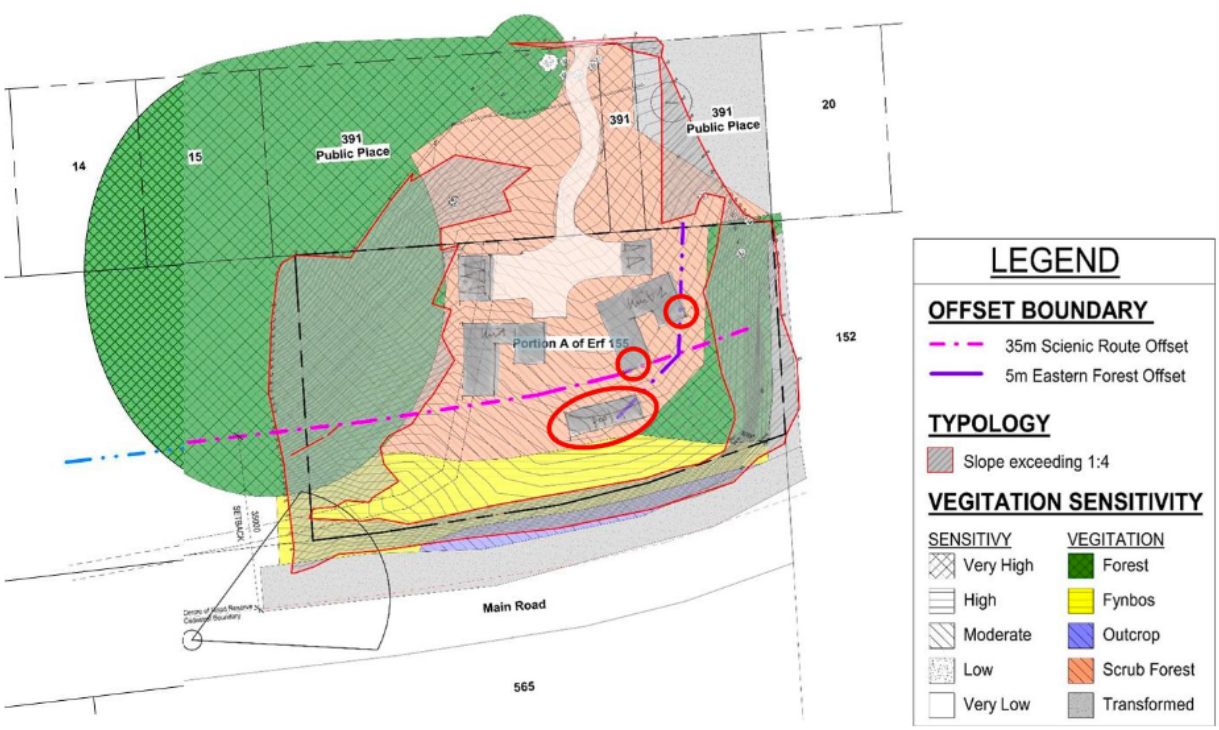


Figure 33: Graphic illustrating the proposed development's infractions on the sensitivity Parameters (Filia Visual, 2025)

It should be noted that despite numerous iterations of the development proposal, no site alternative was investigated. This is relevant to the discussion given the sensitivity of the subject site and the layers of policy that support the protection of open space, scenic resources etc. which may suggest that no matter what is

proposed by the applicant, the land parcel may remain inappropriate for development by its nature. To address this aspect, the planning report submitted to the CA should convincingly demonstrate the desirability of the proposed development on the chosen site, or provide alternative sites for development as necessary.

Figure 34: Simulation looking west (left) and looking east (right) along the scenic route (Slee,, 2025)

Figure 35: Site photograph taken from public beach showing eastern view towards site indicating location of site and visible roofscape (Smit, 2021)

6. SUSTAINABLE AND SOCIAL ECONOMIC BENEFITS

According to the information provided, the potential benefit of the proposed development is likely to include some social and economic benefits through creation of business and employment opportunities for the local economy. The majority of the employment opportunities are likely to benefit local Historically Disadvantaged (HD) members of the community. This would represent a significant opportunity for the local building sector and members of the local community who are employed in the building sector. The potential creation of employment opportunities for local HD members of the community is therefore regarded as an important social benefit.

Based on the information provided, the anticipated socio-economic benefits do not outweigh the likely impacts to heritage resources unless the recommended mitigation measures provided below are implemented.

7. PROPOSED DEVELOPMENT ALTERNATIVES

No development alternatives have been proposed for assessment for this report.

Previous development alternatives were assessed for impact and the results of these assessments are included in the 2021, 2022 and 2025 VIA reports (Filia Visual) and 2021 VIA and PIA reports (Nilssen and Almond) and the 2022 HIA report (Hearth Heritage).

8. RESULTS OF PUBLIC CONSULTATION

HWC requires that any relevant registered conservation body, as well as the local authority, be included in the public participation process for this project. According to the HWC website (accessed June 2022), there is one registered conservation body for this area, Simon van der Stel Foundation Southern Cape. Both the Bitou Local Municipality and Simon van der Stel Foundation Southern Cape will be provided with 30 days to comment on this HIA. In addition, please note that this HIA will form part of the public consultation required in terms of NEMA. The public participation process will be managed by the environmental assessment practitioner.

9. CONCLUSIONS AND RECOMMENDATIONS

Archaeology and palaeontology

According to the specialist reports, there is no evidence of historic or prehistoric occupation of the site. Consequently, the site is regarded to be of low to negligible sensitivity from an archaeological and palaeontological heritage perspective and there are no objections to the proposed residential development on Erf 155 on condition that:

1. Due to the dense vegetation and limited archaeological visibility, a suitably qualified archaeologist should do a foot survey of the site intermittently during clearing of vegetation and once vegetation has been finally cleared before any earthworks are to commence.
2. Although unlikely, there may be buried or currently hidden archaeological material, including human remains, present on site and should these be uncovered or exposed during excavations or vegetation

clearing, HWC should be notified immediately and all development work on site (preconstruction included) should be halted until these finds are investigated by HWC (Att: Ms Waseefa Dhansay 021 483 9685).

3. No negative impact to significant palaeontological heritage is anticipated as the palaeontological sensitivity of the geology of the development area is considered to be very low and there are no objections on palaeontological heritage grounds. In the event of important fossil material being identified during excavations, the HWC Fossil Finds Procedure must be implemented.

Visual and landscape character

According to the Local Area Spatial Plan future development in Keurboomstrand must have low visual impact (Keurbooms and Environs Local Area Spatial Plan, 2013, p. 154). The Department makes specific reference to development proposals on slopes of 1:4 or steeper, where development would be highly visible and recommends development be limited to flatter ground.

Recommendations:
Due to the high value and sensitivity of the receiving environment, landscape character and the visual receptors, it is extremely important that a responsible and enforceable design approach be taken for the planning, construction and operational phases of each dwelling unit and the development as a whole, taking care to minimize the visual impact wherever possible. The Site Development Plan (SDP) and building plans must demonstrate adherence to the recommendations of this report in order for visual impact to be managed successfully.

As a condition of approval for the Rezoning and Subdivision Land use planning approval (this approval), the following visual sensitivity parameters must be strictly adhered to. Adherence to these limitations must be evident in all plans, sections, elevations, axonometric drawings and Site plans submitted for this and future levels of approval:

4. A 35m scenic route setback line measured from the centre line of the MR394 road reserve must be clearly indicated on all plans and technical drawings;
5. Additional 5m setback from the eastern botanical and slope sensitivity no-go areas must be clearly indicated on all plans and technical drawings;
6. The "Developable Area" must be clearly indicated on all plans and technical drawings (Site plans, SDP, building plans etc.);
7. Height restriction of 8m must be clearly indicated in relevant drawings (e.g.; sections, elevations).

As a condition of approval for the Rezoning and Subdivision Land use planning approval (this approval), this VIA recommends that the following documents and plans be submitted along with SDP and building plans to the local municipality for approval:

8. A Landscape Plan and Landscape Guidelines (including vegetation protection methodology) by a suitably experienced and qualified professional, registered with SACLAP (refer to Item 7.2.4 for detailed requirements);
9. An Environmental Management Programme (EMPr) by a suitably experienced and qualified professional (refer to Item 7.2.4 for detailed requirements).
10. Architectural Guidelines by a suitably experienced and qualified professional, registered with SACAP.

The project documentation describing the proposed development at this time is limited to a hand-drawn site plan and section, supported by a Plan view and two simulations. The visual specialist cannot vouch for the accuracy of the simulations in the absence of a 3D model or more detailed architectural drawings.

The following additional information must be displayed on plans and/or provided for this submission:

11. Please ensure that the layouts and details of the proposed development on the "site plan" and "plan view" are in agreement.
12. The site plan should include the following details:
    a. The location and footprint of the new sewer conservancy tank, including area to be cleared for its construction;
    b. The sewer line (including footprint and area that will be disturbed for its construction);
    c. The connection to the water main (including the vegetation clearance required to establish this line);
    d. The adjoining erf 391 must be shown on the site plan, as well as the design and layout of the new private road that will be installed across public land to the north of the proposed dwellings.

Key conditions and mitigation measures that should be noted (in summary) include:

13. No structures, including a swimming pool, may be sited and constructed within the no-go areas, within the 35m scenic route setback line or the 5m botanical/slope sensitivity setback line. Except for the absolutely necessary linear infrastructure, no areas outside of the approximately 1448m² "developable area" may be disturbed.
14. The building envelope, including chimneys, must not protrude above the 8m height restriction (this VIA recommends that the existing ground level (NGL) is the base level from which maximum height permitted is measured so that the height restriction slopes parallel to the existing ground level);
15. The colour palette for materiality and finishes must draw on the colouring of the natural environment, preferencing mid-tone to darker colouring to blend with forest vegetation. If natural material such as stone is used, the stone must be locally sourced and match the colouring (and, if possible, the geological origins) of the site and receiving environment. Materials and finishes may not consist of bright colours, highly reflective surfaces or gratuitous use of glass. Curtain walls, windows, skylights and other glazing features must be shaded/set back under overhangs or similar to prevent glare, especially in the direction of sensitive receptors identified. The use of exposed metal must be kept to a bare minimum, and any potentially shiny or reflective surfaces must be avoided altogether, or covered with matte, non-reflective finishes.
16. All construction activities must be limited to the approved building footprint and a 2m offset buffer zone all around the building footprint.
    a. Limited and appropriate soft landscaping may extend further than the 2m offset around the buildings within the Moderate and Low sensitivity areas (refer to the Sensitivity map), but should avoid the protected forest and fynbos vegetation areas (High and Very high sensitivity).
17. The Landscape Plan must include a Vegetation protection methodology to manage Construction phase impacts on vegetation (before, during and after), including guidelines on the re-establishment, replacement and/or rehabilitation of vegetation per vegetation type in the case of disturbance.
18. No fence or wall should be permitted adjacent to and/or within view of the Scenic route, or within the 35m setback area as indicated on the Visual Sensitivity map. All fencing must be visually permeable and no post top lighting, flood lights, peripheral/boundary security lights or uncovered luminaires of any kind should be allowed.
19. All exterior lighting shall be located and controlled so as to avoid direct illumination, glare or reflection onto any adjoining property or the scenic drive; provide precisely directed illumination to reduce light "spillage" beyond the immediate surrounds of the light source, and should preferably be movement activated.
20. The Landscape plan at SDP stage must show screening and softening of the building edges on the southern side of the buildings. The aim is to visually screen the first storey of the proposed development from the Scenic route views up the slope (the expectation is not that the building will be

hidden, but rather that the screening vegetation allows the buildings to blend into the visual context more easily by reducing the starkness of new built features; especially where these meet the surrounding landscape).

21. Prior to the beginning of the Construction phase, sensitive vegetation must be marked clearly and the rootzones of protected species and areas must be demarcated and made off limits to prevent compaction of soil and damage to the root zones.
22. Please refer to Item 7.2.5 for mitigation measures to be included in the EMPr.

Should the conceptual architectural proposal undergo significant change (especially in terms of height, siting, building envelope and massing, fencing, lighting and perimeter treatment or any feature that would constitute a change to the visual impact of the proposed development), a Visual statement must be prepared by a suitably qualified visual specialist to determine if the findings of this study remain unchanged.

This 2025 revision of the VIA finds that the Preferred Alternative can be endorsed from a visual impact management point of view, but only conditionally. Additional information is needed, and the proposed development must demonstrate complete compliance with the visual sensitivity setbacks as well as the mitigation measures and recommendations set out in Chapter 7 of this VIA either at this time, or at the appropriate time within future application processes (i.e. SDP approval and building plan approval stage).

Conclusion

DEA&DP recommended that all future development in Keurboomstrand have low Visual impacts. The VIA has determined that visual impacts of Low to Moderate Significance will result from the development of the proposed Erf 155 Keurboomstrand project, without mitigation.

The assessment of various iterations of the proposed development has indicated that the proposal cannot meet the requirements of DEA&DP for low visual impacts overall. However, the VIA found that the proposed development may be supported in principle at this level of development approval (EIA and Land Use planning), if additional information is provided for this application, and if the recommendations and mitigation measures of the VIA (and the visual sensitivity setbacks provided) are strictly adhered to.

If a final submission of the application ensures that the above conditions are met (and various other recommendations are meaningfully responded to at the appropriate time), the following additional mitigation measure shall apply:

i. The SDP planning phase must allow for a brief desktop review of the final application by a suitably qualified visual specialist before submission at SDP stage to re-assess visual impact and check the proposal against the recommendations contained in this VIA, when more detailed information is available.

Should the architectural proposal undergo significant change during further design processes, a visual impact statement must be issued by a suitably qualified specialist to re-assess the potential visual impact and determine if the findings of this study remain unchanged.

10. REFERENCES

Impact Assessment Reports Consulted

1. ACRM, 2001. HIA Proposed Development Ptn 10 of the Farm Matjiesfontein No 304, Keurboomstrand.

2. ACRM, 1999. Archaeological Study, Sanderlings, Plettenberg Bay.

3. Deacon, H. 2001. Phase 1 Report AIA of the Proposed Subdivision of Farm Arch Rock No 296 (Keurboomstrand)

4. PHS Consulting, 2014. HERITAGE IMPACT ASSESSMENT WITH INTEGRATED SET OF RECOMMENDATIONS Proposed Residential Development of Nature's Path Lifestyle Village Portions 9 and 10 of the Farm Matjiesfontein No. 304, Keurboomstrand, Plettenberg Bay

5. Webley, 2004. Phase 1 AIA of Ptns 1 and 2 of Arch Rock 296, Plettenberg Bay.

6. Webley, 2001. Phase 1 AIA of Ptns 1/15, 92 and R16 of the Farm Matjiesfontein No 304 Keurboomstrand, Plettenberg Bay.

Further references

7. Peeling Away the Past: The Display of Excavations at Nelson Bay Cave, by Janette Deacon and Michael Brett © 1993 South African Archaeological Society

8. Rabe, 2010. Historical Background Report for Kurland, Bitou Knysna (draft)

9. Storrar, P. 2001. “Plettenberg Bay and the Paradise Coast”, TMG Publishers: South Africa

APPENDIX A: ARCHAEOLOGICAL IMPACT ASSESSMENT (2021)

APPENDIX B: PALAEONTOLOGICAL IMPACT ASSESSMENT (2021)

APPENDIX C: VISUAL IMPACT ASSESSMENT (2025)

Our Ref: HM/ EDEN/ BITOU/ PLETTENBERG BAY/ KEURBOOMSTRAND/ ERF 155
Case No.: 21060110AM0615E
Enquiries: Ayanda Mdludlu
E-mail: ayanda.mdludlu@westerncape.gov.za
Tel: 021 483 5959

ILifa leMveli leNtshona Koloni
Erfenis Wes-Kaap
Heritage Western Cape

EmmyLou Bailey
emmylou@hearthheritage.co.za

FINAL COMMENT
In terms of Section 38(8) of the National Heritage Resources Act (Act 25 of 1999) and the Western Cape Provincial Gazette 6061, Notice 298 of 2003

HERITAGE IMPACT ASSESSMENT: PROPOSED REZONING AND RESIDENTIAL DEVELOPMENT ON ERF 155 KEURBOOMSTRAND, PLETTENBERG BAY, SUBMITTED IN TERMS OF SECTION 38(8) OF THE NATIONAL HERITAGE RESOURCES ACT (ACT 25 OF 1999)

CASE NUMBER: 21060110AM0615E

The matter above has reference.

It was noted that the matter was tabled at Impact Assessment Committee (IACom) meeting held on 20 July 2022.

FINAL COMMENTS:
The IACom Committee notes that heritage resources are not impacted negatively by the proposal. The IACom Committee endorses the APM Committee comments as follows; the APM Committee endorsed the recommendations for mitigation of archaeology and palaeontology on page 43 of the HIA (Hearth Heritage dated June 2022):

1. Due to the dense vegetation and limited archaeological visibility, a suitably qualified archaeologist should do a foot survey of the site intermittently during clearing of vegetation and once vegetation has been finally cleared before any earthworks are to commence.
2. Although unlikely, there may be buried or currently hidden archaeological material including human remains, present on site and should these be uncovered or exposed during excavations or vegetation clearing, HWC should be notified immediately an all-development work on site (preconstruction included) should be halted until these finds are investigated by HWC (Att: Ms Waseefa Dhansay 021 483 9685).
3. No negative impact to significant palaeontological heritage is anticipated as the palaeontological sensitivity of the geology of the development area is considered to be very low and there are no objections on palaeontological heritage grounds. In the event of important fossil material being identified during excavations, the HWC Fossil Finds Procedure must be implemented.

Heritage Western Cape
Erfenis Wes-Kaap
ILifa leMveli leNtshona Koloni

22 July 2022

ILifa leMveli leNtshona Koloni
Erfenis Wes-Kaap
Heritage Western Cape

Our Ref: HM/ EDEN/ BITOU/ PLETTENBERG BAY/ KEURBOOMSTRAND/ ERF 155
Case No.: 21060110AM0615E
Enquiries: Ayanda Mdludlu
E-mail: ayanda.mdludlu@westerncape.gov.za
Tel: 021 483 5959

EmmyLou Bailey
emmylou@hearthheritage.co.za

The IACom Committee endorses the HIA prepared by Hearth Heritage and dated June 2022 as meeting requirement of S.38(3) of the NHRA and supports recommendations that:

To augment the botanical and geotechnical sensitivity mapping, the following visual sensitivity parameters have been established and should be adhered to in the final proposal for all alternatives: a) A 35m Scenic route setback(offset) that delineates a no-go area for development on the site from the part of the receiving environment with the highest exposure and sensitivity; b) Additional 5m offset from the eastern ecological and slope sensitivity exclusion area, to ensure that the dense forest vegetation screening views of the proposed development from the east remains unaffected by development. c) Adherence to the key parameters of the Architectural Guidelines (Pg 118, Smit VIA, 2022). Due to the high value and sensitivity of the receiving environment, landscape character and the visual receptors, it is extremely important that a responsible and enforceable design approach be taken for the planning, construction and operational phases of each dwelling unit and the development as a whole, taking care to minimize the visual impact wherever possible. The Site Development Plan (SDP) and building plans must demonstrate adherence to the recommendations of this report in order for visual impact to be managed successfully. Given that none of the Alternatives are compliant with the visual sensitivity parameters, the proposal should be revised to avoid biodiversity and visual impacts, by proposing buildings within the developable area only (indicated by the Botanical, Geotechnical and Visual sensitivity offsets and no-go areas).

The above comment is valid for a period of 5 years from the date of the written notification thereof to the applicant. This period may, for good reason, be extended provided that application for the extension is made in writing prior to the expiration of the period.

HWC reserves the right to request additional information as required.
Should you have any further queries, please contact the official above and quote the case number.

.....
Nuraan Vallie
Acting Deputy Director

Heritage Western Cape
Erfenis Wes-Kaap
ILifa leMveli leNtshona Koloni

22 July 2022

Heritage Statement for an Environmental Authorization or for a Part Two Amendment of an Environmental Authorisation as Required by the 2014 EIA Regulations

Proposed Residential Development on a Portion of Erf 155, Keurboomstrand, Plettenberg Bay, Western Cape Province

prepared for

Bluepebble Sustainability Solutions, C/O Mr Jonathan Kingwill, Postnet Suite 41, Private Bag X31, Knysna, 6570, E: jonathan@bluepebble.biz on behalf of the applicant Ferpa (Pty) Ltd

prepared by

Dr. Peter Nilssen, PO Box 2635, Mossel Bay, 6500
044 690 4359 | 082 783 5896 |peter@carm.co.za

28 October 2020

NEMA requirements for Specialist Reports		
Appendix 6	**Specialist Report content as required by the NEMA 2014 EIA Regulations, as amended**	**Section**
1 (1)(a)	(i) the specialist who prepared the report; and	Title page & Section 1; as well as the accompanying CV
	(ii) the expertise of that specialist to compile a specialist report including a curriculum vitae;	
(b)	a declaration that the specialist is independent in a form as may be specified by the competent authority;	Section 1
(c)	an indication of the scope of, and the purpose for which, the report was prepared;	Section 2
(cA)	an indication of the quality and age of the base data used for the specialist report;	2020
(cB)	a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	Sections 2, 3 & 4
(d)	the duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;	October 2020 - NA
(e)	a description of the methodology adopted in preparing the report or carrying out the specialised process, inclusive of equipment and modelling used;	Section 3
(f)	details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives;	Section 4 - NA
(g)	an identification of any areas to be avoided, including buffers;	NA
(h)	a map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;	NA
(i)	a description of any assumptions made and any uncertainties or gaps in knowledge;	NA
(j)	a description of the findings and potential implications of such findings on the impact of the proposed activity, or activities;	Section 4
(k)	any mitigation measures for inclusion in the EMPr;	Section 4
(l)	any conditions for inclusion in the environmental authorisation;	NA
(m)	any monitoring requirements for inclusion in the EMPr or environmental authorisation;	NA
(n)	a reasoned opinion-	Section 4
	(i) whether the proposed activity or portions thereof should be authorised; and	
	(iA) regarding the acceptability of the proposed activity or activities; and	
	(ii) if the opinion is that the proposed activity or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan;	
(o)	a description of any consultation process that was undertaken during the course of preparing the specialist report;	NA
(p)	a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	NA
(q)	any other information requested by the competent authority.	NA
2	Where a government notice gazetted by the Minister provides for any protocol or minimum information requirement to be applied to a specialist report, the requirements as indicated in such notice will apply.	NA

1. Name, Expertise and Declaration

I, Peter Nilssen (PhD in archaeology, University of Cape Town 2000), herewith confirm that I am a Professional member - in good standing - of the Association of Southern African Professional Archaeologists (ASAPA), including the Cultural Resource Management section of the same association since 1989 (ASAPA professional member # 097). I am an accredited Principal Investigator for archaeozoology (specialist analysis), coastal, shell midden and Stone Age archaeology; Field Director for Colonial Period archaeology; and Field Supervisor for Iron Age archaeology and Rock Art. I have worked as a professional archaeologist in Cultural Resource Management since 1989 and have completed more than 200 heritage-related impact assessments and mitigation projects that were approved by provincial and national heritage authorities. My CV accompanies this report.

As the appointed independent specialist (archaeologist) for this project hereby declare that I:

- act as an independent specialist in this application;
- regard the information contained in this report as it relates to my specialist input/study to be true and correct;
- do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the NEMA, the Environmental Impact Assessment Regulations, 2014 and any specific environmental management Act;
- have and will not have no vested interest in the proposed activity proceeding;
- have disclosed, to the applicant, EAP and competent authority, any material information that have or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the NEMA, the Environmental Impact Assessment Regulations, 2014 and any specific environmental management Act;
- am fully aware of and meet the responsibilities in terms of NEMA, the Environmental Impact Assessment Regulations, 2014 (specifically in terms of regulation 13 of GN No. R. 982) and any specific environmental management Act, and that failure to comply with these requirements may constitute and result in disqualification;
- am aware that a false declaration is an offence in terms of regulation 48 of GN No. R. 982.

Signature of the specialist:

Name of company: Dr Peter Nilssen

Professional Archaeologist and Specialist Heritage Practitioner

Date: **27 October 2020**

2. Introduction

Mr Jonathan Kingwill of Bluepebble is undertaking the environmental process for the proposed development on a portion of Erf 155, Keurboomstrand, Plettenberg Bay (Figure 1). The site is situated approximately 10km north-east of Plettenberg Bay in the Western Cape Province. Since the proposed site for development is less than 0.5 ha in extent and since the development does not activate any of the triggers relating to the National Heritage Resources Act (Act 25 of 1999), a Notification of Intent to Develop is not being submitted to Heritage Western Cape at this time. Nevertheless, from an archaeological and cultural heritage theme perspective, the DEFF Screening Tool indicates that the site is of High sensitivity due to it falling within the coastal belt, it being within 500m of a heritage site and it being within 1km of a protected area (Kingwill 2020). Consequently, Mr Kingwill appointed this author to conduct a site inspection with the purpose of providing inputs concerning the heritage sensitivity of the affected portion of the property.

While the development plans are currently conceptual and awaiting further inputs during this iterative part of the development process, the residential development will be restricted to a portion of the eastern extent of Erf 155 as shown in Figure 2. Vehicular access to the site will be through the Public Space of Erf 391.

The purpose of the study reported here is to determine whether any archaeological or tangible heritage resources occur on the surface of exposed sediments, to assess the sensitivity of archaeological resources if present in the affected area, to determine the potential impacts on such resources if present, and to avoid and/or minimize such impacts by means of management and/or mitigation measures. Note that the study presented here considered archaeological materials of prehistoric and historic origin. Overall, this study assesses the heritage sensitivity of the affected property in order to raise any potential issues or red flags and to recommend the way forward.

3. Site Inspection

The site was readily accessed by taking the Keurboomstrand turnoff from the N2 road and by following the PO394 road and Main Street that border the southern and northern extents of the development site (Erf 155) and access road to the development site (Erf 391). The inspection was conducted independently and on foot on 21 October 2020. Walk tracks were fixed with a hand held Garmin X30 GPS (map datum WGS84) unit to record the search area (Figure 3, gpx tracking file is available from author). Digital audio notes, video and a comprehensive, high quality digital photographic record were made with a Nikon Coolpix AW130 camera. Photo localities and directions of views were fixed by the camera's on-board GPS and compass respectively, which are indicated in photographs with data stamps (Plates 1 through 5). Note that some of the elevation information on the photo data stamps are incorrect. All coordinate, photographic and video data are available on request.

The affected area is vegetated with coastal thicket, scrub and bush and therefore some parts were difficult to access on foot and ground surfaces are commonly strewn with leaf and vegetation litter. Nevertheless, sufficient ground surfaces, disturbed areas and exposed sediments were open for archaeological inspection for the purpose of this basic assessment.

Visible geological sediments included variable thickness of topsoil underlain by shale and water worn cobble from broken up conglomerate of possible Enon origin. Apart from

existing development activities, disturbances and modern rubbish on Erf 391, there is no evidence of historic or prehistoric occupation of Erf 391 or Erf 155. Existing developments include a water reservoir, pipelines, levelling and trenching for pipelines, small excavations or disturbances and a small electrical "sub-station". The litter on site is mostly on Erf 391 and includes plastic, glass, piping, a vehicle tyre, and so on. No refuse of historic or prehistoric interest or significance was seen on site. Examples of the affected environment are shown in Plates 1 through 5.

4. Conclusions & Recommendations

Although the DEFF Screening Tool rates the site of High sensitivity from an archaeological and cultural heritage perspective, there is no evidence of historic or prehistoric occupation of the site with the exception of the existing modern development activities mentioned above. Consequently, the site is regarded to be of low to negligible sensitivity from an archaeological and cultural heritage perspective. Even though the well known archaeological and Provincial Heritage Site of Matjes River Rock Shelter occurs in the wider area (https://sahris.sahra.org.za/), it will not be impacted in any way by development on Erven 155 and 391.

Because the site is visible from the coastal road - although it is not a known tourist route as such -, development on Erf 155 will have some visual impact on the aesthetics of the area as seen from the east. This, however, is not relevant to the archaeological or cultural heritage themes as there are no significant heritage resources within the immediate surroundings of the affected property. The built environment surrounding Erf 155 is of a modern "coastal holiday village" theme and does not have an architectural style of any known heritage significance. Many residential developments including a large modern structure immediately south of Erf 155 are of a mixed and often elaborate modern design (Plate 2, bottom left). The visual impact of the proposed development on Erf 155 will be dealt with under a separate study.

Because shale – a geological sediment with fossil bearing potential - is present on Erf 155 and Erf 391, a quick search was conducted on the SAHRA website. According to the SAHRIS palaeontological sensitivity map, Erven 155 and 391 fall within a green zone, which is of moderate sensitivity, requiring a desktop Palaeontological Impact Assessment (PIA) study (https://sahris.sahra.org.za/map/palaeo). I recommend Dr John Almond for this study, who can suggest other professional palaeontologists in the event that he is not available.

Apart from the above-mentioned recommendations concerning aesthetic and palaeontological resources, there are no further archaeological or cultural heritage concerns or objections to the proposed residential development on Erf 155.

Overall, and based on the findings of this study, it is recommended that:

- a visual impact assessment, not specific to archaeological or heritage resources, will be facilitated by Mr Kingwill,
- a desktop PIA study is required according to the SAHRIS palaeontological sensitivity map, and
- if any human remains or archaeological materials are exposed during development activities, then the find should be protected from further disturbance and work in the immediate area should be halted and Heritage Western Cape must be notified immediately. These heritage resources are protected by Section 36(3)(a) and Section 35(4) of the NHRA (Act 25 of 1999) respectively and may not be damaged or disturbed

in any way without a permit from the heritage authorities. Any work in mitigation, if deemed appropriate, should be commissioned and completed before construction continues in the affected area and will be at the expense of the developer.

Reference

Kingwill, J. (July 2020) SCREENING REPORT FOR AN ENVIRONMENTAL AUTHORIZATION OR FOR A PART TWO AMENDMENT OF AN ENVIRONMENTAL AUTHORISATION AS REQUIRED BY THE 2014 EIA REGULATIONS – PROPOSED DEVELOPMENT FOOTPRINT ENVIRONMENTAL SENSITIVITY

Figure 1. General location of Erf 155, Keurboomstrand, located approximately 10km north-east of Plettenberg Bay, Western Cape Province. Courtesy of Google Earth 2020.

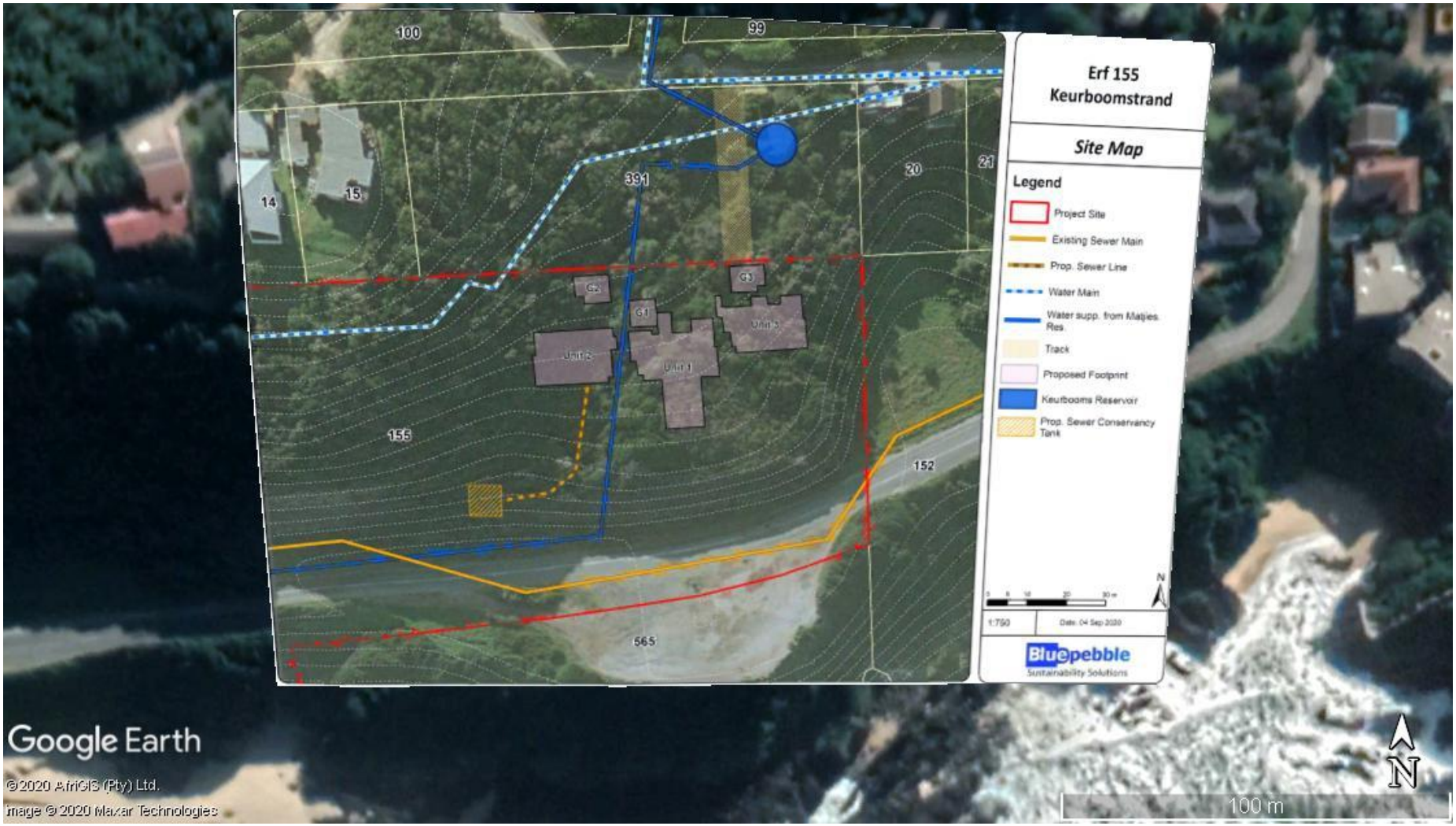


Figure 2. Conceptual site development plan overlaid on the eastern extent of Erf 155 and Erf 391, Keurboomstrand. Courtesy of Bluepebble (Mr Jonathan Kingwill) and Google Earth 2020.

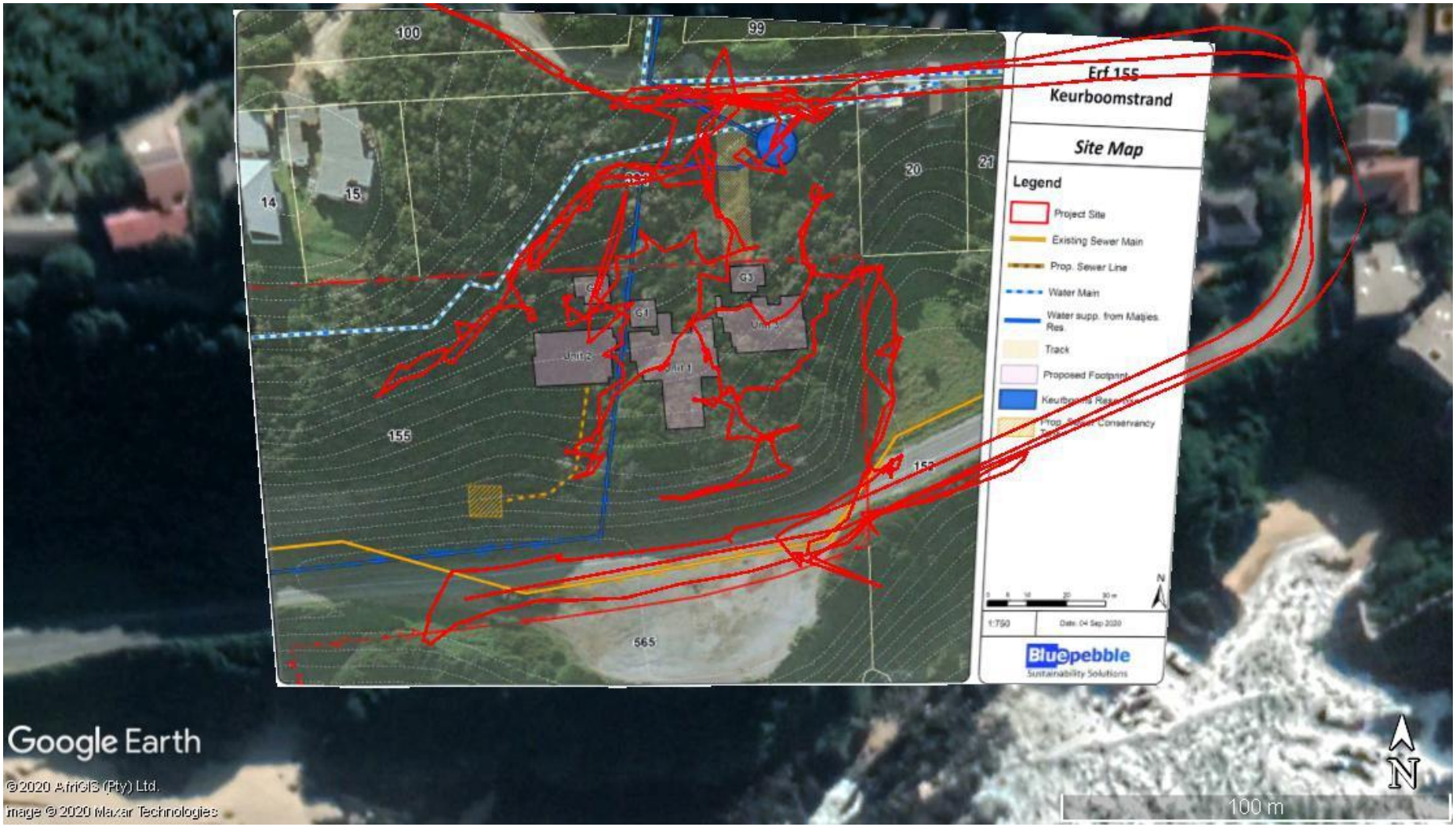


Figure 2. GPS fixed tracks (red lines) of the site inspection overlaid on the conceptual site development plan for the eastern extent of Erf 155 and Erf 391, Keurboomstrand. Courtesy of Bluepebble (Mr Jonathan Kingwill) and Google Earth 2020.

Plate 1. Examples of the receiving environment showing existing developments in the northern extent of Erf 391 and views of the access road site and development site (Erf 155) from Main Street in the north and road PO394 in the south. Also note topography and vegetation cover.

Plate 2. Examples of the affected environment showing topography, vegetation cover and existing developments in the immediate surroundings. Except top left, all views are from Erf 155.

Plate 3. Examples of the affected environment showing topography, vegetation cover and exposed surfaces.

Plate 4. Examples of the affected environment showing vegetation cover and exposed surfaces as well as existing disturbances and pipeline.

Plate 5. Examples of the affected environment showing existing disturbances and minor excavations / trenching.

CURRICULUM VITAE

August 2019

Peter John Nilssen

BIOGRAPHICAL DETAILS:

Name:	Peter John Nilssen
Address:	41, 21st Avenue Mossel Bay 6500 South Africa
Postal Address:	P.O. Box 2635 Mossel Bay 6500 South Africa
Telephone/Contact:	Tel: (home) (27) (044) 691 0051 Cellular phone: (27) 082 783 5896 E-mail: peter@carm.co.za or peter@humanorigin.co.za
Identity Number:	641214 5081 080
Nationality:	South African
Status:	Married with two children
Drivers Licence:	Code 02, 11/02/1987 Code 08, 15/12/1982
Health:	Excellent
Languages:	English Afrikaans

EDUCATION

School:	Rondebosch Boys High School, 1978 - 1982
School Certificate:	Cape Senior Certificate, Full Matriculation Exemption

HIGHER EDUCATION

University:	University of Cape Town (UCT), South Africa
Degrees:	Ph.D. in archaeology (2000), BA (HONS) 1989, and BA 1988

ACCREDITATION

I am a Professional member - in good standing - of the Association of Southern African Professional Archaeologists (ASAPA), including the Cultural Resource Management section of the same association (ASAPA professional member # 097). I am an accredited Principal Investigator for archaeozoology (specialist analysis), coastal & shell midden archaeology and Stone Age archaeology; Field Director for Colonial Period; Field Supervisor for Iron Age and Rock Art.

AWARDS, GRANTS, and SCHOLARSHIPS:

No funding was applied for since 2000.	
1987, 1988, 1989	Pietie Olivier Ysterkoppe Foundation (bursary for undergraduate studies)
	Human Sciences Research Council (bursary for Honours studies)
1989, 1993	Harry Oppenheimer Institute for African Studies (Travel and Subsistence grant)
1990, 1991, 1993, 1994	Foundation for Research Development (bursaries for Masters and Doctoral studies)
1992, 1995	Centre for Science Development (bursaries for Masters and Doctoral studies)
1992, 1993, 1994, 1996, 1997	Department of Archaeology, UCT (departmental grants)
1992	Jock Beattie Memorial Bursary
1993	University of Cape Town Research Committee (research grant)
2000	National Research Foundation: First Time Research Grant

CAREER ACTIVITIES AND ACHIEVEMENTS

- archaeological field trips: leadership, interpersonal relations, working in and with groups, responsibilities
- tutoring, teaching, supervising undergraduate and post-graduate students
- organisational skills, wide-ranging computer skills, management of research materials, projects and field trips, and completed a course at the Professional Communications Unit at UCT.
- played a proactive and influential role in the conservation, management and mitigation of archaeological and heritage-related resources
- involved in the development and initiation of policy, procedures and protocols with respect to cultural resource management such as monitoring of developments and using state-of-the-art field techniques and technology to generate top quality scientific samples and assemblages
- educate and employ individuals from local communities where we conduct field work
- development and presentation of Point of Human Origins experience – the origins of modern human behaviour at Pinnacle Point, Mossel Bay, South Africa and its implications for the future of our species

Interests:

I am particularly interested in Stone Age or hunter-gatherer archaeology. I am co-founder of the Mossel Bay Archaeology Project (MAP), which has made globally significant discoveries concerning the origins of modern humans and is currently one of the best funded projects worldwide. I resigned from academia in 2006 and now work as an independent specialist (archaeologist) consultant for environmental impact assessments. I am involved in outreach, education and tourism related projects aimed at sharing the story of our species' origins and where we may be headed in the future.

Book:

- Nilssen, Peter. 2011. Hunting or Scavenging in the Early and Middle Stone Ages of Africa – Experimental archaeology and reconstructing hominid strategies of carcass acquisition and butchery in the Upper Pleistocene and Plio-Pleistocene. VDM Verlag Dr. Muller GmbH & Co. KG (ISBN 978-3-639-37474-2)

Peer Review Publications:

- Nilssen, Peter and Craig Foster. 2017. The key to our future is buried in the past – philosophical thoughts on saving us from ourselves. The Digging Stick Vol 34, 1
- Antonieta Jerardino, Jonathan Kaplan, Rene Navarro and Peter Nilssen. 2016. Filling in the gaps and testing past scenarios on the Central West Coast: Hunter-gatherer subsistence and mobility at 'Deurspring 16' Shell Midden, Lamberts Bay, South Africa. *The South African Archaeological Bulletin* June 2016.
- McGrath, J.R., Cleghorn, N., Gennari, B., Henderson, S., Kyriacou, K., Nelson-Viljoen, C., Nilssen, P., Richardson, L., Shelton, C., Wilkins, J., & Maeran, C.W. 2015. The Pinnacle Point Shell Midden

Complex: a Mid to Late Holocene Record of Later Stone Age Coastal Foraging Along the Southern Cape Coast of South Africa. South African Archaeological Bulletin 70 (202): 209–219.

- Abe, Y., C.W. Marean, P.J. Nilssen & D.J. Allen. 2014. Taphonomy–Edged, Incised, Hacking, and Impaling Traumas. International Journal of Osteoarchaeology 12(2):142 - 143 · January 2014
- Marean, C.W., Bar-Matthews, M., Fisher, E., Goldberg, P., Herries, A., Karkanas, P., Nilssen, P.J., Thomson, E. 2010. The stratigraphy of the Middle Stone Age sediments at Pinnacle Point Cave 13B (Mossel Bay, Western Cape Province, South Africa). Journal of Human Evolution, 59(3-4):234-55.
- Thalassa Matthews, Curtis Marean & Peter Nilssen 2009. Micromammals from the Middle Stone Age (92–167 ka) at Cave PP13B, Pinnacle Point, south coast, South Africa. Palaeontologia Africana (December 2009) 44: 112–120
- Miryam Bar-Matthews, Curtis Marean , Zenobia Jacobs , Panagiotis Karkanas , Erich Fisher , Andy Herries , Kyle Brown , Hope Williams , Jocelyn Bernatchez , Avner Ayalon , Peter Nilssen. 2010. A high resolution and continuous isotopic speleothem record of paleoclimate and paleoenvironment from 90 to 53 ka from Pinnacle Point on the south coast of South Africa. Quaternary Science Reviews 29(17–18):2131-2145.
- Marean, C. W., Thompson, E., Williams, H., Bernatchez J. Nilssen, P. J *et al* (2007) "Early Human use of Marine resources and pigments in South Africa during the Middle Pleistocene" *Nature*
- Marean, C. W., Nilssen, P. J., Brown, K., Jerardino, A., and D. Stynder (2004) "Paleoanthropological Investigations of Middle Stone Age Sites at Pinnacle Point, Mossel Bay (South Africa): Archaeology and Hominid Remains from the 2000 Field Season." *PaleoAnthropology*
- Yoshiko Abe, Curtis W. Marean, Peter J. Nilssen, Zelalem Assefa, and Elizabeth Stone 2002. "The analysis of cut marks on archaeofauna: a review and critique of quantification procedures, and a new image-analysis GIS approach." *American Antiquity* 67:
- C.W. Marean, Y. Abe, P.J. Nilssen, and E. Stone 2001. "Estimating the minimum number of skeletal elements (MNE) in zooarchaeology: a review and a new image-analysis GIS approach." *American Antiquity* 66:333-348.
- Jerardino, R. Navarro, and P. Nilssen, 2001. An approach to the study of Cape rock lobster (*Jasus lalandii*) exploitation in the past: morphometric equations for estimating carapace length from mandible sizes. *South African Journal of Science* 97:59-62.
- D'Errico, F, C. Henshilwood and P. Nilssen 2001. An engraved bone fragment from c. 70,000-year-old Middle Stone Age levels at Blombos Cave, South Africa: implications for the origin of symbolism and language. *Antiquity* 75 (288): 309-318.
- Nilssen, Peter John. 2000. An actualistic butchery study in South Africa and its implications for reconstructing hominid strategies of carcass acquisition and butchery in the upper pleistocene and plio-pleistocene. Unpublished PhD dissertation, University of Cape Town, South Africa.
- Nilssen, Peter. 1994. Framing the present to capture the past: An example of videography in actualistic research. The *South African Archaeological Bulletin* Vol. XLIX (160): 100-102.
- Henshilwood, C., Nilssen, P. and Parkington, J. 1994. Mussel drying and food storage in the late Holocene, SW Cape, South Africa. *Journal of Field Archaeology*. 21: 103 - 109.
- Parkington, J., Nilssen, P., Reeler, C. and Henshilwood, C. 1992. Making sense of space at Dunefield Midden campsite, western Cape, South Africa. *Southern African Field Archaeology*. 1 (2): 63-71.

Heritage-related Impact Assessments (218 reports, all were accepted and approved by provincial and national heritage authorities):

2018 (15 reports)

- Nilssen, P.J. 2018. Phase 1a Archaeological Impact Assessment - Scoping Phase - Proposed Impofu East Wind Farm, Kouga Local Municipality, Sarah Baartman District Municipality, Eastern Cape Province.
- Nilssen, P.J. 2018. Phase 1a Archaeological Impact Assessment - Basic Assessment Report in terms of NEMA. Proposed Grid Connection for the Impofu Wind Farms; from Kouga area to Sans Souci and Chatty Substations near Port Elizabeth, Eastern Cape Province.
- Nilssen, P.J. 2018. Phase 1a Archaeological Impact Assessment - Scoping Phase. Proposed Impofu North Wind Farm, Kou-Kamma and Kouga Local Municipalities, Sarah Baartman District Municipality, Eastern Cape Province.
- Nilssen, P.J. 2018. Phase 1a Archaeological Impact Assessment - Scoping Phase. Proposed Impofu West Wind Farm, Kouga Local Municipality, Sarah Baartman District Municipality, Eastern Cape Province.
- Nilssen, P.J. 2018. Revised Phase 1a Archaeological Impact Assessment - Proposed development of Herold Meander on Portions 27, 29, 38, 48 & 49 of the Farm Doorn River 98 (Herold), George District and Municipality, Western Cape Province. (HWC Case No. 15060303GT0609E; DEA&DP Pre-Application Ref Number: 16/3/3/6/7/1/D2/19/0106/15).
- Nilssen, P.J. 2018. Revised Archaeological Inspection. Section 24G Application in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) & 2014 Environmental Impact Regulations. Illegal Expansion of Klein Zelpie Dam on Portion 8 of Farm 81 Klippedrif, Zebra, Oudtshoorn and Illegal Widening & Sealing of Klipdrift Water Canal on Portion 7 of Farm 80 and Portion 12 of Farm 81,

George/Oudtshoorn, Western Cape Province. (DEA&DP Ref: 14/1/1/E3/8/9/3/L891/17; HWC Case No: 16112910AS1201E).

- Nilssen, P.J. 2018. Scoping Archaeological Impact Assessment With ADDENDUM for Amendment Application, 2018 (see from pg 23). Proposed development of the Plan 8 Grahamstown Wind Energy Project: including Farms Gilead 361, Peynes Kraal 362 and Tower Hill 363, Grahamstown, Makana Municipality, Eastern Cape Province.
- Nilssen, P.J. 2018. SCOPING REPORT - Archaeological Resources. Proposed rezoning, subdivision and residential development: Erf 3122, Hartenbos Heuwels, Mossel Bay, Western Cape Province.
- Nilssen, P.J. 2018. Phase 1a Archaeological Impact Assessment. Scoping Phase/ Proposed Hotazel Solar and Grid Connection on Remaining Extent (Portion 0) of the Farm York A 279, Portion 0 of Hotazel 280, Portion 11 of the Farm York A 279, and Portion 3 of the Farm York A 279, District of Hotazel, Northern Cape Province.
- Nilssen, P.J. 2018. Phase 1a Archaeological Impact Assessment. Environmental Impact Assessment. Proposed Gaetsewe Solar and Grid Connection on Portion 2 of the Farm Legoko No 460, District of Kuruman Rd, Gamagara Local Municipality, Northern Cape Province.
- Nilssen, P.J. 2018. Phase 1a Archaeological Impact Assessment. Environmental Impact Assessment. Proposed Mogara Solar and Grid Connection on Portions 1 and 2 of the Farm Legoko No 460 and Sekgame 461, District of Kuruman Rd, Gamagara Local Municipality, Northern Cape Province.
- Nilssen, P.J. 2018. Archaeological Inspection. Non-compliant construction works - Pansy Villas on Erf 5216, Mossel Bay, Western Cape Province. (Heritage Western Cape Case No. 121212RN12M).
- Nilssen, P.J. 2018. ARCHAEOLOGICAL LINE WALKDOWN. Construction of a New 66kv Bitou Substation and Overhead Powerline Between New Bitou Substation and Existing Robberg Substation, Plettenberg Bay, Western Cape. Eskom Unique Identifier: Robberg-Bitou 66kv O/H Line; DEA reference number 14/12/16/3/3/1/570; Heritage Western Cape Case No.: 131111TS20.
- Nilssen, P.J. 2018. Statement to Accompany HWC NID. (HWC Case No.: 18052308). Proposed Consolidation, Rezoning and Residential Development (Group Housing) on, Erven 824, 825, 826, 827, 828, 829, 830 and 831, Wilderness, George District Municipality, Western Cape Province.
- Nilssen, P.J. 2018. Phase 1a Archaeological Impact Assessment. (HWC Case No.: 18052308). Proposed Consolidation, Rezoning and Residential Development (Group Housing) on, Erven 824, 825, 826, 827, 828, 829, 830 and 831, Wilderness, George District Municipality, Western Cape Province.

2017 (7 reports)

- Nilssen, P.J. 2017. Report on Archaeological Monitoring at the site of Moquini Beach Hotel, Erf 14796, Mossel Bay, Eden, Western Province - Vegetation clearing for the period 23 May to 7 June 2016 and excavations for the period 1 to 21 November 2016.
- Nilssen, P.J. 2017. Screening Phase Report - Archaeological Resources: Proposed Grid Connection for the Impofu Wind Energy Facilities; from Kouga area to Sans Souci or Chatty Substations near Port Elizabeth, Eastern Cape Province.
- Nilssen, P.J. 2017. Screening Phase Report - Archaeological Resources: Proposed Impofu Wind Farms, Kouga Local Municipality, Humansdorp District, Eastern Cape Province.
- Nilssen, P.J. 2017. Phase 1a Archaeological Impact Assessment: Proposed development of Herold Meander on Portions 27, 29, 38, 48 & 49 of the Farm Doorn River 98 (Herold), George District and Municipality, Western Cape Province. (HWC Case No. 15060303GT0609E; DEA&DP Pre-Application Ref Number: 16/3/3/6/7/1/D2/19/0106/15)
- Nilssen, P.J. 2017. Constraints Analysis - Archaeological Resources: Proposed rezoning, subdivision and residential development: Erf 3122, Hartenbos Heuwels, Mossel Bay, Western Cape Province
- Nilssen, P.J. 2017. Phase 1a Archaeological Impact Assessment: Proposed Residential Development on Portion 71 of the Farm Uitzicht 216, Brenton on Sea, Knysna, Western Cape Province. Heritage Western Cape Case No.: 17020802WD0313E
- Nilssen, P.J. 2017. Constraints Analysis - Archaeological Resources: Proposed residential development of the L'Agulhas Lifestyle Estate: Erven 678, 679 & 680 Agulhas, Cape Agulhas Municipality, Bredasdorp Division, Western Cape Province

2016 (22 reports)

- Nilssen, P.J. 2016. Progress Report on Archaeological Monitoring at the site of Moquini Beach Hotel, Erf 14796, Mossel Bay, Eden, Western Province - Vegetation clearing for the period 23 May to 7 June 2016
- Nilssen, P.J. 2016. Phase 1a Archaeological Impact Assessment: Proposed development of Herold Meander on Portions 27, 29, 38, 48 & 49 of the Farm Doorn River 98 (Herold), George District and Municipality, Western Cape Province (HWC Case No. 1506 0303)
- Nilssen, P.J. 2016. Revised 10th Preliminary Report on Archaeological Monitoring at Gibson Bay Wind Farm, Eastern Cape Province For the period 1 - 30 January 2016
- Nilssen, P.J. 2016. 11th Preliminary Report on Archaeological Monitoring at Gibson Bay Wind Farm, Eastern Cape Province For the period 1 - 29 February 2016
- Nilssen, P.J. 2016. 12th Preliminary Report on Archaeological Monitoring at Gibson Bay Wind Farm, Eastern Cape Province For the period 1 - 31 March 2016

- Nilssen, P.J. 2016. 13th Preliminary Report on Archaeological Monitoring at Gibson Bay Wind Farm, Eastern Cape Province For the period 1 - 30 April 2016
- Nilssen, P.J. 2016. Final Report - Archaeological Monitoring at Gibson Bay Wind Farm, Eastern Cape Province For the period 22 April 2015 - 31 May 2016
- Nilssen, P.J. 2016. Scoping Archaeological Impact Assessment: Proposed development of the AEP Kathu Solar Facility on Portion 0 of the Farm 460 Legoko, Kathu, Northern Cape Province
- Nilssen, P.J. 2016. Phase 1a Archaeological Impact Assessment: Proposed development of the AEP Kathu Solar Facility and associated Access Road and Grid Connection on Portion 0 of the Farm 460 Legoko, Portion 2 of the Farm 460 Legoko and Sekgame 461, Kathu, Northern Cape Province
- Nilssen, P.J. 2016. Scoping Archaeological Impact Assessment: Proposed development of the AMDA Alpha PV (Solar Energy Facility) on Portion 1 of N'Rougas Zuid No 121, Straussheim, and Overhead Power Line Grid Connection to the Eskom Nieuwehoop MTS Sub-Station across Portion 3 of Gemsbok Bult No120, Kenhardt Registration Division, Northern Cape Province
- Nilssen, P.J. 2016. Phase1a Archaeological Impact Assessment: Proposed development of the AMDA Alpha PV (Solar Energy Facility) on Portion 1 of N' Rougas Zuid No 121, Straussheim, and Overhead Power Line Grid Connection to the Eskom Nieuwehoop MTS Sub-Station across Portion 3 of Gemsbok Bult No 120, Kenhardt Registration Division, Northern Cape Province
- Nilssen, P.J. 2016. Scoping Archaeological Impact Assessment: Proposed development of the AMDA Bravo PV (Solar Energy Facility) on Portion 1 of N'Rougas Zuid No 121, Straussheim, and Overhead Power Line Grid Connection to the Eskom Nieuwehoop MTS Sub-Station across Portion 3 of Gemsbok Bult No120, Kenhardt Registration Division, Northern Cape Province
- Nilssen, P.J. 2016. Phase1a Archaeological Impact Assessment: Proposed development of the AMDA Bravo PV (Solar Energy Facility) on Portion 1 of N' Rougas Zuid No 121, Straussheim, and Overhead Power Line Grid Connection to the Eskom Nieuwehoop MTS Sub-Station across Portion 3 of Gemsbok Bult No 120, Kenhardt Registration Division, Northern Cape Province
- Nilssen, P.J. 2016. Scoping Archaeological Impact Assessment: Proposed development of the AMDA Charlie PV (Solar Energy Facility) on Portion 1 of N'Rougas Zuid No 121, Straussheim, and Overhead Power Line Grid Connection to the Eskom Nieuwehoop MTS Sub-Station across Portion 3 of Gemsbok Bult No120, Kenhardt Registration Division, Northern Cape Province
- Nilssen, P.J. 2016. Phase1a Archaeological Impact Assessment: Proposed development of the AMDA Charlie PV (Solar Energy Facility) on Portion 1 of N' Rougas Zuid No 121, Straussheim, and Overhead Power Line Grid Connection to the Eskom Nieuwehoop MTS Sub-Station across Portion 3 of Gemsbok Bult No 120, Kenhardt Registration Division, Northern Cape Province (DEA Reference No: 14/12/16/3/3/2/943)
- Nilssen, P.J. 2016. Heritage Statement - Proposed upgrading of existing road between John Brown Street (extension 13) and Alhof Street (extension 8) on RE 2001, Kwanonqaba, Mossel Bay, Western Cape Province (HWC Case No: 16020309) DEADP Ref No: 16/3/3/6/7/1/D6/7/0208/15 (this is the Pre-Application process reference number)
- Nilssen, P.J. 2016. Scoping Archaeological Impact Assessment: Proposed development of the AMDA DELTA PV (Solar Energy Facility) on Remaining Extent Klondike No 670, and Overhead Power Line Grid Connection to the Mookodi MTS Sub-Station across Remainder of Erf 506 and Remainder of the Farm Rosendal 673, Vryburg, Registration Division, North West Province
- Nilssen, P.J. 2016. Phase1a Archaeological Impact Assessment: Proposed development of the AMDA Delta PV (Solar Energy Facility) on Remaining Extent Klondike No 670, and Overhead Power Line Grid Connection to the Mookodi MTS Sub-Station across Remainder of Erf 506 and Remainder of the Farm Rosendal 673, Vryburg, Registration Division, North West Province (EIA Reference No: NAL431/03)
- Nilssen, P.J. 2016. Scoping Archaeological Impact Assessment: Proposed development of the AMDA ECHO PV (Solar Energy Facility) on Remaining Extent Klondike No 670, and Overhead Power Line Grid Connection to the Mookodi MTS Sub-Station across Remainder of Erf 506 and Remainder of the Farm Rosendal 673, Vryburg, Registration Division, North West Province
- Nilssen, P.J. 2016. Phase1a Archaeological Impact Assessment: Proposed development of the AMDA Echo PV (Solar Energy Facility) on Remaining Extent Klondike No 670, and Overhead Power Line Grid Connection to the Mookodi MTS Sub-Station across Remainder of Erf 506 and Remainder of the Farm Rosendal 673, Vryburg, Registration Division, North West Province (EIA Reference No: NAL432/03)
- Nilssen, P.J. 2016. Scoping Archaeological Impact Assessment: Proposed development of the AMDA FOXTROT PV (Solar Energy Facility) on Remaining Extent Klondike No 670, and Overhead Power Line Grid Connection to the Mookodi MTS Sub-Station across Remainder of Erf 506 and Remainder of the Farm Rosendal 673, Vryburg, Registration Division, North West Province
- Nilssen, P.J. 2016. Phase1a Archaeological Impact Assessment: Proposed development of the AMDA Foxtrot PV (Solar Energy Facility) on Remaining Extent Klondike No 670, and Overhead Power Line Grid Connection to the Mookodi MTS Sub-Station across Remainder of Erf 506 and Remainder of the Farm Rosendal 673, Vryburg, Registration Division, North West Province (EIA Reference No: NAL433/03)

2015 (24 reports)

- Nilssen, P.J. 2015. 1st Preliminary Report on Archaeological Monitoring at Gibson Bay Wind Farm, Eastern Cape Province
- Nilssen, P.J. 2015. 2nd Preliminary Report on Archaeological Monitoring at Gibson Bay Wind Farm, Eastern Cape Province
- Nilssen, P.J. 2015. 3rd Preliminary Report on Archaeological Monitoring at Gibson Bay Wind Farm, Eastern Cape Province June 2015

- Nilssen, P.J. 2015. 4th Preliminary Report on Archaeological Monitoring at Gibson Bay Wind Farm, Eastern Cape Province For the period 1 - 31July 2015
- Nilssen, P.J. 2015. 5th Preliminary Report on Archaeological Monitoring at Gibson Bay Wind Farm, Eastern Cape Province For the period 1 - 31August 2015
- Nilssen, P.J. 2015. 6th Preliminary Report on Archaeological Monitoring at Gibson Bay Wind Farm, Eastern Cape Province For the period 1 - 30 September 2015
- Nilssen, P.J. 2015. 7th Preliminary Report on Archaeological Monitoring at Gibson Bay Wind Farm, Eastern Cape Province For the period 1 - 31 October 2015
- Nilssen, P.J. 2015. 8th Preliminary Report on Archaeological Monitoring at Gibson Bay Wind Farm, Eastern Cape Province For the period 1 - 30 November 2015
- Nilssen, P.J. 2015. 9th Preliminary Report on Archaeological Monitoring at Gibson Bay Wind Farm, Eastern Cape Province For the period 1 - 31 December 2015
- Nilssen, P.J. 2015. Scoping Archaeological Impact Assessment: Proposed development of the AEP Kathu Solar Facility on Portion 0 of the Farm 460 Legoko, Kathu, Northern Cape Province
- Nilssen, P.J. 2015. Scoping Archaeological Impact Assessment: Proposed development of the AEP Legoko Solar Facility on Portion 2 of the Farm 460 Legoko, Kathu, Northern Cape Province
- Nilssen, P.J. 2015. Phase 1a Archaeological Impact Assessment: Proposed development of the AEP Legoko Solar Facility and associated Access Roads and Grid Connections on Portion 2 of the Farm 460 Legoko and Sekgame 461, Kathu, Northern Cape Province
- Nilssen, P.J. 2015. Scoping Archaeological Impact Assessment: Proposed development of the AEP Mogobe Solar Facility on Portion 1 of the Farm 460 Legoko, Kathu, Northern Cape Province
- Nilssen, P.J. 2015. Phase 1a Archaeological Impact Assessment: Proposed development of the AEP Mogobe Solar Facility and associated Access Road and Grid Connection on Portion 1 of the Farm 460 Legoko and Sekgame 461, Kathu, Northern Cape Province
- Nilssen, P.J. 2015. Phase 1a Archaeological Impact Assessment: Proposed Ladismith Bulk Water Supply Scheme on RE/95 (Ylands Valley) and RE/57 (Korrel Land), Ladismith, Kannaland District, Western Cape Province
- Nilssen, P.J. 2015. Phase 1a Archaeological Impact Assessment: Proposed redevelopment of Portions of Farms Roodewal 47/3, 17 and 72 (Spieskamp), Oudtshoorn District and Municipality, Western Cape Province (Heritage Western Cape Case Id: 1504 1501)
- Nilssen, P.J. 2015. Archaeological Micro-Siting of Wind Turbine, Site Camp, Lay-down and Substation Localities: Oyster Bay Wind Farm, Kouga Local Municipality, Humansdorp District, Eastern Cape Province
- Nilssen, P.J. 2015. Archaeological Monitoring of Vegetation Clearing and Earth Moving Activities in Mitigation of Development at Paradise Coast – portion of Project 6: Frail Care Centre and Group Housing - Remainder of the Farm Droogfontein 245, Mossel Bay, Western Cape Province - Progress Report
- Nilssen, P.J. 2015. Scoping Archaeological Impact Assessment: Proposed residential development of The Hill, Erf 1638 Sedgefield and Remainder of Portion 82 of the Farm No 205 RuygteVallei, Knysna Municipality, Sedgefield District, Western Cape Province
- Nilssen, P.J. 2015. MANAGEMENT OF ARCHAEOLOGICAL RESOURCES - PLATTEBOSCH 485 PORTION 51, STILBAAI, WESTERN CAPE PROVINCE
- Nilssen, P.J. 2015. Notification of Management of Archaeological / Heritage Resources at Remainder of Portion 51 of the Farm Plattebosch 485, Stilbaai, Hessequa Municipality, Western Cape Province (Heritage Western Cape Reference No. HW/Stilbaai/Site 54 & 57 Farm 485 PTN 51)
- Nilssen, P.J. 2015. Phase 2 Working Plan for Archaeological / Heritage Resources at Remainder of Portion 51 of the Farm Plattebosch 485, Stilbaai, Hessequa Municipality, Western Cape Province (Heritage Western Cape Reference No. HW/Stilbaai/Site 54 & 57 Farm 485 PTN 51)
- Nilssen, P.J. 2015. Scoping Archaeological Impact Assessment: Proposed development of Ephraim Sun Solar PV Development near Upington on Remainder of portion 62 (portion of portion 9) (Vryheid) of Farm Vaalkoppies no 40., //Khara Hais Municipality, Northern Cape Province
- Nilssen, P.J. 2015. Phase 1a Archaeological Impact Assessment: Proposed development of Ephraim Sun Solar PV Development near Upington on Remainder of portion 62 (portion of portion 9) (Vryheid) of Farm Vaalkoppies no 40. Including Potential Grid Connections Across Portions of the Farm Vaalkoppies 40/3, 9, 52 & 66; Farm 555/7; and Erven 73 & 19951, //Khara Hais Municipality, Kenhardt District, Northern Cape Province

2014 (13 reports)

- Nilssen, P.J. 2014. Scoping Archaeological Impact Assessment: Proposed development of the Droërivier Solar Facility, on Portion 55 of Farm 168 Steenrotsfontein and a portion of Portion 10 of Farm 170 Weltevreden, Beaufort West, Western Cape Province
- Nilssen, P.J. 2014. Phase 1a Archaeological Impact Assessment: Proposed Residential Development on Portions of the Farm Hartenbosch 217/4, 59 and 105, and Erven 1853, 3122 (Sonskynvallei), Mossel Bay District, Western Cape Province
- Nilssen, P.J. 2014. Phase 1a Archaeological Impact Assessment: Proposed New Municipal Cemetery on a portion of Erf 2001/0, Mossel Bay Municipality, Mossel Bay, Western Cape Province. (Heritage Western Cape Case No. 14091716AS1801E; DEA&DP Ref. Nr: 16/3/1/1/D6/28/0047/14)
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Papers:

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- Parkington, J., Reeler, C., Nilssen, P. and Henshilwood, C. "Making sense of space at Dunefield Midden campsite, Western Cape, South Africa." Paper in the Guide to Archaeological Sites in the South-western Cape: For the South African Association of Archaeologists Conference, Cape Town, 1992: 13-19. Compiled by: Andrew B. Smith and Belinda Mutti.
- Parkington, J., Nilssen, P., Vermeulen, C. and Henshilwood, C. "Domestic patterning in a shell midden." Presented at the South African Association of Archaeologists Conference, Kimberley 1990.
- Reeler, C., Nilssen, P. and Parkington, J. "Patterns at Dunefield Midden." Presented at the South African Association of Archaeologists Conference, Cape Town 1992.

Public Speaker:

Woman's Agricultural Association (1993); Dias Museum – Mossel Bay (2000); South Cape Stereo (2000); Probus Club - Mossel Bay (2003); DEAT Heritage Day Mossel Bay (2003); Rotary International - Mossel

Bay (2003); SRK Consulting – Cape St Francis (2003); Ataqua House - KhoeSan Group, Workshop – Oudtshoorn (2004); Woman's Association, Mossel Bay (2005); Suid Kaap Stereo (2012 & 2013). Currently running educational tours to the archaeological cave sites at Pinnacle Point, Mossel Bay (2013 to present).

PROFESSIONAL EMPLOYMENT

DATE	EMPLOYER	JOB DESCRIPTION
1989 - 1994	Prof. J.E. Parkington, UCT	Research Assistant
1990 – 1992	Prof. J.E. Parkington, UCT	Tutor for excavations
1991	Dept. Archaeology, UCT	Tutor for first year course in archaeology
1992	Dept. Archaeology, UCT	Teaching Assistant for third year course in archaeology
1995 & 1996	Prof. A. Sillen, UCT	Research Assistant
1993 - 1999	Various scientists	Analysis of animal bones from archaeological sites
1991 - 1999	Archaeology Contracts Office (UCT) Agency for CRM (J Kaplan)	Cultural Resource Management
1999 - 2004	Prof. C.W. Marean, State University of New York, Stony Brook, USA	Contracted researcher and Faunal Analyst
2000 - 2001	Dr. C.S. Henshilwood, IZIKO	Specialist: Faunal Analysis Blombos Cave, Blombos
2003	Prof. Judith C. Sealy, UCT	Faunal Analyst
2004 - 2006	Institute of Human Origins (IHO), Arizona State University, Tempe, USA	Co-Founder, Co-Director & contracted researcher with the Mossel Bay Archaeology Project
2007 to present	self employed	Specialist Archaeological ` Consultant
2013 to present	Point of Human Origins Pty Ltd	Co-founder and co-owner

MEMBERSHIP

The Association of South African Professional Archaeologists
CRM section of the Association of South African Professional Archaeologists
Steering Committee for the development of Archaeological & Palaeontological Tourism Route in the Western Cape.
Planning Committee for the development of the Point Discovery Centre in Mossel Bay, Western Cape.

CAREER OBJECTIVE

If human behaviour is responsible for the current status of society and the quality of life on earth, and if archaeology investigates the development of human behaviour, then our discipline should be central to understanding the present and to guiding the future of our species and life on earth. An abundance of scientific data shows that in the last few millennia humans have placed life under severe stress and are expediting the sixth extinction event. It seems obvious then that the thrust of current research should focus on securing our future. To this end I specialise in communicating archaeology for education and conservation and am on the team spearheading development of the Point Discovery Centre in Mossel Bay. The purpose of this centre is to create awareness of our shared heritage, to inspire people to return to the original human design and to facilitate research into the potential and avenues for transforming human behaviour.

PALAEONTOLOGICAL HERITAGE ASSESSMENT: DESKTOP STUDY

Proposed Residential Development on a Portion of Erf 155, Keurboomstrand near Plettenberg Bay, Eden District Municipality, Western Cape Province

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December 2020

1. EXECUTIVE SUMMARY

Ferpa (Pty) Ltd is proposing to construct a residential development with associated infrastructure on a Portion of Remainder of Erf 155 (5.6 ha in extent), Keurboomstrand, situated on the Southern Cape coast *c*. 10 km northeast of Plettenberg Bay in the Eden District Municipality, Western Cape Province.

The project area for the proposed residential development is underlain by Late Silurian to Early Devonian marine to coastal sediments of the Baviaanskloof Formation (uppermost Table Mountain Group). Elsewhere along the Southern Cape coast dark, organic-rich mudrocks of possible lagoonal origin within this formation contain important, largely unstudied fossils of primitive land plants while a small range of shelly invertebrate and trace fossils occur within shallow marine sandstone facies in parts of the Western Cape. The overlying Late Caenozoic superficial sediments (colluvium, coversands, soils *etc*) are probably largely or entirely unfossiliferous.

The DEFF Screening Tool does not highlight the potentially high palaeosensitivity of the Keurboomstrand residential development project area while this is assigned a MEDIUM sensitivity on the SAHRIS Palaeosensitivity Map. However, given (1) the demonstrated presence of dark grey mudrocks of the Baviaanskloof Formation, both at surface and within test pits within the project area, and (2) the potential of these mudrocks to contain scientifically valuable fossils, most notably primitive terrestrial plants, a precautionary approach is appropriate here. **Pending a specialist palaeontological site visit, the bedrocks should be provisionally assigned a HIGH to VERY HIGH palaeosensitivity.**

As a condition for Environmental Authorisation of the proposed development, it is recommended that a pre-construction site visit be made by a palaeontological specialist. This is to (1) record any near-surface fossil material and its geological context, (2) assess the site's palaeosensitivity and potential impacts on fossil heritage posed by the development, and (3) make appropriate recommendations for any further palaeontological monitoring or mitigation measures (if any) to be taken in the pre-construction and / or construction phases. The specialist palaeontological field report should be submitted for comment to Heritage Western Cape (HWC contact details: Heritage Western Cape. Protea Assurance Building, Green Market Square, Cape Town 8000. Private Bag X9067, Cape Town 8001. Tel: 086-142 142. Fax: 021-483 9842. Email: hwc@pgwc.gov.za). All reporting should meet the minimum standards for palaeontological reports specified by HWC (2016).

2. INTRODUCTION & BRIEF

The company Ferpa (Pty) Ltd is proposing to construct a residential development with associated infrastructure (*viz*. *c*. 60 m access road, water supply, sewerage storage, electricity supply, rainwater harvesting and stormwater management) on a Portion of Remainder of Erf 155 (5.6 ha in extent), Keurboomstrand, situated on the Southern Cape coast some 10 km northeast of Plettenberg Bay in the Eden District Municipality, Western Cape Province (Figs. 1 & 2). The proposed site layout (preferred option with 3 units) is shown in Figure 3.

The application for Environmental Authorisation for the housing development is being conducted on behalf of the proponent by Bluepebble Sustainability Solutions, Knysna (Contact details: Mr Jonathan Kingwill, Bluepebble Sustainability Solutions. Postnet Suite 41, Private Bag X31, Knysna, 6570. Tel: +27 (82) 777 0705. Fax: +27 (86) 553 8837. E-mail: jonathan@bluepebble.biz). A Heritage Statement for the development prepared by Dr Peter Nilssen, Mossel Bay (Nilssen 2020) illustrated potentially fossiliferous shales on adjoining Erven 155 and 391, as also shown in the relevant geotechnical report by Outeniqua Geotechnical Services (2020), and drew attention to the Moderate Palaeosensitivity of the project area on the SAHRIS Website. A desktop palaeontological study (PIA) for the residential project was therefore recommended and has accordingly been commissioned by Bluepebble Sustainability Solutions.

Figure 1: Extract from topographical sheet 3322 Oudtshoorn (Courtesy of the Chief Directorate: National Geo-spatial Information, Mowbray) showing the approximate location of the proposed residential development on a Portion of Remainder of Erf 155 Keurboomstrand, situated along the south coast *c*. 10 km northeast of Plettenberg Bay, Eden District Municipality, Western Cape Province (blue dot).

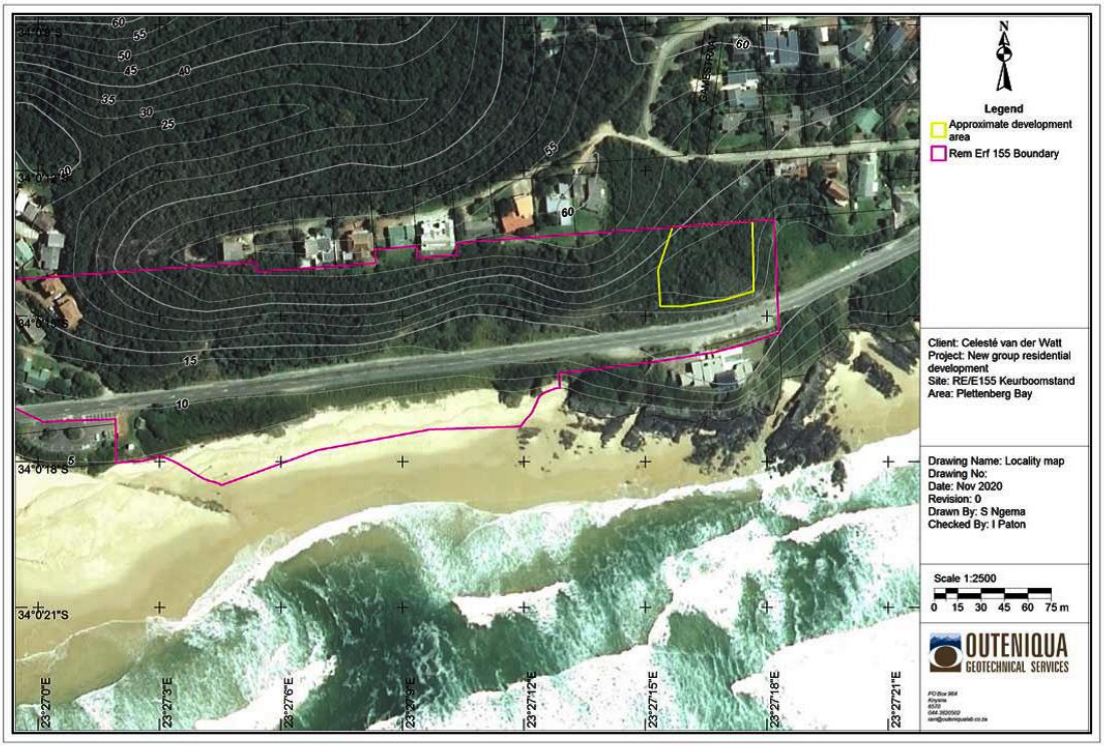


Figure 2: Satellite image showing the boundary of the Remainder of Erf 155 (purple polygon) and the approximate project area of the proposed nearshore residential development at Keurboomstrand (Image abstracted from the Geotechnical Report by Outeniqua Geotechnical Services 2020).

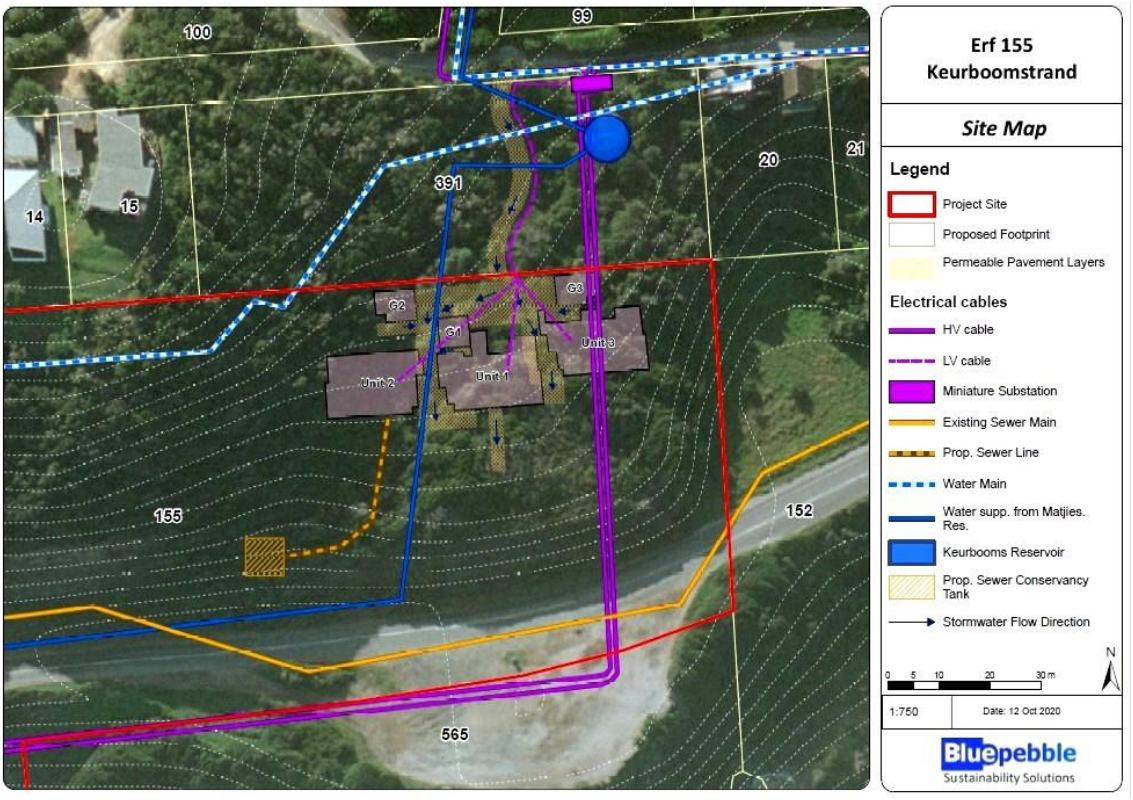


Figure 3: Satellite image showing the preferred layout of the Keurboomstrand residential development (Image provided by Bluepebble Sustainability Solutions).

2.1. Approach used for this palaeontological impact study

The various categories of heritage resources recognised as part of the National Estate in Section 3 of the National Heritage Resources Act, 1999, include, among others:

- geological sites of scientific or cultural importance
- palaeontological sites
- palaeontological objects and material, meteorites and rare geological specimens

This PIA report provides an assessment of the observed or inferred palaeontological heritage within the residential development project area at Keurboomstrand, with recommendations for specialist palaeontological mitigation where this is considered necessary.

The report is based on: (1) a review of the relevant scientific literature, including previous fossil heritage studies of comparable sedimentary rocks in the Western and Eastern Cape (*e.g.* Almond 2005, 2012, 2013, 2019), (2) published geological maps (1: 250 000 sheet 3322 Oudtshoorn) and accompanying sheet explanations (*e.g.* Toerien 1979), (3) the well-illustrated Heritage Statement and Geotechnical Report for the residential development by Nilssen (2020) and Outeniqua Geotechnical Services (2020) respectively, and (4) the author's extensive field experience with the formations concerned and their palaeontological heritage (*cf* Almond & Pether 2008).

The approach to this palaeontological heritage study is briefly as follows. Fossil bearing rock units occurring within the broader study area are determined from geological maps and satellite images. Known fossil heritage in each rock unit is inventoried from scientific literature, previous assessments of the broader study region, and the author's field experience and palaeontological database. Based on this data as well as field photos of representative exposures of the major sedimentary rock units present presented in the reports by Nilssen (2020) and Outeniqua Geotechnical Services (2020), the impact significance of the proposed development is addressed with recommendations for any further studies or mitigation. The likely impact of the proposed development on local fossil heritage is dependent on (1) the palaeontological sensitivity of the rock units concerned and (2) the nature and scale of the development itself, most significantly the extent of fresh bedrock excavation envisaged.

When rock units of moderate to high palaeontological sensitivity are present within the development footprint (as here), a Phase 1 field assessment study by a professional palaeontologist is usually warranted to identify any palaeontological hotspots and make specific recommendations for any monitoring or mitigation required before or during the construction phase of the development. Adverse palaeontological impacts normally occur during the construction rather than the operational or decommissioning phase. Phase 2 mitigation by a professional palaeontologist – normally involving the recording and sampling of fossil material and associated geological information (*e.g.* sedimentological data) may be required (a) in the pre-construction phase where important fossils are already exposed at or near the land surface and / or (b) during the construction phase when fresh fossiliferous bedrock has been exposed by excavations. To carry out mitigation, the palaeontologist involved will need to apply for a Palaeontological Collection Permit from the relevant heritage management authorities, *i.e.* Heritage Western Cape (Contact details: Heritage Western Cape. Protea Assurance Building, Green Market Square, Cape Town 8000. Private Bag X9067, Cape Town 8001. Tel: 086-142 142. Fax: 021-483 9842. Email: hwc@pgwc.gov.za). It should be emphasized that, *providing appropriate mitigation is carried out*,

the majority of developments involving bedrock excavation can make a *positive* contribution to our understanding of local palaeontological heritage.

2.2. Legislative context for palaeontological assessment studies

The proposed residential development is located in an area that is underlain by potentially fossiliferous sedimentary rocks of Palaeozoic and younger, Late Caenozoic age (Sections 3 and 4). The proposed development will entail substantial excavations into the superficial sediment cover and the underlying bedrock as well. This development may adversely affect potential fossil heritage within the study area by destroying, disturbing or permanently sealing-in fossils preserved at or beneath the surface of the ground that are then no longer available for scientific research or other public good.

The present combined desktop and field-based palaeontological heritage study falls under the South African Heritage Resources Act (Act No. 25 of 1999). It will also inform the Environmental Management Programme (EMPr) for this residential project.

The various categories of heritage resources recognised as part of the National Estate in Section 3 of the National Heritage Resources Act include, among others:

- geological sites of scientific or cultural importance;
- palaeontological sites;
- palaeontological objects and material, meteorites and rare geological specimens.

According to Section 35 of the National Heritage Resources Act, dealing with archaeology, palaeontology and meteorites:

(1) The protection of archaeological and palaeontological sites and material and meteorites is the responsibility of a provincial heritage resources authority.

(2) All archaeological objects, palaeontological material and meteorites are the property of the State.

(3) Any person who discovers archaeological or palaeontological objects or material or a meteorite in the course of development or agricultural activity must immediately report the find to the responsible heritage resources authority, or to the nearest local authority offices or museum, which must immediately notify such heritage resources authority.

(4) No person may, without a permit issued by the responsible heritage resources authority—

(a) destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;

(b) destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;

(c) trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or palaeontological material or object, or any meteorite; or

(d) bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assist in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites.

(5) When the responsible heritage resources authority has reasonable cause to believe that any activity or development which will destroy, damage or alter any archaeological or palaeontological site is under way, and where no application for a permit has been submitted and no heritage resources management procedure in terms of section 38 has been followed, it may—

(a) serve on the owner or occupier of the site or on the person undertaking such development an order for the development to cease immediately for such period as is specified in the order;

(b) carry out an investigation for the purpose of obtaining information on whether or not an archaeological or palaeontological site exists and whether mitigation is necessary;
(c) if mitigation is deemed by the heritage resources authority to be necessary, assist the person on whom the order has been served under paragraph *(a)* to apply for a permit as required in subsection (4); and
(d) recover the costs of such investigation from the owner or occupier of the land on which it is believed an archaeological or palaeontological site is located or from the person proposing to undertake the development if no application for a permit is received within two weeks of the order being served.

Minimum standards for the palaeontological component of heritage impact assessment reports (PIAs) have been published by HWC (2016) and SAHRA (2013).

3. GEOLOGICAL CONTEXT

The residential project area on a portion of Remainder of Erf 155 at Keurboomstrand is situated on an elevated, densely-vegetated, south-facing slope with good bedrock exposure along the coastal road along its southern edge (Illustrations in Geotechnical Report by Outeniqua Geotechnical Services 2020 and Heritage Statement by Nilssen 2020). The geology of the residential project area is shown on 1: 250 000 geology sheet 3322 Oudtshoorn (Council for Geoscience, Pretoria) with a brief sheet explanation by Toerien (1979) (Fig. 4). The site is situated on the southwestern limb of a prominent-weathering, narrow anticlinal ridge of Table Mountain Group (TMG) bedrocks with a WNW-ESE fold axis. The TMG ridge is flanked on both sides by Early Devonian mudrocks of the Gydo Formation (basal Bokkeveld Group) that are more recessive weathering and therefore build low-lying terrain along the south coast. The project site is underlain by interbedded feldspathic sandstones and subordinate shaly mudrocks of the Late Silurian to Early Devonian **Baviaanskloof Formation** (Table Mountain Group, Nardouw Subgroup; Fig. 6) which are well-exposed in local road cuttings as well as nearby coastal cliffs and along the rocky shoreline to the south (Figs. 2 & 5). Patches of platy, weathered greyish shale as well as thin, recessive-weathering shaly interbeds are seen locally at surface, while fresher-looking mudrocks are exposed within test pits within the project area (*ibid*.). The level of cleavage development within mudrocks associated with tight anticlinal folding is uncertain.

The **Baviaanskloof Formation** is typically less clean-washed than the older subunits of the Nardouw Subgroup, with a higher proportion of lithic grains and clay minerals giving darker hues and more recessive weathering patterns (*cf* Hill 1991, Almond 2013). Sandstones are often (but not invariably) greyish, impure wackes and may be massive or ripple cross-laminated. Dark grey to black carbonaceous and micaceous mudrock intervals are quite common but in general are rarely well exposed (A *c.* 15 m-thick band of micaceous shale within the upper Baviaanskloof Formation in the Gamtoos area is mentioned by Haughton *et al*., 1937, for example). The heterolithic “passage beds” of the Baviaanskloof Formation incorporate the sedimentary transition between the fluvial-dominated lower units of the Nardouw Subgroup and the marine shelf sediments of the Lower Bokkeveld Group (Fig. 6). Locally abundant shelly fossils such as articulate brachiopods, trace fossils as well as wave ripple lamination demonstrate the shallow marine origins of at least some of the upper sandstones, while the dark mudrocks with dense mats of vascular plant remains may be lagoonal in origin (See Section 4).

According to the illustrated field-based reports by Outeniqua Geotechnical Services (2020) and Nilssen (2020), the steeply SW-dipping bedrocks in the project area are locally overlain by **alluvial and/or colluvial silty sand, gravel and cobbles**. These younger, unconsolidated Late Caenozoic superficial sediments might also, at least in part, represent elevated coastal gravels and **"coversands"** of probable Pleistocene age that are mapped extensively in the Plettenberg Bay area (See discussion and references in Almond 2019).

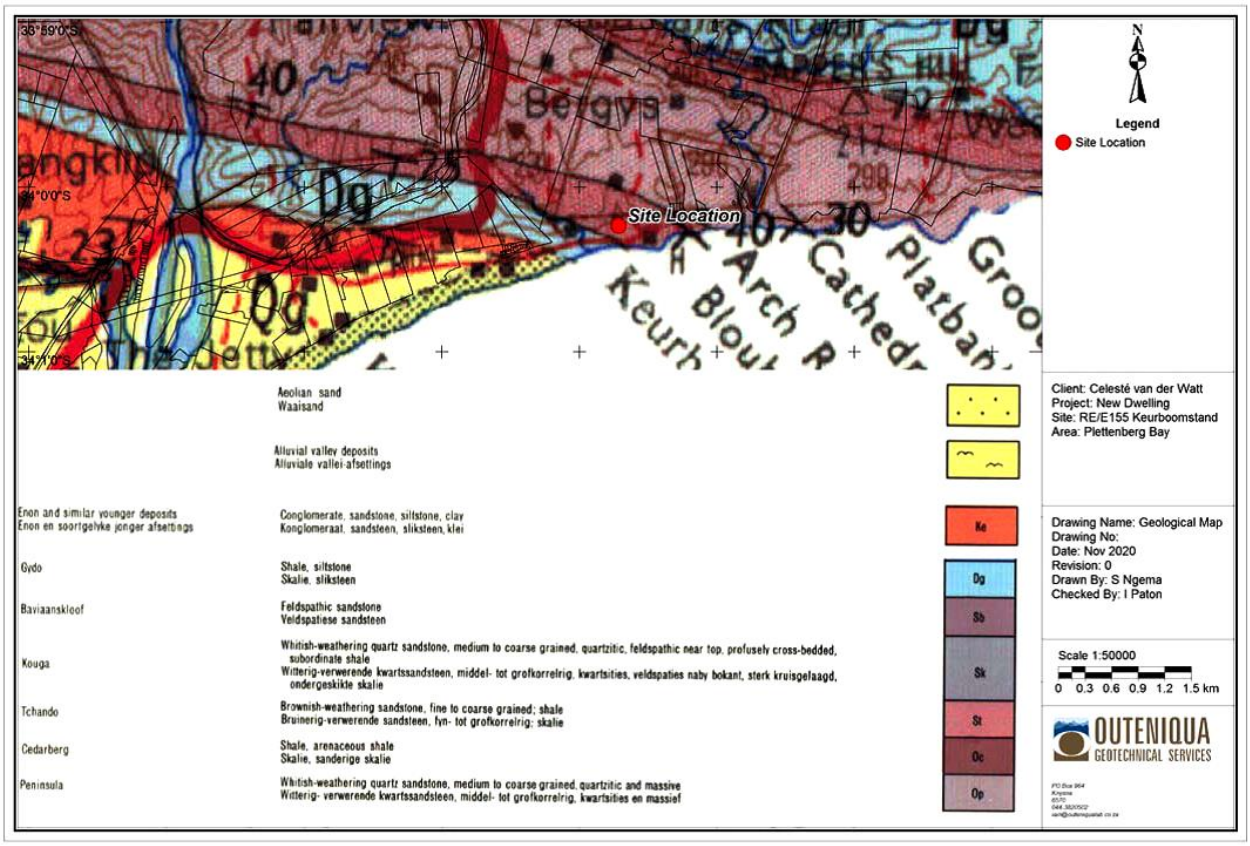


Figure 4: Extract from 1: 250 000 geology sheet 3322 Oudtshoorn (Council for Geoscience, Pretoria, 1979) showing the location of the proposed residential development on a Portion of Remainder of Erf 155 Keurboomstrand, situated *c*. 10 km northeast of Plettenberg Bay, Eden District Municipality, Western Cape Province (red dot) (Image abstracted from the Geotechnical Report by Outeniqua Geotechnical Services 2020).

The main geological units mapped in the Keurboomstrand region include:

TABLE MOUNTAIN GROUP
Baviaanskloof Formation (Sb, dark purple)
Goudini Formation (St, mid-purple) (previous known as the Tchando Formation)

BOKKEVELD GROUP
Gydo Formation (Dg, pale blue)

UITENHAGE GROUP
Undifferentiated (Ke, orange)

Pleistocene cover sands (pale yellow with black dots) shown on the geological map near Plettenberg Bay to the west may also extend into the project area.

Figure 5: SW-dipping, interbedded feldspathic sandstones / wackes and shaly mudrocks of the Late Silurian to Early Devonian Baviaanskloof Formation (uppermost Table Mountain Group) exposed in steep hillslopes bordering the residential development project area along its southern margins (Image abstracted from the Geotechnical Report by Outeniqua Geotechnical Services 2020).

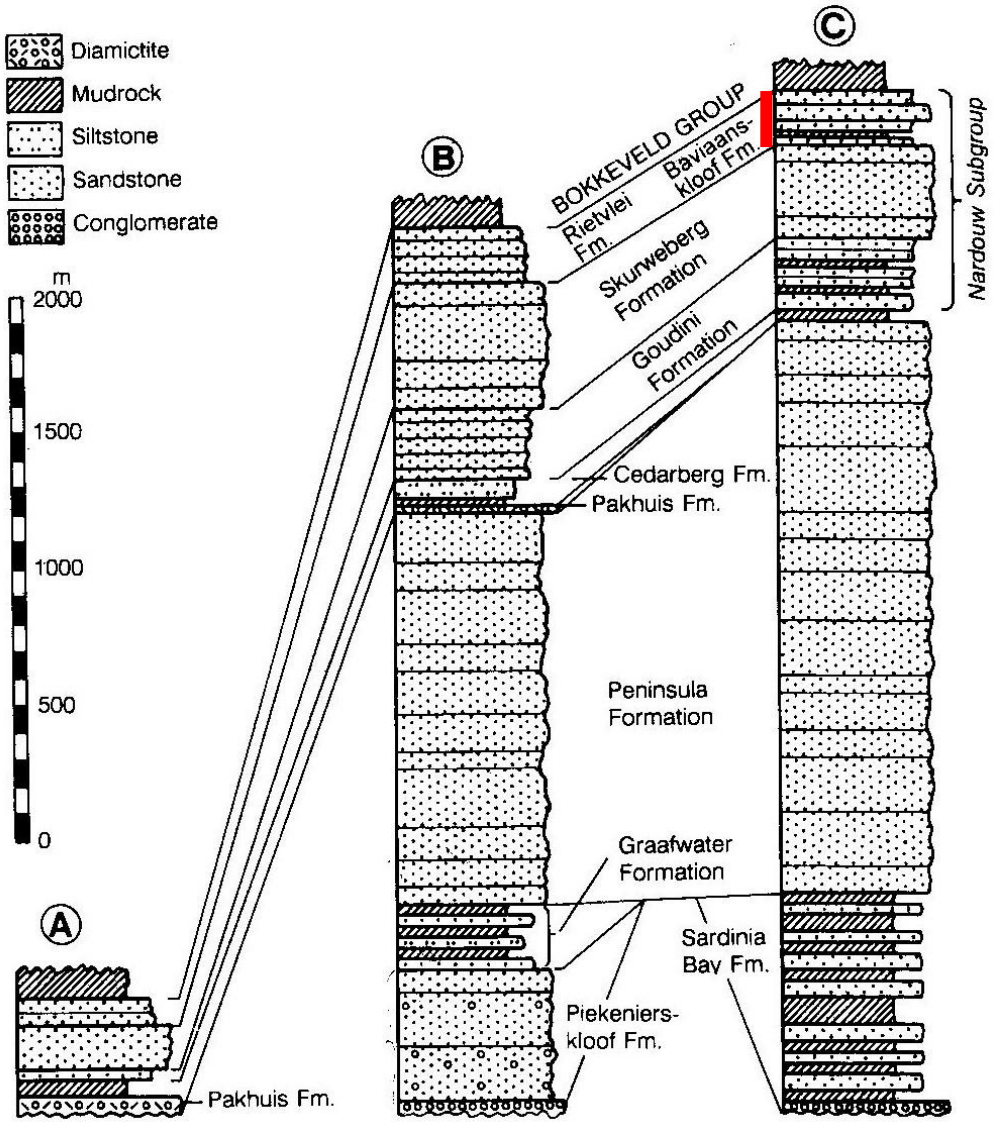


Figure 6: Stratigraphic columns for the Table Mountain Group showing succession of eight constituent formations in the Western Cape (from Johnson *et al*. 1999). Column C, measured to the northeast of Plettenberg Bay, is most relevant to the present study area. The potentially fossiliferous Late Silurian to Early Devonian Baviaanskloof Formation of the Nardouw Subgroup (vertical red bar) underlies the residential development project area.

4. PALAEONTOLOLOGICAL HERITAGE

A distinctive marine shelly invertebrate faunule of Early Devonian, Malvinokaffric aspect characterises the upper, marine-influenced portion of the **Baviaanskloof Formation** from the Little Karoo eastwards along the Cape Fold Belt (Almond 2005, 2013, Hill 1991). It is dominated by the globose, finely-ribbed articulate brachiopod *Pleurothyrella africana*. Rare homalonotid trilobites, a small range of articulate and inarticulate brachiopods, nuculid and other bivalves, plectonotid "gasteropods" and bryozoans also occur within impure brownish-weathering wackes (Boucot *et al*. 1963, Rossouw *et al*. 1964, Johnson 1976, Toerien & Hill 1989, Hill 1991, Theron *et al.* 1991, Almond *in* Rubidge *et al*. 2008). In many cases fossil shells are scattered and disarticulated, but *in situ* clumps of pleurothyrellid brachiopods also occur. This shelly assemblage establishes an Early Devonian (Pragian / Emsian) age for the uppermost Nardouw Subgroup, based on the

mutationellid brachiopod *Pleurothyrella* (Boucot *et al*. 1963, Theron 1972, Hiller & Theron 1988). Trace fossils include locally abundant, mud-lined burrows (*Palaeophycus*, *Rosselia*) and rare giant rusophycid burrows of Devonian aspect (*R. rhenanus*) which are attributed to homalonotid trilobites. Dense assemblages of primitive terrestrial vascular plants with forked axes and conical terminal reproductive structures that are provisionally ascribed to the genus *Dutoitia* have been collected from Baviaanskloof Formation mudrocks of possible lagoonal facies near Cape St Francis and at other localities in the Eastern Cape (Dr Mark Goedhart, Council for Geoscience, Port Elizabeth, pers. comm., 2008; Robert Gess pers. comm., 2011; *cf* Hoeg 1930, Anderson & Anderson 1985) (Fig. 8). These are of special palaeobotanical interest since they are among the oldest vascular macroplant remains recorded from southern Africa. Closely comparable material of *Dutoitia* has recently been described from Early Devonian lagoonal sediments in the Paraná Basin of Brazil (Gerrienne *et al.* 2020). Associated palynomorphs (fossil spores) are likely to be found within unweathered, fine-grained, dark carbonaceous mudrock facies. Mudrock facies of the Baviaanskloof Formation are provisionally considered here to be of HIGH palaeosensitivity, unless highly weathered or cleaved.

The Late Caenozoic superficial deposits overlying the Table Mountain Group bedrocks in the project area are likely to be of low palaeosensitivity in the Plettenberg Bay region (*cf* Almond 2019). So far, substantial fossil remains do not seem to have been reported from the acidic Pleistocene **coversands**. Presumably all but the most robust vertebrate bones and teeth or mollusc shells here will have been destroyed by deep chemical weathering. At Simola, north of Knysna, Acheulian (Earlier Stone Age) stone artifacts were recorded from the base of a coversand profile, suggesting an age of less than 1.8 Ma (Holmes *et al.* 2007). Several comparable exposures of Pleistocene aeolianites featuring well-preserved embedded ESA and MSA stone artefacts are now known.

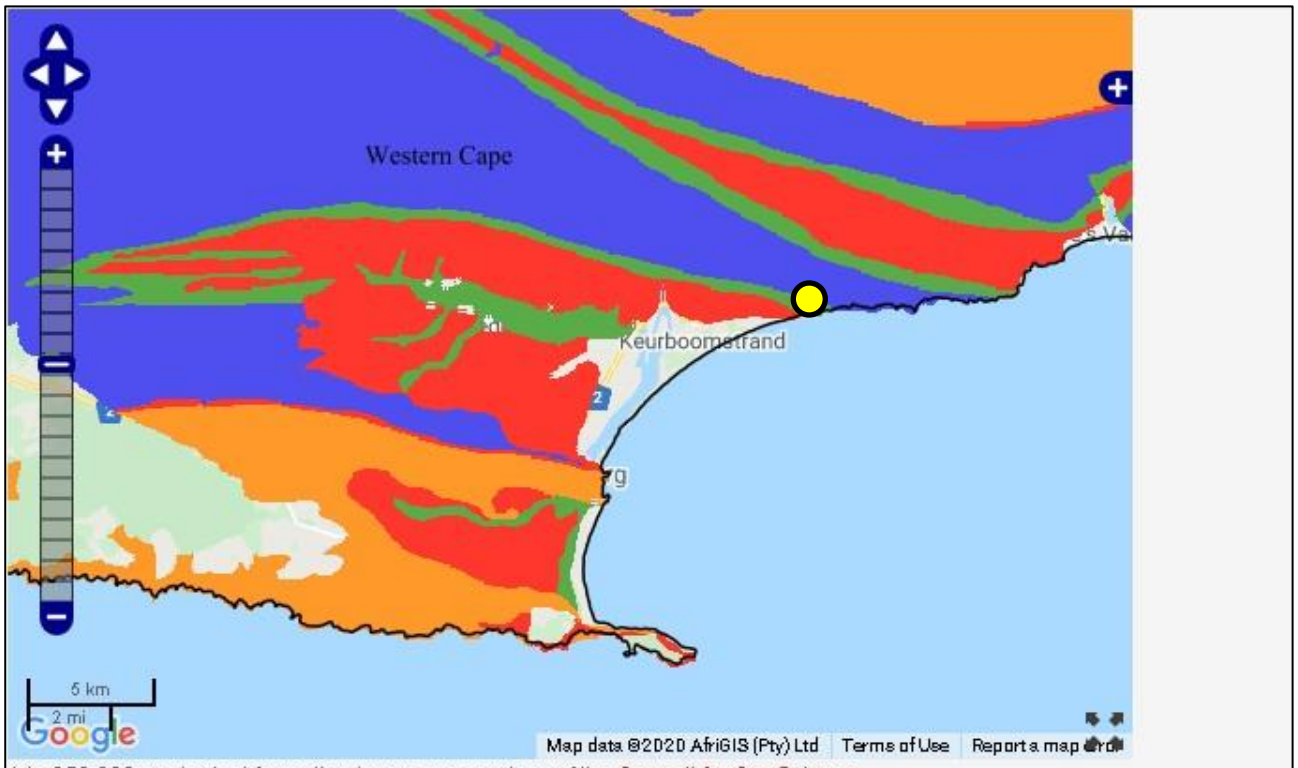
5. CONCLUSIONS & RECOMMENDATIONS

The project area for the proposed residential development on a Portion of Remainder of Erf 155, Keurboomstrand, is underlain by Early Devonian marine to coastal sediments of the Baviaanskloof Formation (uppermost Table Mountain Group). Elsewhere along the Southern Cape coast dark, organic-rich mudrocks within this formation contain important, largely unstudied fossils of primitive land plants while a small range of shelly invertebrate and trace fossils occur within sandstone facies in parts of the Western Cape. The overlying Late Caenozoic superficial sediments (colluvium, coversands, soils *etc*) are probably largely or entirely unfossiliferous.

The DEFF Screening Tool does not highlight the potentially high palaeosensitivity of the Keurboomstrand residential development project area while this is assigned a MEDIUM sensitivity on the SAHRIS Palaeosensitivity Map (Fig. 7). However, given (1) the demonstrated presence of dark grey mudrocks of the Baviaanskloof Formation, both at surface and within test pits within the project area, and (2) the potential of these mudrocks to contain scientifically valuable fossils, most notably primitive terrestrial plants, a precautionary approach is appropriate here. Pending a specialist palaeontological site visit, the bedrocks should be provisionally assigned a HIGH to VERY HIGH palaeosensitivity.

As a condition for Environmental Authorisation of the proposed development, it is recommended that a pre-construction site visit be made by a palaeontological specialist. This is to (1) record any near-surface fossil material and its geological context, (2) assess the site's palaeosensitivity and

potential impacts on fossil heritage posed by the development, and (3) make appropriate recommendations for any further palaeontological monitoring or mitigation measures (if any) to be taken in the pre-construction and / or construction phases. The specialist palaeontological field report should be submitted for comment to Heritage Western Cape (HWC contact details: Heritage Western Cape. Protea Assurance Building, Green Market Square, Cape Town 8000. Private Bag X9067, Cape Town 8001. Tel: 086-142 142. Fax: 021-483 9842. Email: hwc@pgwc.gov.za). All reporting should meet the minimum standards for palaeontological reports specified by HWC (2016).



1 in 250 000 geological formation layers are courtesy of the Council for GeoScience
For more information, go to How to Use the Palaeontological (fossil) Sensitivity Map

Colour	Sensitivity	Required Action
RED	VERY HIGH	field assessment and protocol for finds is required
ORANGE/YELLOW	HIGH	desktop study is required and based on the outcome of the desktop study, a field assessment is likely
GREEN	MODERATE	desktop study is required
BLUE	LOW	no palaeontological studies are required however a protocol for finds is required
GREY	INSIGNIFICANT/ZERO	no palaeontological studies are required
WHITE/CLEAR	UNKNOWN	these areas will require a minimum of a desktop study. As more information comes to light, SAHRA will continue to populate the map.

Figure 7: Extract from the SAHRIS Palaeosensitivity Map on the SAHRIS Website showing the Medium Sensitivity assigned to bedrocks in the Keurboomstrand residential development project area on the south coast near Plettenberg Bay (yellow circle). It is argued in this report that the project area should be provisionally assigned a HIGH palaeosensitivity pending a palaeontological specialist site visit.

Figure 8: Dark grey micaceous siltstones of possible lagoonal origin from the Baviaanskloof Formation of the Eastern Cape containing dense, multi-layered fossilised assemblages of primitive forking vascular plants (*Dutoitia*). The characteristic flared tips (arrowed) bear the reproductive organs (Specimens in collections of the Iziko Museums, Cape Town). The plant axes seen here bear tiny spinules and are 1-1.5 mm wide.

6. ACKNOWLEDGEMENTS

Mr Jonathan Kingwill of Bluepebble Sustainability Solutions, Knysna is thanked for commissioning this study and for providing the necessary project information. Pertinent geological field data in the 2020 reports compiled by Outeniqua Geotechnical Services, Knysna, and Dr Peter Nilssen, Mossel Bay is much appreciated, as is Dr Nilssen's alert concerning the potential palaeosensitivity of the project site and the need for a palaeontological heritage study here.

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8. QUALIFICATIONS & EXPERIENCE OF THE AUTHOR

Dr John Almond has an Honours Degree in Natural Sciences (Zoology) as well as a PhD in Palaeontology from the University of Cambridge, UK. He has been awarded post-doctoral research fellowships at Cambridge University and in Germany, and has carried out palaeontological research in Europe, North America, the Middle East as well as North and South Africa. For eight years he was a scientific officer (palaeontologist) for the Geological Survey / Council for Geoscience in the RSA. His current palaeontological research focuses on fossil record of the Precambrian - Cambrian boundary and the Cape Supergroup of South Africa. He has recently written palaeontological reviews for several 1: 250 000 geological maps published by the Council for Geoscience and has contributed educational material on fossils and evolution for new school textbooks in the RSA.

Since 2002 Dr Almond has also carried out palaeontological impact assessments for developments and conservation areas in the Western, Eastern and Northern Cape, Mpumalanga, Free State, Limpopo, Northwest and Kwazulu-Natal under the aegis of his Cape Town-based company *Natura*

Viva cc. He has been a long-standing member of the Archaeology, Palaeontology and Meteorites Committee for Heritage Western Cape (HWC) and an advisor on palaeontological conservation and management issues for the Palaeontological Society of South Africa (PSSA), HWC and SAHRA. He is currently compiling technical reports on the provincial palaeontological heritage of Western, Northern and Eastern Cape for SAHRA and HWC. Dr Almond is an accredited member of PSSA and APHP (Association of Professional Heritage Practitioners – Western Cape).

Declaration of Independence

I, John E. Almond, declare that I am an independent consultant and have no business, financial, personal or other interest in the proposed project, application or appeal in respect of which I was appointed other than fair remuneration for work performed in connection with the activity, application or appeal. There are no circumstances that compromise the objectivity of my performing such work.

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