

Archaeological Heritage Impact Assessment

final report

Remainder Portion 54 of the Farm Hooge Kraal 238, Magisterial District George, Western Cape Province: proposed development of a small, “Eco Friendly” and environmentally sustainable Health Spa

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Executive Summary

On 5 July and 31 August 2007 an archaeological impact scoping survey was undertaken followed by archaeological monitoring. The final archaeological impact assessment was completed on 28 May 2009 by CHARM cc as commissioned by Karen Waterston of Lekala Eco Tourism Management (PTY) LTD on Remainder Portion 54 of the Farm Hoogekraal 238, George, Western Cape Province.

During the 2007 foot surveys, the main limitations included restricted access to the coastal cliffs due to sea level and topography; and large areas of the property were covered with impenetrable vegetation. Where vegetation was low and less dense, only a small portion of the ground surface was visible for detection of archaeological traces. Due to vegetation clearing and an extensive fire in the Glentana area, about 50% of the property to be impacted by the proposed development was opened for archaeological inspection in 2009. In accordance with recommendations made in the first report (Nilssen 2008), a full Archaeological Impact Assessment was conducted at development “nodes” after the development layout plan was finalized and after vegetation clearing.

More than 100 archaeological occurrences were recorded including materials spanning the bulk of the Stone Age from at least half a million years ago up to the last few thousand years. No archaeological material of the pottery / pastoralist (last 2000 years) or colonial periods (older than 60 years) were observed. The archaeological occurrence shown in Plates 12 and 13 is potentially of great national and international significance as similar deposits are very rare and represent the time period when anatomically and behaviorally modern humans emerged.

Results of the Archaeological Heritage Impact Assessment show that the property is very sensitive regarding archaeological resources. As a result of this study and in accordance with the National Heritage Resources Act (no. 25 of 1999), requirements and recommendations are presented below in section 4.

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1. Introduction

1.1 Background

The property in question is owned by Mrs Plattner of Fancourt who wishes to develop a small, exclusive spa. Being proactive, Mrs Plattner appointed Lekala Eco Tourism Management (Pty) Ltd to undertake a Preliminary Sensitivity Analysis on the property to establish the feasibility of development, and to guide its nature, placement and extent. Ms Karen Waterston of Lekala Eco Tourism Management (Pty) Ltd appointed the Centre for Heritage and Archaeological Resource Management (CHARM cc) to conduct an Archaeological Heritage Impact Assessment (AHIA) on Remainder Portion 54 of the Farm Hooe Kraal 238, Magisterial District George, Western Cape Province (Figures 1 & 2 and Plates 1 & 2). Ms Waterston, based on Tim Hart's (ACO) recommendations, decided to include a preliminary archaeological study, even though large tracts of the property were inaccessible due to impenetrable Fynbos.

The developer's intention is that results of specialist environmental studies guide and mold the nature and layout of development. The development must avoid or minimize adverse impact on sensitive and endangered environmental resources. The layout plan for the proposed development is shown in Figure 4 and activities include;

- Main service road;
- Public access walkway;
- Golf cart paths;
- Pedestrian walkways;
- Dams;
- Main buildings in disturbed areas;
- Wellness centre;
- About 20 units and/or lodges;
- Lookout points;
- Staff accommodation; and
- Associated services (sewage, storm water, water, electricity, etc)

1.2. Purpose and Scope of the Study

Objectives of the Archaeological Heritage Impact Assessment are:

- To assess the study area for traces of archaeological and heritage-related materials;
- To map and record such resources
- To assess the significance of identified archaeological and heritage-related materials;
- To identify options for mitigation in order to minimize or avoid potential negative impacts; and
- To present requirements and make recommendations including mitigation measures.

Terms of Reference (ToR):

- a) Locate boundaries of the study area.
- b) Conduct a foot survey of the study area to identify and record archaeological and heritage-related resources.
- c) Assess the impact of the proposed development on archaeological and heritage-related materials.
- d) Recommend mitigation measures where necessary.
- e) Prepare and submit report to Ms Karen Waterston of Lekala Eco Tourism Management (Pty) Ltd that meets standards required by Heritage Western Cape in terms of the National Heritage Resources Act, No. 25 of 1999.

1.3 Study Area

Remainder Portion 54 of Farm Hooqe Kraal 238, Magisterial District George, Western Cape Province is situated on the coast immediately west of the Maalgaten River, around 4 km - straight line - east of the coastal holiday village of Glentana, and an approximately 13 km crow's flight south west of George (Figures 1 & 2 and Plates 1 & 2). From Mossel Bay, the study area was reached via vehicle by taking the Glentana exit from the N2, turning right at the end of the off ramp, and finally turning left onto an unpaved road for the last 4 km to the study area. The access route is indicated with red arrows in Figure 2.

The study area is 49.2506 hectares in extent, and its main boundary points - rounded to the nearest meter - are as follows (Lat/Lon decimal degrees; map datum WGS 84 and SA Grid; map datum WGS 84; see Plate 2):

A, S34.04711 E22.34074 (decimal degrees); 23 Y0060872 X3769083 (SA Grid)
B, S34.04688 E22.34334 (decimal degrees); 23 Y0060633 X3769056 (SA Grid)
C, S34.04789 E22.34495 (decimal degrees); 23 Y0060483 X3769167 (SA Grid)
D, S34.05199 E22.35388 (decimal degrees); 23 Y0059656 X3769617 (SA Grid)
E, S34.05381 E22.35399 (decimal degrees); 23 Y0059645 X3769818 (SA Grid)
F, S34.05287 E22.34172 (decimal degrees); 23 Y0060778 X3769721 (SA Grid)

Plates 2 through 6, 17 and 18 show diverse vegetation cover, topography, geology, and examples of contexts where archaeological and heritage related resources were identified. Plates 2 through 6 were taken prior to, and Plates 17 and 18 after vegetation clearing and a large veldt fire.

See Jones and Patton (2007) for preliminary descriptions, assessments and concerns regarding environmental and related aspects including, but not restricted to;

- interested and affected parties
- geology, geotechnical or engineering geological aspects, soils and associated flora, soils and land capability, geohydrology and groundwater, soil erodibility, soil utilization potential, land use
- topography
- natural vegetation
- animal life
- surface water, water use, water authority
- sensitive landscapes
- visual aspects
- air quality

1.4 Approach to the Study

To the best of our knowledge, no archaeological or heritage related work has been conducted on the affected property. Archaeological and heritage studies were conducted by J. Kaplan and K. Schulz respectively on an adjacent property where the Lagoon Bay development was recently authorized by DEA&DP (Kaplan pers comm.). Numerous and varied archaeological sites - mostly of Stone Age origin – were identified through impact assessments (Hart, Halkett, Kaplan, Mutti, Marean, this author) and recreational hiking along the coastal strip from Mossel Bay to Herolds Bay and include open air sites and archaeological resources in caves / rock shelters.

On 5 July and 31 August 2007 as well as 28 May 2009 archaeological heritage impact assessments of the affected property were undertaken by this author, Ms Kathleen Collier and Ms Charlene Eloff as commissioned by Ms Karen Waterston of Lekala Eco

Tourism Management (PTY) LTD. The study area was reached and accessed by vehicle with the aid of maps, aerial photos and coordinate data provided by Ms Waterston (Figure 2).

The main limitations to the study included inaccessibility to the coastal cliffs on the property due to very steep to vertical topography and sea levels. Further, the bulk of the study area was covered with impenetrable vegetation and even where vegetation is low and less dense, only a small portion of the ground surface was visible for archaeological inspection (Plates 2 through 6). Consequently, the survey was restricted to vehicle tracks, exposed geological profiles along road/track cuttings, previously disturbed areas around cottage and eastern extent of vehicle track, exposed surfaces of and around rocky outcrops, and accessible portions along and at the base of the coastal cliffs (Plates 2 through 6). The final archaeological impact assessment was conducted after vegetation clearing and after an extensive veldt fire. Approximately 50% of the property was opened for archaeological inspection in 2009. The study focused on development “nodes” after the development layout was finalized.

Our records include waypoint and track data fixed with hand held Garmin GPS units, an assessment of the viability of the survey with respect to accessibility, vegetation and visibility, notes on the materials found as well as their contexts and digital photography (all records are available from CHARM). Identified archaeological materials were assessed for their significance and scale of importance as well as the potential threats of the proposed development.

2. Results

The survey covered a distance of more than 40 km while inspection of exposed ground surfaces covered an area of no less than 24 hectares (Figures 4 & 5). Unfortunately, the GPS used during monitoring did not record walk tracks, but these were reconstructed through a combination of waypoints for archaeological finds, scrutiny of aerial photos with the monitors, a site visit with the monitors, recording areas of vegetation clearing as well as examination of site photographs.

More than 100 archaeological sites and occurrences were recorded including materials originating in the Early Stone Age (around 300 000 years before present and older), Middle Stone Age (from 300 000 to about 30 000 years ago) and Later Stone Age (from some 30 000 to at least 2000 years ago). A detailed description of each archaeological find is not given as there are simply too many.

Archaeological remains on the higher ground in the northern portion of the property, bordered by the northern boundary, are dominated by Early Stone Age (ESA) material located in and under ancient dune sands (Table 1, Figure 5 and Plates 14, 15 & 19-21). Identified implements include hand axes, cleavers, cores, hammer stones, choppers, etc. Their densities can only be guessed at since they are exposed as a result of historic and recent disturbances in the form of plantations, vehicle tracks/roads, construction and so on. The steeper slopes in the middle and south of the property are dominated by a range of Middle Stone Age (MSA) artifacts (Table 1, Figure 5 and Plates 9-13 & 19-21) while the Later Stone Age (LSA) is represented by notably fewer specimens (Table 1, Figure 5 and Plates 7-11 & 20). The most common raw materials are quartzite and quartz. In addition to humanly induced disturbances, artefacts occurring on the slopes are exposed due to low energy erosion resulting from water and wind action.

A find of particular interest and significance is a MSA deposit in a large sea cut cave at locality 55 (Figure 5 and Plates 12 & 13). This is a small remnant of cemented deposit adhering to the eastern wall of the cave approximately 13m above current mean sea level.

The remainder of that deposit, probably mostly un-cemented, was likely scoured from the cave by post depositional high sea level stands. On brief examination it was noted that the remnant deposit contains MSA stone artifacts and marine shell. Based on the presence of shell, it is likely that the deposit also contains bone.

The most probable cause for the cementation process affecting the matrix and fossilization of the organic material, is through permeation of water buffered with calcium carbonates. This cannot occur if water entered the cave only through the acidic, quartzitic sandstone into which it is cut. Calcrete, which does occur on the property, is the most likely geological deposit to provide a source for calcium carbonates (Figure 5 and Plate 16). It is suggested, therefore, that at least portions of the coastal cliffs at Hoogekraal were and/or are capped by a bed of calcrete. Rain and runoff water permeating the calcrete and seeping into the caves below would be enriched with calcium carbonates. This enriched water could induce at least two processes: first; the formation of stalactites and stalagmites, the quality of which is determined by the exposure or lack thereof to the atmosphere surrounding a cave and second; the cementation and fossilization of sediments and organic remains respectively.

The remnant MSA deposit at locality 55 is very similar to those investigated in caves centered on site 13B at Pinnacle Point (PP), Mossel Bay (Marean *et al.* 2004). Like that at locality 55, the PP deposits are cemented remnants of formerly much larger deposits; they were cemented and fossilization of organics occurred as a result of water seeping through a calcrete capping; they also contain MSA stone artefacts and organic remains; they are at 13m above current mean sea level; and only tiny portions of deposit are preserved. The significance of the remnant deposits at PP is that they yielded the earliest dated evidence for the emergence of modern humans (Marean *et al.* 2007). The date for this evidence is around 160 000 years before present and this is around 85 000 years earlier than the dates for similar evidence from Blombos Cave and over 100 000 years earlier than those in Europe. The significance of the South African archaeological record is beyond doubt.

Locality 55, as well as other caves at Hoogekraal, may contain evidence similar to that exposed at PP. It is of significant value as similar deposits are very rare and represent the time period when anatomically and behaviorally modern humans emerged. Further, the potential of stalagmites and stalactites occurring is significant in that these features contain a wealth of information on ancient environments and climates (Bar-Matthews *et al.* in press). At least 8 to 10 other caves occur on the property and though they could not be accessed during field work, they likely contain similar material to that identified at locality 55 (Plates 2, 6 and 17).

No LSA shell midden deposits were identified on the property. This situation is reminiscent of that along and in the coastal cliffs at Pinnacle Point, Mossel Bay. The facts; that this stretch of coastline does not lend itself to easy shellfish harvesting, and that there are no safe, easily accessible caves or rock shelters, go some way to explaining the absence of shell middens that are so common elsewhere along the South Cape coastline. Stone Age materials occur as isolated finds or low density scatters across the entire property, but several areas contain medium to high density artifact scatters.

No archaeological material of the pottery / pastoralist (from about 2000 to years ago) or colonial periods (the last 400 years or so) were identified in the study area.

Overall, the quantity and quality of the archaeological record in the study area is impressive, significant and relatively rare. The contexts of finds are not greatly disturbed by human activity and the potential for the occurrence of palaeontological, climatic and environmental resources should not be ignored.

Table 1. Selected examples of topography, vegetation cover, archaeological finds and contexts as indicated in Figure 5 and various Plates.

GPS Name	Camera File - Wav File - Comment	SA National Grid Datum: WGS84	Lat/Lon Decimal Degrees Datum: WGS84	m above sea level
40	img 3132-3139 stone artefact in profile; isolated LSA	23 Y0060193 X3769707	S34.05278 E22.34806	90 m
42	img 3149-3154; calcrete bed; possible palaeontology	23 Y0059832 X3769707	S34.05280 E22.35197	67 m
44	img 3182-3201; 15m radius; medium density scatter; LSA/MSA	23 Y0059733 X3769740	S34.05310 E22.35303	47 m
45a	img 4218 wav 4218; image; burnt exposed surface	23 Y0060164 X3769525	S34.05113 E22.34838	121 m
46	img 3217-3221; medium density scatter; LSA/MSA	23 Y0059715 X3769704	S34.05277 E22.35323	65 m
46a	img 4220-4224 wav 4221; isolated chopper/hammer/core MSA/ESA	23 Y0060029 X3769538	S34.05126 E22.34984	134 m
48a	img 4243-4248 wav 4248; burnt, isolated disc core; MSA	23 Y0060419 X3769496	S34.05086 E22.34562	132 m
49a	img 4251-4255 wav 4255; 20m radius; medium to low density scatter; mostly MSA with some LSA & possible ESA	23 Y0060468 X3769561	S34.05144 E22.34509	113 m
50a	img 4256-4263 wav 4263; 15m radius; medium to low density scatter; mixed LSA/MSA/ESA	23 Y0060478 X3769537	S34.05122 E22.34498	114 m
51a	img 4265-4269 wav 4269; 51-3a; medium to high density scatter; mixed MSA & LSA	23 Y0060511 X3769615	S34.05193 E22.34462	97 m
052a	img 4270-4273 wav 4273; 51-3a; medium to high density scatter; mixed MSA & LSA	23 Y0060516 X3769607	S34.05185 E22.34457	96 m
053a	img 4274-4277; 51-3a; medium to high density scatter; mixed MSA & LSA	23 Y0060516 X3769614	S34.05192 E22.34456	96 m
55	img 3262-3292	23 Y0059672 X3769832	S34.05393 E22.35369	13 m
56a	img 4285-4288 wav 4288; 10m radius; medium to low density scatter; mostly MSA	23 Y0060468 X3769570	S34.05152 E22.34509	112 m
58a	img 4278-4284; image windlass caves	23 Y0060516 X3769827	S34.05383 E22.34454	----
184	img 3357-3359; low density to isolated artefacts; ESA	23 Y0060050 X3769529	S34.05118 E22.34961	129 m
191	img 7386-7390; isolated flake, probably ESA, possibly MSA	23 Y0060792 X3769217	S34.04832 E22.34160	169 m
193	img 7396-7399; isolated flake; ESA/MSA	23 Y0060510 X3769177	S34.04797 E22.34466	157 m
197	img 7402-7408; isolated convergent flake/point; MSA	23 Y0060805 X3769419	S34.05014 E22.34145	140 m
198	img 7416-7419; low density to isolated; core, probably MSA	23 Y0060768 X3769687	S34.05256 E22.34183	75 m
228	img 4214-4215 wav 4214; image vegetation clearing and burning	23 Y0060064 X3769662	S34.05238 E22.34945	96 m
229	img 4225 & 4226; image vegetation clearing and burning	23 Y0059928 X3769543	S34.05131 E22.35094	----
s002	img 7391-7395; continuous; medium to low density scatter; hand axes, cleavers, choppers, flakes, hammer stones ESA	23 Y0060705 X3769220	S34.04835 E22.34255	----
s043	img 7409-7413; low density to isolated; core probably MSA and possibly LSA	23 Y0060737 X3769535	S34.05119 E22.34218	----

3. Sources of Risk, Impact Identification and Assessment

The developer’s intention is that results of specialist environmental studies guide and mold the nature and layout of development. The development must avoid or minimize adverse impact on sensitive and endangered environmental resources. Preliminary layout plans for the proposed development that will negatively impact on archaeological and environmental resources are shown in Figure 3 and include;

- Main service road;
- Public access walkway;
- Golf cart paths;
- Pedestrian walkways;
- Dams;
- Main buildings in disturbed areas;
- Wellness centre;
- About 20 units and/or lodges;
- Lookout points;
- Staff accommodation; and
- Associated services (sewage, storm water, water, electricity, etc)

In addition, the negative impact of pedestrian traffic – that will increase with the proposed development - on archaeological resources should not be underestimated.

The above results of the AHIA provide compelling evidence that the property is very sensitive regarding archaeological resources. Some archaeological occurrences are potentially of international significance. The possible presence of other environmental resources also requires serious consideration.

Table 2 summarizes the potential impact of the proposed development on heritage related and palaeontological resources with and without mitigation.

Table 2. Potential impact on, and loss of archaeological resources.

	With Mitigation	Without Mitigation
Extent	Local	Local
Duration	Permanent	Permanent
Intensity	Medium to High	High
Probability	High	High
Significance	High	High
Confidence	High	High

4. Required and Recommended Mitigation Measures

The following measures are required:

- All archaeological and heritage related artefacts identified on the property are protected by the National Heritage Resources Act no. 25 of 1999. These materials may in no way be removed or disturbed without a permit from Heritage Western Cape. It follows that any human activities taking place where archaeological materials are known to occur, may only proceed with a permit from Heritage Western Cape.

- In the event that vegetation clearing and earthmoving activities expose archaeological or paleontological materials, such activities must stop and Heritage Western Cape must be notified immediately.
- If archaeological materials are exposed through vegetation clearing or earthmoving activities, then they must be dealt with in accordance with the National Heritage Resources Act (No. 25 of 1999) and at the expense of the developer(s) and/or property owner(s).
- Unmarked human burials may occur anywhere in the landscape and are often exposed during earthmoving activities. Human remains are protected by law and, if older than 60 years, are dealt with by Heritage Western Cape (Mr. Nick Wiltshire 021 483 9685) or the State Archaeologist at the South African Heritage Resources Agency (Mrs. Mary Leslie who can be reached at 021 462 4502).

It is recommended that:

- Because of the quantity and quality of identified archaeological resources, and in order to preserve their significance, the study area should undergo no development.
- In the event that destruction is approved, an archaeological conservation management plan should be developed for the protection, conservation and management of archaeological resources. This should include occurrence-specific mitigation measures.
- If development is to proceed, then full time archaeological monitoring of vegetation clearing and earthmoving activities should be conducted by a professional archaeologist or suitably qualified person. This measure will ensure that negative impact on archaeological and other related environmental resources is avoided or minimized.
- If development proceeds and since a wide variety of archaeological materials occur on the property, a display and brief narrative concerning such materials will make an interesting and valuable contribution to the development.

5. References

Ian Jones and Phil Patton 2007. Glentana Fancourt Development: Pre Application (EIA) Site Investigation. Draft Report v1.1 Compiled by Earth Science Solutions for Lekala Eco (PTY) LTD

Miryam Bar-Matthews, Curtis Marean , Zenobia Jacobs , Panagiotis Karkanas , Erich Fisher , Andy Herries , Kyle Brown , Hope Williams , Jocelyn Bernatchez , Avner Ayalon , Peter Nilssen (in press). Variable climate and environment 90-53,000 years ago in coastal South Africa and bearing on modern human origins and floral diversity

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

Nilssen, P.J. 2008. Archaeological Heritage Impact Assessment. Remainder Portion 54 of the Farm Hooge Kraal 238, Magisterial District George, Western Cape Province: proposed development of a small, "Eco Friendly" and environmentally sustainable Health Spa. For Lekala Eco Tourism Management (Pty) Ltd, Ms Karen Waterson. CHARM cc Great Brak River

Marean, C. W., Nilssen, P. J., Brown, K., Jerardino, A., and D. Styrder (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

Figures and Plates (on following pages)

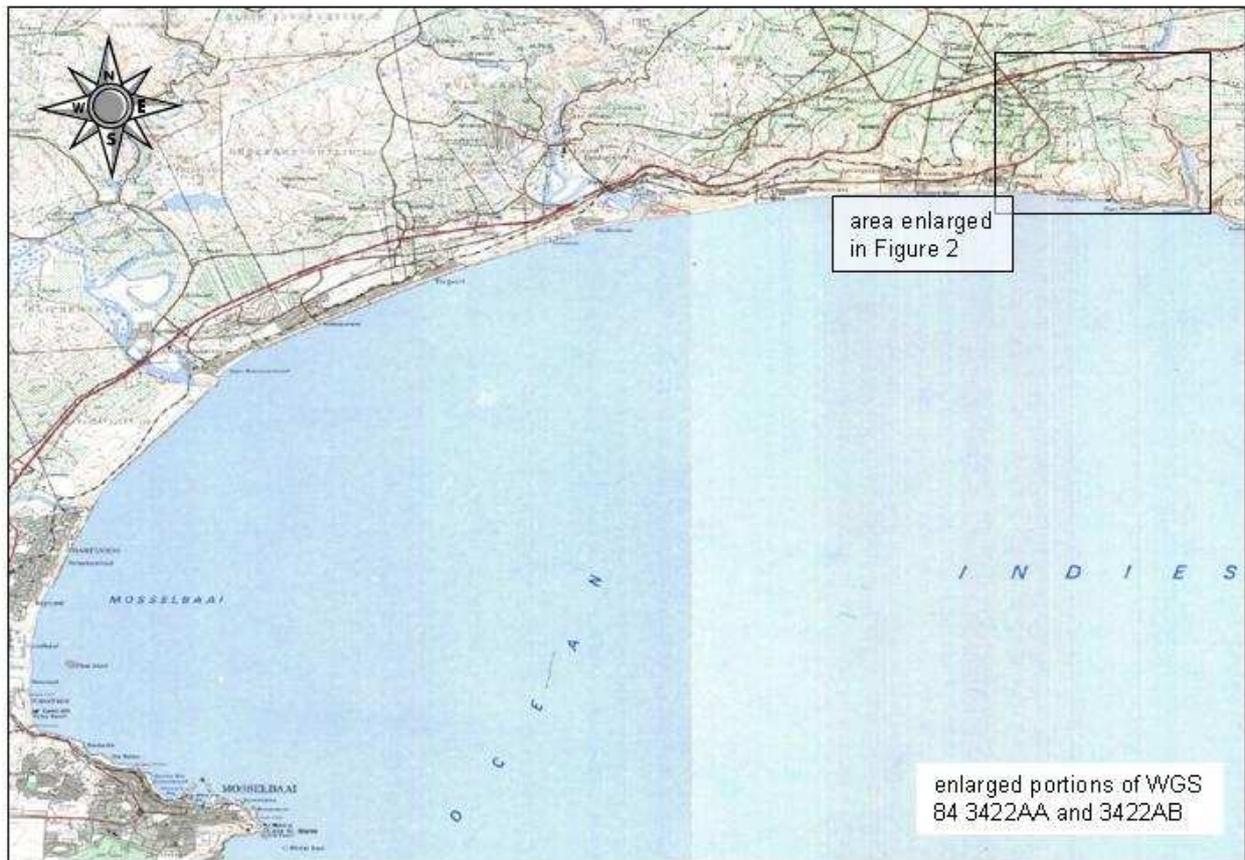


Figure 1. General location of study area – framed in black - relative to Mossel Bay, Western Cape.

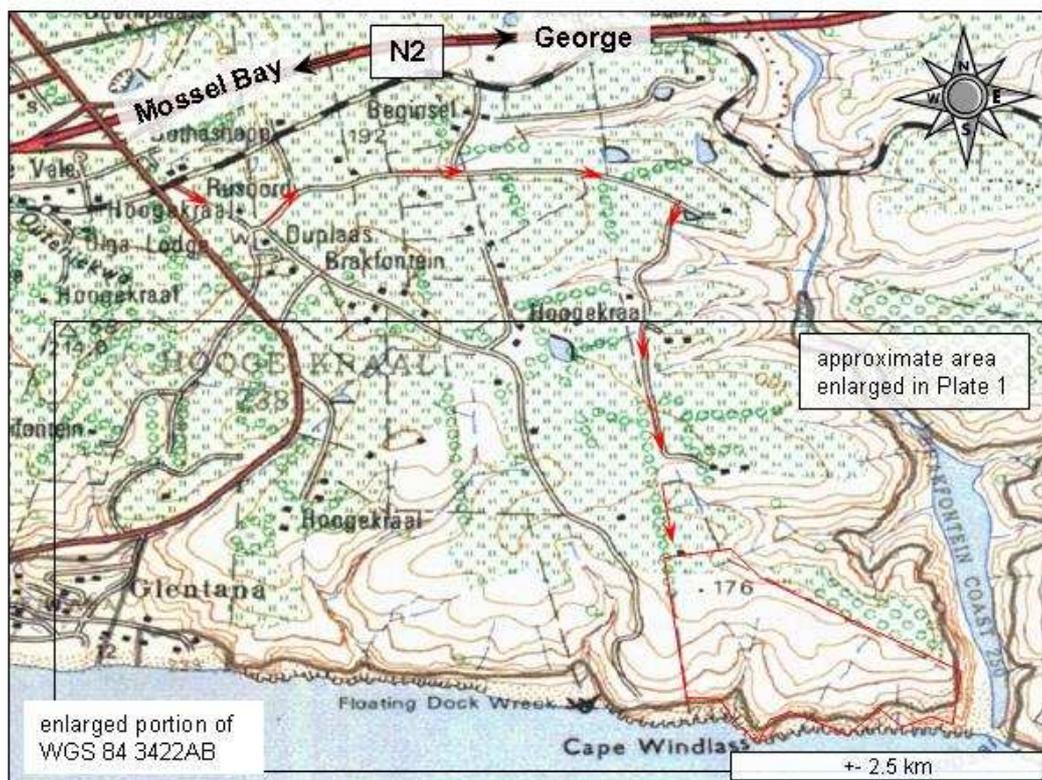


Figure 2. Enlarged area as indicated in Figure 1 showing the approximate extent of study area – red outline - relative to Glentana in the west while red arrows denote the access route.

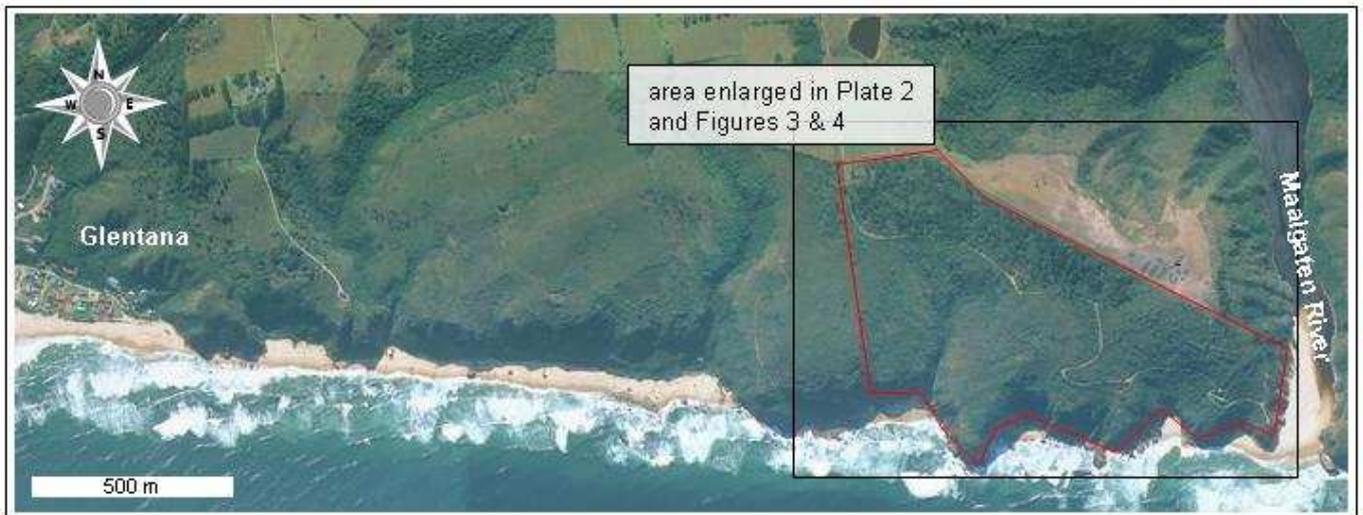


Plate 1. Enlarged area as indicated in Figure 2 showing the study area - outlined in red - relative to Glentana in the west and the Maalgaten River in the east.

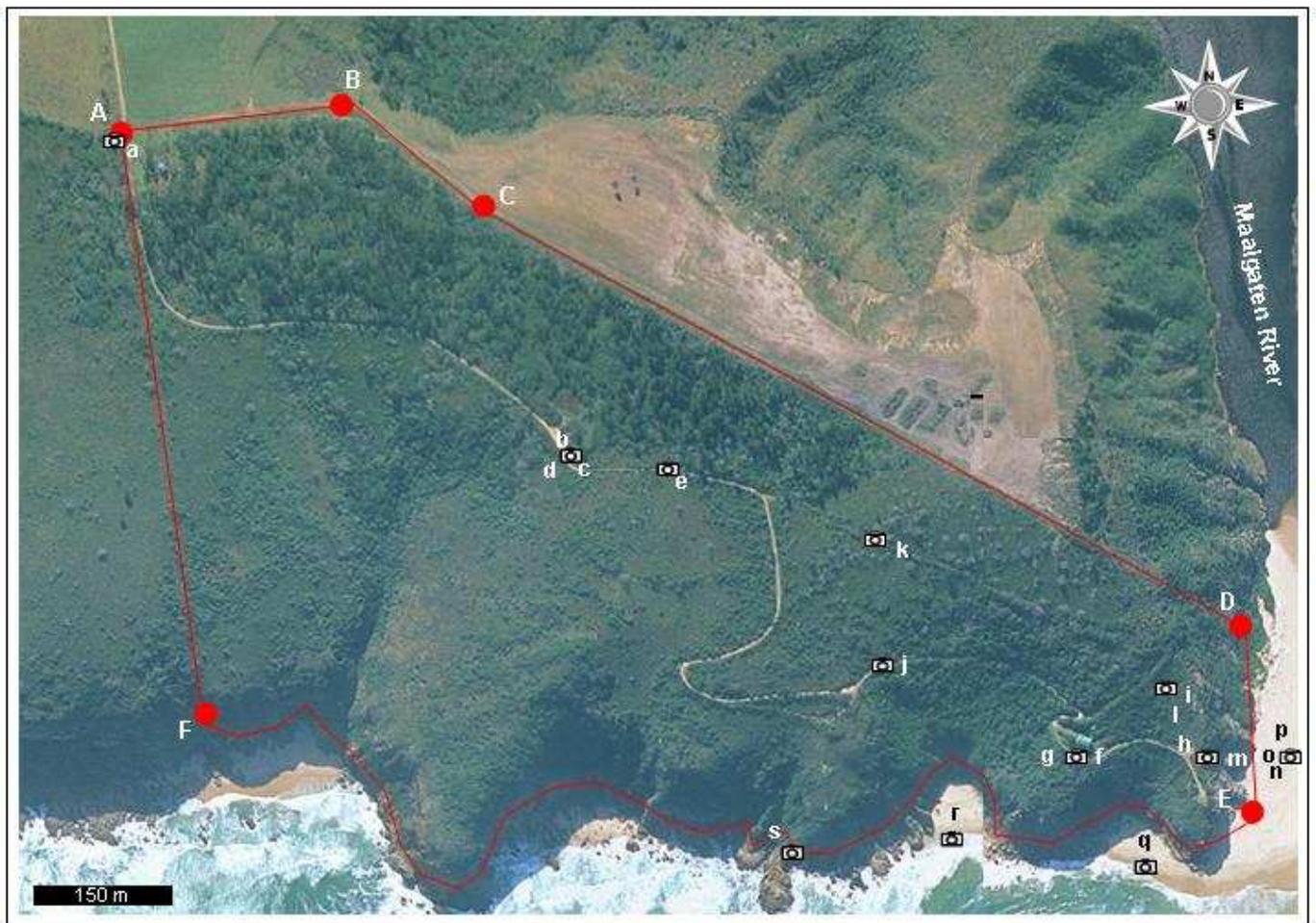


Plate 2. Enlarged area indicated in Plate 1 showing property boundary (coordinate data for A through F given in text) and lower case letters are photo localities of diverse vegetation cover, topography, geology, archaeological contexts, etcetera shown in Plates 3 through 6.

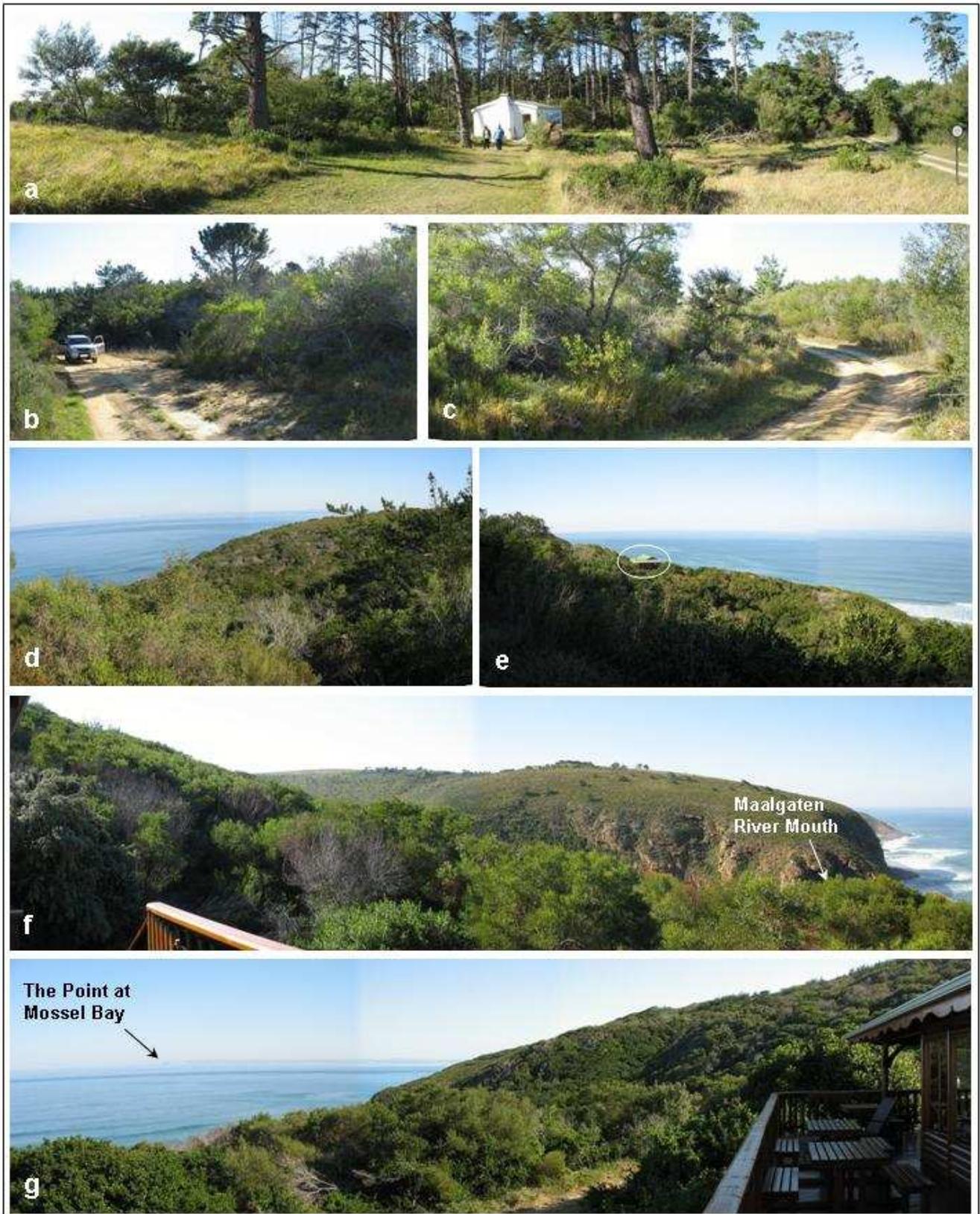


Plate 3. Examples of various vegetation cover and topography in the study area. The locations of above images are indicated with camera icons while the placement of lower case letters relative to camera icons show bearing towards which photos were taken (see Plate 2).

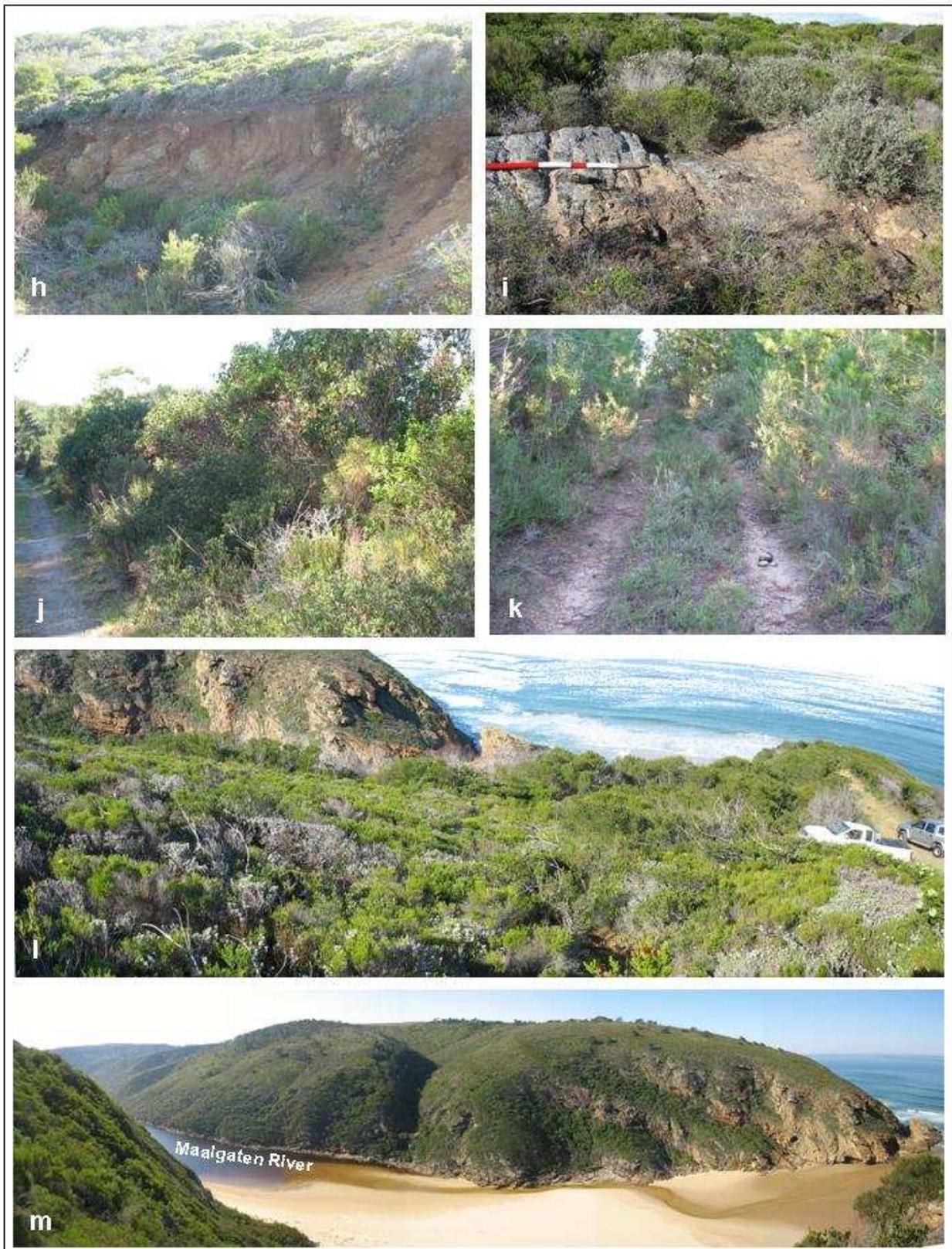


Plate 4. Some examples of contexts where archaeological materials were identified and recorded (h, i, k and l), as well as various vegetation cover and topography are shown above. Locations of images are indicated with camera icons while lower case letters relative to camera icons show direction of view (see Plate 2). White and short red in image i are 20 and 10 cm respectively.

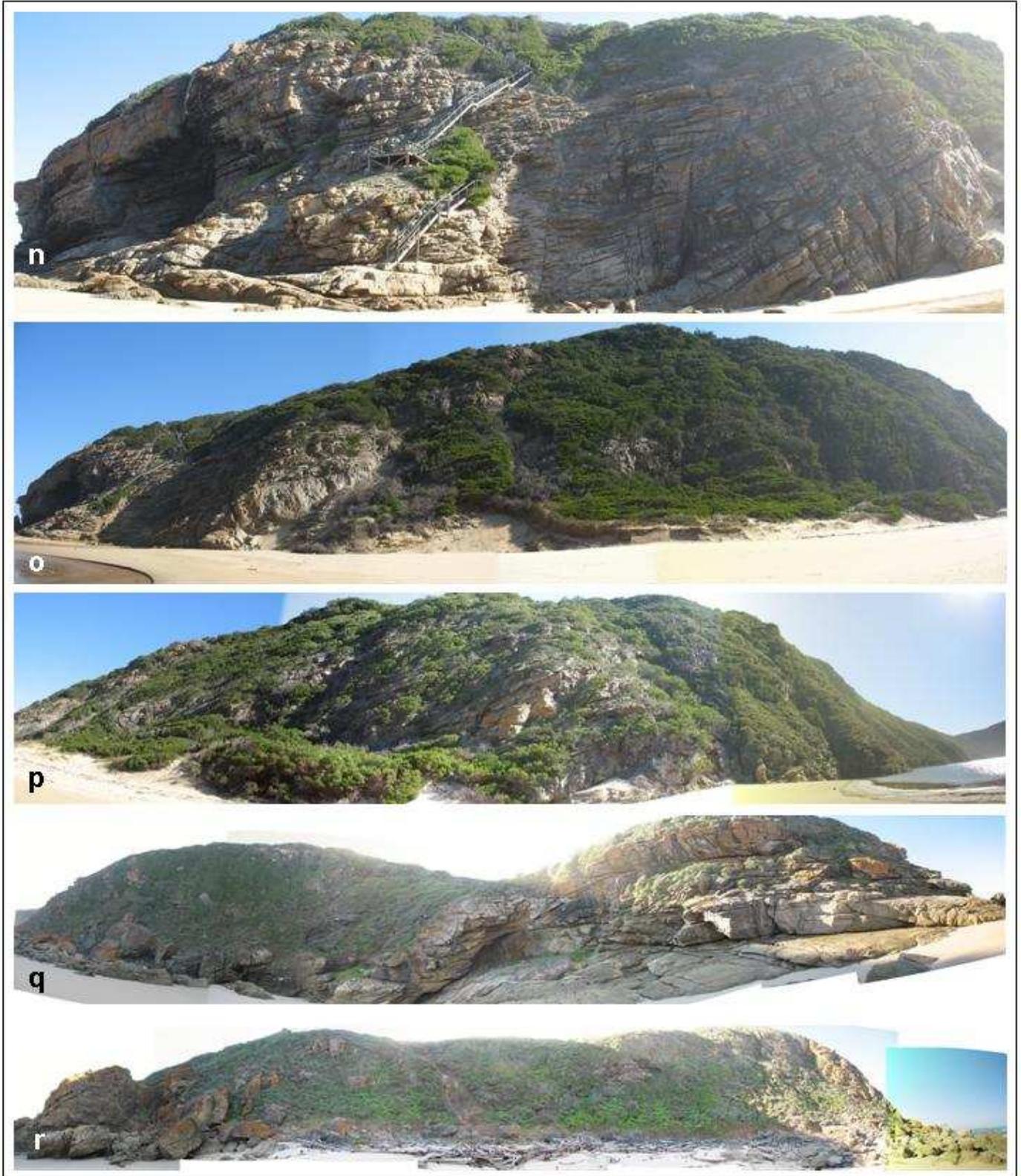


Plate 5. The above are panoramic views showing examples of cliffs, vegetation cover, topography and geology as seen from sea level. Locations of images are indicated with camera icons while lower case letters relative to camera icons show direction of view (see Plate 2). Large cave containing cemented remains of middle stone age origin is shown in n and o.



Plate 6. Several sea cut caves were observed toward the south western extent of the property. Due to several hazards they were not examined, but are almost certain to contain heritage and/or environmental resources. The locality of image is indicated with a camera icon and the lower case s shows direction of view (see Plate 2).

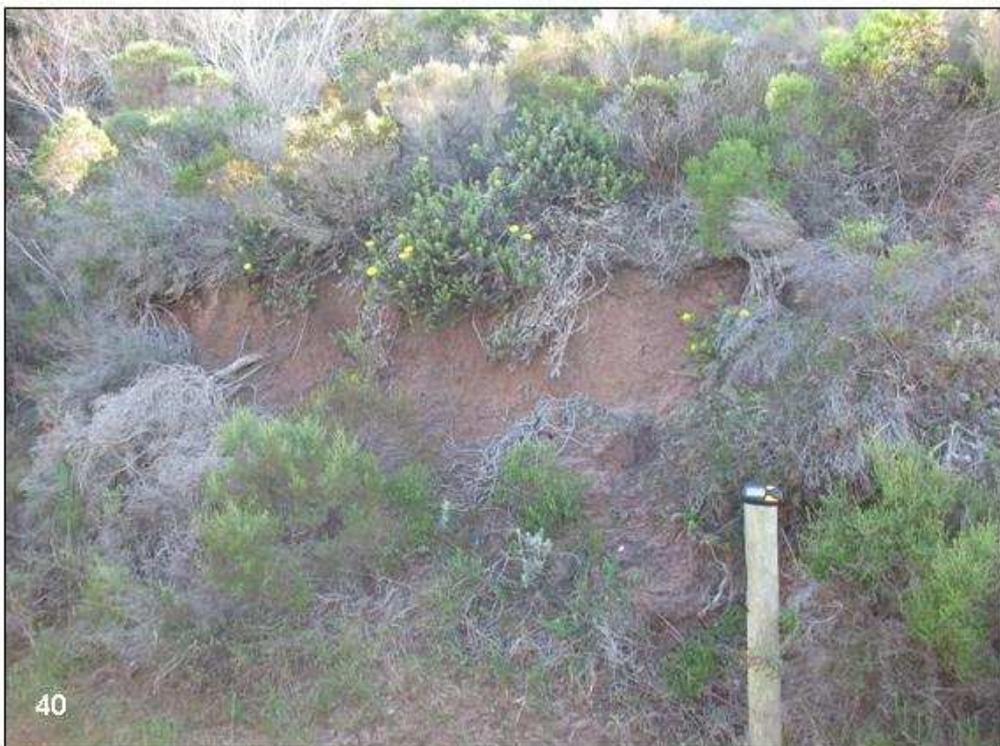


Plate 7. Exposed profile adjacent to vehicle track where several stone artifacts were recorded (see Figure 5). Carmin Camo GPS for scale.



Plate 8. Retouched flake in milky quartz of Later Stone Age origin observed at locality shown in Figure 5. Garmin Camo GPS for scale.



Plate 9. Exposed profile near eastern end of vehicle track with medium density scatters of Middle and Later Stone Age artifacts (see Plate 4 h and Figure 5). Garmin Camo GPS for scale.



Plate 10. Examples of artifacts (circled) observed at locality shown in Figure 5 (see Plate 9). Garmin Camo for scale.



Plate 11. Example of flake blade in quartzite recorded at locality shown in Figure 5.



Plate 12. Large sea cut cave at mouth of Maalgate River that contains a small portion of rare, cemented Middle Stone Age deposit (see Plate 13 and Figure 5 for locality). At right the cliff is about 40m above mean sea level.



Plate 13. Cemented Middle Stone Age deposits containing stone tools and marine shell (examples circled in green and blue respectively). Archaeological deposits like this are very rare and thus highly significant. Garmin Camo GPS for scale.



Plate 14. Disused single vehicle track where isolated Early and Middle Stone Age artifacts were recorded (circled). The locality is shown in Figure 5. Garmin Camo GPS for scale.



Plate 15. Isolated Stone Age artifacts as shown in Plate 14. The specimen at left is of Early Stone Age origin while the one at right is either Middle or Later Stone Age in age. Garmin Camo GPS for scale.



Plate 16. Truncated calcrete deposit with potential for housing palaeontological material. The locality is shown in Figure 5. Garmin Camo GPS for scale.

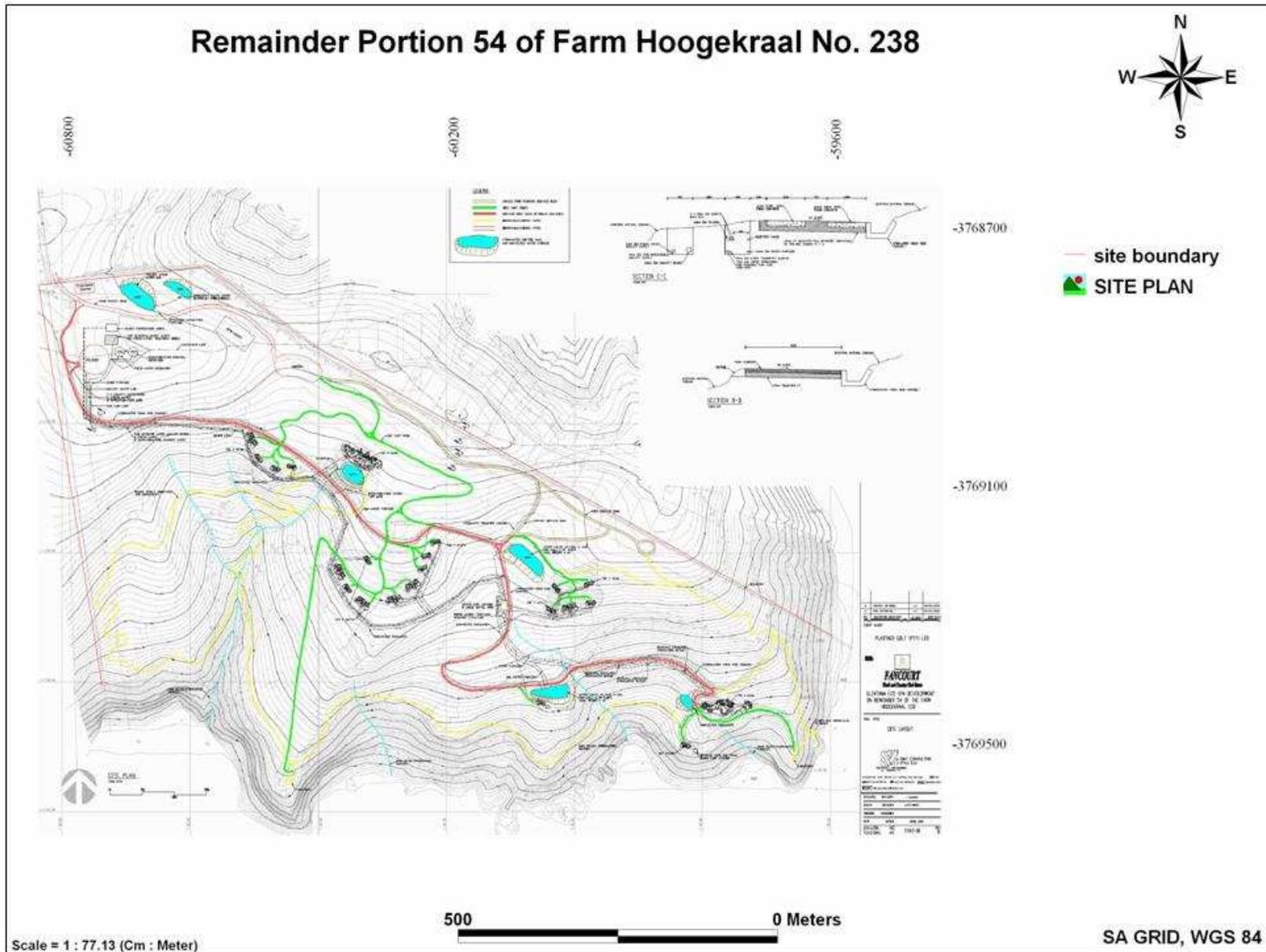


Figure 3. Current layout plan of the proposed development as provided by the client.

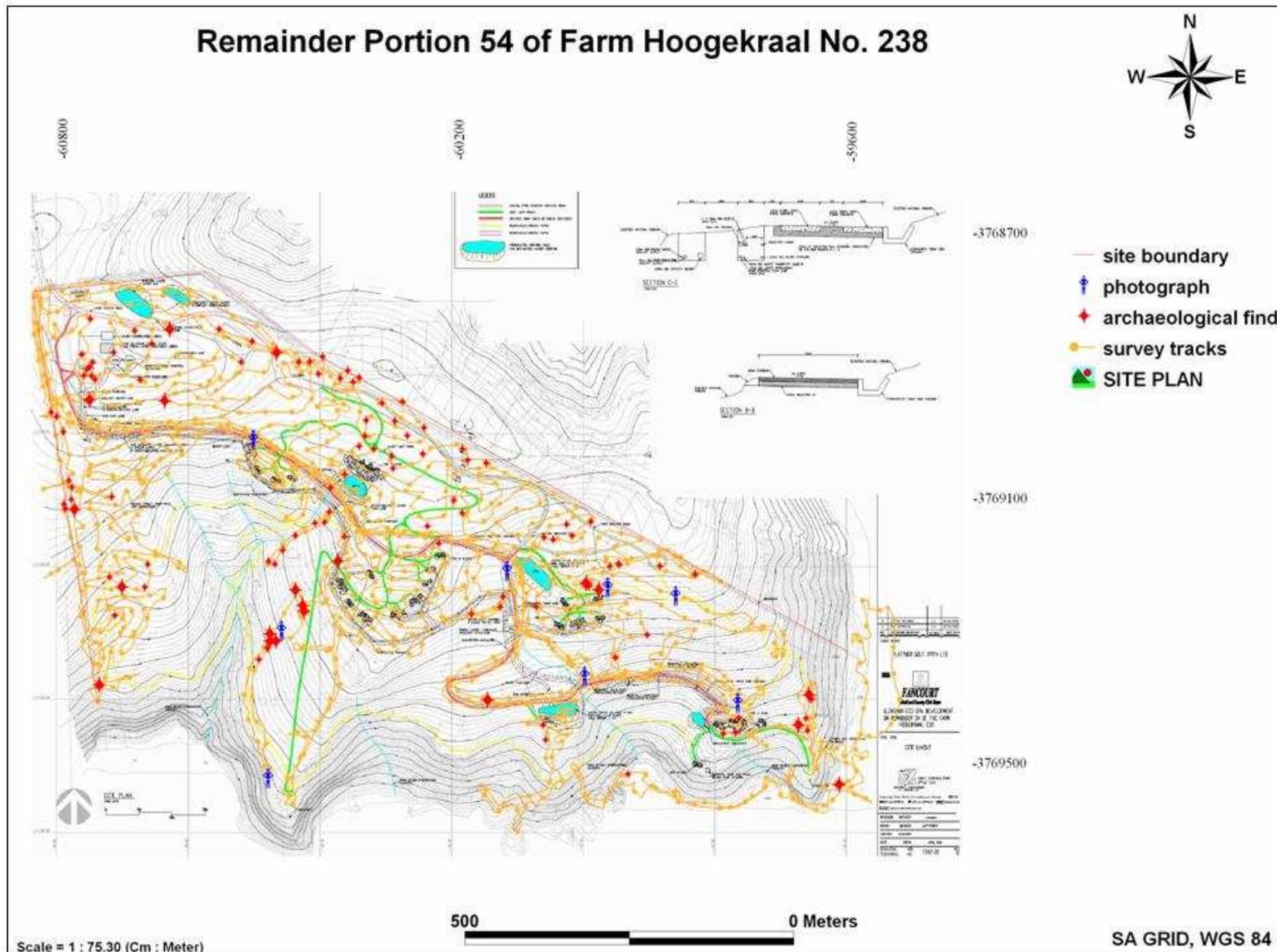


Figure 4. Layout plan with overlay of data generated during Archaeological Impact Assessments and archaeological monitoring.

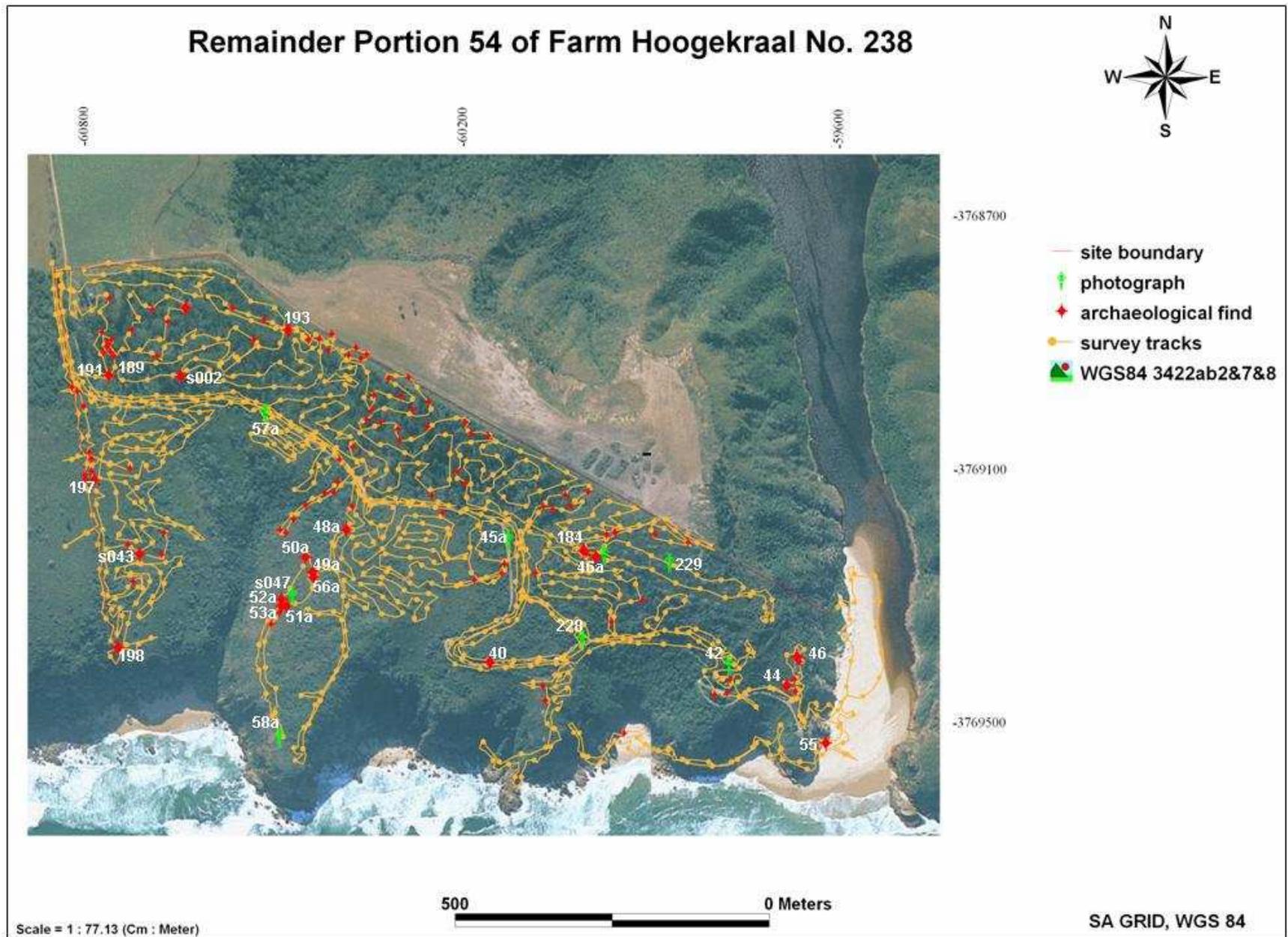


Figure 5. DWAf aerial photo with overlay of data generated during Archaeological Impact Assessments and archaeological monitoring.



Plate 17. Examples of the affected landscape after vegetation clearing and an extensive fire in the Glentana area. See Figure 5 for localities of photographs.



Plate 18. Examples of the affected landscape after vegetation clearing and an extensive fire in the Glentana area. See Figure 5 for localities of photographs.



Plate 19. Examples of artifacts with origins in all epochs of the Stone Age, but dominated by Middle Stone Age and Early Stone Age material. Localities of these examples are shown in Figure 5. Garmin hand held GPS for scale (Etrex Vista and Camo respectively).



Plate 20. Examples of artifacts with origins in all epochs of the Stone Age, but dominated by Middle and Early Stone Age material. Localities of these examples are shown in Figure 5. Garmin Camo hand held GPS for scale.



Plate 21. Examples of artifacts with origins in the Middle and Early Stone Ages. Localities of these examples are shown in Figure 5. Garmin Etrex Vista hand held GPS for scale.