Development at Pinnacle Point, Mossel Bay

ARCHAEOLOGICAL MONITORING OF VEGETATION CLEARING & ALL EARTHMOVING ACTIVITIES

Progress Report

Prepared For:

Heritage Western Cape
(Permit No. 2004-02-002)

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Executive Summary

A progress report of archaeological monitoring at the site of development at Pinnacle Point, Mossel Bay is presented. The goal of this progress report is to: 1) demonstrate that monitoring of all vegetation clearing and earth movement activities was (and is) carried out as required in the Record of Decision issued to the developers by the DEA&DP, 2) describe procedures and protocols for monitoring and associated recording and sample collection procedures and 3) provide a brief and general description of results and finds made to date. Detailed descriptions, results of basic analyses, interpretations, characterisations of archaeological materials recovered during monitoring and a full documentary, photographic and survey record are not given here, but will be the substance of the final report.

1. Introduction

1.1. Background

Despite early investigations at Cape St Blaize Cave (Leith 1888, Goodwin & Malan 1935), the Mossel Bay area did not receive much archaeological attention until recently. That has changed with significant advances in archaeological research at Pinnacle Point over the past few years.

Apart from research activities in the area - which arose from an archaeological impact assessment - archaeological advances were also made through cultural resource management and mitigation measures. Mr. Jonathan Kaplan (Agency for Cultural Resource Management) and the author conducted the archaeological impact assessment of the area for proposed development at Pinnacle Point in 1997 (Kaplan 1997). Numerous sites were recorded during that study and Pinnacle Point (PP) is now the key research area of the Mossel Bay Archaeology Project (Kaplan 1997; Marean *et al* 2004).

The author's involvement with archaeological mitigation at PP began in 2002 when the South African Heritage Resources Agency (SAHRA) were unable to grant permits and Heritage Western Cape (HWC) was not established. Conditions in the Record of Decision (RoD) issued by the Department of Environmental Affairs and Development Planning (DEA&DP) included that full-time archaeological monitoring was to be conducted during all earthmoving activities. In the interest of conserving and managing heritage resources, and with a letter of approval from Mr. David Hart of SAHRA as well as the cooperation of the developers, archaeological monitoring was conducted during the construction phase of the Garden Route Casino and new Pinnacle Point Road. Because no archaeological sites requiring detailed excavations were present on the surface, no other form of archaeological mitigation was necessary. Monitoring of vegetation clearing and earthmoving activities for the latter developments occurred during the months of July through September 2002 during which time numerous stone artefacts of Middle Stone Age (MSA) and Early Stone Age (ESA) origin were detected, mapped and collected by the author. As the pace and scale of vegetation clearing and earthmoving activities increased a second person was trained to assist with monitoring.

Additional developments at PP began in February 2004 and a permit to map and collect artefacts resulting from the monitoring of vegetation clearing and earthmoving activities was granted to the author by HWC (permit no. 2004-02-002). Activities associated with this permit are ongoing and due to the large scale of construction

activities, up to five people have been employed to conduct monitoring and to map and collect artefacts exposed by vegetation clearing and earthmoving activities.

1.2. Purpose of Monitoring and the Mapping and Collection of Artefacts

The archaeological record in the PP area is very rich as evidenced by the documentation of 28 sites during the initial impact assessment (Kaplan 1997). Recent investigations in some of the caves at PP revealed that in addition to the large quantity of archaeological materials, many deposits are of exceptional quality with excellent preservation of bone and *in situ* deposits including features such as hearths (Marean & Nilssen 2002; Marean *et al* 2004). Due to the quantity and high quality archaeological record of the area, the RoD issued to the developers by the DEA&DP required that full-time archaeological monitoring be conducted during all earthmoving activities in the construction phase of the development.

Earlier monitoring during the construction phase of the Garden Route Casino and new Pinnacle Point Road in 2002 revealed that MSA and ESA stone artefacts lie in the topsoil and sand layers of the stratigraphic sequence, but that the densities and spatial distribution of these artefacts are highly variable and unpredictable. At no time were artefact scatters observed to occur in high densities and their occurrences were spatially irregular. It was decided, therefore, that excavation would require a very large scale operation that was unlikely to yield a representative sample of artefacts and that collection and mapping of artefacts during the monitoring of vegetation clearing and earthmoving activities was more likely to generate a representative sample of subsurface materials.

Monitoring during 2002 made it clear that numerous MSA & ESA artefacts recovered showed little evidence of abrasion and polish, which suggested that they were not rolled or transported by natural agents and it appeared likely that some artefacts were in primary or close to primary context. This situation is rare for ESA sites and the mapping and collection of artefacts therefore offered a good opportunity to generate a scientifically valuable assemblage of artefacts.

In addition to the above and since the bulk of *in situ* archaeological materials are sub-surface, monitoring is a critical component of conserving and managing archaeological resources.

1.3. The Study Area

Pinnacle Point is situated approximately 4km southwest of the coastal town of Mossel Bay on the south coast of the Western Cape Province (Figure 1). The boundary of the property is shown in Figure 2. At the southern extent of the property is approximately 2km of coastline that consists mostly of rocky shores at the base of 40m high cliffs in Table Mountain Sandstone (TMS). Hills rise to the north from the top of the cliffs and reach a high point of some 190m above mean sea level near the northern boundary of the property. Variably sized valleys and ravines separate these hills. Some 500m east of the point of PP is a sandy beach and the only other sandy beach occurs at the western extent of the property. The popular Cape St Blaize (hiking) Trail runs along the top of the cliffs from the point at Mossel Bay to Danabaai in the west.

While a great deal of the property was vegetated with alien Rooikranz prior to development, that has changed through eradication of the alien species, which is ongoing, and today the bulk of the property is covered by limestone Fynbos.

The area of the property under development is approximately 380 hectares though some 180 hectares will not be developed including the proclaimed Nature Area in the western portion of the property (Plate 1). Additionally, the approved layout of the

development includes several “conservation” areas that will be protected in perpetuity. The latter is the responsibility of the Home Owners Association.

During archaeological monitoring in 2002 the areas of focus were the new Pinnacle Point Road and Garden Route Casino (Plate 1 & Figure 3). We were not informed about the initial vegetation clearing and earthmoving activities at the site of the Hotel (Figure 3) and therefore monitoring was not conducted and hence the gap in the extent of the monitored area shown in Plate 2. Inspection of the Hotel site after initial vegetation clearing and earthmoving activities revealed the presence of MSA and ESA stone artefacts, though these were certainly in disturbed contexts and were not mapped, but collected for display and educational purposes. Since February 2004 till now, monitoring has focused on the Casino Lodges, Waste Water Treatment Works (WWTW) and Pinnacle Point Beach and Golf Club including roads and services (Plate 1 & Figure 3). Monitoring recently started at the sites of the Fynbos Village and Golf Villas and in the future will continue at the clubhouse and residential stands (Figure 3).

1.4. Monitoring Procedures and Protocols

While the author processes and manages coordinate and photographic data, directs and oversees all work, attends Environmental Liaison Committee meetings and reports to the Environmental Control Officer (ECO), monitoring – apart from 2002 - was conducted by a team of up to five employees managed by Ms Liezel Olivier and Ms Lesley Krone and most recently by Ms Maggi Newton and Mr. Cornelius Goosen. The site managers underwent training with the author and were appointed as managers after showing competency and commitment as well as working with us for at least 2 months. The author and site managers trained all employees. While monitoring is not difficult, it requires diligent adherence to simple procedures and the ability to work long hours in sometimes harsh weather conditions.

The following is taken from a document prepared for the ECO and employees of MAPCRM cc conducting monitoring at PP.

Safety

- Be sure that mechanical operators are aware of your presence.
- Be aware of earth moving machinery at all times.
- Once declared a construction site, wear hard hats and safety boots (if you do not have these items please let Peter know and we will supply them when finances allow).
- Do not climb into trenches deeper than 1.5m without supervision and safety gear.
- Use appropriate measures to protect against cold, heat and sun.
- No unauthorized persons are allowed on site without prior arrangement and signing of indemnity forms, which must be lodged with a Project Manager of SIP.
- Puff adders are highly venomous and common here during the warmer months. To avoid getting bitten make a noise while walking about and *always* be sure to look where you place your hands and feet.
- Scorpions are also commonly found under and/or around rocks, so never stick your hand under a rock before lifting it for inspection.
- **In case of an emergency contact: Police 10111 (044 691 2222), Fire 044 691 3722, Ambulance 044 691 1911**

Security

- In 2002 we lost a few samples and equipment from the container due to burglary. The property is currently well guarded, but to avoid any loss, no expensive or

valuable personal or MAPCRM gear and equipment should be left unattended or stored in the containers.

- Gear – other than artefacts - that is currently stored in the containers should be stored in one of the construction site offices, the PP sales office or the Dias Museum.
- Expensive gear such as GPS, camera etc. should always be carried on the person using those items and never left unattended – this also applies to note books.
- Samples taken for dating and sediment analyses must be handed to Nilssen at the end of a workday. Samples must never be left in the containers, but locked in a car to avoid lugging them around.

Monitoring

- This literally means to "keep an eye on". In our case we are monitoring the clearing of vegetation and subsequent vegetation clearing and earthmoving activities to identify archaeological materials being unearthed or exposed by such activities.
- All vegetation clearing and earthmoving must be monitored during the action and then the exposed surfaces are checked. If exposed surfaces contain artefacts, then a second person should be plotting and collecting while another is watching earthmoving machinery.
- It is critical that vegetation clearing and earthmoving actions are watched because something very significant may be exposed in a second and if our eyes are elsewhere, we will miss and loose it.
- If vegetation clearing and earthmoving activities halt or slow down, then an extra search of the recently exposed surfaces is conducted to collect artefacts missed during the first inspection. Once such inspection is complete and artefacts are plotted, collected, labeled and bagged, then the "spoil heaps" should be searched for *ex situ* material that can be used for educational and display purposes.
- The same areas may be worked repeatedly by earthmoving machinery and every repeat must also be monitored as artefacts occur throughout the sand body, usually up to a depth of up to around 80cm, and sometimes pressed into the underlying clay layer.
- If many areas are being worked, but in different phases, then the **focus is on the process of moving and/or removing previously undisturbed topsoil and sand bodies**, which contain the vast bulk of artefactual remains. Thus far, Nilssen is swayed that no artefacts extracted from clay, calcrete or the underlying quartzitic sandstone are in situ, but rather, have landed in those contexts as the result of agricultural and/or recent earthmoving activities.
- **If vegetation clearing and earthmoving activities expose archaeological materials that require special attention, then the archaeological monitors are authorized to halt vegetation clearing and earthmoving activities in the affected area until the matter is attended to or resolved by Nilssen.**

Procedure to Follow in the Event of Exposing Human Remains

- Stop all vegetation clearing and earthmoving activities where bones were found and demarcate the area with hazard/danger tape. This is to be done by Nilssen or a monitor appointed to do so by him. **NO PERSON may touch or disturb human remains in any way.**

- Contact Nilssen immediately who will take the following steps:
    1) Contact the SAPS, who will inspect the site to determine if any foul play was involved and whether (if they are capable) the remains are younger than 60 years. If the latter, then the matter is in the hands of the SAPS. If no foul play was involved and/or the remains are older than 60 years, then
    2) Contact Mary Leslie at SAHRA, who will either inspect the find personally or appoint an archaeologist to investigate and deal with the matter. If it is decided that the bones must be exhumed for study and/or reburial, the archaeologist appointed to do the work must apply for and obtain a permit to do so from SAHRA. The delay associated with such an event is not predictable and the matter is in the hands of the Heritage Authorities.

Collecting, Marking, Plotting and Curating Artefacts

- When exposed by vegetation clearing and earthmoving, artefacts are covered or coated with sediment and are not always easy to see. It is important, therefore, that clumps and masses of sediment are examined by hand or poked with a trowel, garden fork or similar tool to ascertain if they contain stone artefacts. Sometimes artefacts are broken, flaked or grazed by machinery.
- Sometimes machinery "drags" artefacts, creating furrows running parallel with the movement of the mechanical earthmover. You can often trace such furrows back to where the artefact was first "picked up" and that is the point that you should plot as the artefact's location. Untraceable movement up to several meters is not hugely detrimental as the accuracy of the GPS is around 4m.
- If possible, first identify a series of artefacts and then piece plot them with the GPS, rather than plotting each piece as it is encountered, as the latter method – in Nilssen's experience - is slower. If more artefacts lie close together or if artefacts are exposed very rapidly, then plot the centre point of the collection and note the radius as requested on the information tag that accompanies the artefacts in a zip-lock plastic bag.
- It is important that information tags are completed entirely and that as much information as possible is recorded on the tags as well as in notebooks – this includes stratigraphic context.
- If you are operating without a GPS, then mark the location of artefacts or clusters of artefacts with a surveyor's pin/stake, making sure that machinery will not move the pin/stake. If machinery is likely to "trample" over markers, then position pin/stake outside such areas, but be sure to pace out or measure so that the position of clusters or artefacts can be relocated as accurately as possible.
- Notebooks must include a section that starts with a new date every day. Under that date a record is kept of the GPS being used and the alphabetic prefix, GPS plot numbers or waypoints created that day and notes associated with individual plotted artefacts. In other words, notes in addition to what is recorded on the information tag. In addition to required notes, write all that you think may be relevant.
- Each artefact or cluster of artefacts must be plotted with a GPS. The coordinates of their location are represented by a number from (001 to 500), which is automatically assigned by the GPS. This is referred to as a series of waypoints.

- Each Series of waypoints is assigned an alphabetic prefix from a to z so that there are never duplicate numbers. Once z is reached, then the following prefix will be aa and the next ab and so on.
- One person operates each GPS for a series of waypoints to prevent confusing prefixed series names.
- Waypoints are downloaded from GPS using the Garmin (MapSource) software and the original file is saved before data is copied to excel and resaved as tab delimited text files to later import to GIS (ArcView) (Nilssen does this).
- When waypoints are downloaded from GPS their series prefix name is written into the file name and column D, and added to the number via the formula in column F (Nilssen does this).
- Waypoints represent collection points of single artefacts or clusters of artefacts - details of collection points are recorded on tags that are placed in artefact bags. Waypoint dates are recorded in monitors' notebooks, which are photocopied on a regular basis. Waypoints are not generated for section photographs, but coordinates for photos are recorded in notebooks and logged manually - see My Files/Mossel Bay/MAPCRM/2004/PP Casino Lodges/Photographs/Photographic Log Casino Lodges 2004.xls. Waypoint series a, b, c and d were entered manually from notebooks.
- Once a GPS waypoint has been logged (mark made and saved) on the GPS, tags are completed and placed in the smallest zip-lock bags and the latter are placed inside a plastic bag along with the artefacts or cluster of artefacts. After several bags have been filled, they are transported to and stored in the MAP containers currently at Power Construction Site Offices.

Each GPS must be handed to Nilssen when around 400 waypoints or marks are saved or when waypoint coordinates were not downloaded for 2 consecutive weeks. Always ensure that allocated alphabetic prefixes are correct and logged in notebooks.

Photographic Records of Sections/Profiles

- Wherever profiles are exposed that show the stratigraphy of sediments, these profiles are photographed either with the 35mm camera (use slide film only) or with the Coolpix 990 or 7600 digital cameras.
- Photographs must include a scale (use the A5 notebooks or actual photographic scale) and the entire profile must be visible in the frame/viewfinder. Photographs taken with the digital cameras must be checked directly after taking them to ensure that the profile is fully captured and that the quality of the image is crisp.
- A log of photographs must be kept in a separate part of your notebook and this log must include the date, photo number, what is being photographed and the GPS coordinates of the profile or feature being photographed– waypoints or marks are not saved for photography.

Taking Sediment Samples for Dating and Analyses

- As many samples of sediments as possible must be taken where sediments are known to contain artefacts. Samples of other sediments lying over or under artefact-bearing deposits should also be taken episodically. Samples should be taken at roughly 30 to 50 meter intervals where appropriate. Samples must be given to Nilssen or kept with a monitor or at home. Samples are never to be left in the containers or unattended.

- Where artefact-bearing sediments (topsoil and sand body above clay layer) are thick enough, three samples should be taken from; 1) top of layer, 2) middle of layer and 3) bottom of layer.
- Where sediment is thin, one or two samples should be taken.
- Keep notes and records relating to sediment sampling in a separate portion of your notebook. For each sample include date, description of sediment being sampled and its stratigraphic context, number of samples, name(s) of samples, GPS coordinates and name of person taking sample. Include any additional information you deem relevant.
- **Equipment for taking and recording samples:**
    1) note book & stationery (felt tipped pen for labeling duct tape)
    2) camera & photographic scales
    3) GPS
    4) Trowel/spade and brush
    5) PVC piping
    6) Rubber mallet and/or hammer
    7) Duct tape
    8) Information tags
    9) Small zip-lock bags for information tags
    10) Toilet paper
- **Sampling Procedure:**
    1) Clean selected section/profile with spade/trowel/brush
    2) Hammer PVC pipe into profile - making sure that the pipe is traveling level and not dipping or rising in the deposit - until the pipe is secure (penetrating deposit about 5 to 10cm)
    3) Insert plug of toilet paper and compress inside pipe with mallet/trowel handle to prevent sediment from collapsing in the pipe
    4) Continue pounding pipe into the section while continuously ensuring that the plug of toilet paper is secure inside the pipe and holding the sediment in place. Make sure that the pipe is level as it penetrates or travels into the sediment
    5) Stop pounding when about 10cm of the pipe sticks out of the profile.
    6) Insert another plug of toilet paper and compress inside pipe with mallet/trowel handle to prevent sediment from collapsing and moving around inside the pipe. The plug should be firmly in place.
    7) Use duct tape to make a secure “cap” over the plug of toilet paper (check with a manager or Nilssen if you are not sure).
    8) Label the duct tape in ascending numerical order according to the last number used for sampling. If there are 2 or 3 samples per location, then they are numbered, for example, 26a, 26b, 26c – from top to bottom. The label must be neat and easy to read.
    9) Take a GPS reading and enter in appropriate section (Sediment Samples) of notebook. Do not create waypoints for sediment samples. Simply record the coordinates in your note book and on the tag that will be taped to the PVC pipe.
    10) Take a distant and close-up photograph of the section and sample “tubes” making sure that the distant picture includes the entire profile and that the labeling is clearly visible in the close-up shot.
    11) CAREFULLY and GENTLY extract the PVC pipe containing the sediment sample from the profile. If you struggle because it is too

firmly lodged, use your trowel to excavate around the pipe until it can be extracted without excessive force. The aim is to extract the pipe without collapsing the sediment in the back part of the pipe. Hold the pipe with the back end up as it is freed from the profile.

12) As soon as the pipe is freed from the section, insert another plug of toilet paper in the back end of the tube and compress it inside the pipe with mallet/trowel handle to prevent sediment from collapsing and moving around. The plug should be firmly in place.
13) Use duct tape to make a secure cap over the plug of toilet paper.
14) Complete information tag with date, sample number, GPS reading, photo numbers, etc., and include your name. Place information tag in smallest zip-lock bag and securely tape it to the tube with duct tape.
15) Get samples to Nilssen or keep in car or home and not in container or unattended on site.

2. Description of the Affected Environment

A general description of the property under development at PP is given above in section 1.3. Also referred to in section 1 are the substantial number and high quality archaeological sites in the area being developed. While the bulk and currently deemed most significant sites and deposits are situated in the coastal cliffs that are not directly impacted by development activities, they will be impacted by the dramatic increase of pedestrian traffic resulting from the development. The concern here is with the impact directly effected by development activities during the construction phase. We are in the process of drafting an archaeological conservation management plan for the entire property, but that is beyond the scope of this report.

Sites 27 and 28 are located in areas directly impacted by construction activities and both these sites were reported to be in already compromised contexts and of low significance (Kaplan 1997, figure 1; also see Plate 2). Artefacts were mapped and collected at the location of sites 27 and 28 during monitoring. Additional sites located above and away from the cliff edges are all of medium to low significance with the exception of 23, which is a MSA quarry site (Plate 2). Some construction activities associated with the golf course spilled over the existing Cape St Blaize Trail and artefacts were mapped and collected from those medium to low significance sites during monitoring. Shell middens 18, 19 and 20, situated at the western extent of the property are in the vicinity of residential stands and their associated services, and those sites require mitigation measures other than monitoring (Plate 2). The latter was made clear to developers and we are currently working on proposals for mitigation and/or conservation measures for those shell middens.

As mentioned earlier, numerous MSA and ESA stone artefacts were mapped and collected during the 2002 monitoring season and many more were unearthed since monitoring resumed in February 2004 (Plate 3). This shows that, in addition to sites recorded during the impact assessment, the affected environment includes numerous archaeological occurrences that lie subsurface.

The geological sequence varies across the property and the topsoil and sand body - containing the bulk of artefacts on the plateau above the cliffs - thins down the slopes toward the south. As the sand body decreases in thickness and eventually peters out down most of the slopes, so the numbers of artefacts decrease. Additionally, artefacts recorded down the slopes and in ravines and valleys appear to display more evidence of rolling and transportation by natural agents than artefacts recovered from the hilltop areas. Underlying the sand body is clay in a variety of colours from red to light orange and in some cases mottled and also varying in thickness from 30 to 50 cm.

Below the clay is calcrete that varies spatially in consistency and make-up as well as thickness from 20 to 150 cm. In places the calcrete consists of soft, chalky material while in others it occurs in nodules and yet others in solid and extremely hard form. One test trench was excavated through the calcrete and onto a very hard quartzitic material. To date, no artefacts were noted to be *in situ* in and below the clay layer.

3. Provisional Results of Monitoring

An estimated area of approximately 100 hectares was covered during archaeological monitoring at PP since 2002 (Plate 2). In excess of 5000 GPS readings were taken for isolated stone artefacts as well as clusters of artefacts (Plate 3) and a total of more than 20 000 artefacts were mapped and collected according to procedures and protocols detailed in section 1.4 above. Artefacts were discovered over almost the entire area excavated for development, there were certain "hot spots" where they occurred in higher densities (Plate 4). . While artefacts include MSA and ESA pieces, analysis of a sample from the 2002 collection by Ms Erin Lassiter of the State University of New York (USA) revealed that the vast majority of stone artefacts are of ESA origin. Erin's analysis forms the foundation of her Masters dissertation that is nearly complete and detailed results of her work will be included in the final report. Examples of artefacts recovered are shown in Plates 5,6 and 7. Analysis of the remaining artefacts will be conducted prior to writing the final report.

The geological sequence is described in section 2 above and the bulk of artefacts were retrieved from the sand layer (Plate 8). Some artefacts were located in the topsoil, but it seems likely that this is the result of bio-turbation. Sometimes artefacts were found pressed into the surface of the clay layer. No artefacts were found in the body of the clay layer or in the underlying calcrete even though some artefacts were seen lying in disturbed contexts with calcrete on their surfaces. This is likely the result of artefacts from the sand layer being loosened from the topsoil/sand layers and then "trampled" onto the calcrete by mechanical excavators. No stratigraphic separation was observed between ESA and MSA artefacts. Continued monitoring may reveal such separation and this will necessitate archaeological excavation because few *in situ* ESA occurrences are excavated to date. The density of artefacts is quite low and a horizon of artefacts was never visible in the excavated sections/profiles. Numerous photographs of the geological sequence were taken during monitoring and these images are linked to coordinate data.

Numerous sediment samples were taken - as described in section 1.4 – from artefact bearing deposits and these are intended for future dating and analyses (Plate 9).

In addition to mapping and collecting artefacts, monitoring also resulted in the discovery of a new cave site (see easternmost site indicated with a red dot in Plate 2) with MSA artefacts on the talus as well as an accumulation of fossilized bone in a carnivore lair in the calcrete horizon (site 30 in Plate 2). The latter was exposed during trenching operations and a permit from HWC was obtained to secure the bone-bearing deposits and we will excavate the site in November 2005 to obtain an assemblage of bone for study and to establish the extent of the deposit to aid plans for conservation. We already submitted sediment samples from the fossil-bearing sands to QUADRU for optically stimulated luminescence dating and results are imminent.

Artefacts mapped and recovered through monitoring are currently stored in two containers on the site of development and are locked on a daily basis and secure in a fenced and guarded area. After analyses, these artefacts will be transported to Cape Town for storage in Iziko – South African Museum. Sediment samples are currently stored in our office at the Dias Museum and this material will be stored with the stone artefacts. All coordinate, photographic and other data will be burned to CD/DVD and

submitted along with a hard copy of the final report prepared for HWC. The same will accompany the materials to be stored in Cape Town. In addition, a full copy (CD/DVD) of all data associated with monitoring at PP will be submitted to HWC in addition to the hard copy of the final report.

Acknowledgements

We thank the developers, Pinnacle Point Resorts Pty Ltd, for continued support for the mitigation work we are conducting at Pinnacle Point. We are very grateful to the management and staff of the Dias Museum in Mossel Bay who provide us with office, storage and laboratory space as well as logistical support. We extend a special thanks to our field crew for their unwavering commitment and hard work. They are; Lesley Krone, Liezel Olivier, Maggi Newton, Cornelius Goosen, Jacque du Preez, Dane Newton, John Axer, Lizelle Bezuidenhout and Veneta du Preez.

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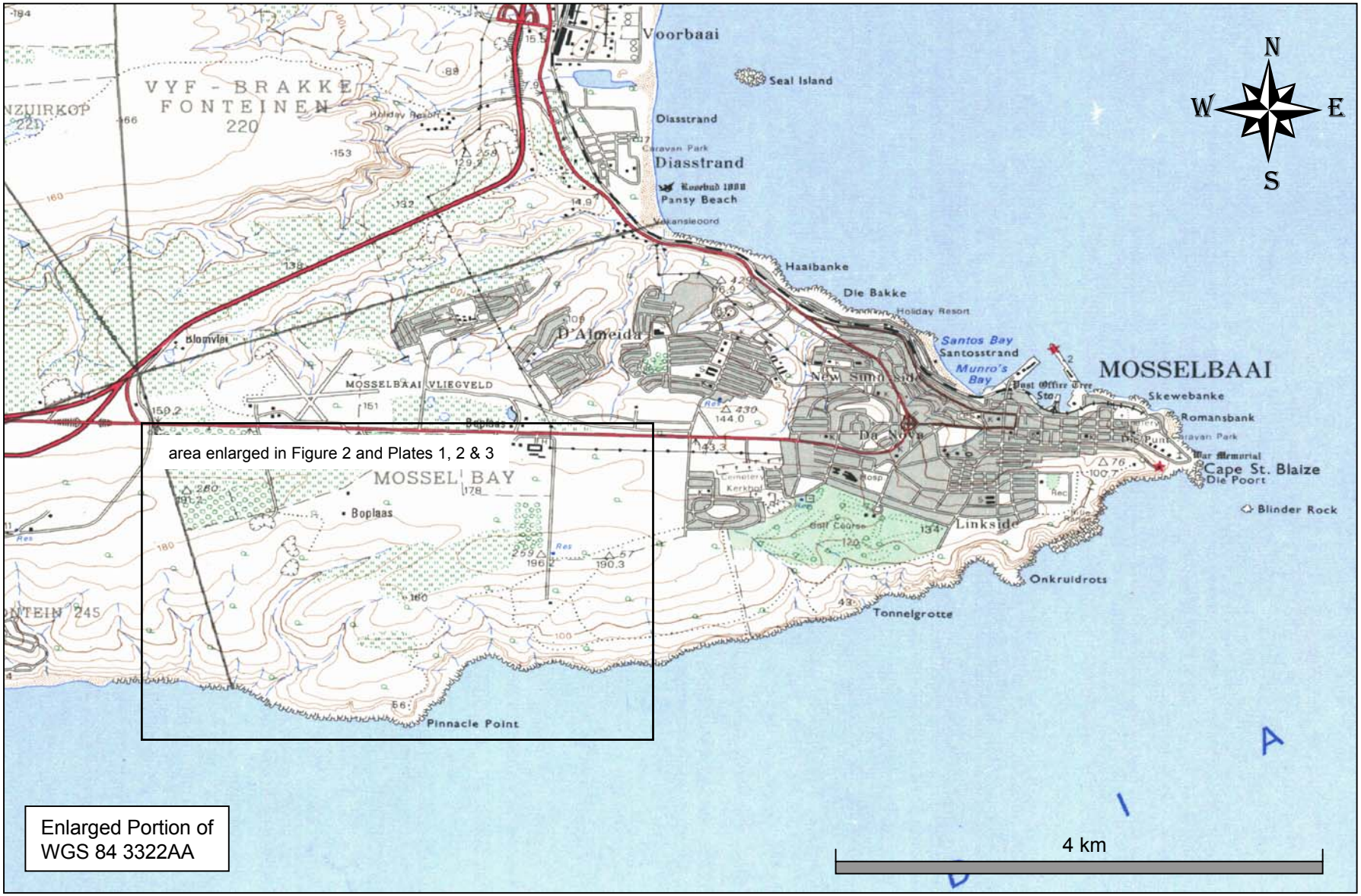

Figure 1. General location of Pinnacle Point and area under development (framed) relative to the coastal town of Mossel Bay, Western Cape Province.

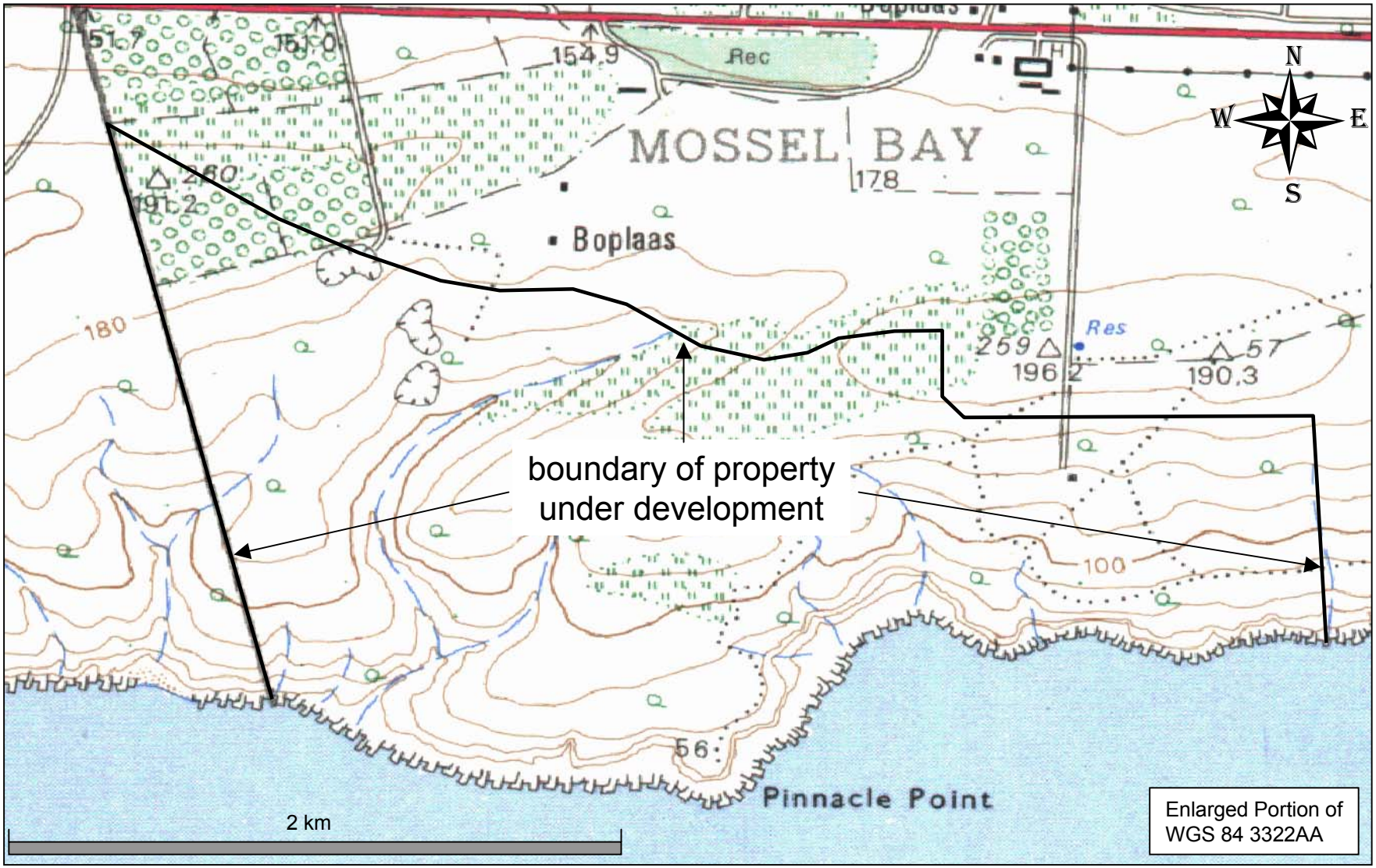

Figure 2. Enlarged area as indicated in Figure 1 showing Pinnacle Point and the boundary of the property under development.

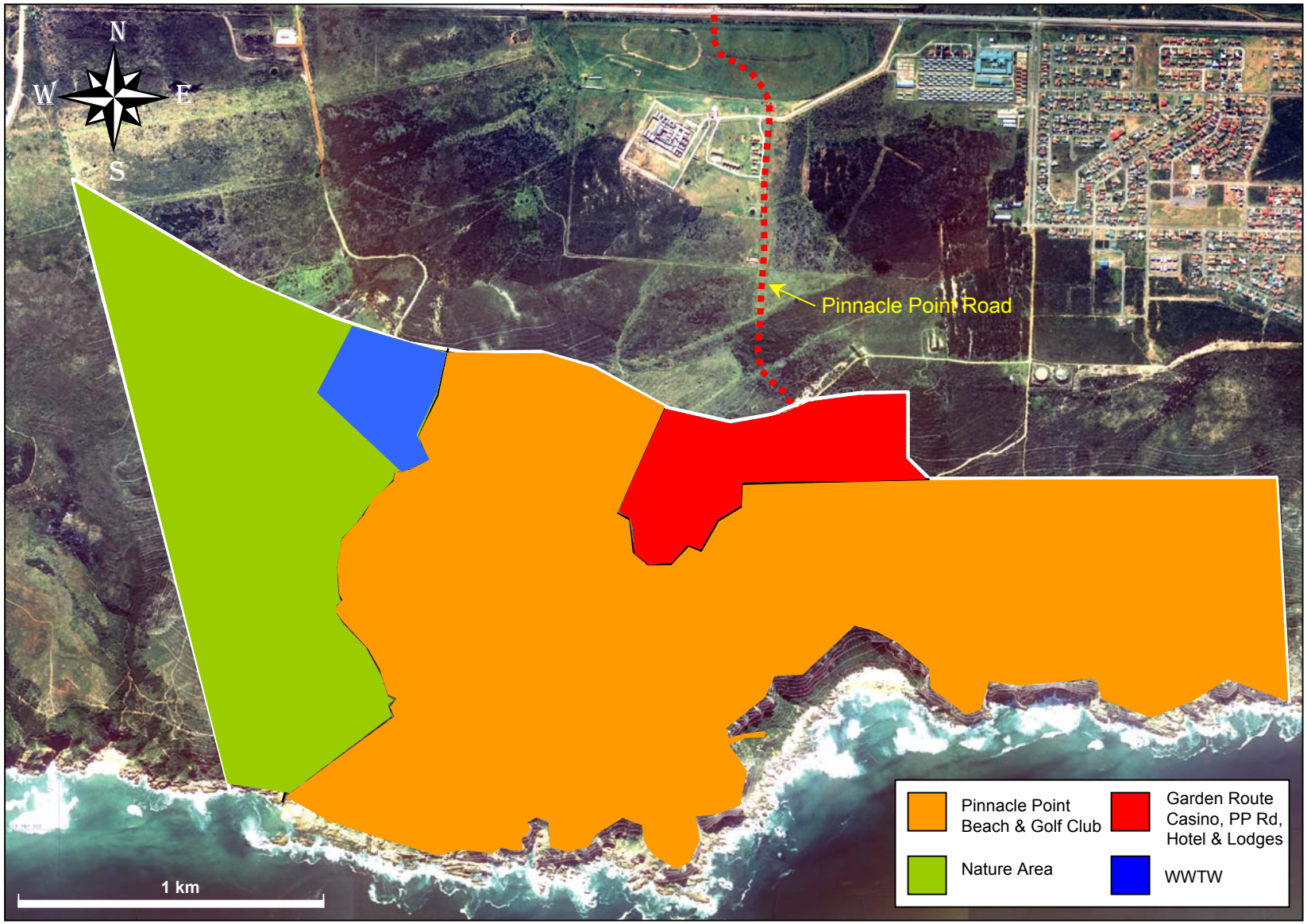

Plate 1. Aerial photograph of the enlarged area as indicated in Figure 1. The boundary of the property under development is indicated by the white outline. Shaded areas represent the different elements of development (detailed layout in Figure 3).

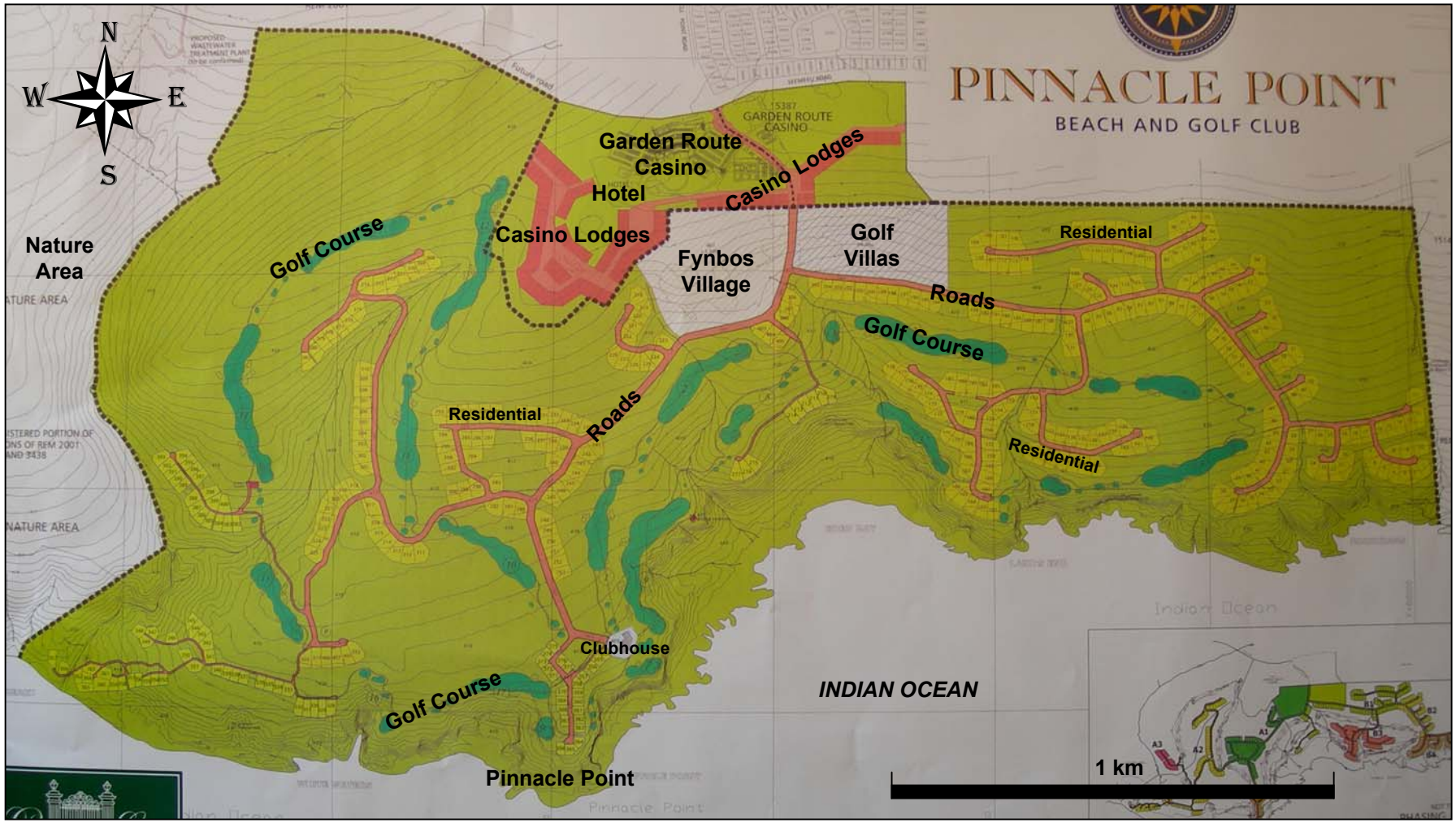

Figure 3. Layout plan of the property under development excluding the western extent that is part of a Nature Area. Indicated are the locations of roads, the Garden Route Casino, Hotel, Casino Lodges, Golf Course and clubhouse, Fynbos Village, Golf Villas and residential stands.

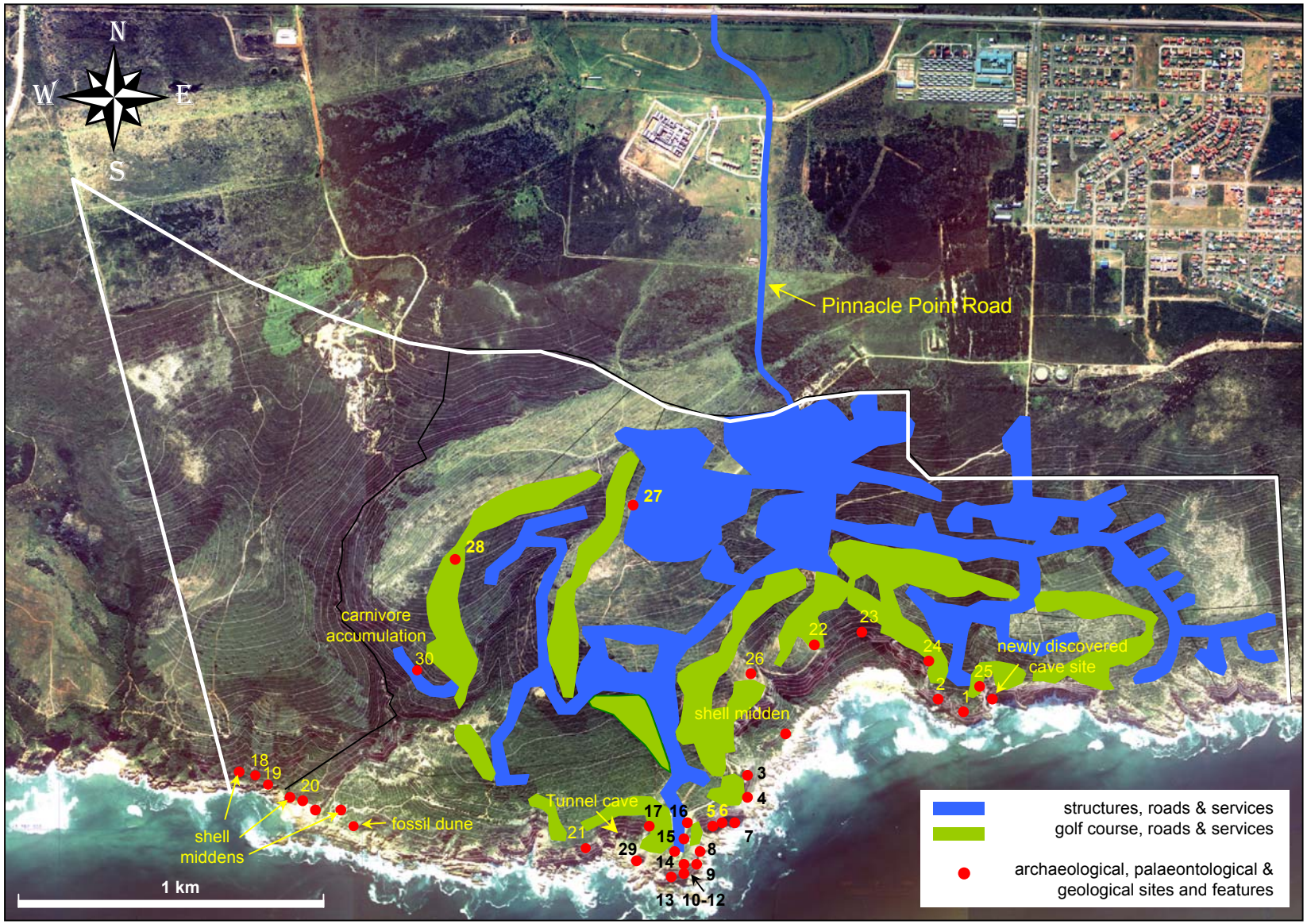

Plate 2. Aerial photograph of the enlarged area as indicated in Figure 1. The boundary of the property under development is indicated by the white outline. Areas shaded blue and green represent the extent of archaeological monitoring since 2002.

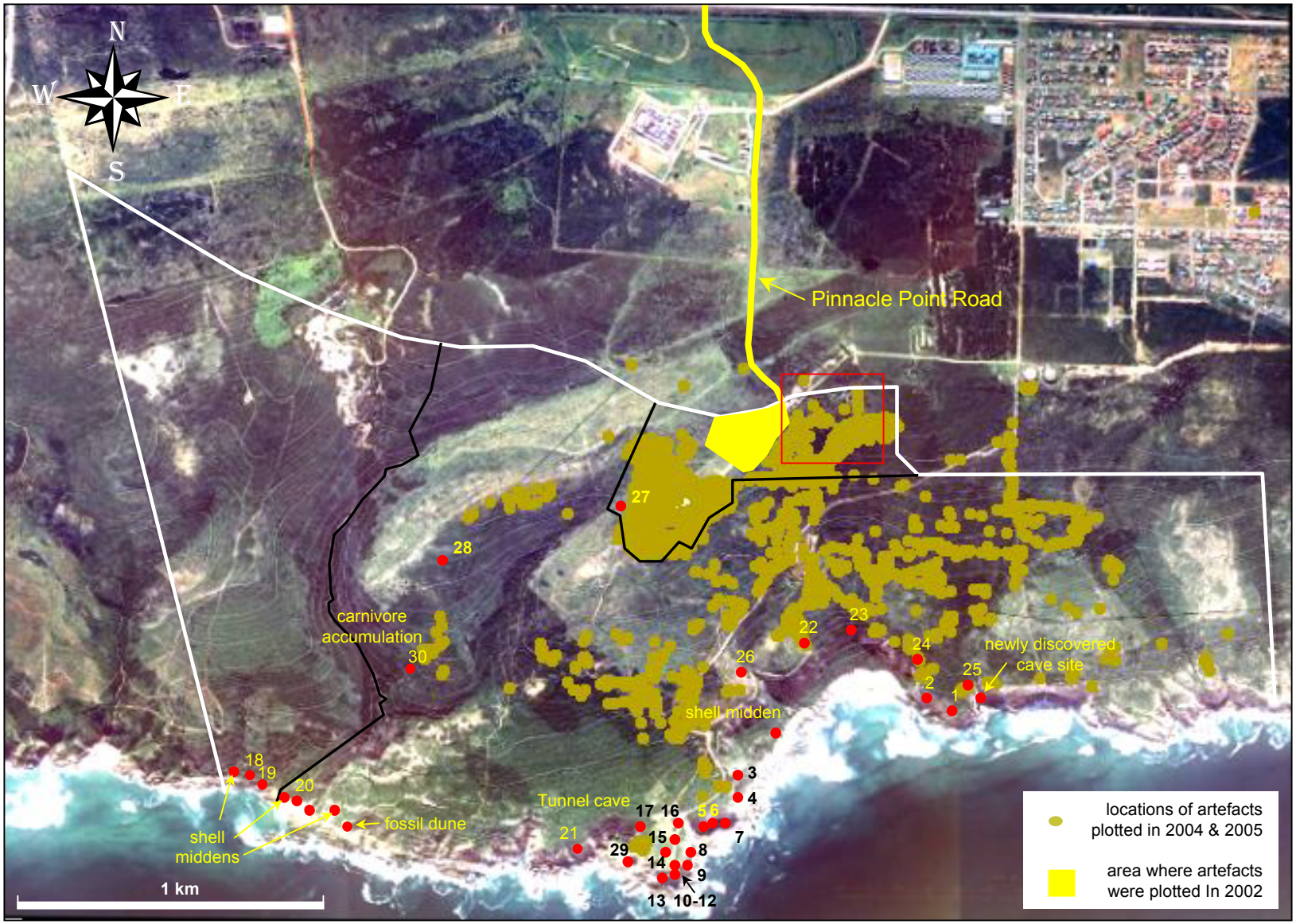

Plate 3. Rectified aerial photograph of the enlarged area as indicated in Figure 1. The boundary of the property under development is indicated by the white outline. Shown are the locations of plotted artefacts and/or artefact scatters (generated using ArcView GIS) and the area monitored in 2002 that includes numerous plotted artefacts and artefact scatters . Area in red frame is enlarged in Plate 4.

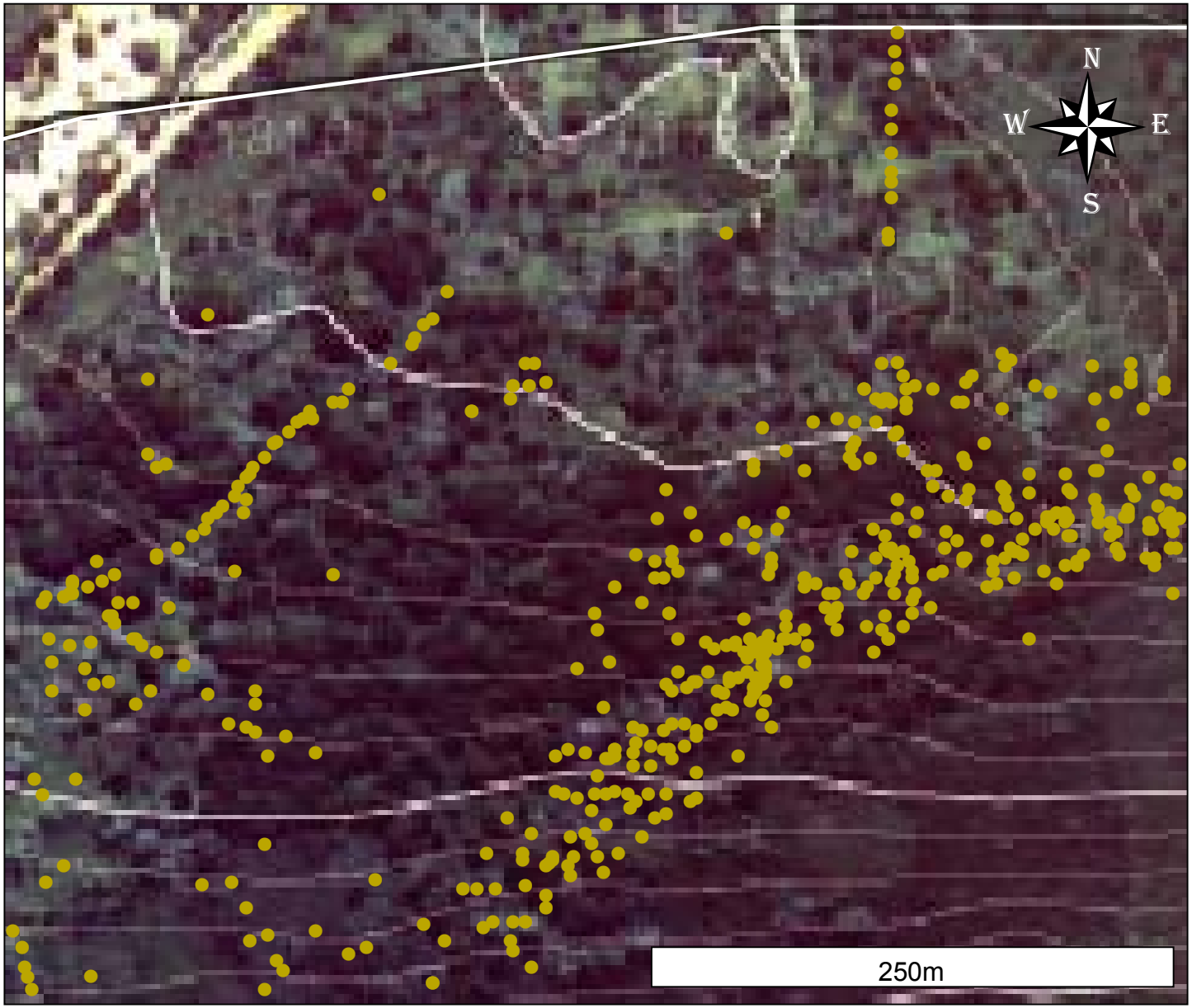

Plate 4. Enlarged area as indicated by the red frame in Plate 3. While linear plotted finds represent roads or trenches, the wider collection area in the lower middle to right of the image shows zones of higher density artefact clusters.

Plate 5. Examples of ESA artefacts showing opposite surfaces in a and b. Small interval on scale is 1cm.

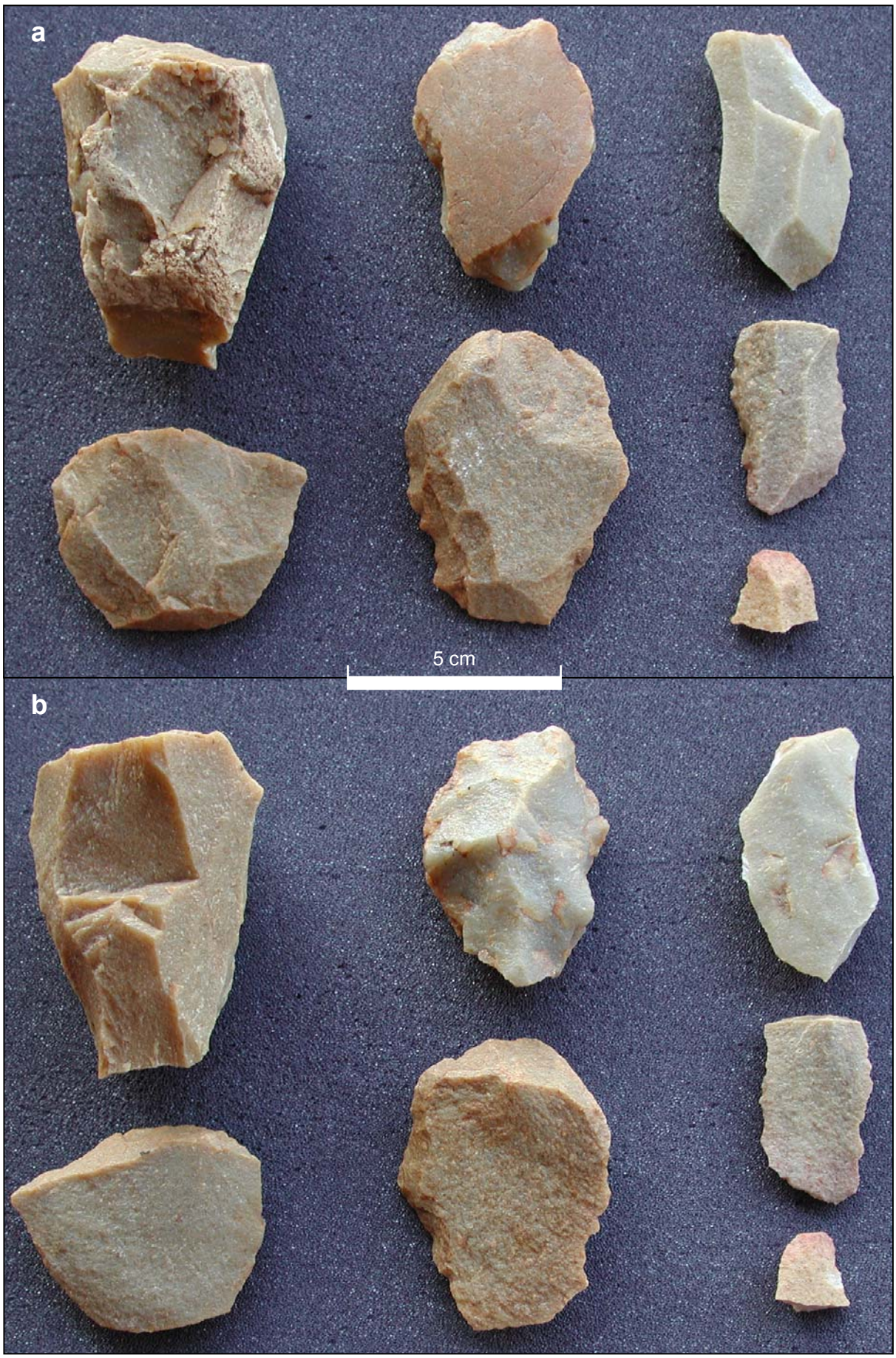

Plate 6. Examples of MSA artefacts showing the dorsal (a) and ventral (b) surfaces.

Plate 7. Example of a bifacial ESA hand axe.

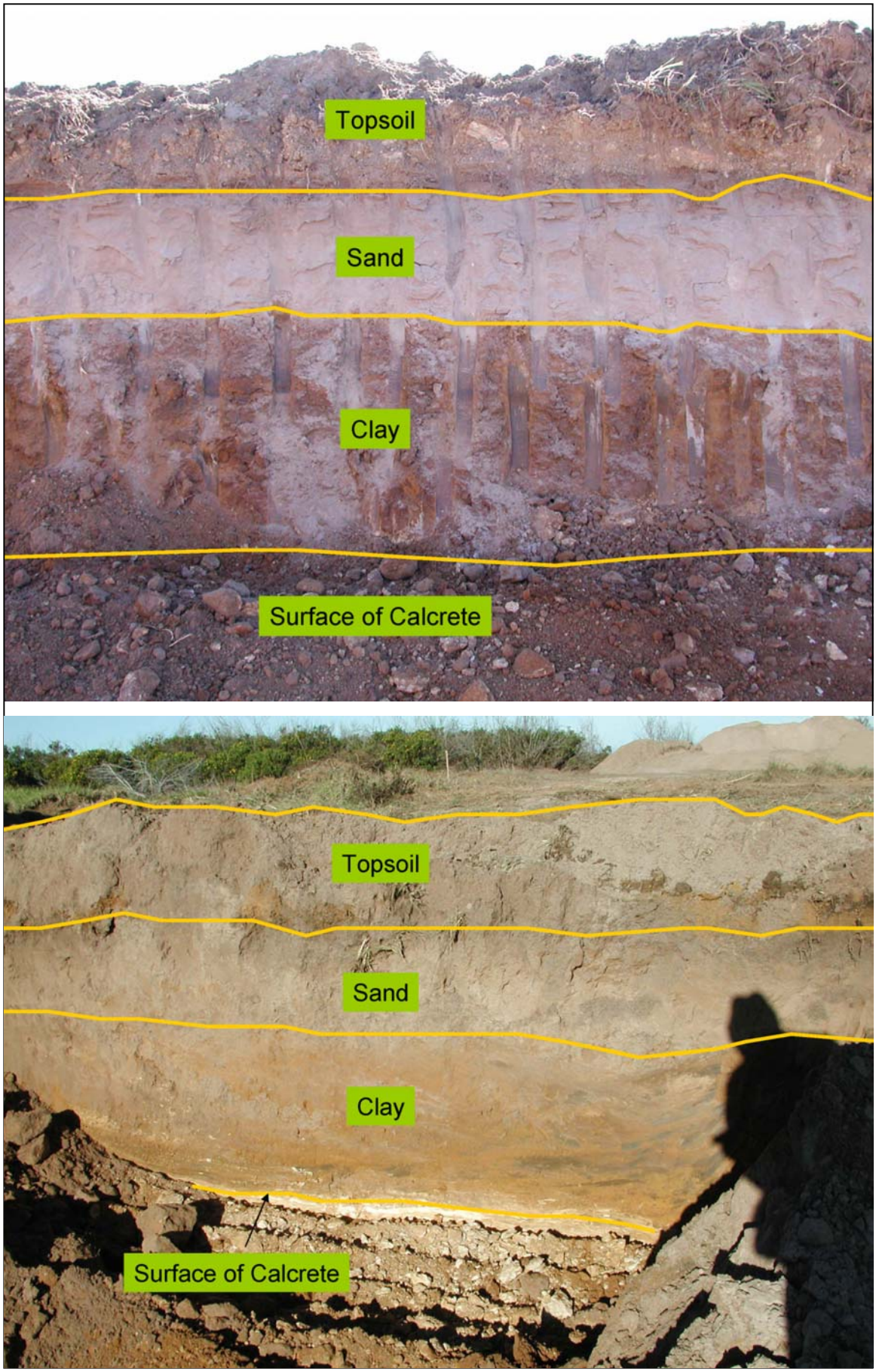

Plate 8. The top and bottom images show examples of the geological sequence at different localities in the vicinity of the Garden Route Casino.

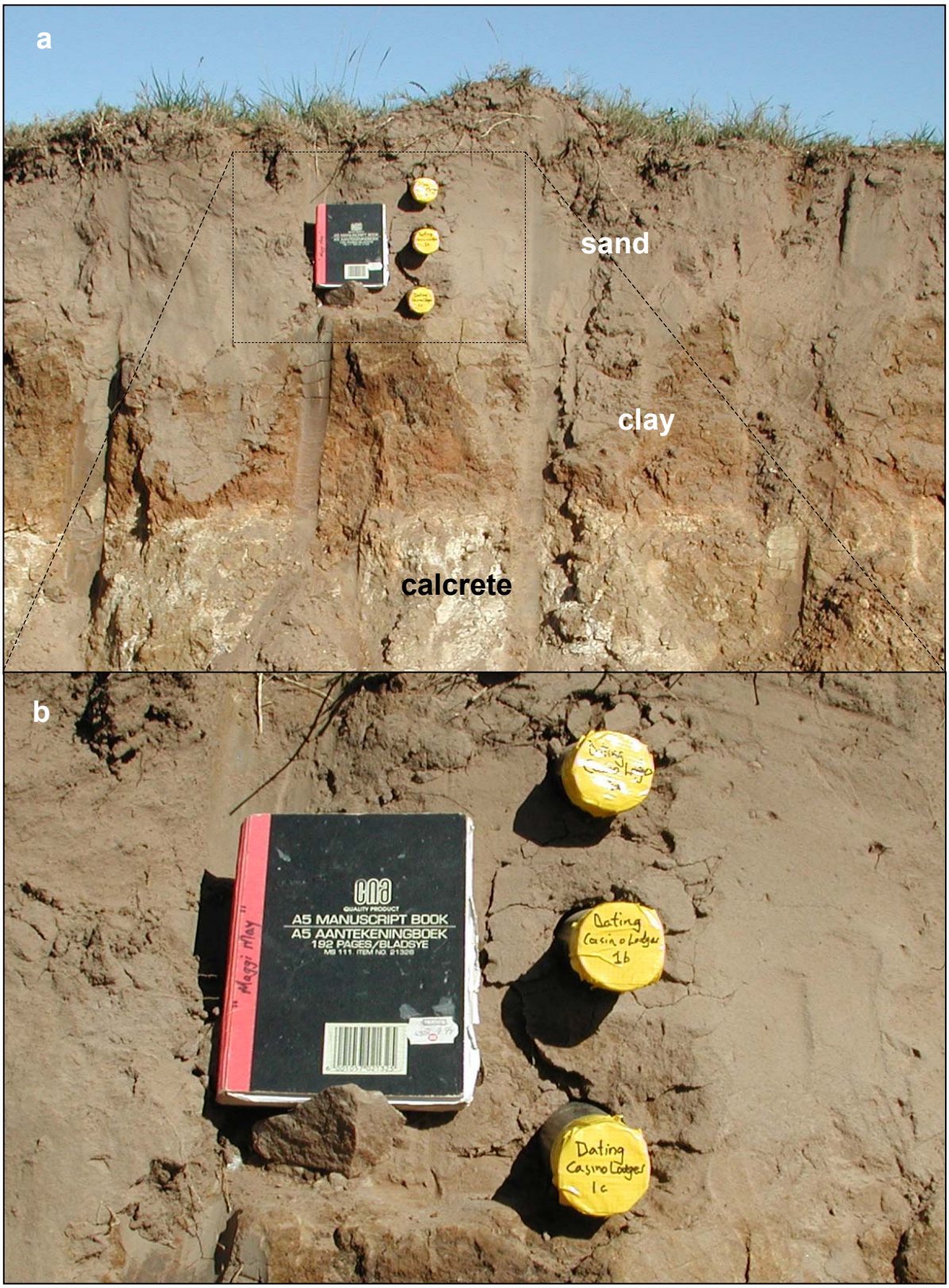

Plate 9. An example of taking sediment samples for future dating and analyses is shown. Samples are most commonly taken from the top, middle and lower part of the artefact bearing sand body (a). An *in situ* stone artefacts supports the A5 notebook inserted for scale (b).