

**A PHASE 1 ARCHAEOLOGICAL IMPACT ASSESSMENT FOR THE PROPOSED
UPGRADE AND EXPANSION OF THE CAPE RECIFE WASTE WATER
TREATMENT WORKS IN PORT ELIZABETH, NELSON MANDELA BAY
MUNICIPALITY, EASTERN CAPE PROVINCE**

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Note: This report follows the minimum standard guidelines required by the South African Heritage Resources Agency for compiling Archaeological Phase 1 Impact Assessment (AIA) reports and is part of an Environmental Impact Assessment.

EXECUTIVE SUMMARY

Purpose of the study

Eastern Cape Heritage Consultants cc was appointed by CEN Integrated Environmental Management Unit to conduct a Phase 1 Archaeological Impact Assessment (AIA) for the proposed upgrade and expansion of the Cape Recife waste water treatment works in Port Elizabeth, Nelson Mandela Bay Municipality, Eastern Cape Province; to establish the range and importance of the archaeological sites/remains, the potential impact of the development and to make recommendations to minimize possible damage to these sites.

The investigation

The dense vegetation and thick dune sand made it difficult to observe heritage sites/materials. No archaeological sites/materials were observed, but a 19th century historical dump area was found in a deflated dune area. Most of the sludge pumping main will be constructed along areas previously disturbed by development.

Cultural sensitivity

Although only one scatter of historical dump material was observed during the investigation, the study area is potentially of high cultural sensitivity. Previous heritage investigations and observations indicated that the study area is rich in marine archaeology (shell middens) and 19th century historical dump material.

Recommendations

1. All construction work must be monitored. An archaeologist must inspect (walkthrough) the areas earmarked for development when the surface vegetation has been cleared and when the trenches for the sludge pumping main has been dug to establish any archaeological sites/materials were exposed.

Alternatively a person must be trained as a site monitor to report to the foreman when heritage sites are found.

2. A specialist/historian must be appointed to devise a collecting strategy for the historical dump material in terms of time and expense. Provision should be made for a budget to conduct collecting of material.
3. If any concentrations of archaeological and/or historical material are exposed, work must stop immediately and reported to the archaeologist (or historian) at the Albany Museum (046 6222312) or to the Eastern Cape Provincial Heritage Resources Authority (043 6422811) immediately.
4. Construction managers/foremen should be informed before construction starts on the possible types of heritage sites and cultural material they may encounter and the procedures to follow when they find sites. Alternatively a person must be trained as a site monitor to report to the foreman, as in 1 above.

PROJECT INFORMATION

The proposed project comprises the upgrading and extension of the existing waste water treatment works (WWTW) in the Nelson Mandela Bay Municipality. The development will take place on Erf 1612, 1611, 121, 126, and 1256 Summerstrand, Port Elizabeth. It will also include the construction of a sludge pumping main of approximately 8 kilometres long between the Drifstands WWTW and Cape Recife WWTW and a new sea outfall for treated effluent (Maps 1-3).

The Developer

Nelson Mandela Bay Municipality

The Consultant

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Purpose of the study

The original proposal was to conduct a survey of possible archaeological sites for the proposed upgrade and expansion of the Cape Recife waste water treatment works on Erf 1612, 1611, 121, 126, and 1256 Summerstrand, Port Elizabeth, Nelson Mandela Bay Municipality, Eastern Cape Province. The survey was conducted to establish;

- the range and importance of possible exposed and *in situ* archaeological sites, features and materials,
- the potential impact of the development on these resources and,
- to make recommendations to minimize possible damage to these resources.

Site and location

The development is located within the 1:50 000 topographic reference map 3325 DC & DD 3425 BA Port Elizabeth (Map 1). It will take place mainly on Nelson Mandela Bay Municipality property (Erf 1612, 1611, 121, 126, and 1256 Summerstrand, Port Elizabeth), except for a portion of the sludge pumping main (approximately 8 km long) between the Cape Recife WWTW and Driftsands WWTW that will traverse a portion of the Nelson Mandela Metropolitan University's property. The development is situated south and south east of Port Elizabeth (Maps 1-3). The Driftsands WWTW (general GPS reading: 34.01.02,09S; 25.36.10,66E) is located approximately three kilometres south-west of the Port Elizabeth Airport and 2,5 kilometres from the coast. The Cape Recife WWTW (general GPS reading: 34.00.58,50S; 25.41.04,10E) is situated a kilometre south-east of the Nelson Mandela Metropolitan University, two kilometres north-west of Cape Recife and 500 metres from the coast. The study area composes of dune sand covered by dense grass and alien vegetation.

Relevant impact assessments in the wider Driftsands/Cape Recife Area

- Binneman, J. 2011. A letter of recommendation (with conditions) for the exemption of a full phase 1 archaeological heritage impact assessment for the proposed development of a military health unit on a portion of Erf 1216, Port Elizabeth, Eastern Cape Province. Prepared for CEN Integrated Environmental Management Unit. Port Elizabeth.
- Binneman, J. and Booth, C. 2010. A phase 1 archaeological impact assessment (AIA) for the proposed 20MW wind farm on three alternative sites: Erf 121, Driftsands (site alternative 1), Bushy Park Farm, remainder of Erf 26, as well as portions 5, 6 and 7 thereof (site alternative 2) and Rietfontein Farm, Erf 594, Van Stadens East (Site Alternative 3), Nelson Mandela Metropolitan Municipality, Port Elizabeth, Eastern Cape Province. Prepared for SRK Consulting. Port Elizabeth.
- Webley, L. 2005a. Cultural and historical assessment of Madiba Bay Leisure Park. Prepared for Coastal and Environmental Services. Grahamstown.
- Webley, L. 2005b. Phase 1 Heritage Impact Assessment of a proposed water reservoir site near Schoenmakerskop, Port Elizabeth. Unpublished Report for SRK Consulting.
- Binneman, J & Webley, L. 1996. Proposed Eastern Cape Zinc and Phosphoric Acid Project: Baseline Report: Sensitivity of Cultural Sites. Prepared for African Environmental Solutions. Claremont.

The Albany Museum in Grahamstown and the Bayworld Museum in Port Elizabeth house collections and information from the study and wider region.

BRIEF ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

Literature review

Pre-colonial archaeology

The archaeology of the immediate Driftsands/Cape Recife area is largely unknown, mainly because little systematic research has been conducted there. The oldest evidence of the early inhabitants in the Port Elizabeth area are large stone tools, called handaxes and cleavers, which can be found amongst river gravels and in old spring deposits in the region (Deacon 1970). These large stone tools are from a time period called the Earlier Stone Age (ESA) and may date between 1,5 million and 250 000 years old. The large handaxes and cleavers were replaced by smaller stone tools called the Middle Stone Age (MSA) flake and blade industries. Evidence of

MSA sites occur throughout the Port Elizabeth region and date between 200 000 and 30 000 years old. Fossil bone may in rare cases be associated with MSA occurrences (Deacon & Deacon 1999).

The majority of archaeological sites found in the Port Elizabeth area date from the past 10 000 years (called the Later Stone Age) and are associated with the campsites of San hunter-gatherers and Khoi pastoralists. These sites are difficult to find because they are in the open veld and often covered by vegetation and sand. Sometimes these sites are only represented by a few stone tools and fragments of bone. The preservation of these sites is poor and it is not always possible to date them Africa (Deacon & Deacon 1999). There are many San hunter-gatherers sites in the nearby Elandsberg and Groot Winterhoekberg Mountains. Here caves and rock shelters were occupied by the San during the Later Stone Age and contain paintings along the walls. The last San/KhoiSan group was killed by Commando's in the Groendal area in the 1880s. Some 2 000 years ago Khoi pastoralists occupied the region and lived mainly in small settlements. They were the first food producers in South Africa and introduced domesticated animals (sheep, goat and cattle) and ceramic vessels to southern Africa.

The most common archaeological sites along the nearby coast are shell middens (relatively large piles of marine shell) found usually concentrated opposite rocky coasts, but also along sandy beaches (Rudner 1968). These were campsites of San hunter-gatherers, Khoi herders and KhoiSan peoples who lived along the immediate coast (up to 5 km) and collected marine foods. Mixed with the shell are other food remains, cultural material and often human remains are found in the middens. In general shell middens in the open date from the past 6 000 years. Also associated with middens are large stone floors which were probably used as cooking platforms (Binneman 2001, 2005).

Historical heritage

Driftsands Historical Dump

A large historical dump dating from 1893-1909 is located in the study area. It is older than 50 years and protected by the National Heritage Resources Act of 1999. A large part of the Driftsands area which stretches from west of Schoenmakerskop to the borders of Walmer and Summerstrand, was covered by a thin distribution of historical rubbish dump material (dating to the Victorian period) between 1893 and 1909.

According to historical records the sand killed all vegetation and posed a threat to the harbour. In 1893 Joseph Storr Lister of the Cape Forestry Department was appointed to solve the drifting sand problem. Lister proposed stabilising the dunes by dumping household rubbish on the dunes. He constructed a railway line nine miles into the dunes and a train (called the 'Driftsands Special') to dumped some 80 tons of town rubbish a day on the shifting sand dunes. The rubbish was spread in a relatively thin layer on the dunes, and the seeds of Australian *acacias* (Rooikranz, Port Jackson and Long-leaf wattles) planted into the garbage. In total some 91 000 metric tons of refuse was dumped on the dunes between 1893 and 1909.

Between 1960 and 1970 amateur bottle collectors illegally mined the old dump extensively Lastovica (1982). Bayworld Museum houses a large collection of material which includes glass bottles, sherds of china from various Port Elizabeth hotels, china dolls, mother of pearl buttons, horse shoes and numerous other artefacts made by Dr Mike Raath. He did most of his collecting in the Summerstrand area and beyond the Nelson Mandela Metropolitan University.

References

- Bennie, J. 1993. The Driftsands. Otolith.
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- Deacon, H.J. 1970. The Acheulian occupation at Amanzi Springs, Uitenhage District, Cape Province. *Annals of the Cape Provincial Museums*. 8:89-189.
- Deacon, H.J. & Deacon, J. *Human beginnings in South Africa*. Cape Town: David Phillips Publishers.
- Dimbleby, E.P. 1961. When desert menaced Port Elizabeth. *Looking Back* (1): 2-8.
- Rudner, J. 1968. Strandloper pottery from South and South West Africa. *Annals of the South African Museum* 49:441-663.
- Scott, H. 1966. Driftsands. *Looking Back* 6:18-21.

ARCHAEOLOGICAL INVESTIGATION

Methodology

The managers at both the Cape Recife WWTW and the Driftsands WWTW were contacted prior to the investigation to inform them about the visit and to gain access to the property. Only Mr Robert Williams of the Cape Recife WWTW was available on the day of the investigation. He explained and pointed out the area for development in the vicinity of the Cape Recife WWTW and we also consulted him on possible locations of archaeological remains, graves, historical buildings and features. To cover as much of the route of the proposed sludge pumping main as possible, we followed tracks which run along or close to the route in a vehicle. Spot investigations were conducted from the vehicle on foot by two people. An area of some 500 metres along the beach opposite the Cape Recife WWTW where a new sea outfall for treated effluent is planned was also investigated on foot. The GPS readings were taken with a Garmin and all important features were digitally recorded.

Limitations and assumptions

Although a large part of the route of the proposed sludge pumping main was followed by vehicle and investigated on foot it was not feasible to do an inclusive survey due to the length of the route and the dense ground cover (Maps 1-3). Due to the dense alien vegetation, grass, small shrubs and thick dune sand the archaeological visibility was restricted and it was difficult to locate archaeological and other heritage sites/materials. Nonetheless, the experience and knowledge gained from previous investigations in surrounding areas and a well documented history of the area provided an information base. This assisted to make assumption and predictions on the incidences and the significance of possible pre-colonial archaeological and historical sites/material which may be located in the area, or which may be covered by the sand and vegetation.

RESULTS

From the Cape Recife WWTW the proposed sludge pumping main runs for approximately 450 metres in a north-westerly direction to Marine Drive where it turns south-west (Maps 1-3). The pipeline will follow an existing pipeline route to Marine Drive which has been disturbed in the past by building and fencing activities (Figure 1). The area is also disturbed by large piles of building rubble and long water-filled trenches along Marine Drive (Figure 2).

No archaeological or historical sites/materials were observed because the area is covered by dense grass, coastal dunes and alien vegetation. Heritage sites/materials may be covered by dune sand and vegetation, but if any are present, the chances will be great that these will be disturbed/destroyed.

The proposed sludge pumping main then follows Marine Drive (southern side) for approximately 3,5 kilometres in a south-westerly direction before it makes a westerly turn and follows the boundary fence of the Nelson Mandela Metropolitan University's property (Figure 3). Several investigations were conducted along Marine Drive, but due to the dense ground cover no archaeological or historical sites/materials were observed. The construction of Marine Drive most probably disturbed/destroyed any sites in the immediate vicinity of the road.

From Marine Drive the sludge pumping main follows the boundary fence of the Nelson Mandela Metropolitan University's property and an overhead Eskom powerline in a westerly direction. The area comprised of sand dunes densely covered by grass and mainly alien vegetation. After about 750 metres it changes direction and follows a northerly direction for approximately 1,2 kilometres before it turns north-west en route towards the Driftsands WWTW (Figures 4-5). No heritage sites/materials were observed along the route, but some 500 metres further along the same track historical dump material were observed in a deflation hollow (Figure 6). Although it is a thin scatter of 19th century historical dump material outside the study area, it is nevertheless a fine example of what may be exposed during the construction of the sludge pumping main.

No access track for the approximate 1,5 kilometres route from the boundary fence of the Nelson Mandela Metropolitan University's property towards the Driftsands WWTW could be negotiated and efforts on foot also proved inadequate to find heritage sites/materials due to the dense alien vegetation.

The sludge pumping main route joins, what appears to be another pipeline and track route (which runs toward Summerstrand), and follows it in a south-westerly direction for about a kilometre before it turns to the south where it joins the Driftsands WWTW (Figures 7-8). The route is well disturbed by pipeline construction, bush clearing activities and tracks/roads. No heritage sites/materials were observed along the route. However, sites/materials may be covered by dune sand and vegetation, but if any are present, the chances will be great that these will be disturbed/destroyed.

An investigation was also conducted along the coast where the new sea outfall for treated effluent is planned. No heritage sites/materials were observed, but shell middens may be covered by dune sand and vegetation. There are no graves or buildings older than 60 years in the study area. The development may proceed as planned (see recommendations below).



Figure 1. General views of the sludge pumping main route from the Cape Recife WWTW to Marine Drive. Note the disturbed nature of the area.



Figure 2. General views of the sludge pumping main route area at Marine Drive. Note the disturbed nature of the area, building rubble and the dense grass and alien vegetation cover.



Figure 3. General views of the sludge pumping main route along Marine Drive.



Figure 4. General views of the sludge pumping main route where it crosses Marine Drive and follows the boundary fence of the Nelson Mandela Metropolitan University's property in a westerly direction.



Figure 5. General views of the sludge pumping main route where it follows the boundary fence of the Nelson Mandela Metropolitan University's property in a northerly direction.



Figure 6. Views of a dune deflation with a thin scatter of 19th century dump material observed outside the study area.



Figure 7. General views of the sludge pumping main route where it follows an existing pipeline route and track in a south-westerly direction towards the the Driftsands WWTW. Note the dense alien vegetation.



Figure 8. General views of the sludge pumping main route where it follows an existing pipeline route in a southerly direction towards the the Driftsands WWTW.



Figure 9. General views of the coast opposite the Cape Recife WWTW where a new sea outfall for effluent is planned. The existing sea outfall is visible in the right insert image.

DISCUSSION AND MITIGATION

The dense vegetation and thick dune sand made it difficult to observe heritage sites/materials and only one scatter of historical dump material was observed outside the study area. However, from a few limited heritage investigations and observations in the wider region, we know that the coastal zone near the study area is dotted with shell middens and a large part of the study area is covered by historical dump material. There exists a strong possibility that shell middens and historical dump material may be covered by dune sand and vegetation and exposed during the construction of the sludge pumping main. After a bushfire in the 1980s, midden material was located about a kilometre inland in the vicinity of the University of Port Elizabeth.

The main impact on archaeological and historical sites/remains will be the physical disturbance of the material and its context. However, from the investigation, it would appear that large parts of the proposed area earmarked for development are already disturbed by previous developments, for example along existing pipeline routes and roads. In these areas the heritage materials will be disturbed and of low archaeological sensitivity. In other areas where the sludge pumping main route passes through the relatively undisturbed Driftsands dunes, heritage site/materials may be located in context. There is also a possibility that human remains may be uncovered. In view of the possibility that sensitive heritage sites/materials may be exposed, the following is recommended/suggested;

1. All construction work must be monitored. An archaeologist must inspect (walkthrough) the areas earmarked for development when the surface vegetation has been removed and when the trenches for the sludge pumping main have been dug to establish any archaeological sites/materials were exposed. Further recommendations will follow after the investigation.
 - Alternatively a person must be trained as a site monitor to report to the foreman when heritage sites are found. This person must monitor all clearing, levelling and trenching activities during the construction phase.
2. If any concentrations of archaeological material are exposed (shell middens, stone tools etc.), work must stop immediately and reported to the archaeologist at the Albany Museum (046 6222312) or to the Eastern Cape Provincial Heritage Resources Authority (043 6422811) immediately. Sufficient time should be allowed to investigate and to remove/collect such material. Recommendations will follow from the investigation (See appendix B for a list of possible archaeological sites that maybe found in the area).
3. Due to the vast expanse of 19th century historical dump material presently covering the Driftsands area, it is highly possible that material will be encountered during the construction phase. A collecting strategy needs to be devised so that the maximum amount of information may be obtained in terms of time and expenses. Provision should be made for a budget to conduct collecting of material.
 - It is suggested that an historian be contracted to develop such a collecting strategy and to inform the site monitor before construction starts. It is suggested that Ms Jenny Bennie, an historian and specialist on the Driftsands historical dump material be contacted (jennifer.bennie@gmail.com). Further recommendations will be introduced by the historian.
 - If any dense concentrations of historical dump material are exposed (glass bottles, sherds of china, etc.), work must stop immediately and reported to the historian or to the Eastern Cape Provincial Heritage Resources Authority (043 6422811) immediately. Sufficient time should be allowed to investigate and to remove/collect such material. Recommendations will follow from the investigation.
3. Construction managers/foremen should be informed before construction starts on the possible types of heritage sites and cultural material they may encounter and the procedures to follow when they find sites. Alternatively it is suggested that a person be trained to be on site to report to the site manager if sites are found, as in 1 above.

GENERAL REMARKS AND CONDITIONS

Note: This report is a phase 1 archaeological impact assessment/investigation only and does not include or exempt other required heritage impact assessments (see below).

The National Heritage Resources Act (Act No. 25 of 1999, section 35) (see Appendix A) requires a full Heritage Impact Assessment (HIA) in order that all heritage resources, that is, all places or objects of aesthetics, architectural, historic, scientific, social, spiritual linguistic or technological value or significance are protected. Thus any assessment should make provision for the protection of all these heritage components, including archaeology, shipwrecks, battlefields, graves, and structures older than 60 years, living heritage, historical settlements, landscapes, geological sites, palaeontological sites and objects.

It must be emphasised that the conclusions and recommendations expressed in this archaeological heritage sensitivity investigation are based on the visibility of archaeological sites/features and may not therefore, reflect the true state of affairs. Many sites/features may be covered by soil and vegetation and will only be located once this has been removed. In the event of such finds being uncovered, (such as during any phase of construction work), archaeologists must be informed immediately so that they can investigate the importance of the sites and excavate or collect material before it is destroyed. The onus is on the developer to ensure that this agreement is honoured in accordance with the National Heritage Act No. 25 of 1999.

It must also be clear that Archaeological Specialist Reports (AIA's) will be assessed by the relevant heritage resources authority. The final decision rests with the heritage resources authority, which should grant a permit or a formal letter of permission for the destruction of any cultural sites.

APPENDIX A: brief legislative requirements

Parts of sections 35(4), 36(3) and 38(1) (8) of the National Heritage Resources Act 25 of 1999 apply:

Archaeology, palaeontology and meteorites

35 (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;*
- (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.*

Burial grounds and graves

36. (3) (a) *No person may, without a permit issued by SAHRA or a provincial heritage resources authority—*

- (a) *destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves;*

- (b) destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or*
- (c) bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) any excavation equipment, or any equipment which assists in the detection or recovery of metals.*

Heritage resources management

38. (1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorized as –

- (a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;*
- (b) the construction of a bridge or similar structure exceeding 50m in length;*
- (c) any development or other activity which will change the character of the site –*
 - (i) exceeding 5000m² in extent, or*
 - (ii) involving three or more erven or subdivisions thereof; or*
 - (iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or*
 - (iv) the costs of which will exceed a sum set in terms of regulations by SAHRA, or a provincial resources authority;*
- (d) the re-zoning of a site exceeding 10 000m² in extent; or*
- (e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must as the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.*

APPENDIX B: IDENTIFICATION OF ARCHAEOLOGICAL FEATURES AND MATERIAL FROM COASTAL AREAS: guidelines and procedures for developers

Shell middens

Shell middens can be defined as an accumulation of marine shell deposited by human agents rather than the result of marine activity. The shells are concentrated in a specific locality above the high-water mark and frequently contain stone tools, pottery, bone and occasionally also human remains. Shell middens may be of various sizes and depths, but an accumulation which exceeds 1 m² in extent, should be reported to an archaeologist.

Human Skeletal material

Human remains, whether the complete remains of an individual buried during the past, or scattered human remains resulting from disturbance of the grave, should be reported. In general the remains are buried in a flexed position on their sides, but are also found buried in a sitting position with a flat stone capping and developers are requested to be on the alert for this.

Fossil bone

Fossil bones or any other concentrations of bones, whether fossilized or not, should be reported.

Stone artefacts

These are difficult for the layman to identify. However, large accumulations of flaked stones which do not appear to have been distributed naturally should be reported. If the stone tools are associated with bone remains, development should be halted immediately and archaeologists notified.

Stone features and platforms

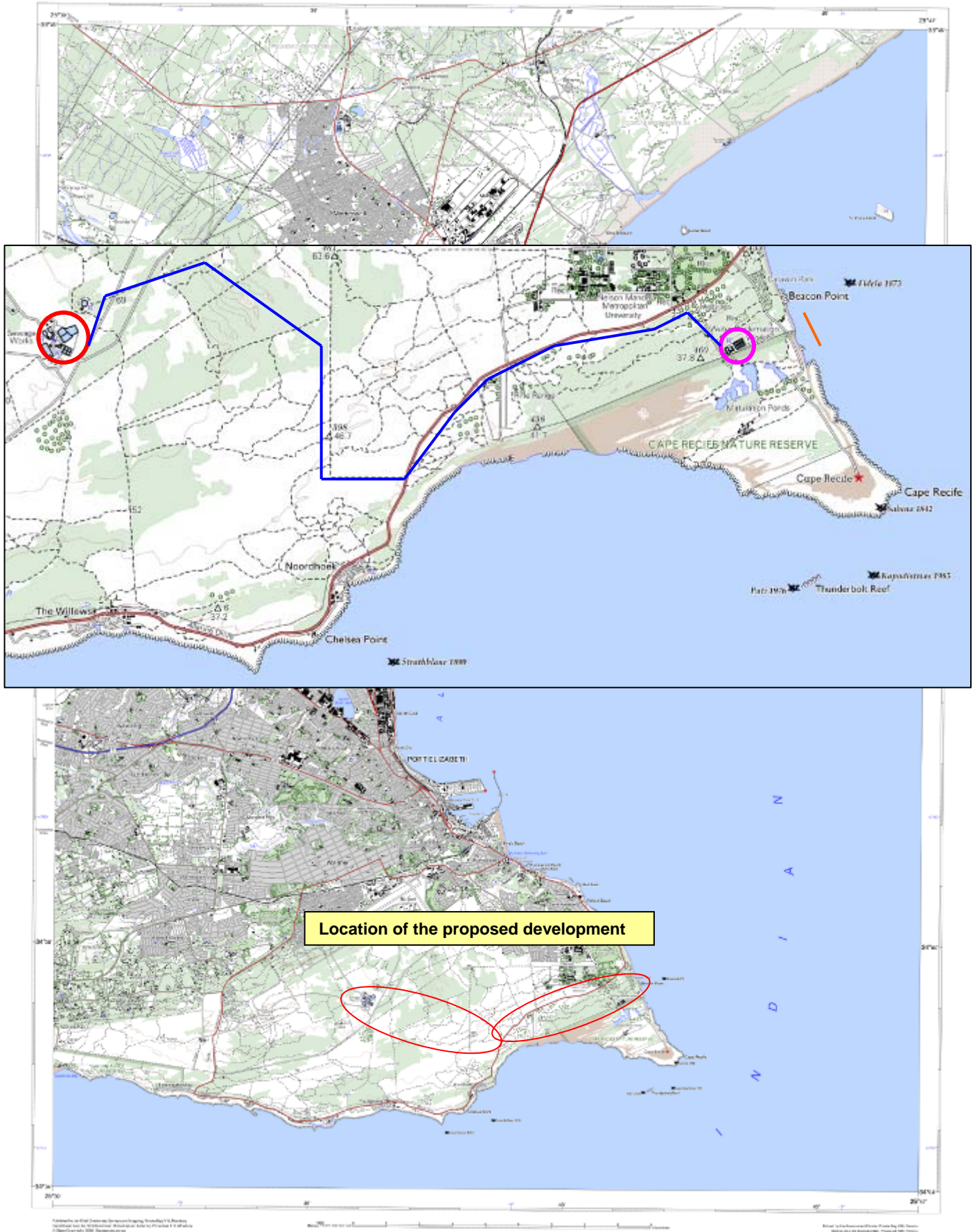
These occur in different forms and sizes, but easily identifiable. The most common are an accumulation of roughly circular fire cracked stones tightly spaced and filled in with charcoal and marine shell. They are usually 1-2 metres in diameter and may represent cooking platforms for shell fish. Others may resemble circular single row cobble stone markers. These occur in different sizes and may be the remains of wind breaks or cooking shelters.

Historical artefacts or features

These are easy to identify and include foundations of buildings or other construction features and items from domestic and military activities.

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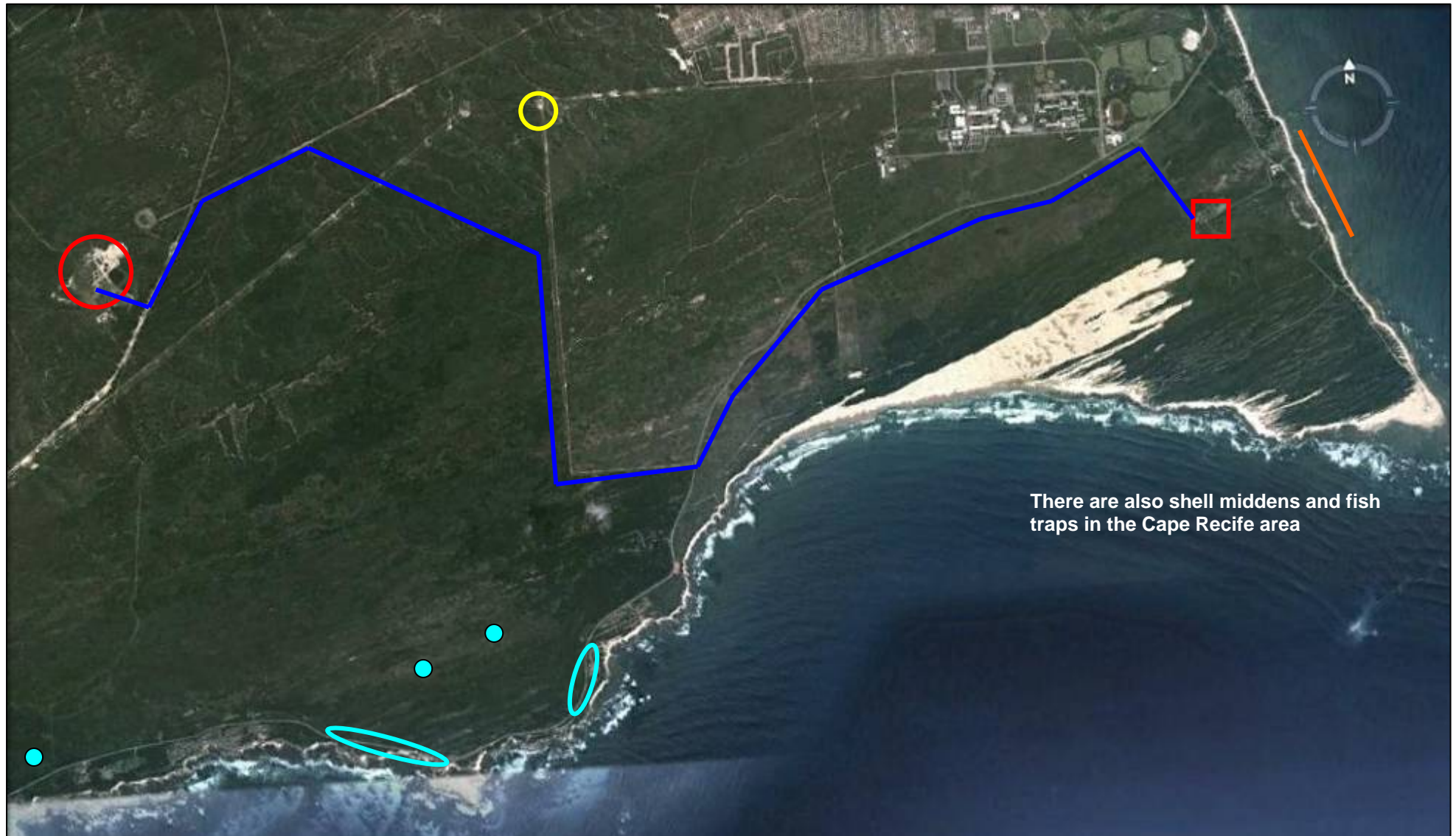
1:50 000 SOUTH AFRICA
EURO AREA



Map 1. 1:50 000 Maps indicating the location of the development. The red ovals mark the approximate location of the development (main map). The red circle marks the Driftsands WWTW, the pink circle the Cape Recife WWTW, the blue line the approximate sludge pumping main route and the orange line the sea outfall (insert map).



Map 2. Aerial images indicating the location of the proposed development. The top insert map shows the proposed sludge pumping main route (image courtesy of CEN Integrated Environmental Management Unit) and the bottom insert the Cape Recife WWTW and sea outfall.



Map 3. An aerial image indicating the location of the development. The red circle marks the Driftsands WWTW, the red square the Cape Recife WWTW, the blue line the approximate sludge pumping main route and the orange line the sea outfall. The yellow circle marks the historical dump area observed during the investigation. The light blue dots and ovals mark shell middens and scatters near the study area (from Binneman and Webley 1996; Binneman and Booth 2010; Webley 2005).