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ARCHAEOLOGICAL STUDY:

PORTION 7 OF DOLLAS DOWNS 264, ARNISTON

Prepared for

CSIR ENVIRONMENTEK

By

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Executive summary

Thirty four archaeological sites were located during a baseline study of Portion 7 of the farm Dollas Downs 264 near Arniston on the Cape south coast, the site for the proposed St Markus Bay development.

The majority of sites (24) comprised low density scatters of stone implements and fragmented marine shell, ostrich eggshell and pottery, on exposed consolidated calcretes, and in wind-deflated basins. Three shell middens were located in the frontal dunes, near Emersonklip, Dassiekrans and Blesman se Krans. One ancient tidal fishtrap (visvywer) was noted near Langklipkrans.

Most of these sites have already been significantly disturbed as a result of natural processes such as wind erosion. All these sites have therefore been given low significance ratings. The impact of the proposed development on the archaeological sites in the study area will be low to negligible. As a result no archaeological mitigation is required.

Five sites have been given medium significance ratings and five sites high significance ratings. These are typically Later Stone Age open sites dating to the last 3000 years, comprising high density scatters of marine shell, stone implements, ostrich eggshell, ochre, and pottery, located on exposed consolidated calcretes, and in wind-deflated basins. These sites, all relatively undisturbed, are spread out over the northern portion of the study area.

Should the proposed development impact on these sites, archaeological mitigation will be required.

Graves from the wreck of the Arniston (1815) may also be encountered during implementation of the proposed development. The location of the burial sites is unknown, but, according to historical records, bodies of victims were buried in soft sand above the beach up and down the coastline. Should these and other indigenous Khoisan burials be encountered during implementation of the proposed project, archaeological rescue will be required.

Appropriate strategies aimed at the recovery of human burials will therefore need to be developed and applied. An archaeological contingency fund should be set aside in the event of this occurring.

The remains of the Arniston and other portions of shipwrecks may also be encountered during implementation of the project, or may be exposed by natural erosion processes during the lifecycle of the project. Any wreck or portion of a wreck older than 50 years of age is protected by the National Monuments Act, and may not be disturbed without a permit from the National Monuments Council.

Vertebrate fossils and archaeological occurrences may also be uncovered from the calcrete deposits and associated sediments in the flat dune area in the study site. It is well established that such fossil and archaeological occurrences are valuable sources of information on the sedimentary, chronological, plaeoenvironmental and palaeoecological contexts of human behavior development during the Middle Stone Age.

Should planned excavations intend to penetrate the calcrete deposits for the extraction of ground water, for example, appropriate strategies aimed at sampling the fossils that might be encountered, will need to be developed and applied.

Secondary impacts, such as increased visitation to the study area and the increasing use of 4 x 4 vehicles in the interior of the study site, may also result in long-term negative impacts on archaeological sites.

The stabilisation, landscaping or removal of dunes may also impact on archaeological sites, particularly human burial sites.

Associated development infrastructure such as the construction of access roads, parking areas, the laying of services, the construction of boardwalks, roads and foot paths to the beach, and the location of work camps may all potentially impact on archaeological sites. The probability of human burials being encountered during this phase of the project is considered to be particularly high.

An archaeological management plan should be implemented.

As the owners of the property, and therefore the custodian of the archaeological sites, the developers of portion 7 of Dollas Downs must ensure that the archaeological sites are protected and properly managed even if project impacts are avoided. Ideally, the location of sites should not be disclosed.

Alternatively, the development of an archaeological hiking trail could be investigated. Sites should be protected against deliberate and accidental damage. Visitor controls should be strictly implemented.

The integration of the history of indigenous people into the management and conservation plan of the proposed development, and the historical location of the study site to the wreck of the Arniston, will 'add value' to the proposed project and could be seen as a positive impact.

1 Introduction

1.1 Background and brief

The Agency for Cultural Resource Management (ACRM) has been requested by the CSIR Environmentek to undertake a baseline archaeological survey of portion 7 of the farm Dollas Downs 264 near Arniston on the south Cape coast, the site for the proposed St Markus Bay development.

According to the owners of the property, Coastal Living Developers, there are no fixed plans for the development. Various options may be offered for consideration. No final decisions on the development will be taken "until the results of the EIA are available" (CSIR Draft Scoping Report Section One. March 1997:1).

The aim of the archaeological study is to locate, identify and map archaeological or historical sites that may be impacted by the planning, construction and implementation of the proposed project and to propose measures to mitigate against the impact.

2. Terms of reference

The terms of reference for the archaeological study were:

1. to determine whether there are likely to be any archaeological or historical sites of significance on the site;

2. to identify and map any sites of archaeological and cultural-historical significance;

3. to assess the status and significance of any impacts resulting from the proposed development; and

4. to identify mitigatory measures to protect and maintain any valuable archaeological and historical sites that may exist.

3. The study site

The study site for the proposed St Markus Bay development is illustrated in Figure 1.

The site for the archaeological study is Portion 7 of the farm Dollas Downs 264, north of Arniston. The precise eastern boundary of the proposed development has not yet been established by the developers. For the purpose of the baseline archaeological study, ACRM has established an imaginary boundary at S 34°38.46 E 20°15.03, at a point where the most easterly located site (DD 9) was found.

Figure 1. Archaeological Study Portion 7 Dollas Downs: study area and location of archaeological sites.

The study site comprises mainly mobile sand dunes which cover most of the area, and are separated from the beach by a windswept strip of exposed consolidated calcrete. As a result archaeological visibility is extremely high.

The vegetation in the study area comprises a mix of both natural (indigenous) and alien vegetation. The western and northern portion of the site has been severely infested with exotic Rooikrans, resulting in low archaeological visibility.

4. Study approach and documentation of archaeological sites

4.1 Method of survey

The approach followed in the baseline archaeological survey entailed a detailed foot survey of Portion 7 of the farm Dollas Downs 264. The baseline study also included the split remainder of land within the study site (Figure 1).

In addition to the field study an examination of the existing records in the South African Museum was also undertaken. According to the records of the Archaeological Data Recording Centre at the South African Museum, archaeological sites have been recorded at Waenhuiskrans, Marcusbaai and at Emersonklip. Rudner (1968) and Kaplan (1993) also reported on shell middens from Waenhuiskrans that occur outside of the affected area. An ancient fishtrap (visvywer) was noted by ACRM at Langklipkrans.

There is strong evidence for the correlation between the distribution of coastal archaeological sites and physical features in the coastal zone (Kaplan 1993). For example, land forms and features such as rocky headlands, wavecut rocky platforms and dunes acted as magnets in the distribution of sites. These features acted as foci that attracted Stone Age people as they offered greater opportunities for the exploitation of marine foods, particularly shellfish. The Arniston coastal zone is characterised by such features.

The Dollas Downs archaeological study is the first detailed archaeological survey to be undertaken on this portion of the southern Cape coast.

It is also well established that vertebrate fossil and archaeological occurrences in the calcrete formations are extremely valuable sources of information on the sedimentary, chronological, palaeoenvironmental and palaeoecological contexts of the development of modern human behavior during the Middle Stone Age[1] (MSA).

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1. A term referring to the period between 200 000 and 20 000 years ago.

Middle Pleistocene archaeological occurrences in the Langebaan Limestone (calcrete) Formations at Saldanha Bay, for example, have provided some of the earliest evidence we have for human exploitation of coastal resources and will contribute significantly to evidence concerning the development of modern human behavior (Volman 1978; Grine & Klein 1993; Berger & Parkington 1995).

4.2 Documentation of archaeological sites

The archaeological sites located in the affected area are described according to accepted archaeological recording techniques. These include a written description of all the sites recorded. All the sites have been plotted on the 1:10 000 orthophotos (3420 CA 20 Waenhuiskrans & 3420 CA Elandsvlei). A photographic record of the important sites have also been made. In addition, Global Positioning System (GPS) readings have been taken.

5. The Arniston

The Arniston was an East Indiaman built in 1794, which was requisitioned in 1813/1814 by the Royal Navy to serve as a government troop transport. On 4 April 1815 she set sail from Ponte de Galle in Ceylon as part of a fleet bound for England carrying soldiers wounded in the Gurkha and Kandian campaigns (Jobling 1982).

The Arniston lost contact with the rest of the fleet in bad weather, and was driven ashore north of present day Waenhuiskrans on 30 May 1815. Of the 378 people on board, 372 drowned including 14 women and 25 children. According to the historical records, the dead were buried in the soft sand dunes above the beach up and down the coastline. The location of the graves are unknown (Jobling 1982:6).

Most of the victims of the Arniston were soldiers which means that the graves can be considered to be war graves. War graves are protected in terms of the National Monuments Act (Act no 28 of 1969), and may not be disturbed without a permit from the National Monuments Council.

6. Results of the impact assessment

Thirty four archaeological sites were recorded in the baseline study (Figure 1). It is possible that because of the mobile nature of the dunes in the study area, more sites could be exposed, while those already mapped in the current study may disappear with the shifting of the dunes and the movement of sand.

Archaeological visibility in most of the study site is high, but is low in the western and northern-most portion of the farm which is severely infested with exotic Rooikrans.

DD refers to Dollas Downs

DD 1. GPS Reading S 34°39.46 E 20°14.05

Ephemeral patches of fragmented marine shell and isolated stone implements were located on large wind-swept consolidated calcretes overlooking the beach east of Langklipkrans.

Significance of finds: low

Suggested mitigation: none required

DD 2. GPS Reading S 34°39.61 E 20°13.95

A low density scatter of fragmented marine shell occurs in a severely eroded sand basin ± 150 m east of the car park at Langklipkrans.

Significance of finds: low

Suggested mitigation: none required

DD 3. GPS Reading S 34° 38.96 E 20°14.30

A few stone implements including quartzite and silcrete flakes, and quartz chunks were located on a series of wind-swept consolidated calcrete north-east of Blesman se Krans.

Significance of finds: low

Suggested mitigation: none required

DD 4. GPS Reading S 34°38.97 E 20°14.22

A low density scatter of split quartzite cobbles and chunks, quartz chunks, silcrete flakes, and a few pieces of ostrich eggshell were located in a deflated basin on consolidated calcrete behind vegetated low frontal dunes north of Dassiekrans. The broken pieces of a thick-walled, quartz tempered, unburnished pot with a lug were also found.

Significance of finds: low

Suggested mitigation: the pottery should be collected

DD 5. GPS Reading S 34°38.96 E 20°14.26

A low density scatter of quartz chunks and a few pieces of ostrich eggshell were located in a deflated basin on windswept consolidated calcrete north-east of DD 4.

Significance of finds: low

Suggested mitigation: none required

DD 6. GPS Reading S 34°38.76 E 20°14.54

The remains of at least three, perhaps four pots were located on south-facing consolidated calcrete north-east of Dassiekrans. These comprise large pieces of thin-walled, unburnished (but blackened) pottery sherds, with lugs. Two large decorated rim sherds were also found (Figure 2). One of these decorated pots is globular-shaped.

Significance of finds: medium

Suggested mitigation: the pottery should be collected

DD 7. GPS Reading S 34°38.59 E 20°14.81

A few small pieces of weathered pottery were located on an exposed consolidated calcrete ridge overlooking the beach at Emersonklip.

Significance of finds: low

Suggested mitigation: none required

DD 8. GPS Reading S 34°38.53 E 20°14.99

A low density scatter of silcrete, quartzite and quartz stone flakes and chunks, including one core, was located on an exposed consolidated calcrete ridge overlooking the beach at Emersonklip. A few small pieces of pottery were also found.

Significance of finds: low

Suggested mitigation: none required

DD 9. GPS Reading S 34°38.46 E 20°15.03

The remains of an eroded shell midden were located in a conspicuous, round, partially vegetated sand dune on the beach at Emersonklip, close to DD 7 and DD 8 (Figure 3). A thin layer of in-situ shell remains in the midden which is dominated by perlemoen and turbo, some of which is burnt. Some 20 metres south of the midden, there occurs a high density scatter of fragmented marine shell on the surface of a low lying frontal dune. Quartzite and silcrete flakes occur as well as pieces of ostrich eggshell.

The remains of eight camphor-wood beams from a shipwreck, spread out in radius of about 40 m were also located on the beach some 20 metres east of DD 9. It is not clear whether these are some of the remains of the Arniston, or from one of the many shipwrecks known to occur along this stretch of coastline (John Gribble, National Monuments Council, pers. comm).

Significance of finds: medium

Suggested mitigation: a small controlled test excavation to be carried out. Mapping and sampling is also required. DD 9, however, may lie outside the envisaged eastern boundary of the proposed development.

DD 10. GPS Reading S 34°39.14 E 20°14.33

A thin layer of in-situ shell, (mainly limpet, with some perlemoen and turbo), is all that remains of a severely disturbed shell midden eroding from a vegetated, south-facing dune at Dassiekrans (Figure 4). Fragmented shell covers part of the dune and is visible in the foot path along the ridge. Fragmented shell is also visible on the rocky ledge at Dassiekrans.

Significance of finds: low

Suggested mitigation: none required

DD 11. GPS Reading S 34°39.41 E 20°14.14

The remains of a severely disturbed shell midden were located in an eroded gully on Blesman se Krans. Fragmented marine shell remains (mainly limpet and turbo) and a few stone flakes (quartzite, quartz and silcrete) and some ostrich eggshell have collected in the steep slope of the gully. A few pieces of quartz are visible on the rocky ledge at Blesman se Krans.

Significance of finds: low

Suggested mitigation: none required

DD 12. GPS Reading S 34°39.23 E 20°13.99

Some fragmented marine shell and stone implements including quartz flakes and two quartz cores, split quartzite cobbles and flakes, and a few pieces of ostrich eggshell were located behind high sand dunes north of Blesman se Krans on consolidated calcrete in a wind-deflated basin. Some of the implements are embedded in the calcrete.

Significance of finds: low

Suggested mitigation: none required

DD 13. GPS Reading S 34°39.16 E 20°14.01

A high density scatter of fragmented and whole marine shell (including limpet, perlemoen and turbo) were located on a low, south-west facing slope (Figure 5). Large numbers of ostrich eggshell pieces (some burnt), and stone implements including quartzite flakes, split

and whole cobbles, chunks, a quartzite reamer, a quartz core and flakes, were also found. Burnt pieces of calcrete, perhaps the remains of a stone hearth, were located. Stone implements and fragmented marine shell were also found on consolidated calcrete in a deflated basin below the dune. The site is not more that 50-60 metres north-east of DD 12.

Significance of finds: high

Suggested mitigation: the site should be mapped and sampled

DD 14. GPS Reading S 34°39.09 E 20°13.96

DD 14 comprises a high density scatter of fragmented and whole marine shell (mainly perlemoen and turbo) within a large wind deflated basin north-west of DD 13 (Figure 6). Large numbers of quartzite, quartz and silcrete stone implements including flakes, chunks, cores, a hammerstone, a grindstone and a few pieces of ochre, were found. Many pieces of ostrich eggshell (some burnt) also occur on the site.

Significance of finds: high

Suggested mitigation: the site should be mapped and sampled

DD 15. GPS Reading S 34°39.24 E 20°13.85

The site comprises a high density scatter of whole and fragmented marine shell (mainly limpets, mussel and turbo), some burnt, in a flat wind-deflated basin between some high sand dunes. Large numbers of shell are also visible on a compacted dune ridge. Large amounts of ostrich eggshell, including some burnt pieces also occur on the site. Stone implements including quartz and silcrete cores, flakes, scrapers, split and whole quartzite cobbles and an upper grindstone were also found. Some of the calcrete is burnt suggesting the remains of a stone hearth.

Significance of finds: high

Suggested mitigation: the site should be mapped and sampled

16. GPS Reading S 34°38.67 E 20°14.82

16 is the site of the monument built to honour the victims of the Arniston which sank of the coast in 1815. monuments is located on a consolidated calcrete ledge overlooking the beach at Emersonklip. Only a few sun-ed bricks remains of the structure which does not ain any architectural integrity (Figure 7). A few

pieces of artefactual stone and fragmented marine shell were found lying about.

Significance of finds: medium

Suggested mitigation: reconstruction of the monument would 'add value' to the development and may be seen as a positive impact

DD 17. GPS Reading S 34°38.80 E 20°14.49

A low density scatter of fragmented marine shell was located in a small area behind a large sand dune about 50 metres west of DD 6. A hammerstone, an upper grindstone, a few stone flakes and two pieces of ochre were also found.

Significance of finds: low

Suggested mitigation: none required

DD 18. GPS Reading S 34°38.82 E 20°14.36

A low density scatter of fragmented and whole marine shell was located in a wind deflated basin below a steep sided sand dune south-west of DD 17. A quartzite chunk and flake, and a quartz core and flake were found.

Significance of finds: low

Suggested mitigation: none required

DD 19. GPS Reading S 34°38.73 E 20°14.23

DD 19 comprises a complex of two or three sites in a flat ially deflated area surrounded by smaller vegetation-overed dunes near the northern boundary of the study rea. The main site comprises a high density scatter of ragmented and whole marine shell (limpets, turbo and erlemoen), with large amounts of ostrich eggshell (some rnt), ochre, bone and stone implements including akes, cores, chunks, split and whole cobbles, mmerstones and grindstone fragments. The remains of two trich eggshell water containers and numerous pieces of d burnished thin-walled pottery were also found (Figure .

nificance of finds: high

gested mitigation: the site should be mapped and pled

DD 20. GPS Reading S 34°38.74 E 20°14.12

The site comprises a low density scatter of fragmented marine shell (limpet, perlemoen, mussel and turbo) close to DD 19. Ostrich eggshell, pieces of unburnished pottery and a few stone implements, mainly quartzite flakes and split and whole cobbles, and some bone was found.

Significance of finds: medium

Suggested mitigation: the site should be mapped and sampled

DD 21. GPS Reading S 34°38.73 E 20°14.14

DD 21 comprises a high density scatter of fragmented and whole marine shell (limpet, turbo, mussel and perlemoen), about 20 metres south of DD 20. Large numbers of ostrich eggshell (some burnt), ochre, bone and many stone implements including flakes, chunks, whole and split cobbles, a grindstone and a hammerstone were found (Figure 9).

Significance of finds: high

Suggested mitigation: the site should be mapped and sampled

DD 22. GPS Reading S 34°38.84 E 20°14.07

A small low density scatter of fragmented marine shell (limpet, turbo and perlemoen) was located about 50 metres west of DD 21 against a small east-facing sand dune within a larger deflated area in the northern portion of the study site. Ostrich eggshell, a few pieces of silcrete, a quartz core and a small broken bored stone was found.

Significance of finds: low

Suggested mitigation: none required

DD 23. GPS Reading S 34°38.88 E 20°14.10

The site comprises a low density scatter of fragmented marine shell (limpet, turbo and mussel) and a few quartzite, quartz and silcrete flakes, split and whole cobbles on consolidated calcrete, close to DD 22. A few pieces of ostrich eggshell were also found.

Significance of finds: low

Suggested mitigation: none required

DD 24. GPS Reading S 34°38.99 E 20°14.15

DD 24 comprises a small localised but fairly high density scatter of fragmented marine shell (limpet and turbo) in a deflated gully surrounded by high sand dunes. A few quartzite, silcrete and quartz flakes and chunks, and pieces of ostrich eggshell were found.

Significance of finds: medium

Suggested mitigation: the site should be mapped and sampled

DD 25. GPS Reading S 34°38.93 E 20°14.19

A low density scatter of fragmented marine shell and a few stone flakes and two pieces of ostrich eggshell were located in a wet deflated pan between some high sand dunes.

Significance of finds: low

Suggested mitigation: none required

DD 26. GPS Reading S 34°38.92 E 20°14.10

DD 26 comprises a low density scatter of fragmented marine shell.

Significance of finds: low

Suggested mitigation: none required

DD 27. GPS Reading S 34°38.85 E 20°14.01

w pieces of fragmented marine shell and two silcrete lakes were located between partially vegetated high sand unes near the northern boundary of the study area.

gnificance of finds: low

ggested mitigation: none required

28. GPS Reading S 34°39.01 E 20°14.07

widespread but low density scatter of fragmented marine ell (limpet and turbo) was located in a deflated wet in of sand and consolidated calcrete. Many pieces of rich eggshell and stone flakes, cores, split and whole bles and a hammerstone were found. A few pieces of re were also found.

nificance of finds: medium

gested mitigation: the site should be mapped and pled

DD 29. GPS Reading S 34°39.31 E 20°13.72

Some fragmented marine shell and a few quartz and quartzite stone flakes were found on consolidated calcrete between vegetated dunes in the western portion of the study area.

Significance of finds: low

Suggested mitigation: none required

DD 30. GPS Reading S 34°39.32 E 20°13.84

Some fragmented marine shell (mainly limpet), two quartz chunks and one piece of ostrich eggshell was found on a south-facing slope in the vegetated north-western portion of the study area.

Significance of finds: low

Suggested mitigation: none required

DD 31. GPS Reading S 34°39.44 E 20°13.84

A thin scatter of fragmented marine shell (limpet and perlemoen) and a few quartzite and quartz flakes and chunks were located on a strip of consolidated calcrete near the vegetated western boundary of the study area.

Significance of finds: low

Suggested mitigation: none required

DD 32. GPS Reading S 34°39.40 E 20°13.72

A thin scatter of fragmented marine shell (limpet, mussel and turbo) was located on consolidated calcrete in an open space between vegetated sand dunes near the north-western portion of the study area.

Significance of finds: low

Suggested mitigation: none required

DD 33. GPS Reading S 34°39.57 E 20°13.74

DD 33 comprises a small patch of fragmented marine shell (limpet and turbo) on consolidated calcrete in open space surrounded by vegetated sand dunes on the western boundary of the study area. One piece of ostrich eggshell, three quartz chunks and a flake was also found.

Significance of finds: low

Suggested mitigation: none required

DD 34. GPS Reading S 34°39.64 E 20°13.73

DD 34 comprises a small patch of fragmented shell and one pieces of ostrich eggshell in a sand track near the western boundary of the study area.

Significance of finds: low

Suggested mitigation: none required

7. Impact statement

According to Coastal Living Developers no final decisions on the development of portion 7 of the farm Dollas Downs 264 will be taken "until the results of the EIA are available".

Without prior knowledge of the proposed development plans it is not yet clear what the physical impacts of the proposed development will be on archaeological sites in the study area. Archaeological sites, however, will most likely be negatively impacted by the proposed project.

The majority of sites (24) in the study area have been given low significance ratings. Most of these sites have already been disturbed as a result of natural processes such as wind erosion. The impact of the proposed development on these sites will therefore be low to negligible.

Five sites have been given medium significance ratings and five sites high significance ratings. These sites, all relatively undisturbed, are spread out over the northern portion of the study area and will suffer severe negative impacts should the proposed development impact on them.

Associated development infrastructure such as construction of access roads, the laying of services, the construction of boardwalks, roads or foot paths to the beach, and the location of work camps and parking areas may all potentially impact on archaeological sites. The stabilisation, landscaping or removal of dunes may also impact on sites, particularly human burials.

The probability of human burials from the wreck of the Arniston (1815) and indigenous Khoisan burials being encountered in the frontal dunes during implementation of the project is considered to be particularly high.

Secondary impacts, such as increased visitation to the study area and the increasing use of 4 x 4 vehicles, may also result in long-term negative impacts on archaeological sites.

Because of the mobile nature of the sand dunes in the study area additional sites could be exposed, or those already located in the current study could in fact

disappear, with the shifting of the dunes and movement of sand.

Should planned excavations intend to penetrate the consolidated calcrete and associated sediments for the extraction of ground water, for example, appropriate strategies aimed at sampling the fossils that might be encountered, will need to be developed and applied.

8. Legislation

All archaeological sites including human burials are protected by the National Monuments Act (Act No. 28 of 1969 as amended). It is an offence to disturb, remove or destroy from its original site, or excavate any such site without a permit from the National Monuments Council.

Any shipwreck or portion of a wreck, and any historical ruin or building over 50 years of age is also protected by the National Monuments Act (Act No. 28 of 1969 as amended), and may not be disturbed, altered or damaged in any way without a permit from the National Monuments Council.

Prior to any development of portion 7 of the farm Dollas Down 264 taking place, a permit to destroy or disturb any sites on the property must be applied for by the developer from the National Monuments Council.

9. Recommendations for archaeological management and mitigation

With regard to the proposed St Markus Bay development, the following recommendations are made.

1. Should DD 9, DD 13-15, DD 19, DD 20-21, DD 24 and DD 28 be impacted in any way by the proposed development, archaeological mapping and sampling of these sites will be required.

2. The pottery from DD 4 and DD 6 should be collected.

3. An archaeological monitoring programme should be implemented in consultation with the CSIR Environmentek and the Agency for Cultural Resource Management.

The proposed construction of secondary access roads, boardwalks or foot paths to the beach, the laying of services, the construction of parking areas, and the removal, landscaping and stabilisation of frontal dunes may all potentially impact on Khoisan graves, as well as graves from victims from the wreck of the Arniston (1815). The Arniston graves are unmarked, but according to historical records, the burial sites are likely to be scattered up and down the coast, the bodies buried in soft sand above the beach. All burials will need to be treated sensitively if uncovered during implementation of the project.

Appropriate strategies aimed at recovering human burials should they be encountered during implementation of the project, will therefore need to be developed and applied. An archaeological contingency fund should be set aside in the event of this occurring.

4. Should excavations intend to penetrate the calcretes and associated sediments, for the extraction of ground water for example, appropriate strategies aimed at sampling the fossils that might be encountered will need to be developed and applied.

5. Reconstruction of DD 16 (the Arniston monument) would 'add value' to the development and may be seen as a positive impact.

6. As the owners of the property, and therefore the custodians of the archaeological sites, Coastal Living Developers should ensure that the medium and high significance rating sites are protected and properly managed even if project impacts are avoided. Ideally, the location of sites should not be disclosed.

Alternatively, in consultation with the National Monuments Council, the development of an archaeological hiking trail could be developed. Sites should be protected against deliberate and accidental damage. Visitor controls should be implemented.

The integration of the history of indigenous people into the management and conservation plan of the proposed development, and the historical location of the study site to the wreck of the Arniston, will 'add value' to the proposed project.

7. The use of 4 x 4 vehicles should be restricted to the coastal portion of the study area. Some of the interior sites have already been damaged by the illegal use of 4 x 4 vehicles in the dunes.

The above recommendations are subject to the approval of the National Monuments Council Archaeological Plans Committee.

10. References

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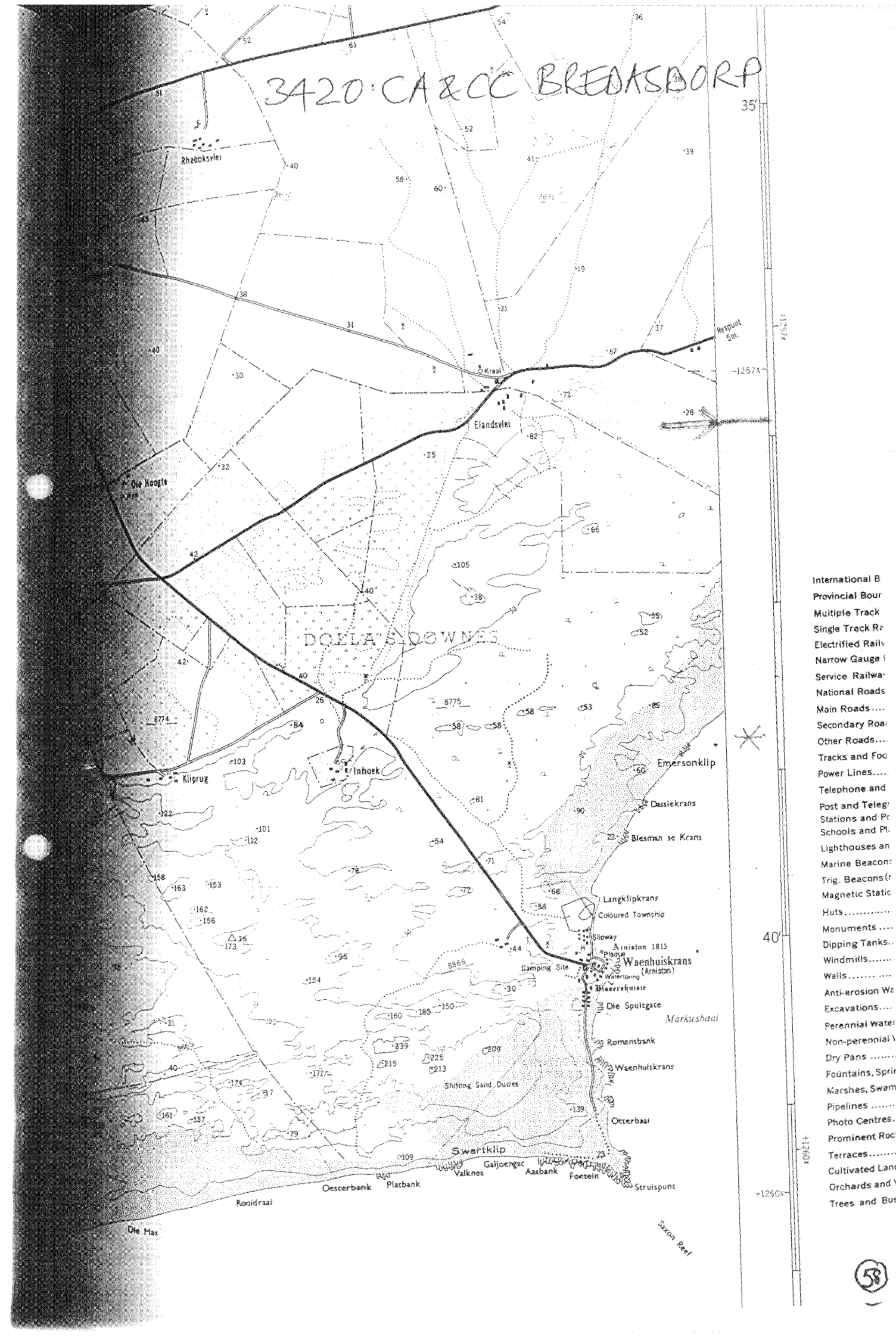
3420 : CA & CC BREDASDORP
35'
40'
Rheboksvlei
Ryspunt
5m.
Kraal
Elandsvlei
Die Hoogte
DOELA'S DOWNES
Kliprug
Inhoek
Emersonklip
Dassiekrans
Blesman se Krans
Langklipkrans
Coloured Township
Slipway
Arniston 1815
Waenhuiskrans
(Arniston)
Camping Site
Watertoring
Die Spuitgate
Markusbaai
Romansbank
Waenhuiskrans
Shifting Sand Dunes
Otterbaal
Swartklip
Oesterbank
Platbank
Valknes
Galjoengat
Aasbank
Fontein
Struispunt
Rooidraai
Die Mas
Saxon Reef
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Provincial Bour
Multiple Track
Single Track Ra
Electrified Railv
Narrow Gauge
Service Railwa
National Roads
Main Roads
Secondary Roa
Other Roads
Tracks and Foo
Power Lines
Telephone and
Post and Teleg
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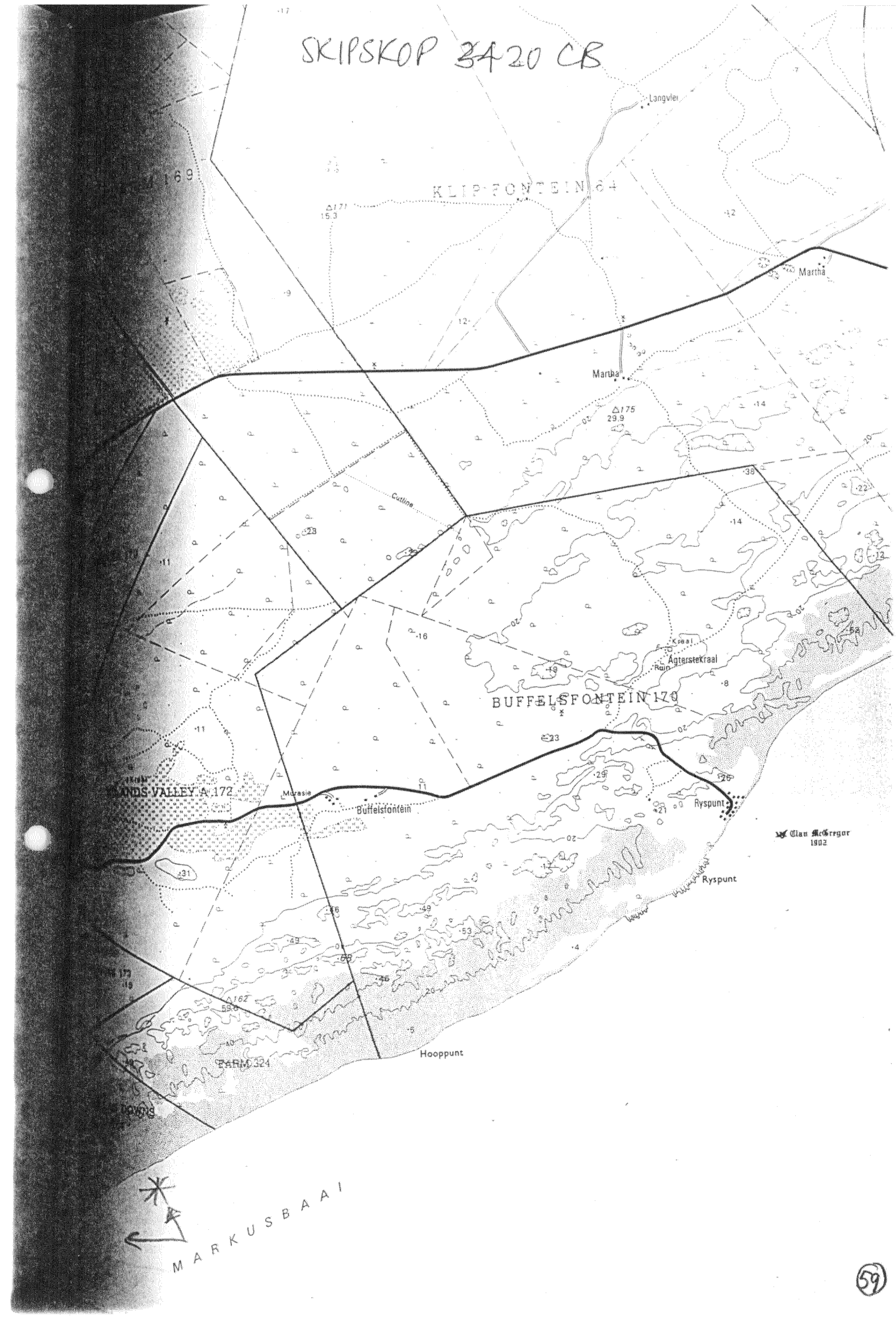
Lighthouses an
Marine Beacons
Trig. Beacons (
Magnetic Static
Huts
Monuments
Dipping Tanks
Windmills
Walls
Anti-erosion Wa
Excavations
Perennial Water
Non-perennial
Dry Pans
Fountains, Sprir
Marshes, Swam
Pipelines
Photo Centres
Prominent Rock
Terraces
Cultivated Land
Orchards and Vi
Trees and Bush

SKIPSKOP 3420 CB



20 HA OWNED BY R.S.A.
264/18

DOLLAS DOWNS
264 Ptn 7

264/4

264/16

SETBACK LINE
63.0m FROM EDGE
OF VEGETATION

CALCRETE RIDGE

LOW TIDE LEVEL

INDIAN OCEAN

167

416
Arniston

264/13

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CSIR 12 Dec 97

SCENARIO 1
STATUS QUO
NO DEVELOPMENT

9/2/2013/11

(8)