

Archaeological Impact Assessment

**Portion 114 of the Farm Zwarte Jongers Fontein 489, Stilbaai
(Jongensfontein), District Riversdal, Western Cape Province:
Proposed Sand Mining**

prepared for
Mr. Gerhard Oosthuizen, Pro-Earth Consulting and Hessequa Sand cc

by
Peter Nilssen



C A R M
PO Box 176
Great Brak River
6525

Executive Summary

An Archaeological Impact Assessment was conducted of the above named property on 15 March 2007. Favourable conditions permitted a comprehensive foot survey. Surface and near surface sands are extensively disturbed by cultivation and animal burrowing and therefore, the context and significance of archaeological materials are severely flawed.

The few identified archaeological occurrences – limited to rare, isolated Stone Age artifacts – are of low to no significance. No materials of the colonial period were seen and there is no indication that the study area contains any other heritage-related resources.

Although the upper sediments are significantly disturbed and archaeological traces are rare, the proposed sand mining activities will negatively impact lower, potentially undisturbed sediments that may – albeit unlikely – contain archaeological materials in primary context. The nature of archaeological traces and size of the property precludes sub-surface investigation by means of shovel test excavations. Consequently, it is recommended that part time monitoring be conducted by a professional archaeologist at the outset of mining and at regular intervals during mining operations. This measure will ensure that negative impact on archaeological materials is avoided or minimized. If archaeological materials are exposed during mining operations, then they must be dealt with in accordance with the National Heritage Resources Act (No. 25 of 1999) and at the expense of the developer(s) and/or property owner(s).

Table of Contents

Content	Page
Executive Summary	2
1. Introduction	4
1.1. Background	4
1.2. Purpose of the Study	4
1.3. Study Area	4
1.4. Approach to the Study	5
2. Results	5
3. Sources of Risk, Impact Identification and Assessment	6
4. Required and Recommended Mitigation Measures.....	6
Figures and Plates	8

1. Introduction

1.1 Background

As a result of proposed sand mining on Portion 114 of the Farm Zwarte Jongers Fontein 489, Stilbaai (Jongensfontein), District Riversdal, Western Cape Province (Figures 1 & 2 and Plates 1 & 2), Ms Ingrid du Plessis of Pro-Earth Consulting appointed CARM to conduct an Archaeological Impact Assessment (AIA).

Proposed sand mining to supply sand to local building and construction industry:

- Sand excavated to depth of 2 m in opencast mine;
- Activities on site restricted to excavation, load and haul;
- Life of mine calculated to 12 years based on current demand of 1042 m³ per month;
- Mine divided into blocks smaller than half a hectare;
- Only one block mined at a time so that simultaneous mining and rehabilitation will ensure that one block is rehabilitated for every block mined;
- Prior to mining a block, topsoil will be removed and stored away from mining so that it can be used for rehabilitation after excavated block is leveled;
- This strategy also ensures that; blocks will be ready for cultivating thatch reeds, and that wind erosion is avoided and/or minimized.

1.2. Purpose and Scope of the Study

Objectives of the Archaeological Impact Assessment are:

- To assess the study area for traces of archaeological materials;
- To identify options for archaeological mitigation in order to minimize potential negative impacts; and
- To make recommendations for archaeological mitigation.

Terms of Reference (ToR):

- a) Locate boundaries of the study area.
- b) Conduct a foot survey of the study area to identify and record archaeological resources.
- c) Assess the impact of the proposed development on archaeological materials.
- d) Recommend mitigation measures where necessary.
- e) Prepare and submit a report to Ms Ingrid du Plessis of Pro-Earth Consulting that meets standards required by Heritage Western Cape in terms of the National Heritage Resources Act, No. 25 of 1999.

1.3 Study Area

The site for proposed sand mining is located some 9 km south west of Stilbaai and 4 km north west of Jongensfontein on the Cape south coast (Figures 1 & 2 and Plate 1). The study area was reached by vehicle via the R331 (old R305) between Stilbaai and Jongensfontein and then via a gravel road (see Figure 1). The study area is approximately 7.7 hectares in extent, and its main boundary points - rounded to the nearest meter - are as follows (map datum WGS 84; see Plate 2):

PE 001, S34.42145 E21.31242 (decimal degrees); 21 Y-028720 X3810456 (SA Grid)
PE 002, S34.42459 E21.31157 (decimal degrees); 21 Y-028640 X3810804 (SA Grid)
PE 003, S34.42465 E21.31190 (decimal degrees); 21 Y-028671 X3810810 (SA Grid)
PE 004, S34.42282 E21.31612 (decimal degrees); 21 Y-029059 X3810609 (SA Grid)
PE 005, S34.42221 E21.31609 (decimal degrees); 21 Y-029057 X3810541 (SA Grid)

Since the early 1900s and till recently, the area was used for cultivation (sediments ploughed). Regular cultivation has rendered vegetation patchy that includes Milk wood trees, small bushes and grass (Plates 3, 4 & 5). In addition to disturbance of sediments by cultivation (plowing), the bulk of the study area is heavily burrowed (Plates 5 & 7).

The topography comprises gently sloping hills (old sand dunes) that descend from the northern and southern extents of the property to a shallow, east-west valley roughly in the middle of the study area. The highest and lowest areas are approximately 160 m and 140 m above mean sea level. The area contains dune sands greater than 2 m deep (thick). The quartzite sands are of Table Mountain Group origin. A few calcrete nodules and "stones" were noted in the southern half of the property

1.4 Approach to the Study

Archaeological work by CARM in the broader area - including Stilbaai and Jongensfontein - reveals that for the most part, shores with rocky inter-tidals are archaeologically sensitive. In undeveloped coastal areas not immediately adjacent to the high water mark, that consist of dune sands and where the inter-tidal zone is sandy however, archaeological traces are usually scarce and occur as isolated artifacts. No archaeological work was conducted in the immediate vicinity of the study area.

On behalf of the property owner, Mr. Gerhard Oosthuizen, and Hessequa Sand CC, Ms. Ingrid du Plessis of ProEarth Consulting provided a layout plan and surveyor's coordinate data indicating the location and extent of the study area. Mr. Oosthuizen was contacted for permission to access the property. The study area was located by means of information provided by Ms. Du Plessis, and the lack of vegetation allowed comprehensive foot survey and inspection (Plate 2). GPS fixes were taken of the walk tracks to show the area covered during the foot survey as well as locations of archaeological occurrences (Plate 2). Notes and a high quality, comprehensive digital photographic record were also made (full data set available from author). Sediments and profiles of a trial excavation associated with proposed mining were also examined.

2. Results

Plate 2 shows the AIA walk tracks - in black dash-dot line in middle of white line - as fixed with a hand held GPS during the foot survey. In about 4 hours of survey a distance of 8.5 km was walked covering an area of around 3.4 hectares. Due to grass cover a smaller area was archaeologically visible. Archaeological visibility was moderate to good but a great deal of sand visible at the surface is associated with burrowing activity (Plate 5). Due to this and a long history of cultivation, the surface and near surface sands are notably disturbed and any archaeological materials in these sands are not in primary context.

A total of three archaeological occurrences, all of Stone Age origin, were identified and recorded (see 16, 17 and 18 in Plate 2). All these are in association with mole heaps and are not in primary context. At 16, a quartzite chunk was recorded with at least one flake scar (Plates 2 & 6). The flake scar is patinated and weathered, and therefore, not of modern origin. The artifact is of either Middle Stone Age or Later Stone Age origin. At 17 a flaked cobble of poor quality quartzite was noted (Plates 2 & 7). With characteristics similar to those described for the previous artifact, this piece is of either Middle Stone Age or Later Stone Age origin. At locality 18 a silcrete flake with small flake scars and potential use-wear micro-flaking was observed and is of Later Stone Age origin (Plates 2 & 8). Coordinate data for these observations are as follows (Map Datum WGS 84, decimal degrees):

- 16, S34.42254 E21.31512
- 17, S34.42282 E21.31540
- 18, S34.42271 E21.31310

No historic archaeology was observed and no rock shelters or caves occur on the property. No evidence of other heritage-related resources was observed. The excavation, sands and profiles at 19 were inspected and no archaeological traces were seen (Plates 2 & 9).

Due to the paucity of archaeological materials and significantly disturbed surface and near surface sands, sub-surface investigation of as yet undisturbed sands by means of shovel testing is not feasible.

3. Sources of Risk, Impact Identification and Assessment

- The proposed mining of sand as outlined in 1.1 above will involve vegetation clearing and earthmoving activities that could have a permanent negative impact on archaeological resources. Archaeological traces of Stone Age origin are very rare and not in primary context and are therefore of low or no significance.
- Mining will, however, excavate into sands unaffected by cultivation and burrowing. It is possible that archaeological materials occur in those undisturbed sands. Part time archaeological monitoring of vegetation clearing and earthmoving activities associated with mining should avoid and/or minimize negative impact on archaeological remains.

Table 1 summarizes the potential impact of the proposed development on archaeological heritage resources with and without mitigation.

Table 1. Potential Impact on and Loss of Archaeological Heritage Resources

	With Mitigation	Without Mitigation
Extent	Local	Local
Duration	Permanent	Permanent
Intensity	Low	Unknown
Probability	Low	Low
Significance	Low	Unknown
Status	Low	Unknown
Confidence	High	High

4. Required and Recommended Mitigation Measures

The following measures are required:

- In the event that vegetation clearing and earthmoving activities expose archaeological materials, such activities must stop and Heritage Western Cape must be notified immediately.
- Unmarked human burials may occur anywhere in the landscape and are often exposed during earthmoving activities. Human remains are protected by law and, if older than 60 years, are dealt with by the State Archaeologist at the South African Heritage Resources Agency (Mrs. Mary Leslie who can be reached at 021 462 4502).

It is recommended that:

- Part time archaeological monitoring of vegetation clearing and earthmoving activities should be conducted by a professional at the start of mining and then at regular intervals during mining operations.
- If archaeological materials are exposed through vegetation clearing or earthmoving activities, then they must be dealt with in accordance with the National Heritage Resources Act (No. 25 of 1999) and at the expense of the developer(s) and/or property owner(s).

Figures and Plates (on following pages)

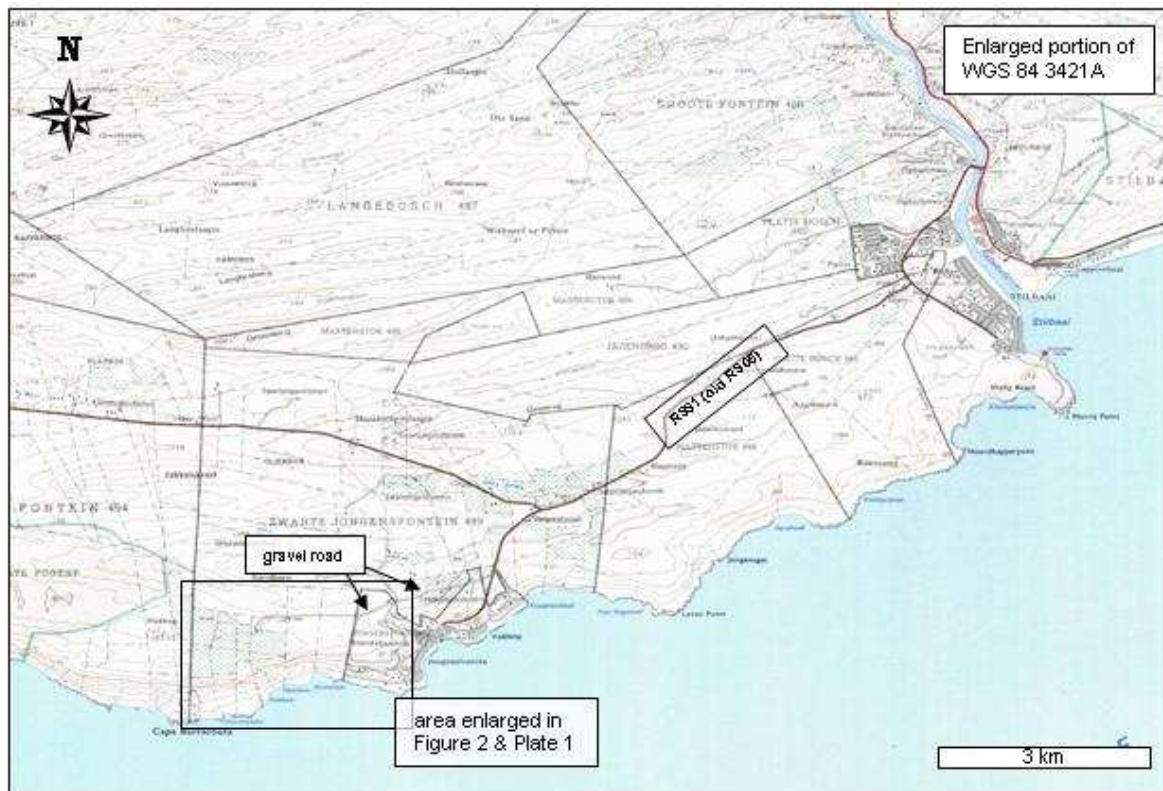


Figure 1. General location of the study area west of Jongensfontein and south west of Stilbaai on the Cape south coast.

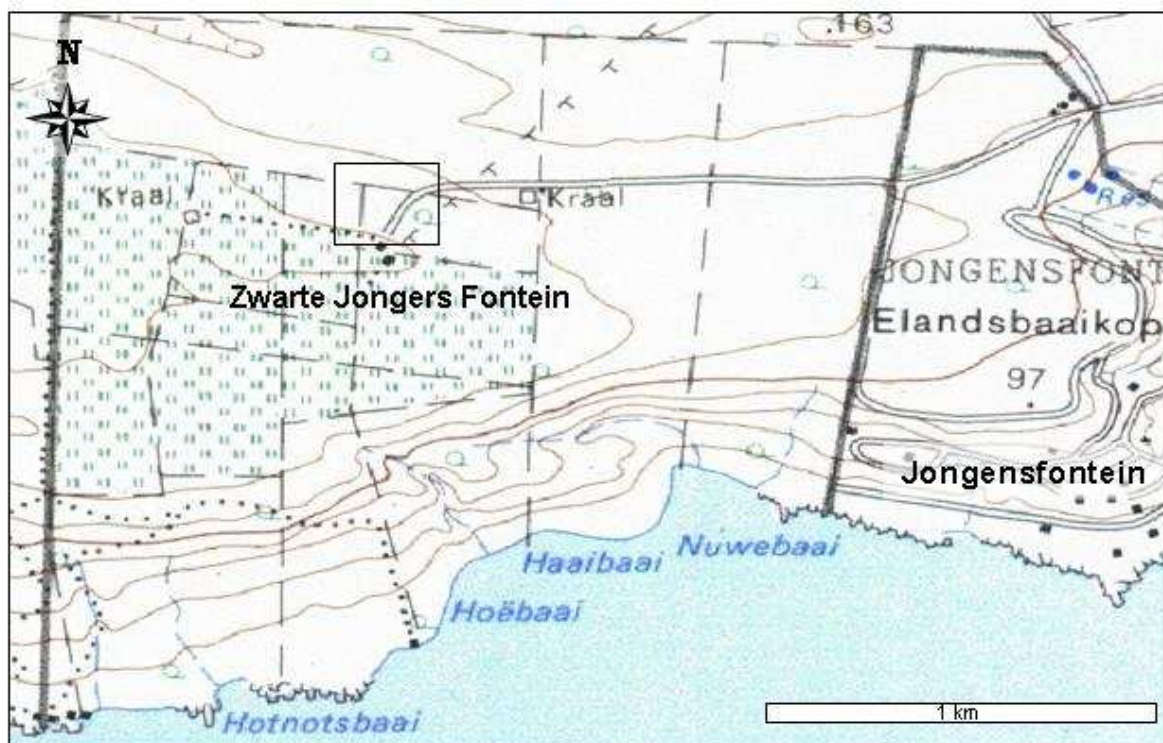


Figure 2. Enlarged area as indicated in Figure 1 showing the location of the study area – Portion 114, Zwarte Jongers Fontein 489 – (small black frame) west north west of Jongensfontein.

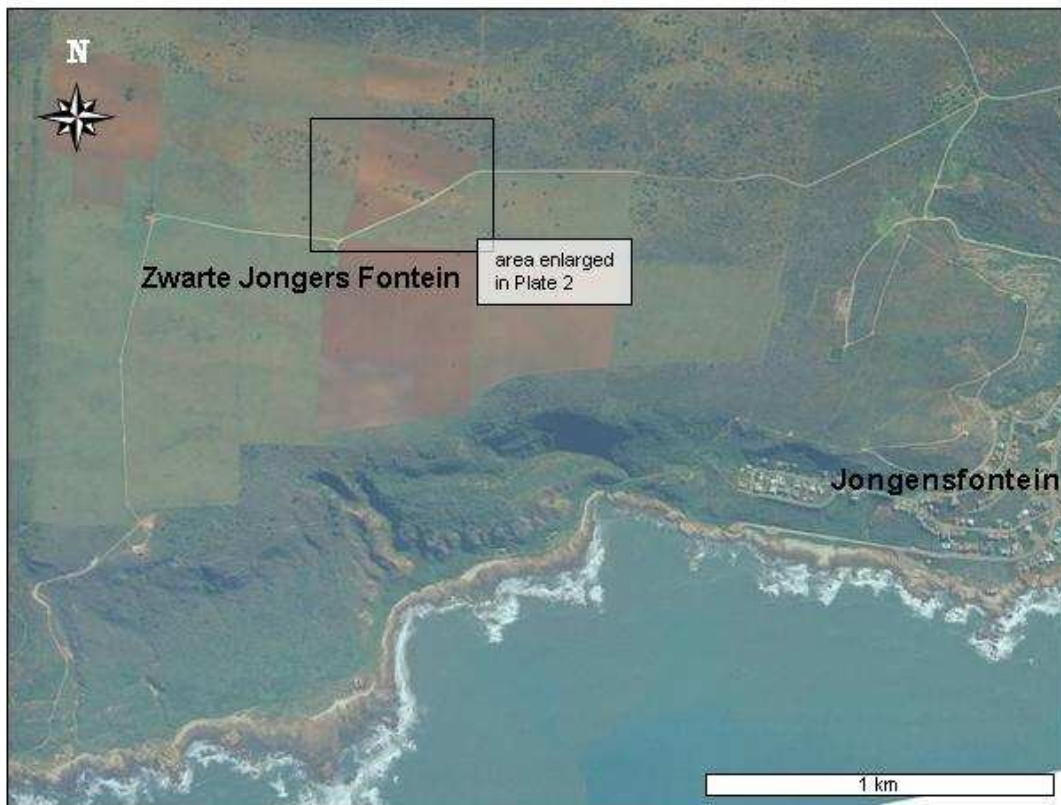


Plate 1. Enlarged area as indicated in Figure 1 showing the location of the study area – Portion 114, Zwarte Jongers Fontein 489 – (small black frame) west north west of Jongensfontein.

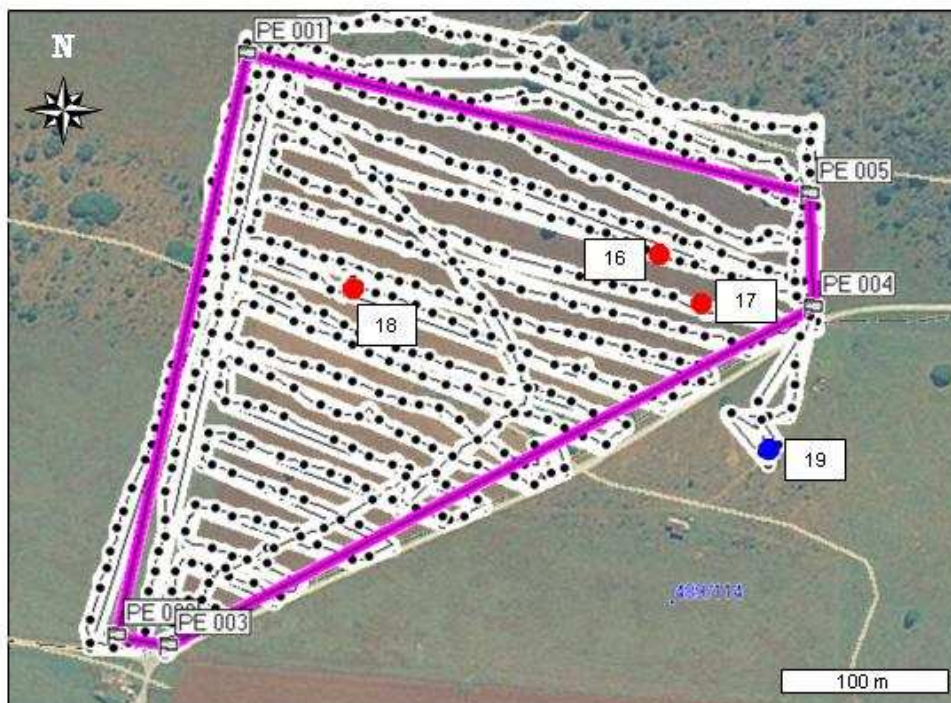


Plate 2. Enlarged area as indicated in Plate 1 showing; the boundary of the study area in purple, AIA walk tracks in black dash-dot line in middle of white line. Red dots mark positions of archaeological occurrences and the blue dot shows position of mining test excavation with exposed profile (see Plate 9).



Plate 3. North, northwestern Panoramic view of the study area as seen from the eastern corner of the property (near PE004 & PE005 in Plate 2).



Plate 4. North northeastern Panoramic view of the study area as seen from the south western corner of the property (near PE003 in Plate 2).



Plate 5. Examples of burrowing, which are ubiquitous across most of the study area. Red bottle is 21 cm tall. Some burrowing is attributable to dune mole rat activity as bones of several specimens were identified (inset top left image – large scale intervals in cm).



Plate 6. Quartzite chunk - not natural in dune sands - with flake scar that does not appear modern (locality indicated by point 16 in Plate 2). Large scale intervals in cm.



Plate 7. Broken quartzite cobble - not natural in dune sands - with old flake scar (locality indicated by point 17 in Plate 2). Large scale intervals in cm.



Plate 8. Silcrete flake of Later Stone Age origin with small flake scars (locality indicated by point 18 in Plate 2). Large scale intervals in cm.



Plate 9. Trial excavation associated with proposed mining. No archaeological traces were seen in these profiles (locality indicated by point 19 in plate 2). The red water bottle is 21 cm long.