

**ARCHAEOLOGICAL IMPACT ASSESSMENT
PROPOSED KARPOWERSHIP AT THE PORT OF NGQURA
EASTERN CAPE PROVINCE**

Assessment conducted under Section 38(3) of the National Heritage Resource Act (No. 25 of 1999)

Prepared for:

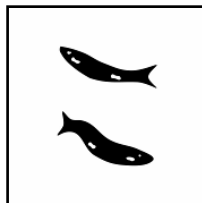
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EXECUTIVE SUMMARY

1. Introduction

ACRM was appointed by Triplo4 Sustainable Solutions (Pty) Ltd to conduct an Archaeological Impact Assessment (AIA) for the proposed Karpower Powership at the Port of Ngqura, within the Coega Industrial Development Zone (IDZ) in the Eastern Cape.

2. The Development proposal

The project entails the generation of electricity from a floating mobile Powership moored in the Port of Ngqura, near Port Elizabeth. From the ship, electricity will be evacuated via a 132kV transmission line over a distance of approximately 6.8 km to the Eskom Dedisa substation north of the N2. The proposed new transmission line crosses Zones 7, 6 and 11 within the Coega IDZ. Proposed construction activities are limited to the transmission and undersea gas supply lines as the ships arrive fully equipped in the port ready for operation.

Triplo4 Sustainable Solutions (Pty) Ltd is the independent Environmental Assessment Practitioner responsible for facilitating environmental authorization for the proposed project.

3. Aim of the AIA

The overall purpose of the AIA is to determine the potential impact of the proposed project on archaeological resources, and to avoid and/or minimise such impacts by means of mitigation measures.

The significance of archaeological resources was assessed in terms of their content and context. Attributes considered in determining significance include artefact and/or ecofact types, rarity of finds, exceptional items, organic preservation, potential for future research, density of finds and the context in which archaeological traces occur.

4. Constraints and limitations

Zone 7 is covered in virtually impenetrable thicket vegetation, resulting in very, low archaeological visibility.

Zone 6 and Zone 11 north of the N2 are also infested with invasive alien vegetation, but mobility was not too severely, constrained and archaeological visibility was reasonably good.

5. Results of the study

A walk-down survey of the proposed 6.8km long transmission line was undertaken on 6 October 2020, in which the following observations were made.

- Dispersed scatters of Middle Stone Age (MSA) tools were recorded in Zone 6 and Zone 11, north of the N2. These comprised mostly unmodified flakes and chunks, and few flaked and broken cobbles on exposed gravels. No formal tools such as points, or scrapers, or any organic remains such as pottery were found. One weathered and broken, Early Stone Age flake was recorded.
- Dispersed scatters of MSA tools were recorded in Zone 7, behind the backdune area nearer to the coast. No formal tools, or any organic remains such as shellfish, pottery or ostrich eggshell was found. The thicket vegetation across Zone 7 is virtually impenetrable, resulting in extremely low archaeological visibility.

According to the archaeologist Dr Johann Binneman, Zone 10 and Zone 7 located at or close to the coast, are considered the 'most sensitive' zones within the entire Coega IDZ, while Zone 11 and Zone 6, north of the N2, are considered the 'least sensitive'.

5.1. Grading of archaeological resources

The small numbers, isolated and disturbed context in which they were found means that the archaeological remains recorded during the survey have been graded as having LOW (IIIC) significance. The majority of tools most likely represent off-site opportunistic knapping over long periods of time.

6. Anticipated impacts on archaeological resources

Construction activities in Zone 6 and Zone 11 will likely impact on MSA resources, but indications are that the significance of the remains are likely to be low.

MSA tools (of low archaeological significance), and traces of potentially important Later Stone Age remains such as shell middens may be impacted by vegetation clearing, road construction activities, and excavations for powerline footings, in the backdune area in Zone 7 closer to the coast.

7. Conclusion.

The baseline study has identified no significant impacts to pre-colonial archaeological remains that will need to be mitigated prior to construction activities commencing.

The overall impact significance of the proposed Karpower Powership at the Port of Ngqura on important archaeological heritage is assessed as LOW, and therefore there are no objections to the development proceeding.

8. Recommendations

Regarding the proposed Karpower Powership Project located at the Port of Ngqura, the following recommendations are made:

1. No archaeological mitigation is required prior to construction activities commencing.
2. Vegetation clearing operations in Zone 7 must be monitored by a professional archaeologist.
3. Excavations for new roads, bulk services and powerline footings must be inspected/monitored by a professional archaeologist
4. If any human burials/remains or ostrich eggshell water containers, for example are uncovered during excavations, work must immediately stop, and the finds reported to the contracted archaeologist.
5. The above recommendations must be included in the Environmental Management Plan for the proposed development

Archaeological Impact Assessment, Proposed Powership at the Port of Ngqura, Coega Industrial
Development Zone

Table of contents

	Page
Executive Summary	1
1. INTRODUCTION	4
2. THE DEVELOPMENT PROPOSAL	5
3. HERITAGE LEGISLATION	6
4. TERMS OF REFERENCE	6
5. DESCRIPTION OF THE RECEIVING ENVIROMENT	6
6. STUDY APPROACH	9
6.1 Method	9
6.2 Constraints and limitations	10
6.3 Identification of potential risks	10
7. RESULTS OF THE DESKTOP STUDY	10
8. FINDINGS	11
8.1 Grading of archaeological resources	11
9. ANTICIPATED IMPACTS	16
10. CONCLUSION	16
11. RECOMMENDATIONS	16
12. REFERENCES	18

1. INTRODUCTION

ACRM was appointed by Triplo4 Sustainable Solutions (Pty) Ltd, on behalf of Karpowership SA (Pty) Ltd, to conduct an Archaeological Impact Assessment (AIA) for the proposed Karpower Powerline at the Port of Ngqura, near Port Elizabeth in the Eastern Cape (Figures 1 & 2).

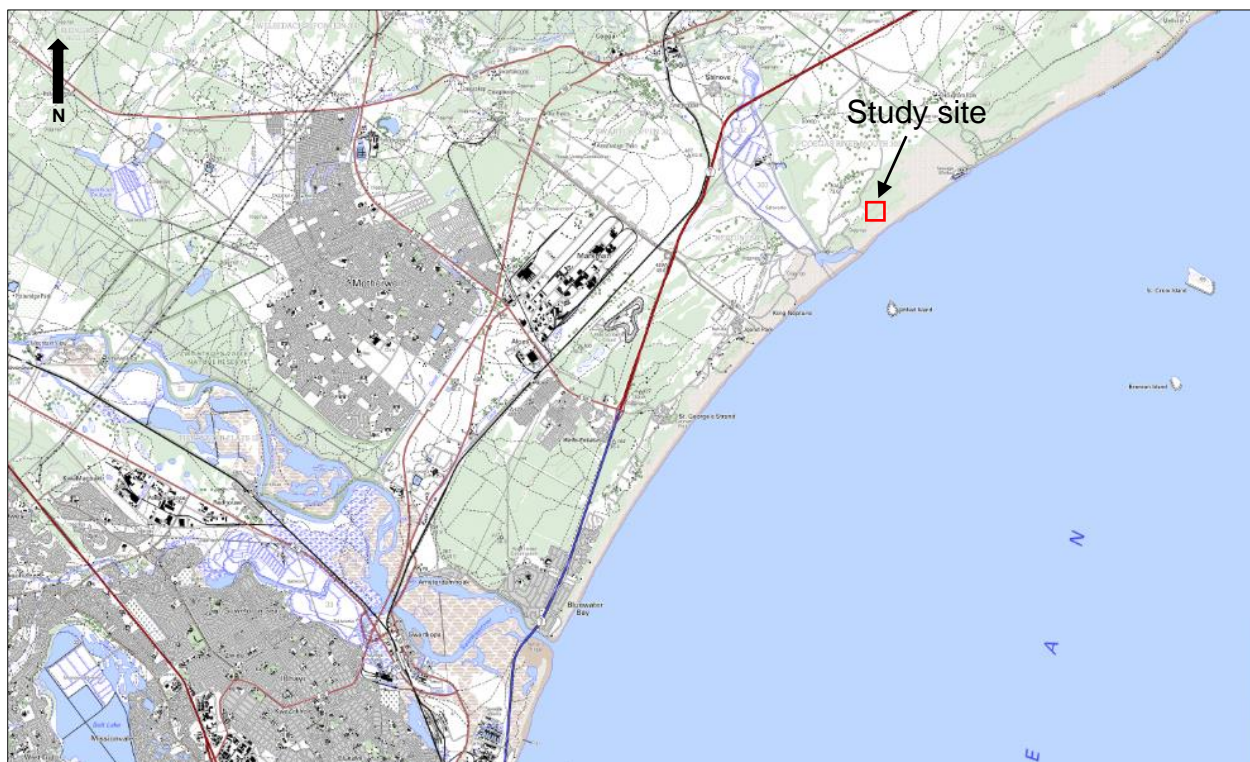


Figure 1. Locality map (3325 DC & DD & 3425 BA Port Elizabeth). Red polygon indicates the study area

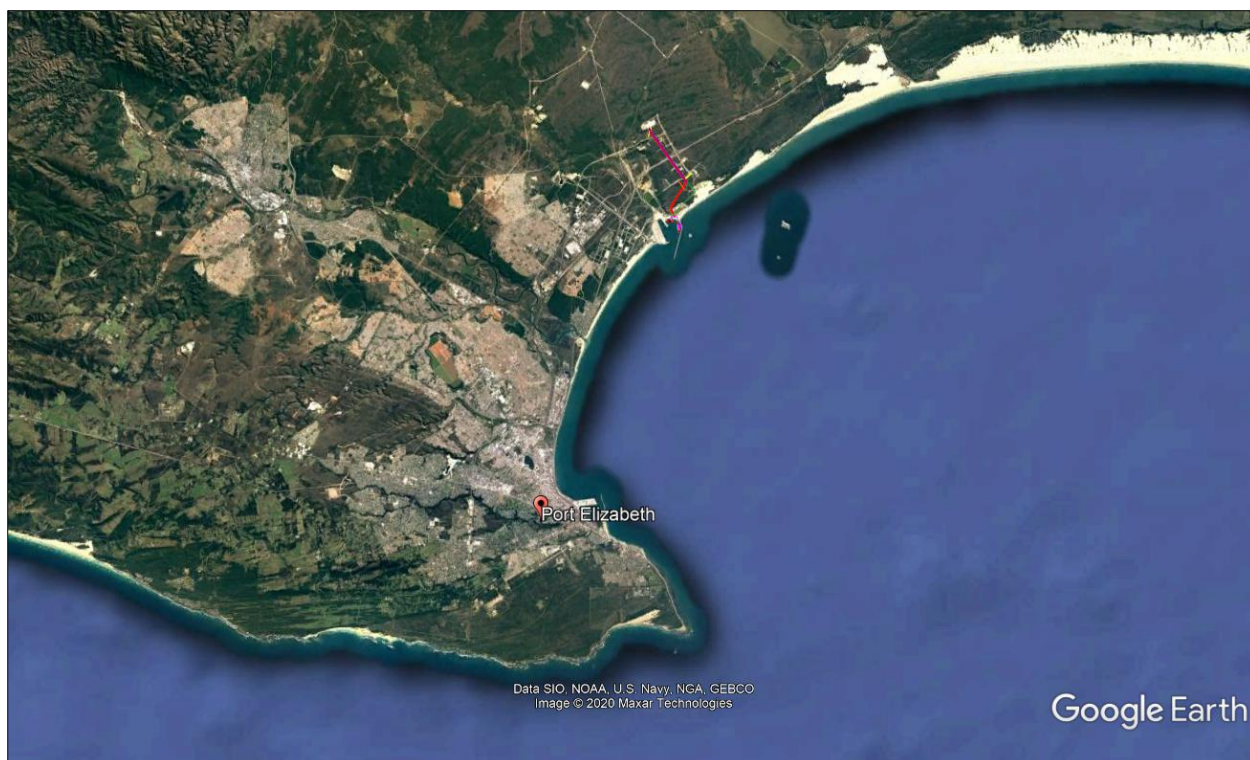


Figure 2. Google satellite map indicating the study site/proposed powerline within the Coega IDZ

2. THE DEVELOPMENT PROPOSAL

The project entails the generation of electricity from a floating mobile Powership moored in the Port of Ngqura within the Coega Industrial Development Zone (IDZ) near Port Elizabeth in the Eastern Cape Province. It proposes three ships berthing during the lifespan of the project, namely a Floating Storage Regasification Unit “FSRU and two Powerships. A Liquefied Natural Gas Carrier (LNGC) carrier will supply LNG to the FSRU on a short-term basis in a 20-day cycle. The natural gas is pumped from the FSRU to the Powership via an undersea gas pipeline. The proposed design capacity for the Ngqura Powership is 540MW, which comprises 27 gas engines having a heat output of 18.32 MW each. The 3 steam turbines have a heat out of 15.45 MW each.

The fuel used by the Powership will be imported natural gas. The gas pipeline connecting the FSRU to the Powership will be routed along the edge of the existing eastern breakwater and will connect to the vessels via a flexible marine hose. The gas pipeline will likely be mounted on small footings requiring minor civil works to construct and install.

From the ship, electricity will be evacuated via a 132kV transmission line over approximately 6.8 kms to the Eskom Dedisa substation north of the N2 (Figure 3). The proposed new transmission line will cross Zones 7, 6 and 11 within the Coega IDZ. Construction is limited to transmission and gas supply lines, as the ships are built internationally and arrive fully equipped in the port ready for operation.

Triplo4 Sustainable Solutions (Pty) Ltd is the independent Environmental Assessment Practitioner responsible for facilitating environmental authorization for the proposed project.

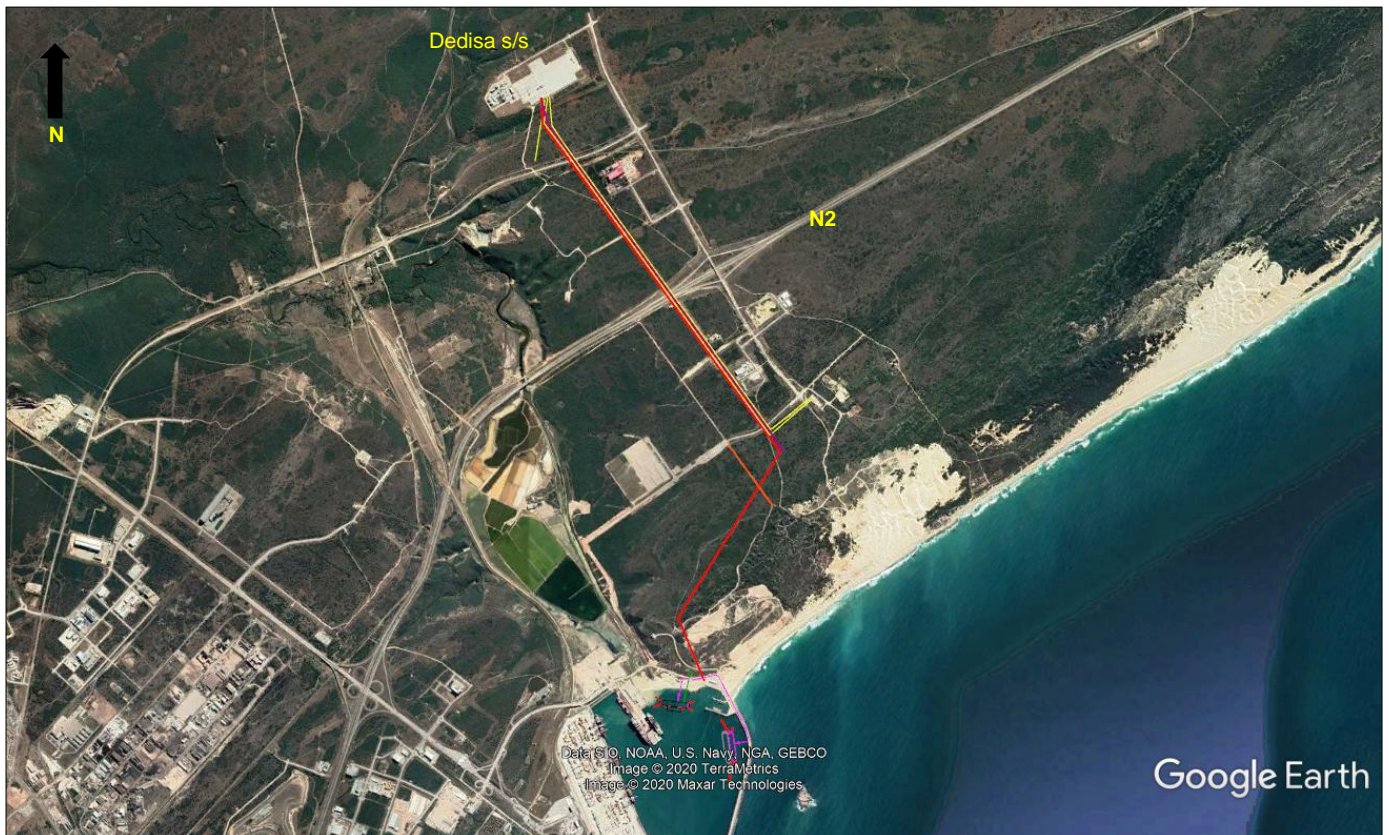


Figure 3. Google satellite map illustrating the proposed 6.8km overhead transmission line from the proposed Powership to the Eskom Dedisa substation north of the N2 within the Coega IDZ

3. HERITAGE LEGISLATION

The National Heritage Resources Act (Act No. 25 of 1999) makes provision for a compulsory HIA when an area exceeding 5000m² is being developed. This is to determine if the area contains heritage sites and to take the necessary steps to ensure that they are not damaged or destroyed during development. The Act provides protection for the following categories of heritage resources:

- Landscapes, cultural or natural (Section 3 (3))
- Buildings or structures older than 60 years (Section 34);
- Archaeological sites, palaeontological material and meteorites (Section 35);
- Burial grounds and graves (Section 36);
- Public monuments and memorials (Section 37);
- Living heritage (including cultural tradition, oral history, performance, ritual, popular memory, skills and techniques, indigenous knowledge systems and the holistic approach to nature, society and social relationships) (Section 2 (d) (xxi)).

Section 38 (1) (a) of the Act stipulates that any person constructing a powerline, pipeline or road, or similar linear development or barrier exceeding 300m in length is required to notify the responsible heritage resources authority, who will in turn advise whether an impact assessment report is needed before development can take place.

4. TERMS OF REFERENCE

The terms of reference for the study are to:

- Determine whether there are likely to be any important archaeological resources that may be impacted by proposed development activities.
- Indicate any constraints that would need to be considered in considering the development proposal.
- Recommend mitigation action

5. DESCRIPTION OF THE RECEIVING ENVIRONMENT

Heavy industry, including the Eskom Dedisa substation, overhead transmission lines, the N2, minor and provincial roads, factories and infrastructure development including new road construction dominate the surrounding industrial landscape.

The proposed new 132 kV transmission line, from the Dedisa substation to the Port of Ngqura, will be aligned alongside existing 132 kV powerlines, in a new servitude crossing Zone 6 and Zone 11 of the Coega IDZ. The receiving environment is infested with invasive alien vegetation and dense grass. Cattle tracks and footpaths, stormwater excavations, minor and Provincial Roads and the N2, characterise the already highly transformed landscape (Figures 4-14).

In Zone 7, the undulating landscape in the backdune area is covered in extremely dense almost impenetrable thicket vegetation (Figures 15-20)..

Historically, much of the area has been grazed by small-scale farming, evidenced by numerous cattle tracks, and occasional farm infrastructure (i.e. fencing, poles, rubble, etc).



Figure 4. Zone 11, view facing south



Figure 7. Zone 11, view facing south



Figure 5. Zone 11, view facing south



Figure 8. Zone 11, view facing south



Figure 6. Zone 11, view facing south



Figure 9. Zone 11, view facing south



Figure 10. N2, view facing south



Figure 13. Zone 6, view facing south



Figure 11. Zone 6, view facing south



Figure 14. Zone 6, view facing south



Figure 12. Zone 6, view facing south. The Cerebos Factory is to the left of the plate



Figure 15. Zone 7, view facing south west



Figure 16. Zone 7, view facign south west



Figure 18. Zone 7, view facing south west



Figure 17. Zone 7, view facing south west



Figure 19. Zone 7, view facing, with the Port of Ngqura in the background of the plate

6. STUDY APPROACH

6.1 Method

The overall purpose of the HIA is to assess the sensitivity of archaeological resources in the proposed new transmission line (i. e. the study area), to determine the potential impacts on such resources, and to avoid and/or minimize such impacts by means of mitigation measures.

A walk down survey of the proposed 6.8km long transmission line was undertaken on the 6 October 2020.

Archaeological resources recorded during the study were mapped using a handheld GPS unit set on the map datum WGS84.

The significance of archaeological resources was assessed in terms of their content and context. Attributes considered in determining significance include artefact and/or ecofact types, rarity of finds, exceptional items, organic preservation, potential for future research, density of finds and the context in which archaeological traces occur.

A literature survey was also carried out to assess the archaeological context of the surrounding area.

6.2 Constraints and limitations

Zone 7 is covered in extremely dense, virtually impenetrable thicket vegetation, resulting in very, low archaeological visibility.

Zone 6 and Zone 11 north of the N2 are also infested with invasive alien vegetation but mobility was not too severely, constrained and archaeological visibility was reasonably good.

6.3 Identification of potential risks

Buried archaeological remains such as stone tools, and shell midden deposits may be uncovered or exposed during vegetation clearing operations, road construction activities, and excavations for powerline footings, but overall, the archaeological risk sources are rated as being LOW.

Unmarked Khoisan human remains may be exposed or intercepted during construction operations, but the probability of this occurring is rated as being low to moderate.

7. RESULTS OF THE DESKTOP STUDY

More than 17 Archaeological Impact Assessments (or AIAs) have been undertaken within the Coega IDZ (Binneman 2010a, b, c, 2008, 1999,1994; Binneman & Webley 1996, 1997a, b; Kaplan 2008, 2007a, b; Van Schalkwyk & Wahl 2006, Webley 2007a, b). The majority of these unpublished reports and notes were found on the South Africa Heritage Resources Information System (or SAHRIS). One or two reports were sourced independently. The archaeologist also consulted with Ms. Celeste Booth, archaeologist at the Albany Museum in Makhanda (Grahamstown).

The most comprehensive survey of the Coega IDZ was conducted by the archaeologist Dr Johan Binneman of the Albany Museum in Grahamstown (Binneman 2010a), which included Zones 1-4, 6, 7, 9, & 10-13. Binneman (2010a:3) brief was 'to conduct a survey of possible archaeological sites in the Coega Industrial Development Zone and to establish the range and importance of the heritage sites/materials, the potential impact of the development on these and to make recommendations to minimize possible damage to these sites'.

The study was severely constrained by the sheer size of the Coega IDZ (more than 10 000ha in extent), and the extremely dense vegetation cover across large areas of the site resulting in very, poor archaeological visibility.

A number of important observations were made, however.

Large numbers of Later Stone Age¹ (LSA) shell middens were recorded in Zone 10 at the coast, while dispersed scatters of Middle Stone Age² (MSA) tools of low archaeological significance were recorded further inland, behind the backdune area in Zone 7, and on exposed cobbles in Zone 6 and Zone 11 north of the N2. Bush clearing for a road in Zone 7 also exposed a thin layer of dune sand and dispersed scatters of marine shellfish, bone fragments, stone tools and pottery. Bulldozing activities associated with the above road construction also exposed a few MSA tools.

¹ A term referring to the last 20 000 years of pre-colonial history in southern Africa.

² A term referring to the period between 200 000 and about 20 000 years ago.

According to Binneman (2010), Zone 7 and Zone 10 are considered 'the most sensitive' zones within the entire Coega IDZ, while Zone 11 and Zone 6 north of the N2 are 'the least sensitive'.

All the AIAs undertaken to date within the Coega IDZ confirm the observations made by Binneman (2010a) during his study.

8. FINDINGS

A walkdown survey of the proposed 6.8km long, transmission line was undertaken on 6 October 2020, in which the following observations were made (Figure 20 & Table 1).

Dispersed scatters of MSA tools were recorded north of the N2 in Zone 6 and Zone 11 on exposed cobbles, and in small animal tracks and footpaths, surrounded by dense invasive vegetation. One weathered ESA flake (Point 033) was also found. Most of the tools comprise triangular shaped flakes with prepared platforms, small chunks, flaked and broken cobbles, and a few irregular shaped cores. Some of the flakes have been retouched/modified, but no formal tools such as points, or scrapers were found. All the tools are in locally available quartzite. The tools most likely comprise flake debris, with the river cobbles being used as a source of raw material for making stone tools, and opportunistic knapping over long periods of time. A few isolated MSA flakes and chunks in quartzite were also found south of the N2 within Zone 7 where cobbles appear to have given way to softer sandy deposits, and a few isolated patches of round pebbles.

Apart from some road construction, the backdune area (i. e. Zone 7) closer to the coast is characterized by extremely dense thicket vegetation. Two round cores (Points 050 & 051), and dispersed, low density scatters of MSA flakes and chunks (Points 052-055) were recorded on exposed beds of quartzite cobbles on north facing slopes, surrounded by dense vegetation. No formal tools such as points, or scrapers were found.

No shell midden deposits, or any other organic remains, such as pottery, ostrich eggshell or bone was found in the backdune area in Zone 7, where such finds have been previously documented (Binneman 2010a).

8.1 Grading of archaeological resources

The small numbers, isolated and disturbed context in which they were found means that the archaeological remains recorded during the survey have been graded as having low (IIIC) significance.

The majority of tools most likely represent off-site opportunistic knapping over long periods of time. These traces have probably been displaced to some extent by environmental processes including vertical collapsing of stratified sequences through erosion and lateral movement down the gently sloping landscape.

A selection of stone tools recorded during the study and the context in which they were found is illustrated in Figures 21-29.

Archaeological Impact Assessment, Proposed Powership at the Port of Ngqura, Coega Industrial Development Zone

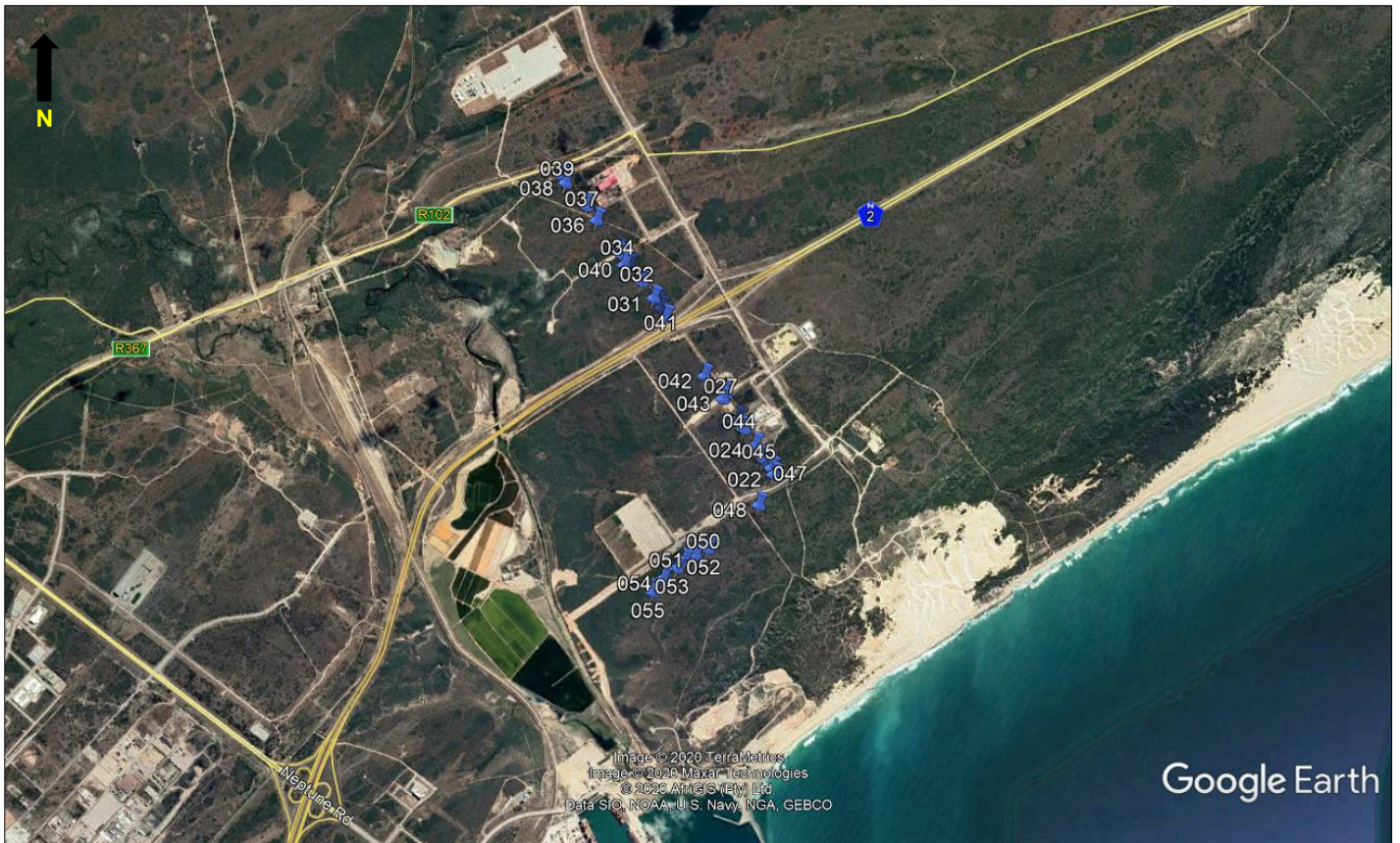


Figure 20. Waypoints of archaeological finds



Figure 21. Collection of stone tools (Zone 11). Penknife is 7cm



Figure 22. Collection of stone tools (Zone 11)



Figure 23. Zone 11. Context in which the remains were found

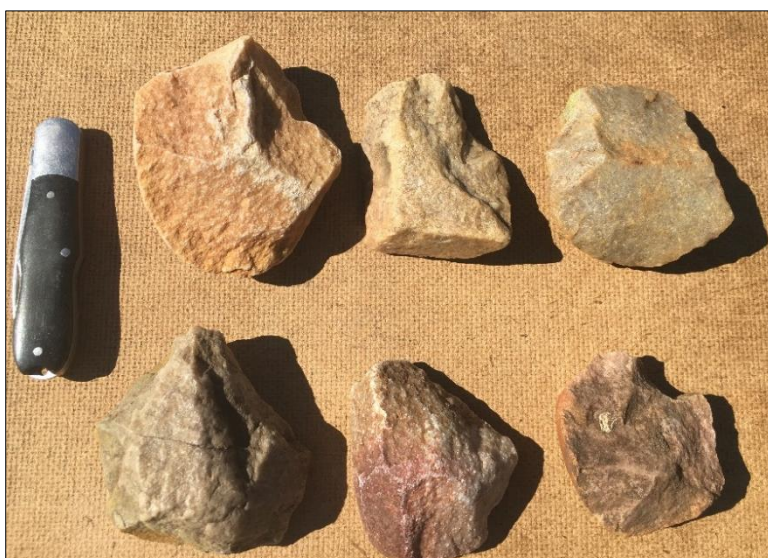


Figure 24. Collection of stone tools (Zone 6)

Archaeological Impact Assessment, Proposed Powership at the Port of Ngqura, Coega Industrial Development Zone



Figure 25. Collection of stone tools (Zone 6)



Figure 26. Points 051-055 (Zone 7). Context in which the remains were found



Figure 27. Point 051-055 (Zone 7). Context in which the remains were found



Figure 28. Quartzite cobble core (Point 051)



Figure 29. MSA core (Point 050)

Point	Name of Farm	Lat/long	Description	Grading	Mitigation
			All in quartzite unless otherwise stated		
022		S33° 46.326' E25° 41.972'	MSA flake	Low/IIIC	None required
023		S33° 46.252' E25° 41.913'	MSA flake & chunk	Low/IIIC	None required
024		S33° 46.196' E25° 41.872'	MSA flake	Low/IIIC	None required
025		S33° 46.118' E25° 41.799'	MSA flake	Low/IIIC	None required
026		S33° 46.080' E25° 41.781'	MSA flake	Low/IIIC	None required
027		S33° 45.966' E25° 41.716'	MSA flake & several chunk in excavation/storm water trench	Low/IIIC	None required
028		S33° 45.964' E25° 41.703'	MSA flake	Low/IIIC	None required
029		S33° 45.586' E25° 41.370'	Several MSA flakes on colluvial gravels north of N2	Low/IIIC	
030		S33° 45.561' E25° 41.346'	A few MSA flakes & chunks on colluvial gravels	Low/IIIC	None required
031		S33° 45.541' E25° 41.330'	A few MSA flakes & chunks on colluvial gravels	Low/IIIC	None required
032		S33° 45.468' E25° 41.267'	A few MSA flakes & chunks on colluvial gravels	Low/IIIC	None required
033		S33° 45.394' E25° 41.200'	Weathered ESA flake	Low/IIIC	None required
034		S33° 45.350' E25° 41.162'	x 2 MSA flakes	Low/IIIC	None required
035		S33° 45.328' E25° 41.143'	MSA flake	Low/IIIC	None required
036		S33° 45.196' E25° 41.025'	Chunk	Low/IIIC	None required
037		S33° 45.134' E25° 40.973'	Chunk	Low/IIIC	None required
038		S33° 45.029' E25° 40.858'	Chunk	Low/IIIC	None required
039		S33° 44.999' E25° 40.840'	Chunk and flake alongside excavation trench/road	Low/IIIC	None required
040		S33° 45.395' E25° 41.172'	MSA flake	Low/IIIC	None required
041		S33° 45.627' E25° 41.394'	MSA flake	Low/IIIC	None required
042		S33° 45.888' E25° 41.601'	chunk	Low/IIIC	None required
043		S33° 45.989' E25° 41.699'	MSA flake in large diggings	Low/IIIC	None required

Archaeological Impact Assessment, Proposed Powership at the Port of Ngqura, Coega Industrial Development Zone

044		S33° 46.123' E25° 41.814'	MSA flake	Low/IIIC	None required
045		S33° 46.258' E25° 41.919'	Chunk	Low/IIIC	None required
046		S33° 46.284' E25° 41.947'	MSA flake	Low/IIIC	None required
047		S33° 46.297' E25° 41.959'	Chunk	Low/IIIC	None required
048		S33° 46.462' E25° 41.893'	Round core in open patch of grass	Low/IIIC	None required
050		S33° 46.656' E25° 41.621'	MSA core	Low/IIIC	None required
051		S33° 46.685' E25° 41.554'	MSA core	Low/IIIC	None required
052		S33° 46.711' E25° 41.495'	Dispersed scatter of MSA flakes & chunks on patch of pebble & cobble gravels on north west facing slopes	Low/IIIC	None required
053		S33° 46.741' E25° 41.455'	Same as above	Low/IIIC	None required
054		S33° 46.788' E25° 41.383'	Same as above	Low/IIIC	None required
055		S33° 46.848' E25° 41.326'	Same as above	Low/IIIC	None required

Table 1. Spreadsheet of waypoints and description of archaeological finds

9. ANTICIPATED IMPACTS

The proposed 6.8km long overhead transmission line crosses Zones 7, 6 and 11 in the Coega IDZ. According to Binneman (2010a:40) Zone 6 and Zone 11 are the 'least archaeologically sensitive', where dispersed scatters of MSA tools of *low* archaeological significance are likely to be encountered, while Zone 7 is regarded 'as the most sensitive'. Binneman (2010a:19) notes that although recording archaeological resources in Zone 7 was difficult due to the dense grass, bush and alien vegetation occurring across this zone, bush clearing for a road exposed a thin layer of dune sand and dispersed scatters of marine shellfish, bone fragments, stone tools and pottery.

10. CONCLUSION.

The study has identified no significant impacts to pre-colonial archaeological remains that will need to be mitigated prior to construction activities commencing.

The overall impact significance of the proposed Karpower Powership at the Port of Ngqura on archaeological heritage is assessed as LOW, and therefore there are no objections to the development proceeding.

11. RECOMMENDATIONS

Regarding the proposed Karpower Powership at the Port of Ngqura within the Coega Industrial Development Zone near Port Elizabeth, the following recommendations are made

1. No archaeological mitigation is required prior to construction operations commencing.
2. Vegetation clearing operations in Zone 7 must be monitored by a professional archaeologist.
3. Excavations for new roads, services, and powerline footings must be inspected/monitored by a professional archaeologist.
4. If any unmarked human remains are exposed or intercepted during construction operations, these must be immediately reported to the contracted archaeologist.

5. The above recommendations must be included in the Environmental Management Plan (EMP) for the proposed development.

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