ARCHAEOLOGICAL IMPACT ASSESSMENT

PROPOSED ESKOM MUISVLAKTE BATTERY ENERGY STORAGE SYSTEM ON PORTION 3 OF THE FARM GYPSYM 5, PORT NOLLOTH, NORTHERN CAPE

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 EIMS to conduct an Archaeological Impact Assessment (AIA) for a proposed battery energy storage system on Portion 3 of the Farm Gypsym No. 5 in Port Nolloth, in the Northern Cape Province.

EIMS are the appointed independent Environmental Assessment Practitioner (EAP) responsible for facilitating the Basic Assessment process for Environmental Authorization.

2. The development proposal

Eskom is proposing to construct a 2 Mega Watt (MW) hour self-contained, battery energy storage system and step up transformer on a ± 1.0 ha site on the Farm Gypsym No. 5/3, in Port Nolloth. The proposed development site is located at the Eskom Muisvlakte Substation, about 5kms north of the small coastal town. Several technologies are being considered for the energy storage facility.

3. Aim

The overall purpose of the study is to assess the sensitivity of archaeological resources in the proposed footprint area, to determine the potential impacts on such resources, and to avoid and/or minimise such impacts by means of management and/or mitigation measures.

4. Identification of potential risks

The results of the study indicate there are no sensitive archaeological features within the proposed footprint area of the battery site.

Unmarked pre-colonial Khoisan graves and ostrich eggshell water caches for example, may be exposed during sub-surface excavations, although this is considered to be highly unlikely due to the limited extent of the excavations (± 150mm), envisaged.

5. Results

A field assessment was undertaken on 25th December 2018, in which the following findings were made:

- No archaeological remains were recorded in the proposed battery site.

- A dispersed scatter of fragmented shellfish, and several quartz flakes and chunks of *low* (Grade 3C) significance were recorded outside the study site.

- No obvious graves or grave features were found in the surrounding area.

6. *Impact Statement*

The results of the study indicate that the proposed construction of a 2 MW hour ion battery storage energy facility on the Farm Gypsym 5/3, in Port Nolloth will not have a significant impact on important archaeological heritage. This applies to each of the proposed technologies being considered for the battery storage facility.

The proposed footprint area for the battery site, and much of the surrounding area, is fairly severely degraded as a result of construction work associated with the Eskom Muisvlakte substation.

The impact significance of the proposed development on archaeological heritage is therefore assessed as LOW.

7. Conclusion

Marginal traces of archaeological deposits were recorded outside the study area of the proposed Eskom Muisvlakte battery energy storage facility, in Port Nolloth.

Indications are that, in terms of archaeological heritage, the receiving environment is not a sensitive or threatened landscape.

There are no objections to the proposed activity, and therefore the proposed development is supported.

8. Recommendations

The following recommendations are made:

1. No archaeological mitigation is required prior to construction activities commencing.

2. No archaeological monitoring is required during the construction phase of the development.

3. Should any unmarked human burials, or ostrich eggshell water flask caches for example, be uncovered during construction activities, these must immediately be reported to the archaeologist (Jonathan Kaplan 082 3210172), or the South African Heritage Resources Agency (Ms Natasha Higgit 021 4624502). Burials must not be removed or disturbed until inspected by the archaeologist.

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

Declaration of independence

I, **Jonathan Kaplan** (MA in Archaeology, University of Cape Town, 1989), hereby confirm that I am a professional member, in good standing, of the Association of South African Professional Archaeologists (ASAPA membership # 064).

I am an accredited Principal Investigator for coastal shell middens and Stone Age archaeology, and Field Director for Rock Art.

As the appointed independent specialist archaeologist for this project, I hereby declare that I:

- Act as an independent specialist in this application;
- Regard the information contained in this report as it relates to my specialist input to be true and correct; and
- Do not have any financial interest in the undertaking of the activity, other than remuneration for work performed.

Signature of the specialist:

Name of company: **Agency for Cultural Resource Management**

Date: **28 January, 2019**

Summary of specialist expertise

ACRM was founded by Jonathan Kaplan in 1992 and is one of the oldest heritage consultancies in the country, having completed nearly 2000 Archaeological and Heritage Impact Assessments (AIAs & HIAs), specialising in the Southern Africa Stone Age, coastal shell middens, and rock art and herder studies.

ACRM has undertaken baseline studies on large infrastructure projects, including the Lesotho Highlands Water Project, The Maguga Dam in Swaziland, Namibia/Botswana Water Transfer Project, Sasol/ACO Gas Pipeline (South Africa & Mozambique), Corridor Sands (Mozambique) and numerous utility projects for Eskom, the Department of Transport and Public Works, local and provincial authorities, as well as private developers. Since 2010, ACRM has conducted baseline studies for a large number of alternative energy (wind & photo-voltaic) projects in the Western and Northern Cape Provinces.

Jonathan has a MA degree in Archaeology (UCT 1989) and is an Association of Southern African Professional Archaeologists (ASAPA) accredited Cultural Resources Management (CRM) practitioner (Membership No 253).

ACRM offers the following specialist services:

- Archaeological Impact Assessments
- Heritage Impact Assessments
- Heritage Management Plans
- Heritage tourism
- Rock art recording
- Excavation and data analysis
- Monitoring of construction activities

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1. INTRODUCTION

ACRM was appointed by Environmental Impact Management Services (EIMS) to conduct an Archaeological Impact Assessment (AIA) for the proposed construction of a self-contained, purpose built, battery energy storage facility on Portion 3 of the Farm Gypsym No. 5 in Port Nolloth in the Northern Cape (Figures 1 & 2).

EIMS are the appointed independent Environmental Assessment Practitioner (EAP) responsible for facilitating the Basic Assessment process for Environmental Authorization.

Figure 1. Locality map (2916BA & BB Port Nolloth). Red polygon indicates the location of the proposed Muisvlakte Battery Energy Storage Facility

2. THE DEVELOPMENT PROPOSAL

The existing Eskom network in the Port Nolloth area is under severe constraint. Due to the remoteness of the area, it is expensive to build new power lines to the town. As a result, the area has been experiencing power failures due to a constrained network. The generation of clean, environmentally friendly electricity is seen as a solution to alleviate the electricity constraints to the town. Eskom is therefore proposing to construct a 2 Mega Watt (MW) hour battery energy storage facility and step up transformer on a 1.0 ha site on Portion 3 of the Farm Gypsym No. 5, in Port Nolloth (Figure 3).

The proposed development site is located at the Eskom Muisvlakte Substation, about 5kms north of the small coastal town, alongside the R388. Several technologies are being considered for the battery storage facility, including Solid state Li Ion, Dual loop flow system, Single loop flow system, sodium-sulfur, sodium nickel chloride, and flywheel energy storage

systems. The battery units will be placed on slabs which will be embedded in shallow surficial sands (± 150 mm).

Figure 2. Google satellite map indicating the location of the proposed battery storage facility (red polygon)

Figure 3. Close up Google satellite map of the proposed development site

3. TERMS OF REFERENCE

The terms of reference for the study were to:

- Determine whether there are likely to be any important archaeological remains that may be impacted by the proposed development;

- Indicate any constraints that would need to be taken into account in considering the development proposal;

- Identify sensitive areas, and

- Recommend mitigation action

4. HERITAGE LEGISLATION

The National Heritage Resources Act (NHRA No. 25 of 1999) protects archaeological and palaeontological sites and materials, as well as graves/cemeteries, battlefield sites and buildings, structures and features over 60 years old. The South African Heritage Resources Agency (SAHRA) administers this legislation nationally, with Heritage Resources Agencies acting at provincial level. According to the Act (Sect. 35), it is an offence to destroy, damage, excavate, alter of remove from its original place, or collect, any archaeological, palaeontological and historical material or object, without a permit issued by the SAHRA.

Notification of SAHRA is required for proposed developments exceeding certain dimensions (Sect. 38), upon which they will decide whether or not the development must be assessed for heritage impacts (an HIA) that may include an assessment of archaeological (a AIA) or palaeontological heritage (a PIA).

5. DESCRIPTION OF THE RECEIVING ENVIRONMENT

The site for the proposed development is located about 5kms north of Port Nolloth on the right hand side of the road (R388), at the Eskom Muisvlakte substation (Figures 4-6).

The proposed development site is fairly level, and much of the surrounding area is degraded as a result of construction work associated with the Eskom Muisvlakte substation. The footprint area is covered in low shrubby vegetation, on a substrate of soft windblown sands. Existing infrastructure includes gravel roads and a, powerline and Telkom servitude. Concrete blocks, building rubble, asbestos sheets, rusted metal, glass and other material associated with the construction of the Muisvlakte substation, lies scattered around the area. A large prospecting trench is located immediately to the south west of the proposed battery site, while the north western portion of the property is also fairly severely degraded. There are no significant landscape features within the proposed development site. Surrounding land use is the Eskom Muisvlakte substation, Eskom and Telkom servitudes, older diamond prospecting pits, excavations and roads (R388).

Figure 4. View of the proposed development site facing south. The Eskom Muisvlakte Substation is in the background of the plate

Figure 5. View of the proposed development site facing north

Figure 6. View of the proposed development site facing north west.

6. STUDY APPROACH

6.1 Method

The purpose of the study is to assess the sensitivity of archaeological resources in the study area, to determine the potential impacts on such resources, and to avoid and/or minimize such impacts by means of management and/or 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.

A field assessment was undertaken on 25th December 2018. The position of archaeological resources, were plotted using a hand held GPS unit set on the map datum wgs 84. A track path of the survey was captured. A desktop study was also carried out to assess the heritage context surrounding the proposed development site.

6.2 Constraints and limitations

There were no constraints or limitations associated with the study. Access to the site was easy and mobility was unhindered.

6.3 Identification of potential risks

Indications are that, there are no sensitive archaeological features within the proposed construction footprint area.

Unmarked pre-colonial Khoisan graves and ostrich eggshell water cache may be uncovered or exposed during sub-surface excavations, but this is considered to be highly unlikely due to the shallow excavations (± 150mm) envisaged.

7. ARCHAEOLOGICAL HERITAGE

Kaplan (1993) has listed 297 shell middens in the Port Nolloth area, while many more sites have been recorded in the restricted Alexkor diamond mining concession area (Parkington 1993; Kaplan 2008, 2014). Rudner (1968) also recorded extensive shell middens in Port Nolloth, where Laidler (1935) had earlier collected much material. He reports that "shell deposits were hundreds of feet in length and breadth…accompanied by ostrich eggshell plaques and pendants, eggshell water bottles, ornamented and plain. Pottery of a 'Hottentot' type occurred mainly on the mounds on which stone implements were scarcest". According to Colson (1905) a complete pot was found in a midden in 1899 south of the Port Nolloth jetty. This pot was half-filled with specularite (an iron powder used as decoration), as well as a bone awl and some ostrich eggshell beads.

More recently a number of archaeological studies (or AIAs) have been undertaken in Port Nolloth as part of the EIA process. Numerous shell middens were recorded by Morris (2006) and Kaplan (2011a) on the Farm Muisvlakte during a survey for a proposed mariculture park and desalination plant. Kaplan (2011a) also showed how unrehabilitated prospecting pits, 4x4 vehicles and recreational quad bikes have damaged and destroyed middens in the dune littoral alongside the Port Nolloth Abalone Farm. Wadley (2009) also recorded several important shell middens and scatters of stone tools and ostrich eggshell on the edge of the large salt pan to the north of the town, while Kaplan (2011b) later recorded shell middens with stone tools, pottery and ostrich eggshell near the town's municipal waste dump, and well preserved shell midden deposits with stone tools, ostrich eggshell and pottery near the town's waste water treatment works (Kaplan 2011c). Further south at McDougall's Bay, there are shell middens capping the dunes along the bay (Kaplan 1993; Wadley 2009), and Rudner (1968) reported on at least 52 clay pots from the area.

8. FINDINGS

Track paths and waypoints of archaeological finds are illustrated in Figure 7.

Site 411 (29°11'23.99"S 16°52'10.49"E)

Isolated quartz chunk outside the study area.

Site 510 (29°11'24.54"S 16°52'8.67"E)

Isolated quartz flake outside the study area

Site 610 (29°11'23.43"S 16°52'7.80"E)

The site comprises a thin, tiny scatter of some fragmented and weathered marine shellfish (mostly adiagnostic limpets), and a small quartz flake, on an eroded patch of ground close to the edge of a small excavation pit outside the study (Figures 8 & 9). No pottery, bone or ostrich eggshell was found. The site has been graded as having *low* (Grade 3C) significance due to the highly degraded context in which the remains were found.

Site 710 (29°11'28.31"S 16°52'10.67"E)

Isolated quartz chunk outside the study area.

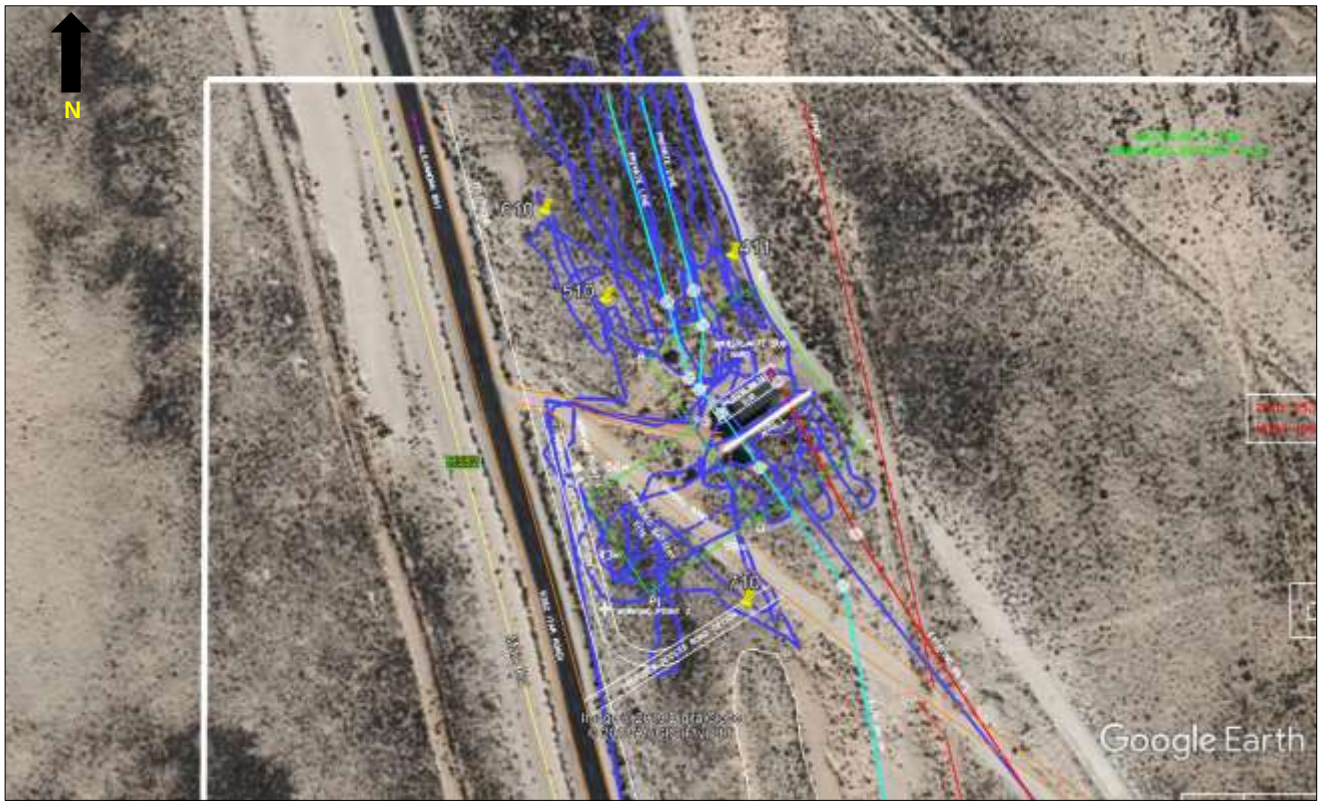

Figure 7. Track paths in blue and waypoints of archaeological finds

Figure 8. Site 610. View of the site facing south east

Figure 9. Quartz flake (Site 610). Scale is in cm

9. ASSESSMENT OF IMPACTS

The results of the study indicate that the proposed construction of a 2 MW hour self-contained, battery energy storage facility on the Farm Gypsym 5/3, in Port Nolloth will not have a significant impact on important archaeological heritage (Table 1).

This applies to each of the proposed technologies being considered for the facility.

Much of the surrounding area for the proposed battery site is fairly severely degraded as a result of construction work associated with the Eskom Muisvlakte substation, and no sensitive archaeological areas were identified.

The impact significance of the proposed development on archaeological heritage is therefore assessed as LOW.

Impact Name	Destruction/loss of archaeological resources during construction of the proposed Muisvlakte Battery Energy Storage Facility				
Alternative	Not Applicable				
Environmental Risk					
Attribute	**Pre-mitigation**	**Post-mitigation**	**Attribute**	**Pre-mitigation**	**Post-mitigation**
Nature	-1	-1	Magnitude	1	1
Extent	1	1	Reversibility	1	1
Duration	5	5	Probability	1	2
Environmental Risk (Pre-mitigation)					-3.25
Mitigation Measures					
Not required					
Environmental Risk (Post-mitigation)					N/A
Degree of confidence in impact prediction:					High
Impact Prioritisation					
Public Response					1
Low: It is unlikely that the occurrence of archaeological resources will be an issue raised in the public responses.					
Cumulative Impacts					1
Low: it is considered highly unlikely the cumulative impact will result in any cumulative change					
Degree of potential irreplaceable loss of resources					1
The proposed project is unlikely to result in the irreplaceable loss of archaeological resources.					
Prioritisation Factor					1
Final Significance					3.25

Table 1. Assessment of archaeological impacts: Proposed Eskom Muisvlakte Battery Energy Storage Facility

10. CONCLUSION

Marginal traces of archaeological deposits were recorded in the surrounding area of the proposed Eskom Muisvlakte battery energy storage facility in Port Nolloth.

Indications are that, in terms of archaeological heritage, the affected environment is not a sensitive or threatened landscape. The impact significance of the proposed development on archaeological resources is assessed as LOW.

Therefore, there are no objections to the proposed activity.

11. RECOMMENDATIONS

With regard to the proposed construction of the Eskom Muisvlakte Battery Energy Storage Facility on Portion 3 of the Farm Gypsym 5 in Port Nolloth, the following recommendations are made:

1. No archaeological mitigation is required prior to construction activities commencing.

2. No archaeological monitoring is required during the construction phase of the development.

3. Should any unmarked human burials, or ostrich eggshell water flask caches for example be uncovered during construction activities, these must immediately be reported to the archaeologist (Jonathan Kaplan 082 321 0172), or the South African Heritage Resources Agency (Att: Ms Natasha Higgit 021 462 4502). Burials must not be removed or disturbed until inspected by the archaeologist.

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

12. REFERENCES

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