HWC CASE NO. 20092505

HERITAGE IMPACT ASSESSMENT
PROPOSED POWERSHIP AT THE PORT OF SALDANHA
WESTERN CAPE

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

Prepared for:

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Applicant:

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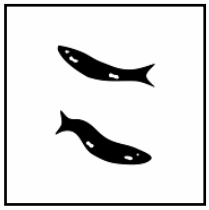
By:



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EXECUTIVE SUMMARY

1. Introduction

ACRM was instructed by Triplo4 Sustainable Solutions (Pty) Ltd to conduct a Heritage Impact Assessment (HIA) for the proposed Karpower Powership at the Port of Saldanha in Saldanha Bay in the Western Cape. The proposed Karpowership will be moored alongside the Saldanha Ore Terminal jetty in Saldanha Bay, with a powerline connecting to the Eskom Blouwater Substation.

2. The Development proposal

The project entails the generation of electricity from a floating mobile Powership moored in the Port of Saldanha Bay. It proposes two ships berthing during the project lifespan, a Floating Storage Regasification Unit (FSRU) and one Powership. A Liquefied Natural Gas Carrier (LNGC) carrier is to 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 the development and operation of a gas pipeline. The proposed design capacity for the Saldanha Powership is 415MW, which comprises of 21 gas engines having a heat output of 18.32 MW each. From the ship, electricity will be evacuated via a 132kV transmission line over a, distance of approximately 7,5 km to the Eskom Blouwater substation. The proposed development will complement the existing land use of the surrounding area, which is dominated by heavy industry

Given the known palaeontological sensitivity of the Saldanha Bay area, a desktop Palaeontologic Impact Assessment (PIA) has been undertaken by consulting palaeontologist, John Pether.

Triplo4 is the appointed independent Environmental Assessment Practitioner (EAP) responsible for facilitating environmental authorization for the proposed development.

3. Aim of the HIA

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

4. Results of the study

4.1 Palaeontology

The proposed route options for the transmission line, from the Port to the Eskom Blouwater Substation are all situated on the calcreted Langebaan Formation, beneath a thin cover of Springfontyn Formation sands. The Langebaan Formation is classified to be of HIGH sensitivity, due to previous fossil finds of significant scientific value. The palaeontological sensitivity of the Springfontyn Formation sands is classified as LOW

Close to the coast the Witsand Formation dunes are underlain by the older aeolianite of the Langebaan Formation and the interbedded shelly beach deposits of the Velddrif Formation.

4.2 Archaeology

A walk down survey of the proposed transmission line route options was undertaken on the 21st and 22nd September 2020, in which the following observations were made:

- Fragments of White Sand Mussel (*Perna perna*) were recorded in a large patch of dune sand in the Port Area, but no pre-colonial archaeological remains were found.

5. Anticipated impacts

5.1 Palaeontology

Buried archaeological material, such as artefacts, shell, and bone scatters, could be uncovered in the loose coversands of the Springfontyn Formation, but the overall palaeontological sensitivity of the coversand deposits in the area is classified as LOW.

The Langebaan Formation is classified to be of high sensitivity, due to previous fossil finds of significant scientific value. Most of the pylon foundations will be embedded in the compact upper Langebaan Formation, calcrete and aeolianite. This shallow depth of the excavations (between 2.0 & 2.6m) will reduce the impact, as fossil bones are overall sparse in the upper calcreted Langebaan Formation. Test pits along the powerline route could unearth important fossil bones.

Close to the coast the surface has been much disturbed and no impact on the Holocene Witsand Formation is expected. Along the initial ~1.5 km of the route, it is possible that shelly beds of the Velddrif Formation may be intersected, although this is considered to be unlikely in shallow excavations

5.1 Archaeology

Buried Pleistocene archaeological remains such as stone tools, bone and marine shell may be intercepted during excavations for powerlines footings and pylons, but overall, anticipated impacts on archaeological resources is rated as being LOW.

6. Recommendations

6.1 Palaeontology

1. The Environmental Control Officer (ECO) and Contractor must inform staff of the need to watch for potential fossil occurrences. A Fossil Finds Procedure is included in the PIA report and provides guidelines to be followed in the event of fossil finds in the excavations. contractors and workers involved in excavating footings for example, must be informed of the need to watch for fossils and archaeological material, and the procedure to follow in the event of any fossils being found.

2. If a significant occurrence of fossil bones or shells is discovered a professional palaeontologist must be appointed to collect them and to record their contexts.

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

6.2 Archaeology

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

2. 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 Heritage Western Cape.

3. The above recommendations must be included in the Environmental Management Plan for the proposed development.

Table of Contents

1. INTRODUCTION

ACRM was instructed by Triplo4 Sustainable Solutions (Pty) Ltd, on behalf of Karpowership SA (Pty) Ltd to conduct a Heritage Impact Assessment (HIA) for the proposed Karpower Powership at the Port of Saldanha in Saldanha Bay in the Western Cape. The Karpowership will be moored alongside the Saldanha Ore Terminal jetty in Saldanha Bay, with a powerline connecting to the Eskom Blouwater Substation (Figures 1 & 2).

Figure 1 locality map indication the location of the proposed powerline route options from the jetty to the Eskom Blouwater Substation (Pether 2020).

Figure 2. Google satellite map indicating the study site/proposed pwerline route options in a regional context

2. THE DEVELOPMENT PROPOSAL

The project entails the generation of electricity from a floating mobile Powership moored in the Port of Saldanha Bay. It proposes two ships berthing during the project lifespan, a Floating Storage Regasification Unit (FSRU) and one Powership. A Liquefied Natural Gas Carrier (LNGC) carrier will supply Liquified Natural Gas to the FSRU on a short-term basis (1-2 days) in a 20-day cycle. The natural gas is pumped from the FSRU to the Powership via the development and operation of a subsea gas pipeline. The proposed design capacity for the Saldanha Powership is 415 megawatt (MW), which comprises 21 gas engines having a heat output of 18.32 MW each. From the ship, electricity will be evacuated via a 132kV transmission line over approximately 7.5kms to the Blouwater substation (Figure 3).

Three transmission line routes to the Eskom Blouwater Substation are under consideration:

- Option 1 route proceeds parallel to existing powerlines with minimal deviation.

- Option 2 differs marginally from Option 1 in the initial part of the route, but otherwise follows the Option 1 route.

- Option 3 follows the Option 1 route from the jetty but deviates from it opposite the Arcelor Mittal Saldanha Steel works where the route deviates southwards to parallel the 132 kV powerlines feeding the works. This route requires an additional small substation.

Triplo4 is the appointed independent Environmental Assessment Practitioner (EAP) responsible for facilitating environmental authorization for the proposed development.

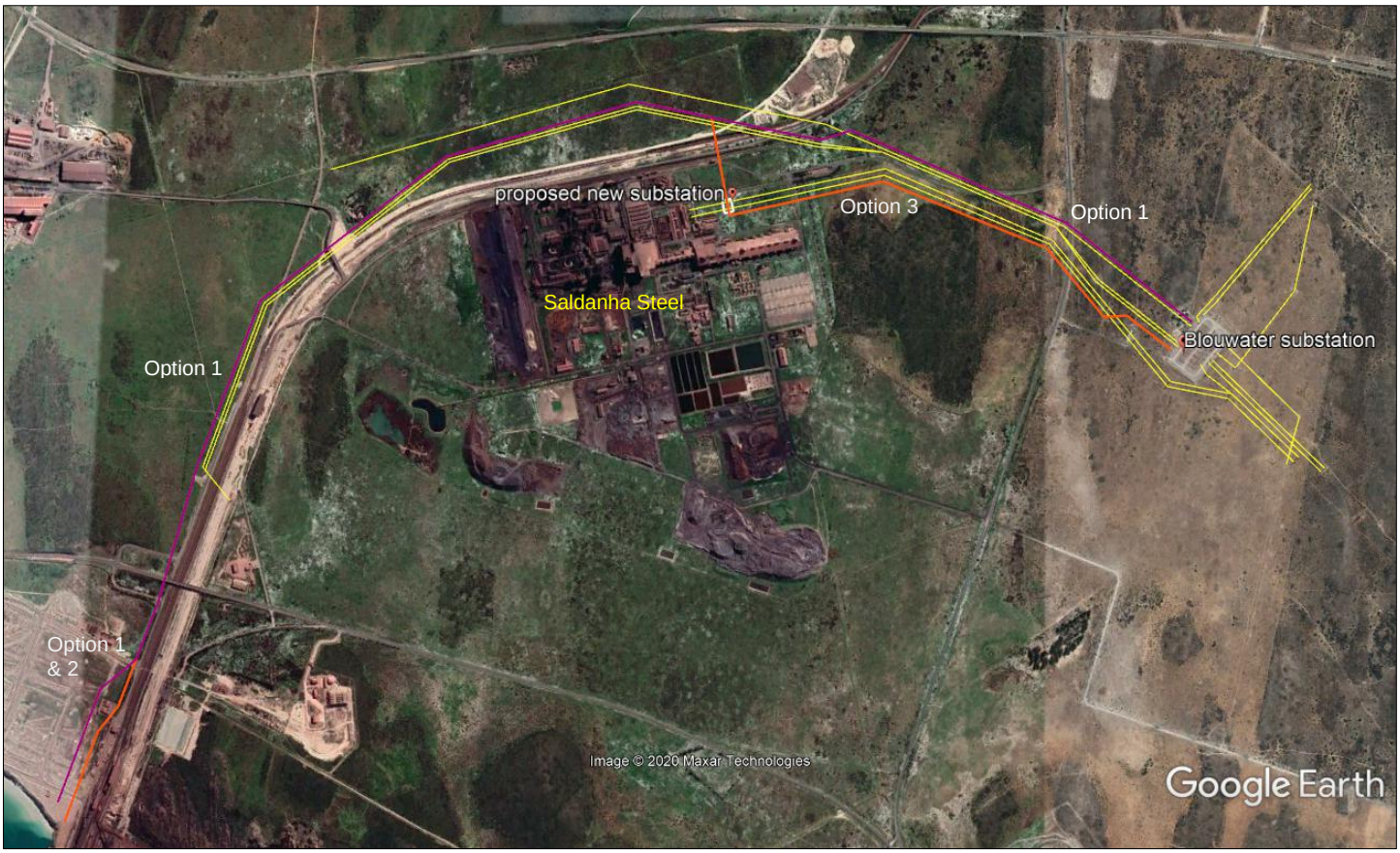

Figure 3. Google satellite map indicating the proposed 132 kV double circuit powerline, Option 1 (Purple), Option 2 (red) & Option 3 (orange). The proposed substation on the Arcelor/Mittal Steel Plant is also indicated. Yellow lines are the existing 66kV and 132 kV overhead powerlines.

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 and palaeontological resources that may be impacted by the proposed development.

- Indicate any constraints that would need to be considered in considering the development proposal.

- Recommend mitigation action.

5. DESCRIPTION OF THE RECEIVING ENVIRONMENT

Eskom overhead transmission lines, heavy industry including the Port of Saldanha, the Sishen Saldanha railway line, Saldanha Steel, Tronox, Namakwa Sands and offshore mariculture, dominate the surrounding environment. The proposed overhead transmission line will be aligned alongside existing Eskom 66 kV and 132 kV powerlines. The undulating, receiving environment is covered in mostly dense vegetation, except for when the proposed transmission line crosses roads, bridges, old agricultural land, railway lines, tailings, and quarries (Figures 4-27).

Figure 4. The Blouwater substation.

Figure 5. Route Option 1. View from the Blouwater sub-station facing west. Saldanha Steel is the background, to the left of the plate

Figure 6. Route Option 1. View facing west

Figure 7. Route Option 1. View facing south west

Figure 8. Route Option 1. View facing south west

Figure 9. Route Option 1. View facing south west

Figure 10. Route Option 1. View facing south

Figure 11. Route Option 1. View facing south

Figure 12. Route Option 1. View facing south


Figure 13. Route Option 1. View facing south


Figure 14. Route Option 1. View facing south


Figure 15. Route Option 1. View facing south

Figure 16. Route Option 1. View facing south


Figure 17. Route Option 1. View facing south

Figure 18. Route Option 1 & 2. View facing south

Figure 19. Route Option 1 & 2. View facing south

Figure 20. Route Option 1 & 2. View facing south

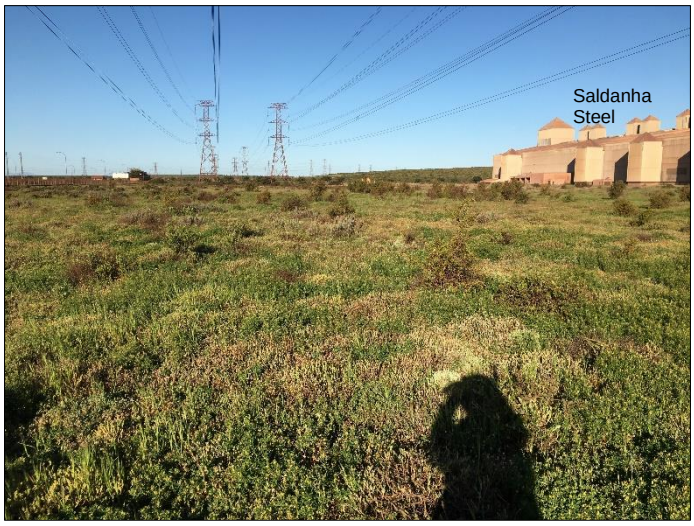

Figure 21. Proposed substation (Route Option 3)

Figure 22. Route Option 3. View facing north east

Figure 23. Route Option 3. View facing north east

Figure 24. Route Option 3. View facing north

Figure 25. Route Option 3. View facing north

Figure 26. Route Option 3. View facing north, with the Blouwater substation in the distance.

Figure 27. Route Option 3. View facing north

6. STUDY APPROACH

6.1 Method

The overall purpose of the HIA is to assess the sensitivity of palaeontological and 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 mitigation measures.

6.2 Palaeontology

The purpose of the PIA is to inform about the palaeontological sensitivities of the project area and the probability of fossils being uncovered in the subsurface and being disturbed or destroyed during the Construction Phase of the development.

The desktop PIA report (Appendix A) is based on the following:

1. A review of the relevant scientific literature.

2. Published geological maps.

3. Background information and maps supplied for the project, and

4. The author's own database and field experience of the rock units concerned

6.3 Archaeology

A walk down survey of the proposed 7.6km long transmission line (Options 1-3) was undertaken on the 21st and 22nd September 2020.

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

6.4 Constraints and limitations

Except for in the Port area, the proposed route options are mostly covered in natural vegetation, grass, and weeds, resulting in low archaeological visibility. However, it is felt that this did not materially affect the findings made during the study.

6.5 Identification of potential risks

6.5.1 Palaeontology

According to Pether (2020), buried archaeological material, such as artefacts, shell, and bone scatters, could be uncovered in the loose coversands of the Springfontyn Formation, but the overall palaeontological sensitivity of the coversand deposits in the area is classified as LOW.

The Langebaan Formation is classified to be of high sensitivity, due to previous fossil finds of significant scientific value. Most of the pylon foundations will be embedded in the compact upper Langebaan Formation, calcrete and aeolianite. This shallow depth of the excavations (between 2.0 & 2.6m) will reduce the impact, as fossil bones are overall sparse in the upper calcreted Langebaan Formation. Test pits along the powerline traverse could also unearth fossil bones.

Close to the coast, the surface has been much disturbed and no impact on the loose Witsand Formation is expected. Along the initial ~1.5 km of the route, it is however, possible that shelly beds of the Velddrif Formation may be intersected, although this is considered to be unlikely in shallow excavations envisaged (Pether 2020).

6.5.2 Archaeology

Buried archaeological remains such as stone tools, bone and shell may be uncovered during excavations for powerline footings, but overall, the archaeological risk sources are rated as being LOW.

7. ARCHAEOLOGICAL CONTEXT

Numerous surveys have been undertaken in the Saldanha Bay IDZ and surrounding area (Kaplan 1994, 1996, 1997, 1998). The majority of the resources comprise isolated tools, and occasionally dispersed (i. e. low density) scatters of Early Stone Age and Middle Stone Age tools (of *low* archaeological significance), mostly always in a highly transformed and degraded context (see also Kaplan 2006, 2010; Hart 2003; Hart & Pether 2008). Occasionally, Later Stone Age remains have also been recorded (Kaplan 2007a, b).

Exceptions are at Hoedjiespunt and Sea Harvest directly at the coast, where Middle Pleistocene archaeological occurrences and the recovery of human remains in the Langebaan Formation deposits has provided some of the earliest evidence in the world for the human exploitation of coastal resources, more than 100 000 years ago (Grine & Klein 1993; Volman 1978). Beside evidence of well-preserved bone, ostrich eggshell, ochre and MSA stone implements, the Hoedjiespunt limestone sediments in Saldanha Bay also contains evidence of early modern human about 125 000 years ago (Berger & Parkington 1995).

8. RESULTS

8.1 Palaeontology

According to Pether (2020), the proposed route options for the 132kV transmission line, from the Port of Saldanha to the Eskom Blouwater Substation, are all situated on the calcreted Langebaan Formation, beneath a thin cover of Springfontyn Formation sands. The overall palaeontological sensitivity of these loose coversands is rated as being LOW.

Excavations that penetrate the deeper calcrteised deposits of the Langebaan Formation may intercept important fossil remains, which could be of international scientific importance. Examples where important fossil finds have been recorded include Saldanha Steel (Route Option 3), Tippler 3 (Viglietti & Kaplan 2019), and in the Port Area (refer to Figure 2 in Pether 2020).

Close to the coast the (degraded) Witsand Formation dunes are underlain by the older aeolianite of the Langebaan Formation and the interbedded shelly beach deposits of the Velddrif Formation, where fossil shell beds may be encountered.

8.2 Archaeology

No archaeological remains were encountered during the field assessment (Figure 28), which comprised a walk down survey of the proposed route options (1-3). However, it should be noted that dense vegetation along the proposed transmission lines resulted in low archaeological visibility.

A scatter of fragmented white sand mussel shell (*Perna Perna*) was noted in a large, patch of disturbed sand in the Port Area (Route Option 1 & 2), but no stone tools, pottery, or any other organic remains (i. e. ostrich eggshell or bone), were found (Figure 29.)

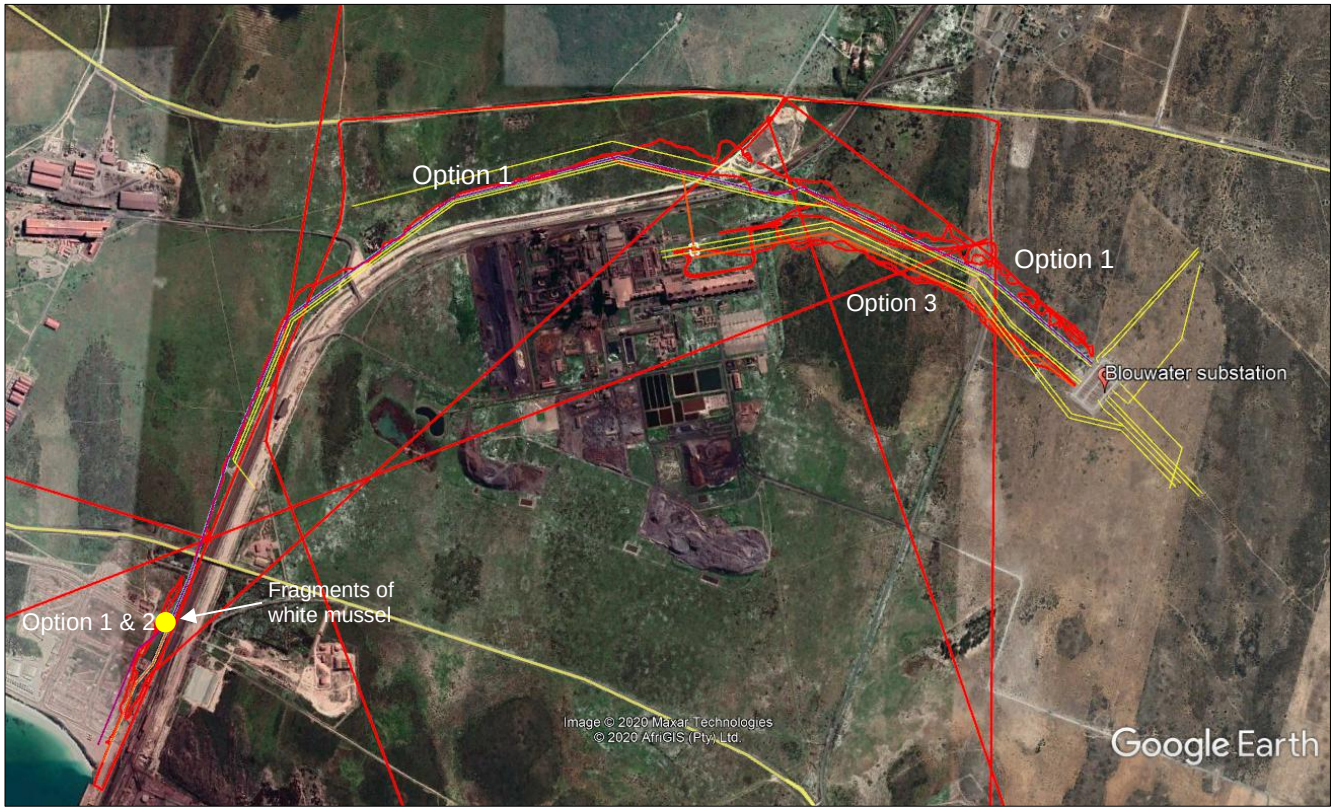

Figure 28. Track paths in red

Figure 29. Fragments of white sand mussel in a large patch of sand (Route Option 1 & 2). View facing south

9. CONCLUSION

9.1 Palaeontology

Buried archaeological material, such as artefacts, shell, and bone scatters, could be uncovered in the loose Springfontyn coversands, during excavations for powerline footings, but overall, the palaeontological sensitivity of the deposits in this area is classified as LOW.

The underlying calcreted Langebaan Formation is classified to be of HIGH sensitivity, due to previous fossil finds of significant scientific value. Isolated fossil bones, and even possibly larger concentration of bones, may be encountered in these compact deposits.

Close to the coast the surface area has been much disturbed and no impact on the Witsand Formation is expected. Along the initial ~1.5 km of the route it is possible that in places the shelly beds of the Velddrif Formation may be intersected, although this is considered to be unlikely in shallow excavations.

Farther inland the marine Uyekraal Fm. is too deep to be intersected in the pylon foundations excavations.

According to Pether (2020), the route options are not distinguished by differing palaeontological sensitivities and do not differ in their impacts.

9.2 Archaeology

Excavations for powerline footings may uncover buried Pleistocene archaeological remains such as stone artefacts, bone, and shell. Larger concentrations of bone, shell and stone tools may be recovered which would elevate the significance of the finds, but this is, considered to be unlikely.

10. RECOMMENDATIONS

Regarding the proposed Karpower Powership at the Port of Saldanha, which includes a 7.5km long overhead powerline from the Port till the Eskom Blouwater substation, the following recommendations are made.

10.1 Palaeontology

1. The Environmental Control Officer (ECO) and contractor must inform staff of the need to watch for potential fossil occurrences. A Fossil Finds Procedure is included in the PIA report and provides guidelines to be followed in the event of fossil finds in the excavations. Contractors and workers involved in excavating footings for example, must be informed of the need to watch for fossils and archaeological material, and the procedure to follow in the event of any fossils being found.

2. If a significant occurrence of fossil bones or shells is discovered a professional palaeontologist must be appointed to collect them and to record their contexts.

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

10.2 Archaeology

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

2. 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 Heritage Western Cape.

3. The above recommendations must be included in the Environmental Management Plan for the proposed development.

11. REFERENCES

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Appendix A

Palaeontological Impact Assessment desk top study, including Fossil Find Procedure