HWC CASE 20092505

HERITAGE IMPACT ASSESSMENT
PROPOSED GAS TO POWER VIA POWERSHIP AT THE PORT OF SALDANHA, SALDANHA BAY LOCAL MUNICIPALITY, SALDANHA BAY, WESTERN CAPE

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

Prepared for:

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OCTOBER 2022

Executive summary

1. Introduction

ACRM was instructed by Triplo4 Sustainable Solutions (Pty) Ltd to conduct a Heritage Impact Assessment (HIA) for the proposed Gas to Power via Powership Project in Saldanha Bay in the Western Cape.

The proposed project is situated within the Port of Saldanha Bay, and in proximity to the Saldanha Bay Industrial Development Zone (SBIDZ), which was designated Special Economic Zone (SEZ) status in June 2017.

The Saldanha Bay Port was identified as a preferred location as it meets the technical requirements for the project, the project specifications, port planning and operational requirements. Additionally, the selected site is positioned within an area of the Port that will not require dredging.

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 7,5kms to the Eskom Blouwater substation.

Three potential route options and switching station location options are now being considered for the transmission line connection from the Powership to the National Grid.

The Preferred Option route proceeds from the quay and crosses the Transnet servitude just south of the MR559 flyover over the servitude, then proceeds northwards and crossing the railroad farther north to then proceed along the Preferred Option route.

The Alternative 1 Option route proceeds from the quay and skirts the western periphery of the Transnet rail, tippler, and conveyor servitude, passing north of the Saldanha Steel and crossing the railroad approaches to connect to the grid just east of the steelworks.

The Alternative 2 Option route proceeds from the quay and crosses the Transnet servitude just south of the MR559 flyover over the servitude, then proceeds south-eastwards adjacent to the MR559 and then northwards along the OP538 road to intersect the ESKOM powerlines.

A submarine gas pipeline is to be assembled incrementally at a Stringing Yard and launch way located east of the ore quay on the beach and dune area adjacent to the aquaculture pond.

The MOSSGAS Laydown and Storage Area on the beach will be used for the laydown and storage of construction materials.

A Palaeontological Impact Assessment (PIA) desktop study has also been conducted by consulting palaeontologist John Pether, while contract marine archaeologist Vanessa Maitland has conducted an Underwater Archaeological Impact Assessment (UAIA).

The PIA and UAIA form part of a wider Heritage Impact Assessment (HIA) for the proposed Gas to Power Powership Project. ACRM is responsible for writing up the integrated HIA report.

Triplo4 Sustainable Solutions is the appointed 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 heritage resources, and to avoid and/or minimise such impacts by means of mitigation measures.

The HIA has been prepared taking cognisance of the palaeontology and underwater heritage. This report provides information on the heritage aspects and impacts, for consideration by the relevant specialists, such as the socio-economic and sustainability specialist, as well as the EAP, to ensure an integrated approach and holistic assessment of the project's Environmental Impact Assessment (EIA) report.

4. Results of the study

4.1 Archaeology

A walk-down survey of the proposed transmission line route options was undertaken in September 2020, in which the following observations were made:

- No pre-colonial Stone Age archaeological heritage resources were encountered during the field assessment, which comprised a walk down survey of the Proposed Alternative Route Options 1-3.

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

4.2 Palaeontology

According to Pether (2022), 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.

4.3 Underwater archaeology

No obvious underwater cultural heritage resources were identified by Maitland (2022) during the UAIA.

5. Anticipated impacts

5.1 Archaeology

Buried archaeological remains such as stone tools, bone and marine shell may be intercepted during excavations for powerlines foundations, but overall, the anticipated impacts on Stone Age archaeological resources are rated as being LOW.

5.2 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 shallow depth, and the small footprints of the excavations for pylon foundations in the upper Langebaan Formation will reduce the impact, as fossil bones are overall sparse in these calcreted aeolianite deposits. Test pits along the powerline route, however, 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. There is, however, the possibility that shelly beds of the Velddrif Formation may be intersected, although this is considered to be unlikely in anticipated shallow excavations.

Proposed activities at the Gas Pipeline Stringing Yard and the MOSSGAS Construction Yard are not expected to have a palaeontological impact.

5.3. Underwater archaeology

The specialist UAIA found that there is a low possibility that impacts to underwater heritage could occur through the proposed Karpower project.

6. Recommendations

6.1 Archaeology

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

2. An archaeologist must monitor excavations for the proposed Stringing Yard and gas pipeline.

3. 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 (Att . Stephanie Barnardt 021 483 9695). Human remains must not be disturbed until inspected by a professional archaeologist.

6.2 Palaeontology

1. The Preferred and Alternative 1 connection routes to the existing Aurora-Saldanha Steel network entail fewer pylon foundation excavations and would be preferred, involving less subsurface disturbance. However, the route options are not distinguished by differing palaeontological sensitivities and, due to the general nature of the prediction of fossil potential, do not differ much in their overall impacts.

2. 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.

3. 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.

The above recommendation must be included in the Environmental Management Plan (EMP) 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 Gas to Power via Powership Project in Saldanha Bay in the Western Cape (Figures 1 & 2). The proposed project is situated within the Port of Saldanha Bay, and in proximity to the Saldanha Bay Industrial Development Zone (SBIDZ), which was designated Special Economic Zone (SEZ) status in June 2017.

The Saldanha Bay Port was identified as a preferred location as it meets the technical requirements for the project, the project specifications, port planning and operational requirements. Additionally, the selected site is positioned within an area of the Port that will not require dredging.

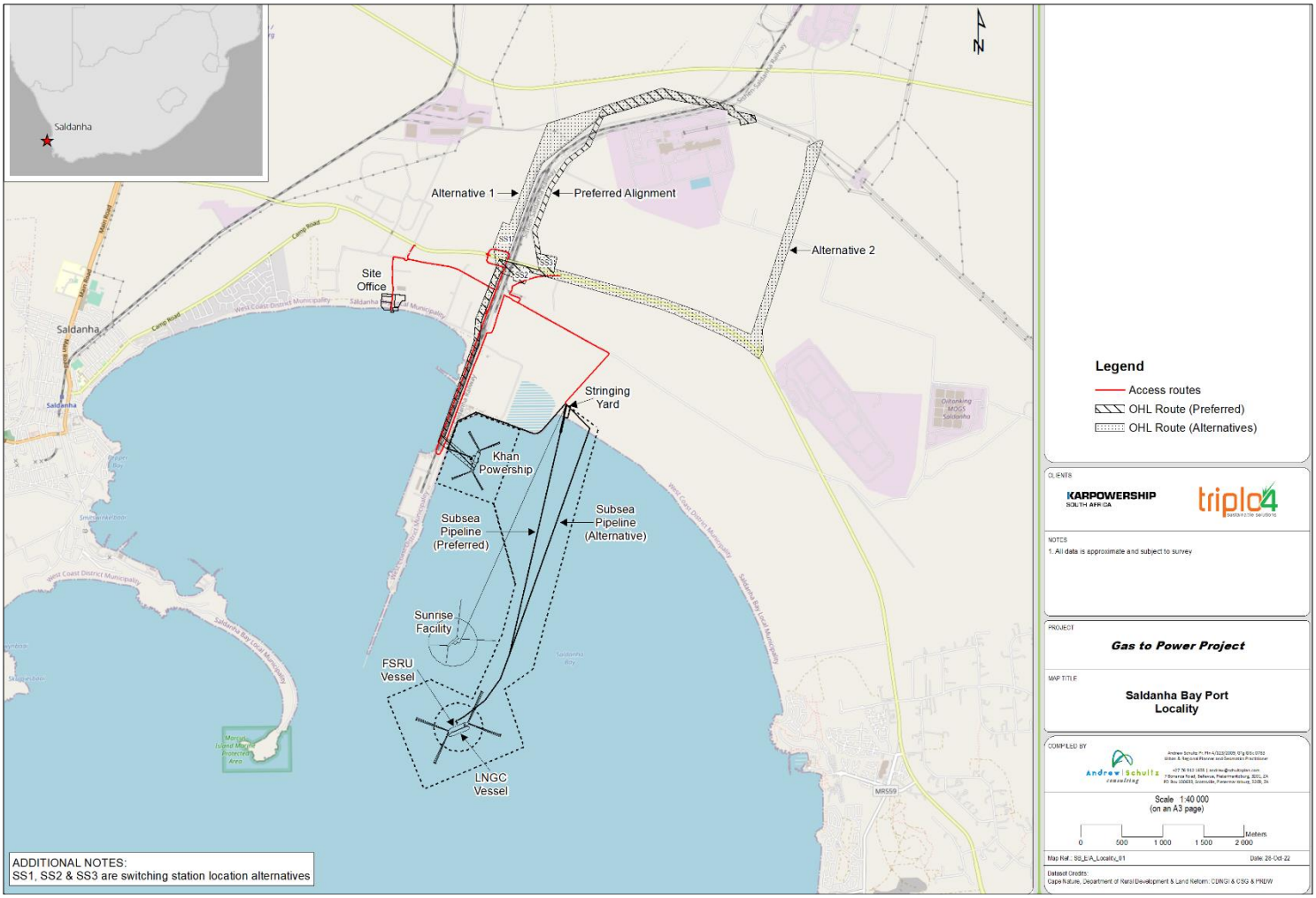

Figure 1. Locality map indicating the proposed powerline route options, from the Powership to the Eskom Blouwater Substation. The position of the proposed MOSSGAS Quay Construction Yard, Stringing Yard/Gas pipeline assembly, & Switching Stations are also indicated.

Figure 2. Google Earth 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 (Figures 1 & 2).

Three potential route options and switching station location options are now being considered for the transmission line connection from the Powership to the National Grid (Figure 3), the choice of which will depend upon the various specialist inputs and upon the landowner approvals.

The Preferred Option route proceeds from the quay and crosses the Transnet servitude just south of the MR559 flyover over the servitude, then proceeds northwards and crossing the railroad farther north to then proceed along the Preferred Option route.

The Alternative 1 Option route proceeds from the quay and skirts the western periphery of the Transnet rail, tippler, and conveyor servitude, passing north of the Saldanha Steel and crossing the railroad approaches to connect to the grid just east of the steelworks.

The Alternative 2 Option route proceeds from the quay and crosses the Transnet servitude just south of the MR559 flyover over the servitude, then proceeds south-eastwards adjacent to the MR559 and then northwards along the OP538 road to intersect the ESKOM powerlines.

The submarine gas pipeline is to be assembled incrementally at a Stringing Yard (1.36ha) and launch way located east of the ore quay on the beach and dune area adjacent to the aquaculture pond (Figure 4).

The MOSSGAS Construction Yard and Storage Area on the coast (Figure 4) will be used for the laydown and storage of construction materials.

Figure 3. Google Earth Satellite map illustrating the proposed and proposed Alternative 132kV, powerline route options, from the quay to the Eskom Bluewater substation. The yellow line is the Preferred Alternative Transmission Line (refer to Kaplan 2022). The orange line is the Proposed Alternative 2 powerline & the green line is the proposed Alternative 3 transmission line.

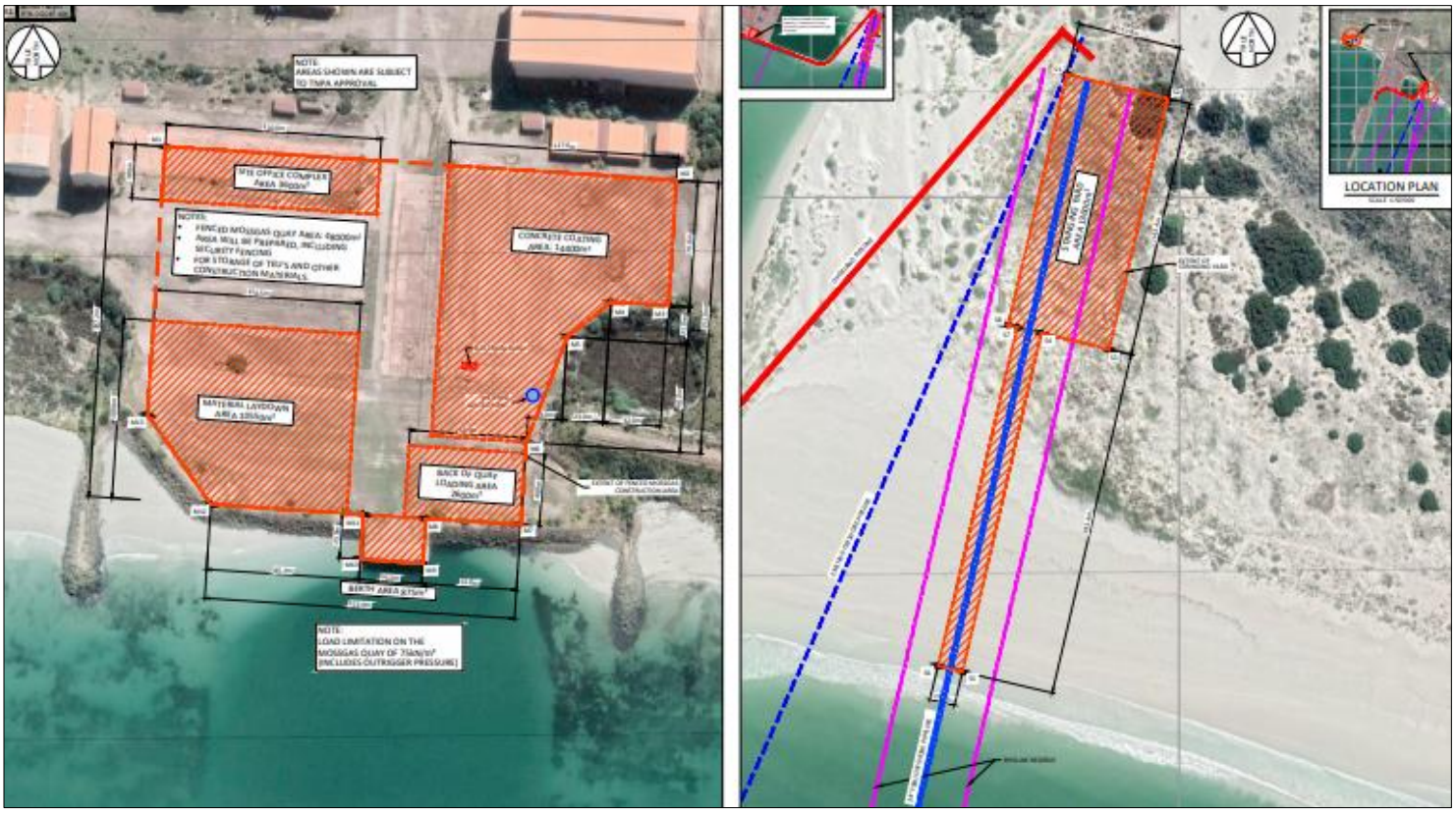

Figure 4. The submarine gas pipeline is to be assembled incrementally at a Stringing Yard & launch way located east of the ore quay on the beach and dune area adjacent to the aquaculture pond. The MOSSGAS Laydown and Storage Area will be used for the laydown & storage of construction materials (Triplo4).

3. APPLICABLE 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

Overhead powerlines, heavy industry including the Port of Saldanha, Sishen Saldanha railway line, Saldanha Steel, Tronox, Namakwa Sands and offshore mariculture, characterize the industrial landscape. 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 where the proposed powerlines cross roads, bridges, agricultural land, railway lines, tailings, and quarries (Figures 5-20).

Figure 5. The Blouwater substation (Kaplan 2020).

Figure 6. Preferred Alternative. View from the Blouwater sub- station facing west. Saldanha Steel is the background, to the left of the plate (Kaplan 2020).

Figure 7. Preferred Alternative. View facing west (Kaplan 2020).

Figure 8. Preferred Alternative. View facing south west (Kaplan 2020). Saldanha Steel is to the left of the plate

Figure 9. Preferred Alternative. View facing south west (Kaplan 2020).

Figure 10. Preferred Alternative. View facing south west (Kaplan 2020).

Figure 11. Preferred Alternative. View facing south (Kaplan 2020).

Figure 12. Preferred Alternative. View facing south (Kaplan 2020).

Figure 13. Preferred Alternative. View facing south (Kaplan 2020).

Figure 14. Preferred Alternative. View facing south (Kaplan 2020).

Figure 15. Preferred Alternative. View facing south (Kaplan 2020).

Figure 16. Preferred Alternative. View facing south (Kaplan 2020).

Figure 17. Preferred Alternative. View facing south (Kaplan 2020).

Figure 18. Preferred and Proposed Alternative 2. View facing south (Kaplan 2020).

Figure 19. Preferred and Proposed Alternative 2. View facing south (Kaplan 2020).

Figure 20. Preferred and Proposed Alternative 2. View facing south (Kaplan 2020).

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.

The HIA has been prepared taking cognisance of the palaeontology and underwater heritage. This report provides information on the heritage aspects and impacts, for consideration by the relevant specialists, such as the socio-economic and sustainability specialist, as well as the EAP, to ensure an integrated approach and holistic assessment of the project's Environmental Impact Assessment (EIA) report.

6.2 Archaeology

A walk down survey of the Preferred and proposed Alternative 1 transmission line options was undertaken on the 21st and 22nd September 2020 (Kaplan 2020).

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

6.3 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

6.4 Underwater archaeology

An Underwater Archaeological Impact Assessment (UAIA) was conducted to identify sensitive cultural heritage sites in the affected environment.

The aim of the survey was to attempt to locate, identify, evaluate and document potential underwater and cultural heritage sites within the designated project area (Maitland 2022).

The UAIA report (Appendix B) is based on the following:

1. A desktop study

2. An underwater survey

6.5 Constraints and limitations

The proposed Powerline Route Options are mostly covered in thick vegetation, grasses, and weeds, resulting in low archaeological visibility. However, this this did not materially affect the findings made during the study.

6.6 Identification of potential risks

6.6.1 Archaeology

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

6.6.2 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 (Pether 2020, 2022).

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 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 ~1.5kms of the route, it is possible that shelly beds of the Velddrif Formation may be intersected, although this is considered to be unlikely in the shallow excavations envisaged (Pether 2020, 2022).

6.6.3 Underwater archaeology

A chance exists that shipwreck material and/or shell middens may be found in the dunes and on the beach during construction of the Stringing Yard and undersea gas pipeline (Maitland 2022).

7. ARCHAEOLOGICAL CONTEXT

The Saldanha Bay Municipality has made a major contribution to the understanding of the archaeological sequence of South Africa, particularly in the last 2000 years when Khoisan herders occupied the landscape. Philip Bateman, a naval officer stationed in Saldanha Bay during the World War II, published the first survey of archaeological sites in the area, where he described shell middens and scatters of artefacts close to the shoreline from Jacobsbaai in the north down to the western end of the Langebaan Lagoon (Bateman 1946). In the 1950s, Jalmar and Ione Rudner completed various excursions along the West Coast (Rudner 1968, 1979) where they recorded numerous sites in the Saldanha Bay/Vredenburg area. The South Africa Museum later embarked on a series of systematic surveys in the 1970s which covered much of the coastline in the area (Thackeray & Cronin 1975).

Numerous surveys have been undertaken in the proposed Saldanha Bay IDZ since the early 1990s (Kaplan 1993, 1994, 1996, 1997, 1998). The majority of the archaeological resources comprised isolated tools, and occasionally ephemeral (i. e. low density) scatters of Early Stone Age (ESA) and Middle Stone Age (MSA) tools of *Low* archaeological significance, mostly always encountered in a highly transformed and disturbed context (see also Kaplan 2006, 2010; Hart 2003; Hart & Pether 2008). Occasionally, Later Stone Age (LSA) resources, including stone tools, ostrich eggshell and dispersed scatters of marine shellfish, have also been recorded (Kaplan 2007a, b).

Exceptions are at Hoedjiespunt and Sea Harvest 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 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 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 Archaeology

No pre-colonial Stone Age archaeological heritage resources were encountered during the 2020 field assessment (Kaplan 2020), which comprised a walk down survey of the Proposed Route Options 1-3 (Figure 21).

A scatter of fragmented white sand mussel shell (*Perna Perna*) was noted in a large, patch of sand in the Port Area (Figure 22), but no stone tools, pottery, or any other organic remains (i. e. ostrich eggshell or bone), were found.

Note: The Proposed Alternative 2 transmission route (refer to Figure 3) has not been physically assessed, as it follows the alignment of the MR559 and the OP538 Road and is not considered to be a sensitive archaeological landscape.

8.2 Palaeontology

According to Pether (2022), 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 (Figure 23).

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.

8.3 Underwater archaeology

No obvious underwater cultural heritage resources were, identified during the underwater archaeological survey (Maitland 2022).

The UAIA found that there is a low possibility that impacts to underwater heritage could occur through the proposed development (Maitland 2022).

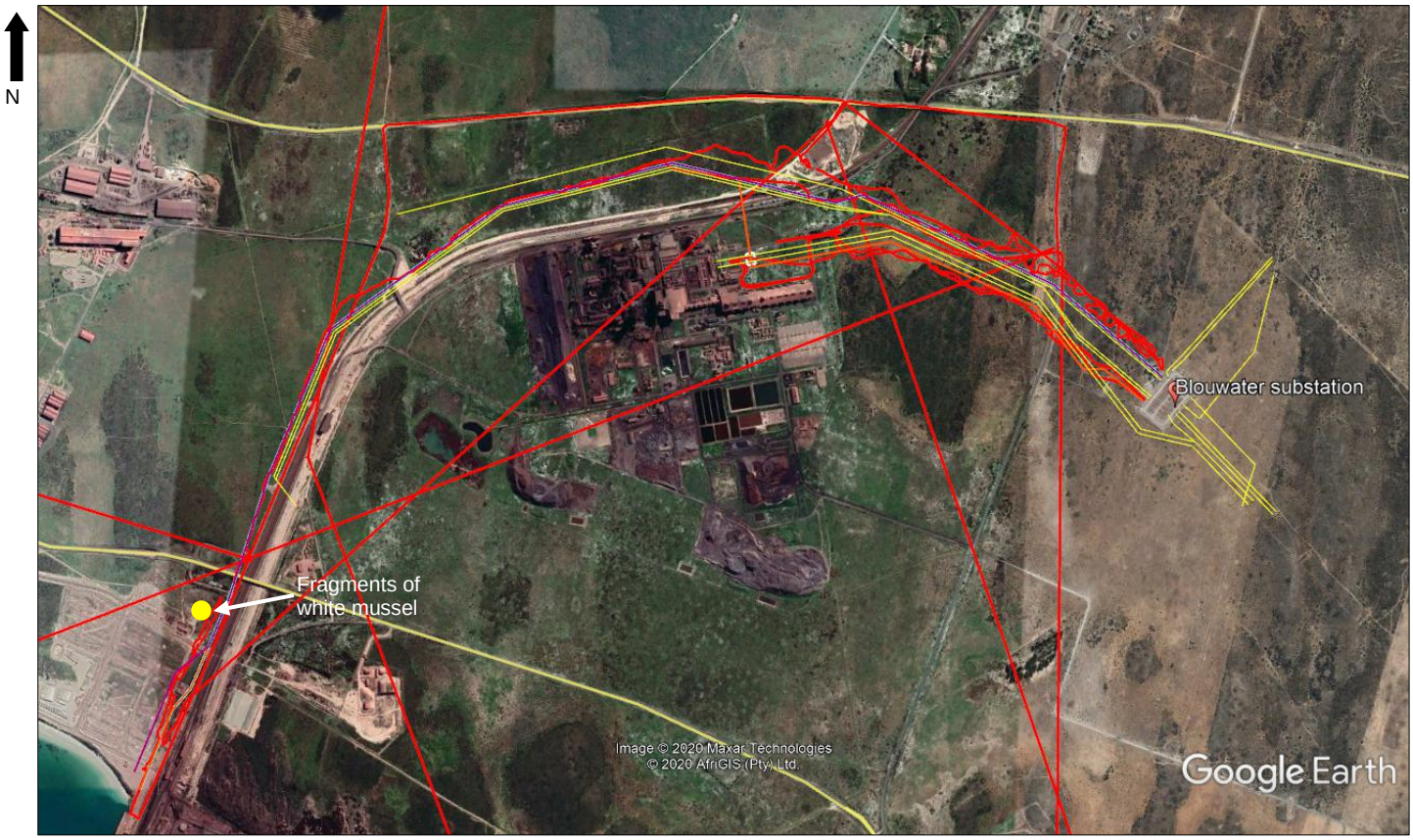

Figure 21. Track paths in red (Kaplan 2020).

Figure 22. Fragments of white sand mussel in a large, disturbed patch of sand were Recorded in the Port Area. View facing south.

Figure 23. Known fossil bone finds in the Saldanha Bay IDZ (Pether 2022).

9. IMPACT CRITERIA – CONSTRUCTION PHASE

9.1 Irreplaceable loss of resources

Without mitigation and rescue of unearthed fossils there will be a COMPLETE LOSS OF RESOURCES within the footprints of the development (Pether 2022:17).

9.2 Reversibility

Palaeontological resources are unique, and their loss is IRREVERSIBLE (Pether 2022:17).

10 CUMULATIVE IMPACT

Regarding Cumulative Impacts associated with the Karpower Gas to Power Powership Project, the following comparable project has been assessed:

▪ Archaeological Impact Assessment, for the Proposed Combined Cycle Gas Turbine (CCGT) Power Plant on a Portion of the Remainder of the Farm Langeberg 188 and associated infrastructure across a number of Farm Portions in the Saldanha Bay Local Municipality, West Coast District Municipality, Western Cape Province (Kruger 2016).

The Cumulative Impact is rated as being Low

According to Pether (2022:17), (The) `Cumulative Impact is the inevitable and permanent loss of fossils and the associated scientific implications. Diligent and successful mitigation contributes to a positive cumulative impact as the rescued fossils are preserved and accumulated for scientific study. Even though just a very minor portion of the bone fossils exposed in coastal excavations has been seen and saved, the rescued fossils have proved to be of fundamental scientific value'.

11. CONCLUSION

11.1 Archaeology

The results of the study indicate that the proposed Gas to Power Powership Project in the Port of Saldanha Bay does not pose a significant threat to local archaeological heritage resources. Excavations for powerline foundations could possibly uncover buried archaeological resources such as stone artefacts, bone, and shell.

Shipwreck remains and shell middens may be uncovered during excavations for the Stringing Yard Construction Area, and undersea gas pipeline (Maitland 2022).

From an archaeological perspective however, there are no fatal flaws and provided that the recommendations made are implemented, there are no objections to the authorisation of the proposed activities

11.2 Palaeontology

According to Pether (2022), the proposed route options are not distinguished by differing palaeontological sensitivities and do not differ in their impacts.

12. 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.

12.1 Archaeology

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

2. An archaeologist must monitor excavations for the Stringing Yard Construction Area and gas pipeline.

3. 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 (Stephanie Barnardt 021 483 9695). Human remains must not be disturbed until inspected by a professional archaeologist.

12.2 Palaeontology

1. The Preferred and Alternative 1 connection routes to the existing Aurora-Saldanha Steel network entail fewer pylon foundation excavations and would be preferred, involving less subsurface disturbance. However, the route options are not distinguished by differing palaeontological sensitivities and, due to the general nature of the prediction of fossil potential, do not differ much in their overall impacts.

2. 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.

3. 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.

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

13. REFERENCES

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Appendix A

Palaeontological Impact Assessment desk top study, including Fossil Find Procedure

Appendix B:

Underwater Archaeological Impact Assessment