

HERITAGE IMPACT ASSESSMENT: PROPOSED EXPANSION AND UPGRADE OF THE MACASSR WASTEWATER TREATMENT WORKS, CITY OF CAPE TOWN, WESTERN CAPE

Required under Section 38(8) of the National Heritage Resources Act (No. 25 of 1999)

HWC Case No.: HWC23100903SB1010

Report for:

Zutari (Pty) Ltd

P.O. Box 494, Cape Town, 8000

Email: Corlie.Steyn@zutari.com

On behalf of:

City of Cape Town



Dr Jayson Orton

ASHA Consulting (Pty) Ltd

40 Brassie Street, Lakeside, 7945

Tel: (021) 788 1025 | 083 272 3225

Email: jayson@asha-consulting.co.za

1st draft: 29 March 2024

Final report: 11 September 2024

SUMMARY

1. Site Name

Macassar Waste Water Treatment Works (WWTW)

2. Location

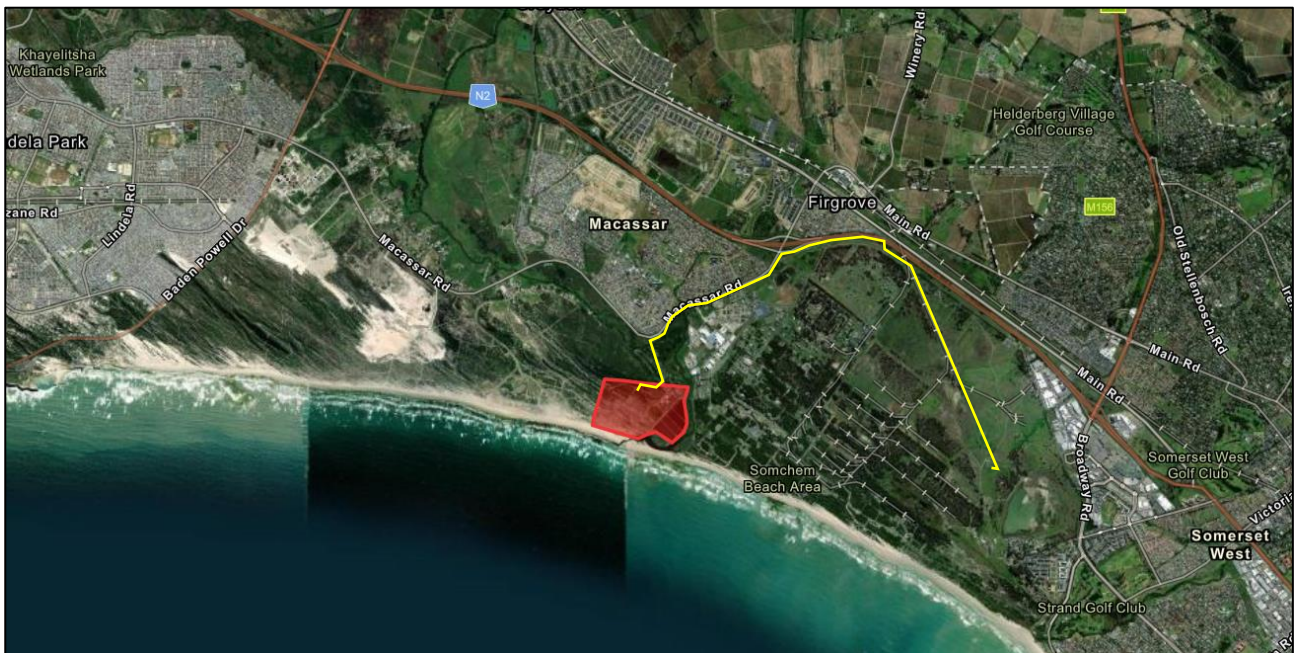
Off Tie Road, Macassar

Centre point at S34° 04' 34.4" E15° 45' 53.7".

The bulk of the WWTW project will occur on erf 1205, but erf 703 and erf 708 are also involved. The electricity cable will cross the following properties:

- | | |
|---|--------------|
| • Farm Zandvliet RE/680 | • Erf 635 |
| • Farm Zandvliet RE/5/680 | • Erf 703 |
| • Farm 18/785 | • Erf 707 |
| • Farm 19/785 | • Erf 708 |
| • Farm Helderberg Sleeper Plantation RE/787 | • Erf RE/710 |
| • Farm Helderberg Sleeper Plantation 11/787 | • Erf RE/710 |
| • Farm 794 - Landowner | • Erf 1063 |
| • Farm RE/38/794 | • Erf 1063 |
| • Farm RE/43/794 | • Erf 1209 |
| | • Erf 7453 |

3. Locality Plan

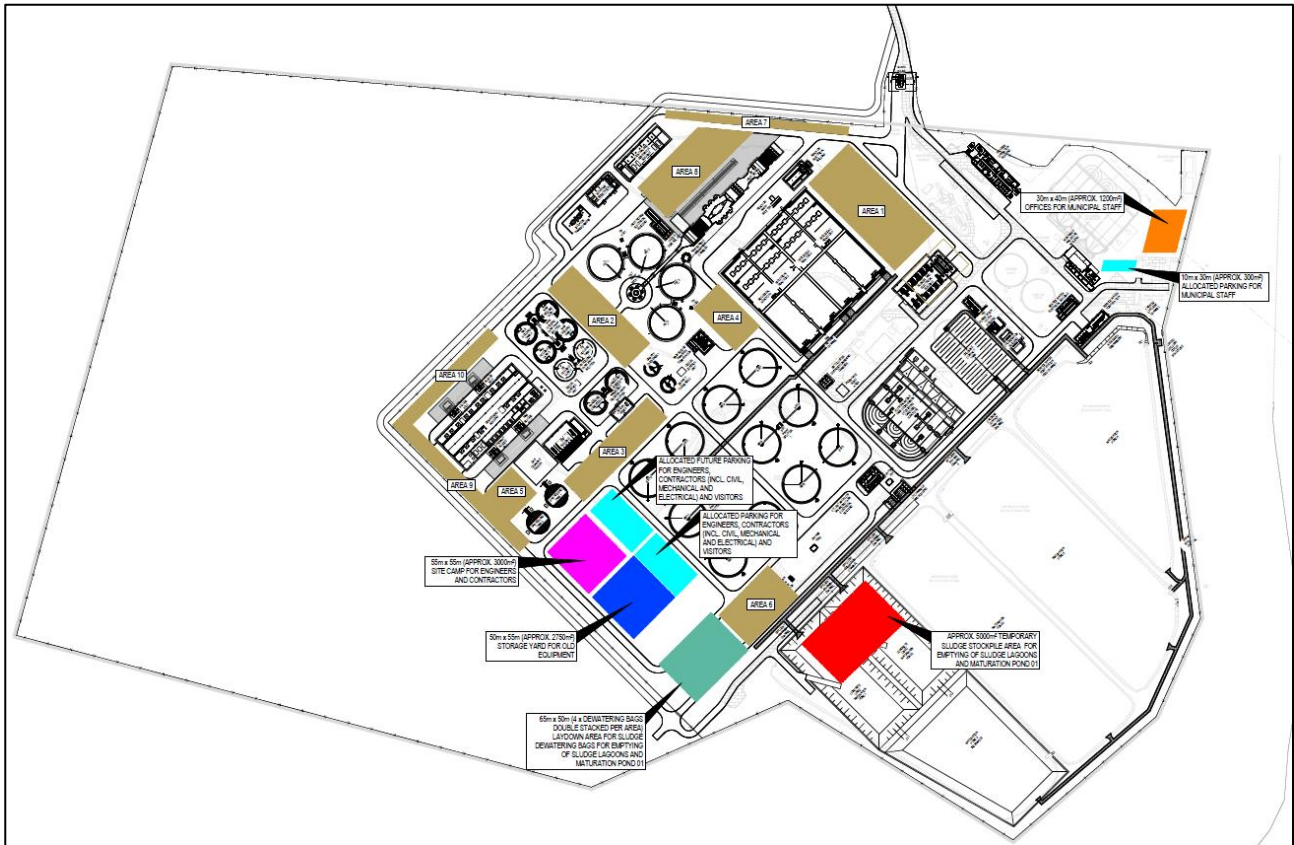


Red polygon shows erf 1205.

Yellow line shows the cable route

4. Description of Proposed Development

It is proposed to expand and upgrade the Macassar WWTW using new technology and an expanded layout. The figure below shows the layout in the central and eastern part of the erf. It is also proposed to construct a new electrical cable linking the WWTW to the substation at Paardevlei to the east.



5. Heritage Resources Identified

At the WWTW the possibility of encountering buried fossils was identified as the primary potential impact. These may occur within the dune sand but are most likely to occur in the underlying Langebaan (aeolianite) and Springfontyn (sand) Formations, and these would be categorized as of very high palaeontological sensitivity. Fossils in these formations are rare and sparsely distributed and, as a result, are of high cultural significance.

Large numbers of Early Stone Age artefacts had previously been recorded within the Paardevlei precinct along the powerline route but a recent survey yielded very few in this same area. Nonetheless, the possibility that artefacts are now buried or covered by grass is real and an impact is thus possible.

The natural dune landscape and its covering of Cape Flats Dune Strandveld vegetation was also identified as a heritage resource.

6. Anticipated Impacts on Heritage Resources

Fossils may be damaged or destroyed during excavations for the project.

Stone artefacts may be damaged or destroyed during excavations for the project.

The dune landscape will be reduced in size as a small area of intact dunes with Cape Flats Dune Strandveld vegetation will need to be destroyed.

7. Recommendations

It is recommended that the proposed expansion of the Macassar WWTW be authorised, but subject to the following recommendations which should be included as conditions of authorisation:

- The Fossil Chance Finds Procedure must be included in the EMPr for the project;
- A Workplan should be in place so that collection of fossils can commence immediately as and if required;
- A palaeontologist must be contracted to monitor the excavation work on the WWTW site;
- Disturbance of the dunes outside the project footprint must be minimised;
- An archaeologist must be contracted to monitor the grubbing (with a focus on WWTW site and Paardevlei precinct);
- A Workplan should be in place so that collection of artefacts can commence immediately as and if required;
- A decision will need to be taken during the monitoring process as to whether enough material is present to warrant retention of a collection, as well as the analysis, curation and reporting of the finds;
- At minimum a photographic record and description of the material and its context should be captured; and
- If any fossils, archaeological material or human burials are uncovered during the course of development then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist (if not present on site at the time). Such heritage is the property of the state and may require excavation and curation in an approved institution.

8. Author/s and Date

Heritage Impact Assessment: Jayson Orton, ASHA Consulting (Pty) Ltd, 29 March 2024
Palaeontological specialist study: Graham Avery, March 2024.

Glossary

Holocene: The geological period spanning the last approximately 10-12 000 years.

Hominid: a group consisting of all modern and extinct great apes (i.e. gorillas, chimpanzees, orangutans and humans) and their ancestors.

Later Stone Age: Period of the Stone Age extending over the last approximately 20 000 years.

Middle Stone Age: Period of the Stone Age extending approximately between 200 000 and 20 000 years ago.

Abbreviations

AECI: African Explosives & Chemical Industries

APHP: Association of Professional Heritage Practitioners

ASAPA: Association of Southern African Professional Archaeologists

BA: Basic Assessment

CRM: Cultural Resources Management

DEA&DP: Department of Environmental Affairs and Development Planning

ECO: Environmental Control Officer

EMPr: Environmental Management Program

GPS: global positioning system

HIA: Heritage Impact Assessment

HWC: Heritage Western Cape

LSA: Later Stone Age

MSA: Middle Stone Age

NCW: Not Conservation Worthy

NEMA: National Environmental Management Act (No. 107 of 1998)

NHRA: National Heritage Resources Act (No. 25 of 1999)

NID: Notification of Intent to Develop

PPP: Public Participation Process

SAHRA: South African Heritage Resources Agency

SAHRIS: South African Heritage Resources Information System

WWTW: Wastewater Treatment Works

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1. INTRODUCTION

ASHA Consulting (Pty) Ltd was appointed by Zutari (Pty) Ltd to conduct an assessment of the potential impacts to heritage resources that might occur through the proposed upgrade and expansion of the Macassar Wastewater Treatment Works (WWTW) located adjacent to the coastline and Eerste River estuary at Macassar, City of Cape Town (Figure 1). A centre point for the proposed work at the WWTW is S34° 04' 34.4" E15° 45' 53.7". The project also includes an electricity supply cable which will run between the WWTW and a substation at Paardevlei located at S34° 04' 57.0" E15° 48' 26.4".

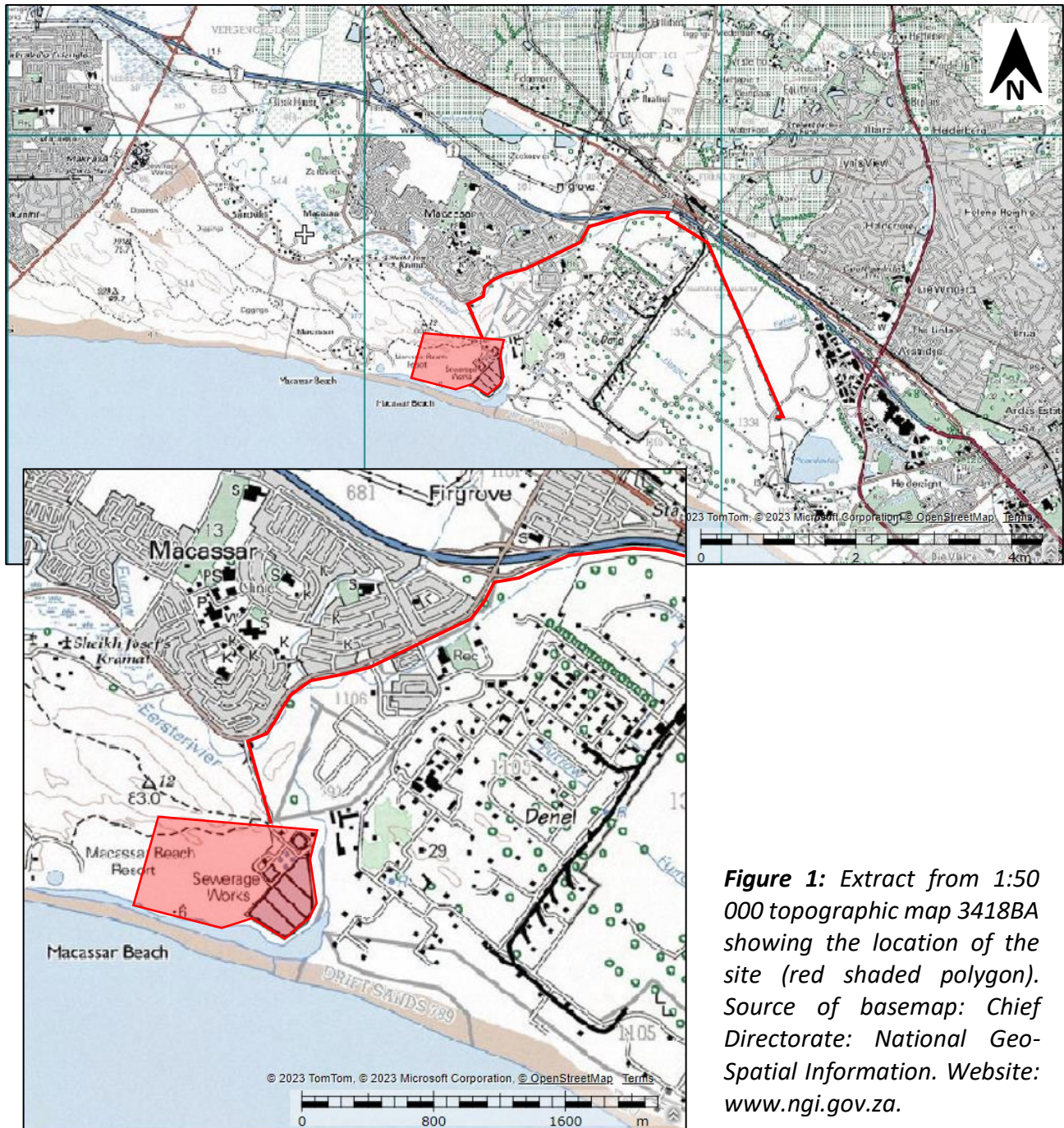


Figure 1: Extract from 1:50 000 topographic map 3418BA showing the location of the site (red shaded polygon). Source of basemap: Chief Directorate: National Geo-Spatial Information. Website: www.ngi.gov.za.

The bulk of the WWTW project will occur on erf 1205, but erf 703 and erf 708 are also involved (Figure 2). The electricity cable will cross the following properties:

- Farm Zandvliet RE/680
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- Erf 703
- Erf 707
- Erf 708
- Erf RE/710
- Erf RE/710
- Erf 1063
- Erf 1063
- Erf 1209
- Erf 7453



Figure 2: Aerial view of the Macassar area showing the location of the three erven involved in the proposed WWTW upgrade (yellow = erf 1205, red = erf 703, orange = erf 708).

1.1. The proposed project

1.1.1. Project description

The CoCT proposes to upgrade and refurbish the existing Macassar WWTW process units and amenities. The proposed development footprint will be located within the boundaries of the property and on portions of the site within the 1:50 year flood line and balance of site in the 1:100-year flood line, and some of the construction activities (limited) proposed might occur within 32m of the Eerste River. The main purpose of the proposed project is to implement the already authorised upgrade of the WWTW, the construction of which has already commenced. However, due to the time that has passed since the approval in 2016, new design engineers have been appointed to finalise the detailed design, which engineers have identified alternative technology options that will enable the works to run more efficiently and improve the quality of the effluent being discharged to the estuary.

Scope of Works: The current proposal is to refurbish and improve process units and facilities of the existing Macassar WWTW. The work is proposed to achieve improved treatment of the wastewater and improved operation of the works, for the liquid and sludge process stream. The current proposal will result in an increased operational capacity for the Macassar WWTW to 80ML/d (average dry weather flow). Further to this, the work is proposed almost entirely within the boundaries of the existing WWTW property (erf 1205), but a small section of pipeline goes into erf 703 and the new guard hut will be built along Tie Road on erf 708. See Figure 3 for a layout.

The scope of the current proposal at the WWTW is as follows:

- 1. Inlet Works:** New elevated inlet works and a primary sludge handling facility will be constructed
- 2. Primary Settling Tank Splitter:** A new primary settlement tank splitter to split the flow to the new primary settling tanks
- 3. Primary Settling Tanks (PSTs):** New PSTs
- 4. Reactor Flow Splitter:** A new reactor flow splitter to split the flow to new biological reactors. The structure will also contain a controlled and passive overflow outlet which will convey flow to the offline balancing tank.
- 5. Biological Reactors:** New reactor modules with the UCT process as the base configuration and the option to switch to a Modified Ludzack-Ettinger (MLE) process
- 6. Offline Balancing Tank:** Modifying and refurbishing the existing biological reactor into an offline balancing tank. Flows coming into the works which are in excess of the PWWF and will include a passive overflow from the Inlet Works or the Reactor
- 7. Secondary Settling Tanks Splitter:** New secondary settling tank splitters to split the flow into the new secondary settling tanks
- 8. Secondary Settling Tanks (SSTs):** New secondary settlement tanks with sloped bottom floors
- 9. Effluent Conveyance Channels:** Will comprise of an outlet channel to collect the treated effluent from the SST's and direct the flow into the disinfection system. It also comprises of channels from the disinfection system to the river and a series of bypass channels and outlets to the maturation ponds
- 10. Disinfection:** A hybrid system of gas chlorination and UV disinfection. Effluent passing through the disinfection system will pass back into the effluent conveyance channel
- 11. Primary Sludge Screening Facility:** New primary sludge screening facilities will be constructed.

- 12. Gravity Thickeners:** Primary sludge will be treated through thickening in new gravity thickeners
- 13. Anaerobic Digesters:** New mesophilic anaerobic digesters
- 14. Waste Activated Sludge (WAS) Holding Tanks:** New WAS holding tanks to store waste activated sludge
- 15. Primary Sludge (PS) Holding Tanks:** New PS holding tanks to store primary sludge
- 16. Dewatering Building:** PS will be thickened on linear screens followed by the PS and the WAS being dewatered via belt presses
- 17. Sludge Silos:** Sludge silos to store the primary and secondary sludge cake before disposal off site
- 18. Main Sludge Transfer Pump Station:** This building will host three types of pump systems, namely to pump primary sludge from the primary sludge screening facility to the gravity thickeners, pump thickened sludge from the gravity thickeners to the anaerobic digesters and pump waste activated sludge from the bioreactors to the WAS holding tanks
- 19. Return Activated Sludge (RAS) Pump Station:** A RAS pumpstation to pump sludge from the under flow of SSTs back into the biological reactors
- 20. Scum Pump Station:** A scum pumpstation to pump scum from PST's, Reactors and the SST's to the Anaerobic Digesters
- 21. Return Flow Pump Station:** A return flow pumpstation to pump sewage back to the inlet works.
- 22. Blower Building:** A new blower facility to house the aeration equipment, including blowers, compressors and other necessary equipment required for aeration.
- 23. Boiler House Facility:** A new boiler house facility, with a steam boiler system
- 24. Gas Holding Tanks:** New gas storage tanks, with gas cleaning facility
- 25. Chlorination building:** A new chlorination building will be required for operation of the chlorine disinfection facilities
- 26. Service water pump station:** A new service water pumpstation for treated effluent reticulation network (wash water) to be used for mechanical equipment and on-site requirements
- 27. Treated sewage effluent (TSE) infrastructure:** Will comprise a new TSE pump station and filter building, used to pump treated effluent to off-site users
- 28. Ancillary Structures:** The construction of small concrete structures including flow diversion, flow division, flow measurement, collection chambers and outlet structures
- 29. MV Substation:** A new MV substation for onsite MV electrical requirements
- 30. Centralised Generator Building:** A new centralised Generator building which will house diesel generators
- 31. Electrical Buildings:** New MCC buildings housing all MCC and energy generation and electrical infrastructure for process units on site. This will comprise of several buildings across the site. Some of the other electrical infrastructure will be incorporated into the footprint of the process unit or process building.
- 32. Combined Heat and Power Building:** New building housing an internal combustion engine which generates electricity from the Biogas for onsite use. The infrastructure also includes a gas engine collector substation.
- 33. Weighbridge:** A new weighbridge with a facility to house the control needed for the weigh bridge
- 34. Process Operations Building:** A new two storey administration building which will comprise of a reception area, laboratory, offices, control room, canteen and kitchenette, board rooms and laundry on the ground floor. The second floor will include offices, storage, kitchenette and eating area, ablutions, boardroom and a braai area.

- 35. Workshop and store Building:** A new two storey workshop and store facility which will have storage area, workshop area, kitchenette and eating area and ablutions on the ground floor. The second floor will include offices and ablution facilities
- 36. Guard House:** A new guard house facility which will house security personnel, the facility will include ablution facilities
- 37. Security Hut:** A new security hut located at the entrance of the WWTW main access road
- 38. Site Clearance and Bulk Earthworks:** Site to be cleared to make provision for the construction of new buildings, process structures, roads and other civil infrastructure. Bulk earthworks will be required for certain areas to level out dunes and to create platforms.
- 39. Flow Diversions and Demolition:** Flow to be diverted to keep the existing plant in operation during construction of the upgrade. Flow to be diverted to the new infrastructure after completion. Decommissioning and demolishment of older process units and older buildings, namely inlet works, secondary settling tanks and associated ancillary structures, 1 x biological reactor, 2 x RAS pumpstation buildings, associated ancillary structures, chlorine contact tank, dewatering building, sludge silo, guard house, inlet works MCC, administration building, workshop building, board rooms, chlorine building, wash water building and generator building.
- 40. Interconnecting Pipework:** The interconnecting pipework associated with directing flow through the new structures and connecting to the existing structures. It will also include the pipelines which will serve as overflow or emergency bypass pipelines.
- 41. Roadworks:** Main access road (tarred), internal roads (paved and gravel) and public road to beach (gravel)
- 42. Stormwater Drainage:** New stormwater drainage systems that includes pipes, channels, inlet catchments and head walls to direct surface water off site
- 43. Potable Water Reticulation:** New potable water network for onsite requirements
- 44. Wash water Reticulation:** New wash water reticulation network for onsite use, which includes use by mechanical equipment and on-site irrigation
- 45. Onsite sewage Reticulation:** New onsite sewage reticulation network to return sewage the inlet works
- 46. Fencing:** A new access road fence and on-site fence
- 47. Maturation Pond Refurbishment:** Cleaning and minor modifications to the existing ponds including the concrete lining of one of the ponds. The ponds modification will also include a new effluent channel and internal modifications to allow flow in the ponds to be diverted through each of the respective ponds.

The scope of the electricity supply cable is as follows:

1. 2 x 11 kV MV Cables (with a distance of 300mm apart) and a length of 6,941m;
2. Construction of the cables will require approx. trench depth of 1m and width of 1m with a buffer of 500mm offset either side of the proposed route;
3. The route follows the previous Eskom overhead line / cable route and then follow the existing roads heading up to the works;
4. Sections of the proposed route falls within a road servitude;
5. The River crossing at the Eerste River will either be via a road / pipe bridge crossing or drilling underneath the river.



Figure 3: Proposed layout of the expanded Macassar WWTW (yellow). For reference, the red polygon shows the fence line of the existing WWTW. The proposed electric cable is shown in turquoise.

1.1.2. Identification of alternatives

A previous NID application was made and approved for the expansion of the Macassar WWTW in 2014. There have been significant advances in technology since then, and now that the project is due to commence it was decided to alter the proposal to accommodate the newer technology and thus improve the outcome. This means that the current proposal is the best option and no other alternative development options are deemed feasible. As such, the only alternative for assessment is the No-Go option in which the current WWTW will remain as is. No options for the electricity cable are being considered as the proposed line follows roads and an existing overhead route and is considered most feasible.

1.1.3. Aspects of the project relevant to the heritage study

All aspects of the proposed development are relevant, since excavations for foundations and/or services may impact on archaeological and/or palaeontological remains, while all above-ground aspects create potential visual (contextual) impacts to the cultural landscape and any significant heritage sites that might be visually sensitive.

1.2. Terms of reference

ASHA Consulting was asked to:

- Describe regional and local features of the receiving environment;
- Conduct desktop research;
- Conduct a field survey to search for sensitive areas and sites of heritage significance;
- Map sensitive features and provide spatial data to inform the final project layout;
- Assess the potential impacts on identified heritage resources within a Heritage Impact Assessment (HIA) report that complied with the requirements of both the NHRA and Appendix 6 of the NEMA EIA regulations;
- Identify relevant legislation and legal requirements; and
- Provide recommendations on possible mitigation measures and management guidelines.

A Notification of Intent to Develop (NID) was submitted to Heritage Western Cape (HWC). They replied on 25th October 2023 as follows:

RESPONSE TO NOTIFICATION OF INTENT TO DEVELOP: HIA REQUIRED
In terms of Section 38(8) of the National Heritage Resources Act (Act 25 of 1999) and the Western Cape
Provincial Gazette 6061, Notice 298 of 2003

NOTIFICATION OF INTENT TO DEVELOP: PROPOSED WASTEWATER TREATMENT WORKS ON ERVEN 703 AND 1205, MACASSAR, SUBMITTED IN TERMS OF SECTION 38(1) OF THE NATIONAL HERITAGE RESOURCES ACT (ACT 25 OF 1999)

The matter above has reference.

Heritage Western Cape is in receipt of your application for the above matter received. This matter was discussed at the Heritage Officers Meeting held on 23 October 2023.

You are hereby notified that, since there is reason to believe that the Proposed wastewater treatment works on Erven 703 and 1205, Macassar, will impact on heritage resources, HWC requires that a Heritage Impact Assessment (HIA) that satisfies the provisions of Section 38(3) of the NHRA be submitted. Section 38(3) of the NHRA provides

*(3) The responsible heritage resources authority must specify the information to be provided in a report required in terms of subsection (2)(a): **Provided that the following must be included:***

- (a) The identification and mapping of all heritage resources in the area affected;*
- (b) an assessment of the significance of such resources in terms of the heritage assessment criteria set out in section 6(2) or prescribed under section 7;*
- (c) an assessment of the impact of the development on such heritage resources;*
- (d) an evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development;*
- (e) the results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources;*
- (f) if heritage resources will be adversely affected by the proposed development, The consideration of alternatives; and*
- (g) plans for mitigation of any adverse effects during and after the completion of the proposed development.*

(Our emphasis)

This HIA must in addition have specific reference to the following:

- Palaeontological Impact Assessment

The HIA must have an overall assessment of the impacts to heritage resources which are not limited to the specific studies referenced above.

The required HIA must have an integrated set of recommendations.

The comments of relevant registered conservation bodies; all Interested and Affected parties; and the relevant Municipality must be requested and included in the HIA where provided. Proof of these requests must be supplied.

Please note that the addition of the guard hut to the project (on erf 708) and the electricity supply cable occurred after submission of the NID but on discussion with HWC it was agreed by email (as shown below) that these aspects could be added to the HIA without submitting a new NID application. The need to include archaeological inputs along the cable route was noted so that this HIA now includes specialist studies of archaeology and palaeontology.

RE: Macassar WWTW project change



From "Stephanie Barnardt" <Stephanie.Barnardt@westerncape.gov.za>
to "Jayson Orton" <jayson@asha-consulting.co.za> and copy to 1 people

09:00:25



Good day Jayson

As the HIA still needs to be submitted, you can motivate the change and expansion of the project in the HIA and then included the AIA as now the ESA site would be impacted.

I am worried that a new NID might cause confusion. Still relevant to the WWTW project just the powerline unless the treat this as a separate project then separated NID just for the Eskom connection portion.

I will leave this decision to you and your client.

Apologies again with the delay.

Kindly note: Due to volume of queries I receive I may not be able to respond to you immediately, if you have not received a reply from within ten working days, please resend your query

Kind regards,

Application forms 2024:

[Applications Link](#)

[Notice](#)

Stephanie-Anne Barnardt-Delport
Specialist Heritage Officer (Archaeologist)
Heritage Western CapeTel: (+27) 021 829 3315

Heritage Resource Management Services
Protea Assurance Building Greenmarket Square, Cape Town

Website: www.hwc.org.za / www.westerncape.gov.za



Western Cape
Government
FOR YOU



ILifa leMveli leNtshona Koloni
Erfenis Wes-Kaap
Heritage Western Cape

1.3. Scope and purpose of the report

An HIA is a means of identifying any significant heritage resources before development begins so that these can be managed in such a way as to allow the development to proceed (if appropriate) without undue negative impacts to the fragile heritage of South Africa. This HIA report aims to fulfil the requirements of the heritage authorities such that a comment can be issued by them for consideration by the Western Cape Department of Environmental Affairs and Development Planning (DEA&DP) who will review the Basic Assessment (BA) and grant or refuse authorisation. The HIA report will outline any management and/or mitigation requirements that will need to be

complied with from a heritage point of view and that should be included in the conditions of authorisation should this be granted.

1.4. The author

Dr Jayson Orton has an MA (UCT, 2004) and a D.Phil (Oxford, UK, 2013), both in archaeology, and has been conducting Heritage Impact Assessments and archaeological specialist studies in South Africa (primarily in the Western Cape and Northern Cape provinces) since 2004 (please see curriculum vitae included as Appendix 1). He has also conducted research on aspects of the Later Stone Age in these provinces and published widely on the topic. He is an accredited heritage practitioner with the Association of Professional Heritage Practitioners (APHP; Member #43) and also holds archaeological accreditation with the Association of Southern African Professional Archaeologists (ASAPA) CRM section (Member #233) as follows:

- Principal Investigator: Stone Age, Shell Middens & Grave Relocation; and
- Field Director: Colonial Period & Rock Art.

1.5. Declaration of independence

ASHA Consulting (Pty) Ltd and its consultants have no financial or other interest in the proposed development and will derive no benefits other than fair remuneration for consulting services provided.

2. LEGISLATIVE CONTEXT

2.1. National Heritage Resources Act (NHRA) No. 25 of 1999

The NHRA protects a variety of heritage resources as follows:

- Section 34: structures older than 60 years;
- Section 35: prehistoric and historical material (including ruins) more than 100 years old as well as military remains more than 75 years old, palaeontological material and meteorites;
- Section 36: graves and human remains older than 60 years and located outside of a formal cemetery administered by a local authority; and
- Section 37: public monuments and memorials.

Following Section 2, the definitions applicable to the above protections are as follows:

- Structures: “any building, works, device or other facility made by people and which is fixed to land, and includes any fixtures, fittings and equipment associated therewith”;
- Palaeontological material: “any fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or trace”;
- Archaeological material: a) “material remains resulting from human activity which are in a state of disuse and are in or on land and which are older than 100 years, including artefacts, human and hominid remains and artificial features and structures”; b) “rock art, being any form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and which is older than 100 years, including any area within 10m of such representation”; c) “wrecks, being any vessel or

aircraft, or any part thereof, which was wrecked in South Africa, whether on land, in the internal waters, the territorial waters or in the maritime culture zone of the Republic, as defined respectively in sections 3, 4 and 6 of the Maritime Zones Act, 1994 (Act No. 15 of 1994), and any cargo, debris or artefacts found or associated therewith, which is older than 60 years or which SAHRA considers to be worthy of conservation”; and d) “features, structures and artefacts associated with military history which are older than 75 years and the sites on which they are found”;

- Grave: “means a place of interment and includes the contents, headstone or other marker of such a place and any other structure on or associated with such place”; and
- Public monuments and memorials: “all monuments and memorials a) “erected on land belonging to any branch of central, provincial or local government, or on land belonging to any organisation funded by or established in terms of the legislation of such a branch of government”; or b) “which were paid for by public subscription, government funds, or a public-spirited or military organisation, and are on land belonging to any private individual.”

Section 3(3) describes the types of cultural significance that a place or object might have in order to be considered part of the national estate. These are as follows:

- a) its importance in the community, or pattern of South Africa’s history;
- b) its possession of uncommon, rare or endangered aspects of South Africa’s natural or cultural heritage;
- c) its potential to yield information that will contribute to an understanding of South Africa’s natural or cultural heritage;
- d) its importance in demonstrating the principal characteristics of a particular class of South Africa’s natural or cultural places or objects;
- e) its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
- f) its importance in demonstrating a high degree of creative or technical achievement at a particular period;
- g) its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;
- h) its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa; and
- i) sites of significance relating to the history of slavery in South Africa.

While landscapes with cultural significance do not have a dedicated Section in the NHRA, they are protected under the definition of the National Estate (Section 3). Section 3(2)(c) and (d) list “historical settlements and townscapes” and “landscapes and natural features of cultural significance” as part of the National Estate. Furthermore, some of the points in Section 3(3) speak directly to cultural landscapes.

2.2. Approvals and permits

2.2.1. Assessment Phase

Section 38(8) of the NHRA states that if an impact assessment is required under any legislation other than the NHRA then it must include a heritage component that satisfies the requirements of S.38(3). Furthermore, the comments of the relevant heritage authority must be sought and considered by

the consenting authority prior to the issuing of a decision. Under the National Environmental Management Act (No. 107 of 1998; NEMA), as amended, the project is subject to a BA. The present report provides the heritage component. HWC is required to provide comment on the proposed project in order to facilitate final decision making by the DEA&DP.

2.2.2. Construction Phase

If archaeological or palaeontological mitigation is required prior to construction, then the appointed archaeologist or palaeontologist would need to obtain a workplan approval from HWC. This would be issued in their name. This is so that the heritage authority can ensure that the appointed practitioner has proposed an appropriate methodology that will result in the mitigation being undertaken properly.

2.3. Guidelines

HWC have issued minimum standards documents for HIAs and specialist studies. There is also a Western Cape Provincial guideline for heritage specialists working in an EIA context and which is generally useful. The reporting has been prepared in accordance with these guidelines. The relevant documents are as follows:

- Heritage Western Cape. 2016. Grading: purpose and management implications.
- Heritage Western Cape. 2019. Public consultation guidelines.
- Heritage Western Cape. 2021. Guide for Minimum Standards for Archaeology and Palaeontology reports submitted to Heritage Western Cape.
- Heritage Western Cape. 2021. Notification of Intent to Develop, Heritage Impact Assessment, (Pre-Application) Basic Assessment Reports, Scoping Reports and Environmental Impact Assessments, Guidelines for submission to Heritage Western Cape.
- Winter, S. & Baumann, N. 2005. Guideline for involving heritage specialists in EIA processes: Edition 1. CSIR Report No ENV-S-C 2005 053 E. Republic of South Africa, Provincial Government of the Western Cape, Department of Environmental Affairs & Development Planning, Cape Town.

2.4. Application timeline

The application to DEA&DP under NEMA is currently in the application phase (submitted on 11/09/2024) with final submission estimated end of November 2024.

3. METHODS

3.1. Literature survey and information sources

A survey of available literature was carried out to assess the general heritage context into which the development would be set. The information sources used in this report are presented in Table 1 with relevant dates of each source referenced in the text as needed. Data were also collected via a field survey. The data quality is suitable for the purpose of informing this report.

Table 1: *Information sources used in this assessment.*

Data / Information	Source	Date	Type	Description
Maps	Chief Directorate: National Geo-Spatial Information	Various	Spatial	Historical and current 1:50 000 topographic maps of the study area and immediate surrounds
Aerial photographs	Chief Directorate: National Geo-Spatial Information	Various	Spatial	Historical aerial photography of the study area and immediate surrounds
Aerial photographs	Google Earth	Various	Spatial	Recent and historical aerial photography of the study area and immediate surrounds
Cadastral data	CapeFarmMapper (http://gis.elsenburg.com/apps/cfm/#)	Current	Spatial	Cadastral boundaries, extents and aerial photography
Cadastral data	Chief Directorate: National Geo-Spatial Information	Various	Survey diagrams	Historical and current survey diagrams, property survey and registration dates
Background data	South African Heritage Resources Information System (SAHRIS)	Various	Reports	Previous impact assessments for any developments in the vicinity of the study area
Palaeontological sensitivity	South African Heritage Resources Information System (SAHRIS)	Current	Spatial	Map showing palaeontological sensitivity and required actions based on the sensitivity.
Background data	Books, journals, websites	Various	Books, journals, websites	Historical and current literature describing the study area and any relevant aspects of cultural heritage.
Screening Tool maps	DFFE	Current	Spatial	Potential sensitivity of the study area

3.2. Field survey

The WWTW site was subjected to a detailed foot survey on 19th September 2023. This was during spring and vegetation cover was quite dense in places, restricting ground visibility for the archaeological survey. Much of the Paardevlei section was surveyed on 2nd August 2021 for another project. It had been a very rainy winter, and the ground was waterlogged with much grass present. This restricted the visibility for the archaeological survey. Other heritage resources are not affected by seasonality. During the survey the positions of finds and survey tracks were recorded on a hand-held Garmin Global Positioning System (GPS) receiver set to the WGS84 datum (Figure 4). Photographs were taken at times in order to capture representative samples of both the affected heritage and the landscape setting of the proposed development.

The cable route was NOT surveyed on site for this project because (1) it was only proposed after completion of the fieldwork, (2) it largely follows existing disturbed areas along a road and (3) almost

all of the easternmost section (which is most relevant to archaeology) has already been surveyed recently by the writer of this report (Orton 2021).

It should be noted that the amount of time between the dates of the field inspection and final report do not materially affect the outcome of the report.

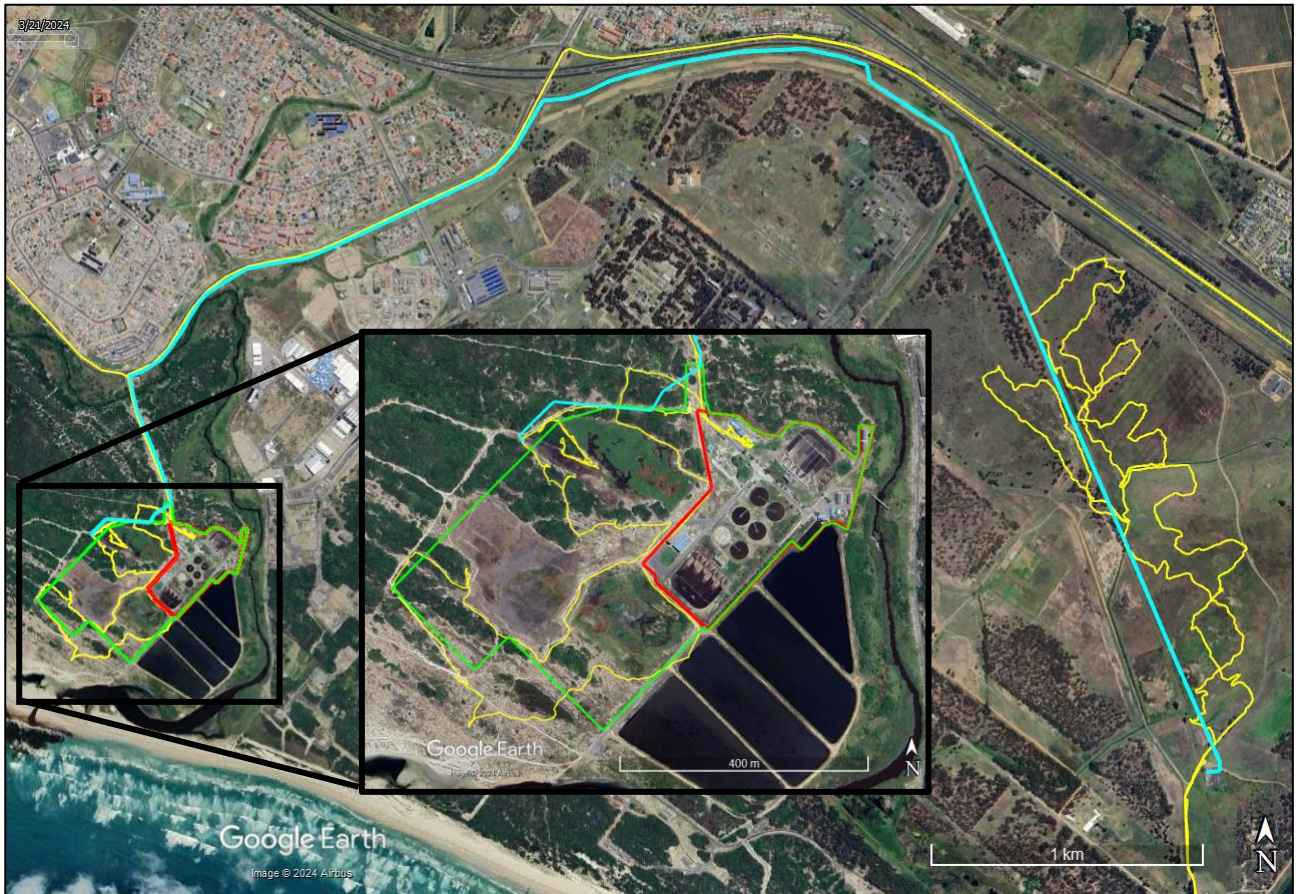


Figure 4: Aerial view of the study area (red polygon) showing the survey tracks (yellow lines).

3.3. Specialist studies

A specialist palaeontological study was commissioned as part of this HIA. It has been compiled by Dr Graham Avery and is attached as Appendix 2. The archaeological specialist work is included as a section within the HIA.

3.4. Impact assessment

For consistency among specialist studies, the impact assessment was conducted through application of a methodology supplied by Zutari.

3.5. Grading

S.7(1) of the NHRA provides for the grading of heritage resources into those of National (Grade I), Provincial (Grade II) and Local (Grade III) significance. Grading is intended to allow for the identification of the appropriate level of management for any given heritage resource. Grade I and II

resources are intended to be managed by the national and provincial heritage resources authorities respectively, while Grade III resources would be managed by the relevant local planning authority. These bodies are responsible for grading, but anyone may make recommendations for grading.

It is intended under S.7(2) that the various provincial authorities formulate a system for the further detailed grading of heritage resources of local significance but this is generally yet to happen. Heritage Western Cape (2016), however, uses a system in which resources of local significance are divided into Grade IIIA, IIIB and IIIC. These approximately equate to high, medium and low local significance, while sites of very low or no significance (and generally not requiring mitigation or other interventions) are referred to as Not Conservation Worthy (NCW).

3.6. Consultation

The draft HIA was submitted to relevant interested and affected parties as required by HWC in their response to the NID application (Section 1.2). This was done as part of the main public participation process (PPP) required under NEMA as part of the BA.

3.7. Assumptions and limitations

The field study was carried out at the surface only and hence any completely buried archaeological and/or palaeontological sites would not be readily located. Similarly, it is not always possible to determine the depth of such material visible at the surface. The dense vegetation and existing ponds over much of the site reduced visibility and made survey difficult. As such, it is necessary to make assumptions as to what archaeological and/or palaeontological heritage might be present.

The cable section between the WWTW and Paardevlei was not specifically considered on site but given the generally sandy substrate and the specialist's previous knowledge of the area, this is not considered to be a significant limitation.

Cumulative impacts are difficult to assess due to the variable site conditions that would have been experienced in different areas and in different seasons. Survey quality is thus likely to be variable. As such, some assumptions need to be made in terms of what and how much heritage might be impacted by other developments in the broader area.

4. PHYSICAL ENVIRONMENTAL CONTEXT

4.1. Site context

The site is an existing WWTW but is surrounded by a natural landscape of vegetated dunes. Aside from a small powerline and the access road to the WWTW, there is no other infrastructure present. Much of the area to the west is part of the Macassar Dunes Conservation Area (Figure 5) but sand mining also occurs there. Cattle were noted grazing on the dunes closest to the coast.

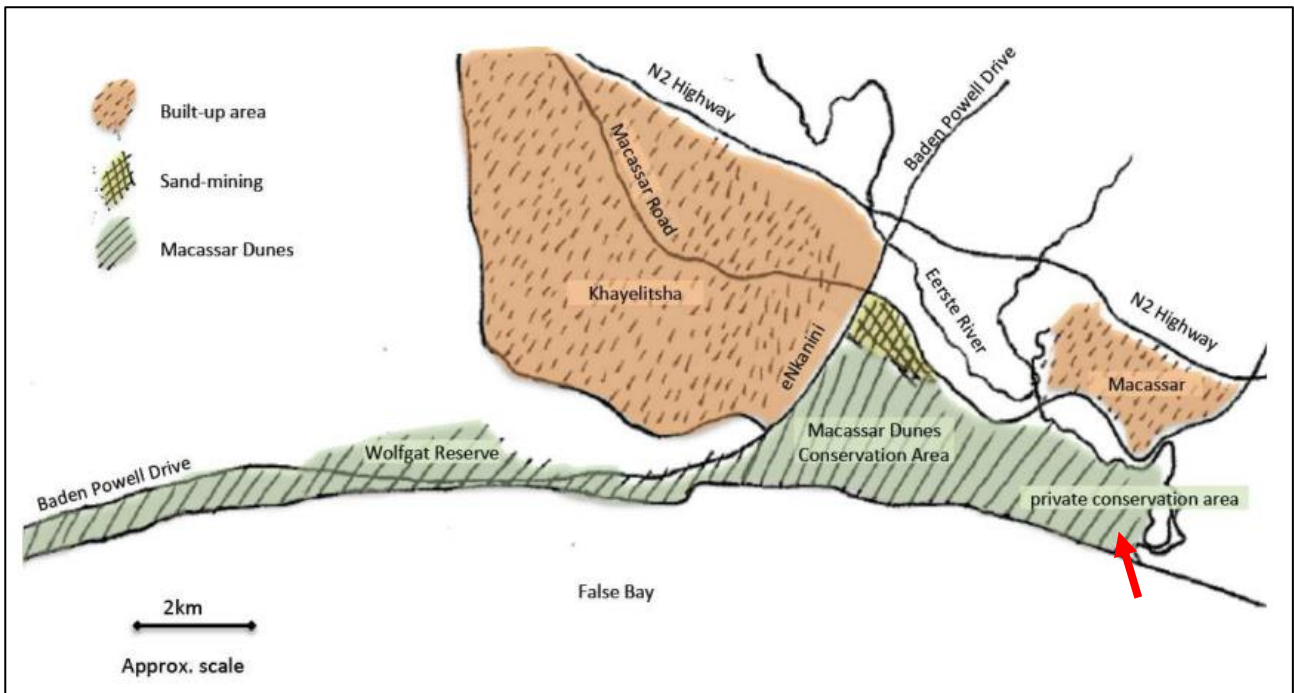


Figure 5: Map showing the local conservation areas relative to sand mining and urban areas. The Macassar WWTW is indicated by the red arrow. Source: Graham & Ernston (2012: fig. 2).

The electrical cable follows roads through Macassar with a mix of residential and undeveloped land adjacent to it. It then enters Paardevlei which is a rural area that has been identified for future urban development. Although this section is currently undeveloped, the surrounding land still bears scattered the remains of the earlier industrial and agricultural uses of the land.

4.2. Site description

The WWTW site has the existing WWTW in its eastern part with informal ponds located to the west. Much of the new development is located over these ponds, but sand dune ridges with intact Cape Flats Dune Strandveld occur between and beyond the ponds. These dune ridges run from southeast to northwest owing to the influence of the prevailing southeast wind. Around the margins of the existing WWTW and closer to the shoreline the vegetation is somewhat disturbed and rather sparse. One the dune ridges, however, it is very dense. Figures 6 to 14 show the WWTW study area.



Figure 6: Panoramic view towards the south from the northern edge of the study area. The existing WWTW is visible towards the left.



Figure 7: Looking west through the settling ponds between natural dune ridges.



Figure 8: Indigenous vegetation on a dune ridge in the western part of the study area.



Figure 9: Looking south across the southern settling pond with cattle grazing on the dunes between the pond and the beach.



Figure 10: Looking north through the western part of the study area with disturbed low ground visible (area with yellow flowering plants).



Figure 11: Looking south across the western corner of the existing WWTW.



Figure 12: View towards the northeast from near the western corner of the study area.



Figure 13: Looking towards the northwest along the south-western boundary of the study area.



Figure 14: View towards the northwest in the southern part of the study area showing an existing settling pond between the dune ridges.

The electric cable route follows existing roads as far as a point along the N2 where it turns into the Paardevlei property and follows a historical alignment.



Figure 15: View towards the northeast in the north-western part of the Paardevlei section of the cable route showing Port Jackson trees and an area where ESA artefacts were previously recorded. From Orton (2021: fig. 7).



Figure 16: View towards the southeast along the existing powerline corridor. From Orton (2021: fig. 8).

5. FINDINGS OF THE HERITAGE STUDY

This section describes the heritage resources recorded in the study area during the course of the project.

5.1. Palaeontology

The SAHRIS Palaeosensitivity Map shows the WWTW site to be of medium palaeontological sensitivity (Figure 17). The study area lies within the eastern end of the Cape Flats Dune Plume. According to Avery (2023), “the surface cover sands are mainly loose ‘white’ Holocene Witzand Formation (Cw) sand that does not normally include palaeontological material; this formation is underlain by compact, greyish to pale orange Springfontyn Formation (Cs) sand and Langebaan Formation (LI) aeolianites. Each of the deposits underlying the Witzand Formation is known to include rare, sparsely distributed palaeontological material that, if encountered, would be of very high importance”. Fossils in such contexts have been revealed at Wolfgat some 9 km to the west as well as from within the Macassar sand mines just to the northwest of the study area. Because of their rarity, such fossils are of high cultural significance and make important contributions to our understanding of past biodiversity and natural and cultural environments.

Some water worn shell fragments were noted in a heavily deflated pathway just outside the southern edge of the study area (waypoint 1435). They could relate to the raised sea level during the mid-Holocene. However, they were in the company of some fresh shell (see above) and small fragments of building rubble. Their origin is thus uncertain, and they are not considered significant.

Avery (2024) reports that the western part of the cable route is similar to the geology for the WWTW but as one moves eastwards the surface sediments peter out and the basement rocks are Malmesbury Group shales. Fossils have not yet been reported from these rocks.



Figure 17: Extract from the SAHRIS Palaeosensitivity Map showing the site (erf 1205 shown in yellow) to be of moderate palaeontological sensitivity.

5.2. Archaeology

5.2.1. Desktop study

Archaeological materials are very rarely encountered on the Cape Flats but sporadic records do occur from the coastal region. Avery (pers. comm. 2006 in Kaplan 2006) has reported Middle Stone Age (MSA) artefacts associated with the top of previously buried calcrete at one of the nearby sand mines. Rudner (1968) and Deacon (pers. comm. 1993 in Kaplan 2006) noted the presence of Later stone Age (LSA) shell scatters along the False Bay coastline and middens are known from the mouth of the Lourens River (Halkett & Hart 1996). The latter appear to have been very recently destroyed by earthworks there (personal observation). A large midden in Gordon's Bay (Van Noten 1974) is a Provincial Heritage Site (PHS).

Located 2.7 km northwest of the Macassar WWTW is the remains of the Zandvliet homestead. It was stripped after July 2006 and its remaining walls were subsequently incrementally demolished with all standing fabric seemingly gone by about 2013. The remnants of the surrounding werf are still visible on modern aerial photography though.

Most surveys in the area do not yield archaeological findings (e.g. Kaplan 2002, 2006) but Kaplan (2006) notes that he recorded one ephemeral scatter of shellfish during a previous survey. Abrahams-Willis (2001) examined an area in the urban part of Macassar and found no archaeological materials. She highlighted the fact that the location of the settlement of Sheikh Yusuf's followers in the area is not known and no evidence for it has ever been found. It is known, however, that in 1707 the houses of the "banished Macassars", which had fallen into decay, were auctioned off.

To the east of the Cape Flats Dune Plume the most commonly reported archaeological materials are Early Stone Age (ESA) artefacts. Such finds were seen by Fourie and Tomose (2011) 1.3 km north of the central part of the proposed cable route and by Halkett and Hart (1996) and Orton (2021) in the eastern part of the route. Interestingly, while Hart and Halkett (1996) saw enough material to warrant mitigation, very little was visible at the time of Orton's (2021) inspection. This area is the southern end of a well-known belt of ESA archaeology that extends from Strand through Stellenbosch and Paarl to Gouda. The first discovery of Acheulean ESA material in South Africa was in this belt and resulted in the naming of what was then known as the "Stellenbosch Culture" (Goodwin & Van Riet Lowe 1929). Other surveys in the Strand area have produced sparse ESA materials (Finnegan 2008; Finnegan & Orton 2011; Hart 2004, 2011; Orton 2004, 2008).

5.2.2. Site visit

The field survey revealed one ephemeral scatter of small shell fragments of unknown origin in a heavily deflated pathway just outside the southern edge of the study area (waypoint 1435; Figure 16). Some were waterworn, indicating a natural origin, while some were fresh. Amongst the latter, *Haliotis midae* (perlemoen), *Cymbula granatina* (granite limpet), *Scutellastra barbara/tabularis* and *Oxystele sinensis* (pink-lipped topshell) are generally more expected on anthropogenic shell accumulations. Some small fragments of building stone and cement were also present in the immediate vicinity. Given the extreme sparsity of the shell, the lack of associated finds and its uncertain origin, this location is not considered significant.



Figure 16: Aerial view showing the location of the shellfish at waypoint 1435 just southwest of the study area.



Figure 17: The location (waypoint 1435) at which some small shell fragments were found.

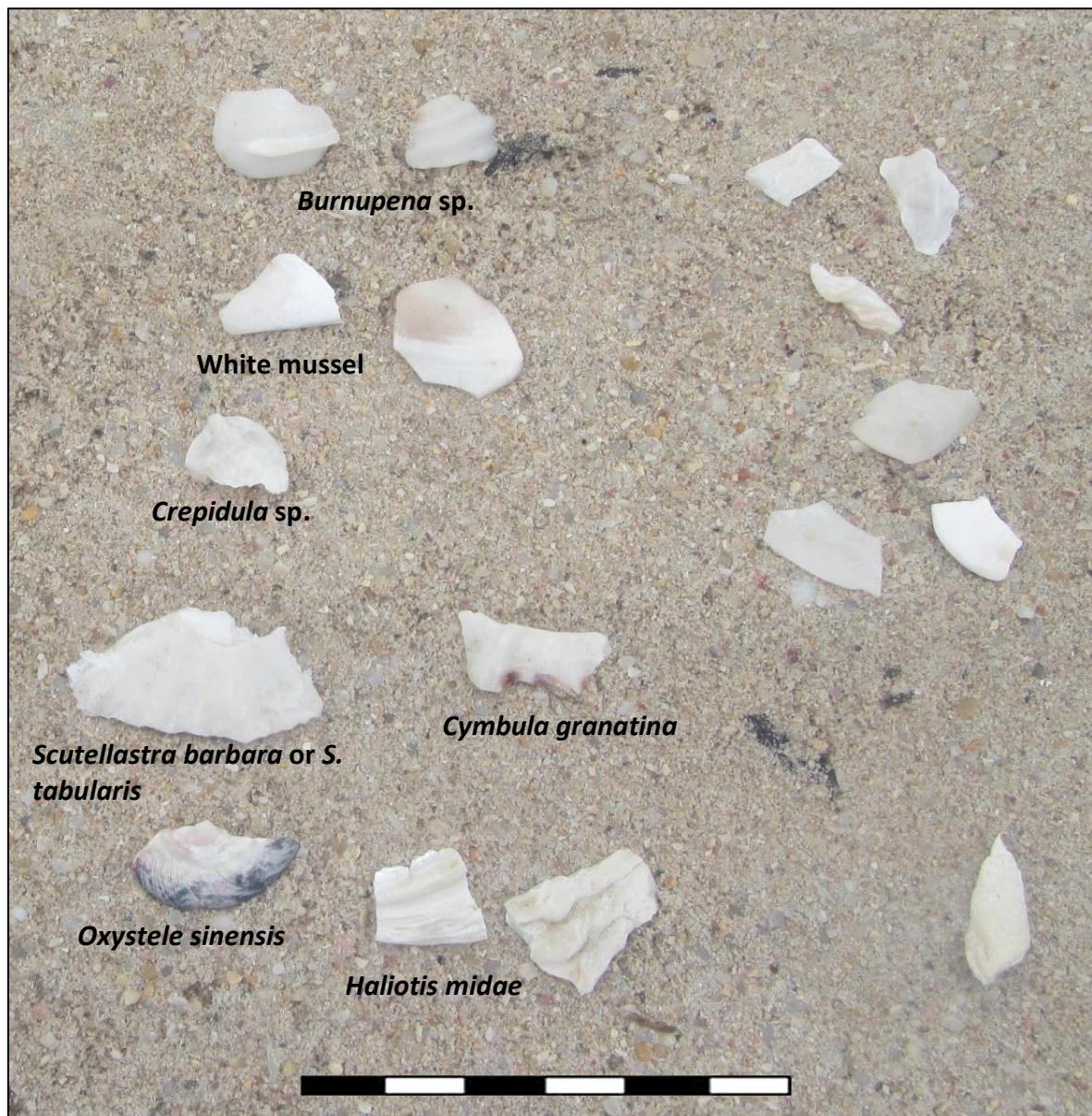


Figure 18: Shell fragments from waypoint 1435. Where identifiable, their species names are indicated. The fragments to the right could not be identified. Scale in cm.

Much of the cable route lies along roads where the sandy substrate would have been disturbed. However, in the Paardevlei area it extends across old fields where, as noted in the desktop study, stone artefacts have been recorded before. The area was not resurveyed and the finds in Orton (2021) are also applicable to the present project.

5.3. Graves

It is possible that isolated Later Stone Age (LSA) graves might occur within the local dunes but, given the general lack of LSA occupation in the area, this possibility is considered unlikely. It is notable, however, that Kaplan (2006) cites a contractor as having reported the finding of burials at Strandfontein Pavillion. Morris (1992) notes burials to have been found on the Cape Flats but location details are very vague. The grave of Sheik Yusuf (also a National Heritage Site) occurs 1.7 km from the WWTW study area and 1.4 km from the cable route.

5.4. Historical aspects and the Built environment

5.4.1. Desktop study

Macassar was named after the place of birth of Sheikh Yusuf (Josef) who was born in Makassar, Indonesia, in 1626. The story of his life is summarised by Cape Mazaar Society (1996). Of note is that he was exiled to South Africa by the Dutch in 1693; he arrived in Cape Town on 27th June of that year. He and his party of 49 followers were settled near the mouth of the Eerste River on the farm Zandvliet. This became the first Muslim community in South Africa, and they spread Islam amongst the slaves of the Cape. Sheikh Yusuf died on 23rd May 1699 and was buried on a low hill in what became known as Macassar (Figure 19). A shrine has been built over the grave. Fransen (2004) states that the current kramat building was designed by F.K. Kendall in 1925 and replaced an earlier, simpler structure. It lies 1.7 km to the northwest of the study area. Abrahams-Willis (2001) provides an extensive history relating to the arrival of Sheikh Yusuf and his time at the Cape.



Figure 19: View towards the south of the Sheikh Yussuf kramat (on the hill) in about 1915. Source: Fransen (2004: 231).

The Macassar WWTW was originally constructed in 1977. Historical aerial photography shows the site to have entirely undeveloped in 1968 with the exception of a sand track that passed through the site (Figure 20). The 1978 image shows the small facility (Figure 21), while by 1989 it had been expanded to reach its current footprint (Figure 22). Subsequent aerial images all show the same sized facility (Figure 23).



Figure 20: 1968 aerial photograph showing the WWTW site completely undeveloped.



Figure 21: 1978 aerial photograph showing the first wastewater treatment works in place.



Figure 22: 1989 aerial photograph showing the wastewater treatment works to have been expanded to its current size.



Figure 23: March 2005 aerial photograph.

To the east of the Eerste River lies Paardevlei and the old African Explosives & Chemical Industries (AECI) Complex. This has been extensively studied over the years and contains many heritage resources – especially buildings – of varying significance (Aikman 2014; Halkett & Hart 1996; Hart 2006; Snelling 2013). The cable route would end within the Paardevlei area but in its northern sector which is old arable land (Figure 24).



Figure 24: 1938 aerial photograph overlaid on Google Earth showing the northern part of the AECL complex as being farmed at that stage. The diagonal clear strip followed by the proposed cable once had a railway line leading to the explosives factory. This was built around 1901 (Halkett & Hart 1996).

5.4.2. Site visit

Aside from some fragments of building rubble in the area to the west of the existing WWTW, no historical materials of any sort were found on the WWTW site. The Paardevlei area is rich in heritage but along the cable route much has been removed. There is no sign of the original field structure or railway, but the alignment of the latter is evident by the trees alongside it. A powerline now also follows this route to the substation.

5.5. Places associated with living heritage

The kramat described above is associated with the history of Islam in South Africa and can be regarded as a place associated with living heritage. The site is far from the project area and will not be affected in any way.

5.6. Cultural landscapes and scenic routes

Cultural landscapes are the product of the interactions between humans and nature in a particular area. Sauer (1925) defined them thus: “The cultural landscape is fashioned from a natural landscape by a cultural group. Culture is the agent, the natural area is the medium, the cultural landscape the result”. Cultural landscapes are thus areas containing multiple ‘sites’ and which have been shaped by the interaction of natural processes and anthropogenic activities such as construction and

agriculture. Scenic routes are well-travelled roads that pass through natural or cultural landscapes with aesthetic value and that often have iconic or visually attractive views.

The river corridor of the Eerste River and its associated wetlands are considered a natural landscape of cultural significance. The river would have been the reason that the agricultural allotments were originally developed. This landscape was also the settling place of Sheik Yusuf on the farm Zandvliet in 1693. The Macassar Dunes Conservation area can be seen as a landscape of aesthetic and scientific significance for the natural vegetation coating the dunes. The area is listed as a Critical Biodiversity Area (Helme 2023).

The Paardevlei Precinct is a cultural landscape of historical buildings and features. However, it has been redeveloped in recent decades and development continues in the area. The many gum trees and open grassed fields in the as yet undeveloped parts contribute a rural character to this part of the study area. It is noted that it is already traversed by an existing powerline and that the electrical substation is also already a part of this landscape.

Baden Powell Drive can be regarded as a scenic route, but the project is well-screened from that road by intervening sand dunes. Due to the isolated location of the WWTW, there are no scenic route concerns for that part of the project. The N2 is not particularly scenic and, in this area, is largely flanked by modern development. The electrical cable will be placed underground and will thus not result in any change to the landscape along its route.

5.7. Statement of significance and provisional grading

Section 38(3)(b) of the NHRA requires an assessment of the significance of all heritage resources. In terms of Section 2(vi), “cultural significance” means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance. The reasons that a place may have cultural significance are outlined in Section 3(3) of the NHRA (see Section 2 above).

The majority of potential palaeontological resources would likely be of very low cultural significance and graded NCW. However, there is a small possibility that finds of high cultural significance at the local level could be found and would be worthy of grading up to IIIA.

The archaeological resources at the WWTW are deemed to have very low cultural significance at the local level for their scientific value and can be graded NCW. Although Orton (2021) reported very few ESA artefacts in the Paardevlei section of the cable route, it is prudent to recognise the earlier survey by Halkett and Hart (1996) which found mitigation-worthy ESA materials. As such, the archaeology in that area is regarded as being of at least low local cultural significance for its scientific value with an associated grade of IIIC.

Graves are deemed to have high cultural significance at the local level for their social value. They would be allocated a grade of IIIA, but the Sheikh Yusuf Kramat is a Grade I National Heritage Site (it is far from the study area and not of concern here). It is also regarded as a place associated with living heritage.

The cultural landscape around the WWTW is largely a natural landscape with aesthetic and scientific value and is rated as having medium cultural significance at the local level. It can be graded IIIB. This grade can likely be extended along the coastal strip to Paardevlei here O'Donoghue grades it IIIB.

Intervening areas that have been disturbed are of very low significance (NCW). Most of the cable route can similarly be regarded as NCW. However, in keeping with O'Donoghue (2022), the undeveloped rural land at Paardevlei can be seen as of medium local significance for its aesthetic and historical value and can be graded IIIC, while Paardevlei itself is worthy of IIIA.

Figure 26 shows a grade map for the WWTW and its immediate surrounds. It should be noted that the land east of the Eerste River is part of the old AECI Complex and the various structures, ruins and spaces are of variable local significance. They are not directly relevant to the present application and will not be affected in any way.

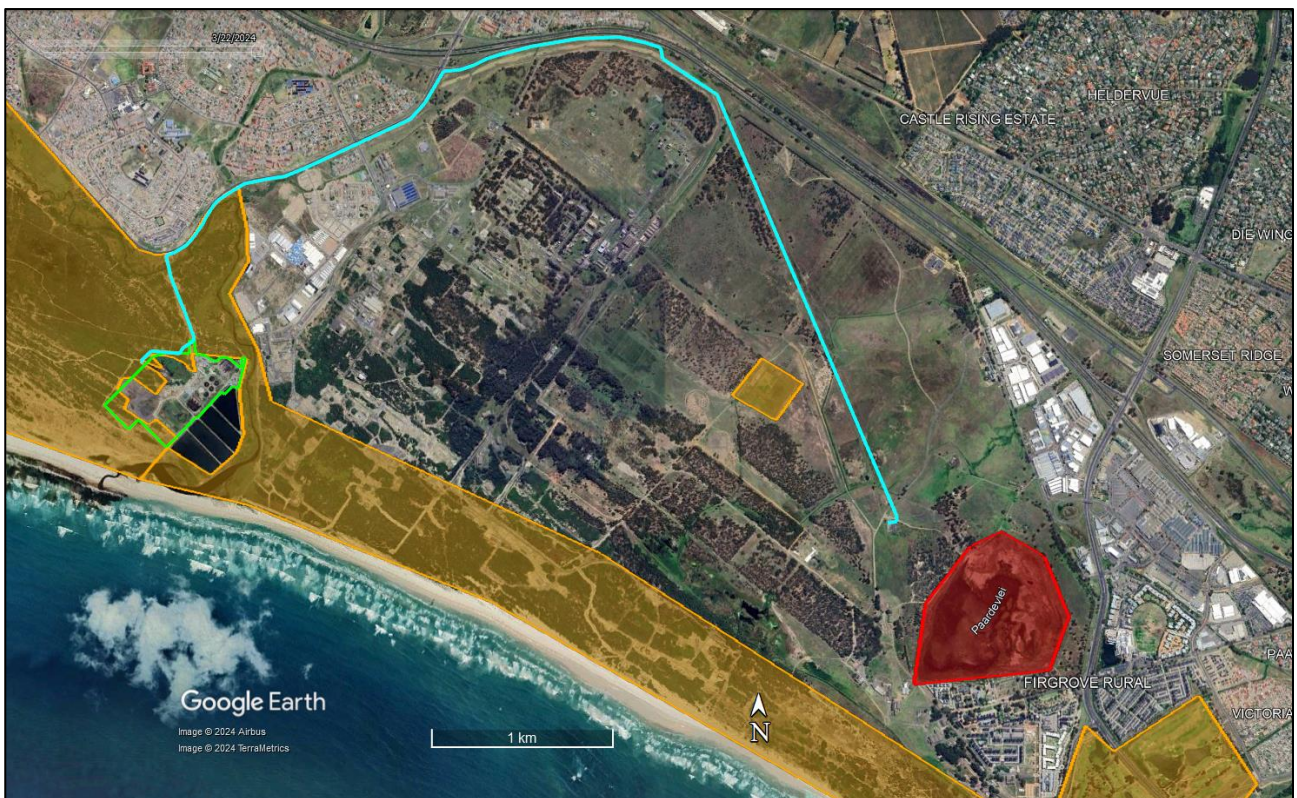


Figure 24: Grade map for the Macassar WTW and surrounds. Orange = Grade IIIB. Intervening areas are NCW. The rural land at Paardevlei and much of the remaining landscape would be graded IIIC but many pockets have not been studied.

5.8. Summary of heritage indicators

Indicator: Fossils and other palaeontological resources should not be damaged or destroyed without assessment by a palaeontologist.

Indicator: The dune landscape should be altered as little as possible with dune removal limited to the development footprint.

Indicator: Significant archaeological resources should not be damaged or destroyed without appropriate further study.

6. ASSESSMENT OF IMPACTS

The impacts identified for this project and assessed here are:

- *Construction phase:*
 - Impacts to palaeontology (please see attached specialist study)
 - Impacts to archaeology
 - Impacts to the cultural landscape
- *Operation phase:*
 - Impacts to the cultural landscape

No decommissioning phase is envisaged. Impacts to graves and archaeological sites are theoretically possible but the chance of this occurring is extremely low since no such resources are known from the study area. The few shell fragments that might be archaeological are of no consequence. While palaeontological heritage is assessed in the separate specialist study, the other impacts are considered here.

6.1. Construction Phase

6.1.1. Impacts to archaeology

Impacts are not expected in the WWTW site or along the western part of the cable route but might occur in the eastern part of the latter. Destruction of archaeological materials is permanent, but the extent of impacts is likely to be limited. The expected density of material on the landscape means the intensity will be low. There is a degree of uncertainty, however, due to the inconsistent findings of Halkett and Hart (1996) and Orton (2021). Nonetheless, an impact significance of **minor negative** is expected before mitigation and, with monitoring (and documentation and/or collection of materials as seems appropriate at the time) the post-mitigation assessment is **negligible negative** (Table 2).

Table 2: Assessment of construction phase impacts to archaeology.

Project phase	Construction			
Impact	Impacts to archaeology			
Description of impact	Damage to or destruction of archaeological materials during grubbing and excavation			
Mitigatability	High	Mitigation exists and will considerably reduce the significance of impacts		
Potential mitigation	Monitoring of excavation of cable trench			
Assessment	Without mitigation		With mitigation	
Nature	Negative		Negative	
Duration	Permanent	Impact may be permanent, or in excess of 20 years	Permanent	Impact may be permanent, or in excess of 20 years
Extent	Limited	Limited to the site and its immediate surroundings	Very limited	Limited to specific isolated parts of the site
Intensity	Low	Natural and/ or social functions and/ or processes are somewhat altered	Very low	Natural and/ or social functions and/ or processes are slightly altered

Probability	Almost certain / Highly probable	It is most likely that the impact will occur	Unlikely	Has not happened yet but could happen once in the lifetime of the project, therefore there is a possibility that the impact will occur
Confidence	Medium	Determination is based on common sense and general knowledge	Medium	Determination is based on common sense and general knowledge
Reversibility	Low	The affected environment will not be able to recover from the impact - permanently modified	Low	The affected environment will not be able to recover from the impact - permanently modified
Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce	Low	The resource is not damaged irreparably or is not scarce
Significance	Minor - negative		Negligible - negative	
Comment on significance	While ESA materials are known to occur in the Paardevlei area, their distribution has changed since 1996 making the assessment somewhat uncertain. Nonetheless, there will definitely be ESA materials present at least in low density and a minor negative impact seems appropriate.			
Cumulative impacts	It is likely that many developments in the area have damaged or destroyed ESA materials. However, the density of such material is probably always low (based on other surveys). The cumulative impact contribution from this project is likely to be low because of its limited spatial extent.			

6.1.2. Impacts to the cultural landscape

Direct impacts to the cultural landscape would occur during the construction phase when construction equipment is brought onto the site and work commences. Despite the high probability, the short duration of the construction phase results in an impact before mitigation of **minor negative** (Table 3). Mitigation will serve to reduce the extent of the impacts, but the significance will still be **minor negative**.

There are no fatal flaws in terms of construction phase impacts to the cultural landscape.

Table 3: Assessment of construction phase impacts to the cultural landscape.

Project phase	Construction			
Impact	Intrusion into the cultural landscape of incompatible structures/features			
Description of impact	Alteration of the landscape through its transformation from a natural to an industrial nature.			
Mitigatability	Low	Mitigation does not exist; or mitigation will slightly reduce the significance of impacts		
Potential mitigation	Minimise the disturbance footprint and ensure that dunes outside the development footprint are not affected.			
Assessment	Without mitigation		With mitigation	
Nature	Negative		Negative	
Duration	Short term	Impact will last between 1 and 5 years	Short term	Impact will last between 1 and 5 years
Extent	Limited	Limited to the site and its immediate surroundings	Very limited	Limited to specific isolated parts of the site

Intensity	Moderate	Natural and/ or social functions and/ or processes are moderately altered	Moderate	Natural and/ or social functions and/ or processes are moderately altered
Probability	Certain / definite	There are sound scientific reasons to expect that the impact will definitely occur	Certain / definite	There are sound scientific reasons to expect that the impact will definitely occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	High	The affected environment will be able to recover from the impact	High	The affected environment will be able to recover from the impact
Resource irreplaceability	Medium	The resource is damaged irreparably but is represented elsewhere	Medium	The resource is damaged irreparably but is represented elsewhere
Significance	Minor - negative		Minor - negative	
Comment on significance	The minor significance is largely due to the short duration of the construction phase and because an existing WWTW is already present on the site.			
Cumulative impacts	Cumulative impacts are expected to be of minor significance.			

6.2. Operation Phase

6.2.1. Impacts to the cultural landscape

Direct impacts to the cultural landscape would occur during the operation phase through the presence of the completed facility in the otherwise natural landscape. The intensity will be low because there will not generally be much activity on site, but the duration is effectively permanent which results in an impact significance of **moderate negative** (Table 4). Mitigation will involve ensuring that operational and maintenance activities remain within the authorised footprint and that new areas are not impacted. While this would reduce the intensity from moderate to low, the post-mitigation significance remains **moderate negative**.

There are no fatal flaws in terms of operation phase impacts to the cultural landscape.

Table 4: Assessment of operation phase impacts to the cultural landscape.

Project phase	Operation			
Impact	Intrusion into the cultural landscape of incompatible structures/features			
Description of impact	Alteration of the landscape through its transformation from a natural to an industrial nature.			
Mitigatability	Low	Mitigation does not exist; or mitigation will slightly reduce the significance of impacts		
Potential mitigation	Ensure that all operational activities remain within the authorised footprint and that no new areas are affected during operation.			
Assessment	Without mitigation		With mitigation	
Nature	Negative		Negative	
Duration	Permanent	Impact may be permanent, or in excess of 20 years	Permanent	Impact may be permanent, or in excess of 20 years
Extent	Limited	Limited to the site and its immediate surroundings	Very limited	Limited to specific isolated parts of the site

Intensity	Moderate	Natural and/ or social functions and/ or processes are somewhat altered	Low	Natural and/ or social functions and/ or processes are somewhat altered
Probability	Certain / definite	There are sound scientific reasons to expect that the impact will definitely occur	Certain / definite	There are sound scientific reasons to expect that the impact will definitely occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	High	The affected environment will be able to recover from the impact	High	The affected environment will be able to recover from the impact
Resource irreplaceability	Medium	The resource is damaged irreparably but is represented elsewhere	Medium	The resource is damaged irreparably but is represented elsewhere
Significance	Moderate - negative		Moderate - negative	
Comment on significance	The main driver of significance is the long duration.			
Cumulative impacts	Cumulative impacts are expected to be of minor significance.			

6.3. Existing impacts to heritage resources

The main threats to the dune system come from sand mining, both legal and illegal, which have compromised the dune landscape through systematically reducing the size of the Macassar Dunes. Disturbance of the dunes from grazing animals and/or off-road vehicles also occurs but is of lesser concern. These impacts would be of **moderate negative** significance.

6.4. Cumulative impacts

In relation to an activity, cumulative impact “means the past, current and reasonably foreseeable future impact of an activity, considered together with the impact of activities associated with that activity, that in itself may not be significant, but may be significant when added to the existing and reasonably foreseeable impacts eventuating from similar or diverse activities” (NEMA EIA Reg GN R982 of 2014).

The project is expected to further reduce the extent of the Macassar Dunes but the area to be disturbed is very small in relation to the existing impacts. For this reason, the cumulative impact contribution from this project is expected to be **minor negative**. Mitigation is as per the individual impacts discussed above and will aim to minimise the disturbance of the dunes. Post-mitigation, the impact is still expected to be **minor negative**.

6.5. Evaluation of impacts relative to sustainable social and economic benefits

Section 38(3)(d) of the NHRA requires an evaluation of the impacts on heritage resources relative to the sustainable social and economic benefits to be derived from the development.

The project is needed in order to improve service delivery in the area and to improve the quality of wastewater discharged into the Eerste River estuary. These are clear economic and social benefits and, if mitigation is applied as suggested above, then the socio-economic benefits outweigh the residual impacts.

6.6. The No-Go alternative

If the project were not implemented then the site would stay as it currently is (impact significance of **neutral**). Although the heritage impacts with implementation of the preferred alternative would be greater than the existing impacts, the loss of socio-economic benefits due to poor service delivery from the WWTW is more significant and suggests that the No-Go option is less desirable in heritage terms.

6.7. Levels of acceptable change

Any impact to an archaeological or palaeontological resource or a grave is deemed unacceptable until such time as the resource has been inspected and studied further if necessary. Impacts to the landscape are difficult to quantify but in general a development that visually dominates the landscape from many publicly accessible vantage points is undesirable. Because of the height of the proposed development, the screening provided by the remaining dunes, and the presence of the existing facility, such an impact to the landscape is not envisaged.

7. INPUT TO THE ENVIRONMENTAL MANAGEMENT PROGRAMME

The actions recorded in Table 5 should be included in the environmental management programme (EMPr) for the project.

Table 5: Heritage considerations for inclusion in the EMPr.

Impact	Mitigation / management objectives & outcomes	Mitigation / management actions	Monitoring		
			Methodology	Frequency	Responsibility
Impacts to palaeontology, archaeology and graves					
Damage or destruction of fossils	Rescue fossils before extensive damage occurs	<u>Construction Phase</u> : Contract a palaeontologist to conduct monitoring site visits. This should be done under an approved Workplan so as to minimise delays in the event that fossils are found.	Appoint palaeontologist	Once-off	Developer
Damage or destruction of archaeological materials	Rescue artefacts before extensive damage occurs	<u>Construction Phase</u> : Contract an archaeologist to conduct monitoring site visits. This should be done under an approved Workplan so as to minimise delays in the event that fossils are found.	Appoint archaeologist	Once-off	Developer
Damage or destruction of archaeological sites, fossils or graves	Rescue information, artefacts, fossils or burials before extensive damage occurs	<u>Construction Phase</u> : Reporting chance finds as early as possible to HWC or an archaeologist / palaeontologist, protect <i>in situ</i> and stop work in immediate area. Implement Fossil Chance Finds Procedure if relevant.	Inform staff to be vigilant and carry out inspections of new excavations	Ongoing basis	Construction Manager or Contractor
				Whenever on site (at least weekly during construction period only)	ECO
Impacts to the cultural landscape					
Visible landscape scarring	Minimise landscape scarring	<u>Construction Phase</u> : Ensure disturbance is kept to a minimum and does not exceed project requirements. Rehabilitate areas not needed during operation.	Monitoring of surface clearance relative to approved layout	Ongoing basis	Construction Manager or Contractor
				As required	ECO
Intrusion into cultural landscape	Minimise visual intrusion	<u>Operation Phase</u> : Ensure that all maintenance vehicles and operational activities stay within designated areas.	Undertake visual inspections and report non-compliance	As required	Environmental Manager

8. CONSULTATION WITH HERITAGE CONSERVATION BODIES

As required by HWC in their response to the NID, the report was sent to the municipality and registered (with HWC) conservation bodies for comment as part of the PPP conducted under NEMA. Any heritage-related responses will be communicated to HWC.

9. CONCLUSIONS

There are three heritage concerns for the proposed project. The first is the possibility that buried fossils may be exposed and destroyed during excavations for the new infrastructure. The locations of such fossils cannot be predicted from the surface and will require monitoring. The second issue is the possibility of damaging or destroying ESA artefacts in the Paardevlei area. Recommendations relating to this area have been reproduced directly from Orton (2021) in order to be consistent. The third concern is the alteration of the natural landscape around the WWTW which has aesthetic and scientific significance. Little can be done to avoid this impact and the development has already been focused largely on the most disturbed areas. The remaining impacts are deemed acceptable in the light of the considerable socio-economic benefits to be derived from the project. Table 6 summarises the heritage indicators and project responses.

Table 6: *Heritage indicators and project responses.*

Indicator	Project Response
Fossils and other palaeontological resources should not be damaged or destroyed without assessment by a palaeontologist.	This is impossible to regulate due to the location of the fossils beneath the surface. Monitoring by a professional is thus recommended.
The dune landscape should be altered as little as possible with dune removal limited to the development footprint.	No alternative layout was feasible and a recommendation has been made to ensure that disturbance is minimised. Due to the strong need for this project, the socio-economic benefits outweigh the impacts.
Significant archaeological resources should not be damaged or destroyed without appropriate further study.	Mitigation has been suggested to determine whether significant materials occur and whether collection and or <i>in situ</i> analysis and recording are required.

9.1. Reasoned opinion of the specialist

Given that palaeontological and archaeological impacts can be readily managed through monitoring and that the landscape impacts are relatively minor, it is the opinion of the heritage specialist that the proposed project should be authorised in its entirety.

10. RECOMMENDATIONS

It is recommended that the proposed expansion of the Macassar WWTW be authorised, but subject to the following recommendations which should be included as conditions of authorisation:

- The Fossil Chance Finds Procedure must be included in the EMPr for the project;
- A Workplan should be in place so that collection of fossils can commence immediately as and if required;
- A palaeontologist must be contracted to monitor the excavation work on the WWTW site;
- Disturbance of the dunes outside the project footprint must be minimised;
- An archaeologist must be contracted to monitor the grubbing (with a focus on WWTW site and Paardevlei precinct);
- A Workplan should be in place so that collection of artefacts can commence immediately as and if required;
- A decision will need to be taken during the monitoring process as to whether enough material is present to warrant retention of a collection, as well as the analysis, curation and reporting of the finds;
- At minimum a photographic record and description of the material and its context should be captured; and
- If any fossils, archaeological material or human burials are uncovered during the course of development then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist (if not present on site at the time). Such heritage is the property of the state and may require excavation and curation in an approved institution.

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APPENDIX 1 – Curriculum Vitae



Curriculum Vitae

Jayson David John Orton

ARCHAEOLOGIST AND HERITAGE CONSULTANT

Contact Details and personal information:

Address: 40 Brassie Street, Lakeside, 7945
Telephone: (021) 788 1025
Cell Phone: 083 272 3225
Email: jayson@asha-consulting.co.za

Birth date and place: 22 June 1976, Cape Town, South Africa
Citizenship: South African
ID no: 760622 522 4085
Driver's License: Code EB
Marital Status: Married to Carol Orton
Languages spoken: English, Afrikaans, basic French

Education:

SA College High School	Matric	1994
University of Cape Town	B.A. (Archaeology, Environmental & Geographical Science)	1997
University of Cape Town	B.A. (Honours) (Archaeology) [First Class]	1998
University of Cape Town	M.A. (Archaeology)	2004
University of Oxford	D.Phil. (Archaeology)	2013

Employment History:

Spatial Archaeology Research Unit, UCT	Research assistant	Jan 1996 – Dec 1998
Department of Archaeology, UCT	Field archaeologist	Jan 1998 – Dec 1998
UCT Archaeology Contracts Office	Field archaeologist	Jan 1999 – May 2004
UCT Archaeology Contracts Office	Heritage & archaeological consultant	Jun 2004 – May 2012
School of Archaeology, University of Oxford	Undergraduate Tutor	Oct 2008 – Dec 2008
ACO Associates cc	Associate, Heritage & archaeological consultant	Jan 2011 – Dec 2013
ASHA Consulting (Pty) Ltd	Director, Heritage & archaeological consultant	Jan 2014 –

Professional Accreditation:

- Association of Southern African Professional Archaeologists (ASAPA) membership number: 233
- ASAPA CRM Section member with the following accreditation:
 - Principal Investigator: Coastal shell middens (awarded 2007)
Stone Age archaeology (awarded 2007)
Grave relocation (awarded 2014)
 - Field Director: Rock art (awarded 2007)
Colonial period archaeology (awarded 2007)
- Association of Professional Heritage Practitioners (APHP) membership number: 43
 - Accredited Professional Heritage Practitioner

Memberships and affiliations:

- | | |
|---|-------------|
| ➤ South African Archaeological Society Council member | 2004 – 2016 |
| ➤ Assoc. Southern African Professional Archaeologists (ASAPA) member | 2006 – |
| ➤ UCT Department of Archaeology Research Associate | 2013 – 2017 |
| ➤ Heritage Western Cape APM Committee member | 2013 – 2023 |
| ➤ UNISA Department of Archaeology and Anthropology Research Fellow | 2014 – |
| ➤ Fish Hoek Valley Historical Association | 2014 – |
| ➤ Kalk Bay Historical Association | 2016 – |
| ➤ Association of Professional Heritage Practitioners member (CRM Section) | 2016 – |
| ➤ Southern African Field Archaeology section editor | 2021 – |

Fieldwork and project experience:

I have extensive experience as Field Director and Principal Investigator throughout Western and Northern Cape, and the western Free State and Eastern Cape. I also work in the eastern part of South Africa through partnership with an Iron Age accredited colleague.

Feasibility studies:

Heritage feasibility studies examining all aspects of heritage from the desktop

Phase 1 surveys and impact assessments:

- | | |
|---|--|
| ➤ Project types | ➤ Development types |
| ○ Notification of Intent to Develop applications | ○ Mining and borrow pits |
| ○ Heritage Impact Assessments | ○ Roads (new and upgrades) |
| ○ Self-standing assessments under Section 38(1) of the NHRA | ○ Residential, commercial and industrial development |
| ○ Assessments under NEMA and Section 38(8) of the NHRA | ○ Agricultural developments |
| ○ Archaeological specialist studies | ○ Dams and pipe lines |
| ○ Strategic assessments | ○ Power lines and substations |
| ○ Phase 1 archaeological test excavations in historical and prehistoric sites | ○ Renewable energy facilities (wind, solar and hydro-electric) |
| ○ Archaeological research projects | |

Phase 2 mitigation and research excavations:

- | | |
|-----------------------------|--|
| ➤ ESA open sites | ○ Duinefontein, Gouda, Namaqualand |
| ➤ MSA rock shelters | ○ Fish Hoek, Yzerfontein, Cederberg, Namaqualand |
| ➤ MSA open sites | ○ Swartland, Bushmanland, Namaqualand |
| ➤ LSA rock shelters | ○ Cederberg, Namaqualand, Knersvlakte, Bushmanland |
| ➤ LSA open sites (inland) | ○ Swartland, Franschhoek, Namaqualand, Bushmanland, De Aar |
| ➤ LSA coastal shell middens | ○ Melkbosstrand, Yzerfontein, Saldanha Bay, Paternoster, Dwarskersbos, Infanta, Knysna, Namaqualand coast, Knersvlakte |
| ➤ LSA burials | ○ Melkbosstrand, Saldanha Bay, Namaqualand coast, Knysna |
| ➤ Historical sites | ○ Waterfront (fort, dump and well), Noordhoek (cottage), variety of small excavations in central Cape Town and surrounding suburbs |
| ➤ Historic burial grounds | ○ Green Point (Prestwich Street), V&A Waterfront (Marina Residential), Paarl, Beaufort West, Franschhoek (farmstead and well), Paarl, De Aar |

Awards:

1998: Frank Schweitzer memorial book prize for an outstanding student.

2015/2016: Western Cape Government Cultural Affairs Awards: Best Heritage Project.

APPENDIX 2 – Palaeontological specialist study

APPENDIX 3 – Site Sensitivity Verification Report

As required in Part A of the Government Gazette 43110, GN 320, a site sensitivity verification was undertaken in order to confirm the current land use and environmental sensitivity of the proposed project area as identified by the National Web-Based Environmental Screening Tool. The details of the site sensitivity verification are noted below:

<i>Date of Site Visit</i>	19 th September 2023
<i>Specialist Name</i>	Dr Jayson Orton
<i>Professional Registration Number</i>	ASAPA: 233; APHP: 043
<i>Specialist Affiliation / Company</i>	ASHA Consulting (Pty) Ltd

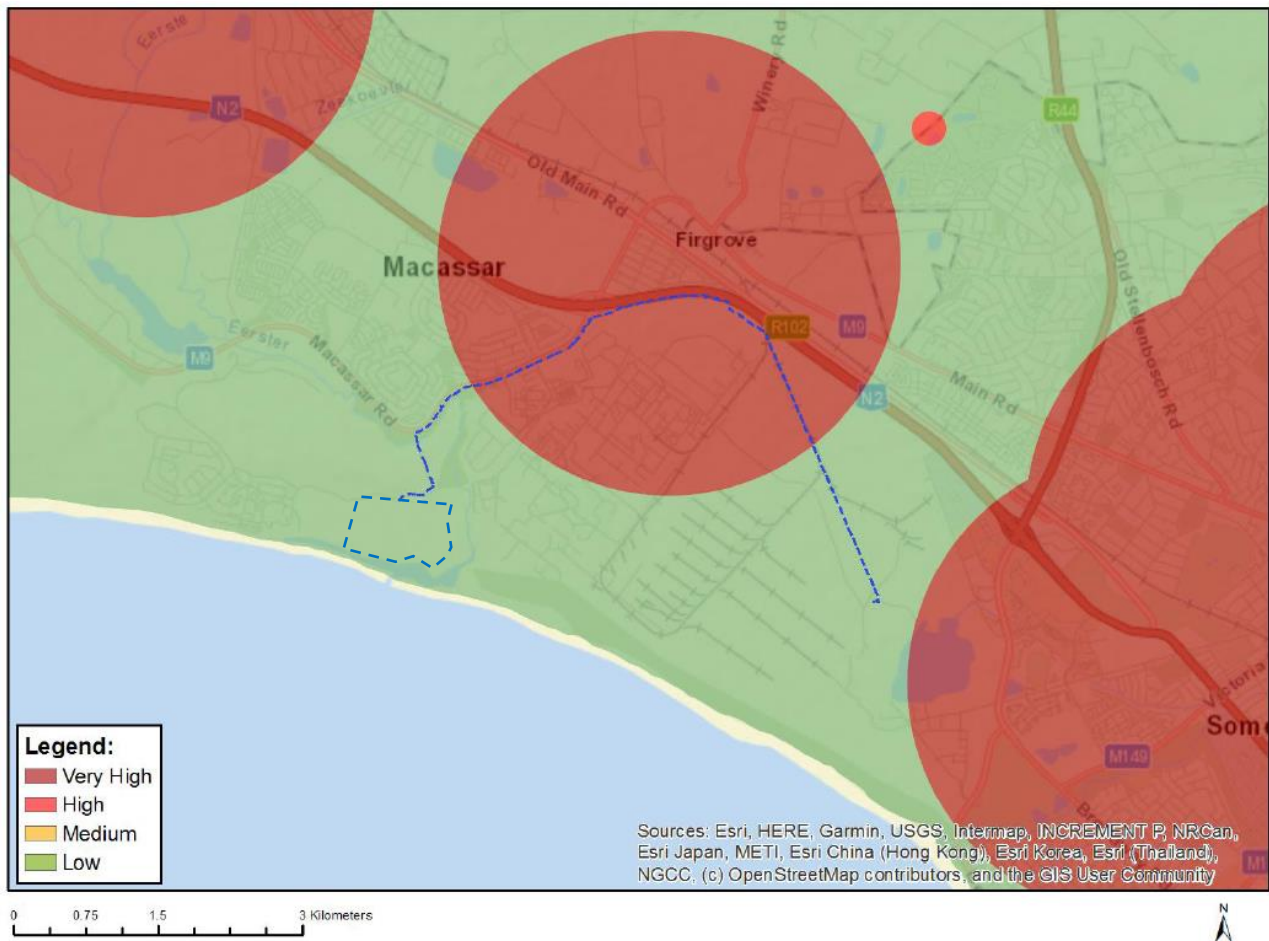
Method of the Site Sensitivity Verification

Initial work was carried out using satellite aerial photography in combination with the author's accumulated knowledge of the local landscape. This suggested that the WWTW site would not be sensitive but that part of the cable route would pass through an area regarded as archaeologically sensitive. Subsequent fieldwork served to ground truth the WWTW site, but the cable route was not studied. This was because it was proposed after the fieldwork was completed and the only part of the route deemed sensitive had already been examined by the author a few years before. Desktop research using maps, historical aerial photography, published literature and commercial reports was also conducted to inform on the heritage context of the area. This information is presented in the report (Sections 5.2.1 and 5.4.1).

Outcome

The first map below is extracted from the screening tool report and shows the archaeological and heritage sensitivity to be low in the WWTW study area while a very high sensitivity zone is traversed by the cable route. The location of this high sensitivity zone is curious since it seems to be centred on the modern suburb of Firgrove. It might have been misplaced since there is a Grade I heritage resource located 3.4 km to the southwest which is not shown on the screening tool map. It is well beyond the study area and not of concern to this project. There are also many areas of high sensitivity within the Paardevlei area (mostly buildings but also the vlei itself, none of which are indicated on the screening tool report. The site visit showed that in fact the WWTW site is of low sensitivity. Previous work in the Paardevlei area suggests that that portion of the cable route is of medium sensitivity because of the Early Stone Age archaeological resources known to occur there. The second map below shows the areas considered to be sensitive from a heritage point of view. Photographs of these sites are included in the impact assessment report.

The heritage specialist therefore **disputes** the Screening Tool map.



Screening tool map.



Heritage specialist map. Red = Grade IIIA, very high sensitivity, orange = Grade IIIB, high sensitivity, much of the remaining landscape would be graded IIIC but many pockets have not been studied.