

ENVIRONMENTAL IMPACT ASSESSMENT
Draft Environmental Impact Assessment Report for
the Proposed Construction, Operation and
Decommissioning of a Seawater Reverse Osmosis
Plant and Associated Infrastructure in
Tongaat, Kwazulu-Natal

**DRAFT
EIA
REPORT**



**CHAPTER 13:
HERITAGE IMPACT
ASSESSMENT**

EXECUTIVE SUMMARY

eThembeni Cultural Heritage was appointed by the CSIR to undertake a heritage impact assessment of the proposed Umgeni Water Desalination Plant and associated infrastructure at Tongaat, within the eThekweni Metropolitan Municipality, in terms of the National Heritage Resources Act No 25 of 1999.

The proposed desalination plant and attendant water supply infrastructure aims to ensure the promotion of sustainable economic development by serving the interests of a growing population, as well as other commercial and agricultural interests in the region. It is recognised that the future of the KwaZulu-Natal region is greatly dependent on an alternative water source to augment current supply.

eThembeni staff inspected the site on 23 February 2015 and again on 22 July 2015, completing a controlled-exclusive surface survey, as well as a database and literature search. The proposed Tongaat plant site is of low sensitivity from all aspects of archaeological heritage.

The SAHRIS Palaeosensitivity Map indicates that the area has high sensitivity. However, the proposed intake/outlet pipelines are to be tunnelled 10–15m below sea-level from the desalination plant into the ocean. Consequently, impacts on the sensitive foreshore are minimised.

The proposed 32kV powerline alignment between La Mercy and Mt. Moreland should be monitored by an archaeologist at tower positions and the establishment of transformer yard infrastructure, once these have been surveyed by Eskom.

The majority of the bulk water supply pipelines into the eThekweni water supply system are along existing servitudes that have been previously surveyed by eThembeni for Tongaat Hulett Developments and Dube Trade Port / ACSA (see SAHRIS Cases and Report's mapping). However, the proposed La Mercy - Waterloo Reservoir pipeline is a "greenfield" alignment to its junction with the existing Waterloo-Mhlothi Reservoirs' servitude. This too should be monitored by an archaeologist once surveyed and during inception.

Should middens or subterranean archaeological and palaeontological material be exposed during these activities, a Phase Two assessment will have to determine their significance and appropriate mitigation. A maritime archaeological desktop assessment of the off-shore pipelines has been commissioned from Maritime Archaeologists at the African Centre for Heritage Activities. This will be submitted under separate cover.

Conclusion

Accordingly, we request that Amafa aKwaZulu-Natali provide in-principle support for the proposed development to proceed, subject to the archaeological and palaeontological monitoring advocated.

If permission is granted for the development to proceed, the client is reminded that the Act requires that a developer cease all work immediately and notify Amafa should any heritage resources, as defined in the Act, be discovered during the course of development activities.

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CHAPTER 13: HERITAGE IMPACT ASSESSMENT

This chapter presents the Heritage specialist study prepared by Len van Schalkwyk of eThembeni Cultural Heritage as part of the Environmental Impact Assessment for the proposed 150 MI Seawater Reverse Osmosis Plant and associated infrastructure in Tongaat, KwaZulu Natal.

13.1 INTRODUCTION

eThembeni Cultural Heritage was appointed by the CSIR to undertake a heritage impact assessment of the proposed Umgeni Water Desalination Plant and associated infrastructure at Tongaat, within the eThekweni Metropolitan Municipality, in terms of the National Heritage Resources Act No 25 of 1999 (refer to Appendix A). The proposed desalination plant and attendant water supply infrastructure aims to ensure the promotion of sustainable economic development by serving the interests of a growing population, as well as other commercial and agricultural interests in the region. It is recognised that the future of the KwaZulu-Natal region is greatly dependent on an alternative water source to augment current supply.

South Africa's heritage resources are both rich and widely diverse, encompassing sites from all periods of human history. Resources may be tangible, such as buildings and archaeological artefacts, or intangible, such as landscapes and living heritage. Their significance is based upon their aesthetic, architectural, historical, scientific, social, spiritual, linguistic, economic or technological values; their representivity of a particular time period; their rarity; and their sphere of influence.

The integrity and significance of heritage resources can be jeopardized by natural (e.g. erosion) and human (e.g. development) activities. In the case of human activities, a range of legislation exists to ensure the timeous identification and effective management of heritage resources for present and future generations.

This report represents compliance with a full Heritage Impact Assessment for the proposed development, including a Palaeontological Impact Assessment compiled by Dr Alan Smith (Appendix E) and a high level desktop Maritime Archaeological Assessment compiled by Maritime Archaeologists at the African Centre for Heritage Activities (Appendix F). As per SAHRA request (Letter dated 8 December 2015 – Appendix G), a desk-based maritime archaeological assessment of MUCH resources in the area is being undertaken. As agreed by SAHRA, the proposed magnetometer survey will take place post-consent, provided it is included as a condition of any approval granted for the proposed development.

13.2 TERMS OF REFERENCE

A Heritage Impact Assessment must address the following key aspects:

- the identification and mapping of all heritage resources in the area affected;
- an assessment of the significance of such resources in terms of heritage assessment criteria set out in regulations;
- an assessment of the impact of the development on heritage resources;

- 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;
- the results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources;
- if heritage resources will be adversely affected by the proposed development, the consideration of alternatives; and
- plans for mitigation of any adverse effects during and after completion of the proposed development.

13.3 PROJECT DESCRIPTION

eThebeni Cultural Heritage was appointed by the CSIR to undertake a heritage impact assessment of the proposed Umgeni Water Desalination Plant and associated infrastructure at Tongaat, within the eThekweni Metropolitan Municipality, KwaZulu-Natal.

The combined footprint of the desalination plant will occupy an area of $\pm 70\,000\text{ m}^2$ (7 ha).

Linear Infrastructure includes –

- Seawater intake (source water) system with screening and sea-bed pipelines to the desalination plant location;
- Brine outfalls constructed in the sea and discharge sea-bed pipelines;
- Terrestrial pipelines transporting brine/permeate between the sea and the desalination plant, and existing bulk water infrastructure;
- A source water pump station located at the desalination plant operational site;
- Electrical power line and transformer yard infrastructure (a 200 m wide corridor); and
- Bulk water supply reticulation into the eThekweni water supply system (50 m wide corridor).

(See Figure 1 and Appendix D)

13.4 PROJECT LOCATION

Tongaat is a sugarcane growing town in KwaZulu-Natal situated on the banks of the Tongati River about 37 km north of Durban. It now forms part of eThekweni, the Greater Durban metropolitan area. Its population is predominantly people of Indian descent who arrived in the Natal Colony in the late 1860's as indentured labour for the expanding sugar industry.¹ Aesthetically English colonial but distinctly cosmopolitan in flavour, the Tongaat district once supported one of the largest sugar-producing districts in the world. Today, rapid residential, commercial and light industrial developments, most associated with the Dube Trade Port and King Shaka International Airport, are fundamentally transforming the previously rural landscape

Tongaat was established in 1845 and its name was corrupted from the river's name, Tongati, the Zulu word for the Strychnos spp trees that flourished on its banks. It comprises a number of townships, those of relevance to this study being Tongaat Beach, Desainager and La Mercy.²

1 125 Years -The Arrival of Natal's Indians in Pictures. <http://natalia.org.za/Files/15/Natalia%20v15%20article%20p18-35%20C.pdf>

2 <http://www.southafrica.com/kwazulu-natal/tongaat/>

The location of the proposed desalination plant is along South Dune Road at Desainagar (29°37'22.38" S 31°e8'48.35" E) and comprises about 7 ha of currently farmed market-gardens (See Figure 13-1). The relevant map sheet is 2831 CA Verulum.

Disturbance to the Lake Victoria wetlands and associated fauna and flora associated with the proposed powerline crossing (Figure 13-1) would result in a fatal flaw from an aquatic ecology perspective. The freshwater specialist study (Chapter 8) has therefore recommended an alternative route to avoid Lake Victoria (Refer to Figure 13-3 below - Alternative 2).

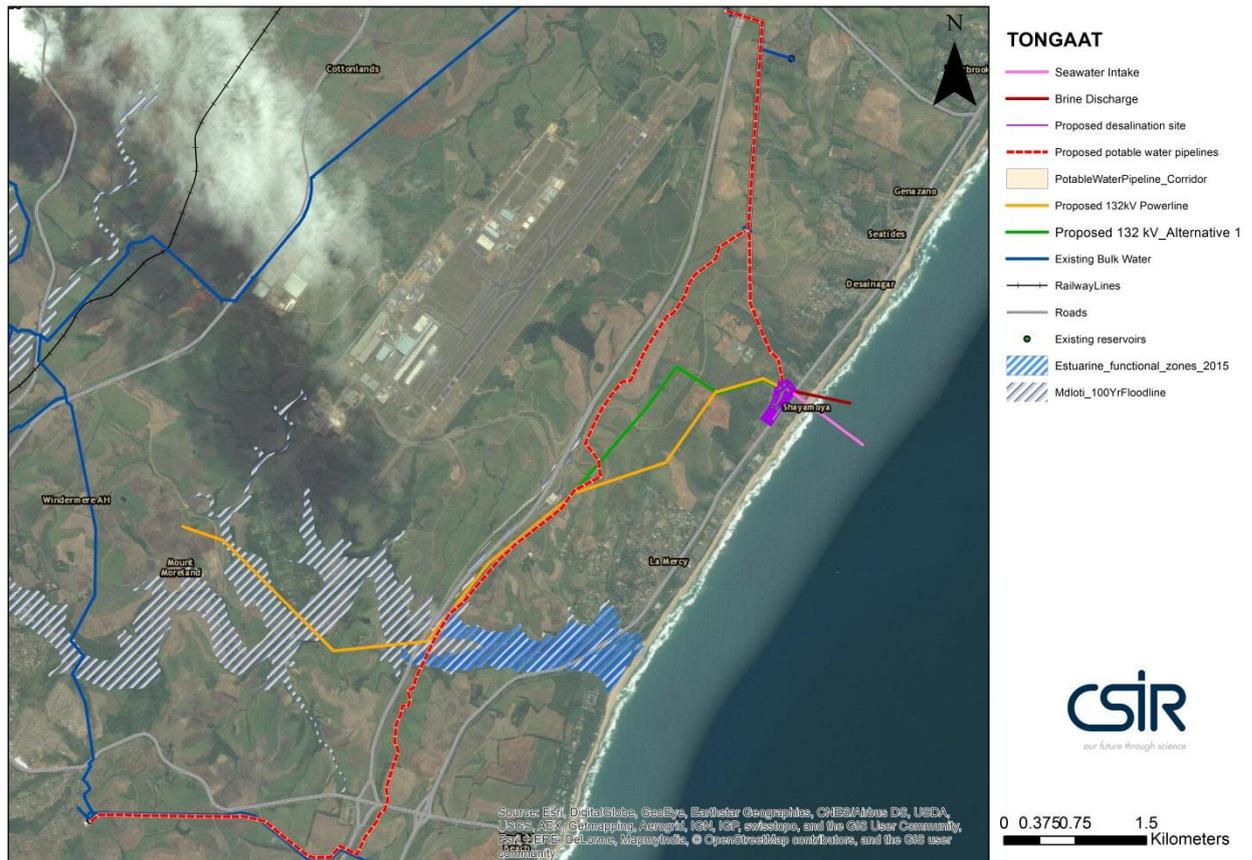


Figure 13-1: Satellite imagery indicating project location and extent



Figure 13-2 Plant Footprint and linear infrastructure

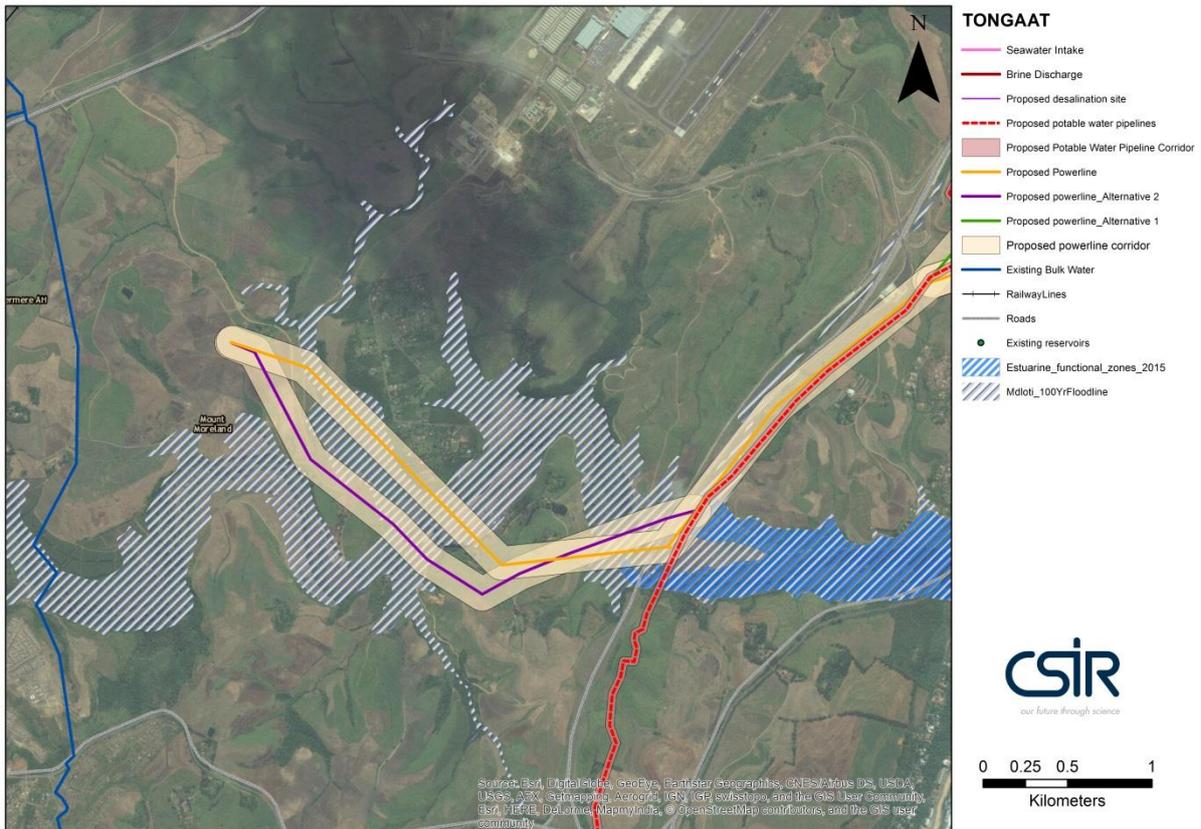


Figure 13-3: Amended powerline route as per the aquatic ecology specialist study recommendation

13.5 CULTURAL CONTEXT OF THE STUDY AREA

The archaeological and historical context of the study area is summarised in Appendix B and readers are referred to the bibliography section for primary sources.

Heritage resources that could require significant mitigation procedures are summarised in Table 13-1. The proponent is advised that subsurface remains of such heritage resources might be uncovered during the construction phase of the proposed project, and is referred to the protocol contained in Section 13-9 below.

Table 13-1: Typical heritage resources and mitigation measures associated with the project area.

Heritage resource	Typical mitigation measures
Iron Age Archaeological sites and shell middens	Visual assessment and sampling and/ or rescue excavation to acquire samples for further scientific study.
Palaeontological deposits and trace fossils	Desktop study, Visual assessment and sampling for further scientific study.
Maritime Archaeological Resources	Geophysical survey to determine ground conditions for the seabed elements of the project in order to inform the requirements for a maritime archaeological assessment.

13.6 OBSERVATIONS AND ASSESSMENT OF IMPACTS

eThembeni staff inspected the site on 23 February 2015 and again on 22 July 2015, completing a controlled-exclusive surface survey, as well as a database and literature search. No development activities associated with the proposed project had begun at the time of our visits, in accordance with heritage legislation.

Archaeological sites

The proposed Tongaat plant site is of low sensitivity from all aspects of archaeological heritage. The plant location within the slack of a primary paleo-dune that has been the subject of intensive market gardening since at least the early 1970's precludes the presence of any primary context archaeological sites. None were observed upslope of the plant site, along the proposed bulk water supply pipeline servitude. This alignment should, however, be assessed during excavation and inception (see below).

The access servitudes for the intake/outlet pipelines under the coastal foreshore dunes and the immediate environs were "red-flagged" for the very probable presence of Iron Age shell middens. Site inspections revealed no immediate evidence of such although tertiary dune vegetation may well currently mask any middens present. The intertidal zone where the intake/outlet pipes are proposed is a contiguous rocky shoreline. Intertidal rocky outcrops occur from Westbrooke Beach in the north to 3 km south of the abstraction point which argues strongly for the likely presence of shell middens at this locale. The KwaZulu-Natal Museum archaeological data base records a number of Iron Age shell midden sites in close proximity to La Mercy, Desainager and Westbrooke beaches, and numerous others on the Topographical Map Sheet 2931 CA Verulum.³

³ See for example Natal Museum Archaeological Data Base: 2931CA 153. Anderson 1996.

Maritime Archaeology

A desktop maritime archaeological assessment has been commissioned from Maritime Archaeologists at the African Centre for Heritage Activities. This will be submitted under separate cover.

Palaeontology

The SAHRIS Palaeosensitivity Map indicates that the area has high sensitivity. However, the proposed intake/outlet pipelines are to be tunnelled 10–15m below sea-level from the desalination plant into the ocean. Consequently, impacts on the sensitive foreshore are probably minimised (Alan Smith, *pers. comm.*; see independent report under separate cover)⁴.

The following table summarises the heritage resources assessed, and our observations follow.

Table 13-2: Heritage resources and observations.

Heritage resource type	Observation
Living heritage	None were identified within the proposed development areas.
Ecofacts	None were identified within the proposed development areas.
Places, buildings, structures and equipment	None were identified within the proposed development areas.
Places to which oral traditions are attached or which are associated with living heritage	None were identified within the proposed development areas.
Historical settlements and townscapes	None were identified within the proposed development areas.
Landscapes and natural features	None were identified within the proposed development areas.
Geological sites of scientific or cultural importance	None were identified within the proposed development areas but please see below.
Archaeological sites	None were identified within the proposed development areas but please see below.
Graves and burial grounds	None were identified within the proposed development areas.
Movable objects excluding any object made by a living person	None were identified within the proposed development areas.
Battlefields	None were identified within the proposed development areas.
Traditional building techniques	None were identified within the proposed development areas.

⁴ Alan Smith - Dept of Geology University of KwaZulu-Natal. http://www.researchgate.net/profile/Alan_Smith5.

13.6.1 DESCRIPTION AND ASSESSMENT OF SIGNIFICANCE

- Iron Age midden material may be exposed below dune vegetation along the foreshore in the vicinity of pipeline laying activities. These can only be assessed for significance during monitoring of such activities.
- Paleontological deposits may be exposed along the foreshore in the vicinity of pipeline laying activities. These can only be assessed for significance during monitoring of such activities.
- Potential maritime archaeological remains can only be assessed once a geophysical survey has been undertaken (see Appendix F).

13.6.2 ASSESSMENT OF IMPACT

No construction activities associated with the proposed project had begun prior to our visit, in accordance with provincial heritage legislation.

Places, buildings, structures and equipment

None will be affected.

Places to which oral traditions are attached or which are associated with living heritage

None will be affected.

Historical settlements and townscapes

None will be affected.

Landscapes and natural features

None will be affected.

Geological / Palaeontological sites of scientific or cultural importance

See appended Palaeontology report

Archaeological sites

- Our only concern would be that activities associated with the excavation, drilling and laying of the abstraction and discharge pipelines may cause disturbance on the immediate foreshore. These may expose Iron Age midden deposits located below the current surface of the tertiary dune vegetation.
- Potential Maritime archaeological resources are assessed and mitigated in the attached report by the African Centre for Heritage Activities.

Graves and burial grounds

None were observed

Sites of significance relating to the history of slavery in South Africa

None will be affected.

Movable objects excluding any object made by a living person

None will be affected.

In conclusion, the proposed development is considered generally to be benign and of low impact potential to possible archaeological and palaeontological deposits described above.

13.7 RECOMMENDED MITIGATION MEASURES

We would advocate however that an archaeological and palaeontological watching brief, in conjunction with the appointed Environmental Control Officer, be required at the time of drilling of the inlet and outlet pipes under the dune cordon. Albeit that the pipelines are proposed to be drilled 10-15 m below sea level, any ancillary above surface activities in this highly sensitive zone would be detrimental to *in situ* archaeological and palaeontological deposits. Should middens, or subterranean archaeological and palaeontological material be exposed during these activities, a Phase Two assessment will have to determine their significance and appropriate mitigation.

As per SAHRA request (Letter dated 8 December 2015 – Appendix G), a desk-based maritime archaeological assessment of MUCH resources in the area is being undertaken. As agreed by SAHRA, the proposed magnetometer survey will take place post-consent, provided it is included as a condition of any approval granted for the proposed development.

13.8 RECOMMENDED MONITORING

The proposed 132 kV powerline alignment between La Mercy and Mt. Moreland should be monitored by an archaeologist at tower positions and the establishment of transformer yard infrastructure, once these have been surveyed by Eskom⁵.

The majority of the bulk water supply pipelines into the eThekweni water supply system are along existing servitudes that have been previously surveyed by eThembeni for Tongaat Hulett Developments and Dube Trade Port / ACSA (see SAHRIS Cases and Reports mapping). However, the proposed La Mercy - Waterloo Reservoir pipeline is a “greenfield” alignment to its junction with the existing Waterloo-Mhlothi Reservoirs’ servitude. This too should be monitored by an archaeologist once surveyed and during inception.

⁵ The coastal foreshore and coastal littoral aligned with Berea formation sands is red-flagged for the presence of Iron Age shell middens and homestead archaeological sites. The latter typically occur within 40-60 cm below the plough zone of cultivated sugar cane. 132kV towers require minimally 10x10 m of surface clearance during erection and their anchoring is sunk well below 1 m of the surface. These activities have the potential to impact on *in situ* archaeological remains. Consequently, potential impacts are best assessed once the power line and tower positions have been determined within the proposed 200 m wide alternative servitudes.

#	Impact description	Status	Extent	Duration	Reversibility	Potential Intensity	Probability	Significance (without mitigation)	Mitigation	Significance (with mitigation)	Confidence level
CONSTRUCTION PHASE											
1	Disturbance of Iron Age archaeological residues (marine)	Negative	Local (2)	Permanent (5)	Irreversibility	High (8)	High probability (0.75)	High (11.25)	Undertake a desk-based maritime archaeological assessment of MUCH resources in the area. As agreed by SAHRA, the proposed magnetometer survey will take place post-consent, provided it is included as a condition of any approval granted for the proposed development.	Low	High
2	Disturbance of Palaeontological trace fossils	Negative	Local (2)	Permanent (5)	Irreversibility	High (8)	Probable (0.5)	Medium (7.5)	Monitoring by an archaeologist at tower positions between La Mercy and Mt. Moreland for the proposed powerline and between La Mercy - Waterloo Reservoir for the proposed pipeline	Low	High

13.9 PROTOCOL FOR THE IDENTIFICATION, PROTECTION AND RECOVERY OF HERITAGE RESOURCES DURING CONSTRUCTION AND OPERATION

It is possible that sub-surface heritage resources could be encountered during the construction phase of this project. The Environmental Control Officer and all other persons responsible for site management and excavation should be aware that indicators of sub-surface sites could include:

- Ash deposits (unnaturally grey appearance of soil compared to the surrounding substrate);
- Bone concentrations, either animal or human;
- Ceramic fragments, including potsherds; and
- Stone concentrations that appear to be formally arranged (may indicate the presence of an underlying burial).

In the event that such indicator(s) of heritage resources are identified, the following actions should be taken immediately:

- All construction within a radius of at least 20m of the indicator should cease. This distance should be increased at the discretion of supervisory staff if heavy machinery or explosives could cause further disturbance to the suspected heritage resource.
- This area must be marked using clearly visible means, such as barrier tape, and all personnel should be informed that it is a no-go area.
- A guard should be appointed to enforce this no-go area if there is any possibility that it could be violated, whether intentionally or inadvertently, by construction staff or members of the public.
- No measures should be taken to cover up the suspected heritage resource with soil, or to collect any remains such as bone or stone.
- If a heritage practitioner has been appointed to monitor the project, s/he should be contacted and a site inspection arranged as soon as possible. The heritage practitioner should notify Amafa (see below).
- If no heritage practitioner has been appointed to monitor the project, Amafa's Pietermaritzburg office should be contacted (telephone 033 3946543)
- The South African Police Services should be notified by an Amafa staff member or an independent heritage practitioner if human remains are identified. No SAPS official may disturb or exhume such remains, whether of recent origin or not.
- All parties concerned should respect the potentially sensitive and confidential nature of the heritage resources, particularly human remains, and refrain from making public statements until a mutually agreed time.
- Any extension of the project beyond its current footprint involving vegetation and/or earth clearance should be subject to prior assessment by a qualified heritage practitioner, taking into account all information gathered during this initial heritage impact assessment.

13.10 SUMMARY OF FINDINGS IN TERMS OF THE NATIONAL HERITAGE RESOURCES ACT 1999 SECTION 38(3)

The identification and mapping of all heritage resources in the area affected
None.

An assessment of the significance of such resources in terms of the heritage assessment criteria set out in regulations

Not applicable.

An assessment of the impact of development on such heritage resources

Not applicable.

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

Not applicable.

The results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources

The proponent has undertaken such consultation in terms of statutory requirements and retained the relevant documentation.

If heritage resources will be adversely affected by the proposed development, the consideration of alternatives

Not applicable.

Plans for mitigation of any adverse effects during and after completion of the proposed development

We advocate that an archaeological and palaeontological watching brief, in conjunction with the appointed Environmental Control Officer, be required at the time of drilling of the inlet and outlet pipes under the dune cordon; and that the 132 kV powerline and the La Mercy – Waterloo bulk water supply line be monitored for potential archaeological sites once surveyed and during inception.

13.11 CONCLUSION

We request that Amafa provide in-principle support for the proposed development to proceed, subject to the archaeological and palaeontological monitoring advocated, and have submitted this report to KwaZulu-Natal Heritage / Amafa aKwaZulu-Natali in fulfilment of the requirements of the National Heritage Resources Act.

According to Section 38(4) of the Act the report shall be considered timeously by the Council which shall, after consultation with the person proposing the development, decide –

- whether or not the development may proceed;
- any limitations or conditions are to be applied to the development;
- what general protections in terms of this Act apply, and what formal protections may be applied to such heritage resources;
- whether compensatory action shall be required in respect of any heritage resources damaged or destroyed as a result of the development; and
- whether the appointment of specialists is required as a condition of approval of the proposal.

The Case Officer, Mrs. Bernadet Pawandiwa, may be contacted at the Amafa Pietermaritzburg office (telephone 033 3946543; bernadetp@amafapmb.co.za).

13.12 BIBLIOGRAPHY

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APPENDIX A

STATUTORY REQUIREMENTS

GENERAL

The identification, evaluation and management of heritage resources in South Africa is required and governed by the following legislation:

- National Environmental Management Act (NEMA) Act No 107 of 1998
 - a. Basic Environmental Assessment – Section (23)(2)(d)
 - b. Environmental Scoping Report – Section (29)(1)(d)
 - c. Environmental Impacts Assessment – Section (32)(2)(d)
 - d. Environmental Management Plan – Section (34)(b)
- KwaZulu-Natal Heritage Act No 4 of 2008
 - a. Protection of heritage resources – Chapters 8 and 9
 - b. Heritage Resources Management – Chapter 10
- National Heritage Resources Act (NHRA) Act No 25 of 1999
 - a. Definition and management of the national estate – Chapter I
 - b. Protection and management of heritage resources – Chapter II
 - c. Heritage Resources Management – Section 38
- Minerals and Petroleum Resources Development Act (MPRDA) Act No 28 of 2002
 - a. Section 39(3)
- Development Facilitation Act (DFA) Act No 67 of 1995.
 - a. The GNR.1 of 7 January 2000: Regulations and rules in terms of the Development Facilitation Act, 1995 Section 31.

NATIONAL HERITAGE RESOURCES ACT NO 25 OF 1999

Heritage Impact Assessments

Section 38(1) of the National Heritage Resources Act of 1999 requires a heritage impact assessment in case of:

- the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length;
- the construction of a bridge or similar structure exceeding 50 m in length;
- any development or other activity which will change the character of a site—
 - (i) exceeding 5 000 m² in extent; or
 - (ii) involving three or more existing erven or subdivisions thereof; or
 - (iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or
 - (iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;
- the re-zoning of a site exceeding 10 000 m² in extent; or
- any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority.

Reports in fulfilment of Section 38(3) of the Act must include the following information:

- the identification and mapping of all heritage resources in the area affected;
- an assessment of the significance of such resources in terms of the heritage assessment criteria set out in regulations;
- an assessment of the impact of the development on such heritage resources;
- 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;
- the results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources;
- if heritage resources will be adversely affected by the proposed development, the consideration of alternatives; and
- plans for mitigation of any adverse effects during and after completion of the proposed development.

Definitions of heritage resources

The Act defines a heritage resource as any place or object of cultural significance i.e. of aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance. This includes, but is not limited to, the following wide range of places and objects:

- living heritage as defined in the National Heritage Council Act No 11 of 1999 (cultural tradition; oral history; performance; ritual; popular memory; skills and techniques; indigenous knowledge systems; and the holistic approach to nature, society and social relationships);
- ecofacts (non-artefactual organic or environmental remains that may reveal aspects of past human activity; definition used in KwaZulu-Natal Heritage Act 2008);
- places, buildings, structures and equipment;
- places to which oral traditions are attached or which are associated with living heritage;
- historical settlements and townscapes;
- landscapes and natural features;
- geological sites of scientific or cultural importance;
- archaeological and palaeontological sites;
- graves and burial grounds;
- sites of significance relating to the history of slavery in South Africa;
- movable objects, but excluding any object made by a living person;
- battlefields; and
- traditional building techniques.

Furthermore, a place or object is to be considered part of the national estate if it has cultural significance or other special value because of—

- its importance in the community, or pattern of South Africa's history;
- its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;
- its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;
- its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;
- its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;

- its importance in demonstrating a high degree of creative or technical achievement at a particular period;
- its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons; and
- its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa.

A **'place'** is defined as:

- a site, area or region;
- a building or other structure which may include equipment, furniture, fittings and articles associated with or connected with such building or other structure;
- a group of buildings or other structures which may include equipment, furniture, fittings and articles associated with or connected with such group of buildings or other structures;
- an open space, including a public square, street or park; and
- in relation to the management of a place, includes the immediate surroundings of a place.

'Structures' means 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.

'Archaeological' means –

- material remains resulting from human activity which are in a state of disuse and are in or on land and are older than 100 years, including artefacts, human and hominid remains and artificial features and structures;
- 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 is older than 100 years including any area within 10 m of such representation;
- 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 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;
- features, structures and artefacts associated with military history which are older than 75 years and the sites on which they are found.

'Palaeontological' means 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.

MANAGEMENT OF GRAVES AND BURIAL GROUNDS

- **Graves younger than 60 years** fall under Section 2(1) of the Removal of Graves and Dead Bodies Ordinance No 7 of 1925 as well as the Human Tissues Act No 65 of 1983 and the National Health Act (Act 61 of 2003) Regulations relating to the management of human remains No.R.363 of 22 May 2013. Such graves are the jurisdiction of the National Department of Health and the relevant Provincial Department of Health and must be submitted for final approval to the Office of the relevant Provincial Premier. This function is usually delegated to the Provincial Member of the Executive Council for Local Government and Planning, or in some cases the MEC for Housing and Welfare.

Authorisation for exhumation and reinterment must also be obtained from the relevant local or regional council where the grave is situated, as well as the relevant local or regional council to where the grave is being relocated. All local and regional provisions, laws and by-laws must also be adhered to. In order to handle and transport human remains the institution conducting the relocation should be authorised under Section 24 of the Human Tissues Act No 65 of 1983 and the National Health Act (Act 61 of 2003) Regulations relating to the management of human remains No.R.363 of 22 May 2013.

- **Graves older than 60 years situated outside a formal cemetery administered by a local authority** fall under Section 36 of the National Heritage Resources Act No 25 of 1999 as well as the Human Tissues Act of 1983. Accordingly, such graves are the jurisdiction of the South African Heritage Resources Agency (SAHRA). The procedure for Consultation Regarding Burial Grounds and Graves (Section 36(5) of NHRA) is applicable to graves older than 60 years that are situated outside a formal cemetery administered by a local authority. Graves in the category located inside a formal cemetery administered by a local authority will also require the same authorisation as set out for graves younger than 60 years over and above SAHRA authorisation.

If the grave is not situated inside a formal cemetery but is to be relocated to one, permission from the local authority is required and all regulations, laws and by-laws set by the cemetery authority must be adhered to.

The **protocol for the management of graves older than 60 years situated outside a formal cemetery administered by a local authority** is detailed in Section 36 of the National Heritage Resources Act:

- (3) (a) No person may, without a permit issued by SAHRA or a provincial heritage resources authority—
 - (a) destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves;
 - (b) destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or
 - (c) bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) any excavation equipment, or any equipment which assists in the detection or recovery of metals.
- (4) SAHRA or a provincial heritage resources authority may not issue a permit for the destruction or damage of any burial ground or grave referred to in subsection (3)(a) unless it is satisfied that the applicant has made satisfactory arrangements for the exhumation and re-interment of the contents of such graves, at the cost of the applicant and in accordance with any regulations made by the responsible heritage resources authority.
- (5) SAHRA or a provincial heritage resources authority may not issue a permit for any activity under subsection (3)(b) unless it is satisfied that the applicant has, in accordance with regulations made by the responsible heritage resources authority—
 - (a) made a concerted effort to contact and consult communities and individuals who by tradition have an interest in such grave or burial ground; and
 - (b) reached agreements with such communities and individuals regarding the future of such grave or burial ground.
- (6) Subject to the provision of any other law, any person who in the course of development or any other activity discovers the location of a grave, the existence of which was previously unknown, must immediately cease such activity and report the discovery to the responsible heritage resources

authority which must, in co-operation with the South African Police Service and in accordance with regulations of the responsible heritage resources authority—

- (a) carry out an investigation for the purpose of obtaining information on whether or not such grave is protected in terms of this Act or is of significance to any community; and
- (b) if such grave is protected or is of significance, assist any person who or community which is a direct descendant to make arrangements for the exhumation and re-interment of the contents of such grave or, in the absence of such person or community, make any such arrangements as it deems fit.

APPENDIX B

ARCHAEOLOGICAL AND HISTORICAL CONTEXT OF THE STUDY AREA

The Stone Age⁶

No systematic Early and Middle Stone Age research has been undertaken in the immediate proposed development area. However, open air scatters of stone artefacts, probably with low heritage significance, have been reported along the coastal littoral by Davies (O. Davies, 1970. Pleistocene beaches of Natal. Annals of Natal Museum 20(2)). Sibudu Cave, along the middle reaches of the Tongaat River, is the focus of current Middle Stone Age investigation and is serially nominated for World Heritage status⁷.

At a general level, South Africa's prehistory has been divided into a series of phases based on broad patterns of technology. The primary distinction is between a reliance on chipped and flaked stone implements (the Stone Age) and the ability to work iron (the Iron Age). Spanning a large proportion of human history, the Stone Age in Southern Africa is further divided into the Early Stone Age, or Paleolithic Period (about 2 500 000–150 000 years ago), the Middle Stone Age, or Mesolithic Period (about 150 000–30 000 years ago), and the Late Stone Age, or Neolithic Period (about 30 000–2 000 years ago). The simple stone tools found with australopithecine fossil bones fall into the earliest part of the Early Stone Age.

- **The Early Stone Age**

Most Early Stone Age sites in South Africa can probably be connected with the hominin species known as *Homo erectus*. Simply modified stones, hand axes, scraping tools, and other bifacial artifacts had a wide variety of purposes, including butchering animal carcasses, scraping hides, and digging for plant foods. Most South African archaeological sites from this period are the remains of open camps, often by the sides of rivers and lakes, although some are rock shelters, such as Montagu Cave in the Cape region.

- **The Middle Stone Age**

The long episode of cultural and physical evolution gave way to a period of more rapid change about 200 000 years ago. Hand axes and large bifacial stone tools were replaced by stone flakes and blades that were fashioned into scrapers, spear points, and parts for hafted, composite implements. This technological stage, now known as the Middle Stone Age, is represented by numerous sites in South Africa.

Open camps and rock overhangs were used for shelter. Day-to-day debris has survived to provide some evidence of early ways of life, although plant foods have rarely been preserved. Middle Stone Age bands hunted medium-sized and large prey, including antelope and zebra, although they tended to avoid the largest and most dangerous animals, such as the elephant and the rhinoceros. They also ate seabirds and marine mammals that could be found along the shore and sometimes collected tortoises and ostrich eggs in large quantities.

6 <http://www.britannica.com>; article authored by **Colin J. Bundy**, Julian R. D. Cobbing, Martin Hall and **Leonard Monteath Thompson**.

7 (Wadley, L. and Jacobs, Z. 2004. SAJS. 100 (3). 146-151; Sibudu Cave, KwaZulu-Natal: Background to the excavations of Middle Stone Age and Iron Age occupations. Wadley, L. 2006. Partners in grime: results of multi-disciplinary archaeology at Sibudu Cave. Southern African Humanities 18:315-341.

○ **The Late Stone Age**

Basic toolmaking techniques began to undergo additional change about 40 000 years ago. Small finely worked stone implements known as microliths became more common, while the heavier scrapers and points of the Middle Stone Age appeared less frequently. Archaeologists refer to this technological stage as the Late Stone Age. The numerous collections of stone tools from South African archaeological sites show a great degree of variation through time and across the subcontinent.

The remains of plant foods have been well preserved in numerous cave and shelter sites in KwaZulu-Natal. Animals were trapped and hunted with spears and arrows on which were mounted well-crafted stone blades. Bands moved with the seasons as they followed game into higher lands in the spring and early summer months, when plant foods could also be found. When available, rock overhangs became shelters; otherwise, windbreaks were built. Shellfish, crayfish, scavenged cetaceans and seabirds were also important sources of food, as were fish caught on lines, with spears, in traps, and possibly with nets.

In the foothills of the Drakensberg and above the escarpment a large number of rock shelters with occupation deposits occur in the Clarence Formation formerly known as Cave Sandstone. These sandstones provide the canvas for the wealth of rock art sites that have been recorded in the Okhahlamba/Drakensberg mountains.

Dating from the Later Stone Age are numerous engravings on rock surfaces, mostly on the interior plateau, and paintings on the walls of rock shelters in the mountainous regions, such as the Drakensberg and Cederberg ranges. The images were made over a period of at least 25 000 years. Although scholars originally saw the South African rock art as the work of exotic foreigners such as Minoans or Phoenicians or as the product of primitive minds, they now believe that the paintings were closely associated with the work of medicine men, shamans who were involved in the well-being of the band and often worked in a state of trance. Specific representations include depictions of trance dances, metaphors for trance such as death and flight, rainmaking, and control of the movement of antelope herds:

‘Most rock art researchers accept that southern African hunter-gatherer (Bushman/San) painters used animal imagery to model beliefs and concepts central to their cosmology. The eland is probably the best-known model, but species choice varies according to geographical area. Previous studies have tended to focus on morphology in order to identify painted and engraved animal depictions that the painters used as natural models. Morphology, however, is not always sufficient to positively identify a motif's zoological affinities [including] therianthrope images from the Western Cape Province and adjacent parts of the Eastern Cape Province, South Africa, popularly known as 'mermaids' (Hollmann 2005b:84).

Iron Age⁸

Archaeological evidence shows that Bantu-speaking agriculturists first settled in southern Africa around AD 300. Bantu-speakers originated in the vicinity of modern Cameroon from where they began to move eastwards and southwards, sometime after 400 BC, skirting around the equatorial forest. An extremely rapid spread throughout much of sub-equatorial Africa followed: dating shows that the earliest communities in Tanzania and South Africa are separated in time by only 200 years, despite the 3 000 km distance between the two regions. It seems likely that the speed of the spread was a

8 Whitelaw (1997). Whitelaw (2009). Whitelaw (2015).

consequence of agriculturists deliberately seeking iron ore sources and particular combinations of soil and climate suitable for the cultivation of their crops.

The earliest agricultural sites in KwaZulu-Natal date to between AD 400 and 550. All are situated close to sources of iron ore, and within 15 km of the coast. Current evidence suggests it may have been too dry further inland at this time for successful cultivation. From 650 onwards, however, climatic conditions improved and agriculturists expanded into the valleys of KwaZulu-Natal, where they settled close to rivers in savanna or bushveld environments. There is a considerable body of information available about these early agriculturists.

Seed remains show that they cultivated finger millet, bulrush millet, sorghum and probably the African melon. It seems likely that they also planted African groundnuts and cowpeas, though direct evidence for these plants is lacking from the earlier periods. Faunal remains indicate that they kept sheep, cattle, goats, chickens and dogs, with cattle and sheep providing most of the meat. Men hunted, perhaps with dogs, but hunted animals made only a limited contribution to the diet in the region.

Metal production was a key activity since it provided the tools of cultivation and hunting. The evidence indicates that people who worked metal lived in almost every village, even those that were considerable distances from ore sources.

Large-scale excavations in recent years have provided data indicating that first-millennium agriculturist society was patrilineal and that men used cattle as bridewealth in exchange for wives. On a political level, society was organised into chiefdoms that, in our region, may have had up to three hierarchical levels. The villages of chiefs tended to be larger than others, with several livestock enclosures, and some were occupied continuously for lengthy periods. Social forces of the time resulted in the concentration of unusual items on these sites. These include artefacts that originated from great distances, ivory items (which as early as AD 700 appear to have been a symbol of chieftainship), and initiation paraphernalia.

This particular way of life came to an end around AD 1000, for reasons that we do not yet fully understand. There was a radical change in the decorative style of agriculturist ceramics at this time, while the preferred village locations of the last four centuries were abandoned in favour of sites along the coastal littoral. In general, sites dating to between 1050 and 1250 are smaller than most earlier agriculturist settlements. It is tempting to see in this change the origin of the Nguni settlement pattern. Indeed, some archaeologists have suggested that the changes were a result of the movement into the region of people who were directly ancestral to the Nguni-speakers of today. Others prefer to see the change as the product of social and cultural restructuring within resident agriculturist communities.

Whatever the case, it seems likely that this new pattern of settlement was in some way influenced by a changing climate, for there is evidence of increasing aridity from about AD 900. A new pattern of economic inter-dependence evolved that is substantially different from that of earlier centuries, and is one that continued into the colonial period nearly 500 years later.

APPENDIX C

METHODOLOGY

Site survey

eThembeni staff inspected the site on 23 February and again on 22 July 2015. We completed a controlled-exclusive surface survey, where 'sufficient information exists on an area to make solid and defensible assumptions and judgements about where [heritage resource] sites may and may not be' and 'an inspection of the surface of the ground, wherever this surface is visible, is made, with no substantial attempt to clear brush, turf, deadfall, leaves or other material that may cover the surface and with no attempt to look beneath the surface beyond the inspection of rodent burrows, cut banks and other exposures that are observed by accident' (King 1978; see bibliography for other references informing methodological approach).

The site survey comprised a non-systematic or random walk across accessible portions of the area proposed for development. Photographs were taken with a Nikon Coolpix camera and a representative selection is included in Appendix D. Geographic coordinates were obtained using a handheld Garmin global positioning unit.

Database and literature review

A concise account of the pre and postcolonial history of the broader study area was compiled from sources including those listed in the bibliography and is included in Appendix B.

Assessment of heritage resource value and significance

Heritage resources are significant only to the extent that they have public value, as implicitly demonstrated by the following guidelines for determining site significance developed by the South African Heritage Resources Agency and utilised during this assessment.

Type of Significance

1. Historical Value: It is important in the community, or pattern of history
 - Importance in the evolution of cultural landscapes and settlement patterns.
 - Importance in exhibiting density, richness or diversity of cultural features illustrating the human occupation and evolution of the nation, Province, region or locality.
 - Importance for association with events, developments or cultural phases that have had a significant role in the human occupation and evolution of the nation, Province, region or community.
 - Importance as an example for technical, creative, design or artistic excellence, innovation or achievement in a particular period
 - It has strong or special association with the life or work of a person, group or organisation of importance in history
 - Importance for close associations with individuals, groups or organisations whose life, works or activities have been significant within the history of the nation, Province, region or community.
 - Importance for a direct link to the history of slavery in South Africa.
2. Aesthetic Value: It is important in exhibiting particular aesthetic characteristics valued by a community or cultural group
 - Importance to a community for aesthetic characteristics held in high esteem or otherwise valued by the community.

- Importance for its creative, design or artistic excellence, innovation or achievement.
 - Importance for its contribution to the aesthetic values of the setting demonstrated by a landmark quality or having impact on important vistas or otherwise contributing to the identified aesthetic qualities of the cultural environs or the natural landscape within which it is located.
 - In the case of an historic precinct, importance for the aesthetic character created by the individual components which collectively form a significant streetscape, townscape or cultural environment.
3. Scientific Value: It has potential to yield information that will contribute to an understanding of natural or cultural heritage
- Importance for information contributing to a wider understanding of natural or cultural history by virtue of its use as a research site, teaching site, type locality, reference or benchmark site.
 - Importance for information contributing to a wider understanding of the origin of the universe or of the development of the earth.
 - Importance for information contributing to a wider understanding of the origin of life; the development of plant or animal species, or the biological or cultural development of hominid or human species.
 - Importance for its potential to yield information contributing to a wider understanding of the history of human occupation of the nation, Province, region or locality.
 - It is important in demonstrating a high degree of creative or technical achievement at a particular period.
 - Importance for its technical innovation or achievement.
4. Social Value: It has strong or special association with a particular community or cultural group for social, cultural or spiritual reasons
- Importance as a place highly valued by a community or cultural group for reasons of social, cultural, religious, spiritual, symbolic, aesthetic or educational associations.
 - Importance in contributing to a community's sense of place.

Degrees of Significance

Rarity: It possesses uncommon, rare or endangered aspects of natural or cultural heritage

- Importance for rare, endangered or uncommon structures, landscapes or phenomena.

Representivity: It is important in demonstrating the principal characteristics of a particular class of natural or cultural places or objects

- Importance in demonstrating the principal characteristics of a range of landscapes or environments, the attributes of which identify it as being characteristic of its class.
- Importance in demonstrating the principal characteristics of human activities (including way of life, philosophy, custom, process, land-use, function, design or technique) in the environment of the nation, Province, region or locality.

Sphere of Significance: High, Medium, Low

- International; National; Provincial; Regional; Local

Assessment of impacts

A heritage resource impact may be defined broadly as the net change, either beneficial or adverse, between the integrity of a heritage site with and without the proposed development. Beneficial impacts occur wherever a proposed development actively protects, preserves or enhances a heritage

resource, by minimising natural site erosion or facilitating non-destructive public use, for example. More commonly, development impacts are of an adverse nature and can include:

- destruction or alteration of all or part of a heritage site;
- isolation of a site from its natural setting; and / or
- introduction of physical, chemical or visual elements that are out of character with the heritage resource and its setting.

Beneficial and adverse impacts can be direct or indirect, as well as cumulative, as implied by the aforementioned examples. Although indirect impacts may be more difficult to foresee, assess and quantify, they must form part of the assessment process. The following assessment criteria have been used to assess the impacts of the proposed development on identified heritage resources:

Criteria	Rating Scales	Notes
Nature	Positive	An evaluation of the type of effect the construction, operation and management of the proposed development would have on the heritage resource.
	Negative	
	Neutral	
Extent	Low	Site-specific, affects only the development footprint.
	Medium	Local (limited to the site and its immediate surroundings, including the surrounding towns and settlements within a 10 km radius);
	High	Regional (beyond a 10 km radius) to national.
Duration	Low	0-4 years (i.e. duration of construction phase).
	Medium	5-10 years.
	High	More than 10 years to permanent.
Intensity	Low	Where the impact affects the heritage resource in such a way that its significance and value are minimally affected.
	Medium	Where the heritage resource is altered and its significance and value are measurably reduced.
	High	Where the heritage resource is altered or destroyed to the extent that its significance and value cease to exist.
Potential for impact on irreplaceable resources	Low	No irreplaceable resources will be impacted.
	Medium	Resources that will be impacted can be replaced, with effort.
	High	There is no potential for replacing a particular vulnerable resource that will be impacted.
Consequence (a combination of extent, duration, intensity and the potential for impact on irreplaceable resources).	Low	A combination of any of the following: <ul style="list-style-type: none"> - Intensity, duration, extent and impact on irreplaceable resources are all rated low. - Intensity is low and up to two of the other criteria are rated medium. - Intensity is medium and all three other criteria are rated low.
	Medium	Intensity is medium and at least two of the other criteria are rated medium.
	High	Intensity and impact on irreplaceable resources are rated high, with any combination of extent and duration. Intensity is rated high, with all of the other criteria being rated medium or higher.
Probability (the likelihood of the impact occurring)	Low	It is highly unlikely or less than 50 % likely that an impact will occur.
	Medium	It is between 50 and 70 % certain that the impact will occur.
	High	It is more than 75 % certain that the impact will occur or it is definite that the impact will occur.

Criteria	Rating Scales	Notes
Significance (all impacts including potential cumulative impacts)	Low	Low consequence and low probability. Low consequence and medium probability. Low consequence and high probability.
	Medium	Medium consequence and low probability. Medium consequence and medium probability. Medium consequence and high probability. High consequence and low probability.
	High	High consequence and medium probability. High consequence and high probability.

Assumptions and limitations of this heritage impact assessment

- The description of the proposed project, provided by the client, is accurate.
- The public consultation process undertaken as part of the Environmental Impact Assessment is sufficient and adequate and does not require repetition as part of the heritage impact assessment.
- Soil surface visibility was low to moderate. Heritage resources might be present below the surface or in areas of dense vegetation and we remind the client that the Act requires that a developer cease all work immediately and notify SAHRA should any heritage resources, as defined in the Act, be discovered during the course of development activities.
- No subsurface investigation (including excavations or sampling) were undertaken, since a permit from SAHRA is required to disturb a heritage resource.
- A key concept in the management of heritage resources is that of non-renewability: damage to or destruction of most resources, including that caused by bona fide research endeavours, cannot be reversed or undone. Accordingly, management recommendations for heritage resources in the context of development are as conservative as possible.
- Human sciences are necessarily both subjective and objective in nature. We strive to manage heritage resources to the highest standards in accordance with national and international best practice, but recognise that our opinions might differ from those of other heritage practitioners.
- Staff members involved in this project have no vested interest in it; are qualified to undertake the tasks as described in the terms of reference; and comply at all times with the Codes of Ethics and Conduct of the Association of Southern African Professional Archaeologists.
- eThembeni staff members take no responsibility for the misuse of the information contained in this report, but take every reasonable precaution to prevent such misuse.

APPENDIX D

PHOTOGRAPHS

See SAHRIS Case ID: 8446



PLANT FOOTPRINT AND LINEAR INFRASTRUCTURE



PROPOSED PLANT LOCATION CURRENTLY UNDER MARKET GARDEN CULTIVATION



PROPOSED PIPELINE TUNNELS BELOW M4 MOTORWAY AND UNDER TERTIARY DUNE CORDON TO BEYOND SURF ZONE (1)



PROPOSED PIPELINE TUNNELS BELOW M4 MOTORWAY AND UNDER TERTIARY DUNE CORDON TO BEYOND SURF ZONE (2)

APPENDIX E

Palaeontological Desktop Assessment

DESK-TOP PALAEOONTOLOGY ASSESSMENT: TONGAAT

Alan Smith Pr. Sci. Nat. (11/11/2015)

TERMS OF REFERENCE

Provide a Desk-top Palaeontological Assessment for the proposed Tongaat Desalination site. The geology was obtained from the 1:250 000 Geological Map (Thomas, 1988).

Fig. 1: Proposed Tongaat desalination site.



Three lithologies crop out, or are anticipated to be at shallow depth, in the proposed Tongaat desalination site:

1. Berea Formation: According to the 1:2500 geological map, this site is entirely Berea Formation (Qb), which is not consolidated. Although it is described as Berea Formation it probably contains dunes of various Quaternary ages. No palaeontology reports are known from this location.
2. Dolerite: May be present as sills or dykes at depth. This rock is igneous and NOT FOSSILIFEROUS.
3. Vryheid Formation underlies the Quaternary at shallow depth and may crop out on the beach from time to time (depending on coastal erosion). This rock is rich in trace fossils but it is extremely common in KwaZulu-Natal and has no scarcity value.

CONCLUSION: NOTHING OF PALAEOONTOLOGICAL SIGNIFICANCE FROM DESK-TOP STUDY

REFERENCES

Thomas, RJ (1988). 2930 DURBAN 125 000 geological map. Council for Geosciences, Government Printer, Pretoria.

GoogleEarth website

APPENDIX F

Maritime Archaeology - Desktop Assessment

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GLOSSARY OF ACRONYMS

ASAPA	Association of Southern African Professional Archaeologists
EIA	Environmental Impact Assessment
HIA	Heritage Impact Assessment
MUCH	Maritime and Underwater Cultural Heritage (Includes underwater and land maritime heritage)
NHRA	National Heritage Resources Act (No. 25 of 1999)

1. INTRODUCTION

This report fulfils the first part of the SAHRA Maritime and Underwater Cultural Heritage Unit's conditions as stated in their "Interim Comment – SAH 15/8447". This report is a desktop survey of existing shipwreck databases in the two areas, as delineated in Section 5.1.

2. TERMS OF REFERENCE

The aim of this desktop survey is to determine if there are any known shipwrecks within the defined areas.

The scope of work consisted of the following:

- Desktop study, consisting of a database of known and suspected wrecks in the area ascertained through study of available written and oral resources

The objectives were to:

- Identify potential MUCH sites within the designated area

3. HERITAGE RESOURCES

3.1. The Legislation

According to Section 32 (1) of the NHRA (No. 25 of 1999), heritage objects consist of:

"An object or collection of objects, or a type of object or list of objects, whether specific or generic, that is part of the national estate and the export of which SAHRA deems it necessary to control, may be declared a heritage object, including— (a) objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects, meteorites and rare geological specimens."

The Act further stipulates that the term "archaeological" includes:

"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."

Section 35 of the Act states:

"(1) Subject to the provisions of section 8, the protection of archaeological and palaeontological sites and material and meteorites is the responsibility of a provincial heritage resources authority: Provided that the protection of any wreck in the territorial waters and the maritime cultural zone shall be the responsibility of SAHRA.

(2) Subject to the provisions of subsection (8)(a), all archaeological objects, palaeontological material and meteorites are the property of the State. The responsible heritage authority must, on behalf of the State, at its discretion ensure that such objects are lodged with a museum or other public institution that has a collection policy acceptable to the heritage resources authority and may in so doing establish such terms and conditions as it sees fit for the conservation of such objects.

(3) Any person who discovers archaeological or palaeontological objects or material or a meteorite in the course of development or agricultural activity must immediately report the find to the responsible heritage resources authority, or to the nearest local authority offices or museum, which must immediately notify such heritage resources authority.

(4) No person may, without a permit issued by the responsible heritage resources authority—

- (a) destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;
- (b) destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;"
- (c) trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or palaeontological material or object, or any meteorite; or

(d) bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assist in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites.”

Furthermore Section 38 of the Act states:

“(1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as—

- (a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
- (b) the construction of a bridge or similar structure exceeding 50 m in length;
- (c) any development or other activity which will change the character of a site—
 - (i) exceeding 5 000 m² in extent; or
 - (ii) involving three or more existing erven or subdivisions thereof; or
 - (iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or
 - (iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;
- (d) the re-zoning of a site exceeding 10 000 m² in extent; or
- (e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

(2) The responsible heritage resources authority must, within 14 days of receipt of a notification in terms of subsection (1)—

- (a) if there is reason to believe that heritage resources will be affected by such development, notify the person who intends to undertake the development to submit an impact assessment report. Such report must be compiled at the cost of the person proposing the development, by a person or persons approved by the responsible heritage resources authority with relevant qualifications and experience and professional standing in heritage resources management; or
- (b) notify the person concerned that this section does not apply.

(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.

(4) The report must be considered timeously by the responsible heritage resources authority which must, after consultation with the person proposing the development, decide—

- (a) whether or not the development may proceed;
- (b) any limitations or conditions to be applied to the development;
- (c) what general protections in terms of this Act apply, and what formal protections may be applied, to such heritage resources;
- (d) whether compensatory action is required in respect of any heritage resources damaged or destroyed as a result of the development; and
- (e) whether the appointment of specialists is required as a condition of approval of the proposal.

(5) A provincial heritage resources authority shall not make any decision under subsection (4) with respect to any development which impacts on a heritage resource protected at national level unless it has consulted SAHRA.

- (6) The applicant may appeal against the decision of the provincial heritage resources authority to the MEC, who—
- (a) must consider the views of both parties; and
 - (b) may at his or her discretion—
 - (i) appoint a committee to undertake an independent review of the impact assessment report and the decision of the responsible heritage authority; and
 - (ii) consult SAHRA; and
 - (c) must uphold, amend or overturn such decision.
- (7) The provisions of this section do not apply to a development described in subsection (1) affecting any heritage resource formally protected by SAHRA unless the authority concerned decides otherwise.
- (8) The provisions of this section do not apply to a development as described in subsection (1) if an evaluation of the impact of such development on heritage resources is required in terms of the Environment Conservation Act, 1989 (Act No. 73 of 1989), or the integrated environmental management guidelines issued by the Department of Environment Affairs and Tourism, or the Minerals Act, 1991 (Act No. 50 of 1991), or any other legislation: Provided that the consenting authority must ensure that the evaluation fulfils the requirements of the relevant heritage resources authority in terms of subsection (3), and any comments and recommendations of the relevant heritage resources authority with regard to such development have been taken into account prior to the granting of the consent.
- (9) The provincial heritage resources authority, with the approval of the MEC, may, by notice in the *Provincial Gazette*, exempt from the requirements of this section any place specified in the notice.
- (10) Any person who has complied with the decision of a provincial heritage resources authority in subsection (4) or of the MEC in terms of subsection (6) or other requirements referred to in subsection (8), must be exempted from compliance with all other protections in terms of this Part, but any existing heritage agreements made in terms of section 42 must continue to apply."

3.2. Conclusion – The legislation in terms of the project

There is extensive national legislation covering MUCH sites. Within the scope of this project, Section 38 of the NHRA (25 of 1999), states that an assessment of potential heritage resources in the development area needs to be done. This is the purpose of the desktop study and the future magnetometer survey. These processes identify potential MUCH sites. If a potential MUCH site is later uncovered during the work, a maritime archaeologist needs to be contacted to assess the find. Thereafter, in conjunction with SAHRA, a decision will be made regarding the significance of the site. If it is deemed to be culturally significant, the contractor can apply to the Maritime Unit of SAHRA for a permit for removal, excavation or destruction in terms of Section 35 of the NHRA.

4. STUDY APPROACH AND METHODOLOGY

4.1. Extent of the Assessment

This desktop survey is concerned with MUCH and covers the area as described in Section 5.

4.2. Methodology

4.2.1. Desktop Survey

A shipwreck database was compiled from the available written and oral sources and is available in Section 5.2.

Limitations

- The database is a research tool that is constantly evolving as information is uncovered and added. In addition, the solitary nature of many wrecks means that information may be scarce and/or inaccurate. Therefore, without definitive information, shipwrecks are allocated to an area, based on limited information and certain assumptions regarding the dynamic nature of the environment.

5. DESCRIPTION OF THE AFFECTED ENVIRONMENT

5.1. Site Location and Description

5.1.1. Tongaat Proposed Desalination Plant

Area off Tongaat Desalination Plant. Collectively called the Tongaat Impact Zone. We have created an impact zone of 500 metres on either side of the proposed sea intake pipe (equals one kilometre) and one kilometre past the end of the pipeline.

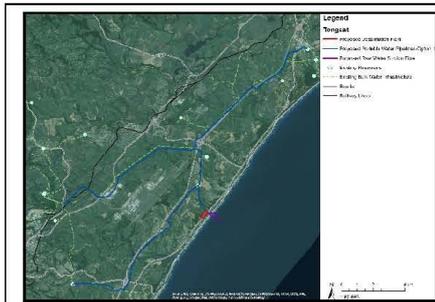


Figure 1: Tongaat Desalination Plant Area (Image eThembeni 2015)



Figure 2: Tongaat MUCH Impact Zone (Google Earth 2016)

6. SHIPWRECK DATABASE

The nature of the environment, poor historical reporting and the length of time since the wrecks occurred means that underwater cultural heritage sites may literally be anywhere and are thus hard to pinpoint with any accuracy beforehand. It is important to have a database because if MUCH sites are uncovered during the project, it will be easier to identify the wreck and thus assess its cultural and historical significance.

#	Name	Events	Home Port	Date	History
Tongaat Impact Zone					
1	<i>SS Octopus</i>	Wrecked	Britain	15-10-1906	Steel, twin-screw hopper dredger of 969-tons. Built in 1895 by W. Simons & Co in Renfrew. Under Capt. Thomas Ogilvie, she ran ashore south of Ballito Bay. The Natal Government had sold her the Administration of Geelong, Australia after having spent a number of years working in Durban Harbour. The <i>Octopus</i> was being delivered to Australia and was heavily laden with 780-tons of coal for the voyage. However, shortly after leaving Durban, she ran into heavy weather and took on water. This inrush of water extinguished her furnaces. Shortly before abandoning her, the crew released a messenger pigeon, presumably requesting assistance.
2	<i>Ocean Surf</i>	Wrecked	SA	29-03-1979	Silver Harvest Trawling Co. Built in 1946 by Richards Iron Works, 27.83 x 6.33 x 2.921m with a 360 bhp that could do 10 knots. Her home port was Cape Town. This 122-ton trawler was en route to the fishing grounds when she became disabled. She drifted onto a reef 200 metres from the shore off Tongaat Beach. She could not be refloated and one person was drowned in the mishap.
3	<i>Isle of Capri II</i>	Wrecked	SA	29-08-1973	This 44-ton charter fishing boat sank in heavy seas off Umhali after her stern was ripped off by the vessel she was towing, the <i>Pelican</i> . All the crew survived.

#	Name	Events	Home Port	Date	History
Wrecked "Off Port Natal"					
6	<i>Colombo</i>	Wrecked	Dutch	24-09-1822	Bound from Batavia for Holland. Wrecked off Port Natal.
7	<i>Buckbay Packet</i>	Wrecked	British	June 1823/24	In February 1828 the government schooner called at Port Natal on her way to Delagoa Bay. Shortly after leaving, she was driven ashore during a gale. Her captain died of 'fever' on the coast.
8	<i>Koh-I-Nor</i>	Abandoned		01-01-1867	This 701-ton British ship under Captain H. Rutter, was on a voyage from Calcutta to Boston with a general cargo. She was abandoned at 30° 22' S 29° 30' E (Please note these cannot be compared to modern day co-ords, they need to be converted). This is somewhere near the Natal coast. The crew were taken aboard the Russian ship, <i>Tahli</i> and were landed at Cape Town a week later.
9	<i>Cotehele</i>	Wrecked	British	18-11-1894	Built in 1892 by Sir R. Dixon & Co. in Middlesbrough. 299.5 x 40.1 x 20.5 feet. 200 hp engine. This 1715-ton steamer sailed from Durban for Delagoa Bay. She struck Tenedos Shoal and returned to Durban for repairs. However, she was wrecked two weeks later on the coast of Natal.
10	<i>Octopus</i>	Wrecked	Durban	14-10-1906	Built in 1895 by W. Simon & Co (Ltd) in Renfrew, this 969-ton steel twin-crew dredger was en route to Australia from Durban on 13 October when she encountered a gale. By the following morning, she had shipped a lot of water and her crew abandoned her in two boats. The boat with Capt. Ogilvie aboard capsized while trying to beach two-and-a-half kilometres north of the Umhlanga River. The captain's wife and two children were drowned. The second boat beached at Umhlanga Rocks and the crew landed. The dredger eventually drifted ashore on the "Natal North Coast" and disintegrated.
Disappeared en route to or from Port Natal/Durban					
11	<i>São Thomé</i>	Abandoned	Portugal	March 1589	This carrack sailed from the Indian port of Cochin in January 1589 under the command of Estevao da Veiga. Although she was one of the richest vessels to sail from India, she was in poor condition, due to rampant corruption. During a south-east gale, one of the seams in her bow opened and although the leak was repaired, allowing her to continue, it wasn't long before a more serious leak developed in her stern. The vessel was approximately 480 kilometres off the southern African coast and her pepper-clogged pumps were unable to clear the water from her hold. The <i>São Thomé</i> was disabled and adrift, her lower decks under water. At dusk, on 16 March, land was sighted. The next morning 109 officers, crew, rich passengers, clergy and a few slaves took the only longboat and abandoned ship, leaving the balance aboard to their fate. However, the long boat was too crowded and eleven people were thrown overboard. Two days later the boat reached shore and only a few managed to walk to Mozambique. While there are different ideas as to where the longboat came ashore, from St Lucia to Lake Sibayi, no one knows where the <i>São Thomé</i> ended up. She may have drifted ashore anywhere on the KwaZulu Natal coast or she may have sunk offshore. For this reason, I have included the vessel in the database as there is a possibility that she may be in the impact zones.
12	<i>Penelope</i>	Disappeared	British	1591	East Coast
13	<i>Zeelt</i>	Disappeared	VOC	1672	After departing Table Bay
14	<i>Kers</i>	Disappeared	VOC	1697	Between. Batavia and Table Bay
15	Unknown	Wrecked		1730's	Anecdotal evidence, from a number of sources, that an English vessel went ashore somewhere south of Durban.
16	I	Disappeared	British	1806	Between Table Bay and Bengal
17	Calcutta	Disappeared	British	1809	Between Mauritius and Britain

#	Name	Events	Home Port	Date	History
18	Jane Duchess of Gordon	Disappeared	British	1809	Between Mauritius and Britain
19	Lady Jane Dundas	Disappeared	British	1809	Between Mauritius and Britain
20	Sir William Bently	Disappeared	British	1809	Between Mauritius and Britain
21	<i>Julia</i>	Disappeared/ Wrecked		December 1824	This 25-ton sloop or brig left Durban for Algoa Bay and disappeared. On her were 11 settlers and 12-days provisions. She was expected to return with supplies for the budding Natal settlement. The Cape Town Gazette (1825) states, "A quantity of staves were picked up near Middle Point Natal by some of Farewell's people, which were recognised to have come from the <i>Julia</i> and leads them to conclude that she was lost near that place.". It was believed that she caught fire and sank.
22	<i>Alma</i>	Disappeared/ Wrecked		May 1864	This schooner under Captain Duzdale was travelling from Cape Town to Natal and disappeared.
23	<i>Tien Esser</i>	Abandoned / Wrecked	German	05-01-1875	This schooner was bound for Natal with a cargo of wheat and flour. She foundered at sea and the survivors were rescued by the Dutch barque <i>Galilie</i> . One life was lost.
24	<i>Emin</i>	Disappeared	German	19-12-1893	Owned by the Deutsche Ost-Afrika Linie, built in 1891 by Blohm & Voss in Hamburg, she measured 172 x 25 x 14.2 feet. 90 hp engine. Home port, Danzig. This 373-ton steamer sailed from Durban for Mozambique with a coal cargo. She disappeared but some scattered wreckage was found later on the Zululand coast.
25	<i>Lindo</i>	Disappeared	Norway	August 1913	Built in 1891 by Workman Clark & Co. in Belfast and measuring 256.2 x 37.9 x 21.9, this 1475-ton vessel (<i>ex-Marian Woodside</i>) under Capt. Jensen was bound from Taltal with a nitrate cargo. She sailed from Durban on 26 August 1913 and disappeared.

7. CONCLUSIONS

As there are at least three possible wrecks in the Tongaat Impact Zone, it is strongly recommended that a magnetometer survey be undertaken. In addition, as can be seen in the database, there are at least five vessels that wrecked in the vicinity of "Port Natal", This was the historical name for Durban and Durban Bay. There are also at least fifteen vessels that disappeared en route to-or-from Durban and may be in the impact zones.

REFERENCES:

Legal Sources:

National Environmental Management Act, 1998 (Act No. 107 of 1998)
 National Heritage Resources Act, 1999 (Act No. 25 of 1999)

Written Sources:

Levine, M. Unpublished Manuscript.
 Maitland, Vanessa. Unpublished Shipwreck Database.
 Turner, Malcolm. 1988. Shipwrecks & Salvage in Southern Africa: 1505 to the Present. Cape Town. C. Struik.

Map Sources:

Google Earth. Accessed 2016.
 eThembeni Cultural Heritage. 2015.

APPENDIX G

SAHRA Letter (8 December 2015)

AMAFA Letter (29 February 2016)



Letter

In terms of Section of the National Heritage Resources Act (Act 25 of 1999)

Attention: Council for Scientific and Industrial Research
P O Box 320
Stellenbosch
7599

Umgeni Water Amanzi (Umgeni Water) is proposing to construct and operate a seawater desalination plant on the Lovu River near Kingsburgh / Mid-Illovo on the KwaZulu-Natal South Coast, using seawater reverse osmosis technology. The plant facility will have a lifespan of approximately 25 years with the potential of a lifespan extension.

Dear Len

Thank you for the ACHA letter with regard to the potential for maritime underwater cultural heritage (MUCH) sites below the high water mark at the proposed site of the Lovu desalination plant, which indicates that there may be nineteen historical wrecks in the general area.

SAHRA notes the recommendation made by ACHA that a magnetometer survey of the area to be affected by the offshore elements of the desalination plant is carried out, which is in line with our previous comment on the development proposals. SAHRA requests that a desk-based maritime archaeological assessment of MUCH resources in the area takes as soon as possible, but is willing to agree to the proposed magnetometer survey taking place post-consent, provided it is included as a condition of any approval granted for the proposed development.

The magnetometer survey must include a suitable buffer zone around the co-ordinates of the proposed development, and provision will need to be made for any discoveries of MUCH resources made as a result of the survey to be suitably mitigated. Mitigation will, in the first instance, comprise avoidance of the MUCH resource/s. Where this is not possible, archaeological intervention will be required.

If you have any questions with regard to any of the comments above, please do not hesitate to get in touch with SAHRA.

Should you have any further queries, please contact the designated official using the case number quoted above in the case header.

Yours faithfully



Proposed Umgeni Water Desalination Plant and associated infrastructure at Lovu, eThekweni Municipality, KwaZulu-Natal.

Our Ref: SAH15/8447



an agency of the
Department of Arts and Culture

Enquiries: John Gribble
Tel: 021 465 2198
Email: jgribble@sahra.org.za
CaseID: 8447

Date: Tuesday December 08, 2015

Page No: 2

John Gribble
Manager: Maritime and Underwater Cultural Heritage Unit
South African Heritage Resources Agency

ADMIN:

Direct URL to case: <http://www.sahra.org.za/node/330771>
(, Ref:)

Terms & Conditions:

1. This approval does not exonerate the applicant from obtaining local authority approval or any other necessary approval for proposed work.
2. If any heritage resources, including graves or human remains, are encountered they must be reported to SAHRA immediately.
3. SAHRA reserves the right to request additional information as required.



The South African Heritage Resources Agency

Street Address: 111 Harrington Street, Cape Town 8000 * Postal Address: PO Box 4637, Cape Town 8000
* Tel: +27 21 462 4502 * Fax: +27 21 462 4509 * Web: <http://www.sahra.org.za>



Final Comment

In terms of Section 38(8) of the National Heritage Resources Act (Act 25 of 1999) and the KwaZulu-Natal Heritage Act (Act 4 of 2008)

Attention: Mr Len van Schalkwyk
eThembeni Cultural Heritage
PO Box 20057
Ashburton
3213

Umgeni Water Amanzi (Umgeni Water) is proposing to construct and operate a seawater desalination plant at Desainagar/La Mercy near Tongaat, on the KwaZulu-Natal North Coast, using seawater reverse osmosis technology. The desalination plant will produce 150 MI/day of freshwater when at final capacity.

We acknowledge receipt of the Heritage Impact Assessment Report and Paleontological Report relating to this application. We note the findings and recommendations proposed by the Paleontologist and Archaeologist respectively regarding this development proposal. It is noted that there is no need for further paleontological work. Considering the archaeological sensitivity of the area, a watching brief proposed by the archaeologist should be implemented.

In view of the Heritage Reports by eThembeni and Alan Smith that we received, Amafa has no objection to the proposed development within limits of the prescribed mitigation measures and recommendations as outlined in the report. This is also subject to approval of development by SAHRA regarding the maritime zone archaeology.

You are also required to adhere to the below-mentioned standard conditions:

Conditions:

1. Amafa should be contacted if any heritage objects are identified during earthmoving activities and all development should cease until further notice.
2. No structures older than sixty years or parts thereof are allowed to be demolished altered or extended without a permit from Amafa.
3. No activities are allowed within 50m of a site, which contains rock art.
4. Sources of all natural materials (including topsoil, sands, natural gravels, crushed stone, asphalt, etc.) must be obtained in a sustainable manner and in compliance with the heritage legislation.

Failure to comply with the requirements of the National Heritage Resources Act and the KwaZulu Natal Heritage Resources Act could lead to legal action being instituted against the applicant.

Should you have any further queries, please contact the designated official using the case number quoted above in the case header.



**Proposed Umgeni Water Desalination Plant and associated infrastructure ,
Tongaat, eThekweni Municipality, KwaZulu-Natal**
Our Ref: SAH15/8446



Enquiries: Bernadet Pawandiwa
Tel: 033 394 6543
Email: bernadep@amafapmb.co.za
CaseID: 8446

Date: Monday February 29, 2016

Page No: 2

Yours faithfully

Bernadet Pawandiwa
Senior Heritage Officer
Amafa/Heritage KwaZulu Natal

Annie van de Venter Radford
Deputy Director: Research, Professional Services and Compliance
Amafa/Heritage KwaZulu Natal

ADMIN:

Direct URL to case: <http://www.sahra.org.za/node/330770>
(, Ref:)

Terms & Conditions:

1. This approval does not exonerate the applicant from obtaining local authority approval or any other necessary approval for proposed work.
2. If any heritage resources, including graves or human remains, are encountered they must be reported to Amafa immediately.
3. Amafa reserves the right to request additional information as required.



**Amafa AkwaZulu-Natali
Heritage KwaZulu-Natal
Erfenis KwaZulu-Natal**

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