MARITIME ARCHAEOLOGICAL IMPACT ASSESSMENT OF PROPOSED EQUIANO CABLE SYSTEM, LANDING AT MELKBOSSTRAND, WESTERN CAPE PROVINCE

Assessment conducted under Section 38 (8) of the
National Heritage Resources Act (No. 25 of 1999) as part of an Environmental Impact Assessment

Prepared for

Acer (Africa) Environmental Consultants

On behalf of the

Openserve Division

of

Telkom SA SOC Limited

Final

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1. EXECUTIVE SUMMARY

ACO Associates cc has been requested by Acer (Africa) Environmental Consultants on behalf of Telkom SA SOC Limited, to undertake a desktop maritime archaeological impact assessment of the selected alignment of the proposed Equiano maritime telecommunications system off the Cape West Coast.

This maritime heritage assessment report supported by recommendations for implementable mitigation measures will form part of an Environmental Impact Assessment for the proposed cable system.

Findings: In respect of submerged prehistoric archaeological potential, this assessment indicates that although there have, to date, been no studies of submerged prehistory in the study area, the archaeological evidence for a Later Stone Age hominin presence in the Bloubergstrand / Melkbosstrand area is plentiful, while approximately 4 km north of the study area are the important Earlier Stone Age sites of Duinefontein 1 and 2. These latter sites have produced Acheulean stone tools in association with animal bone, deposited between 200,000 and 400,000 years ago, around palaeo-pans or lakes that developed in hollows within a large dune field, where hominins were hunting or scavenging animals.

Similar palaeo-pans are likely to have been present on the exposed continental shelf during periods of lower sea level, and together with ancient rivers courses, today buried under modern seabed sediment, would have been an important focus for hominin activity on the exposed continental shelf. There is thus the potential for the occurrence of ancient, submerged archaeological material in association with such sea bed features within the study area for this project.

Regarding shipwrecks, this assessment found that the Equiano cable system will be installed north of the historical anchorage in Table Bay, in an area with very few shipping casualties. Losperds Bay at Melkbosstrand, within which the Equiano cable system will come ashore, has an important, maritime-related historical association as the site at which the British landed their troops on 6 and 7 January 1806 as a prelude to the Battle of Blouberg and the second British occupation of the Cape. Also in this bay is the only known wreck likely to be in close proximity to the proposed cable – the French vessel *L'Lucie* wrecked in 1808. Two other vessels recorded outside the study area are worth bearing in mind as the relative inaccuracy of their estimated positions means they could potentially lie within the study area. Beyond the seaward limit of the study area but within a few kilometres of the proposed route alignment are a further three wrecks which if encountered during the installation of the cable system pose a potential threat to equipment and should be avoided.

The cable design and engineering surveys undertaken by Fugro Germany Marine identified a number of sidescan sonar and magnetic anomalies in and on the sea bed of the cable corridor. Some of these were geological but others may be humanly-derived debris.

Recommendations: No mitigation is required or proposed in respect of submerged prehistoric archaeology as it is extremely unlikely that sites or material will be affected by the installation of the cable.

With regard to historical shipwrecks, the proposed Equiano cable system has a very low potential for impacts arising out of the installation of the sea bed cable. However, in view of the likely presence of *L'Lucie* close to the cable landfall and the potential, albeit very small, for the presence of currently unknown wrecks close to the cable route, the following recommendations are made in respect of mitigation measures to be applied during the installation of the Equiano cable system:

- Any <u>further</u> geophysical data generated to support the installation of the cable system must be archaeologically reviewed for the presence of historical shipwrecks or related material. Datasets

that are particularly useful in this regard are magnetometer, side scan sonar and multibeam bathymetric data. It is recommended that the project archaeologist is consulted before any data are collected to ensure that the survey specifications and data outputs are suitable for archaeological review;

- Should the data identify wreck material at or near the location of any portion of the cable, micro-siting of the cable and/or the possible implementation of an exclusion zone around the archaeological feature should be sufficient to mitigate the risks to the site;
- Should any archaeological material, be accidentally encountered during the course of cable installation, work must cease in that area until the project archaeologist and SAHRA have been notified, the find has been assessed by the archaeologist, and agreement has been reached on how to deal with it.

Based on this assessment, the proposed installation of the Equiano cable system raises no red flags, contains no fatal flaws and is unlikely to have any impact on known or unknown maritime and underwater cultural heritage resources. It is, therefore, considered archaeologically acceptable.

2. INTRODUCTION

ACO Associates cc has been requested by Acer (Africa) Environmental Consultants on behalf of Telkom SA SOC Limited, to undertake a desktop maritime archaeological impact assessment of the selected alignment of the proposed Equiano maritime telecommunications system off the Cape West Coast (**Figure 1**).

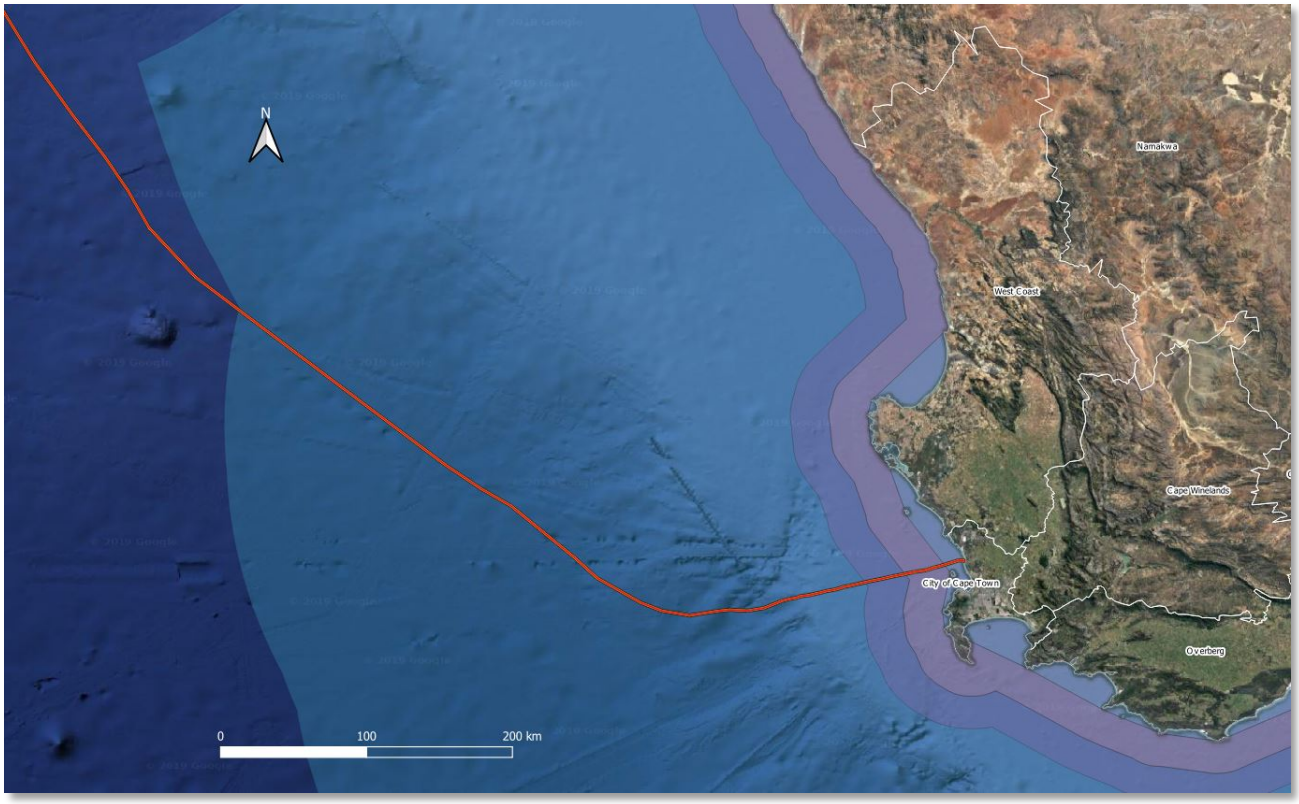

Figure 1: General location map, showing the route of the proposed Equiano Cable System from outside the South African EEZ (blue), across the contiguous zone (purple), territorial waters (mauve) and internal waters (pale blue) to its landfall at Melkbosstrand north of Cape Town (Source: Google Maps).

3. PROJECT BACKGROUND

Telkom SA SOC Limited, acting through its Openserve Division (Openserve), is proposing to install a submarine telecommunications cable in the waters off the Cape West Coast, which will make landfall at Melkbosstrand north of Cape Town.

The cable route will enter South Africa's EEZ almost due west of Lamberts Bay following a south-easterly alignment until approximately 78 nautical miles west of Hout Bay. Thereafter it tracks north-east, skirting three nautical miles north of Robben Island, before making landfall at Melkbosstrand (**Figure 1** above).

Within the territorial waters the general alignment of the Equiano cable system will follow that of the SAT-2 cable system, which was installed in 1993 and decommissioned in 2013 (https://en.wikipedia.org/wiki/SAT-2).

The following offshore activities relevant to this maritime archaeological assessment are anticipated during the installation and operation of the Equiano cable system:

- The laying of cable in the offshore environment in water depths up to 1500 m. The cable will not be fixed by use of anchor points, pins or clamps as, generally speaking, the seabed sediments will allow good burial throughout, either by ploughing or jetting. If there are areas of hard seabed

across which the cable must be laid, these portions of the cable will be held firmly in position by the tension exerted by the nearby buried cable to which they are connected; and
- The burial of the cable within the intertidal zone and across the beach, to a depth of at least 2 m, to the point of termination into the existing SAT-2 beach manhole (BMH) adjacent to Beach Road. The construction of a new BMH at Melkbosstrand will not be required.

This heritage impact assessment deals only with the marine portion of the cable route to the BMH, which is under the jurisdiction of the South African Heritage Resources Agency (SAHRA) (see Section 4.1 below).

The terrestrial portion of the cable route inland of the BMH, falls under the jurisdiction of Heritage Western Cape but does not trigger the relevant section of the National Heritage Resources Act (Section 38(1)) and no heritage assessment for that portion of the route is required.

4. RELEVANT LEGISLATION

4.1. **National Heritage Resources Act (No 29 of 1999)**

The National Heritage Resources Act (NHRA) came into force in April 2000 with the establishment of SAHRA, replacing the National Monuments Act (No. 28 of 1969 as amended) and the National Monuments Council as the national agency responsible for the management of South Africa's cultural heritage resources.

The NHRA reflects the tripartite (national/provincial/local) nature of public administration under the South African Constitution and makes provision for the devolution of cultural heritage management to the appropriate, competent level of government.

Because national government is responsible for the management of the seabed below the high water mark, however, the management of maritime and underwater cultural heritage resources under the NHRA does not devolve to provincial or local heritage resources authorities but remains the responsibility of the national agency, SAHRA.

The NHRA gives legal definition to the range and extent of what are considered to be South Africa's heritage resources. According to Section 2(xvi) of the Act a heritage resource is "any place or object of cultural significance". This means that the object or place has aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance.

In terms of the definitions provided in Section 2 of the NHRA, maritime and underwater cultural heritage can include the following sites and/or material relevant to this assessment:
- material remains of human activity which are in a state of disuse and are in or on land [which includes land under water] and which are older than 100 years, including artefacts, human and hominid remains and artificial features and structures (Section 2(ii));
- 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, a 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 2(ii)); and
- any movable property of cultural significance which may be protected in terms of any provisions of the NHRA, including any archaeological artefact or palaeontological specimen (Section 2(xxix)).

Of the heritage resource types protected by the NHRA, the installation and operation of the Equiano cable system has the potential to impact the following:

- submerged pre-colonial archaeological sites and materials; and
- maritime and underwater cultural heritage sites and material, which are principally historical shipwrecks.

As per the definitions provided above, these cultural heritage resources are protected by the NHRA and a permit from SAHRA is required to destroy, damage, excavate, alter, deface or otherwise disturb any such site or material.

It is also important to be aware that in terms of Section 35(2) of the NHRA, all archaeological objects and palaeontological material is the property of the State and must, where recovered from a site, be lodged with an appropriate museum or other public institution.

4.2. **Maritime Zones Act (No 15 of 1994)**

South Africa's Maritime Zones Act of 1994 is the national legislative embodiment of the international maritime zones set out in the United Nations Convention on the Law of the Sea (UNCLOS).

The Maritime Zones Act defines the extent of the territorial waters, contiguous zone, exclusive economic zone (EEZ) and continental shelf, which together comprise some 4.34 million square kilometres of seabed around the South African coast and sets out South Africa's rights and responsibilities in respect of these various maritime zones.

Under the terms of the maritime zones established by the Act, the application of the NHRA applies within South Africa's territorial waters (12 nautical miles seaward of the baseline) and extends to the outer limit of the maritime cultural zone (24 nautical miles seaward of the baseline). Any offshore activities that have the potential to disturb or damage cultural heritage resources located in or on the seabed within the territorial waters and maritime cultural zone require the involvement of SAHRA, as a commenting body in respect of the National Environmental Management Act EIA process and as permitting authority where impacts to sites or material cannot be avoided and damage or destruction will occur.

The maritime portion of the proposed Equiano Cable System crosses the EEZ, the contiguous zone and territorial waters, and comes ashore landward of the territorial water baseline, within what Section 3 of the Maritime Zones Act defines as South Africa's internal waters. In terms of Section 3(2) of the Act, "any law in force in the Republic, including the common law, shall also apply in its internal waters".

4.3. **National Environmental Management Act (Act No 107 of 1998)**

The National Environmental Management Act (No 107 of 1998) (NEMA) provides a framework for the integration of environmental issues into the planning, design, decision-making and implementation of plans and development proposals that are likely to have a negative effect on the environment.

Regulations governing the environmental authorisation (EA) process have been promulgated in terms of NEMA and include the EIA Regulations (GNR R326/2017) and Listing Notices (LN) 1-3 (R327, R325 and R324) that list activities requiring EA.

The proposed Equiano Cable system triggers activity 14(iii) in LN2 - the development and operation of a structure or infrastructure on, below or along the sea bed – and requires a Scoping and EIA process

to identify and assess all potential environmental impacts (negative and positive) and recommend how potential negative impacts can be effectively mitigated and benefits can be enhanced.

5. METHODOLOGY

This desktop report provides an assessment of the maritime and underwater cultural heritage potential of the offshore portion of the Equiano Cable system within a study area defined in Section 5.1 below.

The report includes a short description of what comprises South Africa's maritime and underwater cultural heritage and the maritime history of the south west Cape coast, followed by a discussion of potential maritime heritage resources along the cable system alignment, framed within that wider context.

The report draws information from readily available documentary sources and databases, including SAHRA's Maritime and Underwater Cultural Heritage database, a database of underwater heritage resources maintained by ACO Associates, and from relevant primary and secondary sources and aims to identify as accurately as possible the maritime heritage resources along the proposed cable route alignment.

In addition, the geophysical survey report for the Equiano cable system prepared by Fugro Germany (Pryne 2019) was reviewed for this HIAS to ascertain whether any potential wreck material had been identified within the sidescan sonar (SSS), multibeam bathymetry (MBES) and magnetometer data collected during the survey of the cable route.

An assessment of the potential impacts of the proposed project on maritime and underwater cultural heritage resources is provided and this is supported by recommendations for measures to mitigate possible impacts arising from the installation of the proposed maritime cable system.

5.1. Maritime Study Area

The study area for this maritime archaeological assessment has been defined as a 1 km buffer on either side of the proposed route alignment between the Mean High Water Mark at Melkbosstrand and the outer edge of the contiguous zone, 24 nautical miles from the baseline (**Figure 2**).

The relative inaccuracy of historical shipwrecks records suggests that the application of this fairly large buffer around the cable route alignment is appropriate.

5.2. Limitations

South Africa's record of maritime and underwater cultural heritage resources is based on a mix of information derived from historical documents and other secondary sources, and from very limited primary sources such as geophysical data and other field-based observations and site recordings.

While every effort has been made to ensure the accuracy of the information presented below, the reliance on secondary data sources means that there are considerable gaps and inaccuracies in this record. The locations of most of the wrecks referred to in the following sections are thus approximate and the potential exists for currently unknown and/or unrecorded maritime heritage sites to be encountered in the course of the proposed project.

Figure 2: Maritime archaeological assessment study area for this report between the outer limit of the contiguous zone (24 NM from the baseline) to the mean high water mark at the landfall at Melkbosstrand. The study area comprises a 1 km buffer (orange) on either side of the proposed cable route (red line).

6. UNDERWATER CULTURAL HERITAGE

South Africa has a rich and diverse underwater cultural heritage. Strategically located on the historical trade route between Europe and the East, South Africa's rugged and dangerous coastline has witnessed more than its fair share of shipwrecks and maritime dramas in the last 500 years. At least 2400 vessels are known to have sunk, grounded, or been wrecked, abandoned or scuttled in South African waters since the early 1500s. This doesn't include the as yet unproven potential for shipwrecks and other sites that relate to pre-European, Indian Ocean maritime exploration, trade and interactions along the South African east coast.

In addition to historical shipwrecks, the record of South Africa's long association with the sea is much broader and extends far back into prehistory. This element of our maritime and underwater cultural heritage is represented around the South African coast by thousands of pre-colonial shell middens and large numbers of tidal fish traps, which reflect prehistoric human exploitation of marine resources since the Middle Stone Age, more than 150,000 years ago. Another, until recently, largely unacknowledged and unexplored aspect of our maritime and underwater cultural heritage are pre-colonial terrestrial archaeological sites and palaeolandscapes which are now inundated by the sea.

This assessment considers maritime and underwater cultural heritage resources along the Equiano Cable system landward of the EEZ/contiguous zone boundary, namely submerged prehistoric resources and historical shipwrecks.

6.1. **Submerged Prehistory**

Since the start of the Quaternary, approximately 2.6 million years ago, the world has been subject to a series of cooling and warming climatic cycles in which sea level generally been lower than it is today. During the last 900,000 years, global sea levels have fluctuated substantially on at least three occasions, the result of increased and decreased polar glaciation. The falls in sea level were caused by the locking up in the polar ice caps of huge quantities of seawater as global temperatures cooled.

The most extreme recent sea level drop occurred between circa 20,000 and 17,000 years ago when at the height of the last glaciation (Marine Isotope Stage (MIS) 2) global sea levels were more than 120 m lower than they are today (Waelbroeck *et al*, 2002; Rohling *et al*, 2009).

As with the MIS 2 low sea level stand, those which corresponded with MIS 4 (~70,000 years ago), MIS 6 (~190,000 years ago), MIS 8 (~301,000 years ago) and MIS 12 (~478,000 years ago) would have "added a large coastal plain to the South African land mass" (Van Andel, 1989:133) where parts of the continental shelf were exposed as dry land (see Cawthra *et al*, 2016) (**Figure 3**).

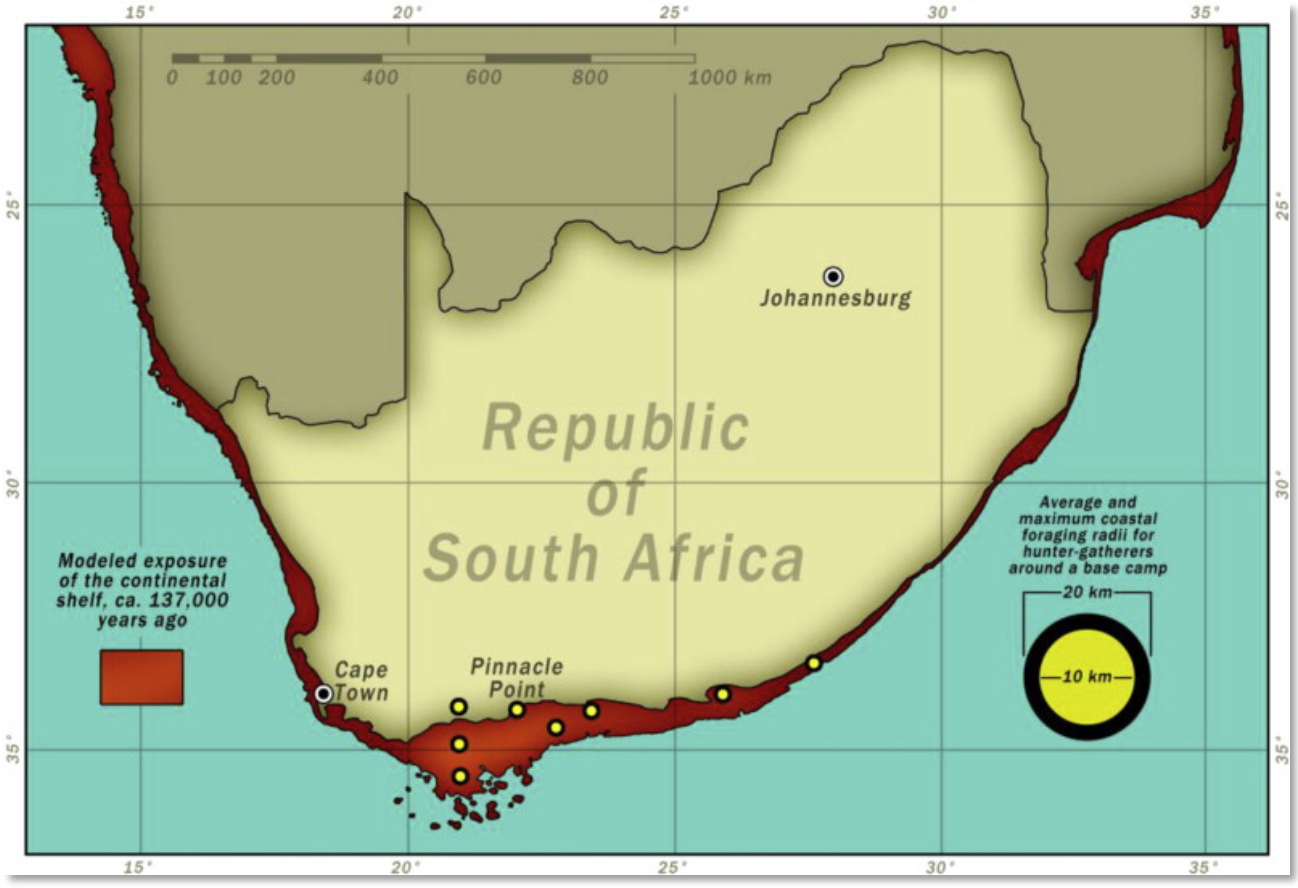

Figure 3: Possible extent of the South African continental shelf c.137,000 years ago (Source: Franklin et al, 2015)

The exposure of the South African continental shelf would have been most pronounced on the wide Agulhas Bank off the southern Cape coast, and it is estimated that a new area of land, as much as 80,000 km^2 in extent, was exposed during the successive glacial maxima (Fisher *et al*, 2010). **Figure 4** below gives an indication of the extent of the continental shelf exposure on the south western Cape coast during the second to last glaciation (MIS 6), including the area covered by this report.

The exposed continental shelf was quickly populated by terrestrial flora and fauna, and also by our human ancestors who were dependant on these resources (Compton, 2011). As a result, for periods

numbering in the tens of thousands of years on at least three occasions during the last 500,000 years our ancestors inhabited areas of what is now seabed around the South African coast. This means that a large part of the archaeological record of the later Earlier, Middle and early Late Stone Age is located on the continental shelf and is now "inundated and for all practical purposes absent from [that] record" (Van Andel, 1989:133-134).

Until relatively recently there was little or no access to the submerged prehistoric landscapes and sites on the continental shelf, although evidence from various parts of the world of drowned, formerly terrestrial landscapes hinted at the tantalising prospect of prehistoric archaeological sites on and within the current seabed.

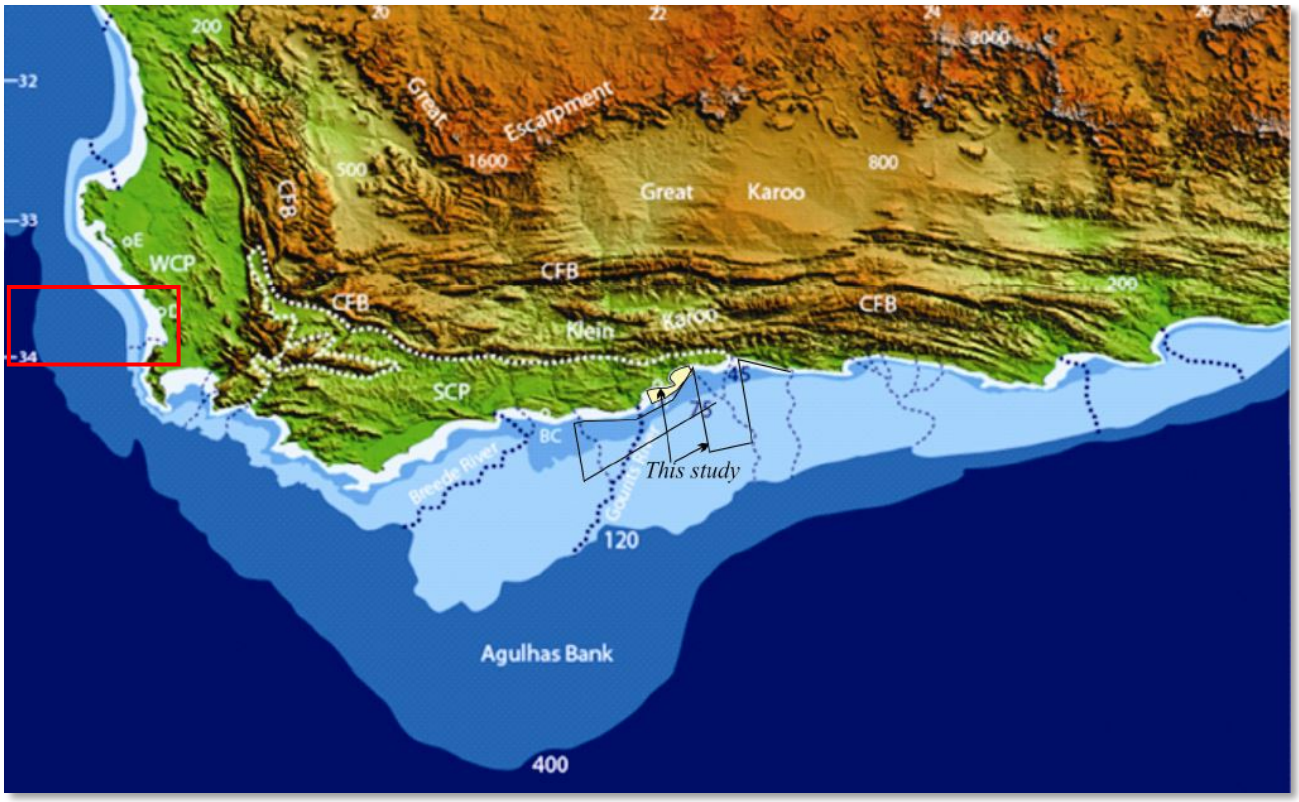

Figure 4: The south coast continental shelf showing the water depths of 45, 75, 120 and 400 m. The Equiano cable system will be installed in the area highlighted in red on the left of the image (Source: Compton, 2011 from Cawthra, 2014).

Perhaps the best-known example of such evidence is archaeological material and late Pleistocene faunal remains recovered in the nets of fishing trawlers in the North Sea between the United Kingdom and the Netherlands throughout the 20th century (Peeters *et al*, 2009; Peeters, 2011) and the University of Birmingham's recent archaeological interpretation of 3D seismic data, collected in the same area by the oil and gas industry, which has revealed well-preserved prehistoric landscape features across the southern North Sea (Fitch *et al*, 2005, Gaffney *et al*, 2010).

Closer to home, there is archaeological evidence for a prehistoric human presence in what is now Table Bay. In 1995 and 1996 during the excavation of two Dutch East India Company shipwrecks, the *Oosterland* and *Waddinxveen*, divers recovered three Early Stone Age handaxes from the seabed under the wrecks. The stone tools, which are between 300,000 and 1.4 million years old, were found at a depth of 7-8 m below mean sea level and were associated with Pleistocene sediments from an ancient submerged and infilled river channel. Their unrolled and unworn condition indicate that they had not been carried to their current position by the ancient river and suggests that they were found more or less where

they were dropped by Early Stone Age hominins more than 300,000 years ago, when the sea level was at least 10 m lower than it is today (Werz and Flemming, 2001; Werz *et al*, 2014).

6.1.1. **Submerged Prehistory of Melkbosstrand Area**

There have, to date, been no studies of submerged prehistory in the study area. However, the archaeological evidence for a hominin presence in the Bloubergstrand / Melkbosstrand area, in particularly the Later Stone Age, is plentiful (see Peringuey, 1911; Laidler, 1929; Rudner, 1968; Kaplan, 1998, 2000; Gray, 2000; Sealy et al, 2004; Orton, 2010, 2013; Hutten, 2014a & b).

More pertinent to this study, however, are the important Earlier Stone Age sites of Duinefontein 1 and 2, approximately 4 km north of the study area (see Deacon, 1975; Klein, 1976; Klein et al, 1999; Cruz-Uribe et al, 2003). These sites have produced Acheulean stone tools in association with animal bone, deposited between 200,000 and 400,000 years ago, around palaeo-pans or lakes that developed in hollows within a large dune field, where hominins were hunting or scavenging animals.

During periods of lower sea level, similar palaeo-pans are likely to have been present on the exposed continental shelf. Together with ancient rivers courses, these water sources, which are today buried under modern seabed sediment, would have been an important focus for hominin activity on the exposed continental shelf, and as demonstrated in Table Bay there is the potential for the occurrence of ancient, submerged archaeological material in association with such sea bed features.

Where alluvial sediment within these channels or features has survived post-glacial marine transgressions there is also the potential to recover palaeoenvironmental data (pollens, foraminifera and diatoms, for example) which can contribute contextual information to our understanding of the ancient human occupation of South Africa.

There is thus the potential for the preservation within current sea bed sediments within the study area of pre-colonial archaeological sites and material.

6.2. **Maritime History of the South African coast**

In 1498 the Portuguese explorer Vasco da Gama finally pioneered the sea route around Africa from Europe to the East. Since then, the southern tip of the African continent has played a vital role in global economic and maritime affairs, and until the opening of the Suez Canal in 1869, represented the most viable route between Europe and the markets of the East (Axelson, 1973; Turner, 1988; Gribble, 2002; Gribble and Sharfman, 2013).

The South African coast is rugged and the long fetch and deep offshore waters mean that the force and size of seas around the coast are considerable; a situation exacerbated by prevailing seasonal winds.

The geographical position of the South African coast on the historical route to the East and the physical conditions mariners could expect to encounter in these waters have, in the last five centuries, been responsible for the large number of maritime casualties which today form the bulk of South Africa's maritime and underwater cultural heritage (Gribble, 2002).

At least 2400 vessels are known to have sunk, grounded, or been wrecked, abandoned or scuttled in South African waters since the early 1500s. More than 1900 of these wrecks are more than 60 years old and are thus protected by the NHRA as archaeological resources. This list is by no means complete and does not include the as yet unproven potential for shipwrecks and other sites that relate to pre-European, Indian Ocean maritime exploration, trade and interactions along the South African east coast. It is,

anticipated that further research in local and foreign archives, together with physical surveys to locate the remains of historical shipwrecks will produce a final tally of more than 3000.

The earliest known South African wrecks are Portuguese, dating to the sixteenth century when that country held sway over the route to the East. Due to the later, more prolonged ascendancy of the Dutch and British in European trade with the East and control at the Cape, the majority of wrecks along the South African coast belong to these two nations. However, at least 36 other nationalities are represented amongst the wrecks that litter the South African coast.

Da Gama's maritime incursion into the Indian Ocean laid the foundation for more than 500 years of subsequent European maritime activity in the waters around the South African coast. The Portuguese and other European nations who followed their lead around the Cape and into the Indian Ocean, however, joined a maritime trade network that was thousands of years old and in which east and south east Africa was an important partner.

This trade spanned the Indian Ocean and linked the Far East, South East Asia, India, the Indian Ocean islands and Africa. Archaeological evidence from Africa points to an ancient trade in African products – gold, skins, ivory and slaves – in exchange for beads, cloth, porcelain, iron and copper. The physical evidence for this trade includes Persian and Chinese ceramics excavated sites on African Iron Age like Khami, Mapungubwe and Great Zimbabwe (see Garlake, 1968, Huffman, 1972, Chirikure, 2014), glass trade beads found in huge numbers on archaeological sites across eastern and southern Africa (Wood, 2012).

There is shipwreck evidence on the East African coast for this pre-European Indian Ocean trade (see for example Pollard et al 2016) and clear archaeological and documentary evidence that this trade network extended at least as far south as Maputo in Mozambique. This suggests that there is the potential for shipwrecks and other sites that relate to pre-European, Indian Ocean maritime exploration, trade and interactions to exist along the South African east coast and offshore waters.

The historical shipwrecks that form part of South Africa's underwater cultural heritage are thus a unique and highly cosmopolitan repository of information about global maritime trade during the last five centuries and potentially much further back into the past. These sites contain a wealth of cultural material associated with that trade and clues to the political, economic, social and cultural changes that accompanied this trade and which contributed to the creation of the modern world.

6.2.1. **Maritime History of the Melkbosstrand Area**

The Equiano cable system will be installed at Melkbosstrand, well to the north of the historical anchorage in Table Bay. While Table Bay has the greatest concentration of historical wrecks in South African waters (more than 400), very few shipping casualties occurred as far north as Melkbosstrand.

Losperds Bay at Melkbosstrand, within which the Equiano cable system will come ashore, has an important, maritime-related historical association as the site at which the British landed their troops on 6 and 7 January 1806 as a prelude to the Battle of Blouberg and the second British occupation of the Cape (Whiting-Spilhaus, 1966; Steenkamp, 2012). Although a small brig was beached to act as a breakwater during these landing, it was subsequently refloated. Thirty-six members of the 93rd Highland Regiment were drowned after their boat capsized in the surf as it came ashore (Burman, 1976; Steenkamp, 2012). They were buried nearby on the beach and there is no record of these graves having been found since.

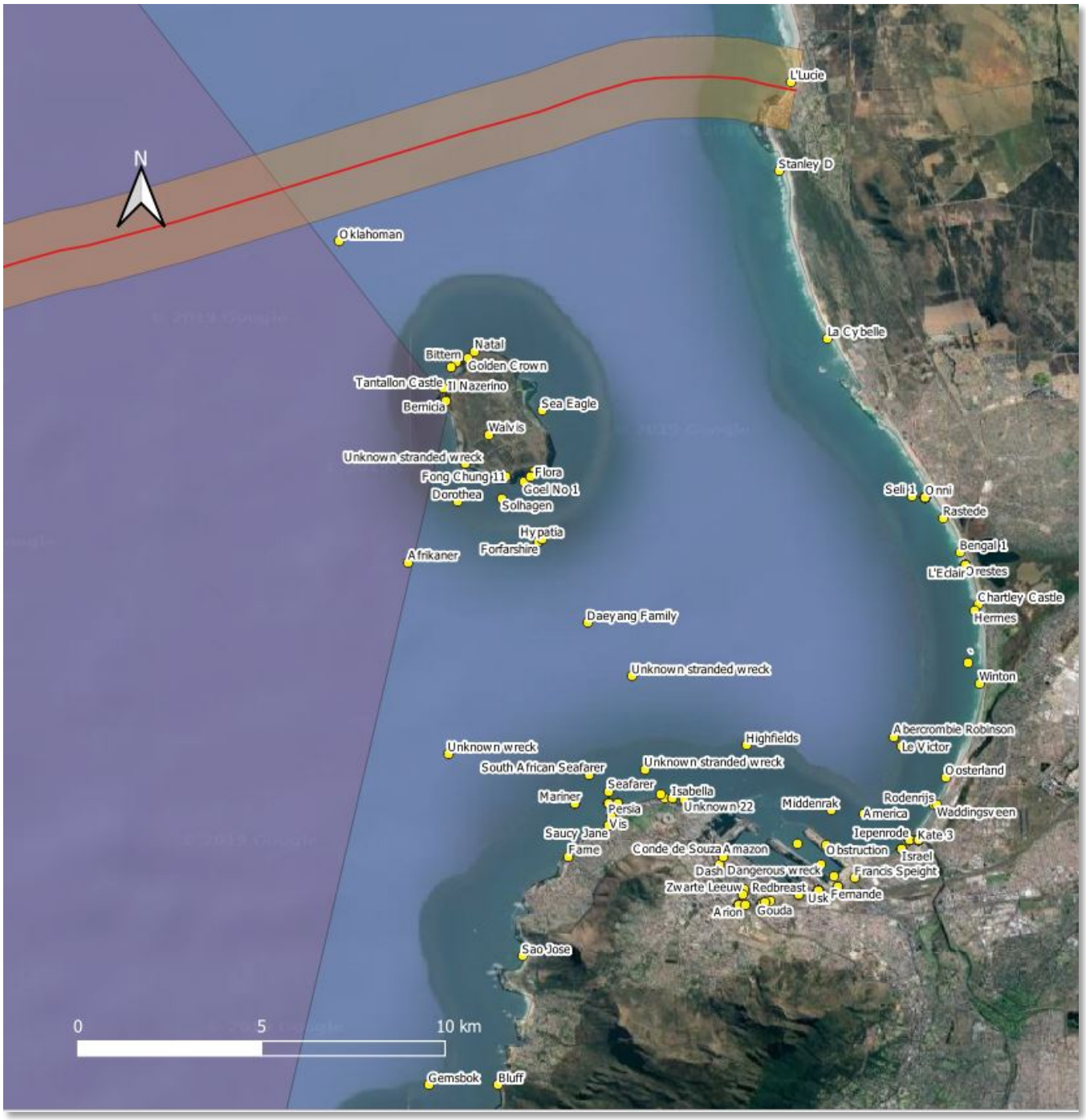

Figure 5: Location of the Equiano cable system within Table Bay. Although only a portion of the total number of historical wrecks in the bay are displayed in this image, the concentration of wrecks in the southern corner of the bay is clear. (Source: Google Earth).

The local records consulted for this study - SAHRIS (http://www.sahra.org.za/sahris), a shipwreck database compiled by Fedde Van den Bosch (2014) and the shipwreck database maintained by ACO Associates - contain records of only one shipping casualty within the study area defined in Section 5.1 above. This is the *L'Lucie*, a French sailing vessel wrecked in Losperds Bay in October 1808. Beyond these basic details, nothing else is known about this wreck (**Figure 6**).

Figure 6: Estimated location of the wreck of *L'Lucie* (1808). Please not that confidence in the accuracy of this position is low (Source Google Earth).

Two other vessels recorded outside the study area are worth bearing in mind as the relative inaccuracy of their estimated positions means they could potentially lie within the study area. These are:

- *Oklahoman*, an American steel steam freighter which foundered north of Robben Island in 1942; and
- Unknown Non-Dangerous Wreck, recorded by a South African naval Notice to Mariners (**Figure 7**).

Other wrecks in wider vicinity of the proposed cable system are shown along with those mentioned above on **Figure 7**. Although there is some leeway in the accuracy of the estimated positions of these additional wrecks, the descriptions of their losses suggest that it is unlikely that any of these sites will be located

within the defined study area around the proposed cable route alignment. A gazetteer of all of the wrecks described above is provided in **Appendix 1**.

Although outside the remit of the NHRA, and therefore this assessment, it is worth noting the presence, within the EEZ, of the *Luba* (1864), the *Chickasaw City* (1942) and the *Princess Royal* (1985), within a few kilometres of the proposed route alignment. These wrecks, if encountered during the installation of the cable system pose a potential threat to equipment and should be avoided.

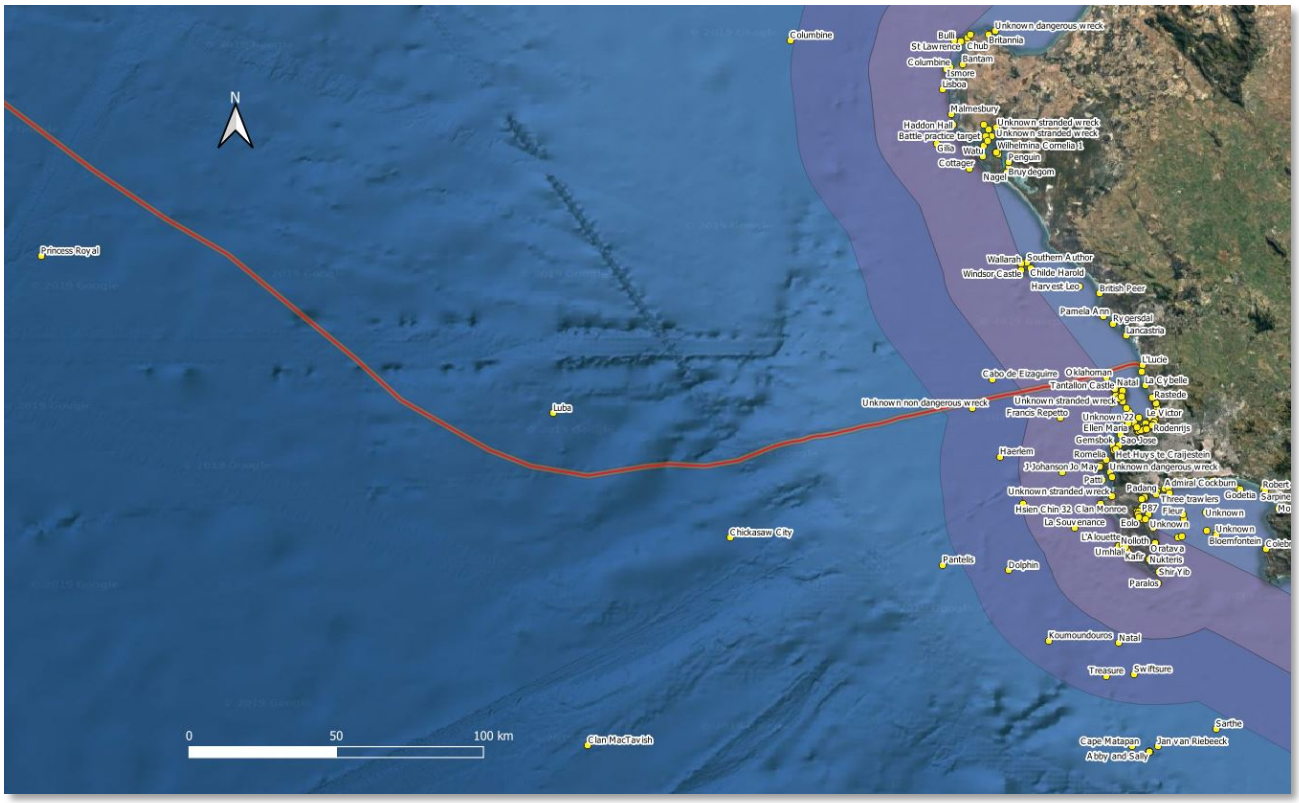

Figure 7: Approximate position of other wrecks in the general vicinity of the cable route mentioned in the text (Source: Google Earth).

6.2.2. **Review of Geophysical Survey Results**

Fugro Germany Marine conducted a series of geophysical and other surveys for cable route design and engineering in July 2019 along the Inshore, Shallow and Deep Water sections of the Equiano cable system (see Pryne 2019). Of interest from a heritage perspective are the results of the sidescan sonar, multibeam bathymetry and magnetometer surveys in the inshore and shallow water portions of the route.

Inshore Water: This area is in water depths of less than 2 m with the seabed comprising medium to coarse sand. The cable route crosses outcropping rock from 33° 43.4796' S, 018° 26.3732' E (KP 0.286) to 33° 43.4020' S, 018° 26.0179' E (KP 0.854) but otherwise the seabed is flat and generally featureless with about 1.5 m sediment on top of the rock (**Figure 8**).

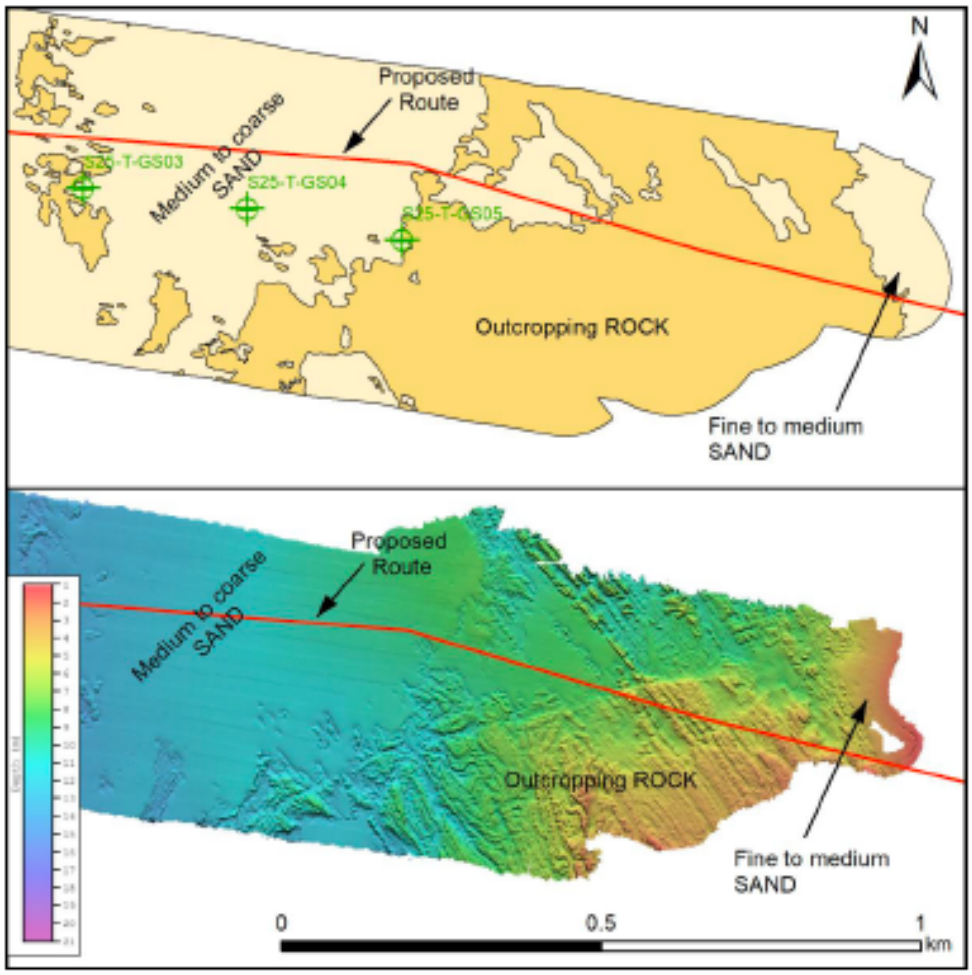

Figure 8: Sediment chart (upper panel) and multibeam bathymetry (lower panel) illustrating the distribution of outcropping rock and sand along the inshore survey route (After Pryne 2019).

Three sonar contacts were detected in the inshore water sidescan sonar data. Two contacts were determined to be sea bed debris and one was a boulder.

Fifteen magnetometer contacts were detected in the inshore survey area of which seven were interpreted as being associated with OOS TELE Moosamedes-Robben Island cable and one with the OOS Fibre SAT 2 seg D1. The remaining seven contacts have not been associated with any objects on the sea bed and they may represent either marine debris or be geological in nature.

Shallow Water: This survey area begins at 33° 43.3233' S, 018° 24.8502' E (KP 2.676) in 18 m water depth on a flat, gently sloping seabed with a gradient of less than 5°. The sea bed comprises dense to very dense sand, while the sub-sea bed geology reveals a sediment thickness of approximately 10 m sand on top of the rock surface.

A total of 153 sidescan sonar contacts were identified along the proposed route. Of these, sixty-three were interpreted as debris and the remaining ninety as boulders.

Seventy-one magnetometer contacts were detected in the shallow water survey corridor. Twenty-four contacts align with the database positions of out-of-service cables and three with the in-service SAFE SEG1 cable. Some magnetometer contacts are found to line up across the corridor in several places along the proposed route, however the cable database has no indications of cables at those locations.

The remaining forty-four magnetometer contacts may represent either marine debris or be geological in nature.

In summary, while a number of the sidescan and magnetometer anomalies were identified in or on the sea bed may be humanly-derived debris, their nature was not possible to discern from the data.

No wrecks were observed in any of the survey data.

7. IMPACT ASSESSMENT

Among the potential impacts associated with the proposed Equiano cable system are impacts on submerged prehistoric and maritime archaeological heritage resources. In both cases impacts can arise where interventions on and in the sea bed intersect with heritage resources – either directly where archaeological sites or material are damaged or disturbed, or indirectly where particularly the downstream effects of sea bed activities can affect sites or material.

Direct impacts to buried archaeological material are caused by the cable burial process itself, where trenching or jetting cut into the seabed. Where cables are laid on the sea bed rather than buried, their placement can also have a direct impact on heritage sites and materials in their footprint. Viewed from the perspective of Openserve, interactions between cables and historical wrecks, in particular, can have a direct impact in the form of damage to the former. Ensuring that direct interactions between project infrastructure and heritage resources are avoided is thus desirable for the heritage receptors and Openserve.

Indirect impacts on heritage resources in sea bed development contexts usually arise from the downstream effects of interventions on or in the sea bed on nearby heritage resources. For example, the placement of cables on the sea bed may affect local current patterns, causing sea bed scour, which can in turn affect nearby heritage sites, both on or within the sea bed.

That said, the small footprint and low profile of the cable is unlikely to cause downstream effects on the surrounding sea bed.

On the basis of the heritage resources review in the preceding sections, the heritage receptors defined for this impact assessment are:

- Submerged prehistoric archaeological resources; and
- Maritime archaeological resources, mostly historical shipwrecks.

The assessment of impacts on these receptor classes is based on the methodology set out in Appendix 4 below.

7.1. **Submerged Prehistory**

Although geophysical data for the study area were not available for this assessment and the stratigraphy of the sea bed is thus not known, there is the potential for archaeological material and palaeoenvironmental evidence to have been deposited on the continental shelf, to approximately the -120 m contour during times of past lower sea level. Where such material has survived post-glacial marine transgression it will form part of the sedimentary make-up of the sea bed and may be impacted by interventions on and in the sea bed.

The small footprint of the sea bed intervention that will result from the installation of the cable system, however, makes the potential for **direct** impacts on submerged prehistoric archaeological material in the study area unlikely.

The nature of the proposed sea bed intervention – either laying of cabling on the sea bed surface in deep water or burial of the cable in the sea bed closer to the coast – suggests that **indirect** impacts, which manifest themselves after and/or downstream of the activity and unlikely.

Based on the likely direct and indirect of the installation of sea bed cables off the Cape west coast, the **cumulative** impacts of this cable system on submerged prehistorical archaeological material, in combination with other systems already installed on the sea bed, are likely to be low.

The **nature** of impacts, were they to occur, will be negative because the finite and non-renewable nature of heritage resources means that they cannot recover if disturbed, damaged or destroyed.

The potential impacts of the installation of the Equiano Cable system on submerged prehistoric archaeological resources can be summarised as follows:

	Spatial Extent	**Duration**	**Intensity**	**Frequency**	**Probability**	**Irreplaceability & Reversibility**	**Significance**	**Confidence**
Without mitigation	Site specific	Short-term	Low	Once off	Improbable	- High irreplaceability - Non-reversible	Medium	Low
	Essential mitigation measures: No mitigation proposed							
With mitigation	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

7.2. **Maritime Archaeology**

Based on the discussion of maritime heritage resources and the results of the sea bed surveys above, only one wreck has been identified with any confidence, as likely to be within the 1 km study area buffer around the proposed cable alignment. Aside from the possible presence of the remains of *L'Lucie* close to the cable landfall within Losperds Bay at Melkbosstrand, there is a very low possibility that other recorded historical shipwreck material will be present on the alignment of the proposed cable system.

The sea bed surveys noted the presence along the route of a possibly humanly-derived debris, although none of these contacts could be more accurately described. It is therefore not known whether any of these anomalies represent historical shipwreck or related material.

The small footprint of the sea bed intervention and the potential for sea bed debris to damage the cable plough, which means that these contacts are likely to be carefully avoided during cable installation, suggests that the potential for **direct** impacts on maritime archaeological sites or material in the study area unlikely.

The nature of the proposed sea bed intervention suggests that while **indirect** impacts, which manifest themselves after and/or downstream of the activity and can take the form of, for example, seabed scour, are unlikely to affect any of the handful of known wrecks in vicinity of the cable system.

Based on the likely direct and indirect of the installation of sea bed cables off the Cape west coast, the **cumulative** impacts of this cable system on maritime heritage resources, in combination with other systems already installed on the sea bed, are likely to be low.

The **nature** of impacts, were they to occur, will be negative because the finite and non-renewable nature of heritage resources means that they cannot recover if disturbed, damaged or destroyed.

The potential impacts of the installation of the Equiano Cable system on maritime heritage resources can be summarised as follows:

	Spatial Extent	**Duration**	**Intensity**	**Frequency**	**Probability**	**Irreplaceability & Reversibility**	**Significance**	**Confidence**
Without mitigation	Site specific	Short-term	Low	Once off	Improbable	- High irreplaceability - Non-reversible	Medium	Low
	Essential mitigation measures: - Any further geophysical data generated to support to installation of the cable system must be archaeologically reviewed for the presence of historical shipwrecks or related material; - Should any maritime archaeological sites or material be accidentally encountered during the course of laying the cable, work must cease in that area until the project archaeologist and SAHRA have been notified, the find has been assessed by the archaeologist, and agreement has been reached on how to deal with it.							
With mitigation	Site specific	Short-term	Low	Once off	Improbable	- High irreplaceability - Non-reversible	Low	Low

8. CONCLUSIONS AND RECOMMENDATIONS

This assessment of the maritime heritage resources within the study area established around the Equiano cable system suggests that although there is the potential for the presence of submerged prehistoric archaeological material on or in the sea bed above the -120 m contour, the minor seabed interventions associated with the installation of the cable system are very unlikely to impact on this resource. The nature of buried prehistoric archaeological sites means that it will be virtually impossible to detect such sites during cable burial. No mitigation is thus proposed in respect of submerged prehistoric archaeological resources.

With regard to historical shipwrecks, the proposed Equiano cable system has a very low potential for impacts arising out of the installation of the sea bed cable. However, in view of the likely presence of *L'Lucie* close to the cable landfall and the potential, albeit very small, for the presence of currently unknown wrecks close to the cable route, the following recommendations are made in respect of mitigation measures to be applied during the installation of the Equiano cable system:

- Any further geophysical data generated to support the installation of the cable system must be archaeologically reviewed for the presence of historical shipwrecks or related material. Datasets that are particularly useful in this regard are magnetometer, side scan sonar and multibeam bathymetric data. It is recommended that the project archaeologist is consulted before any data are collected to ensure that the survey specifications and data outputs are suitable for archaeological review;

- Should the data identify wreck material at or near the location of any portion of the cable, micro-siting of the cable and/or the possible implementation of an exclusion zone around the archaeological feature should be sufficient to mitigate the risks to the site;
- Should any archaeological material, be accidentally encountered during the course of cable installation, work must cease in that area until the project archaeologist and SAHRA have been notified, the find has been assessed by the archaeologist, and agreement has been reached on how to deal with it.

8.1. **Acceptability of the Proposed Activity with Respect to Heritage Resources**

Based on the information and assessment above, it is our reasoned opinion that the proposed installation of the Equiano cable system raises no red flags, contains no fatal flaws and is unlikely to have any impact on known or unknown maritime and underwater cultural heritage resources. It is, therefore, considered archaeologically acceptable.

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APPENDIX 1: RECORDED WRECKS AND SHIPPING CASUALTIES WITHIN & PROXIMATE TO THE MARITIME ARCHAEOLOGICAL STUDY AREA

Ship Name	Area	Place	Latitude (estimated)*	Longitude (estimated)*	Event Type	Vessel Category	Type	Date Wreck
L'Lucie	Bloubergstrand	Losperds Bay	-33.7232	18.4413	Wrecked	Wooden sailing vessel	Unknown	1808/10/11
Oklahoman	Robben Island	2.4 miles north west of	-33.76	18.331	Foundered	Steel steamship	Freighter	1942/07/07
Unknown non dangerous wreck	Robben Island	West of in approximately 180m of water	-33.855	17.9223	Unknown	Unknown	Unknown	Unknown
Chickasaw City	Cape Point	135km, 274 degrees off Cape Point	-34.25	17.1833	Torpedoed	Steel motor vessel	Merchant	1942/10/07
Luba	EEZ	160km off Table Bay	-33.8704	16.6441	Foundered	Sailing Vessel	Barque	1864/02/11
Princess Royal	Dassen Island	278km west of	-33.3911	15.0809	Scuttled	Motor Vessel	Fishing	1985/05/09

* **PLEASE NOTE**: The shipwreck positions provided above are estimated positions based on descriptions of loss in the historical record. Confidence in the accuracy of these positions is thus very low and it is unlikely that the vessels concerned will be found at the given co-ordinates

APPENDIX 2: SPECIALIST CV

Name:	John Gribble
Profession:	Archaeologist
Date of Birth:	15 November 1965
Parent Firm:	ACO Associates cc
Position in Firm:	Senior Archaeologist
Years with Firm:	2+
Years of experience:	27
Nationality:	South African
HDI Status:	n/a

Education:

1979-1983	Wynberg Boys' High School (1979-1983)
1986	BA (Archaeology), University of Cape Town
1987	BA (Hons) (Archaeology), University of Cape Town
1990	Master of Arts, (Archaeology) University of Cape Town

Employment:

- ACO Associates, Senior Archaeologist and Consultant, September 2017 – present
- South African Heritage Resources Agency, Manager: Maritime and Underwater Cultural Heritage Unit, 2014 – 2017 / Acting Manager: Archaeology, Palaeontology and Meteorites Unit, 2016-2017
- Sea Change Heritage Consultants Limited, Director, 2012 – present
- TUV SUD PMSS (Romsey, United Kingdom), Principal Consultant: Maritime Archaeology, 2011-2012
- EMU Limited (Southampton, United Kingdom), Principal Consultant: Maritime Archaeology, 2009-2011
- Wessex Archaeology (Salisbury, United Kingdom), Project Manager: Coastal and Marine, 2005-2009
- National Monuments Council / South African Heritage Resources Agency, Maritime Archaeologist, 1996-2005
- National Monuments Council, Professional Officer: Boland and West Coast, Western Cape Office, 1994-1996

Professional Qualifications and Accreditation:

- Member: Association of Southern African Professional Archaeologists (No. 043)
- Principal Investigator: Maritime and Colonial Archaeology, ASAPA CRM Section
- Field Director: Stone Age Archaeology, ASAPA CRM Section
- Member: Chartered Institute for Archaeologists (CIfA), United Kingdom
- Class III Diver (Surface Supply), Department of Labour (South Africa) / UK (HSE III)

Experience:

I have nearly 30 years of combined archaeological and heritage management experience. After completing my postgraduate studies, which were focussed on the vernacular architecture of the West Coast, and a period of freelance archaeological work in South Africa and aboard, I joined the National Monuments Council (NMC) (now the South African Heritage Resources Agency (SAHRA)) in 1994. As the Heritage Officer: the Boland I was involved in day to day historical building control and heritage resources management across the region. In 1996 I become the NMC's first full-time maritime

archaeologist in which role was responsible for the management and protection of underwater cultural heritage in South Africa under the National Monuments Act, and subsequently under the National Heritage Resources Act.

In 2005 I moved to the UK to join Wessex Archaeology, one of the UK's biggest archaeological consultancies, as a project manager in its Coastal and Marine Section. In 2009 I joined Fugro EMU Limited, a marine geosurvey company based in Southampton to set up their maritime archaeological section. I then spent a year at TUV SUD PMSS, an international renewable energy consultancy based in Romsey, where I again provided maritime archaeological consultancy services to principally the offshore renewable and marine aggregate industries.

In August 2012 I set up Sea Change Heritage Consultants Limited, a maritime archaeological consultancy. Sea Change provides archaeological services to a range of UK maritime sectors, including marine aggregates and offshore renewable energy. It also actively pursues opportunities to raise public awareness and understanding of underwater cultural heritage through educational and research projects and programmes, including some projects being developed in South Africa.

Projects include specialist archaeological consultancy for more than 15 offshore renewable energy projects and more than a dozen offshore aggregate extraction licence areas.

In addition to managing numerous UK development-driven archaeological projects, I have also been involved in important strategic work which developed guidance and best practice for the offshore industry with respect to the marine historic environment. This has included the principal authorship of two historic environment guidance documents for COWRIE and the UK renewable energy sector, and the development of the archaeological elements of the first Regional Environmental Assessments for the UK marine aggregates industry. In 2013-14 I was lead author and project co-ordinator on the Impact Review for the United Kingdom of the 2001 UNESCO Convention on the Protection of the Underwater Cultural Heritage. In 2016 I was co-author of a Historic England / Crown Estate / British Marine Aggregate Producers Association funded review of marine historic environment best practice guidance for the UK offshore aggregate industry.

I returned to South African in mid-2014 where I was re-appointed to my earlier post at SAHRA: Manager of the Maritime and Underwater Cultural Heritage Unit. In July 2016 I was also appointed Acting Manager of SAHRA's Archaeology, Palaeontology and Meteorites Unit.

I left SAHRA in September 2017 to join ACO Associates as Senior Archaeologist and Consultant.
I have been a member of the ICOMOS International Committee for Underwater Cultural Heritage since 2000 and have served as a member of its Bureau since 2009. I am currently the secretary of the Committee.

I have been a member of the Association of Southern African Professional Archaeologists for more than twenty years and am accredited by ASAPA's CRM section. I have been a member of the UK's Chartered Institute for Archaeologist's (CIfA) since 2005, and served on the committee of its Maritime Affairs Group between 2008 and 2010. Since 2010 I have been a member of the UK's Joint Nautical Archaeology Policy Committee.

I am currently a member of the Advisory Board of the George Washington University / Iziko Museums of South Africa / South African Heritage Resources Agency / Smithsonian Institution 'Southern African Slave Wrecks Project' and serve on the Heritage Western Cape Archaeology, Palaeontology and Meteorites Committee.

Books and Publications:

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APPENDIX 3: SPECIALIST DECLARATION

APPENDIX 4: IMPACT ASSESSMENT METHODOLOGY

The following conventions have been adopted and applied to this impact assessment:

- Direct impacts are impacts that are caused directly by the activity and generally occur at the same time and at the place of the activity. These impacts are usually associated with the construction, operation or maintenance of an activity and are generally obvious and quantifiable.
- Indirect impacts of an activity are indirect or induced changes that may occur because of the activity. These types of impacts include all the potential impacts that do not manifest immediately when the activity is undertaken, or which occur at a different place because of the activity.
- Cumulative impacts are those that result from the incremental impact of the proposed activity on a common resource when added to the impacts of other past, present or reasonably foreseeable future activities. Cumulative impacts can occur from the collective impacts of individual minor actions over time and can include both direct and indirect impacts.

- Nature – the evaluation of the nature is impact specific. Most negative impacts will remain negative, however, after mitigation, significance should reduce:
    - Positive.
    - Negative.

- Spatial extent – the size of the area that will be affected by the impact:
    - Site specific.
    - Local (limited to the immediate areas around the site; < 2 km from site).
    - Regional (would include a major portion of an area; within 30 km of site).
    - National or International.

- Duration – the timeframe during which the impact will be experienced:
    - Short-term (0-3 years or confined to the period of construction).
    - Medium-term (3-10 years).
    - Long-term (the impact will only cease after the operational life of the activity).
    - Permanent (beyond the anticipated lifetime of the project).

- Intensity – this provides an order of magnitude of whether the intensity (magnitude/size/frequency) of the impact would be negligible, low, medium or high):
    - Negligible (inconsequential or no impact).
    - Low (small alteration of natural systems, patterns or processes).
    - Medium (noticeable alteration of natural systems, patterns or processes).
    - High (severe alteration of natural systems, patterns or processes).

- Frequency – this provides a description of any repetitive, continuous or time-linked characteristics of the impact:
    - Once off (occurring any time during construction).
    - Intermittent (occurring from time to time, without specific periodicity).
    - Periodic (occurring at more or less regular intervals).
    - Continuous (without interruption).

- Probability – the likelihood of the impact occurring:
    - Improbable (very low likelihood that the impact will occur).
    - Probable (distinct possibility that the impact will occur).
    - Highly probable (most likely that the impact will occur).

    - Definite (the impact will occur).

- Irreplaceability – of resource loss caused by impacts:
    - High irreplaceability of resources (the project will destroy unique resources that cannot be replaced).
    - Moderate irreplaceability of resources (the project will destroy resources, which can be replaced with effort).
    - Low irreplaceability of resources (the project will destroy resources, which are easily replaceable).

- Reversibility – this describes the ability of the impacted environment to return/be returned to its pre-impacted state (in the same or different location):
    - Impacts are non-reversible (impact is permanent).
    - Low reversibility.
    - Moderate reversibility of impacts.
    - High reversibility of impacts (impact is highly reversible at end of project life).

- Significance – the significance of the impact on components of the affected environment (and, where relevant, with respect to potential legal infringement) is described as:
    - Low (the impact will not have a significant influence on the environment and, thus, will not be required to be significantly accommodated in the project design).
    - Medium (the impact will have an adverse effect or influence on the environment, which will require modification of the project design, the implementation of mitigation measures or both).
    - High (the impact will have a serious effect on the environment to the extent that, regardless of mitigation measures, it could block the project from proceeding).

- Confidence – the degree of confidence in predictions based on available information and specialist knowledge:
    - Low.
    - Medium.
    - High.