

NOTIFICATION OF INTENT TO DEVELOP

Nseleni Independent Floating Power Plant (NIFPP) and associated infrastructure, Port of Richards Bay, KwaZulu-Natal

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1. Introduction

HCAC was requested by SE Solutions to submit a Notice of intention to develop (NID) to AMAFA as part of the environmental authorization process for the proposed Nseleni Independent Floating Power Plant (NIFPP). The NIFPP falls within the Port of Richards Bay (Remainder Farm 16230: N0GV0000000162300000; Portion 1 of Farm 6230: N0GV0000000162300001; and Portion 45 of Erf 5333: N0GV04210000533300045), while the associated land-based infrastructure will be located on Remainder Erf 5333 (N0GV04210000533300000), within the uMhlathuze Local Municipality and King Cetshwayo District Municipality (Figure 1 -3).

2. Project Location

Province	KwaZulu-Natal Province
Municipality	uMhlathuze Local Municipality
Nearest Town	Richardsbay
Property Name and Number	Remainder Farm 16230: N0GV0000000162300000; Portion 1 of Farm 6230: N0GV0000000162300001; and Portion 45 of Erf 5333: N0GV04210000533300045), while the associated land-based infrastructure will be located on Remainder Erf 5333 (N0GV04210000533300000),
1:50 000 Map Sheet	2831DD
GPS Co-ordinates (Relative center point of study area)	28°47'56.27"S 32° 1'12.98"E



Figure 1. Regional setting (1:250 000 Topographical map).

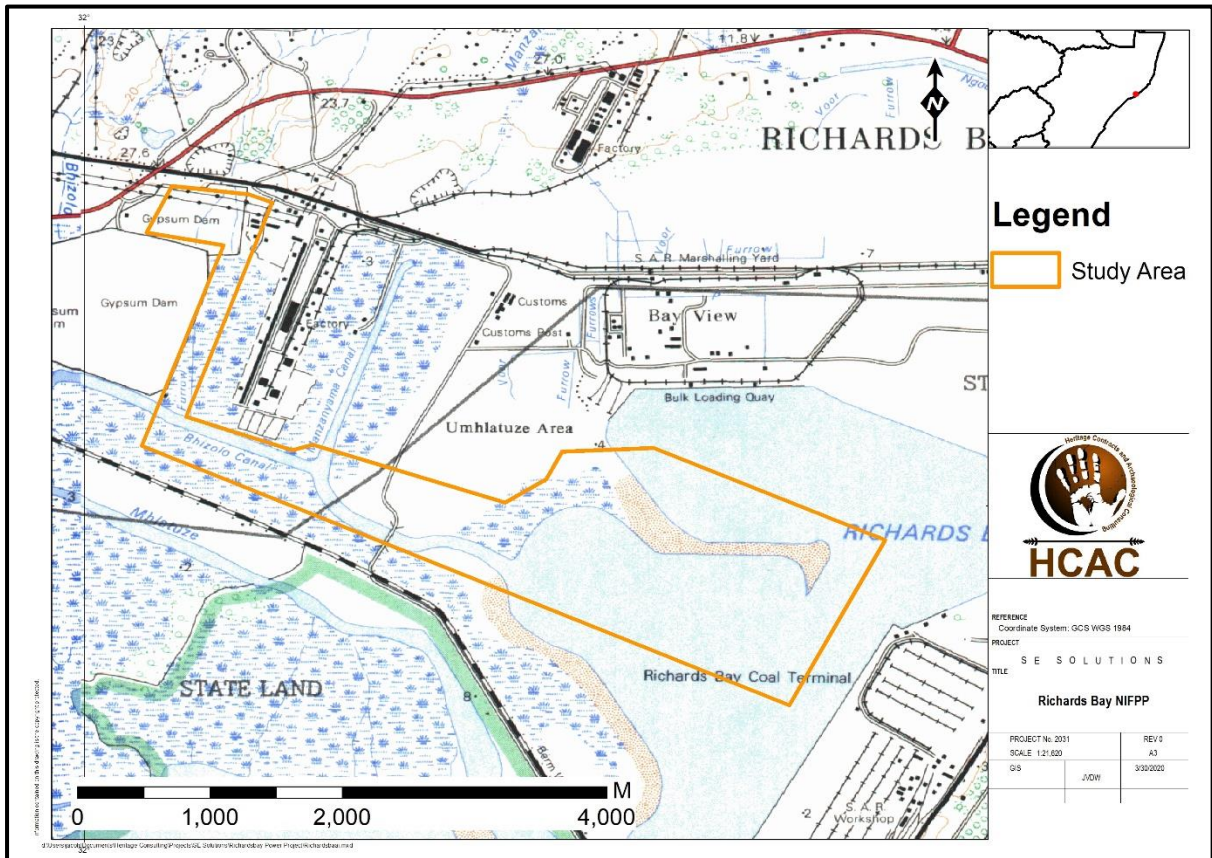


Figure 2. Local setting (1:50 000 Topographical map).



Figure 3. Google Earth image of the study area.

3. Project Details

The proposed Nseleni Independent Floating Power Plant (NIFPP) and associated infrastructure to be located (predominantly) within the Port of Richards Bay. The NIFPP will make use of Combined Cycle Gas Turbine (CCGT) technology fuelled by Liquid Natural Gas (LNG) (Box 1). The project would be made up of a series of individual floating power plants each of which would be capable of generating 1 350 MW. It is proposed to phase the project, gradually bringing in the power plants to create a combined generation capacity of 5 400 MW. Subsequent phases may take the combined power generation to 16 200 MW.

A substation and transmission switching yard is proposed to be located at the NIFPP CCGT Power Station Facility (located on the Power Barge Terminal/ Quay) housing the step-up transformer, circuit breaker arrangements, protection and control equipment (i.e. voltage and current transformers, relays and SCADA systems). The new on-land transmission substation (proposed to be located to the north-west of the Bayside site) would also feature voltage control/ power factor correction devices such as capacitors, reactors or static volt-ampere reactive compensators and equipment, such as phase shifting transformers to control power flow between the two adjoining power systems, as may be required, to convert the power generated at Medium Voltage (MV) at 22 kV for transmission to High Voltage (HV) at 440 kV/ 765 kV.

3.1 Receiving Environment

The project will be located in the port of Richardsbay. The Port of Richards Bay is managed by the Transnet National Ports Authority (TNPA); however, the “sea/estuarine” environment and bed/substrate is owned by the Minister of Environment, Forestry & Fisheries (DEFF). On land, Remainder Erf 5333 is largely vacant and owned by the uMhlatuze Local Municipality, while the adjacent land parcel (Lot 6363, Alton) to the east of the proposed powerline corridor is the Bayside Aluminium smelter, owned by South32 and to the west is the Gypsum Dump.

Two canals that were established to drain the area used for the Bayside Aluminium Smelter exist on the eastern and southern boundaries of Bayside, the Manzamnyama and Bhizolo Canals respectively. The area to the south of the Port of Richards Bay (or Richards Bay Estuary) is known as the Richards Bay Sanctuary or uMhlatuze Estuary and includes the Richards Bay Game Reserve, a protected area.

The Port of Richards Bay, itself, contains a dry bulk terminal, a multi-purpose terminal and the privately-operated coal terminal. Other private operators within the Port include several wood chip export terminals and a bulk liquid terminal. The Port has extensive rail and conveyor belt systems servicing the berths from nearby factories and plants.

The prevailing vegetation type and landscape features of the area form part of the Maputoland Coastal Belt. It is described as a flat coastal plain with Quaternary sediments of marine origin characterised by low shrubs (Mucina & Rutherford, 2006).

4. Legislative Framework

For this project, the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA) and the Kwazulu-Natal Heritage Act, No. 4 of 2008 are of importance and the following sites and features are protected:

- a. Archaeological artefacts, structures and sites older than 100 years
- b. Ethnographic art objects (e.g. prehistoric rock art) and ethnography
- c. Objects of decorative and visual arts
- d. Military objects, structures and sites older than 75 years
- e. Historical objects, structures and sites older than 60 years
- f. Proclaimed heritage sites
- g. Grave yards and graves older than 60 years
- h. Meteorites and fossils
- i. Objects, structures and sites of scientific or technological value.

The national estate includes the following:

- a. Places, buildings, structures and equipment of cultural significance
- b. Places to which oral traditions are attached or which are associated with living heritage
- c. Historical settlements and townscapes
- d. Landscapes and features of cultural significance
- e. Geological sites of scientific or cultural importance
- f. Archaeological and palaeontological importance
- g. Graves and burial grounds
- h. Sites of significance relating to the history of slavery
- i. Movable objects (e.g. archaeological, palaeontological, meteorites, geological specimens, military, ethnographic, books etc.)

Section 34 (1) of the NHRA and Section 33 of the KZN Heritage Act deal with structures that are older than 60 years. Section 35(4) of the NHRA deals with archaeology, palaeontology and meteorites as does Section 36 of the KZN Heritage Act. Section 36 of the NHRA and Section 34 and 35 of the KZN Heritage Act, deal with human remains older than 60 years. Unidentified/unknown graves are also handled as older than 60 years until proven otherwise.

The Notification of Intent to Develop (NID) is submitted to AMAFA in terms of Sections 38(1) and 38(8) of the NHRA. This NID is submitted to outline what (if any) heritage resources are likely to be affected, how the character of the site will change and what processes need to be followed.

4.1 Heritage Site Significance and Mitigation Measures

The presence and distribution of heritage resources define a Heritage Landscape. In this landscape, every site is relevant. In addition, because heritage resources are non-renewable, heritage surveys need to investigate an entire project area. In all initial investigations, however, the specialists are responsible only for the identification of resources visible on the surface.

This section describes the evaluation criteria used for determining the significance of archaeological and heritage sites. National and Provincial Monuments are recognised for conservation purposes. The following interrelated criteria were used to establish site significance:

- » The unique nature of a site;
- » The integrity of the archaeological/cultural heritage deposit;
- » The wider historic, archaeological and geographic context of the site;
- » The location of the site in relation to other similar sites or features;
- » The depth of the archaeological deposit (when it can be determined or is known);
- » The preservation condition of the site; and
- » Potential to answer present research questions.

The criteria above will be used to place identified sites within the South African Heritage Resources Agency's (SAHRA's) (2006) system of grading of places and objects that form part of the national estate. This system is approved by the Association of South African Professional Archaeologists (ASAPA) for the Southern African Development Community (SADC) region.

Table 1. Heritage Field ratings

FIELD RATING	GRADE	SIGNIFICANCE	RECOMMENDED MITIGATION
National Significance (NS)	Grade 1	-	Conservation; national site nomination
Provincial Significance (PS)	Grade 2	-	Conservation; provincial site nomination
Local Significance (LS)	Grade 3A	High significance	Conservation; mitigation not advised
Local Significance (LS)	Grade 3B	High significance	Mitigation (part of site should be retained)
Generally Protected A (GP. A)	-	High/medium significance	Mitigation before destruction
Generally Protected B (GP. B)	-	Medium significance	Recording before destruction
Generally Protected C (GP.C)	-	Low significance	Destruction

4.2. NHRA Section 38 Triggers

The following aspects of Section 38 of the NHRA and the KZN Heritage Act may be triggered by the proposed project.

Table 2. NHRA Triggers

		NHRA Section 38 (1) Activities / Triggers	Summary description (e.g. 500 m road, etc.)
	A	Any linear development or barrier >300 m	Power line
	b	Any bridge or similar structure >50 m	No bridges will be constructed
X	c	Any development or activity that will change the character of a site:	TBC
	i	≥5 000m ² in extent	Applicable
	ii	Involving ≥3 existing erven/ Subdivisions	Not applicable
	iii	Involving ≥3 or more erven/ divisions consolidated within past 5 years.	Not applicable
	d	Rezoning of a site ≥10 000m ² in extent.	Not applicable
X	e	Other triggers, e.g.: in terms of other legislation, (i.e.: National Environment Management Act, etc.)	NEMA, NWA, NEMICMA.

5. Limitations and assumptions

The study area was not subjected to a field survey at this stage in the process. It is assumed that information obtained for the wider area is applicable to the study area. Additional information could become available in future that could change the results of this report.

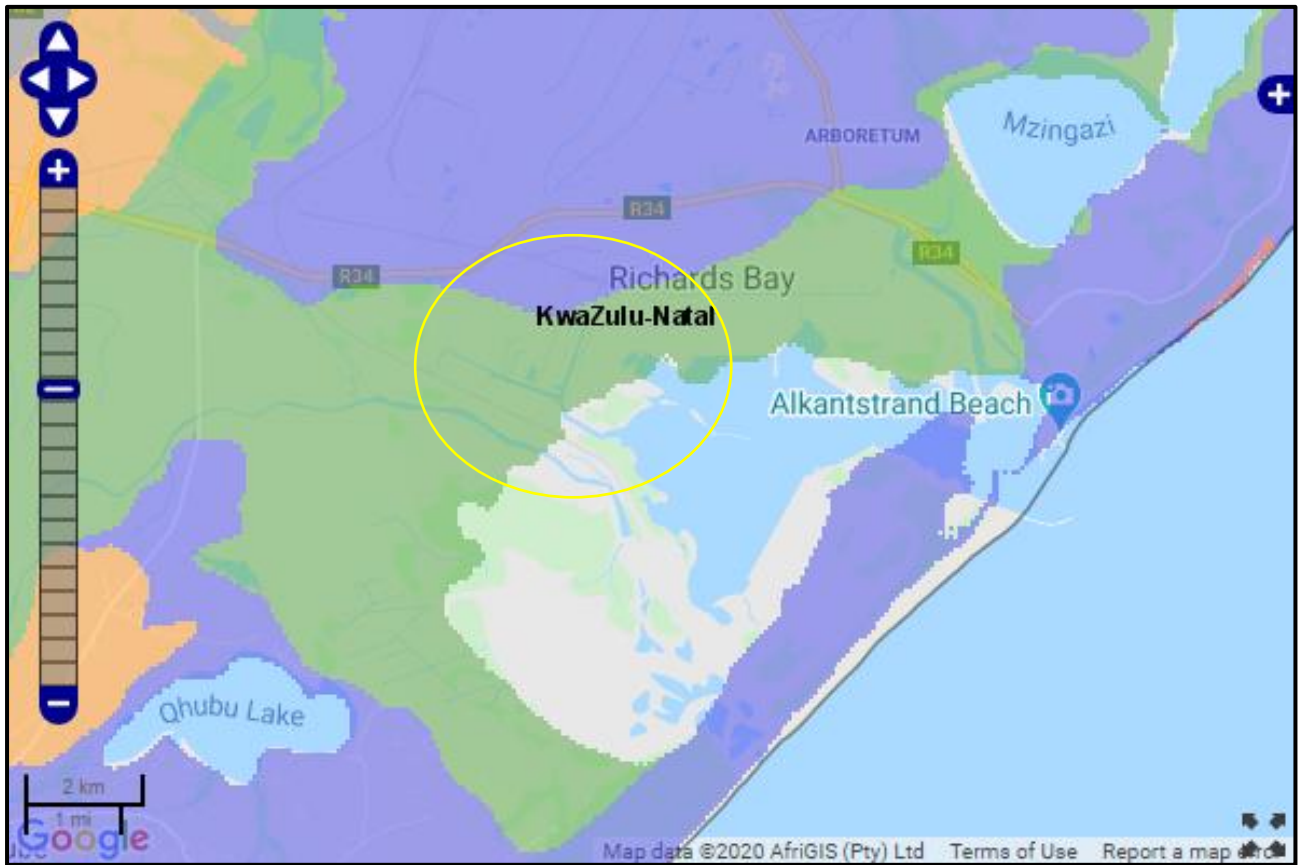
6. Heritage Resources

Heritage resources are defined in Section 2 of the NHRA as “any place or object of cultural significance”, where cultural significance can be understood as meaning “aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance”. Heritage resources together constitute the National Estate, as defined in Section 3 of the NHRA, and each resource is recognized and protected under the Act.

A variety of heritage resources contribute to the heritage character of the area, and these are briefly dealt with below. Each category of heritage resource was assessed to derive the heritage character of the area. This was done by consultation of heritage reports captured into SAHRIS as well as other archaeological databases.

6.1. Paleontological resources

According to the paleontological sensitivity of the study area based on the SAHRA Paleontological map further studies are required (Figure4).



Colour	Sensitivity	Required Action
RED	VERY HIGH	Field assessment and protocol for finds is required
ORANGE/YELLOW	HIGH	Desktop study is required and based on the outcome of the desktop study, a field assessment is likely
GREEN	MODERATE	Desktop study is required
BLUE	LOW	No palaeontological studies are required however a protocol for finds is required
GREY	INSIGNIFICANT/ZERO	No palaeontological studies are required
WHITE/CLEAR	UNKNOWN	These areas will require a minimum of a desktop study. As more information comes to light, SAHRA will continue to populate the map

Figure 4. The approximate study area as indicated on the SAHRA paleontological sensitivity map.

6.2. Archaeological background

The archaeology of KwaZulu-Natal can be divided in three main periods namely the Stone Age, Iron Age and Historical period.

6.2.1. Stone Age

South Africa has a long and complex Stone Age sequence of more than 2 million years. The broad sequence includes the Later Stone Age, the Middle Stone Age and the Earlier Stone Age. Each of these phases contains sub-phases or industrial complexes, and within these we can expect regional variation regarding characteristics and time ranges. For Cultural Resources Management (CRM) purposes it is often only expected/ possible to identify the presence of the three main phases.

Yet sometimes the recognition of cultural groups, affinities or trends in technology and/or subsistence practices, as represented by the sub-phases or industrial complexes, is achievable (Lombard 2011). The three main phases can be divided as follows;

- » Later Stone Age; associated with Khoi and San societies and their immediate predecessors. - Recently to ~30 thousand years ago.
- » Middle Stone Age; associated with Homo sapiens and archaic modern human - . 30-300 thousand years ago.
- » Earlier Stone Age; associated with early Homo groups such as Homo habilis and Homo erectus. - 400 000-> 2 million years ago.

The LSA is well represented in KwaZulu-Natal with an abundance of rock art, like the rock paintings at Giants Castle and Kamberg in the Drakensburg Mountains (Vinnicombe, 1976). Rock art sites have been also been documented in the areas around Estcourt, Mooi River and Dundee. Several caves in KZN contain significant archaeological deposits like the well-known MSA site of Sibudu Cave on the coast of KwaZulu-Natal, which shows evidence for early forms of cognitive human behavioural patterns (Wadley, 2005). Another well-known cave site called Border Cave is situated some 40 kilometres to the north east of the study area at the Ingodini Border Cave Museum Complex. The site was first investigated by Raymond Dart in 1934; here excavations exposed a thick deposit of archaeological material dating from the Iron Age overlaying MSA artefacts. Later excavations, by Beaumont in the early 1970's, revealed a complete MSA sequence succeeded by Early and Later Iron Age deposits (Klein 1977).

6.2.2. Iron Age and historical period

Bantu-speaking people moved into Eastern and Southern Africa about 2,000 years ago (Mitchell, 2002). These people cultivated sorghum and millets, herded cattle and small stock and manufactured iron tools and copper ornaments. Because metalworking represents a new technology, archaeologists call this period the Iron Age. Characteristic ceramic styles help archaeologists to separate the sites into different groups and time periods. The Iron Age as a whole represents the spread of Bantu speaking people and includes both the Pre-Historic and Historic periods. It can be divided into three distinct periods:

- » The Early Iron Age: Most of the first millennium AD.
- » The Middle Iron Age: 10th to 13th centuries AD.
- » The Late Iron Age: 14th century to colonial period.

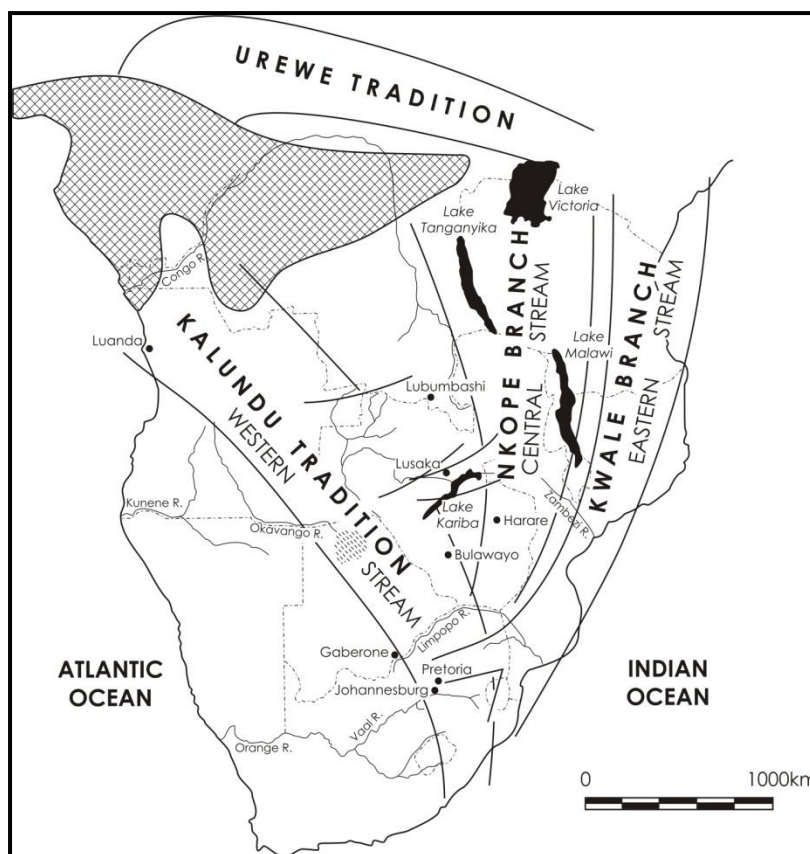


Figure 5: Movement of Bantu speaking farmers (Huffman 2007).

The first 1,000 years is called the Early Iron Age. Early Iron Age people made a living by mixed farming. They had the technology to work metals like iron. Existing evidence dates the Iron Age in southern Africa to the first millennium AD (Huffman, 2007). The site of Mzonjani, 15 km from Durban, is the oldest known Iron Age site in KwaZulu-Natal, dating to the 3rd Millennium AD (Huffman, 2007).

The area that was occupied by the Nguni speaking group of the Eastern Bantu language stream is characterised by settlement patterns defined as the Central Cattle Pattern (CCP) (Huffman, 2007). The Nguni ceramic sequence consists of the *Blackburn* (AD 1050-1500), *Moor Park* (AD 1350-1700) and, *Nqabeni* (AD 1700-1850), although excavated pottery is seldom decorated and therefore complicates archaeological interpretation (Huffman 2007: 441, 443).

Blackburn pottery is on record along the north and south coasts of KwaZulu-Natal, often in shell middens (Huffman 2007: 443). The available radiocarbon dates place *Blackburn* between about AD 1100 and perhaps 1500.

The earliest known type of stonewalling that characterises this settlement pattern (CCP) in the region is the Moor Park site, which dates from the 14th to 16th Centuries AD (Huffman, 2007). This type of stonewalling can be found in defensive positions on hilltops in the Midlands of KZN (Huffman, 2007). Archaeologists have concluded that the function of these structures was to serve mainly as defensive purposes (Huffman, 2007). Archaeologically, the Natal area was occupied by the Zulu people by AD 1050 (Huffman, 2007).

In the late 1400's, a Nguni group under the leadership of Dlamini settled in the Delagoa Bay area. By the late 1700's, the Dlamini clan moved into land settling on the banks of the Pongola River where it cuts through the Lebombo Mountains. An attempt was also made to occupy the area between the Pongola River and Magudu Hills (at that stage the area was under Ndwandwe rule), but they had to retreat back across the Pongola River (Bonner 2002; Fourie 2013).

Serious rivalry between the Ndwandwe under Zwide and the Ngwane (Swazi) under Sobhuza created a period of unrest and confrontation in the early 1800's. An attempt from Zwide to annex the grain fields on the south side of the Pongola River almost destroyed the Ngwane. These successive Ndwandwe attacks lead to the fleeing of the Ngwane to the far north (Bonner, 2002).

The Late Iron Age economy was based on agriculture and livestock. Both components were inextricably linked to cultural practices and even contributed to the evolution of other institutions. In the Nguni groups, economic activities were divided along gender lines; men were closely associated with cattle and women with farming. It is believed that maize was introduced to northern KwaZulu-Natal via the Delagoa Bay trade network and the crop soon became widely cultivated. According to oral tradition, the Mthethwa first produced maize in the late 18th century (Huffman 2007: 453, 457).

Along with cattle and trade beads, (both used as currency for bride wealth); metal objects also became markers of wealth, status and power. Iron and copper ornaments (bangles, neck-and earrings) were worn to indicate social position and were also used in trade (Wylie 2006: 58, 59). Other metal artefacts which may appear in the archaeological record are iron spear points and hoes used for agriculture (very few have been found in context). It is interesting that the deliberate burial of numerous metal objects (mostly spearheads and hoes) seems to have been a common practice in Late Iron Age KwaZulu-Natal (Maggs 1991). This phenomenon is probably connected to the period of instability leading up to the Mfecane.

The Difaqane (Sotho), or Mfekane/Imfecane ("the crushing" in Nguni) was a time of bloody upheavals in Natal and on the Highveld, which occurred around the early 1820's until the late 1830's (Berg 1999: 109-115). It came about in response to heightened competition for land and trade, and caused population groups like gun-carrying Griquas and Shaka's Zulus to attack other tribes (Berg 1999: 14; 116-119). In KwaZulu-Natal, this commenced in the early 1800's when the amaZulu were still under Senzangakona (Omer-Cooper, 1993).

The Mthethwa confederacy also arose in the 18th century as a consolidation of clans that formed part of the greater northern Nguni-speaking cultural group in southern Africa. Their ruling lineage (the Nyambose) originally settled between the Mfolozi and Mhlatuse rivers (Wylie 2006: 49).

Indian Ocean trade contributed to changes in the socio-political structures of many groups, including that of the Mthethwa: imported beads became part of bride-wealth/lobola currency, increased demand for meat and grain from east coast ships necessitated more control of agricultural labour, cattle-raids etc., and even influenced the evolution of the amabutho (age-set regiments) system. Ivory, hides, slaves, grain, and metal hoes were exchanged for incoming commodities such as beads and cloth (Mitchell & Whitelaw 2005: 228; Huffman 2007: 77-80). It was amid the ensuing power struggles between politically complex chiefdoms that the Mthethwa, Ndwandwe in the north and the Qwabe in the south emerged as prominent role-players.

6.3. Identified / Known Heritage Resources

Several CRM assessments have been conducted in the area, the following reports (Table 3) have been consulted in this report:

Table 3. CRM studies consulted for this project.

Author	Year	Project	Findings
Anderson, G. & Anderson, L.	2008	Archaeological Survey of The Proposed Alton Sewer Pipe Upgrade.	No sites were recorded during the course of the survey along the pipeline deviation.
Anderson, G.	2008	Archaeological Survey of The Proposed New Infrastructure at The Arrival Yard at The Richards Bay Coal Terminal	No sites were recorded.
Anderson, G. & Anderson, L.	2009	Heritage Survey of The Proposed Expansion to The Transnet National Ports Authority, Richards Bay	A total of nine sites were recorded during the course of the survey. These sites date from the Cretaceous to the Late Iron Age.
Anderson, G. & Anderson, L.	2010	Heritage Survey of The Proposed Richards Bay Central Industrial Area for Coastal & Environmental Services.	The survey did not locate any heritage sites.
Van Schalkwyk, L. & Wahl, E.	2013	Baseline Heritage Study: Proposed Richards Bay Port Expansion, uMhlatuze Local Municipality, uThungulu District, KwaZulu-Natal	Grave sites.
Van Schalkwyk, L. & Wahl, E.	2014	Application for Exemption from a Phase 1 Heritage Impact Assessment of Proposed Decommissioning of the Legacy Landfills at The Bayside Aluminium Smelter, Richards Bay, KwaZulu-Natal, South Africa	No sites
Galimberti, M.	2015	Proposed gas to power plant within Zone F in the IDZ of Richardsbay, KZN.	No sites
Van der Walt, J.	2016	Proposed Hillside Desalination Plant to be established at the Hillside Aluminium smelter site, Richards Bay, KwaZulu-Natal	No sites
Van Schalkwyk, L.	2018	Application for HIA Exemption RBCT Repeater Mast Port of Richards Bay, Umhlathuze LM, King Cetshwayo DM, KwaZulu-Natal	No sites
Lavin, J and Van Schalkwyk, L.	2019	Proposed development of an edible oil pipeline and Wilmar SA (Pty) Ltd from berth 706/707/708 to RB IDZ Phase 1 A, Richardsbay, KZN.	No sites (though sites in the surrounding area are indicated in the report).

Numerous archaeological and palaeontological sites have been previously recorded in the greater study area both inland and along the coast (Anderson and Anderson 2009) and coastal dune systems are very sensitive in terms of archaeological sites as evidenced by surveys for Richardsbay Minerals to the north of the study area. These sites date to the Iron Age with several Stone Age sites outside of the dune cordon (Anderson and Anderson 2009).

The current area under investigation was assessed as part of a 2009 study conducted by Anderson and Anderson. The survey recorded nine sites dating from the Cretaceous (paleontological) to the Late Iron Age as well as Stone Age scatters. Two of these sites fall within the current study area – Umlando RBP 03 and Umlando RBP 07 (Figure 6 and Table 4). A third site (Figure 6 and Table 4) is on record at the Pietermaritzburg Museum Archaeological Database (2832CC 001 Bhizele Halt) also located within the study area with a grading of 3 B (High significance). It is expected that more sites can be found in the study area.

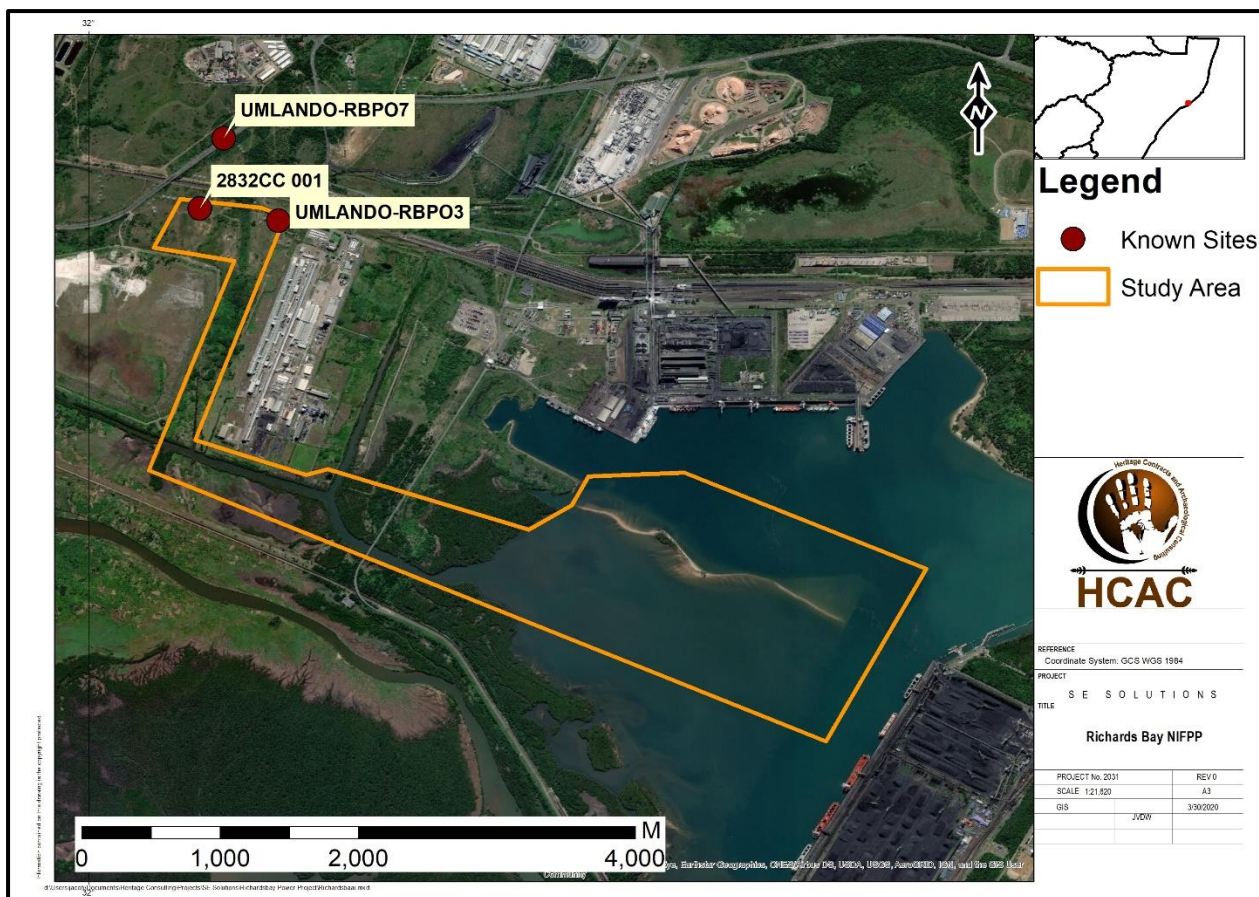


Figure 6. Known sites in the study area.

Table 4. Known sites within the study area.

Site	Source	Description	Significance
Umlando RBP03	Anderson & Anderson 2009	Weathered MSA and LSA stone tools	Low Significance
Umlando RBP07	Anderson & Anderson 2009	Scatter of Early Iron Age pottery.	Low Significance
2832CC 001 (Bhizele Halt)	Pietermaritzburg Museum Database	Artefacts	Indicated as of high significance

7. Potential Impact Assessment

Heritage resources as defined in Section 3 of the NHRA and in Chapter 8 of the KZN Heritage Act are protected by the Act and could occur within the study area. Although all heritage resources are relevant to the Heritage Landscape and are non-renewable, it is anticipated that few sites in the study area could have conservation value. As the presence and location of resources in the impact areas still need to be confirmed by a physical survey, at this level, the potential impacts will be assessed based on a worst-case scenario without mitigation measures in place to avoid direct impacts to heritage resources as outlined in Table 4.

Table 5. Heritage resources in the study area

		Places, buildings, structures and equipment of cultural significance
	3(2)(a)	Description of resource: No standing structures
		Potential impact: None
		Places to which oral traditions are attached or which are associated with living heritage
	3(2)(b)	Description of resource: Places associated with oral traditions and living heritage. This should be confirmed prior to development during the social consultation.
		Potential impact: Degradation of indigenous knowledge systems, intrinsic cultural significance and alteration to the sense-of-place. It should be noted that the greater area is part of a registered land claim by the Mandlazini Community Trust.
		Historical settlements and townscapes
	3(2)(c)	Description of resource: None (Verified by aerial images in Anderson and Anderson (2009).
		Potential impact: None
		Landscapes and natural features of cultural significance
x	3(2)(d)	Description of resource: The red mangrove, <i>Rhizophora mucronate</i> , located to the northeast of the coal terminal in an area proclaimed a Natural Heritage Site.
		Potential impact: There is no known cultural connection with the declared Natural Heritage Site. This will be assessed in the EIA process.
		Geological resources of scientific or cultural importance
	3(2)(e)	Description of resource: None
		Potential impact: None
		Archaeology and/or paleontology (Including archaeological sites and material, fossils, rock art, battlefields & wrecks)
x	3(2)(f)	Description of resource: Numerous sites are indicated in the area on the KZN Database and on SAHRIS including Stone and Iron age sites. The area is of paleontological significance.
		Potential impact: Damage to and/or destruction of non-renewable archaeological resources and paleontological resources.
		Graves and burial grounds (e.g.: ancestral graves, graves of victims of conflict, historical graves & cemeteries)
x	3(2)(g)	Description of resource: Burial sites can be expected anywhere on the landscape.
		Potential impact: Damage to and/or destruction of burial grounds.
		Other human remains
x	3(2)(a)	Description of resource: Unmarked graves.
		Potential impact: Unmarked graves can be accidentally exposed
		Sites of significance relating to the history of slavery in South Africa
	3(2)(h)	Description of resource: None

		Potential impact: None
	3(2)(i)	Movable objects
		Description of resource: None
		Potential impact: None

8. Recommendation

The greater area is rich in heritage resources and sections of the current study area has been assessed by Anderson and Anderson (2009). The survey recorded nine sites dating from the Cretaceous (paleontological) to the Late Iron Age as well as Stone Age scatters. Two of these sites fall within the current study area – Umlando RBP 03 (stone Age artefacts) and Umlando RBP 07 (Iron Age Artefacts), these sites are indicated as of low significance. A third site (Bhizele Halt comprising artefacts) is on record at the Pietermaritzburg Museum Archaeological Database, also located within the study area with a grading of 3 B (High significance). It is expected that more sites can be found in the study area and it is expected that more sites can be found within the area of investigation. Based on the SAHRA paleontological sensitivity map the area is of moderate Paleontological sensitivity and further studies will be required.

Without a field-based heritage assessment of the area the proposed project could have a negative impact on non-renewable heritage resources. It is therefore recommended that a Phase 1 Heritage Impact assessment is conducted for the project including a paleontological assessment.