

# **SCOPING**

## **INTEGRATED HERITAGE IMPACT ASSESSMENT**

In terms of Section 38(8) of the NHRA for the

### **PROPOSED DEVELOPMENT OF THE BOULDERS WIND FARM, VREDENBURG PENINSULA, WESTERN CAPE**

**DEA Ref: Not yet allocated**

**HWC Ref: Not yet allocated**

**Prepared by**

Katie Smuts

**For Vredenburg Wind Farm (PTY) Ltd**

**February 2018**

## THE INDEPENDENT PERSON WHO COMPILED A SPECIALIST REPORT OR UNDERTOOK A SPECIALIST PROCESS

I Kathryn Smuts, as the appointed independent specialist hereby declare that I:

- act/ed as the independent specialist in this application;
- regard the information contained in this report as it relates to my specialist input/study to be true and correct, and
- do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the NEMA, the Environmental Impact Assessment Regulations, 2010 and any specific environmental management Act;
- have and will not have no vested interest in the proposed activity proceeding;
- have disclosed, to the applicant, EAP and competent authority, any material information that have or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the NEMA, the Environmental Impact Assessment Regulations, 2010 and any specific environmental management Act;
- am fully aware of and meet the responsibilities in terms of NEMA, the Environmental Impact Assessment Regulations, 2010 (specifically in terms of regulation 17 of GN No. R. 543) and any specific environmental management Act, and that failure to comply with these requirements may constitute and result in disqualification;
- have ensured that information containing all relevant facts in respect of the specialist input/study was distributed or made available to interested and affected parties and the public and that participation by interested and affected parties was facilitated in such a manner that all interested and affected parties were provided with a reasonable opportunity to participate and to provide comments on the specialist input/study;
- have ensured that the comments of all interested and affected parties on the specialist input/study were considered, recorded and submitted to the competent authority in respect of the application;
- have ensured that the names of all interested and affected parties that participated in terms of the specialist input/study were recorded in the register of interested and affected parties who participated in the public participation process;
- have provided the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not; and
- am aware that a false declaration is an offence in terms of regulation 71 of GN No. R. 543.



Kathryn Smuts

**Signature of the specialist**

12/02/2018

**Date**

## EXECUTIVE SUMMARY

### 1. Site Name

The proposed Boulders Wind Farm is to be located across several farms on the Vredenburg Peninsula.

### 2. Location

The development site is located at the northern end of the Vredenburg Peninsula between the towns of Paternoster and St Helena, in the Saldanha Municipality, Western Cape, at -32.7920657559S and 17.9648628474E (centroid).

The site consists of the properties:

- Boebezaks Kraal 2/40
- Boebezaks Kraal 3/40
- Boebezaks Kraal 5/40
- Frans Vlei 2/46
- Schuitjes Klip 3/22
- Davids Fontyn 9/18
- Schuitjes Klip 1/22
- Het Schuytje 1/21
- Davids Fontyn 7/18
- Uitkomst RE/6/23

### 3. Locality Plan



Locality Plan showing proposed development area in red.

### 4. Description of Proposed Development

It is proposed that a wind farm be built over 10 properties by the proponent, Vredenburg Wind Farms (PTY) Ltd. The identified project site is approximately 5084 hectares in extent, and will include up to 45 wind turbines with a contracted capacity of up to 140MW.

### 5. Heritage Resources Identified

This integrated HIA comprises a collation of the scoping reports for potential impacts to Archaeological and Palaeontological resources, as well as visual impacts pertaining to heritage resources. Although a brief site visit was conducted by the archaeologists, no field assessments were undertaken as part of these scoping exercises, and the known heritage resources in the study area were determined through deskbased analysis and research.

Significant palaeontological deposits within the study area are found at Soetlandskop, on Schuitjies Klip 1/22 in the north of the study area, and are known to include the late-Miocene Prospect Hill Formation, but may also include Saldanha Formation mid-Miocene phosphatic deposits. The early Pliocene Varswater Formation may also be present on Schuitjies Klip 3/22, together with the mid-Pliocene Uyekraal Formation, and the Pliocene to Quaternary Langebaan Formation. Further to this, the Quaternary Velddrif Formation is mapped on the geological maps on Farm Uitkomst RE/6/23, although its presence here has not yet been confirmed. These deposits comprise the Coastal Formations Terrain.

The archaeological scoping report identified a few archaeological sites consisting of artefact/marine shell scatters within the project site, as well as more dense complexes of archaeological sites. Historic farm houses and werfs were identified within the project area, and some of these have associated burials. The significant archaeological sites of Kasteelberg, which together hold significant scientific importance for the study of early pastoralism in the Western Cape, largely fall outside of the proposed development area.

The R45 should be considered a scenic route (Webley et al. 2010; Winter and Oberholzer 2013), while the entire area can be considered a cultural landscape of scenic rolling hills, agricultural fields and historic farmsteads, layered on top of a Stone Age landscape represented by the numerous archaeological sites found throughout the study area.

## **6. Anticipated Impacts on Heritage Resources**

The Coastal Formations Terrain in the western portion of the Project Area is of high sensitivity where the potential impact is **high** (Table 2). This terrain includes the Miocene formations forming Soetlandskop in the north of the study area and the Pliocene to Recent formations which infill the Uitkomst Embayment in the west. The construction of the proposed Boulder Wind Farm, which will entail excavation into bedrock, will result in a **direct**, negative impact on palaeontological/scientific heritage in the absence of effective mitigation. Impacts will be limited to the construction phase.

No “red flag” issues were identified in terms of the known archaeological resources in the area, although the likely impact to archaeological material will only become apparent once the WEF layout is determined. Impacts will result from construction related activities, and, given the abundant archaeological resources found in the area, such as shell middens, stone tool scatters, occupation sites, historic structures and precolonial and colonial period graves and graveyards, the potential impacts are **high**. The development will have a **direct**, negative impact on archaeological resources through disturbance and destruction of sites during ground clearing and installation of infrastructure, where this occurs on or near to sites. Possible **indirect** impacts could arise through encroachment on sites and loss of sense of place, as well as environmental degradation that could damage sites, i.e. through dust accumulation, erosion, etc. Additional people on site during construction phase can also result in loss of archaeological material through intentional or unintentional damage. It is likely, however, that the impacts to archaeology will be **low if significant sites are avoided**. Likely Impacts will be limited to the construction phase.

Visual impacts are likely to occur during construction and operational phases. These impacts are **high** within close proximity to the WEF, and are **direct** impacts arising from the visual intrusion of the turbines on the landscape. These impacts will affect observers travelling along the main (R27, R45 and R399) and secondary roads, people living in built up centres and populated places and people living on farmsteads and homesteads (rural residences). The WEF

could directly impact the visual character and sense of place of the region, specifically the pastoral landscape and small coastal towns. Potential indirect impacts could arise from the ancillary infrastructure; lighting of the facility in terms of light glare, light trespass and sky glow and shadow flicker. Cumulative impacts of the proposed WEF and associated infrastructure in context of the authorised West Coast 1 WEF are also likely. Further assessment of these issues will be undertaken in the EIA phase in order to facilitate mitigation of the visual impacts to sensitive heritage resources.

## **7. Recommendations**

Proposed recommendations for the EIA Phase studies are:

### **Palaeontological Impact Assessment:**

- All excavations in the high sensitivity Coastal Formations Terrain deposits must be inspected by the contracted palaeontologist;
- No further pre-construction study is required for the Boulders Wind Farm subject to the inclusion of the specialist recommendations being included in the Environmental Management Programme.

### **Archaeological Impact Assessment:**

- The buffer areas that have emerged from previous environmental and heritage authorisations may be applicable to the Boulders Wind Farm. While predominantly related to visual issues, some, for example the buffer around Kasteelberg, have a bearing indirectly on the archaeology. Although we have argued why some relaxation may be appropriate, these buffers will have to be negotiated with the respective authorities;
- Take cognisance of the comments of the I&APs with respect to the heritage of the site and area of proposed development arising out of the PPP;
- Propose measures to adequately address or mitigate any identified impacts;
- Any graves and cemeteries outside pre-determined buffer or no-go areas that have not yet been identified, must be clearly demarcated and avoided, especially if situated immediately adjacent to the existing farm roads or proposed roads. The appropriate mechanisms for dealing with chance finds of human remains must be included in the HIA;
- Any changes to the proposed layout that occurs in areas not previously subjected to site inspection, must be assessed during the EIA phase of the project to determine the type, quantity, location and significance of the heritage resources that may be impacted by the WEF infrastructure;
- No Stone Age artefact scatters are likely to be “red flag” issues but may require mitigation in the form of recording and/or sampling if they cannot be avoided;
- Similarly, significant colonial heritage such as historic buildings (including sheds, kraals, etc.) may need to be

recorded and/or avoided if present on the affected sites. As the main farm complexes will be buffered, it is older isolated farm structures that are of more concern. They must be identified, assessed and avoided if necessary.

*The EIA Phase AIA will be reviewed, assessed and collated as part of the Integrated Heritage Impact Assessment Report in terms of the likely impact of the development on and significance to the identified archaeological heritage resources, including archaeological sites, graves and cemeteries and historic farmsteads and cultural landscapes.*

**Visual Impact Assessment (as related to impacts to heritage resources):**

- Undertake additional spatial analyses for the core facility and ancillary infrastructure in order to create a visual impact index that will further aid in determining potential areas of visual impact;
- Site-specific issues and potential sensitive visual receptors should be measured against this visual impact index and be addressed individually in terms of nature, extent, duration, probability, severity and significance of visual impact;
- Specific spatial criteria must be applied to the visual exposure of the proposed facility in order to successfully determine visual impact and ultimately the significance of the visual impact;
- Photo simulations of critical viewpoints should be undertaken where required, in order to aid in the visualisation of the envisaged visual impact.

*The above steps, which will be undertaken as part of the VIA, will be reviewed, assessed and collated as part of the Integrated Heritage Impact Assessment Report in terms of likely visual impact of the development on the identified heritage resources, including sense of place, cultural landscapes and archaeological sites.*

**8. Author/s and Date**

HIA compiled by Kathryn Smuts

12 February 2018

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## **1. INTRODUCTION**

### **1.1 Background Information on the Project**

It is proposed that a Wind Energy Facility (WEF) be constructed over 10 properties at the northern end of the Vredenburg Peninsula between the towns of Paternoster and St Helena, in the Saldanha Municipality, Western Cape (Figures 1 and 2). The identified project site is approximately 5084 hectares in extent, and will include up to 45 wind turbines with a contracted capacity of up to 140MW. The layout of the facility has not yet been determined. Savannah Environmental is the Environmental Assessment Practitioner managing the process for this project.

The proposed WEF will comprise the following:

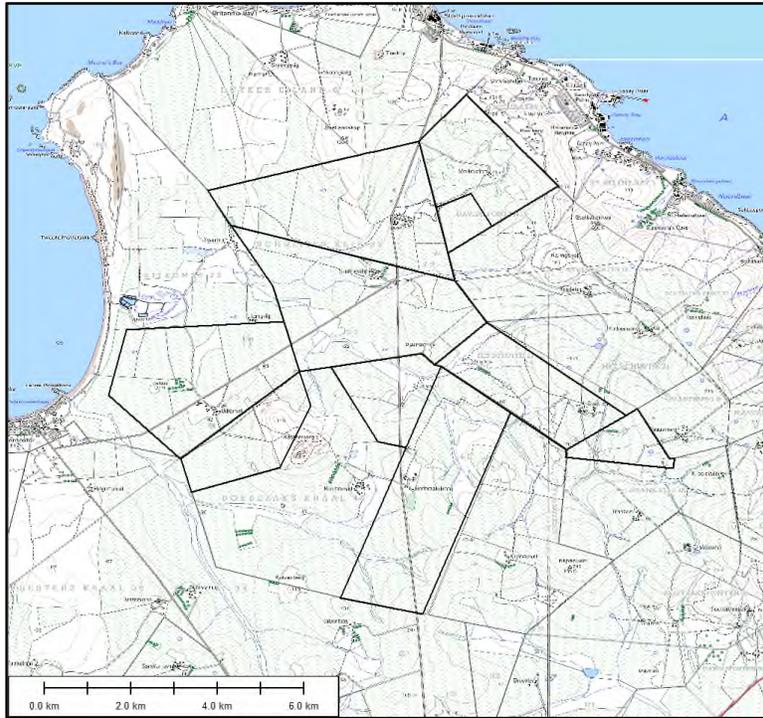
- Up to 45 wind turbines with a maximum hub height of up to 120m. The tip height of the turbines will be up to 165m;
- Concrete foundations to support the turbines;
- Cabling between the turbines, to be laid underground where practical;
- An on-site substation of up to 200m x 200m in extent to facilitate the connection between the wind farm and the electricity grid;
- An overhead 132kV power line, with a 32m servitude, to connect the facility to the electricity grid ;
- A transformer station for each wind turbine;
- Access roads to the site and between project components with a width of approximately 6m;
- Laydown areas, crane hardstand pads, administrative buildings and offices.

### **1.2 Description of Property and affected Environment**

The area proposed for development is located towards the northern end of the Vredenburg peninsula, some 8 km east of Paternoster, 4 km south west of St Helena Bay and 12 km north of Vredenburg. The area is predominantly under wheat cultivation, with some maize, and comprises rolling agricultural fields, broken with irregular patches of Strandveld, or West Coast Renosterveld. The underlying geology consists of fairly extensive granite extrusions of the Vredenburg pluton, mantled with deposits of older and recent sands. The granite extrusions, where these impede ploughing, often remain as pockets of indigenous flora and fauna. In pre-colonial and early historic times, these outcrops were focal landscape features for inhabitants of the area, as they provide shelter from the prevailing winds, and sometimes even act as water sources where rainwater is trapped in hollows and crevasses in the rocks.

Although there is little built fabric outside of the regional towns, the study area is heavily disturbed due to years of intensive wheat farming, and roads, fences, dams and power lines are widespread.

The 47 wind turbines of West Coast 1 WEF, which has been operational since mid-2015, are a visual disruption to the otherwise rural landscape, and are in contrast to the otherwise agricultural features present.



**Figure 1. The location of the proposed wind farm (black polygons) situated on the northern end of the Vredenburg Peninsula. 3217DB&DD Vredenburg, 3218CA&CC Velddrif. (Chief Director Surveys And Mapping)**

## **2. METHODOLOGY**

### **2.1 Purpose of HIA**

The purpose of this Heritage Impact Assessment (HIA) is to satisfy the requirements of section 38(8), and therefore section 38(3) of the National Heritage Resources Act (Act 25 of 1999). No NID has as yet been submitted for this project, but a previous iteration of this application received a “Response to NID” letter from HWC dated 2 July 2014. In that response, HWC required that an HIA be submitted with specific reference to impacts on archaeological and palaeontological heritage resources, and visual impacts to heritage resources and intangible heritage such as sense of place, and therefore those requirements are being implemented in this process.

## 2.2 Summary of steps followed

- Archaeologists were contracted to conduct a survey of archaeological resources likely to be impacted by the proposed development (AIA, see Scoping Report);
- A palaeontologist was contracted to assess palaeontological resources likely to be disturbed by the proposed development (PIA, see Scoping Report);
- A Visual Impact Assessment was undertaken (VIA, see Scoping Report);
- The identified resources were mapped and assessed to evaluate their heritage significance in terms of the grading system outlined in section 3 of the NHRA (Act 25 of 1999);
- Alternatives and mitigation options were discussed with the Environmental Assessment Practitioner.

## 3. HISTORY AND EVOLUTION OF THE SITE AND CONTEXT



Figure 2. Close up image of the area proposed for the Wind Energy Facility, showing the relevant farm portions

### 3.1 Definition of the property

Development of a Wind Energy Facility with a contracted capacity of up to 140MW is proposed to be constructed and operated within a project site identified by the developer (Figures 1 and 2).

The project site under consideration for the development of the Boulders Wind Farm consists of 10 properties which include:

- Boebezaks Kraal 2/40
- Boebezaks Kraal 3/40
- Boebezaks Kraal 5/40
- Frans Vlei 2/46
- Schuitjes Klip 3/22
- Davids Fontyn 9/18
- Schuitjes Klip 1/22
- Het Schuytje 1/21
- Davids Fontyn 7/18
- Uitkomst RE/6/23

### **3.2 Geology, geomorphology, climate and vegetation**

The proposed WEF is situated on predominantly agricultural land on successions of sand layers that mantle the underlying granitic Vredenburg Pluton. The receiving environment is characterised by undulating agricultural fields, interspersed with numerous outcrops of the underlying granite in the form of small koppies.

The indigenous vegetation in this area falls within the West Strandveld, Southwest Fynbos and West Coast Renosterveld Bioregions (Rutherford et al. 2006). This vegetation survives as isolated pockets within and between the cultivated wheat fields, and is often concentrated around the granite outcrops where it is not feasible to plough the land. The development area falls within the Cape Mediterranean-type climatic zone, with hot, dry summers and cool, wet winters. The peak rainfall period is April to October, and mean annual precipitation for the region is 300 mm (Mucina et al. 2006).

### **3.3 Paleontological, Archaeological and Historical Background of the Vredenburg Peninsula**

#### **3.3.1 Palaeontological Background**

According to the SAHRIS Palaeosensitivity map, the area is underlain by geological deposits varying in degrees of sensitivity from zero to very high (SAHRIS 2014). The geology comprises two distinct rock types, the unfossiliferous granitic deposits found across the Peninsula, and the potentially fossiliferous deposits that constitute the Coastal Formations Terrain, and are present at Soetlandskop in the north of the study area and the Uitkomst Embayment at the west.

The oldest bedrock of the region consists of Malmesbury Group shales, which were laid down over 560 million years ago (Ma), at the base of the Adamastor Ocean (Gresse et al. 2006). These deposits were intruded into between 550 and 515 Ma, by molten magmas that cooled and solidified to form the “Cape Granite Suite”. The Sandveld sediments of later Cenozoic age, deposited during the Neogene and Quaternary periods, i.e. during the last 20 million years overlying these sediments (Roberts et al. 2006), but have also been subject to erosion. The Malmesbury Group shales and Sandveld sediments have eroded from this area, exposing the granites in the form of koppies found across the Vredenburg Peninsula. These granites are unfossiliferous, except where they act as traps that accumulate more recent fossils in crevasses or hollows (Pether 2017).

The oldest potentially fossiliferous marine deposits preserved on the coastal plain are of mid-Miocene age, ~16-14 Ma, and are represented by mineralised phosphate deposits of the Saldanha Formation (Pether 2017). Outcrops of this formation are known at Soetlandskop in the northern extent of the study area, on Farm Schuitjes Klip 1/22 and 3/22.

Subsequent palaeoshoreline deposits have been deposited in the Uitkomst Embayment on Uitkomst RE/6/23 in the western extent of the study area, and consist of Pliocene, Miocene and Recent deposits. The early Pliocene (5-4 Ma) Varswater Formation (Pether et al. 2000; Roberts & Siegfried 2014), and the mid-Pliocene (3 Ma) Uyekraal Formation (Rogers et al., 1990) can contain marine fossils and shells (Pether 2017). These are overlain by further shallow marine deposits in the Quaternary Period, collectively referred to as the Velddrif Formation, which were probably laid down in the last 400 000 years (Pether et al. 2000), which, although generally of low fossil sensitivity, can contain extinct shell fossil fauna that are of some significance.

Aeolian deposits, which correlate with periods of low sea levels, are represented across the Peninsula in the form of calcareous dunes with calcrete crusts. Prospect Hill Formation is the oldest of these deposits, and dates to some 12-9 Ma. This formation is known to contain later Miocene fossils including eggshell fragments of the extinct ostrich *Diamantornis wardi* and bones of the extinct three-toed horse *Hipparion*, as well as indeterminate antelope bones, and also occurs on Soetlandskop. The Langebaan Formation is approximately 4 Ma (Pether 2017), and is the most significant of the aeolian deposits in this area. Excavations into these deposits have yielded substantial data on the Quaternary faunas and archaeology of the Western Cape that are of profound scientific value, and have resulted in the extensive fossil beds at nearby Langebaanweg being declared a PHS.

The most recent formation in the study area is the non-calcareous, quartz-sand-rich Springfontyn Formation (Ibid.). While these are of low fossil sensitivity, the coversands can protect underlying fossils that are located on palaeosurfaces and can be exposed during development.

### 3.3.2 Archaeological Background

The Vredenburg area has been inhabited since the Early Stone Age (ESA), more than 1 million years ago. ESA tools, and associated faunal remains, such as those discovered at Elandsfontein Farm, near Langebaan, and Anyskop, near Langebaanweg, attest to this presence. The oldest known human remains in the Cape, so called “Saldanha Man”, come from Elandsfontein, and date to between 700 000 and 400 000 years ago (Singer 1954, Braun et al. 2013).

This occupation continued through the Middle Stone Age (MSA), with the site of Sea Harvest in Saldanha Bay providing some of the earliest evidence in the world for human exploitation of coastal resources, over 100 000 years ago (Klein 1974, 1979). Sea Harvest, together with nearby Hoedjiespunt, has yielded well-preserved bone, ostrich eggshell, ochre and MSA stone implements, early modern human remains from about 125 000 years ago (Churchill et al. 2000). Further MSA flakes, fossil bones and coprolites have been found in the wider region (Plasket 2013, Kaplan 2013). Fossilised footprints dated to 120 000 years ago have also been found in ancient fossil dunes at Kraalbaai, and rank among the oldest modern human footprints in the world (Berger & Hilton-Barber 2000).

More recently, Holocene hunter-gatherers exploited these coastal resources extensively, attracted to the abundant shellfish available along the rocky shores, while sea birds, fish, crayfish, seal, dolphin and even whale meat formed part of their diet. This intensive exploitation of marine resources, particularly shellfish, is attested to by the numerous shell middens along the coast, as well as by the results of several archaeological excavations in the region (Kaplan 2005a, 2005b; Orton 2008).

In addition to widespread evidence for exploitation of this region by hunter-gatherers, the Vredenburg Peninsula holds significant evidence of the arrival in this region some 2000 years ago of the early Khoekhoen Herders (Smith 2006). These people entered South Africa along the Cape West Coast, together with cattle, sheep and ceramics, and the significant site of Kasteelberg, on Boebezaks Kraal, forms the focus of a settlement of these pastoralist herders. The site appears to have been occupied since the MSA, but became a focus of settlement in the last 2000 years (Sadr et al. 1992), when ceramics and domesticated stock remains enter the archaeological record.

Kasteelberg has been subject to extensive archaeological excavation, and attempts have been made since the late 1990s to recognise its significance through declaration. Most recently, Heritage Western Cape (HWC) has attempted to declare the Kasteelberg Archaeological site complex as a Provincial Heritage Site (PHS), but this process has not yet been finalised.

Sites in the vicinity of Kasteelberg on the Vredenburg Peninsula predominantly date to the Later Stone Age (LSA), and include nearly 100 sites thus far identified (Figure 3). These are predominantly concentrated around granite koppies (Sadr 2009), with further sites identified more recently in the wheat fields (Webley and Orton 2010, Halkett

2011). Further significant Holocene sites in this area include Witklip, a small shelter situated on the western outskirts of Vredenburg that provided evidence for a hunter-gatherer settlement between 3000 and 500 years ago. Several shell middens have been recorded at Paternoster and Jacobsbaai, all dated to within this crucially important time period of the past 3000-4000 years, thus straddling the arrival in the area of the Khoekoen Pastoralists (Halkett 1996; Kaplan 2005a, 2005b; Patrick 2008). Several of these middens include human skeletal remains (Orton and Smuts 2007; Orton 2009; Dewar 2007, 2010). A megamidden along Mosselbank Street, near the Mosselbank River (on the Farm Uitkomst 23/37), at Paternoster North Site A (PNNA) that contains abundant faunal remains (Yates 2004), was declared a PHS in April 2009.

### **3.3.3 Historical background**

The name of Saldanha Bay derives from that of an early Portuguese explorer, António de Saldanha, who made landfall at the Cape in 1503, though not at Saldanha itself (Worden et al. 1998). Historical records reveal that the Vredenburg peninsula was extensively utilised by Khoekhoen pastoralists for grazing in the eighteenth century, possibly as part of a seasonal movement of stock between the coast and interior Smith (2006). The arrival of European settlers in this area not only disrupted these indigenous lifeways, but led to conflict between European factions looking to exploit the local marine resources. This conflict resulted in the construction of several Dutch and French military outposts in the Saldanha Bay area during the 17th and 18th centuries (Schrire et al. 1993). Two such outposts were established at St Helena Bay (Sleigh 1993), while a further one was established at Kraalbaai, and has been subject to extensive archaeological investigation that revealed interaction between the soldiers posted there and the local Khoekhoen some 300 years ago (Schrire et al. 1993). Not all of this interaction was peaceful, and the outposts were the site of frequent clashes between the Khoekhoen and the soldiers.

Land in this area was parcelled out to European settlers in the form of quitrent grants from the early nineteenth century, with Boebezaks Kraal being one of the earliest grants (Sadr et al. 2013). Some of these historical farmsteads survive and have evidence for possibly significant associated middens (Kruger 2016). While some excellent nineteenth century vernacular architecture is to be found on the Peninsula, few were recorded as significant by Fransen (2004). Along the coast, traditional fisherman's cottages survive at Paternoster and Saldanha Bay, and three here have been declared a PHS (Figure 3).

Historical records also reveal much about the historic fishing, sealing and whaling industries, particularly near Marcus Island (Outer Bay) and at Salamander Point near Saldanha (David & van Sittert 2008; Malan et al. 2013). While little material evidence for these activities has been identified, it has been postulated that much evidence might remain on the seafloor, in the form of "undocumented archaeological debris such as anchors or other flotsam and jetsam" (Sharfman 2016). Fishtraps also occur along this coastline, although the exact age of these structures, i.e. whether

they are historic or pre-historic, remains contested (Hart & Halkett 1992, 2010; Hine 2004, 2008).

More recent remains relate to the significance of the military installations at Saldanha and the surrounding areas during World War II. Remains in the form of structures, runways and gun and radar installations are still present (Orton 2012).

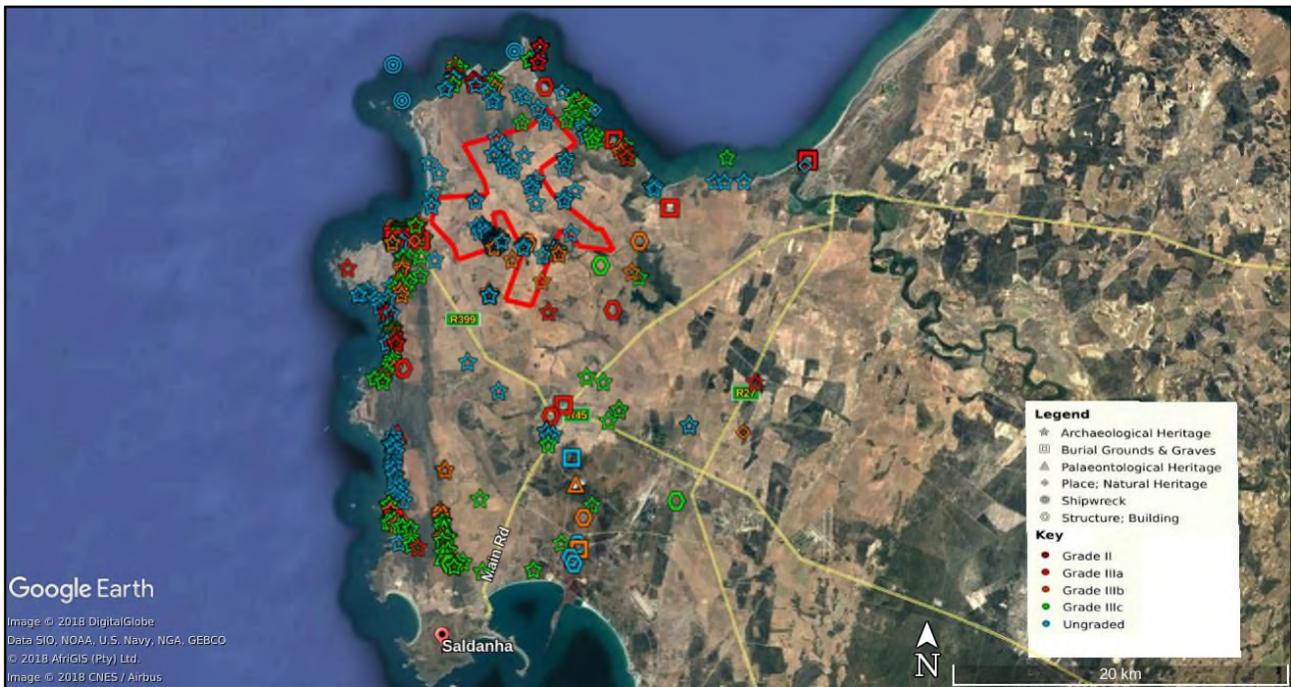
### **3.3.4 Burials**

Unmarked precolonial graves are known from this area and are likely to be most prevalent along the coastline or on and around the granite outcrops (Figure 3). Extensive development in this region has resulted in many burials being identified through impact assessments. Most known precolonial graves have been found in the Saldanha area, including up to six burials from a single midden site in the town (Dewar 2010). Further archaeological burials have been encountered at Kasteelberg and Witklip near the proposed WEF site (Morris 1992).

Colonial burials are likely to be associated with older farm werfs, or settlements, although more isolated historic features such as old stockposts and informal settlements might also contain burials.

### **3.3.5 Cultural landscape**

Rampant recent development on the Vredenburg Peninsula has reduced the prevalence and significance of extant cultural landscapes. Natural landscapes, predominantly occurring along the western coast of the Peninsula, remain as reminders of the past beauty of the region, and where these contain high frequencies of LSA sites, they can be considered Stone Age cultural landscapes. The predominant agricultural landscape of rolling wheat fields, punctuated by granite koppies and interspersed with farmsteads located within groves of mature trees reflects the long history of farming in the vicinity, and much of this landscape predominates. To a degree, there also remains a maritime cultural landscape, centred on the Saldanha Bay area that reflects the area's long record of exploitation of marine resources. The existing turbines of West Coast 1 constitute a further layering in the cultural landscape.



**Figure 3. All known heritage sites within 20kms of the proposed development area**

#### **4. IDENTIFICATION OF HERITAGE RESOURCES**

##### **4.1 Summary of findings of Specialist Reports**

##### **4.1.1 Scoping Archaeological Study**

The Archaeological Scoping Study undertaken by Hart et al. (2017) comprised a review of the existing literature and a brief site visit. The study noted the wealth of available literature on both archaeological and palaeontological resources in the area and concluded that the identification of heritage indicators was well informed.

The archaeologists did not identify any archaeological “red flag” issues, but did note some archaeological sites comprising artefact/marine shell scatters, as well as larger scale or density complexes of archaeological sites. Further heritage resources identified consisted of houses and farm werfs, and their associated burials, as well as isolated buildings.

The archaeologists did note the buffers and no-go zones imposed on the West Coast 1 WEF, which is directly adjacent to the proposed Boulders WEF development area. The authors (Hart et al. 2017) argue that, given the establishment of West Coast 1, and the failure by the authorities to declare Kasteelberg a PHS, the buffers imposed in the revised Department of Environmental Affairs (DEA) Environmental Authorisation (EA) of 8 Apr 2013, can be slightly relaxed (Figure 4). They do maintain, however, that no turbines should be positioned to the west of Kasteelberg in order to maintain clear viewshed to the coast in the event that the proposed declaration of Kasteelberg as a PHS is realised

(Hart et al. 2017). The placement of these buffers, at the Scoping Phase, may render the farms Boebezaks Kraal 3/40 and Uitkomst Re/6/23 no-go areas, but this outcome will be reviewed with subsequent field assessment.

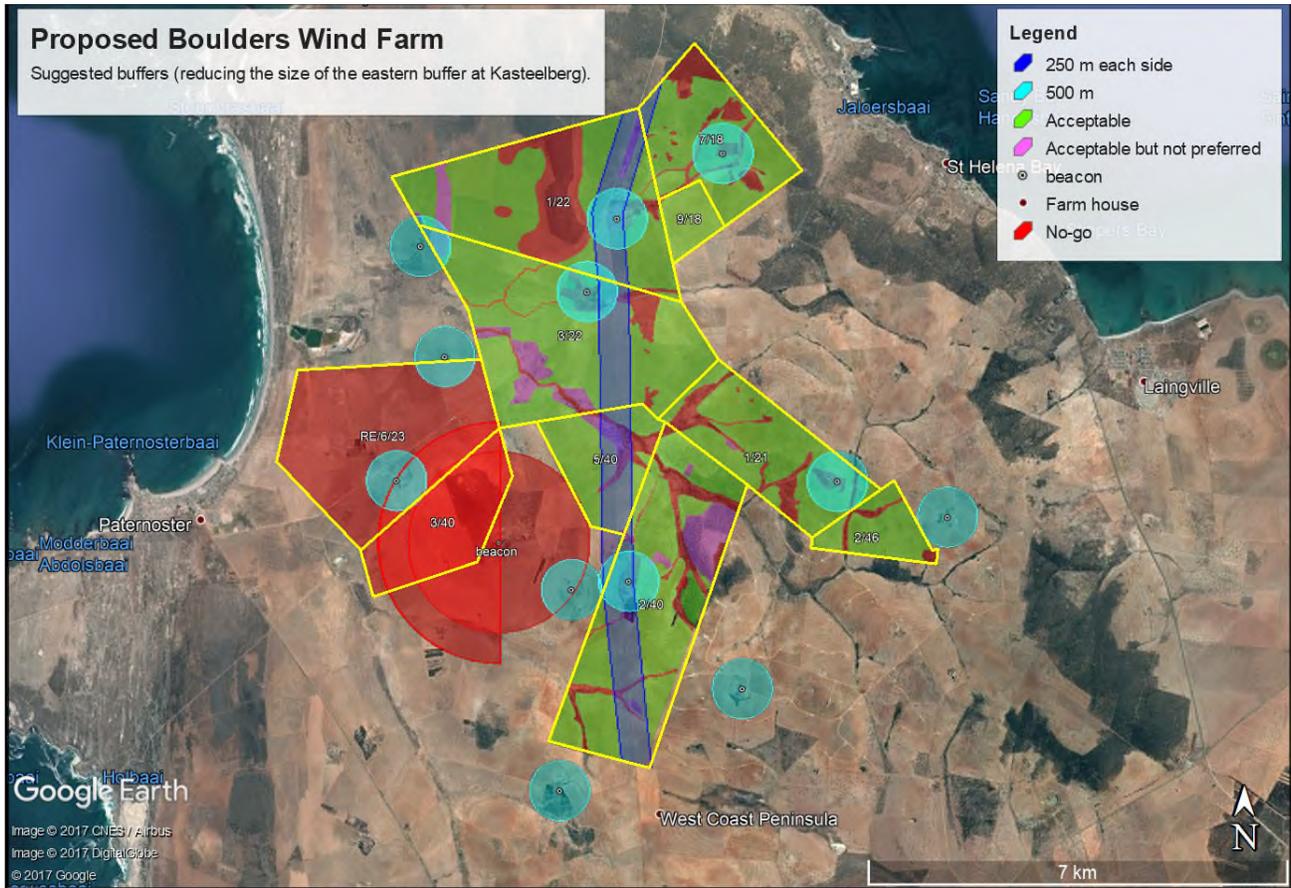


Figure 4. Revised buffers proposed for known heritage sites on Vredenburg Peninsula (Hart et al. 2017).

#### 4.1.2 Scoping Palaeontological Impact Assessment

A Scoping Palaeontological Impact Assessment was completed by Pether (2017) to ascertain the likely impacts on palaeontological resources. According to Pether, while the granitic formations of the Vredenburg Peninsula are unfossiliferous in themselves, it is not impossible that fossils might be found within those rocks. It is, however, far more likely that any fossils uncovered during this development will be located within the Coastal Formations Terrain. These deposits comprise the Miocene formations in the north of the study area at Soetlandskop on Schuitjies Klip 1/22 and 3/22, and the Pliocene to Recent formations to the west, which form the infill of the Uitkomst Embayment, on Uitkomst RE/6/23. According to Pether (2017) the Coastal Formations Terrain is of **HIGH** palaeontological sensitivity and the potential impact of the proposed development in that area is **HIGH**.

The significance of development in this area resides in the palaeontological data that it can possibly produce. At Soetlandskop, fresh exposures of the postulated Saldanha Formation mid-Miocene phosphatic deposits may yield

fossils that can provide age constraints for this Formation, while fossils from late-Miocene Prospect Hill Formation deposits might assist to confirm existing age constraints. The marine Varswater Formation, dating to the early Pliocene, may be represented by reported shelly deposits on Schuitjies Klip 3/22, and fossil recovery from that area will serve to confirm this. The mid-Pliocene Uyekraal Formation must occur in the study area, while the Pliocene to Quaternary Langebaan Formation must be present on Schuitjies Klip 3/22, overlying the Varswater Formation, but positive proof of both occurrences is required for confirmation. Further to this, the Quaternary Velddrif Formation is mapped on the geological maps on Farm Uitkomst RE/6/23, but there is presently no concomitant observational data, while other deposits in the area are poorly understood and any fossils or archaeological finds from these deposits would constitute important contributions to our understanding of the fossil record.

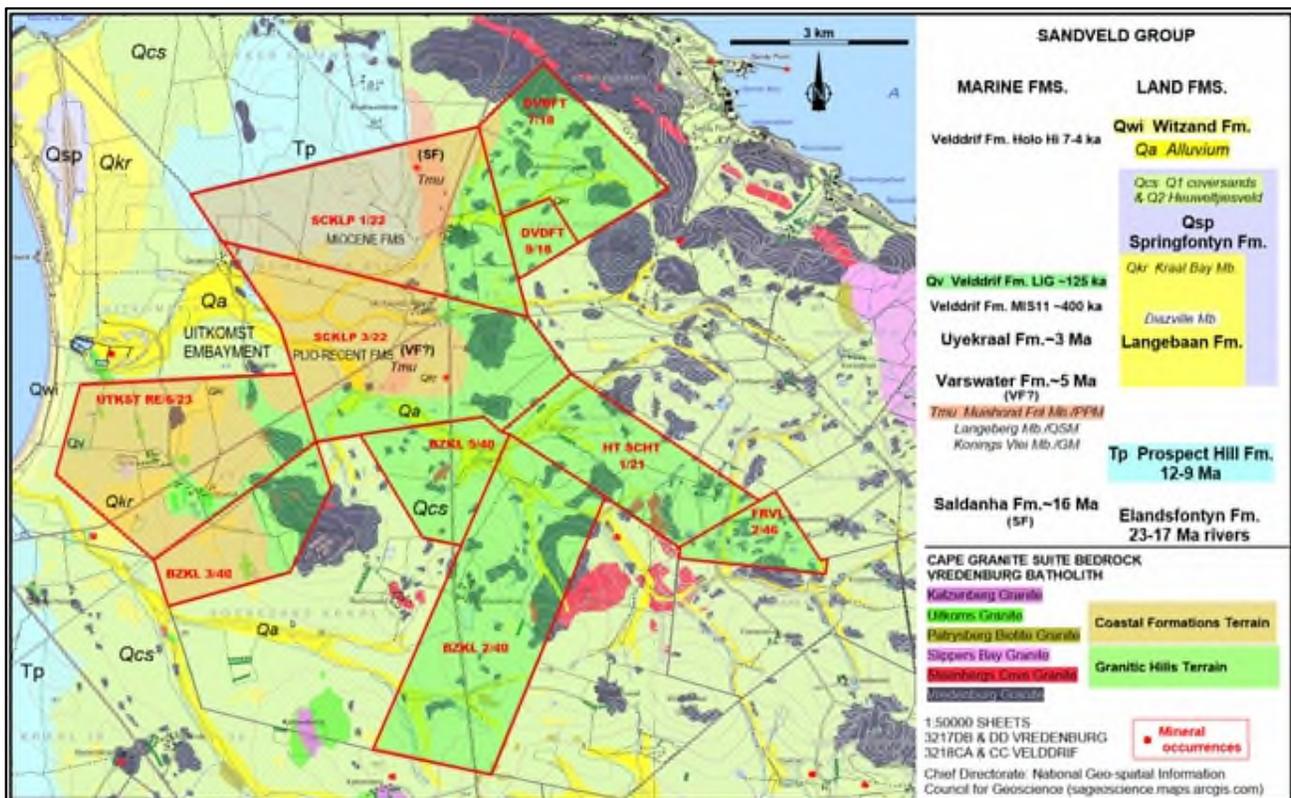


Figure 5. Mapping of Palaeontologically sensitive Coastal Formations Terrain (Pether 2017).

#### 4.1.3 Scoping Visual Impact Assessment

A Scoping Visual Impact Assessment was conducted by Lourens du Plessis (2017). Aspects of this report relate to tangible and intangible heritage resources, and these aspects are considered here. This assessment noted that the study area ranges in elevation from sea level at the coast to approximately 270m above sea level at its highest point, with the terrain consisting of moderately undulating plains to the west and plains to the east, and including several hills such as Patrysborg, adjacent to the R399, Klipheuwel and Kasteelberg. The VIA determined that the receiving environment generally has a high tourism value and tourism potential based on the presence of well-known holiday

towns, such as Paternoster, Britannia Bay, Stompneus Bay and St. Helena Bay, as well as tourist access routes including the R27, R45 and R399. It was further noted that the region is considered to have a pleasing sense of place based on the aesthetic quality of the surroundings.

The study (du Plessis 2017) determined that the development and operation of the proposed Boulders WEF will likely have a visual impact on several potentially sensitive visual receptors. The visual receptors identified as susceptible to this impact will include people travelling along roads and residing in towns and on farms, as well as tourists and visitors to the region. The likely impacts would be loss of sense of place and visual intrusion on the rural character. Significant impact to the Kasteelberg archaeological sites is likely should turbines not be sensitively located, and the study recommended avoiding placing turbines in proximity to the site. The impact, it was noted, will be greatest within 5km of the facility, but could extend beyond this radius. These impacts will be further explored in the EIA phase such that allowances can be made in the layout and turbine positioning to reduce the visual impact to tangible and intangible heritage.

## **4.2 Heritage Resources identified**

While the archaeologists conducted a site visit, no formal site surveys were conducted as part of this scoping assessment, and the heritage resources have generally been identified at a desktop scoping level only.

### **4.2.1 Palaeontology**

In terms of palaeontology, the identified fossil-bearing deposits within the study area are located within the western Coastal Formations Terrain, which is of high palaeontological sensitivity and high heritage significance. Deposits within this terrain are found at Soetlandskop, on Schuitjies Klip 1/22 in the north of the study area, and are known to include the late-Miocene Prospect Hill Formation, but may also include Saldanha Formation mid-Miocene phosphatic deposits. The early Pliocene Varswater Formation may also be present on Schuitjies Klip 3/22, together with the mid-Pliocene Uyekraal Formation, and the Pliocene to Quaternary Langebaan Formation. Further to this, the Quaternary Velddrif Formation is mapped on the geological maps on Farm Uitkomst RE/6/23, although its presence here has not yet been confirmed.

### **4.2.2 Archaeology**

While there are some 550 heritage resources within a 20km radius of the proposed development area, only 33 known sites exist within the properties earmarked for the siting of the WEF (Table 1). All of these are archaeological in nature and ungraded, with the exception of a single ruined nineteenth century structure of rough calcrete blocks and mud-brick at the base of Kasteelberg kopje that has been graded IIIb (Figure 6). The concentration of sites associated with Kasteelberg itself falls outside of the study area (Figure 7). Historical structures are known to occur at the farmsteads of Rooiheuwel and Klipheuwel, while those on Boesakskraal and Frans Vlei have been substantially

altered.

**Table 1: Archaeological sites known within the proposed WEF development area.**

SAHRIS ID	Site No.	Site Name	Site Type	Grading
91577	KAST18	Kasteelberg Kopje 18	Structures	Grade IIIb
92340	BSK1	Karim Sadr Vredenburg Survey - BSK1	Archaeological, Artefacts	Ungraded
92341	BSK2	Karim Sadr Vredenburg Survey - BSK2	Archaeological, Artefacts	Ungraded
92342	BSK3	Karim Sadr Vredenburg Survey - BSK3	Archaeological, Artefacts	Ungraded
92394	KFS1	Karim Sadr Vredenburg Survey - KFS1	Archaeological, Artefacts	Ungraded
92395	KFS10	Karim Sadr Vredenburg Survey - KFS10	Archaeological, Artefacts	Ungraded
92396	KFS11	Karim Sadr Vredenburg Survey - KFS11	Archaeological, Artefacts	Ungraded
92397	KFS12	Karim Sadr Vredenburg Survey - KFS12	Archaeological, Artefacts	Ungraded
92398	KFS2	Karim Sadr Vredenburg Survey - KFS2	Archaeological, Artefacts	Ungraded
92399	KFS3	Karim Sadr Vredenburg Survey - KFS3	Archaeological, Artefacts	Ungraded
92400	KFS4	Karim Sadr Vredenburg Survey - KFS4	Archaeological, Artefacts	Ungraded
92401	KFS5	Karim Sadr Vredenburg Survey - KFS5	Archaeological, Artefacts	Ungraded
92402	KFS6	Karim Sadr Vredenburg Survey - KFS6	Archaeological, Artefacts	Ungraded
92403	KFS7	Karim Sadr Vredenburg Survey - KFS7	Archaeological, Artefacts	Ungraded
92404	KFS8	Karim Sadr Vredenburg Survey - KFS8	Archaeological, Artefacts	Ungraded
92405	KFS9	Karim Sadr Vredenburg Survey - KFS9	Archaeological, Artefacts	Ungraded
92432	SKK-KS1	Karim Sadr Vredenburg Survey - SKK1	Archaeological, Artefacts	Ungraded
92433	SKK-KS2	Karim Sadr Vredenburg Survey - SKK2	Archaeological, Artefacts	Ungraded
92434	SKK-KS3	Karim Sadr Vredenburg Survey - SKK3	Archaeological, Artefacts	Ungraded
92435	SKK-KS4	Karim Sadr Vredenburg Survey - SKK4	Archaeological, Artefacts	Ungraded
92436	SKK-KS5	Karim Sadr Vredenburg Survey - SKK5	Archaeological, Artefacts	Ungraded
92437	SKK-KS6	Karim Sadr Vredenburg Survey - SKK6	Archaeological, Artefacts	Ungraded
92438	SKT1	Karim Sadr Vredenburg Survey - SKT1	Archaeological, Artefacts	Ungraded
92440	SWR-KS1	Karim Sadr Vredenburg Survey - SWR1	Archaeological, Artefacts	Ungraded
92441	SWR-KS2	Karim Sadr Vredenburg Survey - SWR2	Archaeological, Artefacts	Ungraded
92458	UTK1	Karim Sadr Vredenburg Survey - UTK1	Archaeological, Artefacts	Ungraded
92459	UTK2	Karim Sadr Vredenburg Survey - UTK2	Archaeological, Artefacts	Ungraded
92460	UTK3	Karim Sadr Vredenburg Survey - UTK3	Archaeological, Artefacts	Ungraded
92461	UTK4	Karim Sadr Vredenburg Survey - UTK4	Archaeological, Artefacts	Ungraded
92462	UTK5	Karim Sadr Vredenburg Survey - UTK5	Archaeological, Artefacts	Ungraded
92463	UTK6	Karim Sadr Vredenburg Survey - UTK6	Archaeological, Artefacts	Ungraded
92464	UTK7	Karim Sadr Vredenburg Survey - UTK7	Archaeological, Artefacts	Ungraded
92465	UTK8	Karim Sadr Vredenburg Survey - UTK8	Archaeological, Artefacts	Ungraded

#### 4.2.3 Burial Grounds and Graves

Several graves and burial grounds, both recent and older, were noted by the archaeologists during their site visit, where their assessment brought them near to farmsteads (Hart and Halkett 2017).

#### 4.2.4 Scenic routes and cultural landscapes

The R45 is a recognised scenic route (Winter and Oberholzer 2013), while the entire area can be considered a cultural landscape of scenic rolling hills, agricultural fields and historic farmsteads, layered on top of a Stone Age landscape

represented by the numerous archaeological sites found throughout the study area. This landscape has, however, been affected by rampant development, particularly in and around the coastal towns, and also through the establishment of West Coast 1, a Wind Energy Facility comprising 45 turbines that is located immediately to the south east of the proposed development area.

The Visual Impact Assessment (du Plessis 2017) identified that the wind turbines would likely be exposed to residents and tourists in the area travelling along the R399, the Paternoster to Stompneus Bay Road, the Vredenburg to Paternoster Road and the Vredenburg to Stompneus Bay Road. Further to that, it will be visible to towns and farmsteads in the region, including Paternoster, St Helena Bay, Saldanha. This visibility will have the greatest impact within 5kms of the development, with lesser impact experienced beyond this radius.

### 4.3 Mapping of heritage resources



Figure 6. Map of recorded heritage resources within the proposed Boulders Wind Farm, with site numbers provided (see

Table 1).

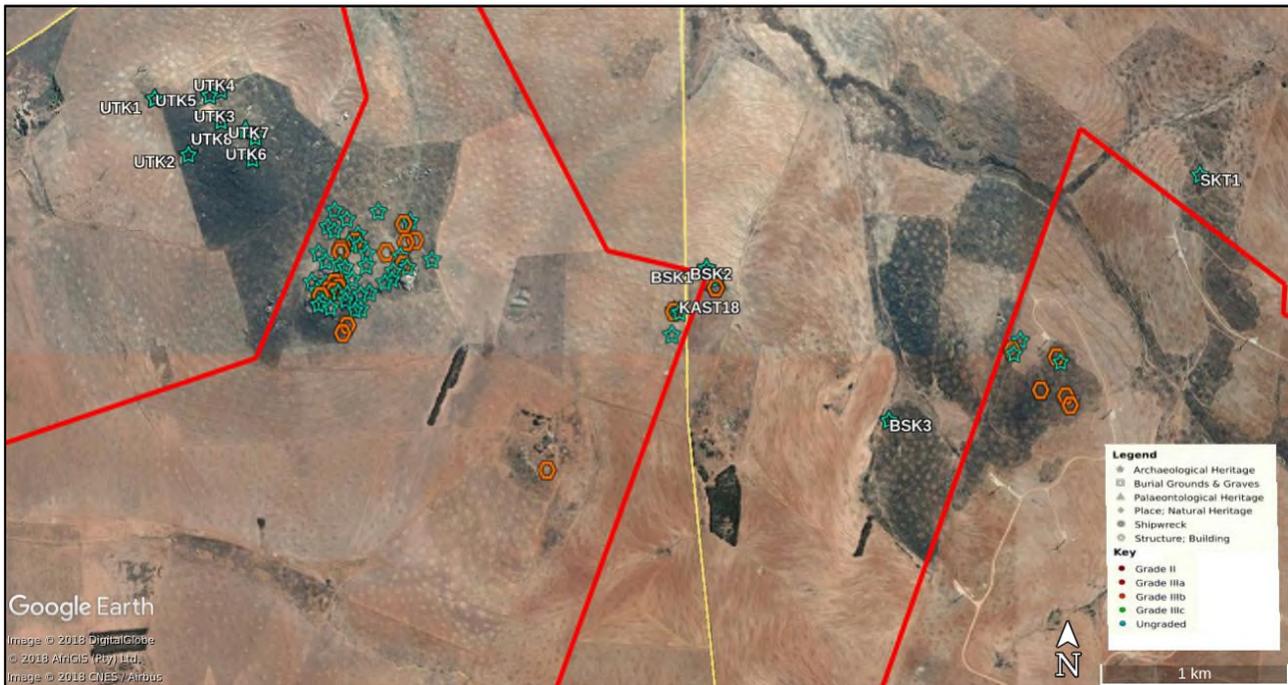


Figure 7. Close up of Kasteelberg Sites Complex relative to proposed development area.

## 5. ASSESSMENT OF THE IMPACT OF THE DEVELOPMENT

### 5.1 Assessment of impact to Heritage Resources

Impacts to heritage resources are expected during construction and operational phases, with different resource types vulnerable at different stages.

#### 5.1.1 Impacts to Palaeontological Heritage

The Project Area is mostly comprised of the Granitic Hills Terrain of low sensitivity where the potential impact is low. The Coastal Formations Terrain in the western portion of the Project Area is of high sensitivity where the potential impact is **high** (Table 2). The construction of the proposed Boulder Wind Farm, which will entail excavation into bedrock, will result in a **direct**, negative impact on palaeontological/scientific heritage in the absence of effective mitigation, which would take the form of inspection of these excavations by a suitably qualified palaeontologist. **With successful mitigation the impact should be positive.** Furthermore, the possible positive contributions of excavations into bedrock mean that there are no no-go areas proposed. Impacts will be limited to the construction phase.

**Table 2. Palaeontological Impacts**

Impacts to palaeontological heritage			
Issue	Nature of Impact	Extent of Impact	No-Go Areas
Excavation into fossiliferous deposits	Permanent loss of fossil heritage and allied geo-scientific data.	Cultural, heritage and scientific impacts are of regional to national extent	Not identified. Excavations may provide useful exposures.
<p><b>Description of expected significance of impact</b></p> <p>Reversibility: The loss of fossil material is irreversible.</p> <p>Irreplaceability: The loss of fossil material is irreplaceable.</p> <p>Mitigation: With due mitigation the impact can be partly mitigated – valuable fossil material may be lost in spite of mitigation</p>			
<p><b>Gaps in knowledge &amp; recommendations for further study</b></p> <p>This review has identified several aspects of the stratigraphy and fossil heritage in the Project Area which require investigation and which would be informed by mitigation at sensitive locations. Excavations in the Coastal Formations Terrain should be inspected, especially if they may intersect the Saldanha, Prospect Hill &amp; Varswater formations, and when turbine locations are chosen, the sites for likely inspection can be prioritised. No further studies have been recommended, however.</p>			

**5.1.2 Impacts to Archaeological Heritage**

No “red flag” issues were identified in terms of the known archaeological resources in the area. The likely impact to archaeological material will only become apparent once the layout of the proposed WEF is determined. Impacts will result from construction related activities, and, given the abundant archaeological resources found in the area, the potential impacts are **high**, where these are not avoided (Table 3). The development will have a **direct**, negative impact on archaeological resources through disturbance and destruction of sites during ground clearing and installation of infrastructure. Possible **indirect** impacts could arise through encroachment on sites and loss of sense of place, as well as environmental degradation that could damage sites, i.e. through dust accumulation, erosion, etc. Additional people on site during construction phase can also result in loss of archaeological material through intentional or unintentional damage. It is likely, however, that the **impacts to archaeology will be low if significant sites are avoided** (Hart et al. 2017). Likely Impacts will be limited to the construction phase.

**Table 3. Archaeological Impacts**

<b>Impacts to archaeological heritage</b>			
<b>Issue</b>	<b>Nature of Impact</b>	<b>Extent of Impact</b>	<b>No-Go Areas</b>
Archaeological sites.	Physical destruction of archaeological material during construction.	Local	As per identified buffer areas. At the Scoping Phase these are the farms Boebezaks Kraal 3/40 and Uikomst RE/6/23.
<p><b>Description of expected significance of impact</b></p> <p>Given that the layout of the proposed Boulders WEF is yet to be determined, assessment of the impact on archaeology cannot be accurately predicted, however there are potential impacts during construction that can result in the permanent disturbance or displacement of archaeological material.</p> <p>Mitigation is possible through avoiding archaeological sites providing that they are known about in the planning stages. Alternatively they can be scientifically removed from their context by archaeological sampling and the process documented.</p> <p>Normally the impact is considered irreversible as archaeological material can never be replaced once disturbed. Indications are that with suitable mitigation the accumulative impact will be insignificant.</p>			
<p><b>Gaps in knowledge &amp; recommendations for further study</b></p> <p>The area is quite well known, however it is important that the new layout is tested against known archaeological sensitivity, and any areas that have not been adequately surveyed be identified and subject to site inspection.</p>			

**5.1.3 Visual Impacts, including cultural landscapes and scenic drives**

Specific anticipated visual impact issues related the proposed development within the affected area included:

1. The visibility of the facility from, and potential visual impact on:
  - observers travelling along the main (R27, R45 and R399) and secondary roads,
  - people living in built up centres and populated places (Vredenburg, Paternoster, Britannia Bay, Stompneus Bay, St Helena Bay, Laingville and Velddrif),
  - farmsteads and homesteads (rural residences).
2. The potential visual impact of the facility on:
  - the visual character and sense of place of the region, with specific reference to the pastoral landscape and small coastal towns.
3. Potential indirect visual impacts arising from:
  - ancillary infrastructure, such as the substation, internal access roads etc., on observers in close proximity of

the facility,

- lighting of the facility in terms of light glare, light trespass and sky glow,
- shadow flicker,
- cumulative impacts of the proposed WEF and associated infrastructure in context of the authorised West Coast 1 WEF, and
- the construction phase of the development.

These impacts are **high** within close proximity to the WEF, and are **direct** impacts arising from the visual intrusion of the turbines on the landscape (Table 4). The existing turbines of West Coast 1 set a precedent for this type of development in this area, and have already had an impact on the cultural landscape. Impacts will occur during the construction phase and the operational phase of this project.

**Table 4. Visual Impacts**

<p><b>Visual Impacts</b></p> <p>Visual impact of the wind farm on observers in close proximity to the proposed wind turbine structures. Potential sensitive visual receptors include:</p> <ul style="list-style-type: none"> <li>• Observers travelling along roads</li> <li>• Residents of towns and homesteads</li> <li>• Visitors at holiday destinations</li> </ul>			
Issue	Nature of Impact	Extent of Impact	No-Go Areas
The viewing of the wind turbine structures	The potential negative experience of viewing wind turbine structures	Observers situated within a 0-5km radius of the wind turbine structures	No turbines must be located on or near Kasteelberg.
<p><b>Description of expected significance of impact:</b></p> <p>Extent: Local            Duration: Long term            Magnitude: very high            Probability: Highly probable            Significance: High            Status (positive, neutral or negative): Negative            Reversibility: Recoverable            Irreplaceable loss of resources: No            Can impacts be mitigated: No</p>			
<p><b>Gaps in knowledge &amp; recommendations for further study</b></p> <p>A layout of the wind turbine positions and turbine dimensions are required for further analysis.</p> <p>Additional spatial analyses are required in order to create a visual impact index that will include the following criteria:</p> <ul style="list-style-type: none"> <li>• Visual exposure</li> <li>• Visual distance/observer proximity to the structures</li> <li>• Viewer incidence/viewer perception (sensitive visual receptors)</li> <li>• Visual absorption capacity of the environment surrounding the structures</li> </ul> <p>Additional activities:</p> <ul style="list-style-type: none"> <li>• Identify potential cumulative visual impacts</li> <li>• Undertake a site visit</li> <li>• Create photo-simulations of the proposed structures</li> <li>• Recommend mitigation measures and/or infrastructure placement</li> <li>• alternatives</li> </ul>			

## **5.2 Cumulative Impacts**

Cumulative effects can be understood as the combined impacts of a single activity or multiple activities where the individual impacts from a single development become significant when combined with other impacts within the same area, or from the same type of development (Cooper 2004). At the Scoping Phase, the likely cumulative effects can be identified, while overall cumulative impacts can only be fully addressed at the EIA Phase.

In terms of the palaeontological resources in the area, the cumulative result of coastal developments is the inevitable permanent loss of fossils (Pether 2017). However, with adequate and appropriate mitigation, the successful recovery of fossil material, can add to the body of scientific evidence and knowledge of past palaeoenvironments, faunal evolution in southern African and the environmental contexts of our prehistoric ancestors (Ibid.).

The cumulative impact to archaeological resources is difficult to measure accurately (Hart 2017), however, it is noteworthy that the destruction of archaeological material was largely avoided during the construction of West Coast 1 (Webley et al. 2010) and similar local WEF initiatives (Hart 2017). Indications are that the accumulative impacts of WEFs to archaeology to date are insignificant in this region.

The most likely cumulative impacts will result from the visual intrusion of this WEF on the landscape, and the accumulative presence of other similar developments in the area. These impacts will have negative results on the cultural landscape and sense of place in this area, as well as impacts to people living and travelling through the region. Of particular significance here is the established West Coast 1 WEF, which is directly adjacent to the Boulders WEF proposed development area. The construction of the Boulders WEF adjacent to the West Coast 1 facility will result in a collective increase in the density and extent of wind turbines in the immediate area. However, the existence of West Coast 1 also sets precedent for the presence of the turbines in this environment and serves to moderate the impact by virtue of its established presence.

Other likely cumulative impacts are expected to be associated predominantly with the potential noise impacts, potential impacts on ecology, birds and bats, and impacts on land use and the social environment.

## **5.3 Sustainable Social and Economic Benefit**

Interaction with key stakeholders will be undertaken during the EIA process, following the circulation of the Scoping Report. However, a Scoping Social Impact Assessment has been undertaken (Barbour and van der Merwe 2017). This study identified the creation of employment and business opportunities, as well as the opportunity for skills development and on-site training, as benefits likely to accrue in the construction and operational phases. Operational benefits would further include the establishment of renewable energy infrastructure and the generation of clean, renewable energy, the establishment of a Community Trust, and socio-economic development and

economic development arising from revenue contributions from the facility.

Potential negative outcomes from the construction phase include impacts associated with the presence of construction workers on site and in the area and an influx of job seekers to the area. The construction phase could pose an increased safety risk to farmers, risk of stock theft and damage to farm infrastructure associated with the presence of construction workers on the site, as well as an increased risk of grass fires. The presence of heavy vehicles could result in negative impacts, including damage to roads, safety and dust, while farming activities might also suffer as a result of on-site activities. During the operational phase, likely negative effects will include the visual impacts and associated impact on sense of place, possible impacts on property values, and potential impacts on tourism.

#### **5.4 Proposed development alternatives**

No development alternatives have been proposed.

### **6. RESULTS OF PUBLIC CONSULTATION**

No public consultation has been undertaken as part of the Scoping Phase of this project. In compliance with the stipulations regarding public participation in Section (2)(4)(f) and (o) of the National Environmental Management Act (NEMA) (Act 14 of 2009) and Section 38(3)(d) of the NHRA (Act 25 of 1999), this will form part of the EIA Phase of the project, when two phases of public participation are planned. It is anticipated that the Integrated HIA will be provided for consultation to the Saldanha Bay Municipality, and all Heritage Conservation Bodies registered for this area, including but not limited to the West Coast Aboriginal Council. In addition, the HIA will be circulated as part of the Public Participation Process for the EIA Phase.

### **7. CONCLUSION AND RECOMMENDATIONS**

#### **7.1 Conclusion**

The proposed construction of the Boulders WEF will likely result in local economic growth, job creation and skills transfer, while also contributing much needed clean energy to the national grid. Due to the known heritage sensitivity of the area in which the facility is to be located, however, the proposed development is likely to impact on significant archaeological, palaeontological heritage resources, and have visual impacts on the landscape. These sensitivities, however, are spatially defined – the archaeology is largely clustered around the granite koppies and old farmsteads, the palaeontologically sensitive areas are confined to the Coastal Formation Terrains, and the visual sensitivity to visual receptors such as people and roads. As such, sensitive development layout and responsive turbine positioning can mitigate against negative impacts to heritage resources. The sensitivity buffering mapped above (Figure 4) visually depicts the likely exclusion zones, but will be refined, specifically for archaeological and

visual sensitivity, during the EIA phase.

As no final layout plan has been derived, and no alternative layouts provided, recommendations at the Scoping Phase speak to the proposed activities that should take place as part of the EIA Phase.

## **7.2 Recommendations**

Proposed recommendations for the EIA Phase studies are:

### **Palaeontological Impact Assessment:**

- All excavations in the high sensitivity Coastal Formations Terrain deposits must be inspected by the contracted palaeontologist;
- No further pre-construction study is required for the Boulders Wind Farm subject to the inclusion of the specialist recommendations being included in the Environmental Management Programme.

### **Archaeological Impact Assessment:**

- The buffer areas that have emerged from previous environmental and heritage authorisations may be applicable to the Boulders Wind Farm. While predominantly related to visual issues, some, for example the buffer around Kasteelberg, have a bearing indirectly on the archaeology. Although we have argued why some relaxation may be appropriate, these buffers will have to be negotiated with the respective authorities;
- Take cognisance of the comments of the I&APs with respect to the heritage of the site and area of proposed development arising out of the PPP;
- Propose measures to adequately address or mitigate any identified impacts;
- Any graves and cemeteries outside pre-determined buffer or no-go areas that have not yet been identified, must be clearly demarcated and avoided, especially if situated immediately adjacent to the existing farm roads or proposed roads. The appropriate mechanisms for dealing with chance finds of human remains must be included in the HIA;
- Any changes to the proposed layout that occurs in areas not previously subjected to site inspection, must be assessed during the EIA phase of the project to determine the type, quantity, location and significance of the heritage resources that may be impacted by the WEF infrastructure;
- No Stone Age artefact scatters are likely to be “red flag” issues but may require mitigation in the form of recording and/or sampling if they cannot be avoided;

- Similarly, significant colonial heritage such as historic buildings (including sheds, kraals, etc.) may need to be recorded and/or avoided if present on the affected sites. As the main farm complexes will be buffered, it is older isolated farm structures that are of more concern. They must be identified, assessed and avoided if necessary.

*The EIA Phase AIA will be reviewed, assessed and collated as part of the Integrated Heritage Impact Assessment Report in terms of the likely impact of the development on and significance to the identified archaeological heritage resources, including archaeological sites, graves and cemeteries and historic farmsteads and cultural landscapes.*

**Visual Impact Assessment (as related to impacts to heritage resources):**

- Undertake additional spatial analyses for the core facility and ancillary infrastructure in order to create a visual impact index that will further aid in determining potential areas of visual impact;
- Site-specific issues and potential sensitive visual receptors should be measured against this visual impact index and be addressed individually in terms of nature, extent, duration, probability, severity and significance of visual impact;
- Specific spatial criteria must be applied to the visual exposure of the proposed facility in order to successfully determine visual impact and ultimately the significance of the visual impact;
- Photo simulations of critical viewpoints should be undertaken where required, in order to aid in the visualisation of the envisaged visual impact.

*The above steps, which will be undertaken as part of the VIA, will be reviewed, assessed and collated as part of the Integrated Heritage Impact Assessment Report in terms of likely visual impact of the development on the identified heritage resources, including sense of place, cultural landscapes and archaeological sites.*

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