ESTABLISHMENT OF A COMMERCIAL WIND FARM, KOUGA LOCAL MUNICIPALITY, EASTERN CAPE, SOUTH AFRICA

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1) TERMS OF REFERENCE

The Cultural Heritage Impact Assessment was commissioned as specialist sub-section to the Environmental Impact Assessment (EIA) by the environmental consultant, Arcus Gibb Engineering and Science (Argus Gibb), for the proposed Red Cap Investments (Pty) Ltd *Kouga Commercial Wind Farm* project, to be located in the Kouga Municipal Area of the Eastern Cape. The assessment consists of a Phase 1 Archaeological Impact Assessment (AIA), a basic Socio-Cultural Impact Assessment (SCIA) and comments on the cultural landscape.

2) INTRODUCTION AND EXECUTIVE SUMMARY

The proposed *Kouga Commercial Wind Farm* development will be situated along the southern Cape coast of the Eastern Cape Province, roughly between Cape St. Francis in the east and the Tsitsikamma River in the west (see Figure 1). The development design is based on the construction of 121 wind turbines together with connecting access roads and transmission lines clustered in 3 areas namely the Eastern Cluster close to Cape St. Francis (27 wind turbines), the Central Cluster close to Oyster Bay (41 wind turbines) and the Western Cluster close to the Tsitsikama River (53 wind turbines). Linear development, comprising access roads and transmission line routes will connect turbine localities.

The purpose of this report is to assess the 3rd and final layout design of the *Kouga Commercial Wind Farm* and the possible impacts on identified archaeological and cultural heritage resources.

Maturation of the project is evidenced by a series of 3 development designs – all associated with an archaeological and heritage component that can briefly be described as:

1st Development Design	- Van Ryneveld, K. 2010a. *Phase 1 Archaeological Impact Assessment. Establishment of a Commercial Wind Farm, Kouga Local Municipality, Eastern Cape, South Africa*;
2nd / 3rd Development Design	- Van Ryneveld, K. 2010b. *Addendum to the Phase 1 Archaeological Impact Assessment. Establishment of a Commercial Wind Farm, Kouga Local Municipality, Eastern Cape, South Africa*; and - Van Ryneveld, K. 2010c. *Cultural Heritage Site Management. Site 2.3, Welgelegen 735/3, Kouga Local Municipality, Eastern Cape*.
3rd Development Design (after public input)	- This report.

Major development design changes include an increase in the number of proposed turbines, from the initially proposed 89 turbine localities (1st development design) (Van Ryneveld 2010a) to between 100-130 turbine localities (2nd development design) (van Ryneveld 2010b), whilst addressing major environmental concerns including from an archaeological and heritage point of view the conservation of Site 2.3 on the property Welgelegen. The 3rd and final development proposal is based on the construction of 121 turbines (Eastern Cluster – 27 wind turbines; Central Cluster – 41 wind turbines and Western Cluster – 53 wind turbines). Changes in development design primarily affect the Central Cluster. Slight alterations to development design in the Eastern and Western Clusters do, to a lesser extent, affect final archaeological and heritage recommendations.

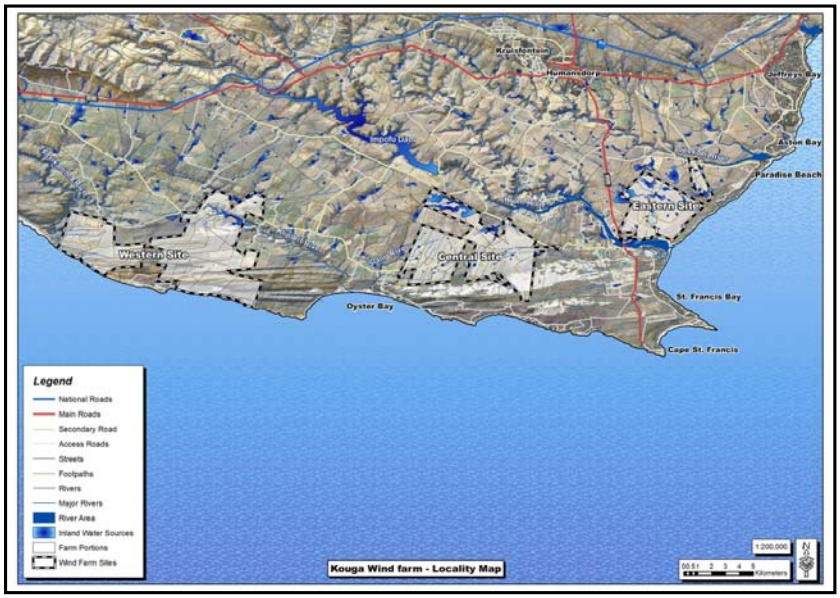


Figure 1: The proposed Kouga Commercial Wind Farm study site; Eastern Cluster, Central Cluster and Western Cluster (courtesy Red Cap Investments).

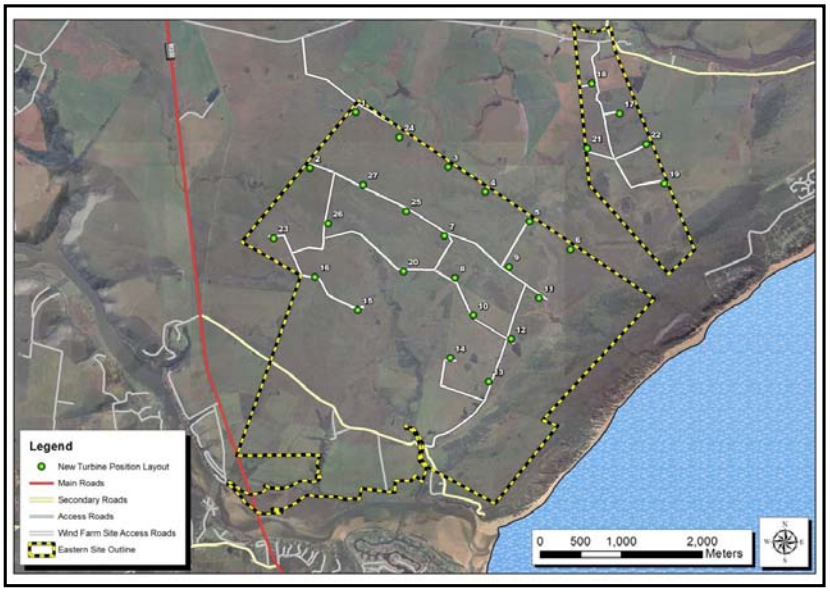


Figure 2: Third and final development design of the Eastern Cluster study site (courtesy Red Cap Investments)

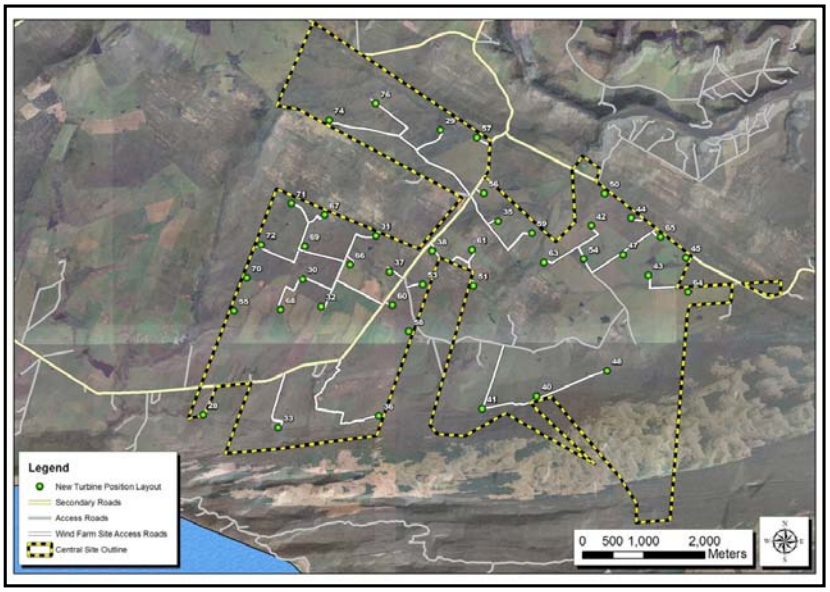


Figure 3: Third and final development design of the Central Cluster study site (courtesy Red Cap Investments)

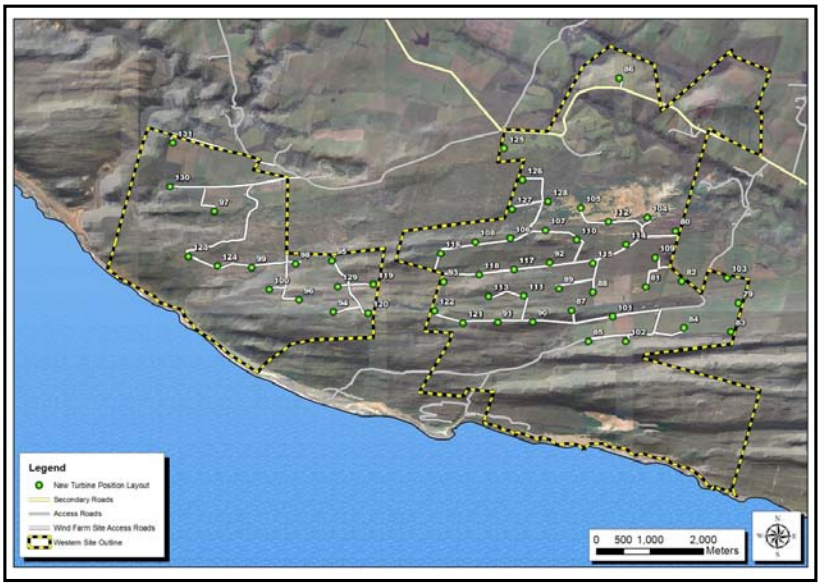


Figure 4: Third and final development design of the Western Cluster study site (courtesy Red Cap Investments)

2.1) Summary of Archaeological and Heritage Concerns

Eighteen archaeological and cultural heritage resources, as defined and protected by the NHRA 1999, were identified during this Cultural Heritage Impact Assessment. Identified sites can briefly be described as:

- **EASTERN CLUSTER:**

Five sites (Sites 1.1-1.5):

1. Four of which comprise of Colonial Period sites (Sites 1.1; 1.2; 1.4 and 1.5) including farmsteads and a cemetery. None of the Colonial Period sites will be negatively impacted on by the development.
2. Site 1.3 constitutes a low density ESA and MSA Stone Age feature. It is recommended that the site be destroyed without the developer having to apply for a SAHRA Site Destruction Permit.
3. All turbine localities and linear development routes will be reassessed during micro-environmental assessment (including an archaeological and heritage component) preceding construction impact.

- **CENTRAL CLUSTER:**

Six sites (Sites 2.1-2.6):

1. Five sites constitute Colonial Period resources (Sites 2.1; 2.2; 2.4; 2.5 and 2.6) including farmsteads, structures and a cemetery. None of the Colonial Period sites will be negatively impacted on by the proposed development.
2. Site 2.3 comprise of a significant ESA and MSA Stone Age site. It was recommended that the site be either formally conserved or mitigated prior to development impact (Phase 2 Archaeological Mitigation) (Van Ryneveld 2010a; 2010c). The developer has opted for formal conservation as management option and from the 2nd to 3rd development design measures were taken to avoid development impact in the vicinity of the site.
3. All turbine localities and linear development routes will be reassessed during micro-environmental assessment (including an archaeological and heritage component) preceding construction impact.
4. Turbine localities WTG 28, 33, 36, 40, 41 and 48 are located particularly close to the archaeologically potentially sensitive vegetated dune landscape to the south of the study site. On-site archaeological monitoring is recommended at the start of construction (surface and sub-surface archaeological inspection)

- **WESTERN CLUSTER:**

Seven sites (Sites 3.1-3.7) and 2 potentially sensitive areas (Area 1 and Area 2):

1. All 7 identified sites (Sites 3.1, 3.2, 3.3, 3.4, 3.5, 3.6 and 3.7) comprise of Colonial Period resources, including farmsteads and a cemetery. None of the identified sites will be negatively impacted on by development.
2. All turbine localities and linear development routes will be reassessed during micro-environmental assessment (including an archaeological and heritage component) preceding construction impact.
3. On-site archaeological monitoring to assess surface and sub-surface sections is recommended at the start of construction in the vicinity of Area 1 (WTG 99, 123 and 124) and Area 2 (WTG 104, 105 and 112).

- **GENERAL:**

1. No intangible heritage resources or sites associated with oral history were identified, situated within the proposed *Kouga Commercial Wind Farm* study site.

2. The visual impact of the *Kouga Commercial Wind Farm* project on the cultural landscape can be described as high, permanent and non-mitigatable. However, from a cultural point of view the visual impact of the development could be seen as evidence of the natural process of 'cultural evolution', reflecting contemporary energy requirements and the emphasis on renewable energy sources. The *Kouga Commercial Wind Farm* development will also contribute, in part, to the conservation of the rural ambiance of the landscape established during the Colonial Period as it will prevent other more destructive development types from possibly taking place on the land in the future. It will allow the famers to continue to make a living from farming (which is becoming financially more challenging) due to an added income from the wind farm. Considering specifically the high sensitivity of the LSA cultural landscape along the southern Cape coast and increasing impact on and destruction of these unique, non-renewable heritage resources, the *Kouga Commercial Wind Farm* development may well prove to be the most significant conservation measure considered to date.

3. Should any archaeological or cultural heritage resources as defined and protected by the NHRA 1999 and not reported on in this report be identified during the course of development the developer should immediately cease operation in the vicinity of the find and report the site to SAHRA / an ASAPA accredited CRM archaeologist.

4. The *Kouga Commercial Wind Farm* development will not impact on any built structures. The developer is however reminded that all structures pre-dating 60 years of age are formally protected under the NHRA 1999, with an automatic blanket *Provincial Heritage Resource* status assigned to them. Any impact on, alteration to or destruction of these resources are subject to application and approval from SAHRA and has to be done under an Eastern Cape Provincial Heritage Resources Agency (EC PHRA) permit. Structures post-dating 60 years of age are not formally protected under the NHRA 1999. Impact on or destruction of such structures is not subject to SAHRA application or approval.

5. LSA archaeological sensitivity is particularly high across the general area and associated graves, customarily unmarked, may well be discovered during the course of development. Should any graves or human remains be encountered the developer should immediately alert both the police and SAHRA / an ASAPA accredited CRM archaeologist. The process associated with the identification of human remains post-dating 60 years of age are managed by the police while the process associated with human remains pre-dating 60 years of age are managed by SAHRA under the NHRA 1999 and in accordance with requirements of the Human Tissues Act, Act No 65 of 1983 (HTA 1983) and the Human Tissues Amendment Act, Act No 51 of 1989 (HTAA 1989).

2.2) Development Particulars

The following development particulars will form part of the 3rd and final development layout. Development particulars have been confirmed by Lance Blaine, Red Cap Investments (Pty) Ltd (E-mail correspondence dated 2010-12-06):

- ***OVERVIEW OF THE PROJECT***

The project entails the construction and operation of a wind energy generation facility (= wind farm) with a final nominal capacity of 300 MW. The farm will consist of the following:

Wind turbines

- *Up to 121 wind turbines of approximately 2.3 to 3.0 MW (each depending on the make and its availability for the South African market), with Hub heights approximately 100 m (90-105m) above ground and rotor blades approximately 45 to 56 m long. The maximum height at blade tip is therefore approximately 150 to 160m.*
- *The developer has agreed to phased the project with the first phase having up to a maximum of 50 turbines. This will ensure that the full impact of the 121 turbines is not experienced in one event and thus lessons learnt from the first phase can be incorporated into any future phases. This is a very good approach to mitigating and reducing the magnitude of any direct and cumulative impacts.*
- *Each turbine will have a concrete foundation with an approximate size 20m x 20m x 2.5 m depth.*
- *Each turbine will have a transformer and a switchgear. This will either be located inside the turbine or in a building size 5m x 5m.*
- *Each turbine will have a gravel surfaced hardstand of 30 m x 60m for the cranes and also to serve as a lay down area for the components. The hardstands will be covered with topsoil and grassed post construction.*

Roads

- *The internal access roads will consist of well compacted multi-layer gravel, with a width of 5 m and will have appropriately designed open storm water infrastructure to mitigate erosion and water inundation after extreme weather events. The total length of the internal gravel roads for each wind farm cluster is approximately 30km, depending on the final approved layouts.*
- *Additional road widths will be required at horizontal curves to accommodate the abnormal long truck movements.*
- *Existing roads will be used/upgraded as far as possible.*

Electrical connections

- *Each cluster will have a substation with an approximate size of 80m x 100m. In one cluster there will also be Control room/ maintenance building size 4000m2 close to the substation.*
- *These 3 substations will be connected with a 132 kV overhead power line to the Eskom Melkhout Substation located 3 km to the north of Humansdorp.*
- *The turbines typically will be connected to each other and to the substation using 11kV or 22kV cables. Transmission cables between closely spaced individual units are to be buried underground.*

Temporary impacts

Suitable lay down areas will be identified which are level enough to serve as a temporary storage area. These areas will be prepared for crane movement and safe storage of wind tower components.

- *A single construction site will be established per cluster. This construction site will not serve as sleeping quarters.*
- *Existing commercial quarries off site as well as existing private quarries on farmland will be sourced for suitable material. No new quarries are intended to be developed. Surplus material excavated from site will be used to backfill the existing quarries*
- *At each turbine a 5m temporary buffer will be cleared around the foundation and the hardstand to allow easier movement of construction vehicles*
- *At each turbine an area of 15m x 15m will be used to store the topsoil removed during construction. No vegetation will be removed from this area and the topsoil will not be stacked higher than two meters.*

2.3) Purpose of the Development Proposal

South Africa is currently experiencing an energy supply crisis. The *Kouga Commercial Wind Farm* project aims to provide much needed generation capacity into the national grid, specifically in the Kouga Region, with its very limited opportunities for energy generation. In addition the project will increase energy security and reduce greenhouse gas emissions, both regionally and nationally, through reduced dependency on coal as a source of electricity (Arcus Gibb 2010).

The proposed *Kouga Commercial Wind Farm* site was chosen based on close proximity to the Eskom grid, inferred limited environmental impacts and from wind modeling undertaken by a specialist wind consultancy for the region (Arcus Gibb 2010).

Wind farm developments are known to have some negative local environmental impacts particularly on birds, landscapes and sustainable land use (including protected areas). The negative environmental impacts from wind energy installations are much lower in intensity than those produced by conventional energies, but it is important that impacts are assessed and mitigated. Wind turbine generated power also has a number of positive environmental impacts, specifically when considered against the greater scheme of electricity generation; the most important of which is the fact that wind energy is one of the cleanest renewable resources available. The number of negative local environmental impacts is thus often overshadowed by positive impacts of global dimension.

3) INTRODUCTION TO THE ARCHAEOLOGY OF SOUTH AFRICA IN RELATION TO THE AFFECTED AREA

Archaeologically the southern African cultural environment is roughly divided into the Stone Age, the Iron Age and the Colonial Period, including its subsequent Industrial component. This cultural division has a rough temporal association beginning with the Stone Age, followed by the Iron Age and the Colonial Period. The division is based on the identified primary technology used. The hunter-gatherer lifestyle of the Stone Age is identified in the archaeological record through stone being the primary raw material used to produce tools. Iron Age people, known for their skill to work iron and other metal, also practiced agriculture and animal husbandry. Kingships and civilizations associated with the Iron Age are indicative of a complex social hierarchy. The Colonial Period is marked by the advent of writing, in southern Africa primarily associated with the first European travelers (Mitchell 2002).

During the latter part of the Later Stone Age (LSA) hunter-gatherers shared their cultural landscape with both pastoralists and Iron Age people, while the advent of the Colonial Period in South Africa is marked by a complex cultural mosaic of people; including LSA hunter-gatherers, pastoralists, Later Iron Age farming communities and Colonial occupation (See Appendix 2).

3.1) Early Hominin Evolution

DNA studies indicates that humans and chimpanzees shared a common ancestor between 8-6Mya (Sibley & Ahlquist 1984). By 4Mya, based on fossil evidence from Ethiopia and Kenya, hominins (humans and their immediate fossil ancestors and relatives) had already evolved. The earliest fossils are ascribed to *Ardipithecus ramidus* (4.4Mya), succeeded by *Australopithecus anamensis* (4.2-3.9Mya). These fossils are inferred to lie at the base from which all other hominins evolved (Leakey *et al.* 1995; White *et al.* 1994).

In South Africa the later hominins are classed into 3 groups or distinct genera; *Australopithecus* (gracile australopithecines), *Paranthropus* (robust australopithecines) and *Homo.* South Africa has 3 major hominin sites: Taung in the North-West Province, where Raymond Dart identified the first *Australopithecus* fossil in 1924 (Dart 1925); The Cradle of Humankind (Sterkfontein Valley) sites in Gauteng, the most prolific hominin locality in the world for the period dating 3.5-1.5Mya which have yielded numerous *Australopithecus, Paranthropus* and limited *Homo* fossils (Keyser *et al.* 2000; Tobias *et al.* 2000); and Makapansgat in the Limpopo Province, where several more specimens believed to be older than most of the Cradle specimens were discovered (Klein 1999).

A. africanus, represented at all 3 sites are believed to have been present on the South African landscape from about 3Mya. From approximately 2.8Mya they shared, at least in the Cradle area, the landscape with *P. robustus* and from roughly 2.3Mya with early forms of *Homo* (Clarke 1999). Global climatic cooling around 2.5Mya may have stimulated a burst of species turnover amongst hominins (Vrba 1992); the approximate contemporary appearance of the first stone tools suggests that this was a critical stage in human evolution. But exactly which early hominin population is to be accredited as the ancestor of *Homo* remains elusive.

H. ergaster is present in the African palaeo-anthropological record from around 1.8Mya and shortly thereafter the first exodus from Africa is evidenced by *H. erectus* specimens from China, Indonesia and even Europe (Klein 1999).

3.2) The Stone Age

3.2.1) The Earlier Stone Age

In South Africa the only Earlier Stone Age (ESA) Oldowan lithic assemblage comes from Sterkfontein Cave. The predominant quartz assemblage is technologically very simple, highly informal and inferred to comprise exclusively of multi-purpose tools (Kuman *et al.* 1997). The latter part of the ESA is characterized by the Acheulean Industrial Complex, present in the archaeological record from at least 2-1.5Mya. Both *H. ergaster* and *P. robustus* may be accredited with the production of these tools. The association between stone tools and increased access to meat and marrow supporting the greater dietary breath of *Homo* may have been vital to *Homo's* evolutionary success; and the eventual extinction of the robust australopithecines (Klein 1999).

Probably the longest lasting artefact tradition ever created by hominins, the Acheulean is found from Cape Town to north-western Europe and India, occurring widely in South Africa. Despite the many sites it is still considered a '*prehistoric dark age*' by many archaeologists, encompassing one of the most critical periods in human evolution; the transition from *H. ergaster* to archaic forms of *H. Sapiens* (Klein 1999).

The Acheulean industry is characterized by handaxes and cleavers as *fosilles directeurs,* in association with cores and flakes. Handaxes and cleavers were multi-purpose tools used to work both meat and plant matter (Binneman & Beaumont 1992). Later Acheulean flaking techniques involved a degree of core preparation that allowed a single large flake of predetermined shape and size to be produced. This *Victoria West technique* indicates an origin within the Acheulean for the *Levallois technique* of the Middle Stone Age (Noble & Davidson 1966).

The ESA lithic artefact component was supplemented by wood and other organic material (Deacon 1970).

3.2.2) The Middle Stone Age

The Middle Stone Age (MSA), dating from approximately 500kya to 40-27/23kya is interpreted as an intermediate technology between the Acheulean and the Later Stone Age (LSA) (Goodwin & van Riet Lowe 1929). The MSA is typologically characterized by the absence of handaxes and cleavers, the use of prepared core techniques and the production of blades, triangular and convergent flakes, with convergent dorsal scars and faceted striking platforms, often produced by means of the *Levallois technique* (Volman 1984). The widespread occurrence of MSA technology across Africa and its spread into much of Eurasia in Oxygen Isotope Stage (OIS) 7 is viewed as part of a process of population dispersal associated with both the ancestors of the later Neanderthals in Europe and anatomically modern humans in Africa (Foley & Lahr 1997).

After the riches offered by the Cradle sites and Makapansgat, southern Africa's Middle Pleistocene fossil record is comparatively poor. Early Middle Pleistocene fossil evidence suggests an archaic appearance and fossils are often assigned to *H. heidelbergensis* and *H. sapiens rhodesiensis* (Rightmire 1976). Modern looking remains, primarily from Border Cave (KwaZulu-Natal) and Klasies River Mouth (Eastern Cape) raised the possibility that anatomically modern humans had, by 120kya, originated south of the Sahara before spreading to other parts of the world (Brauer 1982; Stringer 1985). Subsequent studies of modern DNA indicated that African populations are genetically more diverse and probably older than those elsewhere (Cann *et al.* 1987). Combined, the fossil and genetic evidence underpins the so-called *Out of Africa 2* model (arguing that gene flow and natural selection led regional hominin populations along distinct evolutionary trajectories after *Homo's* expansion from Africa

in the Lower Pleistocene *Out of Africa 1* model) of modern human origins and the continuing debate as to whether it should be preferred to its *Multiregional* alternative (arguing that modern humans evolved more or less simultaneously right across the Old World) (Mellars & Stringer 1989; Aitken *et al.* 1993; Nitecki & Nitecki 1994).

Persuasive evidence of ritual activity or bodily decoration is evidenced by the widespread presence of red ochre at particularly MSA 2 sites (after Volman's 1984 MSA 1-4 model; Hensilwood 2002), while evidence from Lion Cave, Swaziland, indicates that specularite may have been mined as early as 100kya (Beaumont 1973). While evidence for symbolic behavioral activity remains questionable, no evidence for rock art or formal burial practices exists.

3.2.3) The Later Stone Age

Artefacts characteristic of the Later Stone Age (LSA) appear in the archaeological record from 40/27-23kya and incorporates micolithic as well as macrolithic assemblages. Artefacts were produced by modern *H. sapien* or *H. sapien sapien,* who subsisted on a hunter-gatherer way of life (Deacon 1984; Mitchell 2002).

According to Deacon (1984) the LSA can temporally be divided into 4 broad units directly associated with climatic, technological and subsistence changes:

1. Late Pleistocene microlithic assemblages (40-12kya);
2. Terminal Pleistocene / early Holocene non-microlithic (macrolithic) assemblages (12-8kya);
3. Holocene microlithic assemblages (8kya to the Colonial Period); and
4. Holocene assemblages with pottery (2kya to the Historic Period) closely associated with the influx of pastoralist communities into South Africa (Mitchell 2002).

Elements of material culture characteristic of the LSA reflect modern behavior (cultural modernity). Deacon (1984) summarizes these as:

1. Symbolic and representational art (paintings and engravings);
2. Items of personal adornment such as decorated ostrich eggshell, decorated bone tools and beads, pendants and amulets of ostrich eggshell, marine and freshwater shells;
3. Specialized hunting and fishing equipment in the form of bows and arrows, fish hooks and sinkers;
4. A greater variety of specialized tools including bone needles and awls and bone skin-working tools;
5. Specialized food gathering tools and containers such as bored stone digging stick weights, carrying bags of leather and netting, ostrich eggshell water containers, tortoiseshell bowls and scoops and later pottery and stone bowls;
6. Formal burial of the dead in graves (sometimes covered with painted stones or grindstones and accompanied by grave goods);
7. The miniaturization of selected stone tools linked to the practice of hafting for composite tools production; and
8. A characteristic range of specialized tools designed for making some of the items listed above.

3.2.3.1) Rock Art

Rock Art is one of the most visible and informative components of South Africa's archaeological record. Research into LSA ethnography (as KhoiSan history) has revolutionized our understanding of both painted and engraved

(petroglyph) images, resulting in a paradigm shift in Stone Age archaeology (Deacon & Dowson 2001). Paintings are concentrated in the Drakensberg / Maluti mountains, the eastern Free State, the Cape Fold Mountains, the Waterberg Plateau and the Soutpansberg mountains. Engravings on the other hand are found throughout the Karoo, the western Free State and North-West Province (Mitchell 2002). Both forms of LSA art drew upon a common stock of motifs, derived from widely shared beliefs and include a restricted range of naturalistically depicted animals, geometric imagery, human body postures and non-realistic combinations of human and animal figures (anthropomorphic figurines). LSA Rock Art is closely associated with spiritual or magical significance (Lewis-Williams & Dowson 1989).

Aside from LSA or KhoiSan Rock Art, thus art produced by both hunter-gatherer and pastoralist and agro-pastoralist groups, Rock Art produced by Iron Age populations are known the be present towards the north of the country.

3.2.3.2) Shell Middens (Strandloper Cultures)

South Africa's nearly 3,000km coastline is dotted by thousands of shell middens, situated between the high water mark and approximately 5km inland, bearing witness to long-term exploitation of shellfish, mainly over the past 12,000 years. These LSA shell middens are easily distinguishable from natural accumulations of shells and deposits can include bones of animals eaten such as shellfish, turtles and seabirds, crustaceans like crabs and crayfish and marine mammal remains of seals, dolphins and occasionally whales. Artefacts and hearth and cooking remains are often found in shell midden deposits. Evidence exist that fish were speared, collected by hand, reed baskets and by means of stone fish traps in tidal pools (Mitchell 2002).

Shell midden remains were in the past erroneously assigned to 'Strandloper cultures'. Deacon & Deacon (1999) explains that 'no biological or cultural group had exclusive rights to coastal resources.' Some LSA groups visited the coast periodically while others stayed year round and it is misleading to call them all by the same name. Two primary sources of archaeological enquiry serves to shed more light on the lifestyles of people who accumulated shell middens, one being the analysis of food remains in the middens itself and the other being the analysis of LSA human skeletal remains of people buried either in shell middens or within reasonable proximity to the coast.

Shell middens vary in character ranging from large sites tens of meters in extent and with considerable depositional depth to fairly small ephemeral collections, easily exposed and destroyed by shifting dune action. Shell middens are also found inland, along rivers where fresh water mussels occur. These middens are often fairly small and less common; in the Eastern Cape often dated to within the past 3,000 years (Deacon & Deacon 1999).

In addition shell middens are not exclusively assigned to LSA cultures; shellfish were exploited during the Last Interglacial, indicating that the practice was most probably continuous for the past 120,000 years (MSA shell middens). Along the coast of KwaZulu-Natal evidence exist for the exploitation of marine food resources by Iron Age communities. These shell middens are easily distinguished from Stone Age middens by particularly rich, often decorated ceramic artefact content. Colonial Period shell middens are particularly rare and extremely ephemeral in character; primarily the result of European shipwreck survivors and reported on along the coast of KwaZulu-Natal and the Transkei, Eastern Cape.

3.3) The Iron Age

For close to 2 millennia people combining cereal agriculture with stock keeping have occupied most of southern Africa's summer rainfall zone. The rapid spread of farming, distinctive ceramics and metallurgy is understood as the expansion of a Bantu-speaking population, in archaeological terms referred to as the Iron Age.

3.3.1) The Early Iron Age

Ceramic typology is central to current discussions of the expansion of iron using farming communities. The most widely used approach is that of Huffman (1980), who employs a multidimensional analysis (vessel profile, decoration layout and motif) to reconstruct different ceramic types. Huffman (1998) argues that ceramics can be used to trace the movements of people, though not necessarily of specific social or political groupings. Huffman's Urewe Tradition coincides largely with Phillipson's (1977) Eastern Stream. A combined Urewe Tradition / Eastern Stream model for the Early Iron Age can be summarized as:

1. The Kwale branch (extending along the coast from Kenya to KwaZulu-Natal);
2. The Nkope branch (located inland and reaching from southern Tanzania through Malawi and eastern Zambia into Zimbabwe); and
3. The Kalundu branch (stretching from Angola through western Zambia, Botswana and Zimbabwe into South Africa).

In southern Africa, recent work distinguishes two phases of the Kwale branch: The earlier Silver Leaves facies (250-430BP) occurring as far south as the Northern Province. The later expression or Mzonjani facies (420-580BP) occurs in the Northern Province a well as along the KwaZulu-Natal coastal belt (Huffman 1998). Since the Silver Leaves facies is only slightly younger than the Kwale type site in Kenya, very rapid movement along the coast, perhaps partly by boat, is inferred (Klapwijk 1974). Subsequently (550-650BP) people making Mzonjani derived ceramics settled more widely in the interior of South Africa.

Assemblages attributable to the Nkope branch appear south of the Zambezi but north of South Africa from the 5th Century. Ziwa represents an early facies, with Gokomere deriving jointly from Ziwa and Bambata. A subsequent phase is represented by the Zhizo facies of the Shashe-Limpopo basin, and by Taukome (Huffman 1994). Related sites occur in the Kruger National Park (Meyer 1988). Zhizo (7th – 10th Century) is ancestral to the Toutswe tradition which persisted in eastern Botswana into the 13th Century.

Kalundu origins need further investigation; its subsequent development is however better understood. A post Bambata phase is represented by the 5th – 7th Century sites of Happy Rest, Klein Africa and Maunatlana in the Northern Province and Mpumalanga (Prinsloo 1974, 1989). Later phases are present at the Lydenburg Heads site (Whitelaw 1996) and by the succession of Mzuluzi, Ndondonwane and Ntshekane in KwaZulu-Natal (7th – 10th Centuries) (Prins & Grainger 1993). Later Kalundu facies include Klingbeil and Eiland in the northern part of the country (Evers 1980) with Kgopolwe being a lowveld variant in Mpumalanga (10th – 12th Century). Broadhurst and other sites indicate a still later survival in Botswana (Campbell 1991).

Despite the importance accorded to iron agricultural implements in expanding the spread of farming and frequent finds of production debris, metal objects are rare. Metal techniques were simple, with no particular sign of casting, wire drawing or hot working. Jewelry (bangles, beads, pendants etc.) constitute by far the largest number of finds but arrows, adzes, chisels, points and spatulae are known (Miller 1996).

Early Iron Age people were limited to the Miombo and Savannah biomes; excluded from much of the continents western half by aridity and confined in the south during the 1st millennium to bushveld areas of the old Transvaal. Declining summer rainfall restricted occupation to a diminishing belt close to the East Coast and north of S33° (Maggs 1994); sites such as Canasta Place, Eastern Cape, marks the southern-most limit of Early Iron Age settlement (Nogwaza 1994).

3.3.1.1) The Central Cattle Pattern

The Central Cattle Pattern (CCP) was the main cognitive pattern since the Early Iron Age (Huffman 1986). The system can be summarized as opposition between male pastoralism and female agriculture; ancestors and descendants; rulers and subjects; and men and women. Cattle served as the primary means of transaction; they represented symbols exchanged for the fertility of wives, legitimacy of children and appeasement of ancestors. Cattle were also used as tribute to rulers confirming sub-ordination and redistribution as loan cattle by the ruler to gain political support. Cattle represented healing and fertilizing qualities (Huffman 1998; Kuper 1980).

This cognitive and conceptual structure underlies all cultural behavior, including the placement of features in a settlement. The oppositions of male and female, pastoralism and agriculture, ancestors and descendants, rulers and subjects, cool and hot are represented in spatial oppositions, either concentric or diametric (Huffman 1986).

A typical CCP village comprise of a central cattle enclosure (byre) where men are buried. The *Kgotla* (men's meeting place / court) is situated adjacent to the cattle enclosure. Surrounding the enclosure is an arc of houses, occupied according to seniority. Around the outer perimeter of the houses is an arc of granaries where women keep their pots and grinding stones (Huffman 1986). The model varies per ethnic group which helps to distinguish ethnicity throughout the Iron Age, but more studies are required to recognize the patterns.

3.3.2) The Middle Iron Age

The hiatus of South African Middle Iron Age activity was centered in the Shashe-Limpopo Valley and characterized by the 5-tier hierarchical Mapungubwe State spanning some 30,000km^2. By the 1st millennium ivory and skins were already exported overseas, with sites like Sofala and Chibuene, Mozambique, interfacing between interior and transoceanic traders. Exotic glass beads, cloth and Middle Eastern ceramics present at southern African sites mark the beginning of the regions incorporation into the expanding economic system that, partly tied together with maritime trading links across the Indian Ocean, increasingly united Africa, Asia and Europe long before Da Gama or Columbus (Eloff & Meyer 1981; Meyer 1998).

Occupation was initially focused at Bambandanyalo and K2. The Bambananyalo main midden (1,030-1,220BP) stands out above the surrounding area, reaching more than 6m in places and covering more than 8ha: The site may have housed as many as 2,000 people (Meyer 1998). The CCP was not strictly followed; whether this is ideologically significant or merely a reflection of local typography remains unclear. The midden, the size of which may reflect the status of the settlement's ruler, engulfed the byre around 1,060-1,080BP, necessitating relocation of the cattle previously kept there. The re-organization of space and worldview implied suggests profound social changes even before the sites' abandonment in the early 13th century, when the focus of occupation moved to Mapungubwe Hill, 1 km away (Huffman 1998).

Excavations at Mapungubwe Hill, though only occupied for a few decades (1,220-1,290BP), yielded a deep succession of gravel floors and house debris (Eloff & Meyer 1981). Huffman (1998) suggests that the suddenness with which Mapungubwe was occupied may imply a deliberate decision to give spatial expression to a new social order in which leaders physically removed themselves from ordinary people by moving onto more inaccessible, higher elevations behind the stone walls demarcating elite residential areas. Social and settlement changes speak of considerable centralization of power and perhaps the elaboration of new ways of linking leaders and subjects.

At Bambandanyalo and Mapungubwe elite burial grave goods include copper, bone, ivory and golden ornaments and beads. Social significance of cattle is reinforced by their importance among the many human and animal ceramic figurines and at least 6 'beast burials' (Meyer 1998).

Today the drought prone Shashe-Limpopo Valley receives less than 350mm of rainfall per annum, making cereal cultivation virtually impossible. The shift to drier conditions in the late 1200's across the Shashe-Limpopo basin and the eastern Kalahari may have been pivotal in the break-up of the Mapungubwe polity, the collapse of Botswana's Toutswe tradition and the emergence of Great Zimbabwe (1,220-1,550BP), southern Africa's best known and largest (720ha) archaeological site (Meyer 1998).

South of the Limpopo and north of the Soutpansberg, Mapungubwe derived communities survived into the 14th Century, contemporary with the establishment of Sotho-speaking makers of Maloko pottery.

3.3.3) The Later Iron Age

South African farming communities of the 2nd millennium experienced increased specialization of production and exchange, the development of more nucleated settlement patterns and growing political centralization, albeit not to the same extent as those participating in the Zimbabwe tradition. However, together they form the background to the cataclysmic events of the late 18th / early 19th Century *Mfecane* (Mitchell 2002).

Archaeological evidence of settlement pattern, social organization and ritual practice often differ from those recorded ethnographically. The Moloko ceramic tradition seems to be ancestral to modern Sotho-Tswana speakers (Evers 1983) and from about 1,100BP a second tradition, the Blackburn tradition, appears along South Africa's eastern coastline. Blackburn produced mostly undecorated pottery (Davies 1971), while Mpambanyoni assemblages, reaching as far south as the Transkei includes examples of rim notching, incised lines and burnished ochre slip (Robey 1980). At present, no contemporary farming sites are known further inland in KwaZulu-Natal or the Eastern Cape.

Huffman (1989) argues that similarities between Blackburn and early Maloko wares imply a related origin, presumably in the Chifumbaze of Zambia or the Ivuna of Tanzania, which contains a range of ceramic attributes important in the Blackburn as well as beehive grass huts similar to those made by the Nguni. This is one of the few suggestions of contact between Sotho-Tswana and Nguni speakers on the one hand and farming communities who, if Huffman is correct, were already long established south of the Limpopo. Both ethnographic and archaeological data demonstrate that Sotho-Tswana and Nguni are patrilineal and organize their settlements according to the CCP (Kuper 1980).

From 1,300BP there is increasing evidence for the beginning of agro-pastoralist expansion considerably beyond the area of previous occupation. It is also to this time that the genealogies of several contemporary Bantu speaking groups can be traced (Wilson & Thompson 1969). Associated with this expansion was the regular employment of stone, rather than wood, as building material, an adaptation that has greatly facilitated the discovery and identification of settlements. Maggs (1976) describes 4 basic settlement types all characterized by the use of semi weathered dolorite to produce hard binding *daga* for house floors and a wall building tradition employing larger more regular stones for the inner and outer faces and smaller rubble for the infill. As with the more dispersed homesteads of KwaZulu-Natal and the Eastern Cape, sites tend to be in locally elevated situations, reflecting a deep seated Sotho and Nguni preference for benign higher places, rather than supernaturally dangerous riverside localities; another important contrast to both 1st millennium (Maggs 1976) and later Zulu Kingdom settlement patterns (Hall & Maggs 1979).

The lack of evidence for iron production in the interior and eastern part of South Africa emphasize exchange relationships between various groups and associated more centralized polities. By the 19th Century iron production in KwaZulu-Natal was concentrated in particular clans and lineages and associated with a range of social and religious taboos (Maggs 1992). South of Durban comparatively few smelting sites are known (Whitelaw 1991), a trend even more apparent in Transkei (Feely 1987). However, metal remained the most important and archaeologically evident item traded between later farming communities. (Other recorded trade items include glass and ostrich eggshell beads; Indian Ocean seashells; siltstone pipes; *dagga,* and later on tobacco; pigments including ochre, graphite and specularite; hides and salt.)

Rising polity settlements are particularly evident in the north of the country and dated to the 17th Century, including Molokwane, capital of the Bakwena chiefdom (Pistorius 1994) and Kaditshwene, capital of a major section of the Hurutshe, whose population of 20,000 in 1820 almost equals contemporary Cape Town in size (Boeyens 2000). The agglomeration of Tswana settlements in the north of the country was fuelled by both population growth and conflict over access to elephant herds for ivory and long distance trade with the East Coast. During this period ceramic decoration became blander and more standardized than the earlier elaborate decoration that included red ochre and graphite coloring.

The *Mfecane* refers to the wars and population movements of the early 19th Century which culminated in the establishment of the Zulu Kingdom and came to affect much of the interior, even beyond the Zambezi: The late 18th Century was marked by increasing demands for ivory (and slaves) on the part of European traders at Delagoa Bay; as many as 50 tones of ivory were exported annually from 1750-1790. As elephant populations declined, competition increased both for them and for the post 1790 supply of food to European and American whalers calling at Delagoa Bay (Smith 1970). Cattle raiding, conflict over land and changes in climatic and subsistence strategies characterized much of the cultural landscape of the time.

Competition for access to overseas trade encouraged some leaders to replace locally organized circumcision schools and age-sets with more permanently maintained military regiments. These were now used to gain access through warfare to land, cattle and stored food. By 1810 three groups, the Mthethwa, Ndwandwe and Ngwane dominated northern KwaZulu-Natal (Wright 1995). The Mthethwa paramountcy was undermined by the killing of its leader Dingiswayo in *circa* 1818, which led to a brief period of Ndwandwe dominance. In consequence one of Dingiswayo's former tributaries, Shaka, established often forceful alliances with chiefdoms further south. Shaka's Zulu dominated coalition resisted the Ndwandwe who in return fled to Mozambique. As the Zulu polity expanded it consolidated its control over large areas, incorporating many communities into it.

Others sought refuge from political instability by moving south of the Thukela River, precipitating a further *domino effect* as far as the Cape Colony's eastern border (Wright 1995).

3.4) The Colonial Period

In the 15th Century Admiral Zheng He and his subordinates impressed the power of the Ming Dynasty rulers in a series of voyages as far afield as Java, Sri Lanka, southern Arabia and along the East African coast, collecting exotic animals *en route*. But nothing more came of his expeditions and China never pursued opportunities for trade or colonization (Mote 1991).

Portuguese maritime expansion began around the time of Zheng He's voyages; motivated by a desire to establish a sea route to the riches of the Far East. By 1485 Diogo Cao had reached Cape Cross, 3 years later Bartolomeu Dias rounded the Cape of Good Hope and less than a decade later Vasco da Gama called at several places along South Africa's coast, trading with Khoekhoen (Khoi) at Mossel Bay before reaching Mozambique and crossing the ocean to India. His voyage initiated subsequent Portuguese bases from China to Iraq. In Africa interest was focused on seizing important coastal trading towns such as Sofala and gaining access to the gold of Zimbabwe. Following the 1510 Portuguese-Khoekhoen battle at Table Bay, in which the viceroy of India was killed, Portuguese ships ceased to call along the South African coast (Elphick 1985).

A number of shipwrecks, primarily along the eastern coast attest to Portuguese activity including the Sao Joao, wrecked in 1552 near Port Edward and the Sao Bento, destroyed in 1554 off the Transkei coast. Survivors' accounts provided the 1st detailed information on Africa's inhabitants (Auret & Maggs 1982).

By the late 1500's Portuguese supremacy of the Indian Ocean was threatened. From 1591 numerous Dutch and English ships called at Table Bay and in 1652 the Dutch East Indian Company (VOC) established a permanent base, with the intent to provide fresh food and water to VOC ships. In an attempt to improve the food supply a few settlers (free burghers) were allowed to establish farms. The establishment of an intensive mixed farming economy failed due to shortages of capital and labor, and free burghers turned to wheat cultivation and livestock farming. While the population grew slowly the area of settlement expanded rapidly with new administrative centers established at Stellenbosch (1676), Swellendam (1743) and Graaf-Reinet (1785). By the 1760's the Colony's frontier was too long to be effectively policed by VOC officials (Elphick 1985).

From the 1700's many settlers expanded inland over the Cape Fold Mountain Belt. The high cost of overland transport constrained the ability to sell their produce while settlement of the interior was increasingly made difficult by resident KhoiSan groups, contributing due to a lack of VOC military support to growing Company opposition in the years before British control of the Cape (1795 / 1806) (Davenport & Saunders 2000).

In 1820 a major British settlement was implanted on the eastern frontier of the Cape Colony, resulting in large numbers of the community moving into the interior, initially to KwaZulu-Natal, and then after Britain annexed Natal (1843), further into the interior to beyond the Vaal River. Disruptions of the *Mfecane* eased their takeover of African lands and the *Boers* (farmers) established several Republics. A few years later the 2nd South African War saw both the South African and Orange Free State Republics annexed by Britain, a move largely motivated by British desire to control the goldfields of the Witwatersrand. With adjacent regions of the sub-continent also falling, directly or indirectly, under British rule and German colonization of Namibia, European control of the whole of southern Africa was firmly established before the 1st World War (Davenport & Saunders 2000).

3.4.1) Xhosa Iron Age Cultures meets Colonists in the Eastern Cape

From the late 1600's conflict between migrants from the Cape (predominantly *Boers*) and Xhosa people in the region of the Fish River were strife, ultimately resulting in a series of 9 Frontier Wars (1702-1878) (Milton 1983). Both cultures were heavily based and reliant on agriculture and cattle farming. As more Cape migrants, and later settlers from Britain (1820) and elsewhere arrived, population pressures and competition over land, cattle and good grazing became intense. Cattle raiding became endemic on all sides, with retaliatory raids launched in response. As missionaries arrived with evangelical messages, confrontations with hostile chiefs who saw them as undermining traditional Xhosa ways of life resulted in conflicts which flared into wars.

As pressures between the European settlers and the Xhosa grew, settlers organized themselves into local militia, counteracted by Xhosa warring skills: But both sides were limited by the demands of seasonal farming and the need for labor during harvest. Wars between the *Boers* and the Xhosa resulted in shifting borders, from the Fish to the Sundays River, but it was only after the British annexed the Cape in 1806 that authorities turned their attention to the Eastern regions and petitions by the settlers about Xhosa raids. British expeditions, in particular under Colonel John Graham in 1811 and later Harry Smith in 1834, were sent not only to secure the frontier against the Xhosa, but also to impose British authority on the settlers, with the aim to establish a permanent British presence. Military forts were built and permanently manned. Over time the British came to dominate the area both militarily and through occupation with the introduction of British settlers. The imposition of British authority led to confrontations not only with the Xhosa but also with disaffected *Boers* and other settlers, and other native groups such as the Khoekhoen, the Griqua and the Mpondo. The Frontier Wars continued over a period of about 150 years; from the 1st arrival of the Cape settlers, and with the intervention of the British military ultimately ending in the subjugation of the Xhosa people. Fighting ended on the Eastern Cape frontier in June 1878 with the annexation of the western areas of the Transkei and administration under the authority of the Cape Colony (Milton 1983).

3.4.2) The Industrial Revolution

The Industrial Revolution refers roughly to the period between the 18th - 19th Centuries, typified by major changes in agriculture, manufacturing, mining, transport, and technology. Changing industry had a profound effect on socio-economic and socio-cultural conditions across the world: The Industrial Revolution marks a major turning point in human history; almost every aspect of daily life was eventually influenced in some way. Average income and population size began to exhibit unprecedented growth; in the two centuries following 1800 the world's population increased over 6-fold, associated with increasing urbanization and demand for resources. Starting in the latter part of the 18th century, the transition from manual labor towards machine-based manufacturing changed the face of economic activity; including the mechanization of the textile industries, the development of iron-making techniques and the increased use of refined coal. Trade expansion was enabled by the introduction of canals, improved roads and railways. The introduction of steam power fuelled primarily by coal and powered machinery was underpinned by dramatic increases in production capacity. The development of all-metal machine tools in the first two decades of the 19th century facilitated the manufacture of more production machines in other industries (More 2000).

Effects of the Industrial Revolution were widespread across the world, with its enormous impact of change on society, a process that continues today as 'industrialization'.

3.5) Pre-feasibility Assessment of the Proposed Kouga Commercial Wind Farm Project

Based on the above introductory literature assessment of South African archaeology the probability of archaeological and heritage sites within the proposed *Kouga Commercial Wind Farm* study site can briefly be described as:

1. **EARLY HOMININ** : Probability – *None*

2. **STONE AGE**
   - a. ESA : Probability – *Medium*
   - b. MSA : Probability – *Medium* (Human remains not expected but should they be identified they will be of particular scientific significance)
   - c. LSA : Probability – *High* (Human remains may well be expected; should they be identified they will be of both scientific and social significance)
     - i. Rock Art : Probability – *Low*
     - ii. Shell Middens : Probability – *High* (See LSA)

3. **IRON AGE**
   - a. Early Iron Age : Probability – *None*
   - b. Middle Iron Age : Probability – *None*
   - c. Later Iron Age : Probability – *Low*

4. **COLONIAL PERIOD**
   - a. Colonial Period : Probability – *High* (Human remains expected to be primarily associated with formal cemeteries)
   - b. Iron Age / Colonial Period Contact : Probability – *Low-Medium*
   - c. Industrial Revolution : Probability – *High*

A number of Archaeological (AIA) and Heritage Impact Assessments (HIA) have been done in the immediate vicinity of the proposed *Kouga Commercial Wind Farm* study site (See ACO UCT 2010; Anderson 2010; Nillsen 2006; Van Schalkwyk 2009a & 2009b; Webley 2003, 2006a, 2006b). The purpose of this discussion is not to provide a summary of the findings of these assessments, many of which are still under signatory obligations to environmental consultants by the authors. Brief assessments of available report data and personal communication with assessors however served to gain a greater understanding of the sensitivity of the area. Webley's work in the vicinity of Cape St. Francis, on a portion of the property Osbosch 707 (2003), bordering the Krom River and at St. Francis Bay beach (2006a & 2006b) do not directly border or overlap the *Kouga Commercial Wind Farm* study site, but provides a prominent archaeological context setting specifically of the Eastern Cluster study site. The Thuyspunt component of the ACO UCT (2010) study immediately adjoins the Central Cluster study site to the south, while assessments by both Anderson (2010) and Van Schalkwyk (2009a & 2009b) traverses the Central Cluster. No AIA or HIA data of such direct relevance could be identified pertaining to the Western Cluster study site. In addition, archaeological site data can be supplemented by the database of the Albany Museum, Grahamstown, where specifically research by Binneman (1996, 2001, 2004/2005 & 2006/2007) focused on open air shell middens along the southern Cape coast.

The most prominent and potentially sensitive site type in the general project area is shell middens, predominantly of LSA origin, and with an emphasis on more recent KhoiSan temporal association (Binneman 2004/2005 & 2006/2007). Sites are often found within white shifting sand dunes and vary greatly in character; from several meters in extent with significant deposit depth to fairly small ephemeral scatters of lithic artefacts, charcoal and shell. Sites are most common within approximately 400m, but up to 2km from the shoreline (ACO UCT 2010), though Nillsen (2006) draws attention to the presence of shell middens deeper inland, where these are often found sub-surfacely within overgrown dune deposits. Anderson (Pers. Comm. – 2010-12-08) emphasized the possibility that ex-situ lag shell midden deposits may also be expected between the sandstone and mudstone geological members where artefacts would have collected in deflation hollows, while both Anderson and Van Schalkwyk (Pers. Comm. – 2010-12-08) commented on low density MSA lithic artefact scatters that potentially point towards the presence of fairly rare MSA shell middens / occupation. MSA and ESA artefacts closer to the coast have been identified on palaeosols (ACO UCT 2010). Anderson (2010) reported on a single Acheulean artefact located during his survey further inland.

The ACO UCT (2010) as well as Anderson and Van Schalkwyk (Pers. Comm. – 2010-12-08) highlighted the possibility of unmarked LSA graves, which, if discovered or encountered during the course of development would be of significant social and scientific interest.

Aside from prominent Stone Age activity across the cultural landscape, Colonial occupation from the late 1700's and particularly around 1820 greatly served to change the face of tangible heritage resources and the way of life along the south coast, closely related to the establishment of Cape St. Francis as a small trading port and Humansdorp as a trading centre. Colonial Period farmsteads are found strewn across the landscape, with Built Structures pre-dating 60 years of age, reported on by both the ACO UCT (2010) and Anderson (2010), some of which are also described as of living heritage significance (ACO UCT 2010). Associated cultural activities are evidenced by agricultural and live stock farming activities, practiced by (some) farmers with ancestral ties to the project area dating to the 1820's and soon thereafter as well as associated colonist family cemeteries (Anderson 2010). Anderson (Pers. Comm. – 2010-12-08) highlighted the use of the 1953 and 1975 topographical map sets in monitoring more recent, essentially Industrial Period changes to the cultural landscape, while the ACO UCT (2010) reported on the unfortunate poor Built Environment record of the Eastern Cape and specifically the southern Cape coast.

Evidence of the Industrial Revolution across the greater study area is easily identifiable by visible modern roads (albeit many are still gravel), power lines etc, in addition to large scale tourism and residential developments closer to Jeffereys Bay and Cape St. Francis.

4) THE PHASE 1 ARCHAEOLOGICAL IMPACT ASSESSMENT

4.1) Archaeological Legislative Compliance

The Heritage Impact Assessment (HIA) was requested by the South African Heritage Resources Agency (SAHRA) mandatory responsible for the National Heritage Resources Act, Act No 25 of 1999 (NHRA 1999). The HIA comprises of 3 parts for purposes of development compliance to requirements set out in the NHRA 1999, being:

1) The Palaeontological Impact Assessment (PIA);
2) The Archaeological Impact Assessment (AIA); and
3) The Socio-cultural Impact Assessment (SCIA).

The Cultural Heritage Impact Assessment was requested as specialist sub-section to the HIA for the developments' Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) in compliance with requirements of the National Environmental Management Act, No 107 of 1998 (NEMA 1998), the NEMA 2nd Amendment Act, No 62 of 2008 (NEMA 2008) and the NEMA Regulations (2006), and the NHRA 1999 and NHRA Regulations (2000 & 2002).

The Cultural Heritage Impact Assessment aimed to locate, identify and assess the significance of cultural heritage resources, inclusive of archaeological deposits / sites, built structures older than 60 years, burial grounds and graves, graves of victims of conflict and cultural landscapes or viewscapes as defined and protected by the NHRA 1999, that may be affected by the proposed development.

- Palaeontological deposits / sites as defined and protected by the NHRA 1999 are not included as subject to this report.
- Socio-cultural consultation was limited to informal consultation with landowners; consultation did not extent to registered Interested and Affected Parties (I&AP) identified through the environmental Public Participation Process (PPP). The aim of socio-cultural consultation was to gain local information on identified tangible heritage resources, to identify possible intangible heritage resources or sites of cultural significance associated with oral histories that will be impacted on or affected by the development. Socio-cultural consultation, as sub-section to the AIA is complementary to the prescribed Social Impact Assessment (SIA).
- Comments on cultural landscapes and viewscapes are included as a separate sub-section to the Cultural Heritage Impact Assessment.

4.2) Basic Methodology & Assessor Accreditation

The Phase 1 AIA was conducted over a 9 day period over 2 fieldwork sessions: The 1st fieldwork session (2010-08-24 to 2010-09-01) focused on the study site as included in the 1st development design while geographic layout design changes resulting in additional areas being included in the 3rd and final development layout formed the focus of the 2nd fieldwork session (2010-12-29). Consultation with landowners was done at the time of the 1st fieldwork session. No additional sites were identified during the 2nd fieldwork session.

The assessment was done by foot, off-road vehicle and LVD, and limited to a Phase 1 surface survey; no excavation or sub-surface testing was done. GPS co-ordinates were taken with a Garmin GPSmap 60CSx GPS (Datum: WGS84).

Photographic documentation was done with a Pentax K20D camera (Scale bar: Pen = 15cm / 150mm). A combination of Garmap and Google Earth software was used in the display of spatial information.

Phase 1 AIA assessment areas indicated in this report are a combination of the areas assessed during the 1st fieldwork session as described in Van Ryneveld (2010a) together with areas additionally assessed during the 2nd fieldwork session to ensure total coverage of the 3rd and final development design.

The assessment was done by Karen van Ryneveld (ArchaeoMaps):
Qualification: MSc Archaeology (2003) WITS University
Accreditation:

1. 2004 – Association of Southern African Professional Archaeologists (ASAPA) – Professional Member
2. 2005 – ASAPA CRM Section: Accreditation – Field Director (Stone Age, Iron Age, Colonial Period)
3. 2010 – ASAPA CRM Section: Accreditation – Principle Investigator (Stone Age)

Karen van Ryneveld is a SAHRA listed CRM archaeologist.

Environmental impact assessment significance ratings were ascribed according to the system outlined by Arcus Gibb (2010). Archaeological and cultural heritage site significance assessment and associated mitigation recommendations were done according to the system prescribed by SAHRA (2007).

SAHRA ARCHAEOLOGICAL AND CULTURAL HERITAGE SITE SIGNIFICANCE ASSESSMENT			
Site Significance	*Field Rating*	*Grade*	*Recommended Mitigation*
High Significance	National Significance	Grade 1	Site conservation / Site development
High Significance	Provincial Significance	Grade 2	Site conservation / Site development
High Significance	Local Significance	Grade 3A / 3B	Site conservation or extensive mitigation prior to development / destruction
High / Medium Significance	Generally Protected A	-	Site conservation or mitigation prior to development / destruction
Medium Significance	Generally Protected B	-	Site conservation or mitigation / test excavation / systematic sampling / monitoring prior to or during development / destruction
Low Significance	Generally Protected C	-	On-site sampling, monitoring or no archaeological mitigation required prior to or during development / destruction

Table 1: SAHRA archaeological and cultural heritage site significance assessment

4.3) Phase 1 AIA Assessment findings

A total of 18 archaeological and cultural heritage resources, as defined and protected under the NHRA 1999, were identified during the course of the Phase 1 AIA for the proposed *Kouga Commercial Wind Farm* project. Identified resources are discussed according to the clustered study sites and can be summarized as:

1. The Eastern Cluster: 5 sites (4 Historical Period sites and 1 Stone Age site);
2. The Central Cluster: 6 sites (5 Historical Period sites and 1 Stone Age site); and
3. The Western Cluster: 7 sites (7 Historical Period sites) and 2 potentially sensitive areas (Area 1 & Area 2).

In addition to identified sites shifting dune landscapes often located adjacent to or in close proximity to the study site may well prove to be archaeologically sensitive and sites as well as human remains may well be encountered sub-surface once development starts.

4.3.1) The Eastern Cluster

STUDY SITE AND ASSESSMENT PARTICULARS:

The Eastern Cluster comprises of approximately 1,300ha constituting the properties Portion of Osbosch 707, Zeekoe River 694 and Zeekoe River 693. The 3rd and final development design proposes the construction of 27 wind turbines at the study site. Turbines localities will be connected by means of approximately 20km of connecting linear development. Due to open landscape, easy accessibility and very fair visibility, farm roads and particularly existing farm camps, assessment methodology across the indicated assessment area approached a 'surface area survey' rather than a typical 'line route survey', in other words covering the majority of the proposed Eastern Cluster study site.

PHASE 1 AIA ASSESSMENT FINDINGS:

Five archaeological and cultural heritage resources (Sites 1.1 – 1.5), as defined and protected by the NHRA 1999, were identified during the Phase 1 AIA of the Eastern Cluster study site. Identified sites can roughly be divided into 2 periods namely:

1. The Colonial Period (Sites 1.1, 1.2, 1.4 and 1.5); and
2. The Stone Age (Site 1.3).

SUMMARIZED RECOMMENDATIONS:

It is recommended that, with reference to heritage compliance requirements as per the NHRA 1999, development of the Eastern Cluster of the *Koega Commercial Wind Farm* development proceeds as applied for.

Five archaeological and cultural heritage resources (Sites 1.1 – 1.5), as defined and protected by the NHRA 1999 were identified during assessment of the Eastern Cluster study site.

1. Sites 1.1, 1.4 and 1.5 all comprise of Colonial Period Farmsteads, pre-dating 60 years of age. The sites are at present all still in use. All of the sites are fenced with access gates, implying compliance with SAHRA Minimum Site Conservation Standards. None of the identified sites will be impacted on by the proposed development.
2. Site 1.2 comprise of a Colonial Period Cemetery. The site is no longer in use. The site is at present fenced with an access gate, thus complying with SAHRA Minimum Site Conservation Standards. The site will not be impacted on by the proposed development.
3. Site 1.3 constitutes a low density primarily ESA Acheulean scatter. A low concentration of flakes encountered on site may represent byproducts of ESA knapping or alternatively an MSA component to the Stone Age feature. Based on the extremely low density of Stone Age artefacts, the lack of stratigraphy and the expected absence of related organic material it is recommended that the site be destroyed / impacted on without the developer having to apply for a SAHRA Site Destruction Permit.
4. All turbine localities and linear development routes will be reassessed during micro-environmental assessment (including an archaeological and heritage component) preceding construction impact. Should any sites be identified during micro-siting, future site management recommendations should be made and may include site conservation, on-site archaeological monitoring or Phase 2 archaeological mitigation.

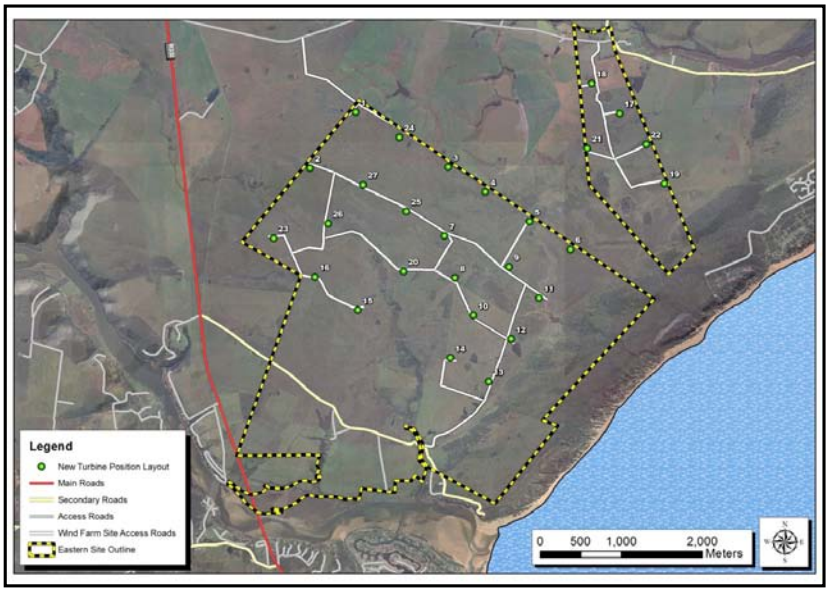


Figure 5: Third and final development design of the Eastern Cluster study site (courtesy Red Cap Investments)

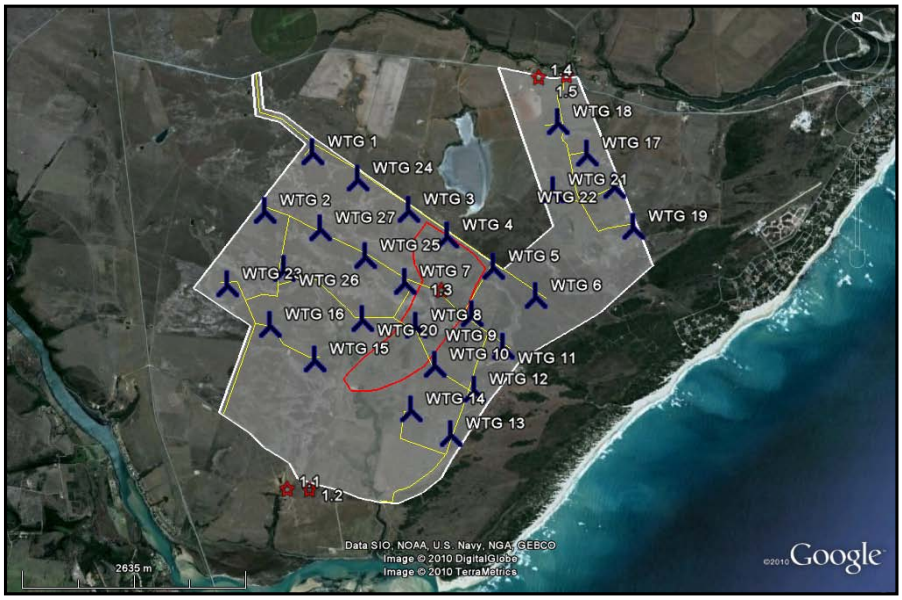


Figure 6: Final development design of the Eastern Cluster study site indicating turbine positions with final numbering and access roads (yellow) in relation to the Phase 1 AIA assessment area and identified site localities (red stars) and site boundaries (red outline)

Figure 7: Phase 1 AIA assessment findings (Sites 1.1-1.5) in relation to the Eastern Cluster study site

Figure 8: View of the Eastern Cluster study site in the vicinity of turbine localities WTG1, WTG2 & WTG24

Figure 9: View of the study site in the vicinity of turbine localities WTG25 & WTG26; ant mounds provided for a degree of sub-surface interpretation

Figure 10: View of the development area in the vicinity of turbine localities WTG 10 & WTG 14

Figure 11: General view of the Eastern Cluster study site from turbine locality WTG6

Figure 12: View of the Eastern Cluster study site in the vicinity of turbine locality WTG19

4.3.1.1) SITE 1.1 - Colonial Period Homestead - S34°07'51.9"; E24°49'14.3"

Site 1.1 (S34°07'51.9"; E24°49'14.3") constitutes the Colonial Period Osbosch farmstead. Origin of the Cape Dutch / Victorian style farmstead date to the 1880's; the property has been in ownership of the Du Toit family since then, implying a 6th generation ownership and use of the heritage resource (Pers. Comm. – H.B. du Toit, landowner). The site constitutes the original farm house and outbuildings with a later addition residence situated approximately 80m to the south. Structures at the site by implication pre-date 60 years of age; the site is formally protected under the NHRA 1999.

Site 1.1 is located immediately south of the Eastern Cluster study site and will not be impacted on by development. The site is at present formally fenced with an access gate implying direct compliance with SAHRA Minimum Site Conservation Standards.

- **RECOMMENDATIONS:** *The Site 1.1 Colonial Period Farmstead comprises of a heritage site as defined and protected under the NHRA 1999. The site is ascribed a SAHRA MEDIUM SIGNIFICANCE and a GENERALLY PROTECTED B FIELD RATING. The site is situated immediately south of the Eastern Cluster study site and will not be impacted on by development; the site will by implication be conserved. Current conservation measures comply with SAHRA Minimum Site Conservation Standards.*

ENVIRONMENTAL IMPACT ASSESSMENT							
Site	*Extent*	*Duration*	*Intensity*	*Probability*	*Significance*	*Status*	*Confidence*
Site 1.1	Site specific	N/A	Low	Improbable	No impact	Neutral	High

Table 2: Environmental impact significance assessment – Site 1.1

Figure 13: View of the Site 1.1 Osbosch farmstead

3.3.1.2) SITE 1.2 - Colonial Period Cemetery - S34°07'52.1"; E24°49'24.7"

The Site 1.2 (S34°07'52.1"; E24°49'24.7") Colonial Period cemetery comprises the original Osbosch family cemetery and is situated approximately 250m from the farmstead and 1.2km from the Eastern Cluster study site. The site is formally fenced with an access gate; complying with SAHRA Minimum Site Conservation Standards. The site again dates to the 1880's, with graves located within the boundaries thereof as a rule pre-dating 60 years of age. The site, no longer in use, is by inference formally protected under the NHRA 1999.

Site 1.2 is situated immediately south of the Eastern Cluster study site and will not be impacted on by development. Current site conservation measures comply directly with SAHRA Minimum Site Conservation Standards: The site is formally fenced with an access gate.

- **RECOMMENDATIONS:** *Site 1.2 (Colonial Period Cemetery) constitutes a heritage site as defined and protected under the NHRA 1999. The site is ascribed a SAHRA MEDIUM SIGNIFICANCE and a GENERALLY PROTECTED B FIELD RATING. The site is situated immediately south of the Eastern Cluster study site and will not be impacted on by development; the site will be conserved. Current conservation measures comply with SAHRA Minimum Site Conservation Standards.*

ENVIRONMENTAL IMPACT ASSESSMENT							
Site	*Extent*	*Duration*	*Intensity*	*Probability*	*Significance*	*Status*	*Confidence*
Site 1.2	Site specific	N/A	Low	Improbable	No impact	Neutral	High

Table 3: Environmental impact significance assessment – Site 1.2

Figure 14: General view of the Site 1.2 Colonial Period cemetery

3.3.1.3) SITE 1.3 - Stone Age (ESA & MSA) - S34°06'36.0"; E24°50'25.9"

Site 1.3 (S34°06'36.0"; E24°50'25.9") demarcates the locality of extremely low densities of Earlier Stone Age (ESA) and inferred Middle Stone Age (MSA) deposits. The general Site 1.3 terrain comprises an area of more or less 2.4x0.8km across the general vicinity of turbine localities WTG 4 and WTG 20. The area is characterized by changing vegetation, an evident result of the underlying more rocky geological substrate rather than anthropic disturbance (although vegetation type exceeds the recorded perimeter of the site / feature). Artefact ratios (artefacts: m²) were extremely low, estimated at≤1:150. The ESA is represented by a single handaxe discovered at S34°06'15.2"; E24°50'26.9", testimony to the ESA Acheulean period, while a large core was encountered at S24°07'10.0"; E24°50'08.9". A low density of flakes was present across the general area, but extremely low densities of artefacts make assignation thereof as a primary MSA deposit or as flakes associated with ESA *fossils directeurs* impossible. Exposed open sections at a dam along the Huis River yielded no identifiable anthropic member within the geological stratification, interpreted as evidence that extremely low surface artefact densities continues sub-surface. No inorganic material was identified in association with lithic artefacts. An average date for the area can be described as ranging from 2Mya to approximately 200kya.

The extremely low densities of artefacts at the site designate the area as a 'low density feature' rather than a site. What is of particular significance though is the close proximity of the site (approximately 2.4km) to the current shoreline and associated dune landscape, habitually interpreted as sensitive particularly with reference to Later Stone Age (LSA) deposits.

ESA sites / artefacts have been recorded along the South Coast (Deacon & Deacon 1999), and both Anderson and Van Schalkwyk (Pers. Comm. – 2010-12-08) made comment on the low presence of ESA and MSA artefacts where their assessments traversed the Central Cluster study site. The presence of particularly low densities of ESA and MSA artefacts can in that be described as a fairly common cultural landscape feature characterizing the greater area.

- **RECOMMENDATIONS:** *The Site 1.3 Earlier and Middle Stone Age (ESA & MSA) feature represents a heritage site as defined and protected under the NHRA 1999. Based on the particularly low recorded surface artefact ratio, with evidence of continuing poor sub-surface stratigraphic deposits and the expected absence of related organic material, the site is ascribed a SAHRA LOW SIGNIFICANCE and a GENERALLY PROTECTED C FIELD RATING. It is recommended that development proceeds as applied for and that the site be destroyed / impacted on without the developer having to apply for a SAHRA Site Destruction Permit prior to impact.*

ENVIRONMENTAL IMPACT ASSESSMENT							
Site	*Extent*	*Duration*	*Intensity*	*Probability*	*Significance*	*Status*	*Confidence*
Site 1.3	Site specific	Permanent	Medium	Probable	*Low to very low	Negative	High
Environmental impact significance assessment * based on recommended site destruction							

Table 4: Environmental impact significance assessment – Site 1.3

Figure 15: General view of the Site 1.3 terrain

Figure 16: A handaxe (rough-out) from Site 1.3

Figure 17: Flakes from the Site 1.3 terrain

Figure 18: Anthropic sterile sections at a dam along the Huis River

4.3.1.4) SITE 1.4 - Colonial Period Homestead - S34°05'14.5"; E24°51'11.3"

The Site 1.4 (S34°05'14.5"; E24°51'11.3") locality represents the Matthee farmstead, located on the property Zeekoe River 694, but situated north of the access road demarcating the proposed Eastern Cluster study site. Origin of the farmhouse is believed to date to approximately 1912 (Pers. Comm. – S. Matthee, landowners sister), but later alterations and additions have radically impacted on the architectural significance of the original structure. The site is still used for residential purposes by the Matthee family. The formally protected structure will not be impacted on by the proposed development. The residence is at present fenced with an access gate, complying directly with SAHRA Minimum Site Conservation Standards.

- **RECOMMENDATIONS:** *The Site 1.4 Colonial Period Farmstead comprises of a heritage site as defined and protected under the NHRA 1999 (Built structure older than 60 years). The site is ascribed a SAHRA MEDIUM SIGNIFICANCE and a GENERALLY PROTECTED B FIELD RATING. The site is situated north of the access road demarcating the northern boundary of the Eastern Cluster study site and will not be impacted on by development. Existing conservation measures comply directly with SAHRA Minimum Site Conservation Standards.*

ENVIRONMENTAL IMPACT ASSESSMENT							
Site	*Extent*	*Duration*	*Intensity*	*Probability*	*Significance*	*Status*	*Confidence*
Site 1.4	Site specific	N/A	Low	Improbable	No impact	Neutral	High

Table 5: Environmental impact significance assessment – Site 1.4

Figure 19: View of the Site 1.4 Zeekoe River farmhouse

4.3.1.5) SITE 1.5 - Colonial Period Homestead - S34°05'13.8"; E24°51'24.2"

Site 1.5 (S34°05'13.8"; E24°51'24.2") constitutes a 2nd Colonial Period farmstead on the farm Zeekoe River. The site comprises of the farmhouse and outbuildings situated north of the access road and a farm workers village located south thereof. The property belongs to the Joubert family and is still in use. Date of origin of the site is unknown but inferred to be temporally very close to the Site 1.4 homestead, implying an early 1900's date. The site by implication pre-dates 60 years of age and is formally protected under the NHRA 1999. Component parts of the site, both north and south of the access road are at present fenced with access gates, complying directly with SAHRA Minimum Site Conservation Standards. Alterations primarily to the main farmhouse have greatly diminished the historical architectural value of the structure. The proposed *Koega Commercial Wind Farm* development will not impact on any of the component parts of the site.

- **RECOMMENDATIONS:** *The Site 1.5 Colonial Period Farmstead comprises of a heritage site as defined and protected under the NHRA 1999. The site is ascribed a SAHRA MEDIUM SIGNIFICANCE and a GENERALLY PROTECTED B FIELD RATING. Site components are situated both north and south of the access road demarcating the northern boundary of the Eastern Cluster study site. None of the components parts of the site will be negatively impacted on by development. Existing conservation measures comply directly with SAHRA Minimum Site Conservation Standards.*

ENVIRONMENTAL IMPACT ASSESSMENT							
Site	*Extent*	*Duration*	*Intensity*	*Probability*	*Significance*	*Status*	*Confidence*
Site 1.5	Site specific	N/A	Low	Improbable	No impact	Neutral	High

Table 6: Environmental impact significance assessment – Site 1.5

Figure 20: View of the Joubert homestead portion of Site 1.5

Figure 21: View of the farm workers village portion of Site 1.5

4.3.2) The Central Cluster

STUDY SITE AND ASSESSMENT PARTICULARS:

The Central Cluster constitutes a total development area of approximately 3,500ha covering the properties Welgelegen 735, Farm 826, Welgelegen 743, Farm 713, Buffelsbosch 742 and Klein Rivier 713. Within the 3rd and final development design it is proposed that 41 turbines be constructed in the Central Cluster. Development at the Central Cluster will include approximately 25km of linear development in order to connect turbine localities with one another and the existing power grid.

Again, as a result of open landscape, accessibility and visibility, assessment methodology approached a 'surface area survey' rather than a typical 'line route survey', covering the majority of the proposed Central Cluster study site. Visibility across the development area proved to be good, but was obscured at agricultural and pasture fields. At the eastern portion of the Central Cluster study site many turbine localities have been planned to intersect agricultural fields, being positioned on eroded sandstone outcrops. No archaeological artefacts were identified at these sandstone outcrops. However as stated by Anderson (Pers. Comm. – 2010-12-08) a low density of artefacts may be present at some outcrops, marking these as potentially sensitive but of low significance. The southern boundary of the study site borders an overgrown dune. A number of archaeological sites, including in particular LSA '*strandloper*' sites are known to occur in dune coastal landscapes (Binneman 1996, 2001, 2004/2005 and 2006/2007). The ACO UCT (2010) whose Thyspunt study site borders the Central Cluster to the south reported on a high number of middens identified in the dune landscape. Identified sites are however not geo-referenced in the report, making further discussion regarding the density of sites and proximity of site localities to the Central Cluster study site not possible at this point in time. In addition Van Schalkwyk (2009a & 2009b) cautions against unmonitored development within shifting dune landscapes. Anderson's (2010) study traverses the Central Cluster; co-ordinates included in his report and additional geo-referenced data (courtesy Gavin Anderson) were made available for purposes of distribution patterns and corroboration of surveyed data. Anderson identified 10 sites (MEL 08, 09, 10, 11, 12, 13, 14, 15, 16 & 17) approximately 1,1km south of proposed turbine locality WTG 41, specifically emphasizing the archaeological sensitivity of the dune.

PHASE 1 AIA ASSESSMENT FINDINGS:

Six archaeological and cultural heritage resources (Sites 2.1 – 2.6), as defined and protected by the NHRA 1999, were identified during the Phase 1 AIA of the Central Cluster study site. Identified sites are divided into 2 periods namely:

1. The Historical Period (Sites 2.1, 2.2, 2.4, 2.5 and 2.6); and
2. The Stone Age (Site 2.3).

In addition to the Central Cluster heritage sites locality Q (S34°08'32.4"; E24°41'57.0") marked as a ruin on the 1:50,000 map turned out to be an old quarry, not of any archaeological or significant cultural heritage value. Locality S (S34°09'05.7"; E24°42'27.0") demarcates the position of another Welgelegen homestead, probably a 3rd generation residence, also pre-dating 60 years of age and formally protected under the NHRA 1999. The site is situated outside of the proposed Central Cluster study site of the *Koega Commercial Wind Farm* development and will not be impacted on (the site is reported on for purposes of proximity only and visibility from the access road. Restricted access to the site prohibited formal assessment).

SUMMARIZED RECOMMENDATIONS:

It is recommended that, with reference to heritage compliance requirements as per the NHRA 1999, development of the Central Cluster of the *Koega Commercial Wind Farm* development proceeds as applied for. Project maturation reflected in revised development designs has accommodated formal conservation of Site 2.3 (See Van Ryneveld 2010b and 2010c): Site 2.3 will be formally conserved within the 3rd and final development design of the proposed *Kouga Commercial Wind Farm* development (See Appendix 1).

Six archaeological and cultural heritage resources (Sites 2.1-2.6), as defined and protected by the NHRA 1999, were identified during assessment of the Central Cluster study site.

1. Sites 2.1, 2.2, 2.4 and 2.6 constitute Historical Period Homesteads, pre-dating 60 years of age. Sites are at present still in use, aside from Site 2.4 and selected parts of Site 2.6. Sites are as a norm fenced with access gates, including individual fencing of farmhouses or within camp portions. Site 2.4 is formally fenced for purposes of SAHRA Site Conservation.
2. Site 2.5 comprise of a Historical Period Cemetery. The site is at present formally fenced with an access gate, complying with SAHRA Minimum Site Conservation Standards.
3. Site 2.3 comprises of a highly significant Earlier and Middle Stone Age (ESA & MSA) site. Acheulean and MSA artefacts are strewn over an approximate 10.3km area of exposed dunes. Actual site extend may well continue beyond the perimeter of the recorded surface exposure. Both ESA and MSA artefacts are of high technological quality and represented by significant artefact ratios, despite the evident secondary context of the surface exposure. The assemblage can preliminary be dated to between 2Mya-150kya. The developer has opted for site conservation as heritage management option (See also Van Ryneveld 2010b and 2010c): Formal site conservation is accommodated within the 3rd and final development design and a Cultural Heritage Site Management plan, to outline formal conservation measures and management procedures has been prepared (Appendix 1)
4. All turbine localities and linear development routes will be reassessed during micro-environmental assessment (including an archaeological and heritage component) preceding construction impact. Should any sites be identified during micro-siting, future site management recommendations should be made and may include site conservation, on-site archaeological monitoring or Phase 2 archaeological mitigation.
5. Turbine localities WTG 28, 33, 36, 40, 41 and 48 are located particularly close to the archaeologically potentially sensitive vegetated dune landscape to the south of the study site. On-site archaeological monitoring is recommended at the start of construction (surface and sub-surface archaeological inspection). Should any sites be identified during on-site archaeological monitoring, future site management recommendations should be made and may include site conservation or Phase 2 archaeological mitigation.

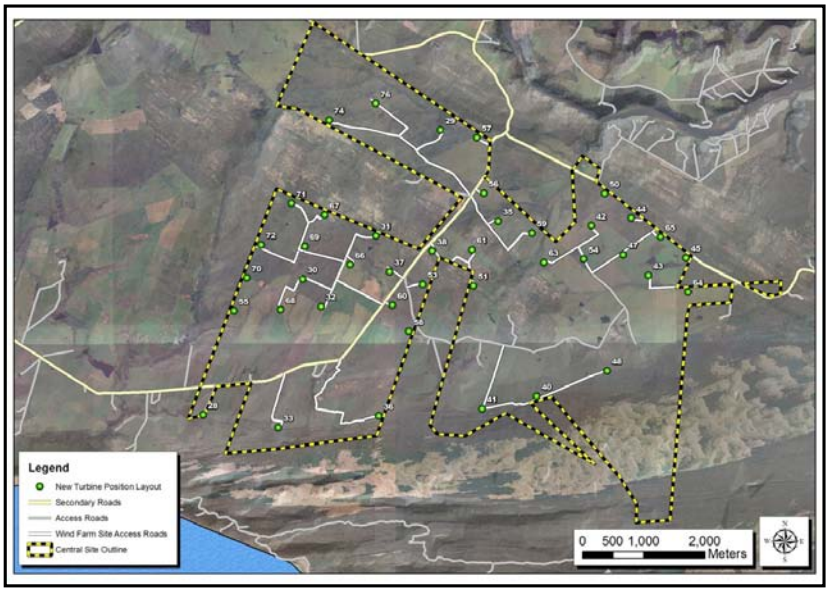


Figure 22: Third and final development design of the Central Cluster study site (courtesy Red Cap Investments)

Figure 23: Final development design of the Central Cluster study site indicating turbine positions with final numbering and access roads (yellow) in relation to the Phase 1 AIA assessment area and identified site localities (red stars) and site boundaries (red outline)

Figure 24: Phase 1 AIA assessment findings (Sites 1.1-1.5) in relation to the Central Cluster study site

Figure 25: The dune landscape at Oyster Bay, typical of the cultural environment in which LSA sites and shell middens are often encountered

Figure 26: View of the Central Cluster study site in the vicinity of turbine localities WTG 31, 69 and 71

Figure 27: Natural vegetation intersecting with farm land in the vicinity south of turbine locality 37

Figure 28: View of the quarry site (Q) marked as a ruin on the 1:50,000 map; the locality proved to be of little cultural significance

Figure 29: Vegetated sandstone and mudstone anthropic basal members characterizing the proposed turbine WTG 40, 48 and 48 line

4.3.2.1) SITE 2.1 - Colonial Period Homestead - S34°09'22.0"; E24°41'16.3"

Site 2.1 (S34°09'22.0"; E24°41'16.3") is inferred to represent the original Colonial Period Welgelegen farmstead. The farmhouse is believed to have been constructed in the 1860's, but may have been built slightly earlier; no records of plans submitted for its construction exists at the local municipality (Pers. Comm.: E.O. Cilliers, landowner). The site comprises of the original farmhouse and outbuildings, situated in fairly close proximity to one another, at present very well conserved and with little later period additions. Site structures are at present still in use. The site pre-dates 60 years of age and is by implication formally protected under the NHRA 1999.

Site 2.1 is situated within the greater Central Cluster study site, approximately 200m south of the main Humansdorp / Oyster Bay road. Individual site features are not formally conserved but the farm portion, containing all site features are fenced; implying indirect compliance with SAHRA Minimum Site Conservation Standards. The site will not be impacted on by the proposed *Koega Commercial Wind Farm* development; in accordance with the development layout and design no turbines will be erected within 500m from a residential structure.

- **RECOMMENDATIONS:** *The Site 2.1 Colonial Period Homestead constitutes a heritage site, as defined and protected under the NHRA 1999. The site is ascribed a SAHRA MEDIUM SIGNIFICANCE and a GENERALLY PROTECTED B FIELD RATING. The site will not be impacted on by the proposed development; development on the farm portion will be restricted to the portion north of the access road. In addition development design makes provision for a conservation buffer of 500m between any turbine locality and a residential structure, vacant or in use. The site will by implication be conserved in situ. Current conservation measures comply indirectly with SAHRA Minimum Site Conservation Standards.*

ENVIRONMENTAL IMPACT ASSESSMENT							
Site	*Extent*	*Duration*	*Intensity*	*Probability*	*Significance*	*Status*	*Confidence*
Site 2.1	Site specific	N/A	Low	Improbable	No impact	Neutral	High

Table 7: Environmental impact significance assessment – Site 2.1

Figure 30: View of the Site 2.1 Colonial Period Welgelegen farmstead

4.3.2.2) SITE 2.2 - Colonial Period Homestead - S34°09'25.0"; E24°41'24.0"

Site 2.2 (S34°09'25.0"; E24°41'24.0") constitutes a 2nd Colonial Period farmstead on the property Welgelegen. The site post-dates Site 2.1 and can reasonably be inferred to have been constructed as a 2nd residence on the original property. The exact date of origin is not known, but according to landowner J.D.W. Strydom the property with the farmhouse was bought by his family in 1912; thus pre-dating 60 years of age and formally protected under the NHRA 1999. The site comprises of the original farmhouse and outbuildings, situated in fairly close proximity to one another. The farmhouse has been altered by later period additions.

Site 2.2 is situated within the greater Central Cluster study site, approximately 330m south of the main Humansdorp / Oyster Bay road. The Colonial Period farmhouse is individually fenced, but not all site features are formally conserved. The site thus complies in part with direct SAHRA Minimum Site Conservation Standards. The site will not be impacted on by the proposed *Koega Commercial Wind Farm* development; in accordance with the development layout and design no turbines will be erected within 500m from a residential structure.

- **RECOMMENDATIONS:** *The Site 2.2 Colonial Period Homestead comprises of a heritage site as defined and protected under the NHRA 1999. The site is ascribed a SAHRA MEDIUM SIGNIFICANCE and a GENERALLY PROTECTED B FIELD RATING. The site will not be impacted on by the proposed development; in accordance with the development design a conservation buffer of 500m are provided for between any turbine locality and a residential structure, vacant or in use. The site will by implication be conserved in situ. Current conservation measures comply indirectly with SAHRA Minimum Site Conservation Standards.*

ENVIRONMENTAL IMPACT ASSESSMENT							
Site	*Extent*	*Duration*	*Intensity*	*Probability*	*Significance*	*Status*	*Confidence*
Site 2.2	Site specific	N/A	Low	Improbable	No impact	Neutral	High

Table 8: Environmental impact significance assessment – Site 2.1

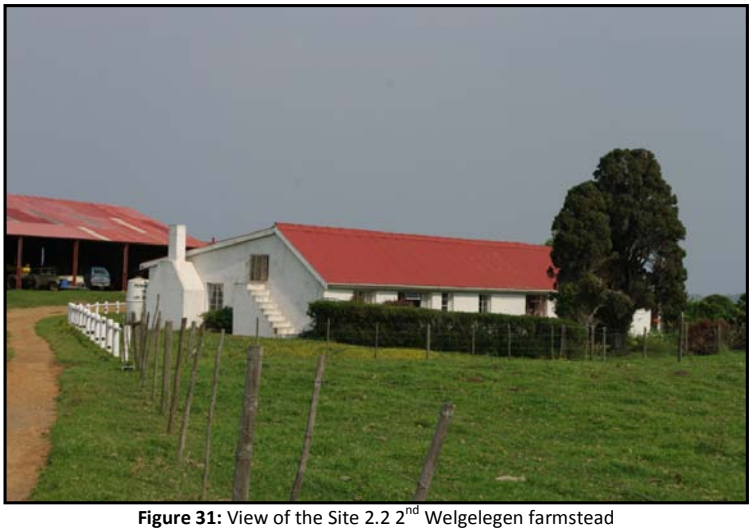


Figure 31: View of the Site 2.2 2nd Welgelegen farmstead

4.3.2.3) SITE 2.3 - Stone Age (ESA & MSA) - S34°09'28.3"; E24°41'40.1"

Site 2.3 (S34°09'28.3"; E24°41'40.1") is characterized by highly significant Earlier and Middle Stone Age (ESA & MSA) deposits scattered across exposed dunes. Recorded surface site extent covers approximately 1x0.3km in extent running roughly parallel to contemporary beach dunes more or less 1.5km south of the site. Actual site extent may well extend beyond the perimeter of the recorded surface exposure; in situ artefact context along with a recorded stratigraphic sequence will significantly aid in furthering our understanding of ESA and MSA use of the seashore as palaeo-landscape and palaeo-environmental changes having resulted in the shifting shoreline, associated with anthropic adaptation to the constantly changing environment. In situ sections may still be present east and south of the recorded site extent; farming impact unfortunately encroaches on the northern and south-western portions of possible in situ sections and may have already impacted on the site. Significant ESA and MSA deposits slightly further into the interior than the known Later Stone Age (LSA) sites often reported on along the dune landscape of the coastline are of particular importance.

Both ESA and MSA artefacts are of high technological quality and represented by significant artefact ratios despite the evident secondary context of the surface exposure. The assemblage can preliminary be dated to between 2Mya-150kya. The Acheulean phase of the ESA is represented by handaxes and cleavers as typical ESA *fossiles directeurs*. Technological and typological high quality flakes and blades represent re-use of the area during MSA times. Exposed artefacts are evidently in a fairly disturbed secondary context: ESA and MSA types are scattered across the dunes and collected in small erosion and stream beds on site. Both wind and water erosion is inferred major post depositional site agents that affected the original artefact context. Assignation of a general artefact ratio (artefacts: m²) is thus particularly difficult: Disturbed artefact clusters yielded artefact ratios approximating 8:1 but at other parts of the site ratios of ≤1:5 were recorded.

The primary raw material used for artefact production is sandstone. A small sandstone outcrops on site may have been used for sourcing raw material but poor quality of the outcrops may imply that another source must have been present in the past or alternatively that artefacts were imported to the area, implying that the site represent an 'activity' site rather than a 'knapping' site. The hypothesis of an 'activity' rather than a 'knapping' site may be supported by the lack of knapping *debitage* on site, but it may also be the mere result of on-site post depositional processes, including specifically water erosion.

Individual clusters of artefacts were not recorded at the time of assessment (SAHRA ARC 2010), the assessment focused primarily on discovery, location, identification and determination of site extent (See Appendix 4). However, in an attempt to, at least in part, comply with the SAHRA ARC (2010) requirements the following roughly geo-referenced description is given (See Figure 32): The site proper can roughly be defined as between S34°09'27.3"; S34°09'31.4" and E24°41'31.8"; E24°41'43.5" (blue outline). The area is easily accessible and traversed by a scraped farm road cross-cutting the site. The site proper yielded the highest concentrations of stone artefacts, as described above, often with artefact ratios (artefacts: m²) of 8:1 and higher. While artefacts were present on dune surfaces the majority of artefacts were clustered in small erosion gullies at the foot of the dune slopes, the result of post-depositional processes. Artefact ratios systematically decreased from the site proper towards the north and west; with artefacts visibly present on dune slopes from the western access road that passes the farmstead (Site 2.2). To the south of the site proper surface artefact presence decreased quite radically, most possibly the result of vegetated dunes characterizing the site demarcation; but in that indicative of the fact that the deposit may well extent sub-surface, implying perhaps better stratigraphic context of artefacts. Towards

the west of the site proper artefact ratios decreased again quite radically, with a surprisingly low density of artefacts present in the vicinity of the gully that cross cuts the site in a north-eastern to south-western direction east of the sandstone outcrops (S34°09'25.9; E24°41'51.1). East of the sandstone outcrops and erosion gully, an area generally characterized by vegetated dunes, only a few odd artefacts were discovered. The presence of the artefacts can signify two possibilities: i) That particularly low artefact densities are indicative of site extent, indicating the gradual decrease of artefacts towards a site's perimeter or ii) That deposits may well continue but that these are primarily buried under vegetated dunes. Should this in fact be the case the eastern portion of the site, with inferred better artefact context and possible industrial / temporal stratigraphic division may well be scientifically the most valuable portion of the site.

Figure 32: Close-up of Site 2.3

- **RECOMMENDATIONS:** *The Site 2.3 Earlier and Middle Stone Age (ESA & MSA) site represents a heritage site as defined and protected under the NHRA 1999. Technological and typological high quality artefacts, fairly high artefact ratio and site locality (palaeo-dune terrain with reference to palaeo-environmental change and cultural adaptation) are important site characteristics. The site can preliminary be dated to between 2Mya-150kya: Site 2.3 is ascribed a SAHRA HIGH SIGNIFICANCE and a GENERALLY PROTECTED A FIELD RATING. It was recommended that development in the vicinity of Site 2.3 be preceded by Phase 2 archaeological mitigation; alternatively that the site be formally conserved. The developer has opted for formal site conservation as site management option: Site 2.3 will be formally conserved within the design parameters of the 3rd and final layout of the Kouga Commercial Wind Farm development. Site specific conservation measures are described in the Cultural Heritage Site Management Plan – Site 2.3, Welgelegen 735/3, Kouga Local Municipality, Eastern Cape included as Appendix 1 of the report.*

ENVIRONMENTAL IMPACT ASSESSMENT							
Site	*Extent*	*Duration*	*Intensity*	*Probability*	*Significance*	*Status*	*Confidence*
Site 2.3	Regional	Permanent	High	Highly probable	* High / Medium	Positive / neutral	High
Environmental impact significance assessment * based on recommended formal site conservation							

Table 9: Environmental impact significance assessment – Site 2.3

Figure 33: General view of Site 2.3, with artefacts identifiable on the exposed dunes

Figure 34: Surface artefacts were scattered amongst party vegetated dunes towards the central and eastern part of the site

Figure 35: The raw material outcrops at Site 2.3

Figure 36: A collection of ESA (top) and MSA (bottom) type artefacts from Site 2.3

Figure 37: An ESA Acheulean cleaver from Site 2.3

Figure 38: MSA type artefacts from Site 2.3

Figure 39: A concentration of in situ artefacts at Site 2.3

4.3.2.4) SITE 2.4 - Colonial Period Homestead - S34°08'33.1"; E24°42'59.7"

Site 2.4 (S34°08'33.1"; E24°42'59.7") comprises of the 4th Colonial Period farmstead on the property Welgelegen, situated on an Eskom owned portion of the farm. The Eskom owned portion of Welgelegen has been subjected to prior Phase 1 AIA assessment and is recorded by Anderson (2010) as Site MEL 07. Despite individual site descriptions and associated site co-ordinates in the ACO UCT report, the document contains a photographic record of Site 2.4 (ACO UCT 2010: 47). The site is at present fenced with an access gate complying with SAHRA Minimum Site Conservation Standards.

Site 2.4 comprises of a single standing residential structure; the site is inferred to post-date Site 2.1 and Site 2.2, but based on architectural style may be temporally similar to the Welgelegen residence marked Site S, situated outside of the Central Cluster study site. The site thus represents subsequent settlement, directly associated with subdivision of the original property. The structure pre-dates 60 years of age and is formally protected under the NHRA 1999. Conservation measures at present comply with SAHRA prescribed Minimum Site Conservation Standards.

- **RECOMMENDATIONS:** *The Site 2.4 Colonial Period Homestead constitutes a heritage site as defined and protected under the NHRA 1999. The site is ascribed a SAHRA MEDIUM SIGNIFICANCE and a GENERALLY PROTECTED B FIELD RATING. The site will not be impacted on by the proposed development. Conservation measures at present comply with prescribed SAHRA Minimum Site Conservation Standards. In addition development will not encroach on the 500m development conservation buffer between turbine localities and residential structures, vacant or in use.*

ENVIRONMENTAL IMPACT ASSESSMENT							
Site	*Extent*	*Duration*	*Intensity*	*Probability*	*Significance*	*Status*	*Confidence*
Site 2.4	Site specific	N/A	Low	Improbable	No impact	Neutral	High

Table 10: Environmental impact significance assessment – Site 2.4

Figure 40: View of the Site 2.4 Welgelegen farmhouse, also recorded by Anderson (2010) as Site MEL 07 and photographically documented by the ACO UCT (2010:47)

4.3.2.5) SITE 2.5 - Colonial Period Cemetery - S34°09'35.4"; E24°42'40.5"

The Site 2.5 (S34°09'35.4"; E24°42'40.5") Colonial Period cemetery constitutes the original Welgelegen cemetery. The site is located on the Eskom owned portion of Welgelegen. The site is formally fenced with an access gate; complying with SAHRA Minimum Site Conservation Standards. Site 2.5 comprises of a formal cemetery with a number of graves, many of which have fairly modern gravestones. The majority of the graves pre-date 60 years of age; the site is thus formally protected under the NHRA 1999.

- **RECOMMENDATIONS:** *The Site 2.5 Colonial Period Cemetery constitutes a heritage site as defined and protected under the NHRA 1999. The site is ascribed a SAHRA MEDIUM SIGNIFICANCE and a GENERALLY PROTECTED B FIELD RATING. The site will not be impacted on by the proposed development. Within the 3rd development design a 500m conservation buffer will be maintained between the site and turbine WTG 41. In addition formal site conservation measures, complying with SAHRA Minimum Site Conservation Standards are already in place.*

ENVIRONMENTAL IMPACT ASSESSMENT							
Site	*Extent*	*Duration*	*Intensity*	*Probability*	*Significance*	*Status*	*Confidence*
Site 2.5	Site specific	N/A	Low	Improbable	No impact	Neutral	High

Table 11: Environmental impact significance assessment – Site 2.5

Figure 41: General view of Site 2.5

4.3.2.6) SITE 2.6 - Colonial Period Homestead - S34°09'08.9"; E24°44'47.3"

Site 2.6 (S34°09'08.9"; E24°44'47.3") constitutes the original Buffelsbosch farmstead. The main residence is believed to date to the 1880's, but may well have been constructed slightly before that. The residence was in use until fairly recently; landowner R.P. Gerber reported that he was born at the main residence. Additional site features include at least 2 more residential structures, 1 vacant and 1 used for labor accommodation, in close proximity to the site. Immediately north of the site an old cattle dip is inscribed with the date 22 March 1911; providing a sequential date for later technological additions to the original farmstead and probably one of the oldest cattle dips in the general area. North-west of the main residence (Site 6.1) an extension to the original Buffelsbosch setup is defined by a contemporary residence (property of H. Knott), but demarcating the locality of a former 2 bedroom stone residential structure, the historical remains of which are totally contained within the modern residence and marking the north-western extremity of the original Buffellsbosch farmstead.

The various site components comprising Site 2.6 are at present not individually fenced for purposes of direct site conservation, but site features are fenced within farm portion camps implying indirect compliance with SAHRA Minimum Site Conservation Standards. The site will not be impacted on by the proposed *Koega Commercial Wind Farm* development; in accordance with the development layout and design no turbines will be erected within 500m from a residential structure, vacant or in use.

- **RECOMMENDATIONS:** *The Site 2.6 Colonial Period Homestead constitutes a heritage site as defined and protected under the NHRA 1999. The site is ascribed a SAHRA MEDIUM SIGNIFICANCE and a GENERALLY PROTECTED B FIELD RATING. No site components will be negatively impacted on by the proposed development. Conservation measures at present comply indirectly with prescribed SAHRA Minimum Site Conservation Standards. The site will by implication be conserved.*

ENVIRONMENTAL IMPACT ASSESSMENT							
Site	*Extent*	*Duration*	*Intensity*	*Probability*	*Significance*	*Status*	*Confidence*
Site 2.6	Site specific	N/A	Low	Improbable	No impact	Neutral	High

Table 12: Environmental impact significance assessment – Site 2.6

Figure 42: View of the Site 2.6 main residence

Figure 43: 22 March 1911, inscribed on a cattle dip located just north of the main Site 2.6 residence

4.3.3) The Western Cluster

STUDY SITE AND ASSESSMENT PARTICULARS:

The Western Cluster constitutes an approximate 4,000ha study site including the properties Ou Driefontein 721, Driefontein 718, Brakkeduinen 719, Langfontein 717, Langekloof 724, Langekloof 725, Langekloof 723, Klippedrift, 722 and Soetfontein. Within the 3rd and final development design a total of 53 wind turbines are proposed for the study site. Development will also include roughly 28km of linear development to connect turbine localities to each other and the existing power grid. Due to open landscape, easy accessibility and very fair visibility, farm roads and particularly existing farm camps, assessment methodology across the general assessment area, but excluding Area 1 and Area 2 approached a 'surface area survey' rather than a typical 'line route survey', in other words covering the majority of the proposed Western Cluster study site. Assessment methodology in Area 1 and Area 2 can be described as 'spot assessment', a result of restricted access roads and vegetation.

PHASE 1 AIA ASSESSMENT FINDINGS:

Seven archaeological and cultural heritage resources (Sites 3.1 – 3.7), as defined and protected by the NHRA 1999, were identified during the Phase 1 AIA of the Western Cluster study site. In addition 2 potentially sensitive areas, Area 1 and Area 2, are located within the study site. Area 1 was included in the initial or 1st development design. From the 2nd to 3rd development designs proposed turbine localities encroached on Area 2, initially demarcated as a 'conservation area', with assessment thereof forming part of the scope of the 2nd fieldwork session. However, the developer has agreed, after input from the ecological specialist, to micro-site the turbines within this area to the edge of the dune area. Thus there will be no turbines within the dune Area 2 and all new positions will be assessed by all specialists as part of the micro-siting process. Both Area 1 and Area 2 are characterized by a mosaic of overgrown and white shifting dunes; very reminiscent of the typical LSA '*strandloper*' type site environments.

SUMMARIZED RECOMMENDATIONS:

It is recommended that, with reference to heritage compliance requirements as per the NHRA 1999, development of the Western Cluster of the *Koega Commercial Wind Farm* development proceeds as applied for.

Seven archaeological and cultural heritage resources (Sites 3.1 – 3.7), as defined and protected by the NHRA 1999, and 2 potentially sensitive areas (Area 1 and Area 2) are located within the study site.

1. Sites 3.1, 3.3, 3.4, 3.5, 3.6 and 3.7 all comprise of Colonial Period Farmsteads, Structures or Villages, pre-dating 60 years of age. The sites are largely still in use, with the majority thereof fenced with access gates. Sites or site features at present not formally fenced are either still in use (formal conservation measures will hamper usage of the sites) or located in such close proximity to access roads that formal conservation may not prove feasible. None of the identified sites will be impacted on by the proposed development.
2. Site 3.2 comprise of a Colonial Period Cemetery. Origin of the site date to the Colonial Period; continuing use is evident. The site is at present fenced with an access gate, thus complying with SAHRA Minimum Site Conservation Standards. The site will not be impacted on by the proposed development.
3. All turbine localities and linear development routes will be reassessed during micro-environmental assessment (including an archaeological and heritage component) preceding construction impact. Should any sites be identified during micro-siting, future site management recommendations should be made and may include site conservation, on-site archaeological monitoring or Phase 2 archaeological mitigation.
4. Both Area 1 and Area 2 comprise of potentially sensitive areas. Sites may well be encountered during the course of development. On-site archaeological monitoring (surface and sub-surface inspection) is recommended at the start of construction in the vicinity of Area 1 (WTG 99, 123 and 124) and Area 2 (WTG 104, 105 and 112). Should any sites be identified during on-site archaeological monitoring, future site management recommendations should be made and may include site conservation or Phase 2 archaeological mitigation.

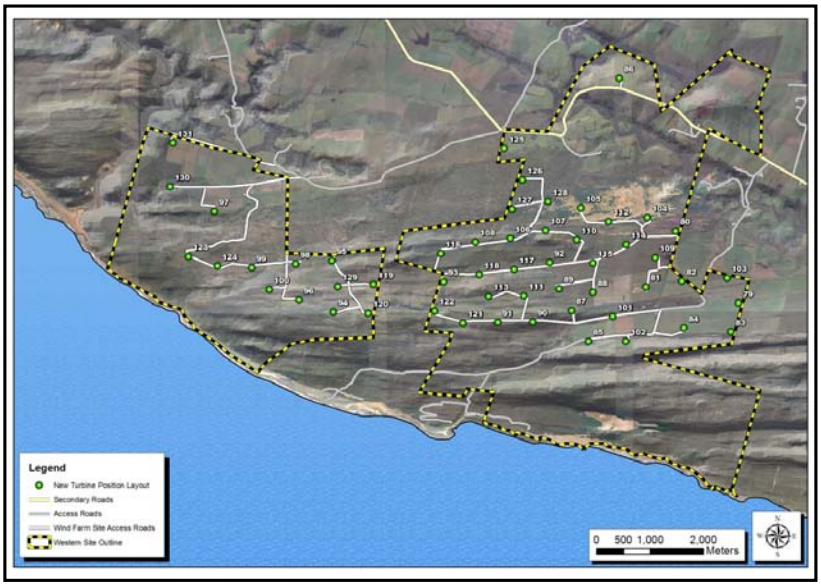


Figure 44: Third and final development design of the Western Cluster study site (courtesy Red Cap Investments)

Figure 45: Final development design of the Western Cluster study site indicating turbine positions with final numbering and access roads (yellow) in relation to the Phase 1 AIA assessment area and identified site localities (red stars) and site boundaries (red outline)

Figure 46: The Western Cluster – Phase 1 AIA assessment findings (Sites 3.1 – 3.7; Area 1 and Area 2)

Figure 47: View of agricultural field along the western part of the study site (Driefontein) in the vicinity of turbine locality 131

Figure 48: The partly exposed dune landscape characterizing Area 1 (area between turbine localities 123 and 124)

Figure 49: Objects collected by landowner Johannes Vermaak at Area 1

Figure 50: General view in the vicinity of turbine localities 94, 96 and 120

Figure 51: General view in the vicinity of turbine localities 117 and 122

Figure 52: View in the general vicinity of turbine locality 111 and 113

Figure 53: General view in the vicinity of turbine locality 102

4.3.3.1) SITE 3.1 - Colonial Period Homestead - S34°07'36.2"; E24°28'50.8"

Site 3.1 (S34°07'36.2"; E24°28'50.8") is situated immediately adjacent to the access road cutting through the north-western portion of the Western Cluster study site. The site comprises of various Colonial Period Farmstead components including the ruined remains of the main homestead north of the access road and various storage facilities and outbuildings south of the road. Site structures pre-date 60 years of age and date of origin can reasonably be inferred to be in the region of the late 1800's / early 1900's. The majority of the site features is at present formally fenced within farm camps including the main residence. One prominent storage facility, immediately adjoining the current road alignment and at present still in use by the landowner is however not; formal conservation (permanent fencing) of the feature is not recommended based on proximity to the road.

The Site 3.1 Colonial Period site is situated within the Western Cluster study site, but will not be impacted on by development. Selected site components are permanently fenced, complying with SAHRA Minimum Site Conservation Standards. It is not recommended that site components (storage facility) at present not formally conserved be fenced due to proximity to the access road.

- **RECOMMENDATIONS:** *The Site 3.1 Colonial Period Homestead constitutes a heritage site as defined and protected under the NHRA 1999. The site is ascribed a SAHRA MEDIUM SIGNIFICANCE and a GENERALLY PROTECTED B FIELD RATING. The site is situated within the Western Cluster study site. Development will not impact negatively on the site. Portions of the site are at present formally conserved, complying directly with SAHRA Minimum Site Conservation Standards. The storage facility to the south of the access road is not formally conserved; no conservation measures are recommended due to proximity to the access road and landowner usage requirements.*

ENVIRONMENTAL IMPACT ASSESSMENT							
Site	*Extent*	*Duration*	*Intensity*	*Probability*	*Significance*	*Status*	*Confidence*
Site 3.1	Site specific	N/A	Low	Improbable	No impact	Neutral	High

Table 13: Environmental impact significance assessment – Site 3.1

Figure 54: Ruined remains of the Site 3.1 main residence

Figure 55: Site 3.1 - Colonial Period storage facilities; formal conservation of the structure is not recommended based on proximity to the road and landowner usage requirements

4.3.3.2) SITE 3.2 - Colonial Period Cemetery - S34°07'40.9"; E24°28'50.3"

The Site 3.2 (S34°07'40.9"; E24°28'50.3") Colonial Period cemetery constitutes an early family cemetery directly related to the Site 3.1 Colonial Period Homestead. The site is situated within the proposed Western Cluster study site, but will not be impacted on by development. The site is at present fenced with an access gate, implying direct compliance with SAHRA Minimum Site Conservation Standards.

- **RECOMMENDATIONS:** *The Site 2.3 Colonial Period Cemetery constitutes a heritage site as defined and protected under the NHRA 1999. The site is ascribed a SAHRA MEDIUM SIGNIFICANCE and a GENERALLY PROTECTED B FIELD RATING. The site is situated within the Western Cluster study site; development will not impact on the site. The Site 2.3 cemetery is at present fenced with an access gate: Site conservation measures thus complies directly with SAHRA Minimum Site Conservation Standards.*

ENVIRONMENTAL IMPACT ASSESSMENT							
Site	*Extent*	*Duration*	*Intensity*	*Probability*	*Significance*	*Status*	*Confidence*
Site 3.2	Site specific	N/A	Low	Improbable	No impact	Neutral	High

Table 14: Environmental impact significance assessment – Site 3.2

Figure 56: View of Site 3.2

4.3.3.3) SITE 3.3 - Colonial Period Homestead - S34°07'47.6"; E24°28'21.5"

Site 3.3 (S34°07'47.6"; E24°28'21.5") constitutes the Colonial Period Grootvlei farmstead, situated on the property Driefontein 718. Origin of the farmstead dates to the 1880's, perhaps even slightly earlier when the property was bought by the Vermaak family, implying a 6th generation ownership and use of the heritage resource (Pers. Comm.: J. Vermaak). The site constitutes the original farm house and outbuildings. Structures at the site by implication pre-date 60 years of age; the site is formally protected under the NHRA 1999. The site, still in use, is at present fenced with an access gate, implying compliance with SAHRA Minimum Site Conservation Standards.

- **RECOMMENDATIONS:** *The Site 3.3 Colonial Period Homestead constitutes a heritage site as defined and protected under the NHRA 1999. The site is ascribed a SAHRA MEDIUM SIGNIFICANCE and a GENERALLY PROTECTED B FIELD RATING. The site, situated within the Western Cluster study site, is in accordance with the development design not within 500m from any turbine locality. Current site conservation measures comply directly with SAHRA Minimum Site Conservation Standards.*

ENVIRONMENTAL IMPACT ASSESSMENT							
Site	*Extent*	*Duration*	*Intensity*	*Probability*	*Significance*	*Status*	*Confidence*
Site 3.3	Site specific	N/A	Low	Improbable	No impact	Neutral	High

Table 15: Environmental impact significance assessment – Site 3.3

Figure 57: General view of Site 3.3

4.3.3.4) SITE 3.4 - Colonial Period Homestead - S34°07'17.3"; E24°32'11.7"

Site 3.4 (S34°07'17.3"; E24°32'11.7") comprises of a Colonial Period Homestead situated on the farm Langfontein 717. Site features are again located both north and south of the access road, with the majority thereof being situated south of the road and formally fenced within the farm boundary. An associated storage facility is situated north of the access road and not fenced, due to proximity to the access road. Selected site features are still in use. The site is inferred to date to the early 1900's. The site will not be impacted on by development.

- **RECOMMENDATIONS:** *The Site 3.4 Colonial Period Homestead constitutes a heritage site as defined and protected under the NHRA 1999. The site is ascribed a SAHRA MEDIUM SIGNIFICANCE and a GENERALLY PROTECTED B FIELD RATING. The site will not be impacted on by the proposed development. Selected site features are at present formally fenced, including the main residence. A storage facility located north of the access road is not fenced; formal conservation of the feature is not recommended based on proximity to the road.*

ENVIRONMENTAL IMPACT ASSESSMENT							
Site	*Extent*	*Duration*	*Intensity*	*Probability*	*Significance*	*Status*	*Confidence*
Site 3.4	Site specific	N/A	Low	Improbable	No impact	Neutral	High

Table 16: Environmental impact significance assessment – Site 3.4

Figure 58: The site 3.4 main residence

Figure 59: The Site 3.4 feature located north of the access road; formal conservation (fencing) of the site is not recommended based on proximity to the road

4.3.3.5) SITE 3.5 - Colonial Period Homestead - S34°07'28.4"; E24°32'41.2"

Site 3.5 (S34°07'28.4"; E24°32'41.2") constitutes a 2nd Colonial Period Homestead on the property Langfontein 717. Site features comprises of a residence and associated structures, some of which are currently used as labor accommodation and some for storage and farming requirements while others are in a ruined state and have been deserted for quite some time. The site is not fenced and no formal site conservation measures are in place. The site will not be impacted on by the proposed *Koega Commercial Wind Farm* development.

- **RECOMMENDATIONS:** *The Site 3.5 Colonial Period Homestead constitutes a heritage site as defined and protected under the NHRA 1999. The site is ascribed a SAHRA MEDIUM SIGNIFICANCE and a GENERALLY PROTECTED B FIELD RATING. The site will not be impacted on by the proposed development. The site is not at present formally fenced; usage requirements however do not allow formal conservation of site features.*

ENVIRONMENTAL IMPACT ASSESSMENT							
Site	*Extent*	*Duration*	*Intensity*	*Probability*	*Significance*	*Status*	*Confidence*
Site 3.5	Site specific	N/A	Low	Improbable	No impact	Neutral	High

Table 17: Environmental impact significance assessment – Site 3.5

Figure 60: General view of Site 3.5

4.3.3.6) SITE 3.6 - Colonial Period Workers Village - S34°07'05.9"; E24°33'59.2"

Site 3.6 (S34°07'05.9"; E24°33'59.2") comprises of a Colonial Period Workers Village situated on the property Soetfontein. The site comprises of a number of residences, all still in use, with date of origin inferred to date to the early 1900's; by implication thus pre-dating 60 years of age and formally protected under the NHRA 1999. The site is at present fenced with an access gate, thus complying with SAHRA Minimum Site Conservation Standards. Access restrictions did not allow a more detailed site inspection.

- **RECOMMENDATIONS:** *The Site 3.6 Colonial Period Workers Village comprises of a heritage site as defined and protected under the NHRA 1999. The site is ascribed a SAHRA MEDIUM SIGNIFICANCE and a GENERALLY PROTECTED B FIELD RATING. The site, still in use for residential purposes, will not be impacted on by development; the site will be conserved. Current conservation measures comply directly with SAHRA Minimum Site Conservation Standards.*

ENVIRONMENTAL IMPACT ASSESSMENT							
Site	*Extent*	*Duration*	*Intensity*	*Probability*	*Significance*	*Status*	*Confidence*
Site 3.6	Site specific	N/A	Low	Improbable	No impact	Neutral	High

Table 18: Environmental impact significance assessment – Site 3.6

Figure 61: The Site 3.6 Historical Period Workers Village

4.3.3.7) SITE 3.7 - Colonial Period Structure - S34°07'19.8"; E24°34'12.3"

Site 3.7 (S34°07'19.8"; E24°34'12.3") comprises of a Colonial Period Structure, situated on the farm Klippe Drift 722. The site is reported on for purposes of proximity to the development area and will not be impacted on. The renovated and particularly well maintained Site 3.7 structure is used for religious purposes providing a direct service to residents of the area. The site, situated immediately adjacent to the main access road to the Western Cluster study site, pre-dates 60 years of age: The site is by implication formally protected under the NHRA 1999. Current conservation measures, a formal fence with an access gate, comply directly with SAHRA Minimum Site Conservation Standards.

- **RECOMMENDATIONS:** *The Site 3.7 Colonial Period Structure comprises of a heritage site as defined and protected under the NHRA 1999. The site is ascribed a SAHRA MEDIUM SIGNIFICANCE and a GENERALLY PROTECTED B FIELD RATING. The site is still in use. Current conservation measures comply directly with SAHRA Minimum Site Conservation Standards.*

ENVIRONMENTAL IMPACT ASSESSMENT							
Site	*Extent*	*Duration*	*Intensity*	*Probability*	*Significance*	*Status*	*Confidence*
Site 3.7	Site specific	N/A	Low	Improbable	No impact	Neutral	High

Table 19: Environmental impact significance assessment – Site 3.7

Figure 62: General view of Site 3.7

5) SOCIO-CULTURAL CONSULTATION

Socio-cultural consultation was limited to informal consultation with landowners; consultation did not extent to registered Interested and Affected Parties (I&AP) identified through the environmental Public Participation Process (PPP). The aim of socio-cultural consultation was to gain local information on identified tangible heritage resources and to identify possible intangible heritage resources or sites of cultural significance associated with oral histories that will be impacted on or affected by the development. Socio-cultural consultation, as sub-section to the Cultural Heritage Impact Assessment, may also be complementary to the prescribed Social (socio-economic) Impact Assessment (SIA).

5.1) Tangible Heritage Resources

Consultation with landowners was done at the time of the field assessment. Information relating to heritage resources formally protected under the NHRA 1999 was limited to Built Structures pre-dating 60 years of age and was included as such in the Phase 1 AIA site descriptions. In conclusion many farmers still operating in the area and whose properties will, in part, be directly affected by the proposed *Kouga Commercial Wind Farm* development have strong ancestral ties to the area, some dating back to the 1820's and others from the early 1900's onwards. Many of the original vernacular farmhouses (and related farming infrastructure) are still in use, but have been altered to a degree that negatively affects the historical architectural value of the structures.

Records of the Chief Surveyor General were consulted to confirm local history (see SAHRA ARC 2010). Records proved to be useful primarily with regards to the registration and subdivision of farms as well as the documentation of subsequent infrastructural development (1960's), but very limiting with regard to ownership and construction of individual farm buildings, and in that could not corroborate locally recorded history.

- **THE EASTERN CLUSTER:**

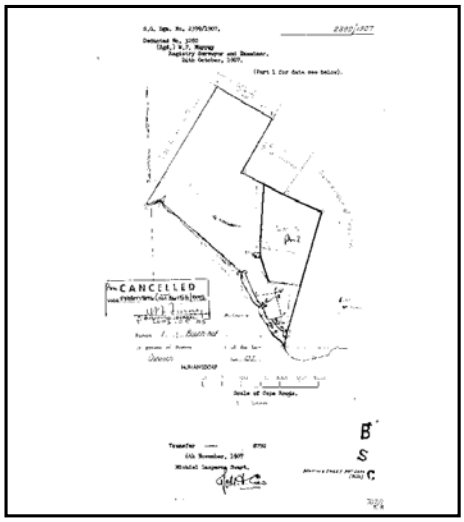


Figure 63: CSG Document nr 3280, Osbosch 707, 1907

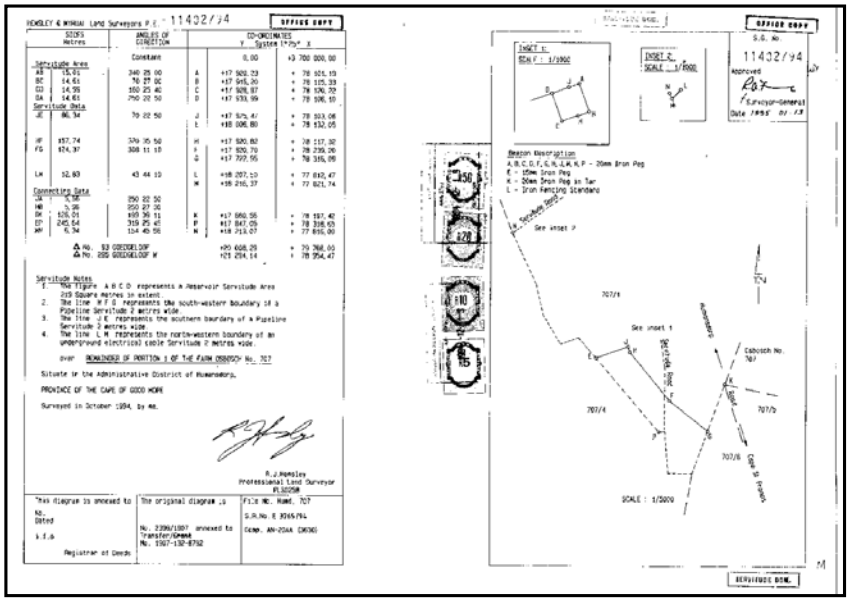


Figure 64: CSG Record number 11402/94 – Osbosch 707 and development of the Humansdorp-Cape St. Francis Road development

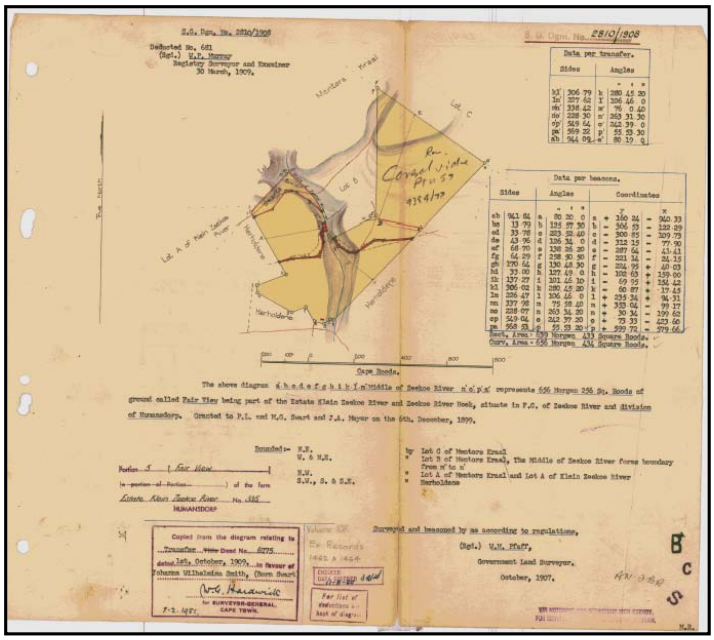


Figure 65: CSG Document nr 2810, Zeekoe River, 1908

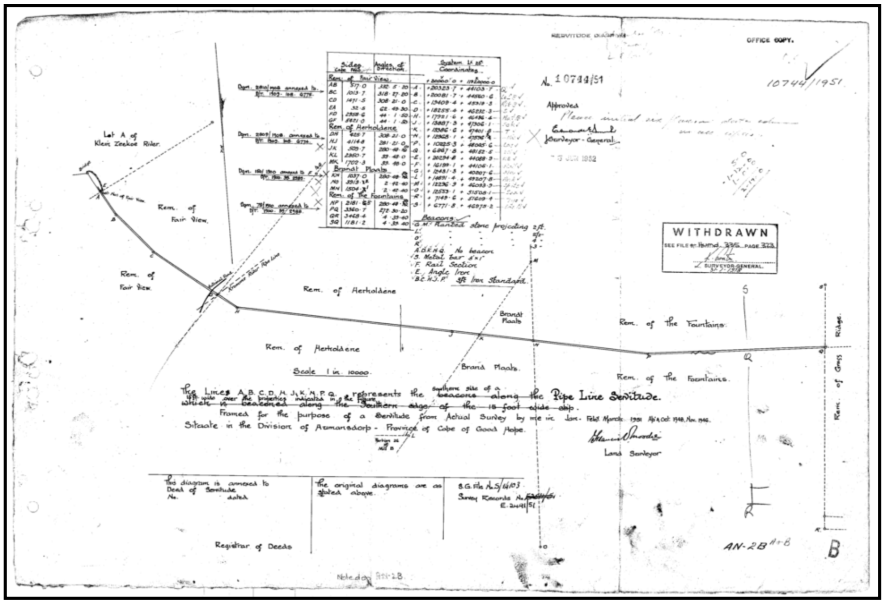


Figure 66: CSG Record number 10744/51, construction of roads and pipelines, Zeekoe River, 1951

- **THE CENTRAL CLUSTER:**

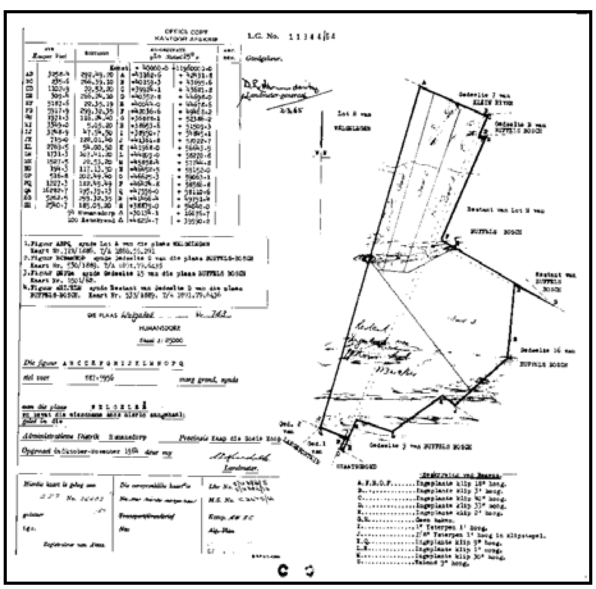


Figure 67: CSG Record number 11344/64 – sub-division of a portion of the property Welgelegen 735, 1964

- **THE WESTERN CLUSTER:**

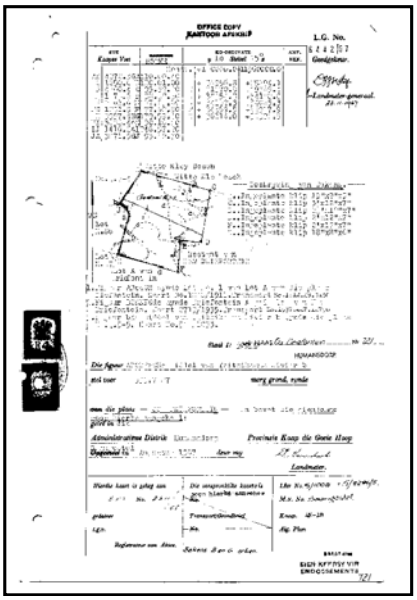


Figure 68: CSG Record number 6442/67, subdivision of Ou Dreiefontein 721, 1967

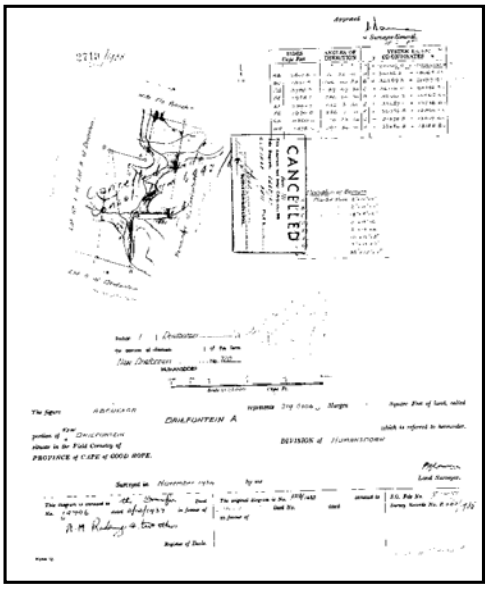


Figure 69: CSG record number 2719/1935 - Subdivision of the Driefontein 718, 1935

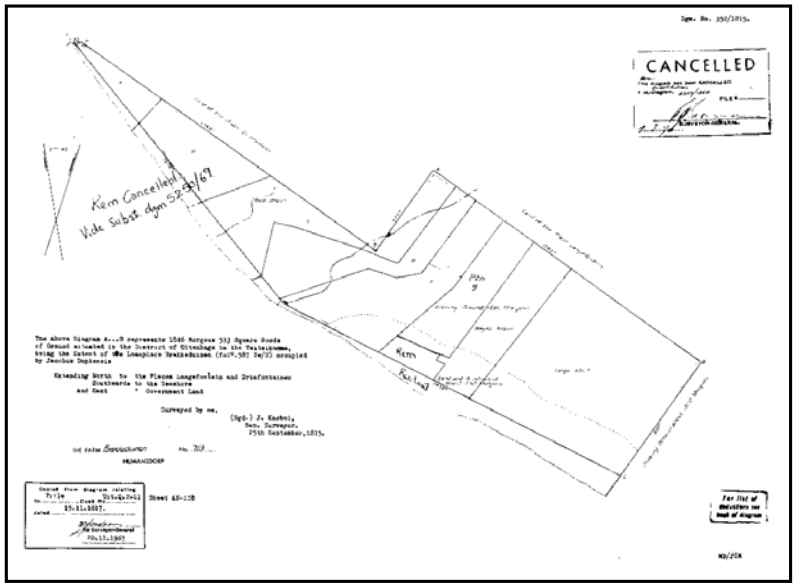


Figure 70: CSG Diagram number 352/1918 – Brakkeduinen 719, 1918

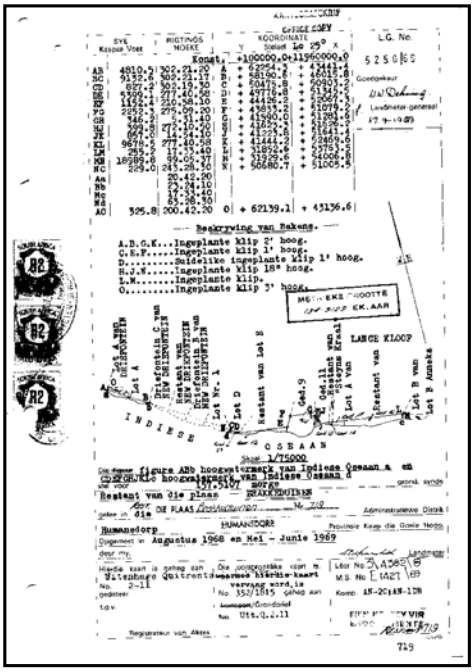


Figure 71: CSG Record number 5250/69 – Brakkeduinen 719, 1969

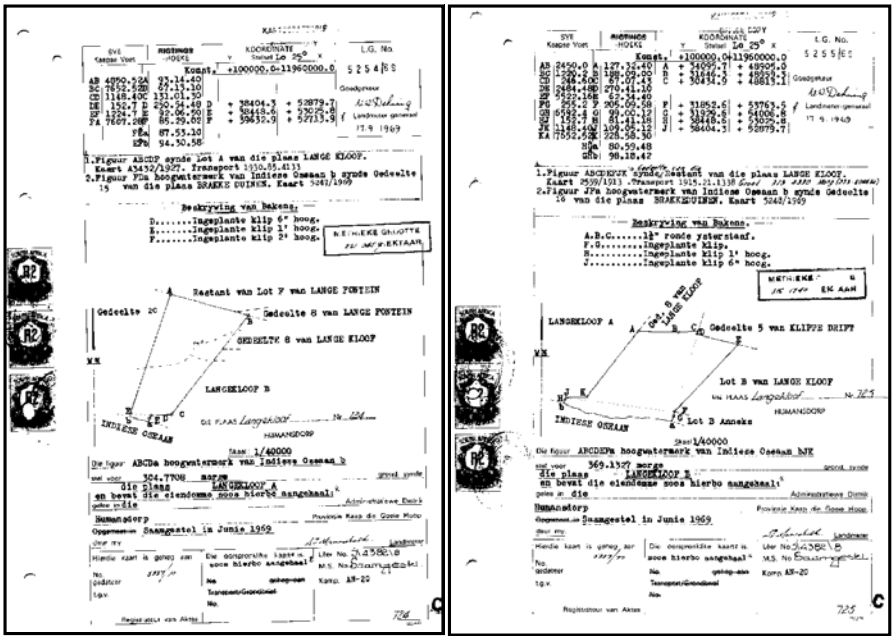


Figure 72: CSG Record number 5254/69 and 5255/69 – Langekloof 724 and Langekloof 725 subdivisions from Brakkeduinen, 1969

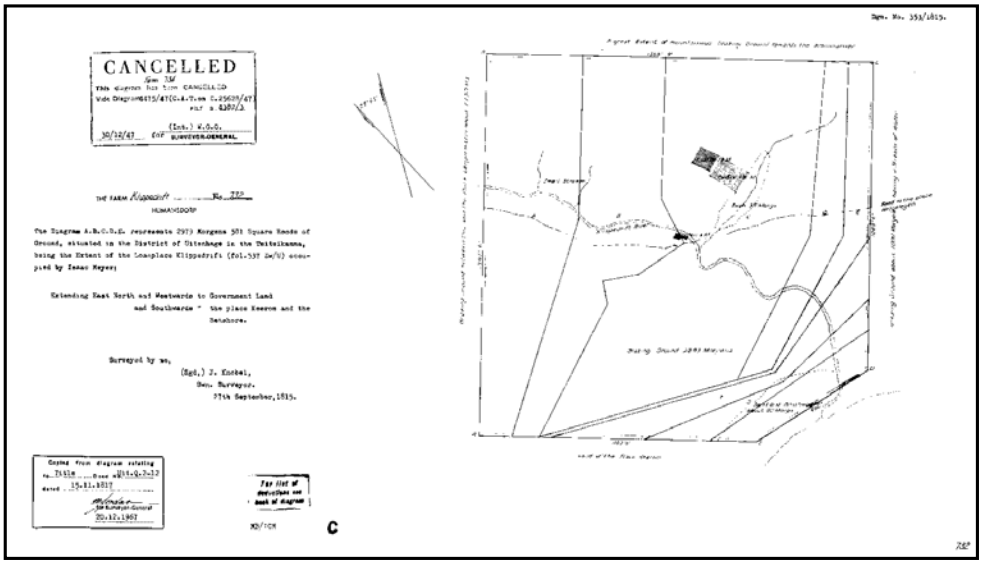


Figure 73: CSG Diagram number 353/15, Klippedrift 722, 1815

5.2) Intangible Heritage Resources

Extract from MINERS CHOICE – March 2010

'HERITAGE IMPACT ASSESSMENT (HIA) RULES: DEVELOPERS MUST REPORT HERITAGE'

(K. Van Ryneveld, ArchaeoMaps)

Socio-cultural consultation, often erroneously referred to as the Social Impact Assessment (SIA), aims to compile socio-cultural data related to a particular study site and its immediate past and present cultural environment for purposes of a Socio-cultural Impact Assessment (ScIA) as sub-component to the HIA. It is thus of utmost importance to clearly distinguish between the Social Impact Assessment, the formal SIA, concerned with the compilation of socio-economic data for a proposed development, required for purposes of an EIA under both the MPRDA 2002 and the NEMA 1998 & 2008 and the HIA required ScIA.

The ScIA first and foremost aims to identify intangible heritage resources. Intangible heritage can be simplified as valued cultural traditions transmitted from generation to generation, constantly changing in response to environmental, social, political and economic circumstances. Living communities therefore often represents the departure point for enquiry. The SAHRA newsletter (Vol 1.1 -2005) define living heritage as representative of the *'…intangible aspects of inherited culture (and including) tradition, oral history, performance, ritual, language, popular memory, skills and techniques (and) indigenous knowledge systems (IKS)…'*

Socio-cultural enquiry relating to the presence of intangible heritage resources was limited to landowners with strong ancestral ties to the proposed *Kouga Commercial Wind Farm* study site, including in the Eastern Cluster H.B. du Toit and S. Matthee, in the Central Cluster E.O. Cilliers, J.D.W. Strydom and R.P. Gerber and in the Western Cluster, J. Vermaak. Consent amongst landowners that the proposed *Kouga Commercial Wind Farm* development will not impact negatively on any significant intangible heritage was evident. Impact was in general regarded as a natural process of change directly related to industrialization and specifically energy demands, a resource that is of vital importance to modern farming practices and reflecting changing continuity of cultural tradition (early Colonial Period farming techniques vs. modern farming techniques). Concern was however raised about the impact of turbine localities in relation to modern agricultural fields, where traditional ploughed fields are today more than often under spill-point irrigation; a concern not of cultural heritage significance, but none the less addressed by Arcus Gibb and Red Cap Investments, as reflected in changes in the proposed development designs from the 1st to the 2nd and 3rd layout.

In addition none of the above mentioned consulted farmers have been contacted by any indigenous population or minority group with regards to the use of a specific heritage site, geographic locality or natural landscape feature for purposes of a specific cultural activity, be it of ceremonial or non-ceremonial nature. It can thus reasonably be inferred that no intangible heritage site of significant cultural value to any indigenous population or minority group is situated on the proposed *Kouga Commercial Wind Farm* development study site. However, the absence of directly identified intangible heritage sites does not exclude the fact that the general cultural landscape, specifically with regards to the strong emphasis on archaeological shell midden sites and possible LSA graves, are not indirectly of tangible or intangible significance to descendant KhoiSan populations.

6) CULTURAL LANDSCAPES AND VIEWSCAPES

A 'Cultural Landscape' refers to a particular geographical area that represents the unique combined work of man and nature (James & Martin 1981). The term has its origins in 16th Century Germany where 'Cultural Landscape' (*Kultur Landshaft*) implies 'shaped lands' to differentiate it from the 'Original Landscape' (*Urlandschaft*), or the 'unaltered' landscape, prior to human impact (Sauer 1925). Sauer (1925) stresses the agency of culture as a force in shaping the visible features of the earth's surface in delimited areas where the physical environment retains a central significance, as the medium with and through which human cultures act. According to Sauer (1925) '*The cultural landscape is fashioned from a natural landscape by a cultural group. Culture is the agent, the natural are the medium, the cultural landscape is the result*'.

In order to better understand the concept of 'Cultural Landscape' it is necessary to separate the term 'Culture' to further our understanding of its many definitions. Within the anthropological arena culture is generally understood as a '*complex whole which includes knowledge, belief, art, morals, law, custom, and any other capabilities and habits acquired by man as a member of society*'. Culture is '*human nature*' and is acquired through a learning process. Through culture people can adapt to their environment in non-genetic ways, so people living in different environments will often have different cultures, or will develop different cultures (Van Willigen 1986). An integral part of culture is change; be it the result of a changing natural environment to which the culture have to adapt or contact with another culture, the primary force of cultural change. Els (1992) explain that cultural contact change usually occurs according to either the process of acculturation (dominating 'donor' culture) or the process of enculturation (dominating 'receiver' culture). Both cultural processes can be spontaneous, forced or guided; but cultural process is never a one-way street; any given cultural system is at once a 'donor' and a 'receiver'. The essence of cultural change lies in the restructuring of the parts so that a new cultural pattern results. Bourguignon (1979) highlights the fact that this 'restructuring' should center on the question of '*What changes are (were) necessary to make culture, as we know it, possible*?' Culture is thus a process of constant change and adaptation; psychologically, behaviorally, technologically, politically, economically and spiritually (religiously), collectively referred to as 'cultural evolution'. [Certain forms of society and culture could simply not have arisen before others; for example, industrial farming could not have been invented before simple farming, and metallurgy could not have developed without previous non-smelting processes involving metals (Van Willigen 1986).]

When considering the concept of 'Cultural Landscape', taking cognizance of the vital force of change as an agent of culture, it is only logical that cultural change will be reflected in a changing cultural landscape.

The concept of 'Cultural Landscape' has also been adapted and developed within international heritage arenas (UNESCO 2005) as part of an international effort to reconcile one of the most encompassing dualisms in Western thought; that of 'nature' and 'culture'. In so doing the World Heritage Committee has adopted 3 categories of 'Cultural Landscape', ranging from (a) those landscapes most deliberately 'shaped' by people, through (b) the full range of 'combined' works, to (c) those least evidently 'shaped' by people (yet highly valued). The 3 categories extracted from the UNESCO Committee's Operational Guidelines, are as follows (Punnell 2006):

1. A landscape designed and created intentionally by man;
2. An 'organically evolved landscape' which may be a 'relict (or fossil) landscape' or a 'continuing landscape'; and
3. An 'associative cultural landscape' which may be valued because of the religious, artistic or cultural associations of the natural environment.

6.1) Cultural Landscapes – The Kouga Commercial Wind Farm study site

Based on existing archaeological and cultural evidence, as described in the general introduction to South African archaeology, but specifically the fairly extensive research conducted by Binneman (1996, 2001, 2004/2005 & 2006/2007) along the more immediate southern Cape coastline and the number of Cultural Resources Management (CRM) projects undertaken in the general area (ACO UCT 2010; Anderson 2010; Nillsen 2006; Webley 2003, 2006a & 2006b and Van Schalkwyk 2009a & 2009b) in association with the findings of the Cultural Heritage Impact Assessment of the *Kouga Commercial Wind Farm* project itself, it can be concluded that the most prominent cultural landscapes that will be affected by the development can be summarized as:

1. Stone Age (ESA & MSA);
2. Stone Age (LSA); and
3. Colonial Period.

THE ESA AND MSA CULTURAL LANDSCAPE: The ESA and MSA Cultural Landscape of the general *Kouga Commercial Wind Farm* study site can be classified, according to the UNESCO Operational Guidelines (Punnell 2006), as an 'organically evolved fossil landscape' that has been least evidently shaped by humans.

Inferred to have been the 1st impact on the natural or unaltered landscape, ESA settlement along the southern Cape coast can be described as highly significant, though sparsely scattered site distribution indicates fairly low population numbers over an extensive period of time, with limited use of natural resources and visual cultural impact on the landscape. Archaeological sites as evidence of ESA occupation include Site 1.3 in the Eastern Cluster and Site 2.3 in the Central Cluster. Together with evidence of the ESA on palaeosols closer to the coast (ACO UCT 2010) it can be inferred that ESA populations made use of a variety of resources both closer and further from the present day shoreline, indicative of a trait of varying landscape use by hunter-gatherer populations throughout the Stone Age. The ESA cultural landscape was overlain by subsequent MSA occupation, evidenced in the archaeological record by low quantities of sparely scattered artefacts (ACO UCT 2010; Anderson 2010; Van Schalkwyk 2009a & 2009b). MSA visual impact on the natural landscape can again be described as minimal, though not denying extensive geographical use thereof.

THE LSA CULTURAL LANDSCAPE: The LSA Cultural Landscape of the general *Kouga Commercial Wind Farm* study site can be classified, according to the UNESCO Operation Guidelines (Punnell 2006), as an 'organically evolved continuing cultural landscape', varying from originally least evidently shaped to a present day combined impact by humans.

Early LSA occupation of the general *Kouga Commercial Wind Farm* study site is evidenced by numerous shell middens known to occur in shifting dunes close to the shoreline and with related type sites reaching geographically much further inland. An increase in the quantity of sites from ESA / MSA times to the LSA may be interpreted as reflecting not only population increase but also changing cultural traditions with confirmed evidence of cultural modernity mirrored in more advanced technology, implying greater exploitation and use of the environment, a greater variety of cultural goods and with cognitive and behavioral changes manifested in the archaeological record in more complex inter-site distribution patterns. Despite the radically altered 'modern' LSA hunter-gatherer way of life, visual cultural impact on the landscape remained low.

Cultural contact and socio-political tension from the late 1700's onwards greatly contributed to the demise of the archaeologically recorded LSA cultural pattern and people of LSA descent joined the then mosaic of cultural

complexity on the south coast; colonial settlers, traders, rebels and rulers, slaves and iron age conflict from the east, in an intricate process of cultural adaptation and change that would forever transform their 'traditional' ways. Albeit changed, KhoiSan traditions survived. Today the KhoiSan, an individually recognized cultural group, is an active participant in modern South Africa culture, essentially a developing industrial society with its known high impact on the natural surrounds.

The case of the KhoiSan remains unique, not only across southern Africa, but on an international level. In South Africa, contemporary KhoiSan represents the oldest surviving, albeit radically transformed cultural group, with an archaeologically confirmed heritage dating back to the LSA, at least 12,000 years ago: Contemporary KhoiSan culture denotes an extraordinary example of cultural evolution (comparable only to the Aboriginal and South East Pacific cultures), with change as the motive behind cultural change reflected in the changing Cultural Landscapes that they have survived in.

THE COLONIAL CULTURAL LANDSCAPE: The Colonial Cultural Landscape of the general *Kouga Commercial Wind Farm* study site can be classified, according to the UNESCO Operation Guidelines (Punnell 2006), as an 'organically evolved continuing cultural landscape', shaped by a range of combined human impacts.

Iron Age cultures are generally accredited with the introduction of farming practices in South Africa. However, the 18th Century saw Colonial farmers, with knowledge of farming practices brought from Europe radically influencing the lifeways of KhoiSan and other populations they encountered along the southern Cape coast. New laws of land ownership (in stark contrast to that of indigenous hunter-gatherer and Iron Age groups), associated land-use practices and improved technology soon altered the natural environment to a degree unequalled before. Colonial settlement left a definite impact on the landscape, evidenced by the number of towns, villages and forts scattered across the landscape. 'Development' soon became associated with infrastructural improvements; better road and railway networks. But in more rural areas impact remained low; dispersed farmsteads, related farming infrastructure and agricultural fields with one of the most prominent visual Colonial Period impacts on the rural landscape being wind pumps (*circa* 1820-1840), marking a technological feat that opened up large parts of South Africa for economically viable farming. Neither Pakenham (1993) nor Milton (1983) makes mention of any significant battles or battlefields in the immediate vicinity of the *Kouga Commercial Wind Farm* study site, though associated tensions are undeniable: The general cultural landscape remained rural, characterized by the tranquil evidence of scattered farmsteads with Colonial urbanization limited to the port at St. Francis and the trading station at Humansdorp.

Subsequent large scale industrialization, initially propelled by descendants of early Colonial settlers and later period European immigrants left an equally marginal visual impact, limited to a better road infrastructure and power lines on the study site itself and an increased population and associated industry in nearby towns.

* * *

Visual impact of the *Kouga Commercial Wind Farm* on the cultural landscape will be high, permanent and non-mitigatable: Holland (2010) emphasizes both turbine height and legislative requirements such as night lights as major factors that directly affect the visual impact of the development on both the study site and neighboring terrain (from as far afield as the coastal town of Jeffereys Bay in the case of the Eastern Cluster). Despite the fact that wind turbines are in theory mitigatable (structures can be dismantled), projected energy demands and the

current emphasis on green, renewable energy would very likely prohibit dismantlement of a nationally essential resource: Demand for energy would thus most likely render the project non-mitigatable.

From a cultural point of view, if Bourguignon's (1979) question of '*What changes are (were) necessary to make culture, as we know it, possible*?' is considered, then visual impact of the development become evidence of the natural process of 'cultural evolution', reflecting contemporary energy requirements and the emphasis on renewable energy sources. However, the effect of contemporary culture on the archaeological cultural landscape will be high, altering tranquil farmland vistas, today still very reminiscent of the Colonial Period for ever. But the *Kouga Commercial Wind Farm* development will also contribute, in part, to the conservation of the rural ambiance of the landscape established during the Colonial Period: Legislative development requirements prohibit light industrial and high density residential development, increasingly characterizing the coastline of South Africa and often impacting on sensitive Stone Age deposits. Considering specifically the high sensitivity of the LSA cultural landscape along the southern Cape coast and increasing impact and destruction of these unique, non-renewable heritage resources, the *Kouga Commercial Wind Farm* development may well prove to be the most significant conservation measure considered to date.

7) RECOMMENDATIONS

With reference to cultural heritage compliance, as per the requirements of the NHRA 1999, it is recommended that the proposed *Koega Commercial Wind Farm* project proceeds as applied for provided the developer complies with the following requirements:

Eighteen archaeological and cultural heritage resources, as defined and protected by the NHRA 1999, were identified within the proposed *Kouga Commercial Wind Farm* study site or within close proximity thereto. Identified sites and associated recommendations are briefly described as:

- **EASTERN CLUSTER:**

Five sites (Sites 1.1-1.5):

1. Four of which comprise of Colonial Period sites (Sites 1.1; 1.2; 1.4 and 1.5) including farmsteads and a cemetery. None of the Colonial Period sites will be negatively impacted on by the development.
2. Site 1.3 constitutes a low density ESA and MSA Stone Age feature. It is recommended that the site be destroyed without the developer having to apply for a SAHRA Site Destruction Permit.
3. All turbine localities and linear development routes will be reassessed during micro-environmental assessment (including an archaeological and heritage component) preceding construction impact.

- **CENTRAL CLUSTER:**

Six sites (Sites 2.1-2.6):

1. Five sites constitute Colonial Period resources (Sites 2.1; 2.2; 2.4; 2.5 and 2.6) including farmsteads, structures and a cemetery. None of the Colonial Period sites will be negatively impacted on by the proposed development.
2. Site 2.3 comprise of a significant ESA and MSA Stone Age site. It was recommended that the site be either formally conserved or mitigated prior to development impact (Phase 2 Archaeological Mitigation) (Van Ryneveld 2010a; 2010c). The developer has opted for formal conservation as management option and from the 2nd to 3rd development design measures were taken to avoid development impact in the vicinity of the site.
3. All turbine localities and linear development routes will be reassessed during micro-environmental assessment (including an archaeological and heritage component) preceding construction impact.
4. Turbine localities WTG 28, 33, 36, 40, 41 and 48 are located particularly close to the archaeologically potentially sensitive vegetated dune landscape to the south of the study site. On-site archaeological monitoring is recommended at the start of construction (surface and sub-surface archaeological inspection).

- **WESTERN CLUSTER:**

Seven sites (Sites 3.1-3.7) and 2 potentially sensitive areas (Area 1 and Area 2):

1. All 7 identified sites (Sites 3.1, 3.2, 3.3, 3.4, 3.5, 3.6 and 3.7) comprise of Colonial Period resources, including farmsteads and a cemetery. None of the identified sites will be negatively impacted on by development.
2. All turbine localities and linear development routes will be reassessed during micro-environmental assessment (including an archaeological and heritage component) preceding construction impact.
3. On-site archaeological monitoring to assess surface and sub-surface sections is recommended at the start of construction in the vicinity of Area 1 (WTG 99, 123 and 124) and Area 2 (WTG 104, 105 and 112).

- **GENERAL:**

1. No intangible heritage resources or sites associated with oral history were identified, situated within the proposed *Kouga Commercial Wind Farm* study site.

2. The visual impact of the *Kouga Commercial Wind Farm* project on the cultural landscape can be described as high, permanent and non-mitigatable. However, from a cultural point of view the visual impact of the development could be seen as evidence of the natural process of 'cultural evolution', reflecting contemporary energy requirements and the emphasis on renewable energy sources. The *Kouga Commercial Wind Farm* development will also contribute, in part, to the conservation of the rural ambiance of the landscape established during the Colonial Period as it will prevent other more destructive development types from possibly taking place on the land in the future. It will allow the famers to continue to make a living from farming (which is becoming financially more challenging) due to an added income from the wind farm. Considering specifically the high sensitivity of the LSA cultural landscape along the southern Cape coast and increasing impact on and destruction of these unique, non-renewable heritage resources, the *Kouga Commercial Wind Farm* development may well prove to be the most significant conservation measure considered to date.

3. Should any archaeological or cultural heritage resources as defined and protected by the NHRA 1999 and not reported on in this report be identified during the course of development the developer should immediately cease operation in the vicinity of the find and report the site to SAHRA / an ASAPA accredited CRM archaeologist.

4. The *Kouga Commercial Wind Farm* development will not impact on any built structures. The developer is however reminded that all structures pre-dating 60 years of age are formally protected under the NHRA 1999, with an automatic blanket *Provincial Heritage Resource* status assigned to them. Any impact on, alteration to or destruction of these resources are subject to application and approval from SAHRA and has to be done under an Eastern Cape Provincial Heritage Resources Agency (EC PHRA) permit. Structures post-dating 60 years of age are not formally protected under the NHRA 1999. Impact on or destruction of such structures is not subject to SAHRA application or approval.

5. LSA archaeological sensitivity is particularly high across the general area and associated graves, customarily unmarked, may well be discovered during the course of development. Should any graves or human remains be encountered the developer should immediately alert both the police and SAHRA / an ASAPA accredited CRM archaeologist. The process associated with the identification of human remains post-dating 60 years of age are managed by the police while the process associated with human remains pre-dating 60 years of age are managed by SAHRA under the NHRA 1999 and in accordance with requirements of the Human Tissues Act, Act No 65 of 1983 (HTA 1983) and the Human Tissues Amendment Act, Act No 51 of 1989 (HTAA 1989).

Comment [LB1]: Does this paragraph refect better what you were trying to say in paragraph above? If so possibly consider reworking this one and deleting one above that to me and others is misleading and not clear.

KOUGA COMMERCIAL WIND FARM, EASTERN CAPE					
EASTERN CLUSTER, CENTRAL CLUSTER & WESTERN CLUSTER					
Map Code	*Site*	*Type / Period*	*Description*	*Co-ordinates*	*Preliminary Recommendations*
Heritage Sites					
Eastern Cluster					
1.1	Site 1.1	Colonial Period	Homestead	S34°07'51.9"; E24°49'14.3"	***In situ conservation*** *(Conservation measures in place)*
1.2	Site 1.2	Colonial Period	Cemetery	S34°07'52.1"; E24°49'24.7"	***In situ conservation*** *(Conservation measures in place)*
1.3	Site 1.3	Stone Age	ESA & MSA	S34°06'36.0"; E24°50'25.9"	***Site Destruction*** *(Site destruction without the developer having to apply for a SAHRA Site Destruction Permit)*
1.4	Site 1.4	Colonial Period	Homestead	S34°05'14.5"; E24°51'11.3"	***In situ conservation*** *(Conservation measures in place)*
1.5	Site 1.5	Colonial Period	Homestead	S34°05'13.8"; E24°51'24.2"	***In situ conservation*** *(Conservation measures in place)*
Central Cluster					
2.1	Site 2.1	Colonial Period	Homestead	S34°09'22.0"; E24°41'16.3"	***In situ conservation*** *(Conservation measures in place)*
2.2	Site 2.2	Colonial Period	Homestead	S34°09'25.0"; E24°41'24.0"	***In situ conservation*** *(Conservation measures in place)*
2.3	Site 2.3	Stone Age	ESA & MSA	S34°09'28.3"; E24°41'40.1"	***In situ conservation*** *(In situ conservation based on exclusion of Welgelegen 735/3 based on both noise modeling and archaeological and heritage sensitivity)* ***See Appendix 1 for Management Plan***
2.4	Site 2.4	Colonial Period	Homestead	S34°08'33.1"; E24°42'59.7"	***In situ conservation*** *(Conservation measures in place)*
2.5	Site 2.5	Colonial Period	Cemetery	S34°09'35.4"; E24°42'40.5"	***In situ conservation*** *(Conservation measures in place)*
2.6	Site 2.6	Colonial Period	Homestead	S34°09'08.9"; E24°44'47.3"	***In situ conservation*** *(Conservation measures in place)*
Q	Quarry	-	-	S34°08'32.4"; E24°41'57.0"	*N/A*
S	Residence	Colonial Period	Homestead	S34°09'05.7"; E24°42'27.0"	*N/A*
Western Cluster					
3.1	Site 3.1	Colonial Period	Homestead	S34°07'36.2"; E24°28'50.8"	***In situ conservation*** *(Conservation measures in place)*
3.2	Site 3.2	Colonial Period	Cemetery	S34°07'40.9"; E24°28'50.3"	***In situ conservation*** *(Conservation measures in place)*
3.3	Site 3.3	Colonial Period	Homestead	S34°07'47.6"; E24°28'21.5"	***In situ conservation*** *(Conservation measures in place)*
3.4	Site 3.4	Colonial Period	Homestead	S34°07'17.3"; E24°32'11.7"	***In situ conservation*** *(Conservation measures in place)*
3.5	Site 3.5	Colonial Period	Homestead	S34°07'28.4"; E24°32'41.2"	***In situ conservation*** *(Conservation measures in place)*
3.6	Site 3.6	Colonial Period	Workers Village	S34°07'05.9"; E24°33'59.2"	***In situ conservation*** *(Conservation measures in place)*
3.7	Site 3.7	Colonial Period	Structure	S34°07'19.8"; E24°34'12.3"	***In situ conservation*** *(Conservation measures in place)*

Table 20: Development and Phase 1 AIA assessment findings – co-ordinate details

ENVIRONMENTAL IMPACT ASSESSMENT							
Site	*Extent*	*Duration*	*Intensity*	*Probability*	*Significance*	*Status*	*Confidence*
Site 1.1	Site specific	N/A	Low	Improbable	No impact	Neutral	High
Site 1.2	Site specific	N/A	Low	Improbable	No impact	Neutral	High
Site 1.3	Site specific	Permanent	Medium	Probable	*Low to very low	Negative	High
Environmental impact significance assessment * based on recommended site destruction							
Site 1.4	Site specific	N/A	Low	Improbable	No impact	Neutral	High
Site 1.5	Site specific	N/A	Low	Improbable	No impact	Neutral	High
Site 2.1	Site specific	N/A	Low	Improbable	No impact	Neutral	High
Site 2.2	Site specific	N/A	Low	Improbable	No impact	Neutral	High
	Regional	Permanent	High	Highly probable	* High / Medium	Positive / neutral	High
Environmental impact significance assessment * based on recommended site conservation							
Site 2.4	Site specific	N/A	Low	Improbable	No impact	Neutral	High
Site 2.5	Site specific	N/A	Low	Improbable	No impact	Neutral	High
Site 2.6	Site specific	N/A	Low	Improbable	No impact	Neutral	High
Site 3.1	Site specific	N/A	Low	Improbable	No impact	Neutral	High
Site 3.2	Site specific	N/A	Low	Improbable	No impact	Neutral	High
Site 3.3	Site specific	N/A	Low	Improbable	No impact	Neutral	High
Site 3.4	Site specific	N/A	Low	Improbable	No impact	Neutral	High
Site 3.5	Site specific	N/A	Low	Improbable	No impact	Neutral	High
Site 3.6	Site specific	N/A	Low	Improbable	No impact	Neutral	High
Site 3.7	Site specific	N/A	Low	Improbable	No impact	Neutral	High

Table 21: Environmental impact significance assessment

7) REFERENCES CITED

Aitken, M.J., Stringer, C.B. & Mellars, P.A. (eds). 1993. *The origin of modern humans and the impact of chronometric dating*. Princeton: Princeton University Press

ACO UCT. 2010. Environmental Impact Assessment for three proposed nuclear power station sites and associated infrastructure – Heritage Impact Assessment (CRM report)

Anderson, G.2010. Heritage Survey of the proposed Melkhout-Oyster Bay Transmission Line (CRM report)

Arcus Gibb. 2010. *Request for Proposal to Conduct a Heritage Specialist Study on the Proposed Establishment of a Wind Farm in the Kouga Local Municipality. Ref J29090.* Unpublished documentation.

Auret, C. & Maggs, T.M.O'C 1982. *The great ship São Bento: remains from a mid-sixteenth century Portuguese wreck on the Pondoland coast*. Annals of the Natal Museum 25:1-39

Beaumont, P.B. 1973. *The ancient pigment mines of South Africa.* South African Journal of Science 69: 41-46

Binneman, J.N.F. & Beaumont, P.B. 1992. *Use-wear analysis of two Acheulean handaxes from Wonderwerk Cave, Northern Cape.* South African Field Archaeology 1:92-97

Binneman, J.N.F. 1996. *Symbolic construction of communities during the Holocene Later Stone Age in the south-eastern Cape.* Unpublished PhD thesis (WITS University).

Binneman, J.N.F. 2001. *An introduction to the Later Stone Age research project along the southeastern Cape coast.* Southern African Field Archaeology 10:75-87

Binneman, J.N.F. 2004/2005. *Archaeological research along the south-eastern Cape coast. Part 1 – Open-air shell middens.* Southern African Field Archaeology 13 & 14: 49-77

Binneman, J.N.F. 2006/2007. *Archaeological research along the south-eastern Cape coast. Part 2 – Caves and Shelters: kabeljous River Shelter 1 and associated stone tool industries.* Southern African Field Archaeology 13 & 14: 49-77

Boeyens, J.C.A. 2000. *In search of Kadishwene.* South African Archaeological Bulletin 55:3-17

Bourguignon, E. 1979. *Psychological Anthropology: An Introduction to Human Nature and Cultural Differences*. New York: Holt, Rinehart and Winston

Brauer, G. 1982. *Early anatomically modern man in Africa and the replacement of the Mediterranean and European Neanderthals.* In De Lumley, H. (ed) L'Home erectus et la place de l'homme de tautavel parmi les hominids fossils. Nice: Centre National de la Recherche Scientifique

Cann, R.L., Rickards, O. & Lum, J.K. 1994. *Mitochondrial DNA and human evolution: our one lucky mother*. Nature 325: 31-36

Campbell, A.C. 1991. *The riddle of the stone walls.* Botswana Notes and Records 23:243-249

Clarke, R.J. 1999. *A discovery of complete arm and hand of the 3.3 million year old Australopithecus skeleton from Sterkfontein.* South African Journal of Science 95:447-480

Dart, R.A. 1925. *Australopithecus africanus: the man-ape of South Africa*. Nature 115:195-199

Davenport, T.R.H. & Saunders, C. 2000. *South Africa: A modern history*. London: Macmillan

Davies, O. 1971. *Excavations at Blackburn.* South African Archaeological Bulletin 26: 165-178

Deacon, H.J. 1970. *The Acheulian occupation at Amanzi Springs, Uitenhage District, Cape Province.* Annals of the Cape Provincial Museums 8:89-189

Deacon, J. 1984. *Later Stone Age people and their descendants in southern Africa*. In Klein, R.G. (ed). Southern Africa prehistory and paleoenvironments. Rotterdam: A.A. Balkema

Deacon, H.J. & Deacon., J. 1999. *Human Beginnings in South Africa. Uncovering the Secrets of the Stone Age.* Cape Town: David Phillip Publlishers

Deacon, J. & Dowson, A.D. (eds.) *Voices from the past. /Xam Bushmen and the Bleek and Lloyd Collection.* Johannesburg: Witwatersrand University Press

Eloff, J.F. & Meyer, A. 1981. *The Greefswald sites*. In Voigt, E.A. (ed) Guide to archaeological sites in the northern and eastern Transvaal. Pretoria: South African Association of Archaeologists

Elphick, R. 1985. *Khoikhoi and the founding of white South Africa*. Johannesburg: Ravan Press

Els, H. *Akkulturasie: Teorie en Praktyk*: Pretoria: University of Pretoria Press

Evers, T.M. 1980. *Klingbeil Early Iron Age sites, Lydenburg, Eastern Transvaal, South Africa.* South African Archaeological Bulletin 35:46-57

Feeley, .M. 1987. *The early farmers of Transkei, southern Africa, before AD 1870.* Oxford: British Archaeology Reports

Foley, R.A & Lahr, M.M. 1997. *Mode 3 technologies and the evolution of modern humans.* Cambridge Archaeological Journal 7:3-36

Goodwin A.J.H. & van Riet Lowe, C. 1929. *The Stone Age cultures of South Africa*. Annals of the South African Museum 27:1-289

Hall, M. & Maggs, T.M.O'C. 1979. *Nqabeni: a later Iron Age site in Zululand*. South African Archaeological Society Goodwin Series 3:159-176

Holland, H. 2010. *Visual Impact Assessment (VIA): The Kouga Commercial Wind Farm, Eastern Cape* (Unpublished report).

Huffman, T.N. 1980. *Ceramics, classification and Iron Age entities.* African Studies 39:123-174

Huffman, T.N. 1989. *Ceramics, settlements and late Iron Age migrations*. African Archaeological Review 7: 155-182

Huffman, T.N. 1986. *Iron Age settlement patterns and the origin of class distinction in southern Africa.* Advances in World Archaeology 5:291-338

Huffman, T.N. 1994. Toteng pottery and the origins of Bambata. Southern African Field Archaeology 3:3-9

Huffman, T.N. 1998. *The antiquity of lobola.* South African Archaeological Bulletin 53:57-62

James, P.E. & Martin, S. 1981. *All possible worlds: A history of geographical ideas*. New York: John Wiley and Sons

Keyser, A., Menter, C.G., Moggi-Cheggi, J., Pickering T.R, & Berger, L.R. 2000. *Drimolen: A new hominid bearing site in Gauteng, South Africa*. South African Journal of Science 96:193-197

Klapwijk, M. 1974. *A preliminary report on pottery from the north-eastern Transvaal, South Africa*. South African Archaeological Bulletin 29:19-23

Klein, R.G. 1999. *The human career: human biological and cultural origins.* Chicago: University of Chicago Press

Kuman, K, Field, A.S. & Thackeray, J.F. 1997. *Discovery of new artefacts at Kromdraai.* South African Journal of Science 93: 187-193

Kuper, A. 1980. *Symbolic dimensions of the southern Bantu homestead*. Africa 1:8-23

Leakey, M.G., Feibel, C.S., McDougall, I & Walker, A.C. 1995. *New four-million-year-old hominid species from Kanopi and Allia Bay, Kenya.* Nature 376:565-57 1

Lewis-Williams, D. & Dowson, T. 1999. *Images of Power. Understanding San Rock Art*. Halfway House: Southern Book Ppublishers

Maggs, T.M.O'C. 1976. *Iron Age communities of the southern Highveld.* Pietermaritzburg: Natal Museum

Maggs, T.M.O'C. 1992. *'My father's hammer never ceased its' song day and night': the Zulu ferrous metalworking industry*. Natal Museum Journal of Humanities 4:65-87

Maggs, T.M.O'C. 1994. *The Early Iron Age in the extreme south: some patterns and problems*. Azania 29/30:171-178

Mellars, P.A. & Stringer, C.B. (eds). The human revolution: behavioural and biological perspectives on the origins of modern humans. Edinburgh: Edinburgh University Press

Miller, D.E. 1996. *The Tsodilo jewellery: metal work from northern Botswana*. Cape Town: University of Cape Town Press

Milton, J. 1983. *The Edges of War. A history of Frontier Wars (1702-1878)*. Kenwyn: Juta & Co.

Mitchell, P. 2002. *The archaeology of southern Africa*. Cambridge: Cambridge University Press

Meyer, A. 1988. *N kultuurhistories interpretasie van die Ystertydperk in die Nasionale Krugerwildtuin*. Phd thesis, University of Pretoria

Meyer, A. 1998. *The archaeological sites of Greefswald.* Pretoria: University of Pretoria Press

More, C. 2000. *Understanding the Industrial Revolution*. London: Routledge

Mote, F.W. 1991. *China in the Age of Columbus.* In Levenson, J.A. (ed) Circa 1492: Art in the Age of Exploration. New Haven: Yale University Press

Nillsen, P.J.N. 2006. *Unpublished interim report on Phase 2 archaeological investigations at the St. Francis Lake Golf course.* (CRM report for citation only)

Nitecki, M.H. & Nitecki, D.V. (eds). 1994. *Origins of anatomically modern humans.* New York: Plenum

Noble, W & Davidson, I. 1996. *Human evolution, language and mind: a psychological and archaeological enquiry*. Cambridge: Cambridge University Press

Nogwaza, T. 1994. *Early Iron Age pottery from Canasta Place, East London district.* South African Field Archaeology 3:103-106

Pakenham, T. 1993. *The Illustrated Boer War*. Parklands: Jonathan Ball Publishers.

Prins, F.E. & Graigner, J.E. 1993. *Early farming communities in northern Transkei: the evidence from Ntsitsana and adjacent areas*. Natal Museum Journal of Humanities 5:153-174

Phillipson, D.W. 1977. *The later prehistory of eastern and southern Africa*. London: Heineman

Prinsloo, H. P. 1974. *Early Iron Age site at Klein Afrika near Wyliespoort, Soutpansberg mountains, South Africa.* South African Journal of science 70:27 1-273

Prinsloo, H.P. 1989. *Vroe Ystertydperk terreine in die Soutpansberg.* M.A. Thesis, Universiy of Pretoria

Punnell, S. 2006. *Reconciling Nature and Culture in a Global Context: Lessons from the World heritage List.* Cairns: James Cook University

Rightmire, G.P. 1976. *Relationships of Middle and Upper Pleistocene hominids from sub-Saharan Africa.* Nature 260:238-240

Robey, T.S. 1980. *Mpanbanyoni, a Late Iron Age site on the Natal south coast.* Annals of the Natal Museum 24:147-164

SAHRA ARC. 2010. *Review Comment on Archaeological Impact Assessment.* (SAHRA File nr 9/2/044/0001)

Sauer, C. 1925. *The Morphology of Landscape*. University of California Publication on Geography 22:19-53

Sibley, C.G. & Ahlquist, J.E. 1884. *The phylogeny of the hominid primates as indicated by DNA-DNA hybridization.* Journal of molecular evolution 20:2-15

Smith, A.K. 1970. *The struggle for the control of southern Mozambique* 1720-1835. Ossa 63-96

South African Government. (No. 107) of 1998. National Environmental Management Act.

South African Government. (No. 62) of 2008. *National Environmental Management Second Amendment Act.*

South African Government. (No. 25) of 1999. National Heritage Resource Act.

South African Heritage Resources Agency. 2007. Minimum standards for the archaeological and heritage components of impact assessments. Unpublished guidelines.

Stringer, C.B. 1985. *Middle Pleistocene hominid variability and the origin of Late Pleistocene humans.* In Delson, E. (ed) Ancestors: the hard evidence. New York: Alan Liss

Tobias, P.V. 2000. *The fossil hominids.* In Partridge, T.C. & Maud, R,R. The Cenozoic of southern Africa. Oxford: Oxford University Press

UNESCO, 2005. Operational Guidelines for the Implementation *of the World heritage Convention.* UNESCO World Heritage Centre, Paris

Van Schalkwyk, L. 2009a. Final Draft Report: Heritage Impact Assessment of Thuyspunt nuclear 400kv Integration Project: Northern Corridor, Cape St. Francis / Uitenhage / Port Elizabeth, Eastern Cape Province, South Africa (CRM report)

Van Schalkwyk, L. 2009b. Final Draft Report: Heritage Impact Assessment of Thuyspunt nuclear 400kv Integration Project: Southern Corridor, Cape St. Francis / Port Elizabeth, Eastern Cape Province, South Africa (CRM report)

Van Willigen, J. 1986. *Applied Anthropology.* New York: Bergin and Garvey Publishers

Volman T.P. 1984. *Early prehistory of southern Africa*. In Klein, R.G. Southen Africa Prehsitory and palaeoenvironments. Rotterdam: A.A. Balkema

Vrba, E.S. 1992. *Mammals as a key to evolutionary theory*. Journal of Mammology 73:1-28

Webley, L. 2003. *St. Francis Bay proposed beach remediation – Phase 1 Heritage Impact Assessment* (CRM report)

Webley, L. 2006a. *Phase 1 Heritage Impact Assessment: Portion 2 of the Farm Osbosch 707, St. Francis Bay.* (CRM report)

Webley, L. 2006b. *Phase 1 Archaeological Impact Assessment along the St. Francis Bay beach.* (CRM report)

White, T.D., Suwa, G. & Asfaw, B. 1994. *Australopithecus ramidus: a new species of early hominid from Aramis, Ethiopia*. Nature 371:306-312

Whitelaw, G. 1991. *Precolonial Iron production around Durban and in southern KwaZulu-Natal*. Natal Museum Journal of Humanities 3:29-39

Whitelaw, G. & Moon, M. 1996. The distribution and ceramics of pioneer agriculturists in KwaZulu-Natal, natal Museum Journal of Humanities 8:53-79

Wilson, M. & Thompson, L. (eds) 2969. *Oxford history of South Africa.* Oxford: Oxford University Press

Wright, J.B. 1995. *Political transformations in the Thukela-Mzimkhulu region in the late eighteenth and early nineteenth centuries*. In Hamilton, C. The *Mfecane* aftermath: Reconstructive debates in southern African history. Johannesburg: Witwatersrand University Press

APPENDIX 1

CULTURAL HERITAGE SITE MANAGEMENT

ARCHAEOMAPS ARCHAOLOGICAL CONSULTANCY
TEL: 043 740 2370; FAX: 086 515 6848; CELL: 084 871 1064; POSTNET SUITE 239, PRIVATE BAG X3, BEACON BAY 5205

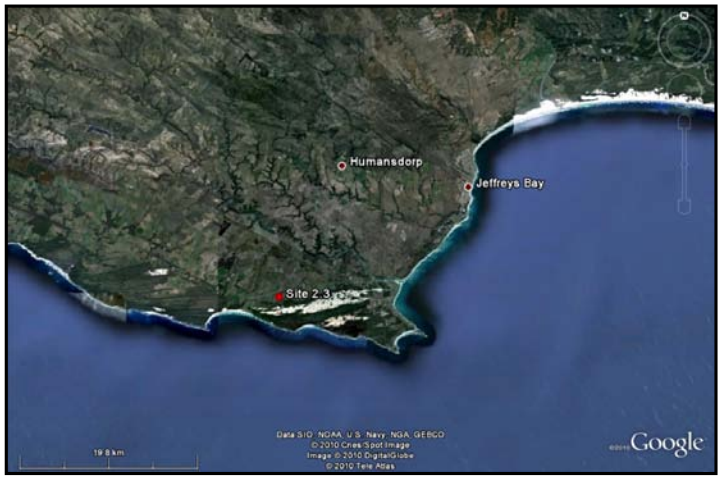
SECTION A – SITE DETAILS

SITE NUMBER	: Site 2.3, Welgelegen 735/3, Kouga Local Municipality, Eastern Cape
NATIONAL SITE NUMBER	: (To be assigned)
SITE NAME	: N/A
ALTERNATIVE NAME	: N/A
HERITAGE STATUS	: No formal heritage status
SITE SIGNIFICANCE	: SAHRA High Significance – Generally Protected A Field Rating
SITE TYPE / PERIOD	: Archaeological – Stone Age – Earlier (ESA) & Middle (MSA) Stone Age
SITE DESCRIPTION	: Open air site of approximately 1km x 300m with ESA & MSA lithic artefacts found on exposed dune landscape

SECTION B – SITE LOCATION

CO-ORDINATES	: S34°09'28.3"; E24°41'40.1
RECORDING DEVICE	: GPS – GPSmap 60CSx, Datum – WGS84
1:50,000 MAP REF	: 3424BA
CITY / TOWN / FARM NAME	: Welgelegen 735/3
MUNICIPAL AREA	: Kouga Local Municipality
PROVINCE	: Eastern Cape
RECORDER	: Karen van Ryneveld (ArchaeoMaps)
RECORDING DOCUMENT	: '*Phase 1 Archaeological Impact Assessment – Establishment of a Commercial Wind Farm, Kouga Local Municipality, Eastern Cape, South Africa*'
RECORDING DATE	: 2010-09-20

SECTION C – SITE LOCATION MAP



SECTION D – SITE DESCRIPTION

SITE 2.3, WELGELEGEN 735/3:

Site 2.3 (S34°09'28.3"; E24°41'40.1") is characterized by highly significant Earlier and Middle Stone Age (ESA & MSA) deposits scattered across exposed dunes. Recorded surface site extent covers approximately 1x0.3km in extent running roughly parallel to contemporary beach dunes more or less 1.5km south of the site. Actual site extent may well extend beyond the perimeter of the recorded surface exposure; in situ artefact context along with a recorded stratigraphic sequence will significantly aid in furthering our understanding of ESA and MSA use of the seashore as palaeo-landscape and palaeo-environmental changes having resulted in the shifting shoreline, associated with anthropic adaptation to the constantly changing environment. In situ sections may still be present south-east of the recorded site extent; farming impact unfortunately encroaches on the northern and south-western portions of possible in situ sections and may have already impacted on the site. Significant ESA and MSA deposits slightly further into the interior than the known Later Stone Age (LSA) sites often reported on along the dune landscape of the coastline are of particular importance.

Both ESA and MSA artefacts are of high technological quality and represented by significant artefact ratios despite the evident secondary context of the surface exposure. The assemblage can preliminary be dated to between 2Mya-150kya. The Acheulean phase of the ESA is represented by handaxes and cleavers as typical ESA *fossiles directeurs*. Technological and typological high quality flakes and blades represent re-use of the area during MSA times. Exposed artefacts are evidently in a fairly disturbed secondary context: ESA and MSA types are scattered across the dunes and small erosion and stream beds of the site. Both wind and water erosion is inferred major post depositional site agents that affected the original artefact context. Assignation of a general artefact ratio (artefacts: m^2) is thus particularly difficult: Disturbed artefact clusters yielded artefact ratios approximating 8:1 but at other parts of the site ratios of ≤1:5 were recorded.

The primary raw material used for artefact production is sandstone. A small sandstone outcrops on site may have been used for sourcing raw material but poor quality of the outcrops may imply that another source must have been present in the past or alternatively that artefacts were imported to the area, implying that the site represent an 'activity' site rather than a 'knapping' site. The hypothesis of an 'activity' rather than a 'knapping' site may be supported by the lack of knapping *debitage* on site, but it may also be the mere result of on-site post depositional process, including specifically water erosion.

- **RECOMMENDATIONS:** *The Site 2.3 Earlier and Middle Stone Age (ESA & MSA) site represents a heritage site as defined and protected under the NHRA 1999. Technological and typological high quality artefacts, fairly high artefact ratio and site locality (palaeo-dune terrain with reference to palaeo-environmental change and cultural adaptation) are important site characteristics. The site can preliminary be dated to between 2Mya-150kya: Site 2.3 is ascribed a SAHRA HIGH SIGNIFICANCE and a GENERALLY PROTECTED A FIELD RATING. It is recommended that development in the vicinity of Site 2.3 be preceded by Phase 2 archaeological mitigation; alternatively that the site be formally conserved.*

*Extract from Van Ryneveld, K, 2010a 'Phase 1 Archaeological Impact Assessment – Establishment of a Commercial Wind Farm, Kouga Local Municipality, Eastern Cape, South Africa' pp34-39

Based on a number of EIA recommendations, including Phase 1 AIA findings, an amended development design confirms the exclusion of Welgelegen 735/3 from the proposed study site. Site 2.3 will thus be conserved; but within the confines of a private landowner acting as legal custodian of the site.

SECTION E – SITE MAP

Phase 1 AIA assessment findings (Sites 1.1-1.5) in relation to the Eastern Cluster study site

SECTION F – CULTURAL CONTEXT: HISTORY & INTERPRETATION

The property Welgelegen 735/3, Kouga Local Municipality, Eastern Cape, has been in ownership of the Strydom family since 1912 (Pers. comm: J.D.W. Strydom). The property has been used for cattle farming purposes, including a degree of agricultural development for pasture land over an extensive period of time. At the time of the assessment pasture fields encroached on Site 2.3 and may have impacted on sub-surface portions thereof. In addition dune vegetation covers portions of the recorded site extent; clearing of vegetation for pasture fields may have impacted on the site, site extent may originally have exceeded the current surface exposure. In general, however, surface extent of the site is closely associated with the exposed dune landscape, the most characteristic landscape marker on which lithic artefacts were encountered. At present a gravel farm road cross cuts the Site 2.3 area, constituting the total of farming impact on the site.

The current landowner, J.D.W. Strydom, was unaware of the fact that the exposed dunes comprises of a legally protected heritage resource; no attempts has thus been made by the landowner to gather information with regards to the history and interpretation of the site. The site has by implication also not been reported to SAHRA.

The Phase 1 AIA report prepared for the Kouga Commercial Wind Farm represents the first recording, site description and interpretation of Site 2.3.

SECTION G – RECORDS & PUBLICATIONS

1. Van Ryneveld, K. 2010. *Phase 1 Archaeological Impact Assessment – Establishment of a Commercial Wind Farm, Kouga Local Municipality, Eastern Cape, South Africa.* (Arcus Gibb Engineering & Science)

SECTION H – GENERAL CONTEXT

1) NATURAL ENVIRONMENT:
Site 2.3 is located on the property Welgelegen 735/3, an operational cattle farm. The site is surrounded by virgin land and agricultural fields with known LSA sensitive dune landscapes situated approximately 1km to the south of the site.

2) SOCIAL ENVIRONMENT:
The site is situated on private property.

3) ECONOMIC ENVIRONMENT:
Welgelegen 735/3 on which Site 2.3 is situated has been excluded from the proposed Kouga Commercial Wind Farm development. The only economic activity that will be applicable to site conservation is continued farming activities.

4) ACCESSIBILITY:
Access to the site is to be arranged directly with the landowner.

5) ACCESS ROADS:
Welgelegen 735/3 is accessible via the main Humansdorp / Oyster Bay gravel road. Access to Site 2.3 is via an internal farm gravel access road.

SECTION I – SITE SIGNIFICANCE

Cultural value	**X**	**Social value**		**Historic value**		**Scientific value**	**X**	**Aesthetic value**	

SITE SIGNIFICANCE ASSESSMENT:

- **RECOMMENDATIONS:** *The Site 2.3 Earlier and Middle Stone Age (ESA & MSA) site represents a heritage site as defined and protected under the NHRA 1999. Technological and typological high quality artefacts, fairly high artefact ratio and site locality (palaeo-dune terrain with reference to palaeo-environmental change and cultural adaptation) are important site characteristics. The site can preliminary be dated to between 2Mya-150kya: Site 2.3 is ascribed a SAHRA HIGH SIGNIFICANCE and a GENERALLY PROTECTED A FIELD RATING. It is recommended that development in the vicinity of Site 2.3 be preceded by Phase 2 archaeological mitigation; alternatively that the site be formally conserved.*

*Extract from Van Ryneveld, K, 2010 'Phase 1 Archaeological Impact Assessment – Establishment of a Commercial Wind Farm, Kouga Local Municipality, Eastern Cape, South Africa' pp34-39

SECTION J – PHOTOGRAPHIC DOCUMENTATION

 General site photo - 1	 General site photo - 2
 General site photo - 3	 General site photo – 4
 General site photo - 5	 General site photo – 6
 General site photo - 7	 General site photo - 8
 General site photo - 9	 General site photo - 10

SECTION J (CONTINUE)

Artefacts - 1

Artefacts - 2

Artefacts - 3

Artefacts – 4

Artefacts - 5

Artefacts – 6

Artefacts - 7

Artefacts – 8

Artefacts - 9

Artefacts – 10

SECTION K – SITE MANAGEMENT & UTILIZATION HISTORY

SITE MANAGEMENT:
The Site 2.3 area, Welgelegen 735/3 was not known to represent an archaeological Stone Age site – No site management procedures has been in place to date.

SITE UTILIZATION:
Site 2.3 is situated amidst pasture fields but at present not utilized aside from a gravel farm road running through the site. The access road is used by the landowner for farming purposes only.

SECTION L – DEVELOPMENT

1.1) DEVELOPER:
The Kouga Commercial Wind Farm project proponent, Red Cap Investments (Pty) Ltd, proposed to include Welgelegen 735/3 as component part of the development's greater study site. EIA findings, specifically including results of the Phase 1 AIA, managed by the appointed Environmental Consultant, Arcus Gibb Engineering & Science, resulted in the total of the property being excluded from the study site. Site 2.3 will by implication be managed by the landowner, J.D.W. Strydom, as legal site custodian, following principles of in-situ conservation.

1.2) PROPOSED DEVELOPMENT:
In-situ conservation.

1.3) PURPOSE OF DEVELOPMENT:
Original development proposed withdrawn – No development.

- **Construction Details**
  N/A
- **Safety Regulations**
  N/A
- **Materials**
  N/A
- **Specialists & Labor**
  N/A
- **Impact on Site**
  An existing gravel access road extends across the site. The landowner will continue to use the access road for farming purposes.
- **Permits & Permissions**
  1. Any additional impact on the site by the landowner is subject to application and approval from SAHRA.
  2. Any proposal for excavation or research at the site is subject to approval of a SAHRA Site Excavation Permit (permit requirements include approval for access to the site by the landowner).
- **Site information**
  Open-air Earlier (ESA) and Middle Stone Age (MSA) site.
- **Maintenance**
  In-situ conservation.

SECTION M – DEVELOPMENT MAP & SKETCHES

N/A: See Section E – Site Map. The property Welgelegen 735/3 has been excluded from the original Red Cap Investments (Pty) Ltd study site for the proposed Kouga Commercial Wind Farm. Two sites identified through the Phase 1 AIA for the project are affected, including Site 2.2 (Historical Period Residence) and Site 2.3 (ESA & MSA Stone Age site). Exclusion of Welgelegen 735/3 affects proposed development of turbine localities 309, 310 & 311 and the associated linear development connecting the turbines. No development will take place on Welgelegen 735/3; Site 2.3 will be conserved in-situ.

SECTION N – MANAGEMENT / ADMINISTRATION

1) MANAGEMENT COMMITTEE:

- **Date & Place of Management Committee Formation**
  No formal management committee. Welgelegen 735/3 has been excluded from the proposed Kouga Commercial Wind Farm study site: Management of the site, by default, becomes / remains the responsibility of the landowner, J.D.W. Strydom, as legal site custodian.
- **Composition of Management Committee and Responsibilities**
  N/A

1.1) **Contact Person** : J.D.W. Strydom [See 2) Land owner / property manager]
Tel / Cell : N/A
Fax : N/A
E-mail : N/A
Postal Address : N/A
Physical Address : N/A

1.2) **Committee Members** (N/A)

- Name :
  Capacity :
  Contact details :
- Name :
  Capacity :
  Contact Details :
- Name :
  Capacity :
  Contact Details :
- Name :
  Capacity :
  Contact Details :
- Name :
  Capacity :
  Contact Details :
- Name :
  Capacity :
  Contact Details :
- Name :
  Capacity :
  Contact Details :
- Name :
  Capacity :
  Contact Details :

2) LAND OWNER / PROPERTY MANAGER:

Land Owner : J.D.W. Strydom
Property Manager : N/A
Contact Person : N/A
Capacity : Landowner
Tel / Cell : 042 295 1487 / 084 511 4434
Fax : 042 295 1487
E-mail : N/A

SECTION O – SITE MANAGEMENT

1) MANAGEMENT OUTLINE:

1) Management requirements to be reported to J.D.W. Strydom by Arcus Gibb as component part and outcome of the EIA for the proposed Kouga Commercial Wind Farm development.
2) Basic management requirements by J.D.W. Strydom as described in 4.1) Management.
3) Management requirements and reports to be made by J.D.W. Strydom directly to the relevant heritage authority / South African Heritage Resources Agency (SAHRA APM Unit).

2) STAFF:

- **Personnel & Duties**
  J.D.W. Strydom: In situ management of Site 2.3, Welgelegen 735/3 in accordance with SAHRA requirements as outlined in this management plan.
- **Qualifications & Training**
  N/A
- **Basic Contractual Agreements**
  N/A

3) GENERAL:

- **Buildings / Facilities / Infrastructure - Management & Maintenance:**
  N/A
- **Communication**
  J.D.W. Strydom - Communication of basic heritage site status and conservation requirements to staff and individuals / scientists requesting access to the site.
  - Communication regarding site conservation to the relevant heritage authority.
- **Safety**
  N/A
- **Waste, Ablution & Sewerage**
  N/A

4) TOURISM:

- **Site Custodians / Guides**
  Site Custodian: J.D.W. Strydom (Landowner)
- **Visitor Monitoring**
  J.D.W. Strydom
- **Information**
  N/A
- **Reporting**
  J.D.W. Strydom

4.1) Management –

In-situ site management based on legal custodianship of landowner J.D.W. Strydom. No development will impact on the site aside from continued use of the existing gravel farm road. Monitoring and management of Site 2.3 is to be the sole responsibility of J.D.W. Strydom. Any alteration or impact on the site is to be reported by him. Any requests for excavation or further research to also be approved by J.D.W. Strydom in accordance with SAHRA permit requirements. SAHRA (South African Heritage Resources Agency) remains the government authority responsible for managing all cultural heritage resources formally protected under the NHRA 1999 (National Heritage Resources Act, No 25 of 1999) as State property.

4.2) Heritage Authority –

SAHRA APM UNIT (South African Heritage Resources Agency – Archaeology, Palaeontology and Meteorites Unit)

Contact Person:	Nnonofo Ndobochani (Head of Department); or Mariagrazia Galimberti (SAHRA APM Unit – Eastern Cape)
Tel:	021 462 4505
Fax:	021 462 4509
Postal address:	P.O. Box 4637, Cape Town, 8000
E-mail:	mgalimberti@sahra.org.za

SECTION P – ON SITE INFORMATION

1) INTERPRETATION CENTRE: COMMUNICATION DESIGN / DISPLAYS:
N/A

2) ON SITE: COMMMUNICATION DESIGN / DISPLAYS:
N/A

3) GENERAL INFORMATION (PAMPHLETS, BROCHURES ETC.):
N/A

4) GUIDED / SELF-GUIDED TOURS:
N/A

SECTION Q – MANAGEMENT IMPLEMENTATION STRATEGY

- Site 2.3, Welgelegen 735/3, Kouga Local Municipality, Eastern Cape, was identified through the '*Phase 1 Archaeological Impact Assessment – Establishment of a Commercial Wind Farm, Kouga Local Municipality, Eastern Cape, South Africa*' by ArchaeoMaps Archaeological Consultancy, 2010. The Phase 1 AIA was conducted as sub-component to the Environmental Impact Assessment (EIA) by the independent environmental consultant, Arcus Gibb Engineering & Science, for the project proponent Red Cap Investments (Pty) Ltd.
- EIA findings, specifically including results of the Phase 1 AIA, managed by Arcus Gibb Engineering & Science, resulted in the total of the property (Welgelegen 735/3) being excluded from the study site. Site 2.3 will by implication be managed by the landowner, J.D.W. Strydom, as legal site custodian, following principles of in-situ conservation.
- In situ conservation requirements are based on the conservation principle of '*as is*', implying that no alteration or impact on the site is allowed unless by prior approval from the South African Heritage Resources Agency (SAHRA), mandatory responsible for implementation of the National Heritage Resources Act, No 25 of 1999 (NHRA 1999), under which Site 2.3 is classed as an Earlier (ESA) and Middle (MSA) Stone Age open-air site, forming part of the formally protected National Estate of South Africa.
- Site conservation is based on in-situ conservation, being the responsibility of the legal custodian or landowner, Mr. J.D.W. Strydom:
    1. At present farming activities, including agricultural fields encroach on the site, but not impacting on the identified surface extent thereof. Agricultural activities will not encroach further onto the site.
    2. An existing gravel farm access road cross-cuts the surface of the site. The road is used exclusively for farming purposes by the landowner. Construction of the road precedes current legislation.
    3. It is recommended that in-situ site conservation be overseen by the landowner / legal custodian of the site, provided continued use of the access road for purposes of social / economic maintenance of the immediate environment.
        - Any additional impact on the site by the landowner is subject to application and approval from SAHRA.
        - Any proposal for excavation or research at the site is subject to approval of a SAHRA Site Excavation Permit (permit requirements include approval for access to the site by the landowner).
        - Natural impact on the site, including water or wind damage, is to be reported as soon as possible to SAHRA.

SECTION R – CONSERVATION & MANAGEMENT STRATEGY

1) SIGNIFICANCE:
Formal in-situ conservation by landowner with reports regarding site conservation to be made directly to SAHRA

2) WEAKNESSESS:
In-situ conservation may result in continuing natural degradation of the site

3) OPPORTUNITIES:
Potential for future research

4) THREATS:
Primary threat – natural impact primarily wind and water erosion
Secondary threat – possible vandalism to site

SECTION S – MANAGEMENT ADMINISTRATION

MANAGEMENT REPORT DATE: ***2010-11-01***

COMPILED FOR:

CLIENT -

Name	**:** Welgelegen 735/3
Contact person	**:** Johan Daniel Wilhelm Strydom
Tel / Cell	**:** 042 295 1487 / 084 511 4434
Fax	**:** 042 295 1487
E-mail	**:** N/A
Postal Address	**:** P.O. Box 623, Humansdorp, 6300
Physical Address	**:** Farm Welgelegen, Humansdorp District

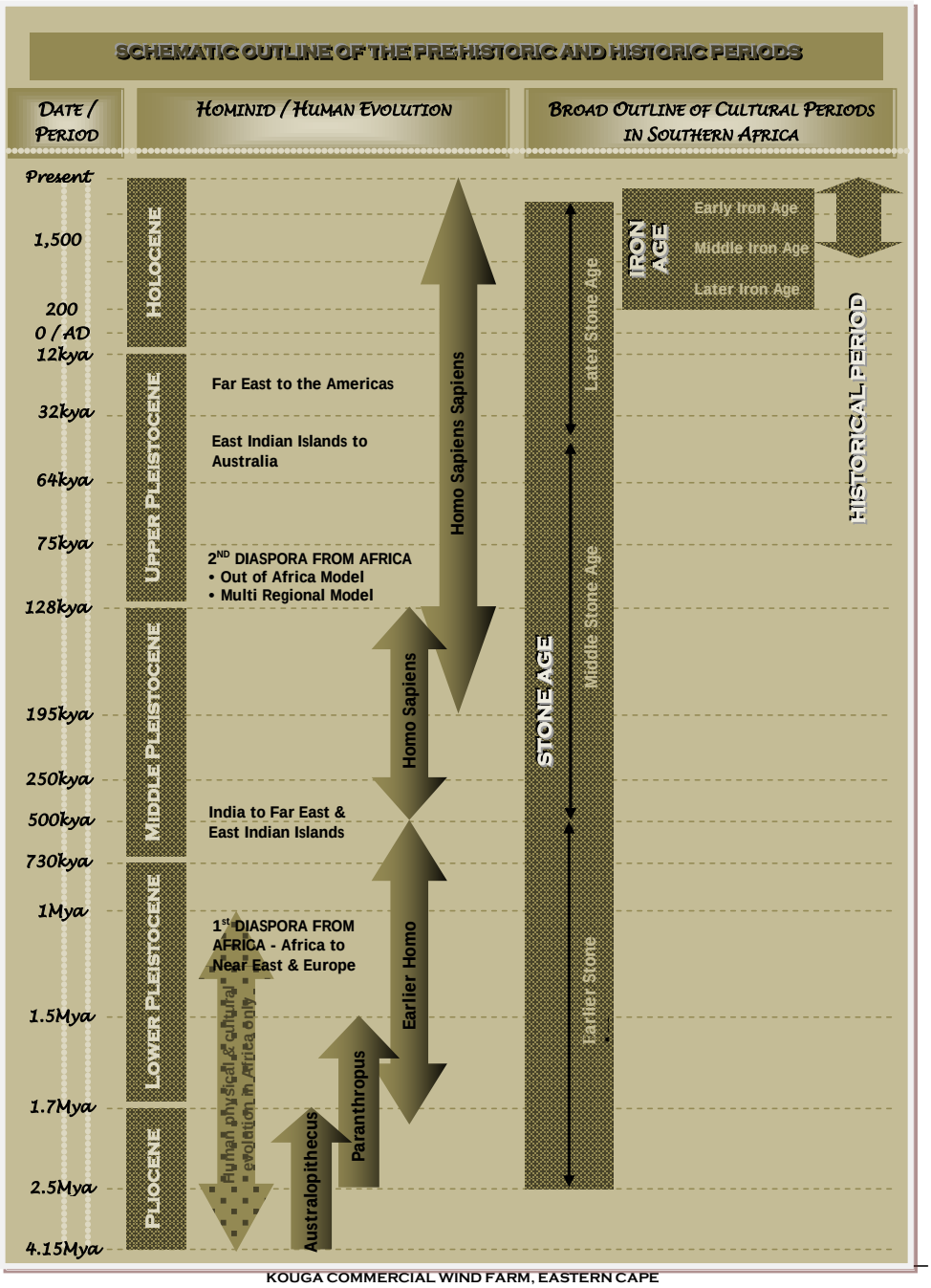
ENVIRONMENTAL CONSULTANCY -

Name	**:** Arcus Gibb Engineering & Science
Contact Person	**:** Norbert Klages
Tel / Cell	**:** 041 392 7500
Fax	**:** 041 363 9300
E-mail	**:** nklages@gibb.co.za
Postal Address	**:** P.O. Box 63703, Greenacres, 6057
Physical Address	**:** Greyville House, Cnr Greyville & Cape Rd, Greenacres, Port Elizabeth

COMPILED BY:

Name	**:** Archaeomaps Archaeological Consultancy
Contact Person	**:** Karen van Ryneveld
Tel / Cell	**:** 043 740 2370 / 084 871 1064
Fax	**:** 086 515 6848
E-mail	**:** kvanryneveld@gmail.com
Postal Address	**:** Postnet Suite 239, Private Bag X3, Beacon Bay, 5205
Physical Address	**:** 17 Jago Place, Double Delight Crs, Gonubie, East London

APPENDIX 2


SCHEMATIC OUTLINE OF THE PREHISTORIC AND HISTORIC PERIODS
DATE / PERIOD
HOMINID / HUMAN EVOLUTION
BROAD OUTLINE OF CULTURAL PERIODS IN SOUTHERN AFRICA
Present
1,500
200
0 / AD
12kya
32kya
64kya
75kya
128kya
195kya
250kya
500kya
730kya
1Mya
1.5Mya
1.7Mya
2.5Mya
4.15Mya
HOLOCENE
UPPER PLEISTOCENE
MIDDLE PLEISTOCENE
LOWER PLEISTOCENE
PLIOCENE
Far East to the Americas
East Indian Islands to Australia
2ND DIASPORA FROM AFRICA
• Out of Africa Model
• Multi Regional Model
India to Far East & East Indian Islands
1st DIASPORA FROM AFRICA - Africa to Near East & Europe
Human physical & cultural evolution in Africa only
Homo Sapiens Sapiens
Homo Sapiens
Earlier Homo
Paranthropus
Australopithecus
STONE AGE
Later Stone Age
Middle Stone Age
Earlier Stone
IRON AGE
Early Iron Age
Middle Iron Age
Later Iron Age
HISTORICAL PERIOD

APPENDIX 3

EXTRACTS FROM THE

ARCHAEOLOGICAL AND CULTURAL HERITAGE LEGISLATIVE COMPLIANCE – METHODOLOGY

Cultural property can be defined as sites having palaeontological, archaeological (pre-historic), historic, religious and unique natural values, encompassing thus both sites of anthropic and natural origin (WB OPN 11.3). These cultural resources are non-renewable and the loss thereof or damage thereto irreversible. In South Africa cultural property is protected under the National Environmnetal management Act (1998), the National Environmental Second Amendment Act (2008) and primarily governed by the National heritage Resources Act (1999). Legislation makes provision for the protection and management of cultural property through the Environmental Impact Assessment (EIA) and specifically the (heritage Impact Assessment (HIA) process, compulsory to any major development including 'the construction of a road, wall, powerline, pipeline, canal or similar form of linear development or barrier exceeding 300m in length; the construction of a bridge or similar structure exceeding 50m in length; any development or other activity which will change the character of a site including developments exceeding 00.5ha in extent; or involving three or more existing erven or subdivisions thereof; or three or more erven or subdivisions thereof which have been consolidated within the past five years and the rezoning of a site exceeding 1ha in extent.

HIA's are managed by the South African Heritage Resources Agency (SAHRA). Limited SAHRA functions are divulged to provincial level and managed by the particular proviinces' Provincial heritage Resources Agency (PHRA's).

The management and evaluation of a particular development's associated HIA process and requirements is largely dependent of the heritage sensitivity of the particular project; basic guidelines are provided by SAHRA.
Any HIA's comprise essentially of 3 parts:

1) The Palaeontological Impact Assessment (PIA);
2) The Archaeological Impact Assessment (AIA); and
3) The Socio-cultural Impact Assessment (SCIA).

SAHRA accepts PIA reports authored by professional palaeontologists accredited with SAHRA (SAHRA listed)

SAHRA accepts AIA reports authored by Association of Southern African Professional Archaeologists (ASAPA) accredited Cultural Resources Management (CRM) practitioners (SAHRA listed)

Sensitivities related to living heritage sites are as a norm identified during the AIA or SCIA of a particular development. In addition to the AIA or SCIA SAHRA may request a Living Heritage Impact Assessment (LHIA)

THE BASICS OF PHASE 1 ARCHAEOLOGICAL IMPACT ASSESSMENTS

Archaeological survey or reconnaissance can be defined as the systematic process of discovery, location (and identification) of archaeological sites (Sharer & Ashmore 1979). By definition reconnaissance incorporates the investigation of old documents and photographs, maps, previous reports and publications in order to learn as much as possible about a particular area before field survey starts (McIntosch 1999). This stage of reconnaissance is often referred to as the *Pre-feasibility Assessment*.

Phase 1 Archaeological Impact Assessments (also termed surface survey or field reconnaissance) are based on visual inspection at ground level (Sharer & Ashmore 1979). Two basic approaches exist, namely total and sample coverage:

1. Total coverage, always the preferred method, aims for total coverage of the data universe. The practicality of total coverage depends largely on the methods used. Total or near total coverage has been achieved by combining ground based and aerial reconnaissance techniques. The feasibility of total coverage may be affected by time and cost constraints, unsuitable environmental or political conditions, or the reconnaissance methods chosen.
2. When total reconnaissance is not possible sample areas can be selected by means of either probabilistic methods (statistical manipulations based upon probability theory, a method only accurate within a certain tolerance range) or non-probabilistic methods (random sampling).

Defined areas are then covered systematically. Encountered sites, features and artefacts may be recorded *in situ*. Alternatively artefacts may be collected, photographically documented and left on site, or they may be removed (in South Africa under a SAHRA Collections Permit) and deposited at a relevant repository (McIntosh 1999).

Artefacts encountered in the field may comprise of stone tools or knapping debris, ceramic, porcelain, earthenware and glass sherds, mineral slag, bone, metal objects, structure remains including foundations and building material ranging from *daga* to branch and brick, occupation middens, shell middens, stock enclosure remains including vetrified dung etc. In addition human remains may be encountered in association with cultural remains. Dense concentrations of artefacts may suggest an occupation site; isolated pieces need to be considered more carefully. Encountered artefacts are preliminary classified to identify sites.

Vegetation change may also be indicative of former occupation. Variations in the color of soil and the luxuriance, line, type and number of species of vegetation may all be the result of former anthropic disturbance of the natural environment (Renfrew & Bahn 1996; Sharer & Ashmore 1979).

Located sites are labeled, with numbers running in consecutive series generally being the easiest. The purpose of labeling sites is to tie locational data with other information; physical descriptions of remains, surface collection taken, drawings, maps, photographs and future excavations (Greene 1996).

The location of encountered sites is recorded to relate new finds to their spatial setting. This can be done by a variety of technical procedures and methods, geographic Plotting Systems (GPS) being the most common method used today (McIntosch 1999). Hereafter field plots are transferred to a base map to provide a complete record of the reconnaissance. The base map often serves to represent a larger area on which overall progress can be gauged and emergent distributional patterns can be examined. Identification of and the plotting of sites further allows the archaeologist to compare anomalies noted during the *Pre-feasibility Assessment* and in making recommendations regarding future excavation or conservation (Greene 1996; Renfrew & Bahn 1996), in Cultural Resources Management (CRM) terms referred to as Phase 2 Archaeological Mitigation (excavation) or Site Management or Phase 3 Archaeological Site Development.

References:

Greene, K. 1996. Archaeology – an introduction. The history, principles and methods of modern archaeology. London: Routledge

McIntosch, J. 1999. The practical archaeologist. London: Thames and Hudson

Renfrew, C. & Bahn, P. 1996. Archaeology: Theory, methods and practice. London: Thames and Hudson

Sharer, R.J. & Ashmore, W. 1979. Fundamentals of Archaeology. California: Benjamin Cummings

APPENDIX 4

EXTRACTS FROM THE
NATIONAL HERITAGE RESOURCES ACT (No 25 of 1999)

DEFINITIONS
Section 2

In this Act, unless the context requires otherwise:

ii. "*Archaeological*" means –
- a) material remains resulting from human activity which are in a state of disuse and are in or on land and which are older than 100 years, including artefacts, human and hominid remains and artificial features and structures;
- b) rock art, being any form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and which is older than 100 years, including any area within 10 m of such representation;
- c) wrecks, being any vessel or aircraft, or any part thereof, which was wrecked in South Africa, whether on land, in the internal waters, the territorial waters or in the maritime culture zone of the Republic,… and any cargo, debris, or artefacts found or associated therewith, which is older than 60 years or which SAHRA considers to be worthy of conservation.

viii. "*Development*" means any physical intervention, excavation or action, other than those caused by natural forces, which may in the opinion of a heritage authority in any way result in a change to the nature, appearance or physical nature of a place, or influence its stability and future well-being, including –
- a) construction, alteration, demolition, removal or change of use of a place or structure at a place;
- b) carrying out any works on or over or under a place;
- c) subdivision or consolidation of land comprising, a place, including the structures or airspace of a place;
- d) constructing or putting up for display signs or hoardings;
- e) any change to the natural or existing condition or topography of land; and
- f) any removal or destruction of trees, or removal of vegetation or topsoil;

xiii. "*Grave*" means a place of interment and includes the contents, headstone or other marker of such a place, and any other structure on or associated with such place;

xxi. "*Living heritage*" means the intangible aspects of inherited culture, and may include –
- a) cultural tradition;
- b) oral history;
- c) performance;
- d) ritual;
- e) popular memory;
- f) skills and techniques;
- g) indigenous knowledge systems; and
- h) the holistic approach to nature, society and social relationships.

xxxi. "*Palaeontological*" means any fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or trance;

xli. "*Site*" means any area of land, including land covered by water, and including any structures or objects thereon;

xliv. "*Structure*" means any building, works, device or other facility made by people and which is fixed to land, and includes any fixtures, fittings and equipment associated therewith;

NATIONAL ESTATE
Section 3

1) For the purposes of this Act, those heritage resources of South Africa which are of cultural significance or other special value for the present community and for future generations must be considered part of the national estate and fall within the sphere of operations of heritage resources authorities.

2) Without limiting the generality of subsection 1), the national estate may include –
- 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 natural features of cultural significance;
- e) geological sites of scientific or cultural importance
- f) archaeological and palaeontological sites;
- g) graves and burial grounds, including –
  - i. ancestral graves;
  - ii. royal graves and graves of traditional leaders;
  - iii. graves of victims of conflict
  - iv. graves of individuals designated by the Minister by notice in the Gazette;
  - v. historical graves and cemeteries; and
  - vi. other human remains which are not covered in terms of the Human Tissue Act, 1983 (Act No 65 of 1983)
- h) sites of significance relating to the history of slavery in South Africa;
- i) movable objects, including –
  - i. objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens;
  - ii. objects to which oral traditions are attached or which are associated with living heritage;
  - iii. ethnographic art and objects;
  - iv. military objects;
  - v. objects of decorative or fine art;
  - vi. objects of scientific or technological interest; and

vii. books, records, documents, photographic positives and negatives, graphic, film or video material or sound recordings, excluding those that are public records as defined in section 1 xiv) of the National Archives of South Africa Act, 1996 (Act No 43 of 1996).

STRUCTURES
Section 34

1) No person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority.

ARCHAEOLOGY, PALAEONTOLOGY AND METEORITES
Section 35

3) Any person who discovers archaeological or palaeontological objects or material or a meteorite in the course of development or agricultural activity must immediately report the find to the responsible heritage resources authority, or to the nearest local authority offices or museum, which must immediately notify such heritage resources authority.
4) No person may, without a permit issued by the responsible heritage resources authority –
    a) destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;
    b) destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;
    c) trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or palaeontological material or object, or any meteorite; or
    d) bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assists in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites.
5) When the responsible heritage resources authority has reasonable cause to believe that any activity or development which will destroy, damage or alter any archaeological or palaeontological site is under way, and where no application for a permit has been submitted and no heritage resources management procedure in terms of section 38 has been followed, it may –
    a) serve on the owner or occupier of the site or on the person undertaking such development an order for the development to cease immediately for such period as is specified in the order;
    b) carry out an investigation for the purpose of obtaining information on whether or not an archaeological or palaeontological site exists and whether mitigation is necessary;
    c) if mitigation is deemed by the heritage resources authority to be necessary, assist the person on whom the order has been served under paragraph a) to apply for a permit as required in subsection 4); and
    d) recover the costs of such investigation from the owner or occupier of the land on which it is believed an archaeological or palaeontological site is located or from the person proposing to undertake the development if no application for a permit is received within two weeks of the order being served.
6) The responsible heritage resources authority may, after consultation with the owner of the land on which an archaeological or palaeontological site or meteorite is situated, serve a notice on the owner or any other controlling authority, to prevent activities within a specified distance from such site or meteorite.

BURIAL GROUNDS AND GRAVES
Section 36

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

HERITAGE RESOURCES MANAGEMENT
Section 38

1) Subject to the provisions of subsections 7), 8) and 9), any person who intends to undertake a development categorised as –
    a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length;
    b) the construction of a bridge or similar structure exceeding 50 m in length;
    c) any development or other activity which will change the character of a site –
        i. exceeding 5 000 m² in extent; or
        ii. involving three or more existing erven or subdivisions thereof; or
        iii. involving three or more erven or subdivisions thereof which have been consolidated within the past five years; or
        iv. the costs which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;
    d) the rezoning of a site exceeding 10 000 m² in extent; or
    e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority,

    must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.
2) The responsible heritage resources authority must, within 14 days of receipt of a notification in terms of subsection 1) –
    a) if there is reason to believe that heritage resources will be affected by such development, notify the person who intends to undertake the development to submit an impact assessment report. Such report must be compiled at the cost of the person proposing the development, by a person or persons approved by the responsible heritage resources authority with relevant qualifications and experience and professional standing in heritage resources management; or
    b) notify the person concerned that this section does not apply.
3) The responsible heritage resources authority must specify the information to be provided in a report required in terms of subsection 2a) …
4) The report must be considered timeously by the responsible heritage resources authority which must, after consultation with the person proposing the development decide –
    a) whether or not the development may proceed;
    b) any limitations or conditions to be applied to the development;
    c) what general protections in terms of this Act apply, and what formal protections may be applied, to such heritage resources;
    d) whether compensatory action is required in respect of any heritage resources damaged or destroyed as a result of the development; and
    e) whether the appointment of specialists is required as a condition of approval of the proposal.

APPOINTMENT AND POWERS OF HERITAGE INSPECTORS
Section 50

7) Subject to the provision of any other law, a heritage inspector or any other person authorised by a heritage resources authority in writing, may at all reasonable times enter upon any land or premises for the purpose of inspecting any heritage resource protected in terms of the provisions of this Act, or any other property in respect of which the heritage resources authority is exercising its functions and powers in terms of this Act, and may take photographs, make measurements and sketches and use any other means of recording information necessary for the purposes of this Act.
8) A heritage inspector may at any time inspect work being done under a permit issued in terms of this Act and may for that purpose at all reasonable times enter any place protected in terms of this Act.
9) Where a heritage inspector has reasonable grounds to suspect that an offence in terms of this Act has been, is being, or is about to be committed, the heritage inspector may with such assistance as he or she thinks necessary –
    a) enter and search any place, premises, vehicle, vessel or craft, and for that purpose stop and detain any vehicle, vessel or craft, in or on which the heritage inspector believes, on reasonable grounds, there is evidence related to that offence;
    b) confiscate and detain any heritage resource or evidence concerned with the commission of the offence pending any further order from the responsible heritage resources authority; and
    c) take such action as is reasonably necessary to prevent the commission of an offence in terms of this Act.
10) A heritage inspector may, if there is reason to believe that any work is being done or any action is being taken in contravention of this Act or the conditions of a permit issued in terms of this Act, order the immediate cessation of such work or action pending any further order from the responsible heritage resources authority.