Phase 1 Archaeological & Cultural Heritage Impact Assessment –

The Dassiesridge Wind Energy Facility (WEF),
between Kirkwood and Uitenhage, Cacadu District, Eastern Cape, South Africa

- 15 September 2014 -

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Specialist Declaration of Interest

I, Karen van Ryneveld (Company – ArchaeoMaps; Qualification – MSc Archaeology), declare that:

- I am suitably qualified and accredited to act as independent specialist in this application;
- I do not have any financial or personal interest in the application, its’ proponent or any subsidiaries, aside from fair remuneration for specialist services rendered; and
- That work conducted has been done in an objective manner – and that any circumstances that may have compromised objectivity have been reported on transparently.

Signature – 15 September 2014
Phase 1 Archaeological & Cultural Heritage Impact Assessment –

The Dassiesridge Wind Energy Facility (WEF),

between Kirkwood and Uitenhage, Cacadu District, Eastern Cape, South Africa

Executive Summary

Terms of Reference -

CES have been appointed as independent EAP by the project proponent, InnoWind, to manage the application for EA to the DEA, including the SR, EIA and EMPr for the proposed Dassiesridge WEF, to be situated at general development co-ordinate S33°35'29.2"; E25°30'18.5" between Kirkwood and Uitenhage in the Cacadu District of the Eastern Cape, South Africa.

The proposed Dassiesridge WEF will form part of the DoE 2010 IPP procurement programme, aiming to ensure that RE targets of 17.8GW are apportioned to the national grid by 2030.

The Dassiesridge WEF development will be situated on an approximate 7,300ha study site, with development expected to directly impact on roughly 2% of the study site. Development will entail the construction of between 42 and 47 wind turbines and associated internal infrastructure (access roads, power lines, substation, construction compound, batching plant and operations building) to generate a power output of 140MW. An approximate 18km power line will connect the development to the Eskom grid.

ArchaeoMaps was appointed by CES to conduct the Phase 1 AIA as specialist component to the development’s HIA, with findings and recommendations thereof to be included in the EIA and EMPr.

The Phase 1 Archaeological Impact Assessment -

Project Area: Dassiesridge WEF (app. 7,300ha area – impact on app. 2% of study site), between Kirkwood and Uitenhage, Cacadu District, EC [1:50,000 Map Ref – 3325CB and 3325DA].

Coverage & Gap Analysis: App. 60 wind turbine localities and associated internal infrastructure (including access roads, power lines etc.), 4 substation localities and app. 18km external power line route.

Field Methodology: Six day field assessment; GPS co-ordinates – Garmin GPSmap 62s; Photographic documentation – Pentax K20D. Site significance assessment – SAHRA 2007 system.

Summary:

<table>
<thead>
<tr>
<th>Map Code</th>
<th>Site</th>
<th>Co-ordinates</th>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dassiesridge WEF study site</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N/A</td>
<td>Low density Stone Age occurrence(s)</td>
<td>N/A</td>
<td>Monitoring after vegetation clearing AND Monitoring of open trench sections of internal power lines</td>
</tr>
<tr>
<td>N/A</td>
<td>Colonial Period / Contemporary farming infrastructure</td>
<td>N/A</td>
<td>(In event of impact, list to be kept by developer for inclusion in ECO / heritage monitoring report)</td>
</tr>
<tr>
<td>DR-S1</td>
<td>Colonial Period – Farmstead remains</td>
<td>S33°36'09.1&quot;; E25°26'38.0&quot;</td>
<td>Temporary conservation measures AND Permanent sign posting</td>
</tr>
<tr>
<td>DR-S2</td>
<td>Colonial Period – Farmstead</td>
<td>S33°35'37.7&quot;; E25°29'45.6&quot;</td>
<td>Permanent conservation measures AND Permanent sign posting (EC PHRA Built Environment Permit – In event of alteration / amendments to structure for purposes of development)</td>
</tr>
</tbody>
</table>

Substations and Power Lines

<table>
<thead>
<tr>
<th>Map Code</th>
<th>Site</th>
<th>Co-ordinates</th>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>Low density Stone Age occurrence(s)</td>
<td>N/A</td>
<td>Monitoring after vegetation clearing</td>
</tr>
</tbody>
</table>

Recommendations –

With reference to archaeological and cultural heritage compliance, as per the requirements of the NHRA 1999, it is recommended that the proposed Dassiesridge WEF, between Kirkwood and Uitenhage, Cacadu District, Eastern Cape, proceeds provided the developer comply with the above listed recommendations, together with any additional requirements, constraints or particulars that may be imposed on the development by the EC PHRA.
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Coastal & Environmental Services (CES) have been appointed as independent Environmental Assessment Practitioner (EAP) by the project proponent, InnoWind (Pty) Ltd (InnoWind), to manage the application for Environmental Authorization (EA) to the Department of Environmental Affairs (DEA), including the Scoping (SR), Environmental Impact Assessment (EIA) and Environmental Management Plan Reports (EMPr) for the proposed Dassiesridge Wind Energy Facility (WEF), to be situated at general development co-ordinate S33°35'29.2”; E25°30’18.5” between Kirkwood and Uitenhage in the Cacadu District of the Eastern Cape, South Africa.

The proposed Dassiesridge WEF will form part of the Department of Energy’s (DoE) 2010 Independent Power Producer (IPP) procurement programme, aiming to ensure that Renewable Energy (RE) targets of 17.8GW are apportioned to the national grid by 2030. The Dassiesridge WEF development will be situated on an approximate 7,300ha study site, with development expected to directly impact on roughly 2% of the study site. Development will entail the construction of between 42 and 47 wind turbines and associated internal infrastructure (access roads, power lines, substation, construction compound, batching plant and operations building) to generate a power output of 140MW. An approximate 18km power line will connect the development to the Eskom grid.

ArchaeoMaps was appointed by CES to conduct the Phase 1 Archaeological & Cultural Heritage Impact Assessment (AIA) as specialist component to the development’s Heritage Impact Assessment (HIA), with findings and recommendations thereof to be included in the EIA and EMPr.

1.1.1) Development Location, Details and Impact

The proposed Dassiesridge WEF development will be situated at general development co-ordinate S33°35’29.2”; E25°30’18.5”, more or less 21km south south-east of Kirkwood, 21km west south-west of Addo and 22km north north-east of Uitenhage in the Cacadu District of the Eastern Cape, South Africa [1:50,000 Map Ref – 3325CB & 3325DA].

The proposed study site comprises of 11 farms / farm portions (farms 3/190, RE/2/189, 3/189, RE/189, 4/189, 5/189, 188, 187, 14/233, 15/233 and 4/233) amounting to an approximate 7,300ha area, with development expected to impact directly on roughly 2% thereof. Final development layout may well include an access road across Portion of Farm 185. General topography of the area is characterised by undulating plains and small river valleys (CES 2014a).

InnoWind is, according to the current development layout, intending to construct between 42 and 47 wind turbines, each with the capacity to generate approximately 3.3MW, on selected of the assessed 60 proposed turbine localities, including associated internal infrastructure (access roads, power lines, substation, construction compound, batching plant and operations building) to generate a power output of 140MW. Wind turbine hub height and rotor blade length are still to be verified and will depend on technical assessment of wind data. Basic infrastructure associated with the development includes (CES 2014a):

1. Concrete foundations to support the wind towers;
2. Approximately 6m wide internal access roads to each turbine;
3. Underground cables connecting each turbine to the other and to the mini substation;
4. A building to house the control instrumentation and interconnecting elements, as well as a storeroom for maintenance equipment; and
5. An on-site mini substation(s) to facilitate interconnection of the Dassiesridge WEF with the Eskom grid (including an approximate 18km external power line).

In addition to the structural and infrastructural development aspects, the Dassiesridge WEF application will include all relevant sub-division and rezoning applications.
InnoWind is a subsidiary of the French company EDF Energies Nouvelles, a market leader in green energy production, focussing mainly on wind energy generation, with a portfolio of 5,525MW of installed capacity worldwide. The proposed Dassiesridge WEF will form part of the South African government’s DoE 2010 IPP procurement programme, aiming to ensure that RE targets of 17.8GW are apportioned to the national grid by 2030. The proposed Dassiesridge WEF is expected to contribute 140MW to the national grid (CES 2014a).
Map 1: General locality of the proposed Dassiesridge WEF, between Kirkwood and Uitenhage, Cacadu District, Eastern Cape
Map 2: The Dassiesridge WEF – Turbine localities in relation to farms / farm portions
**Phase 1 AIA**

The Dassiesridge Wind Energy Facility (WEF), between Kirkwood and Uitenhage, Cacadu District, EC, SA

Coastal & Environmental Services - CES

**Map 3:** Current development layout of the Dassiesridge WEF including turbine localities, internal access roads and power lines and the external power line alignments
Phase 1 AIA – The Dassiesridge Wind Energy Facility (WEF), between Kirkwood and Uitenhage, Cacadu District, EC, SA

Map 4: Locality of the Dassiesridge WEF – 1:50,000 Map Ref – 3325CB & 3325DA
2 - The Phase 1 Archaeological & Cultural Heritage Impact Assessment

2.1.1) Archaeological & Cultural Heritage Legislative Compliance

The Phase 1 Archaeological and Cultural Heritage Impact Assessment (AIA) for the proposed Dassiesridge Wind Energy Facility (WEF), between Kirkwood and Uitenhage, Cacadu District, Eastern Cape, was requested by the Eastern Cape Provincial Heritage Resources Authority (EC PHRA) as specialist component to the development’s Heritage Impact Assessment (HIA), in terms of the National Heritage Resources Act, No 25 of 1999 (NHRA 1999), with specific reference to Section 38.

The Phase 1 AIA 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 basic cultural landscapes or viewscapes as defined and protected by the NHRA 1999, that may be affected by the development.

This report comprises a Phase 1 AIA, including a basic pre-feasibility study and field assessment with comments on the affected cultural landscape and cumulative impact of the development on archaeological and cultural heritage resources.

Additional relevant legislation pertaining to the Phase 1 AIA is listed as:
- National Environmental Management Act, No 107 of 1998 (NEMA 1998) and associated Regulations (2010);

2.1.2) Methodology & Gap Analysis

The Phase 1 AIA includes a basic pre-feasibility study and field assessment:
- The pre-feasibility assessment is based on the Appendix 1 introductory archaeological literature. In addition the SAHRA 2009 Mapping Project Database (MPD), SAHRIS and the SAHRA Database on Declared Provincial Heritage Sites – Eastern Cape and Port Elizabeth, were consulted. The study excludes consultation of the Albany Museum, the SAHRA accredited Data Recording Centre (DRC) for the Eastern Cape region’s database.

- The field assessment was done over a 6 day period (2014-08-25 to 09-01). The assessment was done by vehicle and foot and limited to a Phase 1 surface survey, focusing on proposed turbine localities and associated linear infrastructure alignments – field assessment findings does not represent an all-inclusive record of the cumulative 7,300ha study site. GPS co-ordinates were taken with a Garmin GPSmap 62s (Datum: WGS84). Photographic documentation was done with a Pentax K20D camera. A combination of Garmap and Google Earth software was used in the display of spatial information.

- Comments on the cultural landscape and cumulative impact of the development on archaeological and cultural heritage resources were done with reference to the SAHRA (2007) guidelines and in accordance with the DEAT (2004) Cumulative Effects Assessment guidelines in order to provide an interpretive background for decision making on both a project based and regional scale.

- Archaeological and cultural heritage site significance assessment and associated mitigation recommendations were done according to the system prescribed by SAHRA (2007).
### Assessor Accreditation

The Phase 1 AIA was conducted by Karen van Ryneveld (ArchaeoMaps):

- Qualification: MSc Archaeology (2003) WITS University.
- Accreditation: Association of Southern African Professional Archaeologists (ASAPA) accredited Cultural Resources Management (CRM) practitioner [member nr – 163]
  1. 2004 – Association of Southern African Professional Archaeologists (ASAPA) – Professional Member.

Karen van Ryneveld is a SAHRA / AMAFA / EC PHRA / HWC listed CRM archaeologist.

Karen has been involved in CRM archaeology since 2003 and has been the author (including selected co-authored reports) of more than 300 Phase 1 AIA studies. Phase 1 AIA work is centered in South Africa, focusing on the Northern and Eastern Cape provinces and the Free State. She has also conducted Phase 1 work in Botswana (2006/2007). In 2007 she started ArchaeoMaps, an independent archaeological consultancy. In 2010 she was awarded ASAPA CRM Principle Investigator (PI) status based on large scale Phase 2 Stone Age mitigation work (De Beers Consolidated Mines – Rootipoort, Northern Cape – 2008/2009) and has also been involved in a number of other Phase 2 projects including Stone Age, Shell Middens, Grave / Cemetery projects and Iron Age sites.

In addition to CRM archaeology she has been involved in research, including the international collaborations at Maloney’s Kloof and Grootkloof, Ghaap plateau, Northern Cape (2005/2006). Archaeological compliance experience includes her position as Head of the Archaeology, Palaeontology and Meteorites (APM) Unit at AMAFA aKwa-Zulu Natali (2004).

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**Table 1:** SAHRA archaeological and cultural heritage site significance assessment ratings and associated mitigation recommendations

<table>
<thead>
<tr>
<th>Site Significance</th>
<th>Field Rating</th>
<th>Grade</th>
<th>Recommended Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Significance</td>
<td>National Significance</td>
<td>Grade I</td>
<td>Site conservation / Site development</td>
</tr>
<tr>
<td>High Significance</td>
<td>Provincial Significance</td>
<td>Grade II</td>
<td>Site conservation / Site development</td>
</tr>
<tr>
<td>High Significance</td>
<td>Local Significance</td>
<td>Grade III-A</td>
<td>Site conservation or extensive mitigation prior to development / destruction</td>
</tr>
<tr>
<td>High Significance</td>
<td>Grade III-B</td>
<td>Site conservation or extensive mitigation prior to development / destruction</td>
<td></td>
</tr>
<tr>
<td>High / Medium Significance</td>
<td>Generally Protected A</td>
<td>Grade IV-A</td>
<td>Site conservation or mitigation prior to development / destruction</td>
</tr>
<tr>
<td>Medium Significance</td>
<td>Generally Protected B</td>
<td>Grade IV-B</td>
<td>Site conservation or mitigation / test excavation / systematic sampling / monitoring prior to or during development / destruction</td>
</tr>
<tr>
<td>Low Significance</td>
<td>Generally Protected C</td>
<td>Grade IV-C</td>
<td>On-site sampling, monitoring or no archaeological mitigation required prior to or during development / destruction</td>
</tr>
</tbody>
</table>

Pre-feasibility Assessment
Based on the basic introductory literature assessment of South African archaeology (see Appendix - A) the probability of archaeological and cultural heritage sites within the proposed Dassiesridge Wind Energy Facility (WEF) study site, between Kirkwood and Uitenhage, Cacadu District, Eastern Cape, can briefly be described as:

1. Early Hominin: Probability – None

2. Stone Age
   a. ESA: Probability – Low-Medium
   b. MSA: Probability – Medium-High
   c. LSA
      i. Rock Art: Probability – None-Low
      ii. Shell Middens: Probability – None

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 – Medium (Human remains expected to be primarily associated with formal cemeteries)
   b. Iron Age / Colonial Period Contact: Probability – None-Low
   c. Industrial Revolution: Probability – Low

2.2.1) The SAHRA 2009 MPD & SAHRIS

A fair number of archaeological Cultural Resources Management (CRM) projects are recorded in the SAHRA 2009 Mapping Project Database (MPD) and situated within an approximate 30km radius from the Dassiesridge WEF study site, listed as:


Complimentary to the above a number of additional archaeological CRM studies are available on SAHRIS, the majority of which post-dates compilation of the SAHRA 2009 MPD, reflecting on increasing development in the area and serving to further describe the greater receiving cultural environment of the Dassiesridge WEF within a rough approximate 30km radius area:


Binneman, J. (ECHC). 2012a. A Phase 1 Archaeological Impact assessment of the Proposed Expansion of the Existing Agricultural Activities on Riverbend Citrus Farm, Remainder of Farm 82 Wolwe Kop, Portion 1 of Farm 77 Wellshaven and Portion 3 of Farm 77 Honeyvale, near Addo, Sundays River Valley Municipality, Eastern Cape Province.


Rossouw, L. (Paleo Field Services). 2013a. Phase 1 Heritage impact Assessment of Disco Chicks Farm 2 (Farm 713), Sundays River Valley Municipality.


Of the archaeological CRM documentation available on SAHRIS, the Grassridge WEF study by Booth (2012), with its study site situated immediately adjacent to the Dassiesridge WEF is directly applicable, referenced as:


### 2.2.2) SAHRA Provincial Heritage Site Database – Eastern Cape

![Map 5: Spatial distribution of declared Provincial Heritage Sites in relation to the Dassiesridge WEF study site](image)

Geo-referenced declared Provincial Heritage Sites, recorded in the SAHRA – Eastern Cape database, situated within an approximate 30km radius from the proposed Dassiesridge WEF study site are clustered in the town of Uitenhage, with a single site in the Kirkwood area. No geo-referenced declared Provincial Heritage Sites, recorded in the SAHRA – Port Elizabeth database are situated within the approximate 30km radius from the proposed Dassiesridge WEF site (en.wikipedia.org/wiki/List_of_heritage_sites_in_Eastern_Cape).


**Table 2: Declared Provincial Heritage Sites in relation to the Dassiesridge WEF study site**

<table>
<thead>
<tr>
<th>Map Ref</th>
<th>Identifier</th>
<th>Site Name</th>
<th>Town</th>
<th>NHRA status</th>
<th>Coordinates</th>
</tr>
</thead>
<tbody>
<tr>
<td>BE-EC145</td>
<td>9/2/051/0003</td>
<td>The Look Out, Kirkwood District [Portion of land with raised brick platform and an enclosed area with a few graves. Erected by Sir Percy Fitzpatrick (author of Jock in the Bushveld) to get a better view of the countryside below the hill.]</td>
<td>Kirkwood</td>
<td>Provincial Site</td>
<td>S33°25′45″; E25°26′10″*</td>
</tr>
<tr>
<td>BE-EC191</td>
<td>9/2/095/0004</td>
<td>Dutch Reformed Church Hall, 112 Caledon Street, Uitenhage [Designed in 1818, completed only in 1843. Served as Dutch Reformed Church until it became a church hall in 1927.]</td>
<td>Uitenhage</td>
<td>Provincial Site</td>
<td>S33°45′59″; E25°23′59″*</td>
</tr>
<tr>
<td>BE-EC192</td>
<td>9/2/095/0005</td>
<td>Muir College Boys' Primary School, Park Avenue, Uitenhage</td>
<td>Uitenhage</td>
<td>Provincial Site</td>
<td>S33°45′46″; E25°23′58″*</td>
</tr>
<tr>
<td>BE-EC193</td>
<td>9/2/095/0006</td>
<td>Old Magistrate’s Court, Caledon Street, Uitenhage [Type site: Courthouse.]</td>
<td>Uitenhage</td>
<td>Provincial Site</td>
<td>S33°45′59″; E25°23′59″*</td>
</tr>
<tr>
<td>BE-EC194</td>
<td>9/2/095/0007</td>
<td>Scheepers House, 11/13 Cuyler Street, Uitenhage</td>
<td>Uitenhage</td>
<td>Provincial Site</td>
<td>S33°45′55″; E25°23′38″*</td>
</tr>
<tr>
<td>BE-EC195</td>
<td>9/2/095/0008</td>
<td>34 Cuyler Street, Uitenhage</td>
<td>Uitenhage</td>
<td>Provincial Site</td>
<td>S33°45′55″; 25°23′33″*</td>
</tr>
<tr>
<td>BE-EC197</td>
<td>9/2/095/0011</td>
<td>Old Drostdy, 50 Caledon Street, Uitenhage [Designer – M. L. Thibault, well-known architect. Construction started in 1804, completed in 1810.]</td>
<td>Uitenhage</td>
<td>Provincial Site</td>
<td>S33°46′10″; E25°24′15″*</td>
</tr>
<tr>
<td>BE-EC198</td>
<td>9/2/095/0012</td>
<td>Town Hall, 25 Market Street, Uitenhage</td>
<td>Uitenhage</td>
<td>Provincial Site</td>
<td>S33°46′08″; S25°24′00″E</td>
</tr>
<tr>
<td>BE-EC199</td>
<td>9/2/095/0013</td>
<td>Old Railway Station, Market Street, Uitenhage [Erected in 1875 - original terminus building of one of the earliest railway lines in South Africa.]</td>
<td>Uitenhage</td>
<td>Provincial Site</td>
<td>S33°46′13″; S25°35′36″E</td>
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<tr>
<td>BE-EC200</td>
<td>9/2/095/0014</td>
<td>Blenheim House, 4 Baird Street, Uitenhage [Architecturally vastly altered in the hands of the Dolley family, since its’ conversion into a double-storeyed house, 1903. Originally built in 1815 as residence of Government Surveyor, Mr. Knoble.]</td>
<td>Uitenhage</td>
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<td>23 Cuyler Street, Uitenhage</td>
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<tr>
<td>BE-EC203</td>
<td>9/2/095/0017</td>
<td>Cuyler Manor, Uitenhage District [Cape Dutch homestead erected in 1814 by Col. Jacob Glen Cuyler, landdrost of Uitenhage. Col. Cuyler was closely associated with the settlement of the British Settlers of 1826.]</td>
<td>Uitenhage</td>
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<tr>
<td>BE-EC204</td>
<td>9/2/095/0024</td>
<td>Farmstead, Totteridge Park, near Perseverance, Uitenhage District</td>
<td>Uitenhage</td>
<td>Provincial Site</td>
<td>S33°48′24″; E25°31′00″*</td>
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### 2.2.3) General Discussion

From the archaeological CRM reports listed and consulted it is evident that wide-spread low density Stone Age surface occurrences are common across the landscape. The majority of identified surface deposits are ascribed to the Middle Stone Age (MSA); found in varying low densities, often in poor contexts and produced from a range of local raw material sources. Report recommendations routinely include archaeological monitoring, but the lack of reported on Phase 2 monitoring results prohibits any further interpretation of this evident MSA presence on the landscape. Documentation relating to the Earlier Stone Age (ESA) is noticeably scarcer: Webley (2003a) reported on a possible ESA handaxe, associated mainly with an MSA assemblage, while ESA, MSA and Later Stone Age (LSA) lithic artefacts from a secondary context were reported on from Zone 8 of the Coega IDZ (Almond et. al. 2013). The primary ESA and MSA site from the region thus remains the Amanzi Springs site, excavated in the 1960’s and associated with well-preserved organic material. Following in the footsteps of the 1960’s...
research at Amanzi Springs. WITS excavation permits at the Penhill Farms may well in time serve to further our understanding of the ESA and MSA of the wider area. Reported on LSA material is often directly associated with the MSA, again more than often from ex-situ contexts. Closer to the coastline LSA shell midden sites seem fairly common and including fresh water shell midden sites along the banks of the Sundays and Coega (Koega) Rivers (Almond et. al. 2013; Binneman 2010b; Rossouw 2013b), but these are as a norm found only within the 5km coastal sensitive zone, and even then clustered closer towards the coastline. Archaeological evidence from the Suurberg Mountains towards the north of Addo populates the record, including excavated and dated (circa 1,500AD) LSA hunter-gatherer (San) cave deposits, a wealth of Rock Paintings as well as pastoralist (Khoe) influx: The Iqua, Damasqua and Gonaqua are known to have been active in the area (Rossouw 2013a).

The Dassiesridge WEF study site is situated well south of the southern-most known extent of the Early Iron Age (EIA), in the general vicinity of East London (Nogwaza 1994), while the Eastern Cape is exempt from Middle Iron Age (MIA) distribution (Huffman 2007). To date there is only 1 record of a Later Iron Age (LIA) site, associated with an informal cemetery, from the general Uitenhage area (Van Ryneveld 2011). Colonial Period resources seem more ample with a complex of historical buildings reported on by Binneman (2010a) and further Colonial Period structures recorded by Van Ryneveld (2011, 2012a). However, it is Webley’s (2008b) assessment of the Amanzi Estate that most prominently highlights the significance of the Colonial Period heritage. Included in the record is a homestead build in 1909, the ruins of a 19th Century Victorian Spa, which became the home of Sir Percy Fitzpatrick, author of ‘Jock of the Bushveld’ (1913), the 19th Century Nixon Citrus packing shed, key in the early establishment and development of the citrus industry (1920’s), the miniature Balmoral Castle and 2 cemeteries. Three additional cemeteries and an informal graveyard were also reported on by Bennie (2010).

During the early 19th Century the Sundays River demarcated the eastern boundary of the Cape Colony, with the general area around Kirkwood consequently the scene of many an armed conflict: Khoe against Xhosa, Khoe and Xhosa against the Boers and Boers and British against each other. It was Sir John Francis Cradock, Governor of the Cape Colony, who awarded the 1st farms in the Sundays River Valley to the successful leaders of his commandos (Border Wars: 1811 and 1812). District Magistrate Jacob Glen Cuyler was awarded the farm Geelhoutboom (Dunbrody), near Uitenhage. The town itself was founded in 1804 and named after the Cape Commissioner-General, Jacob Abraham Uitenhage de Mist and declared a municipality in 1877. Commandant Ignatius Muller was awarded the farm Klaaskraal, just outside Kirkwood and Field Cornet J.S. Van Niekerk received Gouvernements Belooning, the property on which Kirkwood was to be established many years later (en.wikipedia.org/wiki/Kirkwood,_Eastern_Cape; en.wikipedia.org/wiki/Uitenhage).

In 1877 James Somers Kirkwood arrived in the area and soon thereafter purchased Gouvernements Belooning with the vision to transform the land into irrigated citrus orchards, with produce delivered via river barges to Port Elizabeth. With this in mind he established the ‘Sundays River Land and Irrigation Company’, but with no financial interest in his venture, probably the result of the Diamond Rush in Kimberley, the company was soon declared bankrupt. Kirkwood’s vision was however realized in the next century when the ‘Sundays River Irrigation Project’ was built. The town of Kirkwood was founded in 1912, and suitably so on Gouvernements Belooning (en.wikipedia.org/wiki/Kirkwood,_Eastern_Cape). The small hamlet of Addo was founded in 1931 after 680ha of land were enclosed to form the Addo Elephant National Park, The name ‘Addo’ bears reference to Khoe heritage in the area, meaning ‘euphorbia ravine’ (en.wikipedia.org/wiki/Addo).
Figure 1: CSG Record Nr 1787/1909 – Blauw Baadjies Vley No 189, dated 1890

Figure 2: CSG Record Nr B84/1869 – Grassridge No 227, dated 1869
The Dassiesridge Wind Energy Facility (WEF) will comprise of 60 wind turbines and associated internal infrastructure including access roads, power lines etc. An approximate 18km external power line will connect the Dassiesridge WEF with the Eskom grid. At present 4 substations are proposed to facilitate the Eskom connection. The proposed development layout can be spatially summarized as:

### Dassiesridge WEF: Spatial Summary of Development Aspects

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<th>Farm Name</th>
<th>Turbine nr.</th>
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Table 3: Dassiesridge WEF – Spatial summary of development aspects

Visibility across the study site varied greatly, from inaccessible thicket vegetation where assessment was literally limited to existing access tracks, often not allowing entree to development footprints, to thick surface cover providing for poor visibility, to open veld with good surface visibility. In general surface visibility increased notably from the north-west towards the south-east of the study site; but even towards the south-east thicket clusters resulted in a mosaic landscape, allowing across large sections of the Dassiesridge WEF study site, including the external power line alignments, for observations based
on accessible access tracks only. Vegetation notably hampered assessment associated with the Dassiesridge WEF layout in the vicinities of:

- Turbine line WTG01-WTG02-WTG03-WTG04;
- Turbine line WTG08-WTG06-WTG07-WTG40-WTG05;
- Turbine line WTG03/04-WTG07/39;
- Turbine line WTG16-WTG17;
- Turbine line WTG20-WTG21;
- Turbine WTG44;
- Turbine WTG46;
- Turbine WTG51; and
- Turbine WTG50.

And with reference to the proposed substations and external power line alignments, in the vicinities of:

- Substation SS1-Node SS1.1
- Substation SS2
- Substation SS2-Node SS2.1-Node SS2.2-Node SS2.3 (intermittent),
- Substation SS3-Node SS3.1-Substation SS4 (intermittent).

Field assessment results indicate a general 2-tiered cultural overlay across the land:

- **STONE AGE** – Stone Age lithic artefacts, primarily of Middle Stone Age (MSA) assignation, but including probable macrolithic Later Stone Age (LSA) tools, scattered in notably low densities across large open surface areas and in access tracks generally associated with limited visibility as a result of vegetation cover, characterise the Dassiesridge WEF study site, including access tracks along external power line alignments. These Stone Age scatters are, based on low artefact ratios (artefacts: m²), average size and the general absence of fossils directeurs (including basic MSA blade on convergent types), ascribed a SAHRA / EC PHRA Low Significance and Generally Protected C Field Rating. However, limited visibility and widespread surface occurrence remain noteworthy factors: Better surface deposits may well be identified during vegetation clearing, while the low density presence of surface lithics may be indicative of subsurface anthropogenic members or lenses.

- **COLONIAL PERIOD** – Two identified Colonial Period sites, Sites DR-S1 and DR-S2, both comprise farmstead remains, testimony to Colonial Period occupation of the area and supporting documentary evidence that farms in the general area were being registered from the early-mid 1800’s. Across the landscape continuing cultural tradition is evidenced by ongoing farming, primarily cattle and game farming, resulting in re-use of resources, and noteworthy for the purpose of this report, farming infrastructure: Re-use, repairs and low keyed upgrades fuse distinction between infrastructural remains of heritage significance (or older than 60 years) and those assigned to the contemporary period (or post-dating 60 years of age). Though it is necessary, and possible, to conserve both identified Colonial Period sites, sites of automatic SAHRA / EC PHRA High Significance and Provincial Grade II Field Ratings, within the current layout of the Dassiesridge WEF proposal, contemporary cultural overlay of farming infrastructure have diminished the associated value thereof. Despite the fact that some of the infrastructural resources may pre-date 60 years of age in origin, implying NHRA 1999 protection, the potential for identification thereof (including consultation) as well as scientific association and research value have been lost in totality.
Phase 1 AIA – The Dassiesridge Wind Energy Facility (WEF), between Kirkwood and Uitenhage, Cacadu District, EC, SA

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**Plate 1:** Access track leading the Turbine WTG20

**Plate 2:** General view of the Turbine WTG56 locality

**Plate 3:** General view of the Turbine WTG11 locality

**Plate 4:** Access track leading towards and locality of Turbine WTG04
Plate 5: View of the Turbine WTG19 locality, characterized by low densities lithic artefacts

Plate 6: General view of the Turbine WTG49 locality

Plate 7: General view of the Turbine WTG49 locality

Plate 8: General view of the Turbine WTG18 locality
Plate 9: General view of the Turbine WTG40 locality

Plate 10: General view of the Turbine WTG38 locality

Plate 11: View of Turbine line WTG25-44

Plate 12: General view of the Turbine WTG16 locality
Plate 13: General view of the Turbine WTG29 locality

Plate 14: General view of the Turbine WTG32 locality

Plate 15: General view of the Turbine 54 locality

Plate 16: General view of the Turbine WTG60 locality
Plate 17: General view of the Substation SS1 locality

Plate 18: General view of the power line alignment from Substation SS1

Plate 19: Thick vegetation hampering assessment in the vicinity of Substation SS2

Plate 20: View of the Substation SS2-SS3-SS4 power line route [1]
Phase 1 AIA – The Dassiesridge Wind Energy Facility (WEF), between Kirkwood and Uitenhage, Cacadu District, EC, SA

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Plate 21: View of the Substation SS2-SS3-SS4 power line route [2]

Plate 22: View of the Substation SS2-SS3-SS4 power line route [3]

Plate 23: General view of the Substation SS3 locality

Plate 24: General view of the Substation SS4 locality
2.3.1) Low Density Stone Age Occurrences

Gravels, regularly associated with stone outcrops or hills result in raw material scatters characterising large parts of the study site, more specifically towards the north-western part and decreasingly notably towards the south-east of the Dassiesridge WEF site, visible on cleared access tracks and in cases, towards the central and eastern part of the study site, in open veld. Infrequent Stone Age artefacts were found routinely strewn amongst raw material nodules. Artefacts encountered comprise mainly of flakes, scrapers and cores. Based principally on lithic size, and in the lack of any fossils directeurs (including basic blade and convergent types), artefacts are ascribed to the Middle Stone Age (MSA) with a few possible macro lithic Later Stone Age (LSA) pieces. Raw material sources used are local and include primarily granites and quartzites. Artefact ratios (artefacts: m²) were too low to attempt an artefact density description at any of the encountered low density occurrences and being as a norm ≤ 1-25. At present it remains impossible to closer describe occurrence surface boundaries, the direct result of thicket vegetation cover across large parts of the study site, often obscuring surface visibility in totality and resulting in general inaccessibility to areas of impact.

Despite the apparent Low Significance of the low density Stone Age occurrences across the Dassiesridge WEF study site limited visibility and widespread surface occurrence remain noteworthy factors: Better surface deposits may well be identified during vegetation clearing, while the low density presence of surface lithics may be indicative of subsurface anthropogenic members or lenses.

- **RECOMMENDATIONS**: Low density Stone Age occurrences are ascribed a SAHRA / EC PHRA Low Significance and a Generally Protected C Field Rating. Despite the ascribed Low Significance of these surface occurrences, better deposits may well be identified during vegetation clearing while the possibility of subsurface anthropogenic members or lenses cannot be excluded and archaeological monitoring at selected intervals during construction would be necessary.

**Low density Stone Age occurrences – Archaeological monitoring:**

1. Archaeological monitoring, to record the presence of possible Stone Age deposits in heavily vegetated areas, not allowing access and by implementation surface visibility at the time of the field assessment should be done at the time of vegetation clearing and reported on to the EC PHRA. Monitoring should be done in the following areas, and where deposits are identified they should be described and relevant recommendations (which may include further subsurface monitoring or Phase 2 test pitting or excavation) be made:
   - Turbine line WTG01-WTG02-WTG03-WTG04;
   - Turbine line WTG08-WTG06-WTG07-(WTG40)-WTG05;
   - Turbine line WTG03/04-WTG07/39;
   - Turbine line WTG16-WTG17;
   - Turbine line WTG20-WTG21;
   - Turbine WTG44;
   - Turbine WTG46;
   - Turbine WTG51; and
   - Turbine WTG50.

2. Subsurface monitoring, at the time when trench sections for underground cables are open, should be done along Turbine Line WTG15-WTG19-WTG23 where low density surface lithic deposits may indicate subsurface anthropogenic members or lenses. The monitoring report should be submitted to the EC PHRA and in the event of identification of significant subsurface Stone Age deposits relevant recommendations regarding suitable mitigation measures be made.
Plate 25: Stone Age artefacts from the general Turbine WTG19 area

Plate 26: Stone Age artefacts from the access track towards Turbine WTG21

Plate 27: A surface artefact from the general Turbine WTG14 area

Plate 28: Stone Age artefacts in access tracks in the WTG44 and WTG45 area
2.3.2) Colonial Period / Contemporary Farming Infrastructure

Farming infrastructure, comprising of large brick and cement or corrugated iron cladded dams, to smaller brick and cement dams, reservoirs and water troughs and feed lots are scattered across the study site. Selected of the infrastructure can reasonably be inferred to pre-date 60 years of age, though amendments, alterations and basic upkeep makes it impossible to differentiate between infrastructure older than 60 years and thus protected by the NHRA 1999 and many a contemporary infrastructural development. Due to the number of, and for the given reason, the localities of farming infrastructure were not recorded for purposes of this assessment. With the aim of the Dassiesridge WEF design layout, to ensure continued current land use, being primarily cattle and game farming, it remains priority to ensure no impact on at least farming infrastructure still in use, encompassing by far the majority of the infrastructure sites encountered during the course of the field assessment.

- **RECOMMENDATIONS:** It is recommended that, in the event of development impacting directly on any farming infrastructure, a list be kept by the developer documenting the type of infrastructure (dam, water trough etc.), co-ordinate, and photographic image and the list be submitted as part of the environmental compliance documentation to the Environmental Control Officer (ECO) / archaeologist appointed to do archaeological and cultural heritage monitoring.
Phase 1 AIA – The Dassiesridge Wind Energy Facility (WEF), between Kirkwood and Uitenhage, Cacadu District, EC, SA

Coastal & Environmental Services - CES

Plate 29: Colonial Period / Contemporary farming infrastructure [1]

Plate 30: Colonial Period / Contemporary farming infrastructure [2]

Plate 31: Colonial Period / Contemporary farming infrastructure [3]

Plate 32: Colonial Period / Contemporary farming infrastructure [4]
2.3.3) **Site DR-S1 – Colonial Period – Farmstead Remains: S33°36'09.1"; E25°26'38.0"**

Site DR-S1, the remains of a Colonial Period farmstead, is situated on the property Prentice Kraal 14/233, at least 1km from the closest turbine position (WTG20) and with the locality not in proximity to any proposed interconnecting access road or power line.

The site comprises the rectangular shaped, approximate 8x13m in size, low rising pebble and cement wall remains. Walls are still standing to more or less 40-50cm in height and indicate a 5-roomed structure, although interior mound remains suggest that more rooms were present, but with original partitions evidently of a material other than pebble and cement. Rusted metal were found on site, but in limited numbers and with no diagnostic pieces, other than basic tins or cans. The structure remains are interpreted as residential remains. Approximately 150m to the south-west of the structure, against the slope of a low rise, a series of undulations and mounds directly associated with alignments of ‘garigboom’ (*Agave sisalana*) suggests associated livestock enclosures built of natural material that have in the interim decayed, leaving the ‘garigboom’ as principle indicator of the former cultural landscape. Rusted metal were again found scattered about the site with a few pieces of earthenware complimenting the surface artefact collection; but more recent brick, metal and plastic artefacts confirms later period add-mixture.

Based on general registration records of the properties in question a rough mid 1800’s date may be ascribed to the site.

- **RECOMMENDATIONS:** The DR-S1 structure remains, being older than 60 years, receives automatic SAHRA / EC PHRA protection as a site of *High Significance* with a *Provincial Grade II Field Rating*. From a general archaeological and cultural heritage perspective, including the DR-S1 structure, livestock and associated cultural landscape remains, the site is ascribed a SAHRA / EC PHRA *Medium Significance* with a *Generally Protected B Field Rating*, with the heritage significance pertaining primarily to Colonial Period archaeology. The site will not be impacted by development – Site DR-S1 will be conserved. Formal conservation (permanent fence with access gate) is not
recommended: This will negatively affect current land-use. It is however recommended that the developer guarantees temporary conservation measures associated with permanent sign-posting to be in place in order to ensure no accidental impact on the site.

**DR-S1 – Temporary conservation measures and permanent sign-posting:**

1. A temporary fence of clearly visible construction netting should be erected along the access track bordering the site to the north. Temporary signage indicating the area as a ‘No Entry – Heritage Sensitive Zone’ should be attached at intervals along the conservation fence for the tenure of construction. All temporary conservation measures should be removed after construction.

2. The site should be permanently sign-posted, indicating at minimum that the site is formally protected by the NHRA 1999. It is preferable that the sign be placed in direct proximity to the DR-S1 structure remains. The sign should be on metal board (approximately 30x40cm in size), mounted on a metal or treated wooden pole. Signage can read as:

   | Site DR-S1 – Colonial Period Farmstead
   | Dassiesridge WEF
   | This site is protected by the National Heritage Resources Act, No 25 of 1999
Phase 1 AIA – The Dassiesridge Wind Energy Facility (WEF), between Kirkwood and Uitenhage, Cacadu District, EC, SA

Plate 33: View of the Site DR-S1 structure remains

Plate 34: Close-up of the Site DR-S1 structure remains

Plate 35: Surface metal artefacts at Site DR-S1

Plate 36: The series of undulations and mounds associated with ‘garingboom’, indicative of former livestock enclosures
**2.3.4) Site DR-S2 – Colonial Period – Farmstead: S33°35′37.7″; E25°29′45.6″**

The Site DR-S2 Colonial Period farmstead is situated on the property Gringley 188, more or less 430m from turbines WTG24 and WTG27 and approximately 600m from turbine WTG43, with the proposed WTG27-43 access road running just south of the site.

Site DR-S2 comprises a Colonial Period farmstead, including a residence and outbuilding. The main residence, in typical Karoo style, is fairly well conserved, though no longer in use: White washed walls with green corrugated iron roof typically supporting a columned roofed veranda or ‘open stoep’. A single outbuilding, with white washed walls and green corrugated iron roof, is situated to the south of the residence. Surface artefacts include rusted metal, earthenware, porcelain and glass pieces, none of which diagnostic, but recent admixture is evidenced by a number of liquor bottles, glass shards, rubber and plastic. The general area is characterized by a chunky calcrete surface within which the infrequent Stone Age lithic artefact is present. The vernacular farmstead is inferred to date to the mid 1800’s.

- **RECOMMENDATIONS:** The DR-S2 structure remains, pre-dating 60 years of age, receive automatic SAHRA / EC PHRA protection as a site of High Significance with a Provincial Grade II Field Rating. However, from a general archaeological and cultural heritage perspective the site is assigned a Medium Significance and a Generally Protected B Field Rating, with this significance pertaining specifically to the architectural value of the site. Despite close proximity of the WTG27-43 access road the site will not be impacted on by development. The site will be conserved. Due to proximity of the proposed access road to the site formal conservation (permanent fence with access gate) associated with permanent sign posting is recommended. Should use of the site be considered by the developer, such as site office, staff accommodation etc. the developer is reminded that any alteration or amendment to a structure / building older than 60 years should be done under an EC PHRA Built Environment Permit.

**DR-S2 – Permanent conservation measures and permanent sign-posting:**
1. The site should be permanently fenced with an access gate prior to development impact. Temporary signage indicating the area as a ‘No Entry – Heritage Sensitive Zone’ should be attached at intervals along the conservation fence for the tenure of construction. Temporary conservation measures should be removed after construction.

2. The site should be permanently sign-posted, indicating at minimum that the site is formally protected by the NHRA 1999. The sign should be on metal board (approximately 30x40cm in size), mounted on a metal or treated wooden pole. Signage can read as:
   - Site DR-S2 – Colonial Period Farmstead
   - Dassiesridge WEF
   - This site is protected by the National Heritage Resources Act, No 25 of 1999

3. Should the developer consider use of the site for purposes of the development the developer is reminded that any alteration or amendments to structures/buildings older than 60 years may only be done under an EC PHRA Built Environment Permit (to be applied for and issued to the developer).
Phase 1 AIA – The Dassiesridge Wind Energy Facility (WEF), between Kirkwood and Uitenhage, Cacadu District, EC, SA

Coastal & Environmental Services - CES
3 - Environmental Impact Assessment Rating

Identified archaeological and cultural heritage sites are ascribed an Environmental Impact Assessment (EIA) rating according to the CES – 2008 system (CES 2014b), based on the Temporal Scale (Short term [≤5 years] = 1; Medium term [5-20 years] = 2; Long term [20-40 years] = 3 and Permanent [40+ years] = 4), Spatial Scale (Localized [≤ a few ha] = 1; Study area [proposed site & immediate environs] = 2, Regional [District & Provincial level] = 3, National [Country level] = 3 and International [International level] = 4), Severity, which can be either positive [+] or negative [-] (Slight = 1, Moderate = 2, Severe = 3, Very severe = 4) and Likelihood (Unlikely = 1, May occur = 2, Probable = 4 and Definite = 8). Based on the above EIA significance criteria a significance point [SP] is assigned as follows:

- SP = (Temporal scale + Spatial scale + Severity + Likelihood).

A maximum of 20 SP can be assigned to an impact. Environmental Significance [S] is assigned based on the SP as follows (CES 2014b):

- 4-8 = Low [An acceptable impact for which mitigation is desirable but not essential. The impact by itself is insufficient even in combination with other low impacts to prevent the development being approved. These impacts will result in either positive or negative medium to short term effects on the social / natural environment];
- 9-12 = Moderate [An important impact which requires mitigation. The impact is insufficient in itself to prevent the implementation of the project but which in conjunction with other impacts may prevent its implementation. These impacts will usually result in either a positive or negative medium to long-term effect on the social / natural environment];
- 13-16 = High [A serious impact, if not mitigated, may prevent the implementation of the project if it is a negative impact. These impacts would be considered by society as constituting a major and usually long-term change to the social / natural environment and result in severe or beneficial effects];
- 17-20 = Very High [A very serious impact which, if negative, may be sufficient by itself to prevent implementation of the project. The impact may result in permanent change. Very often these impacts are unmitigable and usually result in very severe or very beneficial effects].

The significance of an identified impact can be either positive [+] or negative [-].

Environmental impact assessment ratings are grouped per sites with the same basic recommendation per site type or type of impact, with cognizance to the fact that impacts on heritage sites are as a norm irreversible (heritage sites are non-renewable resources) and with reference to the SAHRA (2007) prescribed mitigation options per site significance rating, weighed against development / possible natural impact.
## Environmental Significance

### Archaeological monitoring

<table>
<thead>
<tr>
<th>Site Number</th>
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<tbody>
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<td>Low Density Stone Age Occurrences</td>
<td><strong>Impact: Without Mitigation</strong></td>
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<table>
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<tr>
<th>Effect</th>
<th>Likelihood</th>
<th>Overall score [SP]</th>
<th>Significance [S]</th>
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**Impact: With Mitigation**

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<th>Effect</th>
<th>Likelihood</th>
<th>Overall score [SP]</th>
<th>Significance [S]</th>
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<tr>
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</table>

**Comment:** Low density Stone Age occurrences

**Summary of mitigation points:**

1. **Archaeological monitoring at the time of vegetation clearing at** (further recommendations to be made based on monitoring results):
   - Turbine line WTG01-WTG02-WTG03-WTG04; Turbine line WTG05-WTG07-WTG09; Turbine line WTG03/04-WTG07/09; Turbine line WTG16-WTG17; Turbine line WTG20-WTG21; Turbine WTG44; Turbine WTG46; Turbine WTG51; and Turbine WTG50.
2. **Subsurface monitoring, at the time when trench sections for underground cables are open at:**

**Table 4:** Environmental significance assessment of identified low density Stone Age occurrences

### List of impacted infrastructure to be compiled

<table>
<thead>
<tr>
<th>Site Number</th>
<th>Environmental Significance</th>
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<tr>
<td>Colonial Period / Contemporary Farming Infrastructure</td>
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<tr>
<th>Effect</th>
<th>Likelihood</th>
<th>Overall score [SP]</th>
<th>Significance [S]</th>
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<tr>
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**Impact: With Mitigation**

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<th>Effect</th>
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<tr>
<td>Short term</td>
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**Comment:** Colonial Period / contemporary farming infrastructure

**Summary of mitigation points:**

List of impacted infrastructure to be compiled

**Table 5:** Environmental significance assessment of Colonial Period / contemporary farming infrastructure
### Environmental Significance Assessment of Recorded Colonial Period Farmsteads

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<tr>
<td>Impact: With Mitigation</td>
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<tr>
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<td>Long term</td>
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</tbody>
</table>

**Comment:** Colonial Period farmstead remains

**Summary of mitigation points:**
1. **Site DR-S1:** Temporary conservation measures and permanent sign-posting
2. **Site DR-S2:** Permanent conservation measures and permanent sign-posting. (Alterations to site – EC PHRA Built Environment Unit permit).

*Table 6: Environmental significance assessment of recorded Colonial Period farmsteads*
### 4 – Cultural Landscape and Viewscape

A ‘cultural landscape’ refers to a particular geographic 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 landschaft) 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 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 culture’ 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, and often the result of socio-political pressure. Els (1992) explains 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; those 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.

#### 4.1.1) The Stone Age Cultural Landscape

The primarily Middle (MSA), but including Later Stone Age (LSA) cultural landscape of the Dassiesridge WEF can be described as an organically evolved fossil landscape least evidently shaped by humans, with little to no visual or physical impact altering the landscape itself. Extremely low recorded surface artefact ratios, vast undefined occurrence size and uncertainty thereof as a result of vegetation cover all prohibit further interpretation, but most probably pointing towards a variety of landscape use: Quarrying, or raw material sourcing, and preliminary knapping – more directly associated with surface raw material.
outcrops across hilly terrain, to process knapping and general landscape use across flats and in proximity to drainage lines and other paleo-water sources. Despite the Low Significance rating ascribed to surface observed Stone Age deposits, continued surface and subsurface monitoring during the course of construction can be reasonably inferred to contribute to our understanding of the Stone Age in the area; either confirming its current ascribed Low Significance or shedding light on more distinctive surface or subsurface deposits.

4.1.2) The Colonial Period Cultural Landscape

The Colonial Period cultural landscape of the Dassiesridge WEF can be described as an organically evolved continuing landscape least evidently shaped by humans, again with limited impact on the visual and physical landscape. Sparsely scattered Colonial Period farmstead sites, and probable associated farming infrastructure, directly linked with continuing cultural tradition date back to the rough mid 1800’s. The Dassiesridge WEF study site comprises a landscape where continuing cultural tradition remains key in the evaluation of the Colonial Period resources and associated landscape as the prime cultural layer characterizing the land. This association in turn necessitates comment on ‘cultural evolution’ with the specific aim of addressing Bourguignon (1979) question of ‘What changes are (were) necessary to make culture, as we know it, possible?’ Two highly visual impacts were necessary to allow the Colonial Period farming culture to be established: Firstly, large scale vegetation clearing, being also an integral requirement in Kirkwood’s early vision of the area becoming key in the agricultural arena of the country and secondly, Colonial Period farming infrastructure, with specific reference to wind pumps (circa, 1820-1840), having at the time been the most visual farming infrastructural impact on the landscape and marking a technological feat that opened up large parts of South Africa for economically viable farming.

* * *

Visual impact of the Dassiesridge WEF on the cultural landscape can be described as high and semi-permanent (a 20 year lease will be signed), but turbines can be dismantled, implying that visual impact on the landscape is ultimately mitigatable. However, the high visual impact of the development needs to be weighed against the significance of the identified heritage resources and the cultural landscapes they form part of: The value of the Stone Age cultural landscape lies primarily within its context, the surface, and more importantly the sub-surface context, tied directly with the temporal frame of primarily the MSA but also the LSA. Should significant Stone Age resources be identified during further surface and sub-surface monitoring, the cultural landscape significance thereof would more probably pertain to indicators or trace elements that would assist in the reconstruction of the palaeo landscape, rather than their identification or position on the contemporary landscape. While visual impact on the Colonial Period landscape forms a continuum, specifically when considering technological and economic change to ensure ‘cultural evolution’, the ‘changes necessary to make culture as we know it possible’, then the greater Dassiesridge study site forms an interesting, albeit fairly low keyed example of how changing cultural tradition is reflected in a chancing cultural landscape: From Kirkwood’s initial vision in 1877 to transform the land into irrigated orchards, to the realization thereof in the next Century, and the interim focus on livestock (cattle) farming, the mid-later 20th Century emphasis on the inclusion of, or change to game farming and the contemporary focus on the enclosure of renewable energy farming practices.
Cumulative effects can be defined as impacts which combine from different projects, resulting in significant change, which is larger than the sum of the individual impacts. Cumulative Effects Assessment (CEA) is, in South Africa, an emerging process in the field of Integrated Environmental Management (IEM). It aims to provide direction in the decision making process from a holistic point of view – through the understanding of impacts on past, present and future generations by broadening the spatial and temporal focus of Strategic Environmental Assessment (SEA) and Environmental Impact Assessment (EIA). It focusses on the consideration of long term changes, not only as the result of a single action or development, but the combined effects of many actions over time, and on the environment in order to guide the decision making process through an understanding of local, regional and global linkages (DEAT 2004). The concept of a tiered context analysis to guide the planning and decision making process is not new. Possibly in its simplest form, albeit from the field of architecture, Alvar Aalto (1873 – 1950) explained: ‘Always design a thing by considering it in its next larger context – a chair in a room, a room in a house, a house in an environment, an environment in a city plan.’

CEA can be done as a stand-alone assessment or can be incorporated in the SEA through inclusion in the EIA, with the latter approach being preferred as a result of the more applied methodology inherent therein (DEAT 2004). When CEA principles are included in the EIA level, individual aspects thereof can already be addressed on specialist assessment level. DEAT (2004) prescribes a 2-tiered context for basic analysis, namely:

- Project based; and
- Regional based.

The principles of CEA are not lost on the South African heritage compliance arena, albeit in large limited to the project based level. The SAHRA (2007) guidelines state that: ‘The legislation (NHRA 1999) require that all heritage resources, that is, all places or objects of aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance be protected. Thus any assessment should make provision for the protection of ALL these heritage components, including archaeology, shipwrecks, battlefields, graves and structures over 60 years, living heritage and the collection of oral histories, historical settlements, landscapes, geographical sites and palaeontological sites and objects.’ It continues: ‘Where possible archaeological and palaeontological sites should be saved, but where this is not possible, the loss of information about our heritage resources can be mitigated against or minimized through a process of excavation (or sampling) and dating of a representative sample of the evidence from the site. This allows us to record at least part of the history of the place.’ And ‘When a Phase 1 is part of an EIA, wider issues such as public consultation and assessment of the spatial and visual impacts of the development may be undertaken as part of the general study and may not be required from the archaeologist. If however the Phase 1 forms a major component of an HIA it will be necessary to ensure that the study addresses such issues and complies with Section 38 of the National Heritage Resources Act.’

The above describes the basic process of the SAHRA Heritage Impact Assessment (HIA), including the archaeological (AIA) and palaeontological (PIA) components thereof: Firstly as the type of sites that are protected and needs to be recorded during Phase 1 assessment, their documentation and associated relevant recommendations, either conservation or (Phase 2) mitigation and if the assessment formed a major part of the HIA for inclusion in an EIA, the need to assess the findings in a wider project based context. In practice this is often done by the cumulative description of identified impacts on the immediate receiving cultural environment: An archaeological and cultural heritage description of the impact of development on the cultural landscape and viewscape is a first tier cumulative context description; an interpretation of impact on a project based level.

Specialist input on a regional based level was requested with specific reference to proposed Wind Farm developments in the wider region: With a focus on the Grassridge WEF, situated immediately adjacent to the Dassiesridge WEF study site, south towards Port Elizabeth and the Jeffrey’s Bay / Humansdorp area, to Jansenville in the west, Somerset-East / Bedford in the north and Grahamstown in the east. Many of the proposed developments are still in a Scoping phase, some in a construction phase and with a selected few having been completed.
During the Grassridge Phase 1 AIA, and best describing the immediate greater receiving archaeological and cultural environment of the Dassiesridge WEF, Booth (2012) identified only 3 low density Middle Stone Age (MSA) lithic surface scatters, with additional Stone Age occurrences identified along access roads travelled. Recommendations included archaeological monitoring at the time of vegetation clearing and during excavation activities (very similar to the recommendations contained in this report for the Dassiesridge WEF), but with findings of the recommended archaeological monitoring not available for purposes of this report. Similarities between the recorded Low Significance Stone Age deposits at both Grassridge and at the Dassiesridge WEF supports a low cumulative impact of the proposed Dassiesridge WEF on a project based level, whilst also providing a platform for discussion and comparison with archaeological and cultural heritage findings of Wind Farm developments on a regional level. In addition the identification of 2 Colonial Period sites at the Dassiesridge WEF, both of which will be conserved and considering development time frames, including indirect recording on possible unforeseen or natural impact, ensuring reporting on the conservation thereof for a minimum 20 year period, adding a valuable though low level Colonial Period layer to the existing heritage record of the area.

Though the Phase 1 AIA report for the Coega IDZ WEF was not available for interpretation, Binneman’s (2010c) survey of the greater Coega IDZ provides for a fair interpretation of the area: A number of Earlier (ESA), MSA and Later Stone Age (LSA) sites and occurrences characterized the area with a wealth of LSA shell midden sites clustered in IDZ Zones 1, 7 and 10, along the Coega (Koega) River and the coastline and situated within the general 5km sensitive coastal zone of archaeological shell midden sites. The report highlights the change in archaeological sensitivity, type sites and paleo landscape use across the various geographic zones of the IDZ.

Along the south coast LSA shell midden sites were again identified within the 5km sensitive coastal zone: At the MetroWind WEF study site a number of shell middens were recorded during the Phase 1 AIA (Binneman & Booth 2010). Phase 2 mitigation and monitoring greatly served to further interpretation of the surface identified middens: Pre-pottery and pottery phased hunter-gatherer (San) associated middens were identified with later phased middens intersecting ephemeral pastoralist (Khoe) middens, further describing the past cultural complexity of the area; the result of scientific mitigation and analysis (Nilssen & Van Ryneveld 2012), emphasizing not only the contribution, but also the responsibility of development towards our non-renewable heritage where development may or will impact thereon.

Further along the south coast, despite proximity to the said 5km sensitive coastal zone, recorded shell middens seem to elude CRM documentation despite their known existence in accordance with publicized sites. One significant ESA, MSA and LSA site was recorded in the Central Cluster study site of the Red Cap Kouga WEF (Van Ryneveld 2010), with further reports on low density ESA and MSA occurrences recorded in the Ubuntu, Oyster Bay and Tsitsikamma assessments (Binneman 2011a, 2011b, 2011c). Limited Phase 2 monitoring and mitigation serves to clarify, at least in part, subsurface uncertainties pertaining to the Stone Age record: Adding to our interpretation of technology and typology, but more importantly that of palaeo landscape use and post-depositional processes along the south coast of the Eastern Cape (Van Ryneveld 2012b, 2013). Again the Stone Age record is overlain by a low impact, general Low Significance Colonial Period layer, directly associated with continuing landscape use, and complimented by identified Grave and Cemetery sites (Van Ryneveld 2010, 2013).

No archaeological reports are available on SAHRIS for Wind Farm developments proposed to the west of the Dassiesridge WEF, near Jansenville or further north towards Pearson.

To the north of the Dassiesridge WEF, a desktop assessment by Booth (2011a) describes the range of heritage sites that may be expected in the area. Field assessment at the Golden Valley study site (Hart 2010) confirmed the general presence of widely scattered low density MSA lithic surface material, while an ESA and a LSA site, notable for the presence of ceramics at the site, were identified. The Colonial Period landscape is characterized by ample farmstead and associated farming infrastructural remains, but with the significance thereof greatly diminished by contemporary cultural overlay, the result of continuing cultural tradition, albeit unfortunately not with the necessary cognizance to heritage resources impacted on. The 2-tiered Stone Age / Colonial Period cultural landscape identified at the Golden Valley WEF is echoed by findings of the Amakhala-Emoyeni WEF: Here Halket et. al. (2010) again recorded Pre-colonial Stone Age deposits associated with a Colonial Period layer, primarily comprising of farmstead remains. At the Cookhouse WEF Booth (2011b) reported on MSA and LSA
lithic scatters, with LSA lithics associated with surface finds designating a Colonial Period date, but without a confirmed Colonial Period layer at the site.

Towards the east of the Dassiesridge WEF study site, field assessment at the Peddie WEF (Booth 2011c) identified low density scatters of MSA surface deposits and at Waainek (Anderson 2009) isolated MSA and LSA lithic incidents were reported on, defining the direct impact of these Wind Farm developments on the recorded tangible archaeological and cultural heritage.

* * *

When considering specialist input for purposes of CEA it is, first and foremost, the location of the development that needs to be considered, with evaluation of layered specialist concerns describing and defining aspects to guide the decision making process.

- With reference to the project based cumulative impact on archaeological and cultural heritage resources for the Dassiesridge WEF, recorded low density MSA and LSA Stone Age occurrences and the 2 identified Colonial Period sites provide for a notably low cumulative impact on heritage resources. The described low project based cumulative impact is supported by the correspondingly low heritage impact of the adjacent Grassridge WEF, where construction is currently underway.

- Considering the more regional based impact on archaeological and cultural heritage resources, the locality of the Dassiesridge WEF study site, being situated more than 20km from the coastline, remain paramount; implying that no sensitive coastal archaeological resources, so often associated with intangible heritage aspects and associated cultural landscapes and viewscapes cannot be affected. The general 2-tiered Stone Age / Colonial Period landscape identified at the Dassiesridge WEF is, excluding more coastal based Wind Farms, repeated at study sites towards the east and importantly the Spitskop / Middleton / Amakhala / Golden Valley / Cookhouse WEF complex towards the north: A large WEF complex of low cumulative project and regional based significance. The very similar cultural environment at the Grassridge / Dassiesridge WEF complex will provide for an equally low cumulative project and regional based development, not only confirming the locale’s ideality, but also pointing towards the feasibility of future expansion of the Grassridge / Dassieridge WEF complex.

[Despite the described wide-spread Low Significance Stone Age surface deposits reported on in archaeological CRM reports, the general lack of monitoring and mitigation documentation remains a cause of concern. This can be ascribed to the number of approved development applications and associated varying stages thereof. But negligence to Phase 1 heritage recommendations and legislative implementation of Phase 2 compliance requirements are problematic, with the potential to result in large scale development at the loss of archaeological resources, albeit with cognizance to its identified low surface significance. Such negligence denies the most vital of the archaeological record, namely the subsurface context of deposits – exemplified by the primary method of archaeological investigation, excavation. It is imperative that even low keyed archaeological and cultural heritage recommendations be complied with in order to ensure a surface and subsurface interpretation of the impact of large scale developments.]
Map 8: Locality of the Dassiesridge WEF in relation to Wind Farm proposals and developments relevant to the Cumulative Effects Assessment (CEA)
With reference to archaeological and cultural heritage compliance, as per the requirements of the NHRA 1999, it is recommended that the proposed Dassiesridge WEF, between Kirkwood and Uitenhage, Cacadu District, Eastern Cape, proceeds provided the developer comply with the below listed recommendations, together with any additional requirements, constraints or particulars that may be imposed on the development by the EC PHRA.

Table 7: Archaeological and cultural heritage compliance summary for the proposed Dassiesridge WEF

<table>
<thead>
<tr>
<th>Map Code</th>
<th>Site</th>
<th>Co-ordinates</th>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>Low density Stone Age occurrence(s)</td>
<td>N/A</td>
<td>Monitoring after vegetation clearing 1. Turbine line W TG01-WTG02-WTG03-WTG04; 2. Turbine line W TG08-WTG06-WTG07-{WTG40}; W TG05; 3. Turbine line W TG03/04 W TG07/39; 4. Turbine line W TG01-WTG17; 5. Turbine line W TG20-WTG21; 6. Turbine W TG44; 7. Turbine W TG46; 8. Turbine W TG51; and 9. Turbine W TG50. AND Monitoring of open trench sections of internal power lines 1. Turbine line W TG15-WTG19-WTG23</td>
</tr>
<tr>
<td>N/A</td>
<td>Colonial Period / Contemporary farming infrastructure</td>
<td>N/A</td>
<td>(In event of impact, list to be kept by developer for inclusion in ECO / heritage monitoring report)</td>
</tr>
<tr>
<td>DR-S1</td>
<td>Colonial Period – Farmstead remains</td>
<td>S33°36'09.1&quot;; E25°26'38.0&quot;</td>
<td>Temporary conservation measures AND Permanent sign posting</td>
</tr>
<tr>
<td>DR-S2</td>
<td>Colonial Period – Farmstead</td>
<td>S33°35'37.7&quot;; E25°29'45.6&quot;</td>
<td>Permanent conservation measures AND Permanent sign posting (EC PHRA Built Environment Permit – In event of alteration / amendments to structure for purposes of development)</td>
</tr>
</tbody>
</table>

Substations and Power Lines

<table>
<thead>
<tr>
<th>Map Code</th>
<th>Site</th>
<th>Co-ordinates</th>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>Low density Stone Age occurrence(s)</td>
<td>N/A</td>
<td>Monitoring after vegetation clearing 1. Substation SS1 and along the SS1 power line 2. Power line along the Substations SS2-SS3-SS4 alignment</td>
</tr>
</tbody>
</table>

Notes:

- Should any archaeological or cultural heritage resources, including human remains / graves, 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 the EC PHRA / an ASAPA accredited CRM archaeologist and arrange for an archaeological site inspection. Human remains confirmed younger than 60 years are to be reported directly to the nearest police station.
- Should any registered Interested & Affected Party (I&AP) wish to be consulted in terms of Section 38(3)(e) of the NHRA 1999 (Socio-cultural consultation / SAHRA SIA) it is recommended that the developer / EAP ensures that the consultation be prioritized within the timeframe of the Environmental Impact Assessment (EIA).
### 7 - Acronyms and Abbreviations

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AD</td>
<td>Anno Domini (the year 0.)</td>
</tr>
<tr>
<td>AIA</td>
<td>Archaeological (and Cultural Heritage) Impact Assessment</td>
</tr>
<tr>
<td>AMAFA</td>
<td>Amafa aKwaZulu-Natali</td>
</tr>
<tr>
<td>ASAPA</td>
<td>Association of Southern African Professional Archaeologists</td>
</tr>
<tr>
<td>BAR</td>
<td>Basic Assessment Report</td>
</tr>
<tr>
<td>BC</td>
<td>Before the Birth of Christ (the year 0.)</td>
</tr>
<tr>
<td>BCE</td>
<td>Before the Common Era (the year 0.)</td>
</tr>
<tr>
<td>BIA</td>
<td>Basic Impact Assessment</td>
</tr>
<tr>
<td>BID</td>
<td>Background Information Document</td>
</tr>
<tr>
<td>BP</td>
<td>Before the Present (the year 1950.)</td>
</tr>
<tr>
<td>cm</td>
<td>Centimeter</td>
</tr>
<tr>
<td>CRM</td>
<td>Cultural Resources Management</td>
</tr>
<tr>
<td>DAC</td>
<td>Department of Arts and Culture</td>
</tr>
<tr>
<td>DEAT</td>
<td>Department of Environmental Affairs and Tourism</td>
</tr>
<tr>
<td>DEDEAT</td>
<td>Department of Economic Development, Environmental Affairs and Tourism</td>
</tr>
<tr>
<td>DME</td>
<td>Department of Minerals and Energy</td>
</tr>
<tr>
<td>DSA</td>
<td>Department of Sport, Arts, Culture and Recreation</td>
</tr>
<tr>
<td>ECO</td>
<td>Environmental Control Officer</td>
</tr>
<tr>
<td>EAP</td>
<td>Environmental Assessment Practitioner</td>
</tr>
<tr>
<td>EC PHRA</td>
<td>Eastern Cape Provincial Heritage Resources Authority</td>
</tr>
<tr>
<td>EIA</td>
<td>Environmental Impact Assessment</td>
</tr>
<tr>
<td>EIA₁</td>
<td>Early Iron Age</td>
</tr>
<tr>
<td>EMP</td>
<td>Environmental Management Plan report</td>
</tr>
<tr>
<td>ESA</td>
<td>Earlier Stone Age</td>
</tr>
<tr>
<td>ha</td>
<td>Hectare</td>
</tr>
<tr>
<td>HIA</td>
<td>Heritage Impact Assessment</td>
</tr>
<tr>
<td>HWC</td>
<td>Heritage Western Cape</td>
</tr>
<tr>
<td>HCMP</td>
<td>Heritage Conservation Management Plan</td>
</tr>
<tr>
<td>ICOMOS</td>
<td>International Council on Monuments and Sites</td>
</tr>
<tr>
<td>IEM</td>
<td>Integrated Environmental Management</td>
</tr>
<tr>
<td>km</td>
<td>Kilometer</td>
</tr>
<tr>
<td>Kya</td>
<td>Thousands of years ago</td>
</tr>
<tr>
<td>LIA</td>
<td>Later Iron Age</td>
</tr>
<tr>
<td>LSA</td>
<td>Later Stone Age</td>
</tr>
<tr>
<td>m</td>
<td>Meter</td>
</tr>
<tr>
<td>m²</td>
<td>Square Meter</td>
</tr>
<tr>
<td>MIA</td>
<td>Middle Iron Age</td>
</tr>
<tr>
<td>mm</td>
<td>Millimeter</td>
</tr>
<tr>
<td>MSA</td>
<td>Middle Stone Age</td>
</tr>
<tr>
<td>Mya</td>
<td>Millions of years ago</td>
</tr>
<tr>
<td>PIA</td>
<td>Palaeontological Impact Assessment</td>
</tr>
<tr>
<td>PHRA</td>
<td>Provincial Heritage Resources Authority</td>
</tr>
<tr>
<td>PSSA</td>
<td>Palaeontological Society of South Africa</td>
</tr>
<tr>
<td>PPP</td>
<td>Public Participation Process</td>
</tr>
<tr>
<td>SAHRA</td>
<td>South African Heritage Resources Agency</td>
</tr>
<tr>
<td>SAHRIS</td>
<td>South African Heritage Resources Information System</td>
</tr>
<tr>
<td>ScIA</td>
<td>Socio-cultural Impact Assessment</td>
</tr>
<tr>
<td>SIA</td>
<td>Social Impact Assessment</td>
</tr>
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</table>
8 - References


10. Binneman, J. & Booth, C. (Albany Museum). 2010. A Phase 1 Archaeological Impact Assessment (AIA) for the Proposed 20MW Wind farm on Three Alternative Sites: Erf 121, Driftsands (Site Alternative 1), Bushy Park Farm, Remainder of Erf 26, as well as Portions 5, 6 and 7 thereof (Site Alternative 2) and Rietfontein Farm, Erf 594, Van Stadens East (Site Alternative 3), Nelson Mandela Bay Municipality, Port Elizabeth, Eastern Cape Province.


Appendix A:

## Schematic Outline of the Pre-Colonial and Colonial Periods

<table>
<thead>
<tr>
<th>Date / Period</th>
<th>Hominid / Human Evolution</th>
<th>Broad Outline of Cultural Periods in Southern Africa</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix B:

Introduction to the Archaeology of South Africa
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.

1) Early Hominin Evolution

DNA studies indicates that humans and chimpanzees shared a common ancestor between 6-8Mya (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 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).

2) The Stone Age

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 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 breadth 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 fossiles directeurs (signatory artefact types), 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 lithic artefact component was supplemented by wood and other organic material (Deacon 1970).

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. 1994). 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; Henshield & Sealy 1997), while evidence from Lion Cave, Swaziland, indicates that specularite may have been mined as early as 100kya (Beaumont 1973). Evidence for symbolic behavioral activity is largely absent; no evidence for rock art or formal burial practices exists.

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 micro lithic as well as macroolithic 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 assemblages (12-8kya);
3. Holocene microlithic assemblages (8kya to the Historic 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. 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.

Rock Art

Rock Art is one of the most visible and informative components of South Africa’s archaeological record. Research into LSA ethnography (as KhoSan 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 Outpansberg 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 (anthropomorphomorphic figurines). LSA Rock Art is closely associated with spiritual or magical significance (Lewis-Williams & Dowson 1999).

Aside from LSA or KhoSan 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.

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) explain 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 quite 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) 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.

3.1) 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 Philipson’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 (250-430AD) occurring as far south as the Northern Province. The later expression or Mzoni facies (420-580AD) occurs in the Northern Province as 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 (550-650AD) people making Mzoni facies 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 & Moon 1996) and by the succession of Mzuluzi, Ndondonwane and Ntshekane in KwaZulu-Natal (7th – 10th Centuries) (Prins & Grainger 1993). Later Kalundu facies include Klingbell and Iiland 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 Mombo 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 53° (Maggs 1994); sites such as Canasta Place (800AD), Eastern Cape, mark the southern-most limit of Early Iron Age settlement (Nogwaza 1994).

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 diammatic (Huffman 1986).

A typical CCP village comprise of a central cattle enclosure (byre) where men are buried. The Kgola (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.

3.2) The Middle Iron Age

The Nactus 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 30,000km². By the 11th millennium ivory and skins were already exported overseas, with sites like Sofala and Chiibweu, Mosambique, 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 (Elloff & Meyer 1985; Meyer 1998).

Occupation was initially focused at Bambandanyalo and K2. The Bambananyalo main midden (1030-1220AD) 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 1060-1080AD, necessitating relocation of the cattle previously kept there. The re-organization of space and worldview implies 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 (1220-1290AD), yielded a deep succession of gravel floors and house debris (Elloff & 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 12th’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 (1220-1550AD), southern Africa’s best known and largest (720ha) archaeological site (Meyer 1998).

South of the Limpopo and north of the Southpansberg, Mapungubwe derived communities survived into the 16th Century, contemporary with the establishment of Sotho-speaking makers of Maloko pottery.

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 Maloko ceramic tradition seems to be ancestral to modern Sotho-Tswana speakers (Evers 1980) and from about 1,100AD 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 Transkei, include 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 1,300AD 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 dolerite 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 tons 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, Ndawandwe 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 Ndawandwe dominance. In consequence one of Dingiswayo’s former tributaries, Shakaland, established often forceful alliances with chiefdoms further south. Shaka’s Zulu dominated coalition resisted the Ndawandwe 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).

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 1997).

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 (Ephrick 1885).

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 1960’s the Colony’s frontier was too long to be effectively policed by VOC officials (Ephrick 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 Republic 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).

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 warling 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 Khoikhoi, the Griqua and the Mpondo. The frontier was continued over a period of about 150 years; from the 1st arrival of the Cape settlers, and with the intervention of the British army 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).

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 of 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 productive 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’.

5) References Cited


Phase I AIA – The Dassiesridge Wind Energy Facility (WEF), between Kirkwood and Uitenhage, Cacadu District, EC, SA

Coastal & Environmental Services - CES

Appendix C:

Extracts from the National Heritage Resources Act, No 25 of 1999

Definitions
Section 2

Phase 1 AIA – The Dassiesridge Wind Energy Facility (WEF), between Kirkwood and Uitenhage, Cacadu District, EC, SA

Coastal & Environmental Services - CES
In this Act, unless the context requires otherwise:

i. “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 hominin 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;

xii. “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.

xxx. “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;

xlii. “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 & 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;
   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-interment 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
   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.