AN ARCHAEOLOGICAL DESKTOP STUDY FOR THE PROPOSED ESTABLISHMENT OF THE HIDDEN VALLEY WIND ENERGY FACILITY AND ASSOCIATED INFRASTRUCTURE ON A SITE SOUTH OF SUTHERLAND, NORTHERN CAPE PROVINCE.

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SUMMARY

The area for the proposed Hidden Valley Wind Energy Facility is located approximately 50km south of Sutherland and 22km north of Matjiesfontein within the Karoo Hoogland Local Municipality, Namakwa District Municipality, Northern Cape Province. The proposed area is about 340km^2 in extent and is situated to the east of the R354 regional road that runs between Matjiesfontein in the Western Cape and Sutherland in the Northern Cape, commonly referred to as the Moordenaars Karoo (Murderer's Karoo).

The proposed area for development is hilly and mountainous with the western section of the Klein Roggeveld Berge falling within the boundary of the proposed development. Several perennial rivers such as the Portugals, Komberg and Meintjiesplaas run through the proposed area and smaller dams and reservoirs also occur within the proposed area. The vegetation cover falls within the Western Mountain Karoo ecogeographicsubregion, comprising of the typical Karoo grasses and scrubland.

Little is known about the archaeology of the proposed area for development, mainly because no systematic research has been conducted within the immediate area. Research has been conducted to the north nearby Carnarvon, to the north-east close to Kimberly and within the Eastern Cape Karoo, to the south within the Cape Fold Belt, and to the west in the Richtersveld and Bushmanland. However, two heritage impact assessments have been conducted to the south of Sutherland (Hart 2005; Hart *et al*. 2010; Rossouw 2007) and two within the Witteberg region near to Matjiesfontein (Hart 2007; Hart and Miller nd). A mitigation phase excavation was undertaken at two small rock shelters in the grounds of the South African Astronomical Observatory near Sutherland during November 1983 and March 1984 (Evans *et al.* 1985). These heritage impact assessments and excavations provide recent and accurate information about archaeological resources that may be encountered within the area proposed for development.

Although the reported archaeological findings have been minimal the information provides a base for possible encounters of archaeological material remains and features. In addition, taking into consideration the reported archaeological remains and features nearby and within the wider region of the Karoo and Northern Cape, it is possible that surface scatters of Early, Middle and Later Stone Age stone artefacts may be encountered, as well as associated organic and material remains. Khoekhoen pottery, rock engravings, the remains

of historical buildings, features and European ceramics, as well as stone-walled kraals of both pre-colonial and historical origin may also be encountered during the survey.

It is therefore recommended that:

1. A full phase 1 archaeological impact assessment be conducted to establish the range and importance of the exposed and *in situ* archaeological and heritage materials and features, the potential impact of the development and to make recommendations to minimize possible damage to these sites.

INTRODUCTION AND BRIEF

African Clean Energy Developments (ACED) is proposing to establish a commercial wind energy facility and associated infrastructure. An area of 340km^2 is being considered for the construction of the proposed development. The proposed area was selected based on its wind climate (high wind speeds) and suitable proximity in relation to the existing electricity grid that includes the existing Eskom 400kV powerlines and transmission substation. Wind monitoring is currently being undertaken using 2 x 20m wind monitoring masts to be erected during August 2011. The proposed Farms include: Kentucky 206; Portion 1 of Wolvenkop 207; De Hoop 202; Portion 1, Portion 2, Portion 4 and the Remainder of Orange Fontein 203; LeeuweHoek 183; Annex Orange Fontein 1985; Portion 1, Portion 2, Portion 3 and the Remainder of the Farm RheebokkeFontein 209; Standvastigheid 201 and Zwanepoelshoek 184 (Maps 1 and 2).

The proposed facility will have a generating capacity of between 450MW and 650MW (depending on the choice of turbine) with each turbine generating between 2 – 3.5MW that may comprise of up to 207 individual turbines. Associated infrastructure will include:

- up to 207 wind turbines (depending on the turbine capacity used) between 2 – 3.5 MW);
- cabling between the turbines, to be lain underground where practical;
- internal access roads to each turbine;
- workshop area / office area for control, maintenance and storage;
- up to three 132kV on-site substations and one 400kV substation to facilitate the connection between the wind energy facility and the grid; and
- new overhead power line/s likely to be connected to Eskom's existing Muldersvlei substation that is located on the site.

The Hidden Valley Wind Energy Facility is intended to be registered with the United Nation's Framework Convention for Climate Change as part of the Clean Development Mechanisms Programme.

Savannah Environmental (Pty) Ltd has been contracted to conduct the environmental impact assessment (EIA) by African Clean Energy Developments (ACED) (the developer). This archaeological desktop assessment has therefore been prepared by the Department of Archaeology, Albany Museum, Grahamstown as part of the scoping phase for the proposed project in accordance with the National Environmental Act 107 of 1998, the National Heritage Resources Act 25 of 1999 and guidelines by the South African Heritage Resources Agency (SAHRA).

Declaration of Independence and Qualifications

This section confirms a declaration of independence that Ms Celeste Booth, an employee of the Albany Museum, Grahamstown, has no financial or any other personal interests in the project for the construction of the proposed Hidden Valley Energy Facility. Ms Celeste Booth was appointed on a strictly professional basis to conduct an archaeological desktop study in line with the South African national heritage legislation, the National Heritage Resources Act (Act 25 of 1999), and in response to the recommendations provided by the Department of Environmental Affairs and Tourism and according to the environmental impact assessment (EIA regulations).

Ms Celeste Booth (BSc Honours: Archaeology) is an archaeologist who has been employed at the Albany Museum for three years, conducting research in both the Eastern Cape and along the West Coast of Southern Africa. She has three years of Cultural Resource Management (CRM) experience under the employ of the Albany Museum and has conducted various desktop studies and phase 1 archaeological impact assessments within the Eastern Cape and in the Karoo region across the Eastern Cape, Northern Cape and Western Cape Provinces.

Brief legislative requirements

Parts of sections 35(4), 36(3) and 38(1) (8) of the National Heritage Resources Act 25 of 1999 apply:

Archaeology, palaeontology and meteorites

35 (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;

(d) bring onto or use at an archaeological or palaeontological site any excavation

equipment or any equipment which assist in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites.

Burial grounds and graves

36. (3) (a) No person may, without a permit issued by SAHRA or a provincial heritage resources authority—

(a) destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves;

(b) destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or

(c) bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) any excavation equipment, or any equipment which assists in the detection or recovery of metals.

Heritage resources management

38. (1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorized as –

(a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;

(b) the construction of a bridge or similar structure exceeding 50m in length;

(c) any development or other activity which will change the character of the site –

(i) exceeding 5000m2 in extent, or

(ii) involving three or more erven or subdivisions thereof; or

(iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or

(iv) the costs of which will exceed a sum set in terms of regulations by SAHRA, or a provincial resources authority;

(d) the re-zoning of a site exceeding 10 000m^2 in extent; or

(e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must as 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.

ARCHAEOLOGICAL BACKGROUND AND HERITAGE ("Description of the Affected Environment")

No systematic archaeological research has been conducted within this region of the Northern Cape, therefore little is known about the archaeology of the immediate area proposed for the Hidden Valley Wind Energy Facility. However two heritage impact assessments have been conducted to south of Sutherland (Hart 2005; Hart *et al.* 2010; Rossouw 2007) and two within the Witteberg region near to Matjiesfontein (Hart, 2007; Hart and Miller nd), and a mitigation phase excavation (Evans *et al.* 1985) has been undertaken at two small rock shelters in the grounds of the South African Astronomical Observatory near Sutherland during November 1983 and March 1984. The wider Karoo landscape has been occupied by humans since the Early Stone Age (ESA), spanning an occupation period of about 1.5 million years. Archaeological evidence is usually observed as surface scatters and is widely dispersed across the landscape. Caves are uncommon in the Karoo and open sites (Early Stone Age to the last 2000 years) generally consist of single-level occupations near sources of water such as rivers, streams and springs. Rock engravings are widespread over the Karoo landscape, substantial research has been conducted within the Northern and Western Cape areas of the Karoo (Parkington *et al.* 2008). Early travellers and *trekboere* (Dutch farmers) started entering this part of the Northern Cape towards the end of the 18th century and colonial settlement increased towards the second half of the 19th century.

The following sections describe the possible archaeological encounters that may be expected within the proposed area for development and includes topics such as the Early Stone Age (ESA) and the Middle Stone Age (MSA), the Later Stone Age (LSA) and pastoralism within the last 2000 years, rock art (paintings and engravings), human remains, and the historical period.

The Early Stone Age (ESA) (1.5 million-250 000 years ago)

The Early Stone Age from between 1.5 million and 250 000 years ago refers to the earliest that *Homo sapiens sapiens* predecessors began making stone tools. The earliest stone tool industry was referred to as the Olduwan Industry originating from stone artefacts recorded at Olduvai Gorge, Tanzania. The Acheulian Industry, the predominant southern African Early Stone Age Industry, replaced the Olduwan Industry approximately 1.5 million years ago, is attested to in diverse environments and over wide geographical areas. The hallmark of the Acheulian Industry is its large cutting tools (LCTs or bifaces), primarily handaxes and cleavers. Bifaces emerged in East Africa more than 1.5 million years ago (mya) but have been reported from a wide range of areas, from South Africa to northern Europe and from India to the Iberian coast. The end products were similar across the geographical and chronological distribution of the Acheulian techno-complex: large flakes that were suitable in

size and morphology for the production of handaxes and cleavers perfectly suited to the available raw materials (Sharon 2009).

The most well know Early Stone Age Acheulean site in southern Africa is Amanzi Springs, situated about 10km north-east of Uitenhage, near Port Elizabeth (Deacon 1970). In a series of spring deposits a large number of stone tools were found *in situ* to a depth of 3-4m. Wood and seed material preserved remarkably very well within the spring deposits, and possibly date to between 800 000 to 250 000 years old. Other Early Stone Age sites that contained preserved bone and plant material include Wonderwerk Cave in the Northern Province, near Kimberly (Binneman & Beaumont 1992) and Montagu Cave in the Western Cape, near the small town of Montagu (Mitchell 2007). Early Stone Age sites have also been reported in the foothills of the Sneeuberge Mountains (in Prins 2011). A few Early Stone Age handaxes were also reported from the site near Victoria West (Binneman *et al.* 2011a). A few surface scatters of Early Stone Age stone artefacts had been documented on the site to the west of Matjiesfontein (Hart & Miller, nd) and to the site south of Sutherland (Hart *et al*. 2010).

Early Stone Age sites are relatively scarce; however, it is possible that surface scatters of Early Stone Age artefacts such as handaxes, flakes, and cores may be encountered during the survey.

Middle Stone Age (MSA) (250 000 – 30 000 years ago)

The Middle Stone Age spans a period from 250 000 - 30 000 years ago and focuses on the emergence of modern humans through the change in technology, behaviour, physical appearance, art and symbolism. Various stone artefact industries occur during this time period, although less is known about the time prior to 120 000 years ago, extensive systemic archaeological research is being conducted on sites across southern Africa dating within the last 120 000 years (Thompson & Marean 2008). The large handaxes and cleavers were replaced by smaller stone artefacts called the Middle Stone Age flake and blade industries. Surface scatters of these flake and blade industries occur widespread across southern Africa although rarely with any associated botanical and fauna remains. It is also common for these stone artefacts to be found between the surface and approximately 50-80cm below ground. Fossil bone may in rare cases be associated with Middle Stone Age occurrences (Gess 1969). These stone artefacts, like the Earlier Stone Age handaxes are usually observed in secondary context with no other associated archaeological material.

From as early as 1915, stone artefacts which were of a “peculiar character”, referred to as hand-axes and tortoise-cores by Reginald A. Smith, were plentiful within the Victoria West district. The latter were only found in certain areas and the hand-axes occurred in conjunction with the cores or without them (Smith 1919). During the 1920’s, A.H.J.

Goodwin (1926, 1946), identified the Victoria West stone artefact industry, presumably referring to those artefacts with a “peculiar character” found within the district, the wider Karoo region, as well as along the Vaal River. They comprised mainly of stone tools that had been manufactured using a prepared core technique, and were regarded as being transitional between the Early Stone Age and Middle Stone Age. Recent research has established that the Victoria West cores were the “evolutionary step” towards the Levallois prepared core industry, indicating an outward spread of this technological change (Lycett 2009).

The Middle Stone Age is distinguished from the Early Stone Age by the smaller-sized and distinctly different stone artefacts and *chaîne opératoire* (method) used in manufacture, the introduction of other types of artefacts and evidence of symbolic behaviour. The prepared core technique was used for the manufacture of the stone artefacts which display a characteristic facetted striking platform and includes mainly unifacial and bifacial flake blades and points. The Howiesons Poort Industry (80 000 - 55 000 years ago) is distinguished from the other Middle Stone Age stone artefacts: the size of tools are generally smaller, the range of raw materials include finer-grained rocks such as silcrete, chalcedony, quartz and hornfels, and include segments, backed blades and trapezoids in thestone toolkit which were sometimes hafted (set or glued) onto handles. In addition to stone artefacts, bone was worked into points, possibly hafted, and used as tools for hunting (Deacon & Deacon 1999).

Other types of artefacts that have been encountered in archaeological excavations include tick shell (*Nassarius kraussianus*) beads, the rim pieces of ostrich eggshell (OES) water flasks, ochre-stained pieces of ostrich eggshell and engraved and scratched ochre pieces, as well as the collection of materials for purely aesthetic reasons. Although Middle Stone Age artefacts occur throughout the Eastern Cape, the most well-known Middle Stone Age sites include the type-site for the Howiesons Poort stone tool industry, Howiesons Poort (HP) rock shelter, situated close to Grahamstown and Klasies River Mouth Cave (KRM), situated along the Tsitsikamma coast. Middle Stone Age sites are located both at the coast and in the interior across southern Africa.

Surface scatters of Middle Stone Age stone artefacts are widely distributed across the Karoo landscape and have been reported from the site to the west of Matjiesfontein (Hart & Miller nd) and at the site to the south of Sutherland (Hart *et al.* 2010).

It is therefore likely that surface scatters of Middle Stone Age stone artefacts may be encountered within the area proposed for development. Such occurrences may also occur between the surface and approximately 50-80cm below ground. It is rare that these particular stone artefacts are found to be in association with other archaeological remains

and are usually out of context owing to natural disturbances over time and, more recently, owing to human impact.

The Later Stone Age (LSA) (30 000 – recent) and Pastoralism within the last 2000 years

The Later Stone Age

The Later Stone Age (LSA) spans the period from about 20 000 years ago until the colonial era, although some communities continue making stone tools today. The period between 30 000 and 20 000 years ago is referred to as the transition from the Middle Stone Age to Later Stone Age; although there is a lack of crucial sites and evidence that represent this change. By the time of the Later Stone Age the genus *Homo*, in southern Africa, had developed into *Homo sapiens sapiens*, and in Europe, had already replaced *Homo Neanderthalensis*.

The Later Stone Age is marked by a series of technological innovations, new tools and artefacts, the development of economic, political and social systems, and core symbolic beliefs and rituals. The stone toolkits changed over time according to time-specific needs and raw material availability, from smaller microlithic Robberg (20/18 000-14 000ya), Wilton (8 000-the last 500 years) Industries and in between, the larger Albany/Oakhurst (14 000-8 000ya) and the Kabeljous (4 500-the last 500 years) Industries. Bored stones used as part of digging sticks, grooved stones for sharpening and grinding and stone tools fixed to handles with mastic also become more common. Fishing equipment such as hooks, gorges and sinkers also appear within archaeological excavations. Polished bone tools such as eyed needles, awls, linkshafts and arrowheads also become a more common occurrence. Most importantly bows and arrows revolutionized the hunting economy. It was only within the last 2000 years that earthenware pottery was introduced, before then tortoiseshell bowls were used for cooking and ostrich eggshell (OES) flasks were used for storing water. Decorative items like ostrich eggshell and marine/fresh water shell beads and pendants were made.

Hunting and gathering made up the economic way of life of these communities; therefore, they are normally referred to as hunter-gatherers. Hunter-gatherers hunted both small and large game and gathered edible plantfoods from the veld. For those that lived at or close the coast, marine shellfish and seals and other edible marine resources were available for the gathering. The political system was mainly egalitarian, and socially, hunter-gatherers lived in bands of up to twenty people during the scarce resource availability dispersal seasons and aggregated according to kinship relations during the abundant resource availability seasons. Symbolic beliefs and rituals are evidenced by the deliberate burial of

the dead and in the rock art paintings and engravings scattered across the southern African landscape.

Later Stone Age sites occur both at the coast (caves, rock shelters, open sites and shell middens) and in the interior (caves, rock shelters and open sites) across southern Africa. The majority of archaeological sites found in the area would date from the past 10 000 years where San hunter-gatherers inhabited the landscape living in rock shelters and caves as well as on the open landscape. These latter sites are difficult to find because they are in the open veld and often covered by vegetation and sand. Sometimes these sites are only represented by a few stone tools and fragments of bone. The preservation of these sites is poor and it is not always possible to date them (Deacon and Deacon 1999). Caves and rock shelters, however, in most cases, provide a more substantial preservation record of pre-colonial human occupation.

The Later Stone Age archaeology of the Great Karoo stretching across the Eastern Cape, and Western Cape and Northern Cape is rich and varied. Various studies (Beaumont & Morris 1990, Beaumont & Vogel 1984, Morris & Beaumont 1990), have shown that the general area surrounding the proposed area for the development has been relatively marginal regarding pre-colonial human settlement, but is in fact exceptionally rich in archaeological sites and rock art (paintings and engravings [to be discussed in the following section]). Garth Sampson has conducted thirty years of extensive research within the Seacow River Valley and provides valuable insight on the distribution of both Later Stone Age and pastoralist/herder sites across the landscape. Unfortunately no such similar studies have yet been conducted within the area. Sampson has produced innumerable publications on the area (Sampson 1985) including further studies on Later Stone Age artefacts (Close & Sampson 1998, 1999) and in-depth analysis on the ceramics assemblages (Sampson 1988; Sampson et al. 1989 1997; Sampson & Vogel 1996), to name a few.

Substantial Later Stone Age research has been conducted in the surrounding Northern Cape region in the Richtersveld within the Orange River Valley, to the north near around the Carnarvron area, Bushmanland and the areas surrounding Kimberly, as well to the south of the proposed area for development in the Klein Karoo at site called Boomplaas near Oudtshoorn. The research conducted provides considerable evidence of Later Stone Age occupation within the wider region of the proposed area for development. Scatters of Later Stone Age stone artefacts were documented at the site to the south-west of Matjiesfontein (Hart & Miller nd) and at the site to the south of Sutherland (Hart et al. 2010). The rescue excavations conducted at the two Observatory Shelters near Sutherland yielded a collection of Later Stone Age stone artefacts made predominantly on ironstone raw materials as well as shale, chert, hornfels, chalcedony, quartz, and quartzite. The stone artefact collection comprised a variety of lithic varients including cores, utilized flakes, blades and chuncks, as well as formal tools such as scrapers, adzes, backed blades, points and miscellaneous

retouched pieces. In addition, fragments of ostrich eggshell (OES) and ostrich eggshell beads, faunal remains and fresh water molluscs were documented (Evans *et al*. 1985).

Pastoralism

Until 2000 years ago, hunter-gatherer communities traded, exchanged goods, encountered and interacted with other hunter-gatherer communities. From about 2000 years ago the social dynamics of the southern African landscape started changing with the immigration of two 'other' groups of people, different in physique, political, economic and social systems, beliefs and rituals. Relevant to the study area, one of these groups, the Khoekhoe pastoralists or herders entered southern Africa with domestic animals, namely fat-tailed sheep and goats, travelling through the south towards the coast. They also introduced thin-walled pottery common in the interior and along the coastal regions of southern Africa. Their economic systems were directed by the accumulation of wealth in domestic stock numbers and their political make-up was more hierarchical than that of the hunter-gatherers.

There are two main suggestions on the migration routes of the Khoekhoen pastoralists into South Africa within the last 2000 years that have been based on linguistic comparisons and archaeological evidence. The first route, based on rock art and oral traditions suggest that the pastoralists groups entered from Namibia moved down the west coast into the south-western Cape and then spread to the east along the southern Cape coast (Stow 1905; Cooke 1965). The second route, based on linguistic evidence, suggests that the pastoralist groups entered from Botswana with one branching to the west along the Orange River to the Atlantic west coast and groups branching down the central plateau, through the Karoo (via the Seacow River Valley), down the escarpment into the Eastern Cape (Elphick 1977; 1985). Extensive pastoralist research has yielded evidence from sites along the suggested routes within the Northern Cape, Karoo, Orange River Valley, along the Namaqualand and west coast and into the southern and south-eastern Cape.

Circular dry stone piled wall enclosures up to half a metre high and 3-4m and 9m in diameter situated on the leeward slopes of low ridges were documented on the site south of Sutherland (Hart *et al*. 2010). These enclosures were arranged in complexes of up to 13 interlocking enclosures with adjoining 'lammerkraals' (lamb pens). Archaeological remains associated with these enclosures included fine thin red burnished pottery and ostrich eggshell fragments (OES). In addition, open Khoekhoen encampments situated among the *Kameeldoring* trees along dry river beds in the bottom of valleys were documented on the site south of Sutherland. These encampments are rare and have only been recorded in the Richtersveld area (Hart *et al*. 2010). These sites are relative extensive, approximately 80 - 80m in diameter. The archaeological material remains associated with these encampments included very fine thin wall burnished Cape coastal pottery, numerous informal stone

artefacts, stone features, grinding surfaces, discreet ash middens, animal bone, and a number of graves that have broken grinding stones placed on top. Nineteenth century glass and ceramics were documented at two of the sites. A few small plain body sherds of fine-grained pottery, about 5mm thick, and probably from the same pot, were documented on a talus slope of one of the two Observatory Shelters near Sutherland (Evans *et al*. 1985).

It is therefore highly likely that Later Stone Age stone artefacts and possible open sites containing additional archaeological material remains may be encountered during the survey, as well as dry stone walling encampments that may represent evidence of the Khoekhoen herders mark on the landscape.

Human Remains

It difficult to detect the presence of archaeological human remains on the landscape as these burials, in most cases, are not marked at the surface. Human remains are usually observed when they are exposed through erosion. In some instances packed stones or rocks may indicate the presence of informal pre-colonial burials. The latter two skeletons were eroding out of dongas and the latter skeleton is presumably of more recent origin.

It is possible that informal burials and eroding human remains may be encountered during the survey. Formal graves and family cemeteries related to the farmsteads may also be encountered.

Rock Art (Paintings and Engravings)

Rock art is generally associated with the Later Stone Age period mostly dating from the last 5000 years to the historical period. It is difficult to accurately date the rock art without destructive practices. The southern African landscape is exceptionally rich in the distribution of rock art which is determined between paintings and engravings. Rock paintings occur on the walls of caves and rock shelters across southern Africa. Rock engravings, however, are generally distributed on the semi-arid central plateau, with most of the engravings found in the Orange-Vaal basin, the Karoo stretching from the Eastern Cape (Cradock area) into the Northern Cape as well as the Western Cape, and Namibia. At some sites both paintings and engravings occur in close proximity to one another especially in the Karoo and Northern Cape. The greatest concentrations of engravings occur on the andesite basement rocks and the intrusive Karoo dolerites, but sites are also found on about nine other rock types including dolomite, granite, gneiss, and in a few cases on sandstone (Morris 1988). Substantial research has also been conducted in the Western Cape Karoo area around Beaufort West (Parkington 2008), in the northern parts of the Northern Cape between Springbok, Calvinia, Carnavron, Kimberly, Kuruman, Pomfret and Upington as the outline of the area.

It is possible that rock shelters and caves containing rock painting images and rock engravings on boulders and flat bedrock may be encountered within the proposed area for development.

Historical / Colonial Period (Last 500 years)

Historical archaeology refers to the last 500 years when European settlers and colonialism entered into southern Africa. In the early days of colonialism the Karoo was still a sparse and unknown area. It was only until the early travellers and pioneer Dutch *trekboere* (trek farmers or migrant farmers) ventured into this harsh landscape and documented their encounters with the San hunter-gatherers and Khoekhoen who had originally inhabited the landscape. Various trade goods exchanged between these pioneering Europeans, the San hunter-gatherers, and Khoenkhoen have been recorded in travellers' diaries, historical documents and archaeological excavations within the wider region of the proposed area for development. These include glass beads that documentary evidence suggests were first given to the local Bushmen in the upper Seacow Valley during the Sneeuberg War (c. AD 1770-1795) and later by travellers, missionaries, and resident farmers (Saitowitz& Sampson 1992). This may be a similar situation at Highlands Rock Shelter (Deacon 1976). In addition, rare instances of ammunition and firearm paraphernalia have been excavated from sites in the upper Seacow Valley. Historical records show that the first Dutch farmers transferred their firearms to the Bushmen as early as the 1770's.
Evidence of the remains of historical buildings, stone cairns and features, as well as European ceramic ware has been recorded in one of the specialist studies. Stone packed foundations of a rectangular cottages and associated dumping (waste) area, as well as stone packed kraals positioned on the bottom half of slight-gradient koppies may be encountered during the survey. Broken and fragmented pieces of iron implements, glass bottles and European ceramic wares including stoneware, transfer print and willow pattern ceramic types are included. It is likely that these features may be associated with early farming activities where shepherds would have lived with their flocks and herds of domesticated stock (cattle, sheep, and goats).

It is likely that a variety of historical features and artefacts will be encountered within the proposed area for development owing to early farming activities, the region's historical settlements, movements and migrations through the area, as well as the remnants of the Anglo-Boer war.

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CONCLUSIONS AND RECOMMENDATIONS

The area proposed for the Hidden Valley Wind Energy Facility has not been systematically researched archaeologically, although, there is enough information available, such as previous phase 1 archaeological impact assessments within, closer to the proposed area, and within the wider region to determine the probable archaeological artefacts and remains that may be encountered during the impact assessment. It has been established that the semi-arid Karoo region stretching across the Northern and Western Cape seems marginal regarding pre-colonial human settlement although is rich in archaeological sites and rock art. There is a variety of archaeological resources within the proposed area that may be encountered, ranging from Early, Middle and Later Stone Age stone artefacts as well as associated organic and material remains. Khoekhoen pottery, rock engravings, human remains and graves, the remains of historical buildings, features and European ceramics, as well as stone-walled kraals of both pre-colonial and historical origin may also be encountered during the survey.

It is therefore recommended that:

1. A full phase 1 archaeological impact assessment be conducted to establish the range and importance of the exposed and *in situ* archaeological heritage materials and features, the potential impact of the development and to make recommendations to minimize possible damage to these sites.

IMPACT ON THE ENVIRONMENT (Archaeological and Heritage Resources)

The environment (archaeological and heritage resources) has been divided into five focus areas that may be impacted during the development of the proposed Hidden Valley Wind Energy Facility. Please note that the following affects and impacts on the environments are based on predictions of the probability of the occurrence of archaeological remains and materials that may be encountered, the final assessments of affects and impacts will be included in the phase 1 archaeological impact assessment.

Surface Scatters of Archaeological Remains

Mainly surface scatters of archaeological remains are identified during the phase 1 archaeological impact assessments in relation to previous phase 1 archaeological assessments. These surface scatters may include Early Stone, Middle Stone Age, and Later Stone Age stone artefacts, modified pieces of bone, ostrich eggshell fragments and beads, earthernware pottery fragments and, historical ceramics, implements and associated historical artefacts and remains. These surface scatters are usually regarded as being disturbed and in secondary context owing to disturbances that may have been caused by environmental conditions, treading and burrowing by wild and domestic animals, as well as humans by the construction of farm roads, fences, dams and other associated infrastructure. However, these surface scatters, depending on the density and extent, provide clues for the significance of possible sites and whether there may be further archaeological deposit present below the surface. It is common for Middle Stone Age stone artefacts to be observed between the surface and 50-80cm below ground. At this stage it is difficult to determine the extent that surface scatters of archaeological remains may be distributed across the landscape for the proposed Hidden Valley Energy Facility as no systematic research has been conducted within the specific area for development. Drawing from the archaeological findings reported in previous heritage impact assessments (HIA's) conducted close and within the surrounding area of the proposed area for development, it is possible that ephemeral surface scatters of archaeological remains may be encountered. Therefore, appropriate mitigation in the recommendation of conducting a phase 1 archaeological impact assessment (AIA) is proposed for the environmental impact assessment (EIA) phase to assess the significance and prescribe the appropriate

recommendations for the conservation and preservation of the surface scatters of archaeological remains.

Affects on the surface scatters of archaeological remains would comprise mainly negative direct impacts, in that the surface scatters may be disturbed or destroyed during the construction phase and continuous disturbances and destruction during the operational phase. Vegetation clearing may expose further surface scatters of archaeological remains and excavations would disturb and destroy the vegetation cleared surface scatters. The construction of new roads and associated infrastructure may also disturb and destroy surface scatters of archaeological remains. During the operational phase, maintenance to the turbines, roads and associated infrastructure may further expose, disturb, and destroy areas that may not, during the construction phase, have been affected. The extent of the impact on the surface scatters of archaeological remains, during the scoping phase, is regarded as being of local significance, until the significance has been determined during the phase 1 archaeological impact assessment and environmental impact assessment phase.

***In Situ* Sites**

In situ sites (sites that have remained in their original position or primary context) may be identified by the extent and density of the surface scatters and, therefore, demonstrate potential that the area may yield to be regarded as an *in situ* archaeological site. It is only during the phase 1 archaeological impact assessment (AIA) that possible *in situ* sites may be identified and during phase 2 mitigation that the significance of the *in situ* site can be determined. Possible *in situ* archaeological sites would mainly be affected by negative direct impact during the construction phase and the operational phase. Vegetation clearing may expose *in situ* sites that could previously not be identified and excavations would disturb and destroy the site. The construction of new roads and associated infrastructure may also disturbed and destroy in situ archaeological deposits. During the operational phase, maintenance to the turbines, roads and associated infrastructure may further expose, disturb, and destroy areas that may not, during the construction phase, have been affected. No *in situ* sites have been identified during previous heritage impact assessments (HIA's) close to the proposed area or within the surrounding area. Therefore, the extent of the impact on the *in situ* archaeological deposits, during the scoping phase, is regarded as being of local significance, until the significance has been determined during the phase 1 archaeological impact assessment (AIA) and environmental impact assessment (EIA) phase and further possible phase 2 mitigations.

Rock Art (Paintings and Engravings)

The generic term ‘rock art’ refers to both rock paintings and rock engravings, the affects and significance for each will be discussed separately.

Rock Paintings

Rock paintings occur mainly on the walls of caves and rock shelters; owing to the hilly and mountainous landscape of the proposed area for development it is possible that caves and rock shelters may be encountered on the landscape. These caves and rock shelters may mainly be affected by negative indirect impact if it is proposed that the turbines, new roads and, associated infrastructure are to be constructed within close vicinity to these sites, therefore, it usually recommended that no development activity occurs within 50-100m of caves and rock shelters that contain paintings and possible archaeological deposit. Construction on hill tops or ridges where caves and rock shelters occur below may be vulnerable to construction activities and long-term operational activities. During the scoping phase such sites may be regarded as having a local significance until the phase 1 archaeological impact assessment (AIA) has been conducted to identify these caves and rock shelters and associated rock paintings. The significance may then be determined by the images contained and possible archaeological deposit within the site.

Rock Engravings

Rock engravings may be a more common occurrence within the area proposed for development and occur on boulders and flat rock on the landscape. The features on which rock engravings occur and the rock engravings will mainly be affected by direct negative impacts during the construction and operational phases. Features containing rock engravings may not be easily identified by construction workers and they may also occur in the areas proposed for the construction of turbines, roads and associated infrastructure. Similarly, during the operational phase, maintenance of the turbines, roads and, associated infrastructure, may directly affect the features containing rock engravings. During the scoping, a local significance can be attributed to the occurrence of possible rock engravings, however, it is only during the phase 1 archaeological impact assessment when these features and engravings are identified that significance can be determined. The significance of finding these engravings within this area may establish a regional significance as none have been reported in previous heritage impact assessments conducted close to the area proposed for the Hidden Valley Energy Facility and within the surrounding region. In addition, the particular style/s of the engravings may indicate a national significance.

Features (Archaeological and Historical)

Features are usually regarded as fixed immovable structures distributed across the landscape that may include stone walling features, buildings and graves (graves are discussed in the following section). Features have been divided into archaeological and historical and are discussed separately, although the affects of impacts may similar.

Archaeological Features

A previous heritage impact assessment (HIA) conducted close to the area proposed for the Hidden Valley Energy Facility has established that the main archaeological features were circular complexes of dry stone walling used as kraals to keep domestic stock. Mainly negative direct impact will affect these features during the construction and operational phases. They are easily identified on the landscape but must be protected as construction activities may impede upon these features with negative effects, if such features have not been highlighted on the landscape and cordoned off. Similarly such activities may negatively impact upon these features during operational activities if long term conservation is not considered. These features may be regarded as having a national significance as these complexes have rarely been encountered in southern Africa.

Historical Features

Historical features are associated with European settler occupation within the area and would comprise farmsteads, farm houses and buildings, stone walling, as well as associated infrastructure dated to older than 60 years , according to the National Heritage Resources Act 25 of 1999 that protects these features. These features are visible on the landscape but may be directly negatively impacted if these features are disturbed or destroyed during the construction and operational phases without the appropriate approval from the heritage authorities. These features may be limited to being regarded as having a local significance during the scoping phase as well as the phase 1 archaeological impact assessment (AIA) and environmental impact assessment (EIA) phase; however, this may change if attributes of the features indicate unique characteristics and therefore, a higher significance.

Burial Grounds and Graves

There is a slight distinction between burial grounds and graves, the former usually referring to informal burials and areas that contain more than one informal burial, and the latter referring to formal graveyards that contain headstones. Burial grounds and graves older than 60 years are protected by the National Heritage Resources Act 25 of 1999, burial grounds and graves younger than 60 years are usually protected by the local government legislation or by-laws and fall under the auspices of the local municipality.

Burial Grounds

Informal burials and burial grounds are usually associated with the pre-colonial communities or unmarked or informally marked burials that may be of recent origin but older than 60 years. These burials are not marked on the landscape and the impact of the development may be regarded as being both directly negative and positive. The negative impact is that these burials will be disturbed and destroyed during the construction phase and possibly during the operational phase when undertaking regular maintenance. On the other hand, the direct positive impact would be the exposure of the previously unknown burial/s and if the appropriate procedures are followed to report the uncovering of the human remains to the appropriate heritage resources agency. If such procedures are not followed then in totality the affects are detrimentally and directly negative during both construction and operational phases. However, in certain circumstances such burials may be identified on the landscape by packed stones or cairns that are usually related to burials. These are more easily identified on the landscape and the affect of the impact on these marked burials will be directly negative as there is a clear indicator of the possible burial/s and mitigation measures would avoid construction near to these areas. Informal burials and burial grounds, during the scoping, would be of a local significance until phase 2 mitigation excavation and removal is undertaken to determine the burial and its contents that may contain unique attributes and hence determine a regional or national significance.

Graves

Graves can be regarded as formal burial grounds or graveyards usually associated with the European settler families that may have family graveyards situated on the farm. Depending on the condition of these graveyards they are easily identified on the landscape and would have clearly marked headstones. However, if these graveyards have not been maintained and left to ruins, it may be more difficult to identify owing to overgrown of the vegetation. These graveyards may be affected by direct negative impacts if the area are not highlighted and protected during the construction and operational phases. The graves would be rated as having a local significance, unless, the family or individuals buried are regarded as having acquired certain status in the history and making of South Africa, which would then elevate the graves or graveyard to being rated as being of a regional or national significance.

APPENDIX A: IDENTIFICATION OF ARCHAEOLOGICAL FEATURES AND MATERIAL FROM INLAND AREAS: guidelines and procedures for developers

1. Human Skeletal material

Human remains, whether the complete remains of an individual buried during the past, or scattered human remains resulting from disturbance of the grave, should be reported. In general the remains are buried in a flexed position on their sides, but are also found buried in a sitting position with a flat stone capping and developers are requested to be on the alert for this.

2. Freshwater mussel middens

Freshwater mussels are found in the muddy banks of rivers and streams and were collected by people in the past as a food resource. Freshwater mussel shell middens are accumulations of mussel shell and are usually found close to rivers and streams. These shell middens frequently contain stone tools, pottery, bone, and occasionally human remains. Shell middens may be of various sizes and depths, but an accumulation which exceeds 1 m^2 in extent, should be reported to an archaeologist.

3. Stone artefacts

These are difficult for the layman to identify. However, large accumulations of flaked stones which do not appear to have been distributed naturally should be reported. If the stone tools are associated with bone remains, development should be halted immediately and archaeologists notified

4. Fossil bone

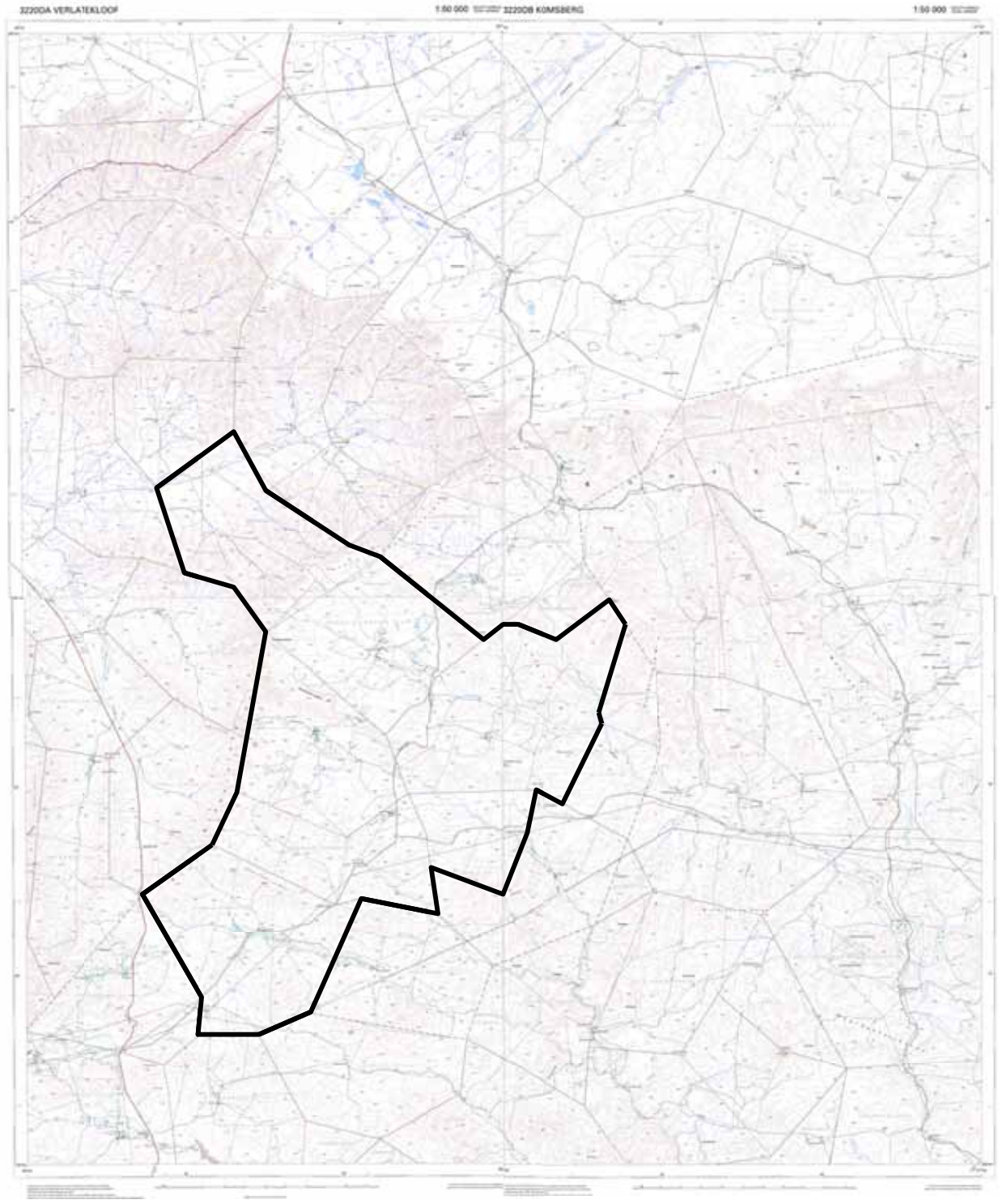
Fossil bones may be found embedded in geological deposits. Any concentrations of bones, whether fossilized or not, should be reported.

5. Large stone features

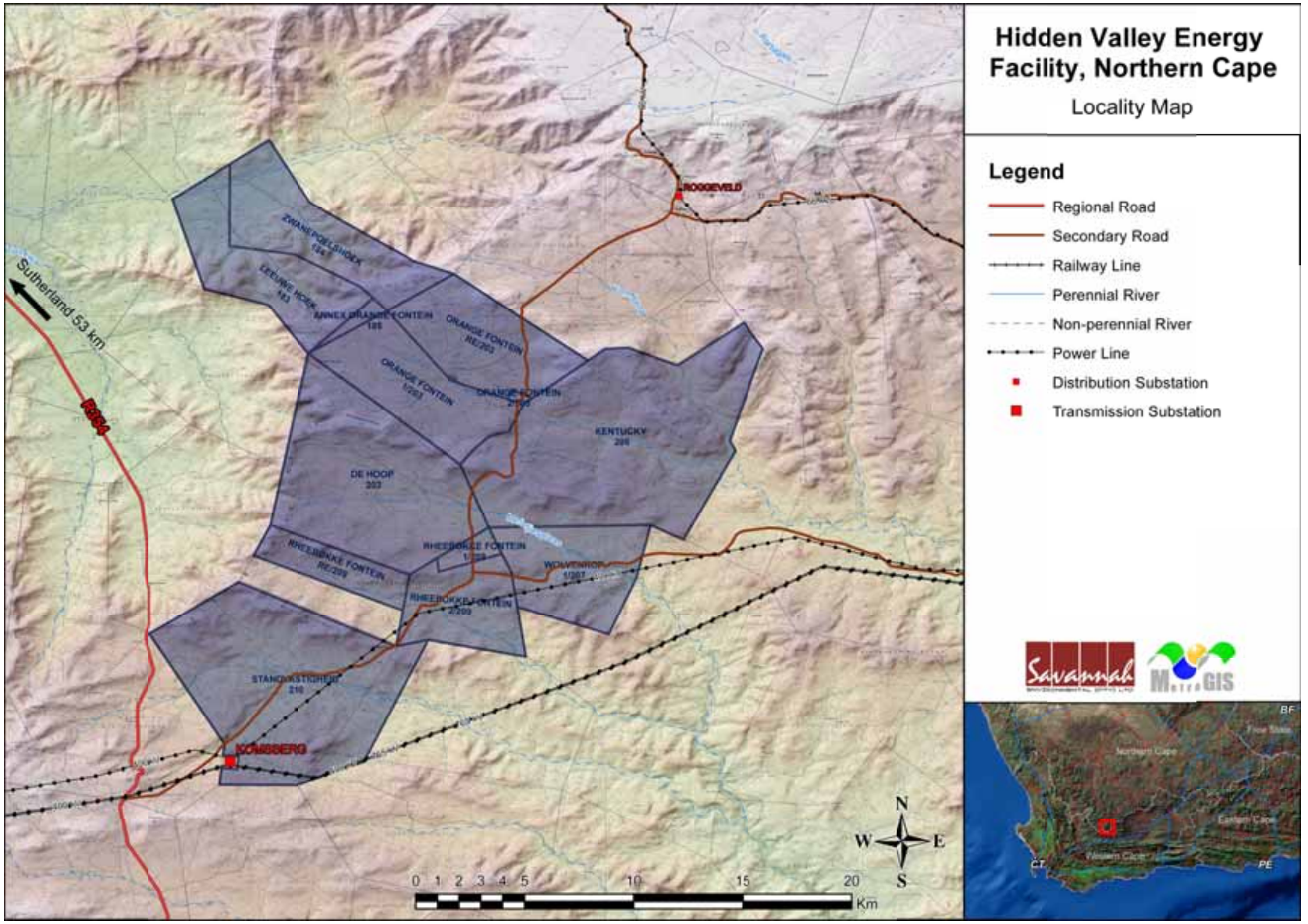
They come in different forms and sizes, but are easy to identify. The most common are roughly circular stone walls (mostly collapsed) and may represent stock enclosures, remains of wind breaks or cooking shelters. Others consist of large piles of stones of different sizes and heights and are known as *isisivane.* They are usually near river and mountain crossings. Their purpose and meaning is not fully understood, however, some are thought to represent burial cairns while others may have symbolic value.

6. Historical artefacts or features

These are easy to identified and include foundations of buildings or other construction features and items from domestic and military activities.



Map 1. 1:50 000 maps 3220DA VERLATEKLOOF, 3220DB KOMSBERG, 3220DC SWARTLAND, and 3220DD KOORNPLAATS stitched together to indicate the area for the proposed Hidden Valley Wind Energy Facility.



Map 2. GIS map indicating the area for the proposed Hidden Valley Wind Energy Facility (courtesy of Savannah Environmental (Pty) Ltd).

Map 3.Wide aerial view of the area for the proposed Hidden Valley Wind Energy Facility.

Map 4.Close-up aerial view of area for the proposed Hidden Valley Wind Energy Facility.