



**siyathembana**  
**trading** 293 PTY LTD

[info.siyathembana@gmail.com](mailto:info.siyathembana@gmail.com)

Reg No. 2011/002530/07 VAT No. 4590259943

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**An Archaeological Scoping and Assessment report for the proposed Gamma (Victoria West, Northern Cape) - Kappa (Ceres – Western Cape) 765Kv (2) Eskom power transmission line**

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**7 NUMBER 22 SELBY COURT,**

**SELBY ROAD**

**MOWBRAY, 7700**

**CAPE TOWN**

[Info.siyathembana@gmail.com](mailto:Info.siyathembana@gmail.com)

**Authors**

Foreman Bandama, BA Hons, PhD  
Shadreck Chirikure, MA Artefact Studies, PhD

Internal Review  
Molebohang Mohapi, MSc, PhD

## **1. Executive summary**

Nzumbululo HS (Pty) Ltd, on behalf of Eskom Holdings contracted Siyathembana Trading 293 (Pty) Ltd to carry out a Scoping Archaeological Impact Assessment for the proposed construction of the 765kv, powerline from Gamma (south of Victoria West, Northern Cape) to Kappa (Ceres, Western Cape) and associated substation works. The scope of the work also required an assessment of the alternatives to accommodate the powerline in sections of Northern Cape and Western Cape Provinces. Electricity provisioning is of high strategic importance, making this project essential for the country.

The proposed development covers multiple districts from Victoria West in the northern Cape to Beaufort West, Three Sisters, Merweville, Murraysburg, Prince Albert, Laingsburg, Touwsriver and Ceres all in the Western Cape. The extent of the proposed (+/- 485km) development falls within the requirements for an archaeological impact assessment as required by Section 38 of the South African Heritage Resources Act (No. 25 of 1999).

A scoping study based on dedicated literature and database search as well as reconnaissance surveys, revealed that this very long stretch of cultural landscape hosts significant archaeological resources stretching from the Early Stone Age, through the Middle Stone Age to the Late Stone Age. Material fingerprints of Khoisan are also on the landscape together with Trek Boer settlements and places associated with the Xhosa migration of the late 19<sup>th</sup> century. Thus the area represented a frontier where different groups interacted and as such is very archaeologically very sensitive.

Based on this study, the following conclusions were reached:

1. The proposed powerline will traverse a sensitive archaeological landscape.
2. There are aspects of the archaeology that are poorly known such as the 19<sup>th</sup> century Xhosa occupation.
3. Overall, very little information is available in the area and AIAs are the only means to document new sites.
4. There is a very high potential to encounter poorly marked historical graves of farm inhabitants and victims of conflict because the project area has also been a scene of colonial wars.

Based on the above conclusions, the following recommendations were made:

- i.** Whichever route will be chosen, a detailed walk down survey must be undertaken to establish the archaeological sites that lie in the development footprint of the recommended route.
- ii.** The position of pylons when determined must be surveyed, and if they are archaeologically sensitive must be moved within the surveyed servitude. If this is not possible, detailed mitigation must be carried out. If archaeological sites or graves are exposed during construction work, they must be reported to the heritage authorities so that an investigation and evaluation of the finds can be made. Significantly, construction work must stop and the affected area must be barricaded while investigations are being carried out.

- iii.** Should any archaeological site be exposed during the development, the developer should carefully safeguard these, preferably in situ, and alert Heritage Western Cape, SAHRA Northern Cape or the SAHRA Head office.
- iv.** Should any grave or human remains be encountered during the development, work must be stopped immediately and the developer should alert Heritage Western Cape, SAHRA Northern Cape or the SAHRA Head office.
- v.** Preferred route: Northern route (marked green on the Figure 1) because it is following an already existing powerline which means the new line will only have cumulative impact. From an archaeological point of view, it will be preferable develop on an already disturbed area than on pristine ground, even though the sites on the later maybe unknown. Most of the sites and threats along the preferred route are already known and their threats can be mitigated or avoided all altogether.

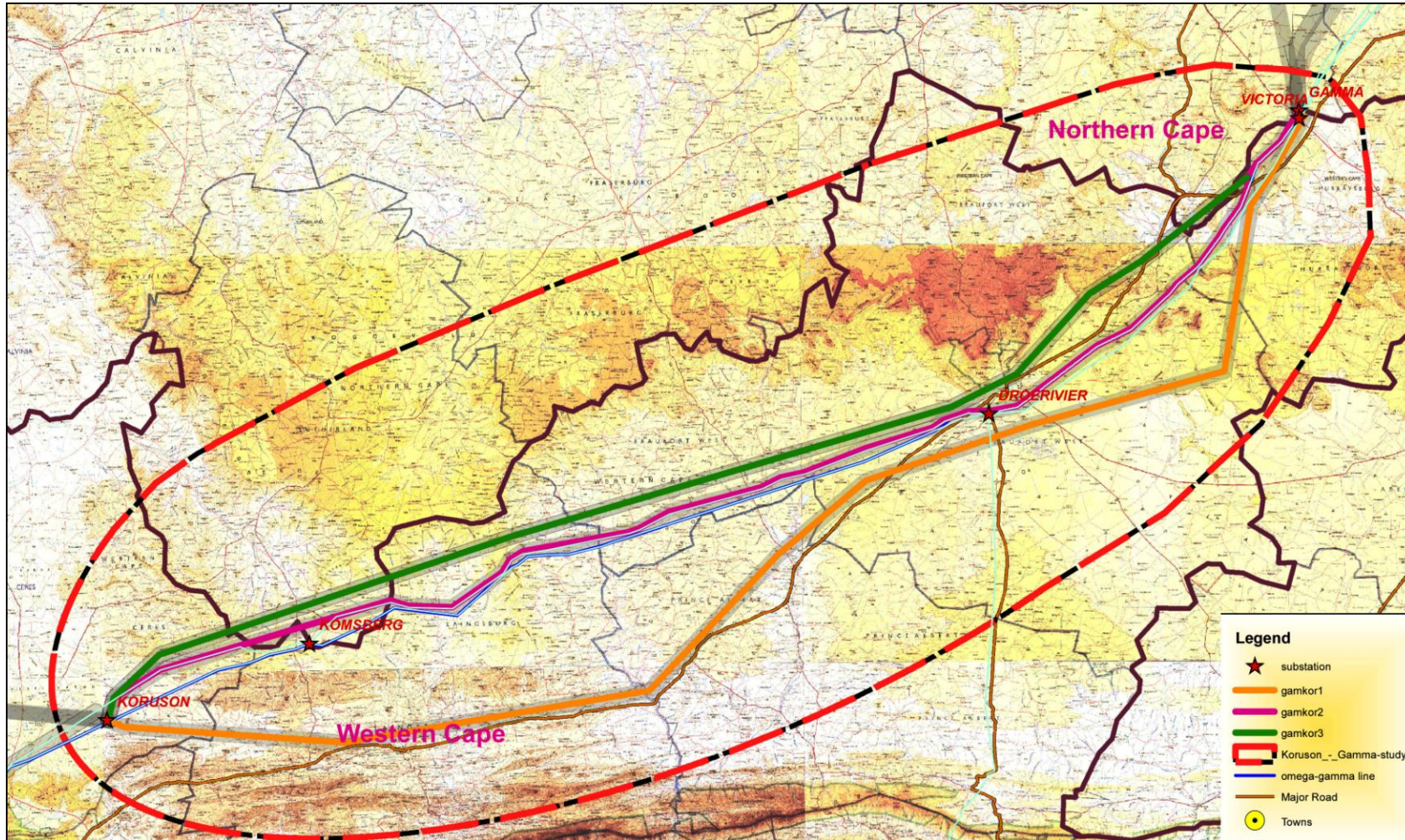


Figure 1: Map showing the proposed routes. (Map supplied by Nzumbululo HS (Pty) Ltd)

## **Stakeholders and people responsible for decisions**

The following stakeholders are collectively and individually responsible for implementing the recommendations of this study:

1. Developer – Eskom must ensure that no heritage sites are destroyed without permission from the relevant authority.
2. Archaeologists must carry out detailed Phase II impact assessment for the selected route
3. The South African Heritage Resources Agency and Heritage Western Cape must ensure that adequate work is done to mitigate impact on archaeological resources, including burial grounds and graves.

In summary, the scoping study indicated that the area proposed for development is very archaeologically sensitive with some areas such as the Victoria West portion hosting hitherto poorly known 19<sup>th</sup> century Xhosa settlements. Archaeological research is generally sparse in the area. As such, it is important to carry out detailed walk downs to identify sites on the proposed pylons sites of the recommended route and other supporting infrastructure such as access roads.

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## 4. Terms of reference (ToR)

Siyathembana 293 (Pty) Ltd was contracted by Nzumbululo HS (Pty) Ltd, on behalf of Eskom Holdings to carry out the archaeological component of the scoping and assessment phase of the proposed Gamma Kappa 2<sup>nd</sup> 765kV powerlines and associated substation works. According to the SAHRA minimum standards, a specialist archaeological scoping phase should establish the scope of the project and terms of reference for the developer while a Phase 1 Impact Assessment/ Specialist Report should:

- a. Identify and map the sites;
- b. Assesses their significance;
- c. Comments on the impact of the proposed development on identified archaeological resources
- d. Makes recommendations for their mitigation or conservation

e Consider alternatives, if archaeological resources will be adversely impacted.

The study area include three alternative powerline servitudes of 4 km in width that run for approximately 485km from Gamma substation (southeast of Victoria West) to Kappa (Koruson) substation (north of Touws River).

## **5. Abbreviations**

AIA	Archaeological Impact Assessment
BEA	Basic Environmental Assessment – Section (23)(2)(d)
EIA	Environmental Impact Assessment
ESA	Early Stone Age
ESR	Environmental Scoping Report – Section (29)(1)(d)
EIA	Environmental Impacts Assessment – Section (32)(2)(d)
EMP	Environmental Management Plan
HP	Historical Period
HWC	Heritage Western Cape
LSA	Late Stone Age
MSA	Middle Stone Age
NEMA	National Environmental Management Act 107 of 1998
NHRA	National Heritage Resources Act 25 of 1999
PHRA	Provincial Heritage Resource Agency
SAHRA	South African Heritage Resources Agency

## **6. Introduction**

Electricity provisioning is of high strategic importance to South Africa in general and the Western Cape in particular, making the establishment of infrastructure to transport electricity to the later of paramount importance. Not surprisngly, Eskom intents to establish a powerline thas will transmit electricity from Victoria West to the Western Cape. Nzumbululo HS (Pty) Ltd, on behalf of Eskom Holdings contracted Siyathembana Trading 293 (Pty) Ltd to carry out an archaeological scoping and assessment of the proposed construction of the 765kv,

power line from Gamma (south of Victoria West, Northern Cape) to Kappa (Ceres, Western Cape) and associated substation works. The scope of the work also required an assessment of the alternatives to accommodate the proposed powerline in sections of Northern Cape and Western Cape Provinces. This report is part of a bigger EIA that seeks to assess the potential impacts of three possible routes between Gamma substations in Victoria West to Kappa in the Western Cape.

The main purpose of this study is to establish the archaeological sensitivity of the proposed routes in order to avoid or mitigate the impact that the development may have on archaeological sites. Additionally, the study also seeks to inform the developer about relevant legislative requirements and steps that should be followed before and or during the development process. To achieve the above objectives, the study combined desk based research with reconnaissance surveys. The area covered by the reconnaissance surveys was inescapably limited but this caveat does not negate the significance of the project: a full walk down involving detailed archaeological surveys will be carried out along the route that will be selected.

In contrast to regions such as the southern Cape Coast that have received sustained archaeological research since the 1920s, the Karoo area is relatively unknown. The only information that is available largely comes from previous AIA reports. Nonetheless, a careful study of the limited literature, together with reconnaissance surveys, have indicated that the study area hosts a variety of archaeological sites, stretching from the Early Stone Age (ESA) (2.6 million – 200 000 BP), through the Middle Stone Age (MSA) (300 000 – 40 000 BP) and the Late Stone Age (LSA) (30 000 -to the recent historical time (last 2000 years) (Sampson 1974; 1985; Sadr 2008; Barham & Mitchell 2008). The material signatures for all these cultural periods have been identified in the area under study and should be taken cognisance of.

In the last 2000 years, the KhoeKhoe pastoralists settled into this part of the Karoo. This group interacted with the LSA hunter-gatherer communities such as the San leading to the creation of a creolised Khoisan group (Sampson 1974). This interaction continued until the arrival of the Dutch on the Cape coast in the 17<sup>th</sup> Century AD. From then on, a new cultural period (Historical Period) commenced but it was not until the late 18<sup>th</sup> Century AD that Dutch farmers (Trek Boers) settled into this area. Prins (2011) states that the earliest farm in the area under study dates to around AD 1770 and this date has since been taken to mark the start of the Historical Period. By the 1790s, some Xhosa (Bantu speaking communities) from Eastern Cape frequented the area to the north until they settled in the adjacent Pramberg area in the early 19<sup>th</sup> century (Anderson 1985). Several military and non-military encounters between (1) the Dutch farmers and the Khoisan, (2) the Dutch farmers and the Xhosa



speaking communities and (3) the Khoisan and the Xhosa speaking groups, left fingerprints on the landscape, in the form of battle grounds and graves, some of which are poorly marked. The rich archaeological resources in the area under study are located on mountains, flats areas and river valleys.

## **7. Legislative context**

The identification, evaluation and assessment of any cultural heritage sites, artifacts or finds in the South African context is required and governed by the following national and provincial legislations:

- (a) National Heritage Resources Act (NHRA) Act 25 of 1999
  - (i). Protection of Heritage resources – Sections 34 to 36; and
  - (ii). Heritage Resources Management – Section 38
- (b) National Environmental Management Act (NEMA) Act 107 of 1998
  - (i). Basic Environmental Assessment (BEA) – Section (23)(2)(d)
  - (ii). Environmental Scoping Report (ESR) – Section (29)(1)(d)
  - (iii). Environmental Impacts Assessment (EIA) – Section (32)(2)(d)
  - (iv). Environmental Management Plan (EMP) – Section (34)(b)
- (c) Western Cape Heritage Resources Management Regulations
  - (i) Promulgation of Heritage Western Cape and its mandate – PN 336 of 23 October 2002
  - (ii) Regulations made by Heritage Western Cape in terms of section 25 (2) (h) of the NHRA (Act 25 of 1999) – PN 298 of 29 August 2003
  - (iii) Protection of certain properties, conservation areas and gardens of remembrance as heritage resources in the Western Cape – PN 106 of 31 March 2005

The NHRA of 1999 stipulates that cultural heritage resources may not be disturbed without authorization from the relevant heritage authority. Section 34 (1) of the NHRA states that “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...”. Subsection 35(4) of the same act states that: 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 assist with the detection or recovery of metals or archaeological material or objects, or use such equipment for the recovery of meteorites.

The NEMA (No 107 of 1998) states that an Integrated Environmental Management Plan should (23:2 (b)) “...identify, predict and evaluate the actual and potential impact on the environment, socio-economic conditions and cultural heritage”.

This Heritage Impact Assessment report is meant to assist the developer to comply with the relevant South African legislations noted above and to ensure that development is done in a sustainable way. The legislation also provides useful working definitions on what constitute heritage resources, archaeological resources, cultural significance and development. The following definitions are adopted in this scoping report:

**Heritage resources**

This means any place or object of cultural significance

**Cultural significance**

This means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance

**Archaeological resources**

This includes:

- i. material remains resulting from human activity which are in a state of disuse and are in or on land and which are older than 100 years including artefacts, human and hominid remains and artificial features and structures;
- ii. 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 10m of such representation;
- iii. 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 as defined in the Maritimes Zones Act, and any cargo, debris or artifacts found or associated therewith, which is older than 60 years or which SAHRA considers to be worthy of conservation;
- iv. features, structures and artifacts associated with military history which are older than 75 years and the site on which they are found.

**Development**

This means any physical intervention, excavation, or action, other than those caused by natural forces, which may in the opinion of the heritage authority in any way result in the change to the nature, appearance or physical nature of a place or influence its stability and future well-being, including:

- i. construction, alteration, demolition, removal or change in use of a place or a structure at a place;
- ii. carrying out any works on or over or under a place;
- iii. subdivision or consolidation of land comprising a place, including the structures or airspace of a place;
- iv. constructing or putting up for display signs or boards;
- v. any change to the natural or existing condition or topography of land; and
- vi. any removal or destruction of trees, or removal of vegetation or topsoil

**8. Description of the project area and route options**

Based on economic and technical feasibility, Eskom has proposed three 765Kv powerline alternatives that all start from Gamma substation (southeast of Victoria West) and end at

Kappa (Koruson) substation (north of Touws River). This archaeological study is supposed to cover a 4 km wide buffer of the servitude for each route. All the three alternative routes traverse different areas of cultural landscape from the Great Karoo, to the Moordenaars Karoo and the Ceres Karoo. Most of the study area was previously assessed as part of the first Eskom 765Kv power line and this report corresponds to Sections 4 and Section 5 of the previous Gamma-Kappa 765 Kv project (see Smith 2008; PGS 2010). Two of the proposed transmission routes (northern –green and central-pink) traverse a small section of the Northern Cape (Figure 1). The Gamma substation south of Victoria West is on the border between the Northern Cape and the Western Cape. The northern route (green) re-enters the Northern Cape just above its border with the Western Cape and also in Victoria West district. The line then travel through the Western Cape until it re-enters Northern Cape just north of Laingsburg and exiting east of the Breede River in the Ceres Mountains (Figure 1). The central route (pink) also traverses this portion of the Northern Cape. However, since the Northern Cape PHRA has neither acknowledged receipt of, nor given directives for the study corridors falling within their region, SAHRA will be required to comment on this area while Heritage Western Cape is responsible for commenting on areas of the study corridors that fall within its boundaries.

The stretch of land traversed by the three routes is located within multiple districts that include Victoria West in the Northern Cape and Beaufort West, Central Karoo District, Three Sisters, Merweville, Murraysburg, Prince Albert, Laingsburg, Touwsrive,r Ceres, Breede Valley and Witzenberg Local municipalities in the Western Cape. **Route Option 1** (green - northerly) runs from Gamma substation to north of Beaufort West, through Karoo National Park, and in an almost straight line towards Kappa substation (Figure 1). **Route Option 2** (pink - central) runs from Gamma substation to areas adjacent of Three Sisters, Beaufort West, Merweville before reaching the Kappa substation (Figure 1). **Route Option 3** (orange - southerly) is from Gamma substation to south of Beaufort West, travelling at varying distances adjacent to the N1 roadway until Kappa substation north of Touws River (Figure 1).

## 9. Methodology and limitations

The study was based on a combination of desktop research of the available literature and databases, and reconnaissance surveys on selected portions of the research area. The literature consulted includes both published and unpublished archaeological, historical and anthropological works. The reports of previous archaeological impact assessments carried out in the area formed a key component of this research. In addition, SAHRA and Heritage Western Cape databases were also consulted together with the database hosted by the Chief Directorate of Surveys and Mapping in Mowbray. Furthermore, interviews were carried out with members of the heritage authorities responsible for the area in which the proposed development falls. The study revealed significant geographical imbalances in research

coverage with some areas well known when compared to others. There were so many inconsistencies particularly in the existing impact assessment reports with some sites lacking geographical coordinates, while some databases were incomplete. In this respect, reconnaissance surveys that involved a drive-through and limited walking were carried out but given the distances concerned and the fact that there are three proposed routes, a full walk down was impractical. However, this makes walk downs for the selected routes important.

### **10. Description of the archaeology of the project area**

Based on the literature and reconnaissance surveys, it was noted that the area under study has a substantial number of archaeological sites that adorn the different portions of the karoo. A photographic record of the general landscape is shown in Figure 2:

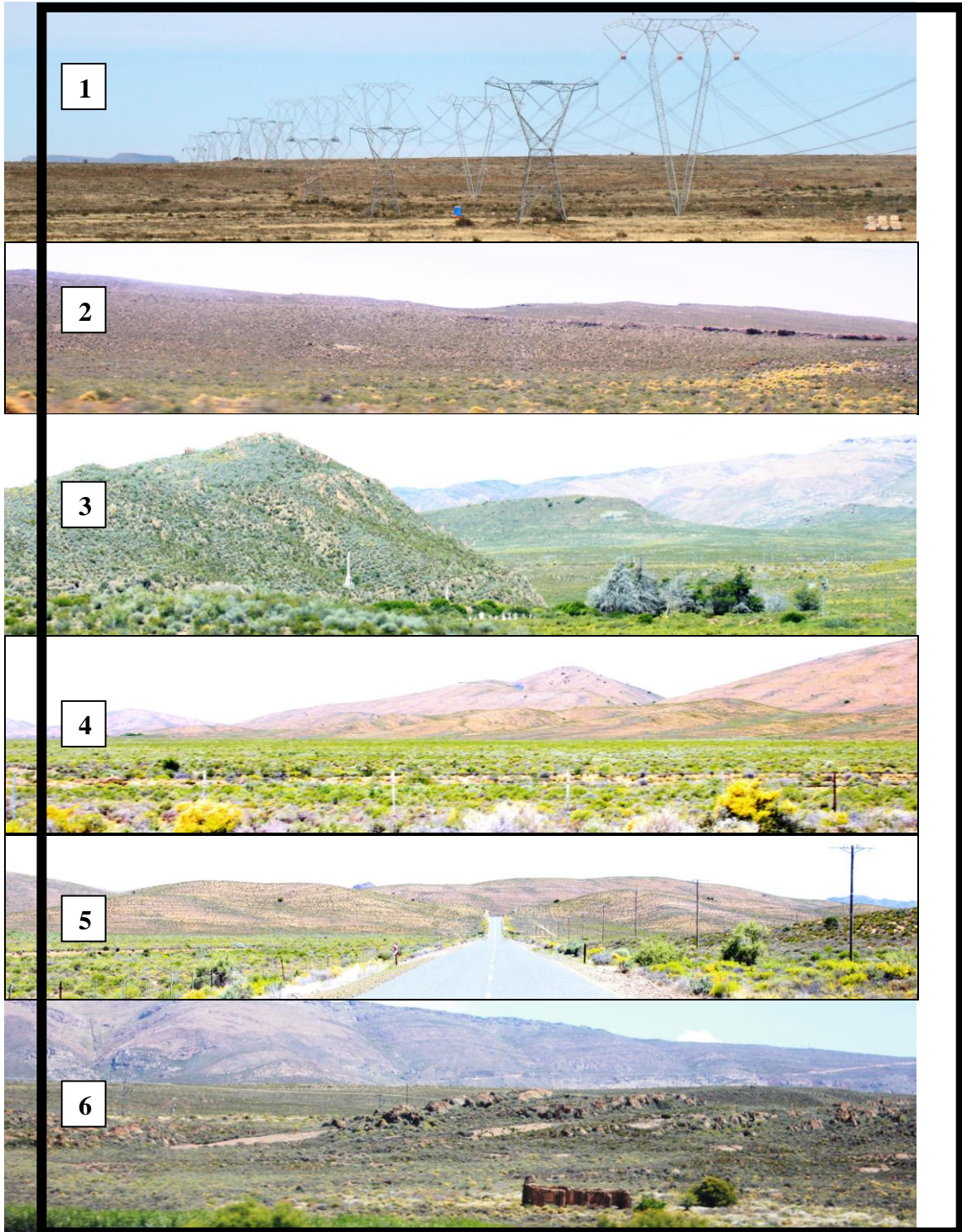


Figure 2: Landscape photos taken during reconnaissance surveys. 1=View of Route Option 1 south east of Sunderland, 2= View of the southwest of Matjiesfontein area (close to Route Option 3), 3=View of historical graves and landscape at Matjiesfontein, 4=View of Route option 3, close to Laingsburg, 5=View of mountain ranges that are parallel to Route Option 2 south of Sunderland (taken from R354 road), 6=View of a historical structure close to Matjiesfontein.

The next section describes the archaeology of the area according to relevant phases.

*i. Early Stone Age*

Stone tools are the principal ESA material to have been found in the area under study. These include crude chopper and other unifacial tools that belong to the Oldowan industry, as well as the characteristic Acheulian hand axes and cleavers (Goodwin & Van Riet Louw 1926; Humphreys 1979; Sampson 1972, 1984). However, as noted by Kaplan (2001), the majority of these tools have now lost their sharp edges and their flake scars are barely recognizable. As such their identification demands careful inspection, especially because most of them appear to have been subsequently modified during either the Middle or Later Stone Age periods (Nilssen 2011). This section of the Karoo is endowed with dolerite dykes, which host hornfels/indurated shale which was used for making these tools (Parkington 1984). The ESA tools in the study area mostly occur in open sites, next to dry riverbeds, pans, vleis, ancient river valleys and mountains are rarely associated with organic remains such as bone (Kaplan 2001, Hart and Webley 2011a). Examples include site 1-4, 14, 36, 65, 70, 135, 139 and 142, that are close to different portions of the three route options (Appendix 1). The overall significance of these sites has been shown to be low but researchers have cautioned that they should not be dismissed outright because of their potential to inform research on the distribution of the ESA in the dry interior (Kaplan 2001). However, the sites appear to be concentrated closer to the central route, probably due to the skewed research coverage. As such, it should be noted that relatively low number of ESA sites closer to Route Option 3 does not automatically translate to the absolute lack of such archaeological resources.



Figure 3: Showing an ESA hand axe from Site 142 (close to R354 road -Route Option 3).

### ii. Middle Stone Age

The MSA is a cultural period which in southern Africa is associated with the emergence of *archaic Homo Sapiens* thought to be responsible for changes in the stone tool technology as well as the beginning of art and symbolic expression – the so called modernity (Hensilhood and Marean 2003). Unlike the ESA lithics that were mostly core tools (Sampson 1974), the MSA tools are characterised by flakes and blades which are relatively smaller when compared to those used in the preceding ESA. MSA sites found in the research area are often defined by clusters of tools or isolated occurrences of stone implements that include cores, hammer stones, flakes, chunks, blades, convergent flakes, unifacial and bifacial points, adzes and several retouched pieces (Prins 2011, Kaplan 2001). Of all the Stone Age periods, the MSA sites occur more frequently in the area under study but just like the ESA, they rarely occur in their original contexts (Kaplan 2001). While this does not necessarily render the sites insignificant, it means threats to their integrity and preservation can be mitigated or eliminated by careful siting of particular pylons without completely changing the direction of the power lines (see Kaplan 2001). Thus care should be taken when siting pylons close to dry riverbeds, pans, vleis and ancient river valleys since they are associated most MSA sites in this area. Site with MSA materials in the present study include 1, 3-5, 32, 34, 35, 50-53, 56, 59, 65, 66, 73, 78, 79, 87, 89, 91, 94, 95, 97, 100, 101, 110, 112, 114 and 128-142 that also appear at different portions of the three routes (Appendix 1).

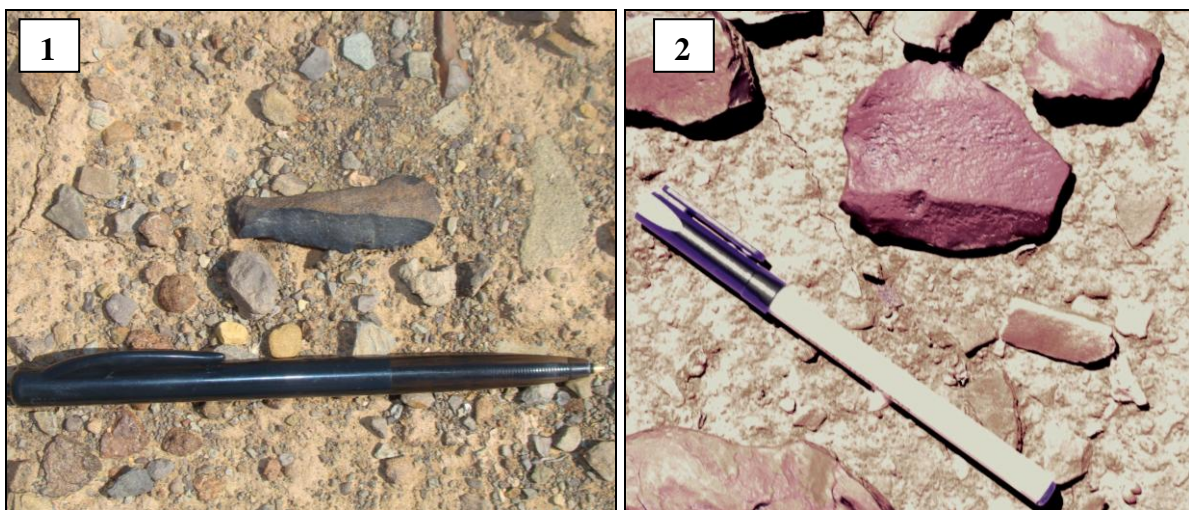


Figure 4: Middle Stone Age tools. 1= Site 97 (close to Route Option 2) and 2=Site 142 (Close to Route Option 3), see Appendix 1.

### iii. Late Stone Age

More technological and behavioural changes than those witnessed in the MSA, occurred during the LSA, which is also associated with *Homo Sapiens* (Barham & Mitchell 2008).

Comparatively, lithics became much smaller, specialised and with more retouch than those of the MSA. More organic tools art and symbolic expressions were also recorded in the LSA of southern Africa in general but the LSA expression in the area under study is limited to lithics and isolated occurrence of Rock Art (both rock paintings and engravings). With regards to lithics, various core types including bladelet cores, hammer stones, flakes, chips, chunks, blades, bladelets, adzes and retouched pieces have been reported in isolated clusters (Prins 2011, Kaplan 2001). These lithics were overwhelmingly made with hornfels though some appear in quartzite, sandstone and mud rock. Closer to Beaufort West, Prins (2011) reports the occurrence of production sites where the reduction sequence can be reconstructed through refitting of flake debris to cores. Other organic materials associated with lithics in this area included ostrich egg shells. A previous study by Kaplan (2001) noted the occurrence of a low density scatter of LSA tools and some ostrich eggshell on the farm La-De-Da, just to south of the Karoo National Park.

The last 10 000 years have been associated with the San groups who produced most of the Rock Art. Parkington *et al* (2008) have reported on the occurrence of rock engravings in this area, of which the best known sites occur at Nelspoort near Beaufort West. The threats to this Rock Art are generally low and can be easily mitigated but other associated services such as roads would need to be sited with great care to ensure that these sites are not affected. Kaplan (2001) red flagged the mountainous portions in this area because of the occurrence of such Rock Art sites, amongst other sites. The animals depicted in the Rock Art include sheep, which together with goats and cattle were introduced in this area by the Khoe Khoe herders (Deacon & Deacon 1999; Sampson 1985). The latter are also associated with the introduction of ceramic vessels but these have not been widely reported in the area under study. At about 1200 – 1400AD, a global climatic fluctuation (known as the Little Ice Age) is thought to have caused an increased rainfall in the now dry Karoo, resulting in the area being more suitable for the grazing by cattle and occupation by Khoe Khoe pastoralists. Prins (2011) argue that archaeology of pastoralist occupation of the Karoo is indicated by various stone kraal complexes similar to several hundreds that have been recorded by Sampson (1985) in the Seacow River Valley. It is now known that stone walling in this part of the world began during the Stone Age (Sadr 2012). A proper identification of these stone walling is important because similar structures are also associated with the 19<sup>th</sup> Century AD Xhosa speaking communities (Zachariou 2011). Some of the LSA sites that occur within the area under study include Site 5-13, 62, 65, 66, 71, 78, 83, 100, 113, 126, 129, 130, 135, 136, 139 and 142 (Appendix 1).

#### *iv. Historical Period*

The archaeology of this area dating after 1770 AD also reflects the cohesion and interactions that relate to the Trekboers and other LSA cultural groups, as well as some Iron Age groups Prins (2011). Being pastoralists themselves, the Trekboers settled on the escarpment where most of the springs were found and they were also mobile (Penn 2005). As a result of conflict with both pastoral groups and the San who raided their livestock was imminent. Not



surprisingly, a period of conflict ensued until the 1880s when San resistance to colonial expansion in the Karoo came to an end but the previous military contact resulted in several marked and unmarked graves that should be noted (Penn 2005; Adhikari 2010; Gall 2002). During the period of conflict some Khoe Khoe groups aided the Trekboers in exterminating the San groups and thus their archaeological signature during this period was slightly modified through the introduction of European goods (Prins 2011; Smith *et al* 2000).



Figure 5: Landmark erected in memory of second lieutenant Desmond Thornhill Gilfillan who died in a place crush on 08 July 1942, at a nearby spot in Beaufort West.

Care should be taken when approaching the Kappa Station using the Route Option 3 because previous studies have documented some stone walled sites not very far from the existing servitude (see Figure 6).



Figure 6: Square shaped historic kraal about 350 from a Powerline in Platfontein farm, near Kappa station. The square shape denotes historic age (after Orton 2008)

Hart and Webley (2011a) and Fourie (2010) also recorded more sites some of which were directly under the servitude (Route Option 2-Central/pink route) (see Figure 1 and Appendix 1). Corbelled huts are another critical archaeological feature that developed as a vernacular architectural designed to cope with a scarcity of wood as a building resource and as a measure to combat San attacks during the nineteenth century (Oberholster 1972). Some of these do occur near Beaufort West and Merweville (Oberholster 1972; Kramer 2010).



Figure 7: Example of corbelled hut from Koppiesfontein Kramer (2010: 5)

The appearance of the Xhosa speaking communities in this part of the Karoo dates back to the 1790s (Anderson 1985). These Bantu speaking communities were moved into this area in order to participate in the ivory trade which initially included the Khoisan and the Trekboers (Zachariou 2011). They also settled in stone walled settlements, most of which will appear similar to those of the Khoisan groups, at first glance. Indeed in most of the previous literature, no such distinctions were made and stone walled sites were merely mentioned as isolated features or structures. Most of these Xhosa sites occur in the Prumberg area, closer to Victoria West but this may as well be a reflection of lack of dedicated research into this type of archaeology.

## **11. Mapping identified sites**

The identified sites were plotted on a Google map in relation to the different power line alternatives as shown in Figure 8 below. The map is in a much bigger scale which clustered some sites close together when in actual fact they are widely separated. Despite this caveat, it is clear that there are fewer sites along the Route Option 1 than Route Option 2 (Figure 8).



Figure 8: Plot of identified sites in relation to various power line alternatives

## 12. Statement of significance and selection of preferred route

The archaeological sites in the area proposed for development are associated with numerous values ranging from cultural, scientific, spiritual, aesthetic and historical. There is general agreement that this area is as yet archaeologically unknown and holds significant potential for enhancing our knowledge of communities that lived in the interior over the course of human history. As such, adequate care must be taken to ensure that negative impact of the development is mitigated. To achieve this, we have provided a table that help in assessing the most preferable route.

**Table 1: The relationships between identified sites and proposed powerline routes.**

	<b>Route Option 1</b>	<b>Route Option 2</b>	<b>Route Option 3</b>
Number of sites near routes <sup>1</sup>	61	120	24
Sites with high significance	21	22	5
Sites with medium-high significance	9	15	10
Sites with medium significance	4	21	0
Sites with medium-low significance	4	4	0
Sites with low significance	14	49	0
Sites with very low significance	9	9	9
Early Stone Age sites	4	9	4
Middle Stone Age sites	22	42	18
Late Stone Age sites	5	23	5
Historical Period sites	11	19	0
Site of unknown period (?)	25	51	6
Comments on the implications of the relationship between identified sites and route options	<ul style="list-style-type: none"> <li>-This is the preferred route.</li> <li>-Has less sites than Option 2.</li> <li>-Sites along this route are better known than those along Route Option 3.</li> <li>-Sites can be avoided through a careful survey of the pylon positions.</li> <li>-Mitigation of sites is possible</li> </ul>	<ul style="list-style-type: none"> <li>-This is the second.</li> <li>-Has more sites than the rest.</li> <li>- Sites along this route are better known than those along Route Option 3.</li> <li>-Mitigation of medium or low significance sites is possible</li> </ul>	<ul style="list-style-type: none"> <li>-This is the least preferred.</li> <li>-Has least number of sites but large portions of this route have not been adequately researched.</li> <li>-There is a likelihood of encountering many new sites, whose significance and mitigation cannot be predicted.</li> </ul>

<sup>1</sup> Some of the sites are closer to more than one route, which is why the total number of sites in this table is more than that in Appendix 1.

### **13. Conclusion and recommendation**

In conclusion, a comprehensive desktop survey of the three alternatives for the +/- 485 kilometre long Gamma-Kappa Eskom transmission line identified the presence of archaeological sites, ranging in antiquity from the ESA, through the MSA and LSA to the recent past. The landscape is therefore a palimpsest of activities spanning different time and cultural periods. The most important observation is that this area is relatively unknown but archaeologists who have worked in this area indicate that the sites have low significance. Perhaps, it is important to consider the cumulative impact, which considers the significance of the ensemble of sites on the landscape. That way, sites will be protected while allowing development to proceed. No outstanding significant sites were reported in the area. Neither are there any provincial sites. It is however important to conduct a detailed walk down to identify and record and mitigate sites that fall in the development footprint.

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### 15. Appendix 1: Gazetteer of known sites from published and unpublished sources

Site ID in this study	Site ID in source	Lat S (°)	Long E (°)	Type	Description	Significance	Route Option	Source
1	2	32.30492	22.63969	ESA&MSA	Scatter of lithics	Low?	2	Nilssen 2011
2	3	32.30552	22.63997	ESA-LSA	Scatter of lithics	Low?	2	Nilssen 2011
3	9	32.30894	22.63409	ESA&MSA	Scatter of lithics	Low?	2	Nilssen 2011
4	74	32.30047	22.64524	ESA?MSA	Scatter of lithics	Low?	2	Nilssen 2011
5	109	32.29356	22.64487	LSA& MSA	Scatter of lithics. Only one MSA tool	Low?	2	Nilssen 2011
6	243	32.28988	22.67518	LSA	Scatter of lithics	Low?	2	Nilssen 2011
7	249	32.28991	22.66876	LSA-like	Scatter of lithics	Low?	2	Nilssen 2011
8	250	32.29014	22.66833	LSA-like	Scatter of lithics	Low?	2	Nilssen 2011
9	251	32.28995	22.66822	LSA-like	Scatter of lithics	Low?	2	Nilssen 2011
10	253	32.28902	22.66737	LSA-like	Isolated scatter of lithics	Low?	2	Nilssen 2011
11	254	32.28893	22.66739	LSA-like	Isolated scatter of lithics	Low?	2	Nilssen 2011
12	255	32.28886	22.66725	LSA-lke	Isolated scatter of lithics	Low?	2	Nilssen 2011
13	313	32.29037	22.66198	LSA-like	Scatter of lithics	Low?	2	Nilssen 2011
14	334	32.28934	22.65836	ESA	Hand axe	Low?	2	Nilssen 2011
15	001	33.04823 500	20.1078300 0	?	Graves, at least 4, marked by mounds covered by local pebbles	High	1&2	Hart & Webley 2011
16	002	33.04816 400	20.1080320 0	?	Graves, 2 probable, immediately adjacent to track, crude stone cairns	High	1&2	Hart & Webley 2011

17	003	33.04850 400	20.1092390 0	?	Stone mounds possibly graves	High	1&2	Hart & Webley 2011
18	004	33.06549 800	20.1102520 0	?	Stone walling (possible kraal or windbreak, on rock outcrop	Medium - low	1&2	Hart & Webley 2011
19	005	33.08436 200	20.1149020 0	?	Graves, 3, on river bank marked by rock cairns	High	1&2	Hart & Webley 2011
20	006	33.10268 400	20.1136370 0	?	Grave, big circular rock cairn	High	1&2	Hart & Webley 2011
21	007	33.10322 700	20.1135030 0	HP	Remains of a stone structure and associated artefactual material in the form of bottles, wire, tin cans etc. (1960's)	Low	1&2	Hart & Webley 2011
22	008	33.10532 300	20.1125230 0	HP	Stone structure, 3 sided, probable kraal. Also some early 20th c ceramics. A small baking oven nearby	High- medium	1&2	Hart & Webley 2011
23	009	33.10552 100	20.1135100 0	?	Stone walling? on koppie opposite 008. No enclosure defined?	Low	1&2	Hart & Webley 2011
24	010	33.08942 900	20.1160310 0	HP	Ruined stone cottage (approx 15x7m) with hearth stack, probably 3 rooms (incl kitchen). Evidence of cement plaster on outside. Associated artefactual material includes blue, green, and white glass, Annular ware, other plain refined earthenware, blue and white pattern refined earthenware. Tin cans.	High	1&2	Hart & Webley 2011
25	011	33.08928 300	20.1162920 0	HP	Well, quarried into bedrock associated with 010	Medium - low	1&2	Hart & Webley 2011
26	012	33.08938 100	20.1166810 0	?	Kraal, small stone square	Medium - low	1&2	Hart & Webley 2011
27	013	33.08972 400	20.1172440 0	?	Stone structure, possibly small dwelling	Low	1&2	Hart & Webley 2011
28	014	33.08934 000	20.1171200 0	?	Grave on river bank	High	1&2	Hart & Webley 2011
29	015	33.08925 400	20.1168890 0	?	Grave on river bank	High	1&2	Hart & Webley 2011
30	016	33.08925 500	20.1169800 0	?	Grave on river bank	High	1&2	Hart & Webley 2011

31	017	33.07178 200	20.1373810 0	?	Graves, 2 possible	High	1&2	Hart & Webley 2011
32	018	33.07108 300	20.1319200 0	MSA	Artefact scatter, silcrete cores, flakes next to road	Low	1&2	Hart & Webley 2011
33	019	33.06748 600	20.1332310 0	?	Graves, 2 neatly packed stone mounds, probably graves. In the Eskom servitude. Close to river in soft soils.	High	1&2	Hart & Webley 2011
34	020	33.06778 000	20.1325000 0	MSA	Artefact scatter consisting of MSA flakes, cores, chunks made on quartzite, hornfels and silcrete. At Eskom pylon in servitude	Low	1&2	Hart & Webley 2011
35	021	33.04086 200	20.0856450 0	MSA	Scatters of lithics next to the river	Low	1&2	Hart & Webley 2011
36	022	33.04252 900	20.0852210 0	ESA	Isolated artefact, probable ESA handaxe	Low	1&2	Hart & Webley 2011
37	023	33.04217 800	20.0909040 0	Historical	Graves, possibly 4-5 marked by stone piles, associated white ceramics (1950's?).	High	1&2	Hart & Webley 2011
38	024	33.04343 000	20.0971770 0	?	Circular (8 m diameter) stone feature, possibly a trapvloer	Low	1&2	Hart & Webley 2011
39	025	33.04321 000	20.0977680 0	HP	Rectangular stone outline, 8 m x 3 m, representing a worker's house?	Low	1&2	Hart & Webley 2011
40	026	33.04315 300	20.0976690 0	?	Graves, approx 8, close to 025. Covered by large cobbles	High	1&2	Hart & Webley 2011
41	027	33.04304 700	20.0976900 0	HP	Domestic dump, containing glass, bone, metal, charcoal. Medicinal type bottle, white ceramic with floral decoration	Medium	1&2	Hart & Webley 2011
42	028	33.04300 600	20.0976620 0	?	Similar to 027 above	Medium	1&2	Hart & Webley 2011
43	029	33.04300 000	20.0977430 0	?	Graves, approx 5 possible with associated ceramics and glass fragments	High	1&2	Hart & Webley 2011
44	030	33.04394 300	20.1018930 0	HP	Small rectangular stone feature (4x3m) next to farm road. Associated aqua and green glass	---	1&2	Hart & Webley 2011

45	031	33.04430 600	20.1022600 0	?	Small stone feature next to farm road	Low	1&2	Hart & Webley 2011
46	032	33.03841 300	20.1038410 0	HP	Domestic refuse dump, held in place by retaining wall on river side. Glass, ceramics, metal	Medium	1&2	Hart & Webley 2011
47	033	33.03847 400	20.1036700 0	?	Kraal, small circular stone	Medium - low	1&2	Hart & Webley 2011
48	034	33.03847 400	20.1035870 0	HP	Various wall footings and possible graves. One "grave" has exotic marine shell (oyster and whelk).	High	1&2	Hart & Webley 2011
49	035	33.03959 900	20.1061640 0	HP	Formal graves associated with old farmstead	High	1&2	Hart & Webley 2011
50	039	33.07359 200	20.0538630 0	MSA	Artefact scatter, heavily patinated grey hornfels. Chunks, flakes, blades, cores but also quite a number of retouched pieces including denticulates	Medium	1	Hart & Webley 2011
51	040	33.07576 700	20.0538860 0	MSA	Artefact scatter, extensive as for 039	Medium	1&2	Hart & Webley 2011
52	L01	33.03888 530	20.1078141 0	MSA	Site above river. Discrete scatter of MSA stone tools, fine-grained, patinated hornfels. Single large blade.	Low	1	Hart & Webley 2011
53	L02	33.07031 700	20.0909731 0	MSA	Located at T114. A scatter of MSA flakes on grey hornfels.	Low	1&2	Hart &Webley 2011
54	Wall	33.05773 780	20.0881895 0	?	Long single row of cobbles, representing stones packed along the bottom of a wire fence (now gone).	Low	1&2	Hart & Webley 2011
55	3220CC	32° 50.5	20° 00	?	Stone tools, ostrich eggshell at Bizarsgat	Medium/ high	1	Smith 2008
56	3220DC	32° 58	20° 33	MSA	MSA scatter at Fortuin	Medium/ high	2	Smith 2008
57	3221CC	32° 46	21° 05	MSA	Lithics at Swaerskraal	Medium/ high	1&2	Smith 2008
58	3221CD	32° 48	21° 18	?	Rock paintings, human skeleton at Amandelboom	Medium/	2	Smith 2008

						high		
59	3221CD	32° 46	21° 26	MSA	Buffelsvlei	Medium/ high	2	Smith 2008
60	3221DC	32° 47	21° 31	?	Rock paintings at Koedoesfontein	Medium/ high	2&3	Smith 2008
61	3222AD	32° 15	22° 22	?	Rock engravings at Doornhoek	Medium/ high	1	Smith 2008
62	3222AD	32° 23	: 22° 25	LSA	Lithics & ostrich eggshell at La-De-Da	Medium/ high	1	Smith 2008
63	3222BB			?	Stone artefacts, rock engravings at Klipkraal	Medium/ high	1	Smith 2008
64	3222BB	32° 04	22° 56	?	Rock engravings at Courlands Kloof	Medium/ high	1	Smith 2008
65	3222BC			ESA, MSA & LSA	Scatter of lithics around the entrance to Municipal Commonage , Loxton Road, Beaufort West	Medium/ high	2&3	Smith 2008
66	3222BC			MSA & LSA	MSA & LSA flakes on road to windmill in Kleinplat	Medium/ high	2&3	Smith 2008
67	3223AA	32° 04	23° 02	?	Stone artefact scatters, decorated pottery at Gamma Siding in Klipkraal	Medium/ high	2	Smith 2008
68	3223AA			?	Stone artefact scatter and rock engravings around the gate to old quarry, within 20m of National Road at Courtland Kloof Estate	Medium/ high	2	Smith 2008
69	3223AA			?	Rock engravings on kopje just above confluence of Krom & Salt Rivers, South side of Salt	Medium/ high	2	Smith 2008
70	3318BB	33° 04	19° 50	ESA	Lithics at Fonteins Kop	Medium/ high	1	Smith 2008
71	3318BB	33° 09	19° 58.5	LSA	Lithics around Zand Rivier	Medium/ high	1, 2 &3	Smith 2008
72	3318BB	33° 13.41	19° 53.1	?	Stone artefacts, pottery, rock paintings at Vaalkloof	Medium/ high	3	Hall & Mazel 2006
73	3318BB	33° 07	19° 59	MSA	MSA lithics at Platfontein	Medium/ high	3	Kaplan 2001
74	3320AA	33° 11.5- 33° 12	20° 09-20° 10.5	?	3 sites at Smousbos with stone artefacts, ostrich eggshell, rock paintings	Medium/ high	3	Smith 2008
75	3320AA	33° 9.5- 33° 9.7	20° 8	?	2 sites at Melkbosch Kraal with stone artefacts, pottery, rock paintings	Medium/ high	3	Smith 2008

76	3320AA	33° 9.5-33°10.5	20° 13.1-20° 13.9	?	Stone artefacts, pottery at Brewelsfontein	Medium/high	3	Smith 2008
77	3320AA	33° 9.5	20° 01	?	Stone artefacts, rock paintings around Zand Rivier	Medium/high	3	Smith 2008
78	3320AA	33° 05	20° 08	MSA&LSA	Stinkfontein	Medium/high	2	Kaplan 2001
79	Gk001	31.71536	23.38842	MSA	Low density scatter of MSA flakes	Medium	2	Fourie 2010
80	Gk002	31.73297	23.37333	?	Circular stone walled structure probably used as small stock pen	Medium	2	Fourie 2010
81	Gk004	31.76409	23.34422	?	Low density scatter of lithics with a large hand axe	Medium	2	Fourie 2010
82	Gk005	31.76409	23.34422	?	A low/medium density scatter of stone tools that include flakes and debitage	Medium	2	Fourie 2010
83	Gk006	31.76799	23.33961	LSA	Low density lithic scatter	Low	2	Fourie 2010
84	Gk007	31.78719	23.31553	Historic?	Rock engravings of train	Medium	2	Fourie 2010
85	Gk008	31.82368	23.28237	?	A small cave of which the entrance was partially closed off with rocks	Low	2	Fourie 2010
86	Gk009	31.86669	23.26297	?	A single line of packed rocks (about 200m) that could have formed the edge of a road or track, or could have formed part of a fence.	Low	2	Fourie 2010
87	Gk010	31.87593	23.25852	MSA	Low density lithic scatter	Low	2	Fourie 2010
88	Gk011	31.95319	23.20754	Historic?	A dam wall or the wall for a weir	Low	2	Fourie 2010
89	Gk012	31.97362	23.19182	MSA?	Low density scatter of lithics	High	2	Fourie 2010
90	Gk013	31.99256	23.17659	LSA KhoeKhoe?	Low/medium density of lithic scatter & a potsherd	High	2	Fourie 2010
91	Gk014	31.99623	23.17362	LSA/Historic	3 circular stone walled enclosures, an extended stone wall, glass fragments of which was written "The Property of Brookes Lemos Bros, Ltd" & lithics and potsherds	High	2	Fourie 2010
91	Gk015	32.01403	23.15922	MSA	A low density scatter of stone tools	Medium	2	Fourie 2010
92	Gk016	32.08010	23.08736	?	A low density scatter of stone tools	Medium	2	Fourie 2010
93	Gk017	32.08549	23.08003	?	Low density lithic scatter	Low	2	Fourie 2010
94	Gk018	32.18406	22.96104	MSA	A low density scatter of MSA cores only	Medium	2	Fourie 2010
95	Gk019	32.18495	22.96019	MSA	A low density scatter of MSA cores & flakes	Medium	2	Fourie 2010
96	Gk020	32.20197	22.93866	?	A medium density scatter of cores & flakes	Medium	2	Fourie 2010
97	Gk022	32.25761	22.82218	MSA	A low density scatter of stone tools	Low	2	Fourie 2010

98	Gk023	32.29726	22.75992	?	A low density scatter of stone tools	Low	2	Fourie 2010
99	Gk024	32.31575	22.73141	?	A low density scatter of stone tools	Low	2	Fourie 2010
100	Gk031	32.40196	22.54005	MSA/LSA	Scatter of MSA tools later modified in LSA	Medium	2	Fourie 2010
101	Gk032	32.40281	22.52232	MSA	A low density scatter of stone tools	Low	2	Fourie 2010
102	Gk033	32.43424	22.39852	?	Consists of half circle shaped stone wall approx 5m in circumference. No cultural materials associated.	Medium	2	Fourie 2010
103	Gk034	32.52057	22.17075	?	The remains of a dilapidated stone circular structure	Medium	2	Fourie 2010
104	Gk035	32.52087	22.17099	?	Dilapidated remains of an unknown collapsed structure associated with several broken glasses	Low	2	Fourie 2010
105	Gk036	32.55921	22.02481	HP	Rectangular stone structure	Medium	2	Fourie 2010
106	Gk037	32.59191	21.89938	?	Circular/slightly oval stone structure (1.0m x 1.5m) that might possibly be a grave	Medium	2	Fourie 2010
107	Gk038	32.61796	21.80763	HP	A small fenced cemetery that belongs to the Le Roux family (local farmers) and consists of 15 graves arranged in three rows. The graves date from 1892 to more recent.	Low	2	Fourie 2010
108	Gk039	32.68060	21.55845	?	A long extended stone wall, partly damaged during the construction of a pylon of the existing line	Low	2	Fourie 2010
109	Gk040	32.69029	21.52057	?	A dry stone wall running north south over the transmission line servitude. It varies in height between 0,5m and 1,50m in sections.	Low	2	Fourie 2010
110	Gk041-2	32.69647	21.49681	MSA?	Consists of a low, dispersed scatter of cores & flakes. Most of the flakes can be refitted to a single prepared core	Low	2	Fourie 2010
111	Gk043	32.69962	21.48319	?	A single bifacial hand axe and a single struck blank	Low	2	Fourie 2010
112	Gk044	32.71825	21.41269	MSA	A low to medium dispersed scatter of cores & flakes	Low	2	Fourie 2010
113	Gk045	32.73334	21.31924	LSA?	A single lithic core	Low	2	Fourie 2010
114	Gk046	32.73396	21.26608	MSA	A single MSA blade with double patination	Low	2	Fourie 2010
115	Gk047	32.85098	21.05001	HP	Remains of two dilapidated structures associated with a midden, glass bottle fragments (blue and clear glass), ceramic fragments and metal objects such as wire and tins	High	2	Fourie 2010

116	Gk048	32.86120	21.03590	?	A single ESA biface/cleaver	Low	2	Fourie 2010
117	Gk049	32.86436	20.93613	HP	Ruins of a farmstead with a stone build main house and the remains of some stone built outbuildings, a threshing floor and a visible ash midden containing bone debris as well as glass and metal artefacts	High	2	Fourie 2010
118	GK050	32.86664	20.94917	HP	A low stone wall constructed as part of a small holding dam for run-off water	Low	2	Fourie 2010
119	GK051	32.91761	20.69140	?	An extended stone wall running for about 400 m	Medium	2	Fourie 2010
120	GK052	32.93701	20.64026	?	A single round stone structure approximately 10.0 metres in diameter with a single opening of 1.0 metre on the east side of the structure.	Medium	2	Fourie 2010
121	GK053	32.93746	20.63956	?	3 round stone packed structures approximately 20 metres on the east of the structure discussed in GK052	High	2	Fourie 2010
122	GK054	32.94880	20.54806	?	Consist of 4-5 stone lined graves aligned east-west	High	2	Fourie 2010
123	GK055	32.95595	20.50446	?	Consists of 3 stone lined graves aligned east-west	High	2	Fourie 2010
124	GK057	33.03746	20.21531	?	A possible informal grave	High	2	Fourie 2010
125	GK058	33.04815	20.18619		2 lithic artefacts	High	2	Fourie 2010
126	GK059	33.05962	20.15575	LSA	A sparse scatter of LSA tools made from exotic chert and crypto crystalline silica	Low	2	Fourie 2010
127	GK060	33.08934	20.07628	LSA	A medium to high dispersed scatter of cores & flakes, as well as an upper grinding stone	High	2	Fourie 2010
128	GK061	33.09793	20.05255	MSA	A low to medium dispersed scatter of cores & flakes	High	1,2&3	Fourie 2010
129	GK062	33.10745	20.02695	MSA&LSA	A low to medium dispersed scatter of cores & flakes	High	1,2&3	Fourie 2010
130	GK063	33.10915	20.02187	MSA&LSA	A low to medium dispersed scatter of cores & flakes	High	1,2&3	Fourie 2010
131	GK064	33.11021	20.02026	MSA	A low to medium dispersed scatter of cores & flakes	High	1,2&3	Fourie 2010
132	GK065	33.11137 - 33.11158	20.01688- 20.01659	MSA	consists of some MSA cores and numerous flakes with faceted platforms	High	1,2&3	Fourie 2010
133	PFN2008 /001	33° 06 09.5	20° 00 23.1	MSA	Gravel with lithics	Very low	1,2&3	Orton 2008



134	PFN2008 /002	33° 06 17.0	20° 00 23.3	MSA	Gravel with lithics	Very low	1,2&3	Orton 2008
135	PFN2008 /003	33° 06 41.9	20° 00 59.6	ESA? MSA & LSA	Deflation with conflated artefacts of varying age and the hollow is probably not a living spot	Very low	1,2&3	Orton 2008
136	PFN2008 /004	33° 06 43.4	20° 00 50.7	MSA & LSA	Good scatter of artefacts, no evidence of organics, just two MSA lithics	Very low	1,2&3	Orton 2008
137	PFN2008 /005	33° 06 37.4	20° 00 59.0	MSA	Gravel with lithics	Very low	1,2&3	Orton 2008
138	PFN2008 /006	33° 06 38.2	20° 01 03.1	MSA	Gravel with lithics	Very low	1,2&3	Orton 2008
139	PFN2008 /007	33° 06 35.6	20° 00 53.8	ESA? MSA & LSA	Low density scatter of lithics with only 1 LSA piece	Very low	1,2&3	Orton 2008
140	PFN2008 /008	33° 06 40.4	20° 00 29.4	MSA	Concentration of lithics on a hilltop	Very low	1,2&3	Orton 2008
141	PFN2008 /009	33° 06 39.7	20° 00 21.4	MSA	Lithic scatters	Very low	1,2&3	Orton 2008
142				ESA,MSA, LSA	Scatter of stonel tools and cores	Low	3	Our analysis