

Archaeological Impact Assessment

**Archaeological Impact Assessment Report for the Garob to Kronos Power Line, near Copperton
in the Northern Cape Province.**

Prepared For

Savannah Environmental (Pty) Ltd

By



HERITAGE

Contracts and Archaeological Consulting

TEL: +27 82 373 8491. E –MAIL JACO.HERITAGE@GMAIL.COM

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CLIENT: Savannah Environmental (Pty) Ltd

CONTACT PERSON: Umeshree Naicker
Cell: 083 353 3341,
Tel: 011 234 6621
Fax: 086 684 0547
E – mail: bongani@savannahsa.com

SIGNATURE: _____

LEADING CONSULTANT: Heritage Contracts and Archaeological Consulting CC (HCAC)

CONTACT PERSON: Jaco van der Walt
Heritage Contracts and Archaeological Consulting
Professional Member of the Association of Southern African
Professional Archaeologist (#159)

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SIGNATURE: _____

EXECUTIVE SUMMARY

Savannah Environmental (Pty) Ltd, on behalf of Juwi Renewable Energies (Pty) Ltd, appointed Heritage Contracts and Archaeological Consulting CC (HCAC) to conduct an Archaeological Impact Assessment for a power line from the proposed Garob Wind Energy Facility to the Kronos substation for connection into the national grid for the Garob Wind Energy Facility. As the Garob wind energy facility was surveyed by HCAC in 2012 and the proposed power lines that were assessed at the time are no longer suitable, a new alternative is proposed that is assessed under the current report. The 14 km power line with a 300m buffer zone was assessed at desktop level as the properties that the power line traverse has been subjected to Archaeological Impact Assessments (vd Walt 2012b, Orton 2012 and Wiltshire 2011). The power line is proposed on portion 5 of the farm Nels Poortje 103, portion 4 of the farm Nels poortje and the remainder of farm Hoekplaas 146. The site is located to the east and south of the town of Copperton within the Siyathemba Municipality in the Northern Cape Province.

The study area consists of a featureless flat plain with relatively low vegetation. Other studies in the area highlighted the archaeological importance of pans in the area (Kiberd 2006, Wiltshire 2011, Orton 2012) however no pans are in close proximity to the proposed power line. Low densities of Early Stone Age (ESA), Middle Stone Age (MSA) and Later Stone Age (LSA) scatters were recorded by the various authors over the study area but have been classified as of low archaeological significance. However, several discrete MSA and LSA sites were found and documented as sites on these properties but again are not in close proximity to the proposed power line. Apart from the Stone Age artefacts recorded single stone enclosures were also found as well as several sites with historic material.

MSA artefacts recorded mostly on portion 5 of the farm Nels Poortje 103 consisted of large flakes, radial and bipolar cores, points, end scrapers, large utilized and retouched blade tools, and utilized and retouched flakes. Raw materials were predominant in fine grained quartzite, hornfels, banded ironstone, chert and vein quartz. Localised Stone Age quarries exploiting the quartzitic bedrock and boulders of vein quartz were also found. This is consistent with finds made on portion 4 of the farm Nelspoortjie and the remainder of farm Hoekplaas 146.

LSA tools were found in comparatively lower concentrations compared to the MSA tallies. LSA tools consisted of chert, hornfels and other indurated shales, banded ironstone, vein quartz and quartzites. Adzes, scrapers, retouched and utilized flakes, bladelets, small round cores, and unmodified flakes and chunks were seen and this was also noted by Kaplan (2010) south-east of Copperton mine, and by Wiltshire (2011) on portion 3 and 4 of the farm Nels poortje.

No buildings are in close proximity to the power line and no cultural landscape elements were noted. Visual impacts to scenic routes and sense of place are slightly higher due to the project's close proximity to the road but are still not assessed to be high.

If the recommendations as made in section 7 of this report are adhered to (subject to approval from SAHRA) there is, from an archaeological point of view, no reason why the development should not proceed.

General

Due to the subsurface nature of archaeological material and unmarked graves, the possibility of the occurrence of such finds cannot be excluded. If during construction any possible finds such as stone tool scatters, artefacts or bone and fossil remains are made, the operations must be stopped and a qualified archaeologist must be contacted for an assessment of the find/s.

Disclaimer: *Although all possible care is taken to identify sites of cultural importance during the investigation of study areas, it is always possible that hidden or sub-surface sites could be overlooked*

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ABBREVIATIONS

AIA: Archaeological Impact Assessment
ASAPA: Association of South African Professional Archaeologists
BIA: Basic Impact Assessment
CRM: Cultural Resource Management
ECO: Environmental Control Officer
EIA: Environmental Impact Assessment*
EIA: Early Iron Age*
EIA Practitioner: Environmental Impact Assessment Practitioner
EMP: Environmental Management Plan
ESA: Early Stone Age
GPS: Global Positioning System
HIA: Heritage Impact Assessment
LIA: Late Iron Age
LSA: Late Stone Age
MEC: Member of the Executive Council
MIA: Middle Iron Age
MPRDA: Mineral and Petroleum Resources Development Act
MSA: Middle Stone Age
NEMA: National Environmental Management Act
PRHA: Provincial Heritage Resource Agency
SADC: Southern African Development Community
SAHRA: South African Heritage Resources Agency

** Although EIA refers to both Environmental Impact Assessment and the Early Iron Age both are internationally accepted abbreviations and must be read and interpreted in the context it is used.*

GLOSSARY

Archaeological site (remains of human activity over 100 years old)

Early Stone Age (~ 2.6 million to 250 000 years ago)

Middle Stone Age (~ 250 000 to 40-25 000 years ago)

Later Stone Age (~ 40-25 000, to recently, 100 years ago)

The Iron Age (~ AD 400 to 1840)

Historic (~ AD 1840 to 1950)

Historic building (over 60 years old)

1 BACKGROUND INFORMATION

Heritage Contracts and Archaeological Consulting CC (HCAC) was appointed to conduct an Archaeological Impact Assessment for the power line from the proposed Garob Wind Energy Facility to the Kronos substation for connection into the national grid for the Garob Wind Energy Facility. As the Garob wind energy facility was surveyed by the HCAC in 2012 and the proposed power lines assessed at the time are no longer suitable and a new alternative is proposed that is assessed under the current report. The 14 km power line with a 300m buffer zone was assessed at desktop level as the properties that the power line traverse has been subjected to Archaeological Impact Assessments (vd Walt 2012b, Orton 2012 and Wiltshire 2011). The power line is proposed on portion 5 of the farm Nels Poortje 103, portion 4 of the farm Nelspoortjie and the remainder of farm Hoekplaas 146. The site is located to the east and south of the town of Copperton within the Siyathemba Municipality in the Northern Cape Province. The study forms part of the BA for the project.

The aim of the study is to identify cultural heritage sites, document, and assess their importance within local, provincial and national context. It serves to assess the impact of the proposed project on non-renewable heritage resources, and to submit appropriate recommendations with regard to the responsible cultural resources management measures that might be required to assist the developer in managing the discovered heritage resources in a responsible manner. It is also conducted to protect, preserve, and develop such resources within the framework provided by the National Heritage Resources Act of 1999 (Act 25 of 1999).

The report outlines the approach and methodology utilized before and during the survey, which includes: Phase 1, a desktop study for the Garob wind energy site on the farm Nels poortje 103 (van der Walt 2012a) that includes collection from various sources and consultations; Phase 2, assessing the impact of the proposed power line on recorded heritage sources; Phase 3, reporting the outcome of the study.

During the survey by Van der Walt (2012b) 4 find spots/background scatters consisting of low density scatters of mainly LSA and MSA material were found and Orton (2012) recorded 3 similar sites (this includes only sites in the current power line corridor, there are numerous sites in the greater area). Possible impacts were identified and mitigation measures are proposed in the following report.

This report must also be submitted to the SAHRA for review.

1.1 Terms of Reference

Desktop study

Conduct a brief desktop study where information on the area is collected to provide a background setting of the archaeology that can be expected in the area.

Field study

No fieldwork was conducted for this assessment as the area has been covered by CRM practitioners (van der Walt 2012b, Orton 2012 and Wiltshire 2011). The results from their field work will be used as it is assumed that: a) the area has been systematically surveyed to locate, identify, record, photograph and describe sites of archaeological, historical or cultural interest; b) significant areas have been recorded as GPS points; c) the levels of significance of the various types of heritage resources recorded in the project area have been determined.

Reporting

Report on the identification of anticipated and cumulative impacts the operational units of the proposed project activity may have on the identified heritage resources for all 3 phases of the project; i.e., construction, operation and decommissioning phases. Consider alternatives, should any significant sites be impacted adversely by the proposed project. Ensure that all studies and results comply with Heritage legislation and the code of ethics and guidelines of ASAPA.

To assist the developer in managing the discovered heritage resources in a responsible manner, and to protect, preserve, and develop them within the framework provided by the National Heritage Resources Act of 1999 (Act 25 of 1999).

1.2. Archaeological Legislation and Best Practice

Phase 1, an AIA or a HIA is a pre-requisite for development in South Africa as prescribed by SAHRA and stipulated by legislation. The overall purpose of a heritage specialist input is to:

- » Identify any heritage resources, which may be affected;
- » Assess the nature and degree of significance of such resources;
- » Establish heritage informants/constraints to guide the development process through establishing thresholds of impact significance;
- » Assess the negative and positive impact of the development on these resources;
- » Make recommendations for the appropriate heritage management of these impacts.

The AIA or HIA, as a specialist sub-section of the EIA, is required under the National Heritage Resources Act NHRA of 1999 (Act 25 of 1999), Section 23(2)(b) of the NEMA and section s.39(3)(b)(iii) of the MPRDA.

The AIA should be submitted, as part of the EIA, BIA or EMP, to the PHRA if established in the province or to SAHRA. SAHRA will be ultimately responsible for the professional evaluation of Phase 1 AIA reports upon which review comments will be issued. 'Best practice' requires Phase 1 AIA reports and additional development information, as per the EIA, BIA/EMP, to be submitted in duplicate to SAHRA after completion of the study. SAHRA accepts Phase 1 AIA reports authored by professional archaeologists, accredited with ASAPA or with a proven ability to do archaeological work.

Minimum accreditation requirements include an Honours degree in archaeology or related discipline and 3 years post-university CRM experience (field supervisor level).

Minimum standards for reports, site documentation and descriptions are set by ASAPA in collaboration with SAHRA. ASAPA is a legal body, based in South Africa, representing professional archaeology in the SADC region. ASAPA is primarily involved in the overseeing of ethical practice and standards regarding the

archaeological profession. Membership is based on proposal and secondment by other professional members.

Phase 1 AIAs are primarily concerned with the location and identification of sites situated within a proposed development area. Identified sites should be assessed according to their significance. Relevant conservation or Phase 2 mitigation recommendations should be made. Recommendations are subject to evaluation by SAHRA.

Conservation or Phase 2 mitigation recommendations, as approved by SAHRA, are to be used as guidelines in the developer's decision making process.

Phase 2 archaeological projects are primarily based on salvage/mitigation excavations preceding development destruction or impact on a site. Phase 2 excavations can only be conducted with a permit, issued by SAHRA to the appointed archaeologist. Permit conditions are prescribed by SAHRA and includes (as minimum requirements) reporting back strategies to SAHRA and deposition of excavated material at an accredited repository.

In the event of a site conservation option being preferred by the developer, a site management plan, prepared by a professional archaeologist and approved by SAHRA, will suffice as minimum requirement.

After mitigation of a site, a destruction permit must be applied for from SAHRA by the client before development may proceed.

Human remains older than 60 years are protected by the National Heritage Resources Act, with reference to Section 36. Graves older than 60 years, but younger than 100 years fall under Section 36 of Act 25 of 1999 (National Heritage Resources Act), as well as the Human Tissues Act (Act 65 of 1983), and are the jurisdiction of SAHRA. The procedure for Consultation Regarding Burial Grounds and Graves (Section 36[5]) of Act 25 of 1999) is applicable to graves older than 60 years that are situated outside a formal cemetery administrated by a local authority. Graves in this age category, located inside a formal cemetery administrated by a local authority, require the same authorisation as set out for graves younger than 60 years, in addition to SAHRA authorisation. If the grave is not situated inside a formal cemetery, but is to be relocated to one, permission from the local authority is required and all regulations, laws and by-laws, set by the cemetery authority, must be adhered to.

Human remains that are less than 60 years old are protected under Section 2(1) of the Removal of Graves and Dead Bodies Ordinance (Ordinance no. 7 of 1925), as well as the Human Tissues Act (Act 65 of 1983), and are the jurisdiction of the National Department of Health and the relevant Provincial Department of Health and must be submitted for final approval to the office of the relevant Provincial Premier. This function is usually delegated to the Provincial MEC for Local Government and Planning; or in some cases, the MEC for Housing and Welfare.

Authorisation for exhumation and reinterment must also be obtained from the relevant local or regional council where the grave is situated, as well as the relevant local or regional council to where the grave is being relocated. All local and regional provisions, laws and by-laws must also be adhered to. To handle and transport human remains, the institution conducting the relocation should be authorised under Section 24 of Act 65 of 1983 (Human Tissues Act).

1.3 Description of Study Area

1.3.1 Location Data

The proposed development will be located on portion 5 of the farm Nels Poortje 103, portion 4 of the farm Nelspoortjie (now known as Vogelstruisbult and the remainder of the farm Hoekplaas 146 (Figure 1). The power line originates on portion 5 of Nelspoortjie (location of Garob wind energy facility) moving south west towards the R357 provincial road. Here the line runs on the northern side but parallel to the R357 to the Kronos substation. The vegetation is predominantly Bushmanland Arid Grassland vegetation in the Nama-Karoo biome (Mucina & Rutherford 2006) which consists of Karoo scrub and grass and a few

isolated *Acacia karoo* trees. Historical imagery on Google earth indicates that the land has been fallow for a number of years.

1.3.2. Location Map

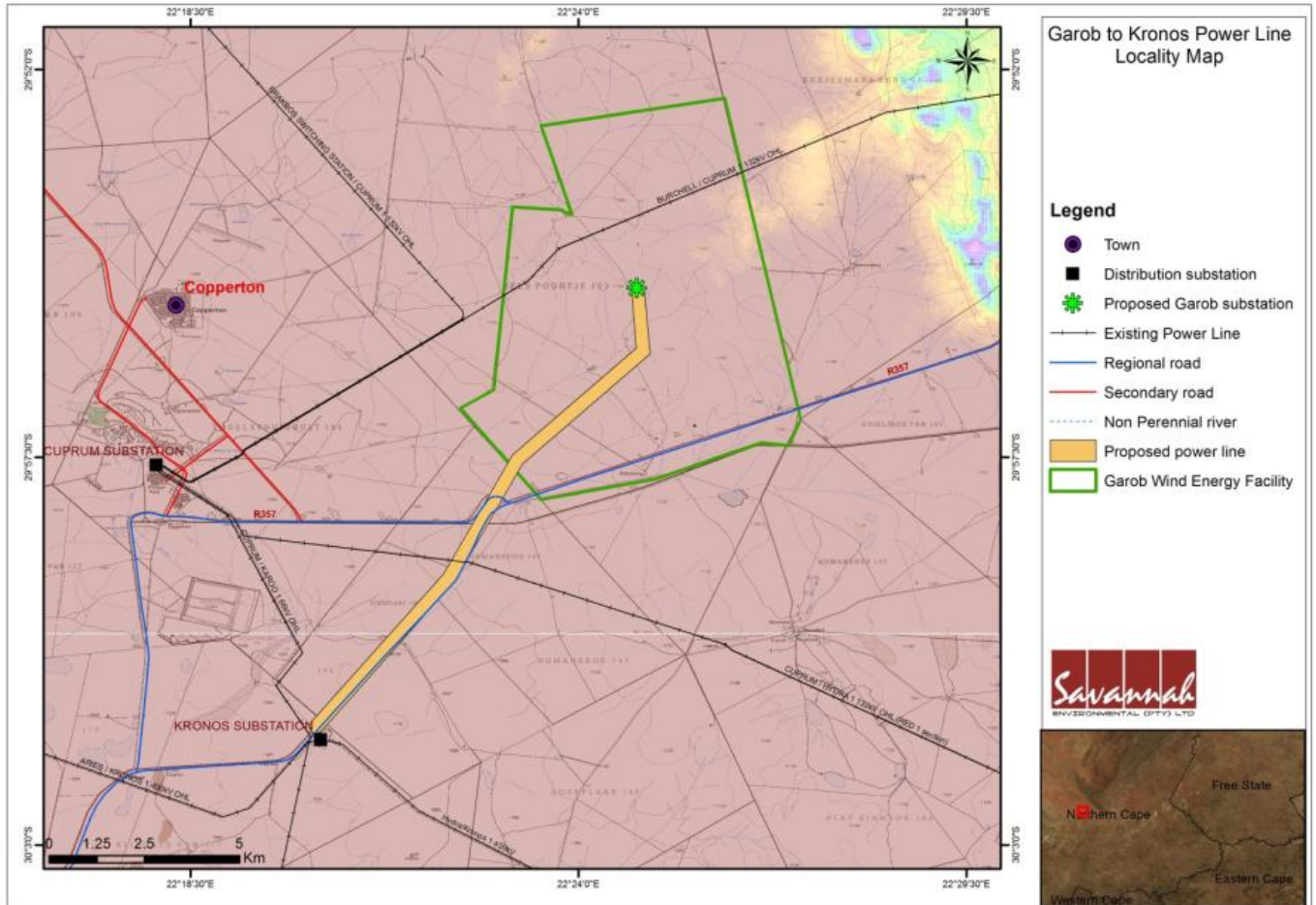


Figure 1: Location map showing the power line alignment in yellow.

2. APPROACH AND METHODOLOGY

The aim of the study is to cover archaeological databases to compile a background of the archaeology that can be expected in the study area followed by field verification; this was accomplished by means of the following phases.

2.1 Phase 1 - Desktop Study

The first phase comprised a desktop study scanning existing records for archaeological sites, historical sites, graves, architecture (structures older than 60 years) of the area.

2.1.1 Literature Search

Utilising data for information gathering stored in the archaeological database at Wits and previous CRM reports done in the area (SAHRIS). The aim of this is to extract data and information on the area in question.

2.1.2 Information Collection

The SAHRA report mapping project (Version 1.0) was consulted to collect data from previously conducted CRM projects in the region to provide a comprehensive account of the history of the study area.

2.1.3 Consultation

No public consultation was done during the study as this is done as part of the BA.

2.1.4 Google Earth and Mapping Survey

Google Earth and 1:50 000 maps of the area were utilised to identify possible places where sites of heritage significance might be located.

2.1.5 Genealogical Society of South Africa

The database of the Genealogical Society was consulted to collect data on any known graves in the area.

2.2 Phase 2 - Physical Surveying

The study area was covered by various heritage specialists and can be summarised as follows:

- vd Walt 2012b, Archaeological Impact Assessment for the proposed Garob Wind Energy Facility on the farm Nelspoortjie
- Orton 2012, Heritage Impact Assessment For A Proposed Photovoltaic Energy Plant On The Farm Hoekplaas
- Wiltshire 2011, Archaeological Impact Assessment Of A Proposed Wind Energy Facility, Power Line And Landing Strip In Copperton

The study area has therefore been extensively covered by means of vehicle and extensive surveys on foot.

2.3. Restrictions

Due to the fact that most cultural remains may occur below surface, the possibility exists that some features or artefacts may not have been discovered/ recorded during the various surveys. Low ground visibility of parts of the study area is due to sand cover and vegetation, and the possible occurrence of unmarked graves and other cultural material cannot be excluded. The power line was assessed at a desktop level based on the findings from the various specialists and it is assumed that the information contained in their reports is valid and accurate. The study did not include a visual specialist or a palaeontological assessment.

Some parts of the study area have very low archaeological visibility due to moderate to deep red Aeolian sands and low bushes. In some instances the Aeolian sands that covered most of the recorded sites also hampered an accurate estimation of site density and site extent. Depending on erosion and movement of the sand these counts can vary to a large degree when the site is revisited in future. It is assumed that information obtained for the wider region is accurate and applicable to this study.

It is incumbent upon the developer to stop operations and inform the relevant heritage agency should further cultural remains, such as stone tool scatters, artefacts, bones or fossils, be exposed during the process of development.

3. NATURE OF THE DEVELOPMENT

The proposed power line corridor is approximately 14 km in length with a 300 meter buffer zone (Figure 3). The proposed alignment forming the project proposal as part of a BA were assessed during various AIA:



Figure 2. Power line corridor

4. HISTORICAL AND ARCHAEOLOGICAL BACKGROUND OF THE STUDY AREA

4.1 Databases Consulted

Archaeological Data Bases

Due to the short timeline for the project it was not possible to get access to the archaeological database at the McGregor Museum in Kimberly.

SAHRA Report Mapping Project

Several previous heritage studies were conducted to the west of the study area (SAHRA report mapping project V1.0) by K van Ryneveld (2006 a,b,c). More recently the proposed alignment was covered by independent studies for various other projects. J Orton (2012) conducted a HIA on the farm Hoekplaas and Wiltshire (2011) on portion 3 and 4 of the farm Nelspoortjie (now called Vogelstruisfontein) and van der Walt (2012b) on portion 5 of the farm Nelspoortjie. All these studies recorded ESA, MSA and LSA artefacts scattered over the landscape with MSA and LSA sites centred around pans. Orton also recorded stone walled enclosures.

Genealogical Society and Google Earth Monuments

Neither the Genealogical Society nor the monuments database at Google Earth (Google Earth also include some archaeological sites and historical battlefields) have any recorded sites in the study area.

4.2. Historiography and Methodology

As part of the AIA by van der Walt (2012b) a brief archival study was conducted focussing on the farm Nelspoortjie. It was necessary to use a range of sources in order to give an accurate account of the history of the area in which the farm Nelspoortje No. 103 is located. Sources included secondary source material, maps and archival documents. Although many sources exist on the history of towns and districts, it is often difficult to compile histories that focus on very specific parts of the area, such as individual farms. No documents could be found in the National Archives of South Africa that specifically refer to this farm. One document specifically referring to the farm Nelspoortje No. 103 can be found in the Cape Town Archives Repository. Unfortunately, it was not possible to obtain this document for this report. This is the following:

- Cape Town Archives Repository. 1889-1890. *KAB, LND: 1/327 L3329. Lot 4826, "Nelspoortje", Prieska: Messrs. Loots' application to purchase out of hand.*

Unfortunately, due to time limitations, not all of the sources that were found could be incorporated into the report. The following are relevant sources that can be consulted in the future, if a more thorough investigation is done on the history of the farm area:

- Anderson, E. A. 1987. *A history of the Xhosa of the Northern Cape, 1795-1879*. MA Thesis. Cape Town: University of Cape Town.
- Evans, M. M. 2000. *Encyclopedia of the Boer War. 1899 – 1902*. Cornwall: MPG Books Limited.
- Hocking, A. 1983. *Kaias and cocopans: the story of mining in South Africa's Northern Cape*. Johannesburg: Hollards Publishers.
- Mountain, A. 2003. *The first people of the Cape*. Claremont: David Philip Publishers.
- Nasson, B. 1988. The War of Abraham Esau 1899-1901: Martyrdom, Myth and Folk Memory in Calvinia. *African Affairs*, Vol. 87, No. 347 (Apr., 1988), pp. 239-265.
- South Africa. Railways and Harbours Board. 1914. *Report of the Board of the South African Railways and Harbours on a proposed line of railway from Prieska to Upington*. Cape Town.

4.3. A Brief History of Human Settlement And Black And White Interaction In The Copperton Area

In order to understand the historical context of a certain area, it is necessary to consider the geographic and climatic nature of the region in question. The town of Copperton is located in a region in South Africa known as the Upper Karoo. One gets a good idea of what the natural landscape in the Upper Karoo was like between the late 1700s and early 1800s when one reads the transcripts of some of the early European travellers who passed through the area. One C. J. Skead compiled a book in which many of these texts are assembled. In November 1900, the traveller W. Somerville wrote about the Groot Riviers Poort, or Prieskapoort, 10km south of Prieska and therefore not very far from Copperton. He noted that grasslands and thorn trees covered the landscape, but that no tree was to be seen. When he neared the Orange River, he noted that the banks were covered with wood, but only along the margin of the river. These were mainly willow and karee trees. Along the tributary streams were thorn trees (Skead 2009: 87).

Exactly one year later, One P. B. Borchers wrote about the Grootrivierpoort at Prieska, making similar remarks about the flora as Somerville did. He also noted that the *poort* at the entrance to the Orange River was known by the "natives" under the name of t'Gariep. When this traveller passed along the banks of the Orange River near Prieska in the same year, he made notes on the Bushmen, who were still present in the area at that time. Regarding the manufacturing of bows and arrows by the Bushmen, he noted that the wood of the bow was of a type of tree commonly known as *caree boomen*, which was very tough and pliable. The arrows were made of a type of reed fairly common along all springs and river flowing there, known as *fluitjies riet*. The Bushmen apparently used the poison of venomous plants and poison extracted from the fangs of snakes to smear on their arrow points. These people also found sustenance in a type of small bulb, commonly called *mans uitjies* by the Khoikhoi, which were described to be the size of small marbles and not unpleasant in taste (Skead 2009: 87-88).

In September 1822, W. J. Burchell passed through Prieska, as well as the area to the south and southwest thereof. Some 50km southwest of Prieska, he found a large muddy dam, which was situated in a very extensive hollow flat. This would become a lake in the rainy season. There was apparently still some clean water to be found. The area around this was hard and dry, and plentifully strewn with stones and low shrubs. Burchell passed through Prieska to the Orange River in the same month. He noted that none of the bushes exceeded a foot in height. Nearer to the Orange River, the travelling party found a group of Khoikhoi camped in a grove.

By 1903, Copperton was located in an area in which the annual rainfall measured between 10 and 20 inches, and was therefore quite arid. The farm area is located in a summer rainfall region. By the early 1900s, the Prieska district, in which Copperton would be located, could not be considered a very agriculturally active area. Only between 25 and 50 sheep were kept per square mile, and only between 2 and 5 heads of cattle. The area where Copperton was later founded would have been too dry and too far from the Orange River to allow for the growing of crops (Burton 1903: 40; 256).

The farm Nelspoortje No. 103 is located in close proximity of the small town of Copperton, and the history of this town is therefore of importance. On 16 November 1991, an article was published in *Die Burger* with regards to the town Copperton. It was asserted that the old deserted Northern Cape mining town would be developed and populated as a "Volkstaatsdorp" (city state / Volkstaat town) by the Oranje Development Corps. It was said that Copperton would then be the second Volkstaat town in South Africa that had been developed exclusively to be inhabited by whites. Earlier that year, Orania had been developed as such a town. Though the town of Copperton had been abandoned at the time, a business centre, primary school, nursery school, an office development and a drive-in theatre had been developed. About 50% of the town's streets were tarred (Anon 1991: 2).

In November 1991, the Weekend Argus also published an article regarding the development of Copperton as an Orania-like town. It was noted that the 300 hectares mine area near the town would be used for industrial development, and that agriculture, as well as light industry such as steel, rubber and textile industries, were expected to be developed in the town. It could not be ascertained whether this town was eventually developed in this way (Anon 1991: 5).

In an article in the Patriot, dated December 1995, some background information is given on the history of the town of Copperton. This town is not very old, as it was only developed in 1972 with the establishment of a copper mine in the area. The mine closed in 1992, and Copperton was sold to a private person, on the condition that the houses in the town would be demolished. About 300 houses were broken down, when it was decided that some homes would be kept in order to develop a retirement town. These houses were apparently solidly built, with stone walls and corrugated roofs. It was noted that the area was very sparsely populated, and that the farmers in the area farmed with sheep. Next to the Orange River, maize and grapes were planted. It was noted that the closest hospitals were located at Prieska, some 35 to 40 minutes' drive from Copperton, and linked with a tarred road (Anon 1995: 4).

4.4. Historical Overview of the Ownership and Development Of The Farm Nelspoortje No. 103

Unfortunately, no documents referring to this farm could be found at the National Archives of South Africa. It is however possible to draw some conclusions with bits and pieces of information that could be found elsewhere.

It seems that the Messrs. Loots applied to buy the farm Nelspoortje, at that time known as Lot 4826 and located in the Prieska district, between 1889 and 1890 (Cape Town Archives Repository *KAB, LND: 1/327 L3329*).

Unfortunately, for the purpose of this report it was not possible to find records with regards to the ownership of Nelspoortje from the late 1800s onwards. It is likely that such records will be available in the Cape. It was however found that one Gideon Bertus Jacobs became the owner of Portion 6 of the farm in 1981 (Deeds Office Property 2012).

Beaumont *et al.* (1995: 240) observed that “thousands of square kilometres of Bushmanland are covered by a low density lithic scatter”. These artefacts are generally very well weathered and mostly pertain to the ESA and MSA. Occasional LSA artefacts are also noted. What is noteworthy of the Northern Cape archaeological record is the presence of pans which frequently display associated archaeological material. Of interest here is the work of Kiberd (2001, 2005, 2006) who excavated Bundu Pan, some 25 to 30 km northwest of Copperton. The site yielded ESA, MSA and LSA horizons and the artefacts were accompanied by warthog and equid teeth to name a few (Beaumont *et al.* 1995).

Orton (2011) noted that to the northwest, west and southwest of Copperton sites have been investigated by Beaumont and colleagues (1995), Smith (1995a) and Parsons (2003, 2004, 2007, 2008) yielding LSA deposits. Work on these sites led to a distinction between hunter-gatherer and herder sites, based on stone artefact assemblages (Beaumont *et al.* 1995). All these Later Stone Age sites have very few, if any, organic items on them. The only organic material found on sites like these is fragments of ostrich eggshell probably belonging to broken water containers. Such flasks have been widely recorded across the Northern Cape (Morris 1994).

4.5. Palaeontology

Dr Johan Almond (2011) conducted a Palaeontological Impact Assessment in the form of a desk top study for a different wind farm facility on portion 3 and 4 of the farm Nelspoortjie and found that the fossil sensitivity in this area is low.

5. HERITAGE SITE SIGNIFICANCE AND MITIGATION MEASURES

The presence and distribution of heritage resources define a 'heritage landscape'. In this landscape, every site is relevant. In addition, because heritage resources are non-renewable, heritage surveys need to investigate an entire project area, or a representative sample, depending on the nature of the project. In the case of the proposed quarry extension the local extent of its impact necessitates a representative sample and only the footprint of the areas demarcated for development were surveyed. In all initial investigations, however, the specialists are responsible only for the identification of resources visible on the surface.

This section describes the evaluation criteria used for determining the significance of archaeological and heritage sites. The following criteria were used to establish site significance:

- » The unique nature of a site;
- » The integrity of the archaeological/cultural heritage deposits;
- » The wider historic, archaeological and geographic context of the site;
- » The location of the site in relation to other similar sites or features;
- » The depth of the archaeological deposit (when it can be determined/is known);
- » The preservation condition of the sites;
- » Potential to answer present research questions.

Furthermore, The National Heritage Resources Act (Act No 25 of 1999, Sec 3) distinguishes nine criteria for places and objects to qualify as 'part of the national estate' if they have cultural significance or other special value. These criteria are:

- » Its importance in/to the community, or pattern of South Africa's history;
- » Its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;
- » Its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;
- » Its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;
- » Its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
- » Its importance in demonstrating a high degree of creative or technical achievement at a particular period;
- » Its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;
- » Its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa;
- » Sites of significance relating to the history of slavery in South Africa.

5.1. Field Rating of Sites

Site significance classification standards prescribed by SAHRA (2006), and acknowledged by ASAPA for the SADC region, were used for the purpose of this report. The recommendations for each site should be read in conjunction with section 7 of this report.

<i>FIELD RATING</i>	<i>GRADE</i>	<i>SIGNIFICANCE</i>	<i>RECOMMENDED MITIGATION</i>
National Significance (NS)	Grade 1	-	Conservation; national site nomination
Provincial Significance (PS)	Grade 2	-	Conservation; provincial site nomination
Local Significance (LS)	Grade 3A	High significance	Conservation; mitigation not advised
Local Significance (LS)	Grade 3B	High significance	Mitigation (part of site should be retained)
Generally Protected A (GP.A)	-	High/medium significance	Mitigation before destruction
Generally Protected B (GP.B)	-	Medium significance	Recording before destruction
Generally Protected C (GP.C)	-	Low significance	Destruction

5.2 Impact Rating of Assessment

The criteria below are used to establish the impact rating of sites as per the impact rating methodology employed by Savannah environmental:

- » The **nature**, which shall include a description of what causes the effect, what will be affected and how it will be affected.
- » The **extent**, wherein it will be indicated whether the impact will be local (limited to the immediate area or site of development) or regional, and a value between 1 and 5 will be assigned as appropriate (with 1 being low and 5 being high):
- » The **duration**, wherein it will be indicated whether:
 - * the lifetime of the impact will be of a very short duration (0-1 years), assigned a score of 1;
 - * the lifetime of the impact will be of a short duration (2-5 years), assigned a score of 2;
 - * medium-term (5-15 years), assigned a score of 3;
 - * long term (> 15 years), assigned a score of 4; or
 - * permanent, assigned a score of 5;

- » The **magnitude**, quantified on a scale from 0-10 where; 0 is small and will have no effect on the environment, 2 is minor and will not result in an impact on processes, 4 is low and will cause a slight impact on processes, 6 is moderate and will result in processes continuing but in a modified way, 8 is high (processes are altered to the extent that they temporarily cease), and 10 is very high and results in complete destruction of patterns and permanent cessation of processes.
- » The **probability of occurrence**, which shall describe the likelihood of the impact actually occurring. Probability will be estimated on a scale of 1-5 where; 1 is very improbable (probably will not happen), 2 is improbable (some possibility, but low likelihood), 3 is probable (distinct possibility), 4 is highly probable (most likely) and 5 is definite (impact will occur regardless of any prevention measures).
- » The **significance**, which shall be determined through a synthesis of the characteristics described above and can be assessed as low, medium or high; and
- » the **status**, which will be described as either positive, negative or neutral.
- » the degree to which the impact can be reversed.
- » the degree to which the impact may cause irreplaceable loss of resources.
- » the *degree* to which the impact can be mitigated.

The **significance** is calculated by combining the criteria in the following formula:

$$S=(E+D+M)P$$

S = Significance weighting

E = Extent

D = Duration

M = Magnitude

P = Probability

The **significance weightings** for each potential impact are as follows:

- » < 30 points: Low (i.e., where this impact would not have a direct influence on the decision to develop in the area),
- » 30-60 points: Medium (i.e., where the impact could influence the decision to develop in the area unless it is effectively mitigated),
- » > 60 points: High (i.e., where the impact must have an influence on the decision process to develop in the area).

6. BASELINE STUDY-DESCRIPTION OF SITES

A total of 7 artefact clusters have been recorded located within the buffer zone of the proposed power line. Four of these were recorded by van der Walt (2012b) on the farm Nelspoortjie while the remaining three was recorded by Orton (2012).

The survey by van der Walt was aimed at covering the proposed infrastructure associated with the Garob wind generating facility, but also focused on specific areas on the landscape that would be more likely to contain archaeological and/or other heritage remains like drainage lines, rocky outcrops as well as slight elevations in the natural topography. These areas were searched more intensively, but many other areas were walked in order to confirm expectations in those areas. At the start of the survey a high density of Stone Age material was immediately noticed scattered in varying densities throughout the study area. Therefor low density scatters (between 3 - 5 artefacts per m²) was recorded as find spots (background scatter). Scatters higher than 5 artefacts per m² were given site numbers. Scatters with densities less than 2 artefacts per m² were not recorded as they occur throughout the area. Individual occurrences were not point plotted within the recorded scatters however an attempt was made at determining site extent. GPS readings were taken roughly in the middle of each identified scatter.

Orton's survey followed the same methodology for the Hoekfontein solar farm, where the study area was covered through a combination of driving and walking. The driving aimed to locate areas that, through experience, would be more likely to contain archaeological and/or other heritage remains. These typically consisted of hills, dense gravel patches and pan and stream margins (Orton 2012). Orton distinguished Stone Age finds between background scatter and sites. Allocating field numbers to the background scatters and actually giving site numbers to those with good integrity.

Both authors noted that artefacts were observed in low densities over much of the study area where quartz, quartzite and cryptocrystalline silica (CCS) is used as raw material. Some of the artefacts show a high degree of weathering probably being washed in from their original context and are therefore of little archaeological value. In some places ESA, MSA and LSA artefacts are mixed and indicate that downward deflation had occurred in the study area.

For a detailed description of methodology, finds and assessments of these areas please refer to the original reports (vd Walt 2012b, Orton 2012).

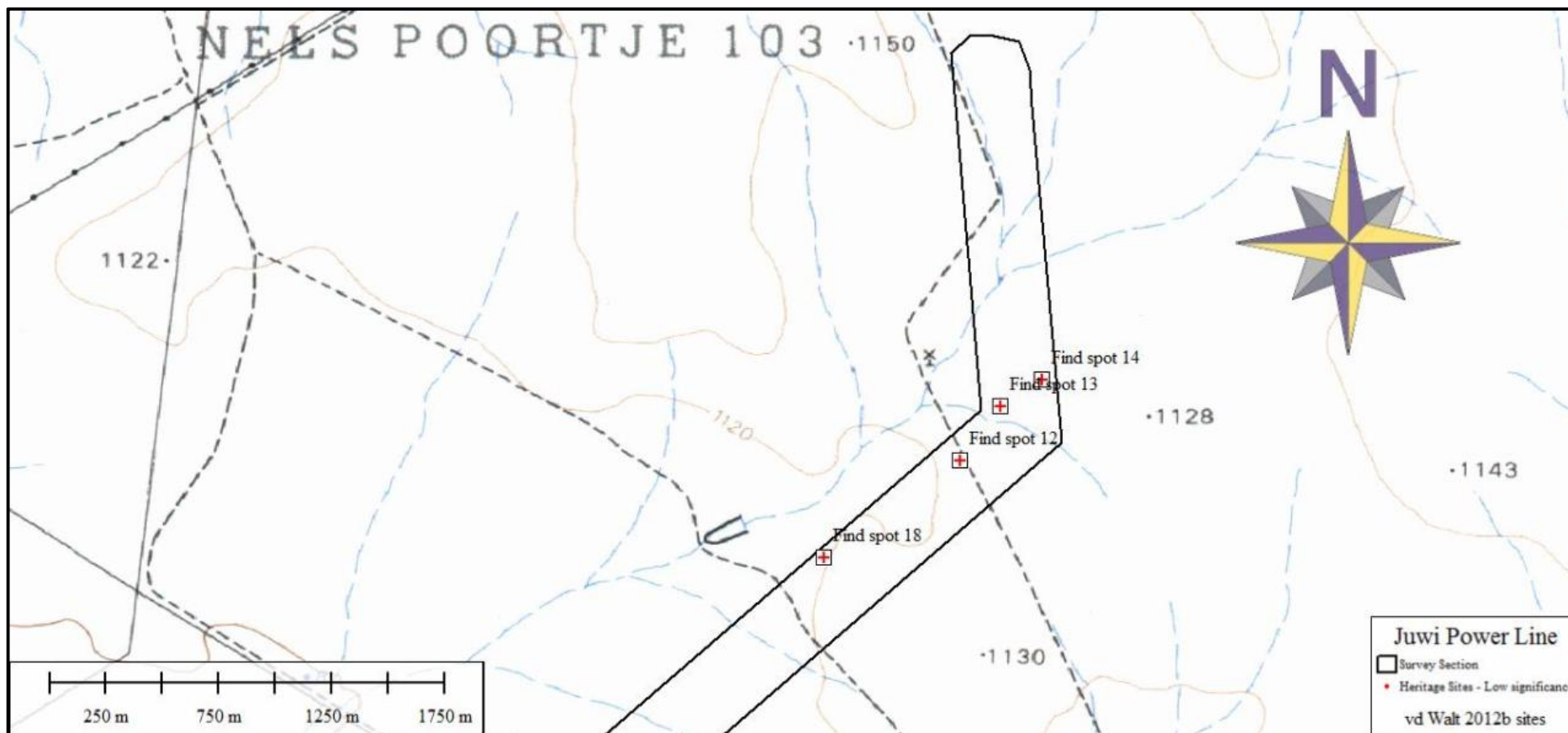


Figure 3. Site distribution map showing find spots in relation to the power line corridor on the farm Nelspoortje 103.

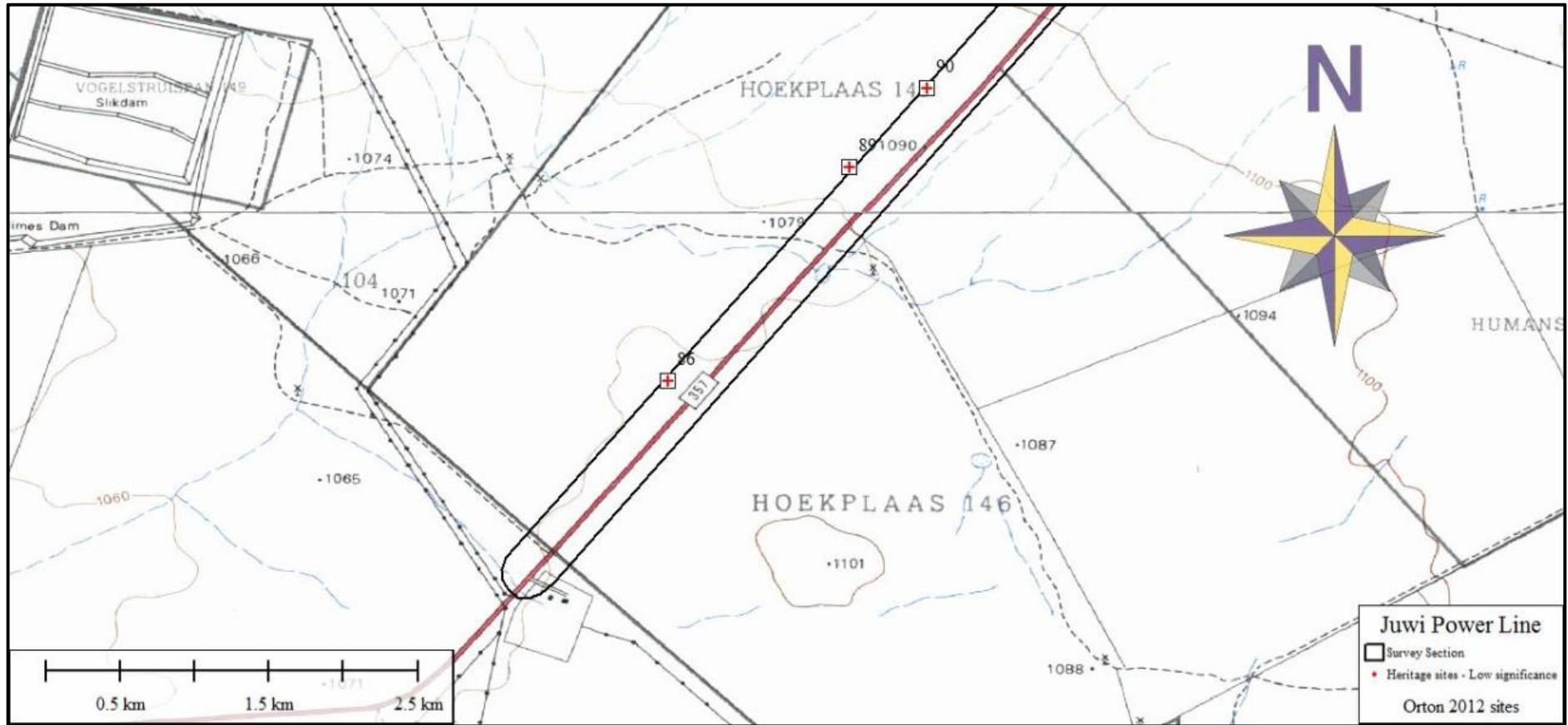


Figure 4: Site distribution map showing find spots in relation to the power line corridor on the farm Hoekplaas 146



Figure 5: General site conditions in the study area

6.2 DESCRIPTION OF FINDS

6.2.1 Sites with Coordinates

Site Number	Type Site	Cultural Markers	Co ordinate	Recorded	Heritage Significance
Find Spot 12	Stone Age	Single possible ESA tool in the road	S29 56 04.5 E22 24 46.1	Van der Walt 2012b	Low Significance
Find Spot 13	Stone Age	Very low density scatter of MSA and LSA tools. Near open patch with calcrete.	S29 55 56.6 E22 24 52.0	Van der Walt 2012b	Low Significance
Find Spot 14	Stone Age	Similar scenario as above	S29 55 52.9 E22 24 57.9	Van der Walt 2012b	Low Significance
Find Spot 18	Historical	Porcelain as well and ostrich egg shell fragments. (Late 19 th century).	S29 56 18.4 E22 24 26.6	Van der Walt 2012b	Very low significance
Field number 086	Stone Age	Background scatter in sandy area with many cores and one handaxe.	S30 00 37.8 E22 20 47.2	Orton 2012	Very low significance
Field number 089	Stone Age	Background scatter in sandy area with some gravel	S29 59 51.3 E22 21 26.8	Orton 2012	Very low significance
Field number 090	Stone Age	Background scatter in gravel area including one very large unfinished cleaver	S29 59 34.3 E22 21 43.5	Orton 2012	Very low significance

The following observations were made for the Nelspoortjie portion. Artefacts were observed in low densities over much of the study area where Quartzite strongly dominates the MSA component and to a lesser degree quartz and banded Iron stone. Artefacts consist mostly of radial and bipolar cores, large flakes and blades. The LSA component is mostly made from cherts, cryptocrystalline silica (CCS), hornfels and banded iron stone and is micro lithic supporting an ascription to the LSA.

Artefact scatters 12, 13,14, 18, 086, 089 and 090

Nature: During the construction phase activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position archaeological and paleontological material or objects.

	Without mitigation	With mitigation
Extent	Local (2)	Local (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Low (2)	Low (1)
Probability	Probable (1)	Probable (1)
Significance	9 (low)	8 (low)
Status (positive or negative)	Negative	Negative
Reversibility	Not reversible	Not reversible
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	
Mitigation: The sites are all of low significance and no further mitigation is necessary.		
Cumulative impacts: Archaeological sites are non-renewable and impact on any archaeological context or material will be permanent and destructive.		
Residual Impacts: Depletion of archaeological record of the area.		

7. RECOMMENDATIONS

Most of the Stone Age archaeology in the study area consists of low densities of scattered (and mixed) MSA and LSA artefacts. These occurrences are referred to as background scatter and are of low significance. However more substantial and significant MSA and LSA archaeological sites do occur in the areas surveyed but are not in close proximity to the proposed power line corridor and therefore not discussed in this report. Other studies in the area highlighted the archaeological importance of pans in the area (Kiberd 2006, Wiltshire 2011, Orton 2012) although no pans have been recorded in close proximity to the proposed power line.

For the proposed Garob to Kronos power line the following recommendations are made

- » Even though no pans were identified during the study, the archaeological significance of pans in the area is well known and if any occur anywhere near the power line they should be fenced off with a buffer zone of at least 100 meters.
- » Find spot 12, 13, 14, 18 and background scatter 086, 089, 090 are located within the power line corridor and will be impacted and small way. These sites are all of low significance and are sufficiently recorded and no further mitigation will be necessary as the impact of the pylon positions are considered to be extremely low and comparative material will remain on the unaffected areas of the site.
- » If any possible finds such as tool scatters, bone or fossil remains are exposed or noticed during construction, the operations must be stopped and a qualified archaeologist must be contacted to assess the find.

No buildings exist on the site and no cultural landscape elements were noted. Visual impacts to scenic routes and sense of place are slightly higher due to the projects close proximity to the road but are still not assessed to be high. No further mitigation is recommended for this aspect.

8. CONCLUSIONS

The impacts to heritage resources by the proposed development are not considered to be highly significant. The recorded sites that will be impacted on are all of low significance and no further mitigation is required for these sites as better preserved representative samples are found in the area like Bundu Pan (Kiberd 2006), Modder Pan (Wiltshire 2011), Hoekplaas (Orton 2012) and no excavations are necessary at these sites.

Due to the subsurface nature of archaeological material and unmarked graves the possibility of the occurrence of unmarked or informal graves and subsurface finds cannot be excluded. If during construction any possible finds such as stone tool scatters, artefacts or bone and fossil remains are made, the operations must be stopped and a qualified archaeologist must be contacted for an assessment of the find.

If the recommendations as made in section 7 of this report are adhered to (subject to approval from SAHRA) there is from an archaeological point of view no reason why the development should not proceed

9. PROJECT TEAM

Jaco van der Walt (BA Honors UP, MA Archaeology Wits)

10. STATEMENT OF COMPETENCY

I (Jaco van der Walt) am a member of ASAPA (no 159), and accredited in the following fields of the CRM Section of the association: Iron Age Archaeology, Colonial Period Archaeology, Stone Age Archaeology and Grave Relocation. This accreditation is also valid for/acknowledged by SAHRA and AMAFA.

Currently, I serve as Council Member for the CRM Section of ASAPA, and have been involved in research and contract work in South Africa, Botswana, Zimbabwe, Mozambique, Tanzania and the DRC; having conducted more than 300 AIAs since 2000.

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MAPS

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