




# ALBERT VAN JAARVELD

**B.A. (Hons)(Pret); M.A. (Rhodes)**

**HERITAGE RESOURCE MANAGER**

**ERFENIS - HULPBRONBESTUURDER**

 **035-3402299**  
 **082 4455 440**  
 **035 340 2259**

 **292**  
**Mtunzini**  
**3867**

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## **HYDRA-PERSEUS AND BETA-PERSEUS 765KV TRANSMISSION POWER LINES ENVIRONMENTAL IMPACT ASSESSEMENT**

### **IMPACT ON CULTURAL HERITAGE RESOURCES**

Albert van Jaarsveld  
P.O. Box 292  
MTUNZINI, 3867  
Tel: (035) 340 2299  
Fax: (035) 340 2259

Client:

PREPARED FOR ARCUS GIBB (Pty) Ltd

P.O. Box 2700

Rivonia, 2128

Tel: (011) 519 4600/13

Fax: (011) 807 5670

Cell: 083 650 5489

E-mail: Jaana-Maria Ball, Project Manager: [jball@gibb.co.za](mailto:jball@gibb.co.za)

## **EXECUTIVE SUMMARY**

Arcus Gibb (Pty) Ltd was contracted by Eskom Holdings to undertake an EIA process for the construction of three new power lines in the Free State and Cape. Part of the EIA process is a cultural heritage impact study which involves natural and man made physical features associated with human activity.

Desk-top research on the study area was followed by a field visit on 25 August 2005. The area is characterized by the occurrence of Stone Age and rock art sites but the absence of remains of the African Iron Age. The historical period is represented by towns, an Anglo-Boer War battlefield site and one declared national monument, all protected by the Heritage Resources Act.

The power lines which Eskom Holdings Limited propose to construct will have a low impact on cultural heritage resources. The author of this report is of the opinion that cultural heritage resources found within the study area will not be negatively impacted upon, provided that Eskom Holdings adheres to recommendations contained in this report. From a cultural heritage point of view, the four proposed alternative routes of the 765 kv transmission line have similar potential negative impacts.

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## **1. Introduction**

Arcus Gibb (Pty) Ltd was contracted by Eskom Holdings to undertake an Environmental Impact Assessment of resources that might occur and be impacted upon as a result of the construction of the following three power lines:

- A 765 kv Transmission Power line from Perseus (near Dealersville) to Hydra (De Aar)
- A single 33 km Transmission Power line between Perseus to a point on the existing 400 kv Beta-Hydra Power line
- A single 765 kv 12 km Transmission Power line between the Perseus and Beta (SSW of Dealesville) substations.

Albert van Jaarsveld was sub-contracted by Arcus Gibb to undertake a scoping review of all cultural resources within the study area which might be impacted upon.

Cultural heritage resources can broadly be defined as “physical features, both natural and manmade, associated with human activity.” South African heritage legislation stretches further than the above restricted definition by also including invisible and intangible beliefs, ideas and oral traditions, which are regarded as important as physical cultural objects. Also included are fossils and meteorite sites. Heritage resources reflected in South African heritage legislation (Act No 25 of 1999) include the following:

- Places, building structures and equipment.
- Places to which oral traditions are attached or which are associated with living heritage
- Historical settlements and townscapes
- Landscapes and natural features
- Geological sites of scientific or cultural importance
- Archaeological and palaeontological sites
- Graves and burial grounds, including
  - ancestral graves
  - royal graves and graves of traditional leaders
  - graves of victims of conflict

- graves of important individuals
  - historical graves and cemeteries older than 60 years, and
  - other human remains which are not covered under the Human Tissues Act, 1983 (Act No 65 of 1981 as amended)
- Movable objects, including
    - objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens
    - ethnographic art and objects
    - military objects
    - objects of decorative art
    - objects of fine art
    - objects of scientific or technological interest
    - books, records, documents, photographic positives and negatives, graphic, film or video material or sound recordings, and
    - any other prescribed categories, but excluding any object made by a living person
  - Battlefields
  - Traditional building techniques
  - Any building older than 60 years
  - Shipwrecks

### **3. Study Approach**

This report gives an overview of cultural heritage resources in the study area (see map) and will attempt to assess the impact that the erection of the proposed power transmission lines will have on these. Mitigation measures to minimize the negative impacts will be considered as well as a management plan to preserve existing cultural heritage resources in the area.

This study commenced with a survey of published material pertaining to the area, as well as maps provided by Arcus Gibb. This was followed by a short field visit on 25 and 26 August 2005 by helicopter. The field visit provided author of this report with an opportunity to become acquainted with the study area by flying from Dealersville to De Aar at a relatively low altitude. Unfortunately time restrictions did not allow stops to evaluate sites of cultural importance.

A proper physical survey on a drive-by / walk basis would have been ideal. This was, due to time restrictions, not possible. Author of this report wishes to stress that under no circumstances a claim is made that a comprehensive physical archaeological survey of the study area was conducted. The evaluation of the area (1 200 000 km<sup>2</sup>) is thus based on existing published information and the field visit.

An attempt was also made to locate all identified archaeological sources (that is Stone Age sites as well as known sites of rock paintings and rock engravings) by contacting S.A.H.R.A. (The South African Heritage Resource Agency), who is in possession of a national register of on site data. The National Museum in Bloemfontein, which has a data-base on archaeological sites in the Free State, was also contacted.

## **4. Description of the affected environment**

### **(a) Background**

Environmental conditions played an important role in influencing past human settlement, hence a discussion on environmental factors that influenced past human beings, is detrimental. The following account of the climate, geology, soils, vegetation and fauna provides the basis for analyzing the area as a hunter-gatherer habitat.

The study area is situated in a semi-arid, summer-rainfall zone with extreme summer and winter conditions typical of an inland plateau area. Strong winds and dust storms occur during August/September, followed by rain in intervals throughout the summer. Night temperatures fall below freezing during winter, but snow is rare. Day temperatures during summer months are often over 40°C. These extreme temperatures causes life, for both man and animal, to become very uncomfortable. This in turn causes a low productivity rate.

The VanderKloof dam, which is situated centrally in the study area, covers the Ecca Series of the Karoo system. These are near-sterile siltstones containing rare plant fossils. Some fragments of the Lower Beaufort shales are exposed in parts of the flood basin. Dolerite and sandstone is present, while exotic rocks occur in the gravel of the Orange River bed and terraces, eg. agates, cherts, carnelious, jaspers and amygdaloidal lavas.

These provided tough material for stone tool production, especially during the Later Stone Age. A striking feature is the occurrence of lideanite, a hard type of stone, blackish in colour, which proved to be very popular in stone tool production.

Vegetation in the study area is seasonal grasses and Karoo scrub, seldom more than half-a-meter high. Leaves are small and succulent in nature and is ideally for goat-and sheep grazing, as well as antelope. Taller bushes and trees occur only on the dolerite hill slopes and ridges, and also along the banks of the river, forming a dense forest,

especially in the VanderKloof Dam area. The Withaak (Whitethorn), Swarthaak (Blackthorn) and Wag-'n-Bietjie (Wait-a-Bit) are common in the area.

The arrival of Europeans in the area during the eighteenth century caused huge numbers of game to disappear as a result of uncontrolled hunting. Some farmers have retained small herds of antelope e.g. Springbok, Steenbok, Blesbok and Duiker. Ostriches also still occur. Carnivores are scarce, though jackals are common. Permanent bird life includes a wide range of species such as Stanley cranes, secretary birds, storks, herons, vultures and several birds of prey. A great variety of snakes, lizards and tortoises abound the area – the latter a great delicacy for Stone Age man.

Although the character of the above environment is altogether menacing of human survival, the environment also offered a lot. Abundance of water in the Gariep river, abundance of meat (large herds of springboks) and the availability of lydianite for stone tool production, made the environment ideal for the hunter-gatherer lifestyle. The occurrence of salt in great quantities in many palls was a further advantage. Disadvantages of the area are the almost absence of rock-shelters. Deep caves, which would have offered ideal shelter, are unknown.



## **(b) The Stone Age**

The Stone Age Culture is the earliest known culture in South Africa and stretches roughly over the last two million years. The Stone Age can, according to cultures, be subdivided in 5 periods, namely an Early, Middle and Later Stone Age with two intermediate phases of cultural change:

**EARLY STONE AGE:** Consists of the Olduvan and Acheullian cultures, commencing 2 million years ago.

**FIRST INTERMEDIATE PERIOD:** In South Africa this is represented by die Fauresmith culture, named after the town of Fauresmith which falls just outside the sturdy area.

**MIDDLE STONE AGE:** In South Africa represented by the “Pietersburg” culture. It commenced just over 100 000 years before present (BP)

**SECOND INTERMEDIATE PERIOD:** The so called Magosian culture.

**THE LATER STONE AGE:** This commenced approximately 30 000 years before present and in South Africa is represented by the Wilton (coastal) and Smithfield (inland) cultures.

The Stone Age commenced with the appearance of modern human beings some two million years ago and ended in the late nineteenth century after the interior of South Africa was penetrated by Black Settlers since 300 AD as well as white settlers since 1652. Stone Age people were hunters, gatherers and scavengers and did not live in permanent settlements. Stone tools produced by these people are found all over South Africa.

The Orange River and its tributaries are well known for its river gravels, in some places containing large amounts of Early Stone Age tools (Acheullian). Olduvan tools are unknown in the Orange River area or have not yet been recorded. (Sampson 1972:3)

In 1962 a Government white paper was published in which details of the Orange River Dam scheme became known. The then director of the National Museum in Bloemfontein, Dr. A.C. Hoffman, secured R18 000 from the SA Association for the Advancement of Sciences to carry out archaeological and palaeontological salvage work in the catchment areas. An archaeological research laboratory was subsequently established at Oviston.

No records have been found of archaeological research prior to the Orange River salvage scheme. In 1963 a preliminary collecting trip was carried out by the National Museum in Bloemfontein and a brief report was published in 1965. (Hoffman & Esterhuysen 1965 : 21 – 27). By August 1965 some 942 Stone Age occurrences were known within the floodbasins of the Gariep and VanderKloof Dams. All sites, except for 16 which were sealed, were “open” and provided no information about stratigraphy, dating or settlement patterns. The 16 sealed sites provided a stratified sequence of the Stone Age industries ranging in time from the Late Acheullian to the 19<sup>th</sup> Century AD. Garth Sampson commenced with fulltime research on the Stone Age Archaeology of the Orange River Scheme and subsequently produced a comprehensive research report which was later published (Sampson 1972 : 1 – 288).

Based on Sampson’s information, it is clear that the entire study area comprises of one huge Stone Age site. Artifacts ranging from the Acheullian period (ESA) to the Smithfield culture (LSA) are known to occur on mainly “open” sites throughout the study area. The helicopter visit on 25 August proved the same: At all 4 sites the helicopter landed Stone Age tools ranging from the Middle Stone Age to the Later Stone Age were found.

### **(c) Rock art and rock engravings**

The greatest concentration of prehistoric rock paintings in the world is to be found in Africa south of the Zambesi river (Lee and Woodhouse 1970 : 13).

There are known to occur at several places within the study area, some of which are marked on the map. Information on other sites was received from the National Museum in Bloemfontein, who has national and provincial data-bases.

### **(d) The African Iron Age**

As a result of the fact that the study area is semi arid with exceptionally low rainfall, the area is unable to sustain cattle. For this reason remains of the African Iron Age is absent from the area and requires no further discussion.

### **(e) The historical period**

#### **(i) Towns**

Whites started penetrating the study area as early as the eighteenth century.

Explorers, missionaries and hunters were the first visitors while towns were only established during the early nineteenth century. Several of these towns, therefore contain buildings of historic and architectural value older than 60 years and is as such protected by the National Heritage Act (Act 25 of 1999 ).

These include:

**Philipstown** : (NC 3024 AD, 30° 26' S; 24° 26' E), situated 56 km north east of De Aar. Philipstown was founded in 1863 as a church centre. Interesting buildings exemplify the style of architecture popular in that period of which the original sandstone church and parsonage (still in use) are good examples. The town was named after Sir Philip Wodehouse, Governor of the Cape Colony. Sheep farming forms the backbone of its economy.

**Petrusville**: (NC 3024 BA, 30° 05' S; 24° 39' E), situated ±45 km from Philipstown by road. Petrusville is surrounded by flat topped and rhino horn shaped hillocks. The town is situated in a fertile valley and was named after Petrus van der Walt, owner of the farm Renosterfontein on which the town was laid out.

**De Aar**: (NC 3024 AA, 30° 09' S; 24° 01' E). De Aar was founded in 1881 and is, after Germiston, the second most important railway station in the country. A marshalling yard and junction was established in the same year and the town received municipality status in 1904. De Aar was named after the farm it was established on – De Aar – purchased from J.G. Vermeulen. The house of renowned author Olive Schreiner is situated in the town (see below).

**Luckhoff**: (FS 2924 DD, 29° 45' S; 24° 47' E), situated 82 km northwest of Philippolis and 56 km west of Fauresmith. The town was established in 1892 and named after the Reverend H.J. Luckhoff (1842-1943). Like Philipstown, sheep farming is the backbone of the town economy.

**Koffiefontein:** (FS 2925 AC, 29° 24' S; 25° 01' E), situated on the Riet River some 55 km northwest of Fauresmith. The name derives from the habitual making of coffee by early transport riders. A monument in the form of a coffee pot was erected in the town center to commemorate the history of the name. Koffiefontein was founded and grew as a result of the diamond rush. In June 1870 a transport rider picked up a diamond in the area. By 1882 Koffiefontein was booming with 4 mining companies establishing offices in the center of town. Several buildings remain from this period, notably the Central Hotel. The town received municipality status in 1892. The main economic activities are diamond mining and sheep farming with the De Beer company mining diamonds from a nearby volcanic pipe.

During the Second World War, Koffiefontein served as a Prisoner of War Camp for almost 2 000 Stallions. A few memorials remain from this period, including two wall paintings of Benito Mussolini and the Italian King. Approximately 800 pro-Nazi South Africans were detained here during the same time, including a later prime minister, B.J. Vorster. Rock paintings are abundant in the area.

**Jacobsdal:** (FS 2924 BB, 29° 08' S; 24° 46' E), situated on the Riet River 60 km south of Kimberley. The town was named after Christoffel Johannes Jacobs, owner of the farm on which the town was laid out. It received municipality status in 1860. An Anglo Boer War blockhouse is situated on the outskirts of the town. Sheep farming and salt mining are the most important economic activity, while wine is produced at Landsicht cellar.

**Dealesville:** (FS 2825 DB, 28° 40' S; 25° 46' E), situated some 70 km northwest of Bloemfontein. Dealesville was laid out on the farm Klipfontein, owned by John Henry Deale. It received municipality status in 1914. The town forms the centre of a flourishing maize and sheep farming operation. Salt

recovery is also being undertaken in the area. Florisbad spring is situated ±37 km away, where Prof. Thomas Dreyer discovered the world known Florisbad skull in 1932, dating back more than 40 000 years.

**Orania:** Orania was a former construction camp of builders of the VanderKloof Dam on the Gariep Rivier. There is therefore no historic buildings. At present it is a retreat for die-hard members of Verwoerdian apartheid. The town has little historic value, if any.

## **(ii) Anglo Boer War Battlefields**

Although it is known that a lot of activity (movement of troops, defense strongholds, etc.) occurred within the study area during the Anglo-Boer war, only one battlefield site is of real significance, namely the site where the Battle of Poplar Grove took place on 7 March 1900 at the Modder river. On this day three British Infantry Divisions, supported by artillery divisions, were to attack 6 000 Boers at a line of Kopje on a ten mile wide front at either side of the Modder river. The battle ended when – to the surprise of the British – the Boers started fleeing. The effects of the battle had a disastrous effect on the British forces in the long run. The British were so badly equipped that it was impossible for them to capture the fleeing Boer force, amongst whom was one of the most well known leaders, Paul Kruger. The Boers were under command of Genl de Wet. Lord Roberts, British Commander, was heavily criticized for British incompetence during the battle (Pakenham 1982 : 373 – 375).

### **(iii) Declared National Monuments**

Only one declared National Monument occurs within the study area, namely the Olive Schreiner house at De Aar. Schreiner, well known South African author, was born in 1855 in Lesotho. In 1894 she married Samuel Cronwright and the couple moved to De Aar in 1908. The Cronwrights had a house built on four erven at 9 Grundling Street and lived here until 1913. Huge gables, wooden ceilings and floors, thick walls and numerous fire places give character to the house. Two of Schreiner's major works were written in the house, namely "Thoughts about Women" and "Closer Union". The first had an important influence on the feminism movement while the latter dealt with her ideas on a Union for South Africa. A synopsis of two of her earlier works "Dream Life" and "Real Life" was also completed here. (Oberholster 1972 : 190).

### **(iv) The Star of South Africa**

One of the most well known diamonds of Southern Africa, namely the "Star of South Africa", was found within the defined study area in 1868 on the farm Zandfontein. A Griqua diviner with the name of "Booi" picked up a diamond weighing 83,5 carats. It was eventually sold for £11 000 to Lilienfeld Bros. at Hopetown. It was resold to the Earl of Dudley for £30 000 and became known as the "Star of South Africa". Its discovery marked the beginning of the diamond boom in the history of South Africa and as such the transformation of the South African economy from agricultural-based to mining and industrialization.

## **5. Identification of risk sources**

Aspects concerning the conservation of culture heritage are dealt with by the Heritage Resources Act (Act 25 of 1999) and to a lesser extent the Environmental Conservation Act (Act No 73 of 1989).

The above Acts aim to preserve and protect South Africa's national heritage so that future generations may bequeath this unique and precious aspect of South African culture. Section 35(4) of the Act stipulates that no person may without a S.A.H.R.A. permit, disturb, destroy, damage or deface any archaeological, palaeontological and historical site or objects. Places and objects should be graded into categories of low, medium and high significance and the resources should be managed accordingly. The Environmental Impact Assessment is focused on two phases of the proposed development, namely the construction and operation phases. From a heritage point of view resources which cannot be avoided can be excavated/documentated while resources not affected by the development can be included in a future management plan.

During the construction phase risks include the actual damage and/or looting of sites. During the operational phase damage to sites may occur due to a deviation from management plans and/or unscheduled construction/developments.

## **6. Impact description and assessment**

Archaeological and historical sites are unique and should be treated as such. Destruction of these as a result of development will require a permit from the relevant Heritage Authority – in this case S.A.H.R.A. Destruction of sites is not necessarily negative in the sense that a proper excavation/analysis of the site may reveal significant information on past human culture. It should be noted, however, that excavations are in essence destructive and permanent. Mitigation measures therefore might have a negative impact.



Author of this report is of the opinion that the proposed Eskom Power transmission lines will have a LOW impact on heritage resources in the study area. Although “open” Stone Age sites occur throughout the study area, the sites are of LOW significance. In most cases these consist of scattered artifacts, as well as waste material, which are not stratified and therefore reveal little more information except for typology. The erection of pylons for the transmission line would have little or no effect on the “open” Stone Age sites. As far as concerned villages, historic buildings, Anglo Boer War Battlefields and declared historical monuments: These are “no-go” areas for Eskom which could easily be avoided. The same applies for sites where rock paintings and engravings occur.

## **7. Recommended Management/Mitigation activities.**

Recommendations regarding mitigation of specific cultural resources are therefore problematic.

General recommendations in respect of mitigation/management issues include:

1. Eskom has to undertake to provide an archaeologist access to each pylon site. “Open” sites could be cleared of artifacts while stratified sites (if any) could be excavated after having obtained a permit from S.A.H.R.A.
2. The same applies for Eskom contractors on construction campsites.
3. All graves/burial yards should be avoided as far as possible.
4. Battlefields, declared historical monuments, buildings older than 60 years as well as sites where rock art is present, should be regarded as “no-go” areas.

5. Any site in near vicinity of water (eg. river banks, pans, etc.) should be carefully considered as human beings have always lived in close proximity to water.
6. The construction team should be made aware that most archaeological material is to be found below ground surface. For this reason, any archaeological sites which might be accidentally exposed during the construction phase, should be reported. In fact, general information on archaeological deposits should be communicated to construction workers so as to enable them to recognize these.

## **8. Discussion**

Mitigation of heritage sites implies total avoidance, or the recovery of sufficient data for future interpretation. Proper assessment can only take place once pylon sites have been inspected.

## **9. Conclusion**

The construction of the three Power Lines as proposed by Eskom, will have a LOW impact on cultural heritage resources within the study area, as long as Eskom adheres to above mentioned principles. From a heritage point of view, the proposed alternative routes have similar potential negative impacts.

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