

**FIRST PHASE ARCHAEOLOGICAL, GEOLOGICAL &  
PALAEOANTHROPOLOGICAL INVESTIGATION OF THE PROPOSED 132KV  
POWER LINE FROM THE HANTAM 3PV SOLAR PLANT TO HELIOS  
SUB-STATION NEAR LOERIESFONTEIN, NORTHERN CAPE**

**REPORT PREPARED FOR:**

**SOLAR CAPITAL  
GREEN POINT  
CAPE TOWN**

**ECOCOMPLIANCE  
(PERCY NGIDI)  
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## **SPECIALIST PANEL & DECLARATION OF INDEPENDENCE**

Cobus Dreyer (MA Archaeology (Wits), is an Archaeologist and accredited member of ASAPA, rated as Principal Investigator for Stone Age, Iron Age, Colonial and Industrial Archaeology, with Specialist rating on Anglo-Boer War history. Based in Bloemfontein he has been involved with heritage and archaeological impact assessments since 1998. After more than 600 environmental and heritage impact assessments in Lesotho, the Free State and North West Province, Karoo, Northern Cape, the upper part of the West Coast and along the Orange River towards the Richtersveld, I consider myself familiar with the archaeology and cultural heritage of the region and competent to do the investigation.

Dr Johan C. Loock, PhD (HC) from Bloemfontein has retired from the Geology Department at the University of the Free State after lecturing for over fifty years. Dr Loock has a thorough understanding of the geology and palaeontology of the Karoo and Free State. Born and bred in the Karoo he has a keen interest in, and a wide knowledge of the history and the farm and place names of the region. His love of fieldwork contributed to his expert knowledge of the saga and paraphernalia of the Anglo-Boer War. He is a member of the Geological Society, Palaeontological Society and the Archaeological Society of South Africa. His publication records include multiple articles in international and national recognised journals, books and popular articles.

Cobus Dreyer and Johan Loock are working as a team of independent specialists, in the delivery of consulting services on the project.

## **EXECUTIVE SUMMARY**

Solar Capital is planning a 7km 132kV power line from the Hantam 3 PV solar plant to the existing ESKOM Helios Sub-station. The access strip will be 7km long and 100m wide.

The proposed power line will cross a portion of the farm Narosies 228, Portion 1 of Narosies 228 and the farm Sous 226.

A considerable number of previous archaeological investigations agree that sparsely distributed Middle Stone Age material is scattered across the whole region. Later Stone Age remains in the form of flakes, grooved stones, pottery and ostrich eggshell fragments, occur on koppies and along dry water courses.

In the present case only two isolated flakes made of Tillite, which seem to be out of context were found.

No other cultural or historical material occurred.

Although the Whitehill Formation of the Ecca Series around Loeriesfontein could contain fossils of *Palaeoniscoid* fishes and remains of the swimming reptile, *Mesosaurus*, a thorough search for fossils in rocks of the traverse investigated, no fossils were found.

Mitigation measures will be to recommend the avoidance of sites with fossil, lithic archaeological material or human skeletal remains.

Further planning of the proposed project may continue.

## **INTRODUCTION & DESCRIPTION**

Solar Capital is planning a 7km 132kV power line from the Hantam 3 PV solar plant to the existing ESKOM Helios Sub-station. A previous EIA has already been approved for the route, but an altered corridor has been identified for the erection of the power line. The access strip will be 7km long and 100m wide.

The proposed power line will affect a portion of the farm Narosies 228, Portion 1 of Narosies 228 and the farm Sous 226.

### **Scope and Limitations**

Solar Capital is planning a 7km 132kV power line from the Hantam 3 PV solar plant to the existing ESKOM Helios Sub-station.

The soil surface consists mainly of large bare patches with a sparsely scattered grass and shrub cover. No limitations were experienced during the field work. I have gained from previous investigations around Van Wyksvlei, Brekkierie and Strydenburg.

## **Methodology**

1. Standard archaeological survey and recording methods applied.
2. Desktop survey of literature and previous HIA reports in the area.
3. Site inspection on foot and by vehicle.
4. Layout of the area and features plotted by GPS.
5. Surroundings and features recorded on camera.
6. Preparation of maps.
7. Research on the history, archaeology & heritage remains.
8. Prepare map with coordinates transferred to Google Earth.

## **INVESTIGATION**

The investigation provided the opportunity to examine the corridor proposed for the connecting power line (Maps 5&6). The site was investigated on 13 October 2015 in the company of Dr Johan Loock, geologist.

The study aims to locate and evaluate the significance of cultural heritage sites, archaeological material, manmade structures older than 60 years, and sites associated with oral histories and graves that might be affected by the proposed developments. In many cases, planted and self-sown trees and other types of vegetation represent a major part of the historical landscape of human settlements in villages and towns, on farmyards or even deserted places in the open veld. These features should be recognised and taken into consideration during any cultural investigation.

The site was examined for possible archaeological and historical material and to establish the potential impact on any cultural material that might be found. The Heritage Impact Assessment (HIA) is done in terms of the National Heritage Resources Act (NHRA), (25 of 1999) and under the National Environmental Management Act, 1998 (Act. 108 of 1998).

Several other impact assessments from around Loeriesfontein produced information about archaeological and heritage remains. Investigations had been done at Gamsberg (Morris 1996, Dreyer 2005), Flamink (Morris 2000), Borrow pits on the Sishen-Saldanha railway line (Morris 2007), Khobab wind farm (Morris 2013), Helios-Juno (Webley & Halkett 2010), Klein Rooiberg (Webley & Halkett 2012), Narosies 228 (Van der Walt 2012), a wind farm near Loeriesfontein (Van Schalkwyk 2011), Loeriesfontein bulk water supply (ACRM 2014) and the Loeriesfontein 2 wind farm (Dutton 2014).

A publication on the history of Loeriesfontein confirms the presence of pioneer Bushmen and Coloured inhabitants during the 18<sup>th</sup> and 19<sup>th</sup> centuries (Möller 1988).

## ARCHAEOLOGICAL BACKGROUND

There is a lack of information from intensive archaeological surveys in the Loeriesfontein and Bushmanland region. Impact assessments during the last two decades have produced information about archaeological and heritage remains to rely on. These investigations reach from Gamsberg near Aggenyes (Morris 1996, Dreyer 2005), to individual development sites near Loeriesfontein. These sites include Flamink (Morris 2000), Sishen-Saldanha railway line borrow pits (Morris 2007), Khobab wind farm (Morris 2013), Helios-Juno sub-station near Nieuwoudtville (Webley & Halkett 2010), Klein Rooiberg PV power plant (Webley & Halkett 2012), Narosies 228 solar energy facility (Van der Walt 2012), a wind farm near Loeriesfontein (Van Schalkwyk 2011), Loeriesfontein bulk water supply (ACRM 2014) and the Loeriesfontein 2 wind farm (Dutton 2014).

The finds indicate a general tendency of small numbers of sparsely scattered Middle Stone Age (MSA) artefacts on quartz and quartzite, while the Later Stone Age (LSA) is represented by artefacts on indurated shale or flakes and blades on Cryptocrystalline Silica (CCS).

These isolated artefacts are considered as of minor significance.

In contrast a wealth of sites had been recorded on dunes and on the outskirts of large pans at Klawer Vlei and Tafelkop (Beaumont & Morris 1985) and Waterkuil (Morris 1996).

## GEOLOGICAL BACKGROUND

The ESKOM Helios substation and the line of the proposed row of pylons are situated on the farms Sous 226 and Narosies 228.

The traverse investigation starts at Helios and extends in the form of three legs to the south west and then crosses the north south road. From there it runs for four kilometres in a straight line to the east. The line stops in the middle of the veld at a spot about five kilometres north of the Narosies homestead.

## GEOLOGY

The geology of the area is uncomplicated (Maps 7&8).

The stratigraphic column of the area has three formations of the Ecca Group, Karoo Super Group. A few small intrusions of Karoo Dolerite are also seen.

Surface Deposits

Loose soil, patches of calcrete & rubble

Karoo Dolerite

An igneous rock consisting of feldspar & pyroxene

Tierberg Formation	Shales, silicious shales
Whitehill Formation	A white-weathering black shale with limestone concretions
Prince Albert Formation	Shale & silicious layers

### **PRINCE ALBERT FORMATION**

The dense and hard shales and silicious layers are only slightly weathered in outcrops.

### **WHITEHILL FORMATION**

The black shales do not occur on the surface because all is deeply weathered to white laminated shale. The black shale contains iron sulphide, which weathers rapidly and liberates sulphuric acid, while in turn causes chemical weathering and a softening of the rock.

When building pylons care must be taken to rest the foundations on solid bedrock. This depth can be determined by drilling.

### **TIERBERG FORMATION**

The well laminated shales and cherty beds are also fresh on the surface. This formation should not cause any engineering problems.

### **KAROO DOLERITE**

The two small dolerite occurrences display a slight weathering on the surface. The only visible specimen lies a little east of the existing pylons near the second leg of the traverse. The rock is slightly weathered on the surface.

### **GEOMORPHOLOGY**

The area is an almost flat surface with low rounded hills. Many shallow and dry rivers and tributaries run towards the south and south east. Thin strips of soil and silt are visible next to the rivers.

In the east a few remnants of a former erosion surface are rubble-strewn.

## **GEOLOGICAL TRAVERSES**

1. Traverse ,0.5km

From Helios to the south west .

Weathered shales, white from the Whitehill Formation

2. Traverse ,0.15km

Towards the south a small outcrop of Karoo Dolerite intruded into White shales of the Whitehill Formation.

3. Traverse ,0.25km

Traverse eastwards towards the road. White shales of the Whitehill Formation.

4. Traverse ,4km

Runs in a straight line towards the east.

The first two kilometres: On rocks of the Whitehill Formation.

A small distance from the road a strange flat surface called “floor” in Bushmanland occurs. This floor will cause engineering problems and must be well-studied, because it has a thin layer of soil covering deeply weathered soft shale.

A careful study of an aardvark burrow revealed the following:

The surface layer of mud and silt of perhaps 30cm is very soft. Lower down the deeply weathered soft and friable shale of the Whitehill Formation extends to where the aardvark burrow stops. The softness of the shale can be proved by the fact that the aardvark actually dug into “rock”.

Before the foundations for a pylon are excavated, the actual depth to hard rock should be determined.

The second part of the traverse of about 0,25km lies on a low rounded hill. The geological map of this area indicates a small outcrop of Karoo Dolerite. This feature was not seen. However, a solitary boulder of dolerite, resting on the Tierberg Formation was noticed.

The fourth portion of 1,75km runs on Tierberg rocks.

Along the traverse, loose pebbles, some heavily ferruginised, can be seen.

## **FOSSILS**

Around Loeriesfontein, the Whitehill Formation contains fossils of Palaeoniscoid fishes in a distinct layer. Imprints of the swimming reptile, Mesosaurus, also occur.

A diligent search for fossils in rocks of the traverse investigated, yielded nothing.

## **HISTORY AND CONTEXT OF LOERIESFONTEIN**

It is said that the town started around a general store established in 1894 by a travelling Bible salesman, named Fredrick Turner. Turner originated from Norwich in England. He was the son of the sister of Charles Haddon Spurgeon, an extremely influential British Baptist preacher. Today the store still exists as the Turner & Haupt SPAR in Loeriesfontein after being in the family for about 120 years (Möller 1988).

The origin of the name Loeriesfontein is speculative and several vague explanations are given (Möller 1988, Raper 2004). Maps compiled between 1795 and 1842 did not display the name of Loeriesfontein, while local names such as Kubiskow, Kamdani, Rheboksfontein, Hantam and Bokkeveld are mentioned. It is only during 1860 that the name is mentioned on a map of the region. Between 1888 and 1892, several prominent Baster leaders, who were occupants of Loeriesfontein, submitted claims to the land.

(Baster = people of mixed descent. In the literature further distinction was also made between “Basters” and “Coloured” people).

Initially Loeriesfontein was described as the “kraal” occupied by the Hottentot leader, Ruyter Philander and his people. A long and drawn-out dispute concerning the occupation of Loeriesfontein followed. In 1889 the Cape Government decided that settlement rights should be given to the last Baster-occupants and that the remainder of land at Loeriesfontein be divided into residential and crop cultivation stands and sold by public auction. The farms Kubiskow, Melkkraal and Rhenosterkolk were added to extend the commonage of Loeriesfontein. Thirty-seven building stands were allocated to accommodate the “Baster” people. On 23 May 1894, the remainder of the erven were offered for sale. With a total of 643 residents at the time, Loeriesfontein was officially declared a town in 1904 and the first town council was elected in the same year (Van der Merwe 1945).

Loeriesfontein forms part of the wider region known as Bushmanland, an area which is also famous for its abundance of wild flowers during spring time and its great variety of different plants. It is claimed that Bushmanland became one of the last strongholds of the Bushman. In this connection, see the report on Breekkierie (Dreyer 2011).

Some of these old characters who lived in the area are still remembered in town. One example was the infamous Klaas Ras (Fig.1), who is described as one of the last “Bushman” from Kop se Berg (Boet Loubser, Loeriesfontein).

## **ANGLO-BOER WAR (1899-1902)**

During the Anglo-Boer War (1899-1902), Boer – commandos were active in the area and invaded Loeriesfontein on several occasions. The forces of Genl. Manie Maritz were involved in a skirmish at Lekkerroog and the siege at Tontelboskolk in December 1901. Genl. Smuts’ commando is also mentioned in the area (Maritz 1939, Möller 1988, Pakenham 1997, Jones & Jones 1999).



Compensation for “losses sustained by the local shopkeepers at the hands of the enemy” (Boers) was duly claimed from the British authorities (Möller 1988).

## LOCALITY

Loeriesfontein is a small town in the Northern Cape and falls within what is known as Bushmanland. The town lies 65km north of Nieuwoudtville on the R357, 82km north west of Calvinia on the R355 and 120km south west of Brandvlei (Maps 1&2).

The present 132kV power line development from the Hantam 3 PV solar plant to the existing ESKOM Helios Sub-station will cover an access strip of 7km long and 100m wide. The proposed power line will cross a portion of the farm Narosies 228, Portion 1 of Narosies 228 and the farm Sous 226 (Maps 3&4).

The soil surface in the area forms an almost flat surface with low rounded hills. Many shallow and dry streams and tributaries run towards the south and south east. Thin strips of soil and silt are visible next to the stream beds.

In the east a few remnants of a former erosion surface are rubble-strewn (Fig. 11).

The following GPS co-ordinates (Cape scale) were taken (3019DA) (Maps 5&6):

<b>HELIOS</b>	30°30'05"S 019°33'36"E Altitude 906m (Fig.2).
<b>C</b>	30°30'06"S 019°33'27"E Altitude 908m (Figs.3&4).
<b>B</b>	30°30'42"S 019°33'24"E Altitude 894m (Figs.5&6).
<b>A</b>	30°30'41"S 019°35'01"E Altitude 925m (Figs.7&8).

## RESULTS

### FINDS

Two solitary stone flakes on Tillite were found on the surface, west of the road near Point B (Fig.9).

This material is in accordance with other archaeological investigations and is considered of minor significance.

To quote Webley & Halkett (2010): “Thousands of square kilometres of Bushmanland are covered by these low density artefact scatters”.

Consistent with finds in previous investigations these arid and highly eroded plains far from water sources did not produce any material of significant importance.

No graves or stone mounds were found.

## **IMPACT ASSESSMENT**

Archaeological material appears to be a solitary find and no other cultural material occurred. The new developments will have no impact on any archaeological or cultural remains in the area.

The developments could have an impact on any graves. It is possible that more burials could be found at the site.

From a heritage perspective the development should be planned in a very sensitive way to avoid damage or disturbance to stone tool scatters, graves and human skeletal remains and other historical features that could be found. The sub-soil presence of archaeological and / or historical remains, features or artefacts are always a strong possibility and needs to be kept in mind at all times. Care should therefore be taken during all development activities that if any material of cultural importance are discovered, a qualified archaeologist should be called in to investigate. This would include the discovery of previously unknown graves.

## **RECOMMENDATIONS**

Further planning of the proposed project may continue.

## **MITIGATION**

Mitigation measures will be required in case of the discovery of human skeletal material. In such a case the Heritage Northern Cape in Kimberley and the South African Heritage Resources Agency (SAHRA) in Cape Town should immediately be informed.

## **ACKNOWLEDGEMENTS**

We thank Boet Loubser from Loeriesfontein for hospitality and for directing us to the farms.

I also thank my colleague and co-author Dr Johan Loock, PhD (HC) from Bloemfontein, for clearing up the local Anglo-Boer War history.

One author (JD) owes gratitude to Mohlalefe Seleke for assistance and encouragement to complete the research and to prepare the paper.

I have also gained from previous investigations at one of the last Bushman strongholds the region of Breekkierie.

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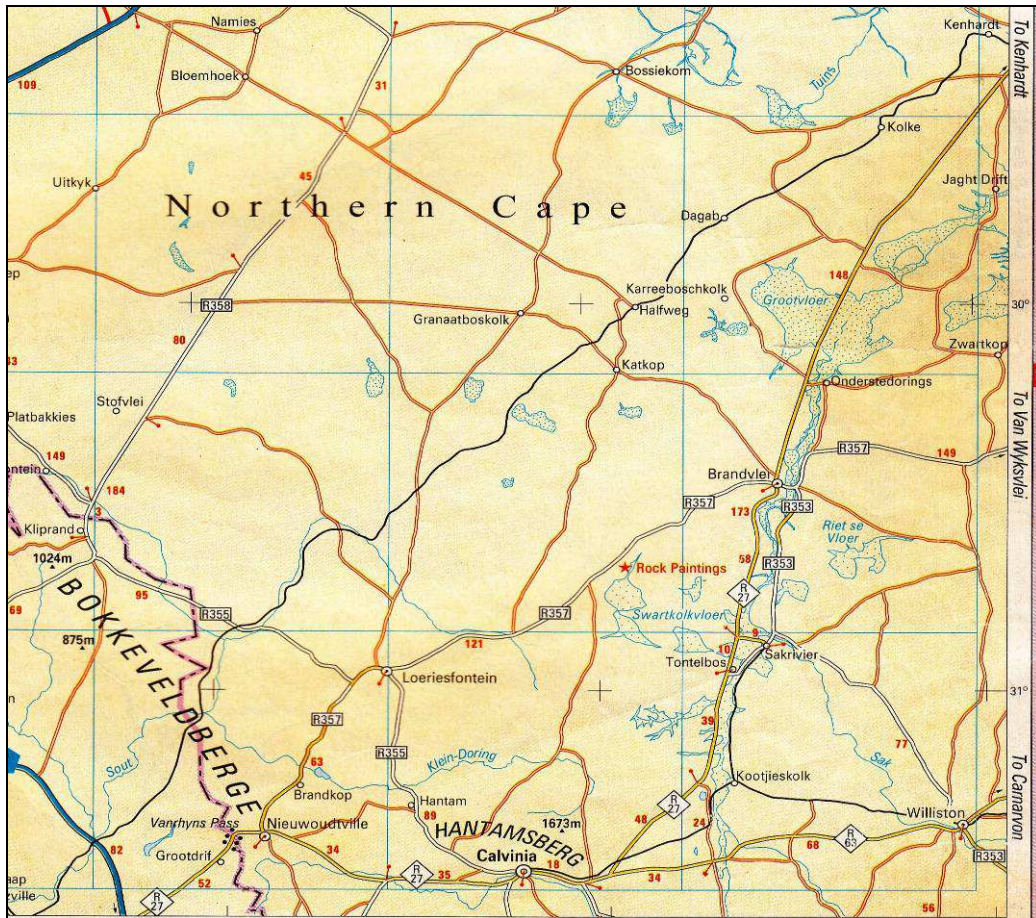
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LIST OF ILLUSTRATIONS:



Map 1 Loeriesfontein in relation to Calvinia, Nieuwoudtville and Williston.

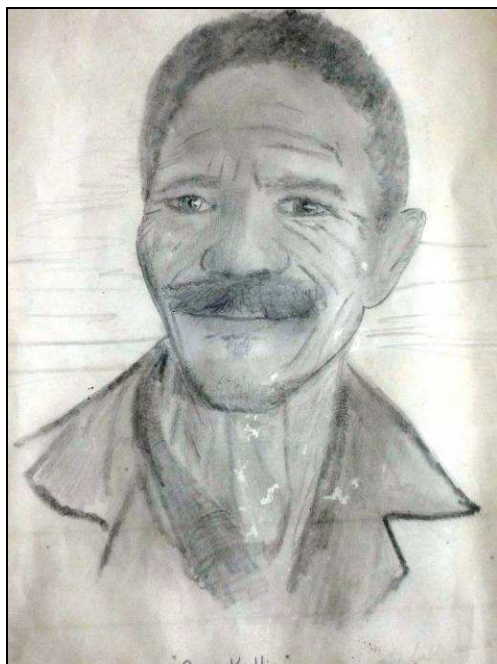
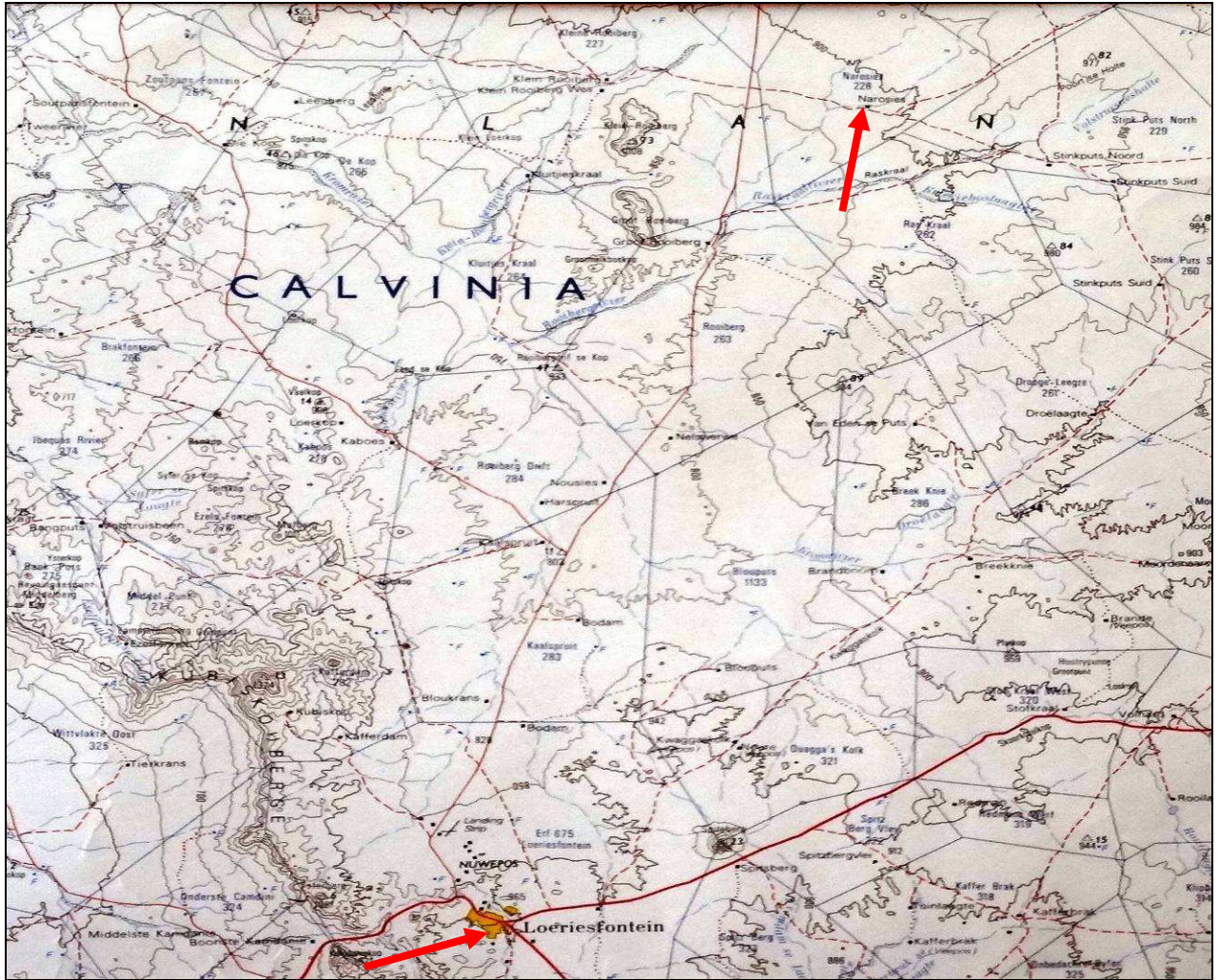


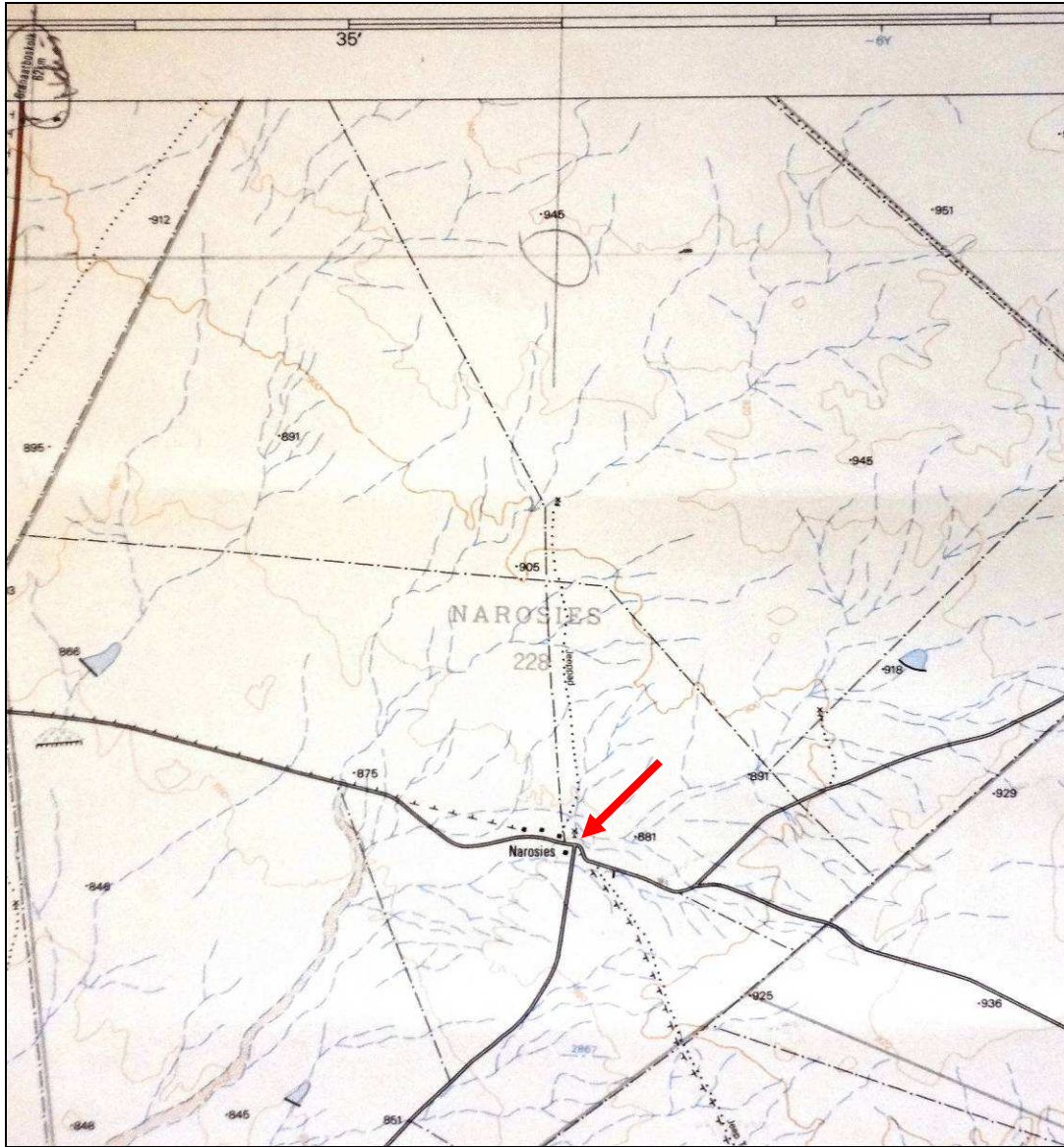
Fig.1 Klaas Ras, one of the last “Bushmen” from Kop se Berg. By courtesy of Boet Loubser from Loeriesfontein.





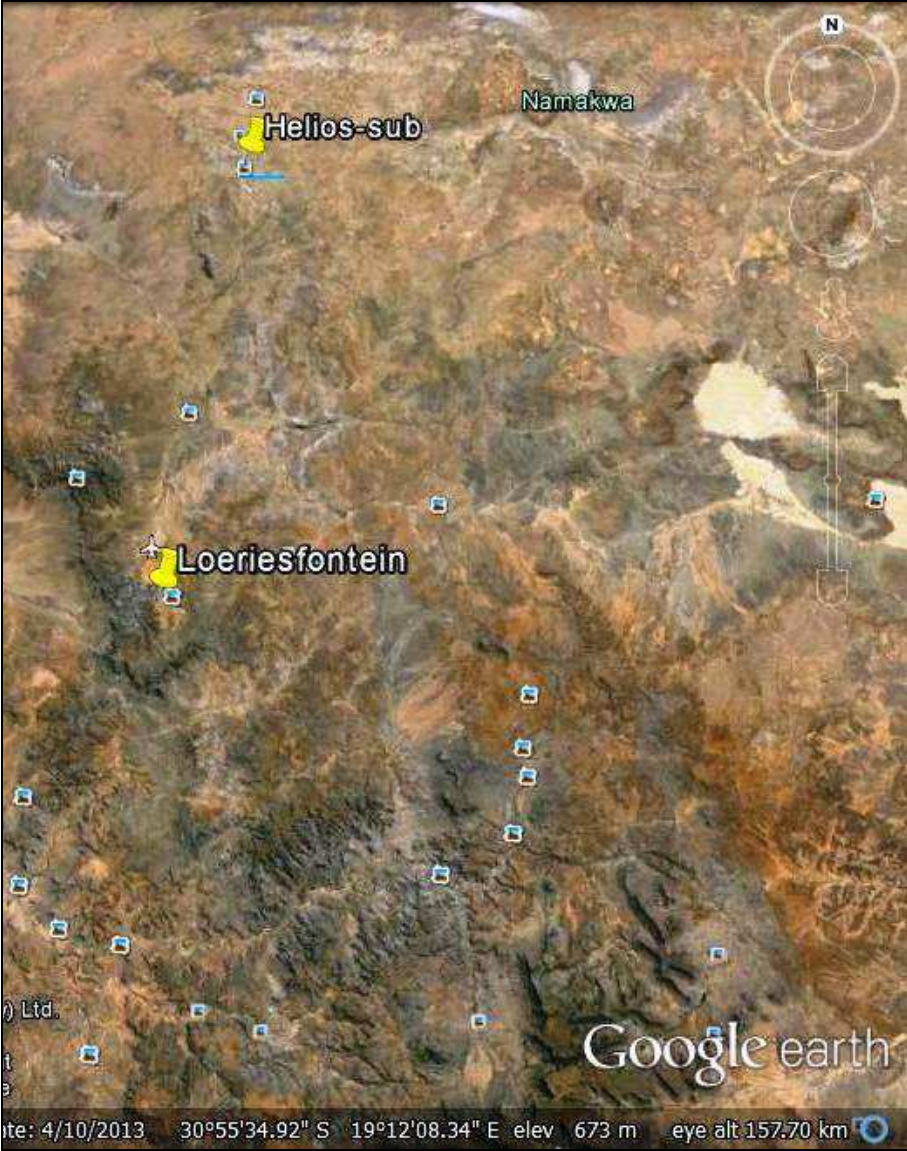
Map 2 Locality of Narosies in relation to Loeriesfontein (3018).





Map 3 Locality of Narosies north east of Loeriesfontein (3019DA).



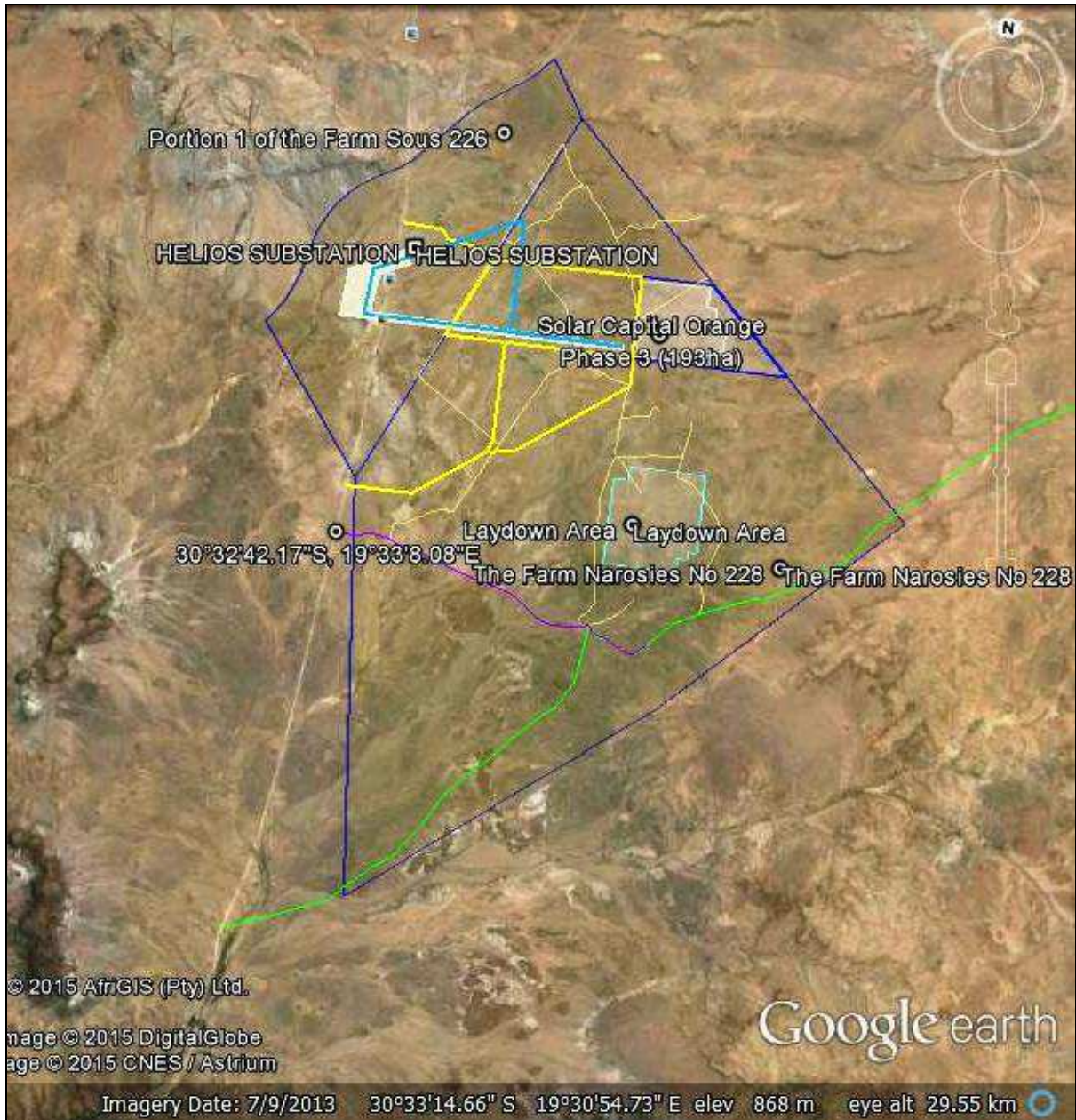


Map 4 Helios Sub-station in relation to Loeriesfontein



Map 5 Narosies farm yard in relation to Helios Sub-station and the proposed power line.



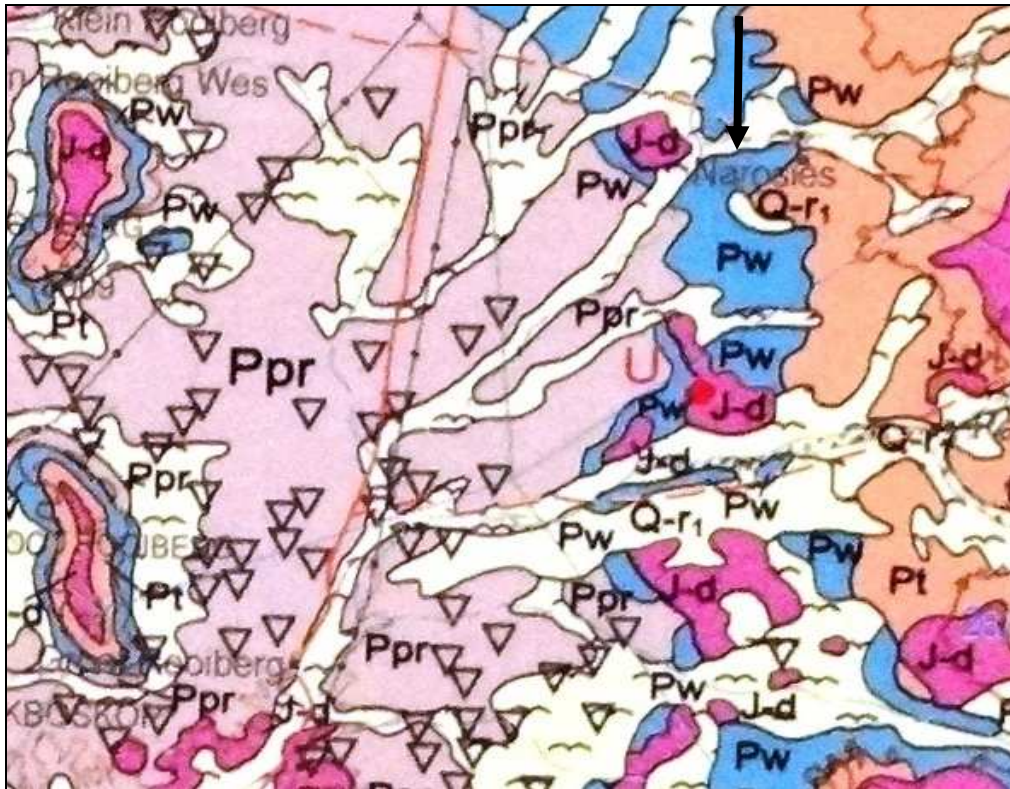


Map 6 Layout of the proposed power line at Narosies.









Map 8 Detail of the geology of Narosies (3018).



Fig.2 Helios Sub-station as seen from Point C.



Fig.3 Point C near ESKOM Helios Sub-station.



Fig.4 Point C near ESKOM Helios Sub-station.





Fig.5 Point B near Eskom Helios Sub-station.



Fig.6 Point B near Eskom Helios Sub-station.





Fig.7 Point A at Narosies near ESKOM Helios Sub-station.



Fig.8 Point A at Narosies near ESKOM Helios Sub-station, facing west.





Fig.9 Tillite flakes found near Point B (Pocketknife = 84mm).



Fig.10 Pebble scatter on the surface near Point A.





Fig.11 Black pebbles found widespread on the surface (Pocketknife = 84mm).



Fig.12 Wide distribution of white shale on the surface.