

**PHASE 1 ARCHAEOLOGICAL IMPACT ASSESSMENT  
PROPOSED CONSTRUCTION OF A WATER  
TREATMENT PLANT AND SUPPLY PIPELINE FROM  
KEIMOES TO KENHARDT  
NORTHERN CAPE PROVINCE**

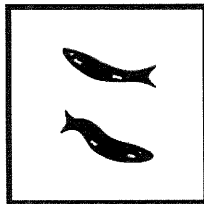
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## **Executive summary**

A Phase 1 Archaeological Impact Assessment of the proposed construction of a water treatment plant and supply pipeline from Keimoes to Kenhardt in the Northern Cape Province has identified no significant impacts to pre-colonial archaeological material that will need to be mitigated prior to the proposed development activities.

Interestingly, relatively large numbers of Later Stone Age tools were documented in the pipeline servitude closer to the town of Keimoes which is situated alongside the Orange River. A few Middle Stone Age tools and one large Early Stone Age core was also found. Few remains were documented further along the pipeline route, but several more stone flakes and a few small pieces of pottery and ostrich eggshell were documented on red sandy slopes at a road cutting alongside the R27, near km 27.0.

The receiving environment along the route is, however, already fairly severely degraded and all the tools were documented in a disturbed context.

**The archaeological remains have therefore been rated as having low local significance.**

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## **1. INTRODUCTION**

EnviroAfrica on behalf of BVI Consulting Engineers (Upington) requested that the Agency for Cultural Resource Management conduct a Phase 1 Archaeological Impact Assessment (AIA) for the proposed construction of a water treatment plant and water supply pipeline from Keimoes to Kenhardt in the Northern Cape Province.

It is proposed that a package water treatment plant be constructed at Lennertsville (near Keimoes) which will supply water via a high pressure pump station, through a 40 km long, 200 mm wide diameter rising main pipeline – to an elevated storage reservoir. From the storage reservoir (at km 40.0), a main gravity pipeline will convey water to the town of Kenhardt's existing reservoir over a distance of some 38 km, to augment their existing water supply.

The total length of the pipeline, situated alongside the R27, is about 75 km.

The farm names, through which the proposed pipeline crosses, or which will be occupied by the associated infrastructure, are:

- Neilers Drift No. 34
- Piet Rooiputs
- Ntrousgas Noord No. 108
- Ntrousgas Zuid No. 121
- Wolfkop No. 122
- Erf 1049 Kenhardt

The extent of the proposed development (a linear development exceeding more than 300 m in length) falls within the requirements for an archaeological impact assessment as required by Section 38 of the South African Heritage Resources Act (No. 25 of 1999).

The aim of the study is to locate and map archaeological heritage sites and remains that may be impacted by the planning, construction and implementation of the proposed project, to assess the significance of the potential impacts and to propose measures to mitigate against the impacts.

## **2. TERMS OF REFERENCE**

The terms of reference for the archaeological study were:

- Identify and map pre-colonial archaeological heritage resources within the proposed pipeline route and associated infrastructure;
- Determine the importance of pre-colonial archaeological heritage resources within the proposed pipeline route and associated infrastructure;
- Determine and assess the potential impacts of the proposed development on pre-colonial archaeological heritage resources, and
- Recommend mitigation measures to minimise impacts associated with the proposed development.

### 3. THE STUDY SITE

A locality map is illustrated in Figures 1A and 1B.

The proposed water pipeline will be located alongside the R27 between Keimoes and Kenhardt.

The planned pipeline will be situated to the west of the R27, and about 3 m from a fence line running alongside the  $\pm 20$  m wide road reserve (Figures 2-15).

The receiving environment along the proposed pipeline route is already quite heavily disturbed and degraded, as a result of construction of the R27 and the 20 m wide road reserve. In addition, there are fairly long sections of the old road which are still visible in the road reserve. There are also disturbed areas along the proposed route where road cuttings and culverts occur. Long sections of the road reserve are covered with Bushmanland Grassveld and pioneer species such as Kraalbos. Kameeldoring (Camelthorn) trees and the occasional Kokerboom (Quiver Tree) also occur in places along the route. Wind blown red sands cover a few portions of the route at several cuttings along the R27, while the local rock types comprise mostly quartz, weathered granite, calcrete and old river gravels.

The proposed 1.0 ha Water Treatment Plant at Lennertsville near Keimoes (on the south bank of the Orange River) constitutes a highly disturbed and degraded landscape (Figures 16 and 17). The surrounding area is heavily trampled and used by the local community; dumping and excavations are widespread and there is also evidence of sheet erosion.

The site for the proposed 5 x 6 x 4 m high elevated storage reservoir at km 40.0 is also degraded (Figure 18). The proposed site is located about 10 m west of the fence line and is heavily overgrazed. Remains of the old road occur alongside the site and dumping of road material is also visible.

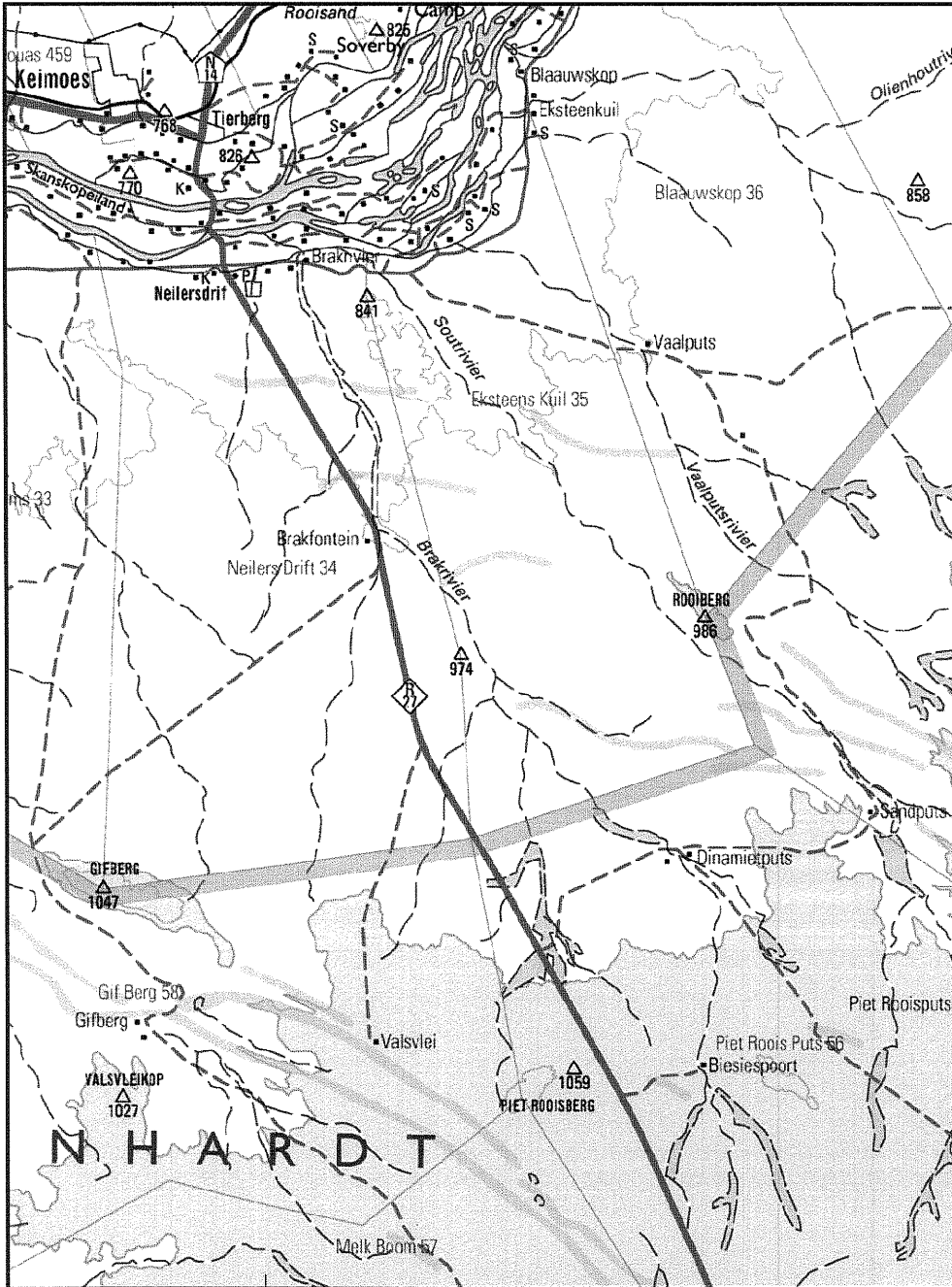


Figure 1 A. 1: 250 000 Locality Map (2820 Upington)

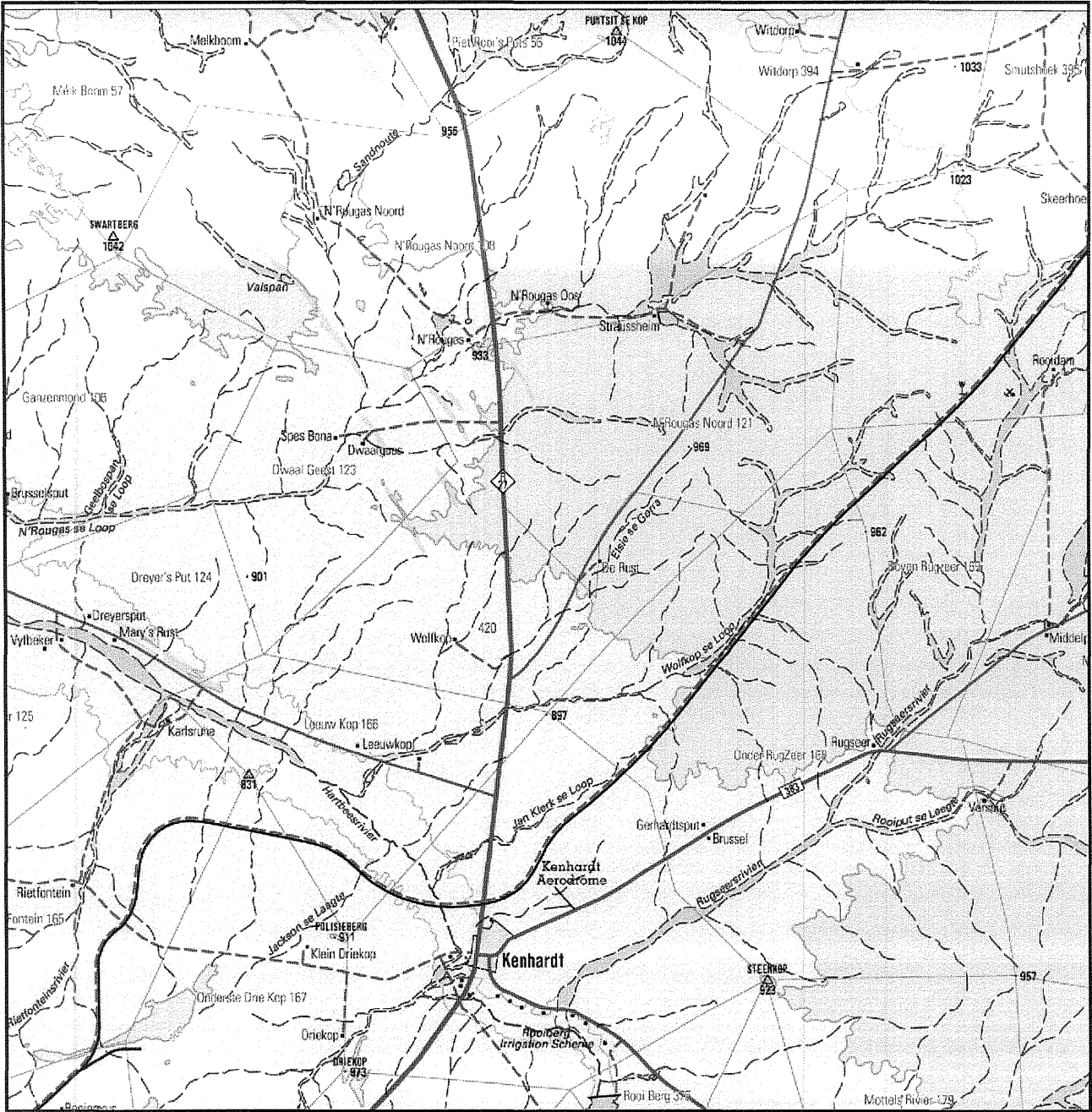
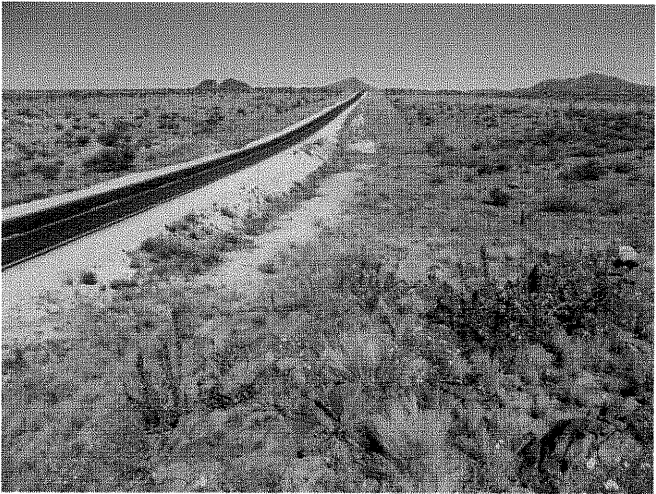


Figure 1B. 1:250 000 Locality map (Kenhardt)





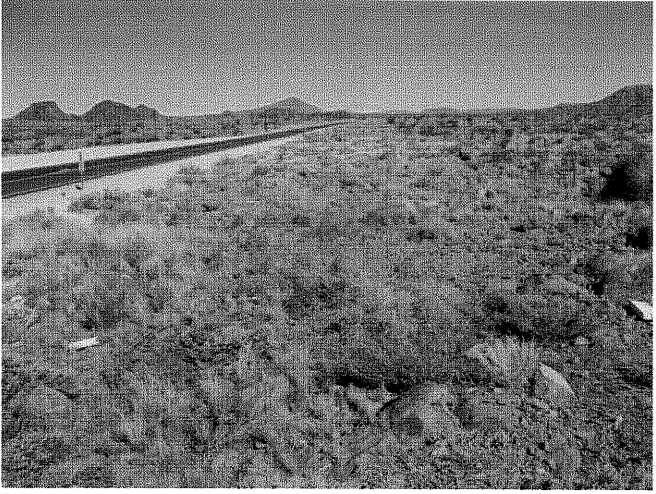
**Figure 2. View of proposed pipeline facing south**



**Figure 5. View of proposed pipeline facing south**



**Figure 3. View of proposed pipeline facing south**



**Figure 6. View of proposed pipeline facing south**



**Figure 4. View of proposed pipeline facing south**



**Figure 7. View of proposed pipeline facing south**





**Figure 8. View of proposed pipeline facing south**



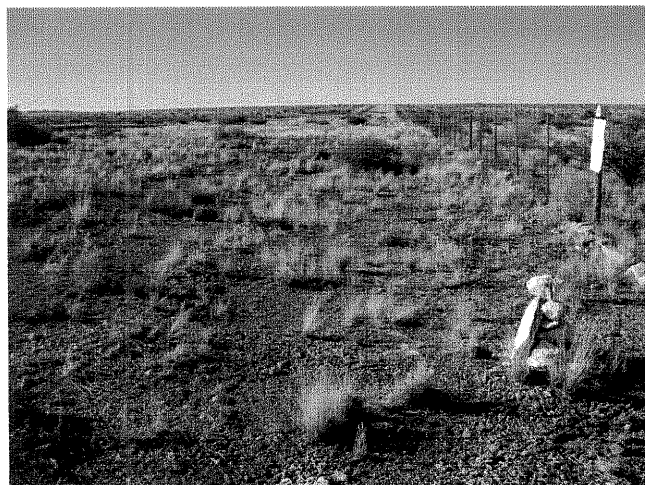
**Figure 11. View of proposed pipeline facing south**



**Figure 9. View of proposed pipeline facing south**



**Figure 12. View of proposed pipeline facing south**



**Figure 10. View of proposed pipeline facing south at km 40**



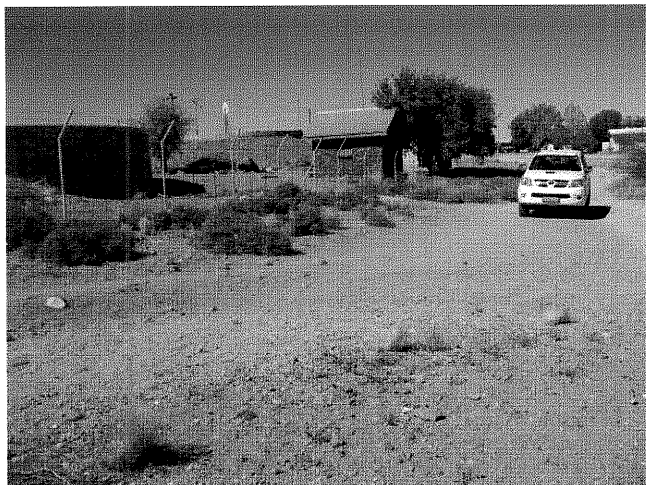
**Figure 13. View of proposed pipeline facing south. Kenhardt is in the distance**



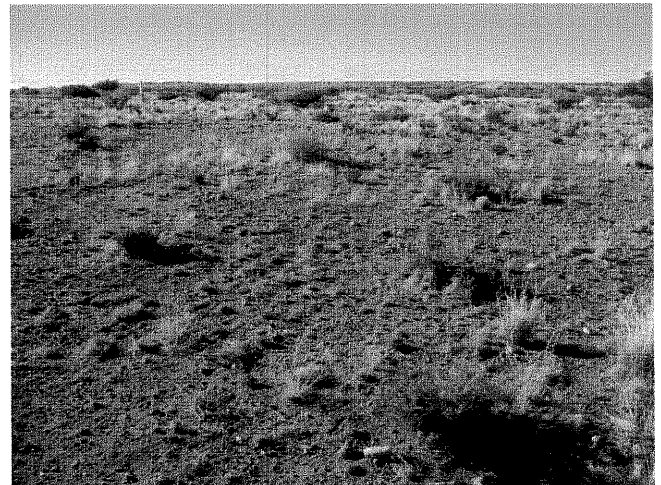
**Figure 14. View of proposed pipeline facing west from storage reservoir at Kenhardt**



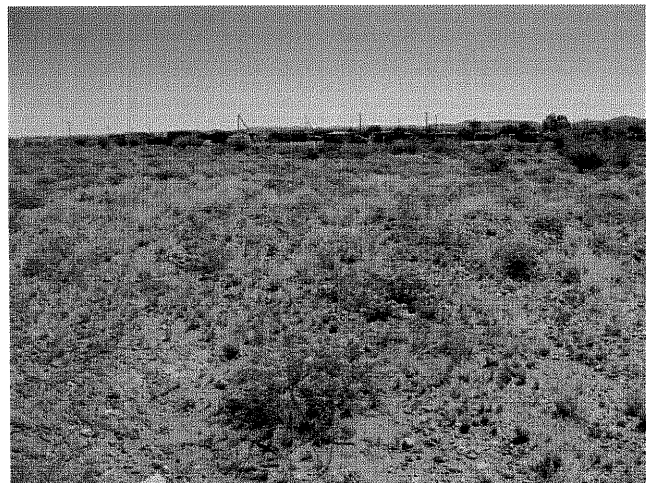
**Figure 17. Proposed Water Treatment Plant at Lennertsville. View facing south**



**Figure 15. Storage reservoir at Kenhardt**



**Figure 18. Proposed site for elevated storage dam at Km 40.0**



**Figure 16. Proposed Water Treatment Plant at Lennertsville. View facing north**

## **4. STUDY APPROACH**

### **4.1 Method**

The approach followed in the archaeological study entailed a ground survey of the proposed pipeline route. The first 15 kms of the route, from Lennertsville (near Keimoes) was searched on foot for archaeological remains. Thereafter, the proposed route was searched at five km intervals. In addition, all road cuttings (especially those through sand dunes), culverts and disturbed areas were also searched.

Archaeological heritage remains located during the study were documented using a Geko GPS 201 unit set on map datum wgs 84.

The site visit and assessment took place on the 11<sup>th</sup> 12<sup>th</sup> and 13<sup>th</sup> September, 2008.

### **4.2 Constraints and limitations**

There were no constraints or limitations associated with the study.

### **4.3 Identification of potential risks**

There are no potential (archaeological) risks associated with the proposed project.

It is unlikely, but unmarked human burials may be intersected during construction of the pipeline trench.

### **4.4 Results of the desk top study**

The northern Karoo (or Bushmanland) was one of the last regions of the Cape Province to be settled by early European farmers, partly because it is so dry and partly because it was so far from Cape Town and produce markets. The result was that it became a last outpost of the /Xam Bushman who still hunted and gathered there in the last decades of the 19<sup>th</sup> Century (Deacon 1986; Morris 1989).

Many archaeological sites have been documented in the region, close to pans, springs, and among sand dunes near dry river beds, while the round dolerite boulders scattered over the flat landscape and on mountain tops and kopjes contain many different types of rock engravings. Most of the sites with stone tools, pottery and ostrich eggshell appear to belong to the Wilton Complex of the Later Stone Age, dating to around 2000 or 3000 years ago (Deacon 1986).



## 5. FINDINGS

### 5.1 Water Treatment Plan (S 28° 45 23.2 E 20° 59 44.4)

One large silcrete core, one Later Stone Age (LSA) silcrete retouched flake and one quartzite flake was found on the proposed water treatment plant (WTP) at Lennertsville. The receiving environment is highly degraded (refer to Figure 16).

### 5.2 Storage Reservoir (S 28° 59 35.3 E 21° 07 19.4)

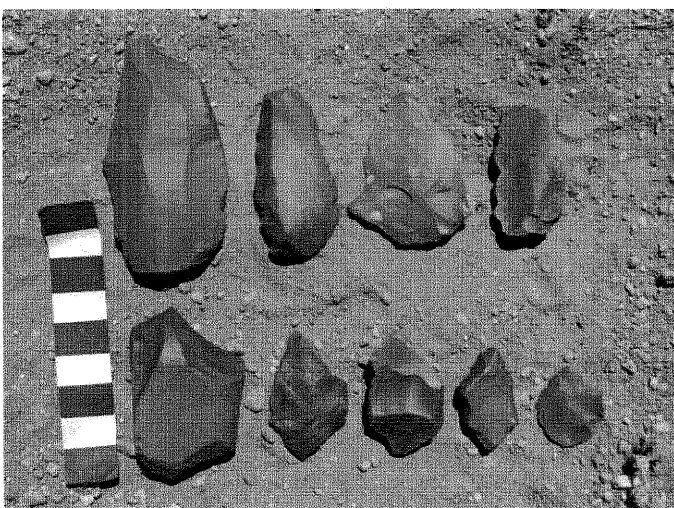
No archaeological remains were found on the proposed site, located at approximately km 40.0, south of Keimoes

### 5.3 Pipeline

S 28° 45 42.9 E 20° 59 35.5

Surprisingly, relatively large numbers of flaked stone tools were documented alongside the fence line, more or less in the alignment of the proposed pipeline route. It is interesting to note that most of the tools were documented in the first 3-4 kms south of the proposed WTP at Lennertsville and the Orange River. More than 99% of the tools are struck off small, river rolled silcrete nodules and were most likely sourced from the River or floodplain itself. Quite a few of the tools and chunks/cores still retain a layer of cortex. Most, if not all, of the flake tools are utilized, or retouched and include flakes of various sizes, bladelets and blade tools such as backed pieces and points, miscellaneous retouched tools and fine punch struck flakes and small round cores. At least four convex scrapers and three side scrapers, and one adze were also counted. A few miscellaneous retouched tools are step flaked (Figures 19 and 20). Several retouched and utilized, indurated shale flake tools were also counted. Unfortunately, all the tools occur in a disturbed context, mostly alongside the fence line. The receiving environment is also very, degraded mainly as a result of construction of the R27.

**The archaeological remains have been rated as having low local significance**



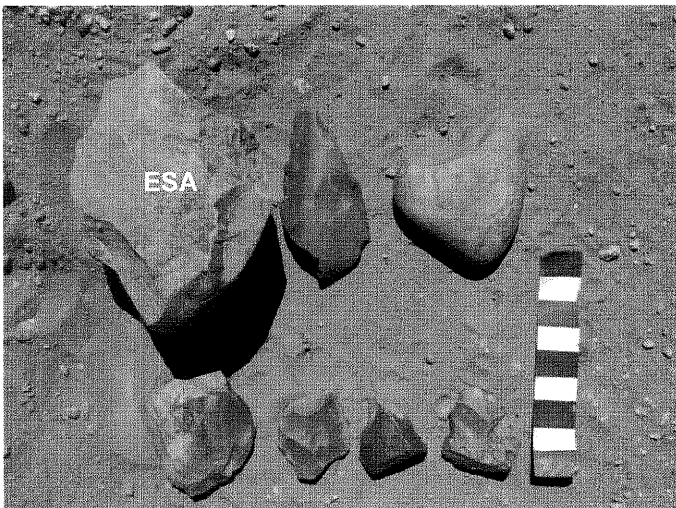
**Figure 19. Collection of stone tools. Scale is in cm**



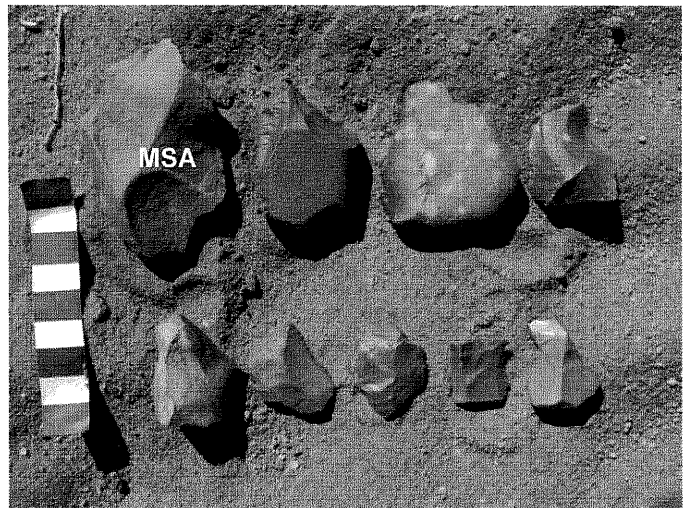
**Figure 20. Scatters of tools occur alongside the road reserve between kms 3 and 4**

The density of stone tools does tend to drop off markedly after km 5.0, but flake tools were still documented in the proposed pipeline route alongside the fence line and in the road reserve (Figures 21 & 22). These include mostly utilized and retouched silcrete flakes, including two scrapers, several backed bladelets/flakes, and fine punch struck flakes. Quite a few of the flakes are burnished/weathered. Several flake tools in indurated shale were also found; as well a few translucent chalcedony flakes and one finely struck backed bladelet. One large Early Stone Age (ESA) core and one weathered, retouched Middle Stone Age (MSA) flake, both in indurated shale, was also found, but most of the tools are clearly LSA in character, most likely belonging to the 'Wilton Complex'. The tools, unfortunately, also occur in a disturbed and degraded context.

**The archaeological remains have been rated as having low local significance**



**Figure 21. Collection of stone tools. Scale is in cm**



**Figure 22. Collection of stone tools. Scale is in cm**

S 28° 47 26.1 E 21° 01 06.7

A low density scatter of tools, including two small, thin indurated shale flakes (one utilized), one miscellaneous retouched silcrete flake, one quartz flake, one quartz chunk, one quartz crystal and four small pieces of ostrich eggshell were documented on soft red sands on a dune at a road cutting at km 27.0. In addition, four very small pieces of undecorated pottery were also found on the sandy slopes directly overlooking the R27.

The surrounding, rocky area west of the fence line was also searched, where only one additional silcrete flake was found.

**The archaeological remains have been rated as having low local significance**

It is interesting to note that the tools described above are remarkably similar to the large numbers of LSA tools documented during a search of a proposed borrow pit near the township of Uap in Upington (Kaplan 2008). The Uap borrow pit is located less than one kilometer from the Orange River.

## **6. IMPACT STATEMENT**

The Phase 1 Archaeological Impact Assessment has identified no significant impacts to pre-colonial archaeological material that will need to be mitigated prior to the proposed development activities.

The assessment of the proposed project has rated the potential impact to archaeological material as being **low**.

The probability of locating important pre-colonial archaeological heritage remains during implementation of the project is likely to be improbable.

It is unlikely but unmarked human burials may be uncovered or exposed during excavations for the pipeline trench.

## **7. RECOMMENDATIONS**

With regard to the proposed construction of a water treatment plant and supply pipeline from Keimoes to Kenhardt in the Northern Cape Province, the following recommendations are made:

- Should any unmarked human remains or graves be disturbed, exposed or uncovered during excavations and associated earthworks, these should immediately be reported to the archaeologist or the South African Heritage Resources Agency (Dr A. Jerardino (021) 462 4502). Burial remains should not be disturbed or removed until inspected by the archaeologist.

## 8. REFERENCES

Deacon, J. 1986. 'My place is the Bitterpits': the home territory of Bleek and Lloyd's /Xam San informants. *African Studies* 45: 135-155.

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Morris, D. 1989. 'Etchings and intaglios' in the Upper Karoo: Part 1: the engravings at Springbok Oog. In: Beaumont, P. and Morris, D. Guide to Archaeological sites in the Northern Cape. McGregor Museum, Kimberley.