

**ASSESSMENT OF PROPOSED BALANCING DAM  
OPTIONS ON THE ORANJE-RIET CANAL (on  
farm Kareevlakte 422, Letsemeng Local  
Municipality, Free State)  
IN TERMS OF ARCHAEOLOGICAL AND OTHER  
HERITAGE SITES**

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**Report compiled for: BKS (Pty) Ltd**



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## 1. EXECUTIVE SUMMARY

The area of the proposed Oranje-Riet balancing dam was surveyed on foot. No sites were discovered apart from some stone structures and rocks containing rock art engravings on a kopje immediately adjacent to the area intended for the dam. It is recommended that the rock art be left undisturbed, but should it need to be moved, a set process as determined by the South African Heritage Resources Agency will have to be followed for its relocation.

## 2. Background information on the project

This report forms part of the environmental impact assessment commissioned by the Department of Water Affairs and Forestry of the area of the proposed balancing dam as well as a construction camp along the Oranje-Riet canal.

Consultant: BKS (Pty) Ltd

Type of development: development which will change the character of the site.

Terms of reference: To carry out an Archaeological Impact Assessment

Legislative requirements: The Heritage Impact Assessment was carried out in terms of the National Environmental Management Act no. 107 of 1998 (NEMA) and following the requirements of the National Heritage Resources Act no. 25 of 1999 (NHRA).

### 2.1. Details of the area surveyed:

Footprint: Three overlapping proposed sites (each approximately 15-20 hectares in size) for a new balancing dam along the Oranje-Riet canal with an additional separate area, one hectare in size, for the construction camp. (Refer to attachment 1)

Current land use: Agricultural (grazing as well as irrigation farming) with natural vegetation cover on the ridges and hills (kopjes) of the area.

## 3. Background to the Archaeological history of the area

No record could be found of any recorded archaeological finds in the immediate vicinity (within a 5km radius) of the surveyed area. Rock art, however, can frequently be found in areas with dolorite outcrops since the Late Stone Age engravers seems to have had a preference for these rocks with its shiny black surfaces. Several farms in the area have reported rock art that are not yet recorded.

Maggs<sup>1</sup> also describes Type R settlements along the Riet River in the south-western Orange Free State of which the archaeological evidence rather reflect the work of Khoisan than Bantu-speaking communities. The closest of these recorded Type R settlements is  $\pm 16,5$ km away in a north/eastern direction from the proposed area of the balancing dam on the banks of the Riet River.

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<sup>1</sup> Maggs, T.M.O. p27 (fig. 7)

Extensive research was also done at Koffiefontein Mine which is situated further south along the Riet River ( $\pm 49$ km away in a eastern direction from the surveyed area) as well as Van Aswegenshoek. Both these areas had historical data but in the case of Van Aswegenshoek an unrecorded possible Type R settlement was noted.

It would, however, seem that there are also unrecorded archaeological sites within a 5km radius of the proposed balancing dam area which, although not in danger of the proposed development, might have a connection with some of the archaeological finds in this report. These sites are clearly visible on the aerial photographs (the closest of which is  $\pm 1,7$ km in a south eastern direction from the SE corner of the proposed balancing dam).

#### **4. Background information of the survey**

##### *4.1. Methodology:*

The areas were surveyed on foot by a team of three people on Wednesday 16 April 2008. All observations were recorded by means of a GPS. No sampling was undertaken and the report is based on a visual inspection of the area. All animal burrows, cattle paths and any other ground disturbances were examined for traces of subsurface material. Indicative finds were photographed for record purposes. (Refer to attachments 4-9)

Research on the property included consultation of the Department of Archaeology's database.

##### *4.2. Restrictions encountered during the survey:*

Visibility of the surface of the ground was reasonable for all of the surveyed areas.

Disturbance seems to be mainly from animal burrows, the fence alongside the canal and an old farm road that does not seem to be in use anymore.

##### *4.3. Details of equipment used in the survey:*

GPS: Garmin etrex Summit

Digital cameras: Sony cybershot

All readings were taken using the GPS. Accuracy was to a level of 5 m.

#### **5. Description of sites and material observed:**

##### *5.1. Locational Data:*

Map reference: 2924BC

Province: Free State

Magisterial District: Xhariep (Letsemeng municipality)

Closest Town: Jacobsdal



### *5.2. Description of the general area surveyed:*

The area surveyed falls within a relatively small area between the Orange and lower Vaal rivers in the western part of the southern Highveld comprising the Dwyka series, one of the sedimentary series of the Karoo system. The Dwyka series is an approximately 600 meter thick series of tillites (deposits of glacier – usually described as massive – not layered -, poorly sorted and composed of multiple types of angular to sub-rounded rocks, but varying greatly with source material.)

The area also falls within the Nama Karoo Biome which is the second-largest biome in South Africa. Rain falls in summer and varies between 100 and 520mm per year which also determines the predominant soil type – over 80% of the area is covered by a lime-rich, weakly developed soil over rock (Kalahari sand on Lime). The dominant vegetation is a grassy, dwarf shrubland. Grasses tend to be more common in depressions and on sandy soils, and less abundant on clayey soils. Most of the grasses in the biome are of the C4 type and, like the shrubs, are deciduous in response to rainfall events.

The immediate area surveyed is relatively flat with little variance in elevation (which slopes from  $\pm 1186 - 1178\text{m}$  in a southern to northern direction and  $\pm 1186$  to  $1174\text{m}$  in an eastern to western direction). A few low rocky outcrops can be found in the immediate vicinity. These dolorite rocky outcrops are quite common in the drier areas to the west and south of the southern highveld. It is seldom more than just a few Individual rocks piled above each other as opposed to the more definite ridges found in the north and east. The exposed surfaces are often shiny black from the redeposition of iron and manganese oxides. The vegetation is typical of the Nama Karoo Biome described above. (Refer to attachment 4 for visual material on the vegetation, surface soil and disturbances.)

### *5.3. Description of sites:*

No sites were found in the proposed areas for the balancing dam but two rocky outcrops that fall within the surveyed area (immediately adjacent to the proposed areas) yielded a few small stone structures as well as rock art.

### *5.4. Dating the findings:*

Refer to description in 5.5

### *5.5. Description and distribution of archaeological material found:*

In the proposed area for the balancing dam (refer to Attachments 1 and 2 for the map) only Stone Artefacts, mostly from the Middle Stone Age (dating between 250,000 and  $\pm 30-25,000$  years ago), were found scattered randomly over the surface. (Refer to attachment 3 for map of survey finds.) These artefacts may or may not be *in situ* in the sands as artefacts can move in sandy

contexts through water action, trampling and other circumstances. (Refer to attachment 5 for examples of these stone artefacts.)

On two of the rocky outcrops stone structures were found. On the kopje on the eastern side of the canal (a typical pile of loose dolerite rocks as frequently found in this area) two areas with stone structures were found on opposite sides of the kopje. Two of these structures are  $\pm 1,5\text{-}2\text{m}$  in diameter and the walls are caved in. On the most western rocky outcrop on the western part of the canal three more stone structures were found. (refer to Attachment 8)

Some of the rocks on the kopje on the eastern side of the canal contain rock art engravings of animals. Several other stones have scratched surfaces but without any apparent pattern. (Refer to attachment 7)

Rock engravings in all traditions were made most commonly by removing the weathered outer surface of rocks such as dolerite to create a colour contrast with the underlying unweathered rock.<sup>2</sup> This could be achieved by using another harder rock such as quartz. The weathered surface was either:

- a. scraped away over the whole area of the image, or
- b. the image was outlined in a single line, or
- c. the weathered rock was pecked out in a chopping motion.

Archaeological evidence show that spaces over the years often seem to have been used for the same purpose and since rock art is believed to be part of the religious experience of the Bushman or San<sup>3</sup>, it is possible that the stone structures might also be connected with some ritual activity of a later and different group. Only one piece of pottery was found close to the one stone structure and apart from not containing any definite markings is not necessarily connected to the stone structures. (Refer to attachment 5) There are, however, as mentioned several unrecorded archaeological stone structured sites in the immediate area that might have some connection with these stone structures but in the absence of any supporting evidence it is not possible to make such connection.

#### *5.6. Summary of findings:*

The proposed area for the actual dam contains only lithic scatterings of low significance. Immediately adjacent to this area, however, are rock art engravings on several rocks which need to be protected from any possible damage. The stone structures on the kopjes are few and no associated finds were found that could shed any light on its creators or its use.

### **6. Statement of Significance (Heritage Value)**

The area is of **XXX** significance in terms of heritage value as described in NHRA, section 3 (3).

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<sup>2</sup> Dowson, 1992

<sup>3</sup> Lewis-Williams, 1981

### 6.1. Field Rating

The field rating of the area would be:

Rock art: Generally Protected A (Field Rating IV A): *mitigation necessary before destruction* (generally high to medium significance), and

Lithic material and stone structures: Generally Protected C (Field Rating IV C): *this site has been sufficiently recorded (in Phase 1)*.

Table 1: Field rating and recommended grading of sites(SAHRA 2005)

Level	Details	Action
National (Grade I)	The site is considered to be of National Significance	Nominated to be declared by SAHRA
Provincial (Grade II)	This site is considered to be of Provincial significance	Nominated to be declared by Provincial Heritage Authority
Local Grade IIIA	This site is considered to be of HIGH significance locally	The site should be retained as a heritage site
Local Grade IIIB	This site is considered to be of HIGH significance locally	The site should be mitigated, and part retained as a heritage site
Generally Protected A	High to medium significance	Mitigation necessary before destruction
Generally Protected B	Medium significance	The site needs to be recorded before destruction
Generally Protected C	Low significance	No further recording is required before destruction

## 7. Recommendations

Should the developer encounter any heritage resources, not reported on in this document, and as defined and protected by NHRA (1999) during the course of the construction of the dam or any activity associated with that, the developer should immediately cease operation in the immediate vicinity and report the site to SAHRA or an ASAPA accredited CRM archaeologist.

## 8. Risk preventative measures associated with construction

Aspect	
Existing and newly discovered sites of archaeological interest	Scattered lithic material – surface material – no clearly distinguishable pattern Stone structures – nature and purpose indeterminable in the absence of any associated finds Rock art – needs to be recorded
Impact	
Damage to existing and newly discovered sites	Preventative measures required to minimise possibility of damaging rock art through any construction activities

<b>Mitigation</b>	
Identify roles and responsibilities	In event of rock art to be moved in order to prevent damage, the services of an ASAPA accredited CRM archaeologist will be required.
Regulations and permits	Permit for removal of rock art required from SAHRA

## 9. References

Lewis-Williams et al. 1989. *Images of Power : Understanding San Rock Art*. Southern Book Publishers, Halfway House.

Maggs, T.M.O. 1976. *Iron Age Communities of the Southern Highveld*. Natal Museum, Pietermaritzburg.

Heritage survey report for the De Beers Consolidated Mines, Koffiefontein Mine, undertaken by Zoe Henderson, 2001 & 2004

Report on Archaeological survey of Van Aswegenshoek Nr 134, undertaken by Zoe Henderson, 2003

SAHRA, 2005. Minimum Standards For The Archaeological And The Palaeontological Components Of Impact Assessment Reports, Draft version 1.4.

Sampson, C.G. 1974. *The Stone Age Archaeology of Southern Africa*. Academic Press. New York.

## Terms used

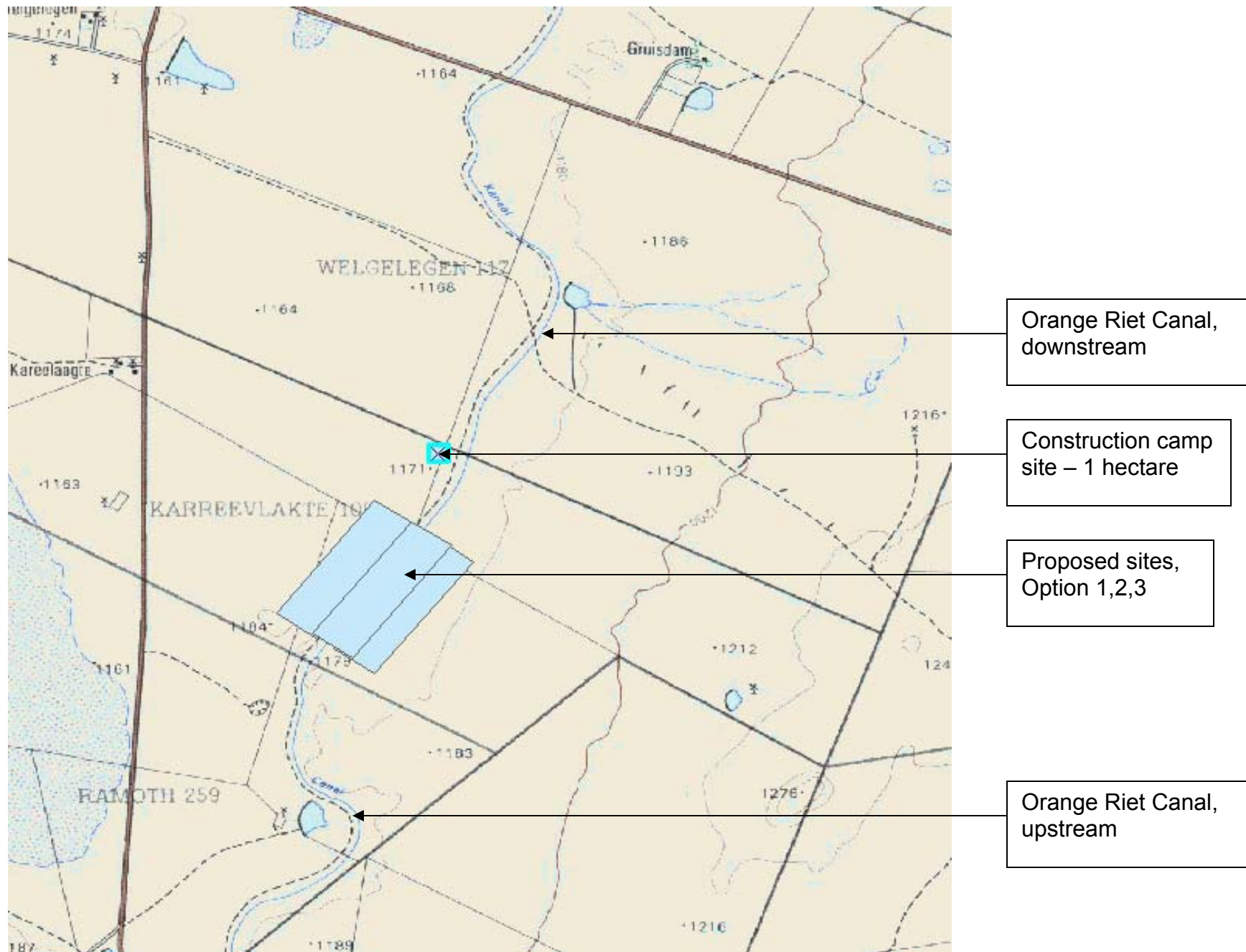
Middle Stone Age: this is an archaeological term used to refer to a time period dating to between 250 000 and 25 000 years ago.

NHRA: National Heritage Resources Act no. 25 of 1999 and associated regulations (2000).

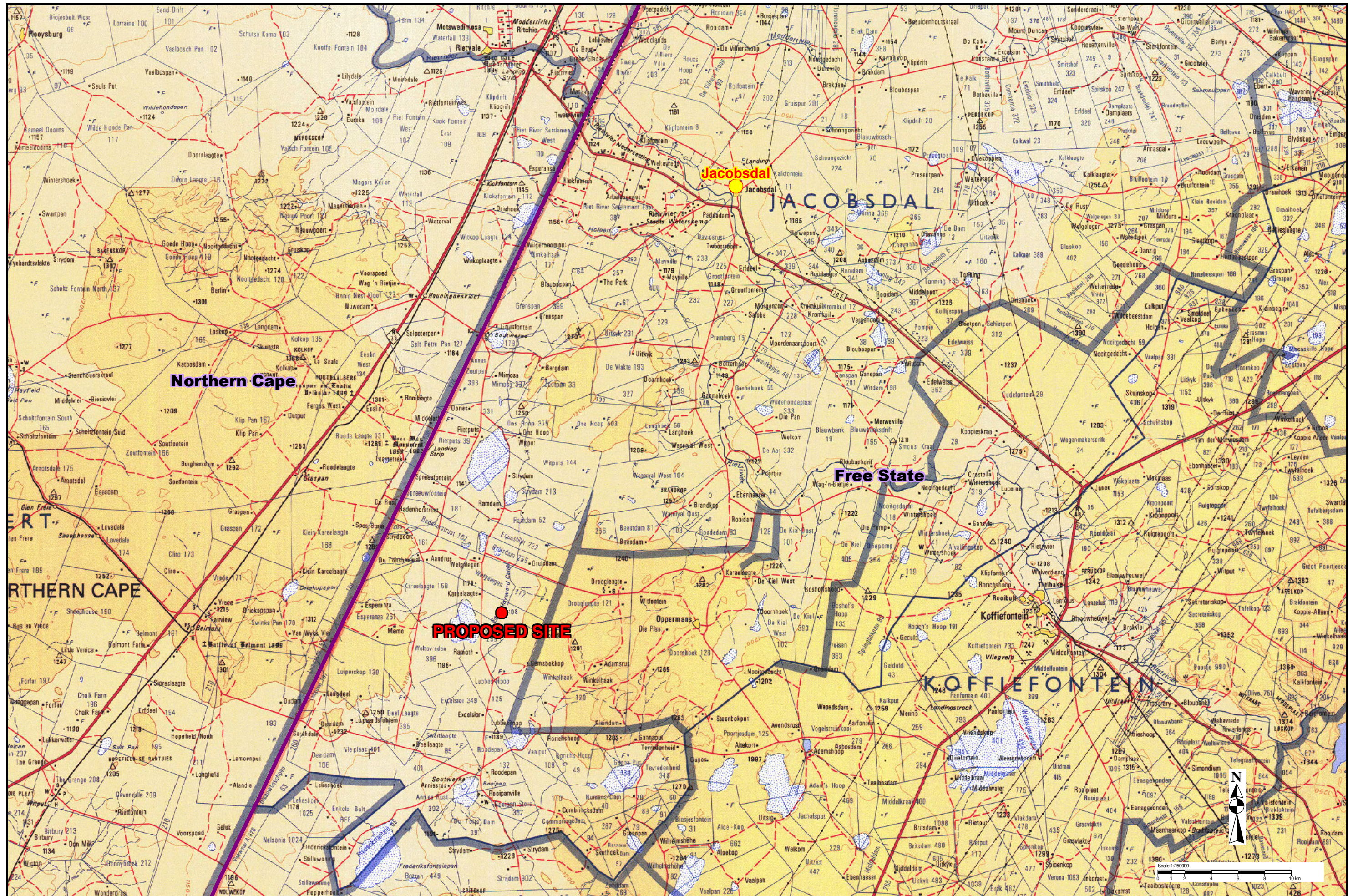
NEMA: National Environmental Management Act no. 107 of 1998 and associated regulations (2006).

SAHRA: South African Heritage Resources Agency.

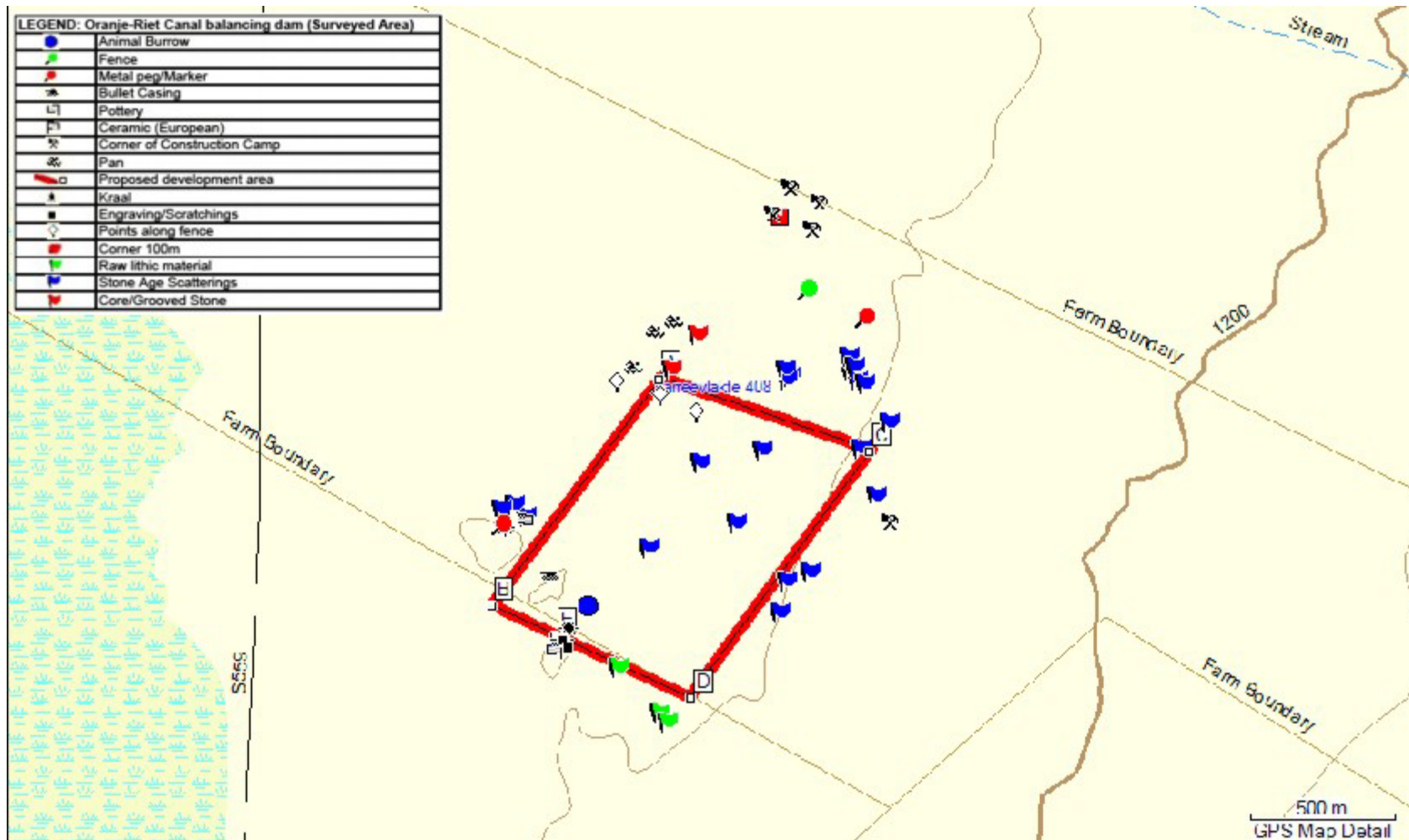












**ATTACHMENT 3-B**

Animal Burrow	S29 24 46.4 E24 35 43.3	1183 m
Bullet Casing	S29 24 43.0 E24 35 38.2	1173 m
Ceramic (European)	S29 24 36.8 E24 35 35.1	1165 m
Core 01	S29 24 19.9 E24 36 17.0	1172 m
Core 02	S29 24 16.0 E24 35 57.4	1168 m
Corner 100m	S29 24 02.8 E24 36 07.9	1166 m
Corner of Construction Camp 01	S29 24 04.0 E24 36 11.9	1170 m
Corner of Construction Camp 02	S29 24 02.2 E24 36 06.9	1169 m
Corner of Construction Camp 03	S29 23 59.4 E24 36 09.2	
Corner of Construction Camp 04	S29 24 01.0 E24 36 12.8	1171 m
Corner of proposed dam area 01	S29 24 20.9 E24 35 52.2	
Corner of proposed dam area 02	S29 24 46.4 E24 35 30.9	
Corner of proposed dam area 03	S29 24 29.0 E24 36 19.3	
Corner of proposed dam area 04	S29 24 56.8 E24 35 56.3	
Corner of proposed dam area 05	S29 24 49.8 E24 35 38.9	
Engraving 01	S29 24 50.2 E24 35 39.7	1185 m
Engraving 02	S29 24 50.3 E24 35 39.7	1185 m
Fence 01	S29 24 11.0 E24 36 11.4	1180 m
Grooved Stone	S29 24 19.9 E24 35 54.0	1170 m
Kraal 01	S29 24 48.8 E24 35 40.6	1187 m
Kraal 02	S29 24 50.1 E24 35 40.0	1188 m
Kraal 03	S29 24 50.1 E24 35 40.1	1188 m
Kraal 04	S29 24 50.8 E24 35 39.2	1185 m
Kraal 05	S29 24 37.6 E24 35 32.3	1183 m
Kraal 06	S29 24 37.5 E24 35 32.5	1181 m
Marker (Cement with metal pipe)	S29 24 37.3 E24 35 32.0	1176 m
Metal peg with no.4	S29 24 14.1 E24 36 18.9	1182 m
Pan	S29 24 19.6 E24 35 49.0	1170 m
Pan 02	S29 24 15.5 E24 35 51.7	1171 m
Pan 03	S29 24 14.3 E24 35 54.1	1169 m
Points along fence 01	S29 24 24.7 E24 35 57.1	1172 m
Points along fence 02	S29 24 22.9 E24 35 52.5	1169 m
Points along fence 03	S29 24 21.3 E24 35 46.9	1169 m
Pottery	S29 24 51.5 E24 35 38.8	1184 m
Quarry	S29 24 36.9 E24 36 22.1	1184 m
Raw lithic material	S29 24 53.4 E24 35 47.1	1180 m
Raw Lithic Material 02	S29 24 58.5 E24 35 52.4	1179 m
Raw lithic material 03	S29 24 59.5 E24 35 53.4	1181 m
Scattering along road 01	S29 24 18.4 E24 36 16.8	1162 m
Scattering along road 02	S29 24 21.2 E24 36 18.0	1177 m
Scattering along road 03	S29 24 25.9 E24 36 22.0	1184 m
Scattering along road 04	S29 24 21.6 E24 36 18.9	1177 m
Scratchings & Bullet Casing	S29 24 50.5 E24 35 39.4	1185 m
Scratchings (Game board)	S29 24 50.2 E24 35 40.2	1188 m
Scratchings 01	S29 24 50.2 E24 35 40.2	1188 m
Scratchings 02	S29 24 50.2 E24 35 40.0	1187 m
Scratchings 03	S29 24 50.2 E24 35 40.2	1187 m
Scratchings 04	S29 24 50.2 E24 35 39.9	1187 m
Scratchings 05	S29 24 51.1 E24 35 40.6	1183 m
Small scattering	S29 24 28.9 E24 36 05.7	



**ATTACHMENT 3-B**

Small Scattering 01	S29 24 19.6 E24 36 17.6	1171 m
Small Scattering 02	S29 24 43.7 E24 36 08.8	1177 m
Small Scattering 03	S29 24 42.7 E24 36 11.8	1178 m
Small Scattering 04	S29 24 20.7 E24 36 09.1	1179 m
Small Scattering 05	S29 24 20.9 E24 36 08.8	1179 m
Small Scattering 06	S29 24 19.9 E24 36 08.6	1179 m
Small scattering 07	S29 24 30.4 E24 35 57.7	
Small scattering 09	S29 24 37.3 E24 36 02.3	
Small scattering 10	S29 24 39.9 E24 35 51.1	
Small Scattering 11	S29 24 47.2 E24 36 07.9	1177 m
Small Scattering 12	S29 24 34.2 E24 36 20.4	1181 m
Small Scattering 13	S29 24 28.8 E24 36 18.4	1177 m
Small Scattering 14	S29 24 36.3 E24 35 35.2	1173 m
Small Scattering 15	S29 24 35.1 E24 35 33.8	1173 m
Small Scattering 16	S29 24 35.5 E24 35 32.0	1177 m

**PHOTOGRAPHIC RECORD - 1**

**Vegetation, surface soil and disturbances (typical Nama Karoo Biome)**



**Photo 1**



**Photo 2**



**Photo 3**



**Photo 4**





**Photo 5 – rocky outcrop**



**Photo 6**



**Photo 7**



**Photo 8**



**PHOTOGRAPHIC RECORD - 2**

**Lithic tools and raw material**



**Photo 9**



**Photo 10**



Photo 11



Photo 12



Photo 13



Photo 14





**Photo 15**



**Photo 16**



Photo 17



Photo 18



**Photo 19**



**Photo 20**





**Photo 21**



**Photo 22**





**Photo 23**



**Photo 24**



**Photo 25**



**Photo 26**





Photo 27



Photo 28





**Photo 29**



**Photo 30**



Pottery



**PHOTOGRAPHIC RECORD - 4**

**Rock Art**



**Geometric patterns scratched over engravings of animals**



**The same rock photographed from a different angle reveals the engraved animals below the geometric patterns**





**Close-up of the engraving on the left side of the crack**



**Close-up of the engravings on the right side of the crack**





**Rock with scratchings - lower left – and the rough outline of an animal immediately adjacent to its right**



**Close-up of outlined animal – legs each end in a two-pointed (or forked)  
“hoof”**





**Several rocks contain patches of scratching as above**







**Depiction of an animal – body pecked out and elongated legs only in outline – two-pronged “hoofs” and a brush at the end of the tail. Straight horns.**





**Detail of head (picture above)**







**PHOTOGRAPHIC RECORD - 5**

**Stone structures – Kopje 1**



**Side and top view of northern stone structure on rocky outcrop**







**Front view and entrance of stone structure**



**Straight rows of stones forming a possible passage – immediately below structure in picture above**





**Top and front views of stone structure on south-eastern side of kopje**







**Kopje (S29°24'48.8", E24°35'40.6") viewed from an eastern direction – approximate position of two stone structure areas indicated by arrows**

**Stone structures - Kopje 2 (on western side of canal)**















Other



Front and back views of an unidentified metal object







**Side and bottom view of a bullet casing**

