

Archaeological Baseline Survey
of the
Proposed Ryst Kuil Uranium Project

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EXECUTIVE SUMMARY

A baseline archaeological survey of the proposed Ryst Kuil Uranium Project near Beaufort West was carried out to establish the sensitivity of the area to disturbance by mining and related works. A total of 500 sample points were examined over approximately 75km of foot traverses. Archaeological occurrences were noted at 256 sample points, with material representative of the late Pleistocene Early Stone Age to recent historic sequence. In general, the survey area is characterized by a low density of surface material, with much displacement by sheet erosion. Seventeen sites were considered to merit further attention and possible mitigation should the Ryst Kuil Uranium Project proceed. More detailed survey may be required in future, when specific mining targets have been identified and the design of surface works decided.

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Appendix (digital version) Report as MSWord; Report as pdf; Site database as Excel spreadsheet; Site database as ArcGIS shp file.

INTRODUCTION

Project background

The Ryst Kuil Uranium Project is situated about 45km southeast of Beaufort West in the Central Karoo of South Africa (Figure 1). The project has as its primary focus a secondary uranium ore-body hosted in a shallow and relatively narrow sandstone paleochannel with a defined extent of approximately 70km. Exploration activity on the farm Ryst Kuil in the 1970s involved a trial mine, although the project was abandoned when the demand for uranium declined in the 1980s. The recent recovery of the commodity price has led to more extensive and detailed exploration, with the possibility of full development in the near future.

Promising as it is, the Ryst Kuil Uranium Project has not reached the stage where the scale of mining is determined, and this means that the size and location of infrastructure, including the plant and waste rock dumps, is not yet known. It is therefore not possible to assess the impact of the project against a development design. The archaeological baseline survey reported here forms part of the environmental scoping study and is intended to characterize the archaeology of the project area environment. The survey presented in detail below attempts to determine the nature of the archaeological record with special attention to its specific environmental setting.

Archaeological background

Relatively little attention has been paid to the archaeology of the Central Karoo in the area southeast of Beaufort West. No archaeological sites are recorded from the actual survey area, although the likelihood of their occurrence has been suggested^α. A number of Holocene Later Stone Age finds have been reported from the Nuweveld Mountains and the Langberg near Restvale, 30km northeast of Beaufort West^β, and limited fieldwork in the Karoo National Park has yielded similar results^γ.

The regional archaeological record suggests that while the late Pleistocene to Holocene and Recent archaeological sequence should be represented in the Central Karoo, local environmental conditions will affect the integrity and the visibility of the evidence. Thus, the earlier components of the sequence are well preserved on the northern margins of the Karoo^δ, and very high local site densities have been recorded for the late Holocene and Recent archaeology in the mountains to the south^ε, where several deep stratified sequences have also been described^ζ.

^α Deacon, H. 2006. Proposed uranium prospecting on various farms in the Karoo – Archaeological Input (SAHRA File ref. 9/2/29/0001).

^β Iziko Museum (Cape Town) Archaeological data bank records for degree squares 3222 and 3223, also containing notes by G & D Fock to the effect that the Murraysburg District is considered to be poor in rock art.

^γ Kaplan, J. 2006. Phase 1 Archaeological Impact Assessment of Proposed Klavervlei Powerline, Karoo National Park (SAHRA File ref. 9/2/022/0024).

^δ Sampson, C. G. 1972. The Stone Age archaeology of southern Africa. New York, Academic Press.

^ε Sampson, C.G. 1985. Atlas of Stone Age settlement in the Seacow Valley. *Memoirs of the National Museum, Bloemfontein* 20: 1-116.

^ζ Deacon, H.J. 1995. Two late Pleistocene-Holocene archaeological depositories from the southern Cape, South Africa. *South African Archaeological Bulletin* 50: 121-31.

The survey area

Typically subdued Central Karoo terrain and geology characterizes the major part of the survey area (Figure 2). Karoo sedimentary rocks, comprising shales and quartzitic sandstones, together with their weathering products, dominate in the central and western parts of the area, while the northeastern parts, forming the lower slopes of the Winterberg, are characterized by more recent intrusive features including large dolerite sills and dykes.

Of archaeological interest is the patchy occurrence of a minor chert horizon that forms an erosion resistant capping on some low hills, incidentally providing a raw material of high quality for stone artefact manufacture. Contact metamorphism on the margins of the dolerites has resulted in the local occurrence of hornfels, another important stone artefact raw material in the Holocene and Recent tool assemblages. Relatively coarse-grained quartzite associated with the Beaufort formation is the common raw material of the earlier Pleistocene assemblages in this part of the Karoo.

There is no permanent surface water in the project area, and the episodic drainage is mainly towards the southeast. The stream systems are small and poorly developed, reflecting the predominantly low gradient. Endoreic drainage is evident mainly in the northeastern parts of the survey area where extensive pans have formed. Incipient pan formation is apparent in the central part of the area, where low artificial berms have been used to improve drainage of pastures. The water table is shallow (<30m BS) throughout the project area.

The vegetation of the project area is typical of the Nama-karoo biome¹¹ and comprises arid grass- and shrub-land, with grassy scrub cover on rocky hillsides, mainly dwarf shrubs including species of *Drosanthemum*, *Eriocephalus* and *Penzia*, on the flat terrain, and some taller shrubs and trees such as various acacias along stream courses. The low and generally sparse vegetation cover is advantageous for archaeological survey, allowing clear visibility of the ground surface over a radius of about 25m from most sample points.

To some extent, the vegetation cover of the project area is the result of intensive livestock grazing over more than a century⁰. The installation of boreholes during this time may also have lowered the water table sufficiently to affect surface water sources used in pre-colonial times. According to records of farm deeds¹ most of the properties in the project area were granted in 1869, and some were added in 1870, 1877 and 1908.

The record is therefore of historically recent settlement, although it is likely that the area was used by *trekboers* and others for many years before. There are no indications of dwellings and other infrastructural improvements on the historical survey diagrams. One property, Klipstavels, is shown as having only a tent in 1869, and the only road or track indicated is the route from Beaufort West to Rietbron. The historical maps do not indicate any military installations from the Anglo Boer War.

¹¹ Palmer, A.R. & Hoffman, M.T. 1997. Nama-karoo. In Cowling, R. Richardson, D. & Pierce, S. eds *Vegetation of southern Africa*. Cambridge University Press, 167-188.

⁰ Hoffman, M.T. in Cowling, R. et al, 507-534.

¹ Office of the Surveyor General, Plein St., Cape Town; farm diagram depository. Cartography is based on the 1890 *Divisional Map of Beaufort West*, Field Cornetries (F.C. Nos. 1 & 2 GOUPH).

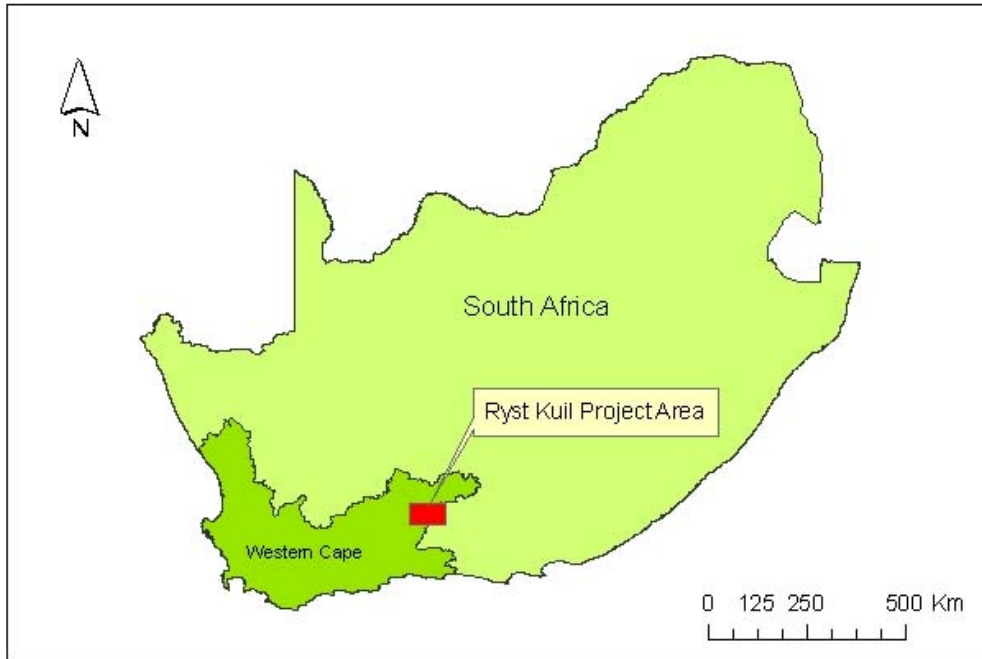


Figure 1: The location of the Ryst Kuil Project Area

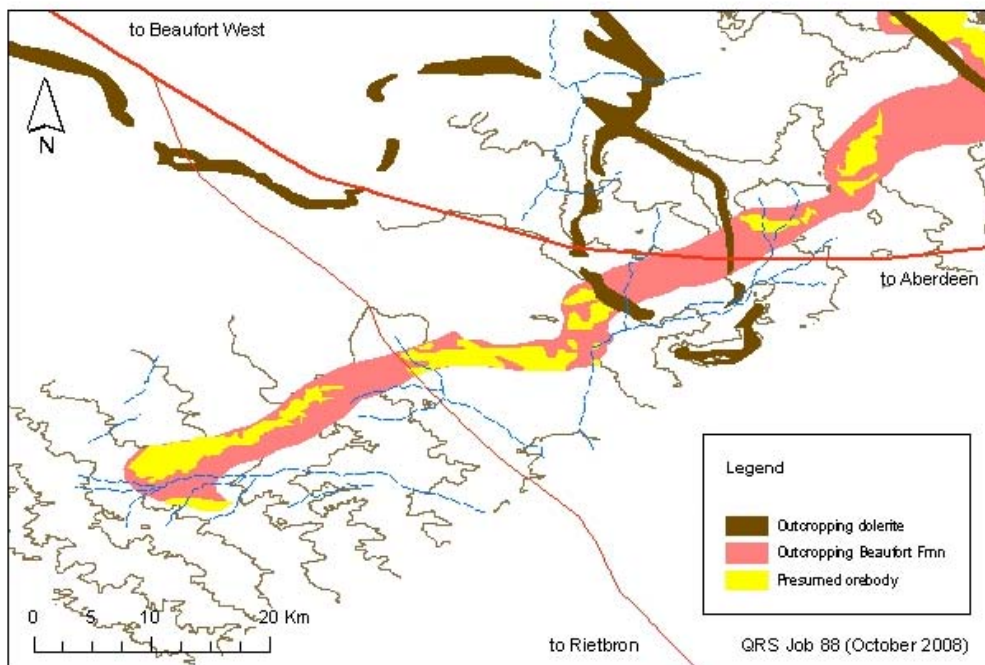


Figure 2: The topographic and geological setting of the Ryst Kuil Project area.

Approach and methods

In view of the fact that mineral exploration of the project area is not yet advanced to the stage of designing the layout of mine infrastructure, the archaeological survey did not address the likely impact of operations. Instead, the survey attempted to establish the archaeological characteristics of the project area, with a view to determining the association of archaeological occurrences with general terrain features, so to aid the prediction of archaeological impacts at a later stage in the project. Site recording criteria used are set out in this section.

The archaeological survey was based on a series of transects over gradients of variation in geology and drainage profile. Sample points were taken every 250m and established by hand-held GPS (WGS 84 datum). Co-ordinates for sample points were stored together with transect track file data, as required by the SAHRA guidelines cited above. Sample point data included the presence or absence of archaeological materials within 25m, the affinity of the material, the size and density of the site, and, if appropriate, the rock type represented in lithic scatters. Other details, as well as sketches and photographs were added to the site documentation.

Figure 3 shows the location of the sample transect areas covered during the field survey, together with selected examples of the survey transect patterns employed. These were of three general patterns, chosen according to terrain conditions: a parallel outward and return transect, spaced at least 500m apart; a quadrat with sides of at least 500m; or a roughly equilateral triangle with sides of at least 750m. A total of 23 transects were examined, with three observers walking abreast and roughly 15m apart. A total of 500 sample points were recorded, including 257 with archaeological remains.

Site logging data categories used in the field survey were as follows: (all site details are provided on the accompanying spreadsheet database).

Geological setting: (predominant rock/soil type)

1. **Dolerite** (dyke and sill features, as well as dolerite rubble hillslopes)
2. **Chert** (mainly thin horizons or surface layers)
3. **Sandstone/quartzite** (mainly Beaufort)
4. **Shales** (Karoo shales and mudstones)
5. **Unconsolidated sediments** (mainly Quaternary sands and silts)

Drainage profile: (predominant form, perpendicular to slope)

1. **No drainage** (pans and other surfaces showing shrinkage cracks)
2. **Sheetwash** (broad movement of sediment, but without visible channels)
3. **Gullying** (clear erosion profile without marginal vegetation)
4. **Streamcourses** (rounded bank profile with marginal vegetation)
5. **Ridge/hill** (rocky outcrop or eminence)

Archaeological affinity: (estimated mainly on technological indicators)

1. **ESA** (Early Stone Age, mid- to late Pleistocene)
2. **MSA** (Middle Stone Age, late Pleistocene)
3. **LSA** (Later Stone Age, Holocene to Recent)
4. **Undifferentiated** (mainly stone features such as grave cairns)
5. **Historical** (coursed stone work, with associated colonial artifacts)

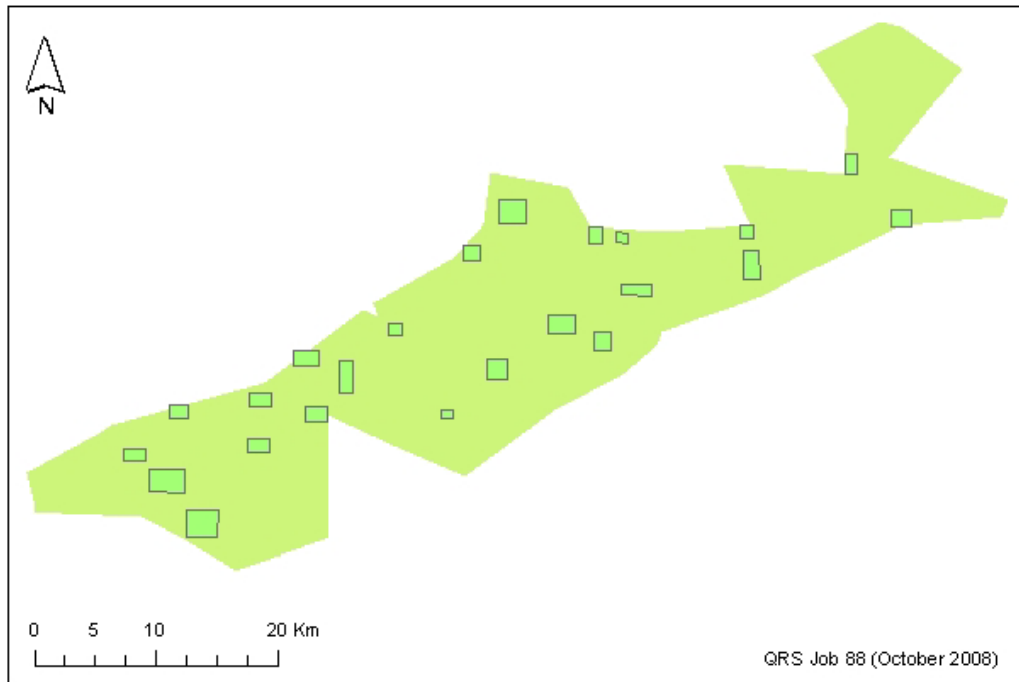


Figure 3: The Ryst Kuil Project Area, showing the distribution of archaeological survey quadrats

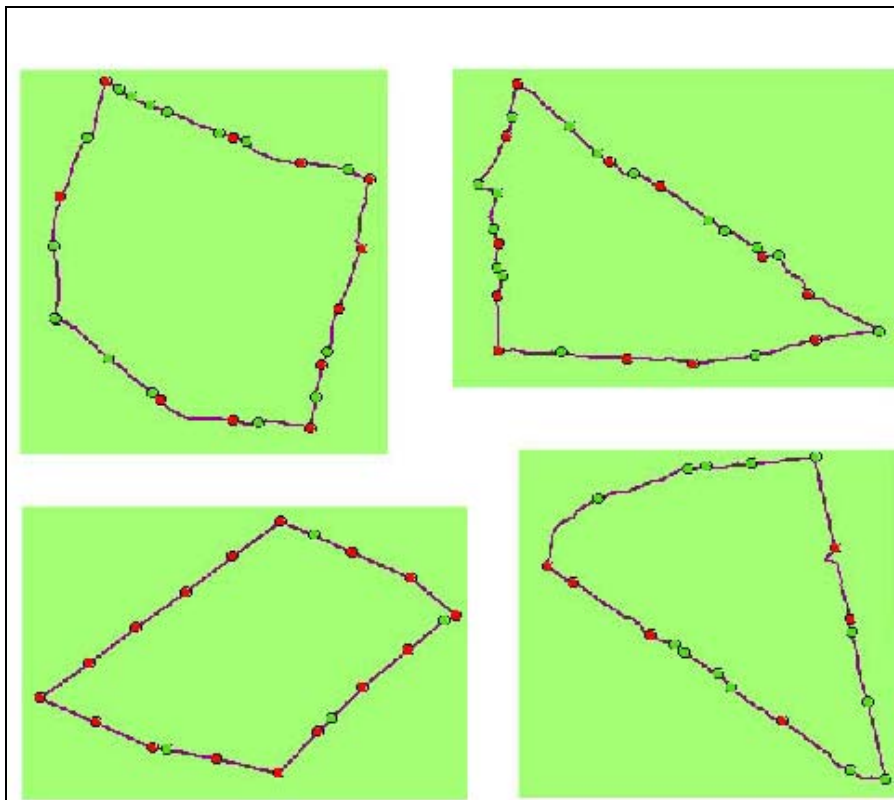


Figure 4: Field survey sample quadrats from Ryst Kuil, with transect course in purple, sample points with sites as green circles and sample points without sites as red circles.

Size/density characteristics: (visual estimate)

1. **Isolated find** (single artefacts)
2. **>1 object/m²** (low density scatters)
3. **>5 objects/m²** (medium density scatters, e.g flaking areas)
4. **>10 objects/m²** (high density scatters, e.g. quarry sites)
5. **Structures/ features** (animal enclosures, huts, grave cairns)

Lithic raw materials:

1. **chert flakes** (without source outcrop on site)
2. **chert outcrop** (source outcrop on site)
3. **hornfels flakes** (without source outcrop on site)
4. **hornfels outcrop** (source outcrop on site)
5. **quartzite/ other**

RYST KUIL ARCHAEOLOGICAL SURVEY:

General remarks

The archaeology of the Ryst Kuil Project Area spans the late Pleistocene to recent historic period^k, as might be expected of almost any similarly-sized area in the South African interior. The Early Stone Age component is represented at only seven sites, or 3% of the total, with isolated finds of medium-grained quartzite artifacts, all showing evidence of fluvial transport. None of the Early Stone Age material was considered to be in primary context and is therefore of little research value.

Middle Stone Age material was noted at 126 sites, or 50% of the total. Isolated finds predominated, and the field survey suggested that the Middle Stone Age finds probably formed part of a continuous surface scatter almost without focal points. Lateral disturbance may therefore have greatly exaggerated the number of sites. Two exceptions to this pattern are discussed in detail below (Sites QRS 88/339 and 88/482). Although the Middle Stone Age artefact material was dominated by quartzite, hornfels and other alteration products were also used. There was some evidence of Levallois core production and examples of Howieson's Poort segments and allied forms were found at a number of sites.

A somewhat more focused distribution was evident in the Later Stone Age component which included a total of 97 sites, or 39% of the total. Although isolated finds still predominated, local scatters were also apparent, and a number of sites were associated with lithic raw material sources such as chert and hornfels outcrops. Some of these sites are discussed in more detail below (Sites QRS 88/3, 88/236, 88/238, 88/307, 88/443, 88/472 and 88/490). No rock art sites were noted during the survey.

^k terminology follows Volman, T. 1984. Early prehistory of southern Africa. In Klein, R.G. ed. *Southern African Prehistory and Paleoenvironments*. A.A. Balkema, Rotterdam, 169-395; and Mitchell, P. 2002. *The Archaeology of Southern Africa*. Cambridge.

Undifferentiated sites, of which there were nine, or 4% of the total, may include several that belong to either the Later Stone Age or late pre-colonial periods. These include a number of suspected pre-colonial hut circles and short lengths of rough, uncoursed walling, as well as possible burial cairns (Site QRS 88/18, discussed below). Historic sites, totaling thirteen, or 5% of the sample, were distinguished in the field by the following simple criteria. Historic stone structures were identified by a roughly rectangular plan and the use of coursed dry-stone construction, with occasional evidence of mud-brick construction; the presence of imported items such as crockery and rifle cartridges was noted on several of these sites (Sites QRS 88/34, 88/161, 88/240, 88/273 and 88/442).

Despite clearly distinct geological contexts, the distribution of archaeological sites in the Ryst Kuil Project Area does not show any particular emphasis. Figure 5, below, compares the estimated total percentage cover of the five main geological contexts, with the distribution of archaeological sites for the same contexts. There are few points of difference: dolerite outcrop is less important archaeologically than it is present on the landscape, as are sandstone, shale and sands. Only chert outcrops seem to have been fully utilized, possibly because they combine an important raw material source with a valuable vantage point on what is generally a featureless landscape.

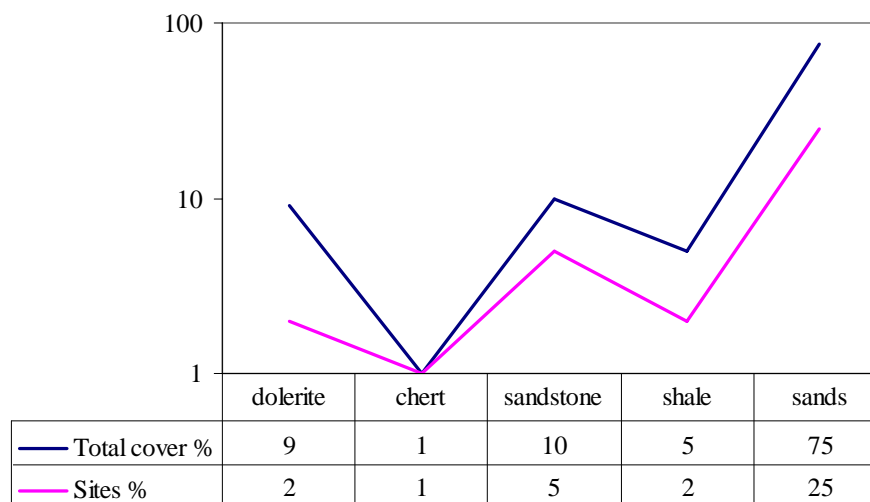


Figure 5: Geological landscape and archaeological setting in the Ryst Kuil Project Area.

A useful comparison with geological context is that of terrain profile, as shown in Figure 6, below. The graph compares the terrain profile distribution of sample points with archaeological sites and those without archaeological sites. Again, there are few points of difference, and archaeological site distributions do not reflect any clear preferences. Two likely explanations are: lateral displacement probably accounts for much of the observed distribution of Middle Stone Age sites; and the lack of focal points in the landscape means that there are no major site concentrations.

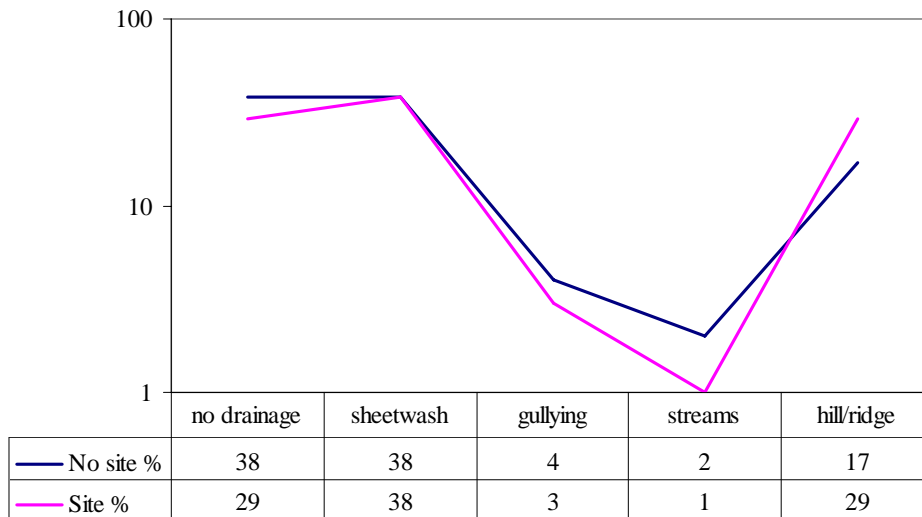


Figure 6: Comparison of terrain profile distribution in sample points with and without archeological sites.

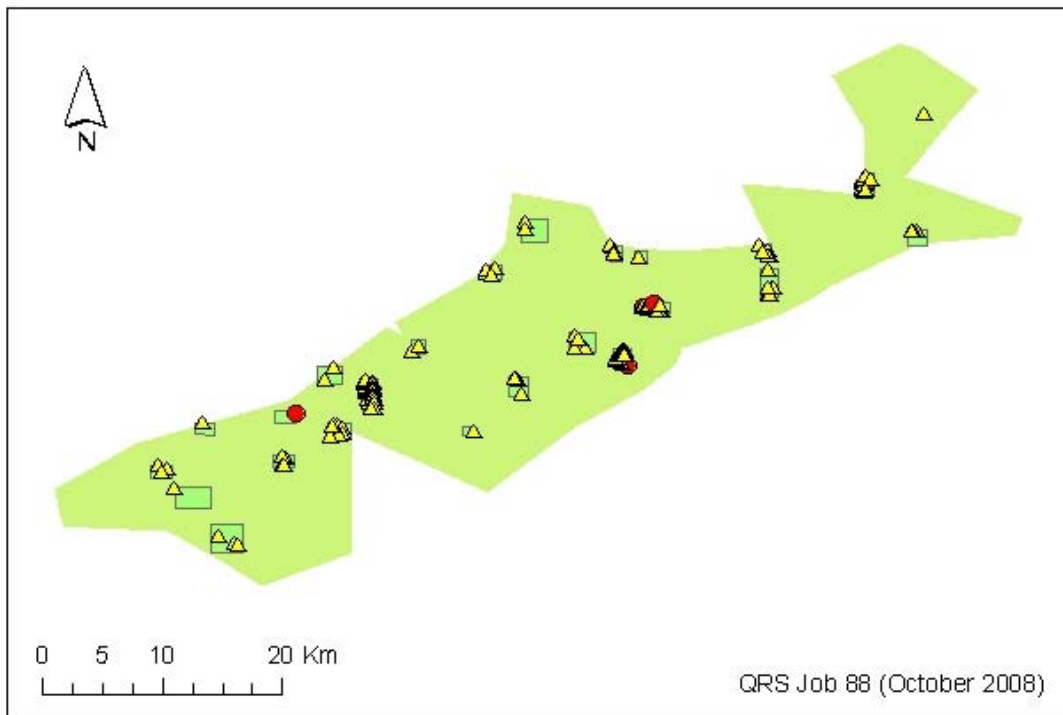


Figure 7: Comparative distribution of Early (red circle) and Middle (yellow triangle) Stone Age sites in the Ryst Kuil Project Area.

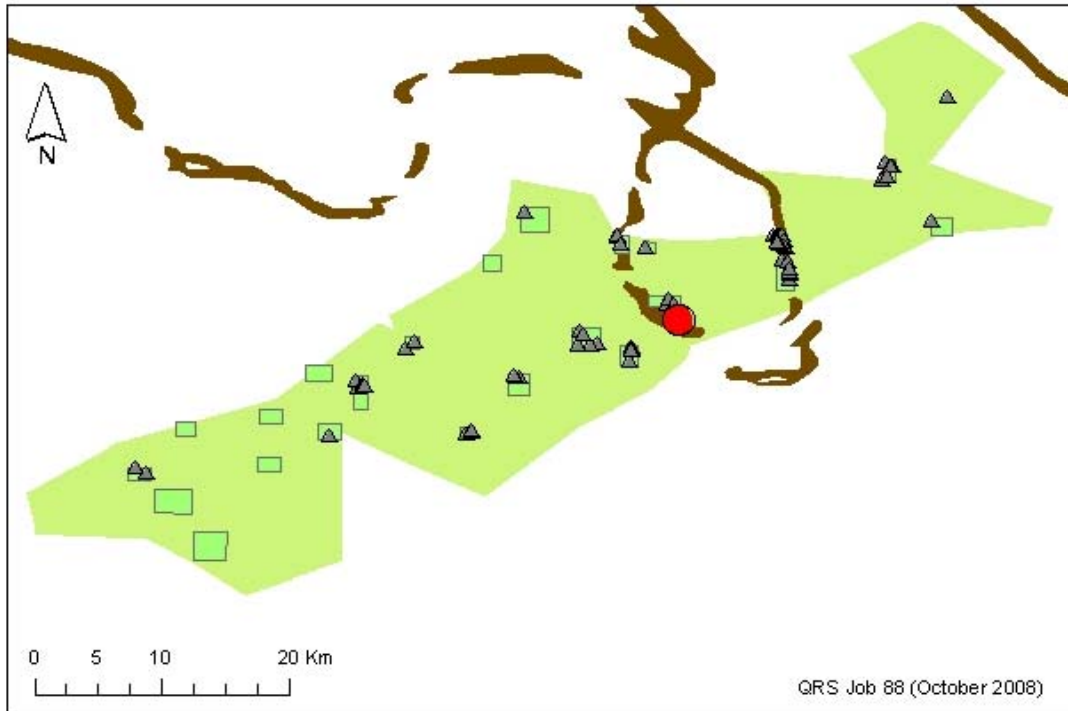


Figure 8: Later Stone Age sites with lithic assemblages dominated by hornfels (grey triangles), and the location of a hornfels quarry site (red circle). Hornfels is a thermal metamorphic product of (Karoo) shale, occurring on the boundaries of intrusive bodies such as dolerite dykes (brown polygon).

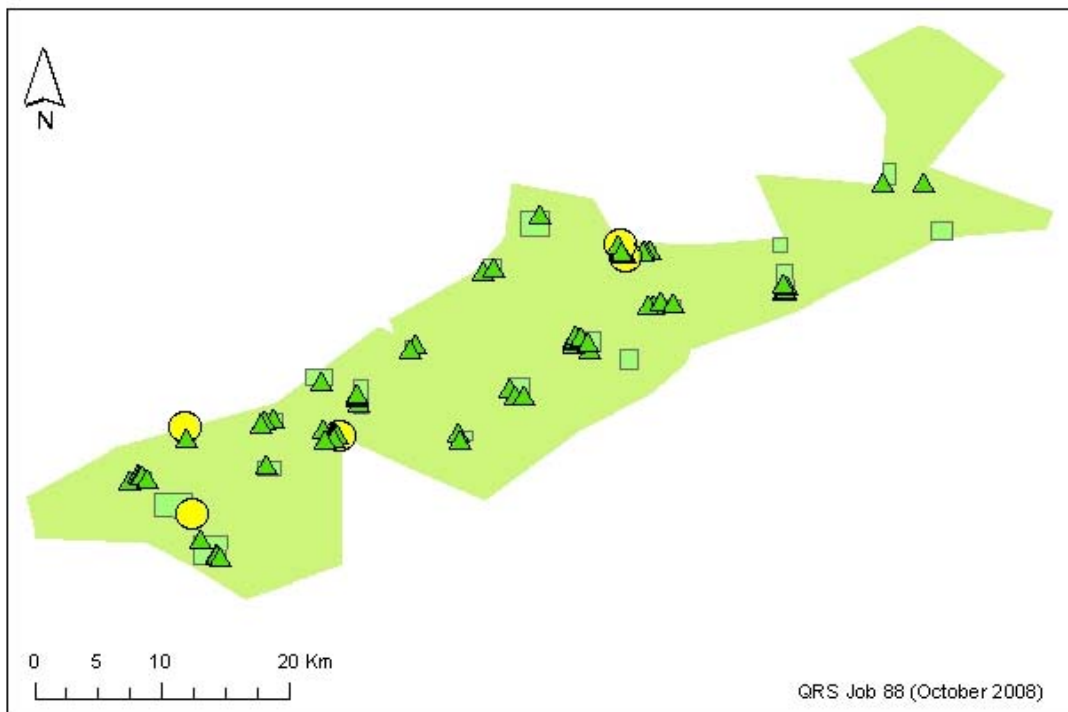


Figure 9: Later Stone Age sites with lithic assemblages dominated by chert (green triangles), and the location of several chert quarry sites (yellow circles). Chert is a sedimentary rock with superior flaking properties, and occurs in this area as an erosion-resistant capping on low hills.

Gazetteer of significant sites

The following seventeen sites are considered to be significant and worthy of mitigation or special protection. The Field rating given in the site entries below is taken from the SAHRA Guidelines, thus:

- IV B Site to be recorded before destruction (medium significance)
- IV A Site to be mitigated before destruction (medium to high significance)
- III B Site to be mitigated and part retained for national register (high significance)
- III A Site to be retained for national register, mitigation not advised (high significance).

The distribution of significant sites is shown in Figure 10, below:

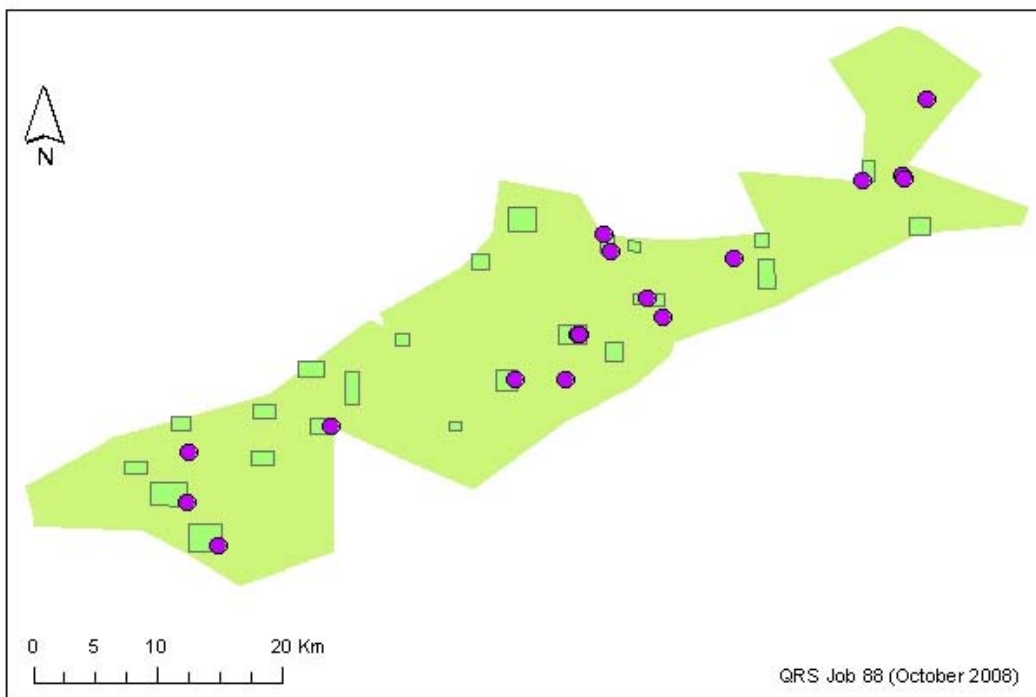


Figure 10: The distribution of significant sites in the Ryst Kuil Project Area

Site No. QRS 88/3
Location Lat. -32.7475 Long. 22.75596
Field rating IV B
Affinity Later Stone Age
Extent 50 x 50m
Setting Low sandstone ridge with minor chert horizon
Comments Artefact density <math><5/m^2</math>, probably dispersed by sheep

Site No. QRS 88/18
Location Lat. -32.779 Long. 22.77892
Field rating IV A
Affinity Undetermined, but probably Later Stone Age or historical

- Extent** Two suspected burial cairns ca 1.8mø
Setting Sandstone rubble lag
Comments The site is within 10m of a heavily used track
- Site No.** QRS 88/33
Location Lat. -32.69165 Long. 22.86121
Field rating III B
Affinity Later Stone Age, with some Middle Stone Age
Extent >100 x 100m
Setting Chert horizon on crest of low hill
Comments Artefact density up to 500/m²; partly disturbed by fence construction, farm tracks and trig. beacon construction.
- Site No.** QRS 88/34
Location Lat. -32.71046 Long. 22.75789
Field rating III B
Affinity Late pre-colonial or late 19th century
Extent Two semi-circular hut features, largest 3mø, with storage cairn in between
Setting Foot-slopes of low shale and sandstone ridge
Comments Diverse assemblage including burnt bone, ostrich eggshell, green and blue bottle glass, fragment of iron pail, sponge-ware rim sherd with blue inside stripe and outside floral pattern, brown transfer ware cup/bowl rim, grey (?exotic) chert suspected gunflint.
- Site No.** QRS 88/151
Location Lat. -32.6575 Long. 22.99386
Field rating III A/ III B
Affinity Historical
Extent Two graves, extended position
Setting Adjacent to farm track
Comments The graves have a concrete cover, with two coffin-shaped mouldings. There are no visible inscriptions. There is some undermining by burrowing animals.
- Site No.** QRS 88/161
Location Lat. -32.599 Long. 23.08885
Field rating III B
Affinity Historical
Extent >100 x 100m
Setting South-western side of low sandstone ridge
Comments Suspected horse corral 33 x 28m, dry-stone wall construction up to 1.5m high and 0.8m thick, partly collapsed. Entrance side has remains of lime-burning, including thick glassy slag and charred calcrete. Other finds include various iron fragments (barrel hoops and fragments of sheet metal), green bottle glass, clear glass, turquoise green glass, base of Walker's of Kilmarnock whiskey bottle, gun flint fragments, various items of 19th century crockery including willow pattern ware, white ware, transfer ware saucer with green pattern and label "Venice" Royal semi-porcelain, floral Grecian garden transfer ware.

Site No. QRS 88/236
Location Lat. -32.6252 Long. 23.039
Field rating III B
Affinity Later Stone Age, or late pre-colonial
Extent 25 x 30m
Setting Foot-slopes of sandstone ridge, above minor streambed.
Comments Low barrier of rock walling, 0.5m high and extending over 25m, associated with suspected burial cairn 2.5m ϕ , and second cairn about 30m to south.

Site No. QRS 88/238
Location Lat. -32.6256 Long. 23.03993
Field rating III B
Affinity Early colonial era pastoral site
Extent 10 x 16m
Setting Low sandstone hilltop
Comments Single lobed hut, 1.2m ϕ , wall maximum height 0.8m; three possible burial cairns within 15m; hut is associated with foot rim sherd of deep earthenware bowl, hand-painted with thin red outside annular ring, also brass cartridge case modified as smoking pipe.

Site No. QRS 88/240
Location Lat. -32.6576 Long. 23.03073
Field rating III A/ III B
Affinity Historical
Extent 15 x 15m
Setting Colluvial gravel and sand
Comments Vlakplaas farm cemetery, with five Swanepoel family headstones (variously granite and marble) and six unmarked grave mounds.

Site No. QRS 88/273
Location Lat. -32.5705 Long. 23.15175
Field rating III B
Affinity Historical
Extent 28 x 18m
Setting Sandstone rubble on unconsolidated sand
Comments Rectangular stock enclosure; associated crockery includes spongeware green floral/leaf pattern with blue annular ring.

Site No. QRS 88/307
Location Lat. -32.5131 Long. 23.24538
Field rating IV A
Affinity Later Stone Age
Extent 20 x 20m
Setting Top of isolated sandstone hill
Comments Hornfels flake scatter > 100/m², associated with dense scatter of broken ostrich eggshell, tortoise bone and fragments of haematite.

Site No. QRS 88/339

Location	Lat. -32.4539 Long. 23.29206
Field rating	III B
Affinity	Middle Stone Age
Extent	>250 x 250m
Setting	Margins of large pan
Comments	Artefact scatter >10/m ²
Site No.	QRS 88/442
Location	Lat. -32.51 Long. 23.27398
Field rating	III A
Affinity	Historical
Extent	50 x 50m
Setting	Sandstone rubble
Comments	Drystone stock pen 30 x 50m and adjacent house of two rooms, with recent cement floor added. Evidence of lime burning, diverse crockery including spongeware bowl rim with green stripe, maroon floral motif, annular ware bowl with broad, flat rim, grey transferware with leaf design on back and front, whiteware fragment with crenelated side, white earthenware bowl foot fragment.
Site No.	QRS 88/443
Location	Lat. -32.5123 Long. 23.2751
Field rating	IIIB
Affinity	Later Stone Age and Historical
Extent	25 x 25m
Setting	Sandstone ridge
Comments	Two low cairn features 1.5 and 2.2mø, associated with chert and hornfels flaking debris, crystalline quartz, ostrich eggshell, glass and fragments of transferware with green Celtic design on inside and outside.
Site No.	QRS 88/472
Location	Lat. -32.5645 Long. 23.06285
Field rating	III B
Affinity	Later Stone Age
Extent	25 x 25m
Setting	Sandstone ridge with outcropping chert
Comments	Chert and hornfels scatter varying from >10/m ² to >100/m ²
Site No.	QRS 88/482
Location	Lat. -32.5523 Long. 23.05756
Field rating	IV A
Affinity	Middle Stone Age and Later Stone Age
Extent	25 x 30m
Setting	Dolerite ridge with outcropping chert horizon
Comments	Middle Stone Age scatter mainly hornfels >5/m ² , Later Stone Age scatter >10/m ²
Site No.	QRS 88/490
Location	Lat. -32.6124 Long. 23.10098

Field rating	III B
Affinity	Middle Stone Age and Later Stone Age
Extent	25 x 25m
Setting	Sandstone hilltop
Comments	Hornfels and chert with greatest densities >100/m ²

Assessment

The Ryst Kuil Project Area is characterized by an almost continuous surface scatter of archaeological material representative of the mid-Pleistocene to recent historic sequence. The earlier components of the sequence are represented mainly by isolated artefact finds, indicating a high degree of lateral displacement by fluvial action. Some sites with high artefact densities have been identified in the previous section as worthy of further investigation.

The Holocene, or Later Stone Age component, shows several well defined foci, mainly at chert and hornfels quarry sites. In the previous section, several of these sites were identified as worthy of further investigation. As regards the Stone Age sequence, there is research potential among the Middle and Later Stone Age sites that would contribute to archaeological knowledge of the Central Karoo. These sites have been given relatively high field ratings, although there are none that are considered to be beyond mitigation.

Poorly represented in the archaeology of the Ryst Kuil Project Area is the late Holocene, or late pre-colonial period that is generally associated with the rise of nomadic pastoralist economies in southern Africa. Among the small number of sites that may belong to this period- identified in the previous section – most appear to be relatively late, having some evidence of colonial contact dating from the late 19th century. Whether these sites are representative of independent pastoralism or post-contact client pastoralism is unclear.

Historical settlement appears to have been rather late in this area, going from the archival records of land grants. The presence of late 19th century crockery (especially annular ware and sponge ware) corroborates this. Most of the sites with stone-walled animal pens are on the eastern side of the project area, close to the historical route from Beaufort West to Aberdeen. The enclosures are probably horse corrals – as suggested by their area and relatively high walls.

Recommendations

A Phase 1 Impact Assessment (AIA) should be commissioned at the next stage of the project when the location of mining infrastructure and related developments such as roads and power-lines has been decided. The Phase 1 study should involve a full archaeological survey of all the affected areas, using the present baseline study as a framework of survey design. The Phase 1 study should also consider options for protection and mitigation measures at any of the significant sites identified in this report that may be affected by development of the mining project.

Burial grounds described in this report include both pre-colonial (archaeological) and historic sites. The examples described here should be used to guide intensive burial survey of all ground to be covered in the Phase 1 study. The Phase 1 study should

consider the full range of recommended options for burial sites, including both site protection measures (preferred option) and possible relocation of the burials. The Phase 1 study should observe the SAHRA Guidelines in detail, and submit reports for SAHRA scrutiny. The present baseline survey report is not required by SAHRA but may be used in negotiating the Phase 1 study if test excavation (shovel test) and surface collection is envisaged.