

**PHASE I HERITAGE IMPACT ASSESSMENT (INCLUDING  
PALAEOLOGICAL DESKTOP ASSESSMENT) FOR A PROSPECTING  
RIGHT APPLICATION ON THE REMAINING EXTENT OF PORTION 1 (ORANJE  
OORD) OF THE FARM BRAKKIES 384, AND PORTION 2 (A PORTION OF  
PORTION 1) OF THE FARM BRAKKIES 384 NEAR DOUGLAS,  
NORTHERN CAPE  
(UPDATED)**



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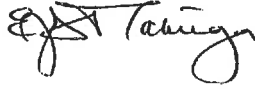
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#### DECLARATION OF INDEPENDENCE

AHSA Pty Ltd is an independent consultancy: I hereby declare that I have no interest, be it business, financial, personal or other vested interest in the undertaking of the proposed activity, other than fair remuneration for work performed, in terms the National Heritage Resources Act (No 25 of 1999).

#### DISCLAIMER

All possible care was taken to identify and document heritage resources during the survey in accordance with best practices in archaeology and heritage management. However it is always possible that some hidden or subterranean sites are overlooked during a survey. AHSA will not be held liable for such oversights and additional costs thereof.



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## EXECUTIVE SUMMARY

1. This report is a Heritage Impact Assessment (HIA) which has been prepared in support of a mine prospecting right application on the Remaining Extent of Portion 1 (Oranje Oord) of the farm Brakkies 384, and Portion 2 (a portion of Portion 1) of the farm Brakkies 384 near Douglas, in the Siyancuma Local Municipality, Northern Cape Province. This entailed a site visit and ground survey conducted on 12 October 2020 during which the heritage sensitivity of the property and potential adverse impacts of the proposed activities were evaluated.

2. The heritage sensitivity of the property is summarised as follows:

3. *The Stone Age*

Stone Age material is widely distributed on the plains, ridges and valleys on the property with 38 occurrences having been recorded. The material comprises scrapers, blades, cores and flakes typologically dating to the Middle Stone Age/Late Stone Age period. The occasional finding of small hand-axes and cleavers may represent a transitional period from the Early Stone Age to the Middle Stone Age. The scattered distribution pattern seems to suggest general hunter-gatherer activity in the area over time. None of the sites found warrant further action.

4. *The Early Iron Age*

No material dating to the Iron Age was found.

5. *The Later Iron Age*

No material dating to the Later Iron Age was found.

6. *Burial grounds*

No burials were reported on the property.

## 7. Archaeological and Heritage Chance Finds Procedure

An archaeological and heritage Chance Finds Procedure is annexed to this report.

## 8. Ranking of sites and Risk Assessment

	<b>RANKING</b>	<b>SIGNIFICANCE</b>	<b>NO OF SITES</b>
1	High	National and Provincial heritage sites (Section 7 of NHRA). All burials including those protected under Section 36 of NHRA. They must be protected.	0
2	Medium A	Substantial archaeological deposits, buildings protected under Section 34 of NHRA. Footprint of early modern mining. Cultural Landscapes. These may be protected at the recommendations of a heritage expert.	0
3	Medium B	Sites exhibiting archaeological characteristics of the area, but do not warrant further action after they have been documented.	38
4	Low	Heritage sites which have been recorded, but considered of minor importance relative to the proposed development.	3
		<b>TOTAL</b>	<b>41</b>

Table 1: Inventory of heritage sites.

SITE NO	LATITUDE	LONGITUDE	PERIOD	DESCRIPTION	RANKING	MITIGATION
BRK01	29°11'31.30"S	23°18'39.20"E	MSA/LSA	Near the summit of a ridge overlooking a stream to the south. Gravelly surface. <i>Swarthaak</i> bushes. A rudimentary tool with sharp cutting edges made from a red-brown stone which appears to contain iron.	Medium B	No further action required
BRK02	29°11'35.20"S	23°18'38.80"E	MSA/LSA	Flat bottom of valley and dry stream bed. Scattered trees. 3 lithics: 1 blade, 2 scrapers.	Medium B	No further action required
BRK03	29°11'41.20"S	23°18'29.70"E	MSA/LSA	South side of a valley. Red-brown gravel and exposures of shale and calcrete. 3 lithics: 2 blades/flakes, 1 scraper.	Medium B	No further action required
BRK04	29°11'33.40"S	23°18'34.80"E	MSA/LSA	Flat bottom of valley, silted, and dry stream bed. Sparse vegetation. 1 cleaver.	Medium B	No further action required
BRK05	29°11'33.90"S	23°18'36.10"E	Modern	Flat bottom of valley, silted, and dry stream bed. Sparse vegetation. A bullet cartridge (used) from a 270 Win hunting rifle.	Low	No further action required
BRK06	29°11'21.20"S	23°19'6.70"E	MSA/LSA	Red-brown gravel and calcretic conglomerate exposed on the cliff edge of a deeply incised head of a stream. 2 lithics: 1 blade, 1 scraper.	Medium B	No further action required
BRK07	29°11'20.40"S	23°19'5.60"E	MSA/LSA	Flat terrain, red-brown gravel, scattered bushes. 3 lithics: 2 scrapers, 1 blade.	Medium B	No further action required
BRK08	29°11'19.60"S	23°19'4.50"E	MSA/LSA	Flat terrain, red-brown gravel, scattered bushes. 4 lithics: 3 scrapers, 1 flake/blade.	Medium B	No further action required
BRK09	29°11'19.50"S	23°19'3.60"E	MSA/LSA	Flat area, red-brown gravel and exposures of calcretic hard pan. 1 scraper.	Medium B	No further action required



BRK10	29°11'21.20"S	23°19'3.70"E	MSA/LSA	Calcretic conglomerate exposed on the cliff edge of a deeply incised head of a stream. 5 lithics: 1 scraper. 4 blades.	Medium B	No further action required
BRK11	29°11'27.10"S	23°19'6.40"E	MSA/LSA	Flat terrain with scattered <i>swarthaak</i> bushes. Red-brown gravel, and calcretic hardpan. 7 lithics found: 1 scraper, 2 blades, 4 flakes.	Medium B	No further action required
BRK12	29°11'27.10"S	23°19'6.40"E	MSA/LSA	Bottom of a valley with cliff sides. 6 lithics: 4 blades, 2 scrapers.	Medium B	No further action required
BRK13	29°11'22.00"S	23°19'7.10"E	MSA/LSA	North side of valley. Calcretic overhang creating a small shelter, 7 lithics: 4 scrapers, 2 blades, 1 flake.	Medium B	No further action required
BRK14	29°11'53.30"S	23°19'43.70"E	Modern	Flat terrain with scattered acacia bushes. Red-brown gravel. Line of calcrete stones, thought to have been laid at the bottom of a fence.	Low	No further action required
BRK15	29°11'54.80"S	23°19'47.80"E	MSA/LSA	Flat area, calcretic hard surface, scattered bushes. 4 lithics: 2 blades, 2 flakes.	Medium B	No further action required
BRK16	29°11'54.80"S	23°19'47.80"E	MSA/LSA	Flat area, red-brown gravel, scattered <i>swarthaak</i> bushes. 3 lithics: 1 scraper, 2 flakes.	Medium B	No further action required
BRK17	29°11'44.80"S	23°19'42.40"E	MSA/LSA	Flat terrain, red-brown gravel and calcrete stones, scattered <i>swarthaak</i> bushes. 2 scrapers.	Medium B	No further action required
BRK18	29°11'42.80"S	23°19'36.70"E	MSA/LSA	Flat terrain, red-brown gravels, scattered <i>swarthaak</i> bushes. 4 scrapers.	Medium B	No further action required
BRK19	29°11'48.10"S	23°19'36.00"E	MSA/LSA	Flat terrain, red-brown gravel, scattered <i>swarthaak</i> bushes. 2 blades.	Medium B	No further action required
BRK20	29°11'59.00"S	23°19'38.00"E	MSA/LSA	Flat terrain, red-brown gravel, scattered <i>swarthaak</i> bushes. 1 blade.	Medium B	No further action required
BRK21	29°11'52.30"S	23°19'33.90"E	MSA/LSA	Flat terrain, calcretic waste and hard surfaces near the cliff edge of a deeply incised head of a stream. 3 lithics: 2 blades. 1 small scraper.	Medium B	No further action required

BRK22	29°11'44.40"S	23°19'29.60"E	MSA/LSA	Flat terrain, gravelly waste, exposed calcretic hard surfaces. 2 scrapers.	Medium B	No further action required
BRK23	29°11'47.80"S	23°19'34.10"E	MSA/LSA	Flat terrain, red-brown gravel, scattered acacia bushes. 1 hand-axe, 1 blade.	Medium B	No further action required
BRK24	29°11'13.30"S	23°18'29.20"E	MSA/LSA	Flat area, red-brown soil with calcretic waste. 2 blades.	Medium B	No further action required
BRK25	29°11'15.60"S	23°18'29.10"E	MSA/LSA	Flat area, with sparse bushes. Brown sandy soil. 3 lithics: 2 blades, 1 scraper.	Medium B	No further action required
BRK26	29°11'16.70"S	23°18'23.60"E	MSA/LSA	Flat terrain, red-brown gravel. Scattered bushes. 4 lithics: 1 scraper, 3 flakes.	Medium B	No further action required
BRK27	29°11'18.10"S	23°18'20.20"E	MSA/LSA	Red brown gravel, <i>swarthaak</i> bushes. 3 lithics: 1 scraper, 2 blades.	Medium B	No further action required
BRK28	29°11'12.80"S	23°18'24.70"E	MSA/LSA	Flat area, fine red-brown gravel. 4 lithics: 2 blades, 2 flakes.	Medium B	No further action required
BRK29	29°11'10.80"S	23°18'24.60"E	MSA/LSA	Flat terrain, sparse bushes. 1 blade.	Medium B	No further action required
BRK30	29°10'34.30"S	23°19'31.30"E	MSA/LSA	Flat terrain, scattered bushes. 5 lithics: 1 blade, 1 scraper, 3 flakes.	Medium B	No further action required
BRK31	29°10'56.50"S	23°19'35.70"E	MSA/LSA	Flat area with red-brown gravel. Scattered acacia bushes. 3 lithics: 1 hand-axe, 2 flakes.	Medium B	No further action required
BRK32	29°10'53.30"S	23°19'35.20"E	MSA/LSA	Flat area with scattered red-brown stones.	Medium B	No further action required
BRK33	29°12'2.30"S	23°19'27.40"E	Modern	An isolated modern house occupied by a farmworker.	Low	No further action required
BRK34	29°8'58.70"S	23°16'56.80"E	MSA/LSA	Flat area with calcretic waste mixed with red-brown stones. Exposure of hard calcretic surfaces. 1 scraper.	Medium B	No further action required
BRK35	29°8'58.70"S	23°16'56.80"E	MSA/LSA	Flat terrain, gravel waster. Acacia bushes. 1 hand-axe.	Medium B	No further action required
BRK36	29°9'7.90"S	23°17'35.10"E	MSA/LSA	Flat area with gravel waste. Scattered acacia bushes. 2 scrapers.	Medium B	No further action required

BRK37	29° 9'4.70"S	23° 17'31.80"E	MSA/LSA	Flat area with calcretic waste. Scattered acacia bushes. 1 scraper.	Medium B	No further action required
BRK38	29° 8'50.80"S	23° 18'9.70"E	MSA/LSA	Flat area with calcretic waste and exposure of hard calcretic surfaces. 3 lithics: 2 scrapers, 1 cleaver.	Medium B	No further action required
BRK39	29° 10'20.00"S	23° 18'3.10"E	MSA/LSA	Flat area with red-brown gravel. Scattered acacia bushes. 1 scraper.	Medium B	No further action required
BRK40	29° 10'39.70"S	23° 17'56.90"E	MSA/LSA	Flat area with red-brown gravel. Scattered acacia bushes. 1 cleaver.	Medium B	No further action required
BRK41	29° 10'34.89"S	23° 18'0.66"E	MSA/LSA	Flat area with red-brown gravel. Scattered acacia bushes. 1 scraper. 1 blade.	Medium B	No further action required



### *9. Conclusions and Recommendations*

The proposed mine prospecting can go ahead as there are no heritage sites that warrant further action after they have been documented. Since archaeological deposits may be buried underground, should important artefacts or skeletal material be exposed in the area during prospecting operations, such activities should be halted, and the provincial heritage resources authority or SAHRA notified in order for an investigation and evaluation of the finds undertaken. An Archaeological and Heritage Chance Finds Procedure (CFP) is annexed to this report.

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## ABBREVIATIONS

CPA	Community Property Association
EIA	Environmental Impact Assessment
HIA	Heritage Impact Assessment
LSA	Late Stone Age
LIA	Later Iron Age
PHRA	Provincial Heritage Resources Authority
MSA	Middle Stone Age
NHRA	National Heritage Resources Act
SAHRA	South African Heritage Resources Agency

## GLOSSARY

**Archaeological material:** remains older than 100 years, resulting from human activities left as evidence of their presence, which are in the form of structure, artefacts, food remains and other traces such as rock paintings or engravings, burials, fireplaces etc.

**Artefact:** Any movable object that has been used modified or manufactured by humans.

**Catalogue:** An inventory or register of artefacts and / or sites.

**Conservation:** All the processes of looking after a site or place including maintenance, preservation, restoration, reconstruction and adaptation.

**Cultural Heritage Resources:** refers to physical cultural properties such as archaeological sites, palaeontological sites, historic and prehistoric places, buildings, structures and material remains, cultural sites such as places of rituals, burial sites or graves and their associated materials, geological or natural features of cultural importance or scientific significance. These include intangible resources such as religious practices, ritual ceremonies, oral histories, memories, indigenous knowledge.

**Cultural landscape:** a stretch of land that reflects “the combined works of nature and man” and demonstrates “the evolution of human society and settlement over time, under the influence of the physical constraints and / or opportunities presented by their natural environment and of successive social, economic and cultural forces, both internal and external”.<sup>1</sup>

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<sup>1</sup> This definition is taken from current terminology as listed on the World Heritage Convention website, URL: <http://whc.unesco.org/en/culturallandscape/#1> accessed 17 March 2016.

**Cultural Resources Management (CRM):** the conservation of cultural heritage resources, management and sustainable utilization for present and future generations.

**Cultural Significance:** is the aesthetic, historical, scientific and social value for past, present and future generations.

**Early Iron Age:** refers to cultural remains dating to the first millennium AD associated with the introduction of metallurgy and agriculture.

**Early Stone Age:** a long and broad period of stone tool cultures with chronology ranging from around 3 million years ago up to the transition to the Middle Stone Age around 250 000 years ago.

**Excavation:** a method in which archaeological materials are extracted from the ground, which involves systematic recovery of archaeological remains and their context by removing soil and any other material covering them.

**Historic material:** means remains resulting from human activities, which are younger than 100 years and no longer in use; that include artefacts, human remains and artificial features and structures.

**Historical:** means belonging to the past, but often specifically the more recent past, and often used to refer to the period beginning with the appearance of written texts.

**Intangible heritage:** something of cultural value that is not primarily expressed in material form e.g. rituals, knowledge systems, oral traditions or memories, transmitted between people and within communities.

**In situ material:** means material culture and surrounding deposits in their original location and context, for instance archaeological remains that have not been disturbed.

**Later Iron Age:** The period from the beginning of the 2<sup>nd</sup> millennium AD marked by the emergence of complex state society and long-distance trade contacts.

**Late Stone Age:** The period from  $\pm$  30 000 years ago up until the introduction of metals and farming technology around 2000 years ago, but overlapping with the Iron Age in many areas up until the historical period.

**Middle Stone Age:** a period of stone tool cultures with complex chronologies marked by a shift towards lighter, more mobile toolkit, following the Early Stone Age and preceding the Late Stone Age; the transition from the Early Stone Age was a long process rather than a specific event, and the Middle Stone Age is considered to have begun around 250 000 years ago, seeing the emergence of anatomically modern humans from about 150 000 years ago, and lasting until around 30 000 years ago.

**Monuments:** architectural works, buildings, sites, sculpture, elements, structures, inscriptions or cave dwellings of an archaeological nature, which are outstanding from the point of view of history, art and science.

**Place:** means site, area, building or other work, group of buildings or other works, together with pertinent contents, surroundings and historical and archaeological deposits.

**Preservation:** means the protecting and maintaining of the fabric of a place in its existing state and retarding deterioration or change, and may include stabilization where necessary.

**Rock Art:** various patterned practices of placing markings on rock surfaces, ranging in Southern Africa from engravings to finger paintings to brush-painted imagery.

**Sherds:** ceramic fragments.

**Significance grading:** Grading of sites or artefacts according to their historical, cultural or scientific value.

**Site:** a spatial cluster of artefacts, structures, organic and environmental remains, as residues of past human activity.

**Site Recording Template:** a standard document format for site recording.



## **1. INTRODUCTION**

This Heritage Impact Assessment (HIA) report has been prepared in support of a mine prospecting right application on the Remaining Extent of Portion 1 (Oranje Oord) of the farm Brakkies 384, and Portion 2 (a portion of Portion 1) of the farm Brakkies 384 near Douglas, in the Siyancuma Local Municipality, Northern Cape Province. A site visit was made on 12 October 2020 and a ground survey undertaken during which the heritage sensitivity of the property and potential adverse impacts of the proposed activities were evaluated.

Prospecting for minerals may entail the following activities:

- Open excavations and trenches;
- Test pits;
- Drilling;
- Opening of temporary service roads; and
- Location of processing plant.

The aim of heritage screening is to establish the possible occurrence of heritage resources that may be affected by such operations and to prescribe appropriate mitigation measures.

### **1.1. Location and physical setting**

The Farm Brakkies 384 is located 50km southwest of Douglas. An important geographical reference is its proximity to the Orange River 50km downstream from its confluence with the Vaal River. The two rivers rise in Lesotho and Mpumalanga Province respectively and take a western course across the Highveld to their confluence at Douglas. Another point of interest is that the farm is on the southern edge of the Ghaap Plateau. From the banks of the Orange River the ground rises dramatically in a series of steps which culminate in the Ghaap Plateau, a vast elevated plain c. 1300m AMSL straddling the Northwest and Northern Cape Provinces. On Brakkies Farm, the superficial geology is quite varied with exposures of calcretic gravel and hardpans. The calcretic deposit is quite extensive with resistant conglomerates forming cliff edges of deeply incised streams. In a southern part of the property there is a flat-bottomed valley through which a seasonal channel runs east into the Orange

River. Standing on the rim of the valley, there are engaging sceneries east towards the Orange River and north towards the Ghaap Plateau. In many places on the farm there is an overburden of red-brown stones, so called the *Rooikoppe gravels*. They are unconsolidated colluvial material derived from rainwash, sheetwash, and flooding, all these alluvial processes which have taken place in a wide basin in which the palaeo-Orange River and its tributaries flowed. The short hooked thorn, *Acacia mellifera subsp. Detinens* (swarthaak) is quite dominant in varying densities (Figures 1-6).



Figure 1: Google-Earth map shows the location the Farm Brakkies 384 near Douglas, Northern Cape Province.



Figure 2: This is a view north from a position in the southern part of the farm. It shows a flat calcrete-capped hill.



Figure 3. Incised valley. Cliff edges show a capping horizon of hardened calcretic conglomerate.





Figure 4: Calcrete gravel and overlying a hardpan the central part of the farm.



Figure 5: Another view of the landscape shows a shallow valley in which an incised channel flows.



Figure 6: Dry streambed shows exposed calcretic bedrock.

## 2. LEGAL FRAMEWORK

This heritage impact assessment fulfils an onus on developers to safeguard heritage resources. This obligation is legislated with Sections 34, 35, 36 and 38 of the National Heritage Resources Act (No 25 of 1999) forming the legal framework in which this HIA report has been prepared.

### 2.1. Section 38 of National Heritage Resources Act on Heritage Impact Assessments

Section 38 of the NHRA states the nature and scale of development which triggers a HIA:

**38.** (1) *Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as—*

*(a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;*

*(b) the construction of a bridge or similar structure exceeding 50 m in length;*

*(c) any development or other activity which will change the character of a site—*

*(i) **exceeding 5 000 m<sup>2</sup> in extent<sup>2</sup>; or***

*(ii) involving three or more existing erven or subdivisions thereof; or*

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<sup>2</sup> Areal extent of the proposed development triggers the HIA.



*(iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or*

*(iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;*

*(d) the re-zoning of a site exceeding 10 000 m<sup>2</sup> in extent; or*

*(e) any other category of development provided for in the regulations by SAHRA or a provincial heritage resources authority,*

*must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.*

## **2.2. Definition of heritage (National Estate)**

Section 3 lists a wide range of cultural phenomena which could be defined as heritage, or the *National Estate* (3(2)). Section 3(3) outlines criteria upon which heritage value is ascribed. This Section is useful as a field checklist for the identification of heritage resources.

## **2.3. Protection of buildings and structures older than 60 years**

Section 34 provides automatic protection for buildings and structures more than 60 years old until it can be proven that they do not have heritage value:

*(1) No person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority.*

## **2.4. Protection of archaeological sites**

Section 35 (4) of the NHRA prohibits the destruction of archaeological, palaeontological and meteorite sites:

*No person may, without a permit issued by the responsible heritage resources authority—*

*(a) destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;*

*(b) destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;*

*(c) trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or palaeontological material or object, or any meteorite; or (d) bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assist in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites.*

## **2.5. Graves and burial grounds**

Section 36 of the NHRA provides for the protection of certain graves and burial grounds. Graves are generally classified under the following categories:

- Graves younger than 60 years;
- Graves older than 60 years, but younger than 100 years;
- Graves older than 100 years; and
- Graves of victims of conflict
- Graves of individuals of royal descent
- Graves that have been specified as important by the Ministers of Arts and Culture.

We are mindful of the fact that graves and burial grounds are held sacred whether they are protected by the law or not.

## **2.6. The National Environmental Management Act**

This act states that a survey and evaluation of cultural resources must be done in areas where development projects that will affect the environment will be undertaken. The impact of the development on these resources should be determined and proposals for the mitigation thereof are made. Environmental management is a much broader undertaking to cater for cultural and social needs of people. Any disturbance of landscapes and sites that constitute the nation's cultural heritage should be avoided as far as possible and where this is not possible the disturbance should be minimized and remedied.

## **2.7. The Burra Charter on Conservation of Places of Cultural Significance**

Generic principles and standards for the protection of heritage resources in South Africa are drawn from international charters and conventions. In particular South Africa

has adopted the **ICOMOS Australia Charter for the Conservation of Places of Cultural Significance (the Burra Charter 1999)** as a benchmark for best practice in heritage management.

### **3. METHODOLOGY AND THEORETICAL APPROACHES**

#### **3.1. Literature survey**

A review of relevant literature included reports of previous HIAs conducted in the broader area. Over time data has been collected to provide general knowledge of the Stone Age in the Orange – Vaal basin as this author has carried out a number of heritage impact assessment studies in the broader region:

**Matenga, E. 2017.** *Phase I Heritage Impact Assessment (including Palaeontological Assessment) requested in terms of Section 38 of the National Heritage Resources Act (No 25/1999) for the proposed Mine Prospecting on the Remaining Extent of Portion 1 of the Farm Viegulands Put 42, Prieska District, Northern Cape Province.* The Farm Viegulands Put is located on the south bank of the Orange River 30 km southwest of Brakkies. One of the highlights of the survey was an ESA hand-axe among the finds predominated by chert scrapers, blades and flakes.

**Matenga, E. 2018.** *Phase I Heritage Impact Assessment (including Palaeontological Assessment) requested in terms of Section 38 of the National Heritage Resources Act No 25/1999 for the proposed mine prospecting and application for mining right on a portion of the remaining extent of the Farm Kransfontein 19 & portion 2 (de rust) of the Farm Kransfontein 19, Prieska District, northern cape province* Kransfontein 19 is on the south bank of the Orange River 20km south of Brakkies. MSA/LSA lithics were found to be widely distributed indicating general hunter-gatherer foraging activities. There were buildings and a burial ground on the property both associated with pioneer commercial farmers.

**Matenga, E. 2019.** *Phase I Heritage impact assessment (including palaeontological assessment) requested in terms of Section 38 of the National Heritage Resources Act No 25/1999 for the proposed Mine Prospecting on a Portion of the Remaining Extent of the Farm Remhoogte 152 Prieska, Northern Cape.* On the farm Remhoogte 152

located on the south bank of the Orang River c 50km to the southwest of Brakkies, MSA/LSA lithics were found to be widely distributed indicating general hunter-gatherer foraging activities.

**Matenga, E. 2019.** *Phase I Heritage impact assessment (including palaeontological assessment) in terms of Section 38 of the National Heritage Resources Act No 25/1999 for the proposed Mine Prospecting on the Farm Katlani 236 near Douglas, Northern Cape.* Stone Age finds, rock engravings and burials were reported.

Other researchers have been involved in the area:

**De Cock, S & G Narainne. 2016.** *Integrated Heritage Impact Assessment in terms of section 38(8) of the National Heritage Resources Act, 1999 (Act 25 of 1999) for the proposed development of Humansrus Solar PV Facility 3 on the Farm Humansrus 147, Prieska District and Pixley Ka Seme District.* The study reported a diffuse spread of ESA and MSA stone artefacts across the study area for Humansrus Solar PV Facility 3; • There are no buildings or graveyards on the property (page 12);

**Mlilo, T. 2018.** *Phase I Archaeological Impact Assessment for the proposed 958m 22kv De-Villiers Powerline in the Douglas Area within Siyancuma Local Municipality in the Northern Cape Province.* The study identified sparse scatters of stone tools occurring as isolated finds mostly along streams. These included cores, scrapers, flakes and flake blades (page 30).

### **3.2. Fieldwork**

Extensive walking surveys were undertaken. A vehicle was used to move from one area to the next to ensure a reasonable coverage and good sample survey given the large size of the property. Photographs taken show the general character of the landscape as well as artefacts and features seen. A Catalogue of the findings is presented in Appendix I of this Report.

#### **3.2.1. Maps of track log**

Maps which provide details of the track log are annexed to this report.

### 3.3. HIA Report and Chance Finds Procedure

The HIA Report has been prepared with and Archaeological and Heritage Chance Finds Procedure (CFP) annexed to it as a standalone document. Since this is a scientific procedure, the CPF has been adapted from similar documents which have been referenced.<sup>3</sup>

## 4. ARCHAEOLOGICAL AND HISTORICAL CONTEXT

An outline of the cultural sequence in South Africa is provides a theoretical framework for the identification of features / structures and objects of archaeological, historical and cultural interest. As summary of the reconstructed cultural sequence is given below:

### 4.1. Cultural sequence summary<sup>4</sup>

PERIOD	EPOCH	ASSOCIATED CULTURAL GROUPS	TYPICAL MATERIAL EXPRESSIONS
Early Stone Age 2.5m – 250 000 YCE	Pleistocene	Early Hominids: <i>Australopithecines</i> <i>Homo habilis</i> <i>Homo erectus</i>	Typically large stone tools such as hand axes, choppers and cleavers.
Middle Stone Age 250 000 – 25 000 YCE	Pleistocene	First <i>Homo sapiens</i> species	Typically smaller stone tools such as scrapers, blades and points.
Late Stone Age 20 000 BC – present	Pleistocene / Holocene	<i>Homo sapiens</i> including San people	Typically small to minute stone tools such as arrow heads, points and bladelets.
Early Iron Age / Early Farmer Period c300 – 900 AD (or earlier)	Holocene	Iron Age Farmers	Typically distinct ceramics, bead ware, iron objects, grinding stones.

<sup>3</sup> Digby Wells Environmental (Undated) Chance Find Procedures for Heritage Resources. Found at: <https://sahris.sahra.org.za/sites/default/files/additionaldocs/Chance%20Find%20Procedures%20%28CFP%29.pdf>; Sativa (2020). Chance Finds Procedure for Sedibeng Regional Sanitation Scheme:Pipe line to Pump Station 2 running in the vicinity of Vereeniging Concentration Camp Cemetery (Beaconsfield Cemetery) in Vereeniging Gauteng Province. Found at: <https://sahris.sahra.org.za/sites/default/files/additionaldocs/CHANCE%20FINDS%20PROCEDURE.pdf>

<sup>4</sup> Adapted from Exigo Consultancy. 2015. Frances Baard District Municipality: Proposed Nkandla Extension 2 Township Establishment, Erf 258 Nkandla, Hartswater, Northern Cape Province.



Later Iron Age 900ADff	Holocene	Iron Age Farmers, emergence of complex state systems	Typically distinct ceramics, evidence of long distance trade and contacts
(ii) Mapungubwe (K2)	1350AD		Metals including gold, long distance exchanges
(ii) Historical period	Tswana / Sotho, Nguni people	Iron Age Farmers	Stone walls Mfecance / Difaqane
(iii) Colonial period	19 <sup>th</sup> Century	European settlers / farmers / missionaries/ industrialisation	Buildings, Missions, Mines, metals, glass, ceramics

## 4.2. Appearance of hominids

South Africa has yielded a very good record of fossil hominids, proto-humans which appeared in South Africa more than 3 million years ago. Three famous sites in Gauteng, Limpopo and Northwest Provinces have been collectively named the Cradle of Humankind and inscribed as a serial UNESCO World Heritage Site.<sup>5</sup> One of these sites Taung near Vryburg is 200 km northwest of the study area. To my knowledge although vertebrate fossils are known in this area, no hominid sites have been reported in the vicinity of the study area.

## 4.3. The Early Stone Age

### 4.3.1. The Early Stone Age (2 million to 250 000 years BP)

The Stone Age dates back more than 2 million years and divided into three epochs, the Early, Middle and Late Stone Ages. These early humans made pear-shaped handaxe, cleavers and core tools (Deacon & Deacon, 1999). Material evidence is found in caves, rock-shelters and on river sides and edges of streams, and very rarely seen in open country.<sup>6</sup> The stone tool industries have been called Oldowan and Acheulean and were probably used to butcher large animals such as elephants, rhinoceros and hippopotamus.

A good profile of the Stone Age in the Northern Cape has been reconstructed from many heritage impact assessments that have been conducted in recent years. Locales along and adjacent to the Orange – Vaal River systems have yielded evidence of great

<sup>5</sup> Deacon, J. and N. Lancaster. 1986. *Later Quaternary Palaeo-environments of Southern Africa*. Oxford: Oxford University Press.

<sup>6</sup> <http://archaeology.about/od/bterms/g/bordercave.htm>

interest.<sup>7</sup> Further north the Wonderwerk Cave has become a benchmark for the characterisation of the Stone Age. Excavations reveal a long sequence of occupation spanning the Early (ESA), Middle (MSA) and Later Stone Ages.<sup>8</sup>

#### 4.3.2. Middle Stone Age (MSA) [250 000 yrs – 30 000 yrs BP]

The Middle Stone Age (MSA), dates from 250 000 years to 40 000 years ago, marked by the introduction of a new tool kit which included prepared cores, parallel-sided blades and triangular points hafted to make spears. By then humans had become skilful hunters, especially of large grazers such as wildebeest, hartebeest and eland. By then, humans had evolved significantly to become anatomically modern and the toolkit reflected significant developments in cognitive capacity. Caves were used for shelter suggesting permanent or semi-permanent settlement. These people had mastered the art of making fire.<sup>9</sup> A number of field surveys have been carried out on the Ghaap Plateau and the Orange-Vaal River basin confirming significant hunter gatherer activity in the area from the MSA onwards.

#### 4.3.3. Later Stone Age (LSA)[40 000 yrs to ca2000 yrs BP]

By the beginning of the LSA, humans are classified as *Homo sapiens* which refers to the modern physical form and thinking capabilities. Several behavioural traits are exhibited, such as rock art and purposeful burials with ornaments, became a regular practice. LSA technology is characterised by microlithic scrapers and segments made from very fine-grained rock. Spear hunting continued, but LSA people also hunted small game with bows and poisoned arrows. Because of poor preservation, open sites become of less value compared to rock shelters.

### 4.4. The Iron Age Culture [ca. 2000 years BP]

The Iron Age culture supplanted the Stone Age at least 2000 years ago, associated with the introduction of farming and use of several metals and pottery. Iron Age communities are associated with speakers of Bantu languages who were farmers keeping domestic animals such as cattle, sheep, goat and chickens. There is however

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<sup>7</sup> Morris, D. 2009. Phase 1 Archaeological Impact Assessment at Bucklands Settlement near Douglas, Northern Cape, p3.

<sup>8</sup> <http://www.southafrica.net/za/en/articles/entry/article-southafrica.net-the-wonderwerk-cave>.

<sup>9</sup> Deacon, J & H. Deacon. 1999. *Human Beginnings in South Africa*. Cape Town: David Philip.

increasing evidence that sheep and probably cattle as well might have moved into the area much earlier than the Iron Age.<sup>10</sup>

#### 4.4.1. *Early Iron Age*

According to Huffman (2007) there were two migration streams of Early Iron Age (EIA) communities converging in South Africa, one originating in eastern Africa which has been called the *Urewe-Kwale Tradition* (or the eastern stream) and another from the west, spreading through Zambia and Angola, which he termed the *Kalundu Tradition* (or western stream). An alternative is that the IA was the result of a gradual spread or expansion of settlement of different groups of people indigenous to the continent which took place over a long period of time. There are few if any sites attributed to the EIA in the western parts of the country. Most IA settlements are concentrated in the eastern part of South Africa.

#### 4.4.2. *The Later Iron Age*

The LIA is marked by the presence of extensive stonewalled settlements such as the Tlhaping capital at Dithakong near Kuruman.<sup>11</sup>

### 4.5. **Historical Context**

On the eve of colonial occupation the Tlhaping, a segment of the Tswana lived in the area. The Tswana belong to the Bantu family probably descending from the Iron Age people and may possibly be connected with the Stone Age predecessors. The early 19th century was a political turning point with an increasingly precarious security situation developing and causing internal displacements. The first of these episodes was the Difaqane characterised by inter-tribal raids.

Then came the Griqua to occupy the area at the confluence of the Vaal and Orange in the 19<sup>th</sup> century. Historically their cradle was in the north-eastern Cape Colony being predominantly of Khoi-Khoi stock with an infusion through marriage of other groups in the area from the 19th century. Adam Kok 1 is considered the founding leader. He

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<sup>11</sup> De Jong 2010: De Jong, R.C. 2010. Heritage impact assessment report: proposed manganese and iron ore mining right application in respect of the remainder of the farm Paling 434, Hay Registration Division, Northern Cape. Unpublished report prepared for Kai Batla Minerals Industry Consultants. Pretoria: Cultmatrix, p

moved his people north from the Cape Colony as the colonial frontier was expanding northward. His successor, Andries Waterboer settled with his people in what became Griqualand West and therein comes the historical connection between the Tlhaping and the Griqua. The Griqua established a town called Klaarwater and subsequently renamed Griquatown. Meanwhile white hunters, traders and missionaries also entered the area. A little later the Afrikaners arrived bringing their stock as part of a mass exodus from the Cape called the Great Trek. The discovery of diamonds at Kimberley sparked the “rush”. The area which became known as Griqualand West was subsequently incorporated into the Cape Colony in the 1880s.

#### **4.6. Early Contact with the Boers**

In the early 19<sup>th</sup> century, a number of traders, hunters, explorers and missionaries transited the area. A few can be named here - PJ Truter's and William Somerville (arriving in 1801), Donovan, Burchell and Campbell, and James Read (arriving around 1870). Subsequently, the arrival of large numbers of Great Trek Boers from the Cape Colony and the borders of Bechuanaland and Griqualand West in 1836 caused conflict with many Tswana groups. Conflict escalated when the Korana and Griqua communities and the British government got involved. In 1872, the British proclaimed Griqualand West as a crown state (i.e. including the area around present-day Griekwastad). It was subsequently incorporated into the Cape Colony in 1880. The annexation of Bechuanaland by the British in 1885 imposed further territorial restrictions on native groups (Engelbrecht & Fivaz, 2018: 17-18, 19).

#### **4.7. Orange and Vaal River alluvial diamond diggings**

The first diamonds were discovered in 1867 near Hopetown near the Orange River in what was then the Cape Colony. Another find was made on a farm called Paarde Kloof on the Orange River, also in the locality of Hopetown (Payton 1872, p1). Thereafter the alluvial diamonds gained spotlight starting in 1869 when a party of prospectors from Natal organised by the British Army started exploration and diggings along the Vaal River Valley. The finds at Klipdrift (Barkly West) sparked South Africa's first diamond rush. Following the news men began to flock from Britain and elsewhere to the new diggings. By April 1871 c. 5000 men had swarmed the Vaal, Modder, and Orange

Rivers. The alluvial stones from the region proved to be of high quality. The miners staked claims while the local Griqua chiefs and the Boer Republics of the Transvaal and Orange Free State also joined in the fray. Ownership rights were initially given to local chiefs and Boer Trekkers. But the diggers proclaimed the Klipdrift Republic on 30th July 1870 with Stafford Parker as its elected president. In 1872, the British annexed the diamond fields and proclaimed Griqualand West as a crown state. It was subsequently incorporated into the Cape Colony in 1880. The majority of the prospectors abandoned the various Vaal River claims in the wake of richer finds at Kimberley in 1871. Mining of the river gravels has been going on sparking sporadic rushes over the last nearly one and half centuries.<sup>12</sup>

The above forms the archaeological and historical context for the identification of heritage resources in the study area.

## **5. FINDINGS OF THE HERITAGE SURVEY**

The heritage sensitivity of the property is summarised as follows:

### **5.1. The Stone Age**

Stone Age material is widely distributed on the plains, ridges and valleys on the property with 38 occurrences having been recorded. The Stone Age material comprises scrapers, blades, cores and flakes typologically dating to the Middle Stone Age/Late Stone Age period. The occasional finding of small hand-axes and cleavers may represent a transitional period from the Early Stone Age to the Middle Stone Age. The scattered distribution pattern seems to indicate general hunter-gatherer activity in the area over time. None of the sites found warrant further action.

### **5.2. The Early Iron Age**

No material dating to the Iron Age was found.

### **5.3. The Later Iron Age**

No material dating to the Later Iron Age was found.

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<sup>12</sup> The Barkly West & Vaal River Diggings. Found at: <http://www.on-the-rand.co.uk/Diamond%20Grounds/Barkly%20West.htm>

#### **5.4. Burial grounds**

No burials were reported on the property.

### 5.5. Ranking of sites and Risk Assessment

	<b>RANKING</b>	<b>SIGNIFICANCE</b>	<b>NO OF SITES</b>
1	High	National and Provincial heritage sites (Section 7 of NHRA). All burials including those protected under Section 36 of NHRA. They must be protected.	0
2	Medium A	Substantial archaeological deposits, buildings protected under Section 34 of NHRA. Footprint of early modern mining. Cultural Landscapes. These may be protected at the recommendations of a heritage expert.	0
3	Medium B	Sites exhibiting archaeological characteristics of the area, but do not warrant further action after they have been documented.	38
4	Low	Heritage sites which have been recorded, but considered of minor importance relative to the proposed development.	3
		<b>TOTAL</b>	<b>41</b>

Table 1: Inventory of heritage sites.

SITE NO	LATITUDE	LONGITUDE	PERIOD	DESCRIPTION	RANKING	MITIGATION
BRK01	29°11'31.30"S	23°18'39.20"E	MSA/LSA	Near the summit of a ridge overlooking a stream to the south. Gravelly surface. <i>Swarthaak</i> bushes. A rudimentary tool with sharp cutting edges made from a red-brown stone which appears to contain iron.	Medium B	No further action required
BRK02	29°11'35.20"S	23°18'38.80"E	MSA/LSA	Flat bottom of valley and dry stream bed. Scattered trees. 3 lithics: 1 blade, 2 scrapers.	Medium B	No further action required
BRK03	29°11'41.20"S	23°18'29.70"E	MSA/LSA	South side of a valley. Red-brown gravel and exposures of shale and calcrete. 3 lithics: 2 blades/flakes, 1 scraper.	Medium B	No further action required
BRK04	29°11'33.40"S	23°18'34.80"E	MSA/LSA	Flat bottom of valley, silted, and dry stream bed. Sparse vegetation. 1 cleaver.	Medium B	No further action required
BRK05	29°11'33.90"S	23°18'36.10"E	Modern	Flat bottom of valley, silted, and dry stream bed. Sparse vegetation. A bullet cartridge (used) from a 270 Win hunting rifle.	Low	No further action required
BRK06	29°11'21.20"S	23°19'6.70"E	MSA/LSA	Red-brown gravel and calcretic conglomerate exposed on the cliff edge of a deeply incised head of a stream. 2 lithics: 1 blade, 1 scraper.	Medium B	No further action required
BRK07	29°11'20.40"S	23°19'5.60"E	MSA/LSA	Flat terrain, red-brown gravel, scattered bushes. 3 lithics: 2 scrapers, 1 blade.	Medium B	No further action required
BRK08	29°11'19.60"S	23°19'4.50"E	MSA/LSA	Flat terrain, red-brown gravel, scattered bushes. 4 lithics: 3 scrapers, 1 flake/blade.	Medium B	No further action required
BRK09	29°11'19.50"S	23°19'3.60"E	MSA/LSA	Flat area, red-brown gravel and exposures of calcretic hard pan. 1 scraper.	Medium B	No further action required



BRK10	29°11'21.20"S	23°19'3.70"E	MSA/LSA	Calcretic conglomerate exposed on the cliff edge of a deeply incised head of a stream. 5 lithics: 1 scraper. 4 blades.	Medium B	No further action required
BRK11	29°11'27.10"S	23°19'6.40"E	MSA/LSA	Flat terrain with scattered <i>swarthaak</i> bushes. Red-brown gravel, and calcretic hardpan. 7 lithics found: 1 scraper, 2 blades, 4 flakes.	Medium B	No further action required
BRK12	29°11'27.10"S	23°19'6.40"E	MSA/LSA	Bottom of a valley with cliff sides. 6 lithics: 4 blades, 2 scrapers.	Medium B	No further action required
BRK13	29°11'22.00"S	23°19'7.10"E	MSA/LSA	North side of valley. Calcretic overhang creating a small shelter, 7 lithics: 4 scrapers, 2 blades, 1 flake.	Medium B	No further action required
BRK14	29°11'53.30"S	23°19'43.70"E	Modern	Flat terrain with scattered acacia bushes. Red-brown gravel. Line of calcrete stones, thought to have been laid at the bottom of a fence.	Low	No further action required
BRK15	29°11'54.80"S	23°19'47.80"E	MSA/LSA	Flat area, calcretic hard surface, scattered bushes. 4 lithics: 2 blades, 2 flakes.	Medium B	No further action required
BRK16	29°11'54.80"S	23°19'47.80"E	MSA/LSA	Flat area, red-brown gravel, scattered <i>swarthaak</i> bushes. 3 lithics: 1 scraper, 2 flakes.	Medium B	No further action required
BRK17	29°11'44.80"S	23°19'42.40"E	MSA/LSA	Flat terrain, red-brown gravel and calcrete stones, scattered <i>swarthaak</i> bushes. 2 scrapers.	Medium B	No further action required
BRK18	29°11'42.80"S	23°19'36.70"E	MSA/LSA	Flat terrain, red-brown gravels, scattered <i>swarthaak</i> bushes. 4 scrapers.	Medium B	No further action required
BRK19	29°11'48.10"S	23°19'36.00"E	MSA/LSA	Flat terrain, red-brown gravel, scattered <i>swarthaak</i> bushes. 2 blades.	Medium B	No further action required
BRK20	29°11'59.00"S	23°19'38.00"E	MSA/LSA	Flat terrain, red-brown gravel, scattered <i>swarthaak</i> bushes. 1 blade.	Medium B	No further action required
BRK21	29°11'52.30"S	23°19'33.90"E	MSA/LSA	Flat terrain, calcretic waste and hard surfaces near the cliff edge of a deeply incised head of a stream. 3 lithics: 2 blades. 1 small scraper.	Medium B	No further action required

BRK22	29°11'44.40"S	23°19'29.60"E	MSA/LSA	Flat terrain, gravelly waste, exposed calcretic hard surfaces. 2 scrapers.	Medium B	No further action required
BRK23	29°11'47.80"S	23°19'34.10"E	MSA/LSA	Flat terrain, red-brown gravel, scattered acacia bushes. 1 handaxe, 1 blade.	Medium B	No further action required
BRK24	29°11'13.30"S	23°18'29.20"E	MSA/LSA	Flat area, red-brown soil with calcretic waste. 2 blades.	Medium B	No further action required
BRK25	29°11'15.60"S	23°18'29.10"E	MSA/LSA	Flat area, with sparse bushes. Brown sandy soil. 3 lithics: 2 blades, 1 scraper.	Medium B	No further action required
BRK26	29°11'16.70"S	23°18'23.60"E	MSA/LSA	Flat terrain, red-brown gravel. Scattered bushes. 4 lithics: 1 scraper, 3 flakes.	Medium B	No further action required
BRK27	29°11'18.10"S	23°18'20.20"E	MSA/LSA	Red brown gravel, <i>swarthaak</i> bushes. 3 lithics: 1 scraper, 2 blades.	Medium B	No further action required
BRK28	29°11'12.80"S	23°18'24.70"E	MSA/LSA	Flat area, fine red-brown gravel. 4 lithics: 2 blades, 2 flakes.	Medium B	No further action required
BRK29	29°11'10.80"S	23°18'24.60"E	MSA/LSA	Flat terrain, sparse bushes. 1 blade.	Medium B	No further action required
BRK30	29°10'34.30"S	23°19'31.30"E	MSA/LSA	Flat terrain, scattered bushes. 5 lithics: 1 blade, 1 scraper, 3 flakes.	Medium B	No further action required
BRK31	29°10'56.50"S	23°19'35.70"E	MSA/LSA	Flat area with red-brown gravel. Scattered acacia bushes. 3 lithics: 1 hand-axe, 2 flakes.	Medium B	No further action required
BRK32	29°10'53.30"S	23°19'35.20"E	MSA/LSA	Flat area with scattered red-brown stones.	Medium B	No further action required
BRK33	29°12'2.30"S	23°19'27.40"E	Modern	An isolated modern house occupied by a farmworker.	Low	No further action required
BRK34	29° 8'58.70"S	23°16'56.80"E	MSA/LSA	Flat area with calcretic waste mixed with red-brown stones. Exposure of hard calcretic surfaces. 1 scraper.	Medium B	No further action required
BRK35	29° 8'58.70"S	23°16'56.80"E	MSA/LSA	Flat terrain, gravel waster. Acacia bushes. 1 hand-axe.	Medium B	No further action required
BRK36	29° 9'7.90"S	23°17'35.10"E	MSA/LSA	Flat area with gravel waste. Scattered acacia bushes. 2 scrapers.	Medium B	No further action required

BRK37	29° 9'4.70"S	23°17'31.80"E	MSA/LSA	Flat area with calcretic waste. Scattered acacia bushes. 1 scraper.	Medium B	No further action required
BRK38	29° 8'50.80"S	23°18'9.70"E	MSA/LSA	Flat area with calcretic waste and exposure of hard calcretic surfaces. 3 lithics: 2 scrapers, 1 cleaver.	Medium B	No further action required
BRK39	29°10'20.00"S	23°18'3.10"E	MSA/LSA	Flat area with red-brown gravel. Scattered acacia bushes. 1 scraper.	Medium B	No further action required
BRK40	29°10'39.70"S	23°17'56.90"E	MSA/LSA	Flat area with red-brown gravel. Scattered acacia bushes. 1 cleaver.	Medium B	No further action required
BRK41	29°10'34.89"S	23°18'0.66"E	MSA/LSA	Flat area with red-brown gravel. Scattered acacia bushes. 1 scraper. 1 blade.	Medium B	No further action required



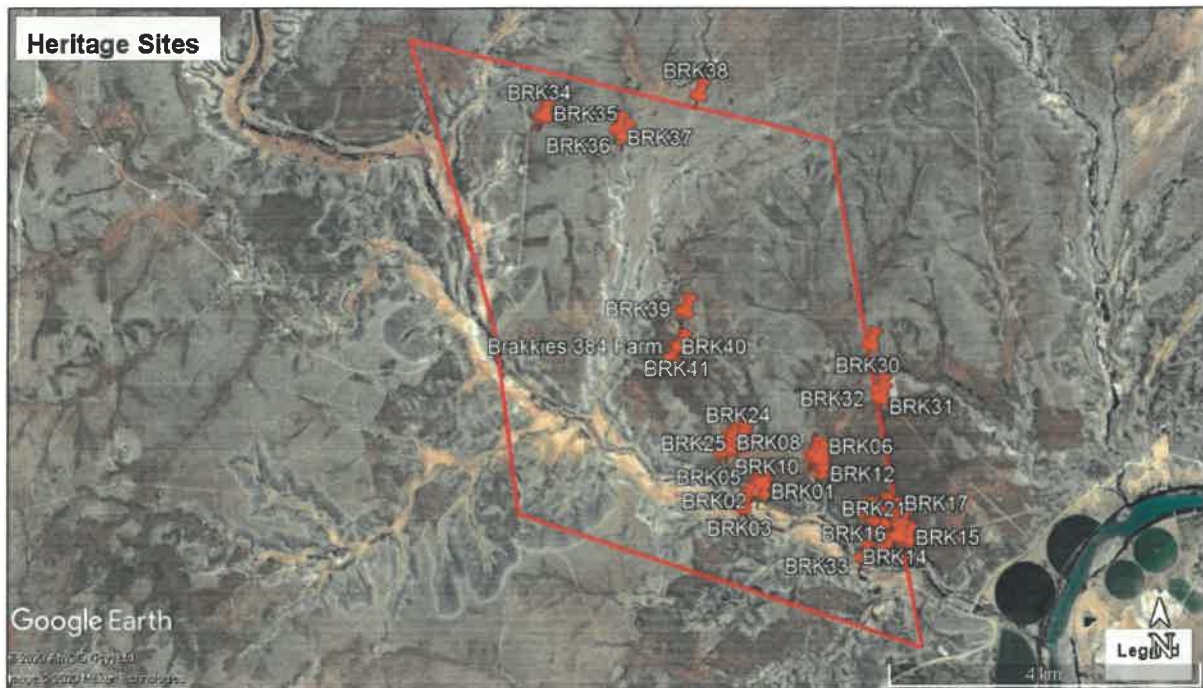


Figure 6: Brakkies 384, location of heritage sites.

## 5.6. Assessment of Impacts using the Heritage Impact Assessment Statutory Framework

### Section 38 of the NHRA

Section 38 (Subsection 3) of the National Heritage Resources Act also provides a schedule of tasks to be undertaken in an HIA process:

*Section 38(3) The responsible heritage resources authority must specify the information to be provided in a report required in terms of subsection (2)(a): Provided that the following must be included:*

***(a) The identification and mapping of all heritage resources in the area affected***

***(b) An assessment of the significance of such resources in terms of the heritage assessment criteria set out in section 6(2) or prescribed under section 7***

There are no Grade I or Grade II sites.

***(c) An assessment of the impact of the development on such heritage resources***

The risk ranking is an index of potential risks based on perceived value of the heritage and potential threats posed by the proposed development. No sites warrant further action.

**(i) An evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development**

Mining in the northern is making a significant contribution to the growth of the South African economy. Mineral wealth can provide stimulus for rapid socio-economic development in the Northern Cape Province in particular and the country as a whole. Mining is labour intensive and can contribute immensely to alleviate the current high rate of employment. General improvement in the quality of livelihoods in local communities and the country at large is expected.

**(e) The results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources**

Public participation was undertaken within the ambit of the broader environmental impact assessment process, a report of which will be submitted with this HIA Report.

**(f) If heritage resources will be adversely affected by the proposed development, the consideration of alternatives**

No heritage sites were found to require protection or other mitigation measures to be taken.

**(g) Plans for mitigation of any adverse effects during and after the completion of the proposed development.**

In the event of discovery of other heritage resources deemed of significance during site preparation and mining phase, the Provincial Heritage Resources Authority or SAHRA will be informed immediately and an archaeologist or heritage expert called to attend.

### 5.7. Risk Assessment of the findings

EVALUATION CRITERIA	RISK ASSESSMENT
Description of potential impact	Negative impacts range from partial to total destruction of surface and under-surface movable/immovable relics.
Nature of Impact	Negative impacts can both be direct or indirect.
Legal Requirements	Sections 34, 35, 36, 38 of National Heritage Resources Act No. 25 (1999).
Stage/Phase	Prospecting for minerals (test pits, drilling); Mining Phase

Extent of Impact	Test pits, excavations and ground clearing can result in damage and destruction of archaeological resources above and below the surface not seen during the survey.
Duration of Impact	Any accidental destruction of surface or subsurface relics is not reversible, but can be mitigated.
Intensity	Uncertain.
Probability of occurrence	Medium.
Confidence of assessment	High.
Level of significance of impacts before mitigation	Medium.
Mitigation measures	If archaeological or other heritage relics deemed of high significance are found during the construction phase, heritage authorities will be advised immediately and a heritage specialist will be called to attend.
Level of significance of impacts after mitigation	Low.
Cumulative Impacts	None.
Comments or Discussion	None.

## 6. CONCLUSION AND RECOMMENDATIONS

The proposed mine prospecting can go ahead as there are no heritage sites that warrant further action after the documentation. Since archaeological deposits may be buried underground, should important artefacts or skeletal material be exposed in the area during prospecting operations, such activities should be halted, and the provincial heritage resources authority or SAHRA notified in order for an investigation and evaluation of the finds undertaken.

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**APPENDIX I: BRAKKIES - CATALOGUE OF HERITAGE SITES**

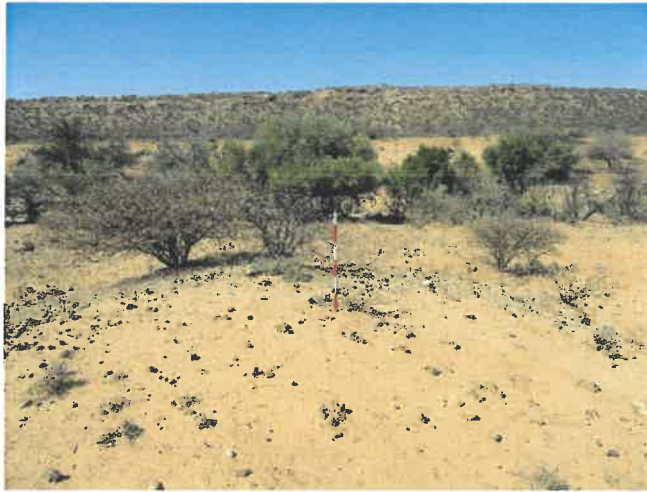
SITE NO	COORDINATES		PERIOD
BRK01	29°11'31.30"S	23°18'39.20"E	MSA/LSA



**DESCRIPTION:** Near the summit of a ridge overlooking a stream to the south. Gravelly surface. *Swarthaak* bushes. A rudimentary tool with sharp cutting edges made from a red-brown stone which appears to contain iron.

<b>HERITAGE SIGNIFICANCE</b>	Evidence of hunter-gatherer activities during the MSA/LSA
<b>MITIGATION</b>	No further action required.

SITE NO	COORDINATES		PERIOD
BRK02	29°11'35.20"S	23°18'38.80"E	MSA/LSA



**DESCRIPTION:** Flat bottom of valley and dry stream bed. Scattered trees. 3 lithics: 1 blade, 2 scrapers.

<b>HERITAGE SIGNIFICANCE</b>	Evidence of hunter-gatherer activities during the MSA/LSA
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<b>MITIGATION</b>	No further action required.
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SITE NO	COORDINATES		PERIOD
BRK03	29°11'41.20"S	23°18'29.70"E	MSA/LSA



**DESCRIPTION:** South side of a valley. Red-brown gravel and exposures of shale and calcrete. 3 lithics: 2 blades/flakes, 1 scraper.

<b>HERITAGE SIGNIFICANCE</b>	Evidence of hunter-gatherer activities during the MSA/LSA
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<b>MITIGATION</b>	No further action required.
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SITE NO	COORDINATES		PERIOD
BRK04	29°11'33.40"S	23°18'34.80"E	MSA/LSA



**DESCRIPTION:** Flat bottom of valley, silted, and dry stream bed. Sparse vegetation. 1 cleaver.

<b>HERITAGE SIGNIFICANCE</b>	Evidence of hunter-gatherer activities during the MSA/LSA
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<b>MITIGATION</b>	No further action required.
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SITE NO	COORDINATES		PERIOD
BRK05	29°11'33.90"S	23°18'36.10"E	Modern



**DESCRIPTION:** Flat bottom of valley, silted, and dry stream bed. Sparse vegetation. A bullet cartridge (used) from a 270 Win hunting rifle.

<b>HERITAGE SIGNIFICANCE</b>	Modern commercial hunting
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<b>MITIGATION</b>	No further action required.
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SITE NO	COORDINATES		PERIOD
BRK06	29°11'21.20"S	23°19'6.70"E	MSA/LSA



<b>DESCRIPTION:</b> Red-brown gravel and calcretic conglomerate exposed on the cliff edge of a deeply incised head of a stream. 2 lithics: 1 blade, 1 scraper.	
<b>HERITAGE SIGNIFICANCE</b>	Evidence of hunter-gatherer activities during the MSA/LSA
<b>MITIGATION</b>	No further action required.



SITE NO	COORDINATES		PERIOD
BRK07	29°11'20.40"S	23°19'5.60"E	MSA/LSA



**DESCRIPTION:** Flat terrain, red-brown gravel, scattered bushes. 3 lithics: 2 scrapers, 1 blade.

<b>HERITAGE SIGNIFICANCE</b>	Evidence of hunter-gatherer activities during the MSA/LSA
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<b>MITIGATION</b>	No further action required.
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SITE NO	COORDINATES		PERIOD
BRK08	29°11'19.60"S	23°19'4.50"E	MSA/LSA



**DESCRIPTION:** Flat terrain, red-brown gravel, scattered bushes. 4 lithics: 3 scrapers, 1 flake/blade.

<b>HERITAGE SIGNIFICANCE</b>	Evidence of hunter-gatherer activities during the MSA/LSA
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<b>MITIGATION</b>	No further action required.
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SITE NO	COORDINATES		PERIOD
BRK09	29°11'19.50"S	23°19'3.60"E	MSA/LSA



**DESCRIPTION:** Flat area, red-brown gravel and exposures of calcretic hard pan.  
1 scraper.

<b>HERITAGE SIGNIFICANCE</b>	Evidence of hunter-gatherer activities during the MSA/LSA
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<b>MITIGATION</b>	No further action required.
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SITE NO	COORDINATES		PERIOD
BRK10	29°11'21.20"S	23°19'3.70"E	MSA/LSA



**DESCRIPTION:** Calcretic conglomerate exposed on the cliff edge of a deeply incised head of a stream. 5 lithics: 1 scraper. 4 blades.

<b>HERITAGE SIGNIFICANCE</b>	Evidence of hunter-gatherer activities during the MSA/LSA
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<b>MITIGATION</b>	No further action required.
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SITE NO	COORDINATES		PERIOD
BRK11	29°11'27.10"S	23°19'6.40"E	MSA/LSA



**DESCRIPTION:** Flat terrain with scattered *swarthaak* bushes. Red-brown gravel, and calcretic hardpan. 7 lithics found: 1 scraper, 2 blades, 4 flakes.

<b>HERITAGE SIGNIFICANCE</b>	Evidence of hunter-gatherer activities during the MSA/LSA
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<b>MITIGATION</b>	No further action required.
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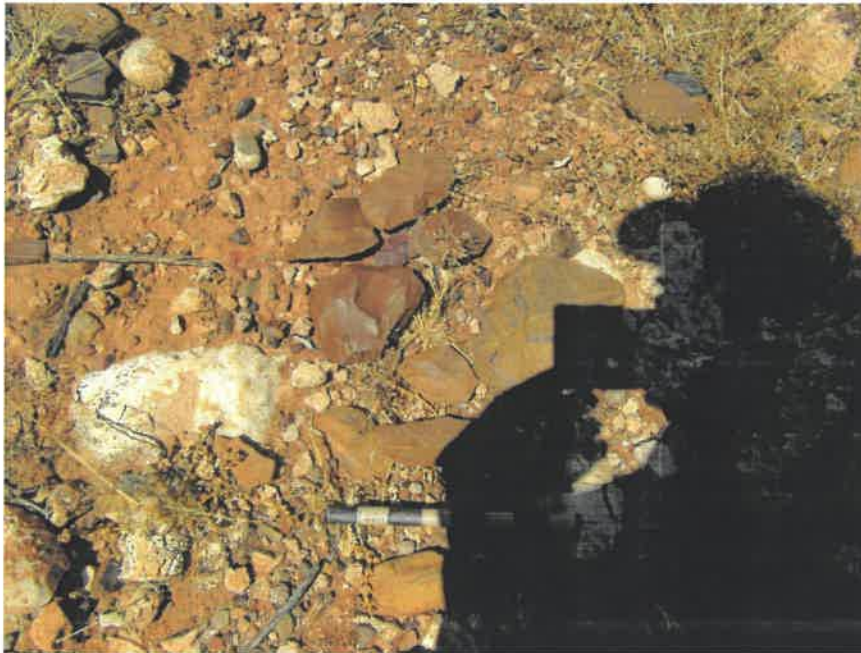
SITE NO	COORDINATES		PERIOD
BRK12	29°11'27.10"S	23°19'6.40"E	MSA/LSA



<b>DESCRIPTION:</b> Bottom of a valley with cliff sides. 6 lithics: 4 blades, 2 scrapers.	
<b>HERITAGE SIGNIFICANCE</b>	Evidence of hunter-gatherer activities during the MSA/LSA
<b>MITIGATION</b>	No further action required.



SITE NO	COORDINATES		PERIOD
BRK13	29°11'22.00"S	23°19'7.10"E	MSA/LSA



**DESCRIPTION:** North side of valley. Calcretic overhang creating a small shelter, 7 lithics: 4 scrapers, 2 blades, 1 flake.

<b>HERITAGE SIGNIFICANCE</b>	Evidence of hunter-gatherer activities during the MSA/LSA
<b>MITIGATION</b>	No further action required.

SITE NO	COORDINATES		PERIOD
BRK14	29°11'53.30"S	23°19'43.70"E	Modern

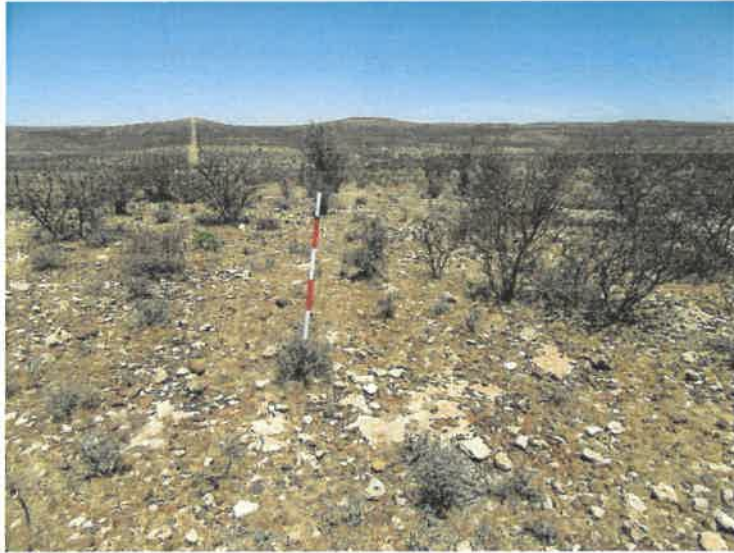


**DESCRIPTION:** Flat terrain with scattered acacia bushes. Red-brown gravel. Line of concrete stones, thought to have been laid at the bottom of a fence.

<b>HERITAGE SIGNIFICANCE</b>	Modern commercial farming period.
<b>MITIGATION</b>	No further action required.

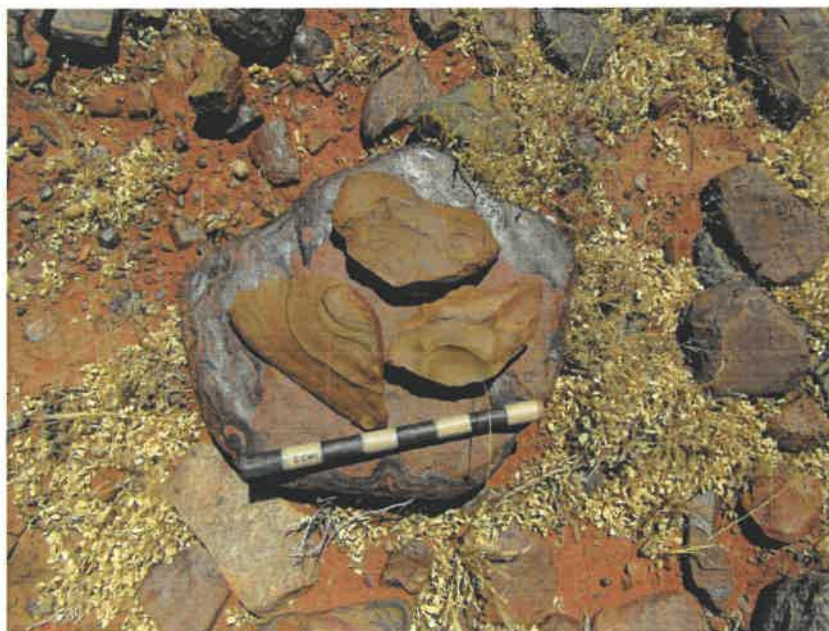


SITE NO	COORDINATES		PERIOD
BRK15	29°11'54.80"S	23°19'47.80"E	MSA/LSA



<b>DESCRIPTION:</b> Flat area, calcretic hard surface, scattered bushes. 4 lithics: 2 blades, 2 flakes.	
<b>HERITAGE SIGNIFICANCE</b>	Evidence of hunter-gatherer activities during the MSA/LSA
<b>MITIGATION</b>	No further action required.

SITE NO	COORDINATES		PERIOD
BRK16	29°11'54.80"S	23°19'47.80"E	MSA/LSA



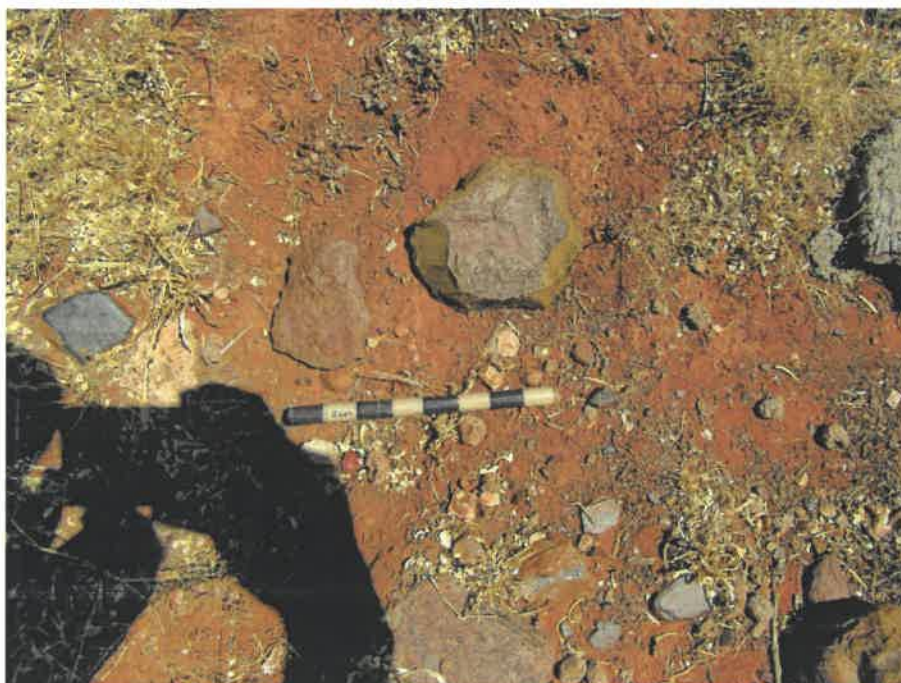
**DESCRIPTION:** Flat area, red-brown gravel, scattered *swarthaak* bushes. 3 lithics: 1 scraper, 2 flakes.

<b>HERITAGE SIGNIFICANCE</b>	Evidence of hunter-gatherer activities during the MSA/LSA
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<b>MITIGATION</b>	No further action required.
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SITE NO	COORDINATES		PERIOD
BRK17	29°11'44.80"S	23°19'42.40"E	MSA/LSA



**DESCRIPTION:** Flat terrain, red-brown gravel and calcrete stones, scattered *swarthaak* bushes. 2 scrapers.

<b>HERITAGE SIGNIFICANCE</b>	Evidence of hunter-gatherer activities during the MSA/LSA
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<b>MITIGATION</b>	No further action required.
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SITE NO	COORDINATES		PERIOD
BRK18	29°11'42.80"S	23°19'36.70"E	MSA/LSA



**DESCRIPTION:** Flat terrain, red-brown gravels, scattered *swarthaak* bushes. 4 scrapers.

<b>HERITAGE SIGNIFICANCE</b>	Evidence of hunter-gatherer activities during the MSA/LSA
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<b>MITIGATION</b>	No further action required.
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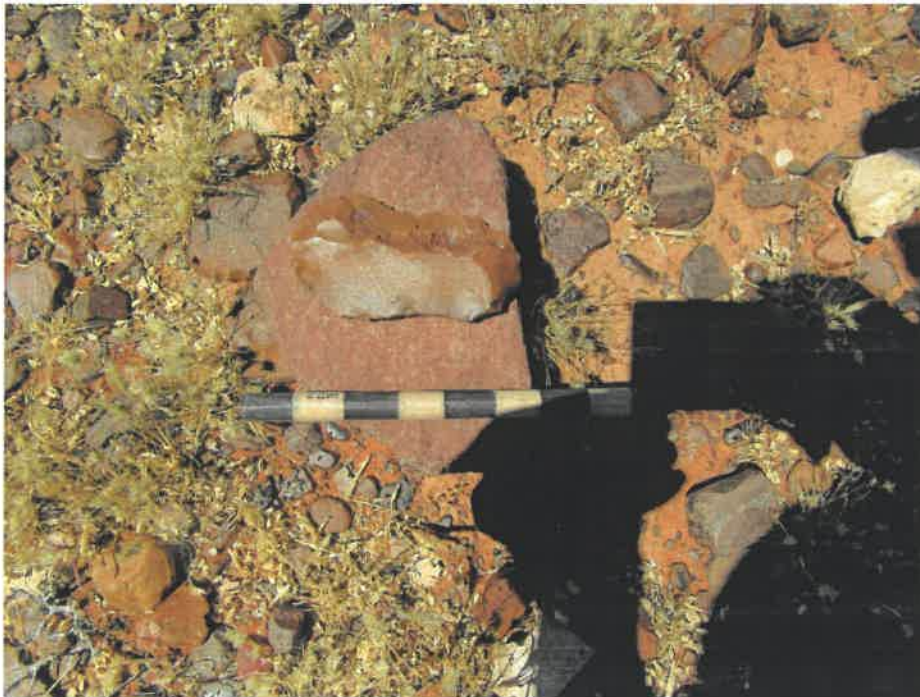
SITE NO	COORDINATES		PERIOD
BRK19	29°11'48.10"S	23°19'36.00"E	MSA/LSA



**DESCRIPTION:** Flat terrain, red-brown gravel, scattered swarthaak bushes. 2 blades.

<b>HERITAGE SIGNIFICANCE</b>	Evidence of hunter-gatherer activities during the MSA/LSA
<b>MITIGATION</b>	No further action required.

SITE NO	COORDINATES		PERIOD
BRK20	29°11'59.00"S	23°19'38.00"E	MSA/LSA

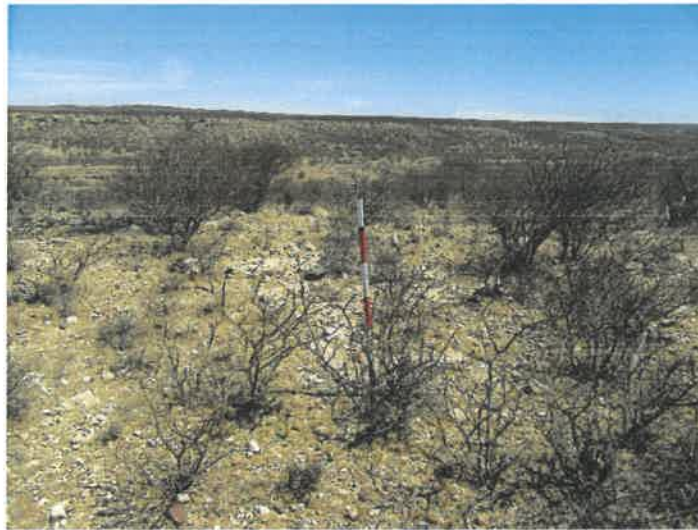


**DESCRIPTION:** Flat terrain, red-brown gravel, scattered *swarthaak* bushes. 1 blade.

<b>HERITAGE SIGNIFICANCE</b>	Evidence of hunter-gatherer activities during the MSA/LSA
<b>MITIGATION</b>	No further action required.



SITE NO	COORDINATES		PERIOD
BRK21	29°11'52.30"S	23°19'33.90"E	MSA/LSA

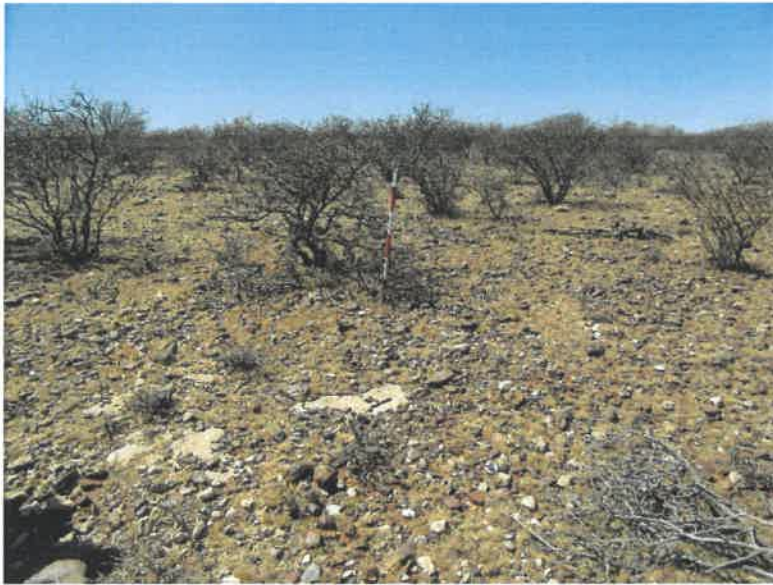


**DESCRIPTION:** Flat terrain, calcretic waste and hard surfaces near the cliff edge of a deeply incised head of a stream. 3 lithics: 2 blades. 1 small scraper.

<b>HERITAGE SIGNIFICANCE</b>	Evidence of hunter-gatherer activities during the MSA/LSA
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<b>MITIGATION</b>	No further action required.
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SITE NO	COORDINATES		PERIOD
BRK22	29°11'44.40"S	23°19'29.60"E	MSA/LSA



**DESCRIPTION:** Flat terrain, gravelly waste, exposed calcretic hard surfaces. 2 scrapers.

<b>HERITAGE SIGNIFICANCE</b>	Evidence of hunter-gatherer activities during the MSA/LSA
<b>MITIGATION</b>	No further action required.



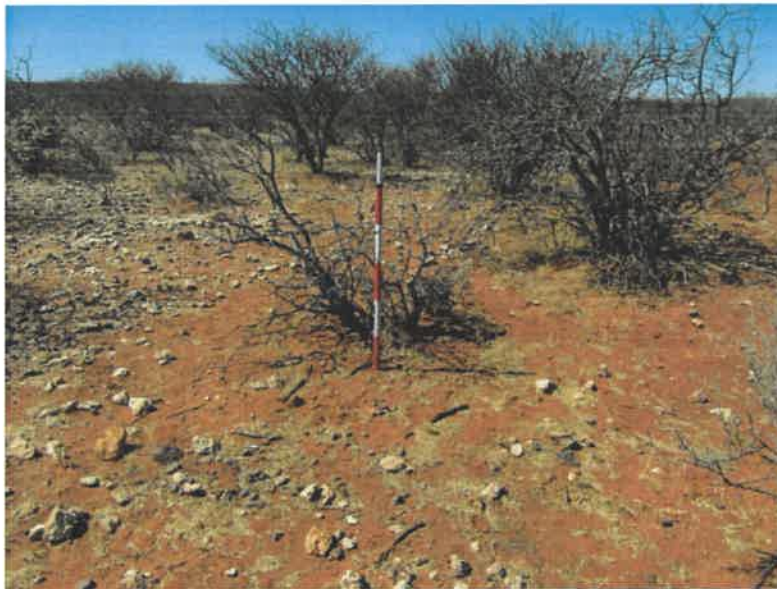
SITE NO	COORDINATES		PERIOD
BRK23	29°11'47.80"S	23°19'34.10"E	MSA/LSA



**DESCRIPTION:** Flat terrain, red-brown gravel, scattered acacia bushes. 1 handaxe, 1 blade.

<b>HERITAGE SIGNIFICANCE</b>	Evidence of hunter-gatherer activities during the MSA/LSA
<b>MITIGATION</b>	No further action required.

SITE NO	COORDINATES		PERIOD
BRK24	29°11'13.30"S	23°18'29.20"E	MSA/LSA



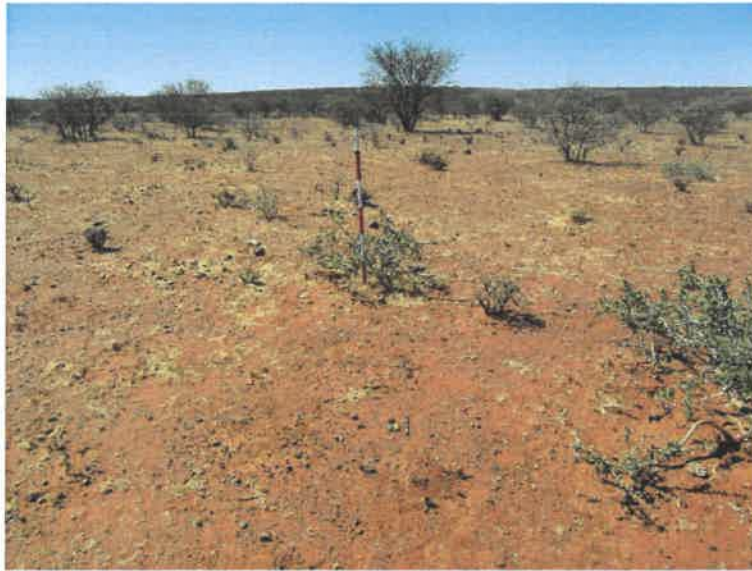
**DESCRIPTION:** Flat area, red-brown soil with calcretic waste. 2 blades.

<b>HERITAGE SIGNIFICANCE</b>	Evidence of hunter-gatherer activities during the MSA/LSA
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<b>MITIGATION</b>	No further action required.
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SITE NO	COORDINATES		PERIOD
BRK25	29°11'15.60"S	23°18'29.10"E	MSA/LSA



**DESCRIPTION:** Flat area, with sparse bushes. Brown sandy soil. 3 lithics: 2 blades, 1 scraper.

<b>HERITAGE SIGNIFICANCE</b>	Evidence of hunter-gatherer activities during the MSA/LSA
<b>MITIGATION</b>	No further action required.

SITE NO	COORDINATES		PERIOD
BRK26	29°11'16.70"S	23°18'23.60"E	MSA/LSA



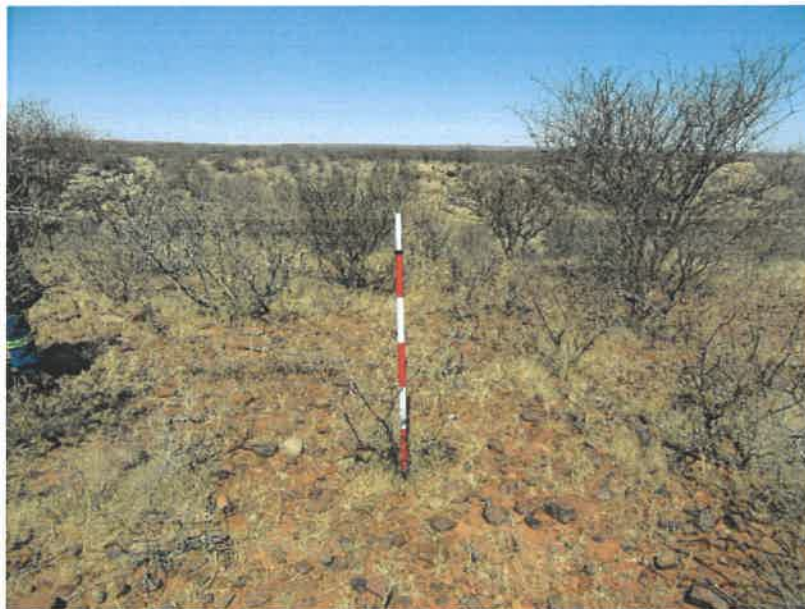
**DESCRIPTION:** Flat terrain, red-brown gravel. Scattered bushes. 4 lithics: 1 scraper, 3 flakes.

<b>HERITAGE SIGNIFICANCE</b>	Evidence of hunter-gatherer activities during the MSA/LSA
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<b>MITIGATION</b>	No further action required.
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SITE NO	COORDINATES		PERIOD
BRK27	29°11'18.10"S	23°18'20.20"E	MSA/LSA

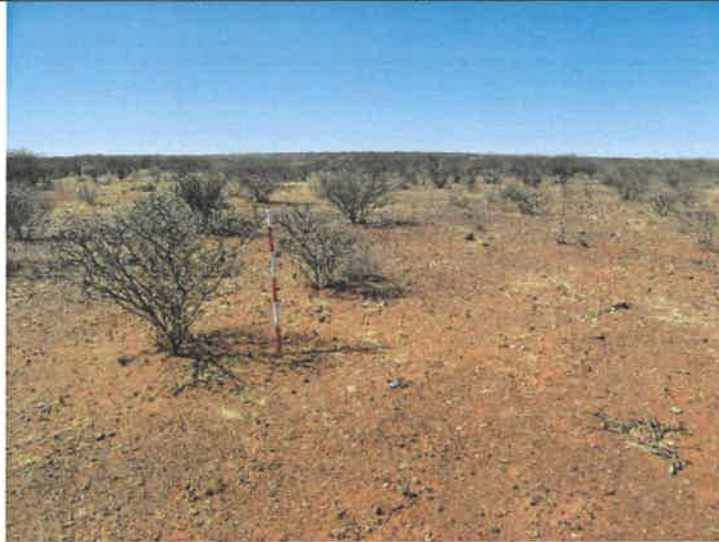


**DESCRIPTION:** Red brown gravel, *swarthaak* bushes. 3 lithics: 1 scraper, 2 blades.

<b>HERITAGE SIGNIFICANCE</b>	Evidence of hunter-gatherer activities during the MSA/LSA
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<b>MITIGATION</b>	No further action required.
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SITE NO	COORDINATES		PERIOD
BRK28	29°11'12.80"S	23°18'24.70"E	MSA/LSA



**DESCRIPTION:** Flat area, fine red-brown gravel. 4 lithics: 2 blades, 2 flakes.

<b>HERITAGE SIGNIFICANCE</b>	Evidence of hunter-gatherer activities during the MSA/LSA
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<b>MITIGATION</b>	No further action required.
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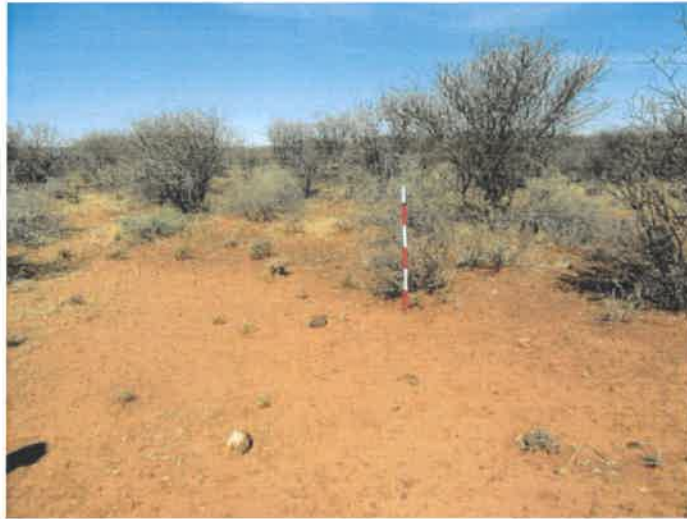


SITE NO	COORDINATES		PERIOD
BRK29	29°11'10.80"S	23°18'24.60"E	MSA/LSA



<b>DESCRIPTION:</b> Flat terrain, sparse bushes. 1 blade.	
<b>HERITAGE SIGNIFICANCE</b>	Evidence of hunter-gatherer activities during the MSA/LSA
<b>MITIGATION</b>	No further action required.

SITE NO	COORDINATES		PERIOD
BRK30	29°10'34.30"S	23°19'31.30"E	MSA/LSA



**DESCRIPTION:** Flat terrain, scattered bushes. 5 lithics: 1 blade, 1 scraper, 3 flakes.

<b>HERITAGE SIGNIFICANCE</b>	Evidence of hunter-gatherer activities during the MSA/LSA
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<b>MITIGATION</b>	No further action required.
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SITE NO	COORDINATES		PERIOD
BRK31	29°10'56.50"S	23°19'35.70"E	MSA/LSA

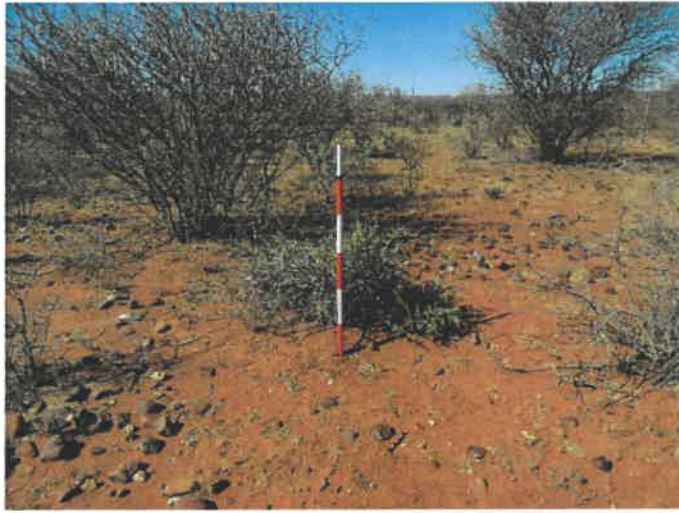


**DESCRIPTION:** Flat area with red-brown gravel. Scattered acacia bushes. 3 lithics: 1 hand-axe, 2 flakes.

<b>HERITAGE SIGNIFICANCE</b>	Evidence of hunter-gatherer activities during the MSA/LSA
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<b>MITIGATION</b>	No further action required.
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SITE NO	COORDINATES		PERIOD
BRK32	29°10'53.30"S	23°19'35.20"E	MSA/LSA



<b>DESCRIPTION:</b> Flat area with scattered red-brown stones.	
<b>HERITAGE SIGNIFICANCE</b>	Evidence of hunter-gatherer activities during the MSA/LSA
<b>MITIGATION</b>	No further action required.



ITE NO	COORDINATES		PERIOD
BRK33	29°12'2.30"S	23°19'27.40"E	Modern



<b>DESCRIPTION:</b> An isolated modern house occupied by a farmworker.	
<b>HERITAGE SIGNIFICANCE</b>	Association with modern commercial farming.
<b>MITIGATION</b>	No further action required.

SITE NO	COORDINATES		PERIOD
BRK34	29° 8'58.70"S	23° 16'56.80"E	MSA/LSA



**DESCRIPTION:** Flat area with calcretic waste mixed with red-brown stones. Exposure of hard calcretic surfaces. 1 scraper.

<b>HERITAGE SIGNIFICANCE</b>	Evidence of hunter-gatherer activities during the MSA/LSA
<b>MITIGATION</b>	No further action required.



SITE NO	COORDINATES		PERIOD
BRK35	29° 8'58.70"S	23°16'56.80"E	MSA/LSA



<b>DESCRIPTION:</b> Flat terrain, gravel waster. Acacia bushes. 1 hand-axe.	
<b>HERITAGE SIGNIFICANCE</b>	Evidence of hunter-gatherer activities during the MSA/LSA
<b>MITIGATION</b>	No further action required.



SITE NO	COORDINATES		PERIOD
BRK36	29° 9'7.90"S	23°17'35.10"E	MSA/LSA



<b>DESCRIPTION:</b> Flat area with gravel waste. Scattered acacia bushes. 2 scrapers.	
<b>HERITAGE SIGNIFICANCE</b>	Evidence of hunter-gatherer activities during the MSA/LSA
<b>MITIGATION</b>	No further action required.

SITE NO	COORDINATES		PERIOD
BRK37	29° 9'4.70"S	23°17'31.80"E	MSA/LSA



**DESCRIPTION:** Flat area with calcretic waste. Scattered acacia bushes. 1 scraper.

<b>HERITAGE SIGNIFICANCE</b>	Evidence of hunter-gatherer activities during the MSA/LSA
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<b>MITIGATION</b>	No further action required.
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SITE NO	COORDINATES		PERIOD
BRK38	29° 8'50.80"S	23°18'9.70"E	MSA/LSA



**DESCRIPTION:** Flat area with calcretic waste and exposure of hard calcretic surfaces. 3 lithics: 2 scrapers, 1 cleaver.

<b>HERITAGE SIGNIFICANCE</b>	Evidence of hunter-gatherer activities during the MSA/LSA
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<b>MITIGATION</b>	No further action required.
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SITE NO	COORDINATES		PERIOD
BRK39	29°10'20.00"S	23°18'3.10"E	MSA/LSA



**DESCRIPTION:** Flat area with red-brown gravel. Scattered acacia bushes. 1 scraper.

<b>HERITAGE SIGNIFICANCE</b>	Evidence of hunter-gatherer activities during the MSA/LSA
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<b>MITIGATION</b>	No further action required.
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SITE NO	COORDINATES		PERIOD
BRK40	29°10'39.70"S	23°17'56.90"E	MSA/LSA



**DESCRIPTION:** Flat area with red-brown gravel. Scattered acacia bushes. 1 cleaver.

<b>HERITAGE SIGNIFICANCE</b>	Evidence of hunter-gatherer activities during the MSA/LSA
<b>MITIGATION</b>	No further action required.



SITE NO	COORDINATES		PERIOD
BRK41	29°10'34.89"S	23°18'0.66"E	MSA/LSA



**DESCRIPTION:** Flat area with red-brown gravel. Scattered acacia bushes. 1 scraper. 1 blade.

<b>HERITAGE SIGNIFICANCE</b>	Evidence of hunter-gatherer activities during the MSA/LSA
<b>MITIGATION</b>	No further action required.



**HERITAGE IMPACT ASSESSMENT FOR A MINE PROSPECTING RIGHT  
APPLICATION ON THE REMAINING EXTENT OF PORTION 1 (ORANJE OORD)  
OF THE FARM BRAKKIES 384, AND PORTION 2 (A PORTION OF PORTION 1)  
OF THE FARM BRAKKIES 384 NEAR DOUGLAS, NORTHERN CAPE**

**ARCHAEOLOGICAL AND HERITAGE CHANCE FINDS PROCEDURE**

Prepared by  
Edward Matenga (PhD)

Sunday, 14 February 2021

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## **ABBREVIATIONS**

BGG	Burial Grounds and Graves unit of SAHRA
CPF	Chance Finds Procedure
ECO	Environmental Control Officer
ESA	Early Stone Age
LSA	Later Stone Age
MSA	Middle Stone Age
NHRA	National Heritage Resources Act (No 25/1999)
SAPS	South African Police Services
SAHRA	South African Heritage Resources Agency



## **1. BACKGROUND**

Thunderflex 78 (Pty) Ltd has applied for a mine prospecting right on the Remaining Extent of Portion 1 (Oranje Oord) of the farm Brakkies 384, and Portion 2 (a portion of Portion 1) of the farm Brakkies 384 near Douglas, in the Siyancuma Local Municipality, Northern Cape Province. When the environmental and heritage approvals have been received prospecting operations will commence at which time the Archaeological and Heritage Chance Find Procedure (CPF) will be applied as a manual for the protection of unidentified heritage resources which may occur in the footprint of the prospecting right.

## **2. LEGAL FRAMEWORK**

The National Heritage Resources Act is the principal law for the protection of heritage resources Act (No 25 / 1999) and for the application of the CPF attention is drawn to the following Sections:

- Section 3 on the definition and types of heritage resources
- Section 4 on the provisional protection of buildings more than 60 years old
- Section 35 on the protection of archaeological and palaeontological resources
- Section 36 on the protection of graves and human remains

## **3. HERITAGE SITES AND OBJECTS THAT MIGHT OCCUR IN THE AREA**

The following site types/objects have been encountered in the broader region and are therefore flagged:

- Surface scatters or concentrations of stone tools of the ESA, MSA, LSA periods
- Substantial subsurface occurrences of stone tools
- Rock paintings and rock engravings (petroglyphs) (MSA to LSA period)
- Buildings and objects associated with modern commercial farming from the 19<sup>th</sup> century
- Graves, burial grounds and human bones

## **4. GENERAL**

A principal aim of the CFP is to raise awareness of all personnel in the project regarding the prospect of finding archaeological resources that unseen during the

Phase 1 scoping heritage assessment and establish a protocol for the protection of these resources. The appointed Environmental Control Officer (ECO) and Site Manager keep copies of the CPF at the field offices. Training of field personnel on cultural heritage resources that might potentially be found on area should be provided.

## **5. PROCEDURE FOR ARCHAEOLOGICAL FINDS**

If you discover what you suspect may be a possible archaeological site:

- Stop all work in the area to avoid damaging the site.
- Do not disturb any archaeological remains that you may encounter.
- The finds must be reported to ECO or Site Manager
- The finds must be reported to the heritage authority, i.e. SAHRA and/or the provincial heritage resources agency.
- The heritage authority will send a heritage specialist and /or ask the permit holder to appoint a heritage specialist to make a preliminary assessment of the findings.
- If the potential significance of the finds are deemed to warrant further action and they cannot be avoided, then then heritage specialist will submit a report advising SAHRA accordingly.
- SAHRA will determine the appropriate course of action.

## **6. PROCEDURE FOR GRAVES, BURIAL GROUNDS AND HUMAN REMAINS**

If you discover what you suspect may be possible human remains:

- Stop all work in the area to avoid damaging the site.
- Do not disturb any possible human remains that you may encounter.
- The finds must be reported to ECO or Site Manager.
- The finds must be reported to the local area station of SAPS.
- The finds must be reported to the SAHRA Burial Grounds and Graves (BGG) Unit.
- The BGG Unit will send a heritage specialist and /or ask the permit holder to appoint a heritage specialist to make a preliminary assessment of the findings.

- If the graves/human remains cannot be avoided SAHRA will require that the human remains be re-interred in a formal cemetery.
- Public participation to identify interested and affected parties (if any) will be undertaken in terms of NHRA Regulations 39, 41 and 41 in the Government Notice No R548 (year 2000).
- An application will be lodged to the BGG for the relocation of the human remains in terms of NHRA Regulations 34 in the Government Notice No R548 (year 2000).
- If the graves/ human remains must not be relocated, the BGG Unit may require that any damage done to the site is repaired and a 100m buffer zone is enforced around the site.

## 7. SAHRA CONTACT DETAILS

SAHRA Head Office	SAHRA BGG Unit
111 Harrington Street Cape Town, 8001 Email: <a href="mailto:info@sahra.org.za">info@sahra.org.za</a> Tel: (021) 462 4502 Fax: (021) 462 4509	Office 101, 1st floor, Sancardia Mall, 541 Madiba Street Pretoria Tel: 012 320 8490/ 4965 Fax: +27 12 320 8486



**TRACK LOG OF THE GROUND SURVEY ON THE FARM BRAKKIES 384 NEAR DOUGLAS, NORTHERN CAPE PROVINCE**

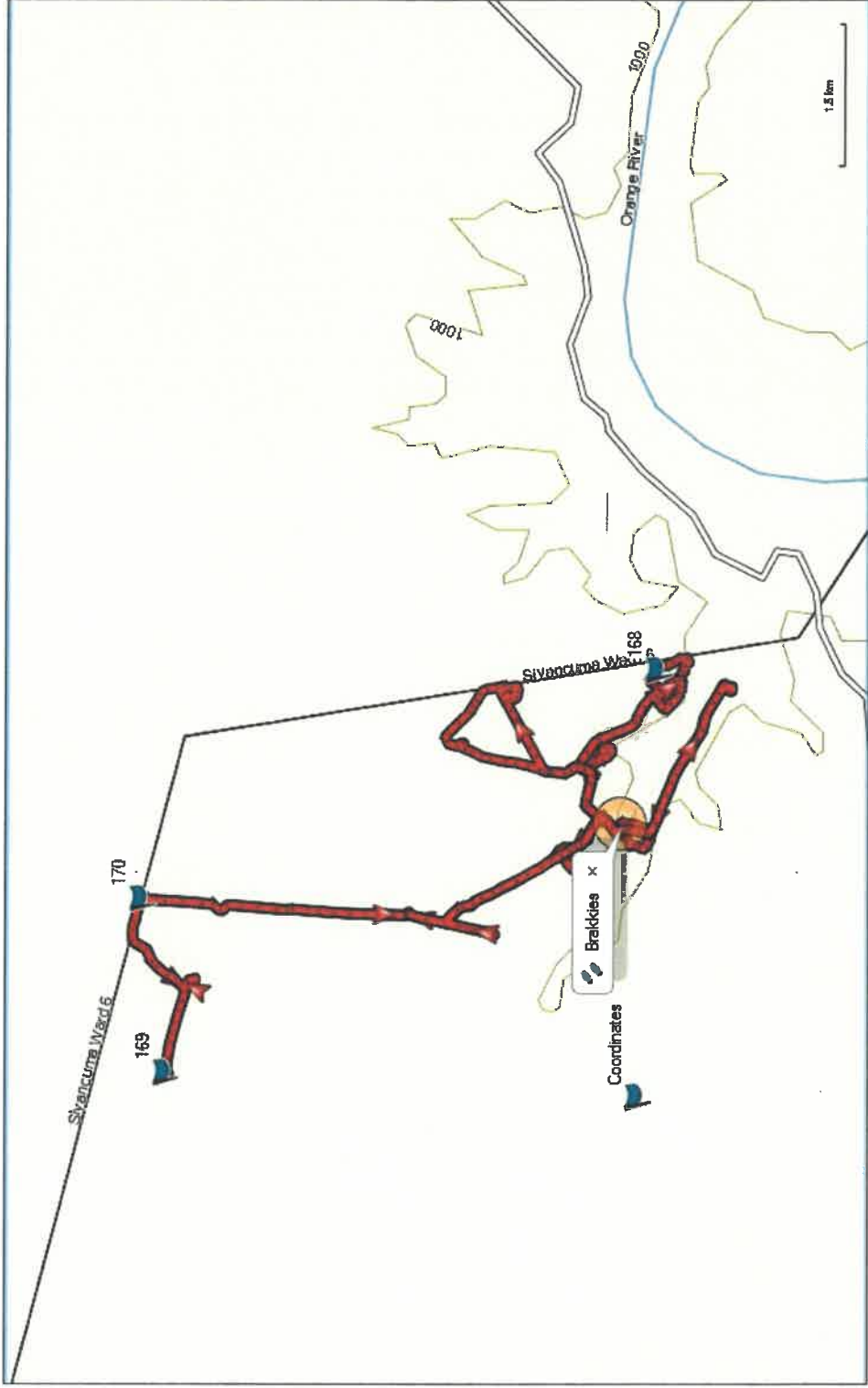


Figure 1: Track log overview map.

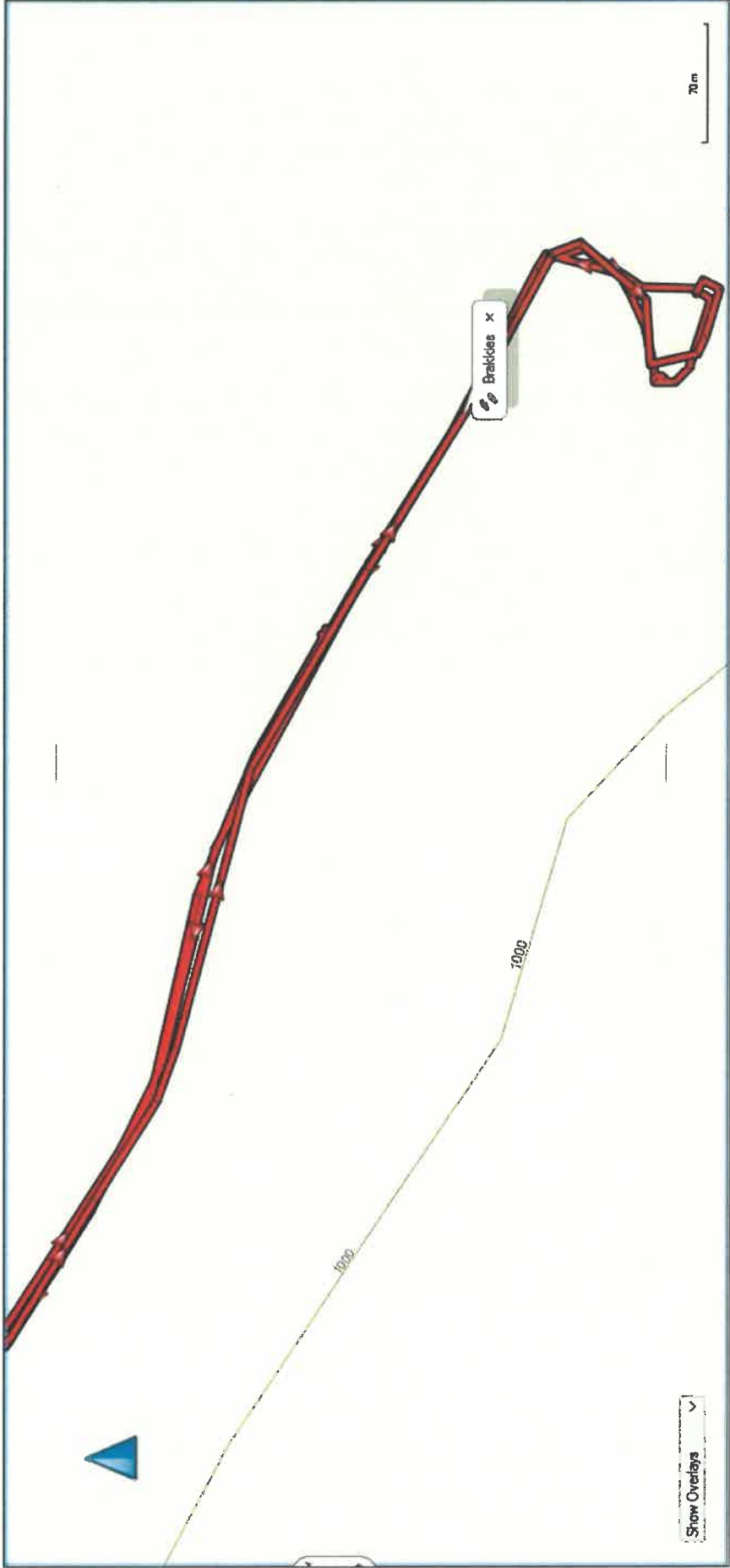


Figure 2. Survey on the southern part of the property





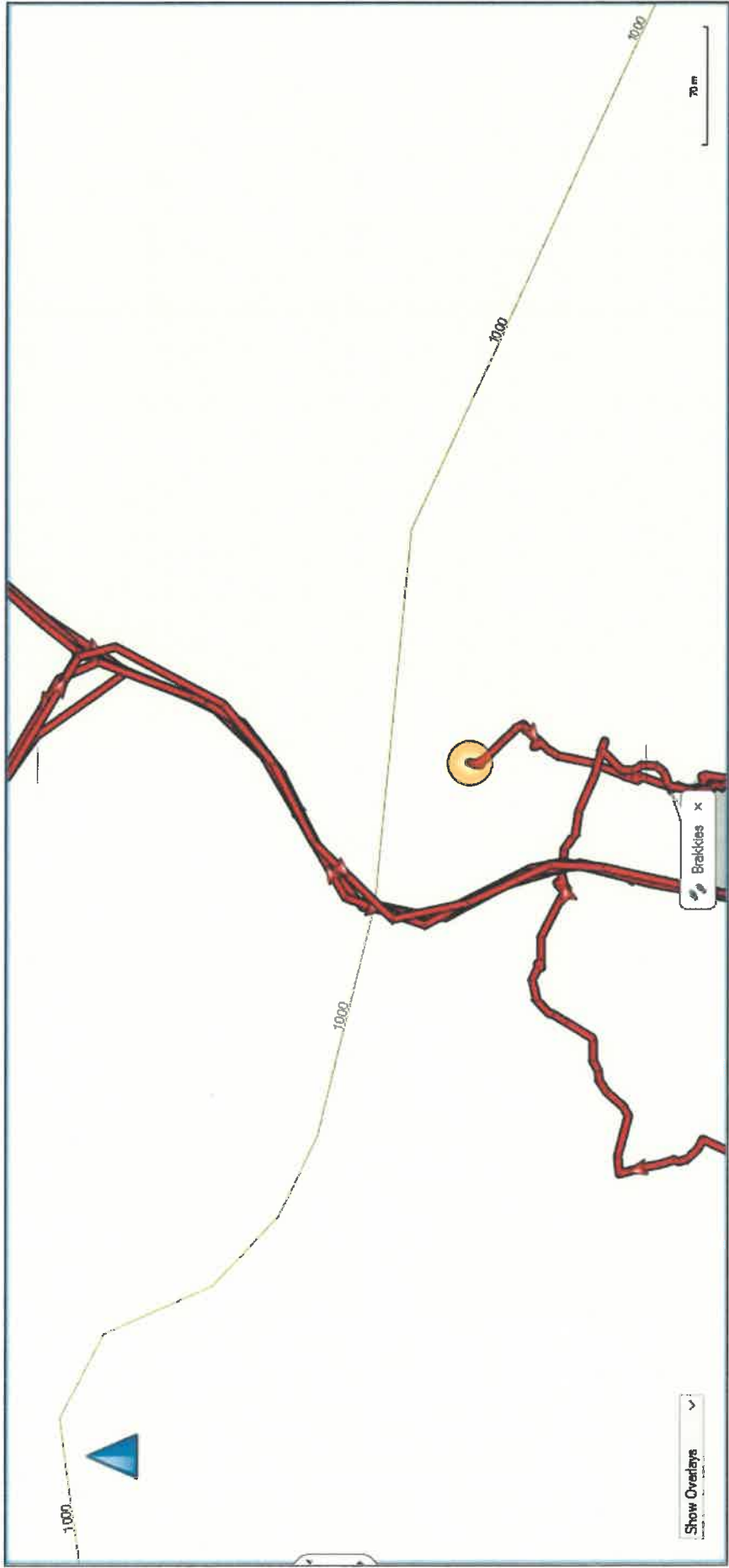


Figure 4: Survey on a south central part of the property, including walking survey (at the bottom of the map).

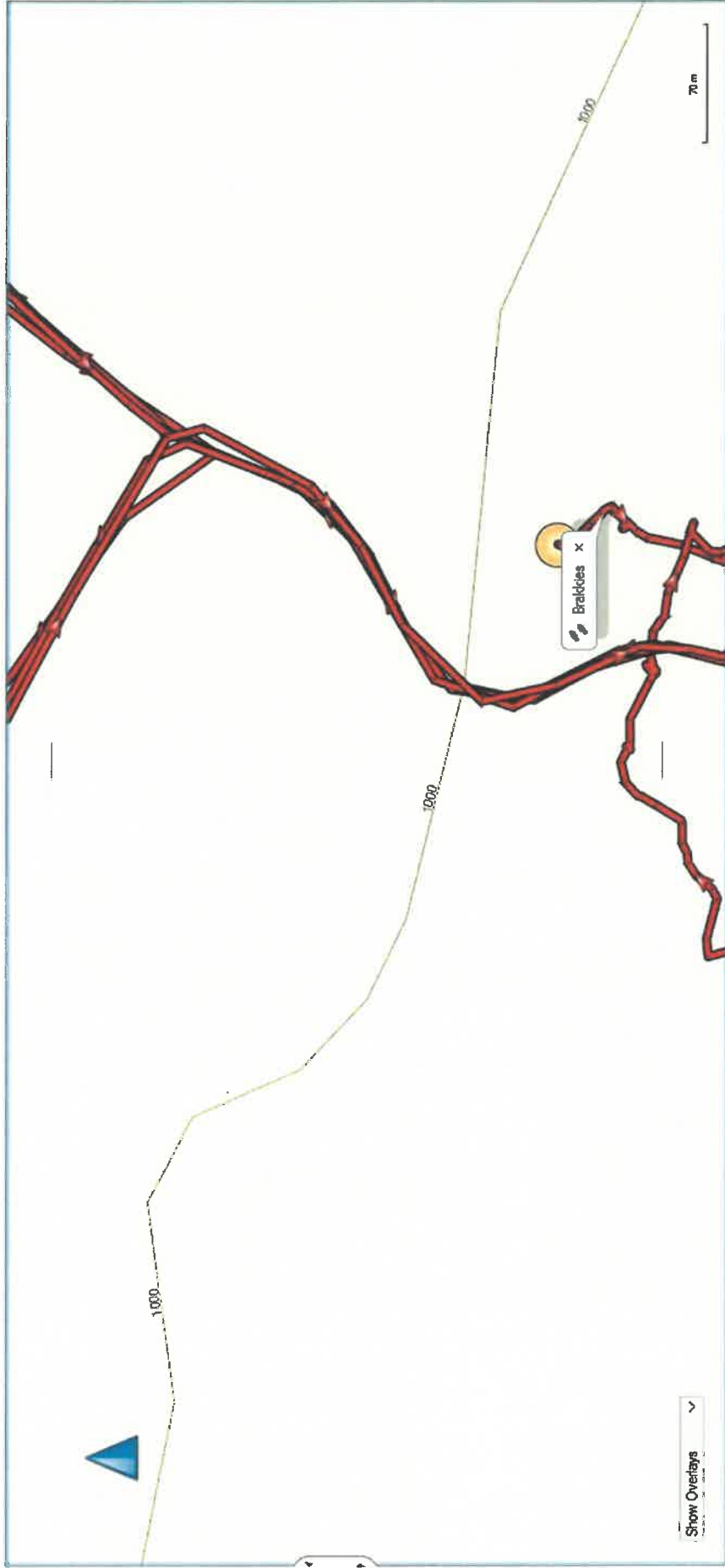


Figure 5: Survey track log shows windscreen survey (repeated trips) as we moved from one survey area to another.

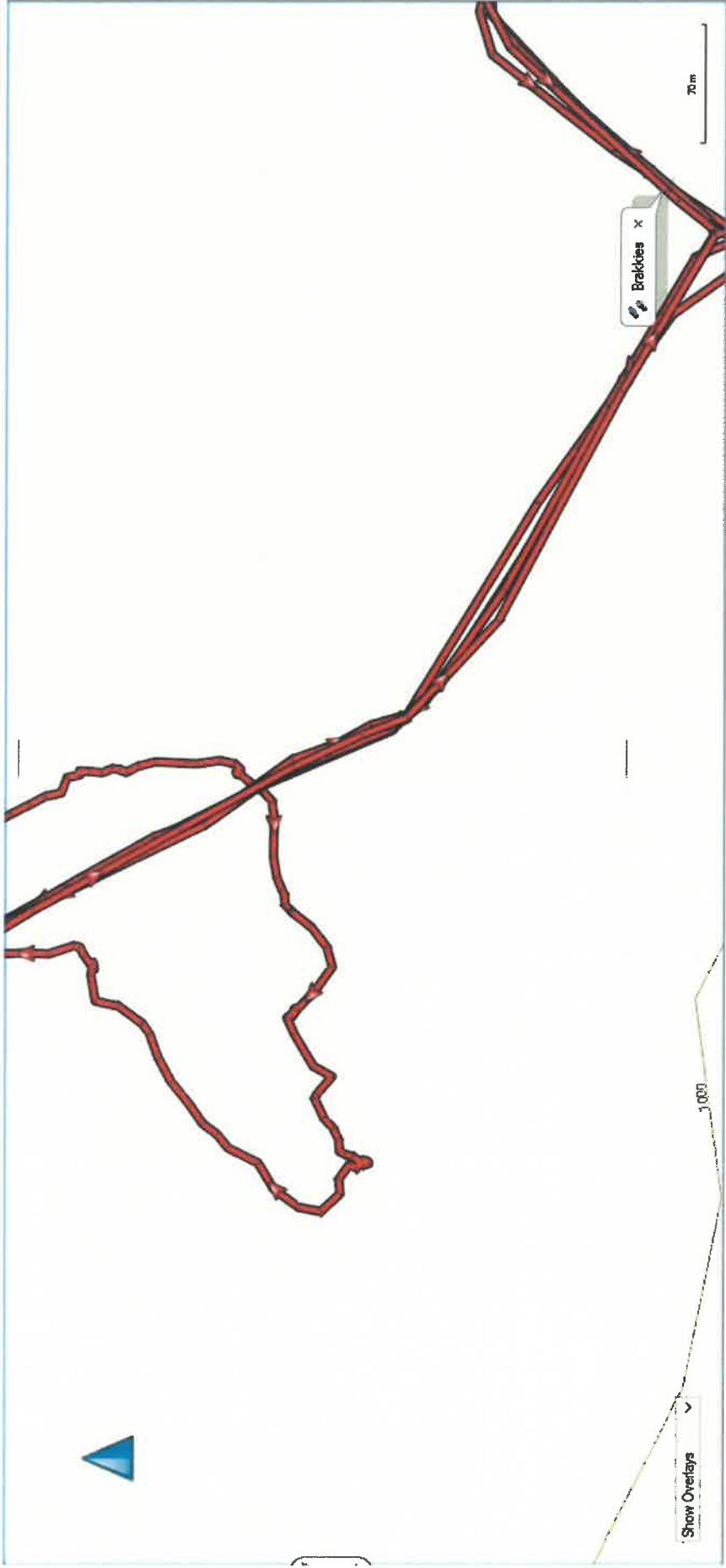


Figure 6: Central part of the property, walking survey and windscreen survey.



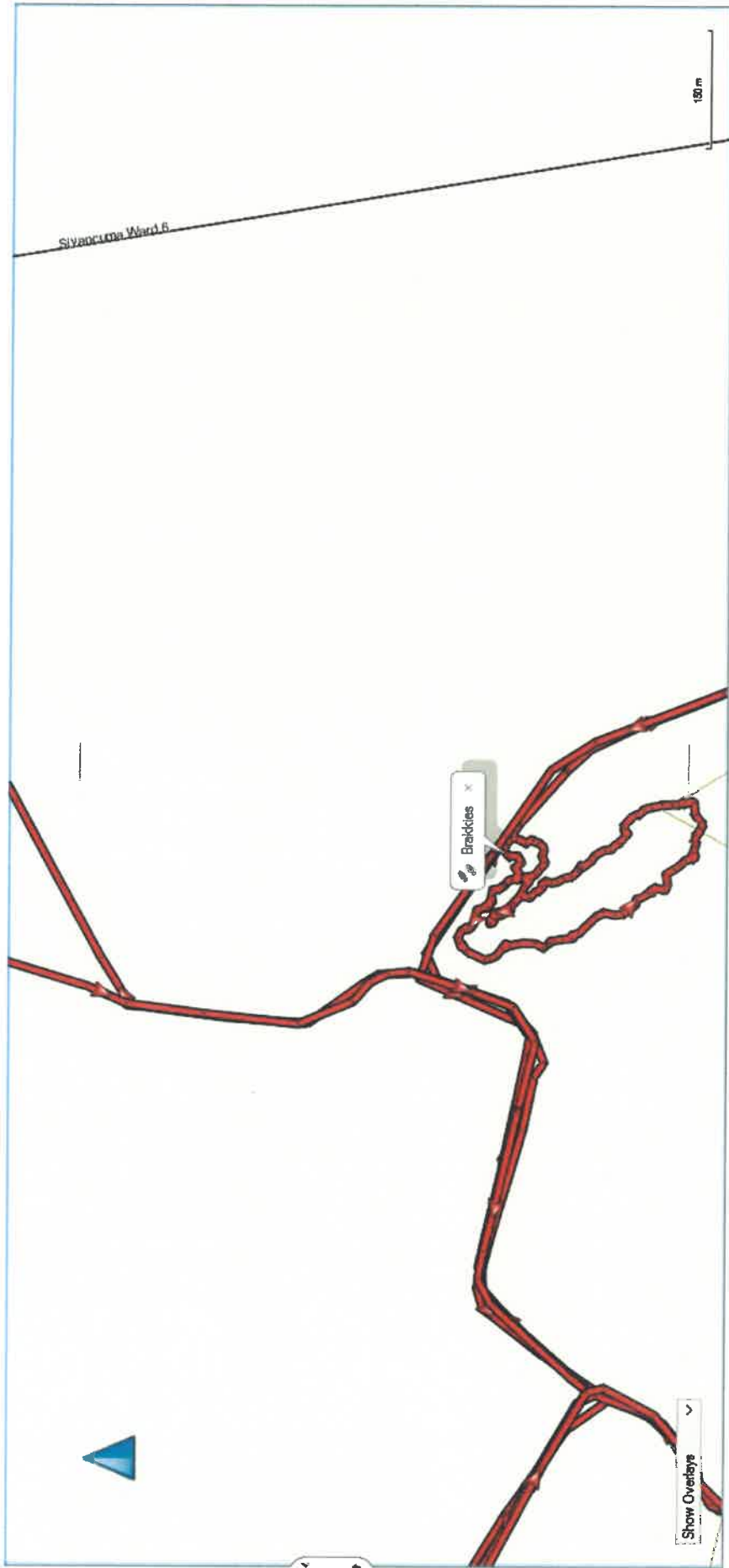


Figure 7: Wind screen survey and walking survey in a southeastern part of the property.

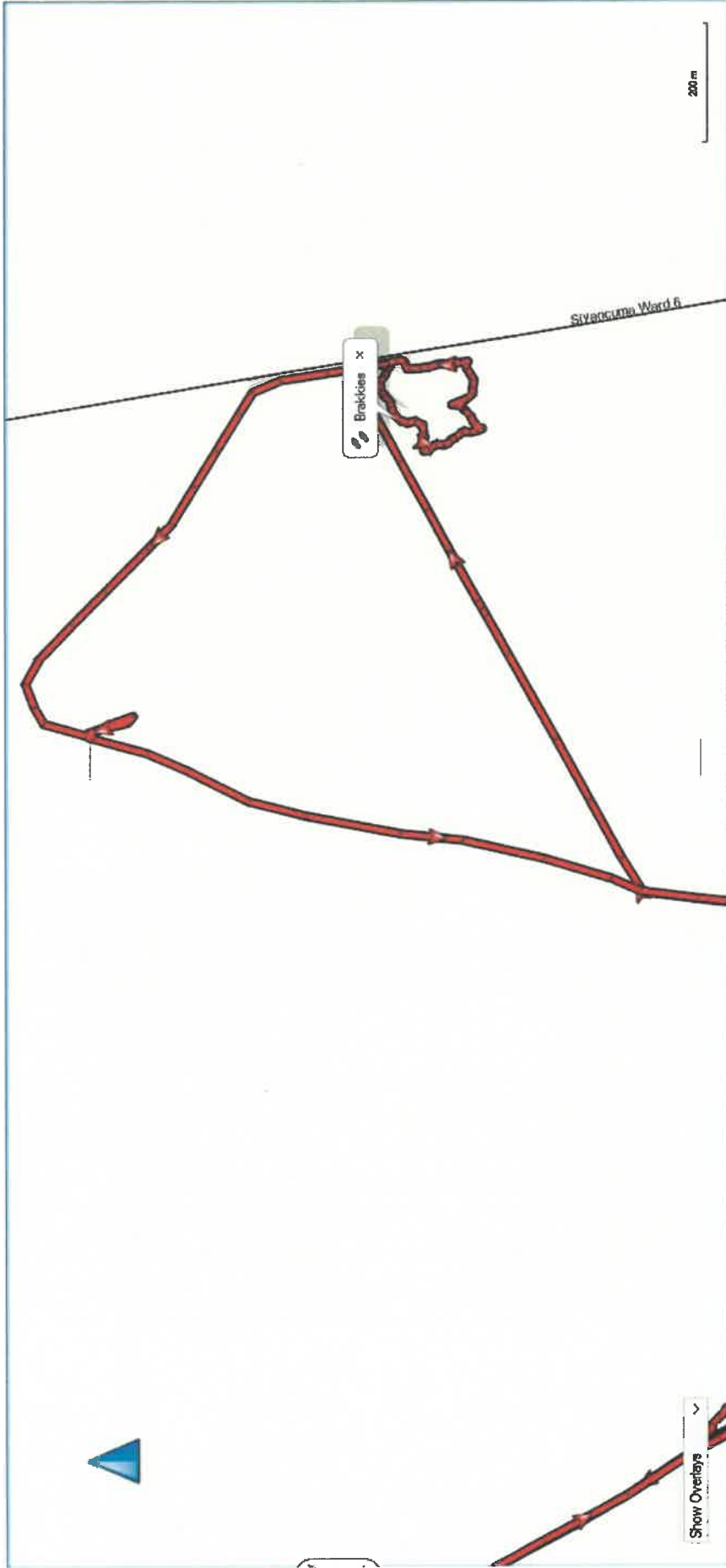


Figure 8: Walking survey in a northeastern part of the property.

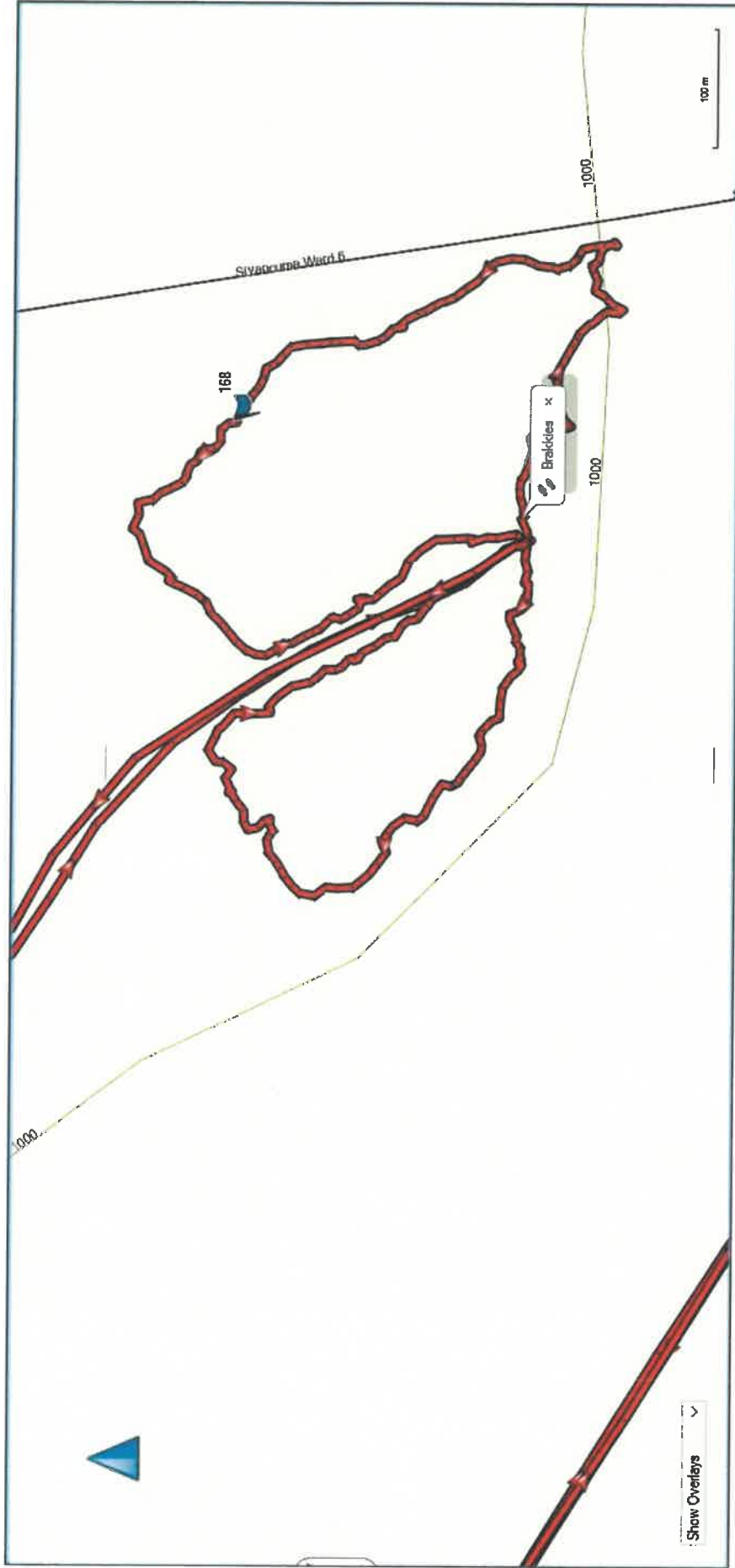


Figure 9: Walking survey in a southeastern part of the property



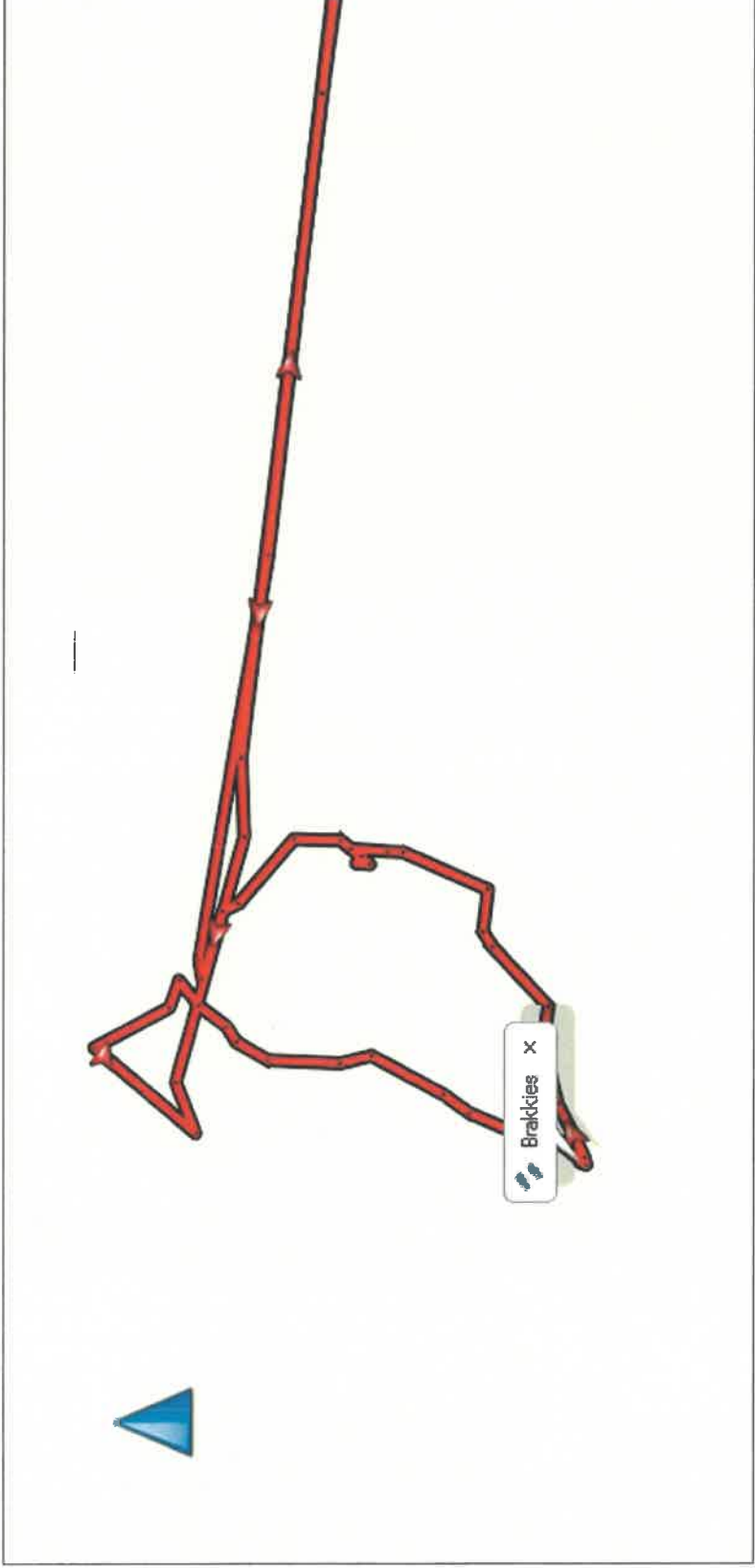


Figure 11: Walking survey on a northwest part of the property



Figure 12. Walking survey in a north-central part of the property