Phase 1 Heritage Impact Desktop Assessment & Palaeontological Desktop Assessment for a Mine Prospecting Right Application on the Remainder of Barst Vley 192 near Kenhardt Town, in the Kai !Garib Municipality, Northern Cape

Prepared by

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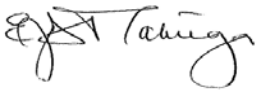
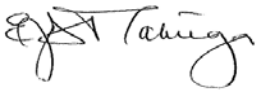
FIELD WORK & REPORT	E. Matenga		12 April 2021

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 remuneration for work performed in terms the National Heritage Resources Act (No 25 of 1999).



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EXECUTIVE SUMMARY

1. This Heritage Impact Assessment report has been prepared on behalf of Barzani Mining (Pty) Ltd in support of a mine prospecting right application on the Remainder of Barst Vley 192 in the Kai !Garib Municipality, Northern Cape. The report is a requirement in terms of Section 38(8) of the National Heritage Resources Act (No 25/1999). It is based on a literature survey undertaken to provide contextual data which can be extrapolated to determine heritage sensitivity on the property while arrangements for access to conduct a ground survey are being made.

2. *General observations*

   It is an established fact that Stone Age material is widely distributed on the plains, ridges and valleys of the upper Karroo area north and south of the Orange Vaal basin. The material comprises scrapers, blades, cores and flakes typologically dating to the Middle Stone Age/Late Stone Age period. Early Stone Age material has been encountered on farms 10km to the southeast of Barst Vley. The scattered distribution pattern seems to suggest general hunter-gatherer activity in the region known in archaeological literature as Bushmanland. Rarely have the findings warranted further action such as professional excavations or the issue of a destruction permit from SAHRA. The findings from the studies cited in the Report, fit within this paradigm of the archaeological sensitivity of the broader area.

3. Other heritage resources that might occur in the broader area and are therefore flagged are:
   a. Rock engravings (petroglyphs) from the Middle Stone Age to Later Stone Age periods
   b. Rock Paintings from the Middle Stone Age to Later Stone Age periods
   c. Buildings and objects associated with modern commercial farming from the 19th century
   d. Graves, burial grounds and human bones.

4. *Postulated heritage sensitivity of the study area*

5. The studies which have been undertaken to provide context form a good theoretical foundation from which to extrapolate the more likely scenarios on the farm under study. We expect to find scatters of stone tools and flake waste on the property. As most pre-industrial communities had a propensity to gravitate to water sources, the ephemeral streams and pans which occur in the area have potential to yield artefacts both above and below the surface. No occurrences are likely to warrant further action beyond primary documentation.

7. The ranking system in the Table below relates to the national grading of heritage sites (adapted from Guidelines for involving Heritage Specialists in EIA processes by Winter S and & N. Baumann (2005, p19). The probability of occurrence of different grades of sites confirms the view that no finds in the study area are likely to warrant further action apart from documentation, which is a minimum requirement. During the exploration phase documentation of the finds can be done within the ambit of the Chance Finds Procedure.

8. The Table below provides a summary of the probability of occurrence of different typologies of heritage and a confidence rating of the predictions:

GRADE	RANKING	SIGNIFICANCE	PROBABILITY OF OCCURRENCE	CONFIDENCE RATING
1a	National	Of high intrinsic, associational and contextual heritage value within a national, provincial and local context, i.e. formally declared or potential Grade 1, 2 or 3A heritage resources,	0%	High
1b	Burial grounds	Grave are sacred and their treatment is a sensitive issue.	50%	High
2	Provincial	Of high intrinsic, associational and contextual heritage value within a national, provincial and local context, i.e. formally declared or potential 2 heritage resources	0%	High
3A	Local	Of high intrinsic, associational and contextual heritage value within a national, provincial and local context, i.e. formally declared or potential Grade 3A heritage resources	10%	Medium
3B	Local	Of moderate to high intrinsic, associational and contextual value within a local context, i.e. potential Grade 3B heritage resources	10%	High
3C	Local	Of medium to low intrinsic, associational or contextual heritage value within a national, provincial and local context, i.e. potential Grade 3C heritage resources	99,99%	High

9. Chance Finds Procedure (CPF)

A Heritage Chance Finds Procedure (CFP) is annexed to this Report.

10. Conclusion and Recommendations

In light of the findings of the desk assessment, the mine prospecting can go ahead. The study is mindful that some important discoveries may be made during prospecting. If this happens operations should be halted, and the provincial heritage resources authority or SAHRA notified in order for an investigation and evaluation of the finds to take place.

ABBREVIATIONS

CPF	Chance Finds Procedure
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
NEMA	National Environmental Management Act.
NHRA	National Heritage Resources Act
SAHRA	South African Heritage Resources Agency

1. INTRODUCTION

This heritage specialist report has been prepared in support of a mine prospecting right application for the Remainder of Barst Vley 192 situated 60 km west of Kenhardt in the Kai !Garib Local Municipality, Northern Cape Province. Section 38 of the National Heritage Resources Act (No 25 of 1999) sets out the procedures for screening for the possible occurrence of heritage resources that may be affected by the proposed activities, and on the basis of which appropriate mitigation measures will be prescribed. The report is the result of an in-depth literature study undertaken to provide contextual data while arrangements are being made for access to the property to conduct a ground survey.

Prospecting for minerals entails the following physical works which may result in damage or destruction of heritage resources above or below the ground:

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

2. DESCRIPTION OF THE RECEIVING ENVIRONMENT

The property under study is a subdivision of the farm Barst Vley 192 (Remainder of Barst Vley 192) which lies 60 km southwest of Kenhardt. The author has the benefit of first had knowledge of the area having undertaken a ground survey in neighbouring properties in August 2021.[1] The area part of an open extensive Karoo plain without any prominent topographical features in the terrain to interrupt long range views. The superficial geology shows red-brown gravels, which have been characterised as deflated gravels, derived from primary fluvial gravels generally dating to the Miocene age. These fluvial gravels were deflated from their original thicknesses as eluvial (derived by in situ weathering) and collegial processes continued. The reddish colour arises from iron staining of the entire

[1] Matenga, E. 2021. Phase 1 Heritage Impact Assessment & Palaeontological Desktop Assessment for a Mine Prospecting Right Application on Portion 1, 2 & the Remaining Extent of the Farm Drieboom Leegte No 345; Portion 1, 2, 3 and the Remaining Extent of Farm Groot Zwart Bast No 189 and Portions 3, 5 & 8 of the Farm Jagt Kolk No 244 near Kenhardt Town, within the Kai !Garib Municipality, Northern Cape

deposits due to oxidation.[2] The vast stoneveld on which these gravels occur is occasionally interrupted by shallow depressions called pans which hold water during the rainy season and for a shorter period thereafter. Vegetation is sparse Karoo scrub and occasional *Acacia karoo* trees found with increasing density along ephemeral channels with beds filled with sand.

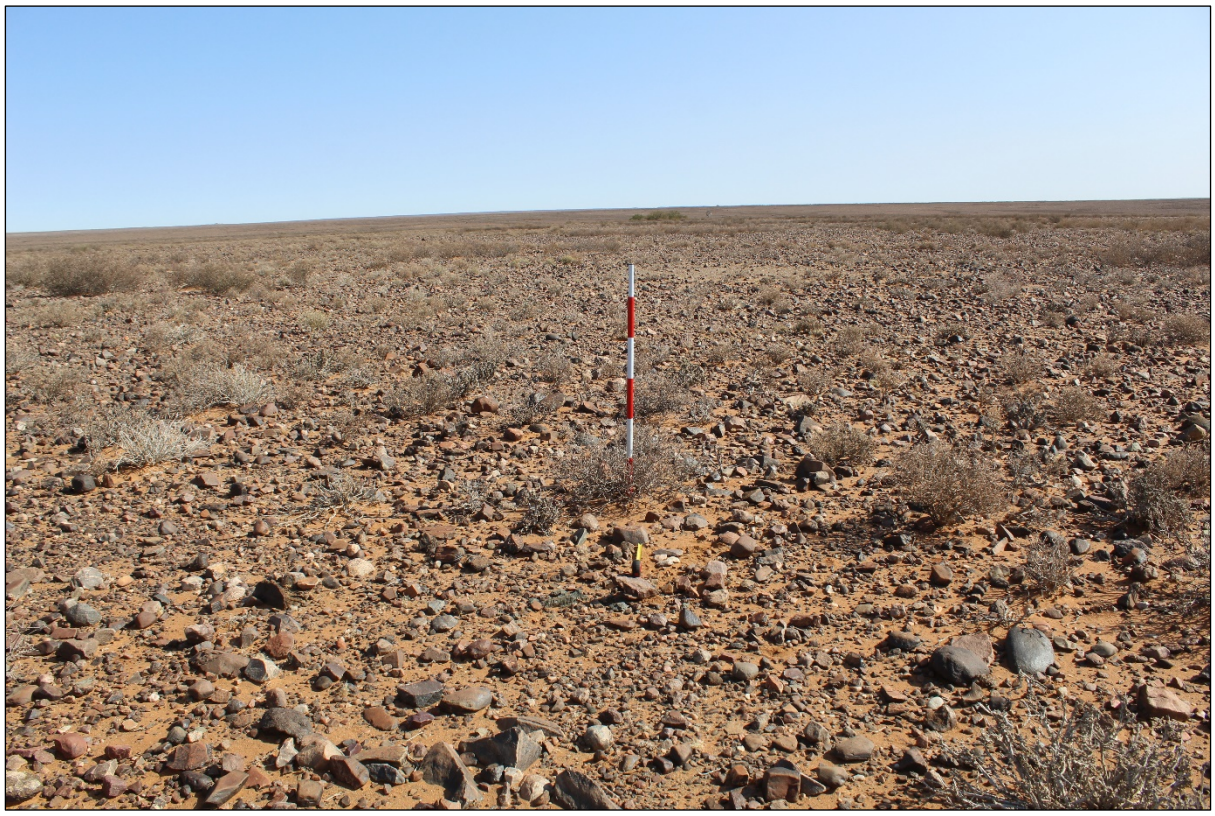

Figure 1: View of the open Karoo landscape on the farm Groot Zwart Bast 189 shows the surface red gravels. Groot Zwart Bast lies 14km southeast of Barst Vley.

[2] Ndwammbi R. 2013. A study of the variation in the Rooikoppie gravels in the Lower Vaal area Rockwell Diamonds Inc. In Diamonds – Source to Use 2013.

Figure 2: Another view the landscape on the farm Groot Zwart Bast 189

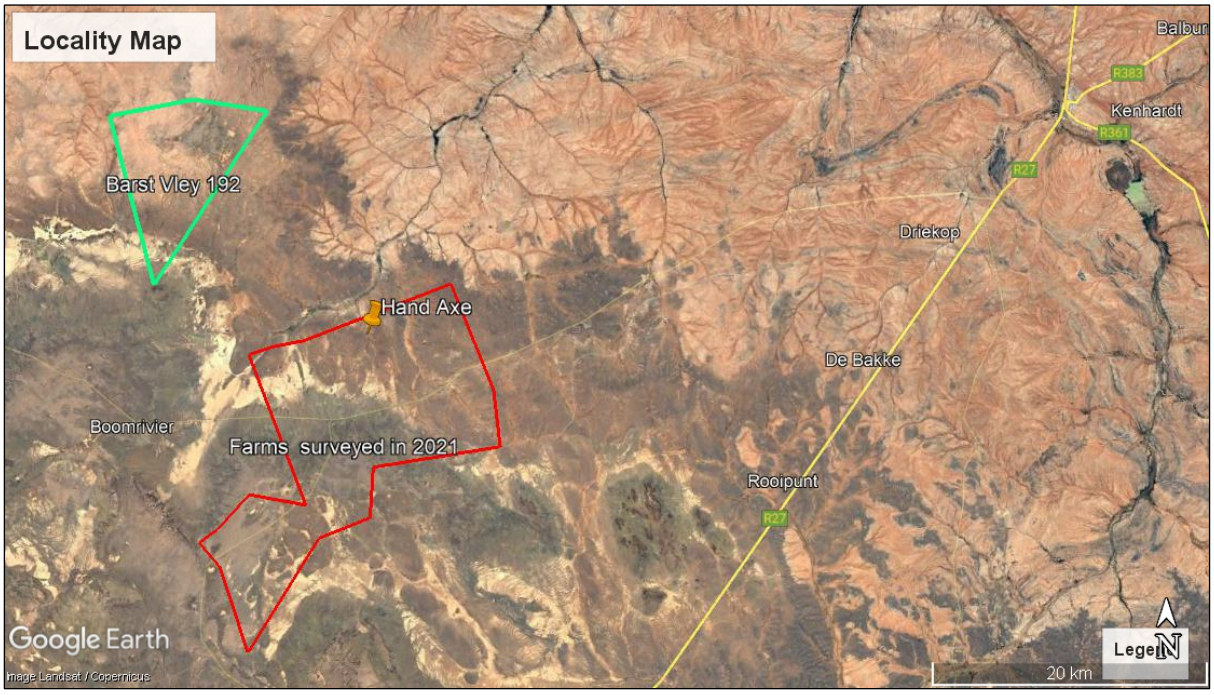

Figure 3. Google Earth map shows the location of the farm Barst Vley 192 in relationship to the area surveyed by the author in Aug 2021

3. 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 within which this HIA report has been prepared.

3.1. 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^2 in extent[3]; or

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

(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^2 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.

[3] Areal extent of the proposed development triggers the HIA.

3.2. 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.

3.3. 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.

3.4. 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.

3.5. 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.

Further to the legal prescripts, we are mindful of the fact that graves and burial grounds are held sacred whether they are protected by the law or not.

3.6. The National Environmental Management Act (NEMA) (No 107 of 2003)

Section 24 of NEMA states that activities which may impact on the environment, socioeconomic conditions and the cultural heritage must be investigated and assessed prior to authorisation, permitting and implementation. 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 (Section 2(2)(iii) of NEMA).

3.7. 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.

4. APPROACH AND METHODOLOGY

4.1. Literature study

The report is based on an intensive search through existing literature for data on the heritage sensitivity of the broader area around the targeted property. The resort to a desktop assessment was in consideration of the imperative to meet set project deadlines, whilst arrangements for access to the property were being made. Heritage Impact Assessment studies conducted in the broader area are the principal source of data. These reports have been carefully selected taking into account factors such as distance from the

target of the present study, and spatial distribution of the reference studies within a radius of 50-100km from the study area. Using this information the potential yield of the property could be reasonably predicted by extrapolation. Extrapolation is a scientific method of building a hypothesis by estimating or predicting results by assuming that what is known and has been established about a particular situation is likely to apply more or less for a neighbouring area/quantity that is unknown.

In August 2021 this author conducted a ground survey for a heritage impact assessment on a numbers of farms with a footprint of 23 000 Ha situated 10 km to the south of Barst Vley 192:

Matenga, E. 2021. *Phase 1 Heritage Impact Assessment & Palaeontological Desktop Assessment for a Mine Prospecting Right Application on Portion 1, 2 & the Remaining Extent of the Farm Drieboom Leegte No 345; Portion 1, 2, 3 and the Remaining Extent of Farm Groot Zwart Bast No 189 and Portions 3, 5 & 8 of the Farm Jagt Kolk No 244 near Kenhardt Town, within the Kai !Garib Municipality, Northern Cape.*

The recent study heritage by the author on neighbouring properties provides near empirical data and justifies a high confidence rating for the conclusions of this report (Figures 5-6). It was found that Stone Age artefacts are widely distributed on the farms comprising scrapers, blades, cores and flakes typologically dating to the Middle Stone Age/Late Stone Age period. A hand-axe was found on the farm Groot Zawrt Bast which dates to the ESA (Figures 4). MSA to LSA lithics are ubiquitous. The scattered occurrence of the artefacts seems to suggest general hunter-gatherer activity in the region now known as Bushmanland. No further action was deemed necessary after the sites had been recorded.

A number of buildings and structures were recorded. Of particular interest were the principal dwellings occupied by farm owners which are of a superior quality compared to other farm buildings. Three burial grounds were recorded on the farms Drieboom Leegte 245 and Groot Zwart Bast 189. Burial grounds are protected in terms of Sections 3 and 36 of the National Heritage Resources Act (No 25/1999). A 100 m servitude must be reserved around them.

Figure 4: Surface finds including a handaxe found on the Remaining Extent of the Farm Groot Zwart Bast N0.189, c. 14 km southeast of the Remainder of Barst Vley 192

Table 1: Ranking of sites recorded on neighbouring properties in August 2021

GRADE	RANKING	SIGNIFICANCE	NO OF SITES
1a	National	Of high intrinsic, associational and contextual heritage value within a national, provincial and local context, i.e. formally declared or potential Grade 1, 2 or 3A heritage resources, and **burial grounds**	3 Burial Grounds
1b	Burial Grounds	Grave are sacred and their treatment is a sensitive issue.	
2	Provincial	Of high intrinsic, associational and contextual heritage value within a national, provincial and local context, i.e. formally declared or potential 2 heritage resources	0
3A	Local	Of high intrinsic, associational and contextual heritage value within a national, provincial and local context, i.e. formally declared or potential Grade 3A heritage resources	0
3B	Local	Of moderate to high intrinsic, associational and contextual value within a local context, i.e. potential Grade 3B heritage resources	
3C	Local	Of medium to low intrinsic, associational or contextual heritage value within a national, provincial and local context, i.e. potential Grade 3C heritage resources	55
		TOTAL	58

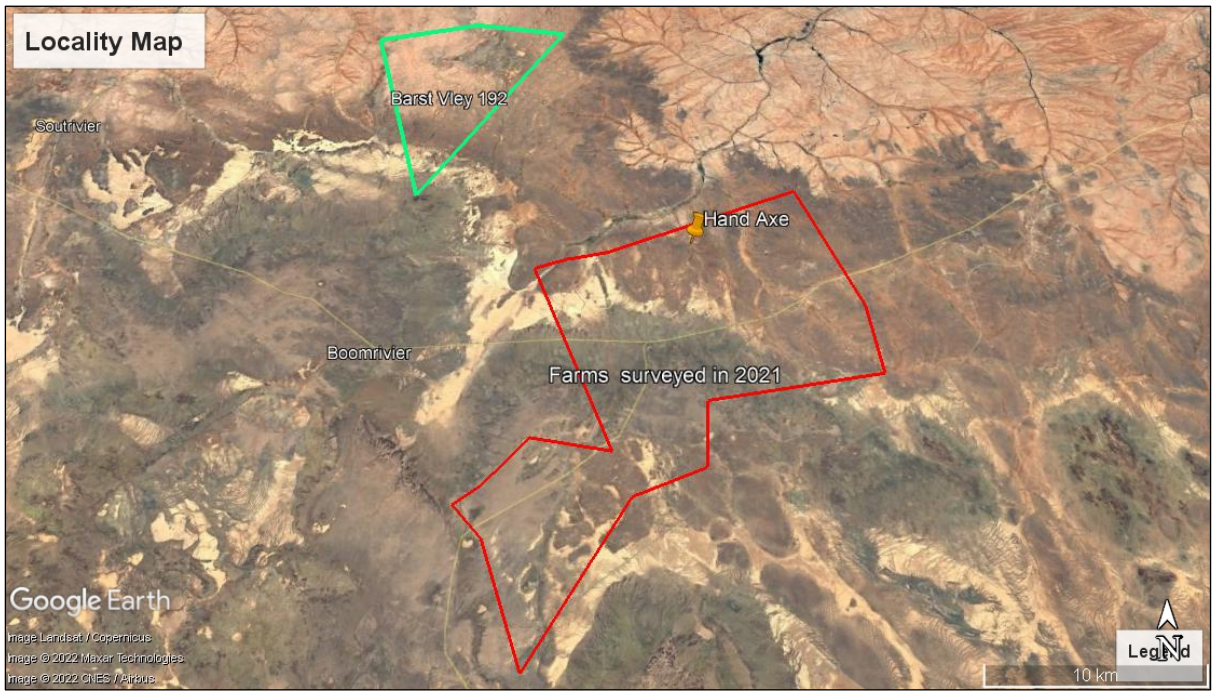

Figure 5: Google Earth map shows the location of the Remainder of Barst Vley 192 and properties surveyed by the author in 2021

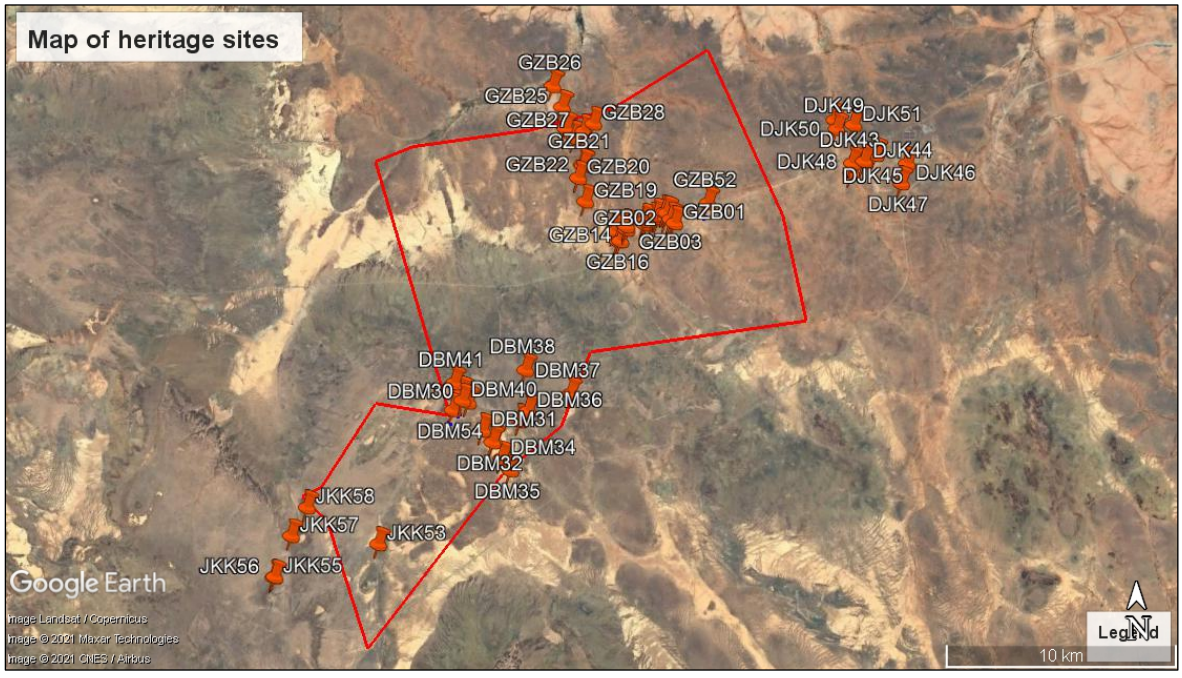

Figure 6: Google Earth map shows the distributions of sites found during the survey of farms 10km south of Barst Vley 192

A number of other heritage impact studies have been undertaken in the recent past in the broader area encompassing Kenhardt, Marydale and Copperton, and a few of the reports are cited here:

Pelser, A. J. 2011. *A report on an archaeological impact assessment (AIA) for the Proposed Solar Energy Plant on Klein Zwart Bast 188, Kenhardt District, Northern Cape.*
This study was undertaken for the establishment of the Aries Power Plant which has been commissioned, and is situated on an adjacent property east of the farms which are the subject of the current study. A number of archaeological sites, features and objects were identified and recorded in the area, dating from the Early to Later Stone Ages, as well as the Historical period. Although some finds were more localized the whole area was covered by scatters of Stone Age artefacts (page 20).

Orton, J. 2019. *Heritage Impact Assessment: Scoping and Environmental Impact Assessment for the Proposed Development of the Skeerhok PV2 solar energy facility on Gemsbokbult 120/9, Kenhardt Magisterial District, Northern Cape Province.*

The farm Gemsbokbult 120/1 is situated 20 km north of Kenhardt. Stone artefacts date ESA, MSA and LSA. Of important significance are LSA sites which are commonly located along the margins of pans. Small rock outcrops were quarried as a source of stone material for making stone tools (page 14).

Orton, J. 2020. *Heritage Impact Assessment: Proposed Access Road on the Remainder and Portion 4 of the Farm Onder Rugzeer 168, Kenhardt Magisterial District, Northern Cape Province*.
The farm Onder Rugzeer lies 15 km north of Kenhardt. The survey revealed background scatter stone artefacts to be present all over the study area. Denser scatters of artefacts were rare, but three were noted along Option C. All are of low to very low cultural significance. No graves were seen and the chances of graves occurring are considered to be negligible (page 2).

Orton, J. 2018a. *Heritage Impact Assessment: Scoping and Environmental Impact Assessment for the Proposed Development of the Skeerhok PV1 Solar Energy Facility on Smutshoek 395/Remainder, Kenhardt Magisterial District, Northern Cape Province. Unpublished Report Prepared for CSIR – Environmental Management Services. Lakeside: ASHA Consulting (Pty) Ltd.*

The farm Smutshoek 395/Remainder lies 40 km north of Kenhardt. Scatters of artefacts found. Of particular significance are artefacts located on the edge of a pan. In the report 1 rock art site is reported located 9 km south of the Farm Gemsbokbult (page 11).

5. ARCHAEOLOGICAL AND HISTORICAL CONTEXT

An outline of the cultural sequence in South Africa 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:

5.1. Cultural sequence summary[4]

PERIOD	EPOCH	ASSOCIATED CULTURAL GROUPS	TYPICAL MATERIAL EXPRESSIONS
Early Stone Age 2.5m – 250 000 YCE	Pleistocene	Early Hominids: *Australopithecines* *Homo habilis* *Homo erectus*	Typically large stone tools such as hand axes, choppers and cleavers.
Middle Stone Age 250 000 – 25 000 YCE	Pleistocene	First *Homo sapiens* species	Typically smaller stone tools such as scrapers, blades and points.
Late Stone Age 20 000 BC – present	Pleistocene / Holocene	*Homo sapiens* 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.

[4] 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	19th Century	European settlers / farmers / missionaries/ industrialisation	Buildings, Missions, Mines, metals, glass, ceramics

5.2. Appearance of hominids

South Africa has a 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.[5] No hominid sites have been reported in the vicinity of the study area.

5.3. The Early Stone Age

The Early Stone Age may date back more than 2 million years. Much of the Karoo in the Northern Cape is covered by gravels from which ESA artefacts have been found. These artefacts are generally very well weathered and have been described as background scatters in that their distribution is conditioned more by geological actions than human actions (Orton 2013, p7). 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 interest.[6] Further north the Wonderwerk Cave has become a benchmark for the characterisation of the

[5] Deacon, J. and N. Lancaster. 1986. *Later Quaternary Palaeo-environments of Southern Africa*. Oxford: Oxford University Press.

[6] Morris, D. 2009. Phase 1 Archaeological Impact Assessment at Bucklands Settlement near Douglas, Northern Cape, p3.

Stone Age. Excavations reveal a long sequence of occupation spanning the Early (ESA), Middle (MSA) and Later Stone Ages.[7]

5.3.1. 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. 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.

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

LSA technology is characterised by microlithic scrapers and segments made from very fine-grained rock. The ephemeral pans in the Northern Cape, also present in the locality of the present study hosted hunter gatherer communities as evidenced by a comparatively high density of LSA lithics found on the edges of these pans.

Rock art, in the form of engravings (petroglyphs), is widely known from the Karoo (Orton 2013, p10) with examples nearest to the study area on the farm Springbokoog 80km to the south, Driekopseiland180km to the ENE), and the farm Katlani 236 (150km ENE). Various subjects are depicted in both stylized and naturalistic motifs including humans and animals.
The upper Karoo region of the Northern Cape is now referred to as Bushmansland in recognition of the strong archaeological and historical footprint of hunter-gatherer communities identified to the San and the Khoikhoi, with a cultural distinction being made between the two as hunter-gatherers and hunter-gatherer pastoralists respectively.

5.4. The Iron Age Culture [ca. 2000 years BP]

The Iron Age culture supplanted the Stone Age at least 2000 years ago, associated with the earliest farming communities keeping domestic animals such as cattle, sheep, goat and chickens, and using several metals and pottery (Huffman 2007). The transition to the Iron Age appears to coincide with the spread of Bantu speakers from the north into Southern Africa.

[7] http://www.southafrica.net/za/en/articles/entry/article-southafrica.net-the-wonderwerk-cave.

Around the beginning of the 2nd millennium, radical changes in the Iron Age culture occurred signifying the transition to the Later Iron Age. Subsequently the Iron Age people built stonewalled settlements present in a large swathe of territory straddling the Northern Cape, Northwest Province, Limpopo Province and the Free State. One such site Dithakong near Kuruman.

5.5. Early Contact with the Boers

In the early 19th 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, a large number of Great Trek Boers from the Cape Colony and established commercial farms in the area. The came into contact with local people who included the Khoisan, Korana, Tswana and Griqua (Van der Walt 2012).

5.6. Brief history of Kenhardt

Kenhardt is a small Karroo town situated about 120 km southeast of Upington, the largest town in the area. It was founded in 1868 on the north bank of the Hartebees, a shallow river, with the riverbed filled with sand. Kenhardt became a municipality in 1909. The Kenhardt landscape is arid and one of the fascinating features are desert aloes (*Aloe karasbergensis Pillans*) which grow up to several metres and a rounded crown

6. FINDINGS OF THE DESKTOP ASSESSMENT

6.1. General observations

It is an established fact that Stone Age material is widely distributed on the plains, ridges and valleys of the upper Karroo area north and south of the Orange-Vaal Rivers.

Other heritage resources that might occur in the broader area are:

- Rock engravings (petroglyphs) dating from the Middle Stone Age to Later Stone Age periods
- Rock Paintings from the Middle Stone Age to Later Stone Age periods

- Buildings and objects associated with modern commercial farming from the 19th century
- Graves, burial grounds and human bones.

The Table below provides a summary of the probability of occurrence of different typologies of heritage and a confidence rating of the predictions. The ranking system relates to the national grading of heritage sites (adapted from Guidelines for involving Heritage Specialists in EIA processes by Winter S and & N. Baumann (2005, p19). The probability of occurrence of different grades of sites confirms the view that no finds in the study area (except for graves) are likely to warrant further action apart from documentation. During the exploration phase monitoring will be undertaken using the Chance Finds Procedure.

GRADE	RANKING	SIGNIFICANCE	PROBABILITY OF OCCURRENCE	CONFIDENCE RATING
1a	National	Of high intrinsic, associational and contextual heritage value within a national, provincial and local context, i.e. formally declared or potential Grade 1, 2 or 3A heritage resources,	0%	High
1b	Burial grounds	Grave are sacred and their treatment is a sensitive issue.	50%	High
2	Provincial	Of high intrinsic, associational and contextual heritage value within a national, provincial and local context, i.e. formally declared or potential 2 heritage resources	0%	High
3A	Local	Of high intrinsic, associational and contextual heritage value within a national, provincial and local context, i.e. formally declared or potential Grade 3A heritage resources	10%	Medium
3B	Local	Of moderate to high intrinsic, associational and contextual value within a local context, i.e. potential Grade 3B heritage resources	10%	High
3C	Local	Of medium to low intrinsic, associational or contextual heritage value within a national, provincial and local context, i.e. potential Grade 3C heritage resources	99,99%	High

6.2. 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

No ground survey undertaken.

(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

Sites that may be found during the exploration and are deemed to be significant will be curated in accordance with the mitigation procedures in the Heritage Chance Finds Procedure.

(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 Cape 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. There is an overwhelming sentiment that the mining industry will mitigate the vagaries of climate change – induced by droughts which have been experienced over the last decade.

(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

A stakeholder relations specialist is engagement with local stakeholders including the farm owner.

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

A Chance Finds Procedure will be used for the treatment of any sites or objects found during the mine exploration and when actual mining commences.

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

In accordance with the CPF in the event of the discovery of heritage resources deemed of significance during exploration or mining, the Provincial Heritage Resources Authority or SAHRA will be informed immediately and an archaeologist or heritage expert called to attend.

6.3. 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.
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 exploration 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.

6.4. Chance Finds Procedure (CPF)

When the environmental and heritage approvals have been received prospecting operations will commence at which time an Archaeological and Heritage Chance Find Procedure (CPF) annexed to the report will be applied as a manual for the protection of unidentified heritage resources which may occur in the footprint of the prospecting right (Appendix I).

7. CONCLUSION AND RECOMMENDATIONS

In light of the findings of the desk assessment, the mine prospecting can go ahead. The study is mindful that some important discoveries may be made during prospecting. If this happens operations should be halted, and the provincial heritage resources authority or SAHRA notified in order for an investigation and evaluation of the finds to take place.

8. 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".[8]

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 2nd millennium AD marked by the emergence of complex state society and long-distance trade contacts.

Late Stone Age: The period from ± 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

[8] 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.

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.

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ANNEXURE I: CHANCE FINDS PROCEDURE

Phase 1 Heritage Impact Desktop Assessment & Palaeontological Desktop Assessment for a Mine Prospecting Right Application the Remainder of Barst Vley 192 near Kenhardt Town, in the Kai !Garib Municipality, Northern Cape

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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

BACKGROUND

Barzani Mining (Pty) Ltd has applied for a mine prospecting right on the Remainder of Barst Vley 192 near Kenhardt Town, in the Kai !Garib Municipality, Northern Cape. When the environmental and heritage approvals have been received prospecting operations will commence at which time the Archaeological and Heritage Chance Finds 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.

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

HERITAGE SITES AND OBJECTS THAT MAY OCCUR IN THE AREA

The following site types/objects have been encountered in the broader region and are therefore flagged for possible occurrence on the farms that will be prospected.

- Surface scatters or concentrations of stone tools of the ESA, MSA, LSA periods
- Substantial subsurface occurrences of stone tools
- Rock engravings
- Buildings and objects associated with modern commercial farming from the 19th century
- Graves, burial grounds and human bones

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.

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.

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.

SAHRA CONTACT DETAILS

SAHRA Head Office	SAHRA BGG Unit
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