HERITAGE IMPACT ASSESSMENT:
PROPOSED SALT MINE ON FARM KONGA 250/REM, GORDONIA MAGISTERIAL DISTRICT, NORTHERN CAPE

Required under Section 38(8) of the National Heritage Resources Act (No. 25 of 1999)
as part of a Heritage Impact Assessment.

SAHRA Case ID: 17748

Report for:

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On behalf of:

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4 January 2022

SUMMARY

ASHA Consulting (Pty) Ltd was appointed by N.J. van Zyl to assess the potential impacts to heritage resources that might occur through the proposed development of a salt mine in Konga Pan and an associated gravel access road, Farm Konga 250/remainder, 120 km north of Upington. A centre point for the proposed mine is S27° 29' 33" E20° 43' 14".

The mine surface was found to be flat with a light scattering of natural stone fragments and artefacts in some areas. The surrounding dunes, where examined, were sterile. The archaeological materials were in very low densities and seemed to be largely from the Middle Stone Age, but with occasional flakes possibly being Later Stone Age. Graves are not expected in the pan but could occur in the sand dunes. The landscape is also a heritage resource. Although the pan has already been compromised by the large salt works in the north, it is not visible from the surrounding landscape due to the sand dunes in the area. None of the potential impacts is of any concern with all rated as being of low significance.

It is recommended that the proposed salt mine be authorised, but subject to the following recommendation which should be included as conditions of authorisation:

- If any archaeological material or human burials are uncovered during the course of development then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist. Such heritage is the property of the state and may require excavation and curation in an approved institution.

Glossary

Background scatter: Artefacts whose spatial position is conditioned more by natural forces than by human agency.

Early Stone Age: Period of the Stone Age extending approximately between 2 million and 200 000 years ago.

Hominid: a group consisting of all modern and extinct great apes (i.e. gorillas, chimpanzees, orangutans and humans) and their ancestors.

Later Stone Age: Period of the Stone Age extending over the last approximately 20 000 years.

Middle Stone Age: Period of the Stone Age extending approximately between 200 000 and 20 000 years ago.

Abbreviations

APHP: Association of Professional Heritage Practitioners

ASAPA: Association of Southern African Professional Archaeologists

BA: Basic Assessment

CRM: Cultural Resources Management

DMRE: Department of Mineral Resources and Energy

EA: Environmental Authorisation

EMPr: Environmental Management Program

ESA: Early Stone Age

GP: General Protection

GPS: global positioning system

HIA: Heritage Impact Assessment

LSA: Later Stone Age

MSA: Middle Stone Age

NBKB: Ngwao-Boswa Ya Kapa Bokoni

NEMA: National Environmental Management Act (No. 107 of 1998)

NHRA: National Heritage Resources Act (No. 25) of 1999

PPP: Public Participation Process

SAHRA: South African Heritage Resources Agency

SAHRIS: South African Heritage Resources Information System

Contents

1. INTRODUCTION

ASHA Consulting (Pty) Ltd was appointed by N.J. van Zyl to conduct an assessment of the potential impacts to heritage resources that might occur through the proposed development of a salt mine in Konga Pan and an associated gravel access road, Farm Konga 250/remainder, 120 km north of Upington (Figures 1 & 2). A centre point for the proposed mine is S27° 29' 33" E20° 43' 14".

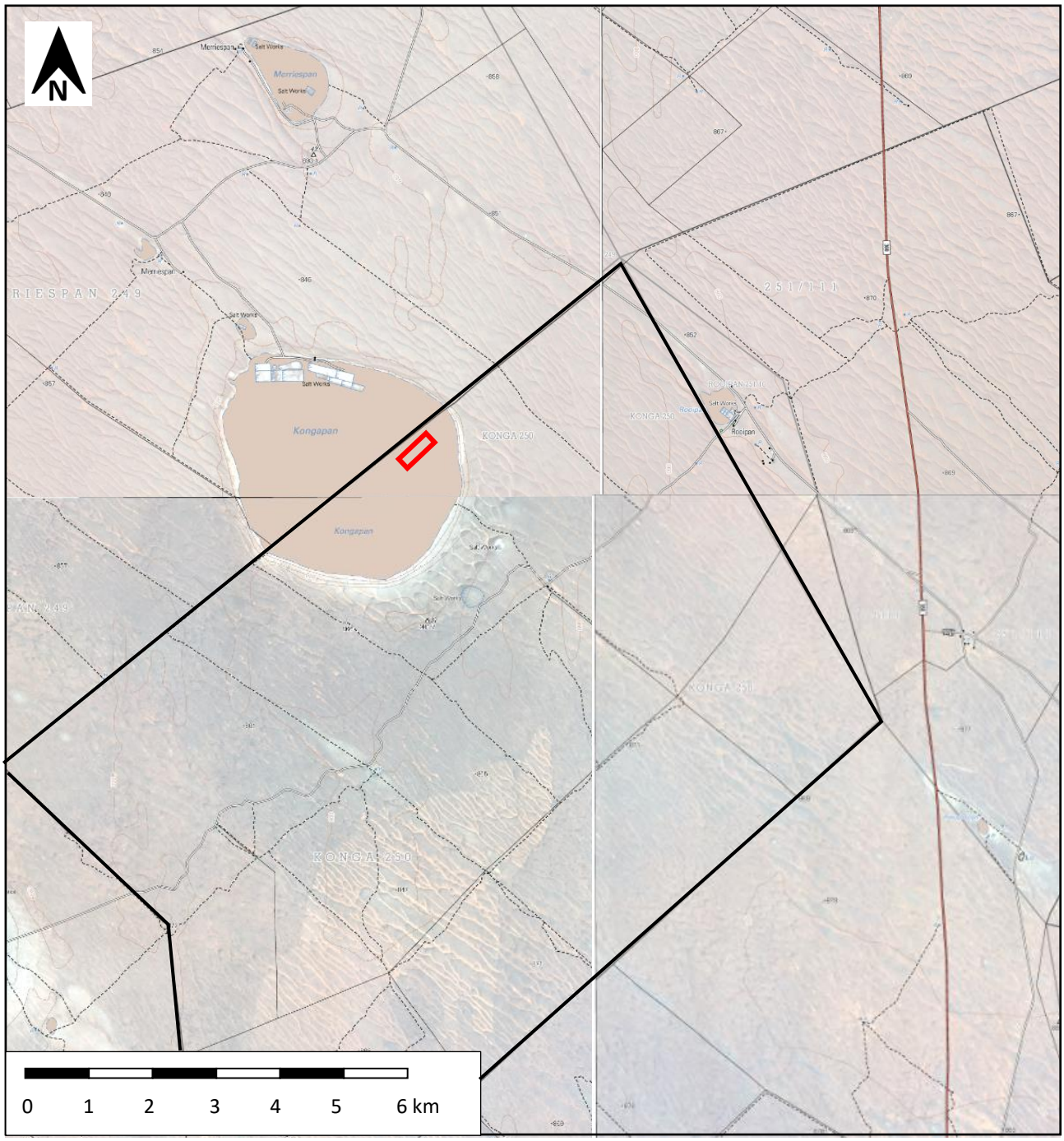

Figure 1: *Extract from 1:50 000 topographic map 2720BC, 2720BD, 2720DA & 2720DB showing the location of the site. Source of basemap: Chief Directorate: National Geo-Spatial Information. Website: www.ngi.gov.za.*

Figure 2: *Aerial view of the area showing the regional context of Conga Pan. The proposed mining area is marked in green within the pan.*

1.1. The proposed project

1.1.1. Project description

A total of 4 crystallisation pans will be developed within a 5 ha area. Depending on quality and quantity of available underground brine there is a possibility that the operation will expand but this would be subject to a new application for a mining right.

The present small-scale mining operation of salt involves:

- The development of the 4 crystallisation pans with adjacent stockpile platforms raised 300mm above natural pan floor;
- The pumping of the underground brine onto crystallisation pans average 80cm deep to form a hardened surfaces on which crystal growth occurs;
- The average depth of boreholes is 60 meters but brine is pumped at a depth of 30 meters;
- The preparation of the pan floor is critical to prevent brine seepage and to allow for movement of harvesting equipment without breaking the pan floor; and
- With the use of waste or low-grade salt from other mining operations the minimum period required to develop the hardened pan floor and stockpile platforms will be 1 year.

The project will also require an access road but an existing track/firebreak will be upgraded by adding a gravel surface and rerouting it around a large dune in one place. Brine will be pumped from boreholes within the pan and their pumps will be solar powered. No other infrastructure is needed; mobile containers will be used for storage and mobile ablution facilities will be provided. The site office will be at the farmstead.

1.1.2. Identification of alternatives

No alternatives are under consideration. This is because the site has been selected for the mineral resource it offers. The methods selected for mining are the best and most efficient for the proposed project. As such, only the preferred and the No-Go option will be assessed.

1.1.3. Aspects of the project relevant to the heritage study

All aspects of the proposed development are relevant, since excavations may impact on archaeological and/or palaeontological remains, while all above-ground aspects create potential visual (contextual) impacts to the cultural landscape and any significant heritage sites that might be visually sensitive.

1.2. Terms of reference

ASHA Consulting was asked to assess the potential heritage impacts that the project might have. The assessment was to include both desktop research and a site visit. The results of the work should be used to compile a Heritage Impact Assessment (HIA) that assessed all relevant aspects of heritage and complied with the requirements of the relevant authorities.

1.3. Scope and purpose of the report

A heritage impact assessment (HIA) is a means of identifying any significant heritage resources before development begins so that these can be managed in such a way as to allow the development to proceed (if appropriate) without undue impacts to the fragile heritage of South Africa. This HIA report aims to fulfil the requirements of the heritage authorities such that a comment can be issued by them for consideration by the National Department of Mineral Resources and Energy (DMRE) who will review the Basic Assessment (BA) and grant or refuse authorisation. The HIA report will outline any management and/or mitigation requirements that will need to be complied with from a heritage point of view and that should be included in the conditions of authorisation should this be granted.

1.4. The author

Dr Jayson Orton has an MA (UCT, 2004) and a D.Phil (Oxford, UK, 2013), both in archaeology, and has been conducting Heritage Impact Assessments and archaeological specialist studies in South Africa (primarily in the Western Cape and Northern Cape provinces) since 2004 (please see curriculum vitae included as Appendix 1). He has also conducted research on aspects of the Later Stone Age in these provinces and published widely on the topic. He is an accredited heritage practitioner with the Association of Professional Heritage Practitioners (APHP; Member #43) and also holds archaeological accreditation with the Association of Southern African Professional Archaeologists (ASAPA) CRM section (Member #233) as follows:

- Principal Investigator: Stone Age, Shell Middens & Grave Relocation; and
- Field Director: Colonial Period & Rock Art.

1.5. Declaration of independence

ASHA Consulting (Pty) Ltd and its consultants have no financial or other interest in the proposed development and will derive no benefits other than fair remuneration for consulting services provided.

2. LEGISLATIVE CONTEXT

2.1. National Heritage Resources Act (NHRA) No. 25 of 1999

The NHRA protects a variety of heritage resources as follows:

- Section 34: structures older than 60 years;
- Section 35: prehistoric and historical material (including ruins) more than 100 years old as well as military remains more than 75 years old, palaeontological material and meteorites;
- Section 36: graves and human remains older than 60 years and located outside of a formal cemetery administered by a local authority; and
- Section 37: public monuments and memorials.

Following Section 2, the definitions applicable to the above protections are as follows:

- Structures: “any building, works, device or other facility made by people and which is fixed to land, and includes any fixtures, fittings and equipment associated therewith”;
- Palaeontological material: “any fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or trace”;
- Archaeological material: a) “material remains resulting from human activity which are in a state of disuse and are in or on land and which are older than 100 years, including artefacts, human and hominid remains and artificial features and structures”; b) “rock art, being any form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and which is older than 100 years, including any area within 10m of such representation”; c) “wrecks, being any vessel or aircraft, or any part thereof, which was wrecked in South Africa, whether on land, in the internal waters, the territorial waters or in the maritime culture zone of the Republic, as defined respectively in sections 3, 4 and 6 of the Maritime Zones Act, 1994 (Act No. 15 of 1994), and any cargo, debris or artefacts found or associated therewith, which is older than 60 years or which SAHRA considers to be worthy of conservation”; and d) “features, structures and artefacts associated with military history which are older than 75 years and the sites on which they are found”;
- Grave: “means a place of interment and includes the contents, headstone or other marker of such a place and any other structure on or associated with such place”; and
- Public monuments and memorials: “all monuments and memorials a) “erected on land belonging to any branch of central, provincial or local government, or on land belonging to any organisation funded by or established in terms of the legislation of such a branch of

government"; or b) "which were paid for by public subscription, government funds, or a public-spirited or military organisation, and are on land belonging to any private individual."

Section 3(3) describes the types of cultural significance that a place or object might have in order to be considered part of the national estate. These are as follows:

a) its importance in the community, or pattern of South Africa's history;
b) its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;
c) its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;
d) its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;
e) its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
f) its importance in demonstrating a high degree of creative or technical achievement at a particular period;
g) its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;
h) its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa; and
i) sites of significance relating to the history of slavery in South Africa.

While landscapes with cultural significance do not have a dedicated Section in the NHRA, they are protected under the definition of the National Estate (Section 3). Section 3(2)(c) and (d) list "historical settlements and townscapes" and "landscapes and natural features of cultural significance" as part of the National Estate. Furthermore, some of the points in Section 3(3) speak directly to cultural landscapes.

Section 38(8) of the NHRA states that if an impact assessment is required under any legislation other than the NHRA then it must include a heritage component that satisfies the requirements of S.38(3). Furthermore, the comments of the relevant heritage authority must be sought and considered by the consenting authority prior to the issuing of a decision. Under the National Environmental Management Act (No. 107 of 1998; NEMA), as amended, the project is subject to a BA. The present report provides the heritage component. Ngwao-Boswa Ya Kapa Bokoni (Heritage Northern Cape; for built environment and cultural landscapes) and the South African Heritage Resources Agency (SAHRA; for archaeology and palaeontology) is/are required to provide comment on the proposed project in order to facilitate final decision making by the DMR.

3. METHODS

3.1. Literature survey and information sources

A survey of available literature was carried out to assess the general heritage context into which the development would be set. The information sources used in this report are presented in Table 1. Data were also collected via a field survey.

Table 1: *Information sources used in this assessment.*

Data / Information	Source	Date	Type	Description
Maps	Chief Directorate: National Geo-Spatial Information	Various	Spatial	Historical and current 1:50 000 topographic maps of the study area and immediate surrounds
Aerial photographs	Chief Directorate: National Geo-Spatial Information	Various	Spatial	Historical aerial photography of the study area and immediate surrounds
Aerial photographs	Google Earth	Various	Spatial	Recent and historical aerial photography of the study area and immediate surrounds
Cadastral data	Chief Directorate: National Geo-Spatial Information	Various	Survey diagrams	Historical and current survey diagrams, property survey and registration dates
Background data	South African Heritage Resources Information System (SAHRIS)	Various	Reports	Previous impact assessments for any developments in the vicinity of the study area
Palaeontological sensitivity	South African Heritage Resources Information System (SAHRIS)	Current	Spatial	Map showing palaeontological sensitivity and required actions based on the sensitivity.
Background data	Books, journals, websites	Various	Books, journals, websites	Historical and current literature describing the study area and any relevant aspects of cultural heritage.

3.2. Field survey

The site was subjected to a detailed foot survey on 30 September 2021. This was during spring but, in this very dry area, the season makes no meaningful difference to vegetation covering and hence the ground visibility for the archaeological survey. Other heritage resources are not affected by seasonality. During the survey the positions of finds and survey tracks were recorded on a hand-held Global Positioning System (GPS) receiver set to the WGS84 datum (Figure 3). Photographs were taken at times in order to capture representative samples of both the affected heritage and the landscape setting of the proposed development.

It should be noted that amount of time between the dates of the field inspection and final report do not materially affect the outcome of the report.

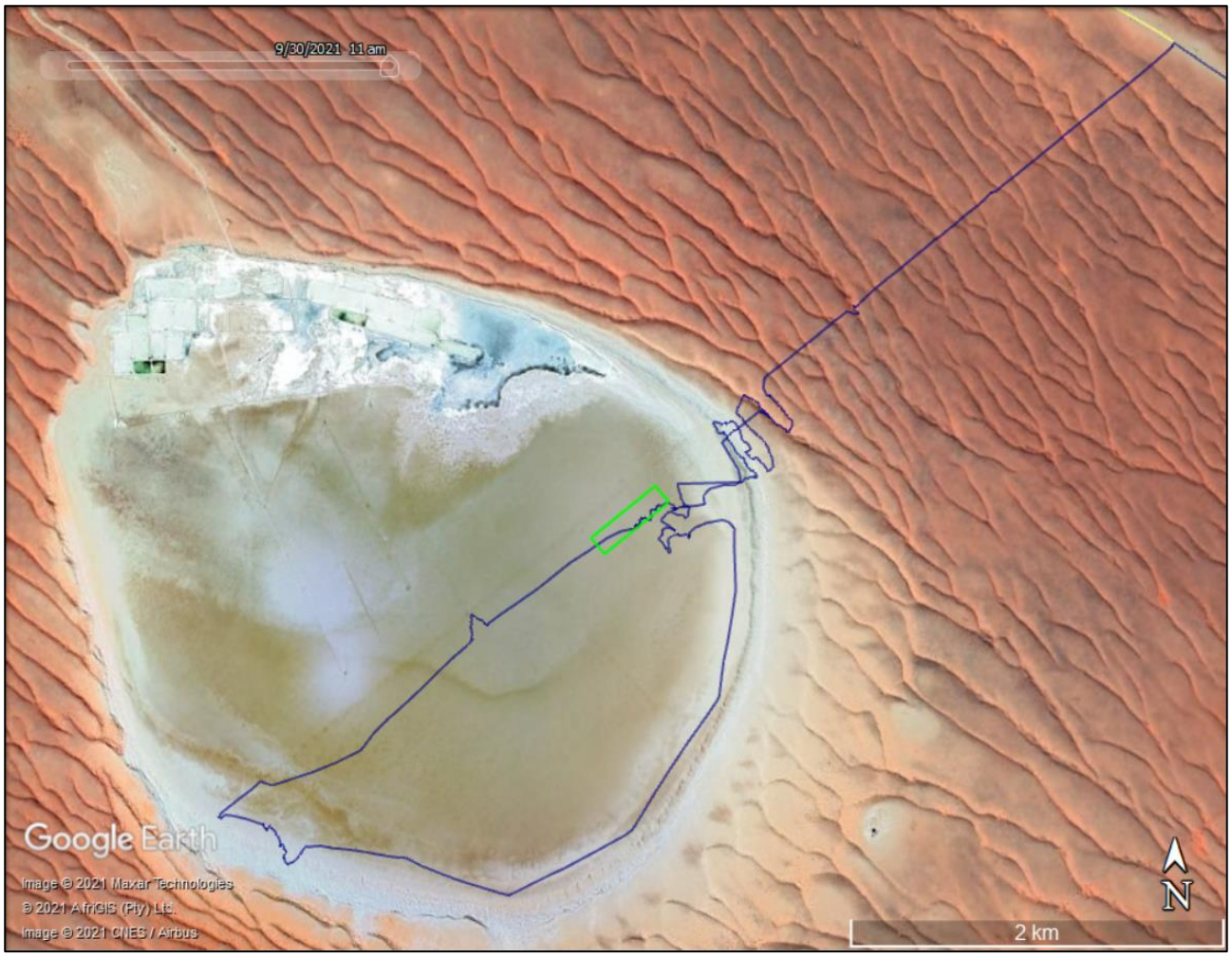

Figure 3: *Aerial view of the study area (green polygon) showing the survey tracks (blue lines).*

3.3. Specialist studies

A separate specialist palaeontological desktop study was commissioned to assess the potential palaeontological impacts. This report is submitted separately with the HIA.

3.4. Grading

S.7(1) of the NHRA provides for the grading of heritage resources into those of National (Grade I), Provincial (Grade II) and Local (Grade III) significance. Grading is intended to allow for the identification of the appropriate level of management for any given heritage resource. Grade I and II resources are intended to be managed by the national and provincial heritage resources authorities respectively, while Grade III resources would be managed by the relevant local planning authority. These bodies are responsible for grading, but anyone may make recommendations for grading.

It is intended under S.7(2) that the various provincial authorities formulate a system for the further detailed grading of heritage resources of local significance but this is generally yet to happen. SAHRA (2007) has formulated its own system[1] for use in provinces where it has commenting authority. In this system sites of high local significance are given Grade IIIA (with the implication that the site

[1] The system is intended for use on archaeological and palaeontological sites only.

should be preserved in its entirety) and Grade IIIB (with the implication that part of the site could be mitigated and part preserved as appropriate) while sites of lesser significance are referred to as having 'General Protection' (GP) and rated as GP A (high/medium significance, requires mitigation), GP B (medium significance, requires recording) or GP C (low significance, requires no further action).

3.5. Consultation

The NHRA requires consultation as part of an HIA but, since the present study falls within the context of an EIA which includes a public participation process (PPP), no dedicated consultation was undertaken as part of the HIA. Interested and affected parties would have the opportunity to provide comment on the heritage aspects of the project during the PPP.

3.6. Assumptions and limitations

The field study was carried out at the surface only and hence any completely buried archaeological sites would not be readily located. Similarly, it is not always possible to determine the depth of archaeological material visible at the surface. The exact footprint of the mine was not yet finalised at the time of the site inspection so the survey examined the general area as well as briefly considering the wider pan area.

4. PHYSICAL ENVIRONMENTAL CONTEXT

4.1. Site context

The site lies in a very remote area some 120 km north of Upington. The surroundings are used mostly for small stock farming but several salt mines already operate from various pans in the area, including one at the northern end of Konga Pan (Figure 4).

Figure 4: *View of the existing salt mining operation situated in the northern part of Konga Pan.*

4.2. Site description

The proposed salt mine lies within the floor of a very large salt pan. The floor of the pan is very flat and generally covered by a hard crust. Vegetation is completely absent from the pan surface. Sand dunes occur around the pan and these are vegetated. Around the south-eastern end of the pan there is a large pan dune, while further away elongated red Kalahari sand dunes cover the landscape (Figure 3). The access road will follow an existing cleared strip (fire break) along the northern boundary of the farm and will cross over many of these sand dune ridges. Figure 5 to 19 illustrate the study area and its surroundings.

Figure 5: *View towards the north showing the surface of the pan close to its centre.*

Figure 6: *Panoramic view towards the north and east from the crest of the pan dune along the southern margin of the pan.*

Figure 7: *View of the pan dune along the southern rim of the salt pan.*

Figure 8: *View towards the southwest from the pan dune along the eastern rim of the salt pan.*

Figure 9: *View towards the south across the section of pan dune included within the application area.*

Figure 10: *View towards the west from the southern edge of the application area and showing the sandy slope leading up and away from the pan.*

Figure 11: *View towards the southeast through the area between the pan dune (to the right) and the first red dune ridge (to the left).*

Figure 12: *Panoramic view towards the south from the crest of the first red sand dune ridge away from the pan.*

Figure 13: *View towards the northwest through the low-lying area behind the first red dune ridge away from the pan (ridge visible to the left).*

Figure 14: *View towards the northeast from the area where the evaporation ponds would be. The access track / firebreak is visible in the background.*

Figure 15: *View towards the northeast along the existing access track / fire break.*

Figure 16: *View towards the northeast along the existing access track / fire break.*

Figure 17: *View towards the north on the top of the tallest dune ridge where the access road would need to be cut in.*

Figure 18: *View towards the northeast along the existing access track / fire break.*

Figure 19: *View towards the northeast along the existing access track / fire break. The main gravel road lies just beyond the point where the track goes over the dune ridge.*

5. FINDINGS OF THE HERITAGE STUDY

This section describes the heritage resources recorded in the study area during the course of the project.

5.1. Palaeontology

The SAHRIS Palaeosensitivity Map shows the site to be of unknown (salt mine) and medium (road) palaeontological sensitivity (Figure 20). There is thus a possibility of finding buried fossils in the study area and a desktop assessment has been commissioned. This study has been written by Prof. Marion Bamford (2021) and is submitted separately with the present report. Her assessment finds only a small chance of fossils being present.

Figure 20: *Extract from the SAHRIS Palaeosensitivity map showing the proposed mine site (red rectangle) and access road (red line) to be of zero and moderate sensitivity (clear in the pan and green shading elsewhere) respectively.*

5.2. Archaeology

5.2.1. Desktop study

The Northern Cape is generally rich in archaeological traces, but many are quite ephemeral and can be attributed to background scatter, that is, artefacts that have been randomly dropped over time or moved to their modern position through erosion. Such low density finds are effectively precolonial litter and offer clues to prehistoric occupation, but little other useful scientific information.

Masson (2006) and Morris (2006) have recorded Early Stone Age (ESA) artefacts at Eenzaamheid Pan, 21 km southeast of Konga Pan. LSA material was also seen on a dune to the east of the pan (Masson 2006). Morris (2005) notes that ESA artefacts are generally found in areas where Dwyka tillite occurs. Morris (2005) examined a pan 21 km to the northeast of the present study area and found a very light scattering of stone artefacts across its surface. His impression was that the material was from the Middle Stone Age (MSA). He also looked at some of the surrounding dunes finding them to be free of archaeology. MSA artefacts were also found on the surface of Bloupan,

some 24 km west-southwest of Konga Pan (Engelbrecht and Fivaz 2019). Likewise, 20 km west of Konga, Moris and Henderson (2019) found isolated MSA artefacts on the surface of the Bettastadt and Tsonga Pans. At Vrysoutpan, Beaumont (2010) found just a single Later Stone Age (LSA) quartzite flake. It is evident that most of the surrounding pans have low density scatters of archaeological materials on them, but that these are always too low in density to be scientifically useful.

5.2.2. Site visit

Stone artefacts were found to be quite common, but highly variably distributed on the surface of Konga Pan. The maximum density was probably in the order of 1 artefact per 10 m^2, but there were also large swathes of the pan that were completely sterile. Most of the survey focused on a small area in the east where the evaporations ponds are proposed and it was in this area that the density was found to be the highest. Moving further towards the centre of the pan the density dropped off considerably. It was also clear that the artefacts and other stone fragments were correlated. Areas in the west and south of the pan which were only briefly visited were found to be free of both natural stone fragments and artefacts. Figures 21 and 22 show the distribution of recorded finds and also map the general distribution of artefactual and non-artefactual stone. The GPS locations are listed in Table 2. There is little more that can be said of this material beyond what is described in Table 2. Figures 23 to 32 show the artefacts.

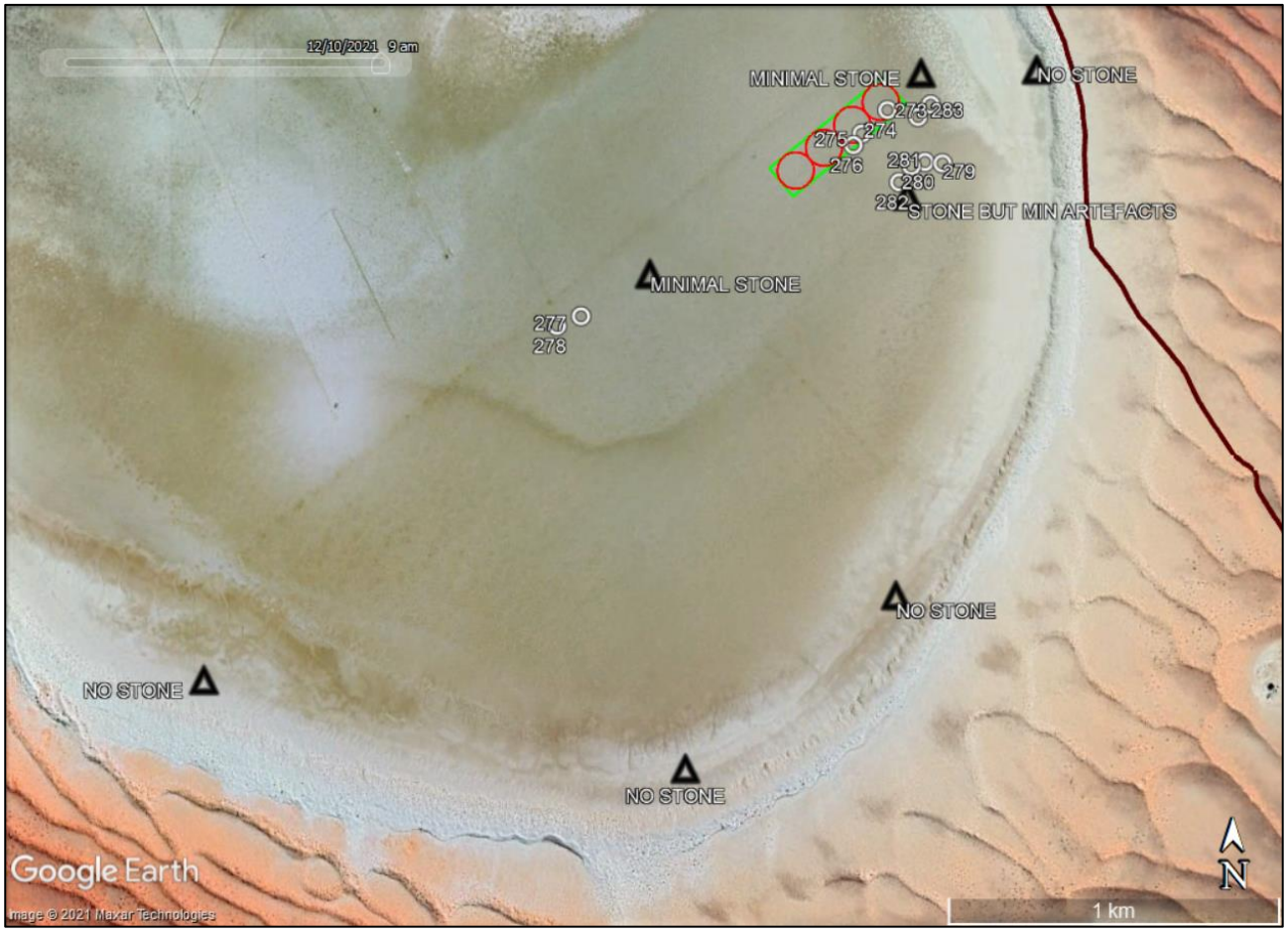

Figure 21: *Map showing the locations of the artefact photographs shown below. The captioned black triangles show the locations of natural stone fragments and, in one instance, stone artefacts.*

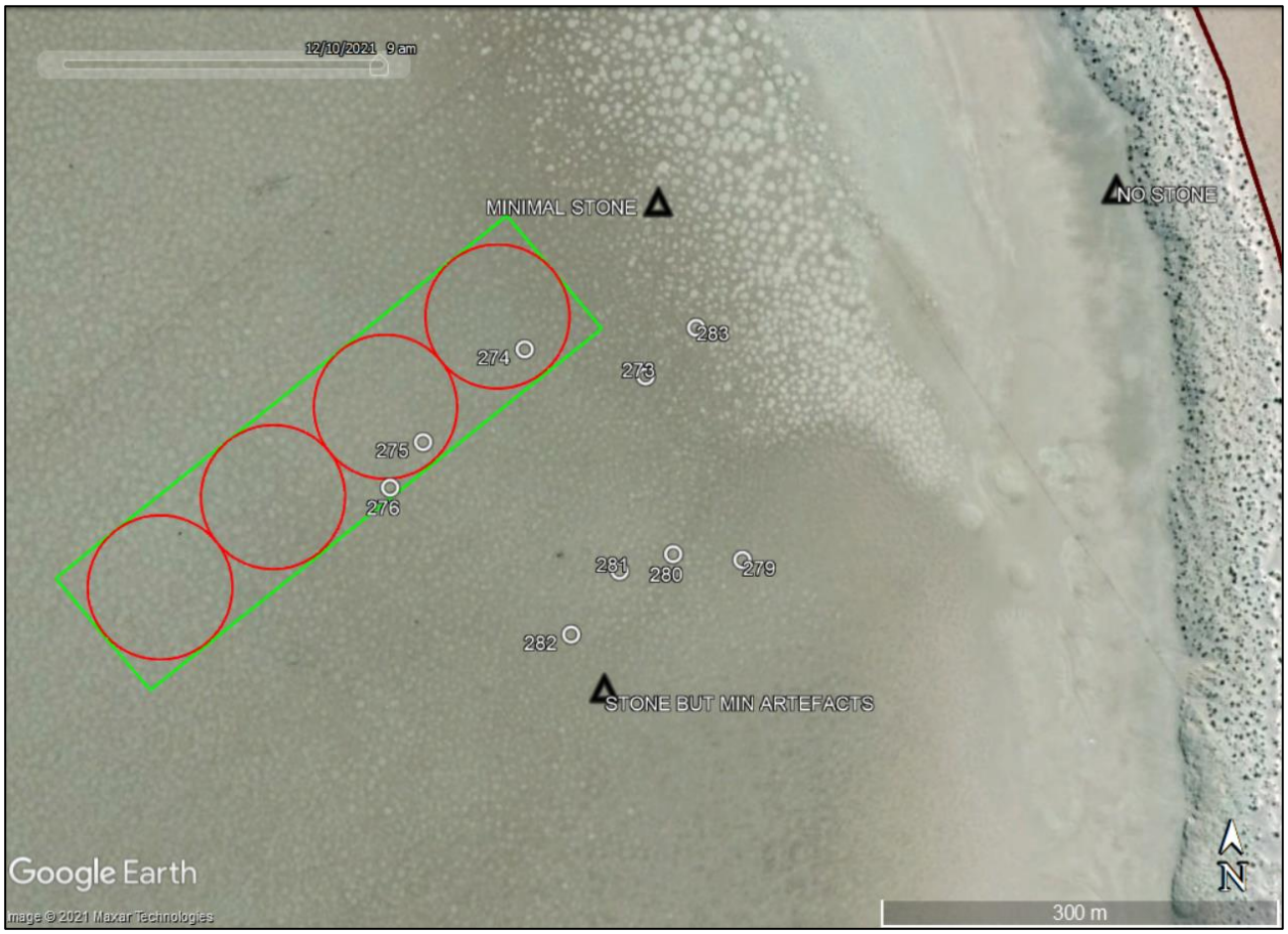

Figure 22: *Enlarged view of the north-eastern part of the surveyed area.*

Table 2: *List of co-ordinates of the photographed artefacts.*

Waypoint	Co-ordinates	Description	Significance/grade
273	S27 29 30.5 E20 43 22.5	Selection of artefacts in varying states of weathering but seemingly mostly from the MSA. A few fresher-looking flakes might have been deposited during the LSA. Quartzite dominates strongly, but occasional artefacts in crypto-crystalline silica also occur.	Low/GPC
274	S27 29 29.8 E20 43 19.2		Low/GPC
275	S27 29 32.1 E20 43 16.3		Low/GPC
276	S27 29 33.2 E20 43 15.4		Low/GPC
277	S27 29 50.0 E20 42 45.4		Low/GPC
278	S27 29 50.9 E20 42 42.7		Low/GPC
279	S27 29 35.0 E20 43 25.2		Low/GPC
280	S27 29 34.9 E20 43 23.3		Low/GPC
281	S27 29 35.3 E20 43 21.8		Low/GPC
282	S27 29 36.8 E20 43 20.5		Low/GPC
283	S27 29 29.3 E20 43 23.9		Low/GPC

Figure 23: *Artefacts from Waypoint 273. Scale in 1 and 5 cm intervals.*

Figure 24: *Artefacts from Waypoint 274. Scale in 1 and 5 cm intervals.*

Figure 25: *Artefacts from Waypoint 275. Scale in 1 and 5 cm intervals.*

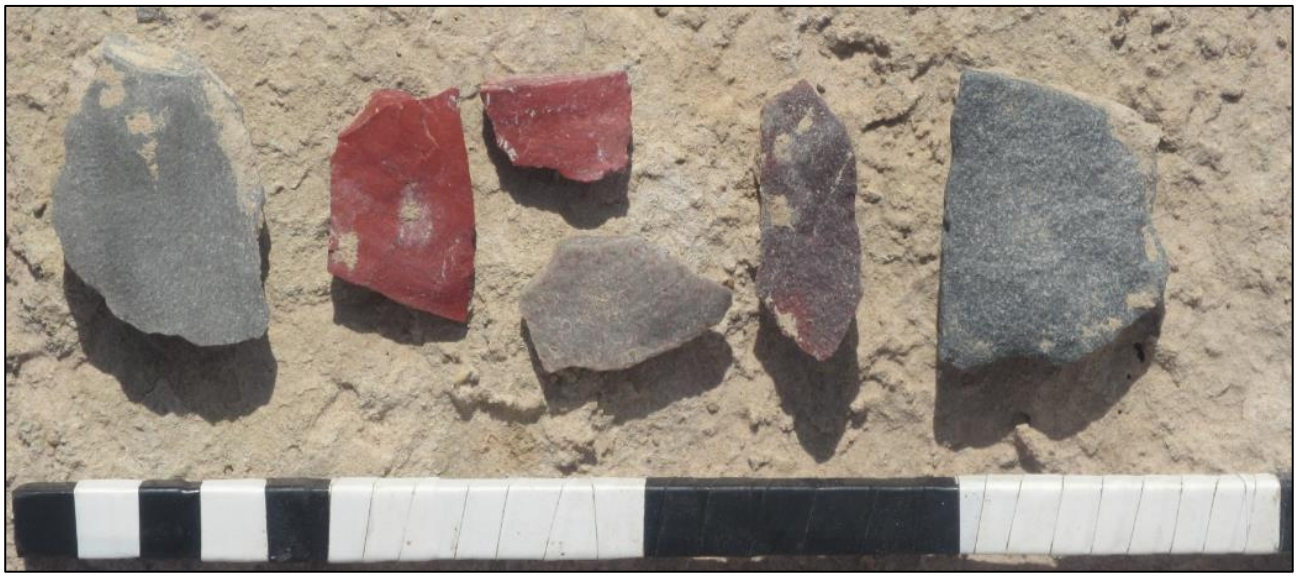

Figure 26: *Artefacts from Waypoint 276. Scale in 1 and 5 cm intervals.*

Figure 27: *Artefacts from Waypoint 277 towards the centre of the pan where artefact density is very low. Scale in 1 and 5 cm intervals.*

Figure 28: *Artefacts from Waypoint 278 towards the centre of the pan where artefact density is very low. Scale in 1 and 5 cm intervals.*

Figure 29: *Artefacts from Waypoint 279. Scale in 1 and 5 cm intervals.*

Figure 30: *Artefacts from Waypoint 280. Scale in 1 and 5 cm intervals.*

Figure 31: *Artefacts from Waypoint 281. Scale in 1 and 5 cm intervals.*

Figure 32: *Artefacts from Waypoint 282. Scale in 1 and 5 cm intervals.*

5.3. Graves

No graves were seen in the pan or in those dunes that were examined to the east of the pan. This does mean that none are present in the dunes since precolonial graves would likely not be marked

at the surface. While graves may thus be uncovered during construction of the access road, no graves are expected from within the pan.

5.4. Historical aspects and the Built environment

5.4.1. Desktop study

The Kalahari, with its scattered pans and extensive red sand dunes, is the iconic Bushman landscape. Precolonial occupation of this area would have continued until quite recently. This is borne out by the fact that Farm Konga 250 was only surveyed for the first time in 1920. Morris (2006) mentions the 20th September 1907 killing of Jakob Marenga, an anti-German colonial resistance leader, at Eenzaamheid Pan, but no significant history could be traced in close proximity to the study area.

Historical aerial photography shows that there was no salt works in Konga Pan in 1969 (Figure 33). By 1978 the salt works had been started which indicates that salt has been produced in this pan for more than 40 years (Figure 34). The operation was still very small though, and has subsequently expanded considerably to result in the disturbance of a large area in the northern part of the pan (Figure 35).

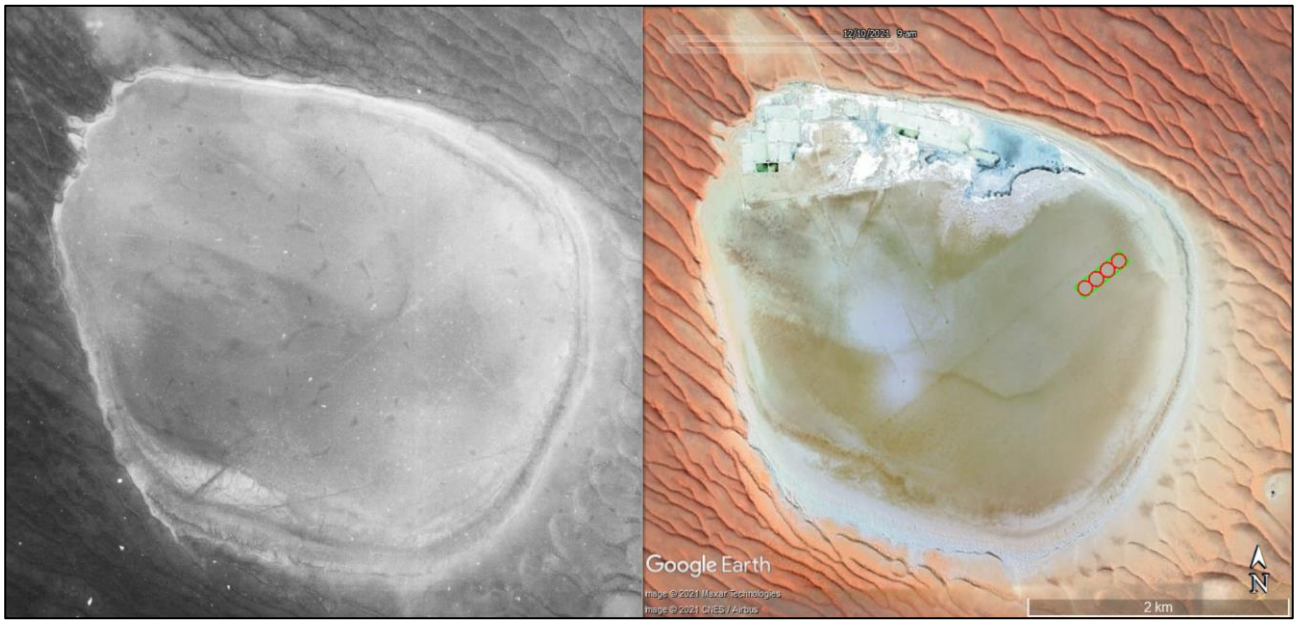

Figure 33: *1969 (640_009_00077) and modern (Google Earth) aerial photography showing the undeveloped Konga Pan. The farm boundary fence can be seen running from northeast to southwest across the pan, while a camp fence is present cutting across the south-eastern part of the pan. The study area is indicated on the modern view.*

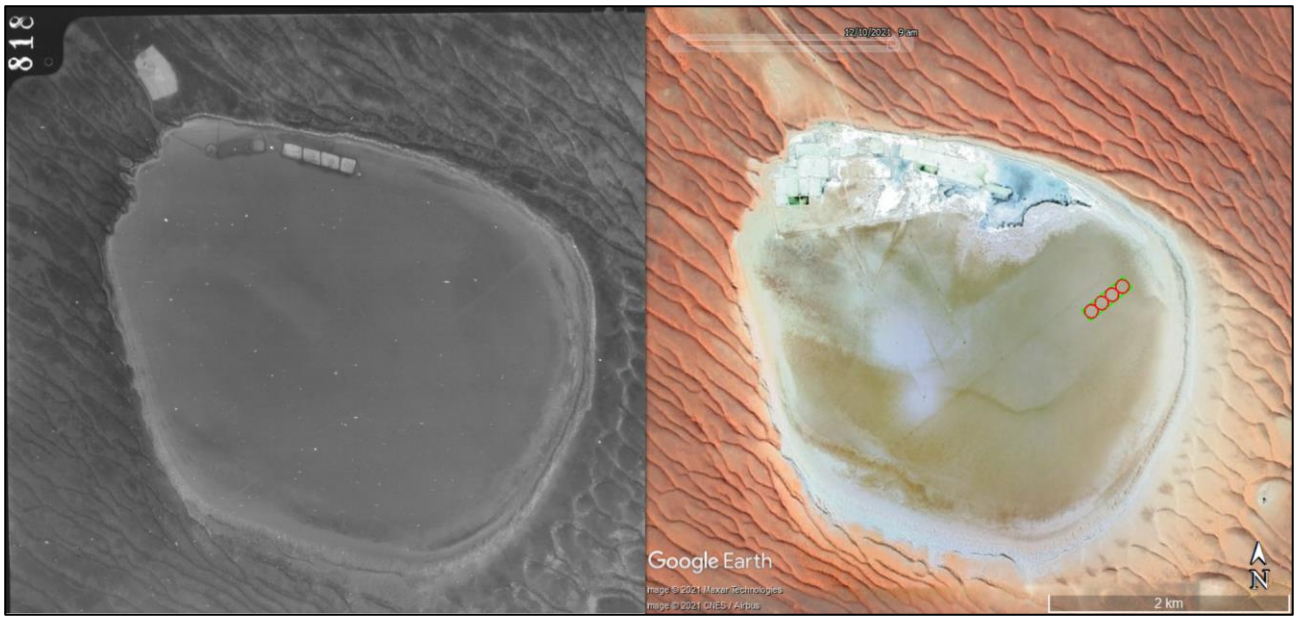

Figure 34: *1978 (818_013_08198) and modern (Google Earth) aerial photography showing the fledgling salt works in the northern part of Konga Pan. The study area is indicated on the modern view.*

Figure 35: *2009 (2720B_2009_135_11_0386_RGB) and modern (Google Earth) aerial photographs showing the extent of the salt works.*

5.4.2. Site visit

No historical features of any sort were seen in or around the pan. The existing salt mine in the north of the pan started operation between 52 and 43 years ago.

5.5. Cultural landscapes and scenic routes

The site is in a very remote area with minimal human intervention aside from the various salt mines and widely scattered farmhouses. Sandy tracks and fences are almost the only other things one sees in the area. For the rest, the landscape is a natural one with considerable scenic beauty. There are no public roads close to the pan so scenic routes are of no concern.

5.6. Statement of significance and provisional grading

Section 38(3)(b) of the NHRA requires an assessment of the significance of all heritage resources. In terms of Section 2(vi), ‘‘cultural significance’’ means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance. The reasons that a place may have cultural significance are outlined in Section 3(3) of the NHRA (see Section 2 above).

The archaeological resources are deemed to have low cultural significance at the local level for their scientific value and can be graded GPC.

Graves are deemed to have high cultural significance at the local level for their social value. If any were found then they would be allocated a grade of IIIA.

The cultural landscape is largely a natural landscape with aesthetic value and is rated as having medium cultural significance at the local level.

5.7. Summary of heritage indicators

- Indicator: Significant archaeological resources or graves should not be damaged or destroyed without further study as required.
- Indicator: The proposed salt works should not dominate the landscape from multiple publicly accessible viewpoints.

6. ASSESSMENT OF IMPACTS

The aspects identified for assessment include archaeology, graves and the cultural landscape.

6.1. Construction Phase

6.1.1. Impacts to archaeological resources

Direct impacts to archaeological materials would occur during the construction phase when the artefacts present in the footprint area get moved, damaged or destroyed. Because of their low cultural significance, however, the impact would be considered of low intensity. Despite the permanence and high likelihood of impacts occurring, the significance is rated as **low negative**

because of the low cultural significance (Table 3). No mitigation is required, since a collection of artefacts would provide almost no useful scientific data. The post mitigation impact significance thus remains **low negative**. There are no fatal flaws in terms of impacts to archaeology.

Table 3: *Assessment of archaeological impacts.*

Potential impacts on palaeontological resources	
Nature and status of impact:	Direct, negative
Extent and duration of impact:	Local, permanent
Intensity	Low
Probability of occurrence:	Definite
Degree to which the impact can be reversed:	Low
Degree to which the impact may cause irreplaceable loss of resources:	High
Cumulative impact prior to mitigation:	Low
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Low
Degree to which the impact can be mitigated:	High (but not required)
Proposed mitigation:	None required
Cumulative impact post mitigation:	Low
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low

6.1.2. Impacts to graves

Direct impacts to graves would occur during the construction phase when graves are exposed, disturbed and damaged by construction activities. Because it is human remains, the cultural significance is high and the impact intensity could be high, depending on how much damage has occurred by the time the grave is seen. Impacts would be permanent but, because the probability is low, the impact significance is rated as **medium negative** before mitigation (Table 4). Mitigation would entail keeping a close watch out for graves during construction of the road and immediately stopping work if bones are uncovered. The find should be protected in place and an archaeologist called to apply for the necessary permit and conduct the exhumation unless the grave can be avoided. With mitigation the significance would drop to **low negative**. There are no fatal flaws in terms of impacts to graves.

Table 4: *Assessment of impacts to graves.*

Potential impacts on archaeological resources	
Nature and status of impact:	Direct, negative
Extent and duration of impact:	Local, permanent
Intensity	High
Probability of occurrence:	Improbable
Degree to which the impact can be reversed:	Low
Degree to which the impact may cause irreplaceable loss of resources:	High
Cumulative impact prior to mitigation:	Low
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Medium
Degree to which the impact can be mitigated:	High
Proposed mitigation:	Protect and report any graves so that formal exhumation can take place.

Cumulative impact post mitigation:	Low
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low

6.1.3. Impacts to the cultural landscape

Direct impacts to the cultural landscape would occur during the construction phase as a result of the introduction of earthmoving equipment and trucks to the area, as well as from the introduction of a gravel surfaced road in the otherwise sandy landscape. However, the area is remote and few people would notice the disruption to the landscape. The intensity is thus low and, despite that the impact would definitely occur if the project proceeds, the significance is rated as **low negative** (Table 5). No mitigation measures are suggested aside from the usual best practice measures of minimising the construction period, minimising the area disturbed and ensuring rehabilitation of any areas not needed during operation. With mitigation, the impact significance would still be **low negative.** There are no fatal flaws in terms of construction phase impacts to the cultural landscape.

Table 5: *Assessment of impacts to the cultural landscape.*

Potential impacts on the cultural landscape	
Nature and status of impact:	Direct, negative
Extent and duration of impact:	Local, short term
Intensity	Low
Probability of occurrence:	Definite
Degree to which the impact can be reversed:	High
Degree to which the impact may cause irreplaceable loss of resources:	Low
Cumulative impact prior to mitigation:	Low
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Low
Degree to which the impact can be mitigated:	Low
Proposed mitigation:	Minimise duration of construction period; Minimise area disturbed; and Ensure rehabilitation of any areas not needed during operation.
Cumulative impact post mitigation:	Low
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low

6.2. Operation Phase

6.2.1. Impacts to the cultural landscape

Direct impacts to the cultural landscape would occur during the operation phase as a result of the movement of trucks to and from the salt works. However, the area is remote and few people would notice this disruption and it is noted that many salt trucks already ply the local roads to and from the several other salt mines in the area. The intensity is thus low and, despite that the impact would definitely occur if the project proceeds, the significance is rated as **low negative** (Table 6). The only mitigation measure is to ensure that all operational phase activities remain within the authorised footprint so that spatial impacts to the landscape are minimised. With mitigation, the impact significance would still be **low negative.** There are no fatal flaws in terms of operational phase impacts to the cultural landscape.

Table 6: *Assessment of impacts to the cultural landscape.*

Potential impacts on the cultural landscape	
Nature and status of impact:	Direct, negative
Extent and duration of impact:	Local, long term
Intensity	Low
Probability of occurrence:	Definite
Degree to which the impact can be reversed:	High
Degree to which the impact may cause irreplaceable loss of resources:	Low
Cumulative impact prior to mitigation:	Low
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Low
Degree to which the impact can be mitigated:	Low
Proposed mitigation:	Ensure that all operation activities remain within the authorised footprint.
Cumulative impact post mitigation:	Low
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low

6.3. Decommissioning Phase

No decommissioning phase is expected to occur.

6.4. Evaluation of impacts relative to sustainable social and economic benefits

Section 38(3)(d) of the NHRA requires an evaluation of the impacts on heritage resources relative to the sustainable social and economic benefits to be derived from the development.

The operation is likely to provide a small number of jobs, but, considering the low significance of heritage impacts, this benefit outweighs the impacts.

6.5. Existing impacts to heritage resources

There are currently no obvious threats to heritage resources on the site aside from the natural degradation, weathering and erosion that will affect archaeological materials and possibly graves. Trampling from grazing animals and/or farm/other vehicles could also occur. These impacts would be of **negligible negative** significance. The existing salt mine at the northern end of Konga Pan but on the neighbouring property does change the character of the area to a degree. However, the pan is not visible from the surrounding area due to all the sand dunes so the significance of this impact to the landscape can be considered **low negative**.

6.6. The No-Go alternative

If the project were not implemented then the site would stay as it currently is. Although the heritage impacts with implementation would be very slightly greater than the existing impacts, the loss of socio-economic benefits is more significant and suggests that the No-Go option is less desirable in heritage terms.

6.7. Cumulative impacts

Other assessments have identified similar stone artefacts in other local pans. However, in all cases these appear to be of low cultural significance which means that, despite the potential loss of artefacts over a wide area, the cumulative impacts are of low significance. Because none of the pans are visible from one another, impacts to the landscape are contained within isolated pockets at each pan where salt is produced. The pans are not generally visible in the landscape from ground level and the proposed project is occurring in a pan that has already been visually compromised so this cumulative impact is of low significance.

6.8. Levels of acceptable change

Any impact to an archaeological or palaeontological resource or a grave is deemed unacceptable until such time as the resource has been inspected and studied further if necessary. Impacts to the landscape are difficult to quantify but in general a development that visually dominates the landscape from many publicly accessible vantage points is undesirable. Because of the limited visibility of the pan, such an impact is not envisaged.

7. INPUT TO THE ENVIRONMENTAL MANAGEMENT PROGRAM

The actions recorded in Table 7 should be included in the environmental management program (EMPr) for the project.

Table 7: *Heritage considerations for inclusion in the EMPr.*

Impact	Mitigation / management objectives & outcomes	Mitigation / management actions	Monitoring		
			Methodology	Frequency	Responsibility
Impacts to archaeology and graves					
Damage or destruction of archaeological sites or graves	Rescue information, artefacts or burials before extensive damage occurs	Reporting chance finds as early as possible, protect in situ and stop work in immediate area	Inform staff and carry out inspections of excavations	Ongoing basis	Construction Manager or Contractor
Impacts to the cultural landscape					
Visible landscape scarring	Minimise landscape scarring	Ensure disturbance is kept to a minimum and does not exceed project requirements. Rehabilitate areas not needed during operation.	Monitoring of surface clearance relative to approved layout	Ongoing basis	Construction Manager or Contractor

8. CONCLUSIONS

This assessment has found no significant impacts to heritage resources that would occur through implementation of the proposed project. The heritage indicators have been met (Table 8) and there are no further concerns pending the discovery of any heritage as a chance find.

Table 8: Heritage indicators and project responses.

Indicator	Project Response
Significant archaeological resources or graves should not be damaged or destroyed without further study as required.	Impacts are highly unlikely and would have to be dealt with as chance finds.
The proposed salt works should not dominate the landscape from multiple publicly accessible viewpoints.	The pan is not visible due to the surrounding dunes so this impact will not occur.

8.1. Reasoned opinion of the specialist

Given the very limited and low significance heritage impacts, it is the opinion of the heritage specialist that the proposed project should be authorised in its entirety.

9. RECOMMENDATIONS

It is recommended that the proposed salt mine be authorised, but subject to the following recommendation which should be included as a condition of authorisation:

- If any archaeological material or human burials are uncovered during the course of development then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist. Such heritage is the property of the state and may require excavation and curation in an approved institution.

10. REFERENCES

Beaumont, P. 2010. Phase 1 archaeological impact assessment report on Portion 148 of Portion 59 (Vrysoutpan) of he farm Kalahari Wes 251 near Askam, Siyanda District Municipality, Northern Cape Province. Kimberley: McGregor Museum.

Masson, J. 2006. Archaeology and geomorphology: Eensaamheid Pan, Northern Cape. *The Digging Stick* 23(1):15-18.

Morris, D. 2005. Report on Phase 1 archaeological assessment of proposed salt works areas on the Goeboe Goeboe Pan, north of Upington, Northern Cape. Kimberley: McGregor Museum.

Morris, D. 2006. Report on Phase 1 archaeological assessment of proposed salt works areas on the Eenzaamheid Pan, north of Upington, Northern Cape. Kimberley: McGregor Museum.

Morris, D. & Hendrerson, A. 2019. Heritage Impact Assessment of proposed prospecting drilling sites at two pans on Gemsbok Horn 242 in the Dawid Kruiper Local Municipality, Northern Cape. Kimberley: McGregor Museum.

SAHRA. 2007. Minimum Standards: archaeological and palaeontological components of impact assessment reports. Document produced by the South African Heritage Resources Agency, May 2007.

Winter, S. & Oberholzer, B. 2013. Heritage and Scenic Resources: Inventory and Policy Framework for the Western Cape. Report prepared for the Provincial Government of the Western Cape Department of Environmental Affairs and Development Planning. Sarah Winter Heritage Planner, and Bernard Oberholzer Landscape Architect / Environmental Planner, in association with Setplan.

APPENDIX 1 – Curriculum Vitae

Curriculum Vitae

Jayson David John Orton

ARCHAEOLOGIST AND HERITAGE CONSULTANT

Contact Details and personal information:

Address: 23 Dover Road, Muizenberg, 7945
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Cell Phone: 083 272 3225
Email: jayson@asha-consulting.co.za

Birth date and place: 22 June 1976, Cape Town, South Africa
Citizenship: South African
ID no: 760622 522 4085
Driver's License: Code 08
Marital Status: Married to Carol Orton
Languages spoken: English and Afrikaans

Education:

SA College High School	Matric	1994
University of Cape Town	B.A. (Archaeology, Environmental & Geographical Science)	1997
University of Cape Town	B.A. (Honours) (Archaeology)*	1998
University of Cape Town	M.A. (Archaeology)	2004
University of Oxford	D.Phil. (Archaeology)	2013

*Frank Schweitzer memorial book prize for an outstanding student and the degree in the First Class.

Employment History:

Spatial Archaeology Research Unit, UCT	Research assistant	Jan 1996 – Dec 1998
Department of Archaeology, UCT	Field archaeologist	Jan 1998 – Dec 1998
UCT Archaeology Contracts Office	Field archaeologist	Jan 1999 – May 2004
UCT Archaeology Contracts Office	Heritage & archaeological consultant	Jun 2004 – May 2012
School of Archaeology, University of Oxford	Undergraduate Tutor	Oct 2008 – Dec 2008
ACO Associates cc	Associate, Heritage & archaeological consultant	Jan 2011 – Dec 2013
ASHA Consulting (Pty) Ltd	Director, Heritage & archaeological consultant	Jan 2014 –

Professional Accreditation:

Association of Southern African Professional Archaeologists (ASAPA) membership number: 233
CRM Section member with the following accreditation:

- Principal Investigator: Coastal shell middens (awarded 2007)
  Stone Age archaeology (awarded 2007)
  Grave relocation (awarded 2014)
- Field Director: Rock art (awarded 2007)
  Colonial period archaeology (awarded 2007)

Association of Professional Heritage Practitioners (APHP) membership number: 43

- Accredited Professional Heritage Practitioner

➢ *Memberships and affiliations:*

South African Archaeological Society Council member	2004 – 2016
Assoc. Southern African Professional Archaeologists (ASAPA) member	2006 –
UCT Department of Archaeology Research Associate	2013 –
Heritage Western Cape APM Committee member	2013 –
UNISA Department of Archaeology and Anthropology Research Fellow	2014 –
Fish Hoek Valley Historical Association	2014 –
Kalk Bay Historical Association	2016 –
Association of Professional Heritage Practitioners member	2016 –

Fieldwork and project experience:

Extensive fieldwork and experience as both Field Director and Principle Investigator throughout the Western and Northern Cape, and also in the western parts of the Free State and Eastern Cape as follows:

Feasibility studies:

- Heritage feasibility studies examining all aspects of heritage from the desktop

Phase 1 surveys and impact assessments:

- Project types
  - Notification of Intent to Develop applications (for Heritage Western Cape)
  - Desktop-based Letter of Exemption (for the South African Heritage Resources Agency)
  - Heritage Impact Assessments (largely in the Environmental Impact Assessment or Basic Assessment context under NEMA and Section 38(8) of the NHRA, but also self-standing assessments under Section 38(1) of the NHRA)
  - Archaeological specialist studies
  - Phase 1 archaeological test excavations in historical and prehistoric sites
  - Archaeological research projects
- Development types
  - Mining and borrow pits
  - Roads (new and upgrades)
  - Residential, commercial and industrial development
  - Dams and pipe lines
  - Power lines and substations
  - Renewable energy facilities (wind energy, solar energy and hydro-electric facilities)

Phase 2 mitigation and research excavations:

- ESA open sites
  - Duinefontein, Gouda, Namaqualand
- MSA rock shelters
  - Fish Hoek, Yzerfontein, Cederberg, Namaqualand
- MSA open sites
  - Swartland, Bushmanland, Namaqualand
- LSA rock shelters
  - Cederberg, Namaqualand, Bushmanland
- LSA open sites (inland)
  - Swartland, Franschhoek, Namaqualand, Bushmanland
- LSA coastal shell middens
  - Melkbosstrand, Yzerfontein, Saldanha Bay, Paternoster, Dwarskersbos, Infanta, Knysna, Namaqualand
- LSA burials
  - Melkbosstrand, Saldanha Bay, Namaqualand, Knysna
- Historical sites
  - Franschhoek (farmstead and well), Waterfront (fort, dump and well), Noordhoek (cottage), variety of small excavations in central Cape Town and surrounding suburbs
- Historic burial grounds
  - Green Point (Prestwich Street), V&A Waterfront (Marina Residential), Paarl

Awards:

Western Cape Government Cultural Affairs Awards 2015/2016: Best Heritage Project.

APPENDIX 2 – Site Sensitivity Verification

A site sensitivity verification was undertaken in order to confirm the current land use and environmental sensitivity of the proposed project area. The details of the site sensitivity verification are noted below:

Date of Site Visit	30 September 2021
Specialist Name	Dr Jayson Orton
Professional Registration Number	ASAPA: 233; APHP: 043
Specialist Affiliation / Company	ASHA Consulting (Pty) Ltd

- Provide a description on how the site sensitivity verification was undertaken using the following means:
(a) desk top analysis, using satellite imagery;
(b) preliminary on -site inspection; and
(c) any other available and relevant information.

Initial work was carried out using satellite aerial photography in combination with desktop research and the author's accumulated knowledge of the local landscape. This was used to provide sensitivity data. Subsequent fieldwork served to ground truth the site, including areas identified as potentially sensitive. The desktop information is presented in the report (Sections 5.2.1 and 5.4.1).

- Provide a description of the outcome of the site sensitivity verification in order to:
(a) confirm or dispute the current use of the land and the environmental sensitivity as identified by the screening tool, such as new developments or infrastructure, the change in vegetation cover or status etc.; and
(b) include a motivation and evidence (e.g. photographs) of either the verified or different use of the land and environmental sensitivity.

The map below is extracted from the screening tool report and shows the archaeological and heritage sensitivity to be low. The site visit showed that the site is indeed of low sensitivity with only low significance archaeological materials having been found. A photographic record and description of the relevant heritage resource is contained within the impact assessment report. The heritage specialist thus confirms the identified sensitivity.


Legend:
Very High
High
Medium
Low
Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community
0
0.1
0.2
0.4 Kilometers
N