FINAL ARCHAEOLOGICAL SURVEY FOR THE PROPOSED KONKOONSIES II SOLAR ENERGY FACILITY, KENHARDT MAGISTERIAL DISTRICT, NORTHERN CAPE

SAHRA Case No.: 292

Report for:

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EXECUTIVE SUMMARY

ASHA Consulting (Pty) Ltd was appointed by Savannah Environmental (Pty) Ltd to conduct a final archaeological survey of the area proposed for development of the Konkoonsies II Solar Energy Facility on Portion 6 of the farm Konkoonsies 91, near Pofadder. The survey was conducted in order to satisfy condition 63 of the environmental authorisation which stated that if there are any changes to the layout, then additional survey work will be required in order to ensure that no sites are impacted and/or to identify the need for an excavation permit. It also serves to provide a more comprehensive statement on the archaeological potential of the development site such that final planning of the project can proceed with the risk of finding archaeological sites during development work minimised.

The study area was a flat plain with some rocky koppies immediately to the northwest and a low hill immediately to the northeast. The layout area was either sandy or gravelly with many small exposures of weathered or solid bedrock. In a few areas in the east wind-blown sand had accumulated into very low dunes. Archaeological visibility was generally excellent.

The study area was found to contain widespread archaeological resources. While a few were of low-medium or medium archaeological significance, the vast majority were of very low significance and are of no further concern. Of the few more significant sites, three fell within the proposed development layout area and would require some mitigation work prior to the commencement of construction activities in order to map the sites and sample the archaeological material present.

It is recommended that planning of the proposed solar facility proceeds but subject to the following:

» Mitigation of the three archaeological sites should be carried out prior to the commencement of construction;
» No disturbance of areas outside of the planned layout footprint should occur; and
» 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 20 000 years ago.

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

ASAPA: Association of Southern African Professional Archaeologists

BAR: Basic Assessment Report

CRM: Cultural Resources Management

ESA: Early Stone Age

GPS: global positioning system

HIA: Heritage Impact Assessment

LSA: Later Stone Age

MSA: Middle Stone Age

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

SAHRA: South African Heritage Resources Agency

SAHRIS: South African Heritage Resources Information System

Contents

1. INTRODUCTION

ASHA Consulting (Pty) Ltd was appointed by Savannah Environmental (Pty) Ltd to conduct a final archaeological survey of the area proposed for development of the Konkoonsies II Solar Energy Facility on Portion 6 of Konkoonsies 91, near Pofadder (Figure 1). Two other solar energy facilities are already located nearby (Figure 2). Although no final survey was actually requested by SAHRA, the present survey was conducted in order to satisfy condition 63 of the environmental authorisation which stated that if there are any changes to the layout, then additional survey work will be required in order to ensure that no sites are impacted and/or to identify the need for an excavation permit. It also serves to provide a more comprehensive statement on the archaeological potential of the development site such that final planning of the project can proceed with the risk of finding archaeological sites during development work minimised.

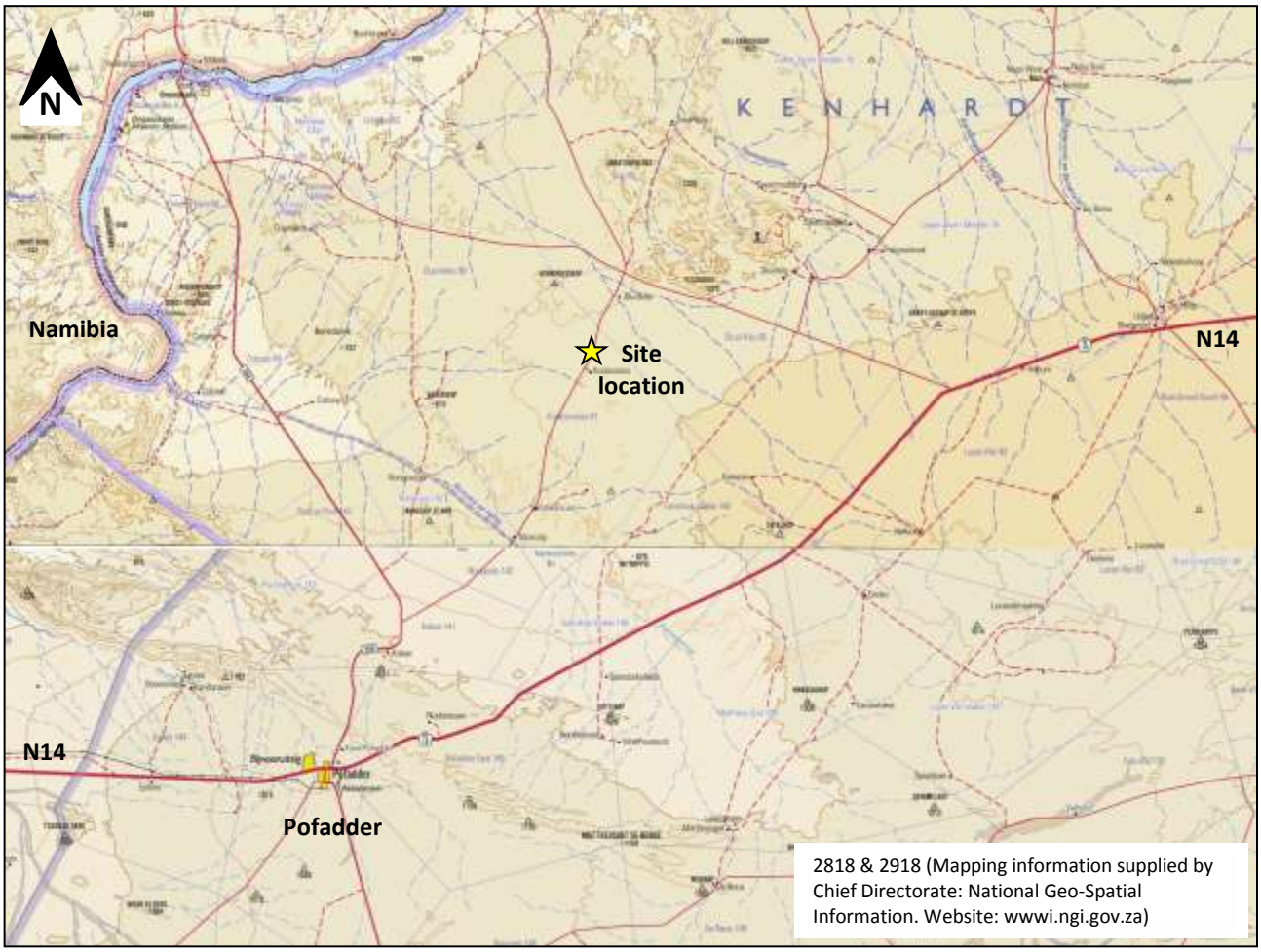

Figure 1: *Map showing the location of the site.*

1.1. Project description

It is proposed to construct and operate a 75 MW solar energy facility on the site. The project has received environmental authorisation and has been awarded preferred bidder status. The grid connection will be to the Paulputs Substation which lies immediately to the north of the development area. A separate Basic Assessment (BAR) is being conducted for this alignment.

1.2. Terms of reference

ASHA Consulting was appointed to survey all the affected areas within the development footprint to locate any archaeological heritage resources that might require mitigation work prior to commencement of construction.

Figure 2: *Aerial view of the study area showing the layout surveyed in blue. The smaller, completed facility to the west of the present project area is the Konkoonsies I facility, while the substantially larger facility only partially visible to the northeast is Kaxu Solar One.*

1.3. Scope and purpose of the report

This final archaeological survey aims to locate any archaeological sites that might be present within the final development footprint and determine their significance and the need for any mitigation work prior to construction. This would avoid any potential delays that might arise should an archaeological site be discovered during development. The nature of any mitigation requirements would also be outlined such that final planning of the development can take place.

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 the Western Cape and Northern Cape provinces of South Africa since 2004. He has also conducted research on aspects of the Later Stone Age in these provinces and published widely on the topic. He is accredited 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. HERITAGE LEGISLATION

The National Heritage Resources Act (NHRA) No. 25 of 1999 protects a variety of heritage resources as follows:

- Section 34: structures older than 60 years;
- Section 35: palaeontological, prehistoric and historical material (including ruins) more than 100 years old;
- 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.

Only archaeological resources, and possibly graves, are relevant to the present project and these are defined in Section 2 as follows:

- 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

3. METHODS

3.1. Literature survey

A survey of available literature was carried out to assess the general heritage context into which the development would be set. This literature included published material, unpublished commercial reports and online material, including reports sourced from the South African Heritage Resources Information System (SAHRIS).

3.1.1. Previous work

Two previous archaeological surveys have taken place on the property (Pelser 2011, 2012). However, from the reporting it is unclear which areas were surveyed and what level of detail was applied, since no track logs are provided. Although the locations of the surveys are unclear, the mapping of project areas for assessment suggests that all of the land should have been considered; the land to the west of the main road in the 2011 report and that to the east in 2012. The very restricted distribution of recorded archaeological sites in both reports,

however, suggests that the surveys were rather limited in their coverage. As a result, the conclusions probably did not present a full picture of the archaeological potential of the site.

3.2. Field survey

Mapping was provided indicating the proposed development footprint. For the purposes of the survey a polygon was created that included all four layout areas as well as some surrounding land that had been included in the original development area. The slightly broader survey allows better management of heritage resources in and around the study area. The site was subjected to a detailed survey on the 30th June and the 1st of July 2015. During the survey the positions of finds were recorded on a hand-held GPS receiver set to the WGS84 datum. Photographs were taken at times in order to capture representative samples of both the affected heritage and the landscape setting of the proposed development.

3.3. Grading

Section 7 of the NHRA provides for the grading of heritage resources into those of National (Grade 1), Provincial (Grade 2) and Local (Grade 3) significance. Grading is intended to allow for the identification of the appropriate level of management for any given heritage resource. Grade 1 and 2 resources are intended to be managed by the national and provincial heritage resources authorities, while Grade 3 resources would be managed by the relevant local planning authority. These bodies are responsible for grading, but anyone may make recommendations for grading – something that is, at times, required in HIAs.

It is intended 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. Heritage Western Cape (2012), however, uses a system in which resources of local significance are divided into Grade 3A, 3B and 3C. These approximately equate to high, medium and medium-low local significance, while sites of low or very low significance (and generally not requiring mitigation or other interventions) are referred to as un-gradeable.

3.4. Assumptions and limitations

The study is carried out at the surface only and hence any completely buried archaeological sites will not be readily located. Similarly, it is not always possible to determine the depth of archaeological material visible at the surface. The nature of the surface meant that there were no limitations to the visibility of archaeological material.

4. PHYSICAL ENVIRONMENTAL CONTEXT

4.1. Site context

The study area is, at present, grazing land. It is split by a gravel road and a power line runs southwards through the western half from the Paulputs Substation which lies at the far northern end of the study area. Two other solar energy facilities are already present in the area, a smaller one immediately to the west of the present layout area and a very much larger one to the northeast that is still under construction (Figure 2). As such, there is a precedent for solar development in the area.

4.2. Site description

The study area is an extensive, open and generally fairly flat grassy plain punctuated by occasional rocky hills and, further away, larger mountains (Figures 3 to 5). The substrate is generally sandy, although fine gravel is ubiquitous. Vegetation cover is sparse, with denser bushes generally indicating the location of very ephemeral seasonal drainage lines (Figure 6). The majority is very open though, and appears to have been overgrazed (Figure 7). Archaeological visibility is thus excellent. In many areas, but less so in the northeast, there are

exposures of heavily weathered and eroded bedrock (Figure 8). These areas are generally more gravelly. Outcrops of solid bedrock are also present (Figure 9) but these are far less common and seemed to be present more often in the south of the study area; some of them trapped pools of water. In the far northeast, just outside of the development footprint, is a small water course with a sand dune and taller vegetation along its southern edge (this area has obviously been deliberately excluded from the development area). In other parts of the eastern half of the development footprint small accumulations of sand were noted, sometimes associated with rocky outcrops.

Figure 3: *View towards the northeast across the western half of the study area.*

Figure 4: *Panoramic view towards the northeast (left), southeast (centre) and southwest (right) from the summit of the large rocky hill at the western edge of the study area. The Konkoonsies I (KKI) facility is visible to the right.*

Figure 5: *View towards the south from a low hill to the northeast of the study area.*

5. ARCHAEOLOGICAL HERITAGE CONTEXT

This section of the report establishes what is already known about archaeological heritage resources in the vicinity of the study area. What is found during the field survey may then be compared with what is already known in order to gain an improved understanding of the significance of the newly reported resources.

Figure 6: *Bushes mark very ephemeral seasonal drainage lines. This one is in the southwest.*

Figure 7: *Sandy surface with minimal vegetation cover in the northeast.*

Figure 8: *Heavily weathered bedrock exposure.* ***Figure 9:*** *Solid bedrock exposure.*

The two surveys by Pelser (2011, 2012) are most relevant. He recorded a number of scatters of ostrich eggshell, although some of these may have been quite ephemeral. He also found scatters of quartz artefacts. All were ascribed to the Later Stone Age (LSA). They occurred in open areas as well as around the foot of the small rocky koppies located to the northwest of the study area. He found nothing in the south. Morris (2012) worked just to the northeast of the present study area and found ostrich eggshell fragments, a small quartz outcrop quarry and a scatter of Early (ESA) and Middle Stone Age (MSA) artefacts.

Examination of the SAHRIS database shows that many small scale mining operations have been applied for and approved in the mountains to the northeast of the study area. For the most part, heritage studies do not appear to have been requested for these projects. However, a survey of certain areas in and around these granite mountains and the larger koppies further to the northeast yielded a variety of Stone Age sites. These included artefact scatters, sometimes with pottery, ostrich eggshell and bone and also granite bedrock outcrops with a number of grinding grooves (Orton & Webley 2013). Historical sites were also found including some stone-packed graves and a stone-built animal trap ('*tierhok*').

A particular feature of Bushmanland is the presence of smoothed patches of bedrock alongside ephemeral pans or other areas where water accumulates. These are assumed to have functioned as lower grindstones for the processing of food. Orton & Webley (2012) recorded such finds to the southwest of Pofadder.

More generally, it can be noted that archaeological sites in the area tend to be more commonly encountered around the fringes of granite hills, on sand dunes or around pans (Beaumont *et al.* 1995). Other surveys in the region support this contention (Halkett 2010; Morris 2011).

6. FINDINGS OF THE HERITAGE STUDY

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

Table 1: *List of archaeological heritage resources recorded during the study. Note that some are outside the layout area but all recorded sites are listed to facilitate proper management of archaeological heritage during construction. Site names have been allocated to those sites that can be spatially defined and that are certain to not represent background scatter. Significance followed by (?) indicates that there could be buried archaeology and the significance could be higher.*

Waypoint Site name	**Co-ordinates**	**Description**	**Significance**
637	S28 52 58.6 E19 33 33.2	Light background scatter of quartz.	Very low
638 **KK2015/001**	S28 53 02.9 E19 33 32.1	LSA scatter of quartz artefacts at the northern foot of the rocky koppie. One scraper noted.	Low
639 **KK2015/002**	S28 53 04.6 E19 33 31.9	A single upper grindstone and a light LSA quartz artefact scatter at the southern foot of a rocky koppie.	Low
640 **KK2015/003**	S28 53 03.8 E19 33 32.9	A dense LSA quartz artefact scatter of about 20 m diameter at the eastern base of a rocky koppie. A bipolar core and an irregular core noted.	Low-medium
641 **KK2015/004**	S28 53 07.5 E19 33 29.2	Large scatter of quartz artefacts of indeterminate age on a ledge on the northern part of the larger rocky koppie.	Low
642-643 **KK2015/005**	S28 53 06.2 E19 33 31.9 S28 53 08.2 E19 33 32.7	A large and very dense LSA quartz artefact scatter of at least 50 m by 100 m in size at the eastern base of the larger rocky koppie. One artefact in CCS was also noted. This appears to be at the same place where Pelser (2011) recorded only some ostrich eggshell fragments (his Site 2).	Medium
644	S28 53 11.3 E19 33 31.9	A small, light scatter of quartz artefacts of indeterminate age at the northern foot of a small rocky koppie.	Very low
645	S28 53 12.7 E19 33 33.9	An outcrop of quartz gravel (no doubt a weathered seam) with many flakes amongst the gravel.	Very low
646	S28 53 31.1 E19 33 16.2	A light scatter of quartz artefacts, probably of mixed age, located at the confluence of three ephemeral drainage lines.	Very low
647	S28 53 51.2 E19 33 25.7	A light scatter of MSA quartz artefacts of about 10 m diameter.	Very low
648	S28 53 51.3 E19 33 29.6	A light scatter of MSA quartz artefacts of about 30 m diameter. There is possibly some LSA here as well.	Very low
649 **KK2015/006**	S28 53 44.5 E19 33 39.6	A quarried quartz outcrop.	Very low

Waypoint Site name	Co-ordinates	Description	Significance
650 **KK2015/007**	S28 53 43.2 E19 33 38.1	A quarried quartz outcrop.	Very low
651	S28 53 35.3 E19 34 09.6	A scatter of ostrich eggshell fragments alongside an ephemeral seasonal drainage line.	Very low
652	S28 54 03.4 E19 33 52.9	A quartz artefact scatter of mixed age in a sandy, deflated area.	Very low
653	S28 53 57.0 E19 33 47.6	A quartz artefact scatter of mixed age in a rocky/deflated area.	Very low
654	S28 53 59.1 E19 33 36.3	A light quartz artefact scatter of mixed age in a sandy, deflated area alongside a bedrock outcrop.	Very low
655	S28 54 04.2 E19 33 46.2	A light quartz artefact scatter of mixed age in a deflated area with bedrock exposures.	Very low
656-657 **KK2015/008**	S28 54 09.1 E19 33 56.1 S28 54 09.4 E19 33 56.1	A dense LSA quartz artefact scatter in a deflated area alongside two bedrock outcrops. One outcrop has several ephemeral grinding patches on it as well as two more heavily ground patches.	Medium **[sample artefacts and record site]**
658 **KK2015/009**	S28 54 02.0 E19 34 00.4	Light quartz artefact scatter, probably LSA, in a deflated area alongside bedrock outcrops.	Very low
659	S28 54 08.3 E19 34 00.7	Bedrock outcrop with a single ground patch on it.	Very low
660-661 **KK2015/010**	S28 54 10.1 E19 33 59.6 S28 54 09.5 E19 33 58.4	Bedrock outcrop with hollows containing standing water. There are several ground patches on it. There are occasional fragments of ostrich eggshell and a few quartz flakes around the outcrop but the scatter is very ephemeral. To the southeast is a second bedrock outcrop, also with a hollow containing standing water. It bears about six ground patches.	Low-medium
662 **KK2015/011**	S28 54 10.8 E19 34 13.6	A light quartz scatter, probably LSA, in a deflated area with bedrock exposures.	Very low
663 **KK2015/012**	S28 54 09.6 E19 34 13.3	Bedrock outcrop with a hollow containing standing water. There are seven ground patches on it. The surrounding sand has quartz and CCS artefacts, pottery and ostrich eggshell fragments. Just further north there is another patch of dense quartz artefact scatter.	Medium **[sample artefacts and record site]**
664	S28 54 07.3 E19 34 13.5	Light LSA quartz artefact scatter on the edge of a low sand dune.	Low
665	S28 54 06.0 E19 34 12.7	Bedrock exposure surrounded by wind-blown sand and with two ground patches on it.	Very low
666	S28 54 07.8 E19 34 10.5	An isolated lower and upper grindstone. The lower grindstone has been flaked along its edge. The lower grindstone was found face up. There were no associated artefacts.	Very low.
667	S28 54 06.8 E19 34 10.6	An isolated lower grindstone found on the southern side of a low sand dune. It was ground on both faces.	Very low
668	S28 54 03.4	Quartz scatter of indeterminate age in a	Very low

Waypoint Site name	Co-ordinates	Description	Significance
	E19 34 01.2	deflated area.	
669 **KK2015/013**	S28 53 36.4 E19 34 22.0	A partly buried lower grindstone and several ostrich eggshell fragments on a sand dune along the southern edge of a small river bed 100 m outside the north edge of the layout area. There was also a fragment of ostrich eggshell beneath the lower grindstone suggesting there could be depth to the archaeological deposit here. A few meters away was a cobble that had been used as an anvil on both its faces as well as a broken lower grindstone. There is a good chance that buried archaeological deposits are present here.	Low-medium (?)
670 **KK2015/014**	S28 53 42.7 E19 34 27.6	A lower grindstone lying on a sand dune on the southern side of a small river bed 250 m outside the north-eastern edge of the layout area. There could be buried archaeological material present.	Low (?)
671 **KK2015/015**	S28 53 51.7 E19 34 08.8	Bedrock outcrop with a hollow containing standing water and wind-blown sand accumulated around it. There are two ground patches on the outcrop. There are also some ostrich eggshell fragments and some quartz artefacts around the outcrop. Most artefacts and ostrich eggshell fragments are in an elevated area to the west of the bedrock outcrop and there could be buried archaeological material here.	Low-medium (?) **[test for depth and capture sample of material]**

Figure 10: *Aerial view of the northern half of the study area showing all the archaeological sites and occurrences recorded. Those found by Pelser (2011, 2012) are indicated by the white diamonds, while green circles denote sites recorded during the present project that do not require sampling. GPS tracks are indicated by the yellow lines.*

Figures 10 and 11 show the locations of all the archaeological sites and occurrences found during the survey. Note that many of the recorded locations cannot be deemed to be archaeological sites because they revealed only background scatter or isolated artefacts of very low significance. Figure 12 shows all those sites that are deemed to be of more than low significance. Note that no sites of high or very high significance were found.

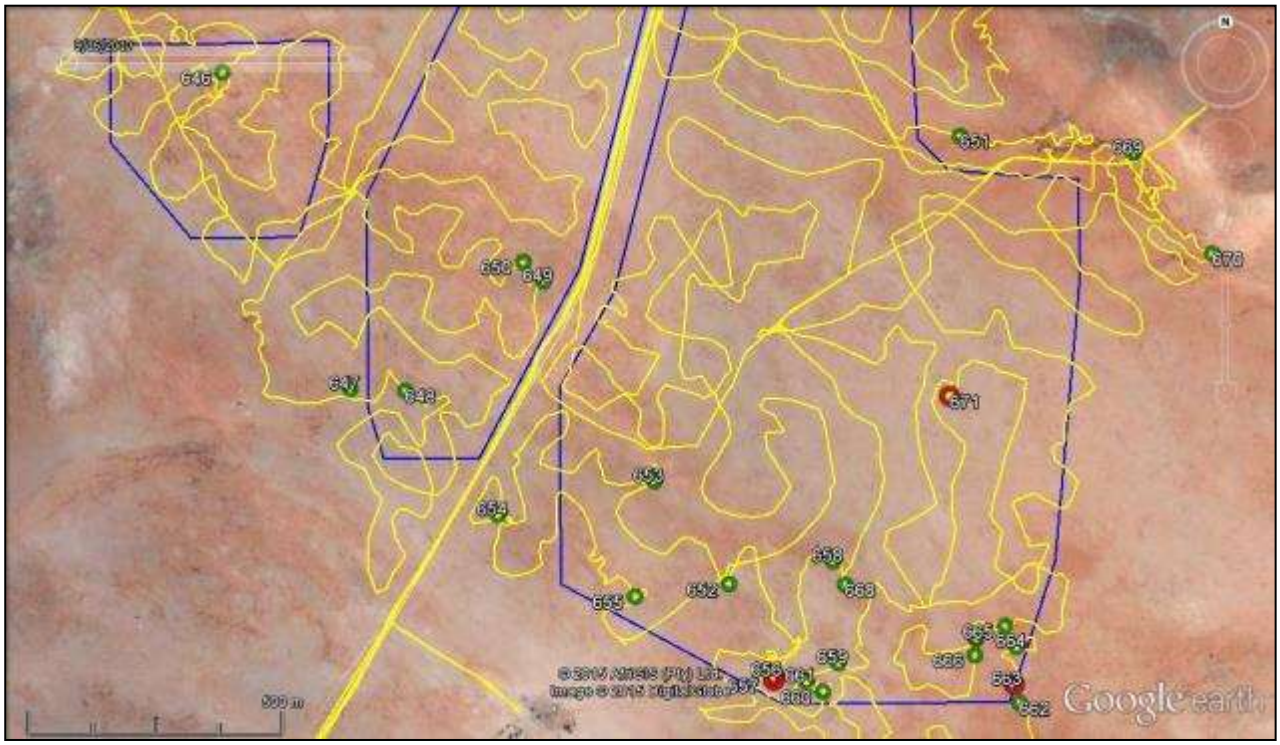

Figure 11: *Aerial view of the southern half of the study area showing all the archaeological sites and occurrences recorded. Green and red circles denote sites recorded during the present project that do and do not require sampling respectively (no sites were found by Pelser in this area). GPS tracks are indicated by the yellow lines.*

This survey has recorded substantially more heritage resources than those that preceded it. The distribution of archaeological material was found to be widespread across the study area, although the vast majority of it is of very low significance. This material included mostly isolated or very low density artefacts that could be attributed to 'background scatter' as well as very light artefacts scatters that, although retaining some spatial integrity, seemed too ephemeral to be able to provide any meaningful archaeological information. In general, the south-western part of the study area was found to have more background scatter than the rest of the site.

Figures 13 to 16 illustrate some occurrences of background scatter and the contexts in which they were found. Figure 17 shows a quartz outcrop that has been used as a quarry to source stone for artefact manufacture with flakes having been removed directly from its edge. Such flaked outcrops are common in Bushmanland and, perhaps surprisingly, dense artefact scatters are seldom found in association with them. This suggests that the flaked material was generally removed and taken to other areas. One isolated quartzite flake was found to have calcrete adhering to its ventral surface. This indicates its great age; it probably dates to the ESA.

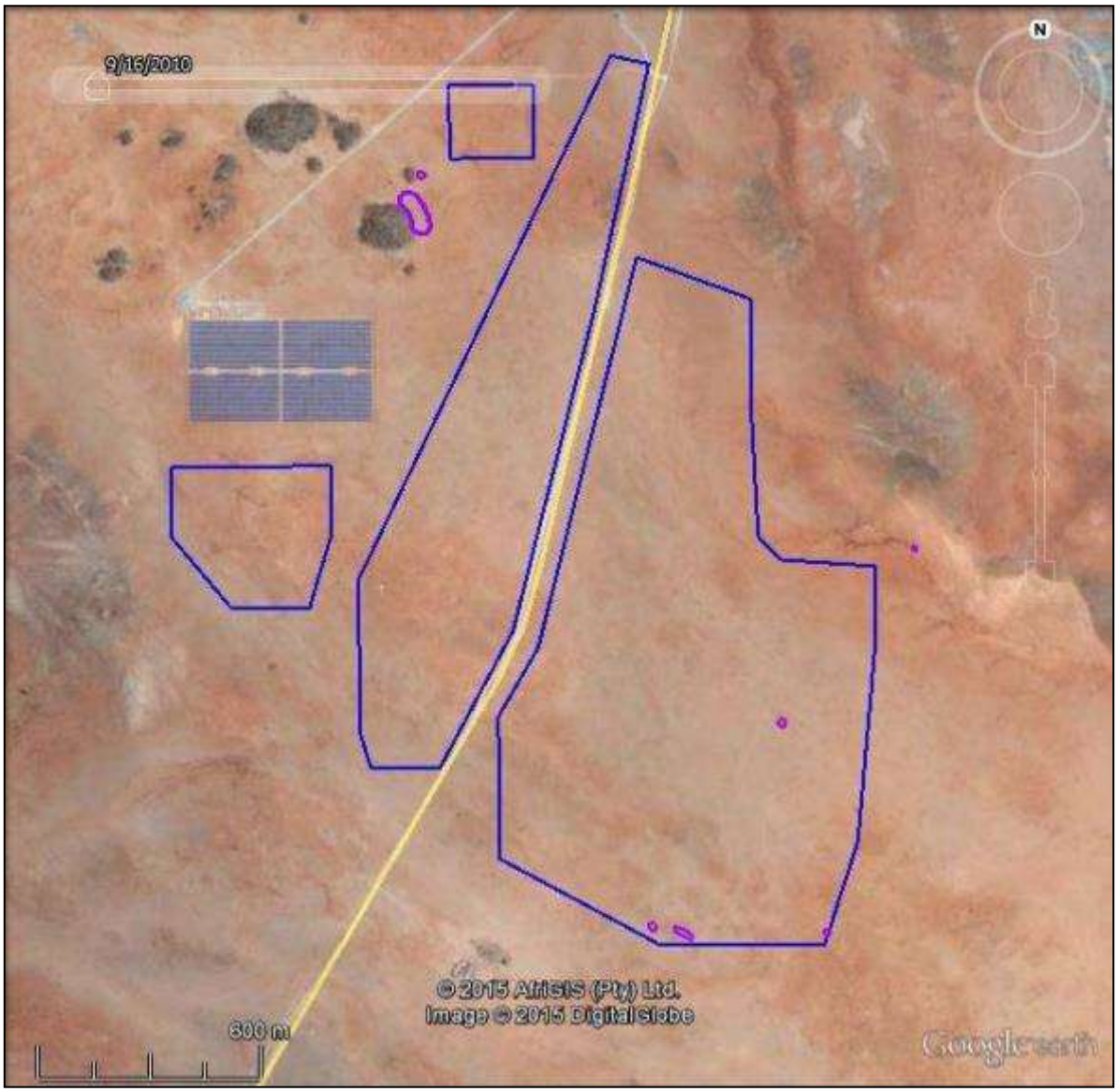

Figure 12: *Aerial view of the study area showing the locations of all sites deemed to be of low-medium or medium significance (seven purple outlines).*

Figure 13: *Stone artefacts from the background scatter at Waypoint 637. Scale in 1 cm intervals.*

Figure 14: *The context of the artefacts found at Waypoint 637.*

Figure 15: *Stone artefacts from the background scatter at Waypoint 648. Scale in 1 cm intervals.*

Figure 16: *The context of the artefacts found at Waypoint 648.*

A number of occurrences were deemed to carry greater significance. The contexts of these sites varied considerably and it is no doubt because of their particular locations that they were more intensely used and hence reveal more archaeological material. The first context of relevance here is the areas around the bases of the rocky hills (Figure 18). Several sites were found around the rocky hills, both during the present survey and also by Pelser (2011). The hills may have afforded the people some shelter during windy periods. It should be noted that all of these rocky hills and their immediate surrounds have been excluded from development such that all sites in these areas are protected.

Figure 17: *A quartz outcrop used as a source of stone material for artefact manufacture. 649 scale in 2 cm intervals.*

Figure 18: *View over the area with a very dense LSA artefact scatter alongside the larger koppie.*

The second context in which more important sites were found is along the sand dune fringing the small river to the northeast of the layout area. Three sites were found there, although one of them (Waypoint 670) yielded just a single artefact. Nevertheless, both here and at Waypoint 669 there could be buried deposits within the sand dune. The third site contained only a light scatter of ostrich eggshell. The people probably used this area after seasonal rains when a small rivulet may have been flowing down the stream bed. This stream bed and its accompanying small dune ridge have been excluded from the development footprint such that these sites will be protected from harm.

The third context is areas of exposed bedrock out in the open that trap rain water. Several such places were found during the study, all within the south-western part of the study area. Figure 19 shows an example where very few artefacts were present in the surrounding area. However, this and another adjoining outcrop both had standing water and several grinding

areas on them. Figure 20 shows another outcrop that has a small but deep (*c.* 30 cm) hole containing water. There were also several ground patches on this rock but the sand around the outcrop contained archaeological remains. These consisted of stone artefacts, pottery fragments (which date within the last 2000 years) and ostrich eggshell fragments (Figure 21).

Figure 19: *The bedrock outcrop at Waypoint 661. The patches of water are visible, as is one of the larger ground patches (arrowed).*

Figure 20: *The bedrock outcrop and water point at Waypoint 663.*

Figure 21: *A potsherd and edge-damaged flake from Waypoint 663. Scale in 5 mm intervals.*

6.1. 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.

Certain archaeological resources are deemed to have low-medium or medium cultural significance for their scientific value, although the majority of occurrences in the study area have very low significance. The former could be assigned a provisional grade of 3c, while the rest are all ungradeable.

7. CONCLUSIONS

The survey has revealed that archaeological resources are far more widespread on the site than was anticipated and that a small number of them have scientific value. Three of the latter fall within the development footprint but none are of high cultural significance and, as such, none of them require *in situ* preservation. Mitigation is recommended for the three sites that will be impacted, however, and this could be easily implemented. This would serve the purpose of documenting the sites and obtaining samples of artefacts and other materials from them that can inform on precolonial use of the landscape and of those sites in particular. Sites where no mitigation is suggested are simply too ephemeral and the information yield would not be worthwhile.

Three sites have been suggested for mitigation in Table 1. These are KK2015/001 (Waypoint 656-657), KK2015/002 (Waypoint 663) and KK2015/003 (Waypoint 671; Figure 22). The first two contain artefact scatters that will provide meaningful data and an excavation covering the areas of artefact scatter should be carried out. The third, however, has relatively little on the surface but the site has a layer of wind-blown sand over it which could be concealing a denser artefact accumulation below. With mitigation work factored in, the development could certainly continue as planned.

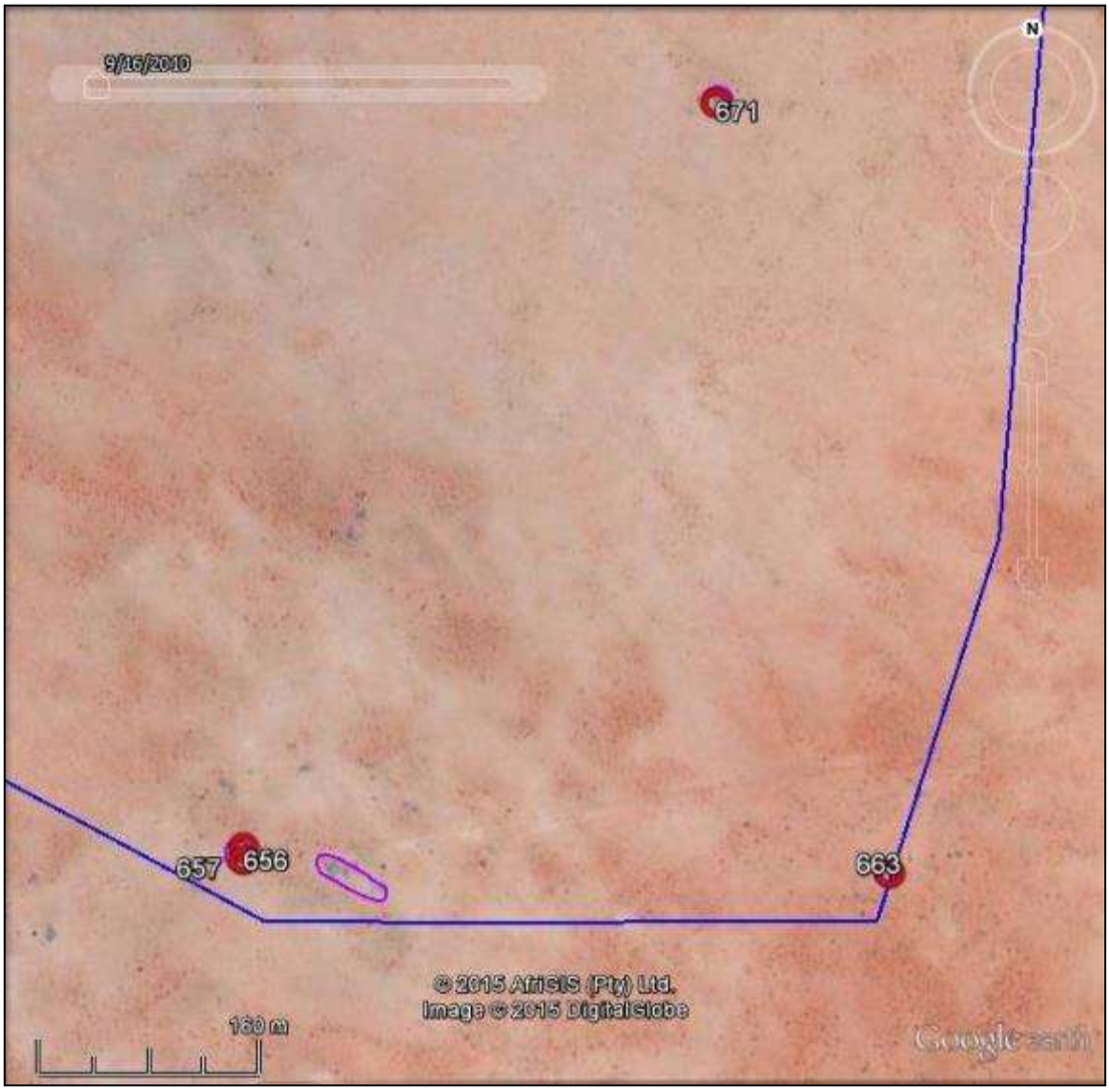

Figure 22: *Aerial view of the south-eastern part of the study area showing the locations of the three important sites that will be impacted and where mitigation should be carried out.*

7.1. Mitigation

The mitigation recommended would entail establishing a grid of one meter squares over the sites, mapping the bedrock exposures and water accumulations and then excavating the archaeological material from the surrounding areas within the grid squares – this is most relevant at KK2015/001 and KK2015/002. At first the surface would need to be scraped off and sieved to collect the surface artefact scatters and then subsurface testing should be carried out in order to check for any deeper deposits. Should deeper material be found then these levels would also need to be sampled over a wider area.

Note that a permit for this excavation work would need to be obtained by the appointed archaeologist. This permit is in the name of the archaeologist and not the developer and is required in order to allow SAHRA to ensure that the work will be carried out by an appropriately experienced archaeologist.

7.2. Management

A number of other sites with low-medium or medium significance were identified outside of the development footprint but still within fairly close proximity of the planned facility. As such, it will be important to ensure that all activities take place within the planned disturbance footprint so as to avoid accidental destruction of archaeological sites that have not been mitigated.

8. RECOMMENDATIONS

It is recommended that planning of the proposed solar facility proceed but subject to the following:

» Mitigation of the three archaeological sites should be carried out prior to the commencement of construction;
» No disturbance of areas outside of the planned layout footprint should occur; and
» 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.

9. REFERENCES

Beaumont, P.B., Smith, A.B., & Vogel, J.C. 1995. Before the Einiqua: the archaeology of the frontier zone. In A. B. Smith (ed.) *Einiqualand: studies of the Orange River frontier*. Cape Town: UCT Press.

Halkett, D. 2010. An assessment of impact on archaeological heritage resulting from replacement of a section of the existing bulkwater supply pipeline from Pella to Pofadder, Northern Cape. Unpublished report prepared for Van Zyl Environmental. St James: ACO Associates cc.

Heritage Western Cape. 2012. A short guide to and policy statement on grading. Version 6, 30th May 2012.

Morris, D. 2011. A Phase 1 Heritage Impact Assessment for the proposed Aggeneis – Paulputs 220kV transmission line. Unpublished report for SSI Engineers and Environmental Consultants.

Orton, J. & Webley, L. 2013. Heritage impact assessment for proposed granite prospecting near Pofadder, Northern Cape. Unpublished report prepared for Sizisa Ukhanyo Trading 830 cc. Diep River: ACO Associates cc.

Pelser, A.J. 2011. A report on an archaeological impact assessment (AIA) for the proposed solar energy plant on Konkoonsies 91, Pofadder District, Northern Cape. Unpublished report prepared for Robert de Jong and Associates. Wonderboompoort: Archaetnos.

Pelser, A.J. 2011. A report on a heritage impact assessment (HIA) for the proposed photo-voltaic solar power generation plant on Konkoonsies 91, Pofadder District, Northern Cape. Unpublished report prepared for EScience Associates (Pty) Ltd. Wonderboompoort: Archaetnos.