HERITAGE IMPACT ASSESSMENT FOR A PROPOSED CHICKEN BROILER FACILITY ON PORTION 40 OF THE FARM JONATHAN 175-JQ, NORTH WEST, ODI 1 MAGISTERIAL DISTRICT, NORTH WEST PROVINCE

Required under Section 38 (8) of the National Heritage Resources Act (No. 25 of 1999).

SAHRA Case ID: 10049

Report for:

CSIR – Environmental Management Services
P.O. Box 320, Stellenbosch, 7599
Tel: 021 888 2432
Email: rmogotshi@csir.co.za

On behalf of:

Jam Rock (Pty) Ltd

Dr Jayson Orton
ASHA Consulting (Pty) Ltd
6A Scarborough Road, Muizenberg, 7945
Tel: (021) 788 8425 | 083 272 3225
Email: jayson@asha-consulting.co.za

Jaco van der Walt
Heritage Contracts Archaeological Consulting
37 Olienhout Street, Modimolle, 0510
Tel: 082 373 8491
Email: jaco.heritage@gmail.com

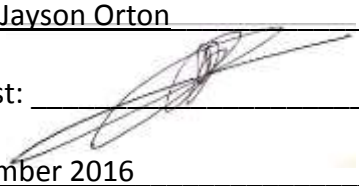
24 November 2016

Specialist declaration

I, Jayson Orton, as the appointed independent specialist, in terms of the 2014 EIA Regulations, hereby declare that I:

- I act as the independent specialist in this application;
- I perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- regard the information contained in this report as it relates to my specialist input/study to be true and correct, and do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the NEMA, the Environmental Impact Assessment Regulations, 2014 and any specific environmental management Act;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I have no vested interest in the proposed activity proceeding;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- I have ensured that information containing all relevant facts in respect of the specialist input/study was distributed or made available to interested and affected parties and the public and that participation by interested and affected parties was facilitated in such a manner that all interested and affected parties were provided with a reasonable opportunity to participate and to provide comments on the specialist input/study;
- I have ensured that the comments of all interested and affected parties on the specialist input/study were considered, recorded and submitted to the competent authority in respect of the application;
- all the particulars furnished by me in this specialist input/study are true and correct; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.

Name of Specialist: Jayson Orton

Signature of the specialist: 

Date: 24 November 2016

EXECUTIVE SUMMARY

ASHA Consulting (Pty) Ltd was appointed by the Council for Scientific and Industrial Research (CSIR) to conduct an assessment of the potential impacts to heritage resources that might occur through the proposed development of a chicken broiler facility on Portion 40 of the farm Jonathan 175-JQ in North West Province. The site is 9.1689 ha in extent and is located at S 25.2670° E 27.8836°. The project would include three hen houses, two storage facilities, a house/office and staff quarters.

The site is located in a rural area that lacks any sort of large scale development. Much land has been ploughed in recent decades, although at present most is unused because of drought conditions. The study area is flat and covered in thorn bushes. Open areas between the bushes tended to be sandy. Archaeological visibility was good between the thorn bushes but not all of the site could be accessed due to dense clumps of bush.

The survey revealed a number of relatively recent features including two small informal cemeteries containing three graves each. One features many cement bricks likely to have been reused from a ruin constructed of the same materials and thought to date to no earlier than the 1950s. This suggests the graves to be much more recent. The other three graves are packed with stones and may be older. Although their ages are uncertain, following the precautionary principle both cemeteries are regarded as heritage resources. Human remains are, in any event, important. The only other heritage resource present was a very low density and widespread scatter of stone artefacts, possible dating to the Middle Stone Age. These are not significant. No fossils were seen and the chances of important fossils occurring are deemed to be very small. Trace fossils, fossil pollens and spores and very rare dinosaur bones are known from the region.

The original proposal would have impacted on at least one of the two cemeteries. Once their locations became known the proposal was redesigned in order to avoid impacts. As such, and provided that the graves are clearly fenced off during construction, no significant impacts to heritage resources are expected.

It is recommended that the proposed chicken broiler facility should be authorised but subject to the following conditions which should be incorporated into the Environmental Authorisation:

- The two graveyards should be fenced off clearly and pointed out to all construction workers and other staff on site to ensure that impacts to them are avoided;
- No construction work should occur within 10 m of any of the graves; and
- If any archaeological material, palaeontological 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 appropriate specialist. 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

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

BAR: Basic Assessment Report

CRM: Cultural Resources Management

GPS: global positioning system

HIA: Heritage Impact Assessment

LSA: Later Stone Age

MSA: Middle Stone Age

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

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

READ: North West Department of Rural Environment and Agricultural Development

SAHRA: South African Heritage Resources Agency

SAHRIS: South African Heritage Resources Information System

Compliance with Appendix 6 of the 2014 EIA Regulations

	Addressed in the Specialist Report
1. (1) A specialist report prepared in terms of these Regulations must contain- a) details of- i. the specialist who prepared the report; and ii. the expertise of that specialist to compile a specialist report including a curriculum vitae;	Section 1.4 & Appendix 1
b) a declaration that the specialist is independent in a form as may be specified by the competent authority;	Page ii
c) an indication of the scope of, and the purpose for which, the report was prepared;	Section 1.3
d) the date and season of the site investigation and the relevance of the season to the outcome of the assessment;	Section 3.2
e) a description of the methodology adopted in preparing the report or carrying out the specialised process;	Section 3
f) the specific identified sensitivity of the site related to the activity and its associated structures and infrastructure;	Section 1.1.1
g) an identification of any areas to be avoided, including buffers;	Section 7.1.2
h) a map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;	Section 6 (Figure 5)
i) a description of any assumptions made and any uncertainties or gaps in knowledge;	Section 3.5
j) a description of the findings and potential implications of such findings on the impact of the proposed activity, including identified alternatives on the environment;	Sections 6 & 7
k) any mitigation measures for inclusion in the EMPr;	Sections 7 & 13
l) any conditions for inclusion in the environmental authorisation;	Sections 7 & 13
m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;	Section 9
n) a reasoned opinion- i. as to whether the proposed activity or portions thereof should be authorised; and ii. if the opinion is that the proposed activity or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan;	Section 13
o) a description of any consultation process that was undertaken during the course of preparing the specialist report;	n/a (see Section 3.6)
p) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	n/a (see Section 3.6)
q) any other information requested by the competent authority.	n/a

Contents

1. INTRODUCTION

ASHA Consulting (Pty) Ltd was appointed by the Council for Scientific and Industrial Research (CSIR) to conduct an assessment of the potential impacts to heritage resources that might occur through the proposed development of a chicken broiler facility on Portion 40 of the farm Jonathan 175-JQ in North West Province (Figures 1 & 2). The site is 9.1689 ha in extent and is located at S 25.2670° E 27.8836°.

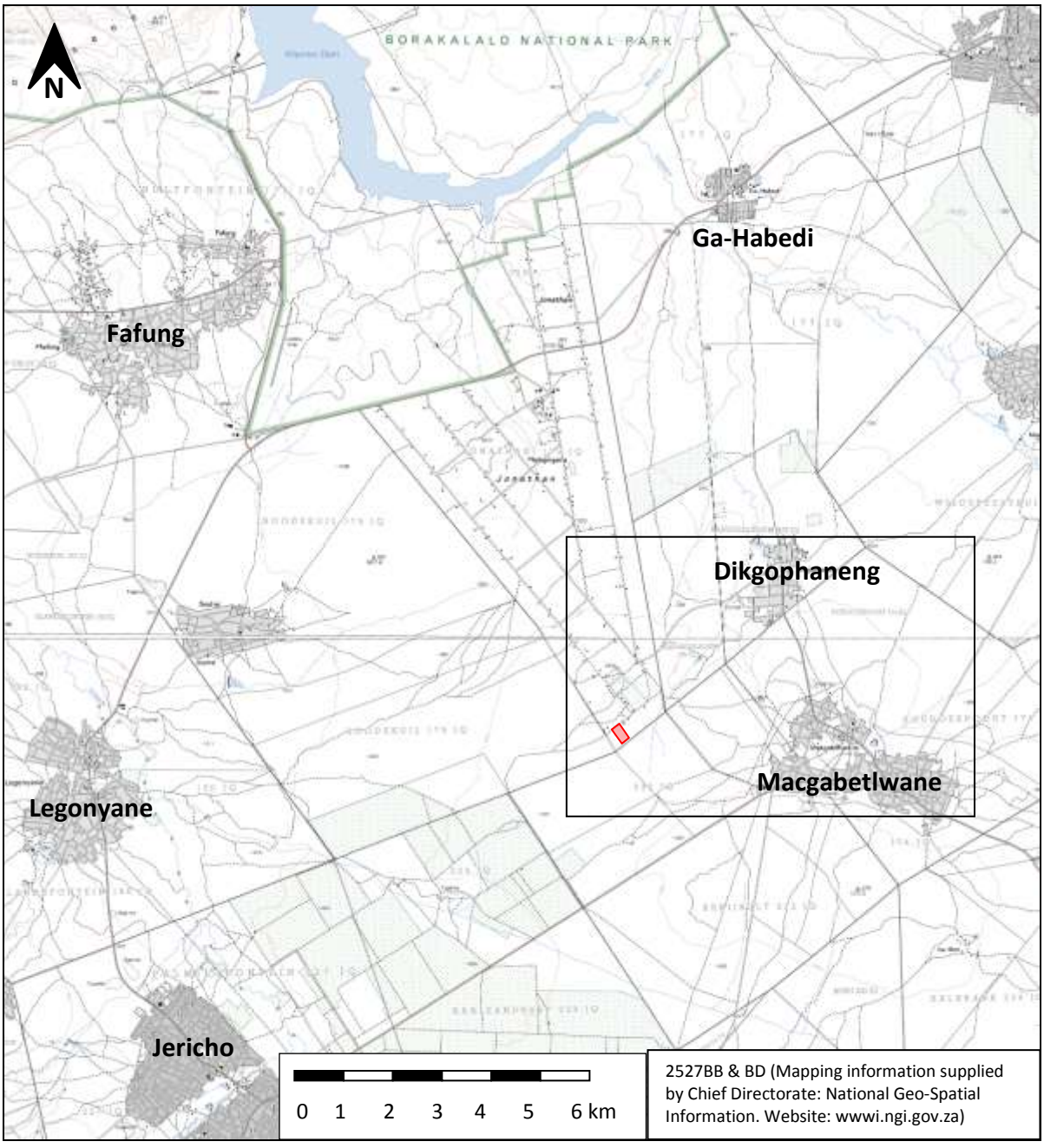


Figure 1: *Map showing the location of the site (red shaded polygon). The boxed area is enlarged in Figure 2.*

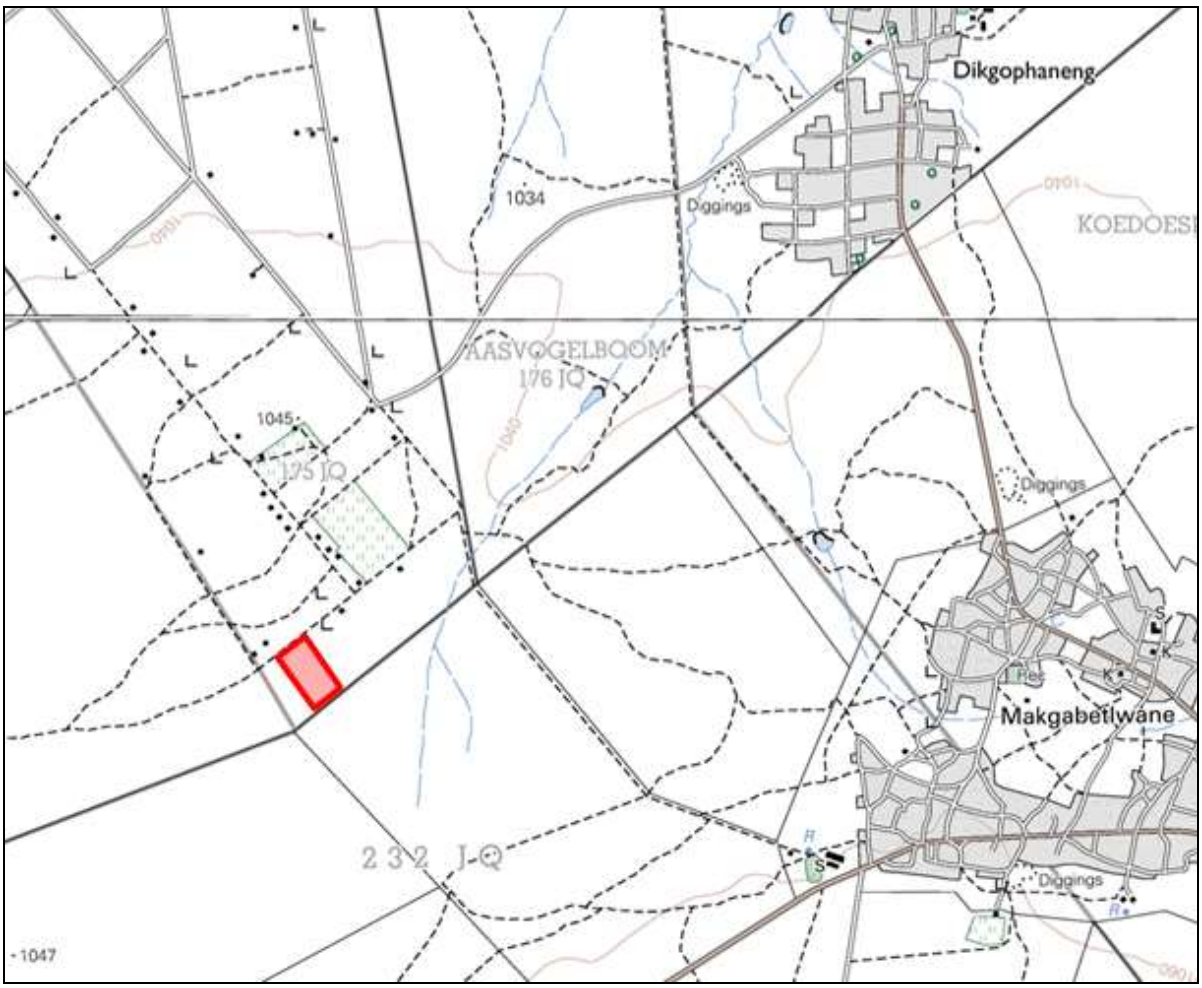


Figure 2: *Enlarged map showing the location of the site (red shaded polygon).*

1.1. Project description

The proposed chicken broiler facility would include the following components:

- Three chicken broiler houses of 20 m by 130 m each;
- An access road;
- A storage building of 60 m by 40 m;
- A storage building of 60 m by 10 m; and
- A farm house and office of 40 m by 40 m.

The farm has an existing borehole and has the capacity to store 10 000 L of water. Figure 3 shows the proposed layout of the facilities on the property. It should be noted that this layout is a revised layout because the original layout would have impacted on graves discovered on the property.

1.1.1. Aspects of the project relevant to the heritage study

All aspects of the proposed development are relevant since excavations for foundations may impact on archaeological and/or palaeontological remains, while the 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 produce a heritage impact assessment that would meet the requirements of the South African Heritage Resources Agency (SAHRA) who had requested that a Heritage Impact Assessment (HIA) be submitted to them for comment.

When SAHRA was notified of the proposed development, they responded on 21st September 2016 with a comment that requested submission of an HIA that included assessments of archaeological resources, palaeontological resources, and any other heritage resources that might be impacted by the proposed development.

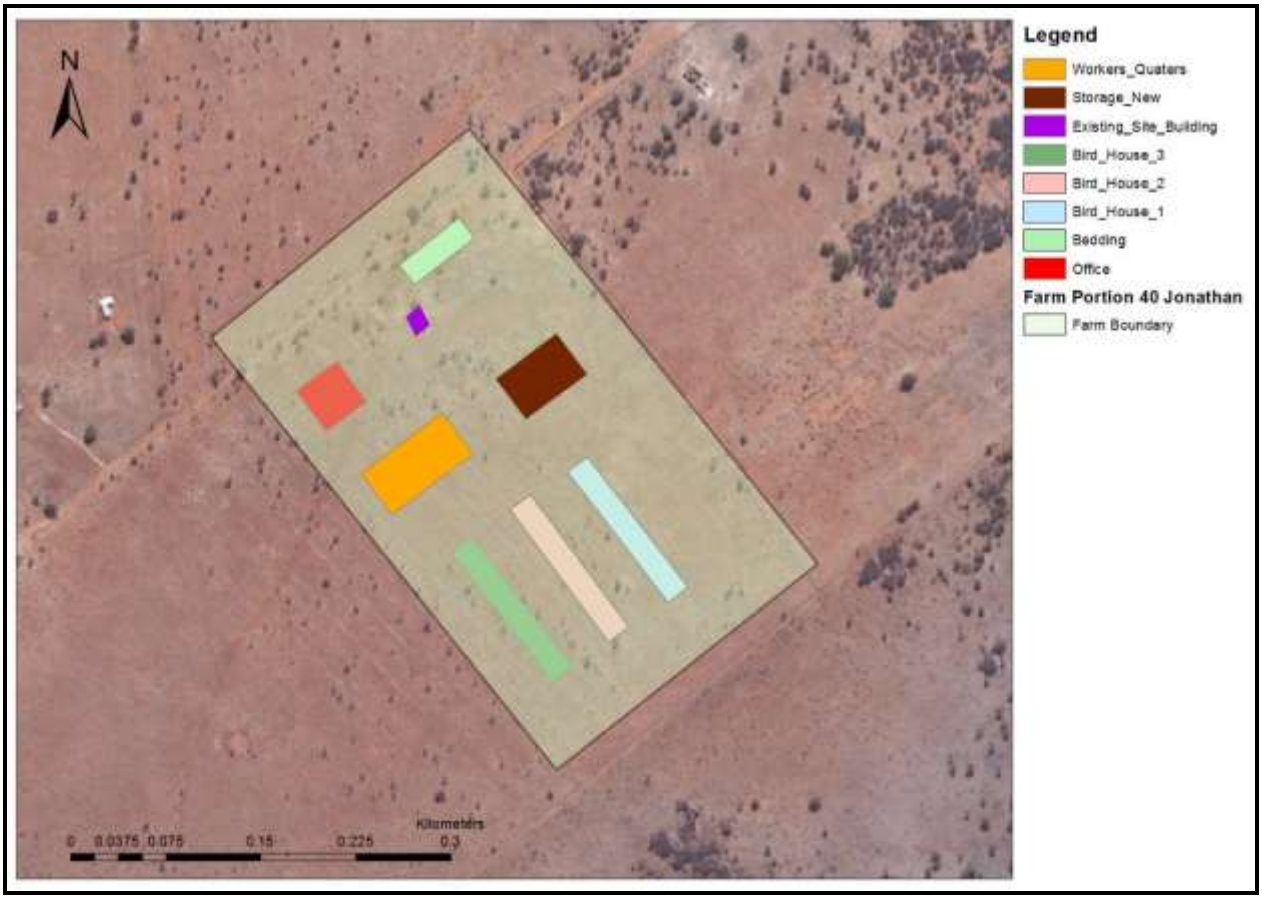


Figure 3: *Aerial view of the study area showing the spatial layout of the proposed facilities. Turquoise polygon = house / office, orange = storage facilities, green = workers' accommodation, yellow = hen houses.*

1.3. Scope and purpose of the report

An 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 for consideration by North West Department of Rural Environment and Agricultural Development (READ) who will review the Basic Assessment Report (BAR) and grant or withhold 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 authors

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 (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) 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.

Jaco van der Walt conducted the fieldwork and necessary background research. He has an MA in Archaeology (Wits, 2012) and has worked in the heritage field since 2001 across much of southern Africa (Please see curriculum vitae included in Appendix 1). He has carried out and published research on Iron Age sites and is an accredited heritage practitioner with the Association of Southern African Professional Archaeologists (ASAPA) CRM section (Member #159) as follows:

- Field Director: Iron Age, Shell Middens & Grave Relocation; and
- Field Supervisor: Colonial Period, Stone Age & Grave Relocation.

In addition a palaeontological specialist study was commissioned. This was carried out by Dr John Almond and is appended to this report.

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.

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."

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, Section 3(3) describes the reasons a place or object may have cultural heritage value; some of these speak directly to cultural landscapes.

Section 38 (2a) states that if there is reason to believe that heritage resources will be affected then an impact assessment report must be submitted. This report fulfils that requirement.

Under the National Environmental Management Act (No. 107 of 1998; NEMA), as amended, the project is subject to a BAR. SAHRA is required to provide comment on the proposed project in order to facilitate final decision making by the North West READ.

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. This literature included published material, unpublished commercial reports and online material, including reports sourced from the South African Heritage Resources Information System (SAHRIS) and site records on the Wits Archaeological Database. The 1:50 000 map and historical aerial images were sourced from the Chief Directorate: National Geo-Spatial Information. The overlay function in Google Earth was used to locate the site on the historical aerial imagery.

3.2. Field survey

The site was subjected to a detailed foot survey by Jaco van der Walt on 21 October 2016. This was at the end of the dry winter season and meant that ground visibility was good, although dense stands of thorn bush prevented comprehensive coverage. 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.

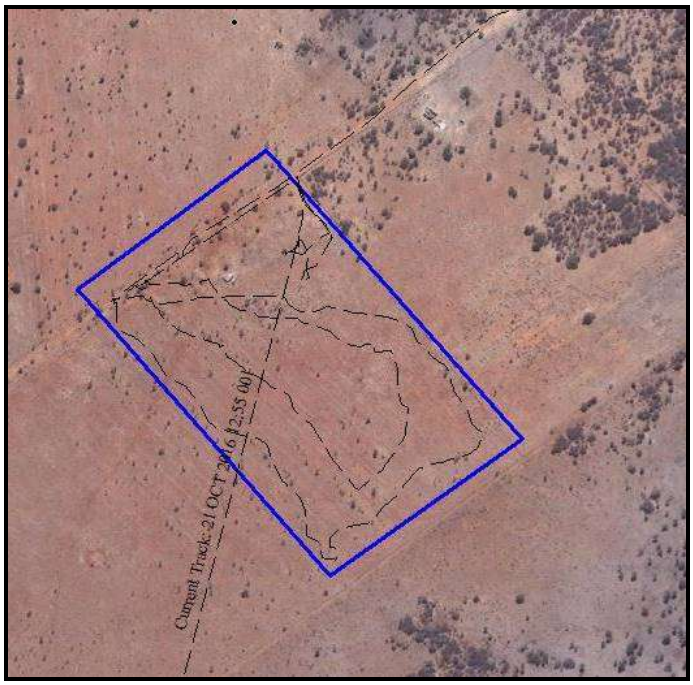


Figure 4: *Aerial view of the study area (blue polygon) showing the walk-paths on the site (black dashed lines).*

3.3. Impact assessment

For consistency, the impact assessment was conducted through application of a scale supplied by the CSIR.

3.4. 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.

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 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 site 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' and rated with an A (high/medium significance, requires mitigation), B (medium significance, requires recording) or C (low significance, requires no further action).

3.5. 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. Bedrock was absent from the surface of the site which meant that the palaeontological assessment had to be based exclusively on desktop work.

The SAHRIS database reflects a number of projects located to the east and southeast but all are more than 15 km away. The majority have no HIA reports attached to them which meant that background information for this project was extremely limited.

3.6. Consultation processes undertaken

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

4. PHYSICAL ENVIRONMENTAL CONTEXT

4.1. Site context

The site lies in a rural area which lacks any sort of large-scale development (Figure 5). The nearest villages are located some 3.5 km to the east and northeast. Only occasional small structures, presumably houses, are scattered on the surrounding farm portions and the access roads tend to be small and relatively informal.

Figure 5: *Aerial view of the broader area around the site (blue polygon) showing the lack of large-scale development aside from the two villages to the east and northeast.*

4.2. Site description

The site is flat and lacks any sort of landscape feature (e.g. rock outcrops, pans, drainage lines). Although much of the area, including the entire study area, has been ploughed and cultivated in the past, the protracted drought has meant that with the lack of agriculture the thorn bush cover was quite extensive at the time of the field inspection. The sandy areas bear minimal grass cover because of the drought and a few scattered larger trees occur in places. Figures 6 and 7 show two views of the site.

Figure 6: *View of the site showing an area with less bush cover. The very flat and sandy nature of the general area is evident.*

Figure 7: *View of the study area showing a patch of dense thorn bushes.*

5. HERITAGE CONTEXT

This section of the report contains the desktop study and establishes what is already known about heritage resources in the vicinity of the study area. What was found during the field survey as presented below may then be compared with what is already known in order to gain an improved understanding of the significance of the newly reported resources. Note that the palaeontological background can be found within the appended palaeontological specialist study.

5.1. Archaeological aspects

The area has seen very little archaeological work carried out and, as such, little background information is on record. The only CRM report relevant here is that by Van Schalkwyk (2013) who examined substation locations and a power line servitude passing through the Winterveldt agricultural holdings area some 20 km to the southeast of the present study area. He found no archaeological heritage resources but did report some graveyards.

Stone Age occupation is likely to be ephemeral in the study area because of the lack of landscape foci, but, broadly-speaking, Stone Age artefacts could be expected almost anywhere.

Iron Age settlement is well-known from the wider area (e.g. Coetzee & Küsel 2008), although the study area and immediate surrounds are unlikely to have been suitable for settlement because of the general lack of stone material with which to build. Iron Age settlement in the broader area would fall into two periods known as the Early Iron Age (approximately AD 400 to AD 1025) and Late Iron Age (approximately AD 1025 to AD 1830).

To the south of the study area, towards Pretoria, many Iron Age sites (more than 127) are on record (Bergh 1999). Approximately 25 km to the south east of the study area is the well known Tswaing Crater where Sotho and Tswana speaking communities produced salt by filtering, boiling and evaporating lake water during AD 1200 – 1830. At the beginning of the nineteenth century, the predominant black tribe in the area north of Pretoria towards the study area was the Manala-Ndebele, the Kgatla were also present in this area

According to the most recent archaeological cultural distribution sequences by Huffman (2007), the study area falls on the boundary of the distribution area of various cultural groupings originating out of both the Urewe Tradition (eastern stream of migration) and the Kalundu Tradition (western stream of migration). The facies that may be present are:

- Urewe Tradition: Moloko Branch – Icon facies AD 1300 - 1500 (Late Iron Age)
- Madikwe facies AD 1500-1700 (Late Iron Age)
- Blackburn Branch- Uitkomst facies AD 1650-1820 (Late Iron Age)
- Rooiberg facies AD 1650-1750 (Late Iron Age)
- Kwale branch- Mzonjani facies AD 450 – 750 (Early Iron Age)
- Kalunda Tradition: Benfica sub-branch – Bambata facies AD 150-650 (Early Iron Age)
- Happy Rest sub-branch – Diamant facies AD 750-1000 (Early Iron Age)
- Eiland facies AD 1000-1300 (Middle Iron Age)

5.2. Historical aspects and the built environment

The area is part of the land that was once incorporated within the homeland state of Bophutatswana. It is very rural and generally lacks historical development. Bophutatswana was a

so-called ‘black home land state’ that was formed in 1977 and continued an independent existence (officially recognised only by South Africa) until 1994.

6. FINDINGS OF THE HERITAGE STUDY

This section describes the heritage resources and other features recorded in the study area during the course of the project. They are listed in Table 1 and their locations mapped in Figure 5. The archaeological material is not located or mapped as it was very thinly spread across the area.

Table 1: *List of sites recorded during the survey. Most appear to be less than 60 years of age and are thus not considered to be heritage resources.*

Label	Co-ordinates	Description	Significance
n/a	n/a	Widespread but very low density scatter of stone artefacts located throughout the study area. There was no focus and their age was indeterminate; they are more than likely from the Middle Stone Age.	Very low
Cemetery 1	S25° 15' 56.5344” E27° 53' 02.0723"	This is the location of three graves that are aligned east to west. The graves are marked by a cement brick outline and are fenced in. The cement bricks are possibly sourced from the bricks from the ruin and would therefore post-date this feature.	High (although may not be a heritage resource)
Cemetery 2	S 25° 15' 57.1032" E27° 53' 00.4453"	The site consists of three graves that are aligned east to west. Based on size of the graves, the graves are of two adults and a child. The graves are marked by elongated stone cairns.	High (although may not be a heritage resource)
Shack	S25° 15' 57.8626" E27° 52' 58.4542"	This is a recently built structure of corrugated iron. Although an older more permanent structure must have been present, all that is left is a cement slab indicating the position of the structure.	n/a
Ruin	S25° 15' 55.3988" E27° 53' 01.6069"	This is the remains of a rectangular structure of unknown purpose. The feature is constructed from cement bricks and measures approximately 8 x 6 meters.	n/a

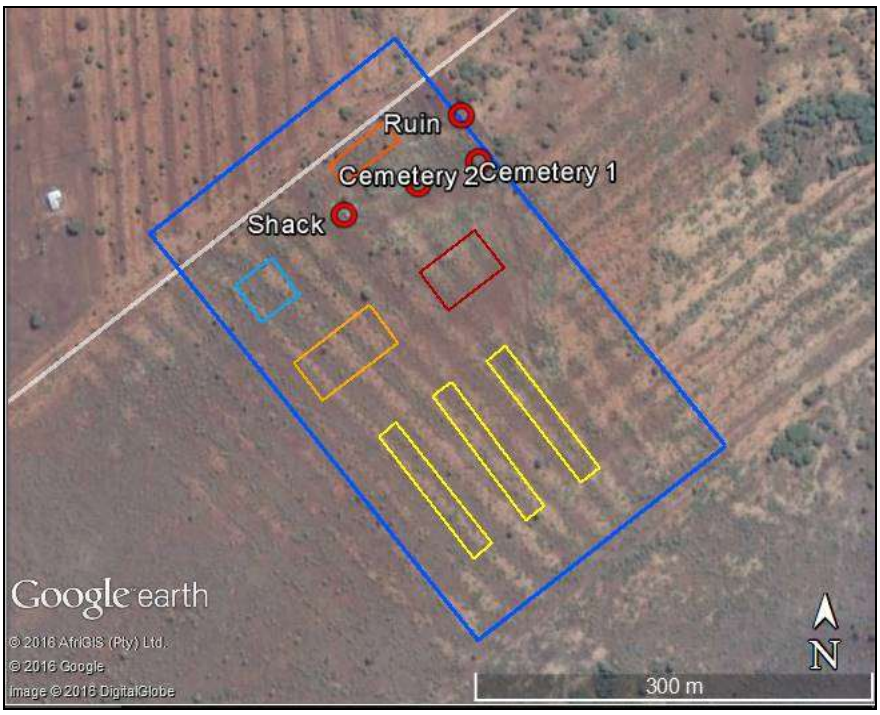


Figure 5: *Aerial view of the study area showing the locations of the various finds.*

6.1. Palaeontology

The archaeological field study reported a flat, sandy land surface devoid of bedrock exposure (see Figure 6). This lack of bedrock has meant that geological and palaeontological knowledge in this area stems largely from analysis of borehole data. Almond (2016:1) reports that the study area overlies the Irrigasie Formation which is comprised of "reddish-brown, readily-weathered mudrocks with subordinate sandstones and minor conglomerates". The kinds of fossils known to occur in the area are primarily trace fossils, while fossil pollens and spores and very rare dinosaur bones have also been reported. No fossils were seen during the archaeological survey.

6.2. Archaeology

The survey showed that a very low density scatter of Stone Age artefacts was present throughout the general area. There was no focus to these artefacts and no 'site' could be delineated; the artefacts can be ascribed to background scatter. Figure 6 shows a few of these artefacts. Most were made from quartzite and some displayed cobble cortex indicating that they were made from river cobbles. Because of their very widespread distribution and very low density, these finds are of minimal heritage significance.

Figure 6: *Stone artefacts of quartz (far left) and quartzite. The two in the middle have cobble cortex. Scale in cm.*

A ruined structure was located along the north-eastern boundary of the property. It was made from cement bricks (Figure 7). It is almost certainly less than 100 years of age and thus is not considered to be a heritage resource. It probably dates to the 1950s because historical aerial photography reveals that the area seemed unaltered in 1948-50 (the earliest available series), but by 1961 a number of 'bright spots' had appeared on the landscape. These spots indicate higher reflectivity from areas cleared of vegetation. One of these spots corresponds with the ruin. Another corresponds with the cement slab noted alongside the corrugated iron shack (Table 1).

Figure 7: *View of the cement brick ruin along the north-eastern boundary of the study area.*

6.3. Graves

Two small informal cemeteries were located on the property. Each had three graves in it. The graves of the first were surrounded by cement bricks that were no doubt obtained from a nearby ruined structure made with the same bricks and located some 35 m away to the northwest (see above). The graves are surrounded by a wire fence and aligned east-west (Figure 8). Because the ruin is relatively recent, the graves are also necessarily recent and must post-date the collapse of the brick structure. These graves are very likely less than 60 years of age and would thus not be regarded as heritage resources in terms of the NHRA (see Section 2 above).

Figure 8: *View of 'Cemetery 1' showing the three graves surrounded by a wire fence.*

The second cemetery also has three graves in it. These graves are covered by stone mounds and are not enclosed by any fence (Figure 9). Two graves appear to be full (i.e. adult) size, while the third is far smaller and is likely that of a child. Larger stones have been placed at the head and foot of each grave. They are aligned east-west. These three graves are very likely older and perhaps completely unrelated to those in 'Cemetery 1'.

Figure 9: *View of 'Cemetery 2' with the smaller grave at far left beneath a thorn bush.*

6.4. Cultural landscape

A survey of historical aerial photography reveals that the landscape on the site was little used during the mid-twentieth century (Figure 10). However, the wider region does show evidence of occupation with small cultivated lands and (presumably stone-built) structures in the south and north respectively (Figure 11).

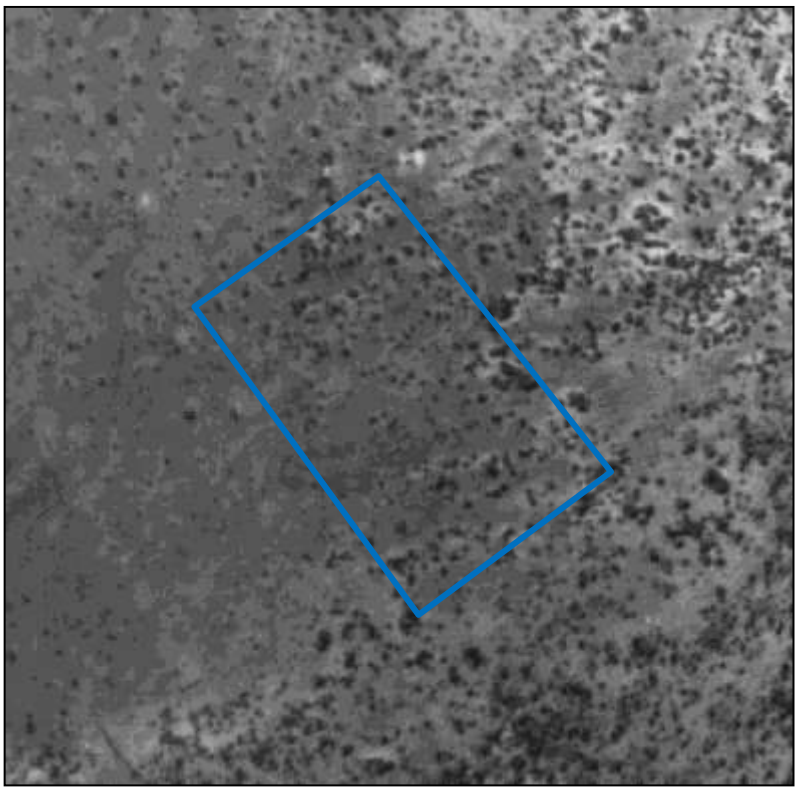


Figure 10: *Aerial photograph dating to 1948-1950 (Job 218, strip 30, photograph 1205) showing the study area to be entirely undeveloped. There is no sign of any settlement or other disturbance of the natural vegetation patterns. The study area is outlined in blue.*

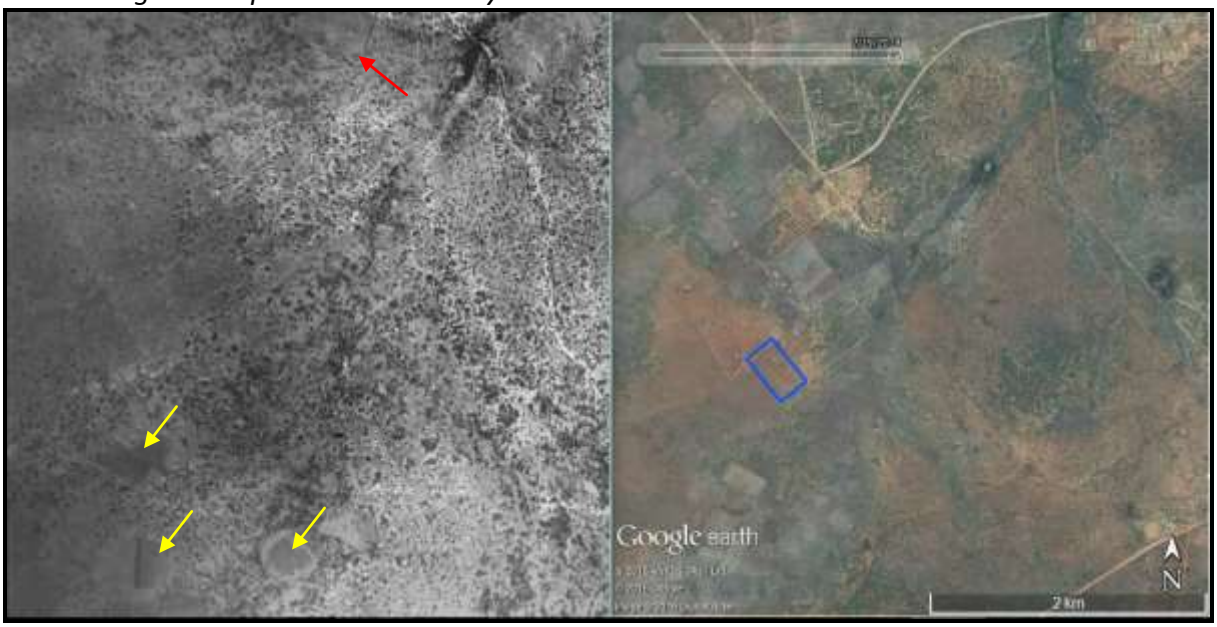


Figure 11: *Comparative aerial photographs dating to 1948-1950 (Job 218, strip 30, photograph 1205) and 2016. Cultivated lands (yellow arrows) and structures are visible (red arrow). The study area is outlined in blue.*

By 1961 there was evidence of cultivation very close to the study area as well as activity on site (Figure 12). Bright spots in the vicinity of the cement brick ruin and cement slab show that structures were likely in place and in use by that time. In the broader area there is quite a bit of agricultural activity (Figure 13). *The study area is outlined in blue.*

Figure 12: *Aerial photograph dating to 1961 (Job 453, strip 6, photograph 6233) showing signs of activity on the ground as 'bright spots' where the vegetation has been disturbed. The study area is outlined in blue.*

Figure 13: *Comparative aerial photographs dating to 1961 (Job 453, strip 6, photograph 6233) and 2016. It is notable that cultivation has commenced in the vicinity. The study area is outlined in blue.*

By 1974 the entire property had been cultivated and the prominent 'bright spot' is still evident around the location of the cement slab (Figure 14). In general the surrounding area shows evidence of far more cultivation than before and houses are visible in places (Figure 15). This evidence shows that a weakly developed agricultural landscape has been developed in the area but it is characterised only by very low grade landscape modification (ploughing) with none of the more

prominent types of features that characterise some agricultural landscapes (like farm complexes, tree lines, dams and farm roads).

6.5. Statement of significance

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 archaeological resources are deemed to have very low cultural significance for their scientific value.

Graves are deemed to have high cultural significance for their social value, although it is noted here that the graves present on the site may, in fact, not be heritage resources. Nevertheless, prudence suggests that they should be treated as heritage just to be safe. In any case, human remains should always be regarded as sensitive.

The cultural landscape is of low cultural significance for its aesthetic, historical and social values.

Figure 14: *Aerial photograph dating to 1974 (Job 729, strip 4, photograph 121) and 2016. The study area is outlined in blue.*

Figure 15: *Comparative aerial photographs dating to 1974 (Job 729, strip 4, photograph 121) and 2016. The study area is outlined in blue.*

6.6. Summary of heritage indicators and provisional grading

The archaeological resources are of very low significance and can be rated as 'General Protection C'. They comprise of a low density, widespread scatter throughout the area. Although it is uncertain whether the graves are in fact old enough to be considered heritage, it is prudent to regard them as important. The one set ('Cemetery 2') may well be older than 60 years. The graves are assigned a provisional grading of IIIA.

7. IMPACT ASSESSMENT

Impacts to heritage resources are possible mainly during the construction phase with a far reduced chance of impacts occurring during the operation phase. No decommissioning phase is envisaged for this project.

7.1. Direct Impacts

7.1.1. Palaeontology

Impacts to palaeontological material would occur during the construction phase only. They would be direct impacts in which the fossils would be moved from their original positions and possibly destroyed. Because of the very small likelihood of fossils actually being present, the potential impact significance is also regarded as being **very low**. There are no fatal flaws and no mitigation or management measures are required. The impacts are assessed in Table 2.

7.1.2. Archaeology

Impacts to archaeological material would occur during the construction phase only. They would be direct impacts in which the artefacts would be moved from their original positions (although

already out of place from ploughing) and possibly damaged or destroyed. Because the artefacts are of very low heritage significance, the potential impact significance is also regarded as being **very low**. There are no fatal flaws and no mitigation or management measures are required. The impacts are assessed in Table 2.

7.1.3. Graves

Because the graves were potentially under threat from the original layout, a new layout was devised so as to avoid both sets of graves. As such, no impacts to the graves are expected during construction, although there is always the slight chance that they could be damaged in error. There are no fatal flaws but it will be necessary to demarcate the graves during construction and alert all personnel to their existence such that they can be adequately protected. It is also recommended that the proponent consider installing permanent fencing in order to properly mark and protect the graves in perpetuity. No construction work should occur within 10 m of the graves. The significance of the potential construction phase impacts before mitigation is rated as **low** because the chances of impacts, given the proposed layout, are small, while with mitigation in the form of complete avoidance the impact significance is reduced to **very low**. The impacts are assessed in Table 2.

There is also a small chance that the graves could be damaged during the operation phase of the project during some other activity taking place on the site. However, with proper demarcation of the graves as suggested above, this impact is highly unlikely. The impact significance would again be **very low** after mitigation.

Further to the above, there is also a small chance that further marked or unmarked graves could lie concealed in the thorn bushes on the site. There is no way to predict and impacts would have to be dealt with on a case by case basis as or if they occur.

7.1.4. Cumulative Impacts

Cumulative impact are unlikely to occur because of the lack of other similar developments in the area. However, there is the potential for further agricultural-related development and the potential cumulative impact significance from such activities on palaeontological resources, archaeological resources and graves is regarded as being very low with mitigation in all three cases (Table 3).

Table 2: Impact assessment summary table – Construction Phase and Operation Phase direct impacts.

Aspect/ Impact pathway	Nature of potential impact/risk	Status	Spatial Extent	Duration	Consequence	Probability	Reversibility of impact	Irreplaceability of receiving environment/resource	Potential mitigation measures	Significance of impact/risk = consequence x probability		Ranking of impact/risk	Confidence level
										Without mitigation /management	With mitigation /management (residual risk/impact)		
CONSTRUCTION PHASE & OPERATION PHASE													
Clearing of land and construction of facilities	**Destruction of palaeontological material**	Negative	Site	Permanent	Slight	Very unlikely	Non-reversible	High	None	Very low	Very low	5	High
	Destruction of archaeological artefacts	Negative	Site	Permanent	Slight	Likely	Non-reversible	High	None	Very low	Very low	5	High
	Destruction of graves	Negative	Site	Permanent	Substantial	Very unlikely	Non-reversible	High	Avoid	Low	Very low	5	High

Table 3: Impact assessment summary table – Cumulative impacts

Aspect/ Impact pathway	Nature of potential impact/risk	Status	Spatial Extent	Duration	Consequence	Probability	Reversibility of impact	Irreplaceability of receiving environment/resource	Potential mitigation measures	Significance of impact/risk = consequence x probability		Ranking of impact/risk	Confidence level
										Without mitigation /management	With mitigation /management (residual risk/impact)		
CONSTRUCTION PHASE & OPERATION PHASE													
Clearing of land and construction of facilities	**Destruction of palaeontological material**	Negative	Site	Permanent	Slight	Very unlikely	Non-reversible	High	None	Very low	Very low	5	High
	Destruction of archaeological artefacts	Negative	Site	Permanent	Slight	Likely	Non-reversible	High	None	Very low	Very low	5	High
	Destruction of graves	Negative	Site	Permanent	Severe	Very unlikely	Non-reversible	High	Avoid	Low	Very low	5	High

8. LEGISLATIVE AND PERMIT REQUIREMENTS

There are no specific permit requirements related to this project, since all potentially significant impacts have been averted through the redesign of the facility. However, should the need to move the graves arise in the future then it would be necessary to research the graves in order to try to establish the names of the deceased. The required consultation process would then need to be followed in advance of application for a permit to remove the graves.

9. ENVIRONMENTAL MANAGEMENT PROGRAMME INPUTS

It should be ensured that both sets of graves are clearly demarcated and fenced off during the construction period and that all workers on site are made aware of their existence. Monitoring would involve ensuring that the graves remain undamaged throughout the duration of the construction phase of the project. It should be ensured that if any substantial archaeological or palaeontological remains are uncovered during development they are immediately protected *in situ* and reported to SAHRA so that appropriate action can be taken.

10. EVALUATION OF IMPACTS RELATIVE TO SUSTAINABLE SOCIAL AND ECONOMIC BENEFITS

Section 38(3)(d) requires an evaluation of the impacts on heritage resources relative to the sustainable social and economic benefits to be derived from the development. No significant heritage impacts are expected for this project and the provision of employment to those who will run the facility is regarded as far more important than any archaeological heritage resources that might be disturbed.

11. CONCLUSIONS

The only significant finds were the two small informal cemeteries. One of them is unlikely to be a heritage resource based on its probable young age, while the age of the other is less easy to determine. Nevertheless, following the precautionary principle, they are both regarded as heritage resources and the development proposal was redesigned around them. As such, no significant impacts to heritage resources are expected. There are no fatal flaws and the project should be allowed to proceed.

12. RECOMMENDATIONS

It is recommended that the proposed chicken broiler facility should be authorised but subject to the following conditions which should be incorporated into the Environmental Authorisation:

- The two graveyards should be fenced off clearly and pointed out to all construction workers and other staff on site to ensure that impacts to them are avoided;
- No construction work should occur within 10 m of any of the graves; and
- If any archaeological material, palaeontological 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 appropriate specialist. Such heritage is the property of the state and may require excavation and curation in an approved institution.

13. REFERENCES

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Cotzee, F.P. & Küsel, U.S. 2008. Phase 2 Archaeological Assessment of Late Iron Age Structures on the Farm Ledig 909 JQ (Quality Vacation Club and Golf Course), North West Province. Unpublished report prepared for Chand Environmental Consultants. Pretoria: UNISA.

Huffman, T.N. 2007. *Handbook to the Iron Age: the Archaeology of Pre-Colonial Farming Societies in Southern Africa*. University of KwaZulu-Natal Press, Scotsville.

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

Van Schalkwyk, J. 2014. Basic heritage assessment report for the proposed construction of the 132 kV Dipompong and Tswaing Substations and overhead power lines. Unpublished report prepared for Envirolution Consulting. Monument Park: J van Schalkwyk.

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.

14. APPENDIX 1 – Curriculum Vitae

Curriculum Vitae

Jayson David John Orton

ARCHAEOLOGIST AND HERITAGE CONSULTANT

Contact Details and personal information:

Address: 6A Scarborough Road, Muizenberg, 7945
Telephone: (021) 788 8425
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 –

Memberships and affiliations:

South African Archaeological Society Council member	2004 –
Assoc. Southern African Professional Archaeologists (ASAPA) member	2006 –
ASAPA Cultural Resources Management Section member	2007 –
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 –

Professional Accreditation:

ASAPA membership number: 233, CRM Section member

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)

Fieldwork and project experience:

Extensive fieldwork 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:

<u>Phase 1 surveys and impact assessments:</u>

- Project types
  - Notification of Intent to Develop applications (for Heritage Western Cape)
  - 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 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)

<u>Phase 2 mitigation and research excavations:</u>

- ESA open sites
  - Duinefontein, Gouda
- 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

CV Jaco van der Walt

PERSONAL PARTICULARS:

NAME:	Jaco van der Walt
MARITAL STATUS:	Married with two dependants
DATE OF BIRTH :	1977-11-04
Work Address	37 Olienhout Street, Modimolle, 0510
E-MAIL:	jaco.heritage@gmail.com
MOBILE:	+27 82 373 8491
FAX:	+27 86 691 6461

SYNOPSIS

Jaco has been actively involved as a professional archaeologist within the heritage management field in southern Africa for the past 17 years. Jaco acted as council member for the Association of Southern African Professional Archaeologists (ASAPA Member #159) in the Cultural Resource Management (CRM) portfolio for two years (2011 – 2012). He is well respected in his field and published in peer reviewed journals and presented his findings on various national and international conferences.

ACADEMIC QUALIFICATIONS:

Date of matriculation:		1995
Particulars of degrees/diplomas and/or other qualifications:		
Name of University or Institution:		University of Pretoria
Degree obtained	**:**	BA
Major subjects	**:**	Archaeology Cultural Heritage Tourism
Year of graduation	**:**	2001
Name of University or Institution:		University of the Witwatersrand
Degree obtained	**:**	BA [Honours]
Major subjects	**:**	Archaeology
Year of graduation	**:**	2002
Name of University or Institution	**:**	University of the Witwatersrand
Degree Obtained		**:**BA [Masters]
Major subject		**:**Archaeology
Year of Graduation		:2012

EMPLOYMENT HISTORY:

2011 – Present:	**Owner - Heritage Contracts and Archaeological Consulting CC**.
2007 – 2010 :	**CRM Archaeologist,** Managed the Heritage Contracts Unit at the University of the Witwatersrand.
2005 - 2007:	**CRM Archaeologist**, Director of Matakoma Heritage Consultants
2004:	**Technical Assistant**, Department of Anatomy University of Pretoria
2003:	**Archaeologist**, Mapungubwe World Heritage Site
2001 - 2002:	**CRM Archaeologists,** For R & R Cultural Resource Consultants, Polokwane
2000:	**Museum Assistant**, Fort Klapperkop.

Countries of work experience include:

Republic of South Africa, Botswana, Zimbabwe, Mozambique, Tanzania, The Democratic Republic of the Congo, Lesotho and Zambia.

MEMBERSHIP OF PROFESSIONAL ASSOCIATIONS:

- Association of Southern African Professional Archaeologists. Member number 159
  Accreditation: Field Director Iron Age Archaeology
  Field Supervisor – Colonial Period Archaeology, Stone Age Archaeology and Grave Relocation
- Accredited CRM Archaeologist with SAHRA
- Accredited CRM Archaeologist with AMAFA
- Co-opted council member for the CRM Section of the Association of Southern African Association Professional Archaeologists (2011 – 2012)

REFERENCES:

1.	Prof Marlize Lombard	Senior Lecturer, University of Johannesburg, South Africa	E-mail: mlombard@uj.ac.za
2.	Prof TN Huffman	Department of Archaeology	Tel: (011) 717 6040
		University of the Witwatersrand	
3.	Alex Schoeman	University of the Witwatersrand	E-mail: Alex.Schoeman@wits.ac.za

15. APPENDIX 2 – Palaeontological study