

ARCHAEOLOGICAL IMPACT ASSESSMENT

Proposed cultivation of pecan nut trees including associated infrastructure on the Farm Bethesda 238/38 & 335/38 Louisevale, Upington Northern Cape

Assessment conducted under Section 38 (3) of the National Heritage
Resource Act (No. 25 of 1999)

Prepared for:

PIETER BADENHORST PROFESSIONAL SERVICES

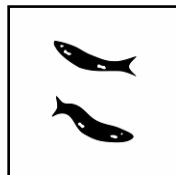
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Executive summary

Introduction

ACRM was appointed by Pieter Badenhorst Professional Services, on behalf of the Strauss Groep to conduct an Archaeological Impact Assessment (AIA) for the proposed cultivation of pecan nut trees and associated infrastructure, on the Farm Bethesda 38/225 and 38/335 in Louisevale, near Upington in the Northern Cape Province.

The proposed pecan nut tree plantation will cover a footprint area of about 12 ha. Water will be supplied via a new storage dam, pump station and pipeline situated on Farm 38/238. The dam and pump station will be sited on existing disturbed land, while the land for the pecan nut tree plantation comprises undeveloped agricultural land. Layout for planting might change due to botanical constraints, but no planting will be done within 35m of any watercourse.

The AIA forms part of a Basic Assessment process that is being conducted by Peter Badenhorst Professional Services.

Legal requirements

In terms of Section 38 (1) (c) (iii) of the National Heritage Resources Act 1999 (Act 25 of 1999), a Heritage Impact Assessment (HIA) of the proposed project is required if the footprint area of the proposed development is more than 5000m² in extent.

Section 38 (1) (a) of the Act also indicates that any person constructing a powerline, pipeline or road, or similar linear development or barrier exceeding 300m in length is required to notify the responsible heritage resources authority, who will in turn advise whether an impact assessment report is needed before development can take place.

Objectives

The overall purpose of the AIA is to assess the sensitivity of archaeological resources in the affected area, to determine the potential impacts on such resources, and to avoid and/or minimize such impacts by means of management and/or mitigation measures.

Findings

A detailed foot survey of the proposed development site, including associated activities was undertaken by ACRM in April 2016, in which the following observations were made:

More than 80 stone artefacts were counted and mapped with a hand held GPS unit. The majority of the tools are assigned to the Later Stone Age (LSA), while less than five Middle Stone Age (MSA) tools were found. No Early Stone Age (ESA) implements such as handaxes, or large angular flakes and chunks, were encountered. The majority of the lithics are spread very thinly and unevenly over the surrounding landscape (i.e. comprising mostly single, isolated occurrences), but several dispersed (i.e. low density) scatters of tools were recorded alongside the Donkerhoekspruit, on a kopje in the south western portion of the site, and alongside an outcropping of dolerite near a small stream outside the proposed footprint area.

The majority of the tools comprise modified (i.e. utilised & miscellaneous retouched pieces) and unmodified flakes and chunks, but a number of round cores were also found. No formal tools such as scrapers or points were found, but two adzes and a backed 'knife' were recorded. One quartzite hammerstone/grindstone was also found, but no organic remains such as pottery, bone or ostrich eggshell were recorded during the field assessment.

More than 96% of the implements are made on locally available banded ironstone, with the remainder in indurated shale, quartz and quartzite. Banded ironstone is well known to have been a favoured and desirable raw material for making stone artefacts and occurs at a number archaeological sites in the Upington area.

As archaeological sites are concerned, however, the occurrences are lacking in context as no pottery, bone or ostrich eggshell was found. While several dispersed scatters of tools were located, mostly outside the proposed footprint area, no evidence of any factory or workshop site, or the result of any human settlement was identified.

Indications therefore, are that the majority of the resources recorded during the study represent discarded flakes and flake debris.

Grading

Overall the relatively small numbers and isolated context in which they were found, means that the archaeological resources have been graded as having *low* (Grade 3C) significance.

Built environment

In terms of the built environment, no old buildings, structures or features, or any old equipment were found on the proposed development site.

Some ruined concrete buildings related to the previous farming enterprise occur on Farm 38/238, but these structures have no intrinsic heritage significance, or value.

Graves

No graves, or typical grave features or markers were encountered during the study.

Impact statement

Overall, the results of the study indicate that the proposed activity (i. e. the cultivation of pecan nut trees) and associated activities (i. e. a storage reservoir, pump station & water pipeline), will not have an impact of great significance on the archaeological heritage, as these are expected to be limited. Therefore, there are no objections to the authorization of the proposed development.

Conclusion

The study has captured a good record of the archaeological heritage present on the proposed development site, which have been graded as having *low* (Grade 3C) significance.

Recommendations

1. No archaeological mitigation is required.
2. Should any unmarked human burials/remains or ostrich eggshell water flask caches be uncovered, or exposed during preparation of the lands for cultivation, , these must immediately be reported to the archaeologist (Jonathan Kaplan 082 321 0172), or the South African Heritage Resources Agency (Ms Natasha Higgitt 021 462 4502). Burials, etc. must not be removed or disturbed until inspected by the archaeologist.

Table of Contents

	Page
Executive summary	1
1. INTRODUCTION	5
2. HERITAGE LEGISLATION	6
3. TERMS OF REFERENCE	7
4. DESCRIPTION OF THE AFFECTED ENVIRONMENT	7
5. STUDY APPROACH	9
5.1 Method of survey	9
5.2 Constraints and limitations	9
5.3 Identification of potential risks	9
5.4 Results of the desk top study	10
6. FINDINGS	10
6.1 Archaeology	10
6.2 Grading	11
6.3 Built Environment	16
6.4 Graves	16
7. ASSESSMENT OF IMPACTS	16
8. CONCLUSIONS	17
9. RECOMMENDATIONS	17
10. REFERENCES	18

1. INTRODUCTION

ACRM was appointed by Pieter Badenhorst Professional Services on behalf of the Strauss Groep, to conduct an Archaeological Impact Assessment (AIA) for the proposed cultivation of pecan nut trees and associated infrastructure on the Farm Bethesda 38/225 and 38/335 in Louisevale (//Khara Hais Local Municipality), near Upington in the Northern Cape (Figures 1 & 2).

The proposed pecan nut tree plantation will cover a footprint area of about 12 ha in extent. Water will be supplied via a new storage dam, pump station and pipeline situated on Farm No. 38/238 (Figure 3). The proposed storage dam and pump station will be sited on existing disturbed land, while the land for the pecan nut tree plantation comprises undeveloped agricultural land. Layout for planting might change due to botanical constraints, but no planting will be done within 35m of any watercourse.

The AIA forms part of the Basic Assessment process that is being conducted by Pieter Badenhorst Professional Services.



Figure 1. Locality Map. Red polygon illustrates the location of the study site

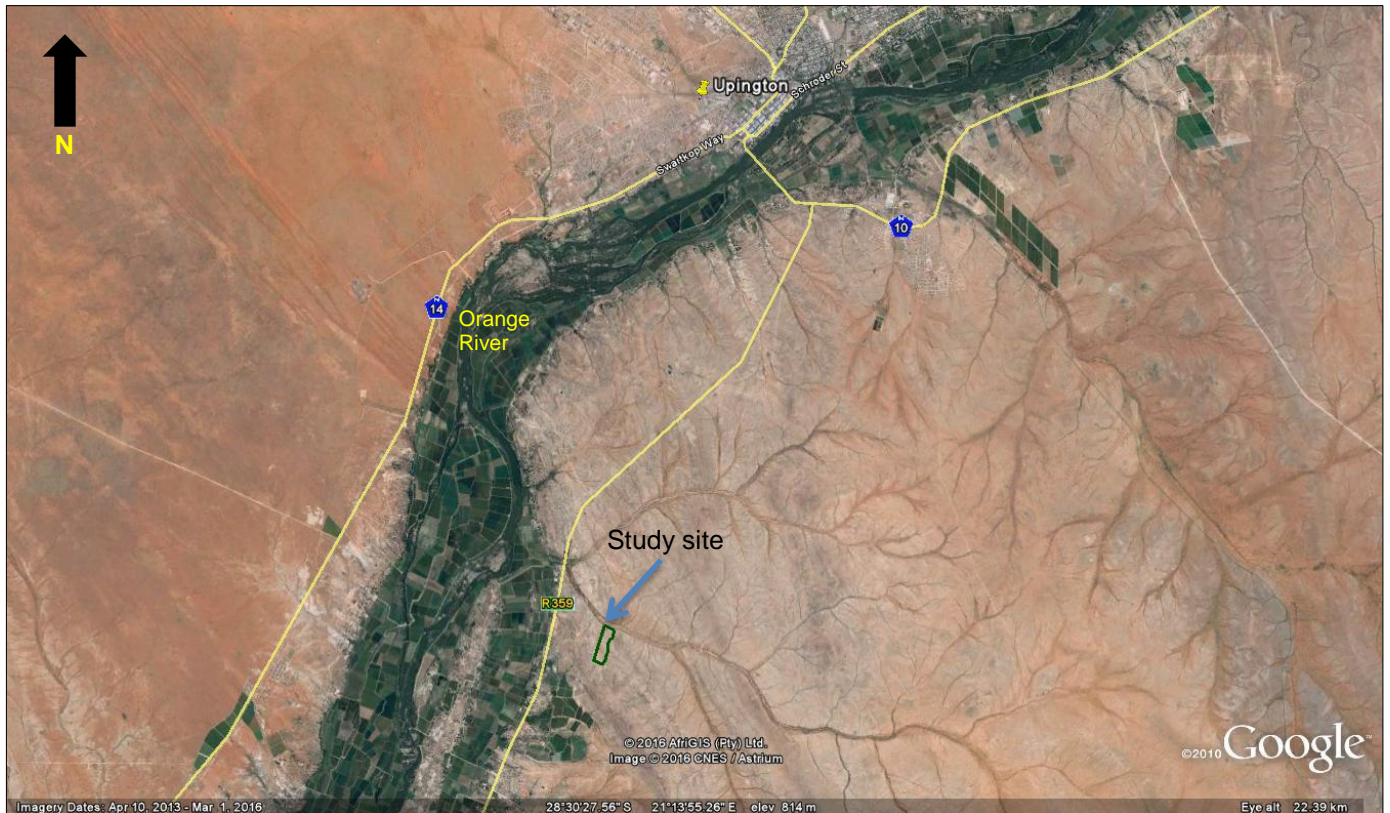


Figure 2. Google image illustrating the location of the proposed development site (green polygon).

2. HERITAGE LEGISLATION

The National Heritage Resources Act (Act No. 25 of 1999) makes provision for a compulsory Heritage Impact Assessment (HIA) when an area exceeding 5000 m² is being developed. This is to determine if the area contains heritage sites and to take the necessary steps to ensure that they are not damaged or destroyed during development.

The NHRA provides protection for the following categories of heritage resources:

- Landscapes, cultural or natural (Section 3 (3))
- Buildings or structures older than 60 years (Section 34);
- Archaeological sites, palaeontological material and meteorites (Section 35);
- Burial grounds and graves (Section 36);
- Public monuments and memorials (Section 37);
- Living heritage (defined in the Act as including cultural tradition, oral history, performance, ritual, popular memory, skills and techniques, indigenous knowledge systems and the holistic approach to nature, society and social relationships) (Section 2 (d) (xxi)).

Section 38 (1) (a) of the Act specifically indicates that any person constructing a powerline, pipeline or road, or similar linear development or barrier exceeding 300m in length is required to notify the responsible heritage resources authority, who will in turn advise whether an impact assessment report is needed before development can take place.

3. TERMS OF REFERENCE

The terms of reference for the archaeological study were to:

- Determine whether there are likely to be any important archaeological resources that may potentially be impacted by the proposed development;
- Indicate any constraints that would need to be taken into account in considering the development proposal;
- Identify potentially sensitive archaeological areas, and
- Recommend any further mitigation action.

4. DESCRIPTION OF THE AFFECTED ENVIRONMENT

The study site is located on the eastern side of the Orange/Gariep River about 12kms south west of Upington. (Figure 3) The proposed pecan nut plantation is situated about 3 km east of the river. Access to the subject property is via the R359. The proposed site is bound by the Donkerhoekspruit on the northern and eastern boundary, an unnamed stream on the southern boundary and a fence line on the western boundary. The site slopes from north to south, and is covered in low scrub and bushes on a gravel and quartz substrate. A few outcroppings of dolerite occur in places. The stream/river courses are infested with thorny Swarthaak. Several, old twee-spoor gravel tracks crisscross the property. There is a kopje in the south western corner, but this has been excluded from the proposed development (Figure 4).

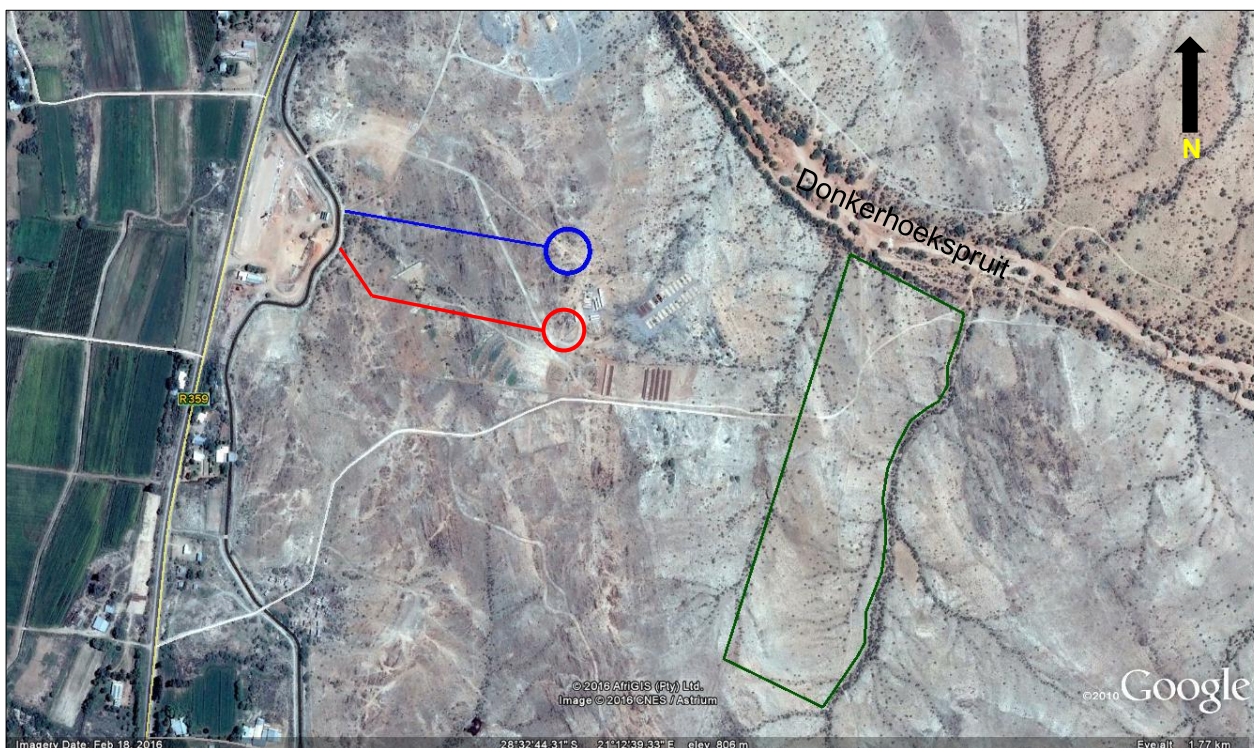


Figure 3. Google satellite map of the proposed pecan nut tree plantation on Farm 35/338 (green polygon) and proposed, and proposed alternative pipeline and storage reservoir (blue & red) on Farm 35/238

Archaeological Impact Assessment proposed cultivation of pecan nut trees on Farm 238/38 and Farm 338/38 Louisevale, Uppington



Figure 4. The proposed development site facing north. Photograph taken from the kopje

The proposed and proposed alternative pipeline and storage reservoir is located on Farm 35/238 (Figures 5-8).



Figure 5. Footprint area for the proposed reservoir (red)



Figure 6. Route for the proposed pipeline (red)



Figure 7. Footprint for the proposed reservoir (blue)



Figure 8. Route for the proposed pipeline (blue)

5. STUDY APPROACH

5.1 Method of survey

The overall purpose of the HIA is to assess the sensitivity of archaeological resources in the affected area, to determine the potential impacts on such resources and to avoid and/or minimize such impacts by means of management and/or mitigation measures.

The significance of archaeological resources was assessed in terms of their content and context. Attributes considered in determining significance include artefact and/or ecofact types, rarity of finds, exceptional items, organic preservation, potential for future research, density of finds and the context in which archaeological traces occur.

Survey track paths were captured (refer to Figure 9) and the position of identified archaeological occurrences and observations were fixed by a hand held GPS unit set on the map datum wgs 84.

A literature survey was also carried out to assess the archaeological context surrounding the proposed development site.

5.2 Constraints and limitations

Overall, archaeological visibility was good. The stream/river banks are, however, infested with thorny Swarthaak vegetation, resulting in very low archaeological visibility, but there will be no agricultural development within 35m of the watercourse.

5.3 Identification of potential risks

Based on the results of the study, there are no archaeological risks associated with the proposed activities (i.e. cultivation of pecan nut trees). It is maintained that the study has

captured a good record of the archaeological heritage present on the proposed development site.

5.4 Results of the desk top study

According to Beaumont and Vogel (2006), the archaeology of the Northern Cape is rich and varied covering long spans of human history. In Upington, no systematic archaeological work has been done, only a handful of commercial archaeology surveys as part of the EIA process. These studies have shown that stone artefact frequencies in the Upington area tend to be low, temporally mixed and occurring in an isolated and displaced context (Beaumont 2006a, b, c, d, 2008; Kaplan 2008; Dreyer 2013; Van Schalkwyk 2014a, 2014b; Nilssen 2012). In contrast Morris (2014) notes that there are, substantial herder encampments along the floodplain of the Orange/Gariep River but these tend to be short duration visits by small groups of hunter-gatherers. Most of these camps have been destroyed by intensive agricultural development alongside the river. Early and Middle Stone Age site older than 20 000 years are rare in the Upington area, but small scatters of tools have been encountered in the area and ESA tools such as handaxes, cleavers cores and blades have been documented north of the town (Morris 2014, Morris 2010, 2012; Kaplan 2013a & b).

6. FINDINGS

6.1 Archaeology

More than 80 stone artefacts were counted and mapped with a hand held GPS unit (Table 1 & Figure 9). More than 95% of the tools are assigned to the Later Stone Age (LSA) while only three Middle Stone Age (MSA) pieces were found. No Early Stone Age (ESA) implements such as handaxes, or large angular flakes and chunks were encountered during the study. Most of the tools are spread very thinly over the surrounding landscape (i.e. they comprise single, isolated occurrences). There is, however, some patterning in the distribution of tools and it is interesting to note that the majority of the tools occur alongside the Donkerhoekspruit, and in the southern portion of the property (alongside an unnamed stream), while only a few tools were recorded in the northern portion of the proposed footprint area (Figure 9).

While most of the GPS readings record single archaeological occurrences, several dispersed (or low density) scatters of tools were recorded alongside the Donkerhoekspruit (Site 268), and on the kopje (Site 255) in the elevated south western portion of the proposed development site. A scatter of lithics comprising flakes, chunks, cores and several retouched tools, indicating more intensive flaking activity, occurs alongside a small unnamed stream that feeds into the Donkerhoekspruit (refer to Figure 16), but the scatter is located outside the proposed footprint area (Figure 9).

The majority of the tools on the site comprise modified and unmodified flakes and chunks, but a number (n = 12) of round cores were also found suggesting more regular flaking activity. Only a few formal tools were found, including two adzes (Site 250 & Site 296), and a possible 'knife' (Site 258). One quartzite hammerstone/grindstone (Site 298) was also found. No organic remains such as pottery, bone or ostrich eggshell were encountered during the field study.

More than 96% of the implements are made on locally available banded ironstone, with the remainder in indurated shale, quartz and quartzite. Banded ironstone is well known to have been a favoured and desirable raw material for making stone artefacts and occurs at a number of sites in the Upington area. It is likely that the raw material was sourced from the Gariep River.

As archaeological sites are concerned, however, the occurrences are lacking in context as no pottery or ostrich eggshell was found. While several dispersed scatters of tools were located, mostly outside the proposed development site, no evidence of any factory or workshop site, or the result of any human settlement was identified.

Indications are that the majority of the remains recorded during the study represent discarded flakes and flake debris.

A collection of tools documented during the study are illustrated in Figures 11-15.

6.2 Grading

Overall the relatively small number of tools, and isolated context in which they were found, means that the archaeological remains have been graded as having *low* (Grade 3C) significance.

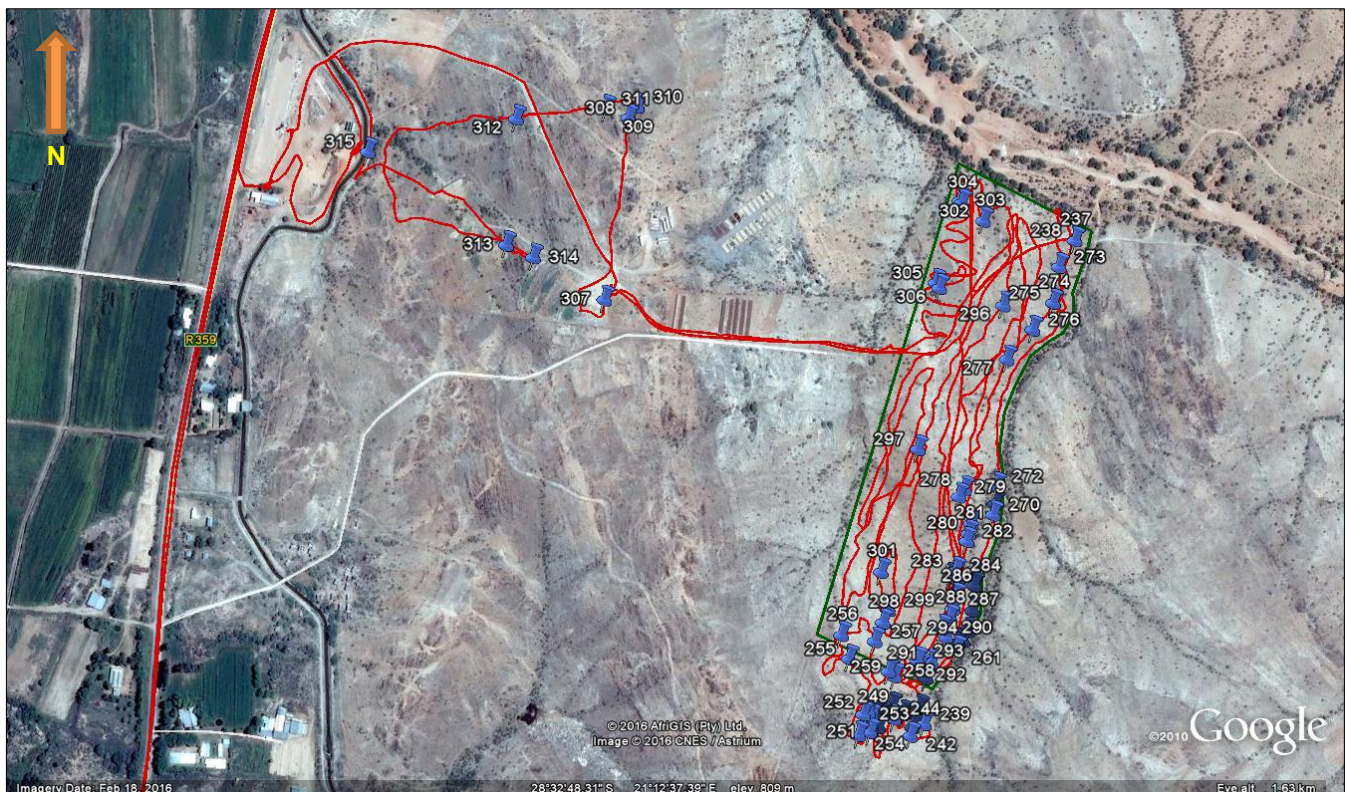


Figure 9. Survey track paths (red) and waypoints of archaeological finds

Archaeological Impact Assessment proposed cultivation of pecan nut trees on Farm 238/38 and Farm 338/38 Louisevale, Upton

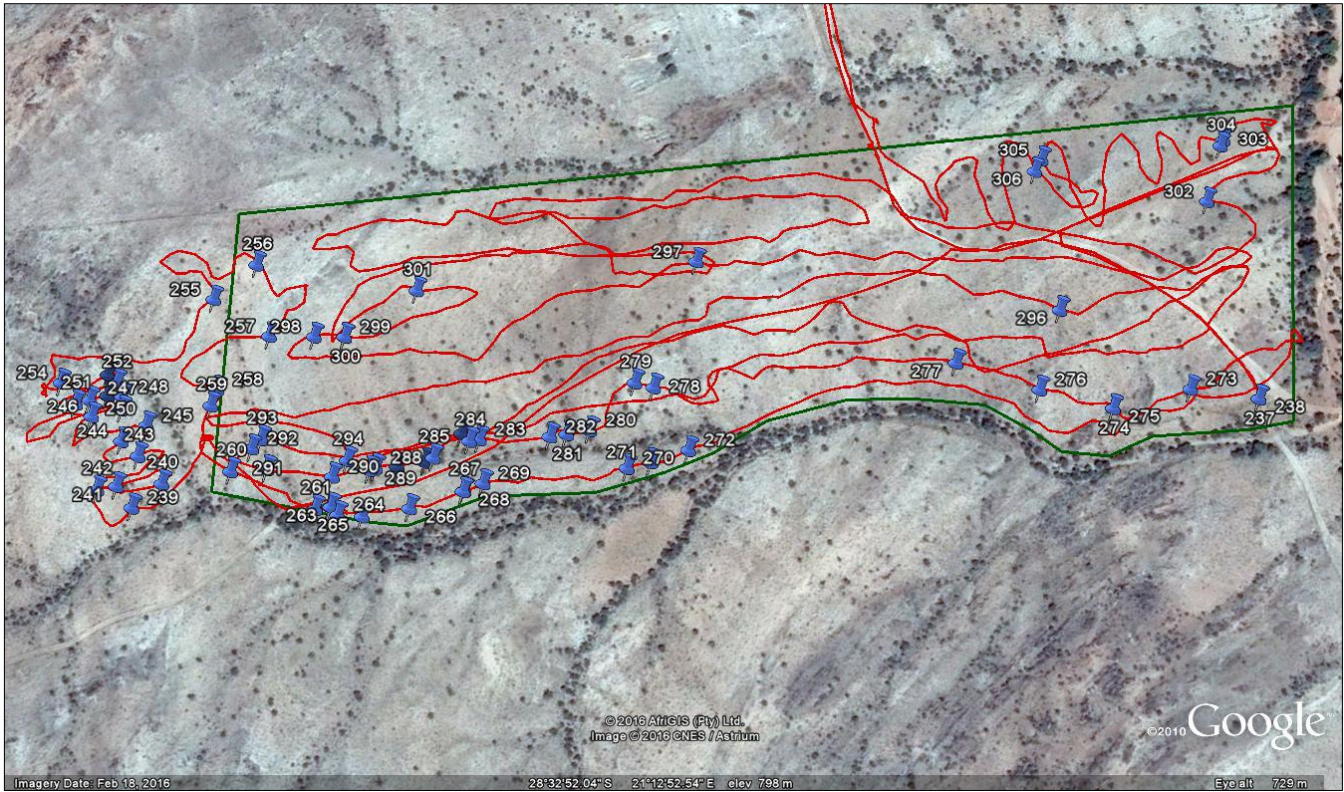


Figure 10. Survey track paths and waypoints of archaeological finds: proposed pecan nut plantation

Site	Farm name	Lat/long	Description of finds	Grading	Suggested mitigation
239		S28° 33.048' E21° 12.832	Banded ironstone (BI) misc. retouched flake	3C	None required (outside footprint area)
240		S28° 33.036' E21° 12.828'	BI utilised/retouched chunk	3C	None required (outside footprint area)
241		S28° 33.050' E21° 12.822'	BI utilised/retouched chunk	3C	None required (outside footprint area)
242		S28° 33.057' E21° 12.820'	BI utilised/retouched flake	3C	None required (outside footprint area)
243		S28° 33.040' E21° 12.814'	Weathered Indurated shale (IS) MSA flake	3C	None required (outside footprint area)
244		S28° 33.043' E21° 12.806'	BI chunk	3C	None required (outside footprint area)
245		S28° 33.034' E21° 12.805'	BI retouched flake and MRP	3C	None required (outside footprint area)
246		S28° 33.050' E21° 12.793'	Broken/split IS cobble & BI chunk	3C	None required (outside footprint area)
247		S28° 33.040' E21° 12.795'	Quartz flake	3C	None required (outside footprint area)
248		S28° 33.038' E21° 12.790'	BI chunk	3C	None required (outside footprint area)
249		S28° 33.043' E21° 12.788'	BI retouched chunk and weathered IS chunk	3C	None required (outside footprint area)
250		S28° 33.049' E21° 12.787'	BI adze (step flaking)	3C	None required (outside footprint area)
251		S28° 33.053' E21° 12.786'	BI chunk	3C	None required (outside footprint area)

Archaeological Impact Assessment proposed cultivation of pecan nut trees on Farm 238/38 and
Farm 338/38 Louisevale, Uppington

					footprint area)
252		S28° 33.038' E21° 12.784'	BI chunk	3C	None required (outside footprint area)
253		S28° 33.040' E21° 12.780'	BI misc. retouched chunk	3C	None required (outside footprint area)
254		S28° 33.055' E21° 12.776'	Dispersed scatter of tools associated with outcropping of dolerite – including BI core , retouched/utilised flakes, chunks & manuport	3C	None required (outside footprint area)
255		S28° 32.998' E21° 12.768'	Dispersed scatter of tools on quartz covered kopje inc. BI core , chunks, utilized/retouched flakes, porphyry core .	3C	None required (outside footprint area)
256		S28° 32.980' E21° 12.762'	BI chunk, 2 flakes	3C	None required
257		S28° 32.985' E21° 12.791'	BI chunk	3C	None required
258		S28° 33.008' E21° 12.802'	BI 'knife' on cobble flake	3C	None required
259		S28° 33.012' E21° 12.807'	BI retouched/utilized flake	3C	None required
260		S28° 33.013' E21° 12.834'	Flat, utilized BI flake	3C	None required
261		S28° 32.992' E21° 12.860'	BI MRP and chunk	3C	None required
262		S28° 32.987' E21° 12.862'	BI utilised/retouched flake	3C	None required
263		S28° 32.987' E21° 12.862'	BI utilised/retouched flake	3C	None required
264		S28° 32.986' E21° 12.866'	BI round core	3C	None required
265		S28° 32.978' E21° 12.870'	BI utilised flake	3C	None required
266		S28° 32.963' E21° 12.874'	Large quartzite chunk	3C	None required
267		S28° 32.944' E21° 12.876'	BI chunk	3C	None required
268		S28° 32.944' E21° 12.876'	A low density scatter of tools, including BI utilized/retouched flakes, core and several flaked chunks alongside the Donkerhoekspruit	3C	None required
269		S28° 32.937' E21° 12.877'	Same as above	3C	None required
270		S28° 32.891' E21° 12.893'	BI chunk	3C	None required
271		S28° 32.883' E21° 12.895'	Split/broken BI cobble	3C	None required
272		S28° 32.870' E21° 12.896'	BI MRP and chunk	3C	None required
273		S28° 32.706' E21° 12.952'	BI chunk/ core	3C	None required
274		S28° 32.733' E21° 12.946'	Quartzite chunk/cobble core	3C	None required
276		S28° 32.753' E21° 12.929'	BI core	3C	None required
277		S28° 32.775' E21° 12.906'	BI chunk	3C	None required
278		S28° 32.872' E21° 12.869'	Weathered BI core /chunk	3C	None required
279		S28° 32.877' E21° 12.864'	Small BI chunk	3C	None required
280		S28° 32.898' E21° 12.874'	BI chunk	3C	None required
281		S28° 32.905' E21° 12.872'	Quartz core /chunk	3C	None required
282		S28° 32.911' E21° 12.870'	BI utilized flake	3C	None required
283		S28° 32.933' E21° 12.860'	IS cortex cobble chunk	3C	None required
284		S28° 32.936' E21° 12.860'	BI MSA retouched flake	3C	None required
285		S28° 32.949' E21° 12.860'	BI chunk	3C	None required
286		S28° 32.952' E21° 12.860'	BI chunk and MSA retouched flake	3C	None required
287		S28° 32.962' E21° 12.858'	Flat, worked out BI core (? MSA)	3C	None required

Archaeological Impact Assessment proposed cultivation of pecan nut trees on Farm 238/38 and
Farm 338/38 Louisevale, Uppington

288		S28° 32.968' E21° 12.855'	Weathered IS retouched cortex flake and BI chunk	3C	None required
289		S28° 32.971' E21° 12.855'	BI cortex cobble core /chunk & BI flake	3C	None required
290		S28° 32.983' E21° 12.851'	BI chunk	3C	None required
291		S28° 33.002' E21° 12.839'	Flat, utilized BI flake and broken BI flake	3C	None required
292		S28° 33.004' E21° 12.829'	BI miscellaneous retouched chunk	3C	None required
293		S28° 33.000' E21° 12.827'	BI chunk	3C	None required
294		S28° 32.976' E21° 12.848'	Small BI flake	3C	None required
295		S28° 32.938' E21° 12.856'	Quartzite chunk/split cobble	3C	None required
296		S28° 32.734' E21° 12.904'	BI cortex flake/ ?backed adze with slight step flaking	3C	None required
297		S28° 32.841' E21° 12.830'	Round quartzite core	3C	None required
298		S28° 32.971' E21° 12.798'	Dolerite hammerstone/grindstone	3C	None required
299		S28° 32.962' E21° 12.803'	BI chunk	3C	None required
301		S28° 32.933' E21° 12.797'	IS flat flake and BI chunk/ core	3C	None required
302		S28° 32.671' E21° 12.887'	Flat BI utilized flake	3C	None required
303		S28° 32.655' E21° 12.868'	BI cobble flake	3C	None required
304		S28° 32.657' E21° 12.869'	Weathered BI flake	3C	None required
305		S28° 32.717' E21° 12.846'	BI MRP	3C	None required
306		S28° 32.721' E21° 12.849'	IS cortex cobble core	3C	None required
307		S28° 32.726' E21° 12.563'	Proposed alternative dam	3C	None required
308		S28° 32.590' E21° 12.585'	Several BI flakes and chunks lying about the existing storage dam	3C	None required
309		S28° 32.582' E21° 12.593'	Existing storage dam	3C	None required
311		S28° 32.583' E21° 12.566'	A few BI flakes alongside existing water pipeline	3C	None required
312		S28° 32.590' E21° 12.489'	BI chunk alongside existing water pipeline	3C	None required
313		S28° 32.685' E21° 12.480'	BI chunk alongside alternative (red) water pipeline	3C	None required
314		S28° 32.694' E21° 12.503'	BI flake alongside proposed alternative (red) pipeline	3C	None required
315		S28° 32.614' E21° 12.362'	Several BI chunks and flakes alongside existing water canal	3C	None required

Table 1. Spreadsheet of waypoints and description of archaeological finds

Archaeological Impact Assessment proposed cultivation of pecan nut trees on Farm 238/38 and Farm 338/38 Louisevale, Uppington



Figure 11. Collection of tools from proposed pecan nut tree plantation. Scale is in cm



Figure 13. Collection of tools from proposed pecan nut tree plantation. Scale is in cm



Figure 12. Collection of tools from proposed pecan nut tree plantation. Scale is in cm



Figure 14. Collection of tools from proposed pecan nut tree plantation. Scale is in cm



Figure 15. Collection of tools from Farm 338/38. Scale is in cm



Figure 16. Site 254. View facing north west, behind the kopje

6.3 Built environment

In terms of the built environment, no old buildings, structures, features, or old equipment were found in the proposed footprint area.

Some ruined concrete buildings related to the previous farming enterprise occur on Farm 38/238, but these structures have no intrinsic heritage significance, or value.

6.4 Graves

No graves, or typical grave features or markers were encountered during the study.

7. ASSESSMENT OF IMPACTS

In the case of the proposed cultivation of pecan nut trees including associated infrastructure on Farm 238/38 and Farm 338/38 in Louisevale, it is expected that archaeological impacts will occur during the implementation phase of the project, but that the overall impact on archaeological resources will be *low* (Table 2).

Potential impacts on archaeological heritage	
Extent of impact:	Site specific
Duration of impact;	Permanent
Intensity	Low
Probability of occurrence:	Probable
Significance without mitigation	Low
Significance with mitigation	Negative
Confidence:	High

Table 2. Assessment of archaeological impacts.

8. CONCLUSION

The results of the study indicate that the proposed cultivation of a 12 ha pecan nut tree plantation on Farm 238/38, and a storage dam, pipeline and pump station on Farm 338/38, will not have an impact of great significance on the archaeological heritage.

The majority of the tools recorded comprise single isolated occurrences, while a few dispersed scatters of tools were mapped alongside the Donkerhoekspuit (Site 268), and outside the proposed footprint area (Site 254 & Site 255).

It is maintained that the baseline study has captured most of the information on the archaeological heritage present on the proposed development site.

9. RECOMMENDATIONS

With regard to the proposed cultivation of a pecan nut tree plantation (Farm 238/38) and associated infrastructure (Farm 238/38) in Louisevale near Upington, the following recommendations are made:

1. No archaeological mitigation is required.
2. Should any unmarked human burials/remains or ostrich eggshell water flask caches be uncovered, or exposed during construction activities, these must immediately be reported to the archaeologist (Jonathan Kaplan 082 321 0172), or the South African Heritage Resources Agency (SAHRA) (Att Ms Katie Smuts 021 462 4502). Burials must not be removed or disturbed until inspected by the archaeologist.

10. REFERENCES

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