Scoping Archaeological Impact Assessment

Proposed Beaufort West Photovoltaic Power Station (Solar): southern portion of properties; 2/158 Lemoenkloof, RE 9/161 Kuilspoort, RE 162 Suid-lemoensfontein and RE 1/163 Bulskop, Beaufort West, Western Province

prepared for

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by

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Executive Summary

In 2010, a Scoping Archaeological Impact Assessment (SAIA) was conducted for the proposed Beaufort West N1 Wind Energy Farm which covered an area including the above-named properties (Nilssen 2010). As a result of the findings of various specialist studies for the wind farm project (notably the large buffer area for the airstrip), a large part of the southern portion of the study area was deemed unsuitable for this type of development. Consequently, EAB Astrum Energy (Pty) Ltd are proposing the development of a photovoltaic (solar) park on the southern section of the Beaufort West Wind Farm property within the 2.5km buffer area from the airstrip, which has excluded wind turbines. Although the solar park will connect to the wind farm's electrical infrastructure – control building, cables, substation and transmission line etc., the proposal for the photovoltaic (solar) park (PV) is considered to be a separate project. For this reason, a SAIA was requested for the southern portion of the above-named study area.

Information obtained for the SAIA conducted for the wind farm project was used to compile the report presented here. For the sake of comprehensiveness, and because the above projects are considered as two separate development proposals, a great deal of the current report is drawn directly from the earlier SAIA (Nilssen 2010). Nevertheless, this report focuses on the southern portion of the former study area.

The study area is a relatively flat part of a large drainage basin and includes several small tributaries of the Kuilspoortspruit drainage system that run to the SW. Apart from Acacia thickets and dense grasses in and immediately adjacent to the watercourses, the landscape is open with typically sparse, low Karoo vegetation providing excellent archaeological visibility across most of the study area. Evidence for modern human activities in the form of structures, vehicle tracks and minor earth moving activities were noted. Considerable evidence for burrowing by large and smaller mammals was also seen.

There were no restrictions to the archaeological investigation and the entire study area was accessible on foot and open to inspection and assessment. No material culture or structural remains of historical significance were observed. Numerous isolated and very low density scatters of Stone Age implements were identified and mapped. Ten occurrences of Stone Age origin were identified and are considered to be of medium to high significance. The preliminary positions of the sites for the PV solar panels lie directly or partially over 4 significant archaeological occurrences. In his Palaeontological Impact Assessment Dr. Almond noted that subsurface archaeological materials occur in the study area.

Based on results from the current study it is recommended that;

- *Because 4 significant archaeological occurrences lie within and on the boundary of the preliminary sites for the solar panels, the sites must be moved so as to avoid all significant archaeological occurrences as indicated in Figure 4,*

- *When the revised placing and layout of the sites for the solar panels is determined and made available, an Archaeological Impact Assessment is required as part of the Heritage Impact Assessment,*
- *Surveyed areas (walk tracks) – with the exception of the 10 significant Stone Age occurrences – are suitable for the proposed activities provided that archaeological monitoring is implemented,*
- *Any areas outside the surveyed tracts are likely to be archaeologically sensitive and therefore, placement of any activities outside the studied areas will require further archaeological investigation and assessment,*
- *Two archaeological occurrences should be sampled via piece-plotting with a Total Station with subsequent collection, analysis and curation of mapped specimens,*
- *The boundaries of 10 archaeological occurrences should be mapped and these sites should be protected, conserved and managed in perpetuity as prescribed in an Archaeological Conservation Management Plan (ACMP) to be drawn up for the proposed project,*
- *Two to four archaeological sites and a collection of artefacts in secondary context should be incorporated into the project for education and tourism purposes since this will add value and provide further attraction to the proposed activity. The specifics of this should be developed in an ACMP for the affected properties.*
- *Archaeological monitoring should be conducted by a professional archaeologist during earthmoving activities so as to avoid or minimize negative impact on potential subsurface archaeological resources.*

Note that;

- *In the event that vegetation clearing and earthmoving activities expose archaeological materials, such activities must stop and Heritage Western Cape must be notified immediately.*
- *If archaeological materials are exposed during vegetation clearing and/or earth moving activities, then they must be dealt with in accordance with the National Heritage Resources Act (No. 25 of 1999) and at the expense of the developer.*
- *In the event of exposing human remains during construction, the matter will fall into the domain of Heritage Western Cape (Mr. Nick Wiltshire) or the South African Heritage Resources Agency (Ms Mary Leslie) and will require a professional archaeologist to undertake mitigation if needed.*

Table of Contents

1. Introduction

1.1 Background

In 2010, a Scoping Archaeological Impact Assessment (SAIA) was conducted for a Proposed Beaufort West N1 Wind Energy Farm which covered an area including the above-named properties (Nilssen 2010). As a result of the findings of various specialist studies for the wind farm project, a large part of the southern portion of the study area was deemed unsuitable for this type of development. Consequently, EAB Astrum Energy (Pty) Ltd are proposing the development of a photovoltaic (solar) park on the southern section of the Beaufort West Wind Farm property within the 2.5km buffer area from the airstrip, which has excluded wind turbines. Although the solar park will connect to the wind farm's electrical infrastructure – control building, cables, substation and transmission line etc., the proposal for the photovoltaic (solar) park is considered to be a separate project. For this reason, a SAIA was requested for the southern portion of the above-named study area.

Information obtained for the SAIA conducted for the wind farm project was used to compile the report presented here. For the sake of comprehensiveness, and because the above projects are considered as two separate development proposals, a great deal of the current report is drawn directly from the earlier SAIA (Nilssen 2010). Nevertheless, this report focuses on the southern portion of the former study area.

Because the final nature and extent of the activity is currently unknown, a phase-based strategy was adopted regarding the archaeological component of the EIA. The first stage involves this Scoping Archaeological Impact Assessment, which aims to determine the archaeological sensitivity of the affected area. Results of the scoping study would provide information regarding potential sites – that are less sensitive - for the placement of solar panels and associated services and facilities as well as the way forward regarding archaeological assessment and mitigation. This scoping study is not a full Archaeological Impact Assessment (AIA).

Mr Florian Kroeber of EAB Astrum Energy (Pty) Ltd appointed CHARM to conduct a Scoping Archaeological Impact Assessment (SAIA) of the southern portion of the affected properties near Beaufort West in the central Karoo, Western Province (Figures 1 & 2).

The proposed activity includes the installation of solar panels and associated structures, services and facilities. The final specifications and scope of the activity will be determined after various specialist impact assessments. For further details contact Ms. Louise van Zyl (details on title page). Development activities will include earthmoving operations that could have a permanent negative impact on archaeological and tangible heritage related resources.

A preliminary layout plan of the project is shown in Figure 3 and coordinate data for the main boundary points of one solar panels site are given in Table 1 (see Figure 4). Coordinate data for the larger study area are also given in Table 1 (see Figure 4).

1.2. Purpose and Scope of the Study

Objectives of the Scoping Archaeological Impact Assessment are:

- To assess an adequate portion of the study area for traces of archaeological and heritage related resources to determine the archaeological sensitivity of the proposed site;

- To identify options for archaeological mitigation and further assessment in order to minimize potential negative impacts;
- To make recommendations for archaeological mitigation where necessary and the way forward for the archaeological component of the EIA process; and
- To identify heritage resources and issues that may require further attention.

Terms of Reference (ToR):
a) Locate boundaries and extent of the study area.
b) Conduct a survey of a portion of the study area to identify and record archaeological and heritage related resources.
c) Assess the impact of the proposed development on above-named resources.
d) Recommend mitigation measures and additional assessment where necessary.
e) Prepare and submit a report to the client that meets standards required by Heritage Western Cape in terms of the National Heritage Resources Act, No. 25 of 1999

1.3 Study Area

The study area is comprised of the southern portion of the following properties: Portion 9 of the Farm 161, Kuilspoort, Remainder of Farm 162 Suid-Lemoensfontein, Remainder Portion 2 of the Farm 158 Lemoenkloof and a portion of Portion 1 of the Farm 163 Bulskop, owned by the Beaufort West Municipality. Some 550ha in extent, the site is situated immediately north of the N1 and from between 5 and 9km NE of Beaufort West, Western Province (Figures 1, 2 & 4 and Table 1). The study area was accessed by vehicle from the N1.

The proposed development site is a relatively flat part of a large drainage basin and includes several small tributaries of the Kuilspoortspruit drainage system that run to the SW. Dr. Almond describes the geological sequence of the area (Almond 2010). Except for Acacia thickets and dense grasses in and immediately adjacent to the watercourses, the landscape is open with typically sparse, low and open Karoo vegetation. Examples of the affected environment – vegetation, topography, and so on - are shown in Plates 1 & 2.

Existing developments on the property include a farm house, outbuildings, informal roads, small scale earthmoving activities, overhead power lines and two wind masts. Considerable evidence for burrowing by large and smaller mammals was also seen.

Table 1. Coordinate data for boundary points of the larger study area and preliminary site for solar panels (see Figure 4)

Name	Description	Datum: WGS 84 Lat/Lon dec.degrees	Datum: WGS 84 Grid: SA National
A	wind farm boundary point	S32.32387 E22.60628	23 Y0037072 X3577834
B	wind farm boundary point	S32.31718 E22.60222	23 Y0037458 X3577094
C	wind farm boundary point	S32.26562 E22.65005	23 Y0032972 X3571360
D	wind farm boundary point	S32.29098 E22.67663	23 Y0030459 X3574165
PVA	solar panels boundary point	S32.30296 E22.63690	23 Y0034197 X3575505
PVB	solar panels boundary point	S32.29881 E22.64543	23 Y0033396 X3575043
PVC	solar panels boundary point	S32.29879 E22.64818	23 Y0033137 X3575039
PVD	solar panels boundary point	S32.30457 E22.64826	23 Y0033127 X3575680
PVE	solar panels boundary point	S32.30884 E22.63687	23 Y0034198 X3576157
PVF	solar panels boundary point	S32.30882 E22.63687	23 Y0034198 X3576155
PVmid	solar panels midpoint	S32.30379 E22.64267	23 Y0033653 X3575595

1.4 Approach to the Study

A review of earlier archaeological work conducted in the area is beyond the scope of this report, but see references given below. The Karoo houses a long and rich archaeological record dating from the earliest stages of Stone Age technology to the historic period. Archaeological sites include caves and rock shelters, open air artefact scatters, rock engravings and historic structures with their associated cultural materials.

On behalf of EAB Astrum Energy (Pty) Ltd, Mrs Siân Holder of *Cape EAPrac* provided a locality map and coordinate data for the affected area. Mr Roelof van Staden of the Beaufort West Municipality arranged for access to the study area, after which the survey was conducted independently. The bulk of the study was done on foot with only a small portion covered by vehicle (1km of a total of 18.4km). Due to the open nature of vegetation cover, most of the study area is accessible on foot and archaeological visibility is excellent. The aim of the study was to determine the archaeological sensitivity of the affected properties and not to record all archaeological and tangible heritage related occurrences.

To adequately assess the archaeological sensitivity of the site and to provide the client with options for placing solar panels and associated services and facilities, it was decided to survey the site in transects roughly 500m apart. The total transect distance is in excess of 18km. While identified archaeological occurrences were mapped, only those considered to be significant were also described and photographed.

Survey tracks were fixed with a hand held Garmin Camo GPS to record the search area (Figure 4, gpx tracking file submitted to HWC and is available from author). The position of identified archaeological occurrences and photo localities were fixed by GPS (Figure 4, Plates 1 through 7, Table 2 and Appendix A). Digital audio notes and a comprehensive, high quality digital photographic record were also made (full data set available from author). In this report, localities of archaeological occurrences and photographs are established by matching the numbers on photographs with those of waypoints in Figure 3. Appendix A contains all coordinate data associated with the study. Directions of views are indicated with compass bearing names like E is east; WSW is west south west, and so on. Bearing names on panoramic views indicate the bearing at the position of the label on the photograph.

2. Results

A distance of 18.4km was walked and 1km traversed by vehicle, covering an area of about 25ha of which an average of some 80% provided excellent archaeological visibility (Figure 4 and Plates 1 through 7). Various obstacles including vegetation, dry watercourses and animal burrows restricted vehicle coverage to a small portion of the study area. Additionally, areas commonly containing archaeological materials are strewn with naturally occurring gravels and therefore, close scrutiny was required to identify anthropogenic material among naturally occurring stone. Such investigation was best accomplished on foot.

Apart from erosion gullies and stream beds of currently dry watercourses, water erosion in the form of sheet wash occurs in large areas of the site and for the most part, stone artefacts of Early, Middle and Later Stone Age origin are mixed as they became

“eroded” onto the same surface. In very few cases were archaeological materials identified in areas capped by soft geological sediments. The latter areas appear to be dry pans.

The vast majority of stone artefacts are in hornfels with considerably fewer implements made of sandstone, quartzite and mud rock. Hornfels and quartzite are metamorphosed mud rock and sandstone respectively, and these raw materials for stone tool manufacture are locally available. Some artefacts in what appear to be sandstone or mud rock may actually represent severely weathered or poorly metamorphosed quartzite or hornfels.

Around 125 archaeological occurrences were identified and are grouped in four types:

1. isolated stone artefacts of either Early, Middle or Later Stone Age origin,
2. very low density stone artefact scatters of Early, Middle and Later Stone Age materials,
3. low to medium density stone artefact scatters of Early, Middle and Later Stone Age materials, and
4. low to medium density stone artefact scatters of Later Stone Age origin.

2.1. Isolated Stone Artefacts and Very Low Density, Mixed Artefact Scatters

Very low density means that artefacts are scattered at least 5m apart whereas isolated artefacts are separated by about 15m or more. Occurrence types 1 and 2 were recorded in the same manner since their significance and requirements for mitigation were considered to be the same. These occurrences were mapped and sometimes recorded via digital audio notes, though only a few representative specimens were photographed (see small green dots in Figure 4, Plate 3[8,11,15,25], Plate 4[71,94,98], Plate 6[211,334,367] and Appendix A). The bulk of anthropogenic finds are associated with alluvial gravels.

Early Stone Age (ESA) specimens include cores, flakes, bifacial hand axes and cleavers (see above-listed Plates and images). On several occasions it was noted that ESA pieces were modified more recently during either the Middle or Later Stone Age periods. Because most specimens are severely weathered, patinated and varnished, raw materials are not readily identifiable, but are dominated by hornfels with quartzite, sandstone, and mud rock present in notably lower numbers. No ESA pieces retain sharp edges and in many cases flake scars are barely recognizable and therefore, the identification of artefacts required careful inspection. ESA materials are less common than those of Middle Stone Age (MSA) age, but occur more frequently and widespread than Later Stone Age (LSA) specimens.

The MSA is represented by blade, irregular and multi-platform cores, flakes, chunks, convergent flakes, bifacial points, blades, retouched pieces, hammer stones as well as modified and re-utilized ESA pieces (see above-listed Plates and images). Most artefacts are in hornfels with very pieces in quartzite. MSA artefacts are variably weathered, which indicates length of exposure in addition to antiquity of flaking activities. Some specimens are rounded and smooth while others retain relatively crisp and sharp edges.

Overall, LSA materials are notably fewer than those of ESA and MSA origin. The exception to this is their appearance in type 4 occurrences as listed above and described in more detail below. Isolated LSA specimens include flakes, blades, bladelets, chunks and

cores (including bladelet cores), and no retouched pieces or formal tools were identified in this type of occurrence (see above-listed Plates and images).

Significance and Recommendation:

Due to the lack of context and the mixed nature of these occurrences, they are considered to be of low significance and retain little scientific value. Nevertheless, their presence in and on the landscape is indicative of human and proto-human occupation of the site for about the last 2 million years or more. The artefacts are also a record of the type and variety of stone tool technologies used in this area and during the different Stone Age periods. It is considered that a representative sample of these occurrences was recorded during the study reported here, and that no further mitigation of these materials is necessary.

2.2. Low to Medium Density Stone Artefact Scatters of Mixed ESA, MSA and LSA Materials

These are type 3 occurrences as listed above and are characterized by frequencies of one or more stone artefacts per square meter. Eight such scatters containing a mixed assemblage of artefacts representing the entire Stone Age spectrum were identified and recorded including waypoints 2, 3, 9, 74 and 109 (large red dots in Figure 4, Plate 3[2,9], Plate 4[74,109], Plate 5[109], Plate 6[190] and Table 2). The largest of these scatters is at least 2000m^2 in extent while smaller ones have a radius of no less than 20m. Waypoints are roughly at the centre of these occurrences.

MSA implements are most common and include cores, hammer stones, flakes, chunks, blades, convergent flakes, unifacial and bifacial points (on convergent flakes), adzes and several retouched pieces were seen; ESA pieces are notably fewer and cores, flakes and bifaces were recorded; and LSA specimens occur in low numbers and are represented by various core types including bladelet cores, hammer stones, flakes, chips, chunks, blades, bladelets, adzes and retouched pieces. Stone artefacts are overwhelmingly in hornfels though specimens in quartzite, sandstone and mud rock were seen.

The following occurrences vary from the above-described pattern;

Waypoint 74 consists of mostly ESA implements that are well weathered and varnished.

Waypoint 109 is dominated by LSA pieces with the MSA represented by notably fewer stone tools.

Significance and Recommendation:

Even though these occurrences lack context and are chronologically mixed, the frequencies and varieties of stone artefacts are considered to be a representative record of Stone Age technology in the local area and in an open context. As such, the sites are of some scientific value and are considered to be of medium significance. It is recommended that the extents of these scatters should be surveyed via Total Station and that they should be protected, conserved and managed in perpetuity. Plans for the latter should be laid out in an Archaeological Conservation Management Plan (ACMP). It is also recommended that one or both of these occurrences should be used for education and tourism purposes so as to add value and provide further attraction to the proposed activity. The specifics of such an endeavour should also be included in an ACMP.

2.3. Low to Medium Density Stone Artefact Scatters of Later Stone Age Origin

The fourth occurrence type is markedly different from those described above. The majority of these lie atop - and are potentially bedded in - fine alluvial sediments. This context contrasts sharply with the alluvial gravels associated with most other archaeological occurrences identified in the study. The sites are clustered and were only observed in the easternmost corner of the study area and include waypoints 243, 249, 250, 251 and 313 (see large red dots in Figure 4, Plate 6[243] and Table 2).

With few exceptions, these artefact scatters consist exclusively of LSA implements and flaking debris that - on average - cover areas of some 100m^2 in extent. Some scatters are more dispersed while others are tight clusters with artefact densities of up to 20 or more pieces per square meter. Except from one milky quartz core, all identified artefacts are in grey to black hornfels, and on cursory inspection it appears that the entire core reduction sequence is represented. If artefacts – formal tools – were finished here, then they were carried from these sites as none were identified in any of the scatters. Closer search for formal tools and inspection of ground surfaces for micro debitage is needed to test this idea. Identified pieces include hammer stones, at least two anvils, various core types (including bladelet cores), flakes, blades, bladelets, chips and chunks (Plate 6[243]). Based on raw material, cortex, dimensions of cores, flakes and blades as well as the close proximity of cores and flaking debris, it is likely that some pieces will refit.

Significance and Recommendation:

Of all identified archaeological materials, these sites appear to have the best contextual integrity and represent only the LSA stage of the Stone Age period. Furthermore, the sites seem to represent relatively brief events suggestive of the core reduction phase of stone tool manufacture. Some scatters are dispersed and include the rare MSA specimen, suggesting that they have been affected by sheet wash and/or other erosion events. Other scatters, however, appear in tact and have not undergone much disturbance and do not include any ESA or MSA implements. As such, a few of these sites are considered to be of high significance and are of scientific value.

As recommended in 2.2 above, the extents of these scatters should be surveyed via Total Station and they should be protected, conserved and managed in perpetuity. Plans for this should be developed in an ACMP for the affected properties.

Because the integrity of these sites are deteriorating as a result of erosion, it is recommended that one or two scatters – preferably waypoints 243 and 313 - should be sampled via piece-plotting with a Total Station with subsequent collection, analysis and curation of mapped specimens.

To contribute to the value and attraction of the proposed activity, one or two of these occurrences can be used for education and tourism purposes. To ensure that this is done in a sensitive and sustainable manner, the specifics should be included in an ACMP.

Table 2. Coordinate and descriptive data for archaeological occurrences considered to be of medium to high significance (see Figure 3 and Plates 3 through 7).

Name	Description img = image snd=sound	Datum: WGS 84 Lat/Lon dec.degrees	Datum: WGS 84 Grid: SA National
2	ESA-MSA-ESA img7297-300 snd7300	S32.30492 E22.63969	23 Y0033934 X3575722
3	ESA-MSA-LSA	S32.30552 E22.63997	23 Y0033907 X3575788
9	ESA-MSA img7310-4 snd7314	S32.30894 E22.63409	23 Y0034460 X3576170
74	ESA ?MSA img7369-73 snd7373	S32.30047 E22.64524	23 Y0033413 X3575226
109	LSA one MSA img7387-96 snd7396	S32.29356 E22.64487	23 Y0033450 X3574460
243	LSA img7444-54 snd7454	S32.28988 E22.67518	23 Y0030596 X3574043
249	LSA - like 243	S32.28991 E22.66876	23 Y0031201 X3574048
250	LSA - like 243 img7458-9 snd7459	S32.29014 E22.66833	23 Y0031241 X3574074
251	LSA - like 243 img7458-9 snd7459	S32.28995 E22.66822	23 Y0031252 X3574053
313	LSA - like 243	S32.29037 E22.66198	23 Y0031840 X3574102

3. Sources of Risk, Impact Identification and Assessment

The preliminary positions of the sites for the PV solar panels lie directly or partially over 4 significant archaeological occurrences (Figure 4). It follows that the site for the solar panels must be revised. A full Archaeological Impact Assessment is required once the layout and placement of the sites are revised with reference to the results presented here. Further recommendations in this regard are given below.

The proposed development will involve considerable earthmoving activities and alteration of the landscape. Construction and installation activities will have a permanent negative impact on archaeological resources in the study area. To minimize and/or avoid negative impacts, recommendations for mitigation are given below. Table 3 summarizes the potential impact of the proposed development on archaeological resources with and without mitigation.

Table 3. Potential impact on and loss of archaeological resources.

	With Mitigation	Without Mitigation
Extent	Local	Local
Duration	Permanent	Permanent
Intensity	Unknown	High
Probability	Medium	High
Significance	Medium to High	Medium to High
Status	Unknown	Medium to High
Confidence	Medium	High

4. Required and Recommended Mitigation Measures

Recommended mitigation measures:

- Because 4 significant archaeological occurrences lie within and on the boundary of the preliminary sites for the solar panels, the sites must be moved so as to avoid all significant archaeological occurrences as indicated in Figure 4,
- When the revised placing and layout of the sites for the solar panels is determined and made available, an Archaeological Impact Assessment is required as part of the Heritage Impact Assessment,
- Surveyed areas (walk tracks) – with the exception of the 10 significant Stone Age occurrences – are suitable for the proposed activities provided that archaeological monitoring is implemented,
- Any areas outside the surveyed tracts are likely to be archaeologically sensitive and therefore, placement of any activities outside the studied areas will require further archaeological investigation and assessment,
- Two archaeological occurrences should be sampled via piece-plotting with a Total Station with subsequent collection, analysis and curation of mapped specimens,
- The boundaries of 10 archaeological occurrences should be mapped and these sites should be protected, conserved and managed in perpetuity as prescribed in an Archaeological Conservation Management Plan (ACMP) to be drawn up for the proposed project,
- Two to four archaeological sites and a collection of artefacts in secondary context should be incorporated into the project for education and tourism purposes since this will add value and provide further attraction to the proposed activity. The specifics of this should be developed in an ACMP for the affected properties.
- Archaeological monitoring should be conducted by a professional archaeologist during earthmoving activities so as to avoid or minimize negative impact on potential subsurface archaeological resources.

Required mitigation measures:

- In the event that vegetation clearing and earthmoving activities expose archaeological materials, such activities must stop and Heritage Western Cape must be notified immediately.
- If archaeological materials are exposed during vegetation clearing and/or earth moving activities, then they must be dealt with in accordance with the National Heritage Resources Act (No. 25 of 1999) and at the expense of the developer.
- In the event of exposing human remains during construction, the matter will fall into the domain of Heritage Western Cape (Mr. Nick Wiltshire) or the South African Heritage Resources Agency (Ms Mary Leslie) and will require a professional archaeologist to undertake mitigation if needed.

References

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Kaplan, J. 2008b. ARCHAEOLOGICAL IMPACT ASSESSMENT PROPOSED AIRSTRIP ON PORTION 4 OF BERGPLAATS 296 BEAUFORT WEST CENTRAL KAROO

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Figures and Plates (on following pages)

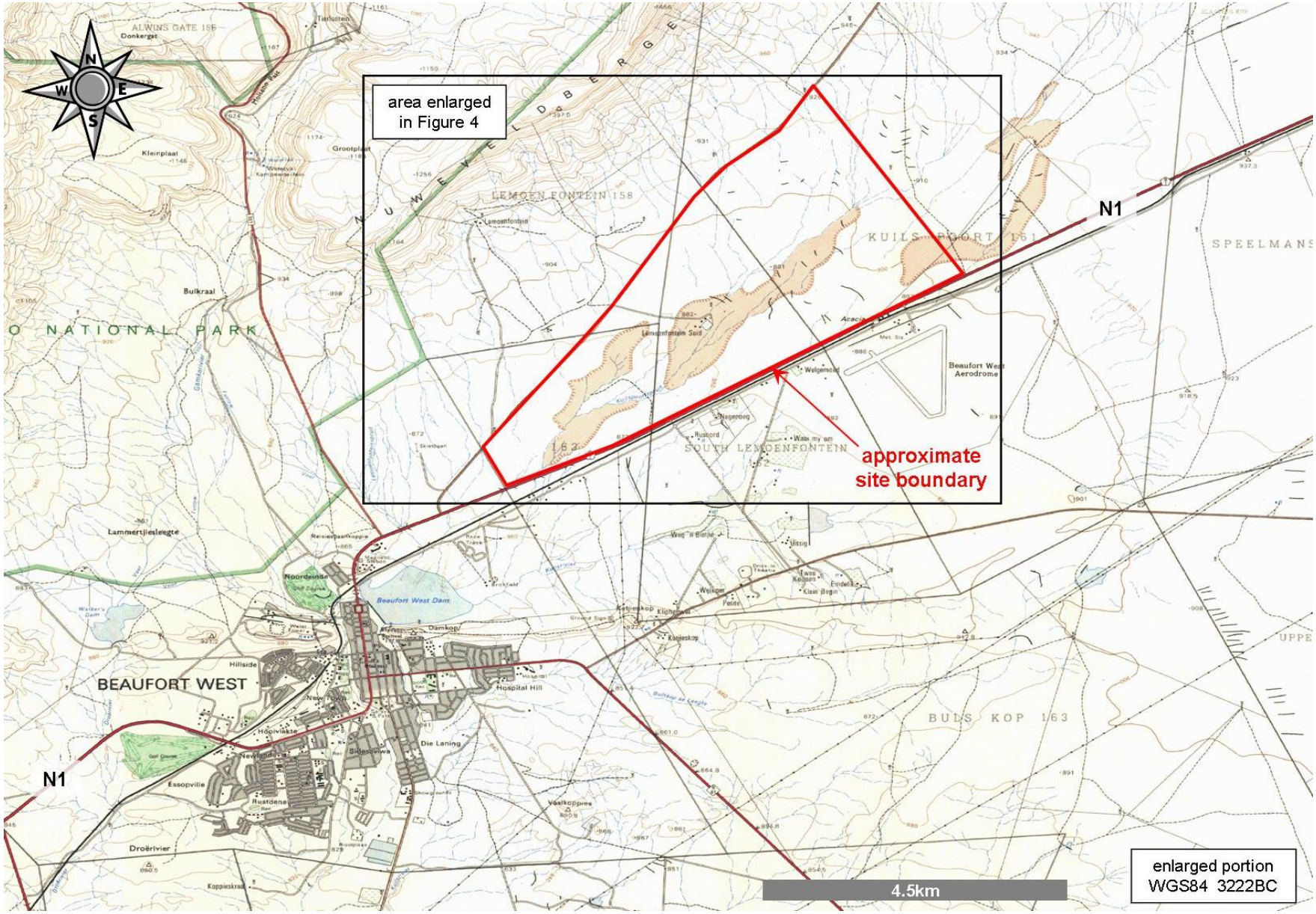

Figure 1. Location of study area relative to Beaufort West, Western Cape Province. (Map courtesy of The Chief Directorate, Surveys & Mapping, Mowbray).

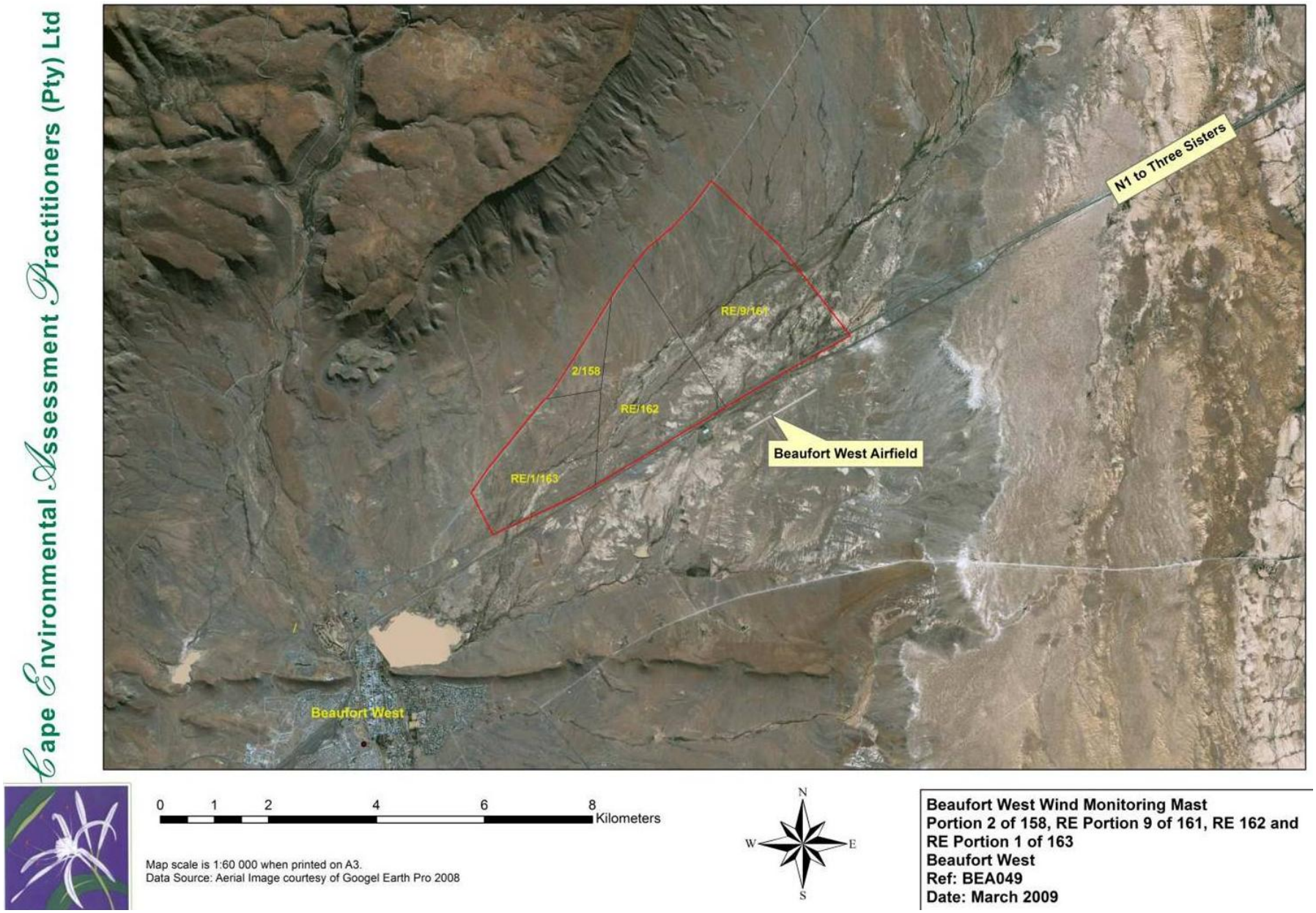

Figure 2. Location of study area and affected properties. (Figure provided by Cape Environmental Assessment Practitioners (Pty) Ltd).

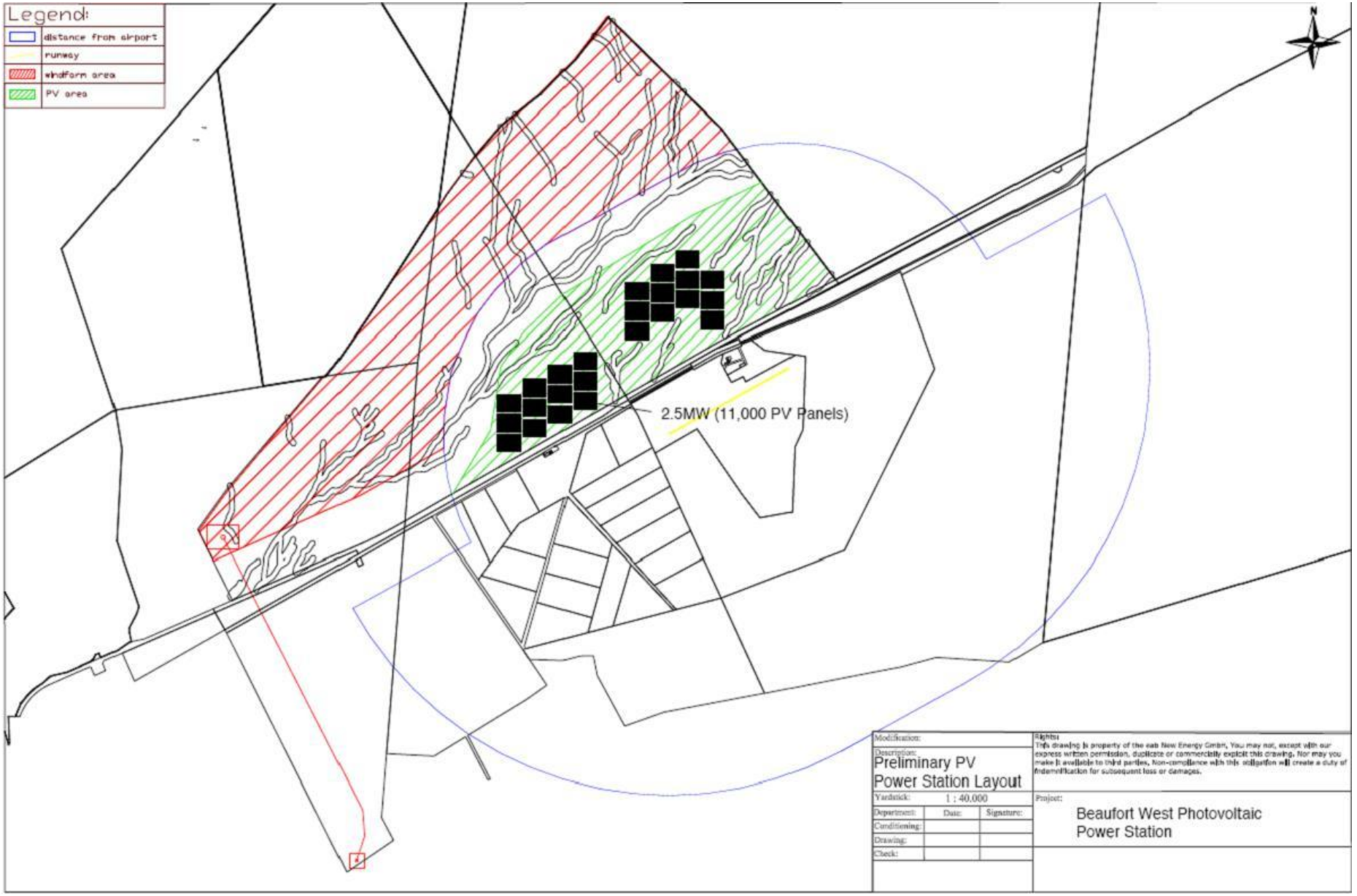

Figure 3. Preliminary layout plan for the proposed Photovoltaic (solar) Park (courtesy of Cape-eaprac).

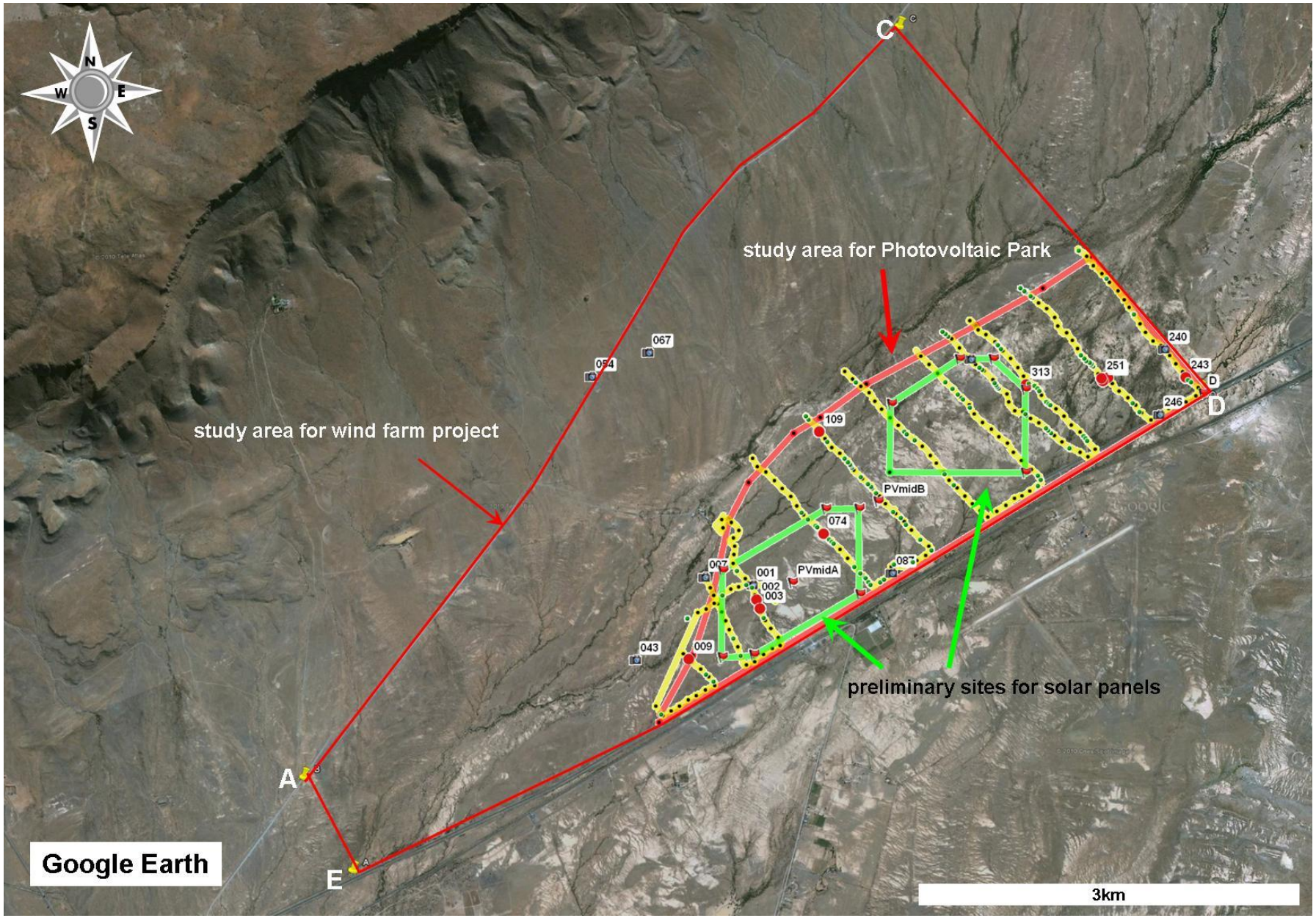

Figure 4. Enlarged area with walk tracks (yellow), photo localities (camera icons) and archaeological occurrences (small green and large red dots).

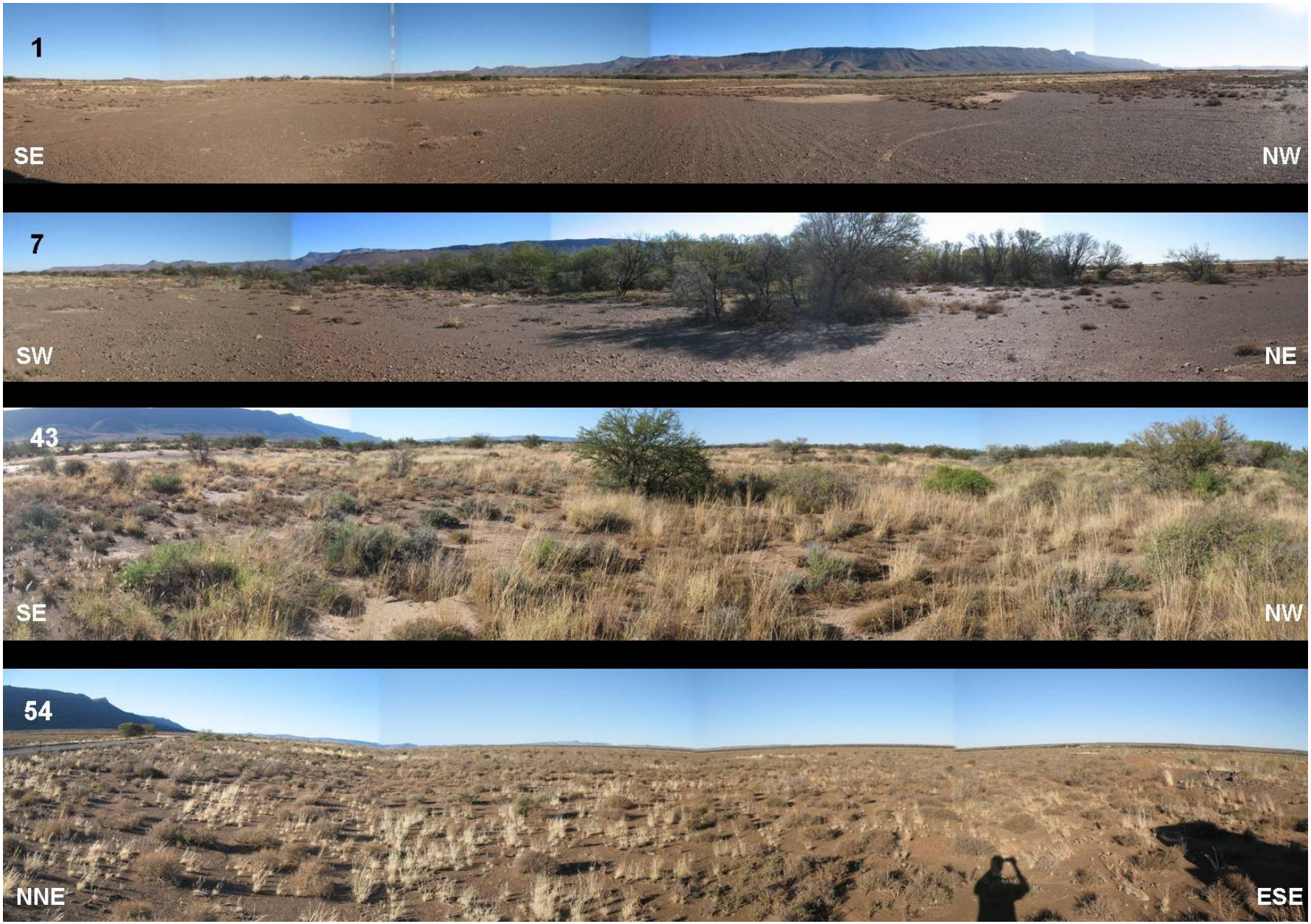

Plate 1. Examples of the surrounding environment, exposures, topography and vegetation cover (see Figure 4 and Appendix A).

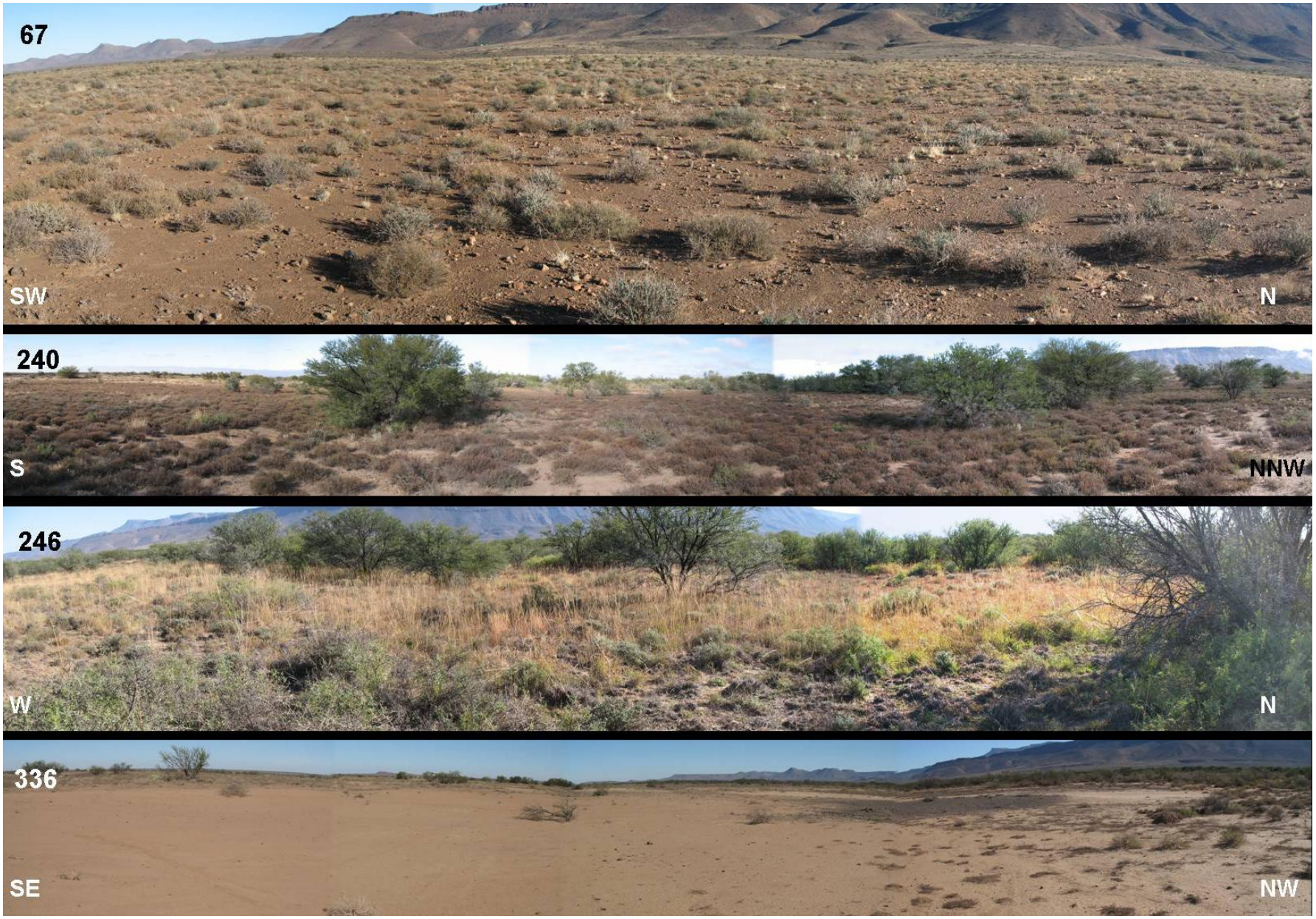

Plate 2. Examples of the surrounding environment, exposures, topography and vegetation cover (see Figure 4 and Appendix A).

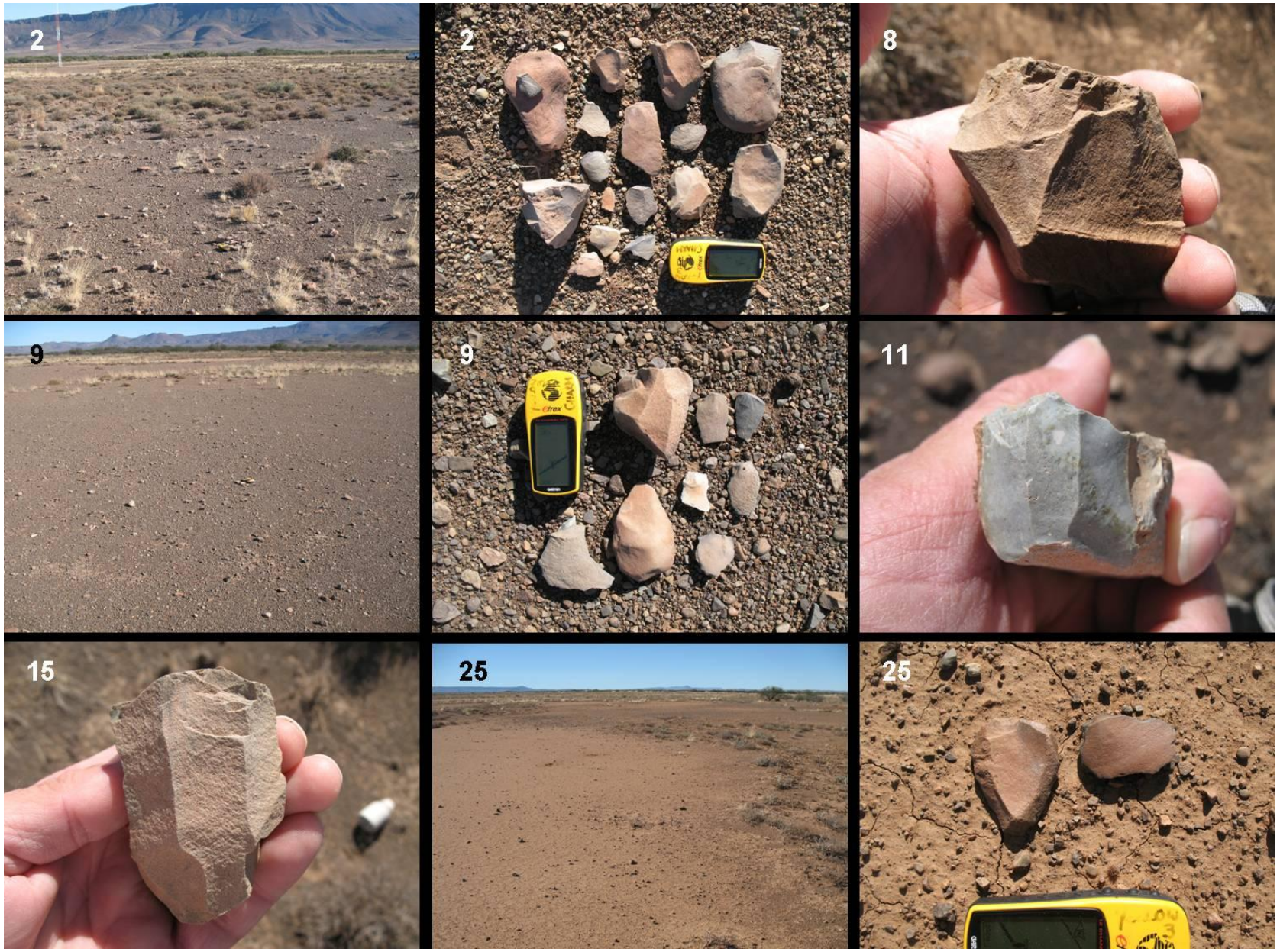

Plate 3. Examples of contexts and archaeological finds (see Figure 4 and Table 2 and Appendix A).

Plate 4 Examples of contexts and archaeological finds (see Figure 4 and Table 2 and Appendix A).

Plate 5 Examples of contexts and archaeological finds (see Figure 4 and Table 2 and Appendix A).

Plate 6 Examples of contexts and archaeological finds (see Figure 4 and Table 2 and Appendix A).

Plate 7 Examples of contexts and archaeological finds (see Figure 4 and Table 2 and Appendix A).

Appendix A

Coordinate and descriptive data for boundary points, photo localities and archaeological occurrences

Name	Description img=image snd=sound	Datum: WGS 84 Lat/Lon dec.degrees	Datum: WGS 84 Grid: SA National	elevation above sea level
1	img7291-6 snd7296	S32.30395 E22.63933	23 Y0033968 X3575614	883 m
2	ESA-MSA-ESA img7297-300 snd7300	S32.30492 E22.63969	23 Y0033934 X3575722	884 m
3	ESA-MSA-LSA	S32.30552 E22.63997	23 Y0033907 X3575788	887 m
4	stone artefact	S32.30613 E22.64029	23 Y0033877 X3575856	887 m
5	stone artefact	S32.30868 E22.63838	23 Y0034056 X3576140	886 m
6	stone artefact	S32.30752 E22.63777	23 Y0034113 X3576010	887 m
7	img7301-5 snd7305	S32.30343 E22.63536	23 Y0034342 X3575558	885 m
9	ESA-MSA img7310-4 snd7314	S32.30894 E22.63409	23 Y0034460 X3576170	884 m
10	stone artefact	S32.30996 E22.63552	23 Y0034325 X3576282	879 m
11	LSA img7315-8 snd7318	S32.31043 E22.63613	23 Y0034267 X3576334	879 m
12	stone artefact	S32.31266 E22.63180	23 Y0034674 X3576582	882 m
43	img7335-8 snd7338	S32.30901 E22.62967	23 Y0034876 X3576178	880 m
46	stone artefact	S32.30616 E22.63398	23 Y0034471 X3575862	882 m
47	stone artefact	S32.30460 E22.63686	23 Y0034200 X3575687	885 m
48	stone artefact	S32.30390 E22.63884	23 Y0034014 X3575609	883 m
49	stone artefact	S32.30407 E22.63932	23 Y0033969 X3575627	889 m
50	stone artefact	S32.30294 E22.63808	23 Y0034087 X3575503	880 m
54	img7349-52 snd7352	S32.28985 E22.62599	23 Y0035230 X3574056	892 m
67	img7362-4 snd7634	S32.28823 E22.63070	23 Y0034786 X3573873	898 m
70	stone artefact	S32.29901 E22.64342	23 Y0033585 X3575065	890 m
71	MSA blade img7365-8 snd7368	S32.29947 E22.64394	23 Y0033536 X3575116	891 m
72	stone artefact	S32.29988 E22.64457	23 Y0033476 X3575162	894 m
73	stone artefact	S32.29999 E22.64472	23 Y0033462 X3575174	893 m
74	ESA ?MSA img7369-73 snd7373	S32.30047 E22.64524	23 Y0033413 X3575226	891 m
75	stone artefact	S32.30082 E22.64569	23 Y0033370 X3575265	890 m
76	stone artefact	S32.30097 E22.64590	23 Y0033350 X3575282	891 m
77	stone artefact	S32.30110 E22.64606	23 Y0033335 X3575296	891 m
78	stone artefact	S32.30267 E22.64778	23 Y0033173 X3575470	891 m
79	stone artefact	S32.30309 E22.64824	23 Y0033129 X3575517	890 m
80	stone artefact	S32.30311 E22.64828	23 Y0033126 X3575519	890 m
81	stone artefact	S32.30338 E22.64863	23 Y0033093 X3575548	891 m
82	stone artefact	S32.30344 E22.64871	23 Y0033085 X3575554	892 m
83	stone artefact	S32.30370 E22.64894	23 Y0033063 X3575584	891 m
84	stone artefact	S32.30389 E22.64912	23 Y0033046 X3575604	890 m
85	stone artefact	S32.30372 E22.64992	23 Y0032971 X3575586	888 m
86	stone artefact	S32.30353 E22.65023	23 Y0032942 X3575565	889 m
87	img7374 snd7374	S32.30314 E22.65083	23 Y0032885 X3575521	890 m
88	stone artefact	S32.30252 E22.65105	23 Y0032865 X3575452	890 m
89	stone artefact	S32.30235 E22.65262	23 Y0032717 X3575433	892 m
90	stone artefact	S32.30155 E22.65416	23 Y0032573 X3575344	892 m
91	stone artefact	S32.30083 E22.65323	23 Y0032660 X3575264	894 m
92	stone artefact	S32.29982 E22.65204	23 Y0032773 X3575153	894 m
93	stone artefact	S32.29936 E22.65163	23 Y0032812 X3575101	893 m
94	MSA img7375-80 snd7380	S32.29896 E22.65098	23 Y0032872 X3575058	895 m
95	stone artefact	S32.29808 E22.65000	23 Y0032965 X3574961	894 m
96	stone artefact	S32.29769 E22.64958	23 Y0033005 X3574917	895 m
97	stone artefact	S32.29736 E22.64925	23 Y0033036 X3574880	894 m
98	MSA img7381-6 snd7386	S32.29726 E22.64917	23 Y0033044 X3574870	895 m
99	stone artefact	S32.29707 E22.64890	23 Y0033069 X3574849	895 m
100	stone artefact	S32.29660 E22.64831	23 Y0033125 X3574797	894 m
101	stone artefact	S32.29596 E22.64758	23 Y0033194 X3574726	894 m
102	stone artefact	S32.29584 E22.64748	23 Y0033203 X3574713	896 m
103	stone artefact	S32.29576 E22.64743	23 Y0033209 X3574704	895 m
104	stone artefact	S32.29560 E22.64725	23 Y0033225 X3574686	895 m
105	stone artefact	S32.29535 E22.64697	23 Y0033251 X3574658	895 m
106	stone artefact	S32.29422 E22.64554	23 Y0033387 X3574533	894 m
107	stone artefact	S32.29364 E22.64498	23 Y0033439 X3574470	893 m
108	stone artefact	S32.29354 E22.64489	23 Y0033448 X3574458	894 m
109	LSA one MSA img7387-96 snd7396	S32.29356 E22.64487	23 Y0033450 X3574460	893 m
110	stone artefact	S32.29272 E22.64398	23 Y0033534 X3574368	896 m
111	stone artefact	S32.29248 E22.64377	23 Y0033554 X3574341	897 m

Name	Description img=image snd=sound	Datum: WGS 84 Lat/Lon dec.degrees	Datum: WGS 84 Grid: SA National	elevation above sea level
141	stone artefact	S32.29019 E22.64791	23 Y0033165 X3574086	897 m
142	stone artefact	S32.29354 E22.65191	23 Y0032787 X3574456	896 m
143	stone artefact	S32.29370 E22.65211	23 Y0032769 X3574474	895 m
144	stone artefact	S32.29411 E22.65277	23 Y0032706 X3574519	893 m
145	stone artefact	S32.29640 E22.65524	23 Y0032472 X3574773	895 m
146	stone artefact	S32.29714 E22.65600	23 Y0032401 X3574854	894 m
147	stone artefact	S32.29720 E22.66295	23 Y0031745 X3574859	899 m
148	stone artefact	S32.29679 E22.66319	23 Y0031724 X3574813	899 m
149	stone artefact	S32.29651 E22.66295	23 Y0031746 X3574782	900 m
150	ESA-MSA-LSA img7401-5 snd7405	S32.29190 E22.65733	23 Y0032277 X3574272	899 m
151	stone artefact	S32.29135 E22.65676	23 Y0032331 X3574211	899 m
152	stone artefact	S32.29102 E22.65634	23 Y0032370 X3574175	899 m
153	stone artefact	S32.29063 E22.65590	23 Y0032412 X3574132	901 m
154	stone artefact	S32.29018 E22.65530	23 Y0032468 X3574082	900 m
236	stone artefact	S32.28128 E22.66634	23 Y0031432 X3573093	911 m
237	stone artefact	S32.28318 E22.66863	23 Y0031215 X3573302	910 m
238	stone artefact	S32.28554 E22.67086	23 Y0031004 X3573563	911 m
239	stone artefact	S32.28560 E22.67090	23 Y0031001 X3573569	911 m
240	img7439-43 snd7443	S32.28799 E22.67336	23 Y0030769 X3573834	908 m
241	stone artefact	S32.28966 E22.67507	23 Y0030607 X3574019	909 m
242	stone artefact	S32.28980 E22.67519	23 Y0030596 X3574035	909 m
243	LSA img7444-54 snd7454	S32.28988 E22.67518	23 Y0030596 X3574043	909 m
244	stone artefact	S32.29004 E22.67535	23 Y0030580 X3574061	910 m
245	stone artefact	S32.29017 E22.67562	23 Y0030555 X3574076	909 m
246	img7455-7 snd7457	S32.29243 E22.67296	23 Y0030804 X3574326	904 m
247	stone artefact	S32.29220 E22.67135	23 Y0030956 X3574301	901 m
248	stone artefact	S32.29161 E22.67079	23 Y0031009 X3574236	902 m
249	LSA - like 243&250-1	S32.28991 E22.66876	23 Y0031201 X3574048	905 m
250	LSA img7458-9 snd7459	S32.29014 E22.66833	23 Y0031241 X3574074	906 m
251	LSA img7458-9 snd7459	S32.28995 E22.66822	23 Y0031252 X3574053	906 m
252	stone artefact	S32.28912 E22.66751	23 Y0031319 X3573962	905 m
253	LSA like but less dense - 243,249,250,251	S32.28902 E22.66737	23 Y0031332 X3573951	904 m
254	LSA like but less dense - 243,249,250,251	S32.28893 E22.66739	23 Y0031331 X3573940	905 m
255	LSA like but less dense - 243,249,250,251	S32.28886 E22.66725	23 Y0031344 X3573933	905 m
256	stone artefact	S32.28875 E22.66694	23 Y0031373 X3573920	904 m
257	stone artefact	S32.28859 E22.66680	23 Y0031386 X3573902	904 m
258	stone artefact	S32.28836 E22.66651	23 Y0031414 X3573878	904 m
259	stone artefact	S32.28447 E22.66251	23 Y0031791 X3573447	905 m
260	stone artefact	S32.28437 E22.66235	23 Y0031806 X3573436	905 m
261	stone artefact	S32.28413 E22.66200	23 Y0031840 X3573410	904 m
262	stone artefact	S32.28408 E22.66193	23 Y0031847 X3573404	904 m
263	stone artefact	S32.28403 E22.66184	23 Y0031855 X3573398	905 m
264	stone artefact	S32.28382 E22.66151	23 Y0031886 X3573375	905 m
310	stone artefact	S32.28761 E22.65957	23 Y0032068 X3573796	900 m
311	stone artefact	S32.28767 E22.65965	23 Y0032060 X3573803	900 m
312	stone artefact	S32.28794 E22.65991	23 Y0032036 X3573832	901 m
313	LSA - like 243 etc	S32.29037 E22.66198	23 Y0031840 X3574102	901 m
314	stone artefact	S32.29027 E22.66220	23 Y0031819 X3574091	901 m
315	stone artefact	S32.29043 E22.66267	23 Y0031775 X3574108	901 m
316	stone artefact	S32.29060 E22.66292	23 Y0031751 X3574127	901 m
317	stone artefact	S32.29078 E22.66307	23 Y0031737 X3574147	901 m
318	stone artefact	S32.29152 E22.66365	23 Y0031682 X3574228	902 m
319	stone artefact	S32.29165 E22.66384	23 Y0031664 X3574243	901 m
320	stone artefact	S32.29174 E22.66398	23 Y0031651 X3574253	901 m
321	stone artefact	S32.29382 E22.66672	23 Y0031392 X3574483	898 m
322	stone artefact	S32.29398 E22.66689	23 Y0031376 X3574500	898 m
323	stone artefact	S32.29415 E22.66703	23 Y0031362 X3574519	897 m
324	stone artefact	S32.29465 E22.66557	23 Y0031500 X3574575	899 m
325	stone artefact	S32.29363 E22.66405	23 Y0031644 X3574463	900 m
326	stone artefact	S32.29344 E22.66379	23 Y0031668 X3574442	899 m
327	stone artefact	S32.29330 E22.66363	23 Y0031683 X3574426	899 m
328	stone artefact	S32.29243 E22.66200	23 Y0031837 X3574330	899 m
329	stone artefact	S32.29234 E22.66192	23 Y0031844 X3574320	899 m
330	stone artefact	S32.29061 E22.65971	23 Y0032053 X3574129	900 m

Name	Description img=image snd=sound	Datum: WGS 84 Lat/Lon dec.degrees	Datum: WGS 84 Grid: SA National	elevation above sea level
331	stone artefact	S32.29049 E22.65958	23 Y0032066 X3574116	901 m
332	stone artefact	S32.29038 E22.65949	23 Y0032074 X3574103	900 m
333	stone artefact	S32.29025 E22.65938	23 Y0032085 X3574089	901 m
334	ESA handaxe img7460-4 snd7464	S32.28934 E22.65836	23 Y0032181 X3573988	901 m
335	stone artefact	S32.28920 E22.65812	23 Y0032203 X3573973	901 m
336	img7465-8 snd7468	S32.28867 E22.65735	23 Y0032276 X3573915	902 m
337	stone artefact	S32.28709 E22.65554	23 Y0032448 X3573740	901 m
338	stone artefact	S32.28692 E22.65532	23 Y0032468 X3573722	902 m
339	stone artefact	S32.28677 E22.65507	23 Y0032492 X3573705	902 m
A	wind farm boundary point	S32.32387 E22.60628	23 Y0037072 X3577834	
B	wind farm boundary point	S32.31718 E22.60222	23 Y0037458 X3577094	
C	wind farm boundary point	S32.26562 E22.65005	23 Y0032972 X3571360	
D	wind farm boundary point	S32.29098 E22.67663	23 Y0030459 X3574165	