

# ARCHAEOLOGICAL SPECIALIST STUDY

In terms of Section 38(8) of the NHRA for a

## **Proposed Development of the Bulskop PV Cluster and Associated Infrastructure near Beaufort West, Western Cape**

Prepared by

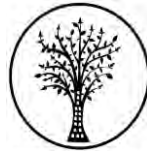


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In Association with

**Bulskop PV (Pty) Ltd  
Bulskop GMA (Pty) Ltd**

October 2021



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## EXECUTIVE SUMMARY

Six solar photovoltaic (PV) facilities (Hardeveld PV, Rosenia PV, Hoodia PV, Salsola PV, Gamka PV, Bulskop PV) (collectively referred to as the Bulskop PV Cluster) are proposed to be developed on the Remaining Extent (Portion 0) of Farm 423 near Beaufort West in the Western Cape Province. The boundary of the study area is approximately 2 600 ha in size. The cluster is expected to comprise six PV facilities (each ~250 ha in extent) with a potential generating output capacity of 100 MW per PV facility. The proposal also includes the construction and operation of grid connection infrastructure connecting the Bulskop PV cluster to the Droerivier Main Transmission Substation (MTS)

The findings of this assessment largely correlate with the findings of other assessments completed in the vicinity such as the findings of the ACO (2013, SAHRIS NID 503074) who note that “Because of the scarcity of caves and shelters, more than 90% of Karoo archaeological sites are open sites of stone artefacts, ostrich eggshell fragments and occasionally, pottery. Bone remains are rarely preserved. Artefacts of both the Early and Middle Stone Age are widespread and may generally be described as an ancient litter that occurs at a low frequency across the landscape.” This same archaeological signature has been identified within the development footprint.

It is noted that high numbers of quarried stone artefacts predominantly from the Middle Stone Age period were found on this property which is consistent with observations on neighbouring farms through impact assessments and research surveys. These artefacts are particularly visible in deflated open sites where the top soil has washed away onto a harder gravel surface. No shelters were found on the property and no rock paintings, graves or engravings were located.

Based on the outcomes of this report, it is not anticipated that the proposed development of a solar pv facility or its associated grid connection infrastructure will negatively impact on significant archaeological heritage. The following recommendations are made:

- No mitigation is required for archaeological material recorded in the footprint areas of the proposed solar PV facilities, or the proposed powerline. Despite the high number of observations of artefacts, the grading was not conservation worthy as they are common and representative of similar scatters across widespread areas of the Karoo.
- No impact must occur to the abandoned werf identified at BLK055 and as such, a 50m no-go buffer around this site is recommended
- Although all possible care has been taken to identify sites of cultural importance during the investigation of the study area, it is always possible that hidden or subsurface sites could be overlooked during the assessment. If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils, burials or other categories of heritage resources are found during the proposed development, work must cease in the vicinity of the find and HWC must be alerted immediately to determine an appropriate way forward.

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## 1. INTRODUCTION

### 1.1 Background Information on Project

Six solar photovoltaic (PV) facilities (Hardeveld PV, Rosenia PV, Hoodia PV, Salsola PV, Gamka PV, Bulskop PV) (collectively referred to as the Bulskop PV Cluster) are proposed to be developed on the Remaining Extent (Portion 0) of Farm 423 near Beaufort West in the Western Cape Province. The boundary of the study area is approximately 2 600 ha in size. The cluster is expected to comprise six PV facilities (each ~250 ha in extent) with a potential generating output capacity of 100 MW per PV facility. The proposal also includes the construction and operation of grid connection infrastructure connecting the Bulskop PV cluster to the Droerivier Main Transmission Substation (MTS).

Each facility will comprise of solar PV technology with fixed, single or double axis tracking mounting structures, with a net generation (contracted) capacity of 100 MW AC (MegaWatts), as well as associated infrastructure, which will include:

- On-site substation / collector switching station;
- Auxiliary buildings (gate-house and security, control centre, office, warehouse, canteen & visitors centre, staff lockers etc.);
- Inverter-stations, transformers and internal electrical reticulation (underground cabling);
- Battery Energy Storage System (BESS);
- Access and internal road network;
- Laydown area;
- Rainwater tanks; and
- Perimeter fencing and security infrastructure.

The facilities intend to connect to the National Grid via the Droerivier Main Transmission Substation (MTS) (approximately 17.5 km west of the facility). The grid connection infrastructure will traverse five (5) properties, namely:

- Remaining Extent of Farm 423
- Portion 4 of Farm 169
- Portion 5 of Farm 169
- Portion 1 of Farm Steenrotsfontein No 168
- Portion 10 of Farm Weltevreden No 170

The development of the Bulskop Grid Connection Infrastructure will include the following infrastructure components:

- A new Collector Substation/Switching Station of up to 1.25 ha in extent, including:
- Construction of a new platform with earth mat and civil works.
- New feeder bay/s and busbar/s (up to 132 kV) complete with protection equipment.
- A double-circuit power line of up to 132 kV between the Bulskop Collector Substation/Switching Station and the existing Droerivier Main Transmission Substation (MTS), complete with structures, foundations, conductor, fibre layout, insulation, and assemblies;



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- A jeep track (up to 8 m wide) to provide access to and along the power line servitude;
- Works within the Droerivier MTS HV yard:
- Establish new feeder bay/s (up to 132 kV), inclusive of line bays, busbars, bussection and protection equipment.
- Provision to install a new transformer (up to 500 MVA 400/132 kV), if required.

A 17.5 km long and 300 m wide grid connection corridor will be assessed to allow for the optimisation of the grid connection infrastructure and to accommodate the environmental sensitivities identified within the corridor. Thereafter, the final placement of the grid connection infrastructure will be confirmed when the proposed Bulskop solar PV facilities are awarded Preferred Bidder status by the Department of Mineral Resources and Energy (DMRE).

## 1.2 Description of Property and Affected Environment

The study area lies south and southeast of Beaufort West. The R61 main road to Graaff-Reinet dissects the eastern end while the N1 and N12 highways border the western side of the study area. The Hansrivier farm, currently abandoned, is in the central area while Farm 423 holds the area currently envisaged for the solar PV facilities. The entire study area was surveyed in order to provide various options for the layouts of the solar PV facilities as well as the route of the powerline connecting the energy generation area to the main substation nearer to the N12. Hansrivier Farm (Portion 4 of Farm 169) was recently advertised for tourism facilities through a tender on the Beaufort West Municipality's website and two 765kV powerline routes already traverse the full length of the property. The municipal refuse dump is on the northern border of Hansrivier farm and windblown litter was found extensively, even as far as the eastern side of the study area.

The site is located in the Karoo Region of the Western Cape. It is within the arid zone of South Africa where the rainfall is low and erratic, and where the main farming activity is sheep and goat production. Crop production in general only takes place where there is irrigation water available. Occasionally, opportunistic cropping is practiced and then only after rainwater has been stored in the soil profile do the crops have a regional chance to mature. Remaining Extent (Portion 0) of Farm 423 is currently used for small livestock grazing. According to the Department of Agriculture, Land Reform and Rural Development (DALRRD) the land falls into Class vii. It is considered as low potential land suitable for livestock and conservation.

The landscape on the eastern side of Farm 423 is almost entirely flat besides one or two areas closer to the farmhouse where the slope gradient changes ever so slightly by a few metres. This area is denoted in the "Lower Plaat Doorns" area of the Council for Geosciences Map 3222 and mainly consists of hard baked Quaternary sands in a long dune cordon that extends north, south and eastwards of this property.

The vegetation has all but completely died off due to an extremely long period of drought in the Beaufort West area (approximately 5 years). We did not see many grazing animals during the survey and even reptiles and small antelope were scarce. A few meerkats and hares were observed as well as birdlife. The ground was easy to cover and visibility



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was excellent. Naturally occurring hornfels, greywacke and siltstones are abundant and litter the level plain. A high game fence forms the eastern boundary of the property and a few water tanks, mainly abandoned or demolished, were found dotted across the farm.

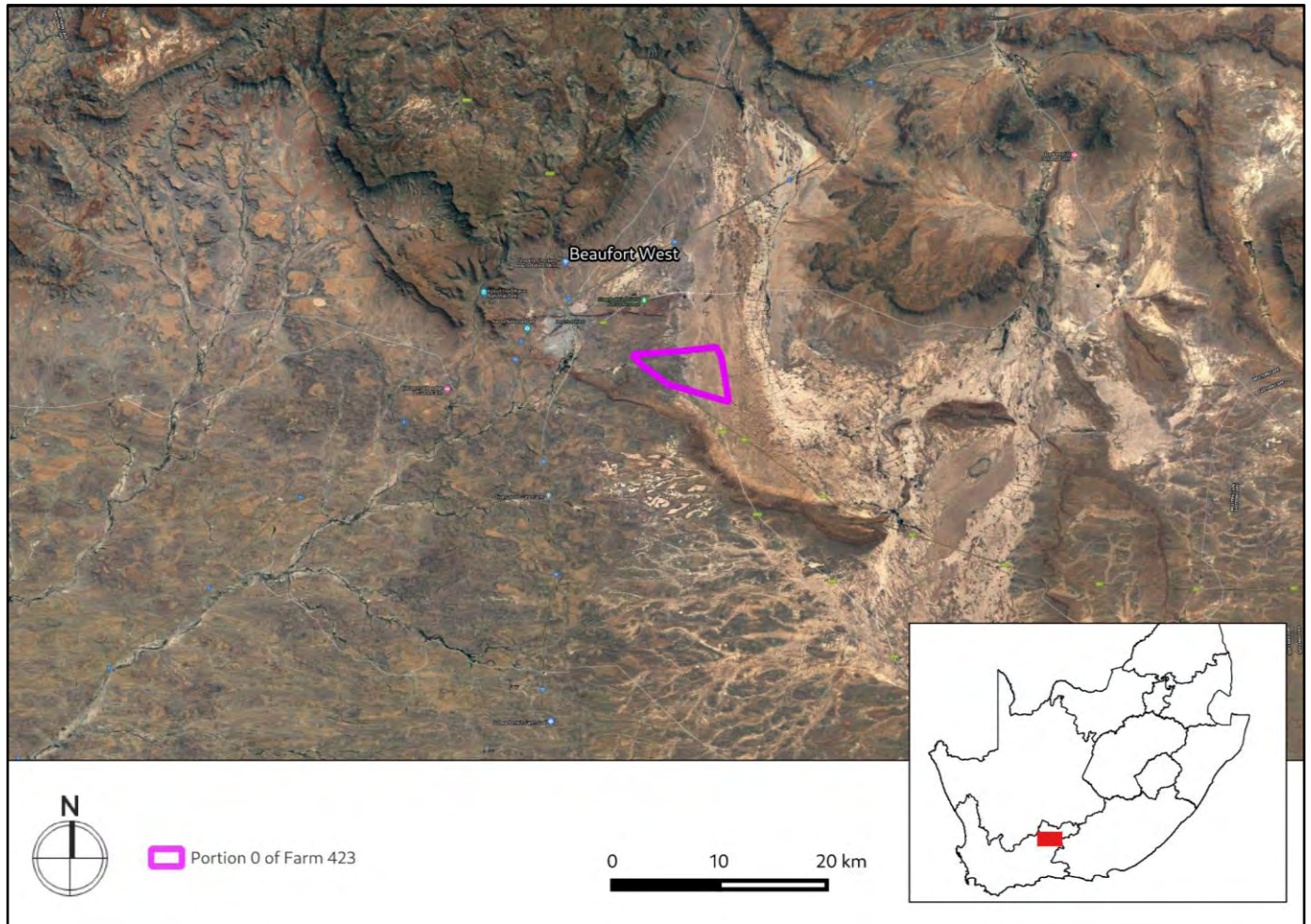


Figure 1.1: Satellite image indicating proposed location of development



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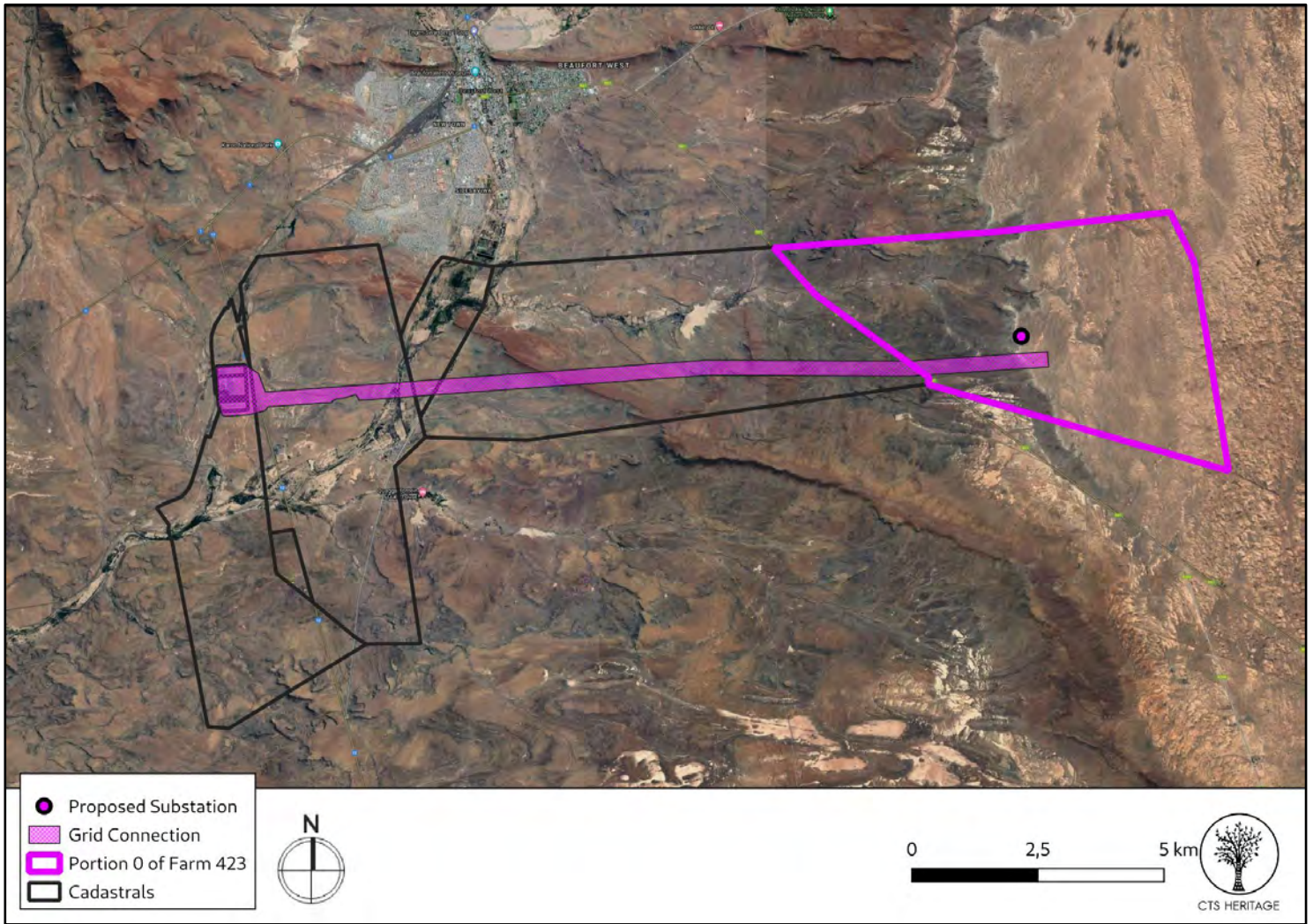


Figure 1.2: Proposed project boundary



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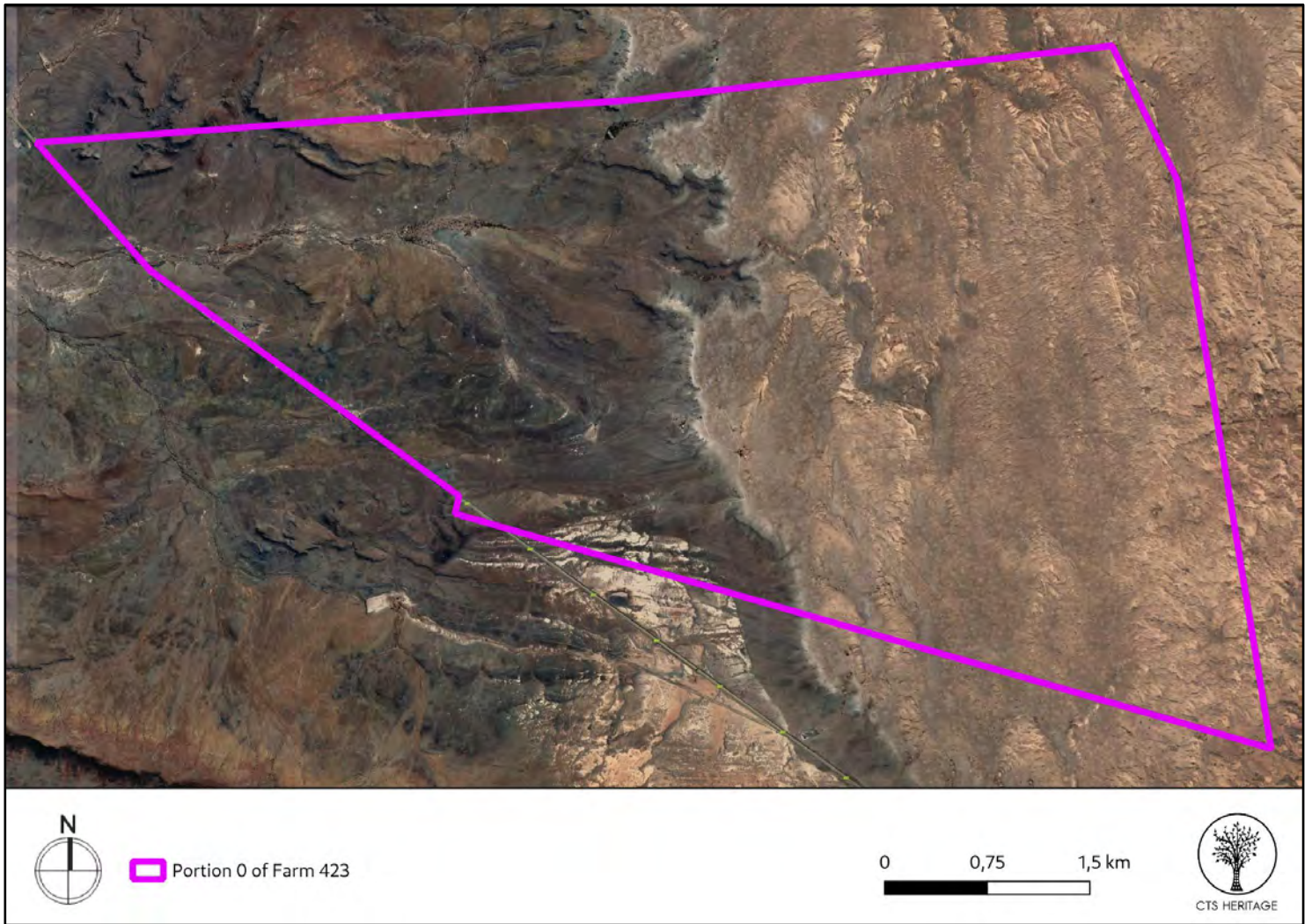


Figure 1.3: Total farm portion considered for the proposed PV Facilities



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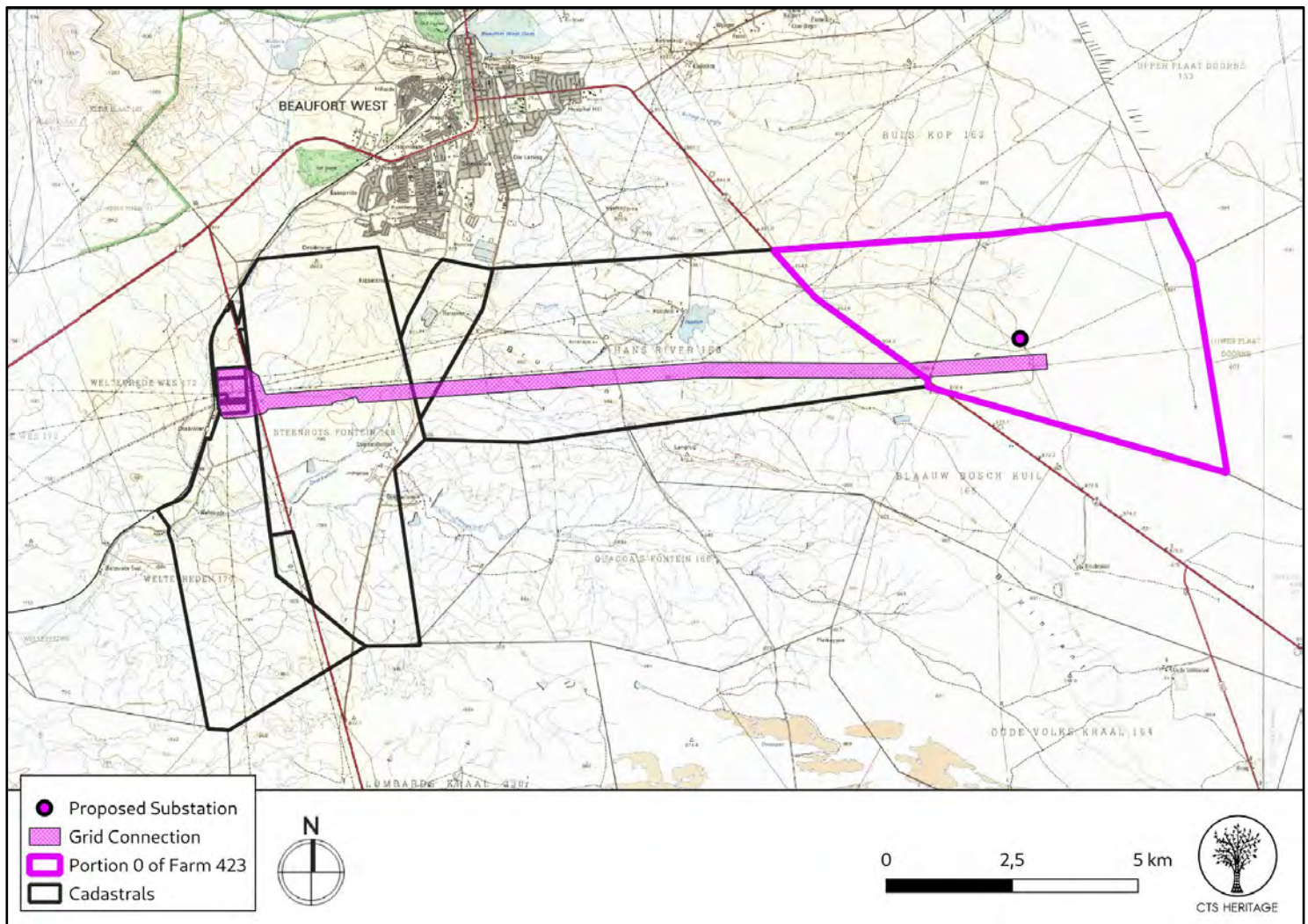


Figure 1.4: Proposed development area for the PV facility and grid connection 1:50 000 Topo Map

## 2. METHODOLOGY

### 2.1 Purpose of Archaeological Study

The purpose of this archaeological study is to satisfy the requirements of section 38(8), and therefore section 38(3) of the National Heritage Resources Act (Act 25 of 1999) in terms of impacts to archaeological resources, as well as Appendix 6 of the EIA Regulations, 2014.

### 2.2 Summary of steps followed

- An archaeologist conducted a survey of the site and its environs from 06 to 09 September 2021 to determine what archaeological resources are likely to be impacted by the proposed development.
- The area proposed for development was assessed on foot, photographs of the context and finds were taken, and tracks were recorded using a GPS.
- The identified resources were assessed to evaluate their heritage significance in terms of the grading system outlined in section 3 of the NHRA (Act 25 of 1999).





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### 3. HISTORY AND EVOLUTION OF THE SITE AND CONTEXT

#### **Background:**

The area proposed for the Bulskop PV Cluster and grid connection is located approximately 10km southeast of Beaufort West, east of the R61 and within the identified Beaufort West REDZ (Figure 2b). Beaufort West was the first town to be established in the central Karoo. The historic core of Beaufort West retains some heritage significance in the number of significant heritage resources located here (Figure 3a).

#### **Archaeology**

A number of heritage assessments have been completed within close proximity to the area proposed for development (Figure 2a). Known heritage resources within the broader context of the development area are mapped in Figure 3 and 3a.

According to Nilssen (2014, SAHRIS NID 504763), “The Karoo houses a long and rich archaeological record dating from the earliest stages of Stone Age technology that are over a million years old, to the historic period that consists of the last few hundred years of human occupation (see Nilssen 2011 and references therein). Archaeological sites include caves and rock shelters, open air artefact scatters, rock engravings and historic structures with their associated cultural materials.” According to ACO (2013, SAHRIS NID 503074), “Because of the scarcity of caves and shelters, more than 90% of Karoo archaeological sites are open sites of stone artefacts, ostrich eggshell fragments and occasionally, pottery. Bone remains are rarely preserved. Artefacts of both the Early and Middle Stone Age are widespread and may generally be described as an ancient litter that occurs at a low frequency across the landscape. Where definable scatters of Early and Middle Stone Age material occur, they are considered to be significant heritage sites. More intensive occupation of the Karoo started around 13 000 years ago during the Later Stone Age, which is essentially the heritage of Khoisan groups who lived throughout the region. The legacy of the San includes numerous open sites while traces of their presence can also be found in most large rock shelters, often in the form of rock art. They frequently settled a short distance from permanent water sources (springs or waterholes) and made use of natural shelters such as rock outcrops or large boulders or even large bushes. In the Great Karoo natural elevated features such as dolerite dykes and ridges played a significant role in San settlement patterns.”

It is likely that similar archaeological heritage exists within the areas proposed for development and as such, impact to these resources must be assessed.



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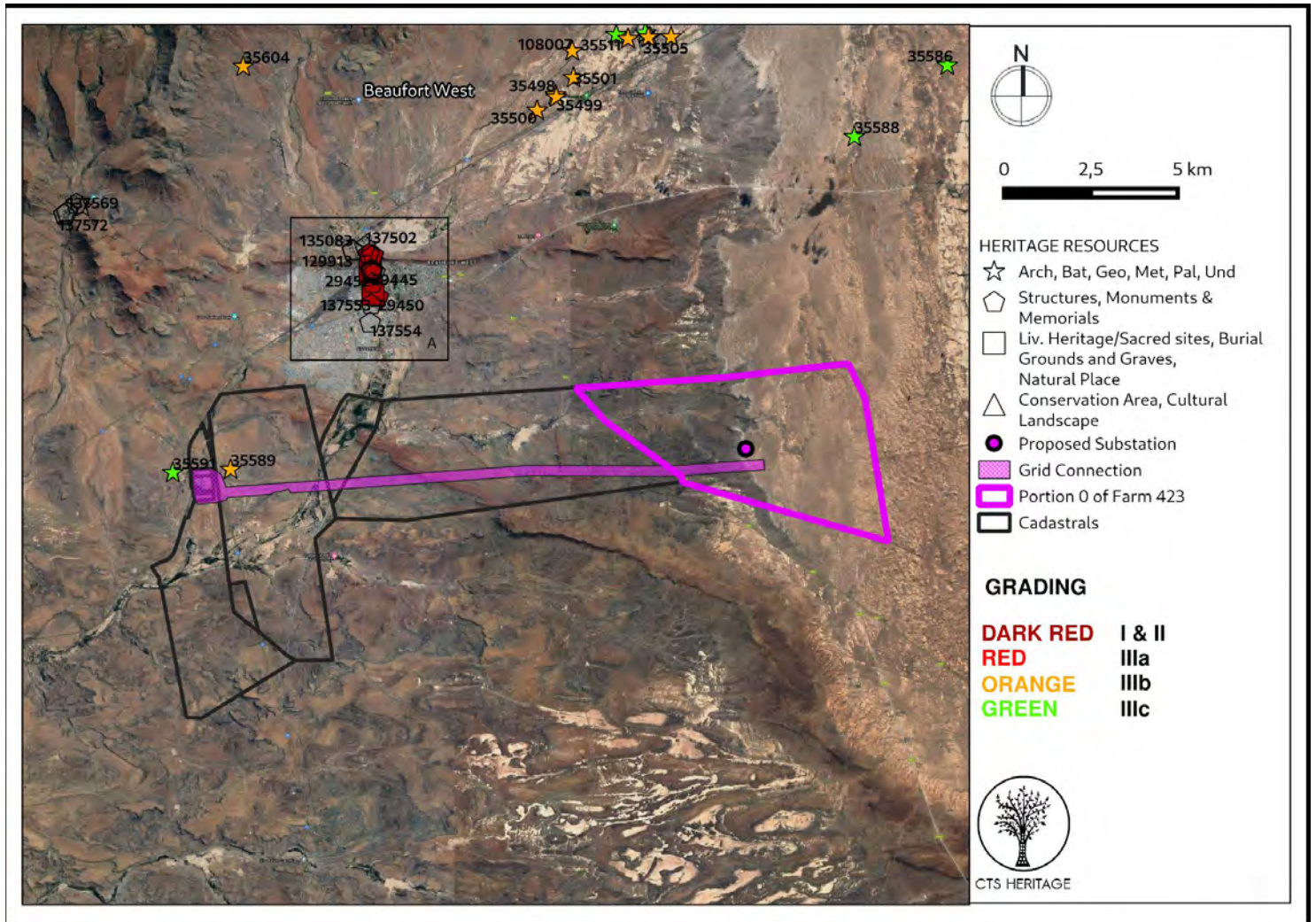


Figure 3. Heritage Resources Map. Heritage Resources previously identified in and near the study area, with SAHRIS Site IDs indicated



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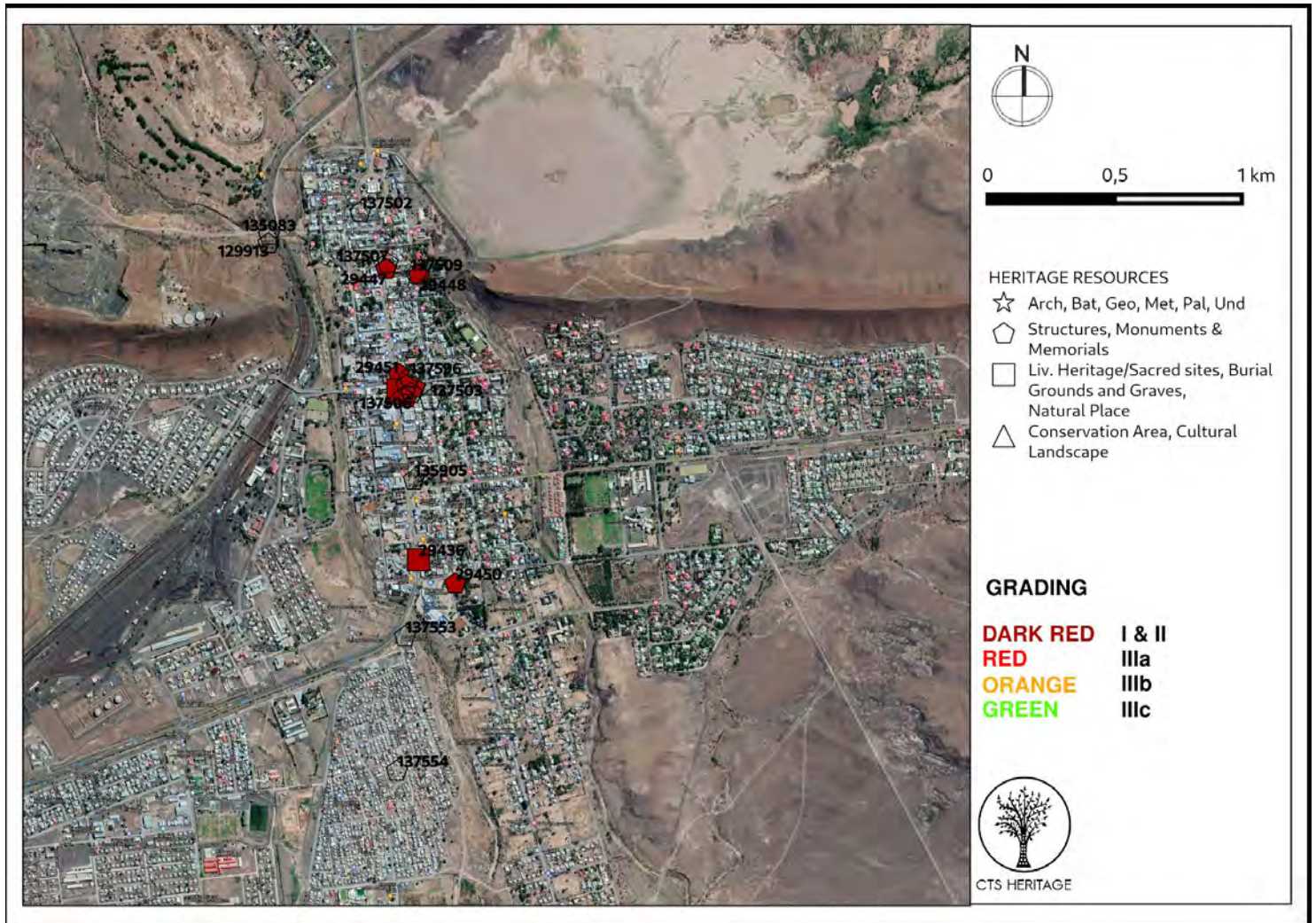


Figure 3a. Inset

#### 4. IDENTIFICATION OF HERITAGE RESOURCES

##### 4.1 Field Assessment

Middle Stone Age artefacts are dominant with a smaller amount of Later Stone Age material. The MSA artefacts also appeared to hold two different subsets - an early MSA, or possibly a late ESA assemblage and a typical later MSA assemblage likely dating to the last 100 000 years. The artefacts were found on the surface in deflated areas and it is difficult to determine the date range purely based on the typology of the material found, however, further studies may find a continuous occupation record throughout the MSA.

The artefactual material was rarely retouched and volumes at each assessed location were low as no significant source outcrops of raw stone materials were found. It appears that hunter-gatherers moved through this part of the landscape, sampling the smaller cobbles and leaving a couple of struck flakes at a time over a widely dispersed area which can be attributed to the long period over which this pattern of behaviour took place. Higher concentrations of material will no doubt be found closer to the main water sources and natural shelters formed in kloofs surrounding the area. Most of the



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cobbles were extremely weathered, patinated by desert varnish and submersion in mud and dust over millennia. 79 locations spread across the study area were assessed with most (75) holding MSA or LSA open-site materials dominated by greywacke, siltstones and hornfels. Besides various small farm dams and windmills spread evenly throughout the farms, historical layering is concentrated at the Hansrivier farmhouse complex which is situated in the middle of the study area.

The Hansrivier farmhouse complex is currently abandoned and consists of the main farmhouse, painted yellow with a green corrugated roof and outbuildings as well as vandalised/ruined labourers cottages. The farm was recently advertised for tourism proposals through a tender on the Beaufort West Municipality's website. Most of the buildings seen at the farms incorporated in the study area are modern and are not older than 60 years.

When moving closer to the river courses, thicker fluvial sands seemed to obscure the amount of artefacts seen and it is likely that previous flooding events have shifted the position of MSA material in these areas. Artefact visibility increased as one moved about 100-200m away from the river courses. Small dolerite outcrops east of the Hansrivier farm dam were also assessed but no engravings were found.



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Figure 4.1: Contextual Image of Farm 423



Figure 4.2: Contextual Image from the south of Farm 423



Figure 4.3: Contextual Images of Farm 423



Figure 4.4: Contextual Images of Development Area including grid



Figure 4.5: Contextual Images - Existing grid connection along proposed grid alignment



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Figure 4.6: Contextual Images



4.7: Contextual Images of landscape



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Figure 4.8: Contextual Images of Landscape



Figure 4.9: Contextual Images of grid connection corridor



Figure 4.10: Contextual Images of grid connection corridor

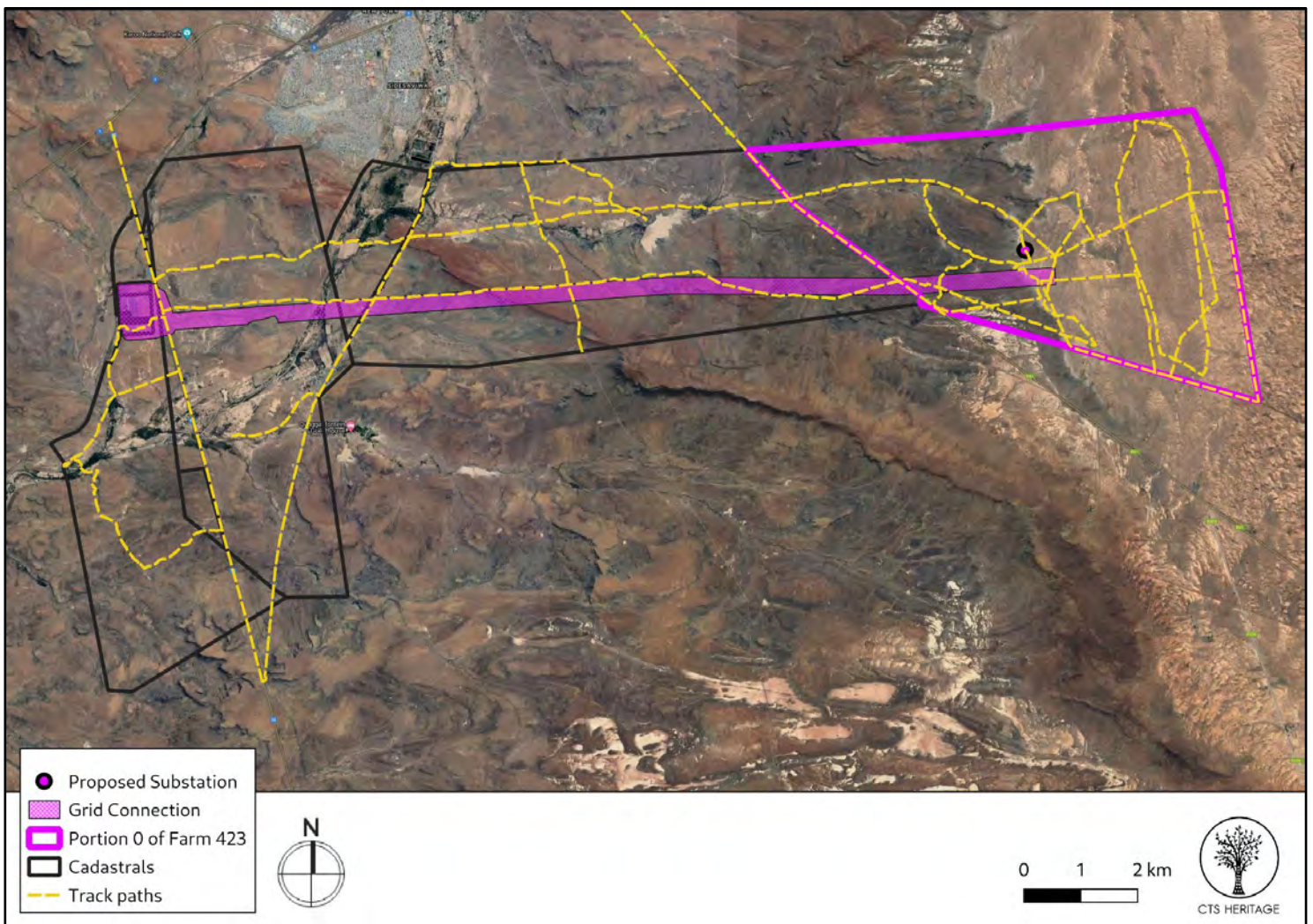


Figure 5: Overall track paths of survey (vehicular and on foot)



## 4.2 Archaeological Resources identified

**Table 1: Observations noted during the field assessment**

POINT ID	Site Name	Description	Period	Co-ordinates		Grading	Mitigation
BLK 001	Bulskop 001	Heavily weathered hornfels core flake	MSA	-32.38692	22.72886	NCW	None required
BLK 002	Bulskop 002	Hornfels flakes, not patinated	MSA	-32.38536	22.72871	NCW	None required
BLK 003	Bulskop 003	Green silcrete flake	MSA	-32.38114	22.72802	NCW	None required
BLK 004	Bulskop 004	Green siltstone flakes, cores	MSA	-32.37902	22.72696	NCW	None required
BLK 005	Bulskop 005	Dark siltstone flake, large bulb of percussion, dorsal flake scars	MSA	-32.37658	22.72303	NCW	None required
BLK 006	Bulskop 006	Green silcrete core flake, almost all cortex remains, edge of core retouched	MSA	-32.37921	22.71815	NCW	None required
BLK 007	Bulskop 007	Green siltstone flake blade unworked	MSA	-32.38178	22.71692	NCW	None required
BLK 008	Bulskop 008	Green siltstone flake dorsal flake scars	MSA	-32.39055	22.71575	NCW	None required
BLK 009	Bulskop 009	Hornfels flake and core	MSA	-32.39496	22.71737	NCW	None required
BLK 010	Bulskop 010	Hornfels core	LSA	-32.39597	22.71775	NCW	None required
BLK 011	Bulskop 011	Silcrete flake triangular	MSA	-32.39726	22.71843	NCW	None required
BLK 012	Bulskop 012	Heavily patinated silcrete cores and flaked cores	MSA	-32.40463	22.72142	NCW	None required
BLK 013	Bulskop 013	Hornfels core	LSA	-32.40687	22.72226	NCW	None required
BLK 014	Bulskop 014	Green siltstone flake, hinge terminations on dorsal	MSA	-32.40999	22.72278	NCW	None required
BLK 015	Bulskop 015	Dark grey siltstone flake blade	MSA	-32.41324	22.72449	NCW	None required
BLK 016	Bulskop 016	Dark grey siltstone flake blade	MSA	-32.41627	22.73121	NCW	None required
BLK 017	Bulskop 017	Heavily patinated hornfels flake	MSA	-32.41194	22.73235	NCW	None required
BLK 018	Bulskop 018	Heavily patinated hornfels rounded retouched flake	MSA	-32.41021	22.73219	NCW	None required
BLK 019	Bulskop 019	Heavily patinated hornfels flakes with secondary scarring	MSA	-32.40646	22.73142	NCW	None required
BLK 020	Bulskop 020	Green siltstone triangular flake	MSA	-32.40522	22.73125	NCW	None required
BLK 021	Bulskop 021	Heavily patinated silcrete flake, almost all patinated	MSA	-32.39359	22.72976	NCW	None required
BLK 022	Bulskop 022	Silcrete flake	MSA	-32.40322	22.70224	NCW	None required
BLK 023	Bulskop 023	Unworked flake struck off siltstone rock	MSA	-32.40671	22.70348	NCW	None required
BLK 024	Bulskop 024	Two flakes, one blade, green siltstone, patinated	MSA	-32.40691	22.70466	NCW	None required
BLK 025	Bulskop 025	Dark grey siltstone flake	MSA	-32.40772	22.70767	NCW	None required
BLK 026	Bulskop 026	Hornfels flake, point with step flaking	LSA	-32.4096	22.70958	NCW	None required
BLK 027	Bulskop 027	Green siltstone flakes	MSA	-32.41035	22.70693	NCW	None required
BLK 028	Bulskop 028	Heavily weathered flake, siltstone	MSA	-32.40994	22.70508	NCW	None required
BLK 029	Bulskop 029	Grey silcrete flake blade	MSA	-32.40882	22.70195	NCW	None required
<b>BLK 030</b>	<b>Bulskop 030</b>	<b>Open site with mixed raw materials, flakes, cores, siltstone, hornfels. Floodplain, vegetation slightly better condition here due to groundwater</b>	<b>MSA</b>	<b>-32.40809</b>	<b>22.69982</b>	<b>IIIC</b>	<b>None required</b>
BLK 031	Bulskop 031	Grey siltstone flake	MSA	-32.40651	22.69487	NCW	None required
BLK 032	Bulskop 032	Hornfels core, siltstone flake large	MSA, LSA	-32.40471	22.6893	NCW	None required



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BLK 033	Bulskop 033	Chert core with edge use, adze	MSA	-32.4034	22.68452	NCW	None required
BLK 034	Bulskop 034	Hornfels core	MSA	-32.4018	22.67288	NCW	None required
BLK 035	Bulskop 035	Hornfels core	LSA	-32.40424	22.66248	NCW	None required
BLK 036	Bulskop 036	siltstone and siltstone flakes, blade	MSA	-32.40409	22.65943	NCW	None required
BLK 037	Bulskop 037	siltstone core	MSA	-32.40372	22.65101	NCW	None required
BLK 038	Bulskop 038	Silcrete flake	MSA	-32.4025	22.64437	NCW	None required
BLK 039	Bulskop 039	Hornfels flake	MSA	-32.40215	22.6426	NCW	None required
BLK 040	Bulskop 040	siltstone flake	MSA	-32.40205	22.6414	NCW	None required
BLK 041	Bulskop 041	Microlithic hornfels flake	LSA	-32.40034	22.6379	NCW	None required
BLK 042	Bulskop 042	Dam walling	Modern	-32.40054	22.62725	NCW	None required
BLK 043	Bulskop 043	Quartz microlith	LSA	-32.40128	22.62028	NCW	None required
BLK 044	Bulskop 044	Hornfels and siltstone flakes	MSA	-32.40172	22.61767	NCW	None required
BLK 045	Bulskop 045	Core, greywacke, longitudinally reduced	MSA	-32.40202	22.61279	NCW	None required
BLK 046	Bulskop 046	Hornfels segment, retouched	MSA	-32.40253	22.60578	NCW	None required
BLK 047	Bulskop 047	Hornfels flake and core	MSA	-32.4028	22.59989	NCW	None required
BLK 048	Bulskop 048	greywacke core	LSA	-32.40284	22.59742	NCW	None required
BLK 049	Bulskop 049	Hornfels flake patinated	MSA	-32.40379	22.58604	NCW	None required
BLK 050	Bulskop 050	Hornfels radial core	MSA	-32.40381	22.58573	NCW	None required
BLK 051	Bulskop 051	greywacke blades and core	MSA	-32.40391	22.58393	NCW	None required
BLK 052	Bulskop 052	siltstone flake	MSA	-32.39454	22.58319	NCW	None required
BLK 053	Bulskop 053	siltstone flake triangular	MSA	-32.39405	22.59016	NCW	None required
BLK 054	Bulskop 054	siltstone flaked core	LSA	-32.39251	22.60392	NCW	None required
<b>BLK 055</b>	<b>Bulskop 055</b>	<b>Hansrivier farmhouse complex. Currently abandoned - consists of main farmhouse painted yellow with green corrugated roof and outbuildings as well as vandalised/ruined labourers cottages.</b>	<b>Modern, Historic</b>	<b>-32.39148</b>	<b>22.62556</b>	<b>IIIC</b>	<b>50m Buffer</b>
BLK 056	Bulskop 056	siltstone flake	MSA	-32.39004	22.62777	NCW	None required
BLK 057	Bulskop 057	Hornfels flake	MSA	-32.38984	22.63529	NCW	None required
BLK 058	Bulskop 058	siltstone flake	MSA	-32.38994	22.64006	NCW	None required
BLK 059	Bulskop 059	Hornfels blade flake unworked	MSA	-32.38919	22.64634	NCW	None required
BLK 060	Bulskop 060	greywacke core	MSA	-32.38738	22.65969	NCW	None required
BLK 061	Bulskop 061	Silcrete core	MSA	-32.38714	22.66099	NCW	None required
BLK 062	Bulskop 062	siltstone flake, prominent bulb of percussion, dorsal flakes, core	MSA	-32.38613	22.66574	NCW	None required
BLK 063	Bulskop 063	siltstone core	MSA	-32.38607	22.6675	NCW	None required
BLK 064	Bulskop 064	siltstone flake	MSA	-32.38572	22.6714	NCW	None required
BLK 065	Bulskop 065	Banded siltstone flake, cortex remaining on dorsal	MSA	-32.38584	22.68166	NCW	None required
BLK 066	Bulskop 066	greywacke flake	MSA	-32.38701	22.68539	NCW	None required
BLK 067	Bulskop 067	Hornfels flake edge retouched	MSA	-32.38721	22.68589	NCW	None required
BLK 068	Bulskop 068	greywacke core	MSA	-32.3888	22.68872	NCW	None required
BLK 069	Bulskop 069	siltstone flakes	MSA	-32.39028	22.69333	NCW	None required
BLK 070	Bulskop 070	greywacke flake	MSA	-32.39155	22.69553	NCW	None required



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BLK 071	Bulskop 071	Steenrotsfontein farm complex	Modern	-32.41786761	22.56415294	NCW	None required
BLK 072	Bulskop 072	Hornfels core	MSA	-32.40442281	22.56297622	NCW	None required
BLK 073	Bulskop 073	Hornfels flake	MSA	-32.40577561	22.54473359	NCW	None required
BLK 074	Bulskop 074	Siltstone flake	MSA	-32.400085	22.53740282	NCW	None required
BLK 075	Bulskop 075	Hornfels flake	MSA	-32.39544973	22.56741379	NCW	None required
BLK 076	Bulskop 076	Weltevrede farm complex	Modern	-32.43087949	22.51879667	NCW	None required
BLK 077	Bulskop 077	greywacke flake	MSA	-32.4556196	22.53397243	NCW	None required
BLK 078	Bulskop 078	greywacke flake	MSA	-32.44547375	22.53155959	NCW	None required
BLK 079	Bulskop 079	Hornfels blade	MSA	-32.42378687	22.53075683	NCW	None required

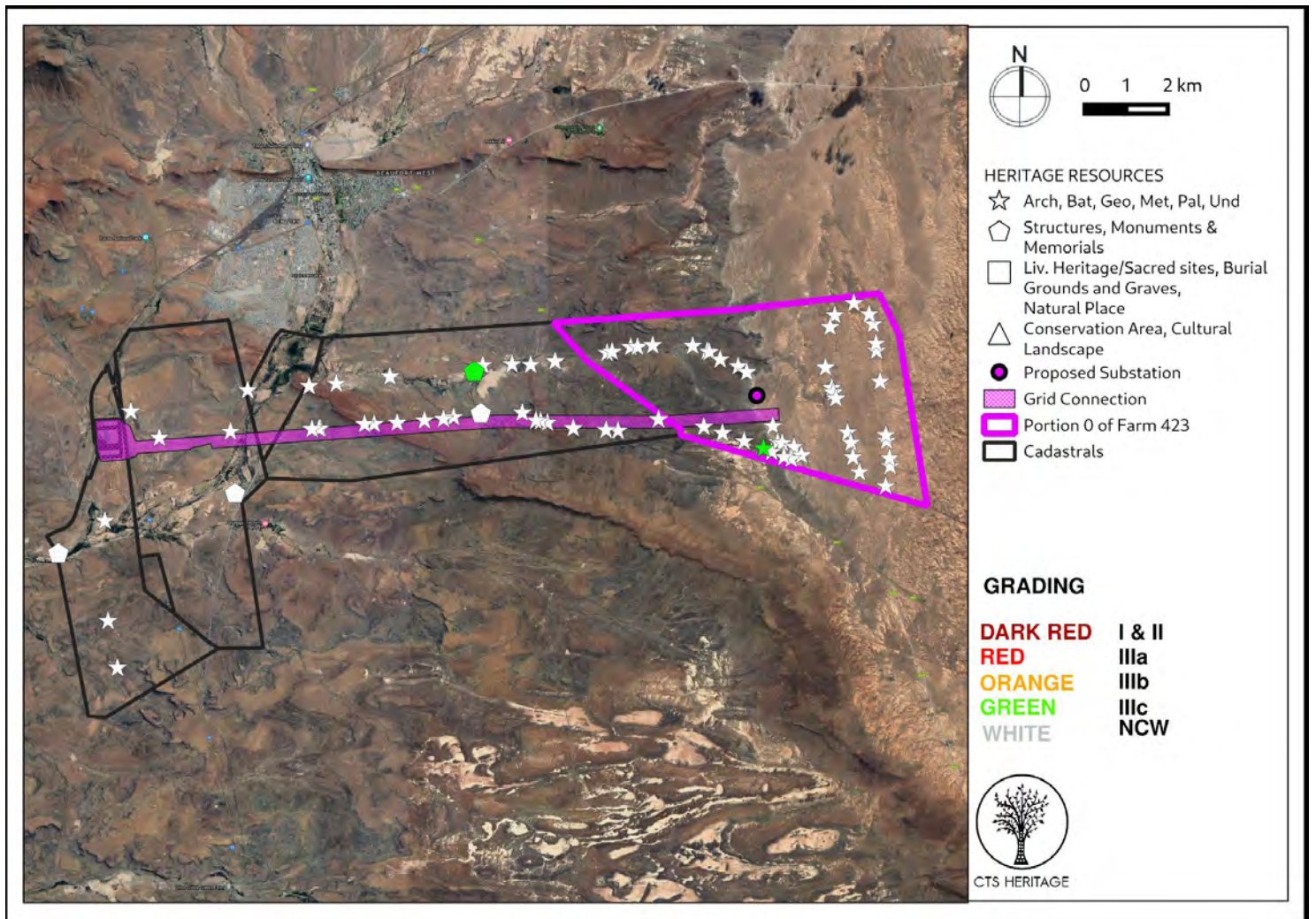


Figure 7: Map of heritage resources identified during the field assessment relative to the proposed development footprint



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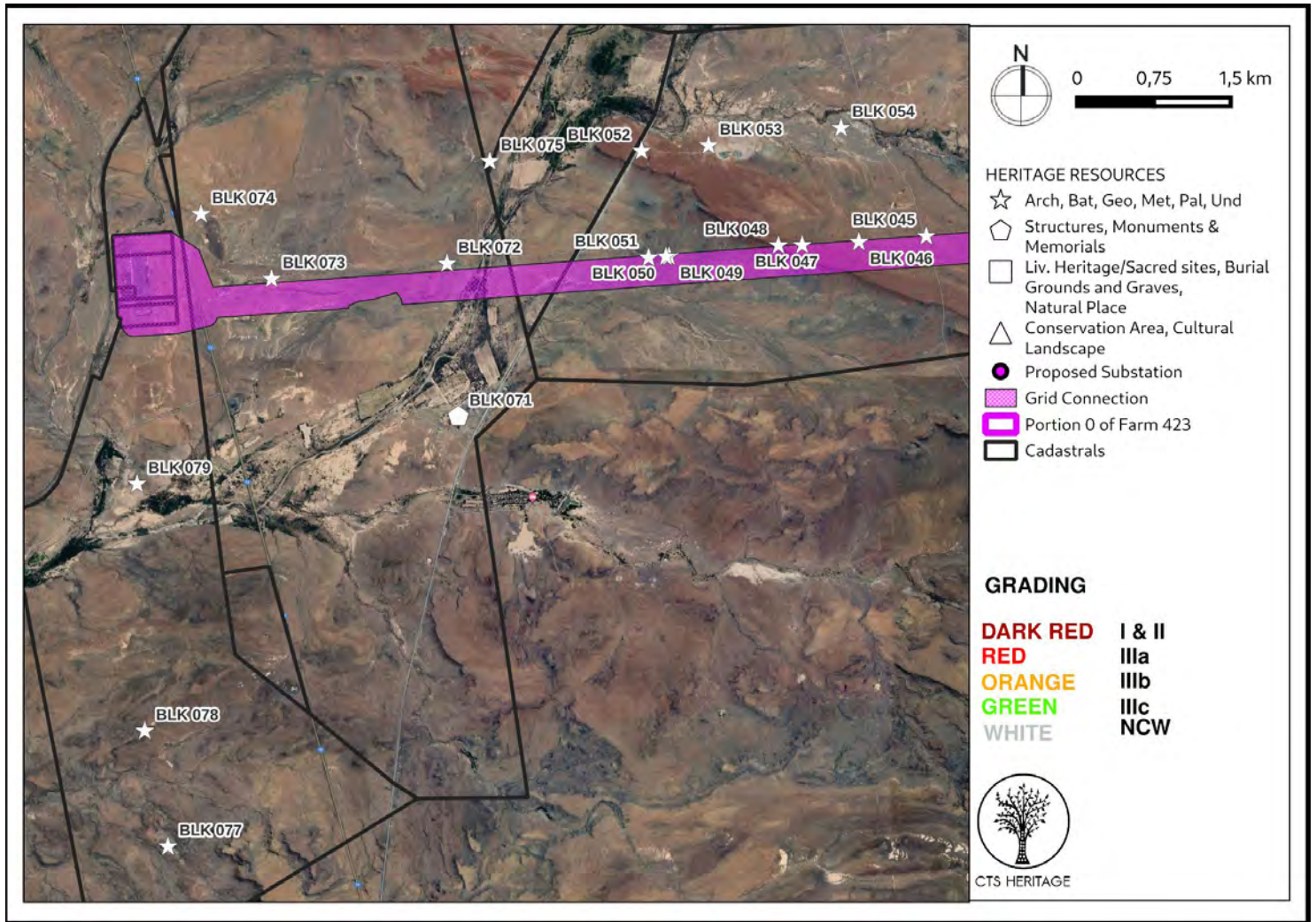


Figure 7.1: Map of heritage resources within the proposed grid connection alignment



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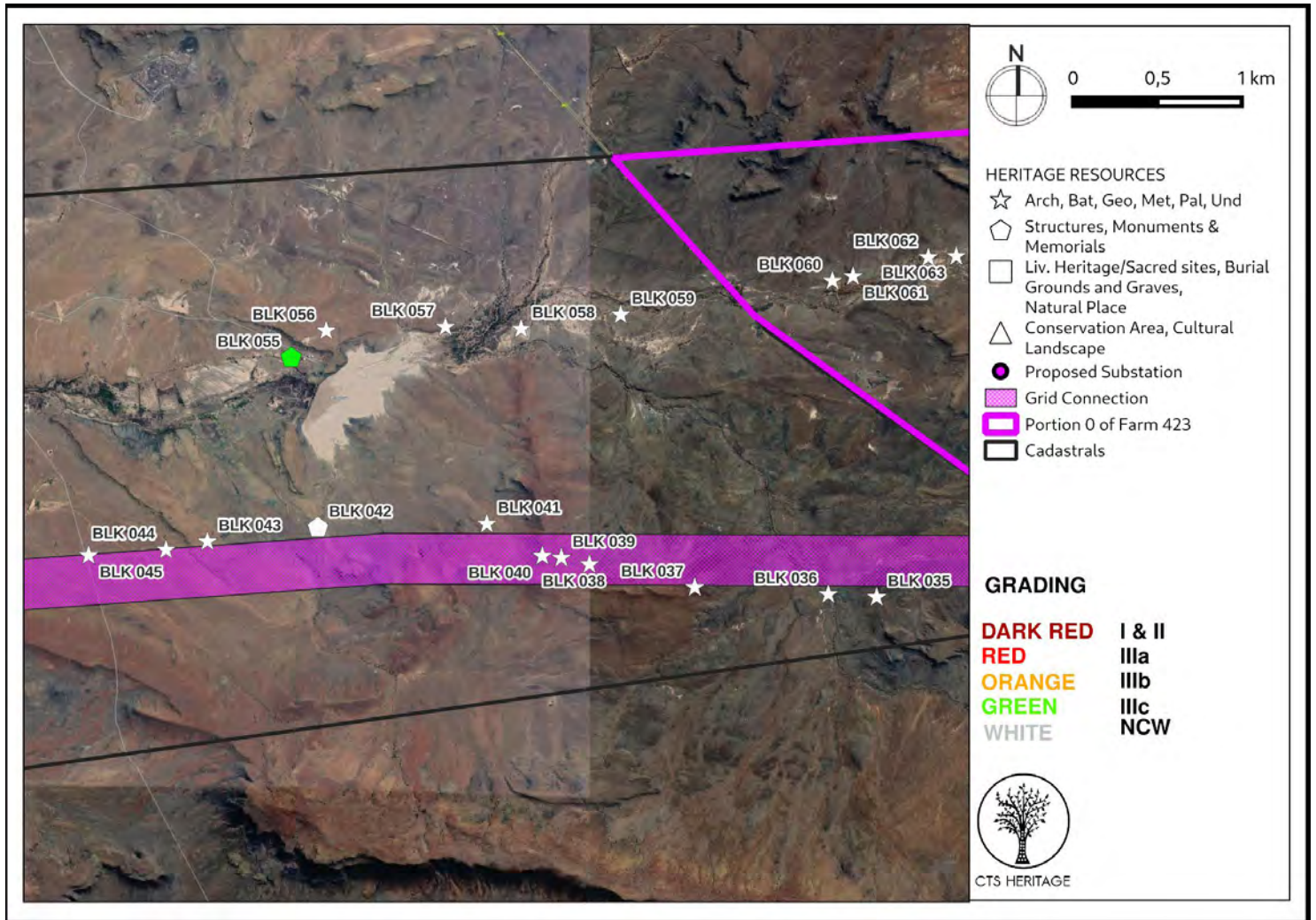


Figure 7.2: Map of heritage resources within the proposed grid connection alignment



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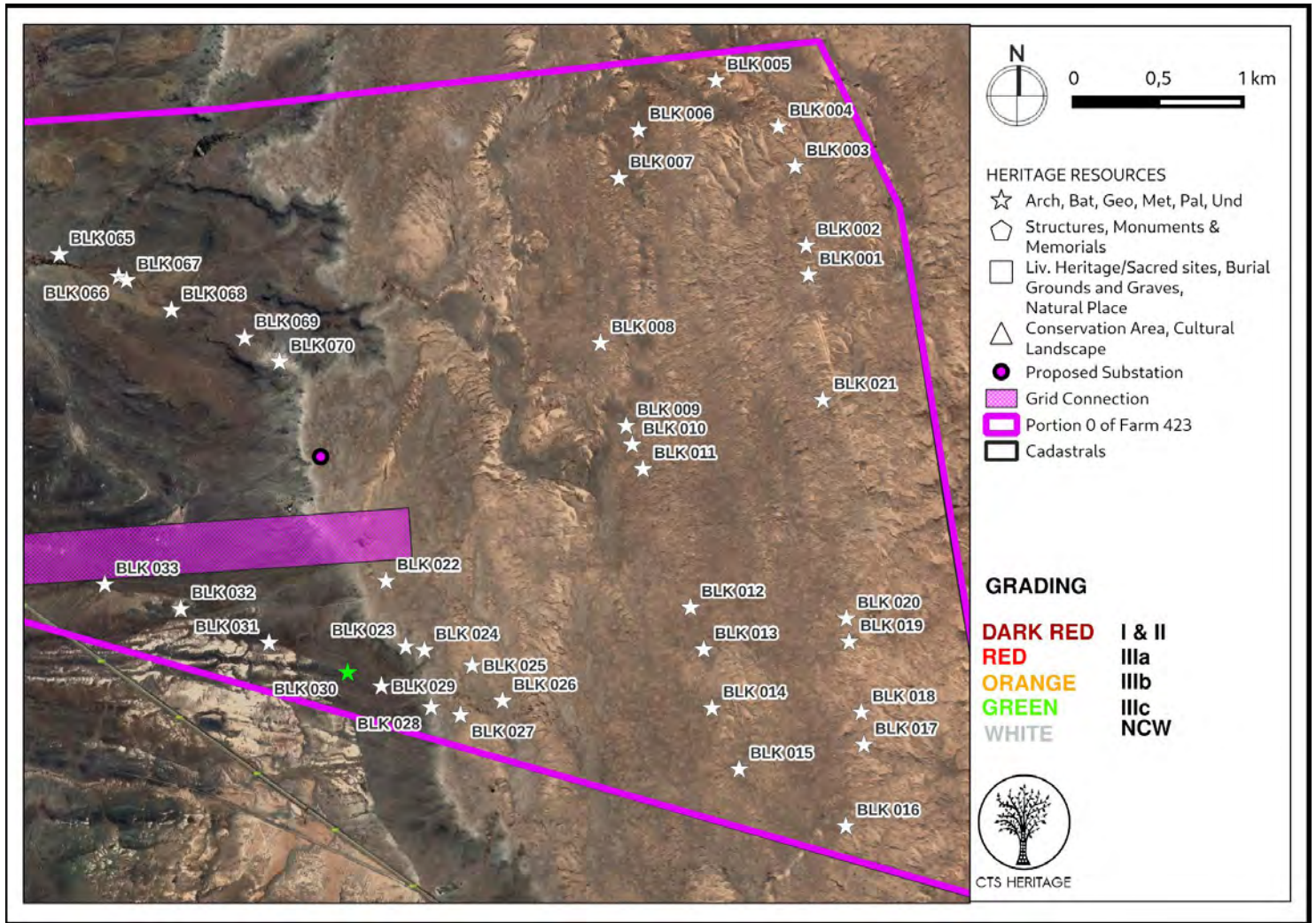


Figure 7.3: Map of heritage resources within the proposed PV development area

### 4.3 Selected photographic record

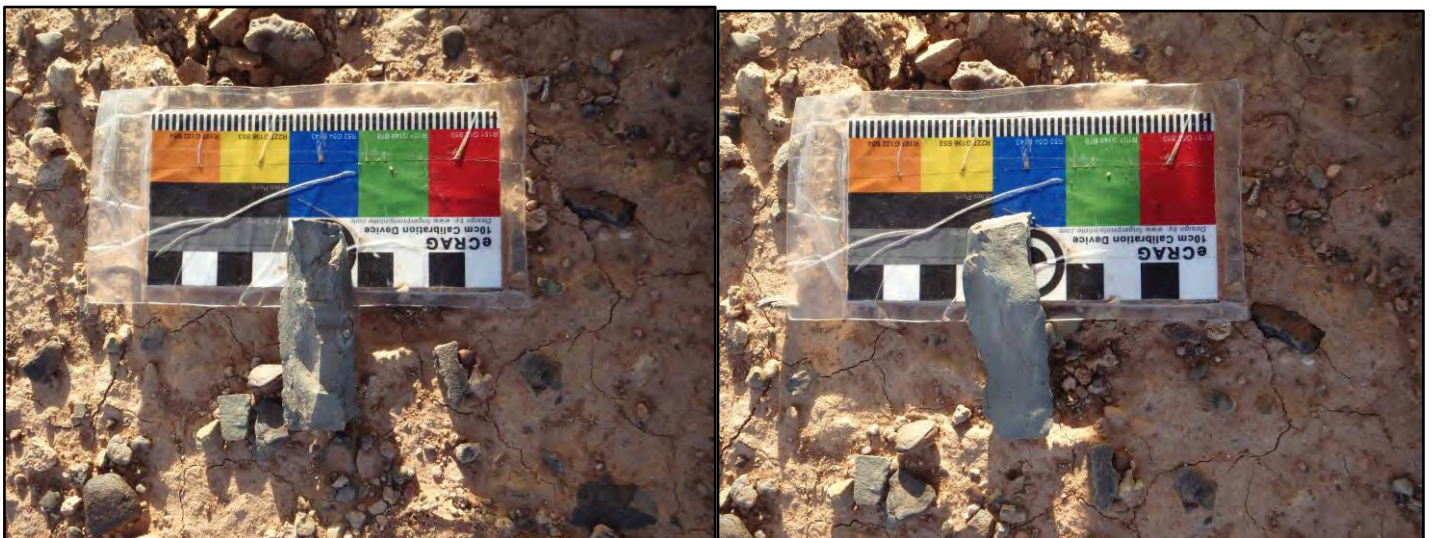
(a full photographic record is available upon request)



Figure 6.1: Observation BLK001



Figure 6.2: Observation BLK010





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Figure 6.3: Observation BLK016



Figure 6.4: Observation BLK022



Figure 6.5 Observation BLK030 (Grade IIIC)



Figure 6.6 Observation BLK039



Figure 6.7 Observation BLK045



Figure 6.8 Observation BLK048



Figure 6.9: Observation BLK055 (Grade IIIC)



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Figure 6.10: Observation BLK055 (Grade IIIC)



Figure 6.11: Observation BLK060

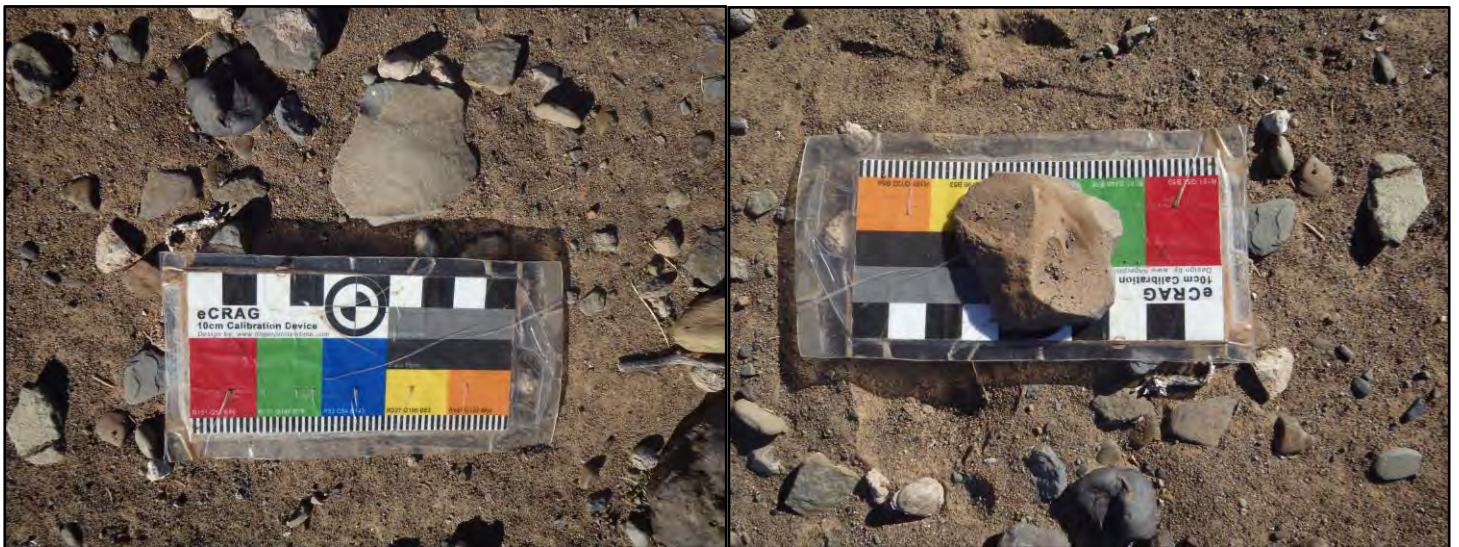
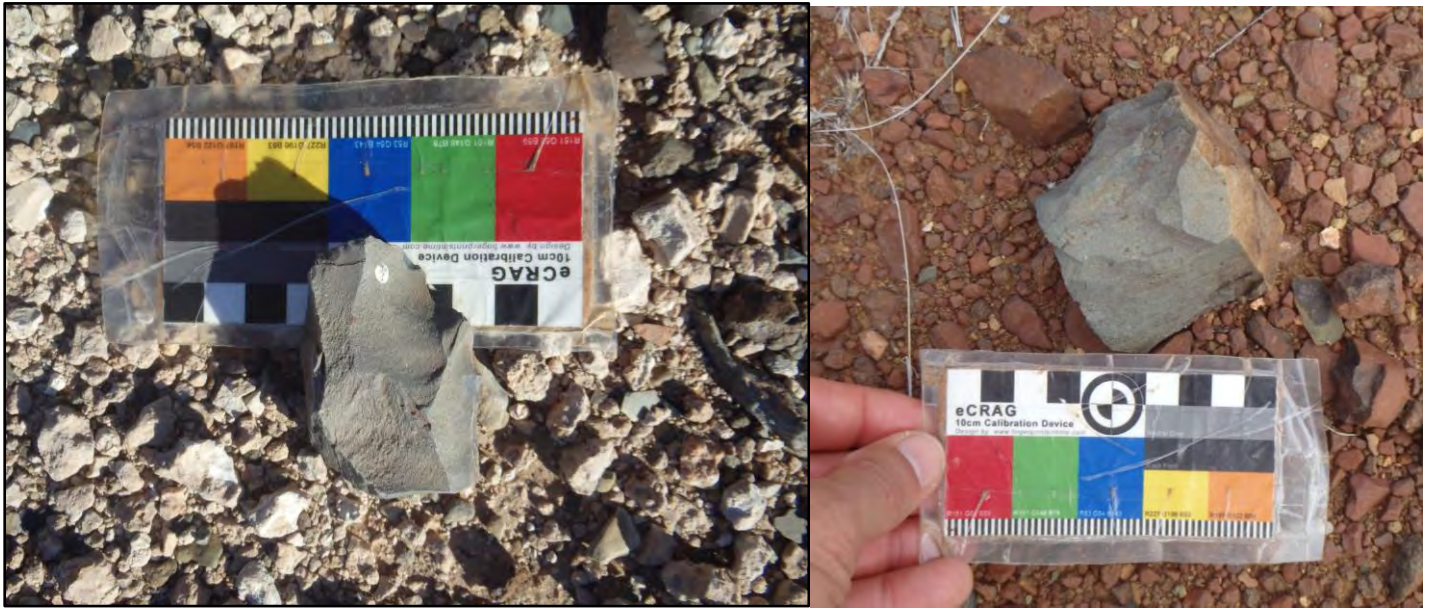


Figure 6.12: Observation BLK064



Figures 6.13: Observations BLK070 and 072



Figure 6.14: Observation BLK075



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## **5. ASSESSMENT OF THE IMPACT OF THE DEVELOPMENT**

### **5.1 Assessment of impact to Archaeological Resources**

The proposed development will not have a negative impact on the heritage resources identified within the proposed development area for the PV facility and the grid connection. The majority of the lithic material identified is of low significance (not conservation-worthy), and even though the resources may be destroyed during construction, the impact is inconsequential. No mitigation is required for archaeological material recorded in the footprint areas of the proposed development. Despite the high number of observations of artefacts, these resources are common and representative of similar scatters across widespread areas of the Karoo.

One Grade IIIC archaeological site was identified within the boundaries of Portion 0 of Farm 423. This site, BLK033, represents an open site with mixed raw materials such as siltstone and hornfels made into flakes and cores. At this site, the floodplain vegetation seems to be in a slightly better condition due to the available groundwater. In terms of possible impact to this site, no site specific recommendations are necessary however if avoidance of impact is possible, this is preferred.

Additionally, one abandoned Farm Werf, the Hansrivier Farmhouse complex, was identified within 1km of the area proposed for the grid alignment (BLK055). This site is described as consisting of a main farmhouse painted yellow with green corrugated roof and outbuildings as well as vandalised/ruined labourers' cottages. This werf is not particularly significant per se as most of the additions and buildings are modern and no impact is anticipated as the proposed grid connection corridor is located approximately 1km south of the farm werf. To ensure that no impact occurs, we have recommended a 50m buffer around this site.

Despite the very high numbers of observations made, the archaeological material is ubiquitous across the entire area and in general, the results of this assessment indicate that the archaeological sensitivity of the development area is low.



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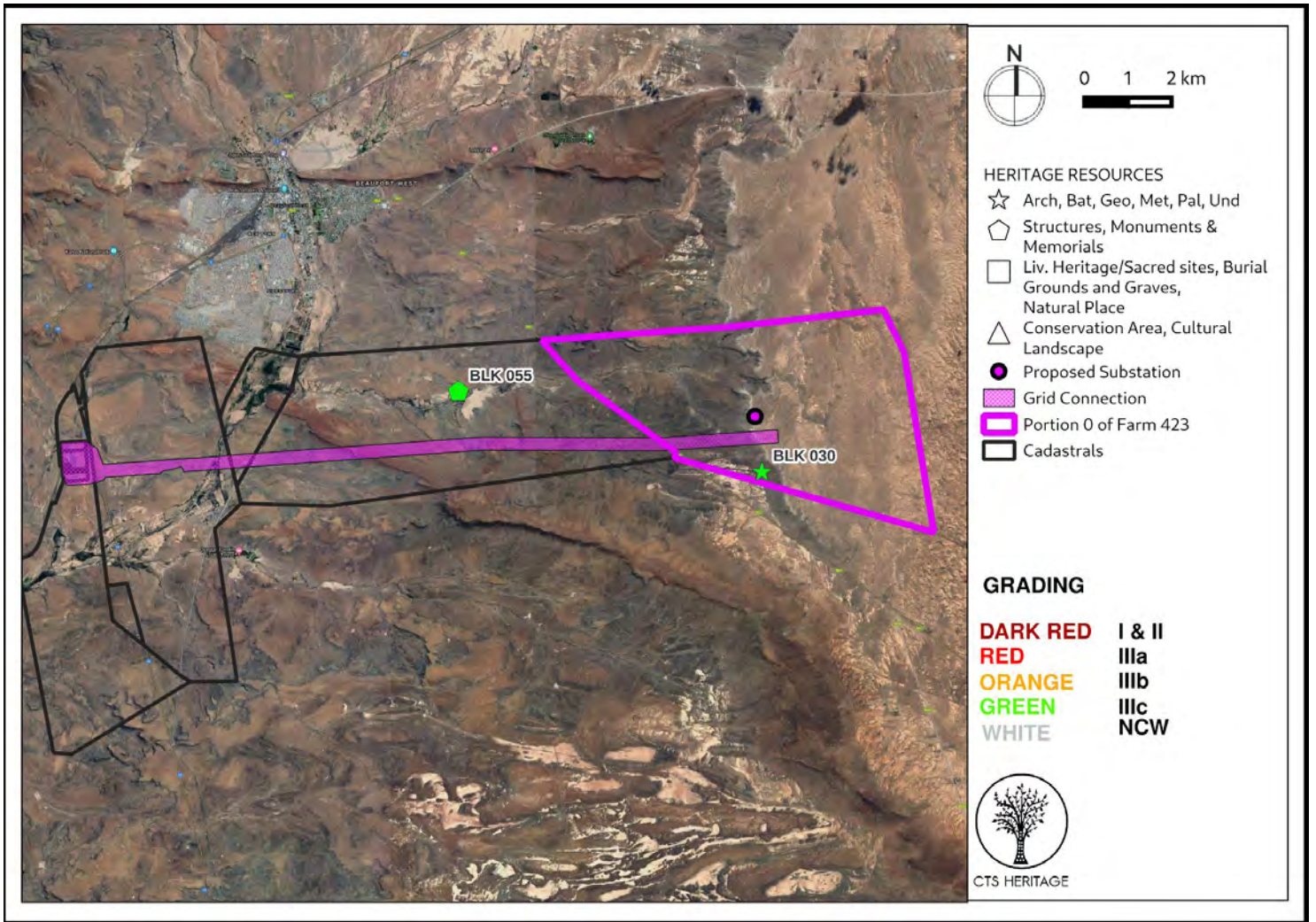


Figure 7.4: Map of significant heritage resources within the broader assessment area



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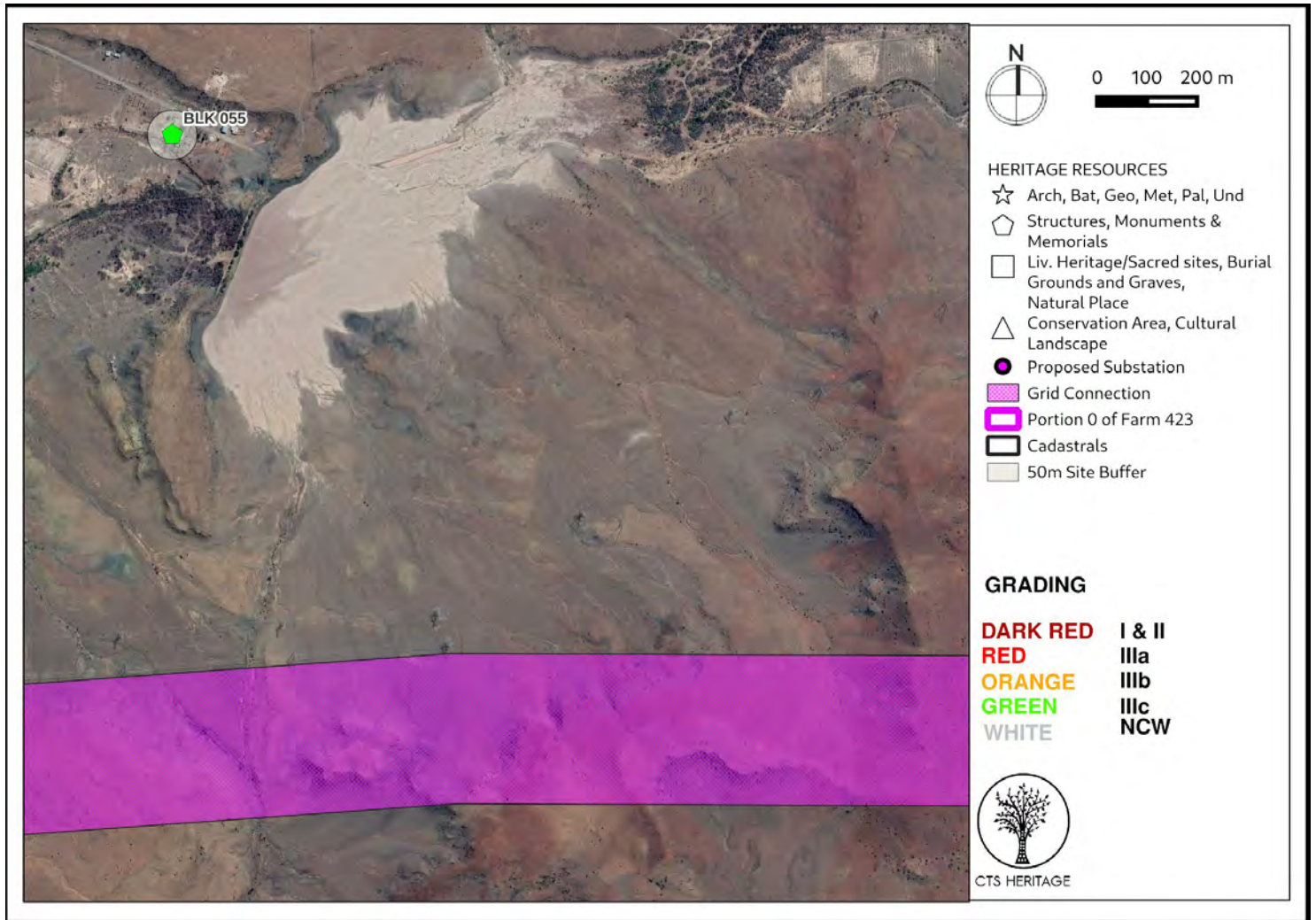


Figure 7.4: Map of heritage resources within the broader assessment area relative to the grid connection corridor



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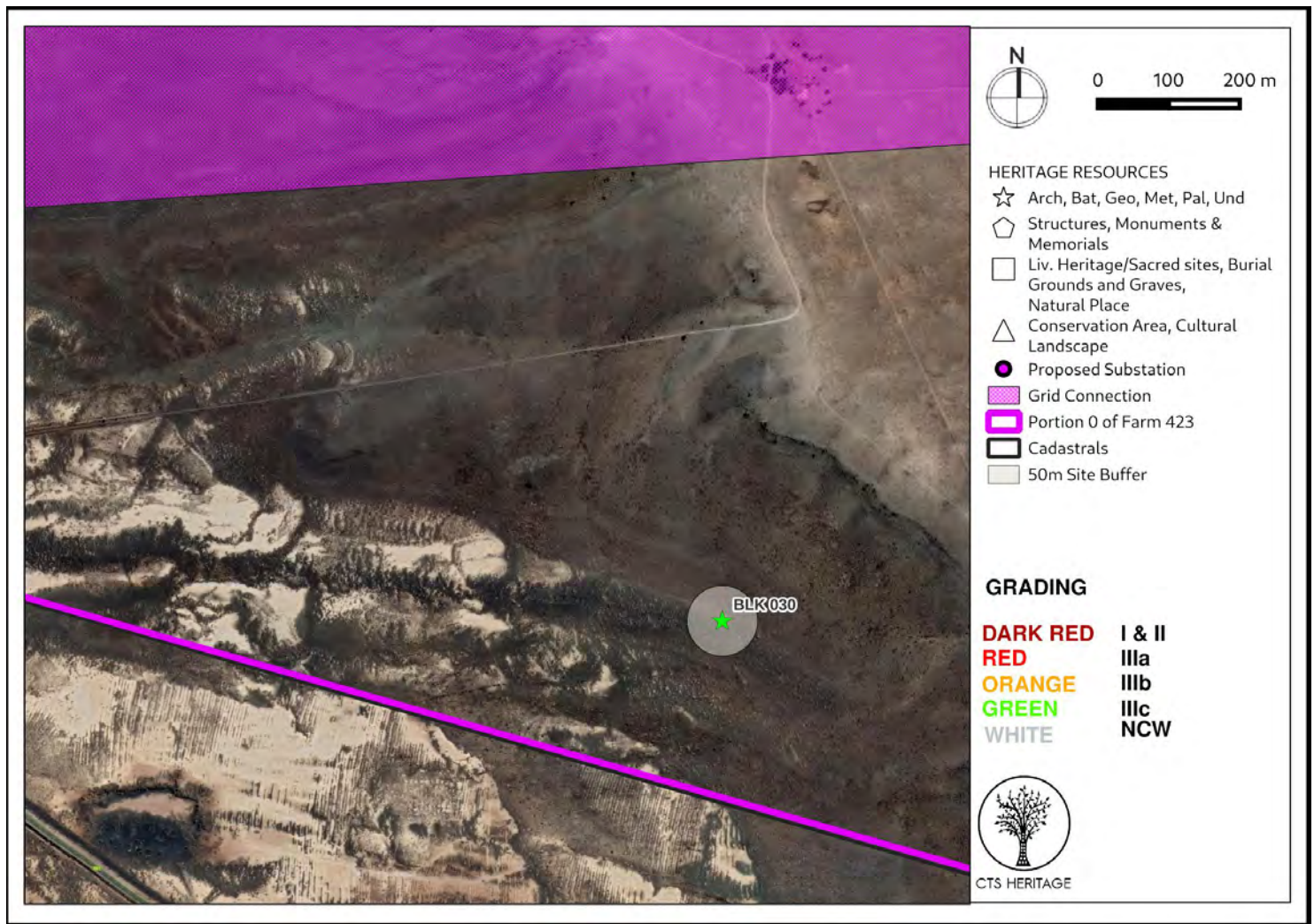


Figure 7.4: Map of heritage resources within the broader development area of the solar PV facilities

## 6. CONCLUSION AND RECOMMENDATIONS

The findings of this assessment largely correlate with the findings of other assessments completed in the vicinity such as the findings of the ACO (2013, SAHRIS NID 503074) who note that “Because of the scarcity of caves and shelters, more than 90% of Karoo archaeological sites are open sites of stone artefacts, ostrich eggshell fragments and occasionally, pottery. Bone remains are rarely preserved. Artefacts of both the Early and Middle Stone Age are widespread and may generally be described as an ancient litter that occurs at a low frequency across the landscape.” This same archaeological signature has been identified within the development footprint.

It is noted that high numbers of quarried stone artefacts predominantly from the Middle Stone Age period were found on this property which is consistent with observations on neighbouring farms through impact assessments and research surveys. These artefacts are particularly visible in deflated open sites where the top soil has washed away onto a harder gravel surface. No shelters were found on the property and no rock paintings, graves or engravings were located.



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Based on the outcomes of this report, it is not anticipated that the proposed development of a solar pv facility or its associated grid connection infrastructure will negatively impact on significant archaeological heritage. The following recommendations are made:

- No mitigation is required for archaeological material recorded in the footprint areas of the proposed solar PV facilities, or the proposed powerline. Despite the high number of observations of artefacts, the grading was not conservation worthy as they are common and representative of similar scatters across widespread areas of the Karoo.
- No impact must occur to the abandoned werf identified at BLK055 and as such, a 50m no-go buffer around this site is recommended
- Although all possible care has been taken to identify sites of cultural importance during the investigation of the study area, it is always possible that hidden or subsurface sites could be overlooked during the assessment. If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils, burials or other categories of heritage resources are found during the proposed development, work must cease in the vicinity of the find and HWC must be alerted immediately to determine an appropriate way forward.

## 7. REFERENCES

Heritage Impact Assessments				
Nid	Report Type	Author/s	Date	Title
3809	AIA Phase 1	Cobus Dreyer	29/09/2005	Archaeological and Historical Investigation of the Proposed Residential Developments at the Farms Grootfontein 180 & Bushmanskop 302, Beaufort West, South-Western Cape
4013	AIA Phase 1	Jonathan Kaplan	01/02/2006	Phase 1 Archaeological Impact Assessment Proposed Klavervlei Powerline Karoo National Park
4153	AIA Phase 1	Hilary Deacon	27/06/2005	Central Karoo District Municipality Borrow Pit Archaeological Impact Assessment Report: Existing Borrow Pit on DR 2308 Km 59 L (Dam), Farm Grootfontein 180
6461	AIA Phase 1	Jonathan Kaplan	01/02/2008	Phase 1 Archaeological Impact Assessment: Proposed Development Remainder of Farm 185 (Now Called Plot 8419) Beaufort West, Western Cape Province
7852	AIA Phase 1	J Kinahan	03/10/2008	Archaeological Baseline Survey of the Proposed Ryst Kuil Uranium Project
354680	HIA Phase 1	Lita Webley, David Halkett	30/11/2015	Heritage Impact Assessment: Proposed Uranium Mining and Associated infrastructure on portions of the farm Quaggasfontein and Ryst Kuil near Beaufort West in the Western Cape and De Pannen near Aberdeen in the Eastern Cape
354681	AIA Phase 1	Lita Webley	30/11/2015	Archaeological Impact Assessment: Proposed uranium mining and associated infrastructure on portions of the farms Quaggasfontein and Ryst Kuil near Beaufort West in the Western Cape and De Pannen near Aberdeen in the Eastern Cape
354683	PIA Phase 1	Bruce Rubidge	24/04/2008	Palaeontological study of the Rystkuil channel
356853	PIA Phase 1	John Almond	01/05/2008	PALAEONTOLOGICAL IMPACT ASSESSMENT, DAMKOPPIE HOUSING DEVELOPMENT, BEAUFORT WEST (WESTERN CAPE)
357439	AIA Phase 1	Dave Halkett	01/09/2009	AN ARCHAEOLOGICAL ASSESSMENT OF URANIUM PROSPECTING ON PORTIONS 1, 3 AND 4 OF THE FARM EERSTE WATER 349, AND REMAINDER OF THE FARM RYST KUIL 351, BEAUFORT WEST
406266	AIA Phase 1	Peter Nilssen	07/06/2010	Scoping Archaeological Impact Assessment: Proposed Beaufort West N1 Wind Energy Farm: 2/158 Lemoenkloof, RE 9/161 Kuilspoort, RE 162 Suid-lemoensfontein and RE 1/163 Bulskop, Beaufort West, Western Province
406299	HIA Phase 1	Stefan de Kock	01/10/2011	HERITAGE IMPACT ASSESSMENT: PROPOSED N1 WIND FARM PROJECT: LEMOENFONTEIN 158/2, KUILSPOORT 161/9, LEMOENFONTEIN SOUTH 162/REM & BULSKOP 163/1, BEAUFORT WEST DISTRICT
503074	Heritage	ACO	01/04/2013	Heritage impact assessment (scoping level) of the proposed Aberdeen to



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	Scoping Report			Droegrivier 400 kV transmission line Western Cape Province (Central Karoo District) Eastern Cape Province (Kakadu District)
503083	HIA Phase 1	ACO	04/08/2011	HERITAGE ASSESSMENT OF THE PROPOSED UPGRADE TO THE STORMWATER AND RETENTION FACILITIES AT BEAUFORT WEST, WESTERN CAPE
503102	PIA Phase 1	Jennifer Botha-Brink	04/07/2011	PALAEONTOLOGICAL IMPACT ASSESSMENT OF THE PROPOSED UPGRADE TO THE STORMWATER AND DETENTION FACILITIES IN HILLSIDE, BEAUFORT WEST, WESTERN CAPE
503109	HIA Phase 1	Jayson Orton	07/07/2011	HERITAGE IMPACT ASSESSMENT FOR A PROPOSED PHOTO-VOLTAIC FACILITY ON STEENROTS FONTEIN 168/1, BEAUFORT WEST MAGISTERIAL DISTRICT, WESTERN CAPE
503116	Desktop PIA	John E. Almond	01/06/2011	PALAEONTOLOGICAL IMPACT ASSESSMENT: DESKTOP STUDY. Proposed Photovoltaic Power Facility, Farm Steenrotsfontein 168, Beaufort West Municipality, Western Cape Province
503201	AIA Phase 1	Peter Nilssen	15/09/2014	Scoping Archaeological Impact Assessment: Proposed development of the Droërvier Solar Facility, on Portion 55 of Farm 168 Steenrotsfontein and a portion of Portion 10 of Farm 170 Weltevreden, Beaufort West, Western Cape Province
503202	Heritage Statement	Stefan de Kock	01/06/2011	NOTICE OF INTENT TO DEVELOP (NID) & HERITAGE STATEMENT IN TERMS OF SECTION 38(8) OF THE NATIONAL HERITAGE RESOURCES ACT, 1999 (ACT 25 OF 1999): BEAUFORT WEST PHOTOVOLTAIC PARK KUILSPOORT 161/9 & LEMOENFONTEIN SOUTH 162/REM, DISTRICT BEAUFORT WEST
503231	AIA Phase 1	Peter Nilssen	25/05/2011	Scoping Archaeological Impact Assessment: Proposed Beaufort West Photovoltaic Power Station (Solar): southern portion of properties; 2/158 Lemoenkloof, RE 9/161 Kuilspoor, RE 162 Suid-lemoensfontein and RE 1/163 Bulskop, Beaufort West, Western Province
503273	Desktop PIA	John E. Almond	01/06/2011	PALAEONTOLOGICAL IMPACT ASSESSMENT: DESKTOP STUDY: Proposed Photovoltaic Power Station, Beaufort West Municipality, Western Cape
503276	HIA	Stefan de Kock	01/11/2011	FINAL INTEGRATED HERITAGE IMPACT ASSESSMENT COMPILED IN TERMS OF SECTION 38(8) OF THE NATIONAL HERITAGE RESOURCES ACT, 1999 (ACT 25 OF 1999). PROPOSED PHOTOVOLTAIC PARK: KUILSPOORT 161/9, LEMOENFONTEIN SOUTH 162/REM & BULSKOP 163/1, DISTRICT BEAUFORT WEST
504763	AIA Phase 1	Peter Nilssen	15/09/2014	Scoping Archaeological Impact Assessment Proposed development of the Droërvier Solar Facility, on Portion 55 of Farm 168 Steenrotsfontein and a portion of Portion 10 of Farm 170 Weltevreden, Beaufort West, Western Cape Province