HERITAGE IMPACT ASSESSMENT

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

Proposed development of Ilanga 1 100MW Solar PV Facility and associated infrastructure on a site near Upington in the Northern Cape Province.

Prepared by CTS Heritage

CTS HERITAGE

For

Savannah Environmental Consultants

November 2019

Updated January 2020

Updated July 2020

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EXECUTIVE SUMMARY

Emvelo Capital Projects is proposing the construction and operation of nine Solar PV Facilities and a CSP facility on a site located within the Upington renewable energy development zones (REDZ), east of Upington in the Northern Cape. The location of the project site within a REDZ and Power Corridor makes it possible to undertake Basic Assessment (BAR) processes for the projects in support of the application for authorisation. Separate applications for Authorisation are to be made for each solar energy facility. This HIA is for the proposed Ilanga 1 100MW Solar PV Facility and associated infrastructure.

The archaeological field assessment covered the area proposed for development (approximately 60km^2, linear access roads and pipeline totalling ~40km) thoroughly. Stone Age archaeological resources were identified within the development footprint, however these are considered to be not conservation-worthy as they are widely scattered and have no associated contextual material.

The findings made during the field assessment were consistent with previous work undertaken in the area. Larger quantities of debitage were found where quarrying of quartz and quartzite had taken place, hornfels percentages climbed in areas closer to the Orange River to the north and east of the study site and almost all of the observations were of Middle Stone Age material. Later Stone Age remains were very sparse and limited across the study site.

No engravings, formal or informal graves were identified within the development footprint and the only built structures included modern cattle farming kraals, jeep tracks and fences.

The study area near Upington is largely underlain by unfossiliferous Precambrian basement rocks of the Namaqua-Natal Province as well as a range of unfosssiliferous to poorly-fossiliferous superficial sediments of Late Caenozoic age. The construction phase of the solar park will entail extensive surface clearance as well as shallow excavations into the superficial sediment cover (soils, alluvial gravels etc.) and locally also into the underlying bedrock. These excavations notably include site clearance activities as well as excavations for the parabolic mirror array and heliostat footings, excavation for the power tower foundations, buried cables, new internal access roads,
power line pylon footings, storm water infrastructure, as well as foundations for various buildings such as the central tower and control buildings. All these developments may adversely affect any fossil remains within the study area by destroying, disturbing or permanently sealing-in fossils at or below the ground surface that are

then no longer available for scientific research or other public good. Once constructed however, the operational and decommissioning phases of the solar facilities will not involve potential further adverse impacts on palaeontological heritage.

No significant archaeological or palaeontological resources were identified during this HIA. Therefore, no further mitigation is required, and from a heritage point of view, there is no objection to the proposed development in this area.

There is no objection to the proposed development on heritage grounds and the following is recommended:

- No mitigation is required prior to construction operations commencing.
- During the construction phase all deeper (> 1 m) excavations into sedimentary bedrock should be monitored for fossil remains by the responsible Environmental Control Officer (ECO). Should substantial fossil remains such as vertebrate bones and teeth, petrified wood, plant-rich fossil lenses or dense fossil burrow assemblages be exposed during construction, the responsible ECO should safeguard these, preferably in situ, and alert the South African Heritage Resources Authority (SAHRA) so that appropriate action can be taken by a professional palaeontologist,
- Should 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 or other categories of heritage resources be found during the proposed development, SAHRA APM Unit (Natasha Higgitt/Phillip Hine 021 462 5402) must be alerted.
- If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (Mimi Seetelo 012 320 8490), must be alerted immediately as per section 36(6) of the NHRA. A professional archaeologist must be contracted as soon as possible to inspect the findings. A Phase 2 rescue excavation operation may be required subject to permits issued by SAHRA.
- The above recommendations must be included in the Environmental Management Programme (EMPr) for the project

Details of Specialist who prepared the HIA

Jenna Lavin, an archaeologist with an MSc in Archaeology and Palaeoenvironments, and currently completing an MPhil in Conservation Management , heads up the heritage division of the organisation, and has a wealth of experience in the heritage management sector. Jenna's previous position as the Assistant Director for Policy, Research and Planning at Heritage Western Cape has provided her with an in-depth understanding of national and international heritage legislation. Her 8 years of experience at various heritage authorities in South Africa means that she has dealt extensively with permitting, policy formulation, compliance and heritage management at national and provincial level and has also been heavily involved in rolling out training on SAHRIS to the Provincial Heritage Resources Authorities and local authorities.

Jenna is on the Executive Committee of the Association of Professional Heritage Practitioners (APHP), and is also an active member of the International Committee on Monuments and Sites (ICOMOS) as well as the International Committee on Archaeological Heritage Management (ICAHM). In addition, Jenna has been a member of the Association of Southern African Professional Archaeologists (ASAPA) since 2009. Recently, Jenna has been responsible for conducting training in how to write Wikipedia articles for the Africa Centre's WikiAfrica project.

Since 2016, Jenna has drafted over 50 Heritage Impact Assessments throughout South Africa.

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APPENDICES

1. INTRODUCTION

1.1 Background Information on Project

Emvelo Capital Projects is proposing the construction and operation of nine Solar PV Facilities and a CSP facility on a site located within the Upington renewable energy development zones (REDZ), east of Upington in the Northern Cape. The location of the project site within a REDZ and Power Corridor makes it possible to undertake Basic Assessment (BAR) processes for the projects in support of the application for authorisation. Separate applications for Authorisation are to be made for each solar energy facility. This HIA is for the proposed Ilanga 1 100MW Solar PV Facility and associated infrastructure.

The project is being developed with an installed capacity of 150MWp (DC) and will produce 100 MW AC of electricity. The two main components of the project are the solar field consisting of solar panels and building infrastructure. The other component of the project is the associated infrastructure.

- Solar Field
- ±250 ha free field single axis tracker or fixed tilt PV – 150 MW DC
- Solar module mounting structures comprised of galvanised steel and aluminium
- Below ground electrical cables connect the PV arrays to the inverter stations, O&M building and collector substations
- Inverter and mini subs

- Collector Substation
- ±1ha 11/22/33 kV to 132 kV collector substation to receive, convert and step electricity from the PV facility to the 132 kV grid supply. The substation facility with house the control rooms and grid control yards for both Eskom and the IPP Project Company. A 32m telecommunications tower (lattice or monopole type) will be established in the substation area.

- O&M Area
- O&M buildings
- ±1 ha O&M laydon area located near or adjacent to the substation
- ±0,01 solar measuring station
- Parking, reception area, offices ablution facilities for operational staff, security and visitors
- Workshops, storage areas foe materials and spare parts

- Water storage tanks or lined ponds (approx. 160 kl/day during the first 3-6 months of construction, approx. 90kl/day for the rest of the construction period; approx. 20kl/day during the operations phase
- Septic tanks and sewer lines to service ablution facilities
- Central waste collection and storage area

- Access Road
- ±15 km long, ± 8m wide tarred access road from from the N10
- Alternative gravel access road from the N10

- Internal Service Roads
- ±10km of ±4 m wide gravel internal service roads within the plant boundary

- Other infrastructure
- Perimeter fencing and internal security fencing and gates as needed.
- Stormwater channels
- ±10 km long of small diameter water supply pipeline

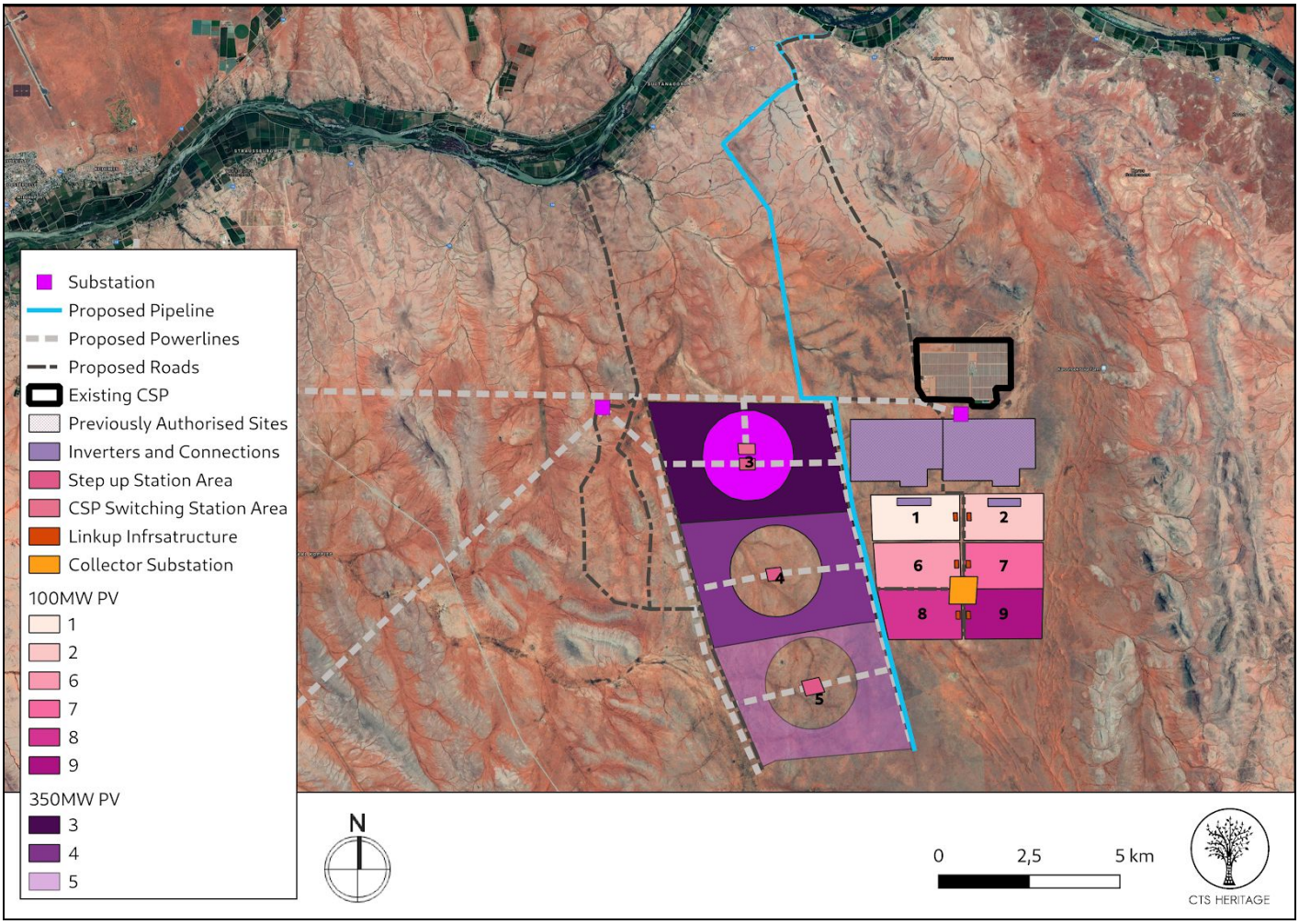
1.2 Description of Property and Affected Environment

The existing Karoshoek Solar Farm was completed towards the end of 2018 and lies to the north and north east of the proposed areas surveyed for the new solar installations. It covers an area of roughly 4.147 km² and holds a large array of curved mirrors that heat up piped water which in turn is fed into a steam turbine system to generate electricity. This has advantages over conventional solar farms which can only generate electricity during daylight hours as the heat from the piped water continues to generate electricity through the course of the night. Two large previously authorised sites abut the current facility on their southern end as well as the main powerline connecting this facility to the national grid. This power line runs due west of the facility and along the northern boundary of the study site.

The area chosen for the proposed solar facilities is nearly entirely level and flat apart from a low dune cordon in the far southwestern end of the development area. Quartzite dominated higher ground lies to the north and is situated between the areas surveyed and the N10 highway running between Upington and Groblershoop. This will provide much of the visual cover for the new facilities from the northern end.

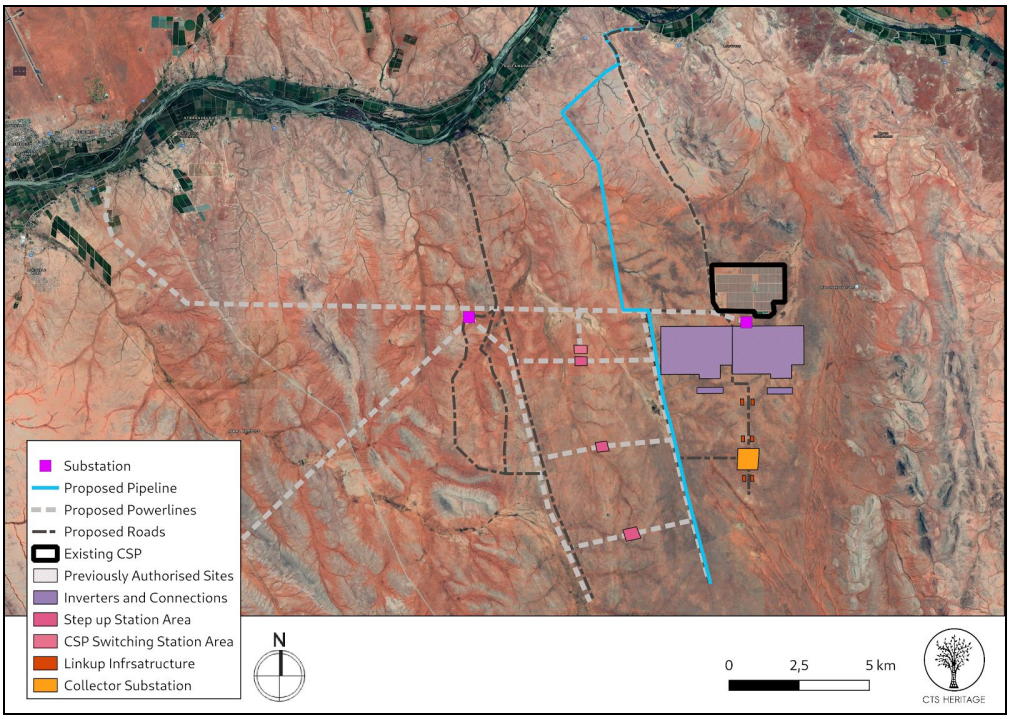
The vegetation is predominantly Bushmanland Arid Grassland vegetation in the Nama-Karoo biome (Mucina & Rutherford 2006) which consists of Karoo scrub and grass and a few isolated Acacia karoo trees. Red Kalahari aeolian sands cover most of the site and there are many areas where the calcrete beneath the Kalahari sands is exposed. Dolerite sills, exposed quartz veins and quartzitic bedrock outcrops in low (40cm high) formations occur sporadically across the study site.

Only one shallow natural pan was encountered in the study area. A cattle kraal has been built here and a few other cattle kraals are dotted around the farms selected for the solar facilities. No running streams were found but a few dry stream beds crisscross the study site.



Map 1a: The proposed development area including all proposed PV Facilities as part of the Ilanga PV Project

Map 1b: The proposed development area for Ilanga 1 100MW Solar PV Facility



Map 1c: The proposed infrastructure associated with the Ilanga 1 100MW Solar PV Facility

2. METHODOLOGY

2.1 Purpose of HIA

The purpose of this Heritage Impact Assessment (HIA) is to satisfy the requirements of section 38(8), and therefore section 38(3) of the National Heritage Resources Act (Act 25 of 1999).

2.2 Summary of steps followed

- A Desktop Study was conducted of relevant reports previously written (please see the reference list for the age and nature of the reports used)
- An archaeologist conducted an assessment of archaeological resources likely to be disturbed by the proposed development. The archaeologist conducted his site visit from 21 to 25 October 2019.
- A palaeontological desktop assessment was conducted in 2015 that covers the proposed development area. The results of this assessment were incorporated into this HIA.
- The identified resources were assessed to evaluate their heritage significance
- Alternatives and mitigation options were discussed with the Environmental Assessment Practitioner

2.3 Assumptions and uncertainties

- The *significance* of the sites and artefacts is determined by means of their historical, social, aesthetic, technological and scientific value in relation to their uniqueness, condition of preservation and research potential. It must be kept in mind that the various aspects are not mutually exclusive, and that the evaluation of any site is done with reference to any number of these.

- It should be noted that archaeological and palaeontological deposits often occur below ground level. Should artefacts or skeletal material be revealed at the site during construction, such activities should be halted, and it would be required that the heritage consultants are notified for an investigation and evaluation of the find(s) to take place.

However, despite this, sufficient time and expertise was allocated to provide an accurate assessment of the heritage sensitivity of the area.

2.4 Constraints & Limitations

The final layout for the proposed facilities had not been provided until the morning of the first day of the survey. As a result, the full desktop screening assessment of areas already surveyed could not be completed and this had

to be done on site by the archaeologist. This was particularly relevant to the footprints chosen for the pipeline and new access routes. However, the area was covered thoroughly during the survey on foot and in a vehicle where possible. The ground is particularly easy to survey given the low vegetation cover and flat terrain and the number of observations made was high as a result.

The experience of the heritage practitioner, and observations made during the study, allow us to predict with some accuracy the archaeological sensitivity of the receiving environment.

2.5 Savannah Impact Assessment Methodology

Direct, indirect and cumulative impacts of the issues identified through the Scoping study, as well as all other issues identified in the EIA phase were assessed in terms of the following criteria:

- The nature, which shall include a description of what causes the effect, what will be affected and how it will be affected.
- The extent, wherein it will be indicated whether the impact will be local (limited to the immediate area or site of development) or regional, and a value between 1 and 5 will be assigned as appropriate (with 1 being low and 5 being high).
- The duration, wherein it will be indicated whether:
    - The lifetime of the impact will be of a very short duration (0 – 1 years) – assigned a score of 1.
    - The lifetime of the impact will be of a short duration (2 – 5 years) – assigned a score of 2.
    - Medium-term (5 – 15 years) – assigned a score of 3.
    - Long term (> 15 years) – assigned a score of 4.
    - Permanent – assigned a score of 5.
- The consequences (magnitude), quantified on a scale from 0 – 10, where 0 is small and will have no effect on the environment, 2 is minor and will not result in an impact on processes, 4 is low and will cause a slight impact on processes, 6 is moderate and will result in processes continuing but in a modified way, 8 is high (processes are altered to the extent that they temporarily cease), and 10 is very high and results in complete destruction of patterns and permanent cessation of processes.
- The probability of occurrence, which shall describe the likelihood of the impact actually occurring. Probability will be estimated on a scale of 1 – 5, where 1 is very improbable (probably will not happen), 2 is improbable (some possibility, but low likelihood), 3 is probable (distinct possibility), 4 is highly probable (most likely) and 5 is definite (impact will occur regardless of any prevention measures).

- The significance, which shall be determined through a synthesis of the characteristics described above and can be assessed as low, medium or high.
- The status, which will be described as either positive, negative or neutral.
- The degree to which the impact can be reversed.
- The degree to which the impact may cause irreplaceable loss of resources.
- The degree to which the impact can be mitigated.

The significance is calculated by combining the criteria in the following formula:

S = (E + D + M) x P

S = Significance weighting

E = Extent

D = Duration

M = Magnitude

P = Probability

The significance weightings for each potential impact are as follows:

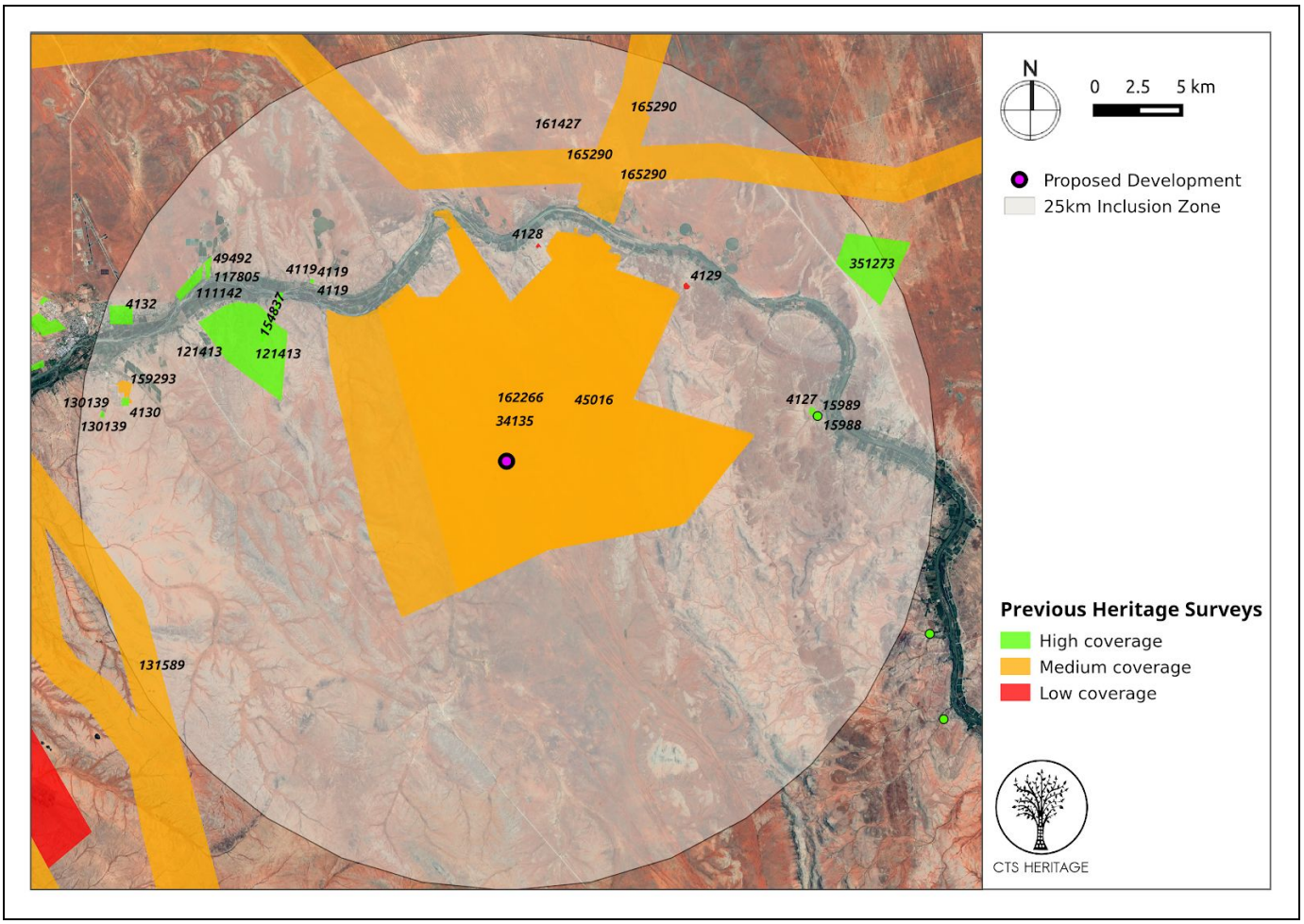
- < 30 points: Low (i.e. where this impact would not have a direct influence on the decision to develop in the area).
- 30 – 60 points: Medium (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated).
- > 60 points: High (i.e. where the impact must have an influence on the decision process to develop in the area).

3. HISTORY AND EVOLUTION OF THE SITE AND CONTEXT

3.1 Desktop Assessment

The area proposed for development is located approximately 20km east of Upington. Upington originated as a mission station established along the banks of the Orange River in 1871 and run by Reverend Christiaan Schröder, and was founded as a town in 1873. According to Gaigher (2012, SAHRIS ID 34135), prior to colonial settlement, this area was occupied by the Korana who had been forced to the outskirts of the Cape Colony along the Gariep River. When this area was eventually settled by colonists, war broke out between the colonial settlers and the Korana, who were then dispersed upon their defeat.

Upington has been noted as being the sunniest location on the planet for three months of the year, from November through to January, which is likely why this area has been earmarked for the development of renewable energy facilities as part of the Karoshoek Solar Valley development. The geomorphology of the area has been described by Van Schalkwyk (2011, SAHRIS ID 162266) as irregular plains with hills occuring to the south. The vegetation is described as Orange River Nama Karoo. Van Schalkwyk (2011) further notes that the area proposed for development were used for grazing purposes and no farmsteads were constructed this far from the Orange River.



Map 2: Spatialisation of heritage assessments conducted in proximity to the proposed development (see Appendices for insets)

Numerous Renewable Energy developments have been proposed for this area as part of the Karoshoek Solar Valley development and each of these proposed developments have undergone assessments for impacts to

archaeological resources (Figure 2). Areas located to the south-east of the study area were surveyed by Sampson (1985), revealing a number of Karoo stone age sites, however similar densities of stone age sites are not known from the proposed development area. In his assessment, Van Schalkwyk (2011) identified a number of Later Stone Age artefacts associated with a non-perennial stream that traverses the development area, as well as along the outer edges of a pan (graded III). He also identified two small historic structures in the study area made of clay bricks of low heritage significance. Gaigher (2012, SAHRIS ID 34135) also assessed this area for impacts to archaeological resources. Gaigher identified "limited scatterings of Middle to Later Stone Age tools found in various areas". He notes that these finds in themselves do not constitute sites, but do indicate the possible occurrence of such sites. The heritage resources identified in these reports have been extracted and mapped in Figures 3a to 3e. Further archaeological impact assessment work has been completed in this area by Van der Walt (2015 and 2016 - see Appendix 2). Van der Walt notes that the various assessments conducted in this area provide a robust baseline for the archaeology expected in this area. "These studies show that almost no significant archaeological sites occur within the immediate vicinity of the Ilanga Solar Facility. Although artefacts dating to the Early, Middle and Later Stone Age were recorded in the larger area, they occur as isolated finds that are temporally mixed, in deflated and un-stratified contexts without organic remains and other cultural materials. As a result, the archaeological record of the larger area is considered to be of low significance."

Palaeontology

According to Almond's Desktop PIA for the proposed additional CSP sites within the Karoshoek Solar Valley (November 2015, SAHRIS ID 344305), which covers this area proposed for this development, the development area is underlain by PreCambrian basement rocks as well as late Caenozoic superficial sediments. Almond (2015) further notes that "The Precambrian igneous and metamorphic basement rocks underlying the entire study area at depth are entirely **unfossiliferous**. The fossil record of the Pleistocene to Recent Kalahari Group is generally sparse and low in diversity. The Gordonia Formation dune sands were mainly active during cold, drier intervals of the Pleistocene Epoch that were inimical to most forms of life, apart from hardy, desert-adapted species. **Porous dune sands are not generally conducive to fossil preservation**. However, mummification of soft tissues may play a role here and migrating lime-rich groundwaters derived from the underlying bedrocks (including, for example, dolerite) may lead to the rapid calcretisation of organic structures such as burrows and root casts. Occasional terrestrial fossil remains that might be expected within this unit include calcretized rhizoliths (root casts) and termitaria (*e.g. Hodotermes*, the harvester termite), ostrich egg shells (*Struthio*) and shells of land snails (*e.g. Trigonephrus*) (Almond 2008, Almond & Pether 2008). Other fossil groups such as freshwater bivalves and gastropods (*e.g. Corbula, Unio*) and snails, ostracods (seed shrimps), charophytes (stonewort algae), diatoms

(microscopic algae within siliceous shells) and stromatolites (laminated microbial limestones) are associated with local watercourses and pans. Microfossils such as diatoms may be blown by wind into nearby dune sands. These Kalahari fossils (or subfossils) can be expected to occur sporadically but widely, and **the overall palaeontological sensitivity of the Gordonia Formation is therefore considered to be low**. Underlying calcretes of the Mokolanen Formation might also contain trace fossils such as rhizoliths, termite and other insect burrows, or even mammalian trackways. It is noted that potentially fossiliferous alluvial gravels of Neogene or Quaternary age ("High Level Gravels") associated with the Orange River are *not* mapped within the present study area."

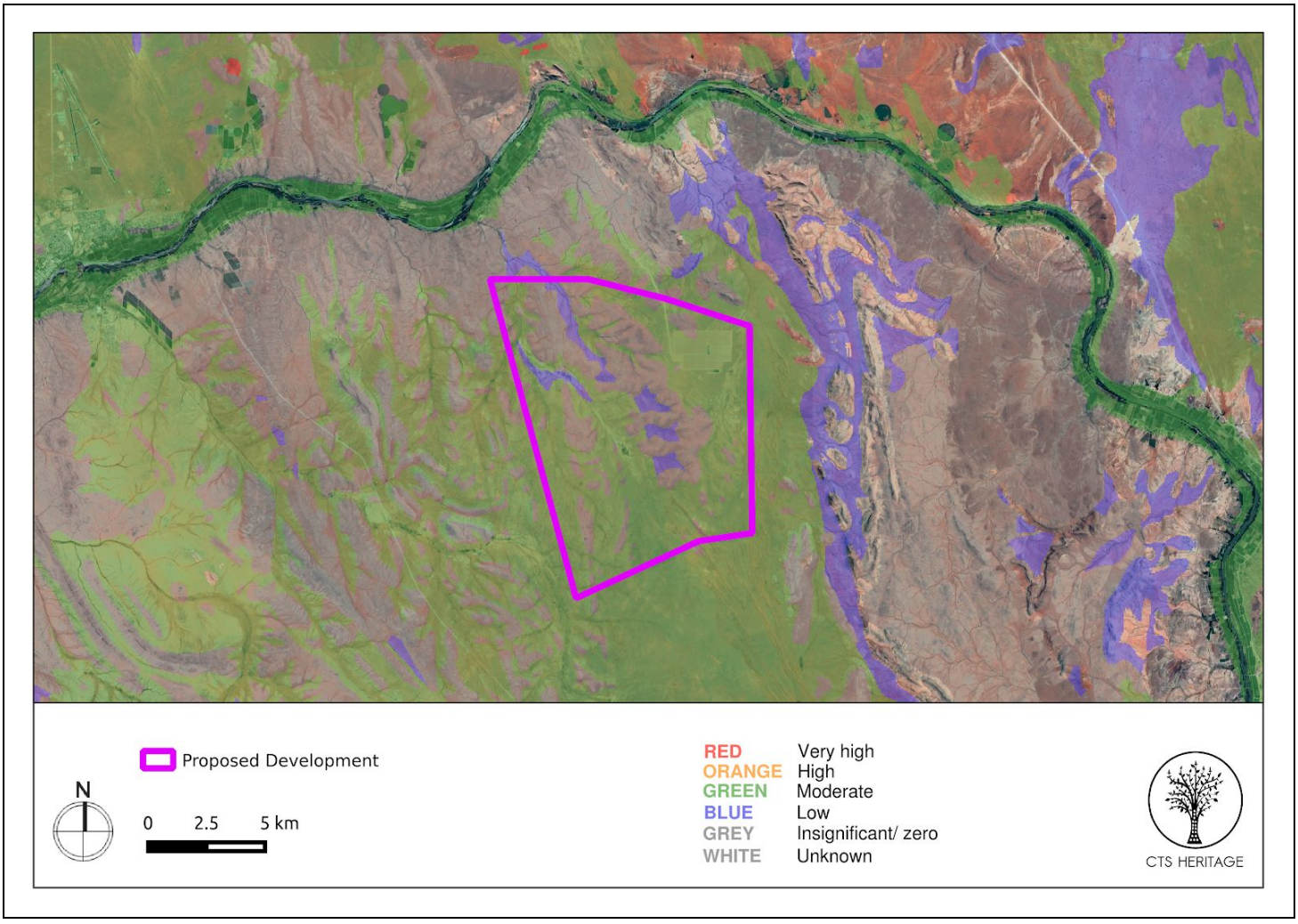
3.2 Geology

Geology (from Almond, 2015)

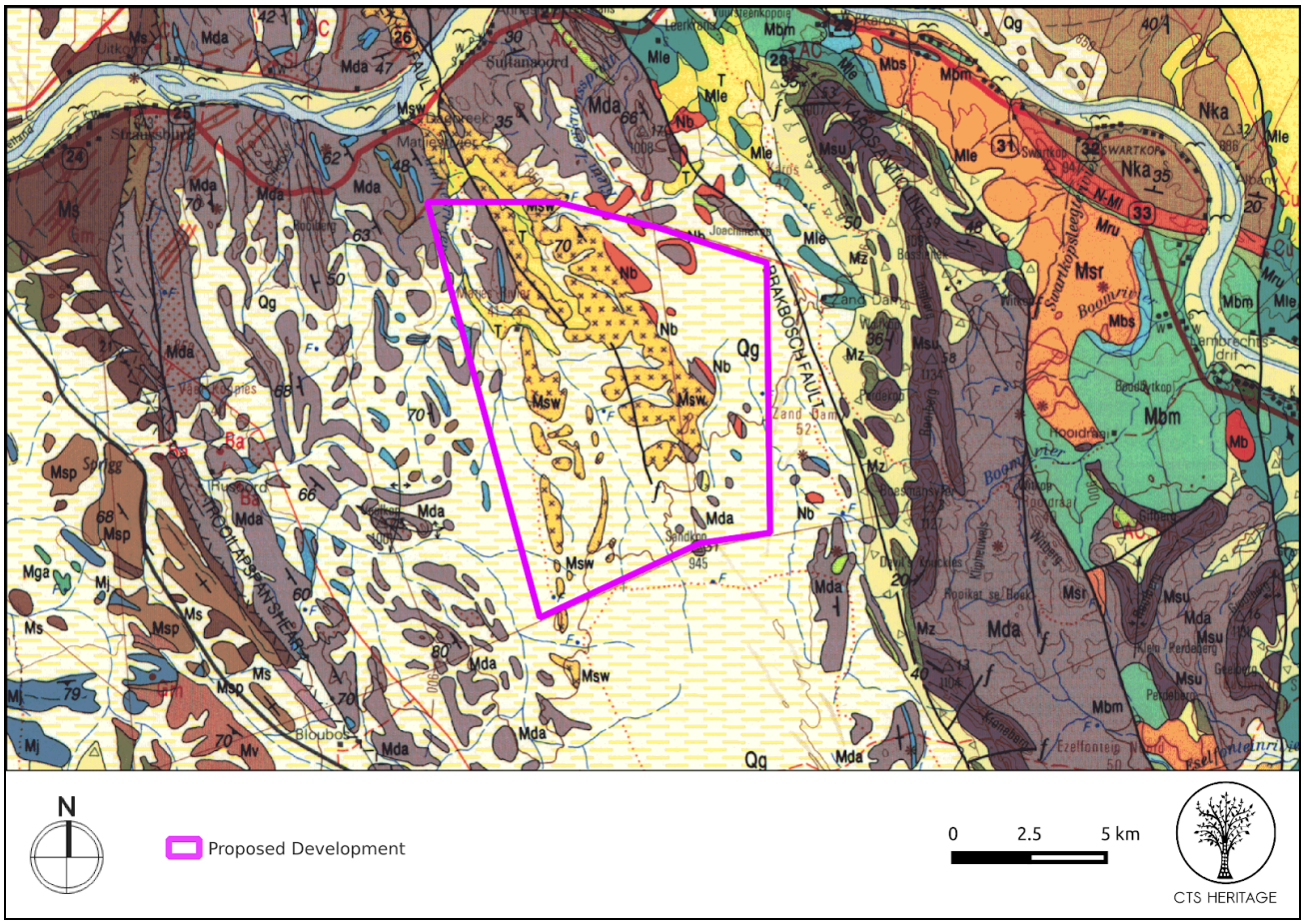
The geology of the study area near Upington is shown on the 1: 250 000 geology map 2820 Upington (Council for Geoscience, Pretoria; Fig. 3). A comprehensive sheet explanation for this map has been published by Moen (2007). The study area is underlain at depth by a range of ancient Precambrian basement rocks – largely medium to high grade metamorphic rocks (e.g. gneisses, metapelites, quartzites) and intrusive granitoids – that belong to the Namaqua-Natal Province of Mid Proterozoic (Mokolian) age (Cornell et al. 2006, Moen 2007). The rock units concerned include quartzites and schists of the Vaalkoppies Group, various metasediments and volcanics of the the Areachap Sequence and Wilgenhoutsdrif Group as well as basic and acidic lavas of the Koras Group. These basement rocks are approximately two to one billion years old and are entirely unfossiliferous (Almond & Pether 2008). They mainly crop out as small, isolated patches of basement rocks or low Inselberge due to the extensive superficial sediment cover.

A large portion of the study area, especially the central portion and towards the south, is covered by fine-grained aeolian (wind-blown) sands of the Gordonia Formation (Qg, pale yellow with dashed ornament in Fig. 3). This is the youngest, Pleistocene to Recent, subunit of the Kalahari Group. Prominent NW-SE trending linear dunes of orange-hued sands are clearly visible on satellite images in the south-eastern portion of the study area as well as along its eastern margins. The geology of the Late Cretaceous to Recent Kalahari Group is reviewed by Thomas (1981), Dingle et al. (1983), Thomas & Shaw 1991, Haddon (2000) and Partridge et al. (2006). The Gordonia dune sands are considered to range in age from the Late Pliocene / Early Pleistocene to Recent, dated in part from enclosed Middle to Later Stone Age stone tools (Dingle et al., 1983, p. 291). Areas of calcrete pedocretes in the northern sector of the study area (T, medium yellow in Fig. 3) may be tentatively correlated with the Quaternary Mokalanen Formation of the Kalahari Group (Moen 2007, p. 148), although older, Tertiary calcretes may also be represented here. Other Quaternary to Recent superficial deposits in the study area include downwasted surface

gravels, colluvium and gravelly to sandy stream sediments. High Level Gravels associated with the Orange River are not mapped within the study area, including along the river banks.



Map 2: Palaeontological sensitivity of the proposed development area



Map 3: Geology Map. Indicating the underlying geology across the study area through overlaying the geology maps from the CGS series 2820 Upington (T: Kalahari Groep (Talk), Nb: Blauwbosch Granite (Granite porphyry), Qg: Gordonia (Red-brown, wind-blown sand and dunes), Msw: Swanartz Gneiss (Porphyroblastic biotite gneiss), Mda: Dagbreek (Quartzite and schist grading into banded gneiss and migmalite; lenses of leucogneiss; amphibolite and serpentinite))

Table 1: Explanation of symbols for the geological map and approximate ages

Symbol	Group/Formation	Lithology
Qg	Gordonia Formation	Red brown wind blown sand and dunes
T	Tertiary Kalahari Group	Calcrete
Msw	Swanartz Gneiss	Porphyroblastic biotite gneiss
Mda	Dagbreek Formation	Quartzite and schist grading into banded gneiss and migmatite
Nb	Blaauwbosch Granite	Granite porphyry

4. IDENTIFICATION OF HERITAGE RESOURCES

4.1 Summary of findings of Specialist Reports

Archaeology

The archaeological field assessment covered the area proposed for development (approximately 60km^2, linear access roads and pipeline totalling ~40km) thoroughly. Stone Age archaeological resources were identified within the development footprint, however these are considered to be not conservation-worthy as they are widely scattered and have no associated contextual material.

The findings made during the field assessment were consistent with previous work undertaken in the area. Larger quantities of debitage were found where quarrying of quartz and quartzite had taken place, hornfels percentages climbed in areas closer to the Orange River to the north and east of the study site and almost all of the observations were of Middle Stone Age material. Later Stone Age remains were very sparse and limited across the study site.

No engravings, formal or informal graves were identified within the development footprint and the only built structures included modern cattle farming kraals, jeep tracks and fences.

Palaeontology (Almond 2015)

The study area near Upington is largely underlain by unfossiliferous Precambrian basement rocks of the Namaqua-Natal Province as well as a range of unfosssiliferous to poorly-fossiliferous superficial sediments of Late Caenozoic age. The construction phase of the solar park will entail extensive surface clearance as well as shallow excavations into the superficial sediment cover (soils, alluvial gravels etc.) and locally also into the underlying bedrock. These excavations notably include site clearance activities as well as excavations for the parabolic mirror array and heliostat footings, excavation for the power tower foundations, buried cables, new internal access roads,

power line pylon footings, storm water infrastructure, as well as foundations for various buildings such as the central tower and control buildings. All these developments may adversely affect any fossil remains within the study area by destroying, disturbing or permanently sealing-in fossils at or below the ground surface that are then no longer available for scientific research or other public good. Once constructed however, the operational and decommissioning phases of the solar facilities will not involve potential further adverse impacts on palaeontological heritage.

4.2 Heritage Resources identified

Archaeology

No significant heritage resources were identified within the footprint for the proposed Ilanga 1 100MW Solar PV facility and associated infrastructure. The stone age occurrences identified consist of isolated finds, and low-density ex-situ surface scatters containing predominantly of Middle Stone Age (MSA) material, with a few incidences of Later Stone Age (LSA) lithics. Whether indicative of the original discard patterns, or subsequent displacement by erosion and animal activity, the material is too scattered to be connected to knapping sites, and no evidence of concurrent human occupation was found in association with the lithics. The identified archaeological materials are therefore of low significance, as the archaeological sample is small and without context, and therefore of little scientific value. These Stone Age heritage finds are considered not conservation-worthy. This means these sites have been sufficiently recorded and no further action is required.

Table 2: Artefacts identified during the field assessment within the Ilanga 1 100MW Solar PV area and associated infrastructure

POINT ID	Area	Site Name	Description	Co-ordinates		Grading	Mitigation
14	1	**100MW - 1**	silcrete core, MSA	-28.5246733	21.5194367	NCW	None
15	1	**100MW - 1**	silcrete flake, MSA	-28.5223067	21.51659	NCW	None
16	1	**100MW - 1**	yellow silcrete flaked, MSA	-28.5208833	21.5214733	NCW	None
17	1	**100MW - 1**	silcrete flake and chunk, MSA	-28.5225317	21.5288767	NCW	None
18	1	**100MW - 1**	blue Quartzite flakes and biface MSA	-28.5239867	21.5288533	NCW	None
19	1	**100MW - 1**	radial core silcrete, MSA	-28.524045	21.5288383	NCW	None
20	1	**100MW - 1**	radial core silcrete, MSA	-28.5245933	21.5287683	NCW	None
21	1	**100MW - 1**	silcrete flake, MSA	-28.52637	21.5288117	NCW	None
22	1	**100MW - 1**	hornfels flake retouched, MSA	-28.52637	21.5288317	NCW	None
23	1	**100MW - 1**	patinated silcrete long flake, MSA	-28.52752	21.5290333	NCW	None
89	1	**100MW - 1**	quartzite and silcrete flakes, MSA	-28.5304133	21.50768	NCW	None
90	1	**100MW - 1**	Hornfels flakes, MSA	-28.5295967	21.5072217	NCW	None
91	1	**100MW - 1**	blue Quartzite flake, MSA	-28.5284683	21.506555	NCW	None
129	10	**Roads**	access road route, quartzite, Hornfels, quartz flakes and cores, MSA	-28.445615	21.427785	NCW	None
131	10	**Roads**	Hornfels and views, MSA	-28.4739183	21.4363017	NCW	None
132	10	**Roads**	quartzite flakes, cores, MSA	-28.4894533	21.440945	NCW	None
135	10	**Roads**	quartzite flake, MSA	-28.5468883	21.446985	NCW	None
136	10	**Roads**	green quartzite, MSA	-28.5468067	21.4525667	NCW	None
137	10	**Roads**	quartzite flake, MSA	-28.54676	21.4555233	NCW	None

173	10	**Roads**	access road and Hornfels flake, MSA	-28.5381233	21.4266433	NCW	None
176	10	**Roads**	quartz unifacial, MSA	-28.5004717	21.42949	NCW	None
177	10	**Roads**	Hornfels flake, MSA	-28.499945	21.42959	NCW	None
178	10	**Roads**	quartzite core flake, MSA	-28.4987733	21.4297783	NCW	None
179	10	**Roads**	dark quartzite, MSA	-28.4977033	21.4299017	NCW	None
181	10	**Roads**	Hornfels flake, MSA	-28.4968333	21.43102	NCW	None
184	10	**Roads**	Hornfels flake, MSA	-28.4948283	21.4393383	NCW	None
185	10	**Roads**	Hornfels flakes, MSA	-28.4956	21.4386517	NCW	None
122	11	**Pipelines**	quartzite flake, MSA	-28.5014183	21.49935	NCW	None
123	11	**Pipelines**	silcrete core flake, Hornfels, debris field, MSA	-28.49831	21.4978433	NCW	None
191	11	**Pipelines**	quartzite core and Quartz source, MSA	-28.4169633	21.4844	NCW	None
192	11	**Pipelines**	Grey quartzite flakes, MSA	-28.4188633	21.481535	NCW	None
193	11	**Pipelines**	radial core quartzite, MSA	-28.4232683	21.4759783	NCW	None
195	11	**Pipelines**	quartzite cores, MSA	-28.4259567	21.4724717	NCW	None
198	11	**Pipelines**	heavily patinated Hornfels, MSA	-28.4334983	21.4674367	NCW	None
200	11	**Pipelines**	quartzite core and flake, MSA	-28.44203	21.474215	NCW	None

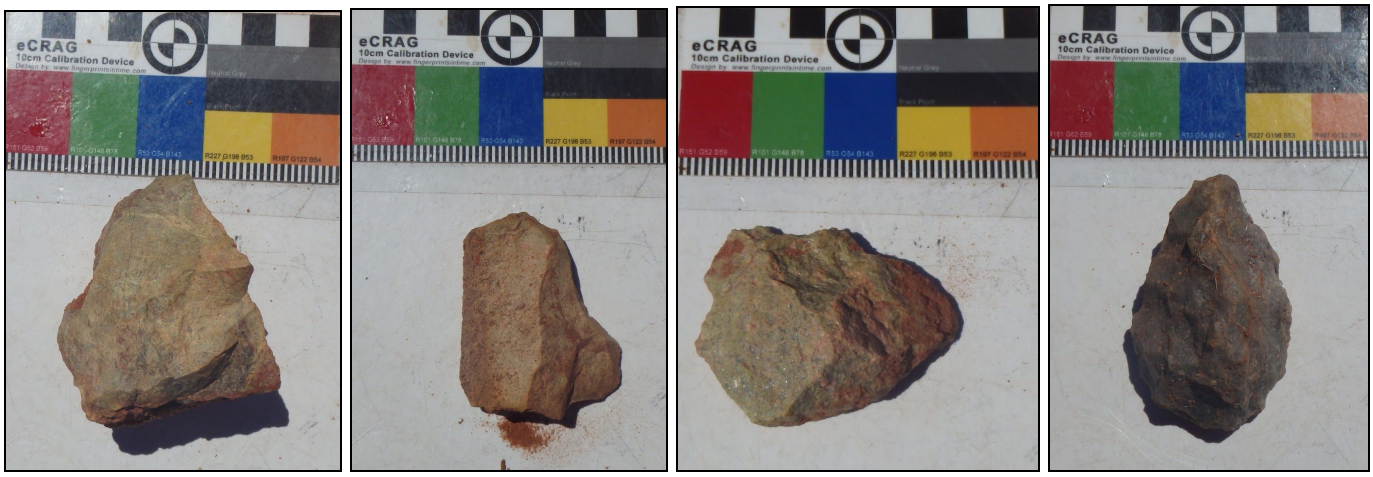


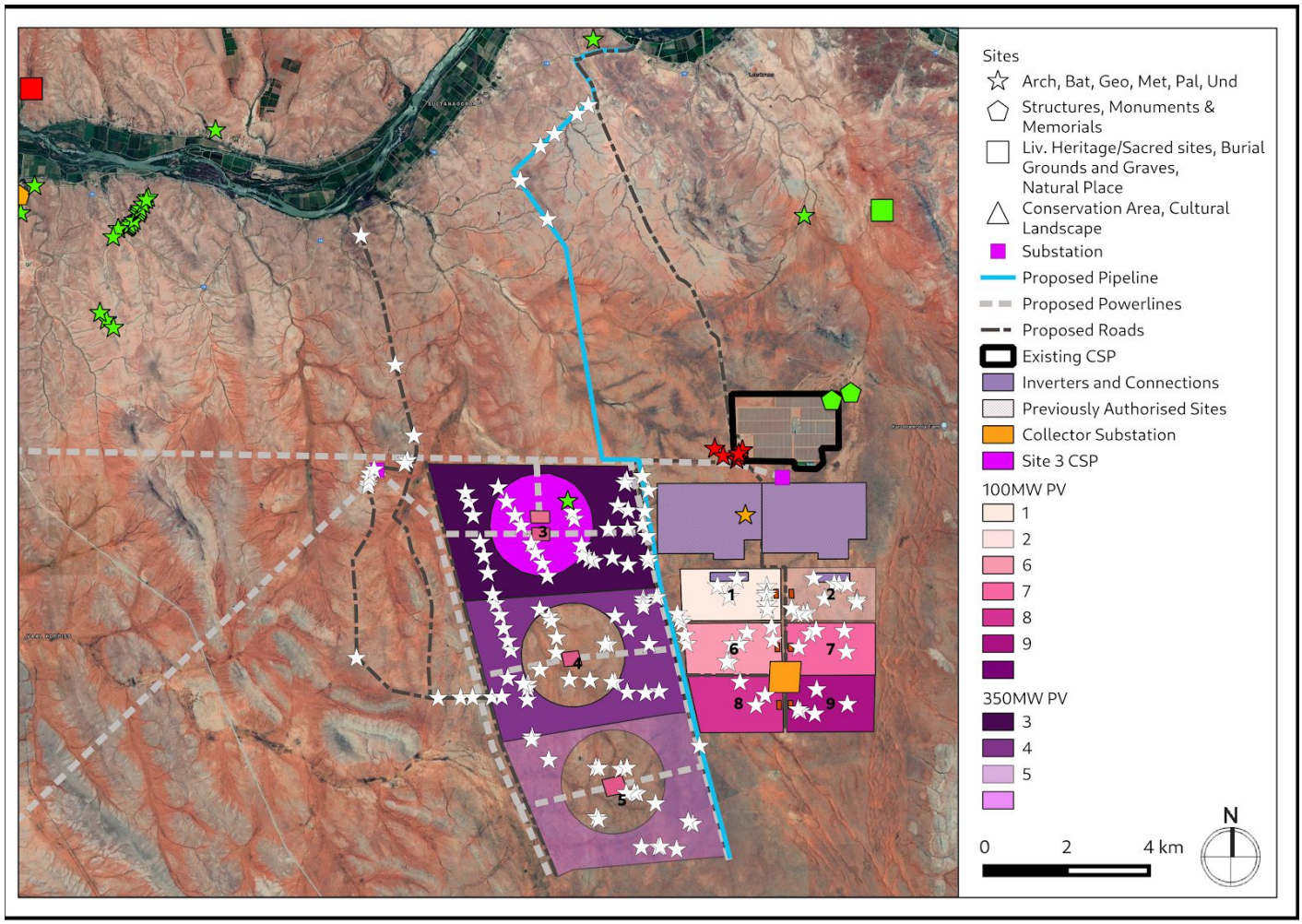
Figure 4: Observations from Area 1 (14, 15, 16 and 18)

Palaeontology

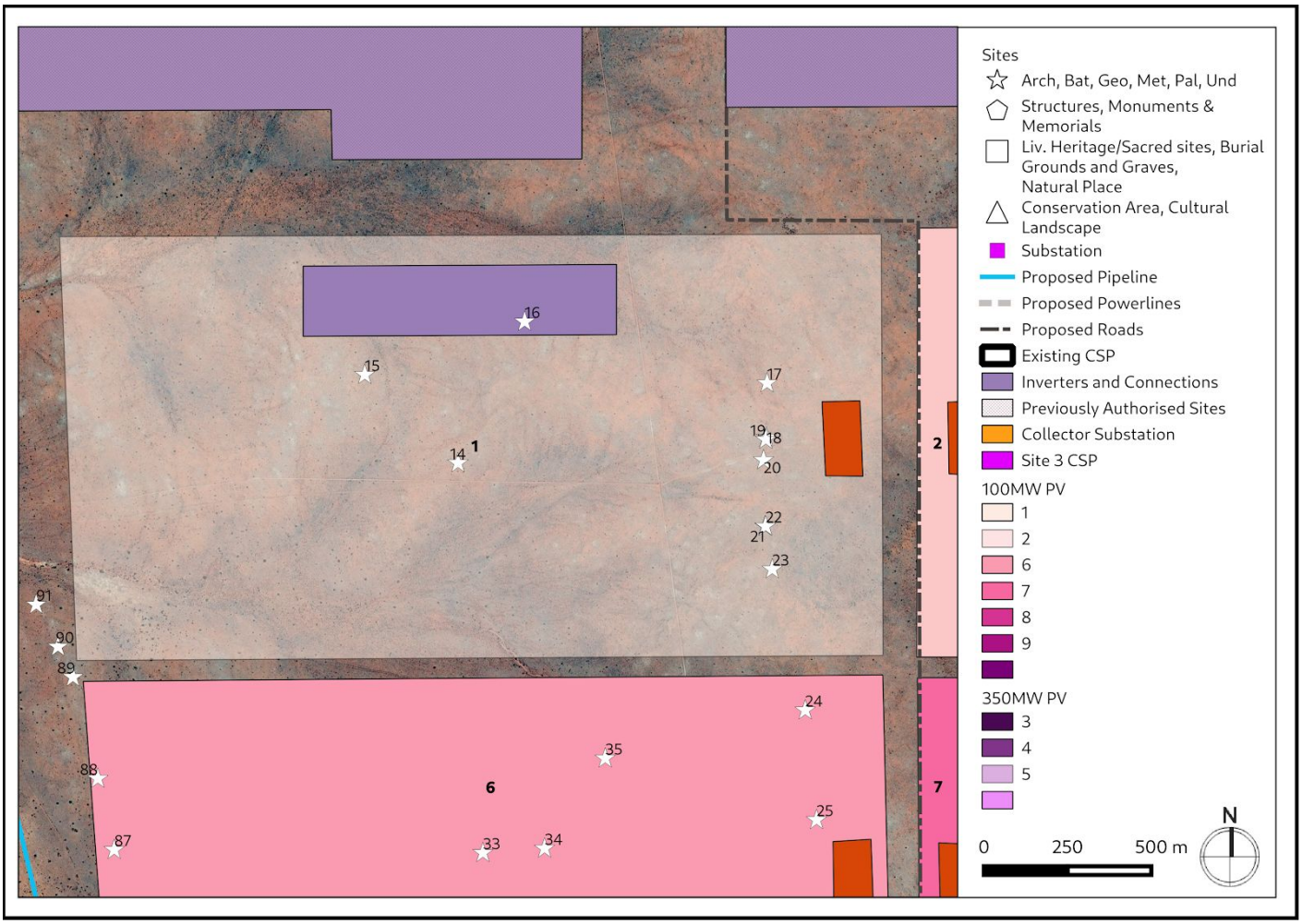
The igneous and metamorphic basement rocks of Precambrian age underlying the entire study area are entirely unfossiliferous. The overlying aeolian sands, calcretes, surface gravels and stream deposits of the Kalahari Group mantling the ancient bedrocks are generally of low to very low palaeontological sensitivity. The project areas lie too far from the river to affect any possible – but unmapped - older (Tertiary - Quaternary) fossiliferous river gravels along the southern banks of the Gariep.

Some of the superficial sedimentary formations represented within the study area – such as the Quaternary calcretes (T, dark yellow in geological map Map 3) - contain fossils of some sort (e.g. trace fossils, microfossils, possible vertebrate remains). Low-level impacts on fossil heritage here are probable. However, the probability of significant impacts on palaeontological heritage is considered to be low because of (a) the generally very sparse occurrence of palaeontologically valuable fossils (i.e. unusual fossils such as well-preserved vertebrate remains) within the superficial sediments, (b) the widespread occurrence of the most of the fossils concerned outside the study area (i.e. not unique).

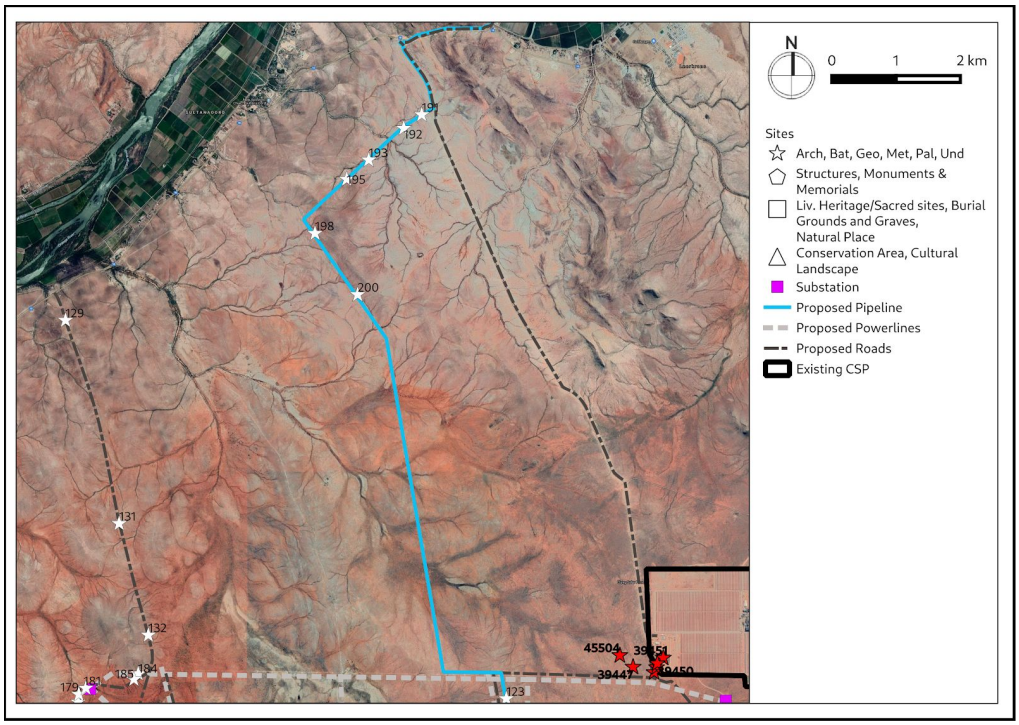
4.3 Mapping and spatialisation of heritage resources



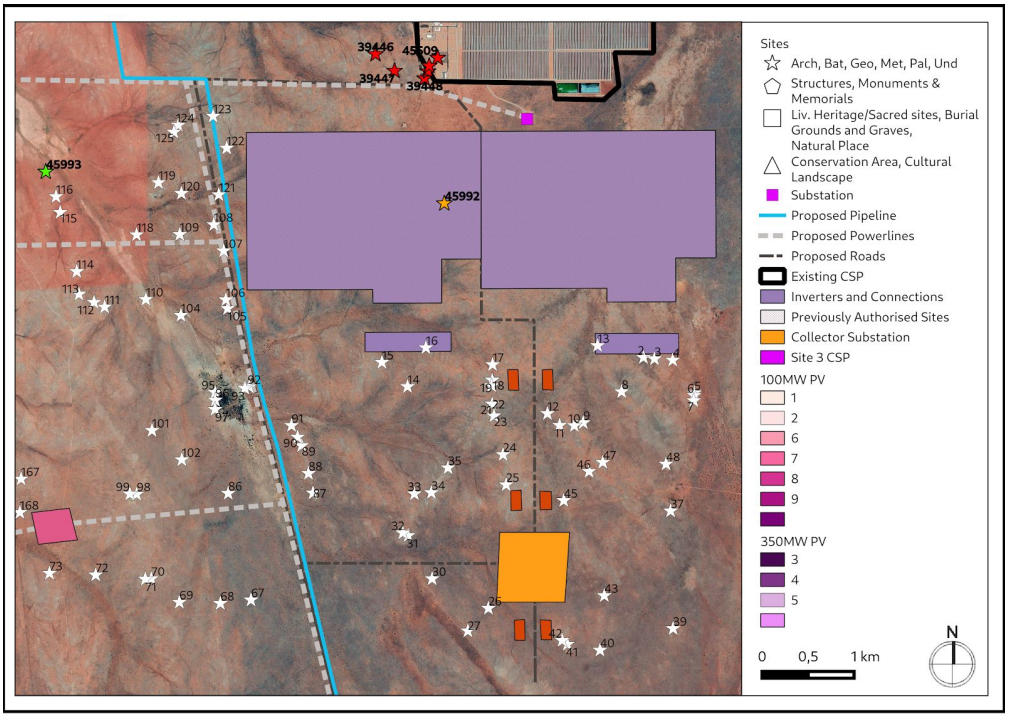
Map 5.1: Heritage resources in the vicinity of the proposed development



Map 5.2: Heritage resources in the vicinity of the proposed Ilanga 1 100MW Solar PV Facility



Map 5.3: Heritage resources in the vicinity of the infrastructure associated with the proposed Ilanga 1 100MW Solar PV Facility



Map 5.4: Heritage resources in the vicinity of the infrastructure associated with the proposed Ilanga 1 100MW Solar PV Facility

5. ASSESSMENT OF THE IMPACT OF THE DEVELOPMENT

5.1 Assessment of impact to Heritage Resources

The proposed development will not have a negative impact on the heritage resources identified within the Ilanga 1 100MW Solar PV facilities' footprint and its associated infrastructure. 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 Ilanga 1 100MW Solar PV facility. Despite the high number of observations of artefacts, these resources are common and representative of similar scatters across widespread areas of the Northern Cape.

In general, the destruction, damage or disturbance out of context of fossils preserved at the ground surface or below ground that may occur during construction represents a negative consequence. The palaeontological sensitivity of the bedrocks and superficial sediments within the study area is rated as low to very low and therefore the impact significance is rated as Very low (-). Negative impacts on fossil heritage resources can usually be mitigated but cannot be fully rectified or reversed; i.e. they are permanent in duration and non-reversible. Potential impacts are confined to the development footprint i.e. very limited in extent. No no-go areas of high palaeontological sensitivity were identified within the study area during the present desktop study.

While all fossils, once damaged or destroyed, are irreplaceable, this has to be seen in the context of the probable widespread occurrence of most fossil groups within the rock units concerned here (with the notable exception of any well-preserved vertebrate remains).

Table 3: Impacts of the Ilanga 1 100MW Solar PV facility and associated infrastructure to heritage resources

NATURE: No heritage resources of significance were identified during the field assessments for archaeology and the desktop assessment for palaeontology within the development footprint				
		Archaeology		**Palaeontology**
MAGNITUDE	**L (2)**	No significant archaeological resources were identified within the development area, however a number of archaeological resources of low significance were identified	**L (2)**	The palaeontological sensitivity of the bedrocks and superficial sediments within the study area is rated as low to very low .The impact would be very unlikely.
DURATION	**H (5)**	Where manifest, the impact will be permanent.	**H (5)**	Where manifest, the impact will be permanent.
EXTENT	**L (1)**	Localised within the site boundary	**L (1)**	Limited to the development footprint
PROBABILITY	**L (1)**	It is extremely unlikely that any significant archaeological resources will be impacted	**L (1)**	It is extremely unlikely that any fossils will be impacted, however fossils can occur in sediments that lie more than 1m below the surface in sedimentary bedrock.

SIGNIFICANCE	**L**	(2+5+1)x1=8	**L**	(2+5+1)x1=8
STATUS		Neutral		Neutral
REVERSIBILITY	**L**	Any impacts to heritage resources that do occur are irreversible	**L**	Any impacts to heritage resources that do occur are irreversible
IRREPLACEABLE LOSS OF RESOURCES?	**L**	Unlikely	**L**	Unlikely
CAN IMPACTS BE MITIGATED		NA		Yes
MITIGATION: During the construction phase all deeper (> 1 m) excavations into sedimentary bedrock should be monitored for fossil remains by the responsible Environmental Control Officer (ECO). Should substantial fossil remains such as vertebrate bones and teeth, petrified wood, plant-rich fossil lenses or dense fossil burrow assemblages be exposed during construction, the responsible ECO should safeguard these, preferably in situ, and alert the South African Heritage Resources Authority (SAHRA) so that appropriate action can be taken by a professional palaeontologist,				
RESIDUAL RISK: Should any significant resources be impacted (however unlikely) residual impacts may occur, including a negative impact due to the loss of potentially scientific cultural resources				

5.2 Sustainable Social and Economic Benefit

During the construction phase a employees would be required for the construction. These employees would consist of low skilled, semi-skilled and skilled individuals. It is highly likely that the semi-skilled and low skilled individuals could be sourced from Upington, Straussburg (Ntsikelelo), Dagbreek, Karos and Leerkrans situated along the N10 in close proximity to the farms Annashoek and Zandemm. These individuals would be employed for some basic construction activities requiring manual labour. As large sectors of the local population have been involved in the agricultural sector it is assumed that they would thus be able to undertake the basic construction activities required with the minimum additional training required. Permanent employees would be required during the operational period of the facility. Due to the relative limited number of individuals involved it is thus anticipated that the short term employment boost during the construction phase would have a more intense impact on the local communities than the permanent employment opportunities. This benefit, however, could be further enhanced by focused training, capacity building and skills development enabling individuals to be considered for permanent employment. Regional economic benefits of the Ilanga Solar Park would not only accrue through the creation of an additional stable electricity supply but also through the downstream benefits to the local and regional economy.

5.3 Proposed development alternatives

The siting of the initial facilities within the broader Karoshoek Solar Valley Development considered various critical criteria including the sensitivity of the broader site in order to inform the positioning of these facilities as well as

provincial and local planning in terms of renewable energy development. The areas within which these authorised facilities are planned do not infringe on any identified areas of high sensitivity. In addition, the broader site is located within the identified Solar Development Corridor as defined by the PSDF, as well as within a proposed REDZ for solar development. The siting of these facilities is considered to be acceptable from an environmental perspective.

The following Grid Connection Alternatives have been proposed for Ilanga PV1:

- On-site inverter (step up facility) to convert power from Direct Current (DC) to an Alternative (AC) and step up the electricity current from 33kV to 132kV that will connect to the on-site substation at authorised site 1.4 via underground cables. The electricity will be evacuated via the authorised grid connection (DEA Ref:. 14/12/16/3/3/2/299) to the existing Ilanga substation.
- An onsite 11kV/22kV/33kV collector substation to receive, convert and step up electricity from the PV facility directly to the existing 132kV Ilanga Substation via underground cables (The on-site collector substation at authorised site 1.4 connects to the Ilanga substation).
- Loop in and loop out the 132kV lines connecting the existing Ilanga Substation to Gordonia Substation

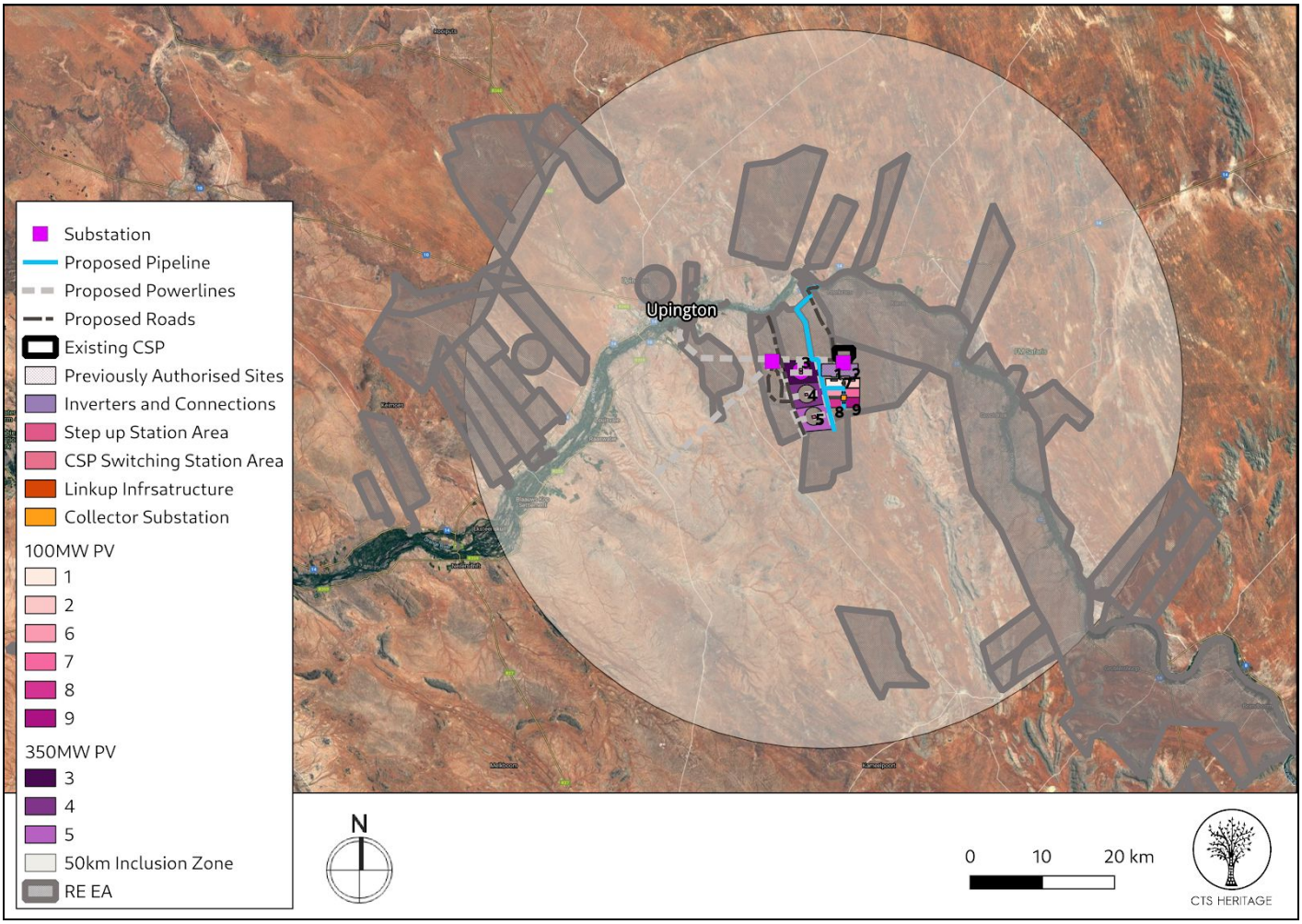
Based on the assessment completed, there is no additional impact to heritage resources associated with any of these alternatives on condition that the recommendations included below are implemented.

5.4 Cumulative Impacts

Cumulative impact in terms of heritage was assessed by reviewing the renewable energy facilities that are proposed within 50km of the proposed development area. 85 Renewable Energy Facilities are proposed within 50km of this proposed development area. This, however, includes the previously assessed and authorised renewable energy facilities that fall within the development area assessed in this HIA.

In addition, impacts to heritage result from all kinds of development and as such, this assessment of cumulative impacts to heritage was not limited to impact from renewable energy facilities. Of the 49 Heritage Assessments conducted within 25km of the proposed development area (Appendix 2 of the Heritage Screening Assessment), 25 are for Renewable Energy Facilities and 6 are for associated infrastructure such as electricity lines, pipelines and roads. The remaining assessments relate to mining infrastructure and residential township developments. At this stage, there is the potential for the cumulative impact of proposed solar energy facilities to negatively impact the cultural landscape due to a change in the landscape character from natural wilderness to semi-industrial,

however, due to the remoteness of the area the impact on the experience of the cultural landscape is not foreseen to be significant. In addition, it is preferable to have renewable energy facility development focussed in an area such as a REDZ.



Map 6: Authorised REF projects within 50km of the proposed development area

Table 4: Cumulative Impact Table

NATURE: Cumulative Impact to the sense of place				
		Overall impact of the proposed project considered in isolation		**Cumulative impact of the project and other projects in the area**
MAGNITUDE	**L (4)**	Low	**L (4)**	Low
DURATION	**M (3)**	Medium-term	**H (4)**	Long-term
EXTENT	**L (1)**	Low	**L (1)**	Low

PROBABILITY	**L (2)**	Improbable	**H (3)**	Probable
SIGNIFICANCE	**L**	(4+3+1)x2=16	**L**	(4+4+1)x3=27
STATUS		Neutral		Neutral
REVERSIBILITY	**H**	High	**L**	Low
IRREPLACEABLE LOSS OF RESOURCES?	**L**	Unlikely	**L**	Unlikely
CAN IMPACTS BE MITIGATED		NA		NA
CONFIDENCE IN FINDINGS: High				
MITIGATION: No impacts are anticipated and as such, no mitigation is required				

6. RESULTS OF PUBLIC CONSULTATION

The public consultation process will be undertaken by the EAP during the EIA. No heritage-related comments have been received to-date. SAHRA is required to comment on this HIA and make recommendations prior to the granting of the Environmental Authorisation.

7. CONCLUSION

The proposed development will not have a negative impact on the heritage resources situated within the footprint of Ilanga 1 100MW Solar PV Facility The lithic material identified is of low significance, and even though the resources may be destroyed during the construction, the impact is inconsequential.

The igneous and metamorphic basement rocks of Precambrian age underlying the entire study area are entirely unfossiliferous. The overlying aeolian sands, calcretes, surface gravels and stream deposits of the Kalahari Group mantling the ancient bedrocks are generally of low to very low palaeontological sensitivity. The project areas lie too far from the river to affect any possible – but unmapped - older (Tertiary - Quaternary) fossiliferous river gravels along the southern banks of the Gariep.

Some of the superficial sedimentary formations represented within the study area – such as the Quaternary calcretes (T, dark yellow in geological map Map 3) - contain fossils of some sort (e.g. trace fossils, microfossils, possible vertebrate remains). Low-level impacts on fossil heritage here are probable. However, the probability of significant impacts on palaeontological heritage is considered to be low.

In addition, the proposed development is located within a previously identified REDZ and Power Corridor. Due to the REDZ, there are a number of similar existing and/or proposed PV facilities in the area and as such, there is the

potential for the cumulative impact of proposed solar energy facilities to negatively impact the cultural landscape due to a change in the landscape character from natural wilderness to semi-industrial, however, due to the remoteness of the area the impact on the experience of the cultural landscape is not foreseen to be significant.

No significant archaeological or palaeontological resources were identified during this HIA. Therefore, no further mitigation is required, and from a heritage point of view, there is no objection to the proposed development in this area.

8. RECOMMENDATIONS

There is no objection to the proposed development on heritage grounds and the following is recommended:

- No mitigation is required prior to construction operations commencing.
- During the construction phase all deeper (> 1 m) excavations into sedimentary bedrock should be monitored for fossil remains by the responsible Environmental Control Officer (ECO). Should substantial fossil remains such as vertebrate bones and teeth, petrified wood, plant-rich fossil lenses or dense fossil burrow assemblages be exposed during construction, the responsible ECO should safeguard these, preferably in situ, and alert the South African Heritage Resources Authority (SAHRA) so that appropriate action can be taken by a professional palaeontologist,
- Should 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 or other categories of heritage resources be found during the proposed development, SAHRA APM Unit (Natasha Higgitt/Phillip Hine 021 462 5402) must be alerted.
- If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (Mimi Seetelo 012 320 8490), must be alerted immediately as per section 36(6) of the NHRA. A professional archaeologist must be contracted as soon as possible to inspect the findings. A Phase 2 rescue excavation operation may be required subject to permits issued by SAHRA.
- The above recommendations must be included in the Environmental Management Plan (EMP) for the project

9. REFERENCES

Heritage Impact Assessments				
Nid	**Report Type**	**Author/s**	**Date**	**Title**
4119	AIA Phase 1	Jonathan Kaplan	01/08/2008	An Archaeological Assessment of Two Borrow Pits Alongside DR 3321 Uap, Northern Cape Province
4127	AIA Phase 1	Peter Beaumont	15/08/2006	On a Planned Extension of the Lambrechtsdrift Township, Siyanda District Municipality, Northern Cape
4128	AIA Phase 1	Peter Beaumont	16/08/2006	On a Planned Extension of the Leerkrantz Township, Siyanda District Municipality, Northern Cape
4129	AIA Phase 1	Peter Beaumont	16/08/2006	On a Planned Extension of the Karos Township, Siyanda District Municipality, Northern Cape
4130	AIA Phase 1	Peter Beaumont	16/08/2006	Phase 1 Heritage Impact Assessment Report on a Planned Extension of the Louisvaleweg Township, //Khara Hais Municipality, Northern Cape Province
4132	AIA Phase 1	Peter Beaumont	18/08/2006	Phase 1 Heritage Impact Assessment Report on a Planned Extension Flanking Rondomstraat, //Khara Hais Municipality, Northern Cape Province
15988	Heritage Statement	Johnny Van Schalkwyk	01/04/2012	DOCUMENTATION OF FOUR BRIDGES ON THE N10 NATIONAL ROAD BETWEEN UPINGTON AND GROBLERSHOOP, NORTHERN CAPE PROVINCE
15989	Palaeontological Specialist Reports	John E Almond	01/03/2012	RECOMMENDED EXEMPTION FROM FURTHER PALAEONTOLOGICAL STUDIES & MITIGATION: PROPOSED UPGRADING OF FOUR ROAD BRIDGES ALONG THE N10 BETWEEN GROBLERSHOOP & LAMBRECHTSDRIFT, NORTHERN CAPE
34135	HIA Phase 1	Stephan Gaigher	30/04/2012	Heritage Impact Assessment Report EIA Phase: Proposed Establishment of the Karoshoek Valley Solar Park Components on Sites 1.1, 1.3, 1.4, 2, 3, 4 & 5 on Sites Located South and East of Upingtone, Northern Cape Province
45016	HIA Phase 1	Johnny Van Schalkwyk	01/05/2011	Heritage Impact Assessment for the Proposed Establishment of the Ilanga Solar Thermal Power Plant near Upington, Northern Cape
49492	HIA Phase 1	Cobus Dreyer	09/09/2011	FIRST PHASE ARCHAEOLOGICAL & HERITAGE ASSESSMENT OF THE HOUSING DEVELOPMENTS AT MELKSTROOM 563, UPINGTON, NORTHERN CAPE
108359	HIA Phase 1	Cobus Dreyer	01/09/2011	FIRST PHASE ARCHAEOLOGICAL & HERITAGE ASSESSMENT OF THE HOUSING DEVELOPMENTS AT MELKSTROOM 563, UPINGTON, NORTHERN CAPE
111142	HIA Phase 1	Johnny Van Schalkwyk	01/03/2012	Heritage Impact Assessment for the Proposed Development of an Agri-estate on the Farm Melkstroom East of Upington, Gordonia Magisterial District, Northern Cape Province
117805	AIA Phase 1	Cobus Dreyer	18/04/2013	FIRST PHASE ARCHAEOLOGICAL & HERITAGE ASSESSMENT OF THE HOUSING DEVELOPMENTS AT MELKSTROOM 563, UPINGTON, NORTHERN CAPE
121280	HIA Phase	Robert de	05/11/2010	FINAL HERITAGE IMPACT ASSESSMENT REPORT: PROPOSED LAND USE CHANGE TO

	1	Jong		PROVIDE FOR THE DEO GLORIA OLIVE ESTATE ON PORTION 67 AND THE REMAINDER OF THE FARM VAALKOPPIES 40 NEAR UPINGTON, KAI! GARIB MUNICIPALITY, NORTHERN CAPE PROVINCE
121413	AIA Phase 1	Johnny Van Schalkwyk	01/08/2010	Archaeological impact survey report for THE LAND USE CHANGE ON SECTIONS OF THE FARM VAALKOPPIES 40, GORDONIA DISTRICT, NORTHERN CAPE PROVINCE
121413	AIA Phase 1	Johnny Van Schalkwyk	01/08/2010	Archaeological impact survey report for THE LAND USE CHANGE ON SECTIONS OF THE FARM VAALKOPPIES 40, GORDONIA DISTRICT, NORTHERN CAPE PROVINCE
130139	Archaeological Specialist Reports	Jonathan Kaplan	01/02/2013	ARCHAEOLOGICAL IMPACT ASSESSMENT THE PROPOSED UPGRADING OF THE LOUISEVALE ROAD WASTE WATER TREATMENT WORKS IN LOUISVALE
131589	Heritage Impact Assessment Specialist Reports	Stephan Gaigher	22/02/2013	Proposed Establishment of Several Electricity Distribution Lines within the Northern Cape Province
154837	AIA Phase 1	Peter Nilssen	06/12/2012	AIA - Proposed Deo Gloria Bulk Water Supply Line & Reservoir
154839		John E Almond	31/03/2013	Letter of Exemption
159293	HIA Phase 1	Johnny Van Schalkwyk	12/03/2014	Cultural Heritage Impact Assessment for proposed township development, Louisvale Weg, UPINGTON
161427	HIA Phase 1	Stephan Gaigher	15/04/2014	Proposed Establishment of Several Electricity Distribution Lines within the Northern Cape Province
162266	Heritage Impact Assessment Specialist Reports	Johnny Van Schalkwyk	31/05/2011	Heritage Impact Assessment for the Proposed Establishment of the Ilanga Solar Thermal Power Plant near Upington, Northern Cape Province
165290	AIA Phase 1	Neels Kruger	01/04/2015	ARCHAEOLOGICAL IMPACT ASSESSMENT (AIA) OF A DEMARCATED SURFACE PORTION ON THE FARM AVONDALE 410 FOR THE PROPOSED AVONDALE 1 PHOTOVOLTAIC POWER PLANT & 132KV POWER LINES DEVELOPMENT, //KHARA HAIS LOCAL MUNICIPALITY, ZF MGCAWU DISTRICT MUNICIPALITY, NORTHE
254926	PIA Desktop	Barry Millsteed	10/02/2015	Full Palaeontological Heritage Impact Assessment Report on the Site of Proposed Solar Energy Generation Facilities (Grootdrink Solar Projects 1 and 2) to be located on the farm Albany 405 near Karos, Northern Cape Province
254927	Heritage Scoping	Jaco van der Walt	10/02/2015	Heritage Scoping Report for the Proposed Grootdrink Solar (PV) Energy Facility East of Upington

266098	Archaeological Specialist Reports	Jaco van der Walt	13/03/2015	Archaeological Impact Assessment for the Proposed Realignment of the N10 to Facilitate Access to the Ilanga CSP Facility Site, East of Upington, NC Province
341377	HIA Phase 1	Jayson Orton	22/06/2015	
344305	PIA Desktop	John E Almond	13/11/2015	Palaeontological Heritage Assessment Desktop Study for the Additional CSP Facilities Associated with the Authorized CSP Sites (1.3, 1.4, 3, 4 & 5) within the Karoshoek Solar Valley Development near Upington, ZK Mgcawu Distrcitu, NC Province
344306	Heritage Scoping	Jaco van der Walt	13/11/2015	Archeological Scoping Report for the Additional CSP Facilities Associated with the Authorized CSP Sites (1.3, 1.4, 3, 4 & 5) within the Karoshoek Solar Valley Development near Upington, ZK Mgcawu Distrcitu, NC Province
351273	Palaeontological Specialist Reports	Barry Millsteed		FULL PALAEONTOLOGICAL HERITAGE IMPACT ASSESSEMENT REPORT ON THE SITE OF PROPOSED SOLAR ENERGY GENERATION FACILITIES (TEWA ISITHA SOLAR 1 AND 2) TO BE LOCATED ON THE REMAINING EXTENT OF THE FARM ALBANY 405 NEAR KAROS, NORTHERN CAPE PROVINCE
351279	Archaeological Specialist Reports	Jaco van der Walt	02/12/2015	Archaeological Impact Assessment for the proposed Tewa Isitha Solar 1 PV Facility East Of Upington, Northern Cape Province.
351311	Archaeological Specialist Reports	Jaco van der Walt	02/12/2015	Archaeological Impact Assessment for the proposed Tewa Isitha Solar 2 PV Facility East Of Upington, Northern Cape Province.
354735	PIA Desktop	John Almond	16/11/2015	Palaeontological Heritage Assessment: Desktop Study for the Proposed Ilanga CSP 7, 8 & 9 facilities and associated infrastructure within the Karoshoek Solar Valley Development near Upington, NC Province
354736	Archaeological Specialist Reports	Jaco van der Walt	16/11/2015	Archaeological Scoping Report for the Ilanga CSP 9 facility and associated infrastructure within the Karoshoek Solar Development near Upington, NC Province
354743	Archaeological Specialist Reports	Jaco van der Walt	16/11/2015	Archaeological Scoping Report for the Ilanga CSP 7 & 8 facilities and associated infrastructure within the Karoshoek Solar Development near Upington, NC Province
361653	Heritage Impact Assessment Specialist Reports	Jaco van der Walt	18/04/2016	Archaeological Impact Assessment Report for the Proposed Establishment of the Ilganga CSP 2 Project, near Upington, Northern Cape Province

361654	Heritage Impact Assessment Specialist Reports	Jaco van der Walt	13/04/2016	Archaeological Impact Assessment Report for the Proposed Establishment of the Ilanga Tower 1 Project, near Upington, NC Province
363353	Archaeological Specialist Reports	Jaco van der Walt	12/04/2016	Archaeological Impact Assessment Report for the Ilanga CSP 3 Project, near Upington, Northern Cape Province
363356	Archaeological Specialist Reports	Jaco van der Walt	11/04/2016	Archaeological Impact Assessment Report for the Proposed Establishment of the Ilanga CSP 5 Project, near Upington, Northern Cape Province
363357		Jaco van der Walt		Archaeological Impact Assessment Report for the Proposed Establishment of the Ilanga CSP 4 Project, near Upington, Northern Cape Province
365243	Archaeological Specialist Reports	Jaco van der Walt	20/06/2016	AIA for the proposed Ilanga Tower 1 project, near Upington, NC Province
365251	Archaeological Specialist Reports	Jaco van der Walt	20/06/2016	AIA for the proposed establishment of the Ilanga CSP 3 project, near Upington, NC Province
365252	Archaeological Specialist Reports	Jaco van der Walt	20/06/2016	AIA for the proposed Ilanga CSP 5
365253	Archaeological Specialist Reports	Jaco van der Walt	20/06/2016	AIA for the Ilanga CSP 4
365875	Archaeological Specialist Reports	Jaco van der Walt	14/06/2016	Ilanga CSP9 and Associated Infrastructure Within Karoshoek Solar Valley Development Near Upington, Northern Cape Province
365889		Jaco van der Walt		Archaeological Impact Assessment Report