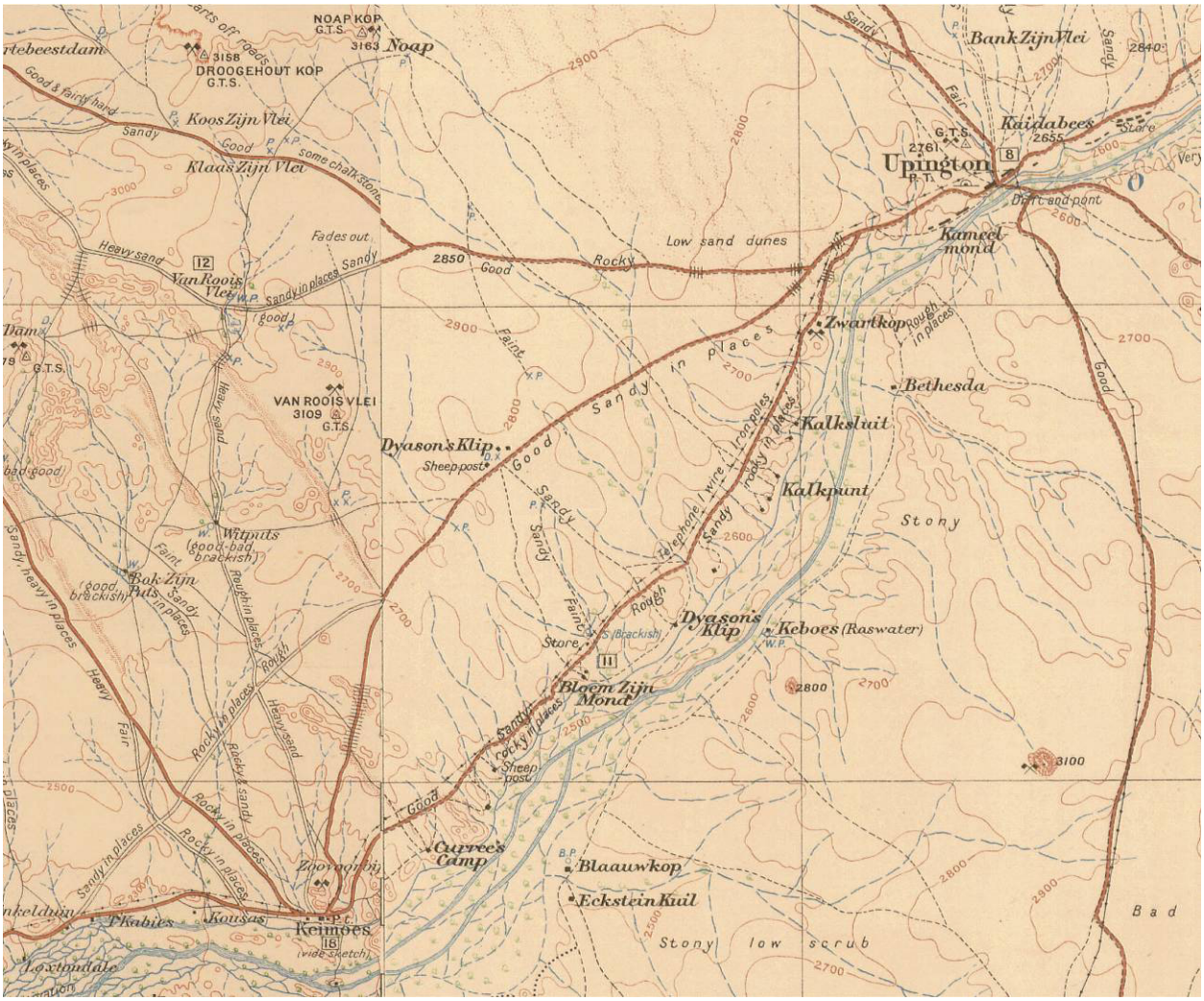
SAHRA Case Id: 6333

INTEGRATED HERITAGE IMPACT ASSESSMENT IN TERMS OF SECTION 38(8) OF THE NATIONAL HERITAGE RESOURCES ACT, 1999 (ACT 25 OF 1999)

PROPOSED DEVELOPMENT OF THE DYASONSKLIP SOLAR ENERGY FACILITY 1 ON A PORTION OF THE FARM DYASON'S KLIP 454/ REMAINDER, UPINGTON DISTRICT, NORTHERN CAPE



On behalf of: Dyasonsklip Solar Energy Facility 1 (Pty) Ltd

November 2014

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CONTENTS:

ANNEXURES:

FIGURES:

REFERENCES and ACKNOWLEDGEMENTS:

ABBREVIATIONS:

1. CDSM – Chief Directorate Surveys & Mapping
2. DEA – National Department of Environmental Affairs
3. HIA – Integrated Heritage Impact Assessment
4. NHRA - National Heritage Resources Act, 1999 (Act 25 of 1999)
5. PHRA – Provincial Heritage Resources Agency
6. PHS – Provincial Heritage Site

COVER: *Compilation of early (1906-1914) mapping for the area between Upington and Keimoes (Source: Reconnaissance Series No 16, CDSM)*

1. INTRODUCTION

PERCEPTION Planning was appointed by *Dyasonsklip Solar Energy Facility 1 (Pty) Ltd* to compile and submit to the *South African Heritage Resource Agency (SAHRA)* and *Ngwao Boswa Kapa Bokoni* an Integrated Heritage Impact Assessment (HIA) in terms of Section 38(8) of the National Heritage Resources Act, 1999 (Act 25 of 1999) with relation to proposed development of the property listed below (hereafter referred to as, "the site"). Sanction for submission of this HIA was provided by Mr. Craig Stanley *(on behalf of registered owner)*, and is attached as part of Annexure 1.

The cadastral land unit subject to this application is as follows:
Dyason's Klip 454/ Remainder, Upington District and Kai !Garip Municipality, ZF Mgcawu District Municipality, measuring approximately 5,725.2825 ha, registered to Owen Davies Trust and held under T1269/1997.

This report serves as an ***Integrated Heritage Impact Assessment (HIA)*** and includes inputs from the following specialist reports sanctioned as part of the HIA:

- Basic archival background research (Perception Planning, S. de Kock);
- Archaeological Impact Assessment (ACO Associates, Dr. L. Webley & D. Hallkett);
- Desktop Palaeontological Impact Assessment (Natura Viva, Dr. J. Almond).

2. INDEPENDENCE OF ASSESSOR

With relation to the author's appointment to compile an Integrated Heritage Impact Assessment in terms of Section 38(8) of the National Heritage Resources Act, 1999 (Act 25 of 1999), it is hereby declared:

- This consultancy (including the author) is not a subsidiary, legally or financially, of the proponents;
- Remuneration for professional services by the proponent in relation to this proposal is not linked to approval by any decision-making authority responsible for permitting this proposal;
- Nor this consultancy, nor the author has any interests in secondary or downstream activities as a result of the authorisation of this project.

It is further hereby certified that the author has 17 years professional experience as urban planner (3 years of which were abroad) and 8 years professional experience as heritage practitioner. The author holds the following qualifications:

- Urban and Regional Planning (B-Tech, CPUT, 1997)
- Environmental Impact Assessment Management – Heritage, Environmental (Diploma, Dublin University, 2002)
- Architectural & Urban Conservation (CDP, UCT, 2007)
- Urban Design (CPD, UCT, 2009)

The author is professionally registered as follows:

- Professional Heritage Practitioner (Association for Professional Heritage Practitioners)
- Professional Planner (South African Council for Planners)

3. METHODOLOGY

As part of the compilation of this Integrated HIA report the site and its environs was studied, visited, photographed and assessed, which more specifically involved the following (for broad overview of HIA process refer to explanatory flow diagram below):

- Field work carried out by *ACO Associates* on 17th and 18th October 2014;
- Liaising with project manager, environmental consultant and various specialist consultants;
- Assimilating findings and recommendations emanating from specialist inputs into HIA;
- Identification of heritage-related issues and concerns;
- Analysis of development site and its environs;
- Identification of contextual spatial informants;
- Establishing cultural significance, based on criteria set out in NHRA;
- Identification of heritage-related design informants based on the above;
- Focussed public participation process to be coordinated as part of Environmental Impact Assessment facilitated by *Cape Environmental Impact Assessment Practitioners (Pty) Ltd*;
- Assess conformity of final proposed site layout to design informants identified;

- Submission to competent authorities (*SAHRA* and *Ngwao Boswa Kapa Bokoni)* via SAHRIS.

4. DESCRIPTION OF STUDY AREA

The proposed development site (±500ha in extent) is located ±28km southwest of Upington, ±25km northeast of Keimoes and northwest of the Orange River (Figure 1). The site forms part of the remainder of the farm Dyasonsklip 454 (± 5,725ha in extent), located in the ZF Mgcawu district of the Northern Cape Province and jurisdiction area of the Khai Garib Local Municipality.

Figure 1: *Location of proposed development site in relation to Upington and Keimoes (Source: GoogleEarth)*

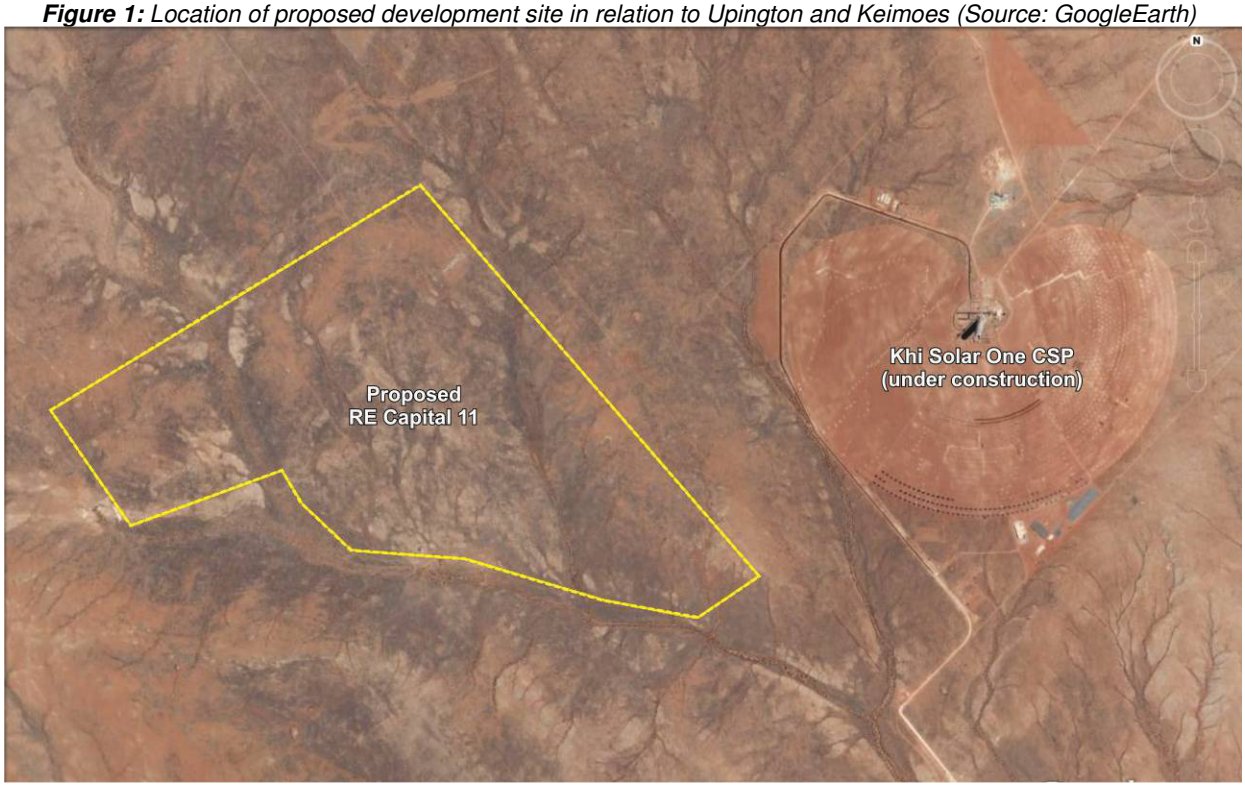

Figure 2: *Proposed site boundaries in relation to adjoining Khi Solar One CPS project currently under construction (Source: GoogleEarth)*

The proposed development site is ±6.7km northwest of the N14 National Road and adjoins the Solar One CSP (concentrated solar facility) currently under construction (see Figure 2). It is a narrow strip of land extending from the Orange River in a north-westerly direction. Morris (2013) describes the environment of the farm as an arid, gently sloping plain with shallow drainage lines running through it. The landscape is very sparsely vegetated. Higher ground drains towards multiple depressions (seasonal washes), forming waterways towards the river corridor. No structures or ruins were noted on the proposed site.

5. PROPOSED DEVELOPMENT

The proposed development of the *Dyasonsklip Solar Energy Facility 1 (Pty) Ltd (also RE Capital 11)* is associated with the installation of proposed transmission lines/ grid alignments, which is the subject of a separate application (SAHRA Ref. _____).

5.1 Description of activity

The proposed facility has a planned peak capacity of be 75 MW_p. with an estimated development footprint of 200ha to 240ha. The estimated portion of land each component of the facility will typically occupy is summarised in the table below (with average area taken as 200ha):

Table 1: Component sizes of the proposed RE Capital 11 Solar Development (Solek, 2014)

Component	Estimated extent of each 75 MW plant	Percentage of selected area (± 200 ha)	Percentage of whole farm (±5725 ha)
PV modules	180 ha (1.8 km^2)	90%	3%
Internal roads	18 ha (0.18 km^2)	9%	0.31%
Auxiliary buildings	2 ha (0.02 km^2)	1%	less than 0.1%

The proposed infrastructure that is planned to be constructed includes CPV[1] modules, or a series of solar PV arrays, inverters, internal electrical reticulation, and an internal road network. It will also be necessary to construct an onsite substation which would typically include a transformer to allow the generated power to be connected to Eskom's electricity grid. Auxiliary buildings, including ablution, workshops, storage areas and fencing are planned to be erected. A distribution line will also be required to distribute the generated electricity from the site to the Eskom substation and grid (see Figure 3).

Figure 3: *Typical layout of the components of a Solar PV facility (Source: Solek, 2014)*

In accordance with requirements of the National Department of Environmental Affairs, the overhead electrical transmission line / grid connection (connecting to existing Eskom Substations) associated with the proposed facility, will be dealt with through a separate EIA Process.

[1] *Concentrated photovoltaic module*

5.2 Development alternatives

A number of alternatives, including activity, layout and technological alternatives were considered for the proposed *Dyasonsklip Solar Energy Facility 1*. The RE Capital 3 solar projects (a similar PV solar facility previously developed, and authorised, on the same Remainder of Farm 454, Dyason's Klip) is also shown in the figure below in order to obtain perspective.

The *Dyasonsklip Solar Energy Facility 1* (this application) has taken the approved access roads and power lines for grid connection of the RE Capital 3 projects into consideration in order to reduce cumulative impacts. This scoping phase study site was inspected by the EAP and Technical Experts in order to determine its suitability and to highlight any potential fatal flaws.

A preliminary study site of 510 ha was identified as part of study area for the scoping phase of the *Dyasonsklip Solar Energy Facility 1 (Pty) Ltd* project (see Figure 2). The 510 ha area was identified because of its level surface, road access alternatives, and distance to the new authorised Eskom Upington MTS. The low rainfall also means that vegetation is not very dense or high, eliminating the chances of casting shadows on the solar arrays. In addition the land is considered to have a low agriculture potential, with limited carrying capacity.

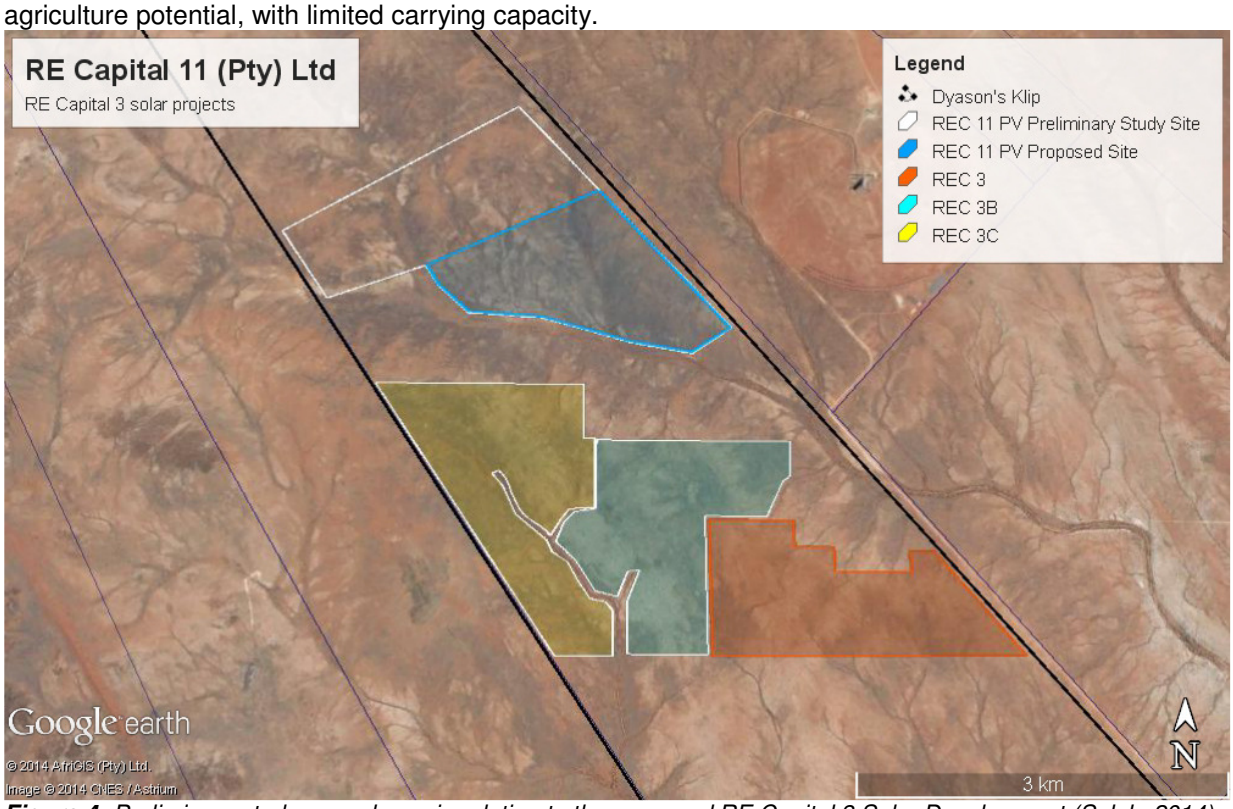

Figure 4: *Preliminary study area shown in relation to the approved RE Capital 3 Solar Development (Solek, 2014)*

Alternative 1 (Uniform layout) – As a first layout option, the potential sensitive areas were included in theoriginal 510ha preliminary study site. Layout option 1 included as uniform development across the total preliminary study site. These possible drainage lines and sensitive areas will be assessed and confirmed by the specialist studies, especially ecological study (see Figure 5).

With this alternative it is proposed to build across the drainage lines in order to keep the solar design as rectangular as possible. The solar frames can be installed using a ramming method which would have the minimum impact on the environment. As far as practically possible the ramming poles would be driven as far as possible from all drainage lines and sensitive areas to take the ecological constraints into account.

Alternative 2 – In order to avoid possible highly sensitive areas a proposed site layout has been selected and excludes the main drainage line. Based on specialist studies, the impact of this layout on potentially sensitive areas will be evaluated and assessed in order to develop the preferred layout. As mentioned above, the solar arrays will be placed in such a way that would have the least influence on the drainage lines while avoiding the ecological sensitive areas where practically possible. Although the annual rainfall within this region is extremely low, the drainage lines were carefully considered and the most viable alternative selected (see Figure 6).

Alternative 3 (Preferred Alternative) – The preferred layout will be developed to be responsive to the constraints defined by the participating specialists, while at the same time achieving technical feasibility. This preferred layout will be developed in the EIR phase of the Environmental Process and will become the layout that is proposed for authorisation.

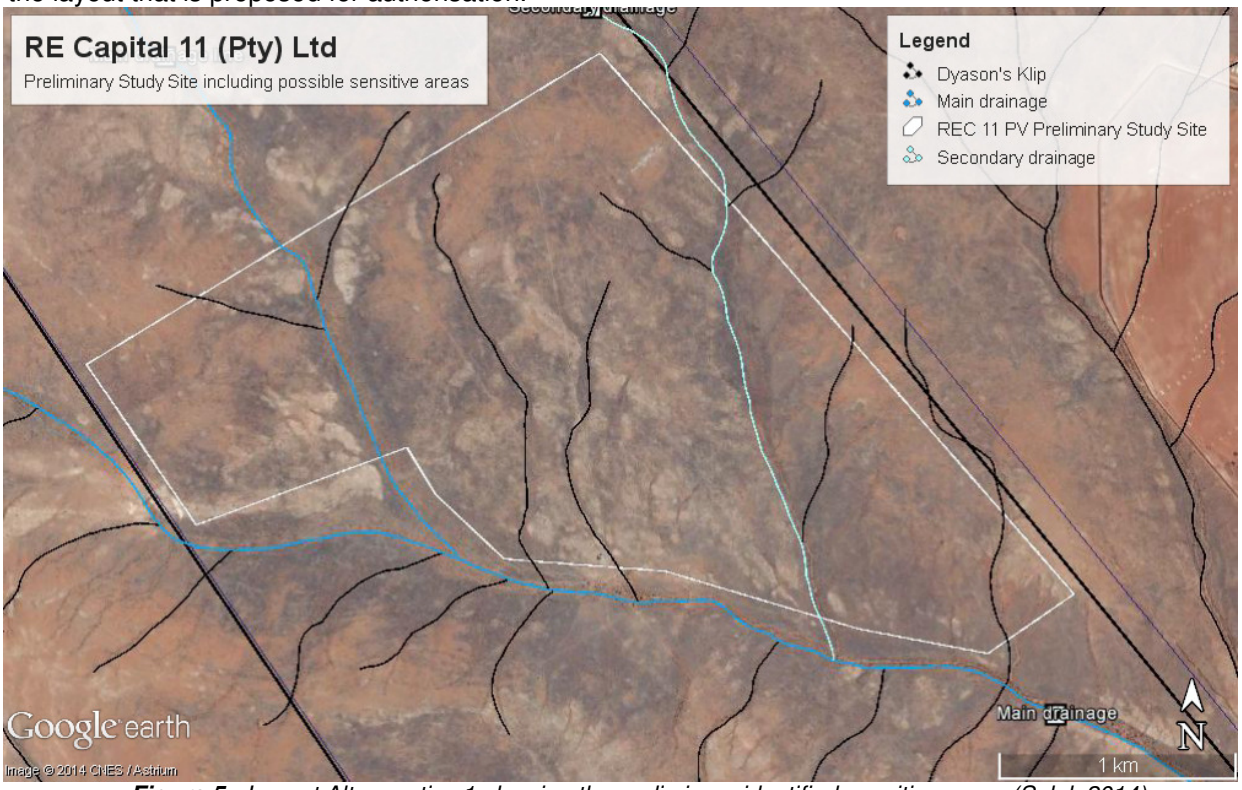

Figure 5: *Layout Altwernative 1 showing the preliminary identified sensitive areas (Solek 2014).*

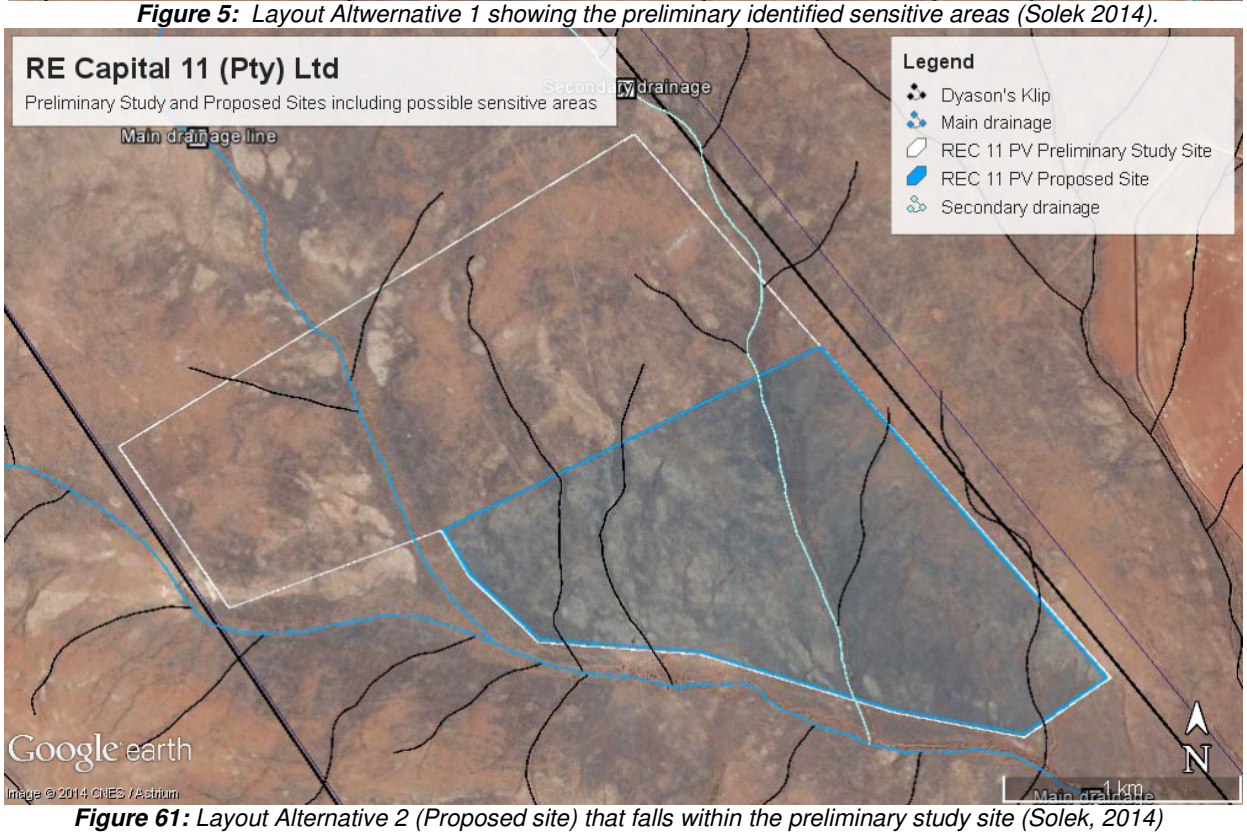

Figure 61: *Layout Alternative 2 (Proposed site) that falls within the preliminary study site (Solek, 2014)*

No-Go / Status-Quo Alternative, which proposes that the *Dyasonsklip Solar Energy Facility 1* not go ahead and that the farm remain undeveloped as it is currently. The no-go alternative is thus not considered a favourable option in light of the benefits associated with the proposed solar facility development, however it will be used as a baseline from which to determine the level and significance of potential impacts associated with the proposed solar development during the Impact Assessment phase

of the on-going environmental process. Five alternative access roads are currently under investigation (see Figure 7).

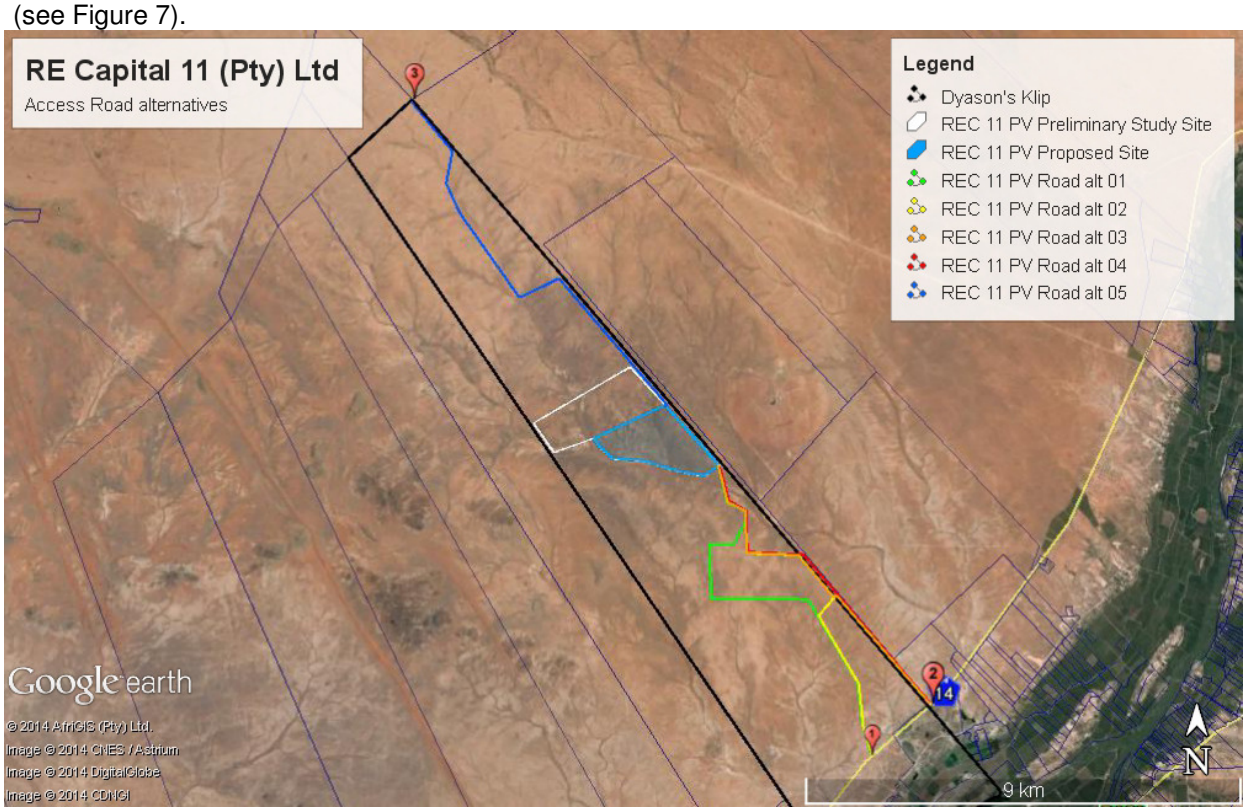

Figure 7: *Access road alternatives for the proposed RE Capital 11 Solar Development (Solek, 2014)*

6. PLANNING CONTEXT

A Town and Regional Planner will be appointed for this project and will be responsible for undertaking the necessary applications. The planning specialist will also consider the consistency of the project in terms of local and regional planning policies, in order to consider need and desirability of the project. Further details on the progress with the planning applications are included in this report and will be presented in more detail in the Draft Environmental Impact Report.

7. HISTORICAL BACKGROUND[2]

Early travellers such as Wikar and Gordon travelled along the Orange River in the 1770s and described various communities living along the river (Penn 1995). By the mid-19th century the stretch of the Orange River to the west of Upington was settled by the Korana, a Khoekhoen group whose origins are still unclear (Strauss 1979). With increasing Trekboer encroachment from the south, the Korana became involved in a struggle to maintain an independent existence. The attempt by the Korana to resist resulted in two wars, that of 1868-9 and 1878-9.

According to Morris (2013), the name Dyason's Klip is derived from events which occurred during the Korana War of 1879-1880. Apparently a certain Captain Dyason of the Northern Border Police was killed by Korana adversaries while walking between two rocks at this place in 1880. However, it is not recorded exactly where these stones are situated. The adjoining property of McTaggarts Camp also derives its name from events during the Korana War when Captain McTaggart set up his military camp here. It is assumed that the camp was located close to the river and that it is unlikely to have left much of an archaeological trace.

In his assessment of the farm Olyvenhout's Drift, Dreyer (2006) reported finding a heavily soldered food tin resembling British rations from the Anglo-Boer War (1899-1902). He considered it possible that a British camp may have existed in the area. Van der Walt (2011) reported the presence of a sandy track marking an old wagon-track on the farm Geel Kop to the west of Dyason's Klip. The wagon road between Keimoes and Upington crossed the farm and is marked on maps dating to 1908 (Van der Walt

[2] *Transposed from AIA, ACO Associates, November 2014*

2011). To the north of the farm Geel Kop, on the farm Van Rooi's Vley 443, is the Rebellion Tree monument (Van der Walt 2011). It marks the Rebellion of 1914 in which many Afrikaners opposed the plan of the South African government to invade German South-West Africa at the commencement of World War I (Van Vollenhoven 2012). The site is a Provincial Heritage site.

Van der Walt (2011) mentions the presence of mining exploration trenches on the farm Geel Kop dating to 1929 and Morris (2013) also reports on tungsten mining on the north-western portion of the farm McTaggarts Camp dating to the early 1930s. Morris (2013) identified two ruined mud-brick structure, presumably that of 19th/20th century farm workers, on the farm Dyason's Klip.

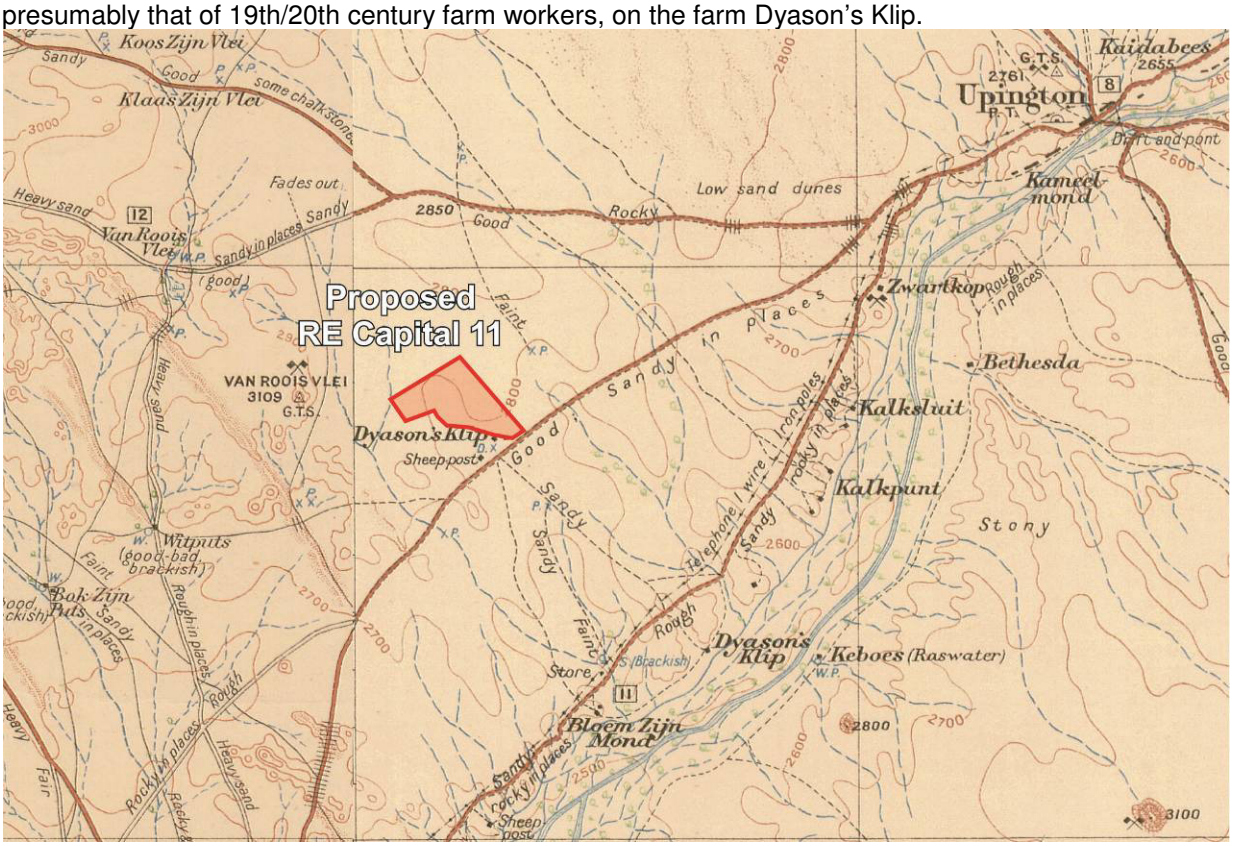

Figure 8: *Approximate location of proposed development site transposed onto extract from early (1906-1914) mapping for the area south of Upington (Source: CDSM)*

Early mapping (1906-1914) shows the location of former farmsteads on early farms in relation to the proposed site boundary. The mapping highlights the alignment of several historic roads through the area, including that of the current N14, which remains roughly unchanged. Mapping furthermore emphasises use of the area for sheep farming and describes soil conditions as sandy, with several pans and dams within the proximity Dyason's Klip.

Basic historic background research did not identify or highlight any significant historic or other heritage-related themes, which may be negatively impacted through the proposed development.

8. HERITAGE RESOURCES AND ISSUES

8.1 Landscape Character

8.1.1 Cultural landscape context

The term "*cultural landscape*" refers to the imprint created on a natural landscape through human habitation and cultivation over an extended period of time. While the Cape has been inhabited for many hundreds of thousands of years (pre-colonial history) prior to Western settlement (colonial history), the nomadic lifestyles of early inhabitants are not always as evident within the landscape as the significant imprints made by humans during the last two – three hundred years and more. Unlike ancient landscapes in parts of the world where environmental conditions allowed more intensive cultivation over periods much longer than locally have allowed natural and cultural components of the landscape to become interwoven, landscape components Northern Cape have not yet developed in such a manner. The fact that natural and cultural landscape components in the region is therefore more distinguished

means that the cultural landscape is likely to be very vulnerable to the cumulative impact of inappropriate large-scale development.

Ultimately, definition of a cultural landscape can be informed by the following elements, weighed through professional opinion, public values and statutory (legal) framework:

- Natural Landscape
- Public Memory
- Social History
- Historical Architecture
- Palaeontology
- Archaeology

The site may be described as forming part of a typical Kalahari landscape and defined by flat and wide open spaces overgrown by sparse, low-growing vegetation. From a Pre-Modern perspective, the site formed part of an area mostly used for small stock farming and so, modern man-made features noted on the site included e.g. shallow pans, fences, wind pumps and cement water reservoirs related to said land use. There is some evidence for early 20th century mining (mining trenches and old mining equipment) on the property. Given the proximity to the Orange/ Gariep River, the river corridor is characterised by intensive agricultural farming, including vineyards. The landscape within the direct proximity of the site is however visually dominated by the 200m high CSP structure, directly east of the subject site. From a cultural landscape perspective, the site is therefore considered to be of no local cultural significance.

8.2 Archaeology

A copy of the Archaeological Impact Assessment (AIA), compiled by *ACO Associates*, is attached as Annexure 2/ Figure 9, the findings of which are summarised below with permission from authors. Kindly refer to specialist's full report and findings.

"The area was surveyed by Lita Webley and David Halkett on 17th and 18th October 2014. The property was accessed by the local farm roads and transects were walked across the study area. We drove along sections of the access road where this was possible. Archaeological visibility was good. The only limitations experienced was in following all the powerline options, many of which will go through the Khi Solar One facility property boundaries.

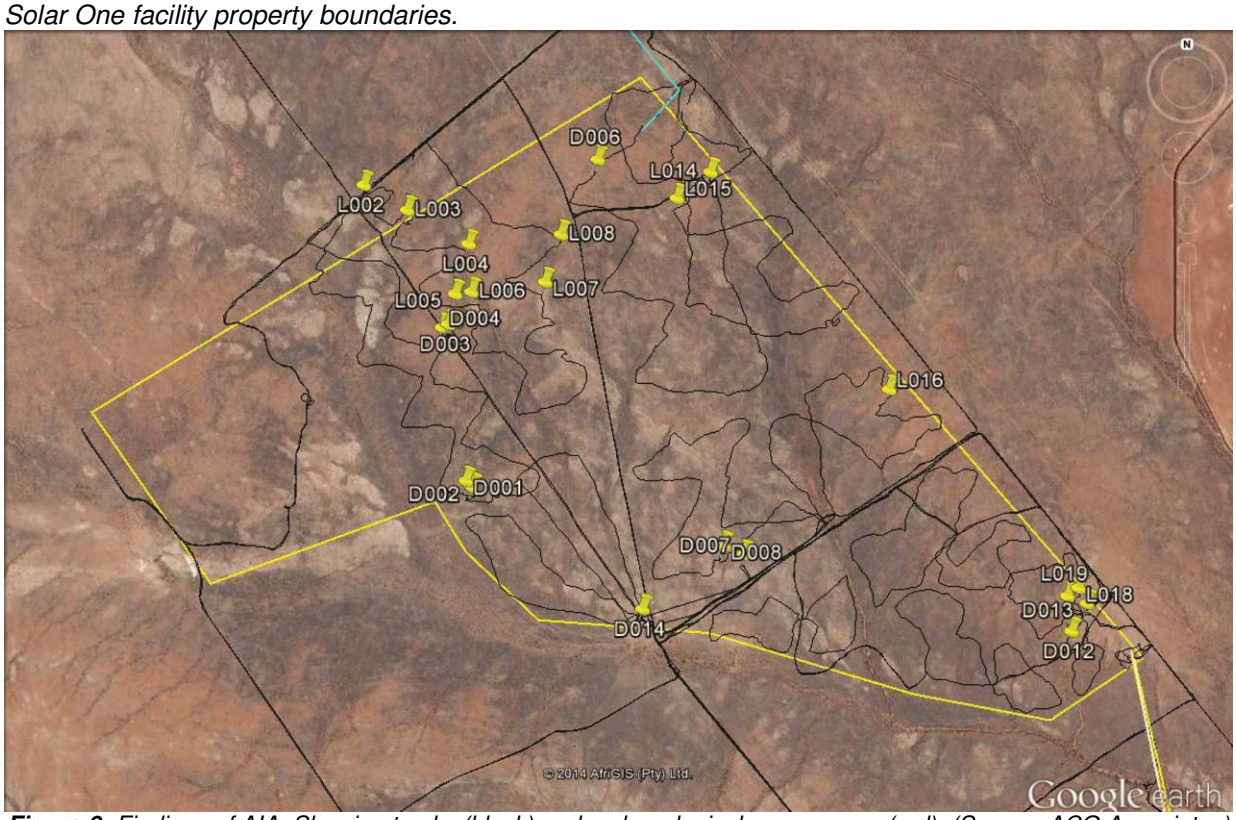

Figure 9: *Findings of AIA: Showing tracks (black) and archaeological occurrences (red) (Source: ACO Associates)*

Numerous heritage impact assessments have been conducted in close vicinity to the study area during the last decade. Morris (2013a) surveyed portions Dyason's Klip to the north and south of the study area for the RE Capital 3 Solar Facility. None of these reports have identified sites of high significance. The landscape is characterised as a gently sloping plain crossed by shallow drainage lines and covered in sparse vegetation.

The field assessment identified:

- *Very ephemeral scatters of ESA and MSA material;*
- *Some stone cairns which are unlikely to represent graves;*
- *A ruined mud brick shepherd's hut;*
- *Evidence for 20th century mining, possibly of tungsten.*

Indications are that in terms of archaeological heritage the proposed activity is viable; impacts are expected to be very limited and controllable. Construction of the proposed solar facility may proceed according to the layout assessed in this report. The following recommendations should be enforced:

- *If any human remains are uncovered during construction, the ECO should have the area fenced off and contact SAHRA (Tel: 021 462 4502) immediately;*
- *If there are any significant changes to the layout of the facility, the new design should be assessed by a heritage practitioner.*

8.3 Palaeontology

The findings and recommendations from a desktop palaeontological study (summarised below), compiled by *Natura Viva* (Dr. John Almond) conclude that no further related studies or mitigation would be required. Kindly refer to specialist's full report and recommendations, attached to this report as Annexure 3.

"The igneous and metamorphic Precambrian basement rocks underlying the Dyasonsklip study area at depth are entirely unfossiliferous. The overlying aeolian sands and stream gravels of the Kalahari Group mantling the older bedrocks are generally of low palaeontological sensitivity.

It is concluded that the proposed Dyasonsklip Solar Energy Facility 1 near Upington, including the associated short transmission line, is unlikely to have significant impacts on local palaeontological heritage resources.

It is therefore recommended that, pending the discovery of significant new fossils remains before or during construction, exemption from further specialist palaeontological studies and mitigation be granted for the proposed RE Capital 11 solar facility development on Farm Dyasonsklip 454 near Upington, Northern Cape.

Should any substantial fossil remains (e.g. mammalian bones and teeth) be encountered during excavation, however, these should be safeguarded, preferably in situ, and reported by the ECO to SAHRA, i.e. The South African Heritage Resources Authority, as soon as possible (Contact details: Mrs Colette Scheermeyer, P.O. Box 4637, Cape Town 8000. Tel: 021 462 4502 (Email: cscheermeyer@sahra.org.za), so that appropriate action can be taken by a professional palaeontologist, at the developer's expense. Mitigation would normally involve the scientific recording and judicious sampling or collection of fossil material as well as associated geological data (e.g. stratigraphy, sedimentology, taphonomy) by a professional palaeontologist."

8.4 Eco-tourism[3]

One of the goals of ecotourism is to offer tourists insight into the impact of human beings on the environment, and to foster a greater appreciation of our natural habitats and from an economic perspective, heritage resources may prove to be valuable resources when used in sustainable manner through eco-tourism. This may for example include investment in adaptive reuse of historic buildings so as to conserve and enhance the unique character and historic themes pertinent to this area. Heritage tourism can therefore serve as a driver for economic development, including infrastructure development and poverty alleviation through job creation. The broader region's rich archaeological, palaeontological, historical and natural heritage has the potential to provide unique tourism opportunities when developed and used in responsible and sustainable ways.

Given the location as well as pattern of existing land use within the proximity of the site and furthermore, the relative low density of heritage resources considered of cultural significance noted as part of this assessment, we do not consider that the proposed development would offer significant heritage-related eco-tourism opportunities associated with the development site.

[3] *Section included in accordance with requirements set by National Department of Environmental Affairs*

9. HERITAGE INFORMANTS AND INDICATORS

According to the requirements of Section 38(3) of the NHRA, land use planning and EIA processes must be informed by and incorporate heritage informants and indicators (as done through the mapping and grading of relevant heritage resources in Section 8 of this report). It is the purpose of this Section to define heritage informants and indicators pertaining to the way in which heritage resources must be incorporated into the overall layout and design of the proposed development as read in conjunction with preceding Sections.

9.1 Cultural landscape issues

From a regional and natural landscape perspective, the proposed development site forms part of a highly-transformed landscape altered through mining activities as well as high concentration of proposals for development of several renewable energy (solar) facilities. While the proposal would relate to a landscape modification, we do not consider that it would alter any natural or cultural landscape of cultural significance.

9.2 Archaeology

All recommendations contained in AIA, as summarised in Section 8.2 of this HIA report shall be adhered to.

9.3 Palaeontology

It is concluded that the proposed Dyasonsklip Solar Energy Facility 1 near Upington, including the associated short transmission line, is unlikely to have significant impacts on local palaeontological heritage resources. Recommendations reflected in the desktop palaeontological study, as summarised in Section 8.3 of this HIA report shall be adhered to.

10. PUBLIC PARTICIPATION

Due to the fact that there are no known local heritage conservation bodies in the Upington area (registered as such with the relevant provincial heritage resources authority in terms of Section 25 of the National Heritage Resources Act, 1999 (Act 25 of 1999)), the Public Participation Process (PPP) for this HIA will be coordinated with that of the EIA Process facilitated by *Cape Environmental Assessment Practitioners (Pty) Ltd* (Cape EAPrac) in terms of the National Environmental Management Act, 1998 (Act 107 of 1998), so as to solicit possible heritage-related comments with relation to the proposed development.

11. LIMITATIONS AND ASSUMPTIONS

- This report is limited to the assessment of the potential impact of the proposed facility on heritage resources found on/ within the proximity of the development site as defined in this report;
- There is a limitation in terms of understanding the cumulative impacts of the project when taken in conjunction with other similar future development projects in the surrounding area.

12. RECOMMENDATIONS

Having regard to the above assessment, it is recommended that:

12.1 This report fulfils the requirements of an Integrated Heritage Impact Assessment (HIA);

12.2 That the recommendations below be incorporated into the proposed development and that the Department of Environmental Affairs be informed accordingly:

	Recommended Conditions of Approval
AIA-1	*If any human remains are uncovered during construction, the ECO should have the area fenced off and contact SAHRA (Tel: 021 462 4502) immediately*
AIA-2	*If there are any significant changes to the layout of the facility, the new design should be assessed by a heritage practitioner*
PIA-1	*Should any substantial fossil remains (e.g. mammalian bones and teeth) be encountered during excavation, however, these should be safeguarded, preferably in situ, and reported by the ECO to SAHRA, i.e. The South African Heritage Resources Authority, as soon as possible (Contact details: Mrs Colette Scheermeyer, P.O. Box 4637, Cape Town 8000. Tel: 021 462 4502 (Email: cscheermeyer@sahra.org.za), so that appropriate action can be*

	taken by a professional palaeontologist, at the developer's expense. Mitigation would normally involve the scientific recording and judicious sampling or collection of fossil material as well as associated geological data (e.g. stratigraphy, sedimentology, taphonomy) by a professional palaeontologist.

PERCEPTION Planning
24th November 2014

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