ARCHAEOLOGICAL SCOPING REPORT

FOR THE ILANGA CSP 7 AND 8 FACILITIES AND ASSOCIATED INFRASTRUCTURE WITHIN THE KAROSHOEK SOLAR VALLEY DEVELOPMENT NEAR UPINGTON NORTHERN CAPE PROVINCE

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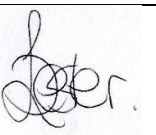
Archival Study	**Ms Liesl Bester**		**November 2015**

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EXECUTIVE SUMMARY

Site name and location: The proposed projects are located the following farm portions (refer to locality map).

» Lot 944 Karos Settlement,
» Portion 2 of Matjiesrivier 41;
» Portion 3 of Matjiesrivier (Annashoek) 41; and
» Portion 4 of Trooilaps Pan 53

The property is located approximately 30 km east of Upington within the Khara Hais Local Municipality and the !Kheis Local Municipality in the Northern Cape.

1: 50 000 Topographic Map: 2821CB and 2821DA.
EIA Consultant: Savannah Environmental (Pty) Ltd.
Developer: Emvelo Eco Projects (Pty) Ltd ("Emvelo")
Heritage Consultant: Heritage Contracts and Archaeological Consulting CC (HCAC).
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Date of Report: 27 November 2015

Findings of the Assessment:

CRM surveys and research projects conducted in the general study area, e.g. Beaumont 2005 & 2008, Van Ryneveld 2007a & 2007b, Dreyer, 2006, Van Schalkwyk 2011, Gaigher 2012 and van der Walt 2014 provide a good basis for understanding the local archaeology and the following sites can be expected in the study area:

- Archaeological sites are expected in the form of widespread stone artefact scatters mainly from the Middle Stone Age (MSA) and Later Stone Age (LSA), Early Stone Age (ESA) material is also recorded to the north west of the study area;
- Where ever granite outcrops occur with "pans" or shallow depressions that contain seasonal water as well as areas along stream beds might contain sites;
- Farming infrastructure (such as dams and wind pumps) can occur throughout the study area but is not anticipated to be older than 60 years. No standing structures are visible on Google images of the area;
- Some stone cairns are recorded in the wider region and could be graves and similar occurrences can be expected in the study area. Family cemeteries might be found in association with farmsteads and labourer dwellings.

Based on the current information obtained for the area at a desktop level it is anticipated that any sites that occur within the proposed development area can be mitigated. No red flags are identified. Based on the presence of archaeological material in the larger area it is recommended that the study area must be subjected to a Phase 1 AIA as part of the EIA phase of the project

Contents

Figures

ABBREVIATIONS

AIA: Archaeological Impact Assessment
ASAPA: Association of South African Professional Archaeologists
BIA: Basic Impact Assessment
CRM: Cultural Resource Management
ECO: Environmental Control Officer
EIA: Environmental Impact Assessment*
EIA: Early Iron Age*
EIA Practitioner: Environmental Impact Assessment Practitioner
EMP: Environmental Management Plan
ESA: Early Stone Age
GPS: Global Positioning System
HIA: Heritage Impact Assessment
LIA: Late Iron Age
LSA: Late Stone Age
MEC: Member of the Executive Council
MIA: Middle Iron Age
MPRDA: Mineral and Petroleum Resources Development Act
MSA: Middle Stone Age
NEMA: National Environmental Management Act
PRHA: Provincial Heritage Resource Agency
SADC: Southern African Development Community
SAHRA: South African Heritage Resources Agency

**Although EIA refers to both Environmental Impact Assessment and the Early Iron Age both are internationally accepted abbreviations and must be read and interpreted in the context it is used.*

GLOSSARY

Archaeological site (remains of human activity over 100 years old)
Early Stone Age (2 million to 300 000 years ago)
Middle Stone Age (300 000 to 30 000 years ago)
Late Stone Age (30 000 years ago until recent)
Historic (approximately AD 1840 to 1950)
Historic building (over 60 years old)
Lithics: Stone Age artefacts

1. INTRODUCTION

Heritage Contracts and Archaeological Consulting CC was contracted by Savannah Environmental (Pty) Ltd to conduct a Heritage Scoping Study for the proposed Ilanga CSP 7, 8 facilities and associated infrastructure within the Karoshoek Solar Valley development, located approximately 30 km east of Upington within the Khara Hais Local Municipality and the !Kheis Local Municipality in the Northern Cape. The heritage scoping report forms part of the EIA for the proposed project.

The aim of the scoping report is to conduct a desktop study to identify possible heritage resources within the project area and to assess their importance within a Local, Provincial and National context. The study furthermore aims to assess the impact of the proposed project on non - renewable heritage resources and to submit appropriate recommendations with regards to the responsible cultural resources management measures that might be required to assist the developer in managing the discovered heritage resources in a responsible manner, in order to protect, preserve and develop them within the framework provided by Heritage legislation.

The report outlines the approach and methodology utilized for the Scoping phase of the project. The report includes information collected from various sources and consultations. Possible impacts are identified and mitigation measures are proposed in the following report. It is important to note that no field work was conducted as part of the scoping phase but will be conducted as part of the Impact Assessment phase of the EIA.

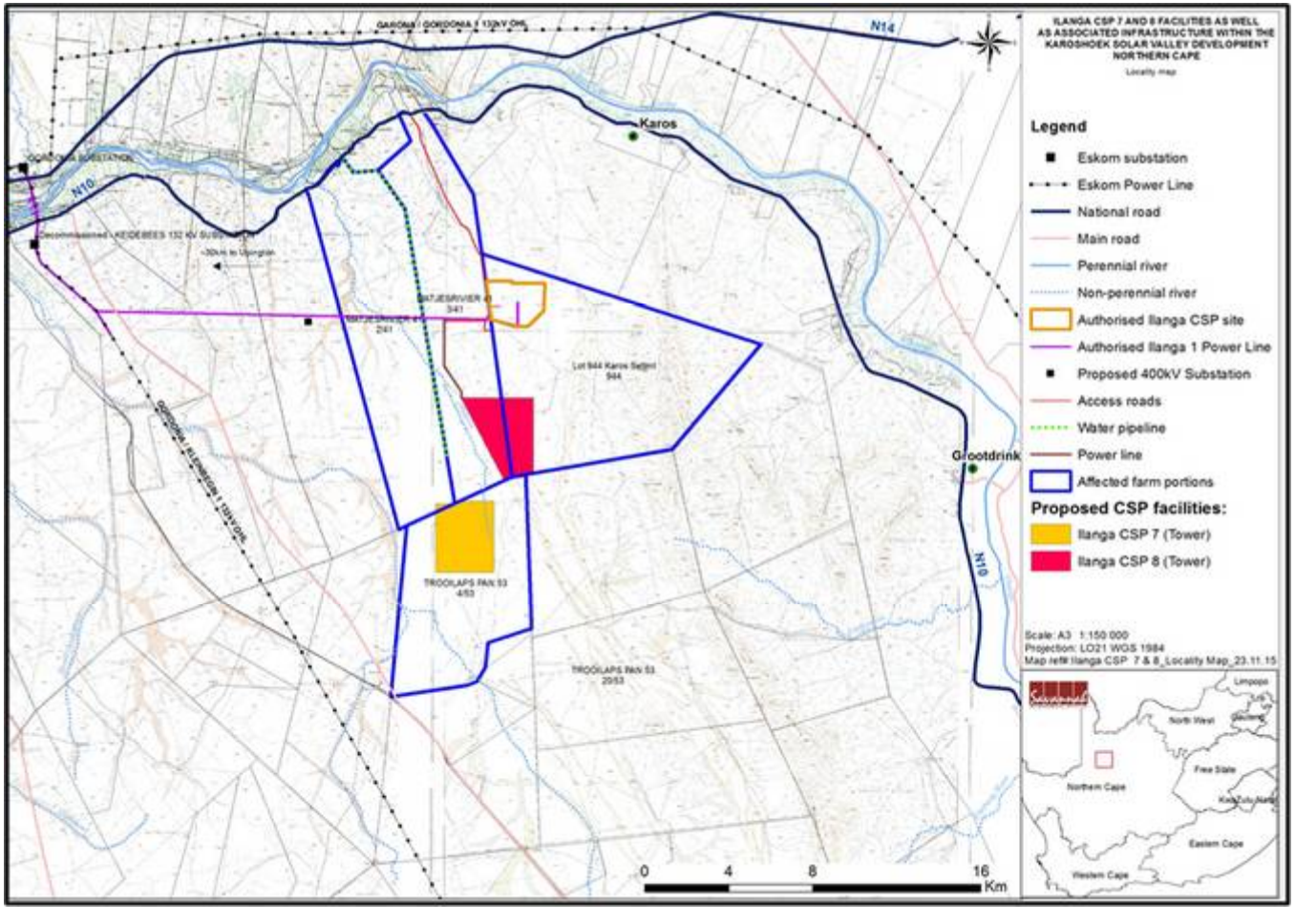

Figure 1: Locality map showing the proposed Ilanga CSP 7 and 8 sites provided by Savannah Environmental.

1.1 Terms of Reference

The main aim of this scoping report is to determine if any known heritage resources occur within the study area and to predict the occurrence of any possible heritage significant sites that might present a fatal flaw to the proposed project. The objectives of the scoping report were to:

- Conduct a desktop study:
  - Review available literature, previous heritage studies and other relevant information sources to obtain a thorough understanding of the archaeological and cultural heritage conditions of the area;
  - Gather data and compile a background history of the area;
  - Identify known and recorded archaeological and cultural sites;
  - Determine whether the area is renowned for any cultural and heritage resources, such as Stone Age sites, Iron Age sites, informal graveyards or historical homesteads.
- Compile a specialist Heritage Scoping Report in line with the requirements of the EIA Regulations

The reporting of the scoping component is based on the results and findings of the desk-top study, wherein potential issues associated with the proposed project will be identified, and those issues requiring further investigation through the IA Phase highlighted. Reporting will aim to identify the anticipated impacts, as well as cumulative impacts, of the operational units of the proposed project activity on the identified heritage resources for all 3 development stages of the project, i.e. construction, operation and decommissioning. Reporting will also consider alternatives should any significant sites be impacted on by the proposed project. This is done to assist the developer in managing the discovered heritage resources in a responsible manner, in order to protect, preserve and develop them within the framework provided by Heritage Legislation.

1.2 Nature of the development

Ilanga 7 and 8: Tower

Both Site 7 and 8 will comprise of heliostats and a molten salt tower system each with a generation capacity of ~150MW. An area of approximately 1000 ha is required for each facility.

Infrastructure associated with the project includes:

- Molten salt tower (MTS) up to 270 m in height with surrounding heliostat field.
- Waste management infrastructure including evaporation dams and a wastewater treatment facility.

» On-site substation and associated 132 kV power line linking the facility to the national electricity grid.

» Access roads and internal access roads.

» A water supply pipeline from the Orange River (including water treatment, storage reservoirs and evaporation ponds).

1.3 The receiving environment

The proposed project is located the following farm portions (Figure 1).

» Lot 944 Karos Settlement,
» Portion 2 of Matjiesrivier 41;
» Portion 3 of Matjiesrivier (Annashoek) 41; and
» Portion 4 of Trooilaps Pan 53

The study area is located approximately 30 km east of Upington within the Khara Hais Local Municipality and the !Kheis Local Municipality in the Northern Cape

The study area falls within a Savannah Biome as described by Mucina et al (2006) with the vegetation described as Bushmanland Arid Grassland in the west with Kalahari Karroid Shrubland to the east. The study area is relatively flat with low hills, the area is characterised by red Kalahari windblown sand.

2. APPROACH AND METHODOLOGY

The assessment is to be undertaken in two phases, a desktop study as part of the Scoping phase and an Archaeological Impact Assessment as part of the Environmental Impact Assessment phase. This report concerns the scoping phase. The aim of the scoping phase is to cover archaeological and cultural heritage data available to compile a background history of the study area in order to identify possible heritage issues or fatal flaws that should be avoided during development.

This was accomplished by means of the following phases (the results are represented in section 4 of this report):

2.1 Literature review

Utilising data for information gathering stored in the archaeological database at Wits University, published articles on the archaeology and history of the area. The aim of this is to extract data and information on the area in question, looking at archaeological sites, historical sites and graves of the area.

2.2 Information collection

The SAHRA report mapping project (Version 1.0) and SAHRIS was consulted to further collect data from CRM practitioners who undertook work in the area to provide the most comprehensive account of the history of the area where possible.

2.3 Public consultation

No public consultation was conducted during this phase but will be conducted during the EIA phase.

2.4 Google Earth and mapping survey

Google Earth and 1:50 000 maps of the area were utilised to identify possible places where archaeological sites might be located.

2.5 Genealogical Society of South Africa

The database of the genealogical society was consulted to collect data on any known graves in the area.

2.6. Restrictions

This study did not assess the impact on the palaeontological component of the project.

This report is based on a desktop study only and no field work was conducted. A field assessment will be done in the EIA phase of the project.

3. LEGISLATION

For this project the National Heritage Resources Act, 1999 (Act No. 25 of 1999) is of importance and the following sites and features are protected:

a. Archaeological artefacts, structures and sites older than 100 years
b. Ethnographic art objects (e.g. prehistoric rock art) and ethnography
c. Objects of decorative and visual arts
d. Military objects, structures and sites older than 75 years
e. Historical objects, structures and sites older than 60 years
f. Proclaimed heritage sites
g. Grave yards and graves older than 60 years
h. Meteorites and fossils
i. Objects, structures and sites or scientific or technological value.

The national estate that includes the following:

a. Places, buildings, structures and equipment of cultural significance
b. Places to which oral traditions are attached or which are associated with living heritage
c. Historical settlements and townscapes
d. Landscapes and features of cultural significance
e. Geological sites of scientific or cultural importance
f. Archaeological and palaeontological importance
g. Graves and burial grounds
h. Sites of significance relating to the history of slavery
i. Movable objects (e.g. archaeological, palaeontological, meteorites, geological specimens, military, ethnographic, books etc.)

Section 34 (1) of the Act deals with structures which is older than 60 years. Section 35(4) of this Act deals with archaeology, palaeontology and meteorites. Section 36(3) of the National Heritage Resources Act, deals with human remains older than 60 years. Unidentified/unknown graves are also handled as older than 60 years until proven otherwise.

3.1 Heritage Site Significance and Mitigation Measures

The presence and distribution of heritage resources define a Heritage Landscape. In this landscape, every site is relevant. In addition, because heritage resources are non-renewable, heritage surveys need to investigate an entire project area. In all initial investigations, however, the specialists are responsible only for the identification of resources visible on the surface.

This section describes the evaluation criteria used for determining the significance of archaeological and heritage sites. National and Provincial Monuments are recognised for conservation purposes. The following interrelated criteria were used to establish site significance:

- The unique nature of a site;
- The integrity of the archaeological/cultural heritage deposit;
- The wider historic, archaeological and geographic context of the site;
- The location of the site in relation to other similar sites or features;
- The depth of the archaeological deposit (when it can be determined or is known);
- The preservation condition of the site;
- Potential to answer present research questions.

The criteria above will be used to place identified sites with in SAHRA's (2006) system of grading of places and objects which form part of the national estate. This system is approved by ASAPA for the SADC region. The recommendations for each site should be read in conjunction with section 11 of this report.

FIELD RATING	***GRADE***	***SIGNIFICANCE***	***RECOMMENDED MITIGATION***
National Significance (NS)	Grade 1	-	Conservation; national site nomination
Provincial Significance (PS)	Grade 2	-	Conservation; provincial site nomination
Local Significance (LS)	Grade 3A	High significance	Conservation; mitigation not advised
Local Significance (LS)	Grade 3B	High significance	Mitigation (part of site should be retained)
Generally Protected A (GP.A)	-	High/medium significance	Mitigation before destruction
Generally Protected B (GP.B)	-	Medium significance	Recording before destruction
Generally Protected C (GP.C)	-	Low significance	Destruction

4. REGIONAL OVERVIEW

4.1 General Information

4.1.1. Literature search

For this study the following previous CRM reports (SAHRIS) conducted in the area were consulted: Van Schalkwyk (2011), Gaigher (2012) van der Walt (2014) and is discussed in section 6 of this report. The aim of this is to extract data and information on the area in question, looking at archaeological sites, historical sites and graves of the area. Several unpublished CRM projects were conducted in the general study area (Beaumont 2005 & 2008, Van Ryneveld 2007a & 2007b, Dreyer, 2006). These studies identified Early and Middle Stone Age assemblages as well as historical structures

4.1 2. Public consultation

No public consultation was conducted by the heritage consultant during the scoping phase. A full public consultation process will be conducted during the EIA phase by an independent specialist.

4.1.3. Google Earth and mapping survey

Google Earth and 1:50 000 maps of the area was utilised to identify possible places where archaeological sites might be located.

4.1.4. Genealogical Society of South Africa

No grave sites are indicated within the study area.

4.2 Archaeological and Historical Information Available on the Study Area

It was necessary to use a wide range of sources in order to give an accurate account of the history of the area. Sources included secondary source material, maps and archival documents. While it was possible to compile a more detailed history of the Gordonia area, there was limited information available on the history of the actual farms under investigation. Thus, although many sources exist on the general history it is difficult to compile histories that focus on very specific parts of the area, such as individual farms.

5. HISTORICAL OVERVIEW OF THE AREA

By the early 20th century, the farms under investigation would have formed part of the Kenhardt division of the Gordonia district in the Cape Colony. Today, the farm area falls within the Khara Hais Local Municipality and the !Kheis Local Municipality in the Z. F. Mgcawu District Municipality in the Northern Cape Province

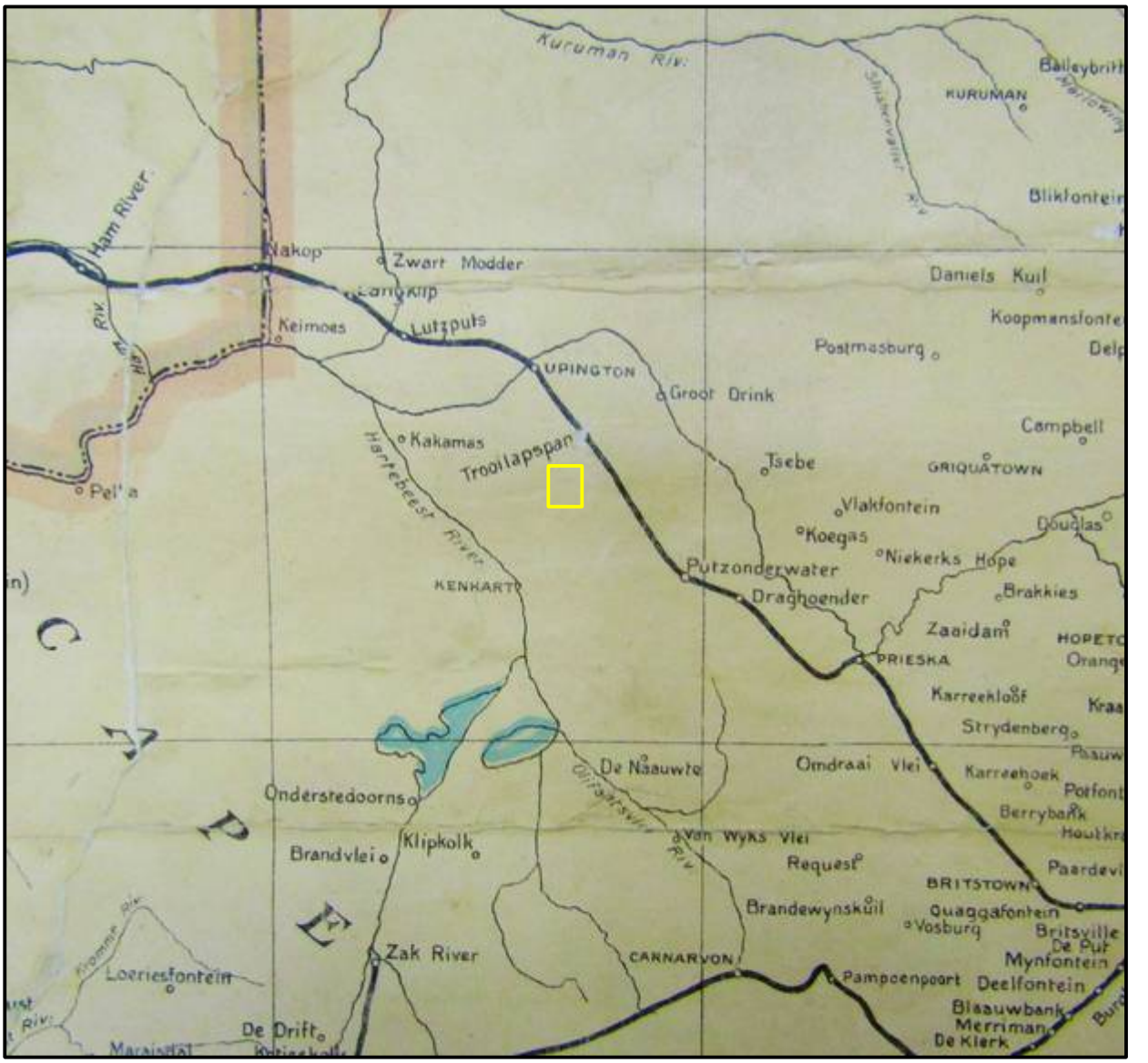

Figure 2: 1901 Map of the Gordonia district. The area under investigation is located about 30 km to the southeast of Upington. The approximate location of the study area is marked in yellow, to the south of the Orange River, in the old Kenhardt division. (NASA Maps: 2/532).

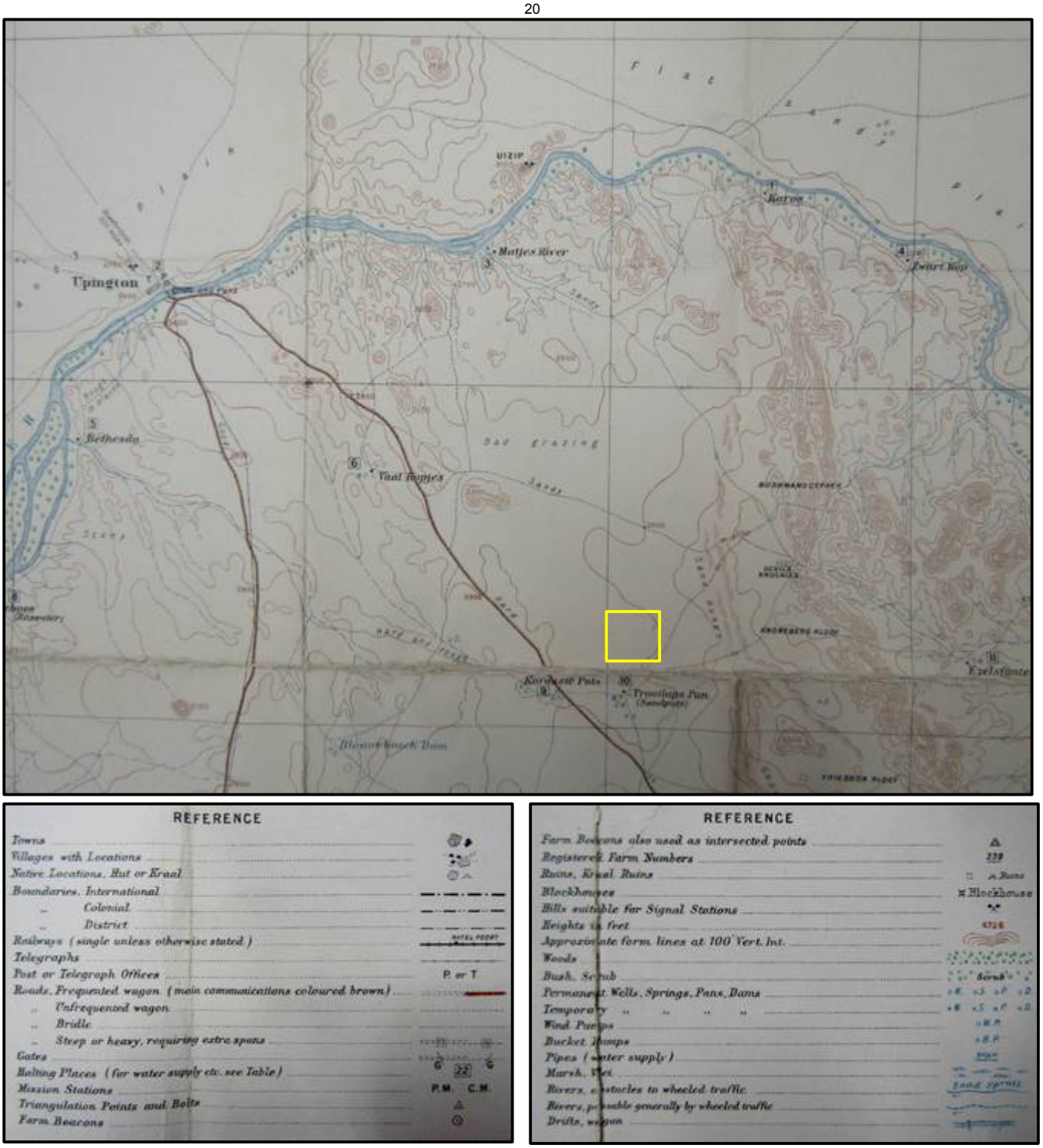

Figure 3: 1908 Map of the Upington district. Approximate location of the study area marked in yellow. Upington is visible some distance to the northwest. A table supplied with the map listed Matjes Rivier as a halting place that got an unlimited supply of water from the Orange River, but grazing was apparently poor.

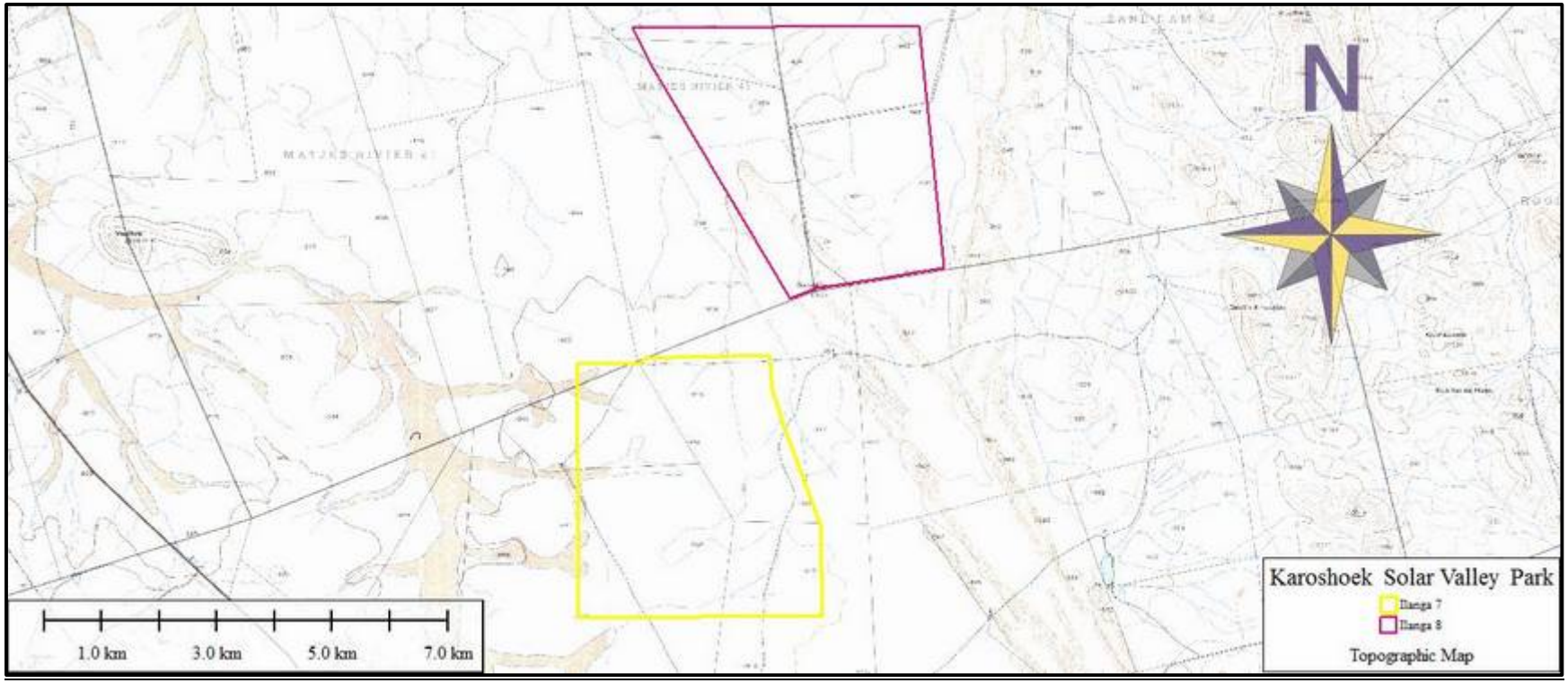

Figure 4 : Early 1990s topographical map of the farms under investigation. No developments are visible on these properties. (Topographical Map 1990 [*2821CB Trooilapspan*]; Topographical Map 1990 [*2821AD Upington (East)*]; Topographical Map 1991 [*2821BC Karos*]; Topographical Map 1991 [*2821DA Wilgenhoutsdrif*])

5.1. A BRIEF HISTORY OF HUMAN SETTLEMENT AND BLACK AND WHITE INTERACTION IN THE FARM AREA

The development of the Gordonia area: The Orange River Irrigation Systems

The irrigation of the Orange River has been central to the economic existence of the area in the vicinity of Upington since the 1880s. To the north of the river lies the Kalahari and to the south lies "Bushmanland", these two areas being some of the driest land in South Africa. Moolman attributes the beginning of irrigation in this area to the Basters who he calls: "primitive pastoral people", who had "crude" ways to divert the river water to their "little gardens". According to Legassick the first person to irrigate the Orange River was one Abraham September, from whose lead the Dutch Reformed Church missionary Reverend C.H.W. Scröder and John H. Scott, the Special Magistrate for the Northern Border, stationed at Upington, would have gotten the idea to start irrigating the river on a much larger scale. (Legassick 1996: 371-372; Moolman 1946: 670).

The first 81 farms to be given out to the north of the Orange River from Kheis (opposite the present Groblershoop) to the Augrabies Falls were allocated almost exclusively to Basters in 1882. The term "Baster" refers to a group of people who have moved out of the Cape Colony to avoid social oppression and could refer to people of mixed parentage, particularly white and Khoikhoi or slave and Khoikhoi and also implies an economic category that implies the possession of property and who is culturally European. The farms bordering on the river measured in sizes ranging from 4 000 to 10 000 morgen, these farms were "laid out on the basis of half an hour's ride along the river and two and a half hours' ride away from the river into the 'back country'". Once the irrigation canal was completed these farms were further divided into "water-erven" for irrigation and "dry-erven" for establishing buildings and the like. (Morris 1992: 14; Legassick 1996, p. 379).

The district of Gordonia was established on 30 September 1885 and formed part of British Bechuanaland. It was only administrated as part of British Bechuanaland from April 1889. The Cape government instructed the Special Magistrate appointed for the area to settle the territory with "Baster farmers" living on the southern side of the Orange River. The area was soon settled with Basters, a few whites at first largely related to the Basters by marriage and some Kora, San and Xhosa people. In 1891 the first census in the area recorded 735 whites, 1 429 "aboriginal natives" and 3 121 "other coloured persons" living in the area. (Legassick 1996: 374-377).

It is interesting to note the sudden growth in the number of coloured people who settled in the Gordonia area, and especially in the years between the 1936 and the 1970 census. By 1970, coloured people still made up the vast majority of the population of the Gordonia district, as they had done in 1911. By 1970 the smallest proportion of the population of

Gordonia was black people. The following table provides population numbers for the Gordonia Census District between 1911 and 1970: (De Klerk 1979: 7).

Population group	Area	1911	1921	1936	1946	1951	1960	1970
White	Urban	1096	1935	3194	4095	5258	6755	9288
	Rural	5066	5893	13607	13735	12683	11206	7035
	Subtotal	6162	7828	16801	17830	17941	17961	16323
Black	Urban	235	228	1006	2328	3405	5041	6355
	Rural	597	753	1296	2351	4574	5273	4092
	Subtotal	832	981	2302	4679	7979	10314	10447
Coloured	Urban	2157	1716	3985	5970	7269	11567	31877
	Rural	7595	7788	17059	21778	24390	32886	24770
	Subtotal	9752	9504	21044	27748	31659	44453	56647
Total population		16746	18313	40147	50259	57597	72728	83417

Today the town of Karos, as well as the farms under investigation form part of the // Khara Hais Local Municipality and the !Kheis Local Municipality, a Category B municipality that is located in the ZF Mgcawu District Municipality (previously Siyanda District Municipality), which is the second-largest district in the Northern Cape. It is the commercial, educational, military, agricultural, medical, transport and tourism centre of the area. Upington is the central town, situated 400km west of Kimberley, and has an airport and a landing strip. Natural boundaries provide a unique aspect to the town – one is the Kalahari Desert and another is the Orange River, South Africa's largest river. The main economic sector of this municipality is agriculture. (The Local Government Handbook 2015 *ZF [//Khara Hais Local Municipality]*)

5.2. HISTORICAL OVERVIEW OF THE OWNERSHIP AND DEVELOPMENT OF THE PROPERTIES UNDER INVESTIGATION

Documents and maps found in the National Archives of South Africa were used to write this section. Unfortunately sources such as a register of land owners for farms in the Northern Cape, as well as more detailed local maps are not kept in the National Archives but rather at archive repositories in the Cape. These are not readily available and could therefore not be included in this report. Documents dating to the 1920s and 1930s were however found and give some insight regarding the history of the properties Zand Dam (Karos Settlement 944) and Matjes Rivier.

Zand Dam:

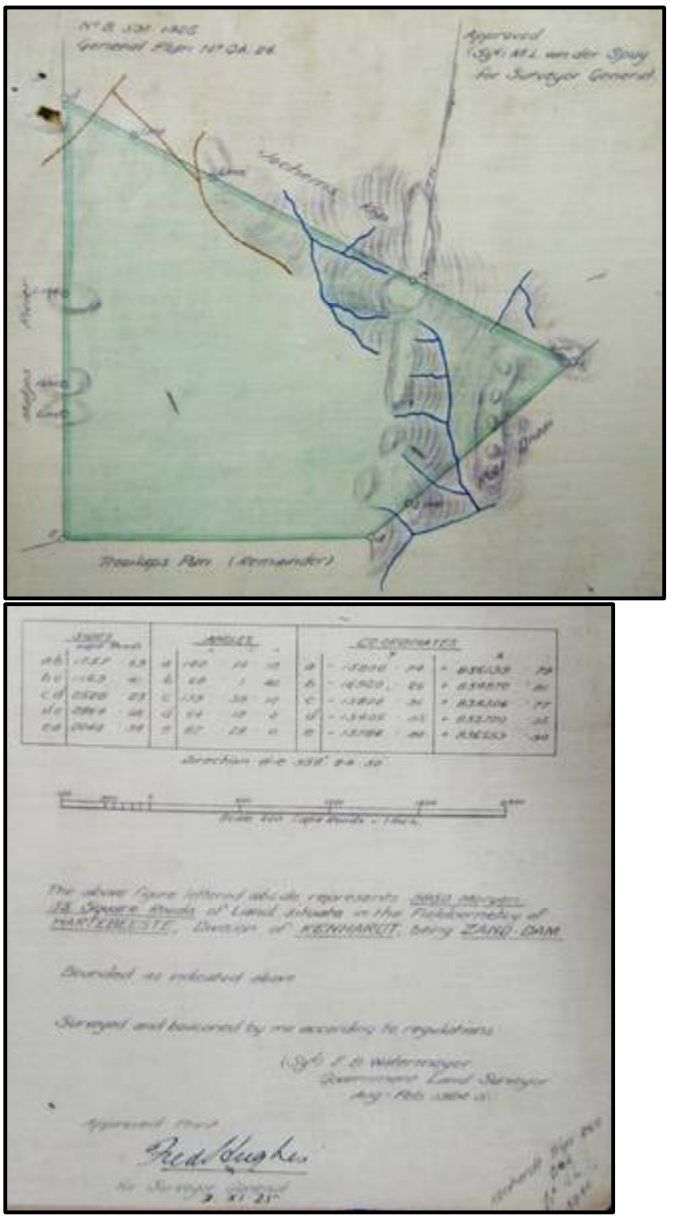

Figure 5**:** 1925 Sketch of Zand Dam. (NASA *SAB, ACT: 391 13417*)

In 1925 a government inspector wrote a farm inspection report on the property that was at the time known as Zand Dam No. 2, located in the Kenhardt district. The farm was 9850 morgen 35 square roods in extent and the nearest town was Upington, about 36 miles (±58 km) north of the property. Trooi Laps Pan was the nearest railway station, about 6 miles (±10 km) to the west. The farm was uninhabited except for temporary occupants residing there under grazing licences. The only improvement on the land was a small dam made by the original owner of Karos. There was sufficient water available on the property for domestic purposes and stock, and the farm was capable of supporting stock the whole year through in average seasons. It was believed that water could be found by well sinking. No black labourers were living on the farm, as black labour was scarce in that area. No forest, scrub or bush existed on the property. The land was described as follows: "Red sandy soil and sand hills covered with grass. All pastoral land."

There were numerous sand dunes on the land but they did not appear to be shifting much. Chiefly cattle were kept, but it was believed that goats would do well on the eastern part of the farm. (NASA *SAB, ACT: 391 13417*)

There were no active or abandoned mineral workings or prospecting shafts, any natural indication of the existence of minerals or precious stones, nor reports as to the existence of either. Though the inspector believed that the farm was suitable for occupation and residence throughout the year, as well as affording subsistence to a settler, he did not believe that the property could beneficially support two or more families. As a general remark, he added that Zand Dam was an excellent cattle proposition and with the railway so nearby, it could be a very desirable dairying farm (NASA *SAB, ACT: 391 13417*).

In 1925 the Cape Land Board resolved that ten farms would be utilised for closer settlements. These farms were Jochems Kop, Zand Dam, Rooi Draai, Ezelfontein, Rooi Zypher, Kalk Puts, Beest Pan, Blaauwbosch, Pan, Brul Pan and Hoekom. The Minister had approved that these farms would be disposed of under the Land Settlement Act of 1912. At a Land Board Meeting that took place on 29th January 1926, it was however specifically recommended that actions regarding the holdings Jochems Kop and Zand Dam, which included portions of the original farm Karos, would be reserved for the time being. Investigations were still being made as to the manner of its disposal. By 17 April 1926 the Under Secretary for Mines and Industries approved the disposal of these two properties, noting that no mining or prospecting rights existed thereon (NASA *SAB, ACT: 391 13417*).

In March 1929, the Secretary of Lands wrote to the Superintendent of the Karos settlement, noting that the farm Zand Dam could be used as grazing land for animals that would be used in connection with levelling operations at the Karos Settlement. No animals would

however be allowed on the land without the permission of the superintendent, or without grazing licences issued by the Kenhardt Magistrate (NASA *SAB, ACT: 391 13417*).

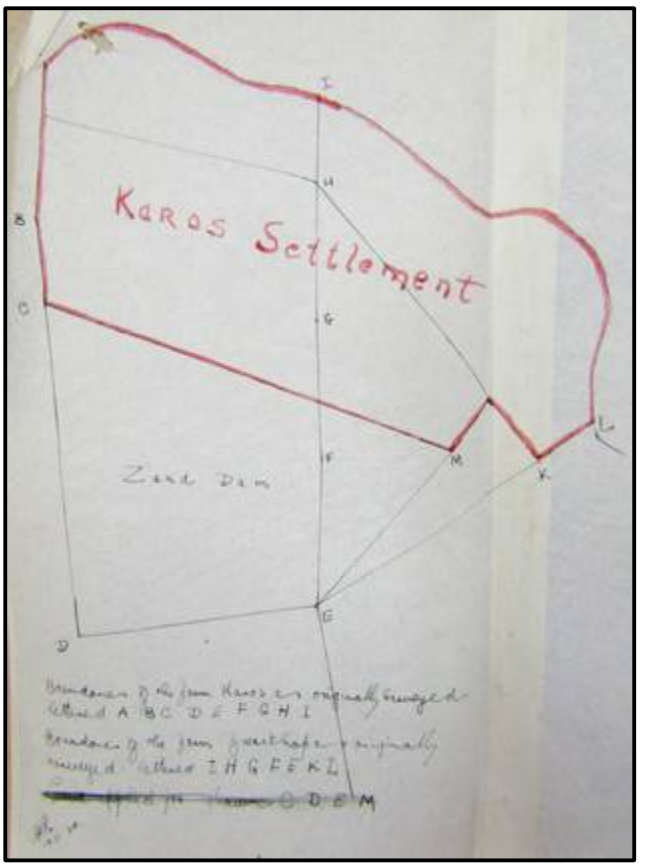

Figure 6: 1930 Sketch of the Karos settlement, bordering the farm Zand Dam. The boundaries of the original farm Karos are lettered A B C D E F G H I, and the boundaries of original farm Zwartkop are lettered I H G F E K L. (NASA *SAB, ACT: 391 13417*)

By April 1930 the farm Zand Dam formed a portion of Karos and Zwartkop as originally surveyed, as seen on the above sketch. No boring had taken place on the land and no expenditure, except survey expenses, had been incurred on it. This land, together with the back portions of the other farms in the vicinity, was being withheld from alienation on the recommendation of the Irrigation Commission as it could be required for grazing in connection with the settlements which it was proposed to establish along the river. As the minister was anxious to have boreholes sunk on these outer farms, the Secretary of Lands wrote to the Superintendent of the Karos Settlements, to ascertain from his board of control what portion, if any, of these outer farms they considered should be cut off in order to supply grazing ground for the settlers who were about to be settled on the land which would be irrigated by the Buchuberg Canal. Zand Dam was at the time still used by the Superintendent of the Karos Settlement for the purpose of grazing stock utilised in connection with levelling operations on the settlement (NASA *SAB, ACT: 391 13417*).

Matjes Rivier:

In 1928 there was a transfer of ownership of the farm Matjes Rivier from the nil desperandum development syndicate Rooth and Wessels to the government of the Union of South Africa. (NASA *SAB, JUS: 766 1/160/23/137*)

On 28 June 1930 the Secretary for Lands reported that the following properties had been transferred to the government:

a) Matjes Rivier Settlement A, being a portion of the farm Annas Hoek, portion of Matjes Rivier, Division of Kenhardt, measuring 442 morgen 26889 square feet.

b) Matjes Rivier Settlement B, being a portion of the farm Dagbreek, portion of Matjes Rivier, Division of Kenhardt, measuring 293 morgen 45298 square feet.

(NASA *SAB, MNW: 1028 MM1403/30*)

It was requested that the properties would be withdrawn from prospecting. In August 1930 the Inspector of Mines wrote an interesting report to the Government Mining Engineer regarding Matjes Rivier. He noted that the farm was notable from a geological point of view, as on it were present some of the oldest shale beds belonging to the Swaziland System of rocks. These shale beds had old granite intruded. A good portion of the farm surface disclosed decomposed granitic gneiss. More recent sand deposits covered a portion of the property. Volcanic and sedimentary rocks of the Ventersdorp system could be seen in the extreme north east corner of Matjes Rivier. The Orange River bed took two distinct curves along the northern boundary, which would make irrigation on the farm fairly simple. The inspector believed that there were undoubtedly minerals on the farm but that it was doubtful that any would be found there in payable quantities. The farm was however an ideal agricultural proposition and taking into consideration the rock formations the ground would most likely be fertile, especially for wheat grown under irrigation. It was recommended for this reason that the land would be withdrawn from prospecting. Prospecting on the land was officially prohibited as of 13 October 1930. (NASA *SAB, MNW: 1028 MM1403/30*).

By 1930, a portion of Matjes Rivier belonged on one Mr Gert Jacobus Nel. The government desired to exchange his portion of Matjes Rivier for a section of Zand Dam, in order to ensure that the Karos settlement and irrigation district would be a continuous strip of land. Nel was however not willing to give up a 33 morgen piece of land on which his home and farming operations were situated. This matter was however resolved soon thereafter. The official agreement between Mr Nel and the government was concluded on 18 October 1930, when the government recommended an exchange by private treaty of the government owned grazing farm Zand Dam, for 100 morgen of irrigable and 400 morgen of grazing land

on the farm Annas Hoek, a portion of Matjes Rivier, division of Kenhardt, which was required by the Government in connection with the Karos Settlement, and the issue of a Crown Grant in respect of the farm Zand Dam in favour of Anna Magdalena Petronella Nel (born Strauss). (NASA *SAB, URU: 1162 3089*; NASA *SAB, ACT: 391 13417*).

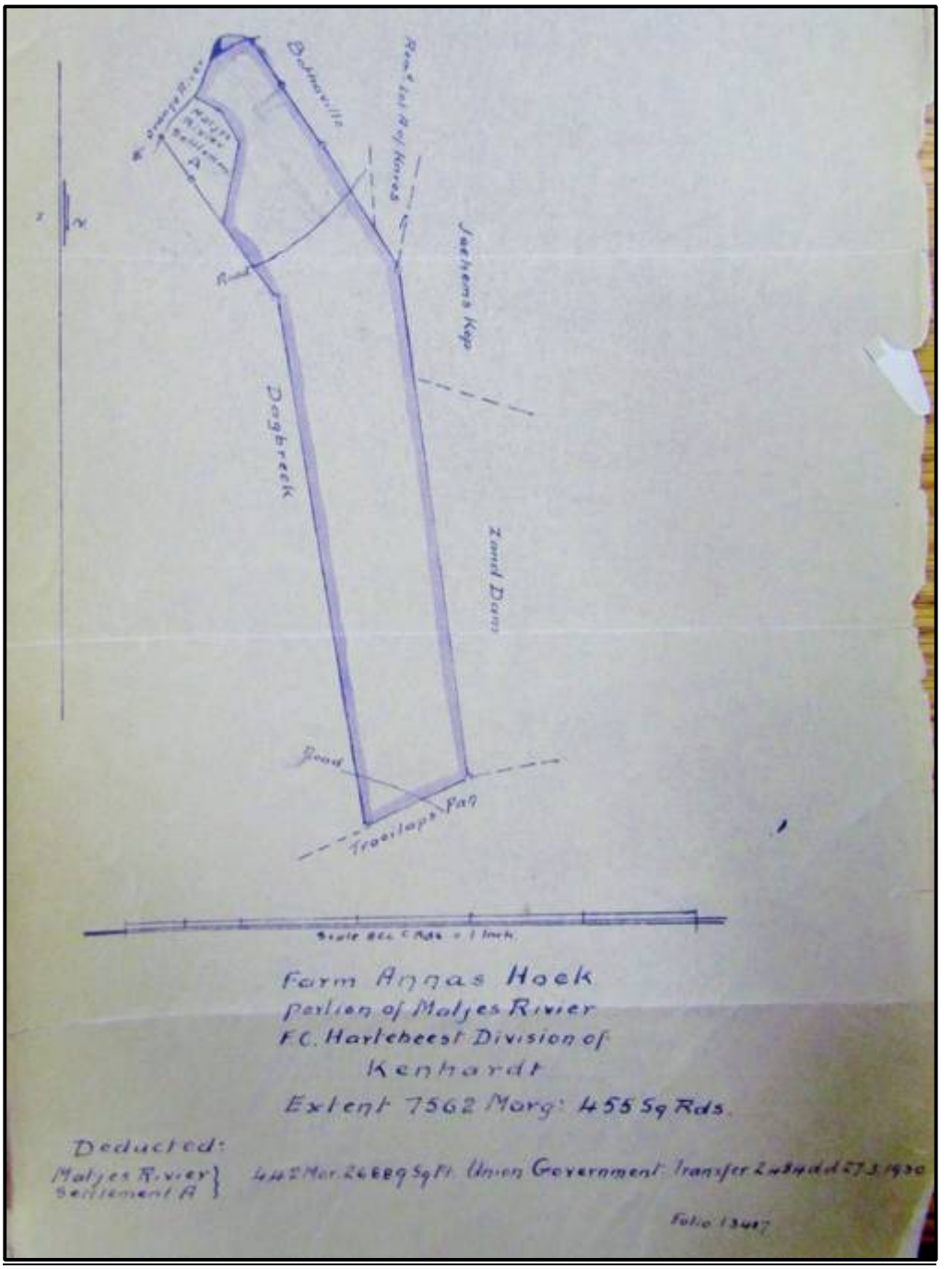

Figure 7: Sketch of the farm Annas Hoek, a portion of Matjes Rivier. (NASA *SAB, ACT: 391 13417*)

It was planned that Annas Hoek would be cut up into probationary settlement holdings as a continuation of the Karos Settlement. Each plot would measure from 6 to 8 morgen, and building plots of 1 ½ morgen in extent would be surveyed above the water furrows, as near as possible to the irrigable plots. It was proposed that 15 houses would be constructed on the building lots as soon as possible. (NASA *SAB, ACT: 391 13417*).

Once the government owned the necessary land to expand the Karos Settlements, it was specified that it would reserve the right of free access to construct water furrows and weirs for irrigation purposes over the land without compensation to the proprietors. The proprietors would furthermore allow the public travelling along any of the roads running over the land the right to pass over and graze their loose cattle, horses, sheep and goats to an extent not exceeding four hundred yards on each side of any such road and to outspan, graze and water stock on the said land that had been granted. (NASA *SAB, ACT: 391 13417*).

On 3 June 1938, the firm Schroder & Van Copenhagen attorneys wrote to the Secretary of the Department of Lands on behalf of Mr Nel, who used to be the owner of Annas Hoek, a section of Matjes Rivier. According to this letter it was specified by the government that, when Nel became the owner of a section of the property Zand Dam in exchange for the half share of his irrigated lands (about 130 morgen), the department would allow the remaining owners on Annas Hoek to use the department's irrigation furrow free of charge. The conditions of the agreement were met. A 5 morgen piece of land on Annas Hoek however did not meet the department's standards, and remained the property of Mr Nel. According to the agreement Nel had no rights to water for this land. This section of land lay close to the main stream of the Orange River, but it would be less costly for the landowner to use water from the department's furrow than to divert water from the river. The landowner therefore wished to negotiate with the government to bring this land under irrigation. No further information was however available regarding this matter. (NASA *SAB, ACT: 391 13417*).

5.3. STONE AGE BACKGROUND

5.3.1 Introduction

South Africa has a long and complex Stone Age sequence of more than 2 million years. The broad sequence includes the Later Stone Age, the Middle Stone Age and the Earlier Stone Age. Each of these phases contains sub-phases or industrial complexes, and within these we can expect regional variation regarding characteristics and time ranges. For Cultural Resources Management (CRM) purposes it is often only expected/ possible to identify the presence of the three main phases.

Yet sometimes the recognition of cultural groups, affinities or trends in technology and/or subsistence practices, as represented by the sub-phases or industrial complexes, is achievable (Lombard 2011). The three main phases can be divided as follows;

- Later Stone Age; associated with Khoi and San societies and their immediate predecessors. Recently to ~30 thousand years ago
- Middle Stone Age; associated with Homo sapiens and archaic modern humans. 30-300 thousand years ago.
- Earlier Stone Age; associated with early Homo groups such as Homo habilis and Homo erectus. 400 000-> 2 million years ago.

The following section is an extract from a report summarising the academic research relating to the Northern Cape and Upington in particular, authored by Prof Marlize Lombard (2011), Department of Anthropology and development studies, University of Johannesburg, commissioned by Heritage Contracts and Archaeological Consulting CC.

5.3.2 The Later Stone Age

5.3.2.1 Hunters-with-livestock/herders

The region is well-known as one that produced the largest sample (n = 56) of prehistoric skeletons in South Africa (Morris 1995). Excavated in 1936, known as the 'Kakamas Skeletons', and currently housed in the National Museum in Bloemfontein, they are considered the 'type' specimens of Khoi morphology (1992). Grave locations can be expected along the Gariep (perhaps up to 35 km from its shore), and on the Gariep Islands between Upington and the Augrabies Falls. They are often marked with stone burial cairns, dug into the alluvial soil or into degraded bedrock above the alluvial margin. Graves can be isolated or grouped in small clusters, sometimes containing up to eight graves (Morris 1995).

Burial cairns can be elaborately formed, some with upright stones in their centres, but they are often disturbed. Cairns from near the Gariep Islands are often characterised by their high conical shapes, and the grave shafts filled with stones. Those closer to Augrabies Falls, however, are low and rounded with ashes in the grave shaft (Dreyer & Meiring 1937). The placing of specularite or red ochre over the body was common, but other grave goods are rare (Morris 1995).

Where dating was possible, most of the skeletons were dated to the last 200 years-or-so, but association with archaeological material from up to about 1200 years old is possible. The grave sites show parallels to those of recent Khoi populations (Morris 1995).

Apart from the grave locations, archaeological sites of this period in the region have been further divided into Swartkop and Doornfontein sites. Doornfontein sites are mostly confined to permanent water sources. The assemblages contain a consistently large complement of thin-walled, grit-tempered, well-fired ceramics with thickened bases, lugs, bosses, spouts, and decorated necks or rims. Lithics are often produced on quartz, and dominated by coarse irregular flakes with a small or absent retouched component (Beaumont et al. 1995; Lombard & Parsons 2008; Parsons 2008). Late occurrences contain coarser potsherds with some grass temper, a higher number of iron or copper objects, and large ostrich eggshell beads. These assemblages are mostly associated with the Khoi (Beaumont et al. 1995).

Post-Wilton

Swartkop sites can be almost contemporaneous with, or older than, the Doornfontein sites. They are usually characterised by many blades/bladelets and backed blades. Coarse undecorated potsherds, often with grass temper, and iron objects are rare. These sites are remarkably common throughout the region. They usually occur on pan or stream-bed margins, near springs, bedrock depressions containing seasonal water, hollows on dunes, and on the flanks or crests of koppies (Beaumont et al. 1995; Parsons 2008). Some of these sites are also associated with stone features, such as ovals or circles, which may represent the bases of huts, windbreaks or hunter's hides (Jacobson 2005; Lombard & Parsons 2008; Parsons 2004). These sites are linked to the historic /Xam communities of the area who usually followed a hunter-gatherer lifeway (Deacon 1986, 1988; Beaumont et al. 1995).

Wilton

These assemblages are distinguished by a significant incidence of cryptocrystalline silicates (mainly chalcedony) and contain many formal tools such as small scrapers, backed blades and bladelets. A regional variation of the Wilton in the area is often referred to as the Springbokoog Industry (Beaumont et al. 1995).

Oakhurst

A few heavily patinated Later Stone Age clusters, that include large scrapers, may represent Oakhurst-type aggregates (Beaumont et al. 1995).

5.3.2.2. The Middle Stone Age

Previous collections of stone tools in the region include artefacts with advanced prepared cores, blades and convergent flakes or points. Most of the scatters associated with the Middle Stone Age have a 'fresh' or un-abraded appearance. They appear to be mostly associated with the post-Howiesons Poort (MSA 3) or MSA 1 sub-phases (Beaumont et al. 1995).

Substantial Middle Stone Age sites seem uncommon. However, where archaeological sites were excavated, such as only two farms west of Geelkop 456, on Zoovoorbij 458, a Middle Stone Age assemblage was excavated beneath Later Stone Age deposits (Smith 1995). This shows that, although not always visible on the surface, the landscape was inhabited during this phase. The large flake component of the lower units of Zoovoorbij Cave has Levallois-type preparation on the striking platforms, reinforcing their Middle Stone Age context.

5.3.2.3. The Earlier Stone Age

Stone artefacts associated with this phase, based on their morphology, seem moderately to heavily weathered. Scatters may include long blades, cores (mainly on dolerite), and a low incidence of formal tools such as handaxes and cleavers. Clusters with distinct Acheulean characteristics have been recorded in the area (Beaumont et al. 1995).

6 PROBABILITY OF OCCURRENCE OF SITES

A Phase 1 HIA (Van Schalkwyk 2011) was conducted for the Karoshoek Solar Valley Development where the pipeline and a large part of the power line is situated and another HIA for the power line connection into the grid by Gaigher (2012) as well as van der Walt (2014). During these studies numerous sites (Figure 5) were recorded for the different project components and is summarised under Table 1. No heritage sites were recorded for the proposed development footprint considered within this report.

Table 1: Known Heritage Sites

Site Number	Recorded by:	Type Site	Cultural Markers	Coordinate (accuracy 4 meters)
Site 1	vd Walt (2014) and van Schalkwyk (2011)	Late Stone Age	Seasonal pans with flakes	S28.49389 E21.51799
SG 1	Gaigher (2012)	Stone Age	Scattered MSA/LSA flakes	S28.40118 E21.48513
SG 2	Gaigher (2012)	Historical	Porcelain	S28.40118 E21.48513
SG 3	Gaigher (2012)	Cemetery	Headstones etc.	S28.45036 E21.31508
SG 4	Gaigher (2012)	Cemetery	Headstones etc.	S28.43233 E21.29913
JvS 1	van Schalkwyk (2011)	Late Stone Age	Flakes and cores	S28.49227 E21.51588
JvS 3	van Schalkwyk (2011)	Late Stone Age	Flakes and cores	S28.49464 E21.52133
JvS 4	van Schalkwyk (2011)	Late Stone Age	Flakes and cores	S28.49395 E21.52172
JvS 5	van Schalkwyk (2011)	Late Stone Age	Flakes and cores	S28.49341 E21.52184
JvS 6	van Schalkwyk (2011)	Late Stone Age	Flakes and cores	S28.49263 E21.52279
JvS 7	van Schalkwyk (2011)	Recent	Clay brick dwellings	S28.48176 E21.54503
JvS 8	van Schalkwyk (2011)	Recent	Clay brick dwellings	S28.48010 E21.54974

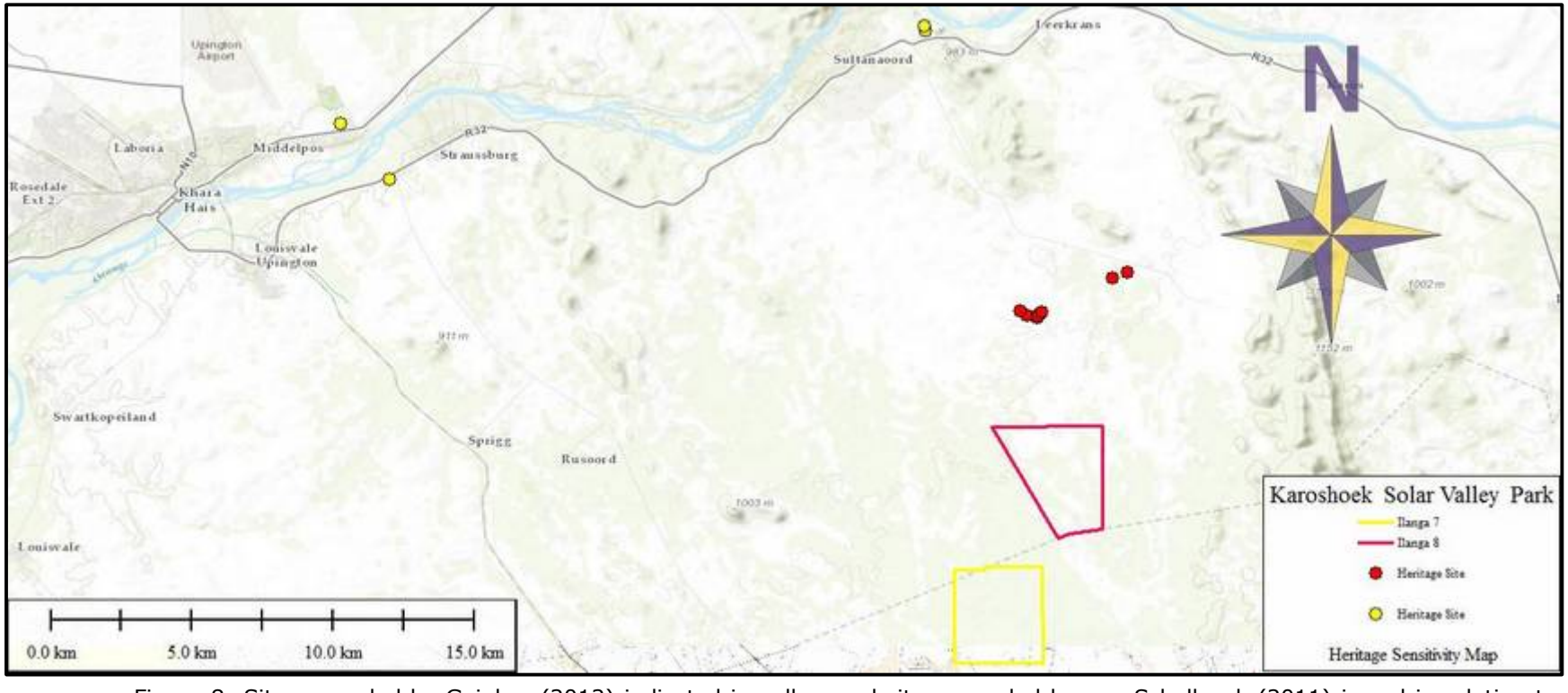

Figure 8: Sites recorded by Gaigher (2012) indicated in yellow and sites recorded by van Schalkwyk (2011) in red in relation to the study area.

Based on the above information, it is possible to determine the probability of finding archaeological and cultural heritage sites within the study area to a certain degree and areas of possible heritage sensitivity are mapped (Figure 9 and 10). Figure 9 and 10 were compiled based on high lying areas and drainage lines in the study area where heritage artefacts might be expected. For the purposes of this section of the report the following terms are used – low, medium and high probability.

Low indicates that no known occurrences of sites have been found previously in the general study area.

Medium probability indicates some known occurrences in the general study area are documented and can therefore be expected in the study area.

High probability indicates that occurrences have been documented close to or in the study area and that the environment of the study area has a high degree of probability having heritage sites.

» Archaeological And Cultural Heritage Landscape

NOTE: *Archaeology is the study of human material and remains (by definition) and is not restricted in any formal way as being below the ground surface*.

*Archaeologica*l remains dating to the following periods can be expected within the study area:

» Stone Age finds

ESA: *Medium Probability*

MSA*: High Probability*

LSA: High Probability

LSA –Herder: Low to Medium Probability

» Iron Age finds

EIA: *Not applicable*

MIA*: Not applicable*

LIA: Not applicable

» Historical finds

Historical period: *-Medium Probability*

Historical dumps: *Medium Probability*

Structural remains: *Medium Probability*

Cultural Landscape*: Low probability*

» Living Heritage

For example rainmaking sites: *Low Probability*

» Burial/Cemeteries

Burials over 100 years: *Medium Probability*

Burials younger than 60 years*: Medium Probability*

Subsurface excavations including ground levelling, landscaping, and foundation preparation can expose any number of the above.

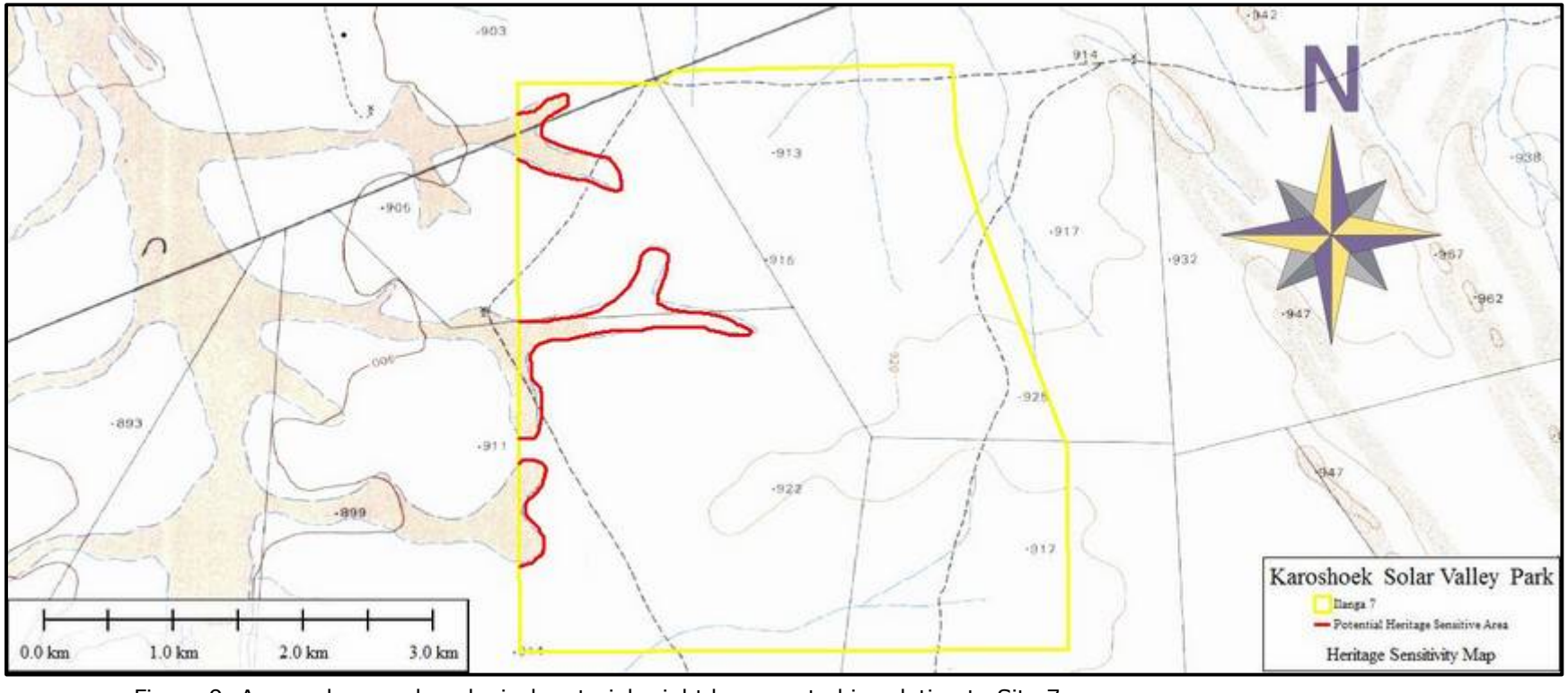

Figure 9: Areas where archaeological material might be expected in relation to Site 7.

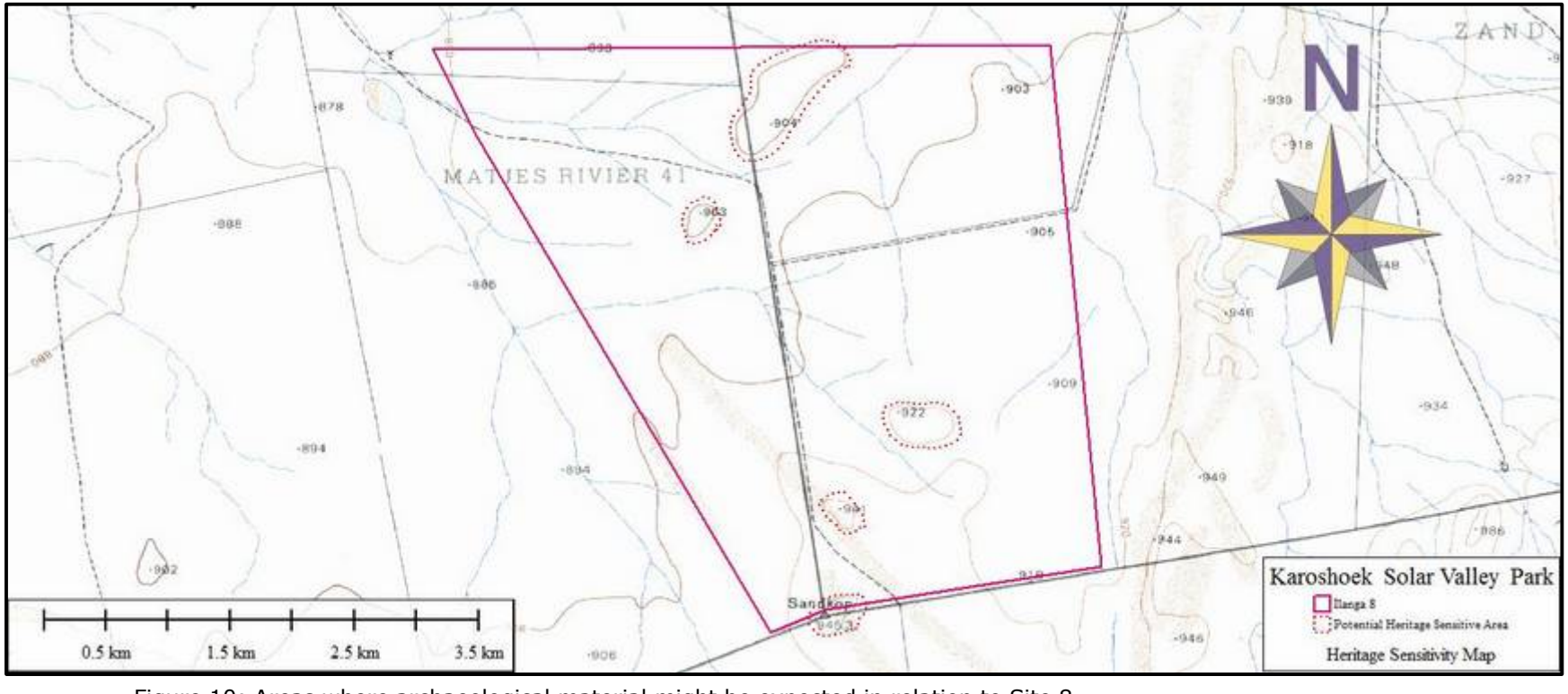

Figure 10: Areas where archaeological material might be expected in relation to Site 8.

7. ASSUMPTIONS AND LIMITATIONS

The study area was not subjected to a field survey as this will be done in the EIA phase. It is assumed that information obtained for the wider area is applicable to the study area.

8. FINDINGS

The heritage scoping study revealed that the following heritage sites, features and objects can be expected within the study area.

8.1. Archaeology

8.1.1 Archaeological finds

The brief background study indicates that an extensive range of Stone Age manifestations can be expected in the study area. Those that are most sensitive are the Later Stone Age grave sites that may be recognised by variously shaped stone cairns. Where these have been disturbed/removed variations in the soil may include ashy or stony patches, and could signify the locations of ancient graves. Patches of soil, stained red with specula rite or ochre, may also be an indication of the presence of a grave site. LSA artefact scatters can be expected around depressions that contain seasonal water and stream bed margins that was utilised in the past (van Schalkwyk 2011, van der Walt 2014). Stone circles or ovals demarcating Later Stone Age living or activity sites, and engraved boulders or stones may occur throughout the area.

Concentrations of stone tools point to activities that took place at various stages over the past 1.5 million years, representing the different groups of people who inhabited or moved across the landscape over time.

8.1.2 Nature of Impact

The construction phase of the project could directly impact on surface and subsurface archaeological sites.

8.1.3 Extent of impact

The project could have a low to medium impact on a local scale.

8.2. Historical period

8.2.1 Historical finds: I

Historical finds include middens, structural remains and cultural landscape. The study area has been fallow for a number of years and no agricultural activities occurred on the farm. It is assumed that the farm was utilised for grazing in the past and features dating to this period associated with farming can occur but is doubtful to be older than 60 years.

8.2.2 Nature of Impact

The construction of the project can directly impact on both the visual context and sense of place of historical sites.

8.2.3 Extent of impact

The construction of the project could have a low impact on a local scale.

8.3. Burials and Cemeteries

8.3.1 Burials and Cemeteries

Graves and informal cemeteries can be expected anywhere on the landscape. Family cemeteries can be expected close to farmsteads while stone cairns could represent graves as recorded in the wider area (Dreyer & Meiring 1937, Morris 1995).

8.3.2 Nature of Impact

The construction and operation of the proposed project could directly impact on marked and unmarked graves.

8.3.3 Extent of impact

The project could have a low to medium impact on a local scale.

Impact on Heritage resources

The construction of the proposed projects could directly impact on graves, archaeological sites and historical sites.

Issue	Nature of Impact	Extent of Impact	No-Go Areas
Disturbance and destruction of archaeological sites and graves.	Construction activities could cause irreversible damage or destroy heritage resources and depletion of the archaeological record of the area.	Low to Medium on a local scale.	TBC after field work

Description of expected significance of impact

Significance of sites, mitigation and significance of possible impact can only be determined after the field work has been conducted, but based on previous work in the area, Stone Age sites of Low to Medium significance can be expected in the development area. If grave sites are found in the study area the grave sites will be of high social significance.

It should be able to mitigate impacts to sites by micro adjustments to the lay outs to preserve the sites. Alternatively grave sites can be relocated and Stone Age sites can be test excavated and mapped. All these mitigation measures will require adherence to the NHRA and the required permits from the SAHRA.

Gaps in knowledge & recommendations for further study

The study area has not been subjected to a cultural resource study and it is assumed that information obtained for the wider region is applicable to the study area. To address these gaps it is recommended that a field study should be conducted to confirm the presence of heritage resources after which mitigation will be recommended.

The following impacts can be expected to heritage resources in the area:

» Direct impacts to heritage resources including damage and destruction of sites

» Indirect impacts including impacts on the cultural landscape and sense of place of the area

» Cumulative impacts including the permanent destruction of heritage resources throughout the wider region due to extensive renewable energy developments in the area.

» Residual risks for the proposed project include depletion of the archaeological record of the wider Upington region.

9. POTENTIAL SIGNIFICANCE OF HERITAGE RESOURCES

Based on the current information obtained for the area at a desktop level it is anticipated that any sites that occur within the proposed development area will have a Generally Protected B (GP.B) field rating apart from graves and rock art that could have a Generally Protected A (GP.A) field rating and all sites should be mitigatable and no red flags are identified.

10. CONCLUSIONS AND RECOMMENDATIONS

This scoping study revealed that a range of heritage sites occur in the larger region and similar sites can be expected within the study area. Every site is relevant to the Heritage Landscape, but it is anticipated that few sites in the study area could have conservation value. The following conclusions are applicable to the following sites:

» Archaeological sites

All sites could be mitigated either in the form of conservation of the sites with in the development or by a Phase 2 study where the sites will be recorded and sampled before the client can apply for a destruction permit for these sites prior to development.

» Historical finds and Cultural landscape

It is not anticipated that the built environment will be severely impacted upon as no structures occur within the study area (based on Google Earth). This assumption will how ever have to be verified in the field. If any sites dating to the Anglo Boer War occur in the study area it is recommended that these sites are conserved.

» Burials and cemeteries

Formal and informal cemeteries as well as pre-colonial graves occur widely across Southern Africa. It is generally recommended that these sites are preserved within a development. These sites can how ever be relocated if conservation is not possible, but this option must be seen as a last resort and is not advisable. The presence of any grave sites must be confirmed during the field survey and the public consultation process.

» General

It is recommended that as part of the public consultation process the presence of graves, archaeological and historical sites should be determined.

From an archaeological viewpoint the proposed project is considered to be viable.

11. PLAN OF STUDY

The development triggers the NHRA in the following areas and a Phase 1 study is required:

Action Trigger	Yes/No	Description
Construction of a road, wall, power line, pipeline, canal or other linear form of development or barrier exceeding 300 m in length.	Yes	Access roads and power lines for connection into the grid
Construction of a bridge or similar structure exceeding 50 m in length.	No	
Development exceeding 5000 m²	Yes	Footprint of impact area exceeds 5000m²
Development involving more than 3 erven or sub divisions	No	
Development involving more than 3 erven or sub divisions that have been consolidated in the past 5 years	No	
Re-zoning of site exceeding 10 000 m²	Yes	Re-zoning from agricultural to renewable energy
Any other development category, public open space, squares, parks or recreational grounds	No	

With cognisance of the recorded archaeological sites in the wider area and in order to comply with the National Heritage Resources Act (Act 25 of 1999) it is recommended that a Phase 1 Archaeological Impact Assessment must be undertaken. During this study sites of archaeological, historical or places of cultural interest must be located, identified, recorded, photographed and described. During this study the levels of significance of recorded heritage resources must be determined and mitigation proposed should any significant sites be impacted upon, ensuring that all the requirements of SAHRA are met.

11.1 Reasoned Opinion

If the above recommendations are adhered to and based on approval from SAHRA, HCAC is of the opinion that the development can continue as the impact of the development on heritage will not impact negatively on the archaeological record of the area. If during the pre-construction phase or during construction, any archaeological finds are made (e.g. graves, stone tools, and skeletal material), the operations must be stopped, and the archaeologist must be contacted for an assessment of the finds. Due to the subsurface nature of archaeological material and graves the possibility of the occurrence of unmarked or informal graves and subsurface finds cannot be excluded.

12. LIST OF PREPARERS

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Liesl Bester (Archival Specialist)

13. STATEMENT OF COMPETENCY

The author of the report is a member of the Association of Southern African Professional Archaeologists and is also accredited in the following fields of the Cultural Resource Management (CRM) Section, member number 159: Iron Age Archaeology, Colonial Period Archaeology, Stone Age Archaeology and Grave Relocation. Jaco is also an accredited CRM Archaeologist with SAHRA and AMAFA.

Jaco has been involved in research and contract work in South Africa, Botswana, Mozambique, Zimbabwe, Tanzania and the DRC and conducted well over 300 AIAs since he started his career in CRM in 2000. This involved several mining operations, Eskom transmission and distribution projects and infrastructure developments. The results of several of these projects were presented at international and local conferences.

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APPENDIX:

Archival documents of interest for future research in the area:

Western Cape Archives:

DEPOT KAB
SOURCE PAS
TYPE LEER
VOLUME_NO 2/1090
SYSTEM 07
REFERENCE L46/GX/3
PART 1
DESCRIPTION **KENHARDT. KAROS** CEMETERIES.
STARTING 1932
ENDING 1932

DEPOT KAB
SOURCE PAR
TYPE LEER
VOLUME_NO 133
SYSTEM 01
REFERENCE 39/44
PART 1
DESCRIPTION **KENHARDT** DIVISION. CANNON ISLAND TO UPINGTON AND UPINGTON TO **KAROS** ROAD.
STARTING 19410000
ENDING 19460000

DEPOT KAB
SOURCE ACLT
TYPE LEER
VOLUME_NO 10
SYSTEM 01
REFERENCE 17502
PART 2
DESCRIPTION **KAROS-BUCHUBERG** SETTLEMENT. DIVISIONS OF KENHARDT **AND** PRIESKA. DIVERSE CORRESPONDENCE.
STARTING 19370000
ENDING 19400000

DEPOT KAB
TYPE Map
REFERENCE M4/241
DESCRIPTION Noting map of **Karos** - Buchuberg (Boegoeberg) settlements in Buchuberg water reserve, in the division of **Kenhardt** and Prieska showing farms, lots, etc. along the Orange River.
STARTING 1933
ENDING 1933
REMARKS L Gordon. Surveyor General's Office. Drawing.

National Archives of South Africa:

DEPOT SAB
SOURCE SPM
TYPE LEER
VOLUME_NO 234
SYSTEM 01
REFERENCE 396/1987
PART 1

DESCRIPTION PROKLAMASIE VAN DIE STAATSPRESIDENT VERKLARING VAN GROEPSGEBIEDE INGEVOLGE DIE WET OP GROEPSGEBIEDE, 1966, TE LOUISVALEWEG, LEERKRANS, **KAROS,** GROOT DRINK EN WEGDRAAI, ADMINISTRATIEWE DISTRIK **KENHARDT** PROVINSIE KAAP DIE GOEIE HOOP.
STARTING 19870000
ENDING 19870000

DEPOT SAB
SOURCE ACT
TYPE LEER
VOLUME_NO 244
SYSTEM 01
REFERENCE 8929
PART 1
DESCRIPTION **KENHARDT.** KAAP. **KAROS.**
STARTING 19190000
ENDING 19240000

DEPOT SAB
SOURCE ACT
TYPE LEER
VOLUME_NO 245
SYSTEM 01
REFERENCE 8929
PART 2
DESCRIPTION **KENHARDT.** KAAP. **KAROS.**
STARTING 19250000
ENDING 19270000

DEPOT SAB
SOURCE ACT
TYPE LEER
VOLUME_NO 245
SYSTEM 01
REFERENCE 8929
PART 3
DESCRIPTION **KENHARDT.** KAAP. **KAROS.**
STARTING 19290000
ENDING 19350000

DEPOT SAB
SOURCE ACT
TYPE LEER
VOLUME_NO 246
SYSTEM 01
REFERENCE 8929
PART 4
DESCRIPTION **KENHARDT.** KAAP. **KAROS.**
STARTING 19370000
ENDING 19440000

DEPOT SAB
SOURCE ACT
TYPE LEER
VOLUME_NO 246

SYSTEM 01
REFERENCE 8929
PART 5
DESCRIPTION **KENHARDT.** KAAP. **KAROS.**
STARTING 19460000
ENDING 19490000

DEPOT SAB
SOURCE ACT
TYPE LEER
VOLUME_NO 246
SYSTEM 01
REFERENCE 8929
PART 6
DESCRIPTION **KENHARDT.** KAAP. **KAROS.**
STARTING 19510000
ENDING 19680000

DEPOT SAB
SOURCE ACT
TYPE LEER
VOLUME_NO 247
SYSTEM 01
REFERENCE 8929
PART 7
DESCRIPTION **KENHARDT.** KAAP. **KAROS.**
STARTING 19680000
ENDING 19720000

DEPOT SAB
SOURCE ACT
TYPE LEER
VOLUME_NO 247
SYSTEM 01
REFERENCE 8929
PART 8
DESCRIPTION **KENHARDT.** KAAP. **KAROS.**
STARTING 19660000
ENDING 19710000

DEPOT SAB
SOURCE ACT
TYPE LEER
VOLUME_NO 247
SYSTEM 01
REFERENCE 8929
PART 9
DESCRIPTION **KENHARDT.** KAAP. **KAROS.**
STARTING 19520000
ENDING 19540000

DEPOT SAB
SOURCE ACT
TYPE LEER
VOLUME_NO 249

SYSTEM 01
REFERENCE 8929/16
PART 1
DESCRIPTION **KENHARDT.** CAPE. **KAROS** SETTLEMENT. GRAZING.
STARTING 19280000
ENDING 19400000