

# HERITAGE WALK-DOWN REPORT

(REQUIRED AS A CONDITION OF AUTHORISATION)

FOR THE APPROVED ARIES - UPINGTON 400kV LINE, NORTHERN CAPE PROVINCE

**Type of development:**

Electrical infrastructure

**Client:**

BioAssets

**Applicant:**

Eskom Holdings

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## Executive Summary

BioAssets appointed Beyond Heritage to conduct a Heritage walk-down for the authorised 400kV powerline from the Aries substation near Kenhardt to the Upington substation (formerly referred to as Solar Park Substation) near Upington. The line is approximately 145km in length and located in the Kai!Garib and Khara Hais Local Municipality, Mgcawu District Municipality, Northern Cape Province. This walk-down was commissioned by Eskom Holdings SOC Limited to fulfil the recommendations following a prior Environmental Impact Assessment process. From the walk-down the following key findings were made:


- The archaeology in the northern and southern portions of the proposed power line is remarkably similar. Both areas were intensively surveyed for renewable energy projects and provide some insight as to the occupation of the area;
- Surveys in the south around the Aries substation e.g., Jonathan Kaplan (2011), Halkett & Orton (2011), Webley & Halkett (2012), Anton Pelser (2012) & Jaco van der Walt (2017), recorded widespread distribution of Early and Middle Stone Age material with a few Later Stone Age sites;
- Going north over the plains the artefact density drastically drops and is marked by a lack of raw material suitable for manufacturing lithics;
- The northern section of the power line is again characterised by widespread distribution of MSA material mostly on quartzite found close to the Orange River and well recorded through Heritage Impact Assessments (e.g., Gaigher 2013, Fourie 2014 and Van der Walt 2015, 2019 a and b);
- Rocky outcrops in the north should rather be avoided as they contain ephemeral LSA material;
- Further mitigation of isolated find spots/ background scatter is considered unnecessary due to the lack of in situ archaeological surface sites or indications of stratified archaeological deposits and the fact that further mitigation is unlikely to result in a greater understanding of the material and the various time periods;
- Other finds consisted of refuse scatters, mining trenches and exploration pits, as well as stone-built structures alluding to occupation in the area dating to the recent past/historical period;
- A cemetery, a single grave and several potential graves were recorded during the survey and these features should be avoided;
- The preferable course of action is avoidance of the recorded observations to prevent impacts to the recorded sites. If this is not possible extensive Phase 2 mitigation will be required.

The impacts to heritage resources by the proposed development can be mitigated to an acceptable level if the recommendations made in this report are adhered to, based on the South African Heritage Resource Authority (SAHRA) 's approval. The following recommendations apply and should be implemented together with the site-specific recommendations and Chance Find procedure in Section 7 (Table 8):

**Recommendations:**

- The koppie (74 m from pillar 43) should be indicated on development plans and avoided during construction
- The area at Pillar 176 – 177 is sensitive (Waypoint 6) and should be avoided for stringing and construction
- Pylon excavations must be monitored and could require further mitigation at waypoint 383 (Pillar 177 to 179);
- Pillars 219, 260 – 261 and 299 should be micro sited to avoid the Stone Age features at waypoint 3431, 3461 and 3481.
- The small shelter at waypoint 10 (Pillar 193 – 194) should be demarcated and avoided during construction
- The remains of structures should be avoided by the development by moving the relevant pillars (Pillar 190 and 191 at waypoint 91), if this is not possible mitigation will be required consisting of mapping and recording prior to applying for a destruction permit.
- Graves and burial sites (as well as potential graves until proven otherwise) should be avoided with a 30 m buffer zone and as such Waypoint 7, 11, 3491, 3501, 3511 should be indicated on development plans and the associated pillars (184 – 187, 194 – 195 and 299) should be micro sited to avoid these features. Access for the family members should be ensured;
- Recorded heritage features should be indicated on development plans and construction crews should be made aware of expected resources and applicable mitigation measures;
- The study area should be monitored by the ECO during construction to implement the Chance Find Procedure for the project.

**Declaration of Independence**

<b>Specialist Name</b>	Jaco van der Walt
<b>Declaration of Independence</b>	<p>I declare, as a specialist appointed in terms of the National Environmental Management Act (Act No 107 of 1998) and the associated 2014 Environmental Impact Assessment (EIA) Regulations (as amended), that I:</p> <ul style="list-style-type: none"> <li>• I act as an independent specialist in this application;</li> <li>• I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;</li> <li>• I declare that there are no circumstances that may compromise my objectivity in performing such work;</li> <li>• I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;</li> <li>• I will comply with the Act, Regulations and all other applicable legislation;</li> <li>• I have no, and will not engage in, conflicting interests in the undertaking of the activity;</li> <li>• I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;</li> <li>• All the particulars furnished by me in this form are true and correct; and</li> <li>• I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 49 A of the Act.</li> </ul>
<b>Signature</b>	
<b>Date</b>	12/12/2022

**a) Expertise of the specialist**

Jaco van der Walt has been practising as a Cultural Resource Management (CRM) archaeologist for 15 years. He obtained an MA degree in Archaeology from the University of the Witwatersrand focussing on the Iron Age in 2012. Jaco is an accredited member of the Association of South African Professional Archaeologists (ASAPA) (#159) and have conducted more than 500 impact assessments in Limpopo, Mpumalanga, North West, Free State, Gauteng, Kwa Zulu Natal (KZN) as well as the Northern and Eastern Cape Provinces in South Africa.

Jaco has worked on various international projects in Zimbabwe, Botswana, Mozambique, Lesotho, Democratic Republic of the Congo (DRC) Zambia, Guinea, Afghanistan, Nigeria and Tanzania. Through this, he has a sound understanding of the International Finance Corporations (IFC) Performance Standard requirements, with specific reference to Performance Standard 8 – Cultural Heritage

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**ABBREVIATIONS**

ASAPA: Association of South African Professional Archaeologists
BGG Burial Ground and Graves
CFPs: Chance Find Procedures
CMP: Conservation Management Plan
CRR: Comments and Response Report
CRM: Cultural Resource Management
DFFE: Department of Fisheries, Forestry and Environment,
EA: Environmental Authorisation
EAP: Environmental Assessment Practitioner
ECO: Environmental Control Officer
EIA: Environmental Impact Assessment*
EIA: Early Iron Age*
EAP Environmental Assessment Practitioner
EMPr: Environmental Management Programme
ESA: Early Stone Age
ESIA: Environmental and Social Impact Assessment
GIS Geographical Information System
GPS: Global Positioning System
GRP Grave Relocation Plan
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, 2002 (Act No. 28 of 2002)
MSA: Middle Stone Age
NEMA National Environmental Management Act, 1998 (Act No. 107 of 1998)
NHRA National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NID Notification of Intent to Develop
NoK Next-of-Kin
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 (~ 2.6 million to 250 000 years ago)

Middle Stone Age (~ 250 000 to 40-25 000 years ago)

Later Stone Age (~ 40-25 000, to the historic period)

The Iron Age (~ AD 400 to 1840)

Historic (~ AD 1840 to 1950)

Historic building (over 60 years old)

## **1 Introduction and Terms of Reference:**

Beyond Heritage was appointed to conduct a Heritage walk-down for the authorised 400kV powerline from the Aries substation near Kenhardt to the Upington substation near Upington. The line is approximately 145km in length and located in the Kai!Garib and Khara Hais Local Municipality, Mgcawu District Municipality, Northern Cape Province (Figure 1.1 to 1.3). This is in fulfilment of the requirements of the Environmental Authorisation conditions and recommendations from the EIA process.

The report outlines the approach and methodology utilized before and during the survey, which includes: Phase 1, review of the Heritage Impact Assessment (HIA) for the project; Phase 2, the physical surveying of the area on foot and by vehicle; Phase 3, reporting the outcome of the study.

General site conditions and features on sites were recorded by means of photographs, GPS locations, and site descriptions.

### **1.1 Terms of Reference**

This Heritage Walk Down report was compiled by Beyond Heritage for the proposed construction of the powerline in fulfilment with the conditions of authorisation for the project.

The process consisted of three phases:

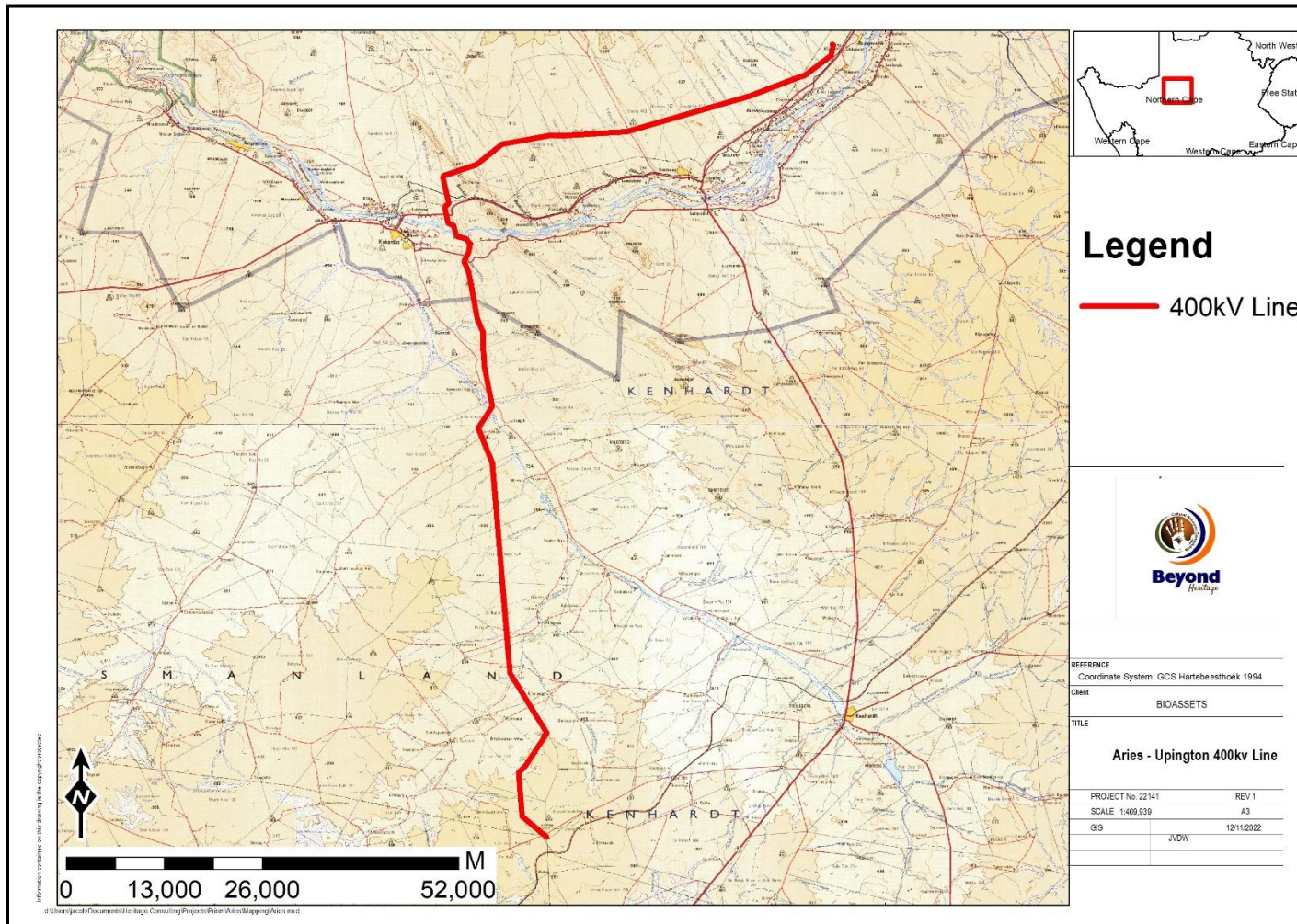
- Phase 1, review of the existing HIA for the project;
- Phase 2, the physical surveying of the area on foot and by vehicle;
- Phase 3, reporting the outcome of the study.

### **1.2 Scope and purpose of the report**

The report is intended to report on any heritage resources that might occur within the final footprint of the proposed powerline and make recommendations for any mitigation measures that may need to be implemented prior to construction.

### **1.3 Project Description**

It is proposed to construct a 400kV power line that will run in a north-easterly to south-westerly direction for approximately 145km between the Aries Substation, southwest of Kenhardt, and the Upington Substation near Upington. Excluding structures within the limits of the existing Substations, the proposed line would require a total of three hundred and seventeen pylons.





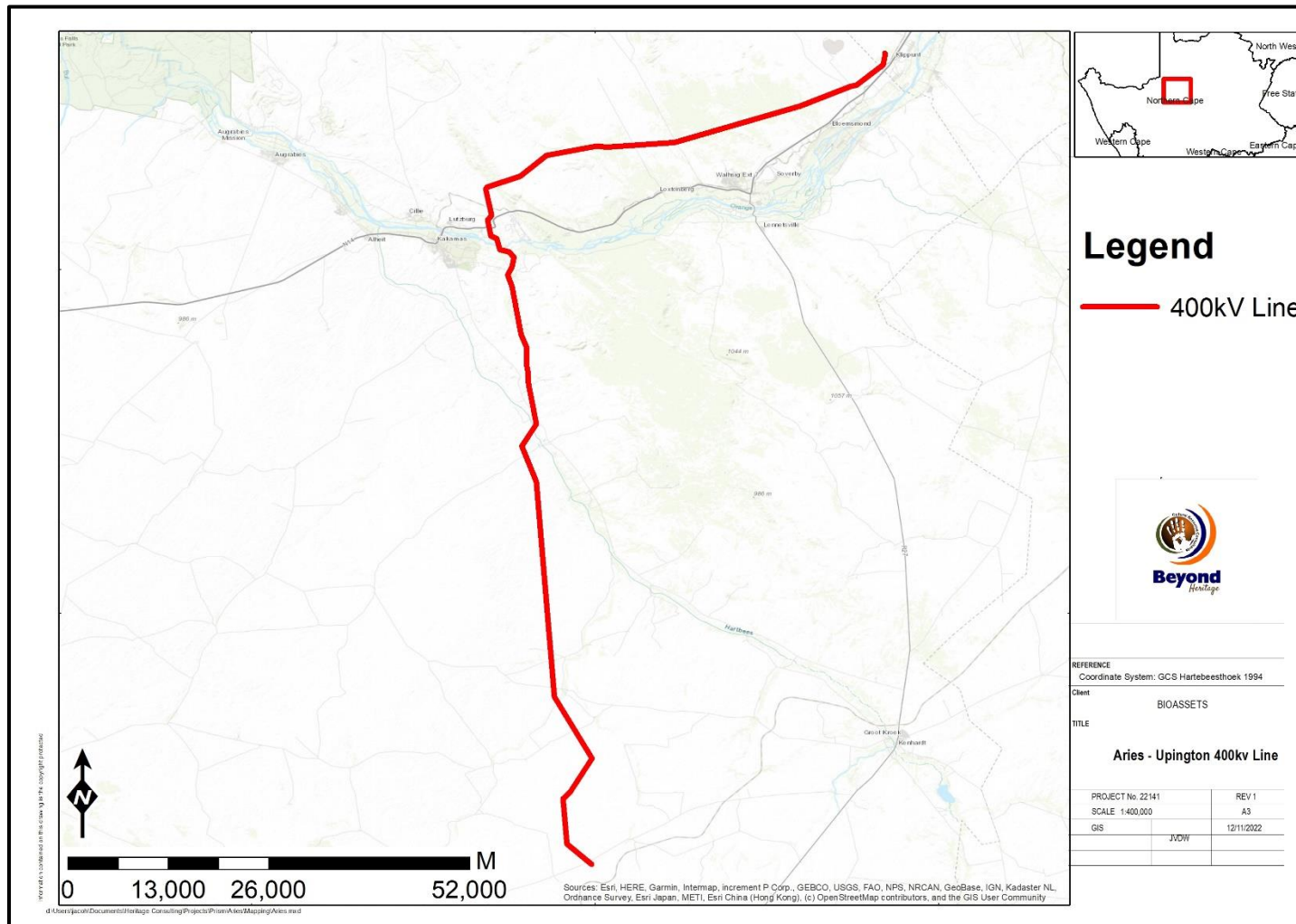


Figure 1.2. Local setting of the Project (1: 50 000 topographical map).

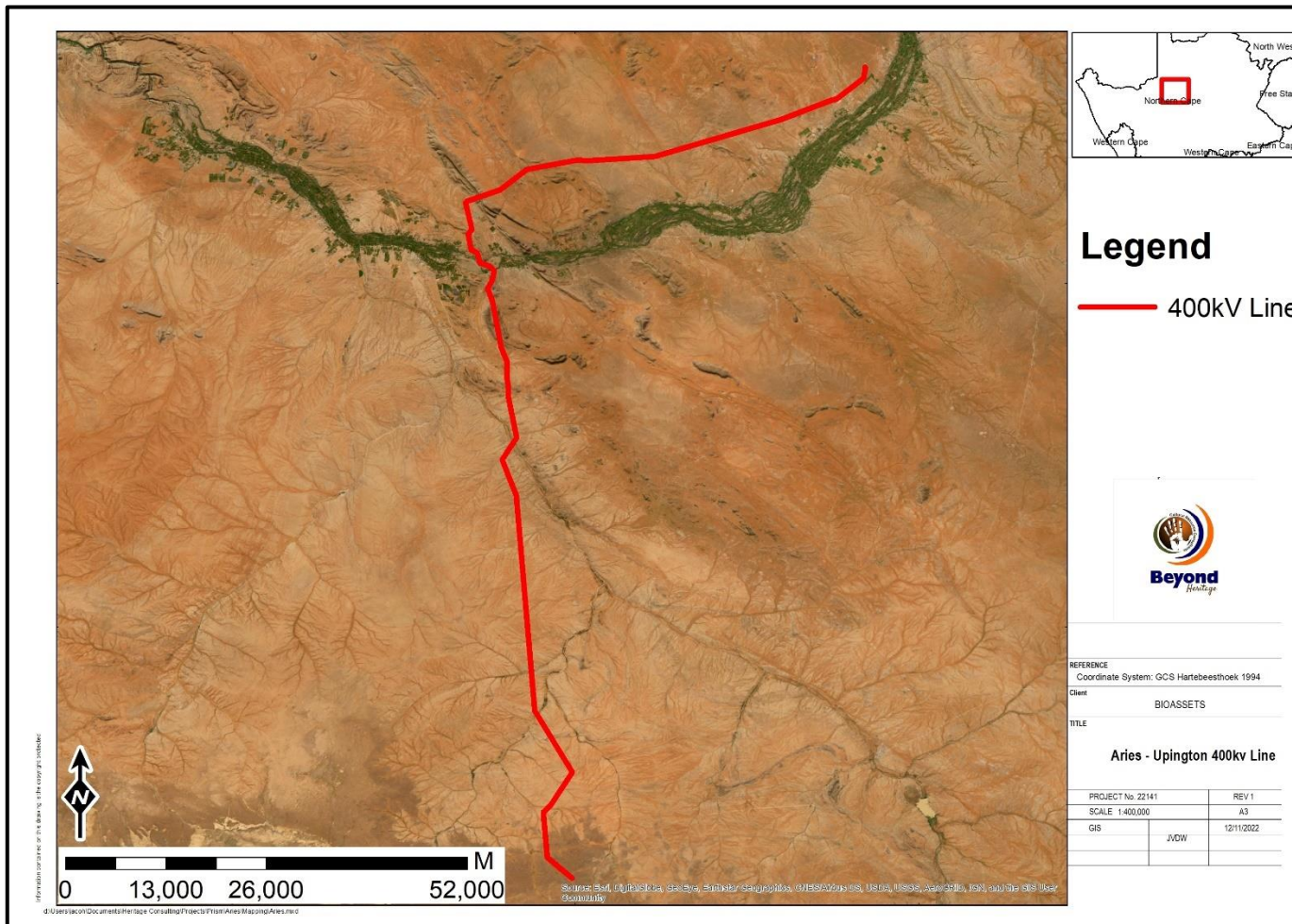


Figure 1.3. Aerial image of the Project area.

## 2 Heritage Legislation

The identification, evaluation and assessment of any cultural heritage site, artefact or find in the South African context is required and governed by the following legislation:

- i. National Environmental Management Act (NEMA), Act 107 of 1998
- ii. National Heritage Resources Act (NHRA), Act 25 of 1999
- iii. Mineral and Petroleum Resources Development Act (MPRDA), Act 28 of 2002

The following sections in each Act refer directly to the identification, evaluation and assessment of cultural heritage resources.

- i. National Environmental Management Act (NEMA) Act 107 of 1998:
  - a. Basic Environmental Assessment (BEA) – Section (23) (2)(d)
  - b. Environmental Scoping Report (ESR) – Section (29) (1)(d)
  - c. Environmental Impact Assessment (EIA) – Section (32) (2)(d)
  - d. Environmental Management Plan (EMP) – Section (34) (b)
- ii. National Heritage Resources Act (NHRA) Act 25 of 1999:
  - a. Protection of Heritage Resources – Sections 34 to 36; and
  - b. Heritage Resources Management – Section 38
- iii. Mineral and Petroleum Resources Development Act (MPRDA) Act 28 of 2002:

Phase 1 HIA's are primarily concerned with the location and identification of heritage sites situated within a proposed development area. Identified sites should be assessed according to their significance. Relevant conservation or Phase 2 mitigation recommendations should be made. Recommendations are subject to evaluation by SAHRA. Conservation or Phase 2 mitigation recommendations, as approved by SAHRA, are to be used as guidelines in the developer's decision-making process.

Phase 2 archaeological projects are primarily based on salvage/mitigation excavations preceding development destruction or impact on a site. Phase 2 excavations can only be conducted with a permit, issued by SAHRA to the appointed archaeologist. Permit conditions are prescribed by SAHRA and includes (as minimum requirements) reporting back strategies to SAHRA and deposition of excavated material at an accredited repository.

In the event of a site conservation option being preferred by the developer, a site management plan, prepared by a professional archaeologist and approved by SAHRA, will suffice as minimum requirement. After mitigation of a site, a destruction permit must be applied for with SAHRA by the applicant before development may proceed.

Human remains older than 60 years are protected by the National Heritage Resources Act, with reference to Section 36. Graves older than 60 years, but younger than 100 years fall under Section 36 of Act 25 of 1999 (National Heritage Resources Act), as well as the Human Tissues Act (Act 65 of 1983) and are the jurisdiction of SAHRA. The procedure for Consultation Regarding Burial Grounds and Graves (Section 36[5]) of Act 25 of 1999 is applicable to graves older than 60 years that are situated outside a formal cemetery administrated by a local authority. Graves in this age category, located inside a formal cemetery administrated by a local authority, require the same authorisation as set out for graves younger than 60 years, in addition to SAHRA authorisation. If the grave is not situated inside a formal cemetery, but is to be relocated to one, permission from the local authority is required and all regulations, laws and by-laws, set by the cemetery authority, must be adhered to.



Human remains that are less than 60 years old are protected under Section 2(1) of the Removal of Graves and Dead Bodies Ordinance (Ordinance No. 7 of 1925), as well as the Human Tissues Act (Act 65 of 1983) and are the jurisdiction of the National Department of Health and the relevant Provincial Department of Health and must be submitted for final approval to the office of the relevant Provincial Premier. This function is usually delegated to the Provincial MEC for Local Government and Planning; or in some cases, the MEC for Housing and Welfare. Authorisation for exhumation and reinternment must also be obtained from the relevant local or regional council where the grave is situated, as well as the relevant local or regional council to where the grave is being relocated. All local and regional provisions, laws and by-laws must also be adhered to. To handle and transport human remains, the institution conducting the relocation should be authorised under Section 24 of Act 65 of 1983 (Human Tissues Act).

### 3 METHODOLOGY

#### 3.1 Literature Review

Before the physical walk-down Beyond Heritage staff compared the proposed power line route with data from previous projects undertaken in the wider region (SAHRIS) to contextualize the study area. A HIA was conducted for the power line by Stephan Gaigher in 2012.

#### 3.2 Site Investigation

The aim of the site visit was to:

- a) survey the proposed project area to understand the heritage character of the area and to record, photograph and describe sites of archaeological, historical or cultural interest;
- b) record GPS points of sites/areas identified as significant areas;
- c) determine the levels of significance of the various types of heritage resources recorded in the project area.

**Table 1: Site Investigation Details**

	Site Investigation
Date	13 to 21 November 2022
Season	Summer – the time of year and season did not affect the survey. Overall heritage visibility was high due to short grass cover and the Project area was sufficiently covered by two archaeologists to understand the heritage character of the area (Figure 3.1).

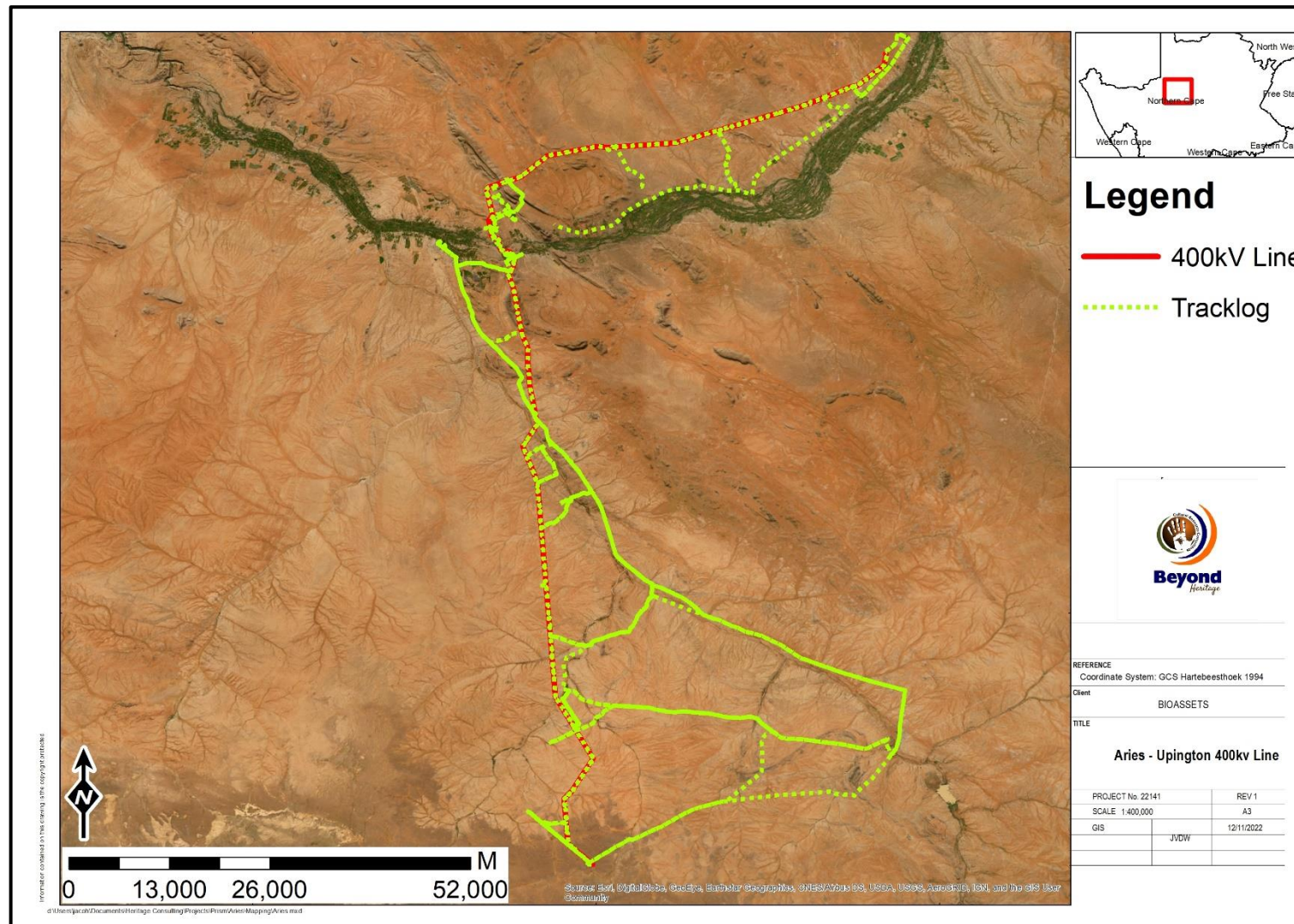


Figure 3.1. Tracklog of the survey path in green.

### 3.3 Site Significance and Field Rating

Section 3 of the NHRA distinguishes nine criteria for places and objects to qualify as 'part of the national estate' if they have cultural significance or other special value. These criteria are:

- Its importance in/to the community, or pattern of South Africa's history;
- Its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;
- Its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;
- Its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;
- Its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
- Its importance in demonstrating a high degree of creative or technical achievement at a particular period;
- Its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;
- Its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa;
- Sites of significance relating to the history of slavery in South Africa.

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, or a representative sample, depending on the nature of the project. In the case of the proposed project the local extent of its impact necessitates a representative sample and only the footprint of the areas demarcated for development were surveyed. 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. The following criteria were used to establish site significance with cognisance of Section 3 of the NHRA:

- The unique nature of a site;
- The integrity of the archaeological/cultural heritage deposits;
- 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/is known);
- The preservation condition of the sites; and
- Potential to answer present research questions.

In addition to this criteria field ratings prescribed by SAHRA (2007), and acknowledged by ASAPA for the SADC region, were used for the purpose of this report. The recommendations for each site should be read in conjunction with section 10 of this report.

**Table 2: Heritage significance and field ratings**

<b><i>FIELD RATING</i></b>	<b><i>GRADE</i></b>	<b><i>SIGNIFICANCE</i></b>	<b><i>RECOMMENDED MITIGATION</i></b>
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

### 3.4 Impact Assessment Methodology

The criteria below are used to establish the impact rating on sites:

- 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; or
  - \* permanent, assigned a score of 5;
- The **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; and
- 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:

$$S = (E+D+M) P$$

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).

### 3.5 Limitations and Constraints of the study

Due to the nature of heritage resources and pedestrian surveys, the possibility exists that some features or artefacts may not have been discovered/recorded and the possible occurrence of graves and other cultural material cannot be excluded. This limitation is successfully mitigated with the implementation of a Chance Find Procedure and monitoring of the study area by the Environmental Control Officer (ECO). This report only deals with the footprint area of the proposed development and consisted of non-intrusive surface surveys. This study did not assess the impact on medicinal plants and intangible heritage as it is assumed that these components will be highlighted through the public consultation process conducted during the EIA if relevant. It is possible that new information could come to light in future, which might change the results of this Impact Assessment. A Small section north of the Orange River was not physically assessed due to safety concerns where the powerline crosses steep cliffs.

## 4 Description of the Physical Environment

From the Upington substation the line is located south-westward along the Orange River and N14 Highway next to an existing 132 kV distribution line to just before Kakamas (about 60 km). There the line turns south, crosses over the Orange River and heads south for the 75 km to the Aries Substation, crossing over the Hartbees River.

These two rivers are also focal points on the landscape that is otherwise dominated by plains that make up the largest section of the study area. Some areas to the north of the Orange River are covered with red dunes, probably aeolian in origin. Pans occur sporadically in these areas. Small hills and outcrops of dolerite occur along the middle and northern sections of the line. The area is rugged and falls within the bioregion described by Mucina et al (2006) as the Bushmanland Bioregion with the vegetation described as Bushmanland basin shrub land.

The geology of the region is largely sedimentary in nature, being made up of sand, limestone, clay, dune sand, calcrete and silcrete, with some dolerite intrusions. In the south at the Aries Substation gravel pavements occur widely that was a source of raw material during Stone Age times. The topography is classified as flat to gently rolling plains. The area is sparsely populated and mostly used for sheep farming except for vineyards along the Orange River. Infrastructure consists of fences, existing powerlines and roads. General site conditions are illustrated in Figures 4.1 to 4.4.





Figure 4.1. Gravel pavements in the south close to Aries substation.



Figure 4.2. Existing powerline in the southern section of the study area.



Figure 4.3. General site conditions along the middle section of the line. Marked by drainage lines and plains with ridges and kopjes.



Figure 4.4. General site conditions along the northern section of the line, viewed from a sand dune showing the plains that will be traversed by the line.

## 5 Findings of the walk-down

### 5.1 Heritage Resources

Different types of heritage resources were recorded during the walk-down of the route that focussed on tangible heritage resources and is categorised and discussed below. Categories include archaeological observations related to the Stone Age, structures and refuge material dating to the recent past/historical period as well as graves and burial sites. The distribution map (Figure 5.1) shows clusters of observations in the south around the Aries substation, in the central section along the Orange River and again in the north approaching the Upington substation close to the Orange River. Spatial data and brief site descriptions are provided in Annexure A. Recorded observations were given waypoint numbers in the field and is retained for reporting purposes.

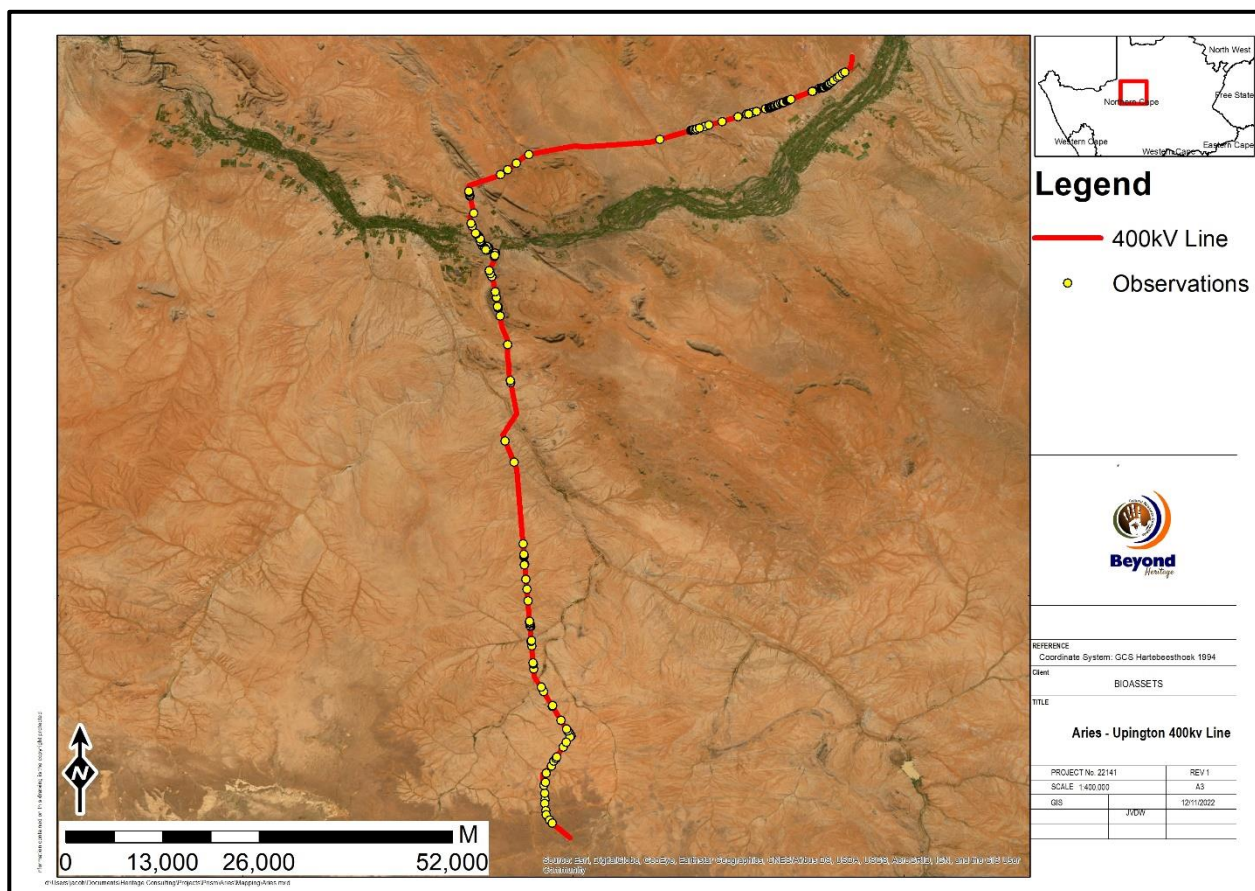


Figure 5.1. Distribution map of recorded observations.

#### Category 1: Stone Age

Stone Age lithics were found along most of the route. These are found in a deflated context, often where the calcrete is exposed or where raw material occurs and span all three periods i.e., Earlier through to the Later Stone Age. These are considered as background scatter (Orton 2016) and are generally speaking of low heritage significance and does not represent distinct archaeological sites. Clusters with slightly higher concentrations was recorded, notably in the south around the Aries substation on the farm Klein Zwart Bast (KZB) and along the Orange River in the north approaching the Upington Substation.

The area surrounding the Aries substation is characterised by extensive gravel pavements (Figure 4.1) that provides a rich source of raw material for the manufacturing of stone tools. Previous work around the Aries substation by Jonathan Kaplan (2011), Halkett & Orton (2011), Webley & Halkett (2012), Anton Pelsner (2012) and van der Walt (2017) recorded vast quantities of ESA, MSA and LSA material scattered in the



respective study areas. Collection of surface samples by Beaumont and Pelser in this area means that stone artefacts from the area around the Aries substation have been analysed and indicates the presence of humans in the area for the last two million years and is ample mitigation against the impact of the new line. An analysis of artefacts from this area by Lombard (2012) indicated that LSA material was made mainly from Jasper, CCS and chert. MSA and ESA artefacts are mainly from quartzite.

The area along the Orange River in the north (on the farms Bloemsmond, Geelkop, Daysonsklip and Tungsten Lodge to name a few) approaching the Upington Substation was the subject of various HIA's for renewable energy projects (Gaigher 2013, Fourie 2014 and Van der Walt 2015, 2019 a and b). In this area, next to drainage lines and higher-lying areas, where the calcrete is exposed through the sand cover, palimpsests of widespread background scatter of mainly MSA and to a lesser extent LSA lithics are found in a deflated context with isolated ESA Acheulean hand axes. Raw materials are also found in abundance in this area. A unique shelter was excavated in this area on the farm on Zoovoorbij 458 and a Middle Stone Age assemblage was excavated beneath Later Stone Age deposits (Smith 1995). The line is located ~ 4 km to the northwest of the site. Excavated material from the site 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. The Stone Age archaeology of this area is well described and the impact of the line on the archaeological record of this area is low.

A single discreet Stone Age site (Waypoint 6) was however recorded on the southern banks of the Orange River. The site is located on an elevated ridge and artefacts (mostly LSA with a few MSA lithics) are being washed down and piling up against jagged rocks. The site is of low to medium significance and should be avoided. Several rocky outcrops that could hold seasonal water were also recorded where a few LSA lithics were noted. Selected artefacts and observations are illustrated in Figure 5.2 -5.5.

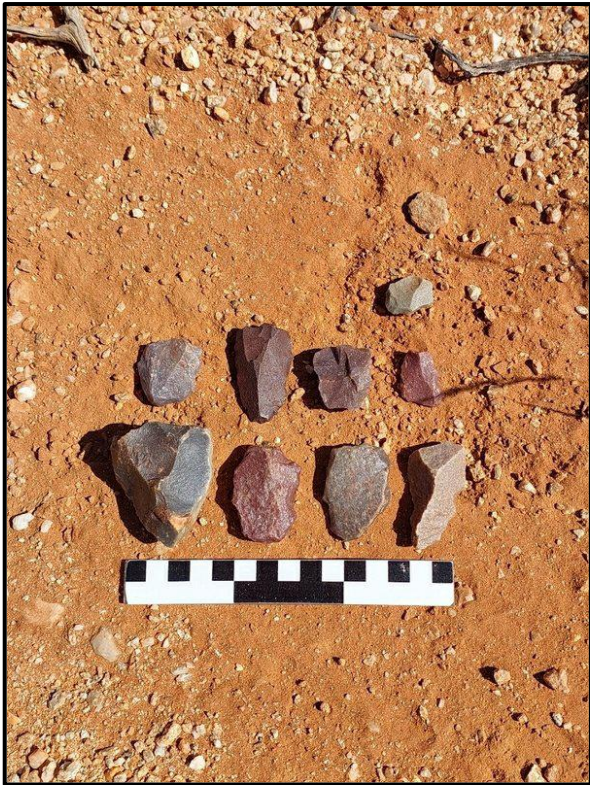


Figure 5.2. Dorsal and ventral views of MSA lithics situated on the side of the rocky hill at Waypoint 4



Figure 5.3. Dense accumulation of artefacts at Waypoint 6.





Figure 5.4. Selection of artefacts at Waypoint 6.



Figure 5.5. Acheulean hand axe from Waypoint 3401.

### **Category 2. Remains from the recent past/historical**

Occupation dating to the historical period/recent past is alluded to by the remnants of multiple packed stone features situated along the proposed line within the mountainous terrain near the Orange River. Findspots of refuse (including broken glass bottles and cans) as well as exploration pits and trenches were also noted and are illustrated below in Figure 5.6 – 5.9.





Figure 5.6. View of the historical trench at waypoint 5 - Image taken facing west.



Figure 5.7. General view of the small, stone packed structure at Waypoint 9.



Figure 5.8. Metal artefacts at Waypoint 8.



Figure 5.9. Broken glass bottles at Waypoint 8.



### Category 3. Burial Sites

Burial sites and graves are always of high social significance and during the walkdown formal graves as well as soil mounds with a few rocks that could potentially be graves were recorded at the following waypoints 7, 11, 3491, 3501 and 3511 (Figure 5.10 and 5.11).



Figure 5.10: Single grave at Waypoint 7.



Figure 5.11: Cemetery at Waypoint 11.

## 5.2 Cultural Landscape

The cultural landscape qualities of the region essentially consist of two components. The first is a rural area in which the human occupation is made up of a pre-colonial (Stone Age) occupation and a much later colonial (farmer) component marked by the occasional homestead and farming infrastructure. This rural landscape has always been sparsely populated. The second component is urban in character marked small towns like Kakamas & Keimoes and bigger towns like Upington, most of which developed during the last 150 years or less

## 6 Potential Impact

Beaumont et al. (1995:240) note that “thousands of square kilometres of Bushmanland are covered by a low-density lithic scatter” and indicates that these stone artefact scatters are common in this part of Bushmanland. Widely distributed scatters of ESA, MSA and ESA artefacts were noted along the proposed powerline, mainly on extensive gravel pavements in the south as well as in the north where raw material regularly occurs. These background scatters are generally speaking of low significance and some of the scatters (which lack discrete boundaries) will be impacted on by construction of the tower positions. Construction activities relating to the tower positions will be limited to a relatively small area and other areas will remain relatively undisturbed and the impact to archaeological material is considered to be low. Further mitigation of isolated find spots/ background scatter is considered unnecessary due to the lack of *in situ* archaeological surface sites or indications of stratified archaeological deposits and the fact that further mitigation of the small assemblage in the study area is unlikely to result in a greater understanding of the

material and the various time periods. Impacts to sites with higher concentrations of lithics with associated landscape features such as rocky outcrops that holds seasonal water can be mitigated by avoidance of the area (Waypoint 4, 6, 3431, 3461, 3481, 3421).

Stone Packed ruins at Waypoints 9, 10, 91 and 92 are degraded to such an extent that from an architectural point of view the features are severely compromised. The features are possibly older than 60 years and therefore protected by the NHRA based on their age.

Graves are always of high social significance and the recorded burial sites and potential graves should be avoided by the development. Graves (and potential graves until confirmed otherwise) at Waypoint 7, 11, 3491 and 3501 must be preserved *in situ* with a 30-meter buffer as mitigation measure (prescribed by SAHRA), which means that the line will have to be micro sited. After mitigation the impact will be Low.

Impacts to heritage resources without mitigation within the project footprint will be permanent and negative and occur during the pre-construction and construction activities. Any additional effects to subsurface heritage resources can be successfully mitigated by implementing a chance find procedure. Mitigation measures as recommended in this report should be implemented during all phases of the project. Impacts of the project on heritage resources can be managed to an acceptable level. Table 3 indicates the potential impact on the recorded sites and Table 4,5 and 6 indicates the potential impact of the project on the recorded resources. The proposed line in relation to recorded sites is illustrated in Figure 6.1 to 6.3.

**Table 3. Impact (Pillars) and proposed mitigation measures.**

Tower	Waypoint	Description	Significance	Mitigation
43	4	Archaeological Stone Age site (at koppie)	Low Significance GP C	No Mitigation required - the koppie should be indicated on development plans and avoided during construction
176 - 177	6	Archaeological site - LSA and MSA site	Medium Significance GP B	The area is sensitive and should be avoided for stringing and construction
177 - 179	383	High density Background scatter - MSA and LSA	Low to Medium Significance GP B	Pylon excavations must be monitored and could require further mitigation
177 - 179	386	Background scatter - MSA and LSA	Low to Medium Significance GP B	Pylon excavations must be monitored and could require further mitigation
184 - 187	7	Grave	High Significance GP A	Pillar 186 and 187 should be micro cited to protect the grave site

190 - 191	91	Stone structure - only foundation left	Medium Significance GP B	Micro Site pillar to preserve site alternatively mitigation will be required consisting of mapping and recording prior to applying for a destruction permit
193 - 194	10	Shelter - closed up	Low to Medium Significance GP B	Demarcate and avoid during construction
194 - 195	11	Cemetery	High Significance GP A	The pillars should be micro sited to avoid the area
219	3431	High density MSA artefacts - avoid	Low to Medium Significance -GP B	Demarcate and avoid the rocky outcrop
260 - 261	3461	Rocky outcrop - LSA scatter	Low to Medium Significance -GP B	Avoid the area during construction
299	3481	Seasonal water MSA/ LSA scatter - Avoid	High Significance GP A	Micro site Pillar 299 and avoid the area
299	3491	Potential Grave	High Significance GP A	Micro site Pillar 299 and avoid the area
299	3501	Potential Grave	High Significance GP A	Micro site Pillar 299 and avoid the area

### 6.1.1 Pre-Construction phase

It is assumed that the pre-construction phase involves the removal of topsoil and vegetation as well as the establishment of infrastructure. These activities can have a negative and irreversible impact on heritage features if any occur. Impacts include destruction or partial destruction of non-renewable heritage resources.

### 6.1.2 Construction Phase

During this phase, the impacts and effects are similar in nature but more extensive than the pre-construction phase. Potential impacts include destruction or partial destruction of non-renewable heritage resources.

### 6.1.3 Operation Phase

No impacts are expected during the operation phase.

#### 6.1.4 Impact Assessment for the Project

Table 4. Impact assessment for the proposed project on Stone Age Scatters at Waypoint 3341, 3311, 320, 324, 325, 326, 327, 328, 329, 330, 3, 334, 335, 336, 338, 339, 340, 343, 344, 345, 346, 348, 349, 354, 355, 356, 357, 358, 359, 360, 364, 365, 368, 370, 3371, 3391, 3401, 372, 373, 374, 375, 376, 377, 378, 379, 380, 382, 383, 386, 390, 391, 392, 393, 395, 396, 397, 398, 399, 401, 402, 8, 405, 406, 407, 408, 409, 412 3441, 414, 415, 420, 418, 12, 423, 424, 425, 426, 427, 428, 429, 433, 434, 435, 437, 438, 439, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 3471, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 13, 337, 440, 3321, 3331, 3351, 3361, 3381, 3411, 3451, 347, 350, 353, 363, 366, 367, 369, 384, 385, 387, 388, 389, 394, 400, 403, 404, 413, 416, 417, 419, 422, 430, 432, 436, 456

<b>Nature:</b> During the construction phase activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position archaeological material or objects.		
	<b>Without mitigation</b>	<b>With mitigation (Preservation/recording)</b>
<b>Extent</b>	Site specific (1)	Site specific (1)
<b>Duration</b>	Permanent (5)	Permanent (5)
<b>Magnitude</b>	Minor (2)	Minor (2)
<b>Probability</b>	Improbable (2)	Improbable (2)
<b>Significance</b>	<b>16 (Low)</b>	<b>16 (Low)</b>
<b>Status (positive or negative)</b>	Negative	Negative
<b>Reversibility</b>	Not reversible	Not reversible
<b>Irreplaceable loss of resources?</b>	Yes	Yes
<b>Can impacts be mitigated?</b>	Yes	Yes
<b>Mitigation:</b> Due to the low impact no mitigation is required prior to construction. A Chance Find Procedure should be implemented for the project.		
<b>Residual Impacts:</b> If sites are destroyed this results in the depletion of archaeological record of the area and even though surface features can be avoided or mitigated, there is a chance that completely buried sites would still be impacted but this cannot be quantified. However, if sites are recorded and preserved or mitigated this adds to the record of the area.		



**Table 5. Impact assessment for the proposed project on Archaeological sites (Waypoint 4, 6, 382, 383, 386, 3431, 3461 and 3481)**

<b>Nature:</b> During the construction phase activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position archaeological material or objects.		
	<b>Without mitigation</b>	<b>With mitigation (Preservation/recording)</b>
<b>Extent</b>	Site specific (1)	Site specific (1)
<b>Duration</b>	Permanent (5)	Permanent (5)
<b>Magnitude</b>	Moderate (6)	Minor (2)
<b>Probability</b>	Probable (3)	Not Probable (2)
<b>Significance</b>	<b>36 (Medium)</b>	<b>16 (Low)</b>
<b>Status (positive or negative)</b>	Negative	Negative
<b>Reversibility</b>	Not reversible	Not reversible
<b>Irreplaceable loss of resources?</b>	Yes	Yes
<b>Can impacts be mitigated?</b>	Yes	Yes
<b>Mitigation:</b> <ul style="list-style-type: none"> <li>The preferable course of action at is avoidance of the features to prevent impacts to the recorded sites. If this is not possible extensive Phase 2 mitigation will be required which will require mapping and test excavations before a destruction permit can be applied for.</li> <li>The koppie (waypoint 4) (74 m from pillar 43) should be indicated on development plans and avoided during construction</li> <li>The area at Pillar 176 – 177 is sensitive (Waypoint 6) and should be avoided for stringing and construction</li> <li>Pylon excavations must be monitored and could require further mitigation at waypoint 383 (Pillar 177 to 179);</li> <li>Pillars 219, 260 – 261 and 299 should be micro sited to avoid the Stone Age features at waypoint 3431, 3461 and 3481.</li> <li>The study area should be monitored by the ECO during construction to implementation the Chance Find Procedure for the project.</li> </ul>		
<b>Residual Impacts:</b> If sites are destroyed this results in the depletion of archaeological record of the area and even though surface features can be avoided or mitigated, there is a chance that completely buried sites would still be impacted but this cannot be quantified. However, if sites are recorded and preserved or mitigated this adds to the record of the area.		

Table 6. Impact assessment of the project on ruins (Waypoint 10 and 91)

<b>Nature:</b> During the construction phase activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position archaeological material or objects.		
	Without mitigation	With mitigation (Preservation/recording)
<b>Extent</b>	Site specific (1)	Site specific (1)
<b>Duration</b>	Permanent (5)	Permanent (5)
<b>Magnitude</b>	Moderate (6)	Minor (2)
<b>Probability</b>	Probable (3)	Not Probable (2)
<b>Significance</b>	<b>36 (Medium)</b>	<b>16 (Low)</b>
<b>Status (positive or negative)</b>	Negative	Negative
<b>Reversibility</b>	Not reversible	Not reversible
<b>Irreplaceable loss of resources?</b>	Yes	Yes
<b>Can impacts be mitigated?</b>	Yes	Yes
<b>Mitigation:</b> <ul style="list-style-type: none"> <li>The small shelter at waypoint 10 (Pillar 193 – 194) should be demarcated and avoided during construction</li> <li>The remains of structures should be avoided by the development by moving the relevant pillars (Pillar 190 and 191 at waypoint 91), if this is not possible mitigation will be required consisting of mapping and recording prior to applying for a destruction permit.</li> </ul>		
<b>Residual Impacts:</b> If sites are destroyed this results in the depletion of archaeological record of the area and even though surface features can be avoided or mitigated, there is a chance that completely buried sites would still be impacted but this cannot be quantified. However, if sites are recorded and preserved or mitigated this adds to the record of the area.		

Table 7. Impacts of the project on burial sites (Waypoint 7, 11, 3491, 3501, 3511).

<b>Nature:</b> During the construction phase activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position archaeological material or objects.		
	Without mitigation	With mitigation (Preservation/recording)
<b>Extent</b>	Local (2)	Local (2)
<b>Duration</b>	Permanent (5)	Permanent (5)
<b>Magnitude</b>	Moderate to high (7)	Moderate (6)
<b>Probability</b>	Highly Probable (4)	Not Probable (2)
<b>Significance</b>	<b>56 (Medium to high)</b>	<b>26 (Low)</b>
<b>Status (positive or negative)</b>	Negative	Negative
<b>Reversibility</b>	Not reversible	Not reversible
<b>Irreplaceable loss of resources?</b>	Yes	Yes
<b>Can impacts be mitigated?</b>	Yes	Yes
<b>Mitigation:</b> <ul style="list-style-type: none"> <li>Graves and burial sites (as well as potential graves until proven otherwise) should be avoided with a 30 m buffer zone and as such Waypoint 7, 11, 3491, 3501, 3511 should be indicated on development plans and the associated pillars (184 – 187, 194 – 195 and 299) should be micro sited to avoid these features. Access for the family members should be ensured;</li> <li>Recorded heritage features should be indicated on development plans and construction crews should be made aware of expected resources and applicable mitigation measures;</li> </ul>		
<b>Residual Impacts:</b>		

If sites are destroyed this results in the depletion of archaeological record of the area and even though surface features can be avoided or mitigated, there is a chance that completely buried sites would still be impacted but this cannot be quantified. However, if sites are recorded and preserved or mitigated this adds to the record of the area.

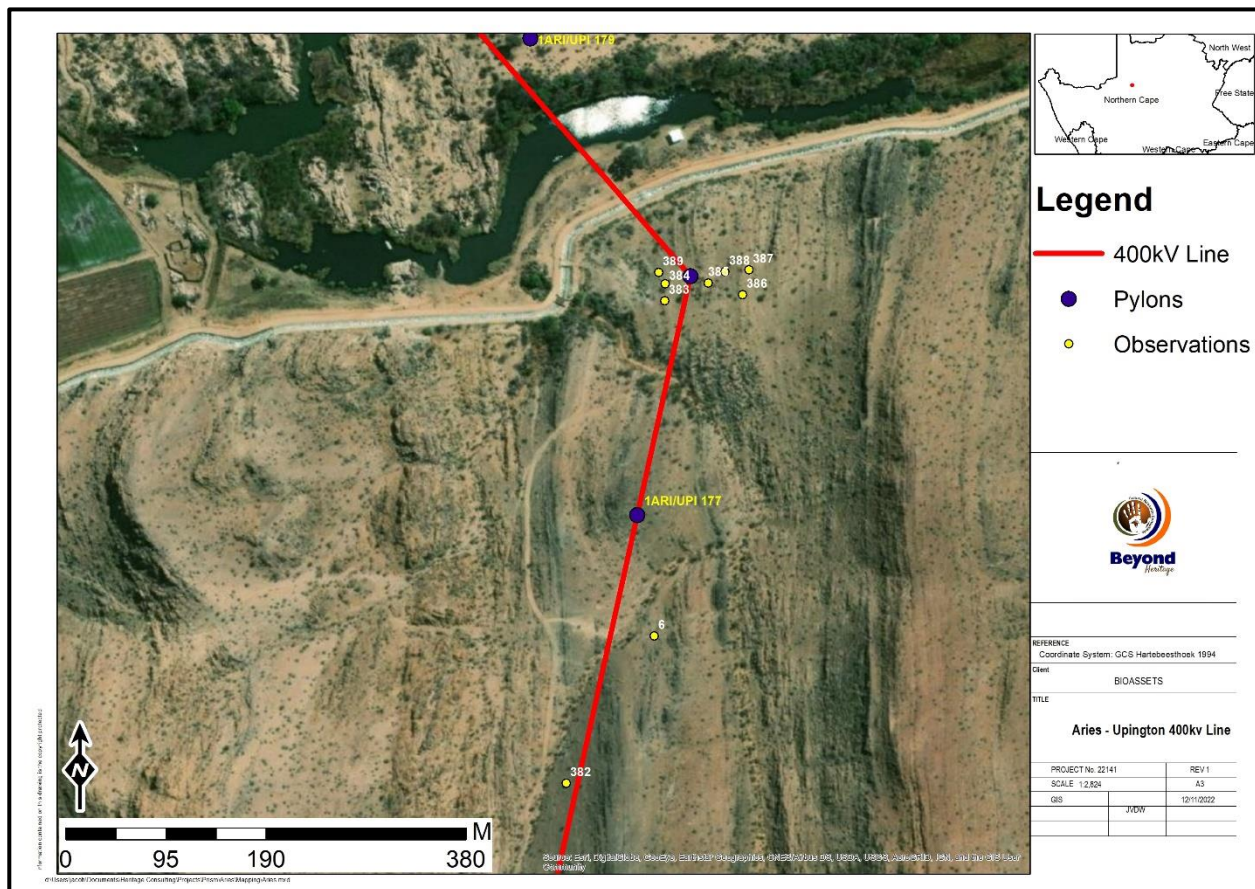


Figure 6.1. Waypoint 6, that should be avoided in relation to the proposed line.

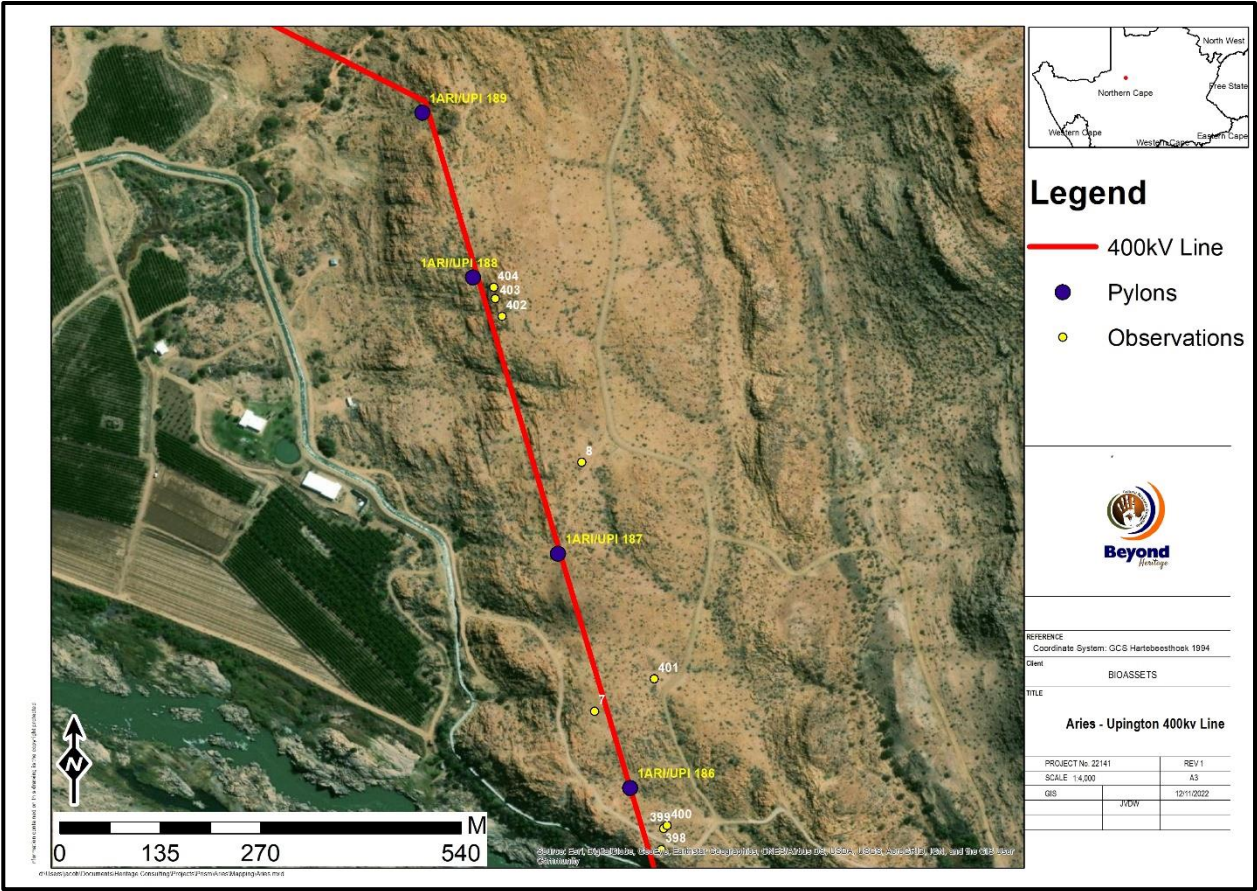


Figure 6.2. Waypoint 7 (grave that should be avoided) in relation to the proposed line as well as recorded Stone Age scatters at Waypoint 398– 404.



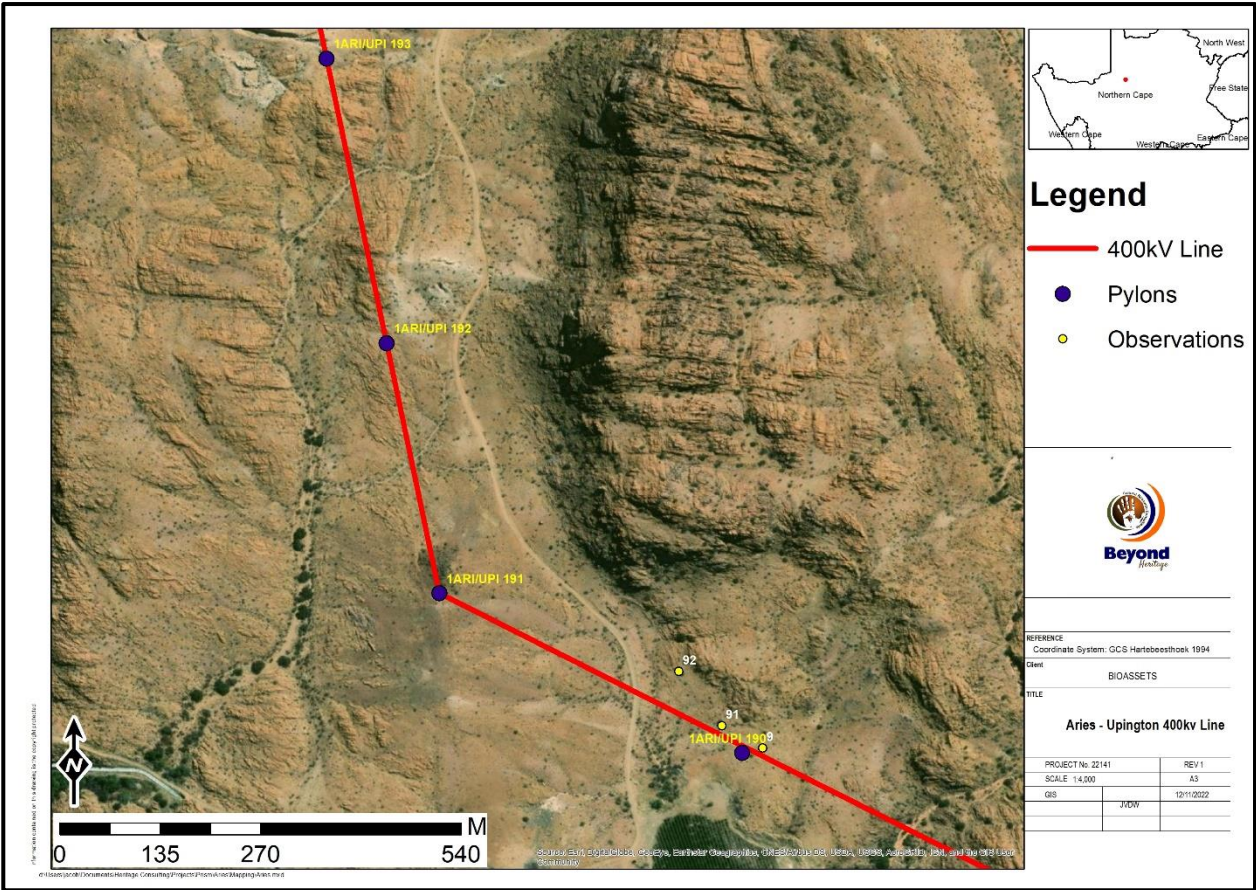


Figure 6.3. Proximity of the proposed line on recorded remnants of structures at Waypoint 91 and 92.

## 7 Conclusion and recommendations

Widely distributed scatters of MSA artefacts and possibly ESA artefacts were noted along the proposed power line, mainly on extensive gravel pavements. Some of the scatters (which lack discrete boundaries) will be impacted on by construction of the tower positions. Construction activities relating to the tower positions will be limited to a relatively small area and other areas will remain relatively undisturbed and the impact to archaeological scatters is considered to be low.

Beaumont *et al.* (1995:240) note that “thousands of square kilometres of Bushmanland are covered by a low-density lithic scatter” and indicates that these stone artefact scatters are common in this part of Bushmanland. These scatters are therefore given a field rating of Generally Protected C.

In addition, Beaumont *et al.* 1995 have undertaken a systematic collection of material on the broader Olyven Kolk Farm and a lithic analysis on material from Klein Zwart Bast was conducted by Prof. Marlize Lombard (2012). A collection and analysis of stone artefacts from this area therefore exists and further mitigation of Stone Age background scatter is considered unnecessary in view of the existing collections. Stone Age sites with a higher concentration of artefacts and distinct sites with associated landscape elements such as rocky outcrops and seasonal water should be indicated on development plans and pylons micro sited in these areas to avoid the sites.

The remains of structures should be avoided by the development by moving the relevant pillars (Pillar 190 and 191 waypoint 91), if this is not possible mitigation will be required consisting of mapping and recording prior to applying for a destruction permit.

Graves and burial sites (as well as potential graves until proven otherwise) should be avoided with a 30 m buffer zone and as such Waypoint 7, 11, 3491, 3501, 3511 should be indicated on development plans and the associated pillars (184 – 187, 194 – 195 and 299) should be micro sited to avoid these features.

The impact on heritage resources can be mitigated to an acceptable level provided that the recommendations in this report are adhered to and based on the South African Heritage Resource Authority (SAHRA) 's approval.

### 7.1 Recommendations for condition of authorisation

The following recommendations apply, and the project may only proceed based on approval from SAHRA:

#### Recommendations:

- The preferable course of action at is avoidance of the features to prevent impacts to the recorded sites. If this is not possible extensive Phase 2 mitigation will be required which will require mapping and test excavations before a destruction permit can be applied for.
- The koppie (74 m from pillar 43) should be indicated on development plans and avoided during construction
- The area at Pillar 176 – 177 is sensitive (Waypoint 6) and should be avoided for stringing and construction
- Pylon excavations must be monitored and could require further mitigation at waypoint 383 (Pillar 177 to 179);
- Pillars 219, 260 – 261 and 299 should be micro sited to avoid the Stone Age features at waypoint 3431, 3461 and 3481.
- The small shelter at waypoint 10 (Pillar 193 – 194) should be demarcated and avoided during construction
- The remains of structures should be avoided by the development by moving the relevant pillars (Pillar 190 and 191 at waypoint 91), if this is not possible mitigation will be required consisting of mapping and recording prior to applying for a destruction permit.
- Graves and burial sites (as well as potential graves until proven otherwise) should be avoided with a 30 m buffer zone and as such Waypoint 7, 11, 3491, 3501, 3511 should be indicated on development plans and the associated pillars (184 – 187, 194 – 195 and 299) should be micro sited to avoid these features. Access for the family members should be ensured;
- Recorded heritage features should be indicated on development plans and construction crews should be made aware of expected resources and applicable mitigation measures;
- The study area should be monitored by the ECO during construction to implementation the Chance Find Procedure for the project (Section 7.2).

**Table 8. Site specific recommendations for the project.**

Tower	Waypoint	Longitude	Latitude	Description	Significance	Mitigation
43	4	20° 46' 29.0856" E	29° 19' 57.6732" S	Archaeological Stone Age site (at koppie)	Low Significance GP C	No Mitigation required - the koppie should be indicated on development plans and avoided during construction
176 - 177	6	20° 42' 17.3519" E	28° 47' 18.5495" S	Archaeological site - LSA and MSA site	Medium Significance GP B	The area is sensitive and should be avoided for stringing and construction
177 - 179	383	20° 42' 17.6796" E	28° 47' 08.2357" S	High density Background scatter - MSA and LSA	Low to Medium Significance GP B	Pylon excavations must be monitored and could require further mitigation

177 - 179	386	20° 42' 20.0737" E	28° 47' 08.0592" S	Background scatter - MSA and LSA	Low to Medium Significance GP B	Pylon excavations must be monitored and could require further mitigation
184 - 187	7	20° 41' 13.4844" E	28° 46' 15.9132" S	Grave	High Significance GP A	Pillar 186 and 187 should be micro cited to protect the grave site
190 - 191	91	20° 40' 54.4045" E	28° 45' 43.0561" S	Stone structure - only foundation left	Medium Significance GP B	Micro Site pillar to preserve site alternatively mitigation will be required consisting of mapping and recording prior to applying for a destruction permit
193 - 194	10	20° 40' 39.0253" E	28° 45' 09.4500" S	Shelter - closed up	Low to Medium Significance GP B	Demarcate and avoid during construction
194 - 195	11	20° 40' 33.3911" E	28° 44' 57.7105" S	Cemetery	High Significance GP A	The pillars should be micro sited to avoid the area
219	3431	20° 43' 13.0151" E	28° 41' 03.8473" S	High density MSA artefacts - avoid	Low to Medium Significance -GP B	Demarcate and avoid the rocky outcrop
260 - 261	3461	20° 54' 15.6241" E	28° 38' 52.0188" S	Rocky outcrop - LSA scatter	Low to Medium Significance -GP B	Avoid the area during construction
299	3481	21° 05' 24.5004" E	28° 35' 22.4952" S	Seasonal water MSA/ LSA scatter - Avoid	High Significance GP A	Micro site Pillar 299 and avoid the area
299	3491	21° 05' 20.4397" E	28° 35' 23.4420" S	Potential Grave	High Significance GP A	Micro site Pillar 299 and avoid the area
299	3501	21° 05' 19.7448" E	28° 35' 24.4140" S	Potential Grave	High Significance GP A	Micro site Pillar 299 and avoid the area



## **7.2 Chance Find Procedures**

### **7.2.1 Heritage Resources**

The possibility of the occurrence of subsurface finds cannot be excluded. Therefore, if during construction any possible finds such as stone tool scatters, artefacts or bone and fossil remains are made, the operations must be stopped, and a qualified archaeologist must be contacted for an assessment of the find and therefore chance find procedures should be put in place as part of the EMP. A short summary of chance find procedures is discussed below and monitoring guidelines for this procedure are provided in Section 10.5. This procedure applies to the developer's permanent employees, its subsidiaries, contractors and subcontractors, and service providers. The aim of this procedure is to establish monitoring and reporting procedures to ensure compliance with this policy and its associated procedures. Construction crews must be properly inducted to ensure they are fully aware of the procedures regarding chance finds as discussed below.

- If during the pre-construction phase, construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance or heritage site, this person must cease work at the site of the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager.
- It is the responsibility of the senior on-site Manager to make an initial assessment of the extent of the find and confirm the extent of the work stoppage in that area.
- The senior on-site Manager will inform the ECO of the chance find and its immediate impact on operations. The ECO will then contact a professional archaeologist for an assessment of the finds who will notify the SAHRA.

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## 9 Annexure A

**Table 9. Recorded Heritage features**

Tower	Label	Longitude	Latitude	Description	Significance	Mitigation
10	3341	20° 46' 01.4412" E	29° 27' 53.1935" S	Gravel pavement with raw material in deflated context dating to the ESA, MSA, LSA	Low to medium GP C	No Mitigation required
014 - 015	3311	20° 45' 56.4047" E	29° 26' 46.8960" S	Gravel pavement with raw material in deflated context dating to the ESA, MSA, LSA	Low to medium GP C	No Mitigation required
015 - 017	320	20° 45' 54.1799" E	29° 26' 18.9961" S	Gravel pavement with raw material in deflated context dating to the ESA, MSA, LSA	Low to Medium Significance -GP B	No Mitigation required
016 - 017	324	20° 45' 50.6917" E	29° 25' 43.5937" S	Gravel pavement with raw material in deflated context dating to the ESA, MSA, LSA	Low to Medium Significance -GP B	No Mitigation required

018 - 019	1	20° 45' 57.1859" E	29° 25' 30.8820" S	Isolated Lithics, part of Background scatters, mostly MSA	Low Significance GP C	No Mitigation required
21 - 22	2	20° 46' 01.0993" E	29° 24' 51.9733" S	Historical exploration / well	Low Significance GP C	No Mitigation required
048	343	20° 45' 49.5037" E	29° 18' 56.1421" S	Isolated Lithics, part of Background scatters, mostly MSA	Low Significance GP C	No Mitigation required
048 - 049	344	20° 45' 38.8188" E	29° 18' 36.4141" S	Isolated Lithics, part of Background scatters, mostly MSA	Low Significance GP C	No Mitigation required
054 -055	345	20° 45' 06.1742" E	29° 17' 17.7793" S	Isolated Lithics, part of Background scatters, mostly MSA	Low Significance GP C	No Mitigation required



055 - 056	346	20° 45' 04.8241" E	29° 16' 56.1793" S	Isolated Lithics, part of Background scatters, mostly MSA	Low Significance GP C	No Mitigation required
060 - 061	348	20° 44' 57.7861" E	29° 15' 37.6740" S	Isolated Lithics, part of Background scatters, mostly MSA	Low Significance GP C	No Mitigation required
061 - 062	349	20° 44' 55.4029" E	29° 15' 18.1116" S	Isolated Lithics, part of Background scatters, mostly MSA	Low Significance GP C	No Mitigation required
065 - 067	354	20° 44' 52.7928" E	29° 14' 12.6959" S	Isolated Lithics, part of Background scatters, mostly MSA	Low Significance GP C	No Mitigation required
065 - 067	355	20° 44' 50.0928" E	29° 14' 08.2608" S	Isolated Lithics, part of Background scatters, mostly MSA	Low Significance GP C	No Mitigation required

065 - 067	356	20° 44' 49.5529" E	29° 14' 00.0025" S	Isolated Lithics, part of Background scatters, mostly MSA	Low Significance GP C	No Mitigation required
065 - 067	357	20° 44' 48.6133" E	29° 13' 57.4968" S	Isolated Lithics, part of Background scatters, mostly MSA	Low Significance GP C	No Mitigation required
065 - 067	358	20° 44' 48.4799" E	29° 13' 50.5019" S	Isolated Lithics, part of Background scatters, mostly MSA	Low Significance GP C	No Mitigation required
072 - 073	359	20° 44' 41.5141" E	29° 12' 20.7864" S	Isolated Lithics, part of Background scatters, mostly MSA	Low Significance GP C	No Mitigation required
075 - 076	360	20° 44' 36.5639" E	29° 11' 30.2459" S	Isolated Lithics, part of Background scatters, mostly MSA	Low Significance GP C	No Mitigation required

82	5	20° 44' 24.6155" E	29° 09' 45.9755" S	Mining trenches	Low Significance GP C	No Mitigation required
082 - 083	364	20° 44' 27.1716" E	29° 09' 42.3431" S	Mining Trenches	Low Significance GP C	No Mitigation required
084 - 085	365	20° 44' 23.9713" E	29° 09' 09.5327" S	Isolated Lithics, part of Background scatter, mostly MSA	Low Significance GP C	No Mitigation required
084 - 085	368	20° 44' 23.7157" E	29° 09' 03.3731" S	Isolated Lithics, part of Background scatter, mostly MSA	Low Significance GP C	No Mitigation required
087 - 088	370	20° 44' 19.5721" E	29° 08' 13.3945" S	Isolated Lithics, part of Background scatter, mostly MSA	Low Significance GP C	No Mitigation required

110 - 111	3371	20° 43' 40.0871" E	29° 02' 16.9224" S	Isolated Lithics, part of Background scatter, mostly MSA	Low Significance GP C	No Mitigation required
135 - 136	3391	20° 43' 26.4073" E	28° 56' 31.2828" S	Isolated Lithics, part of Background scatter, mostly MSA with one ESA Acheulean hand axe	Low Significance GP C	No Mitigation required
136 - 137	3401	20° 43' 23.9665" E	28° 56' 21.9084" S	Isolated Lithics, part of Background scatter, mostly MSA with one Acheulean hand axe found to the north	Low Significance GP C	No Mitigation required
156 - 157	372	20° 42' 39.2652" E	28° 51' 41.7168" S	Isolated Lithics, part of Background scatter, mostly MSA	Low Significance GP C	No Mitigation required
158 - 160	373	20° 42' 32.1913" E	28° 51' 05.9689" S	Isolated Lithics, part of Background scatter, mostly MSA	Low Significance GP C	No Mitigation required
158 - 160	374	20° 42' 31.1291" E	28° 51' 00.8639" S	Isolated Lithics, part of Background scatter, mostly MSA	Low Significance GP C	No Mitigation required

158 - 160	51	20° 42' 29.2716" E	28° 50' 59.4167" S	Isolated Lithics, part of Background scatter, mostly MSA	Low Significance GP C	No Mitigation required
162 - 163	375	20° 42' 23.4252" E	28° 50' 21.2063" S	Isolated Lithics in the larger area	Low Significance GP C	No Mitigation required
162 - 163	376	20° 42' 23.2704" E	28° 50' 21.1523" S	Isolated Lithics in the larger area	Low Significance GP C	No Mitigation required
164 - 165	377	20° 42' 19.3860" E	28° 49' 54.9083" S	Isolated Lithics in the larger area	Low Significance GP C	No Mitigation required
168 - 169	378	20° 42' 03.4343" E	28° 48' 50.5403" S	Isolated Lithics, part of Background scatter, mostly MSA	Low Significance GP C	No Mitigation required



169 - 170	379	20° 41' 57.8185" E	28° 48' 36.3385" S	Isolated Lithics, part of Background scatter, mostly MSA	Low Significance GP C	No Mitigation required
170 - 172	380	20° 41' 52.6776" E	28° 48' 24.0516" S	Isolated Lithics, part of Background scatter, mostly MSA	Low Significance GP C	No Mitigation required
176 - 177	6	20° 42' 17.3519" E	28° 47' 18.5495" S	Stone Age Archaeological site between the pillars - the area is sensitive and should be avoided for stringing and construction.	Medium Significance GP B	The area is sensitive and should be avoided for stringing and construction
176 - 177	382	20° 42' 14.6521" E	28° 47' 23.0821" S	Stone Age Archaeological site between the pillars - the area is sensitive and should be avoided for stringing and construction	Medium Significance GP B	Avoid the area during stringing and construction

177 - 179	383	20° 42' 17.6796" E	28° 47' 08.2357" S	High density scatter of mostly MSA and LSA artefacts in a disturbed context. Pylon excavations must be monitored and could require further mitigation	Low to Medium Significance GP B	Pylon excavations must be monitored and could require further mitigation
177 - 179	386	20° 42' 20.0737" E	28° 47' 08.0592" S	High density scatter of mostly MSA and LSA artefacts in a disturbed context. Pylon excavations must be monitored and could require further mitigation	Low to Medium Significance GP B	Pylon excavations must be monitored and could require further mitigation
180 - 184	390	20° 41' 49.7401" E	28° 46' 51.3481" S	Low density background scatter	Low Significance GP C	No Mitigation required
180 - 184	391	20° 41' 50.5645" E	28° 46' 45.5771" S	Low density background scatter	Low Significance GP C	No Mitigation required

180 - 184	392	20° 41' 47.5799" E	28° 46' 42.3228" S	Low density background scatter	Low Significance GP C	No Mitigation required
180 - 184	393	20° 41' 40.1532" E	28° 46' 38.8343" S	Low density background scatter	Low Significance GP C	No Mitigation required
180 - 184	395	20° 41' 32.7157" E	28° 46' 44.5621" S	Low density background scatter	Low Significance GP C	No Mitigation required
180 - 184	396	20° 41' 37.3741" E	28° 46' 52.3885" S	Low density background scatter	Low Significance GP C	No Mitigation required
180 - 184	397	20° 41' 37.3741" E	28° 46' 52.4676" S	Low density background scatter	Low Significance GP C	No Mitigation required

184 - 187	7	20° 41' 13.4844" E	28° 46' 15.9132" S	Isolated Lithics, part of Background scatter, mostly MSA as well as a potential grave between 186 and 187, the grave is of high significance. Pillar 186 and 187 should be avoided to protect the grave site	High Significance GP A	Pillar 186 and 187 should be avoided to protect the grave site
184 - 187	398	20° 41' 16.3969" E	28° 46' 21.9361" S	Isolated Lithics, part of Background scatter, mostly MSA as well as a potential grave between 186 and 187, the grave is of high significance. Pillar 186 and 187 should be avoided to protect the grave site	High Significance GP A	Pillar 186 and 187 should be avoided to protect the grave site
184 - 187	399	20° 41' 16.4904" E	28° 46' 21.0287" S	Isolated Lithics, part of Background scatter, mostly MSA as well as a potential grave between 186 and 187, the grave is of high significance. Pillar 186 and 187 should be avoided to protect the grave site	High Significance GP A	Pillar 186 and 187 should be avoided to protect the grave site

184 - 187	401	20° 41' 16.0837" E	28° 46' 14.5019" S	Isolated Lithics, part of Background scatter, mostly MSA as well as a potential grave between 186 and 187, the grave is of high significance. Pillar 186 and 187 should be avoided to protect the grave site	High Significance GP A	Pillar 186 and 187 should be avoided to protect the grave site
187 - 189	402	20° 41' 09.4597" E	28° 45' 58.7304" S	Isolated Lithics, part of Background scatter, MSA and LSA	Low Significance GP C	No Mitigation required
187 - 189	8	20° 41' 12.9301" E	28° 46' 05.0737" S	Isolated Lithics, part of Background scatter, mostly MSA as well as a potential grave between 186 and 187, the grave is of high significance. Pillar 186 and 187 should be avoided to protect the grave site	High Significance GP A	Pillar 186 and 187 should be micro sited to protect the grave site
190 - 191	91	20° 40' 54.4045" E	28° 45' 43.0561" S	Stone structure foundation and ephemeral stone walling. Micro site pillar to preserve site alternatively mitigation will be required consisting of mapping and recording prior to applying for a destruction permit	Medium Significance GP B	Micro site pillar to preserve site alternatively mitigation will be required consisting of mapping and recording prior to applying for a destruction permit



193 - 194	10	20° 40' 39.0253" E	28° 45' 09.4500" S	Shelter with stone wall and stone built structures. Demarcate and avoid during construction	Low to Medium Significance GP B	Demarcate and avoid during construction
194 - 195	11	20° 40' 33.3911" E	28° 44' 57.7105" S	Shelter with stone wall and stone built structures. Demarcate and avoid during construction. A cemetery is located between 194 and 195 and the pillars should be micro sited to avoid the area	High Significance GP A	The pillars should be moved to avoid the area
198 - 200	405	20° 40' 45.0552" E	28° 44' 13.3945" S	Isolated Lithics, part of Background scatter, MSA and LSA	Low Significance GP C	No Mitigation required
198 - 200	406	20° 40' 45.0479" E	28° 44' 12.8004" S	Isolated Lithics, part of Background scatter, MSA and LSA	Low Significance GP C	No Mitigation required

204	407	20° 40' 27.9300" E	28° 42' 58.9534" S	Isolated Lithics, part of Background scatter, MSA and LSA	Low Significance GP C	No Mitigation required
204 - 205	408	20° 40' 26.0797" E	28° 42' 52.1137" S	Isolated Lithics, part of Background scatter, MSA and LSA	Low Significance GP C	No Mitigation required
205	409	20° 40' 25.1796" E	28° 42' 44.9532" S	Isolated Lithics, part of Background scatter, MSA and LSA	Low Significance GP C	No Mitigation required
205 - 206	412	20° 40' 24.0167" E	28° 42' 41.2127" S	Isolated Lithics, part of Background scatter, MSA and LSA	Low Significance GP C	No Mitigation required
219	3431	20° 43' 13.0151" E	28° 41' 03.8473" S	Rocky outcrop with artefacts dating to the LSA to the north of the line - demarcate and avoid the rocky outcrop	Low to Medium Significance -GP B	Demarcate and avoid the rocky outcrop
221 - 222	3441	20° 43' 49.9799" E	28° 40' 36.1307" S	Isolated MSA Quartz flakes	Low significance GP C	No Mitigation required

260 - 261	3461	20° 54' 15.6241" E	28° 38' 52.0188" S	Rocky outcrop - LSA scatter avoid the area during construction	Low to Medium Significance -GP B	Avoid the area during construction
267 - 269	414	20° 56' 30.5268" E	28° 38' 13.4411" S	Background scatter - MSA and LSA lithics	Low Significance GP C	No Mitigation required
267	415	20° 56' 33.8134" E	28° 38' 13.6176" S	Background scatter - MSA and LSA lithics	Low Significance GP C	No Mitigation required
267	420	20° 56' 51.7307" E	28° 38' 11.0579" S	Background scatter - MSA and LSA lithics	Low Significance GP C	No Mitigation required
Not impacted on by this line	9	20° 40' 56.1791" E	28° 45' 44.0280" S	Stone structure - only foundation left	Low to Medium Significance GP B	No Mitigation required

Not impacted on by this line	92	20° 40' 52.5289" E	28° 45' 40.6801" S	Stone structure - only foundation left	Low to Medium Significance GP B	No Mitigation required
Not impacted on by this line	13	21° 00' 42.4835" E	28° 37' 03.1548" S	Hammerstone on Dune - Find spot	Low Significance GP C	No Mitigation required
Not impacted on by this line	337	20° 47' 29.0077" E	29° 21' 39.6937" S	Background scatter - MSA and LSA	Low Significance GP C	No Mitigation required
Not impacted on by this line	440	21° 02' 19.9392" E	28° 36' 32.2199" S	Background scatter - MSA and LSA	Low Significance GP C	No Mitigation required
Not impacted on by this line	3321	20° 45' 54.4609" E	29° 27' 03.8809" S	ESA and MSA Background Scatter	Low Significance GP C	No Mitigation required

Not impacted on by this line	3331	20° 45' 58.7701" E	29° 27' 34.9993" S	ESA and MSA Background Scatter	Low Significance GP C	No Mitigation required
Not impacted on by this line	3351	20° 46' 15.6647" E	29° 28' 15.4019" S	Background scatter - MSA and LSA	Low Significance GP C	No Mitigation required
Not impacted on by this line	3361	20° 46' 26.8644" E	29° 28' 28.6103" S	Background scatter - MSA and LSA	Low Significance GP C	No Mitigation required
Not impacted on by this line	3381	20° 43' 02.0173" E	29° 00' 44.8523" S	Background scatter - MSA and LSA	Low Significance GP C	No Mitigation required
Not impacted on by this line	3411	20° 43' 13.3609" E	28° 53' 46.5251" S	Acheulean Hand axe	Low Significance GP C	No Mitigation required
Not impacted on by this line	3421	20° 42' 42.0084" E	28° 41' 25.4905" S	High density MSA artefacts - avoid	Medium Significance GP B	Demarcate and avoid the area to preserve the site.



Not impacted on by this line	3451	20° 44' 45.4163" E	28° 39' 57.8736" S	ESA Background Scatter	Low Significance GP C	No Mitigation required
Not impacted on by this line	3511	21° 05' 20.8139" E	28° 35' 23.1361" S	Potential Grave	High Significance GP A	Demarcate and avoid the area to preserve the site.
Not impacted on by this line	347	20° 45' 03.9457" E	29° 16' 51.8447" S	Background scatter - MSA and LSA	Low Significance GP C	No Mitigation required
Not impacted on by this line	350	20° 44' 55.6655" E	29° 15' 16.3980" S	Background scatter - MSA and LSA	Low Significance GP C	No Mitigation required
Not impacted on by this line	353	20° 44' 55.8203" E	29° 15' 15.0120" S	Background scatter - MSA and LSA	Low Significance GP C	No Mitigation required

Not impacted on by this line	363	20° 44' 32.2763" E	29° 10' 48.1656" S	Background scatter - MSA and LSA	Low Significance GP C	No Mitigation required
Not impacted on by this line	366	20° 44' 23.9315" E	29° 09' 06.2639" S	Background scatter - MSA and LSA	Low Significance GP C	No Mitigation required
Not impacted on by this line	367	20° 44' 23.8883" E	29° 09' 05.0832" S	Background scatter - MSA and LSA	Low Significance GP C	No Mitigation required
Not impacted on by this line	369	20° 44' 23.3989" E	29° 08' 59.7120" S	Background scatter - MSA and LSA	Low Significance GP C	No Mitigation required
Not impacted on by this line	384	20° 42' 17.6941" E	28° 47' 07.7137" S	Background scatter - MSA and LSA	Low Significance GP C	No Mitigation required

Not impacted on by this line	385	20° 42' 19.0188" E	28° 47' 07.6992" S	Background scatter - MSA and LSA	Low Significance GP C	No Mitigation required
Not impacted on by this line	387	20° 42' 20.2680" E	28° 47' 07.2925" S	Background scatter - MSA and LSA	Low Significance GP C	No Mitigation required
Not impacted on by this line	388	20° 42' 19.5335" E	28° 47' 07.3465" S	Background scatter - MSA and LSA	Low Significance GP C	No Mitigation required
Not impacted on by this line	389	20° 42' 17.4997" E	28° 47' 07.3752" S	Background scatter - MSA and LSA	Low Significance GP C	No Mitigation required
Not impacted on by this line	394	20° 41' 22.0776" E	28° 46' 35.1481" S	Background scatter - MSA and LSA	Low Significance GP C	No Mitigation required

Not impacted on by this line	400	20° 41' 16.6416" E	28° 46' 20.8956" S	Background scatter - MSA and LSA	Low Significance GP C	No Mitigation required
Not impacted on by this line	403	20° 41' 09.1679" E	28° 45' 57.9528" S	Background scatter - MSA and LSA	Low Significance GP C	No Mitigation required
Not impacted on by this line	404	20° 41' 09.0997" E	28° 45' 57.4633" S	Background scatter - MSA and LSA	Low Significance GP C	No Mitigation required
Not impacted on by this line	413	20° 40' 23.5921" E	28° 42' 38.0951" S	Background scatter - MSA and LSA	Low Significance GP C	No Mitigation required
Not impacted on by this line	416	20° 56' 34.5696" E	28° 38' 13.1029" S	Background scatter - MSA and LSA	Low Significance GP C	No Mitigation required

Not impacted on by this line	417	20° 56' 37.2588" E	28° 38' 11.9113" S	Background scatter - MSA and LSA	Low Significance GP C	No Mitigation required
Not impacted on by this line	419	20° 56' 44.7253" E	28° 38' 09.6433" S	Background scatter - MSA and LSA	Low Significance GP C	No Mitigation required
Not impacted on by this line	422	20° 56' 56.8716" E	28° 38' 06.6696" S	Background scatter - MSA and LSA	Low Significance GP C	No Mitigation required
Not impacted on by this line	430	21° 00' 54.7381" E	28° 36' 57.5315" S	Background scatter - MSA and LSA	Low Significance GP C	No Mitigation required
Not impacted on by this line	432	21° 01' 00.7716" E	28° 36' 55.6021" S	Background scatter - MSA and LSA	Low Significance GP C	No Mitigation required

Not impacted on by this line	436	21° 02' 11.8463" E	28° 36' 35.6257" S	Background scatter - MSA and LSA	Low Significance GP C	No Mitigation required
Not impacted on by this line	456	21° 03' 35.5429" E	28° 36' 02.6893" S	Background scatter - MSA and LSA	Low Significance GP C	No Mitigation required