

**HERITAGE IMPACT ASSESSMENT OF THE  
KWAHLOKOHLOKO SUB-SUPPLY AREA PHASE 2**

**FOR TERRATEST (PTY) LTD**

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## **EXECUTIVE SUMMARY**

*The King Cetshwayo District Municipality is undertaking the KwaHlokoHloko Sub-Supply Area Phase 2. The pipeline will run between the existing Reservoir (R1-1), tie into the proposed Reservoir R1-2 and then tie into the existing R 2-1*

*The pipeline occurs in the uMlalazi Local Municipality, King Cetshwayo District Municipality, Wards 9, 10, 27 and 26*

*A heritage survey was undertaken for the proposed KwaHlokoHloko sub-supply area Phase 2, Eshowe, KZN. Most of the alignment occurs alongside road reserves. Eight heritage sites were noted during the survey. These sites include settlement in the form of house foundations and/or graves. Some of the foundations were visible but the long grass made some surface features difficult to locate, especially potential graves. These area need to be assessed with public participation for potential graves. If no graves are known, then the pipeline still needs to be re-aligned.*

*Along the northern part of the line are several graves nearby each other. The graves are stone cairns without headstones. The pipeline will not be affecting these graves as it was realigned.*

*The pipeline occurs mostly in an area of no/low palaeontological sensitivity. No further palaeontological mitigation is required.*

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## Abbreviations

HP	Historical Period
IIA	Indeterminate Iron Age
LIA	Late Iron Age
EIA	Early Iron Age
ISA	Indeterminate Stone Age
ESA	Early Stone Age
MSA	Middle Stone Age
LSA	Late Stone Age
HIA	Heritage Impact Assessment
PIA	Palaeontological Impact Assessment

## INTRODUCTION

The King Cetshwayo District Municipality is undertaking the KwaHlokoHloko Sub-Supply Area Phase 2. The pipeline will run between the existing Reservoir (R1-1), tie into the proposed Reservoir R1-2 and then tie into the existing R 2-1. These include:

- DN500 pipe ±8km (ends where the pipeline turns under the P230 road towards the reservoir)
- DN500 pipe ±2km
- DN400 pipe ±4.3km (partly in shared trench with DN500)
- DN315 pipe ±1.2km (in shared trench with DN500)
- Reservoir R1-2

The pipeline occurs in the uMlalazi Local Municipality, King Cetshwayo District Municipality, Wards 9, 10, 27 and 26

Umlando was requested to undertake an HIA of the proposed irrigation. Figures 1 – 6 show the location of the development.



FIG. 1 GENERAL LOCATION OF THE PROPOSED DEVELOPMENT

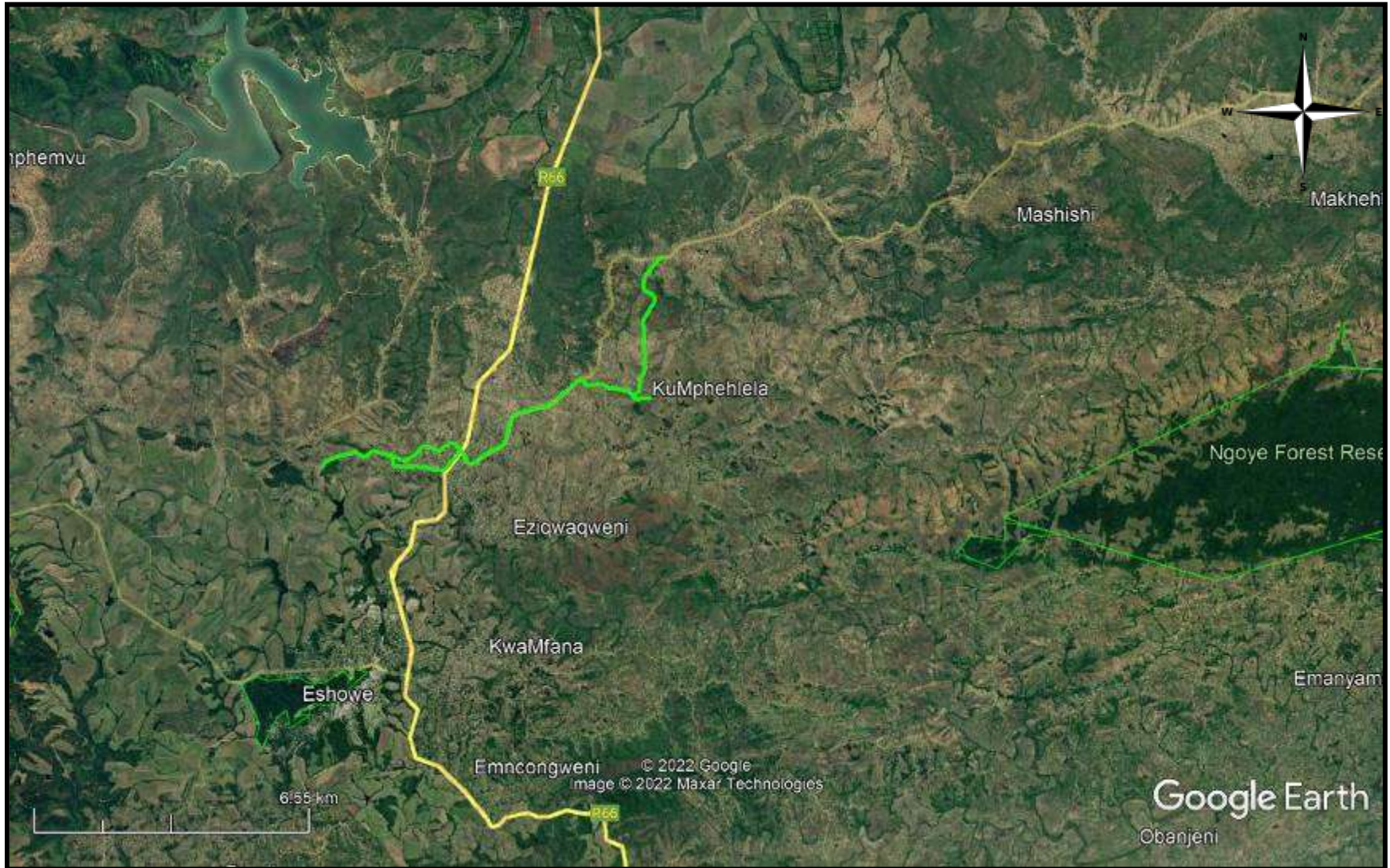




FIG. 2: AERIAL OVERVIEW OF THE PROPOSED DEVELOPMENT

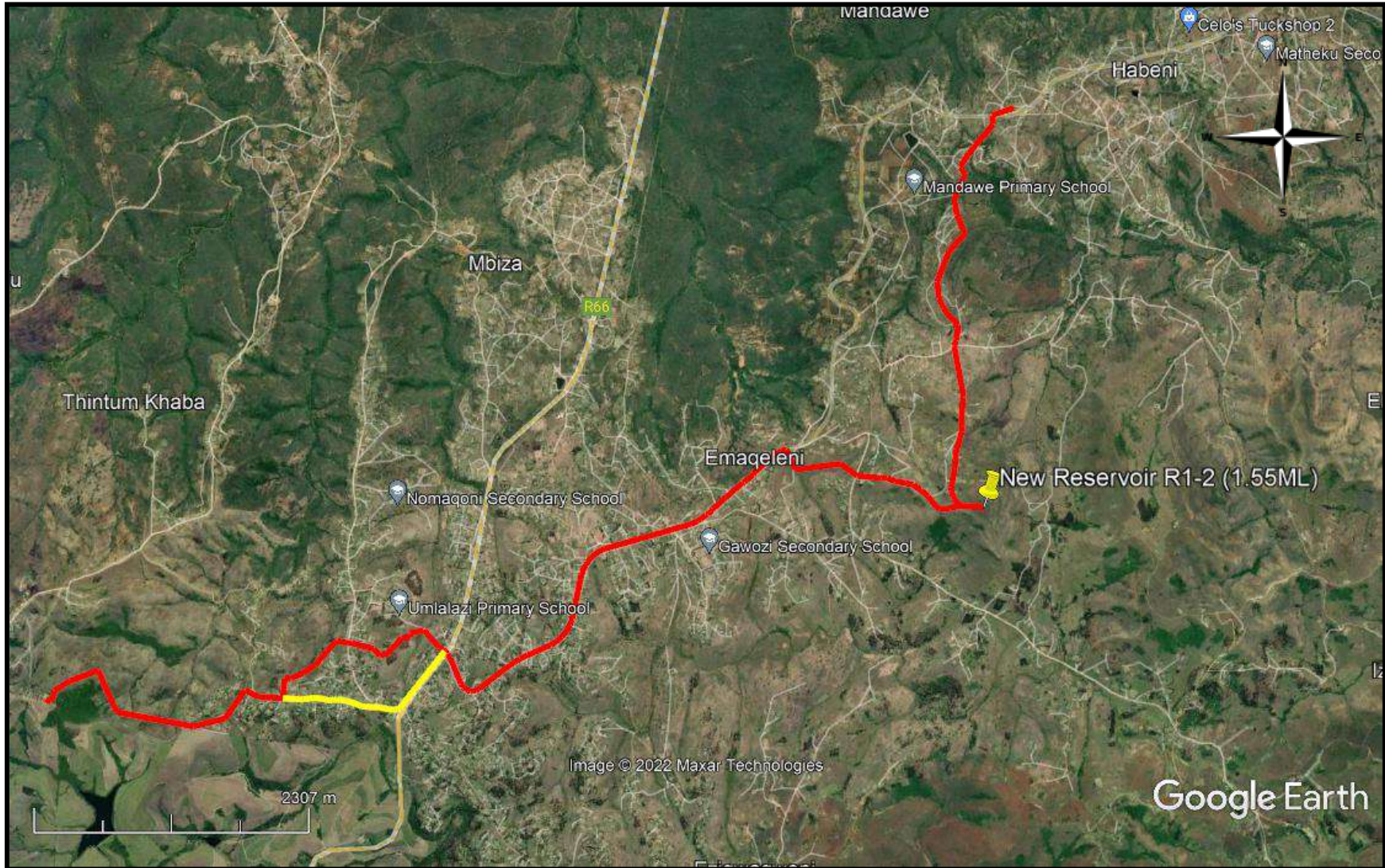




FIG. 3: TOPOGRAPHICAL MAP OF THE PROPOSED DEVELOPMENT (2000)

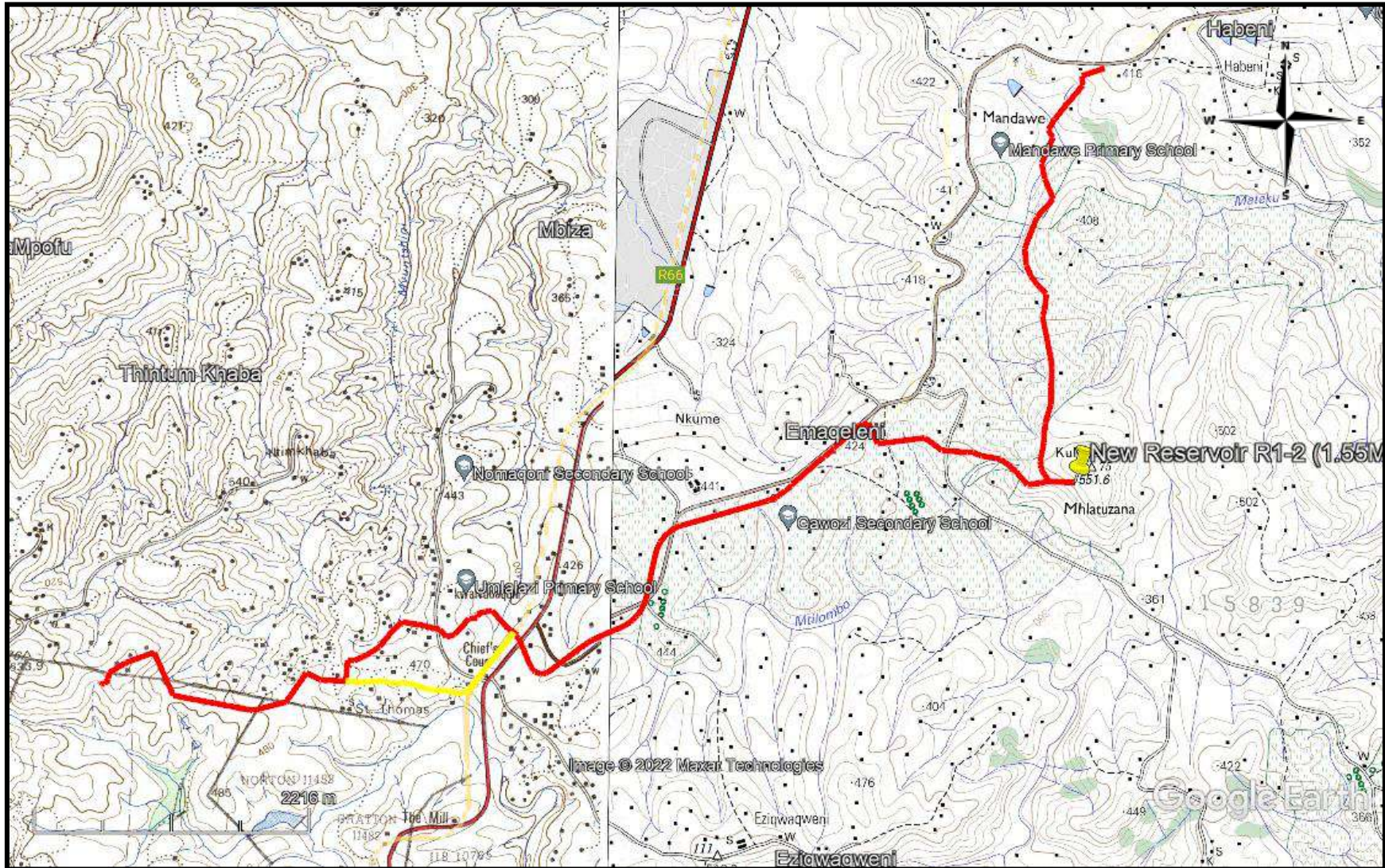




FIG. 4: SCENIC VIEWS OF THE STUDY AREA



## **KWAZULU NATAL AMAFA AND RESEARCH INSTITUTE, ACT 05, 2018**

“General protection: Structures.—

- No structure which is, or which may reasonably be expected to be older than 60 years, may be demolished, altered or added to without the prior written approval of the Council having been obtained on written application to the Council.
- Where the Council does not grant approval, the Council must consider special protection in terms of sections 38, 39, 40, 41 and 43 of Chapter 9.
- The Council may, by notice in the *Gazette*, exempt—
- A defined geographical area; or
- defined categories of sites within a defined geographical area, from the provisions of subsection where the Council is satisfied that heritage resources falling in the defined geographical area or category have been identified and are adequately protected in terms of sections 38, 39, 40, 41 and 43 of Chapter 9.
- A notice referred to in subsection (2) may, by notice in the *Gazette*, be amended or withdrawn by the Council.

General protection: Graves of victims of conflict.—No person may damage, alter, exhume, or remove from its original position—

- the grave of a victim of conflict;
  - a cemetery made up of such graves; or
  - any part of a cemetery containing such graves, without the prior written approval of the Council having been obtained on written application to the Council.
- General protection: Traditional burial places.—
- No grave—
  - not otherwise protected by this Act; and
  - not located in a formal cemetery managed or administered by a local authority, may be damaged, altered, exhumed, removed from its original position, or otherwise disturbed without the prior written approval of the Council having been obtained on written application to the Council.

The Council may only issue written approval once the Council is satisfied that—

- the applicant has made a concerted effort to consult with communities and individuals who by tradition may have an interest in the grave; and
- the applicant and the relevant communities or individuals have reached agreement regarding the grave.

General protection: Battlefield sites, archaeological sites, rock art sites, palaeontological sites, historic fortifications, meteorite or meteorite impact sites.—

- No person may destroy, damage, excavate, alter, write or draw upon, or otherwise disturb any battlefield site, archaeological site, rock art site, palaeontological site, historic fortification, meteorite or meteorite impact site without the prior written approval of the Council having been obtained on written application to the Council.
- Upon discovery of archaeological or palaeontological material or a meteorite by any person, all activity or operations in the general vicinity of such material or meteorite must cease forthwith and a person who made the discovery must submit a written report to the Council without delay.
- The Council may, after consultation with an owner or controlling authority, by way of written notice served on the owner or controlling authority, prohibit any activity considered by the Council to be inappropriate within 50 metres of a rock art site.
- No person may exhume, remove from its original position or otherwise disturb, damage, destroy, own or collect any object or material associated with any battlefield site, archaeological site, rock art site, palaeontological site, historic fortification, meteorite or meteorite impact site without the prior written approval of the Council having been obtained on written application to the Council.
- No person may bring any equipment which assists in the detection of metals and archaeological and palaeontological objects and material, or excavation equipment onto any battlefield site, archaeological site, rock art site, palaeontological site, historic fortification, or meteorite impact site, or use similar detection or excavation equipment for the recovery of



- meteorites, without the prior written approval of the Council having been obtained on written application to the Council.
- The ownership of any object or material associated with any battlefield site, archaeological site, rock art site, palaeontological site, historic fortification, meteorite or meteorite impact site, on discovery, vest in the Provincial Government and the Council is regarded as the custodian on behalf of the Provincial Government.”

## METHOD

The method for Heritage assessment consists of several steps.

The first step forms part of the desktop assessment. Here we would consult the database that has been collated by Umlando. This databases contains archaeological site locations and basic information from several provinces (information from Umlando surveys and some colleagues), most of the national and provincial monuments and battlefields in Southern Africa (<http://www.vuvuzela.com/googleearth/monuments.html>) and cemeteries in southern Africa (information supplied by the Genealogical Society of Southern Africa). We use 1<sup>st</sup> and 2<sup>nd</sup> edition 1:50 000 topographical and 1937 aerial photographs where available, to assist in general location and dating of buildings and/or graves. The database is in Google Earth format and thus used as a quick reference when undertaking desktop studies. Where required we would consult with a local data recording centre, however these tend to be fragmented between different institutions and areas and thus difficult to access at times. We also consult with an historical architect, palaeontologist, and an historian where necessary.

The survey results will define the significance of each recorded site, as well as a management plan.

All sites are grouped according to low, medium, and high significance for the purpose of this report. Sites of low significance have no diagnostic artefacts or features. Sites of medium significance have diagnostic artefacts or features and these sites tend to be sampled. Sampling includes the collection of artefacts for future analysis. All diagnostic pottery, such as rims, lips, and decorated sherds are sampled, while bone, stone, and shell are mostly noted. Sampling usually occurs on most sites. Sites of high significance are excavated and/or extensively sampled. Those sites that are extensively sampled have high research potential, yet poor preservation of features.

### **Defining significance**

Heritage sites vary according to significance and several different criteria relate to each type of site. However, there are several criteria that allow for a general significance rating of archaeological sites.

These criteria are:

#### **1. State of preservation of:**

- 1.1. Organic remains:
  - 1.1.1. Faunal
  - 1.1.2. Botanical
- 1.2. Rock art
- 1.3. Walling
- 1.4. Presence of a cultural deposit
- 1.5. Features:
  - 1.5.1. Ash Features
  - 1.5.2. Graves
  - 1.5.3. Middens
  - 1.5.4. Cattle byres
  - 1.5.5. Bedding and ash complexes

**2. Spatial arrangements:**

- 2.1. Internal housing arrangements
- 2.2. Intra-site settlement patterns
- 2.3. Inter-site settlement patterns

**3. Features of the site:**

- 3.1. Are there any unusual, unique or rare artefacts or images at the site?
- 3.2. Is it a type site?
- 3.3. Does the site have a very good example of a specific time period, feature, or artefact?

**4. Research:**

- 4.1. Providing information on current research projects
- 4.2. Salvaging information for potential future research projects

**5. Inter- and intra-site variability**

- 5.1. Can this particular site yield information regarding intra-site variability, i.e. spatial relationships between various features and artefacts?
- 5.2. Can this particular site yield information about a community's social relationships within itself, or between other communities?

**6. Archaeological Experience:**

- 6.1. The personal experience and expertise of the CRM practitioner should not be ignored. Experience can indicate sites that have potentially significant aspects, but need to be tested prior to any conclusions.

**7. Educational:**

- 7.1. Does the site have the potential to be used as an educational instrument?
- 7.2. Does the site have the potential to become a tourist attraction?
- 7.3. The educational value of a site can only be fully determined after initial test-pit excavations and/or full excavations.

**8. Other Heritage Significance:**

- 8.1. Palaeontological sites
- 8.2. Historical buildings
- 8.3. Battlefields and general Anglo-Zulu and Anglo-Boer sites



- 8.4. Graves and/or community cemeteries
- 8.5. Living Heritage Sites
- 8.6. Cultural Landscapes, that includes old trees, hills, mountains, rivers, etc related to cultural or historical experiences.

The more a site can fulfill the above criteria, the more significant it becomes. Test-pit excavations are used to test the full potential of an archaeological deposit. This occurs in Phase 2. These test-pit excavations may require further excavations if the site is of significance (Phase 3). Sites may also be mapped and/or have artefacts sampled as a form of mitigation. Sampling normally occurs when the artefacts may be good examples of their type, but are not in a primary archaeological context. Mapping records the spatial relationship between features and artefacts. Table 1 lists the grading system.

**TABLE 1: SAHRA GRADINGS FOR HERITAGE SITES**

<b>SITE SIGNIFICANCE</b>	<b>FIELD RATING</b>	<b>GRADE</b>	<b>RECOMMENDED MITIGATION</b>
<b>High Significance</b>	National Significance	Grade 1	Site conservation / Site development
<b>High Significance</b>	Provincial Significance	Grade 2	Site conservation / Site development
<b>High Significance</b>	Local Significance	Grade 3A / 3B	
<b>High / Medium Significance</b>	Generally Protected A		Site conservation or mitigation prior to development / destruction
<b>Medium Significance</b>	Generally Protected B		Site conservation or mitigation / test excavation / systematic sampling / monitoring prior to or during development / destruction
<b>Low Significance</b>	Generally Protected C		On-site sampling monitoring or no archaeological mitigation required prior to or during development / destruction

## RESULTS

### DESKTOP STUDY

The desktop study consisted of analysing various maps for evidence of prior habitation in the study area, as well as for previous archaeological surveys. The

general area is known for its (fig. 5). No surveys have occurred near the study area; however, the general area is known to be archaeologically sensitive. There is a LIA/HP site 300m to the east of the study area. Further to the northeast are KwaBulawayo (King Shaka kaSenzangakhona's first residence), Queen Nandi's grave, and Coward's Bush.

The 1953 aerial photograph indicates that there are ten settlements within 100m of the pipeline (fig. 6). Two of these, S1, S4, S5, S9 and S10 occur within 30m of the pipeline. Given that the aerial photographs are not exactly geo-located, there is an approximate 20m – 50m margin. These settlements should be given a 50m buffer and be marked as sensitive areas.

The 1964 topographical map indicates that there are 15 settlements within 100m of the pipelines. Only two of these, H3 and H14 occur within 30m of the pipeline. Many of the others have been renovated or built over by 2022.

The latest Google Earth imagery was also used to identify more recent abandoned settlements near the proposed line. Eight settlements were noted of which two, G4 and G8, probably have graves and require route realignment.

The location of these sites is given in Table 2. These desktop sites will be visited during the Field Survey. These sites were given the prefix 'G'. If any heritage feature occurs at the site then it will be noted. If there are no heritage features, then there will be no comment in the Field Survey.

The desktop study suggests that settlements, and thus graves, will occur near the pipeline. The archaeology will tend towards open Stone Age sites that would have low significance. All sites from the topographical map should have a 50m sensitivity buffer around them. This means they could have human graves and should be avoided if possible. Alternatively, the contractors must be made aware of possible human graves in that area.

FIG. 5: LOCATION OF KNOWN HERITAGE SITES IN THE GENERAL AREA

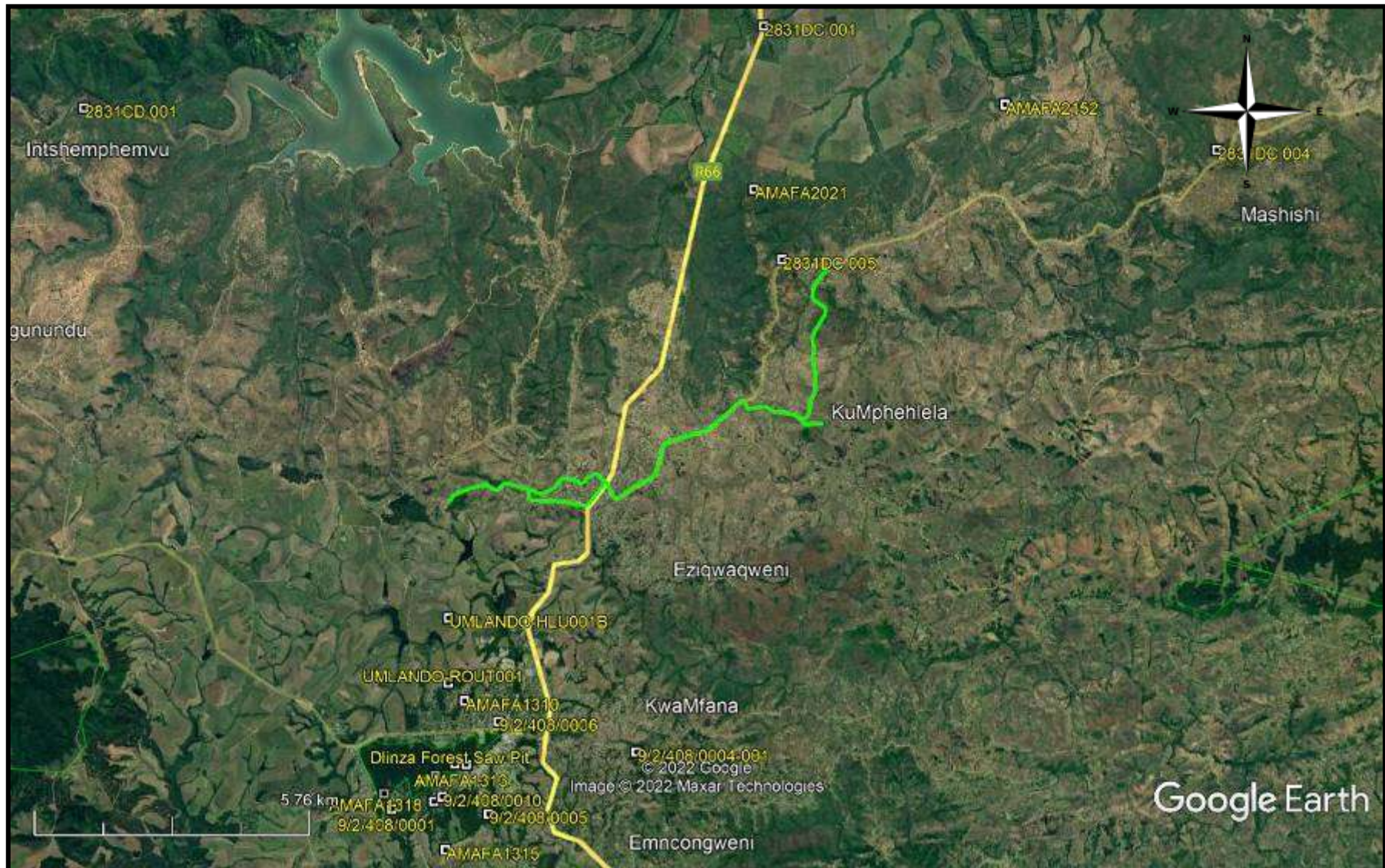




FIG. 6: LOCATION OF THE STUDY AREA IN 1953

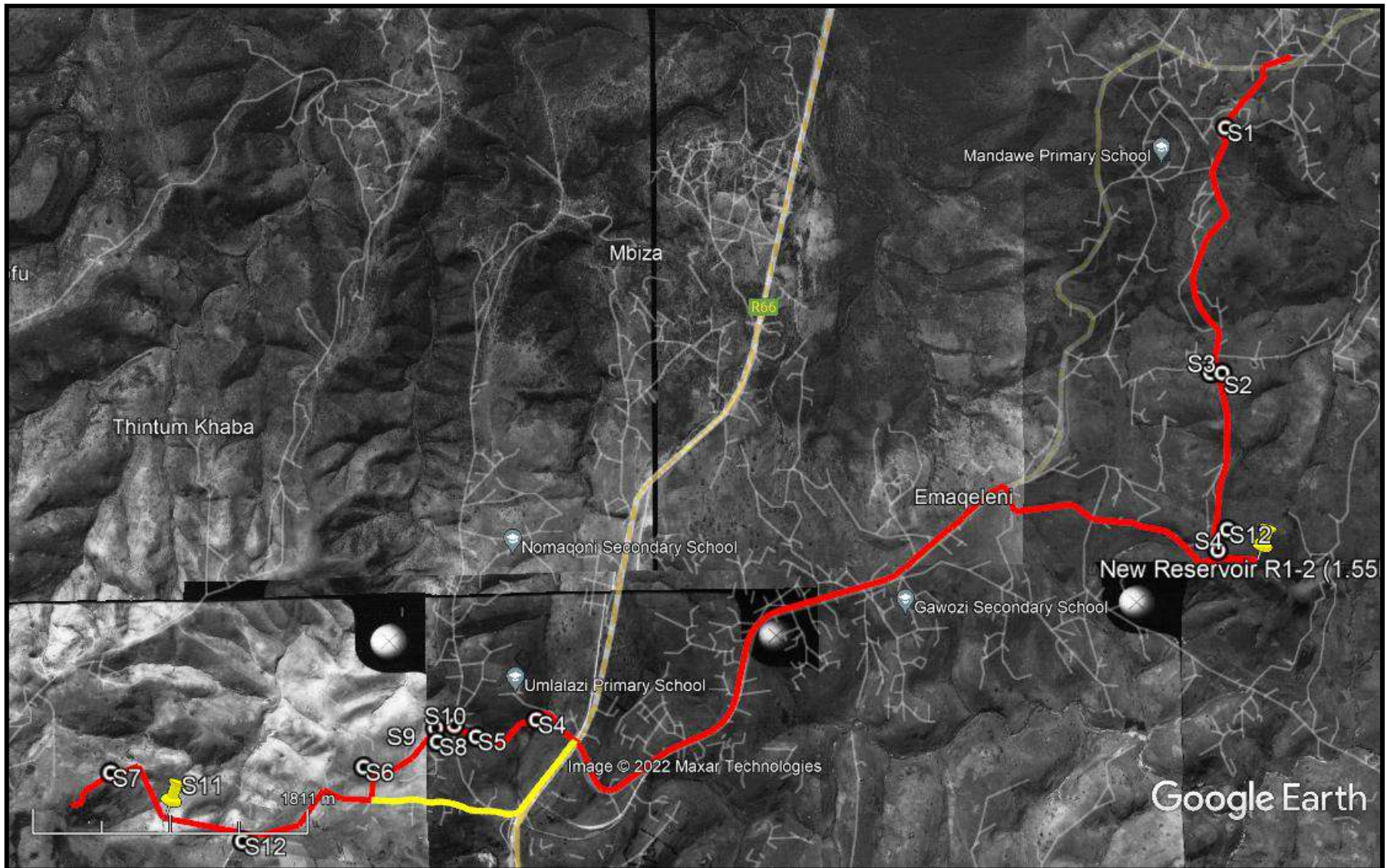




FIG. 7: LOCATION OF THE STUDY AREA IN 1963

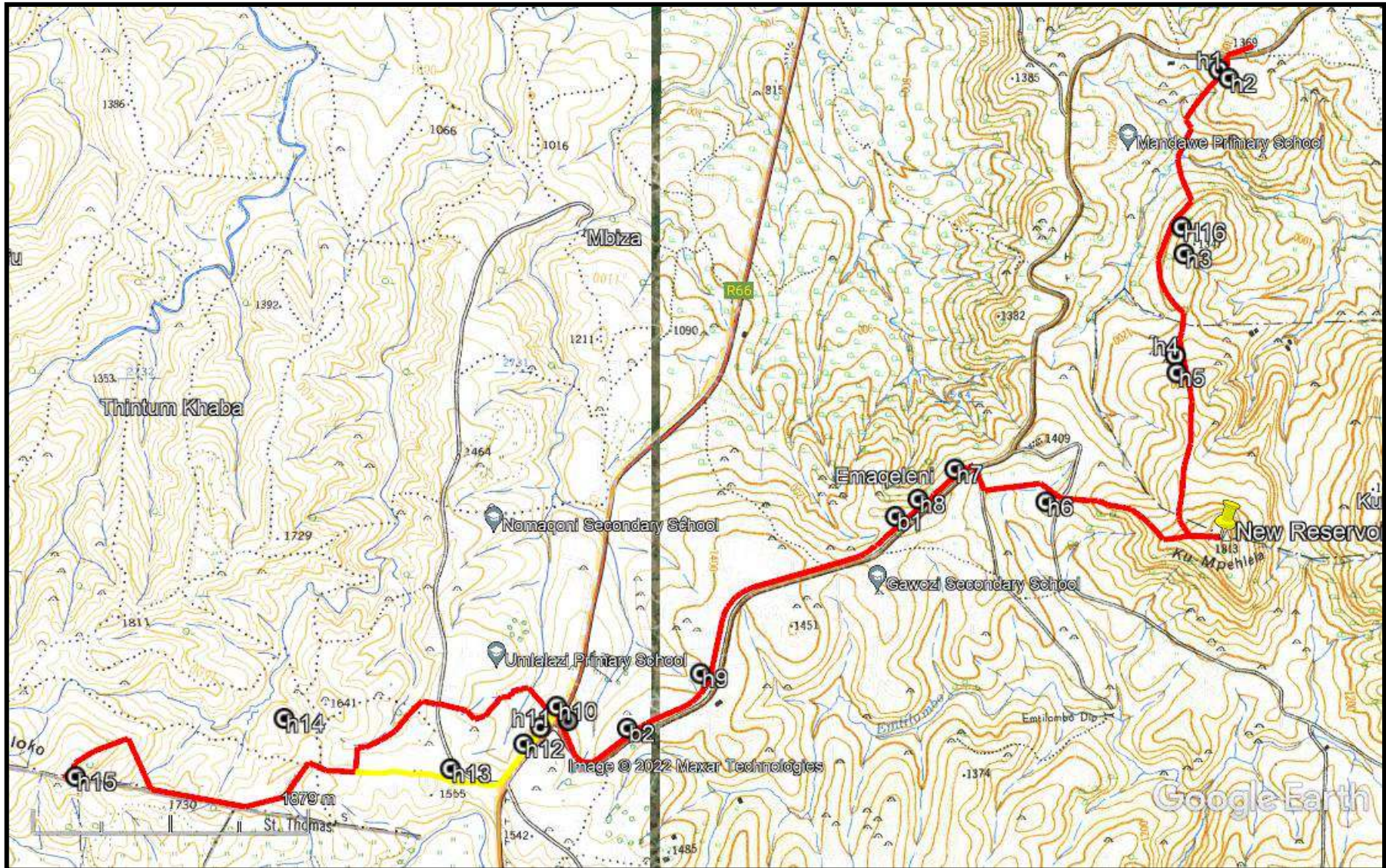




TABLE 2: LOCATION OF SETTLEMENTS IN 1953, 1964 &amp; 2002

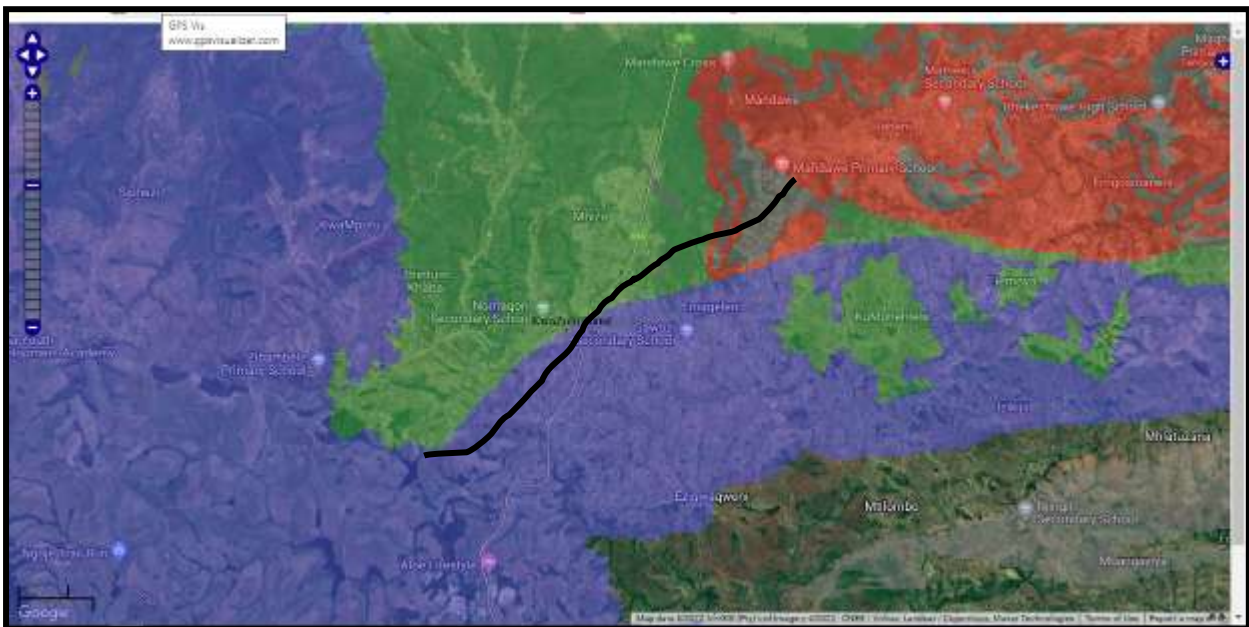
Map Date	NAME	LATITUDE	LONGITUDE	DESCRIPTION
1964	h1	-28.802167929	31.540239561	House
	h2	-28.802702724	31.540920205	House
	h3	-28.813657556	31.537720667	House
	h4	-28.819995760	31.537160090	House
	h5	-28.821066730	31.537200905	House
	h6	-28.829176408	31.528276289	House
	h7	-28.827078691	31.521421639	House
	h8	-28.829001414	31.519023012	House
	b1	-28.830092807	31.517388614	House
	h9	-28.840012035	31.503316158	House
	b2	-28.843459439	31.498051498	House
	b3	-28.842975981	31.493786571	House
	h10	-28.842066553	31.492963559	House
	h11	-28.843397027	31.491793498	House
	h12	-28.844431865	31.490586602	House
1953	h13	-28.845989859	31.485324503	House
	h14	-28.842784951	31.473405783	House
	h15	-28.846410131	31.458467679	House
	S1	-28.804888768	31.538382658	House
	S2	-28.819941836	31.537969782	House
	S3	-28.819938105	31.537183102	House
	S4	-28.830667985	31.537163204	House
	S4	-28.841071337	31.490245846	House
	S5	-28.842031643	31.486128147	House
	S6	-28.843817045	31.478398672	House
	S7	-28.843913468	31.461422843	House
	S8	-28.842335989	31.483429267	House
2002	S9	-28.841512331	31.483303994	House
	S10	-28.841312982	31.484646251	House
	S11	-28.846747	31.464828	House
	S12	-28.848223	31.470137	House
	G1	-28.844775978	31.475789802	Possible house
	G2	-28.841856264	31.485209992	Tree
	G3	-28.831263753	31.535935017	Possible kraal
2002	G4	-28.844557692	31.459937336	Possible house
	G5	-28.828144236	31.536791749	Possible house remains
	G6	-28.826299248	31.537510844	Possible house remains
	G7	-28.807609530	31.537712634	Possible house



## PALAEONTOLOGICAL SENSITIVITY

The area is in an area of mostly low/no palaeontological sensitivity with one areas being of medium sensitivity (fig. 8). A PIA letter of Exemption was submitted Dr Alan Smith (Appendix A).

**FIG. 8: PALAEONTOLOGICAL SENSITIVITY MAP OF THE GENERAL ALIGNMENT**



COLOUR	SENSITIVITY	REQUIRED ACTION
RED	VERY HIGH	field assessment and protocol for finds is required
ORANGE/YELLOW	HIGH	desktop study is required and based on the outcome of the desktop study, a field assessment is likely
GREEN	MODERATE	desktop study is required
BLUE	LOW	no palaeontological studies are required however a protocol for finds is required
GREY	INSIGNIFICANT/ZERO	no palaeontological studies are required
WHITE/CLEAR	UNKNOWN	these areas will require a minimum of a desktop study. As more information comes to light, SAHRA will continue to populate the map.

## FIELD SURVEY

A field survey was undertaken on the July 2022. Ground visibility was varied from poor in the valleys and some grassland to very good in areas that had been recently burnt, cultivated or recently developed. Poor visibility tended to be on steeper slopes where human occupation would not be normally expected. The grassland areas did show signs of terracing for house foundations, and even circular house foundations, but no other surface features were identified. The visibility issue would be for sites G3, G4, G5, G8, and H14. The occurrence of graves at these five areas can be confirmed by the community PPP, or a final site walk through when the vegetation is less dense.

Subsequent to the survey, the alignment was changed affecting two areas. Sensitive areas with graves have now been avoided and the below text will reflect these changes.

### H14

H14 is located on the upper part of the hill and below contemporary houses. The area probably comprises of 2 – 3 settlements in an area 120m x 40m (fig 9). Several terraced areas for houses were noted and in some cases, the foundations of the circular house as well.

There is a possible grave by the sole tree.

**Significance:** The house foundations are of low significance. However, the possible grave(s) is of high significance.

**Mitigation:** The site is no longer affected.

FIG. 9: VIEWS OF H14





**G3**

G3 appears to be the remains of a settlement. The area is a terrace with a few raised areas (possible house foundations) and a sisal plant (fig. 10). No other features were observed.

**Significance:** The site is of low significance as no graves were noted.

**Mitigation:** No further mitigation is required as the pipeline is to the south.

**FIG. 10: SITE G3**



## **G4 & S7**

These are two houses from the desktop study near Reservoir R1-1. The grass was too tall and dense to observe any subsurface features; however, there may be human graves in the area. No photos were taken.

**Significance:** The area is of possible high significance.

**Mitigation:** The pipeline should be re-aligned as far south as possible. The area should be noted as being sensitive for possible human graves. The occurrence of graves can be confirmed by the community. If needed the specific area can be resurveyed once the grass is shorter and/or the area is prepared for the pipeline.

## **S11 and S12**

These two areas were noted in the desktop study and may be affected by the new pipeline alignment. The two areas were surveyed as it followed an access road to the reservoir. The access road was not useable near the top of the hill. No sites were noted; however, S11 was under dense vegetation.

**Significance:** The area is of possible high significance.

**Mitigation:** The pipeline alignment will miss S11 and S12, and no further mitigation is required.

## **H3**

H3 is located on the slopes of a hill. The site consists of at least four settlements, each with graves (fig 11). These features will predate 1964. The

graves occur in the bushes and some will be affected by the pipeline. The green line in Fig. 11 shows the current alignment. The red line is a proposed realignment.

**House 1** ( $28^{\circ}48'48.36''\text{S}$   $31^{\circ}32'16.63''\text{E}$ ) consists of a toppled cairn and a rectangular cut stone (fig. 12). There is a cactus growing next to the slab. These may be graves. The graves are no longer affected by the pipeline.

**FIG. 11: LOCATION OF GRAVES AT H3**



**House 2** ( $28^{\circ}48'49.19''\text{S}$   $31^{\circ}32'15.92''\text{E}$ ) consists of at least three graves in dense bush (fig. 13). The graves are stone cairns in a north-south orientation. The graves are no longer affected by the pipeline.

**House 3** ( $28^{\circ}48'51.68''\text{S}$   $31^{\circ}32'15.36''\text{E}$ ) consists of a toppled stone cairn (fig. 14). This cairn is probably a grave and is in a northwest-southeast alignment. The cairn is no longer affected by the pipeline.

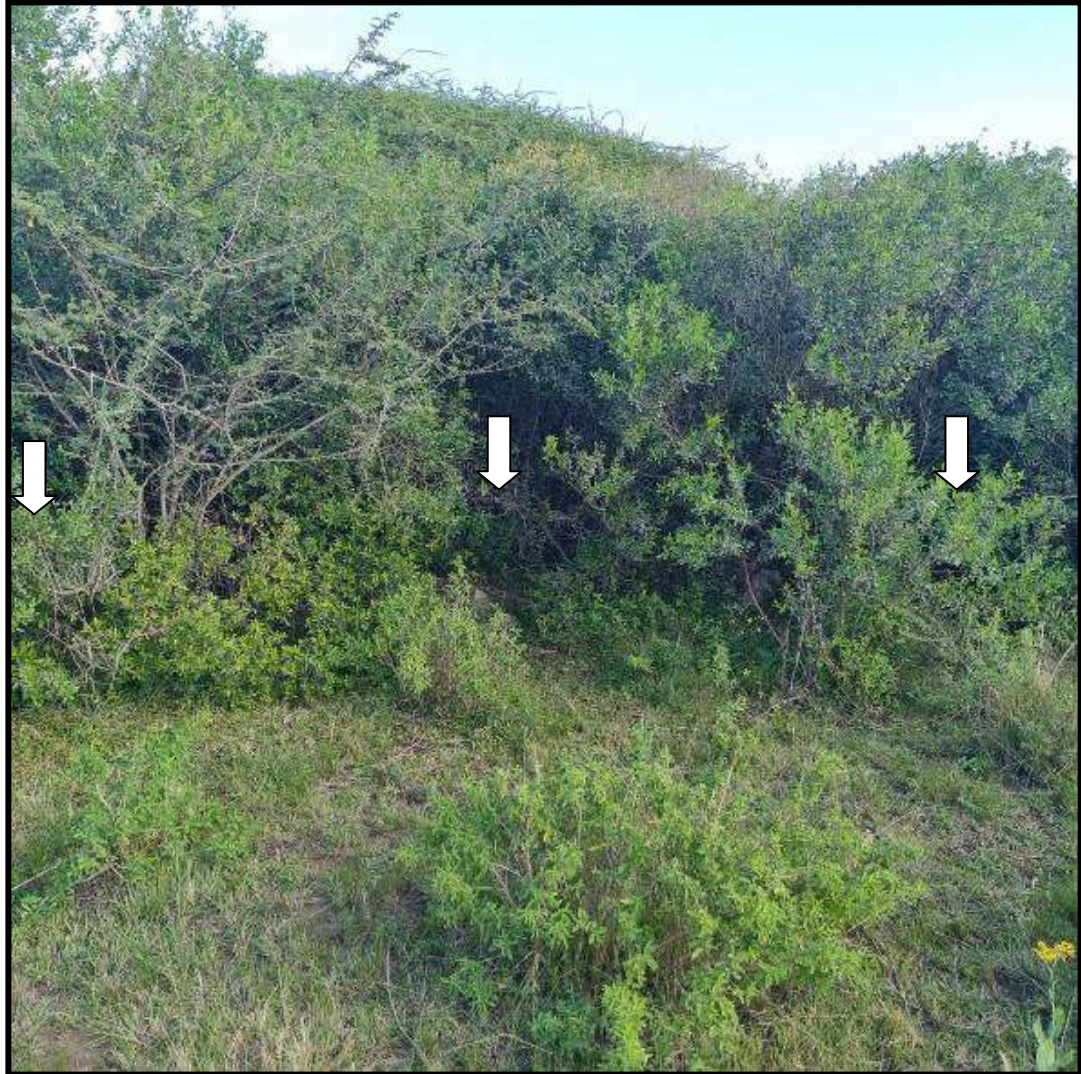


**House 4** (28°48'54.14"S 31°32'14.82"E) consists of two stone cairns (fig. 15). The cairns are in a north-south alignment. The cairns are no longer affected by the pipeline.

**FIG. 12: HOUSE 1**



**FIG. 13: GRAVES AT HOUSE 2**



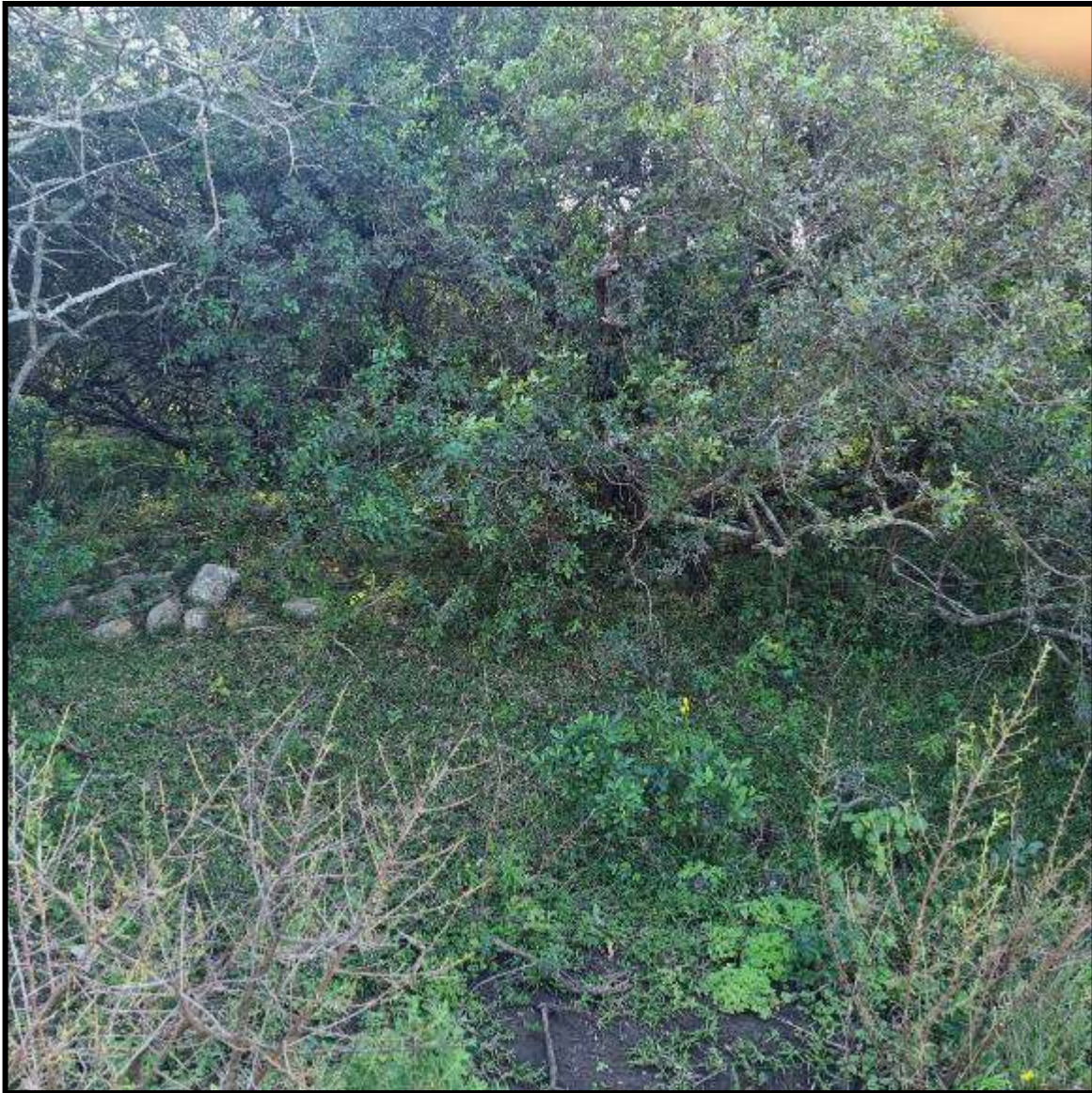


**FIG. 14: GRAVES AT HOUSE 3**





**FIG. 15: STOINE CAIRNS AT HOUSE 4**



**Significance:** All graves, and possible graves, are of high significance.

**Mitigation:** These sites are no longer affected.

**SHARA Rating:** 3A

## RECOMMENDATIONS

Ten areas near the pipeline alignment occur near old houses with(out) graves. Fig. 16 shows the locations of these sites and Table 3 gives the locations. In some cases, the grass was too dense to note possible graves even when house foundations were visible. In these instances, the public participation process can be used to confirm the occurrence of graves. If no graves are confirmed, the area should be treated as sensitive as these settlements tend to have graves in the vicinity. This occurs at sites S7, G3, G4, G5, G8, and H14: only G4 and S7 might be affected in this manner.

The realignment of the pipeline will not affect recorded graves.

When the pipeline is re-aligned, the footprint of the pipeline needs to be at least 20m from the edge of the closest grave. In addition to this, sites must be clearly demarcated before and during construction. There must be a 5m buffer between the grave and the demarcation. Proof of demarcation must occur.

The pipeline occurs mostly in an area of no/low palaeontological sensitivity. No further palaeontological mitigation is required.

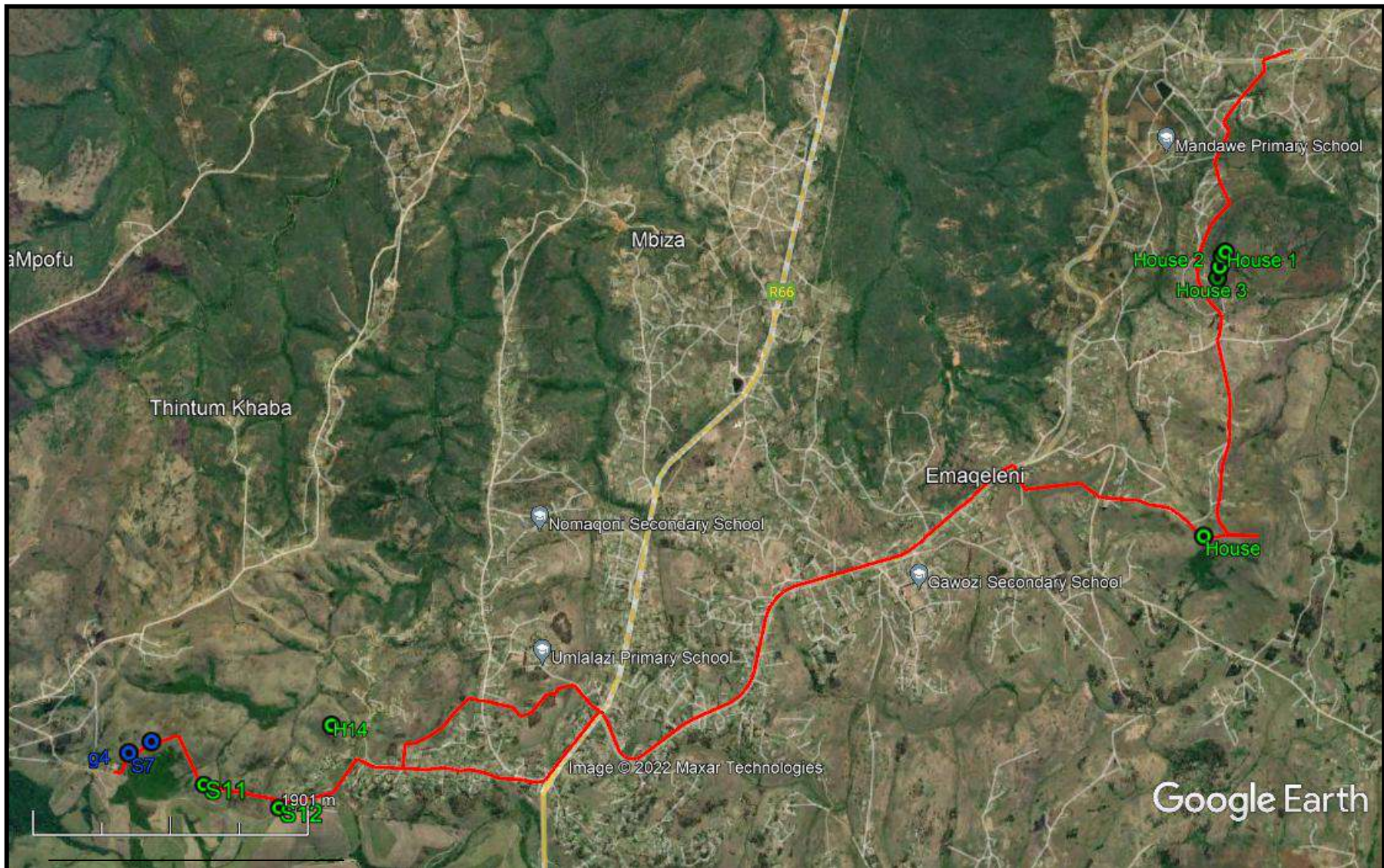
**TABLE 3: LOCATION OF RECORDED SITES**

Name	Latitude	Longitude	Name	Description
<b>G3</b>	-28.831262000	31.535988000	House	House foundations in long grass
<b>G4</b>	-28.844557692	31.459937336	g4	House foundations in long grass
<b>H14</b>	-28.843200600	31.474034900	H14	House foundations in long grass. Not affected
<b>House 1</b>	-28.813433333	31.537952778	House 1	2 x possible graves. Not affected
<b>House 2</b>	-28.813664200	31.537755700	House 2	3 graves, H3 Not affected
<b>House 3</b>	-28.814355400	31.537598900	House 3	1 x possible grave Not affected
<b>House 4</b>	-28.815038800	31.537450900	House 4	2 graves Not affected
<b>S7</b>	-28.843913468	31.461422843	S7	House foundations in long grass





FIG. 15: LOCATION OF RECORDED SITES<sup>1</sup>



<sup>1</sup> Green = not affected; blue = needs re-alignment; red = latest route alignment

## CONCLUSION

A heritage survey was undertaken for the proposed KwaHlokoHloko sub-supply area Phase 2, Eshowe, KZN. Most of the alignment occurs alongside road reserves and through agricultural fields. Eight heritage sites were noted during the survey. Only two of these sites could be affected by the pipeline. However, a slight realignment to the south will avoid the impact.

The pipeline occurs mostly in an area of no/low palaeontological sensitivity. No further palaeontological mitigation is required.

## REFERENCES

### **1:50 000 Topographical Maps**

2831CD Eshowe 1964, 1992

2831DC Blackburn 1964, 2000

### **Aerial Photographs**

330\_003\_02730

330\_003\_02731

330\_003\_02732

### **Database**

KZN Museum

SHARIS

Umlando

### **EXPERIENCE OF THE HERITAGE CONSULTANT**

Gavin Anderson has a M. Phil (in archaeology and social psychology) degree from the University of Cape Town. Gavin has been working as a professional archaeologist and heritage impact assessor since 1995. He joined the Association of Professional Archaeologists of Southern Africa in 1998 when it was formed. Gavin is rated as a Principle Investigator with expertise status in Rock Art, Stone Age and Iron Age studies. In addition to this, he was worked on both West and East Coast shell middens, Anglo-Boer War sites, and Historical Period sites.

### **DECLARATION OF INDEPENDENCE**

I, Gavin Anderson, declare that I am an independent specialist consultant and have no financial, personal or other interest in the proposed development, nor the developers or any of their subsidiaries, apart from fair remuneration for work performed in the delivery of heritage assessment services. There are no circumstances that compromise the objectivity of my performing such work.

A handwritten signature in black ink, appearing to read 'Gavin Anderson', with a horizontal line underneath.

Gavin Anderson  
Archaeologist/Heritage Impact Assessor



**APPENDIX A**  
**PIA LETTER OF EXEMPTION**



**Dr Alan Smith  
Alan Smith Consulting  
29 Browns Grove  
Sherwood  
Durban  
4091**

**UMLANDO: Archaeological Surveys & Heritage  
Management  
PO Box 102532, Meerensee, KwaZulu-Natal 3901  
phone (035)7531785 fax: 0865445631  
cell: 0836585362 / 0723481327  
Email:umlando@gmail.com**

**Letter of Exemption from Palaeontological Impact Assessment for:**

**KWAHLOKOHLOKO SUB-SUPPLY AREA PHASE 2, ESHOWE, KWAULU-  
NATAL.**

**Dear Sir**

Dr Alan Smith was asked by UMLANDO: Archaeological Surveys & Heritage Management to conduct a PIA for the above named project.

The proposed development will take place in an area which is not fossiliferous. This project will intercept basement rock (1.1 Ga) and perhaps Natal Group Sandstone. The latter is coded green by SAHRIS but no fossils have ever been found here. The basement rock is not fossiliferous, by definition.

Consequently there is no reason to conduct a PIA for this project. Exemption from Palaeontological Impact Assessment (PIA) is therefore requested for this project.

However a “Chance Find Protocol” is attached to cover any chance find, although this eventuality is very unlikely.

Should any of the proposed plans change then the project will need to be reassessed in terms of a PIA

**Dr Alan Smith.**  
**Alan Smith Consulting**  
**7 July, 2022**





## **CHANCE FIND PROTOCOL**

This Chance Find Protocol must be included in the site EMPr.

If any fossils are found, a Palaeontologist must be notified immediately by the ECO and/or EAP and a site visit must be arranged at the earliest possible time with the Palaeontologist.

In the case of the ECO or the Site Manager becoming aware of suspicious looking palaeo-material:

- The construction must be halted in that specific area and the Palaeontologist must be given enough time to reach the site and remove the material before excavation continues.
- Mitigation will involve the attempt to capture all rare fossils and systematic collection of all fossils discovered. This will take place in conjunction with descriptive, diagrammatic and photographic recording of exposures, also involving sediment samples and samples of both representative and unusual sedimentary or biogenic features. The fossils and contextual samples will be processed (sorted, sub-sampled, labeled, and boxed) and documentation consolidated, to create an archive collection from the excavated sites for future researchers.

### **Functional responsibilities of the Developer**

1. At full cost to the project, and guided by the appointed Palaeontological Specialist, ensure that a representative archive of palaeontological samples and other records is assembled to characterize the palaeontological occurrences affected by the excavation operation.
2. Provide field aid, if necessary, in the supply of materials, labour and machinery to excavate, load and transport sampled material from the excavation areas to the sorting areas, removal of overburden if necessary, and the return of discarded material to the disposal areas.
3. Facilitate systematic recording of the stratigraphic and palaeo-environmental features in exposures in the fossil-bearing excavations, by described and measured geological sections, and by providing aid in the surveying of positions where significant fossils are found.

4. Provide safe storage for fossil material found routinely during excavation operations by construction personnel. In this context, isolated fossil finds in disturbed material qualify as “normal” fossil finds.
5. Provide covered, dry storage for samples and facilities for a work area for sorting, labeling and boxing/bagging samples.
6. Costs of basic curation and storage until collected. Documentary record of palaeontological occurrences must be done.
7. The contractor will, in collaboration with the Palaeontologist, make the excavation plan available to the appointed specialist, in which appropriate information regarding plans for excavations and work schedules must be indicated on the plan of the excavation sites. This must be done in conjunction with the appointed specialist.
8. Initially, all known specific palaeontological information will be indicated on the plan. This will be updated throughout the excavation period.
9. Locations of samples and measured sections are to be pegged, and routinely and accurately surveyed. Sample locations, measured sections, etc., must be recorded three-dimensionally if any “significant fossils” are recorded during the time of excavation.

## DETAILS OF SPECIALIST

### **Dr Alan Smith**

**Private Consultant:** *Alan Smith Consulting, 29 Brown's Grove, Sherwood, Durban, 4091*

&

**Honorary Research Fellow:** *Discipline of Geology, School of Agriculture, Earth and Environmental Sciences, University of KwaZulu-Natal, Durban.*

**Role:** Specialist Palaeontological Report production

### **Expertise of the specialist:**

- PhD in Geology (University of KwaZulu-Natal), Pr. Sc. Nat., I.A.H.S.
- Expert in Vryheid Formation (Ecca Group) in northern KZN, this having been the subject of PhD.
- Scientific Research experience includes: Fluvial geomorphology, palaeoflood hydrology, Cretaceous deposits.
- Experience includes understanding Earth Surface Processes in both fluvial and coastal environments (modern & ancient).
- Alan has published in both national and international, peer-reviewed journals. He has published + 50 journal articles with 497 citations (detailed CV available on request).
- Attended and presented scientific papers and posters at numerous international and local conferences (UK, Canada, South Africa) and is actively involved in research.

Selected recent palaeo-related work includes:

- Desktop PIA: Proposed middle income housing units on Portion 23 of Farm Lot H Weston 13026, Bruntville, Mpofana Local Municipality. Client: UMLANDO.
- Desktop PIA: Proposed ByPass Pipeline for Ulundi bulk water pipeline upgrade. Client: UMLANDO.
- Fieldwork PIA: Bhekuzulu Epangweni KZN water reticulation project, Cathkin Park. Client: Mike Webster, HSG Attorneys.
- Fieldwork PIA: Mpungoze water supply scheme, Empangeni. Client: Enviropro.
- Fieldwork PIA: Helpmekaar Dam. Client: Afzelia environmental consultants.
- Desktop PIA: Zuka valley, Ballito. Client: Mike Webster, HSG Attorneys.
- Mevamhlope proposed quarry palaeontology report. Client: Enviropro.



- Desktop PIA: Proposed Lovu Desalination site. Client: eThembeni Cultural Heritage.
- Desktop PIA: Tinley Manor Phase 2 North & South banks: eThembeni Cultural Heritage
- Desktop PIA: Tongaat. Client: eThembeni Cultural Heritage.
- Palaeontological Assessment Reports (3) to Scatec Solar SA (Pty) Ltd on an Appraisal of Inferred Palaeontological Sensitivity for a Potential Photo Voltaic Park at (1) Farm Rooilyf near Groblershoop, N Cape; (2) Farm Riet Fountain No. Portions 1 and 6, 18km SE of De Aar, N Cape; and (3) Dreunberg, near Burgersdorp, Eastern Cape. Client: Sustainable Development Projects.