HIA FOR THE RPOPOSED NYALA FARM CC BROILERS

FOR EXIGENT ENGINEERING CC

DATE: 27 MAY 2022

REVISED: 24 OCTOBER 2022

By Gavin Anderson

Umlando: Archaeological Surveys and Heritage Management

PO Box 10153, Meerensee, 3901

Phone:035-7531785 Cell: 0836585362

umlando@gmail.com

EXECUTIVE SUMMARY

Construction of 12 new chicken broiler houses with dimensions of 15m x 120m, each housing 50 000 chickens. All of the broilers will be on the remaining extent of portion 13 of the farm Wagenbeetjies Draai 875 FT. The site will have 12 houses adjacent to each other, with dimensions of 15m x 120m, each housing 50 000 chickens.

The desktop heritage survey noted that much of the area has been disturbed either by agricultural fields and/or field clearance. No structures were visible on the historical maps.

The heritage survey noted that there are several Early and Middle Stone Age stone tools occur in the study area. These are of low significance and no further mitigation is required.

A stone cairn, that resembles a grave, was noted in the southern part of the study area. While it is unlikely to be a human grave, it currently falls within the definition of a human grave and needs to be treated as such. The cairn was re-assessed after the vegetation was cleared and it was identified as a stone cairn as a result of a trench excavation. It is not a grave.

The PIA study noted that it was unlikely for any significant fossils to occur within the study area. No further mitigation is required, but a Chance Find protocol should be initiated.

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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

Rainbow Farms (Pty) Ltd (Rainbow) own and manage a number of poultry farms across South Africa. As a result of Rainbow's market share increasing, they have recently commenced with an out-growers partnering program and they are providing guidance and expertise for the establishment of new poultry facilities in the province of Kwa-Zulu Natal.

One such proposed partnership is the establishment by 'NYALA Farm CC' of twelve poultry houses (broiler houses) on the Remaining extent of Portion 13 of the Farm Wagenbeetjies Draai 875 FT.

Generally, poultry farms require simple infrastructure. The poultry houses are fenced within the development area. Security offices and ablution facilities for the workers are located within the development area. The road access is imperative as feed is imported into the farm and the chickens, once fully developed, are captured and transported out of the area.

This stormwater and wastewater management plan forms part of a Basis Assessment for the development of the poultry farm. Revision 1 of this document was compiled in October 2021, and the current revision 2 has been updated to correlate with the revised layout of the broiler houses and other infrastructure on the farm.

Considering the basic infrastructure of the proposed poultry farm, this management plan addresses the following:

- The disposal of wastewater (grey water) and sewerage from the ablution facilities.
- The separation of polluted wash water areas from clean stormwater runoff areas.
- The containment and management of the wash water from the poultry houses.

- The attenuation and management of clean stormwater run-off.

Umlando was requested to undertake an HIA of the proposed irrigation developments. Figures 1 – 4 show the location of the development.

FIG. 1 GENERAL LOCATION OF THE PROPOSED DEVELOPMENT

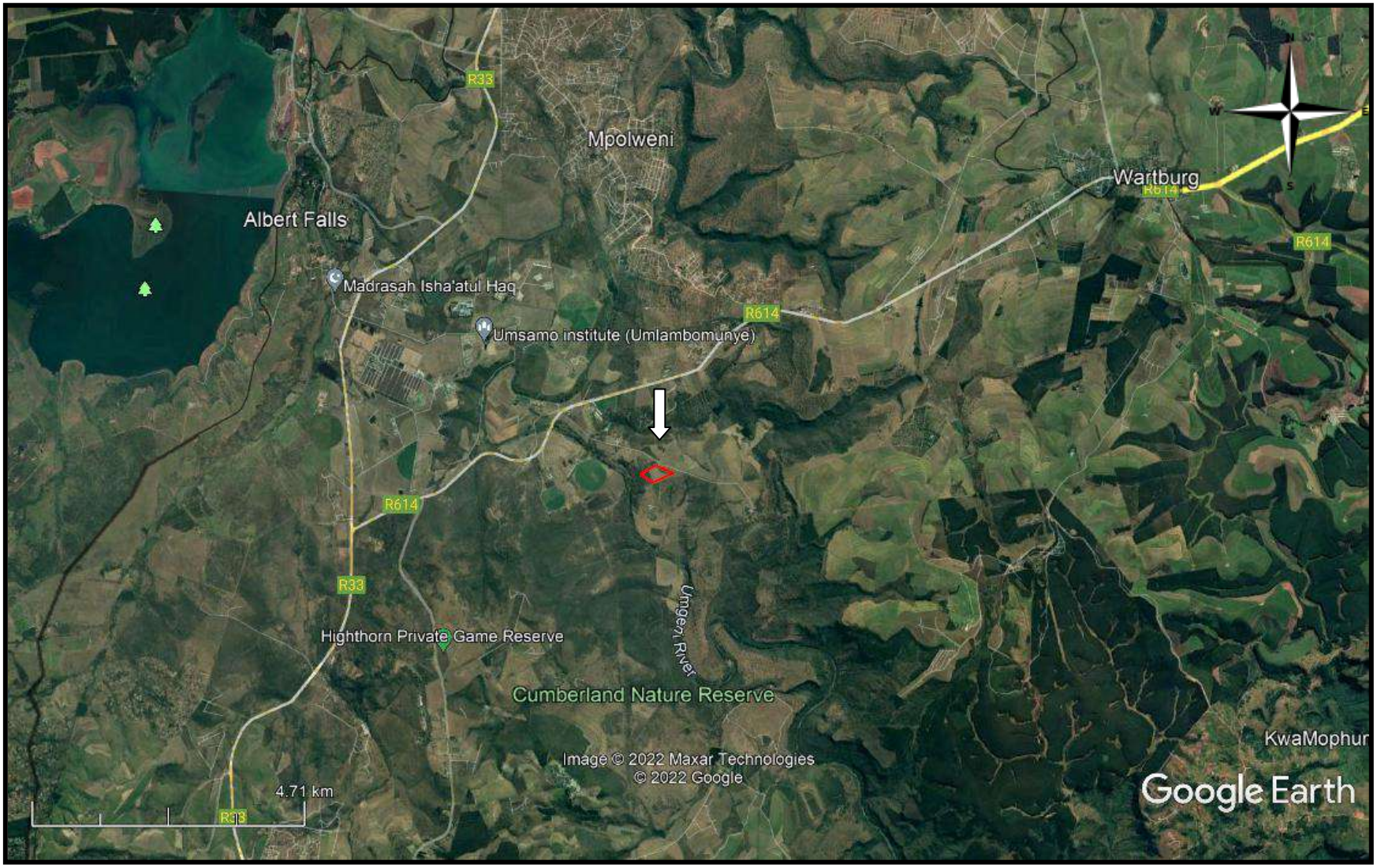


FIG. 2: AERIAL OVERVIEW OF THE PROPOSED DEVELOPMENT

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

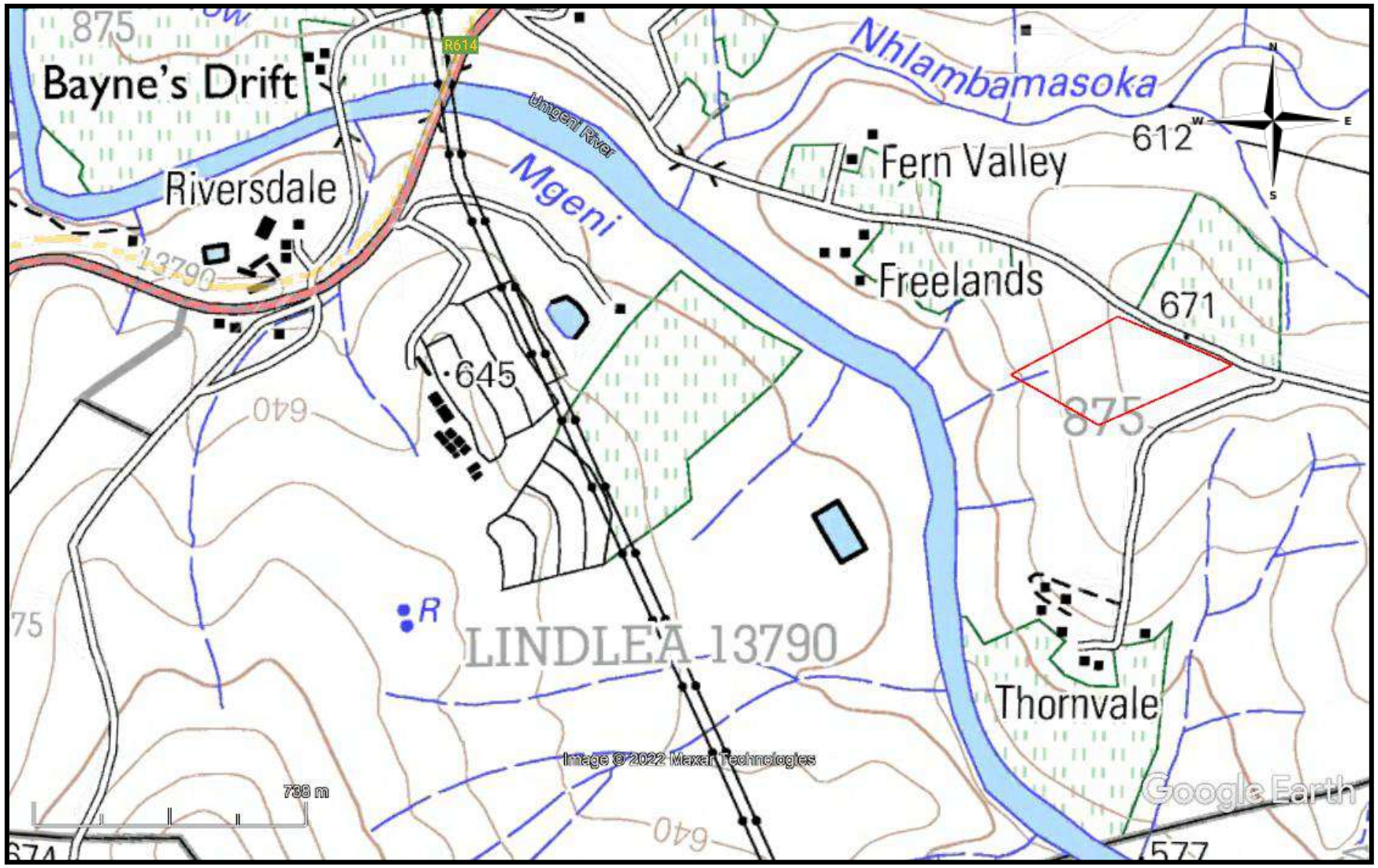


FIG. 4: SCENIC VIEWS OF THE STUDY AREA

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 1st and 2nd 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

SITE SIGNIFICANCE	FIELD RATING	GRADE	RECOMMENDED MITIGATION
High Significance	National Significance	Grade 1	Site conservation / Site development
High Significance	Provincial Significance	Grade 2	Site conservation / Site development
High Significance	Local Significance	Grade 3A / 3B	
High / Medium Significance	Generally Protected A		Site conservation or mitigation prior to development / destruction
Medium Significance	Generally Protected B		Site conservation or mitigation / test excavation / systematic sampling / monitoring prior to or during development / destruction
Low Significance	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. Few archaeological sites occur in the general area. This will be a result of a lack of surveys, rather than an indication of the amount of sites. The archaeological sites in the general area include Early Stone Age, Early Iron Age, and Late Iron Age sites. Some historical buildings do occur in the general area (fig. 5).

The original farm, Wagenbeetjes Draai 875 was first surveyed in 1848 and sold shortly thereafter (fig. 6). The farm was later subdivided where the study area is now on Lindlea 13970. This suggests that some buildings in the general could date to at least 1848.

The 193, 1963, 1970 and 1989 aerial photographs indicate that the area was been partially cultivated on the upper part of the hill (fig.'s 8 – 11). The 1963 topographical map suggests that part f the slope was also under cultivation (fig. 9).

No visible structures are noted in any of these maps and photographs.

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

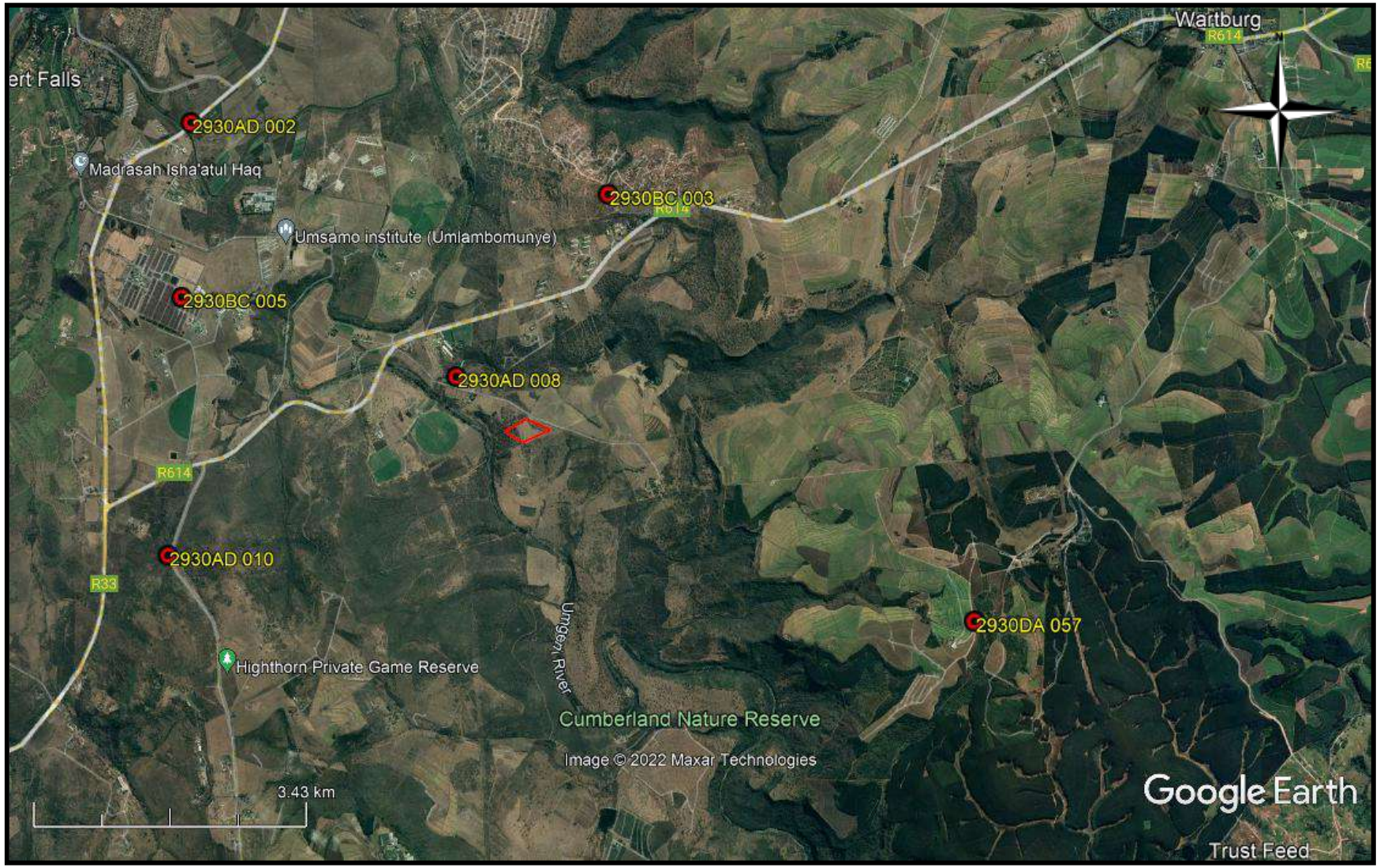
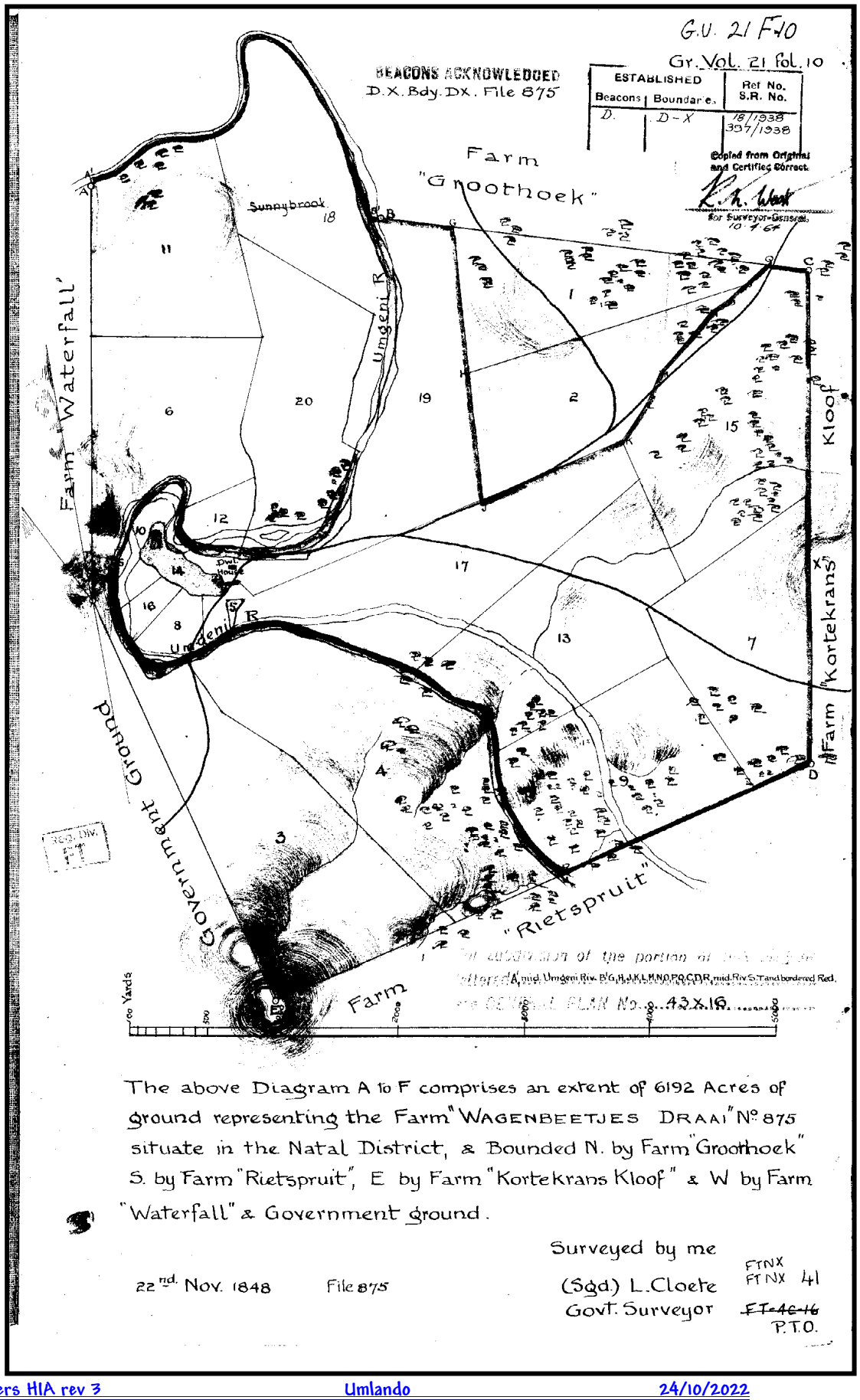


FIG. 6: ORIGINAL FARM WAGENBEETJES DRAAI 875 (1848)



The above Diagram A to F comprises an extent of 6192 Acres of ground representing the Farm "WAGENBEETJES DRAAI" Nº 875 situate in the Natal District, & Bounded N. by Farm "Groothoek" S. by Farm "Rietspruit", E by Farm "Kortekrans Kloof" & W by Farm "Waterfall" & Government ground.

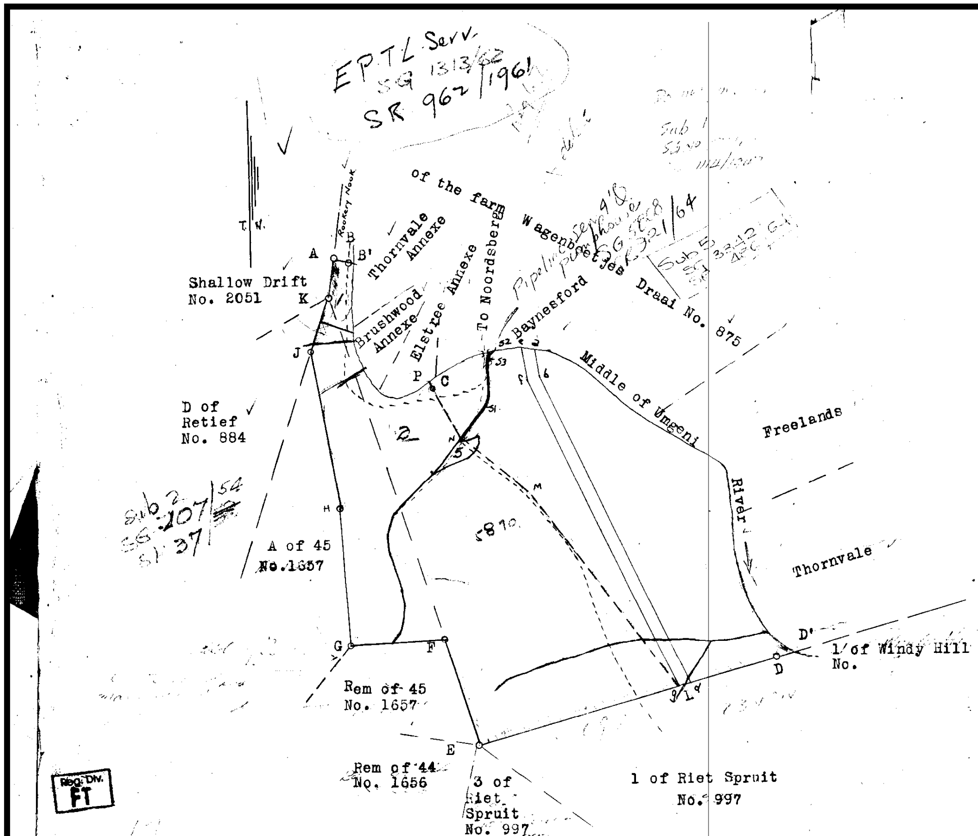
Surveyed by me

22nd. Nov. 1848 File 875

(Sgd) L. Cloete
Govt. Surveyor

FTNX
FT NX 41
~~FT-46-16~~
P.T.O.

FIG. 7: FARM LIDLEA 13790 INCLUDING FREELANDS (1947)



OFFICE COPY

CONSOLIDATED TITLE DIAGRAM
Section 41, Act No. 9 of 1927

S.G. No. 5797/47

Approved

Surveyor General

26 FEB 1948

SIDES. ENGLISH FEET.		ANGLES ~~OF DIRECTION.~~				SYSTEM Lo CO-ORDINATES. Y	X
AB	336.2	A	78	36	40		
BC	3413.3	B	143	23	30		
CD	9823.1	C	198	14	40		
DE	7018.2	D	54	10	30		
EF	2511.2	E	92	12	20		
FG	2064.5	F	255	23	00		
GH	3107.9	G	90	22	00		
HJ	3571.3	H	186	41	00		
JK	1271.8	J	150	44	00		
KA	902.0	K	190	12	20		
BB'	132.0						
DD'	356.4						

ESTABLISHED Beacons	Boundaries	Ref No. S.R. No.
GH	GH-HJ	8/1955 1181/1954

The figure A.B' middle of Umgeni River D' E F G H J K

represents 1419.6300 Acres of of land being

THE FARM LINDLEA NO. 13790 and comprises the figures as quoted at left,

situate in the County of PIETERMARITZBURG Province of Natal.

Compiled for Certificate of Consolidated Title. ~~Surveyed~~ in October 1947, by me

Land Surveyor.

And comprises :-

1. The figure KFGHJ representing B2 of Lot 45 No. 1657 in extent 213 acres, 2 roods, 20.80 perches. Diagram S.V. 51 Folio 102 relating to D/T No. 575/1880.
2. The figure AB' middle of Umgeni River PNMLEK representing Sub-division 3 ~~Baynes Drift~~ of the farm Wagenbeetjes Draai No 875 in extent 606 acres. Diagram S.V. 659 Folio 19 relating to D/T 5490/1925.
3. The figure P middle of Umgeni River D'LMN representing Sub-division 4 ~~Settle~~ of the farm Wagenbeetjes Draai No. 875 in extent 600 acres. Diagram S.V. 659 Folio 20, relating to Deed of Transfer 5491/1925.

This diagram relates to C.C.T 23-8-1951. No. 6856/1951 (Sgd) D. White Registrar of Deeds.	The original diagrams are as ~~No.~~ quoted to the left relating to Deed of No.	File No. 6070 Survey Records 1114/47 Compilation Degree Sheet 53

T.S.M.—P.M.B. 9601 9-46

FIG.8: LOCATION OF THE STUDY AREA IN 1937

FIG. 9: LOCATION OF THE STUDY AREA IN 1963

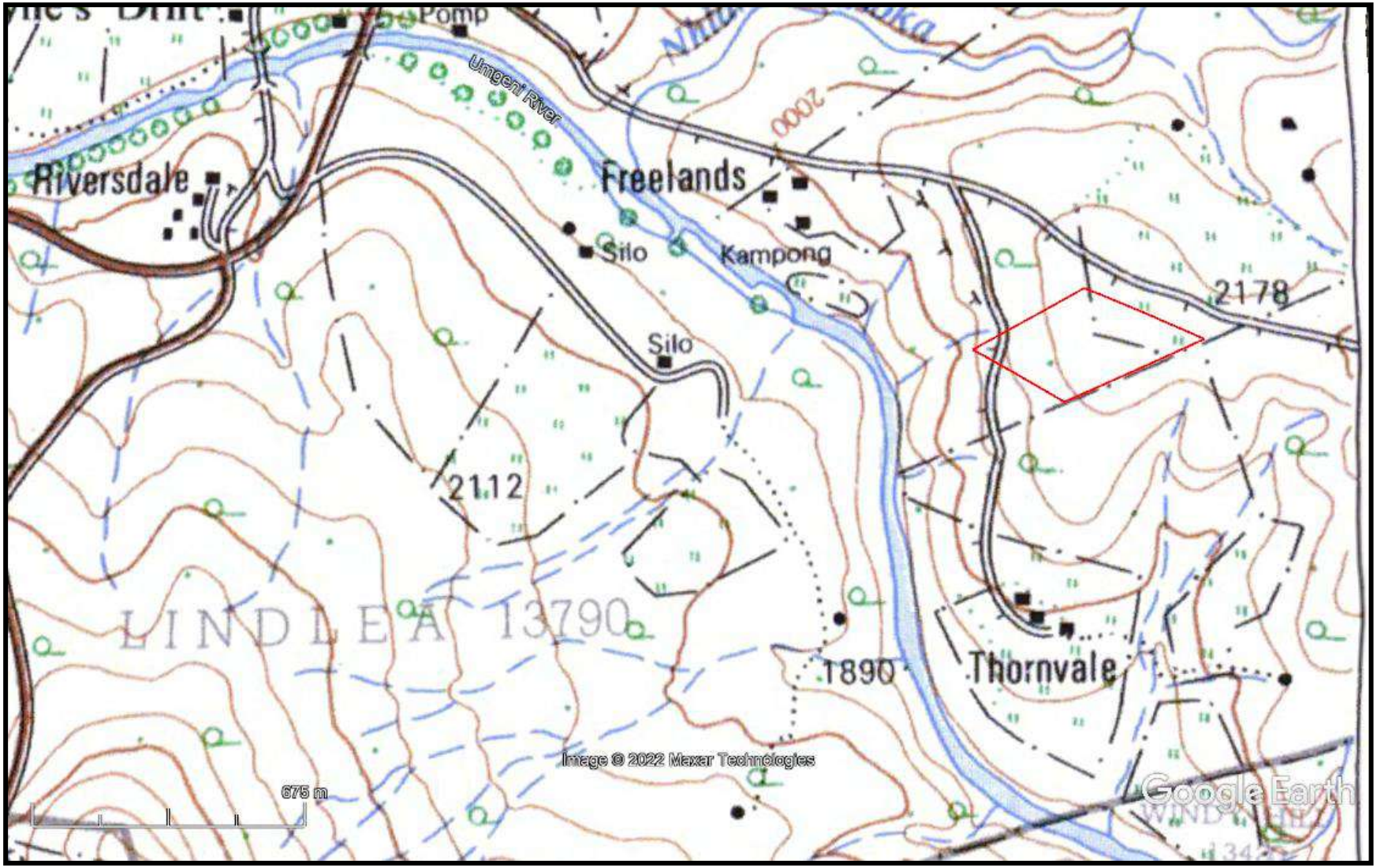


FIG. 10: LOCATION OF THE STUDY AREA IN 1970

FIG. 11: LOCATION OF THE STUDY AREA IN 1989

PALAEONTOLOGICAL SENSITIVITY

The area is in an area of medium palaeontological sensitivity (fig. 12). Dr. Alan Smith undertook a brief analyses of the area and suggested a letter of exemption will suffice. He states that the underlying rock is Dyka Group. Trace fossils may be found but these are not significant. No significant palaeontological finds have been made in this lithology (Appendix A).

No further PIA mitigation is required.

FIG. 7: PALAEONTOLOGICAL SENSITIVITY MAP

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 18 May 2022. Much of the area was covered in long grass; however, there were enough tracks and cleared areas to make a satisfactory survey.

There has been systematic field clearance on most of the property up to the current line of thornbush trees. This is seen by the piles of boulders on the edges of the property.

The upper part of the site has several Early Stone Age and Middle Stone Age stone tools (fig. 13). These are in a secondary context and have been disturbed by previous ploughing and natural post depositional movement. The tools are of low significance and form part of the general scatter of stone tools in the area. The tools do not form an archaeological site and should be noted as an occurrence of stone tools

Within the thornbush area is a stone cairn (29°28'47.13"S 30°29'27.97"E) that is next to an interlinking track (fig. 14) The cairn is approximately 1.2m x 2m in size and consists of packed rocks and sand infill. It is in a north-south orientation. While the cairn is probably not a grave, it needs to be treated as such until proven otherwise as it fits the criteria for a grave. The area should have a demarcated buffer 5m from it, and a non-development buffer of 20m. The slope of the cairn follows the slope of the hill, and is thus not a base for a water tank or similar object.

The location of the stones tools and cairn are shown in fig. 15.

Subsequent to the survey the cairn was re-assessed. The vegetation had been cleared around the cairn and general area. . The cairn is clearly the result of a small excavated trench. The material from the trench was placed in one pile

that subsided into a ~1.2m x 2m pile of rocks with sand in the middle. The profile of both sides of the trench are clear indications that there is no grave and that the cairn is only a pile of rocks placed on top of the surface.

The re-assessment is shown in fig. 16.

FIG. 13: STONE TOOLS WITHIN THE STUDY AREA





FIG. 14: STONE CAIRN

FIG. 15: LOCATION OF STONES TOOLS AND STONE CAIRN

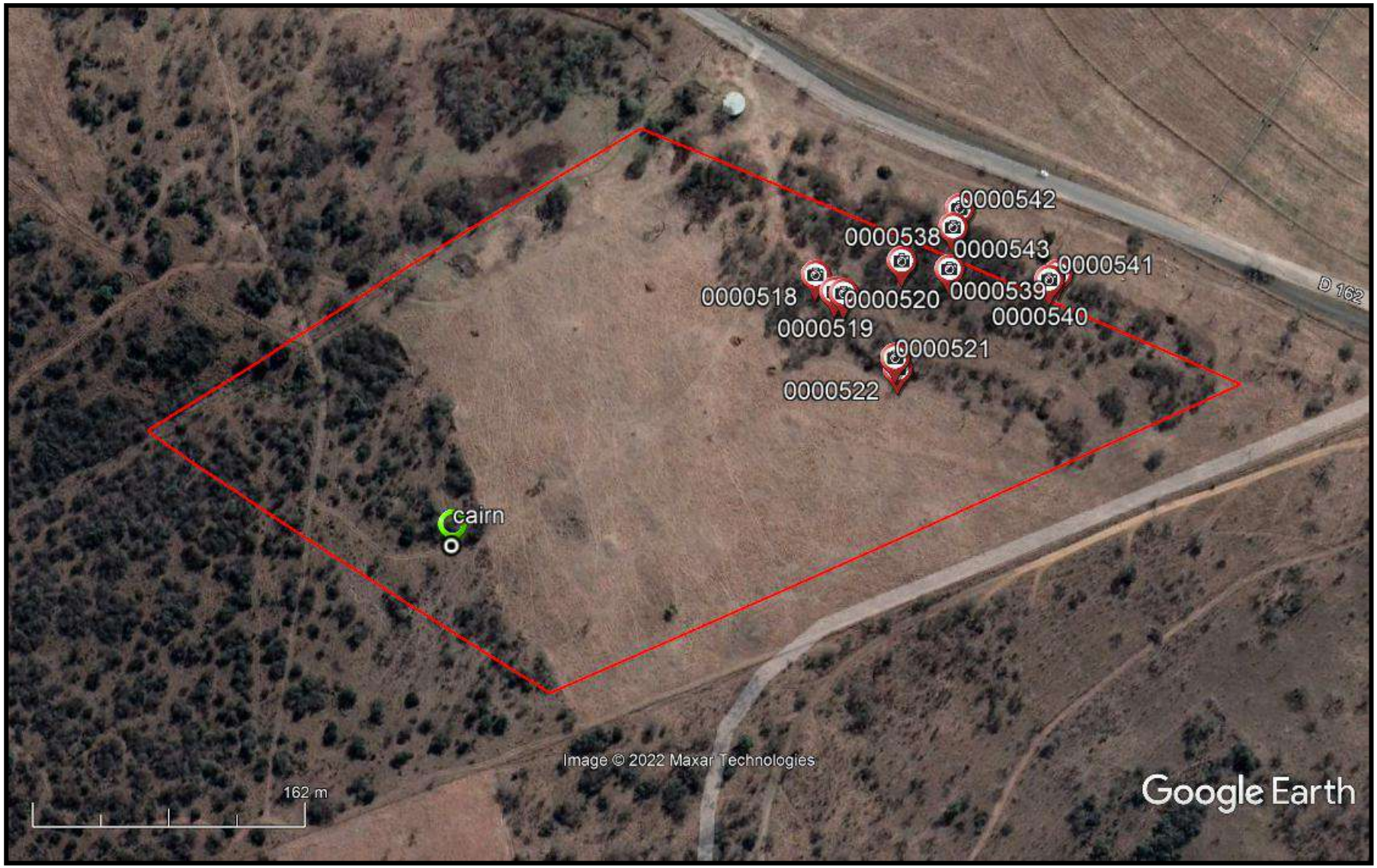
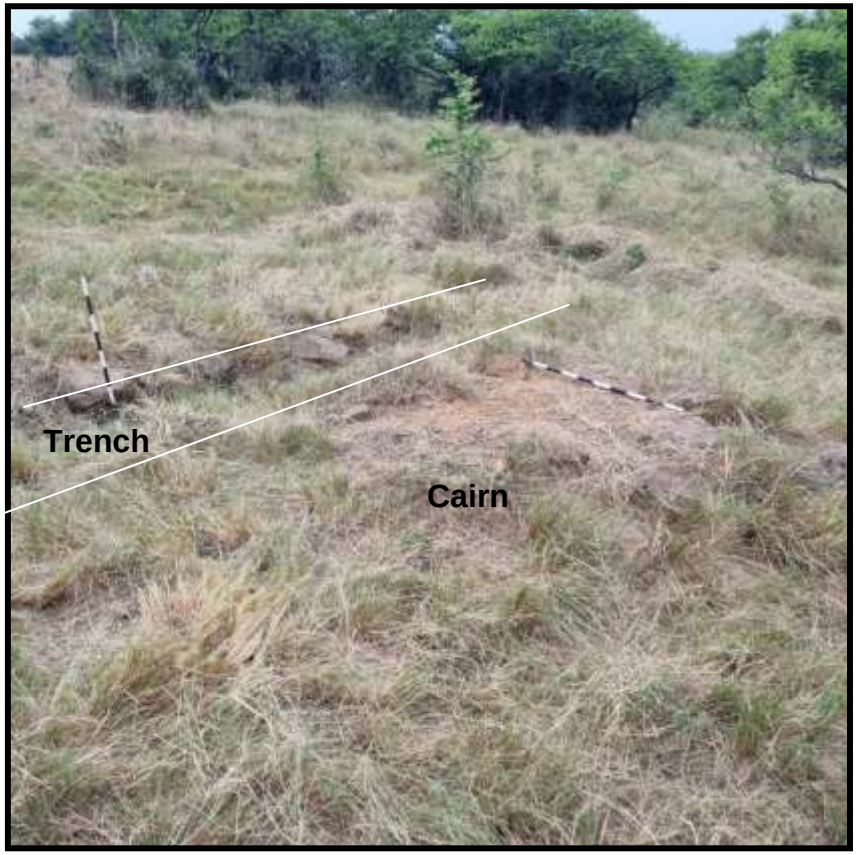


FIG. 16: RE-ASSESSMENT OF THE STONE CAIRN



RECOMMENDATIONS & MANAGEMENT PLAN

No further heritage mitigation is required.

A Chance find Protocol has been initiated for the palaeontology.

CONCLUSION

A Heritage survey was undertaken for the proposed Nyala Farm cc chicken broilers. Twelve chicken broilers will be built within the study area. The heritage survey noted that there are several Early and Middle Stone Age stone tools occur in the study area. These are of low significance and no further mitigation is required.

A stone cairn that resembles a grave was noted in the southern part of the study area. It was alter determined to not be a grave, but the result of a small trench excavation that placed all the material on one area.

REFERENCES

Surveyor General map
GV 21 F10
SG 5792147

1:50 000 Topographical Maps
2930AD 1968, 2000 Albert Falls

Aerial Photographs
117B_017_38200
807_011_08620
933_007_01903

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.

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:

NYALA DEVELOPMENT NEAR ALBERT FALLS UMSHWATHI LOCAL MUNICIPALITY, EASTERN CAPE.

Dear Sir

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

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The proposed development will take place in rocks colour coded green in the SAHRIS Map. This site is about 250 X 370 m, but will have shallow foundations and to be constructed on agricultural land which is already disturbed. The underlying rock is Dyka

Group. Trace fossils may be found but these are not significant. No significant palaeontological finds have been made in this lithology.

Consequently there is no reason to conduct a PIA for this project. Exemption from Palaeontological Impact Assessment (PIA) is requested for this project. However a "Chance Find Protocol" is attached to cover any chance find.

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
25 May, 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.