HERITAGE IMPACT ASSESSMENT OF THE PROPOSED DAMS AND ORCHARDS FOR THE GUBENXA VALLEY, E. CAPE

FOR INDWE ENVIRONMENTAL CONSULTING CC

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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 general project area is located around 31°21'31.719"S 28°9'19.92"E within the Gubenxa Valley. The project area is about 37 kilometers away from the town of Elliot and can be accessed via the R56.

The EC DRDAR is in the process of assisting 13 beneficiaries to develop and irrigate a deciduous fruit operation within the Gubenxa Valley which is part of the Sakhisizwe Local Municipality within the Chris Hani District Municipality. These landowners need to be completely developed individually in order to successfully obtain an operating deciduous set-up. Such development will include the following:

• Building of thirteen (13) water storage dams for irrigation of These dams are of different sizes and capacities, have dam walls that exceed 5m in height and most have a capacity over 50 000m3 in volume

Pumps and piping of the water to localised balancing/ lei dams. These dams will function as holding dams for the irrigation of orchards.

• In field irrigation development on both existing and new plantation lands.

• Development of approximately 21 orchards across different farms within the area.

Table 1 lists the various dams and their sizes

Umlando was requested to undertake the HIA for the development. The survey was for the dams and orchards only. The survey does not include pipelines between the dams and the orchards. These can be assessed at a desktop level once finalised. Feedback from the Chief Engineer from ECDRDAR is that “The laydams will be located at each land, but the positions will be determined by the irrigation designer. The pipelines will obviously then follow the shortest route between the dam and the laydam. All of that was planned to be done by the irrigation designer, and not the dam designer. It is therefore not

possible to give accurate positions for those at this stage". Once the irrigation designer has determined provisional pipeline routes, a condition of the EA should be that the heritage practitioner assess the routes beforehand and ensure that any additional heritage items are addressed

Fig. 1 – 3 shows the location of the various dams.

TABLE 1: DAMS IN THE STUDY AREA

Farm name	Dam no.	Dam capacity (m3)	Dam wall volume (m3)	Dam wall height (m)
Macingwane	1	79 039	12 264	12.4
Tasana	2	28 825	6 161	8.89
Hope	3	148 294	40 422	12
Berg	4	173 816	57 399	15.16
Qwathitolo	5	420 163	22 760	11.97
Qwathitolo	6	447 539	65 226	13.68
Mgedezi	7	58 159	21 167	5.69
Paardekraal	8	134 796	25 808	7.81
Gubenxa Trust	9	253 919	32 515	11.84
Wadelands	10	114 437	18 397	10.18
Greenfields	11	75 816	30 062	12.5
Magoda	13	51 500	21 308	12
Qangule	14	631 124	88 348	17.08

FIG. 1 GENERAL LOCATION OF THE STUDY AREA

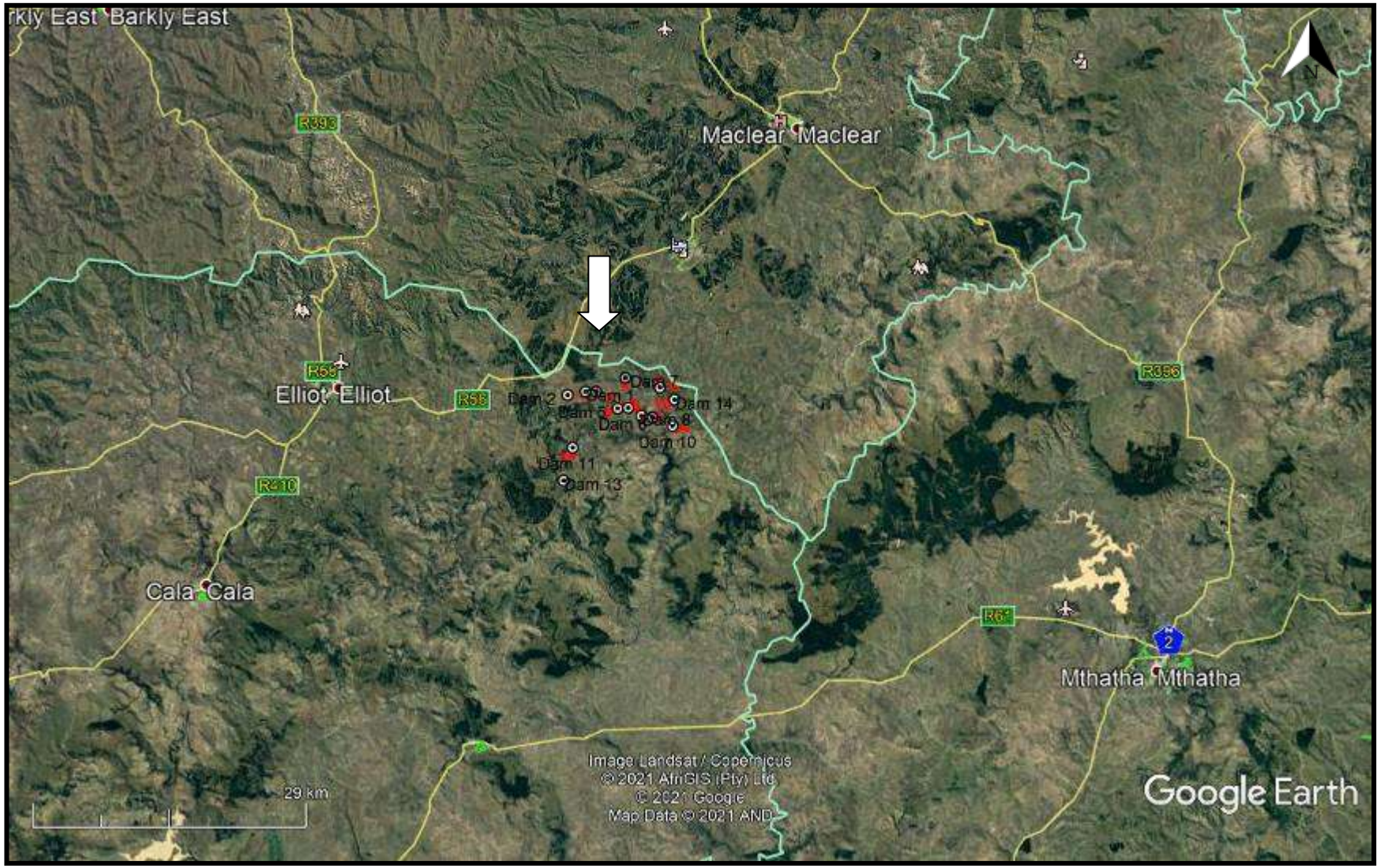


FIG. 2: AERIAL OVERVIEW OF THE STUDY AREA

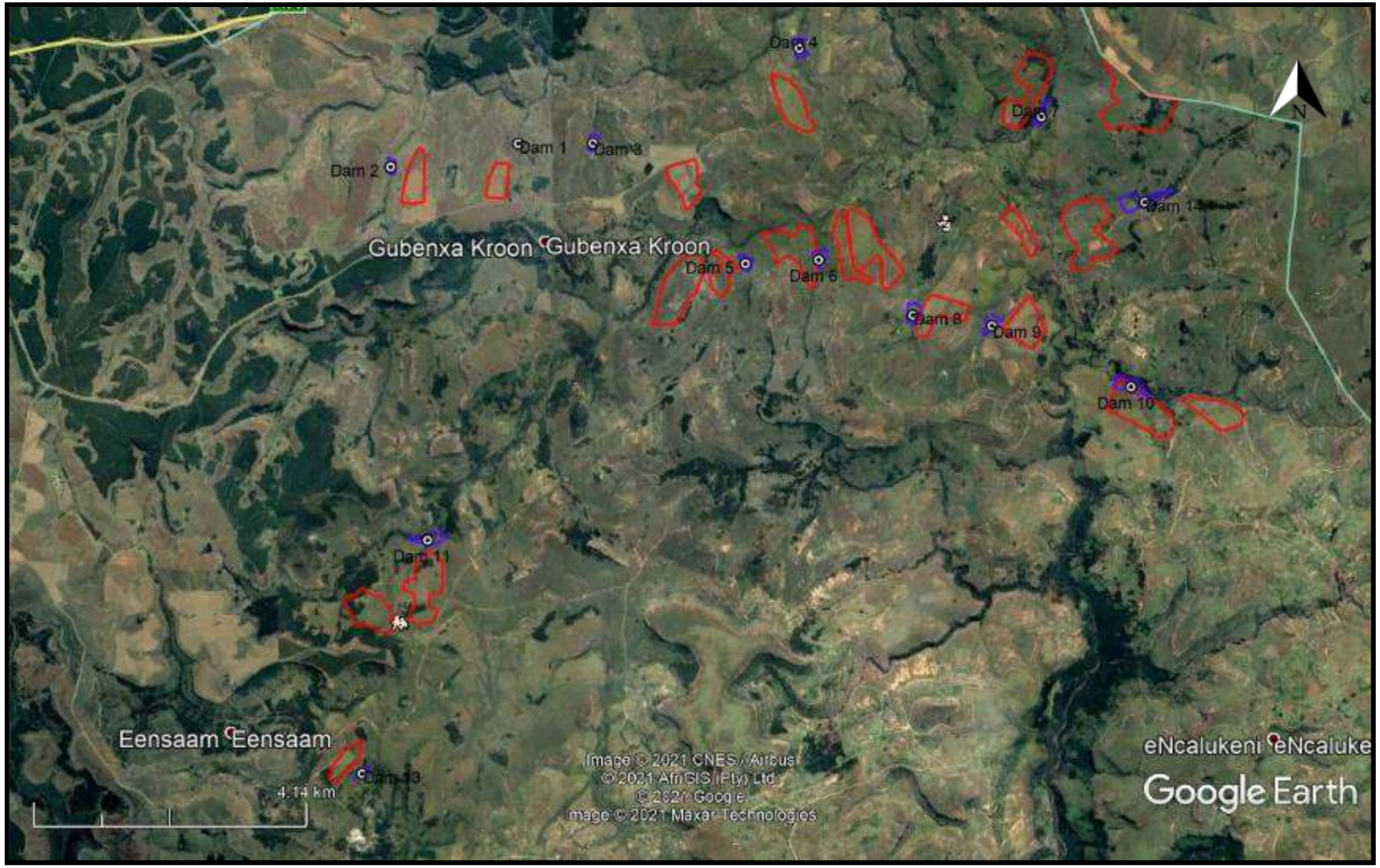
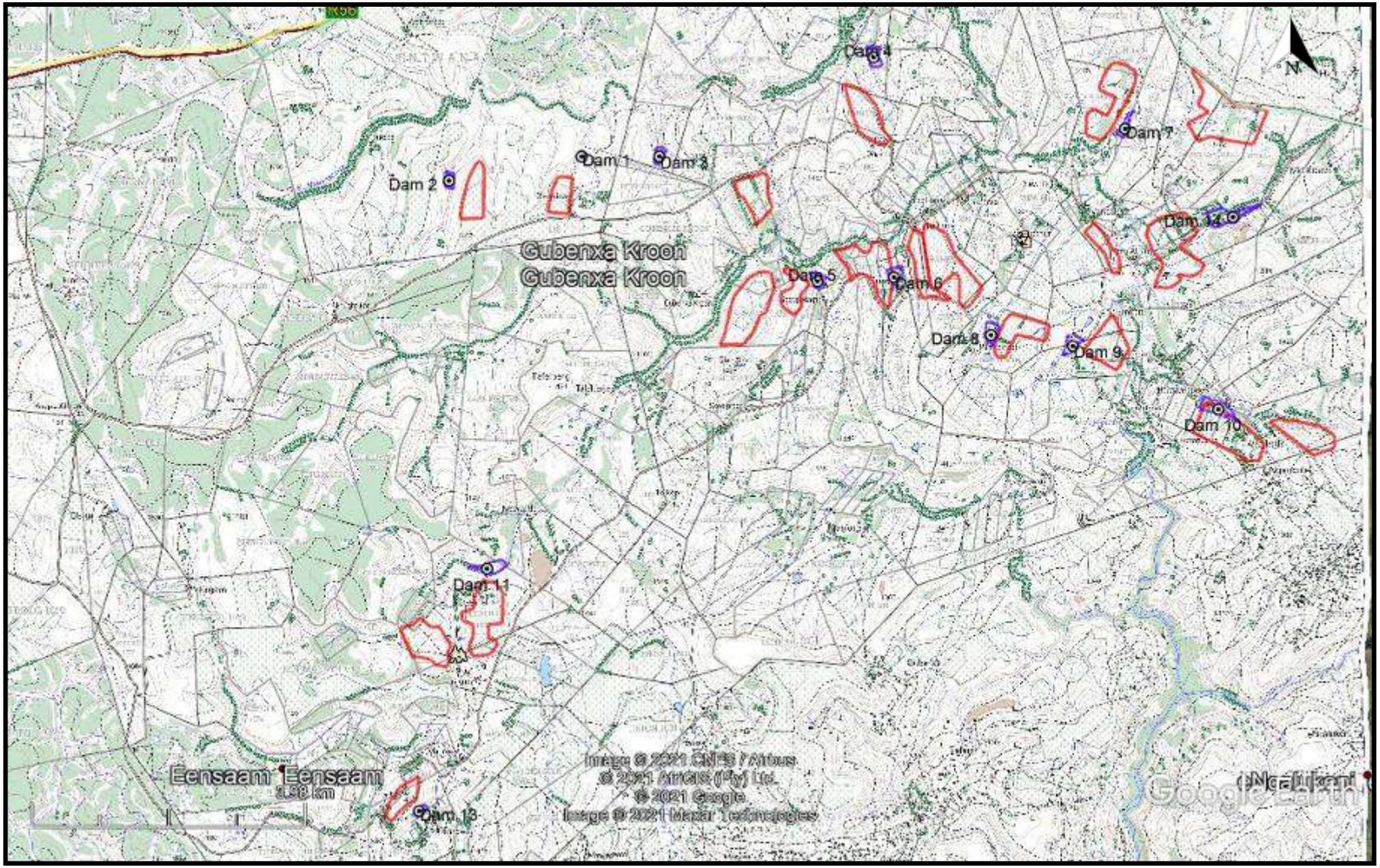


FIG. 3: TOPOGRAPHICAL MAP OF THE STUDY AREA



NATIONAL HERITAGE RESOURCES ACT OF 1999

The National Heritage Resources Act of 1999 (pp 12-14) protects a variety of heritage resources. This are resources are defined as follows:

1. **"**For the purposes of this Act, those heritage resources of South Africa which are of cultural significance or other special value for the present community and for future generations must be considered part of the national estate and fall within the sphere of operations of heritage resources authorities.
2. Without limiting the generality of subsection (1), the national estate may include—
   - 2.1. Places, buildings, structures and equipment of cultural significance;
   - 2.2. Places to which oral traditions are attached or which are associated with living heritage;
   - 2.3. Historical settlements and townscapes;
   - 2.4. Landscapes and natural features of cultural significance;
   - 2.5. Geological sites of scientific or cultural importance;
   - 2.6. Archaeological and palaeontological sites;
   - 2.7. Graves and burial grounds, including—
     - 2.7.1. Ancestral graves;
     - 2.7.2. Royal graves and graves of traditional leaders;
     - 2.7.3. Graves of victims of conflict;
     - 2.7.4. Graves of individuals designated by the Minister by notice in the Gazette;
     - 2.7.5. Historical graves and cemeteries; and
     - 2.7.6. Other human remains which are not covered in terms of the Human Tissue Act, 1983 (Act No. 65 of 1983);
3. Sites of significance relating to the history of slavery in South Africa;
   - 3.1. Movable objects, including—

4. Objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens;
   4.1. Objects to which oral traditions are attached or which are associated with living heritage;
   4.2. Ethnographic art and objects;
   4.3. Military objects;
   4.4. objects of decorative or fine art;
   4.5. Objects of scientific or technological interest; and
   4.6. books, records, documents, photographic positives and negatives, graphic, film or video material or sound recordings, excluding those that are public records as defined in section 1(xiv) of the National Archives of South Africa Act, 1996 (Act No. 43 of 1996).
5. Without limiting the generality of subsections (1) and (2), a place or object is to be considered part of the national estate if it has cultural significance or other special value because of—
   5.1. Its importance in the community, or pattern of South Africa's history;
   5.2. Its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;
   5.3. Its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;
   5.4. Its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;
   5.5. Its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
   5.6. Its importance in demonstrating a high degree of creative or technical achievement at a particular period;
   5.7. Its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;
   5.8. Its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa; and

5.9. sites of significance relating to the history of slavery in South Africa"

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. These database contain 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.

The above significance ratings allow one to grade the site according to SAHRA's grading scale. This is summarised in Table 1.

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

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. I also used various sources for historical information. Other studies occur further a field and relate to bulk water systems and transmission lines (fig. 4).

Prins (2010) undertook a survey in the general area for an ESKOM transmission line. Most of the line followed the existing roads. Prins noted some historical sites within the general study area.

No national monuments, battlefields, or historical cemeteries are known to occur in the area of the orchards or dams. However, some do occur nearby.

The Surveyor General Title Deed maps indicate that all of the farms, except two, were surveyed in 1913 and probably sold with Title Deeds shortly thereafter (fig.'s 5 – 17). This is significant as it probably relates to "The Natives Land Act of 1913". This does not mean that the farms were not already on lease before 1913. The Title Deeds do however give an approximate date to some of the farms in the study area. The Deeds survey also suggests that many of the farms were occupied by white farmers from about 1914 onwards, and thus the buildings are older than 60 years in age. These buildings, even if in ruin, are thus protected by the heritage legislation.

The 1966 topographical map shows, which farms in the study area, have built features that could be affected by the dams and orchards. This is summarised in Table 3. In fig. 9 there is an area shown being reserved for a church at Dam 5. This church was not built, but could have been moved to the church at Blue Gum Vale A (a.k.a. Gubenxa). Dam 6 is noted for having a grave. Qangule 2 orchards and Wadelands 2 have old buildings and/or ruins.

TABLE 3: SUMMARY OF 1966 TOPOGRAPHICAL MAP

Farm Name	Dam No.	Historical Features In Dam	Historical Features Near Dam	Historical Features In Orchard	Historical Features Near Orchard	Description
Macingwane	1	No	No	No	Yes	Farm Clearview
Tasana	2	No	No	No	No	NA
Hope	3	No	No	NA	NA	NA
Berg	4	No	No	No	Yes	Farm Geluk
Qwatsitolo	5	No	No	No	No	NA
Qwatsitolo	6	No	No	No	Yes	Farm Sunnyside, apparent grave
Mgedezi	7	No	No	No	No	NA
Paardekraal	8	No	Yes	No	No	Farm Paardekraal
Gubenxa Trust	9	No	No	No	No	NA
Wadelands	10	No	No	Yes	No	Farm Wadelands Ruins
Greenfields	11	No	No	No	No	NA
Magoda	13	No	No	No	No	NA
Qangule	14	No	No	Yes	Yes	Farms Kortvlei, Albany & Afgunst

FIG. 4: KNOWN HERITAGE SITES IN THE AREA

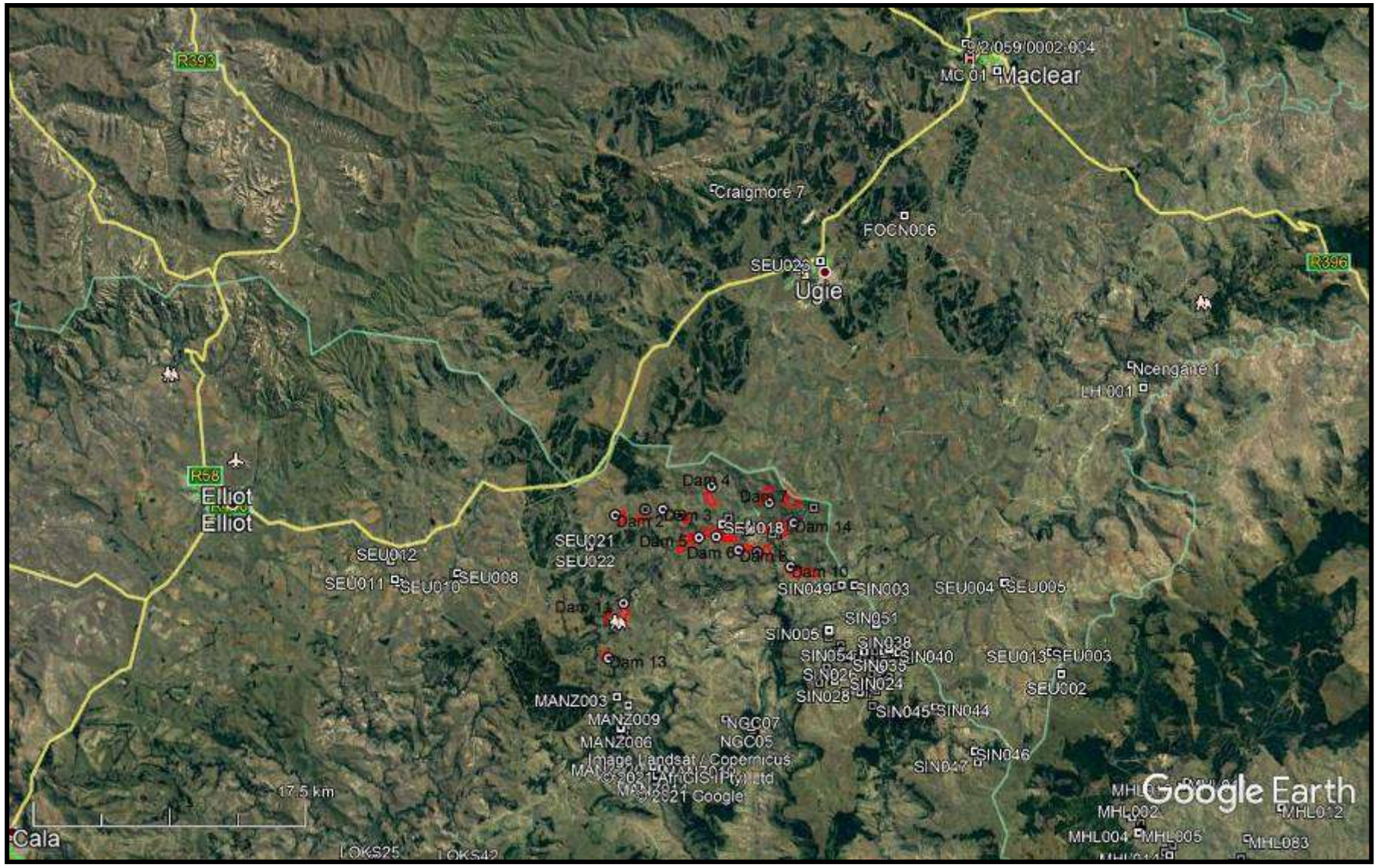


FIG. 5: DAM 1 & 2 ON ENTWAZANA RESERVE (1884)

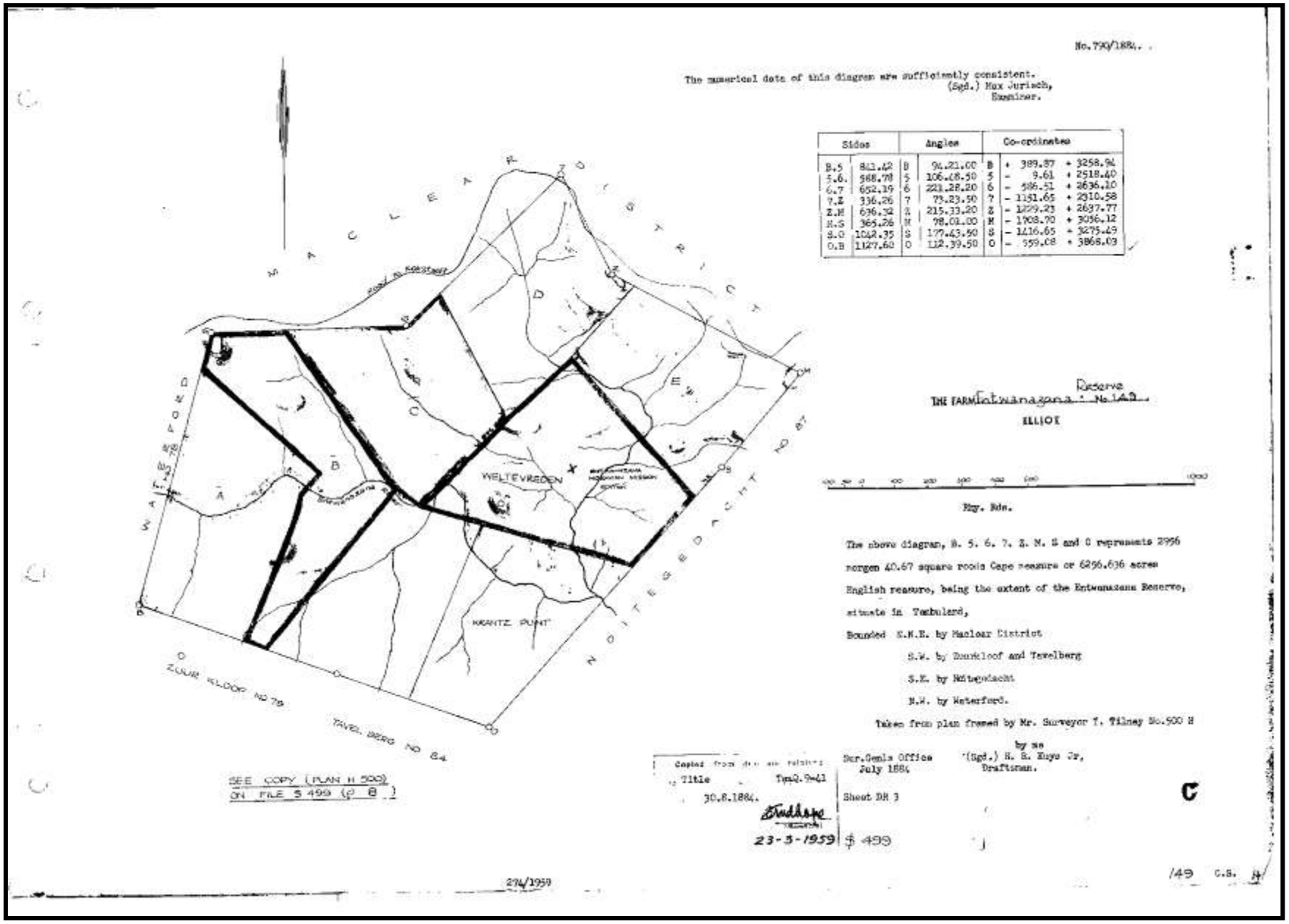


FIG. 6: DAM 3 ON ERF GIVUN A (1913)

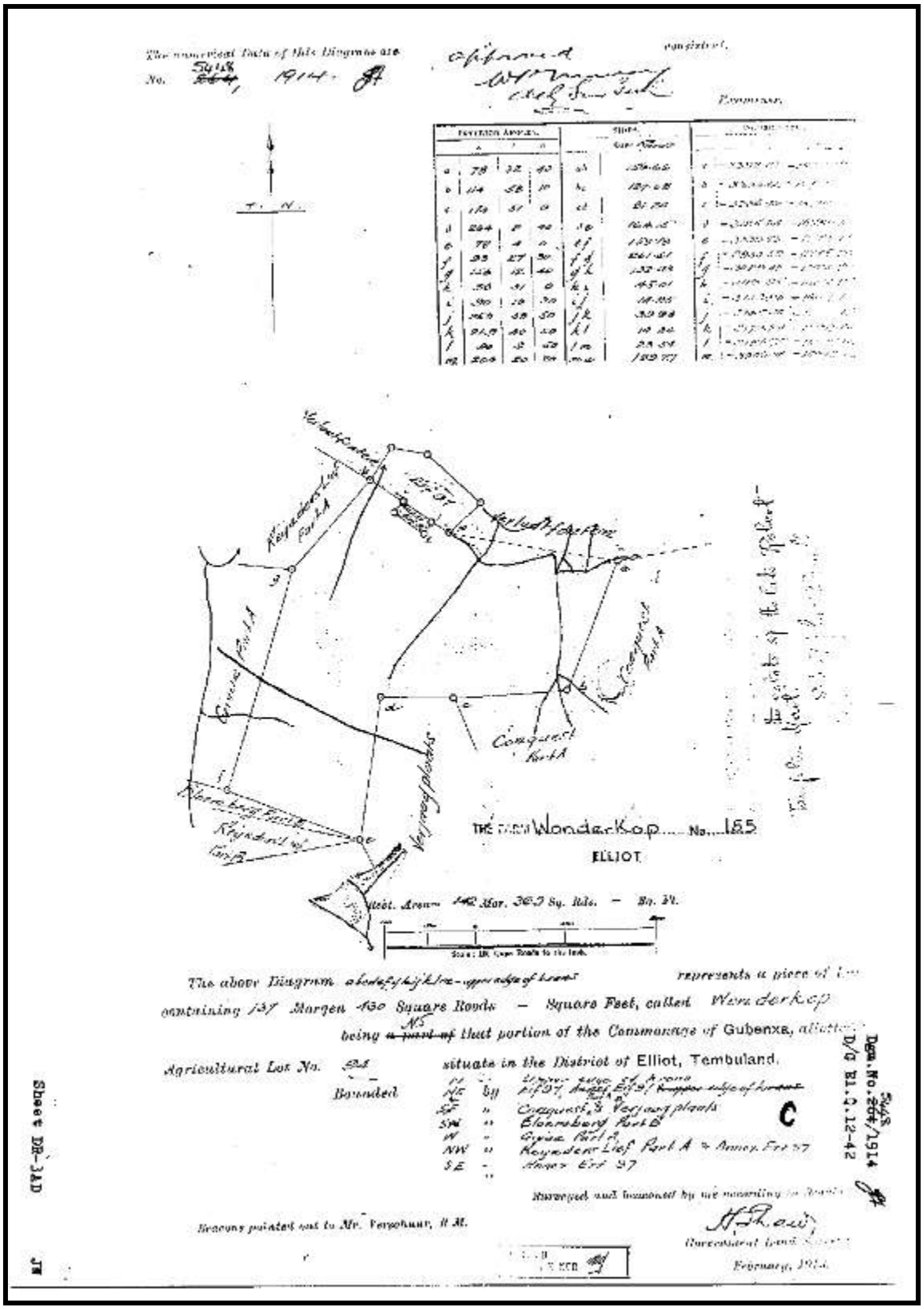


FIG. 7: DAM 4 ON FARM GELUK (1913)

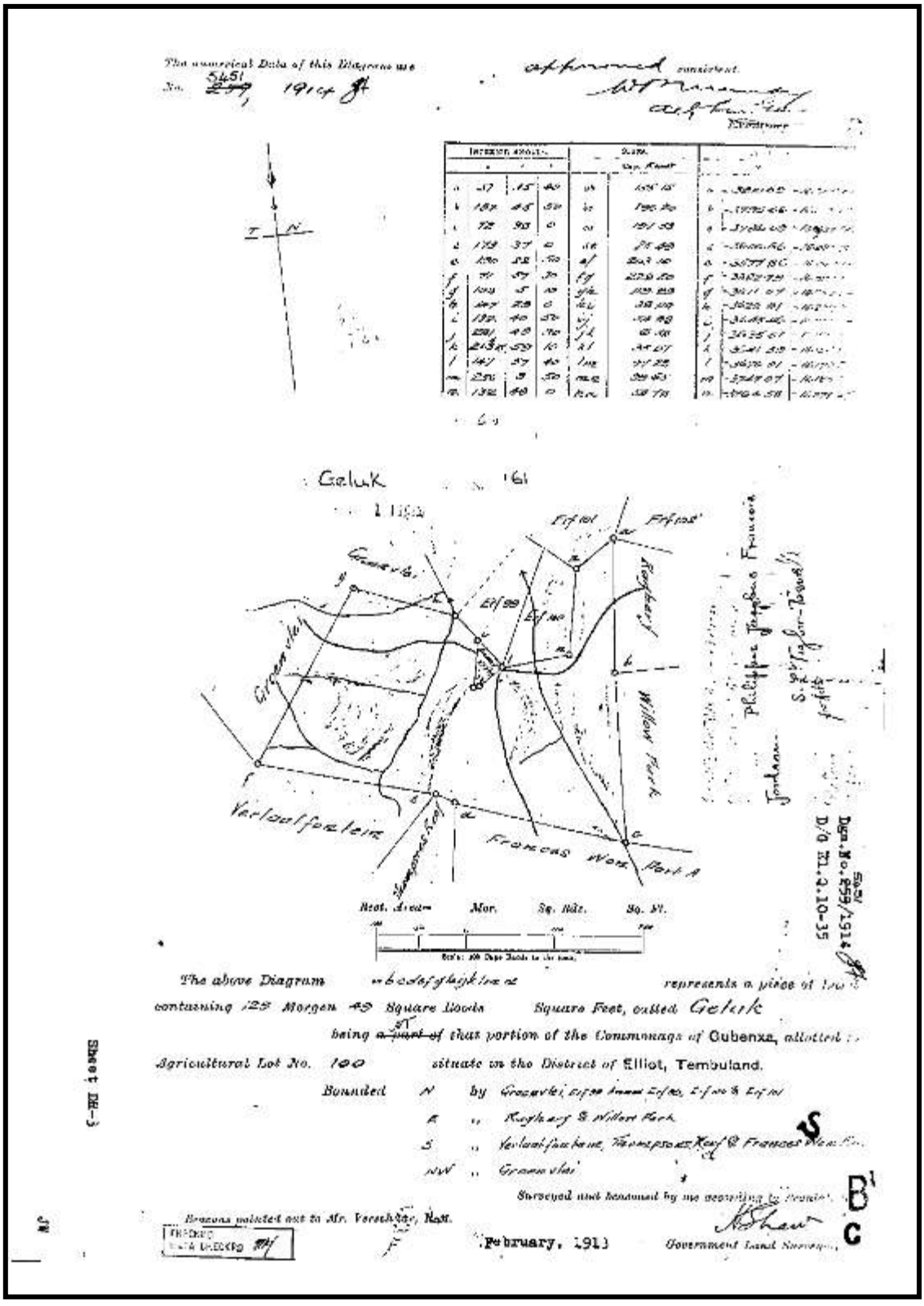


FIG. 8: DAM 5 ON FARMS SUNFLOWER VALLEY AND GOODGEDACHT (1913)

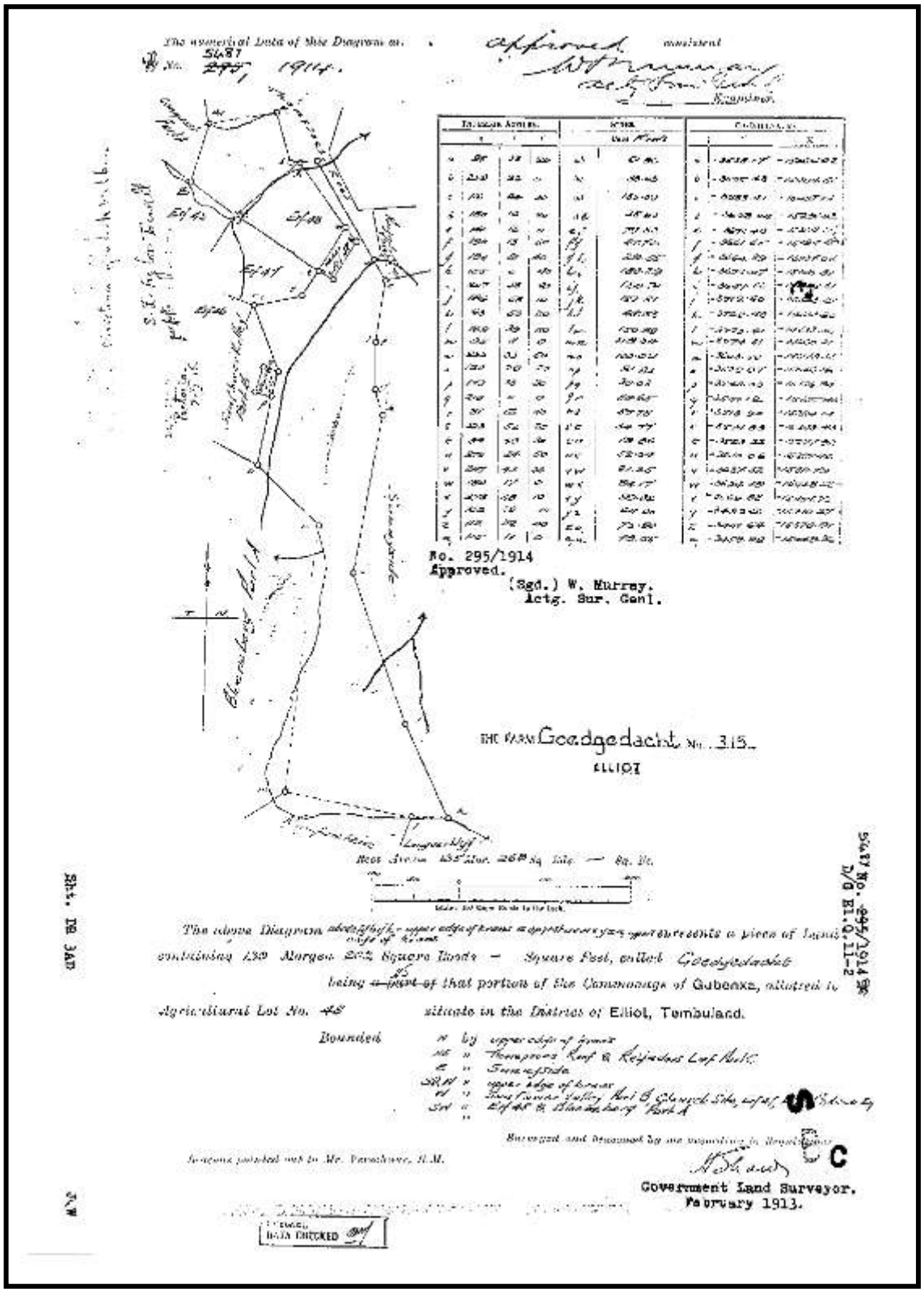
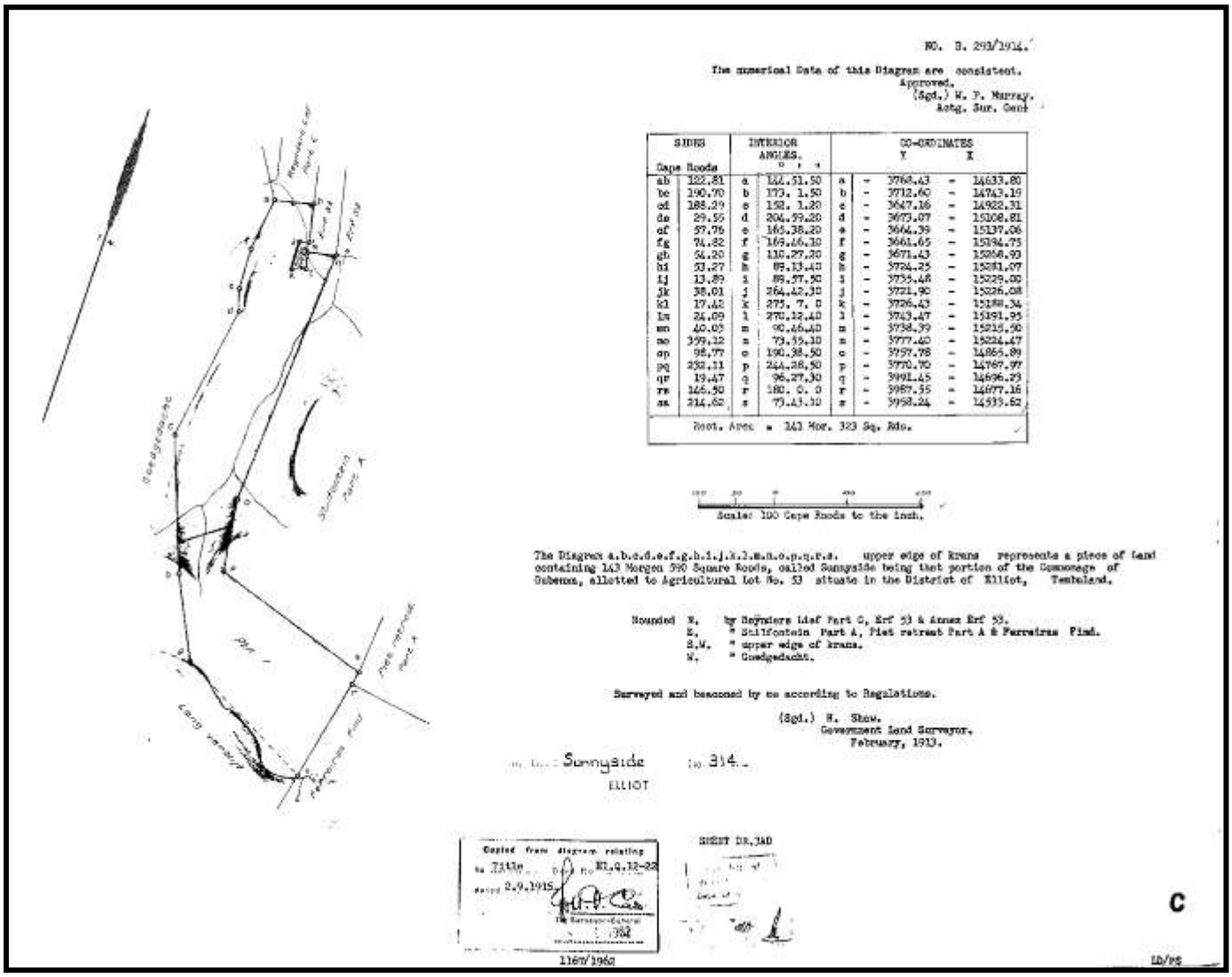


FIG. 9: DAM 6 ON FARM SUNNYSIDE (1913)



NO. D. 293/1914.

The numerical Data of this Diagram are consistent.
Approved.
(Sgd.) W. F. Murray.
Actg. Sur. Gen.

SIDES Cape Roods		INTERIOR ANGLES. ° ' "		CO-ORDINATES Y	X
ab 122.81	a	122.51.50	a	- 3768.43	- 14633.80
bc 190.70	b	173. 1.50	b	- 3712.60	- 14743.19
cd 188.29	c	152. 1.20	c	- 3647.16	- 14922.31
de 29.55	d	204.59.20	d	- 3673.07	- 15008.81
ef 57.76	e	165.38.20	e	- 3664.39	- 15137.06
fg 74.82	f	169.26.10	f	- 3661.65	- 15194.75
gh 54.20	g	110.27.20	g	- 3671.43	- 15268.93
hi 53.27	h	89.13.40	h	- 3724.25	- 15281.07
ij 13.89	i	89.57.50	i	- 3735.48	- 15229.00
jk 38.01	j	264.42.30	j	- 3721.90	- 15226.08
kl 17.42	k	275. 7. 0	k	- 3726.43	- 15188.34
lm 24.09	l	270.12.40	l	- 3743.47	- 15191.95
mn 40.03	m	90.46.40	m	- 3738.39	- 15215.90
no 359.12	n	73.55.10	n	- 3777.40	- 15224.47
op 98.77	o	190.38.50	o	- 3757.78	- 14865.89
pq 232.11	p	244.28.50	p	- 3770.70	- 14767.97
qr 19.47	q	96.27.30	q	- 3991.45	- 14696.23
rs 146.50	r	180. 0. 0	r	- 3987.55	- 14677.16
sa 214.62	s	73.43.10	s	- 3958.24	- 14533.62

Root. Area = 143 Mor. 323 Sq. Rds.

Scale: 100 Cape Roods to the Inch.

The Diagram a.b.c.d.e.f.g.h.i.j.k.l.m.n.o.p.q.r.s. upper edge of krans represents a piece of land containing 143 Morgen 590 Square Roods, called Sunnyside being that portion of the Commonage of Gubenxa, allotted to Agricultural Lot No. 53 situate in the District of Elliot, Tembuland.

Bounded N. by Reyniers Lief Part C, Erf 53 & Annex Erf 53.
E. " Stiltfontein Part A, Piet retreat Part A & Ferreiras Find.
S.W. " upper edge of krans.
N. " Goedgedacht.

Surveyed and beaconed by me according to Regulations.

(Sgd.) H. Shaw.
Government Land Surveyor.
February, 1913.

Sunnyside No. 314.
ELLIOT

Copied from diagram relating to Title No. ET.4.12-22 dated 2.9.1915
The Surveyor-General 1962

SHEET DR.340

C

1169/1962

LD/PS

FIG. 10: DAM 7 ON DE WETS RUST (1913)

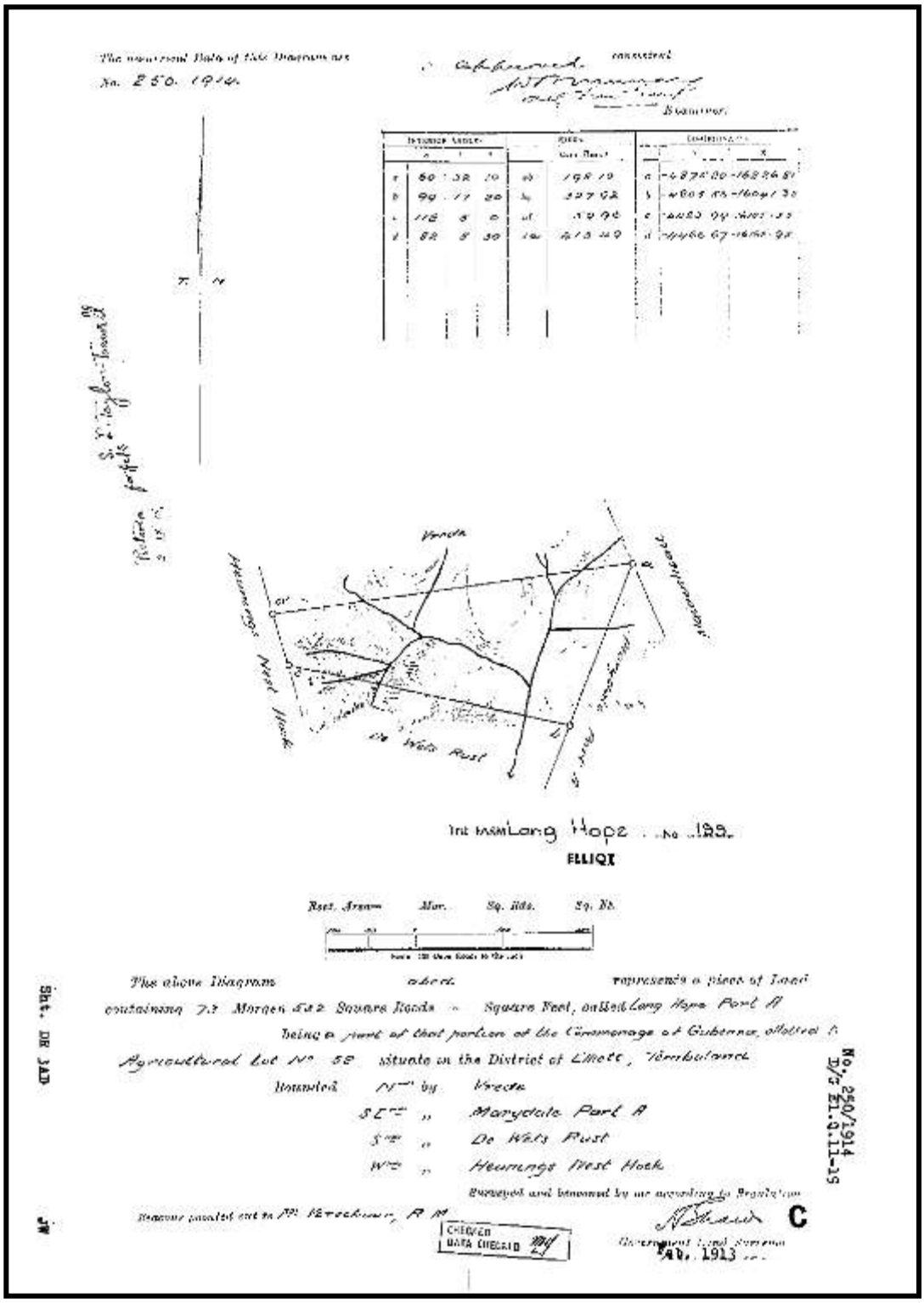


FIG. 11: DAM 8 ON PAARDEKRAAL (1913)

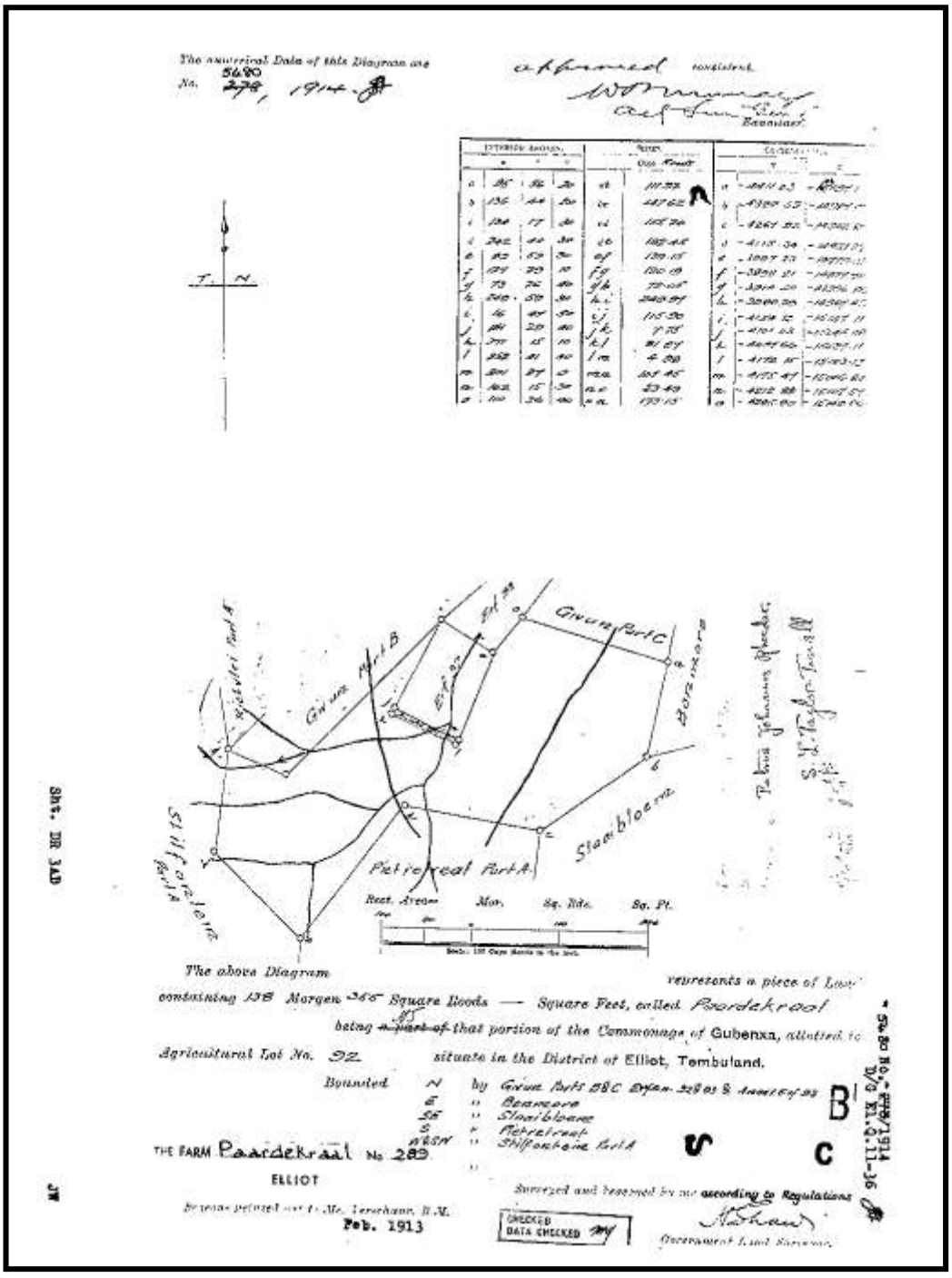


FIG. 12: DAM 9 ON FARMS BENMORE AND SLAAIBLOEM (1913)

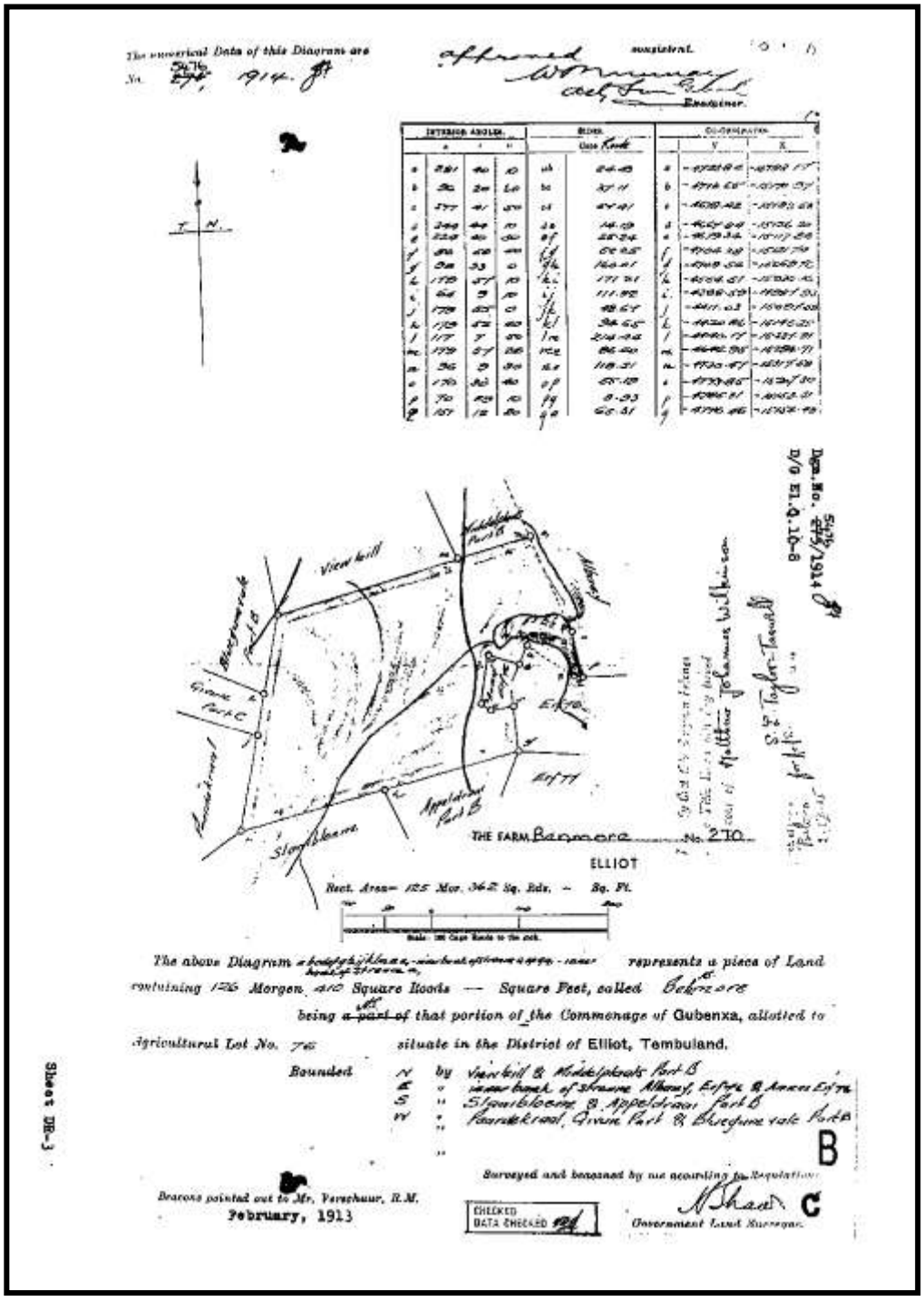


FIG. 13: DAM 10 ON FARM WADELANDS (1913)

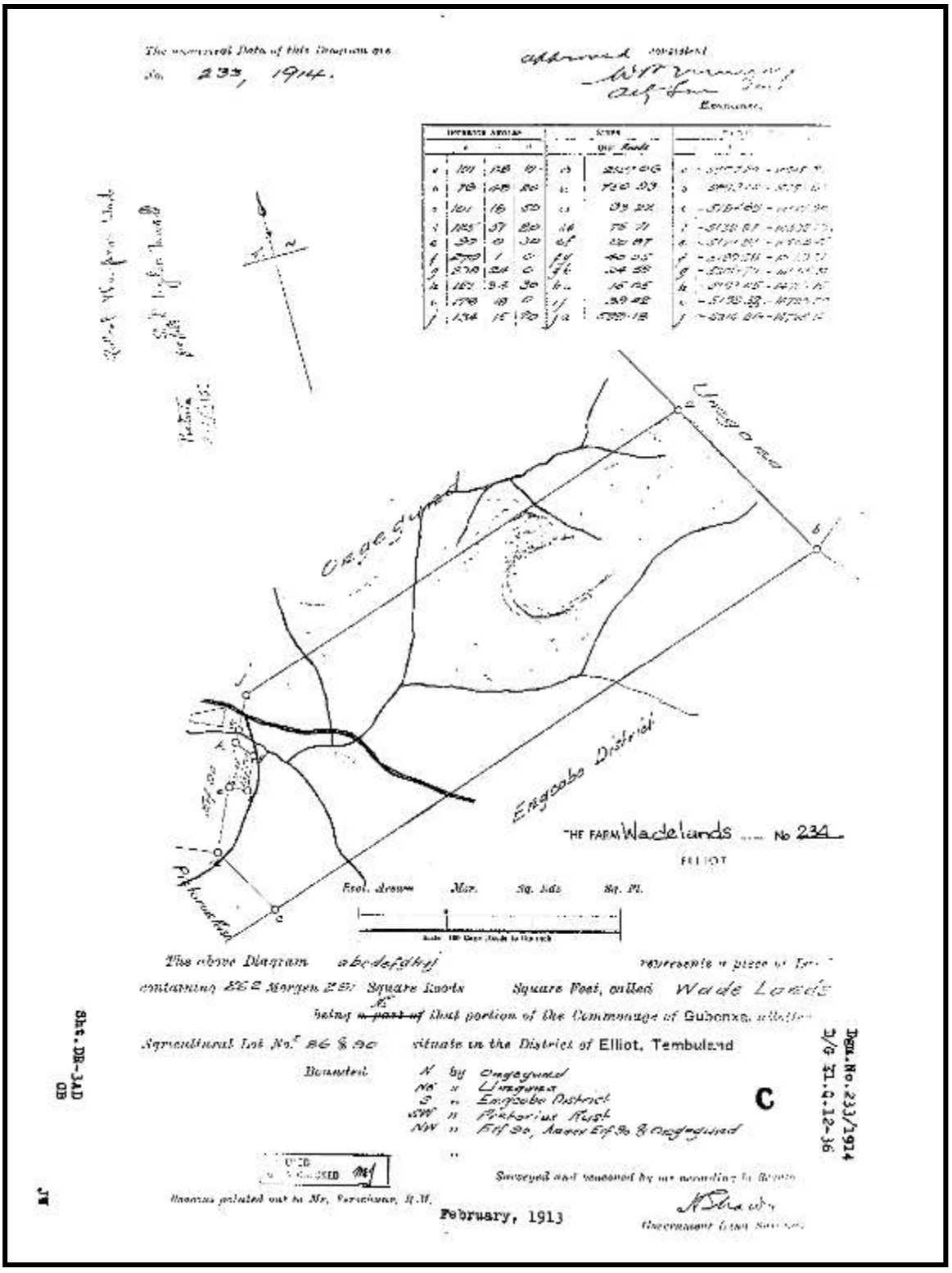


FIG. 14: DAM 11 ON FARM GREENFIELDS (1920)

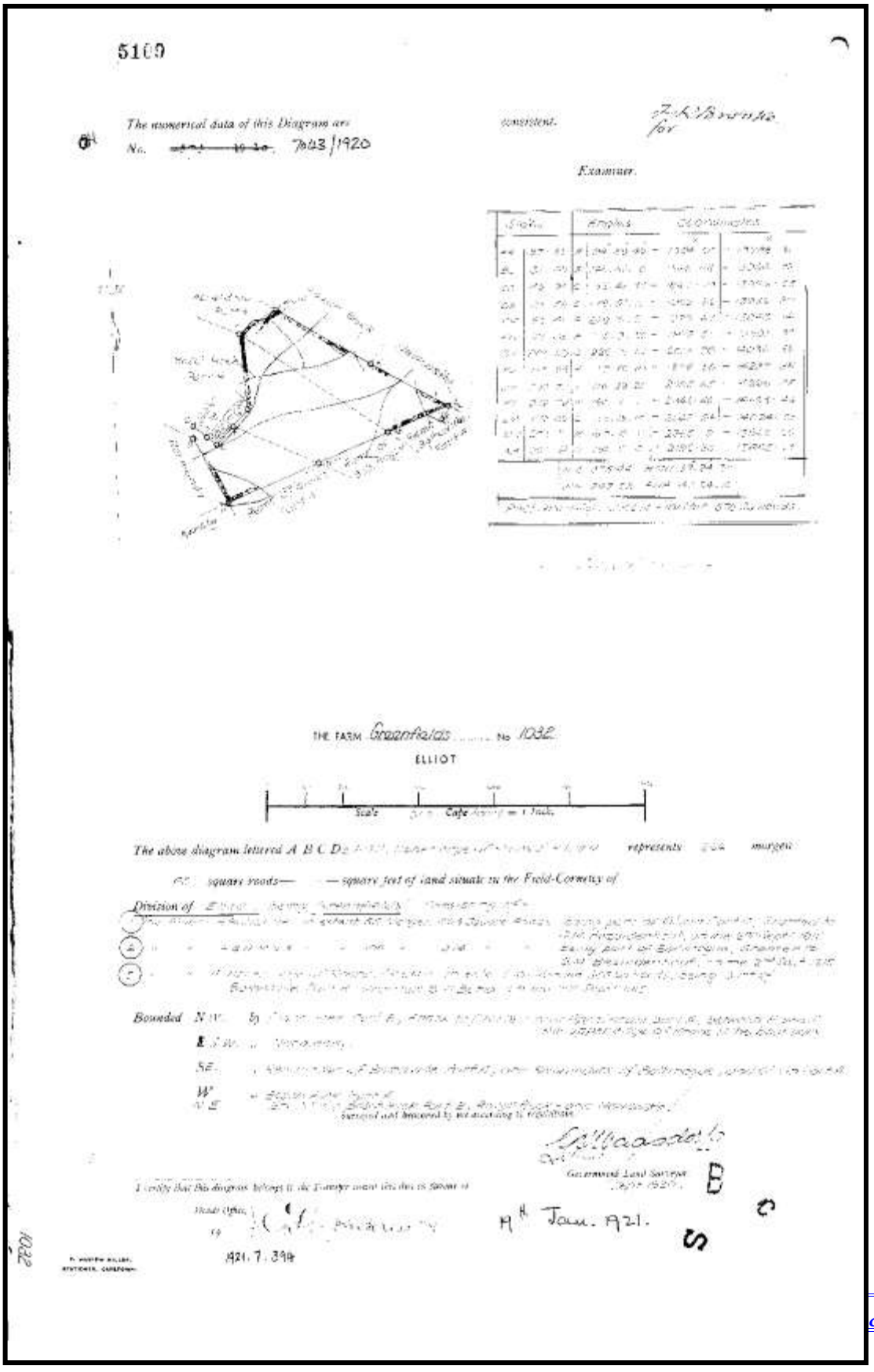


FIG. 15: DAM 13 ON FARM BRAND WACHT (1913)

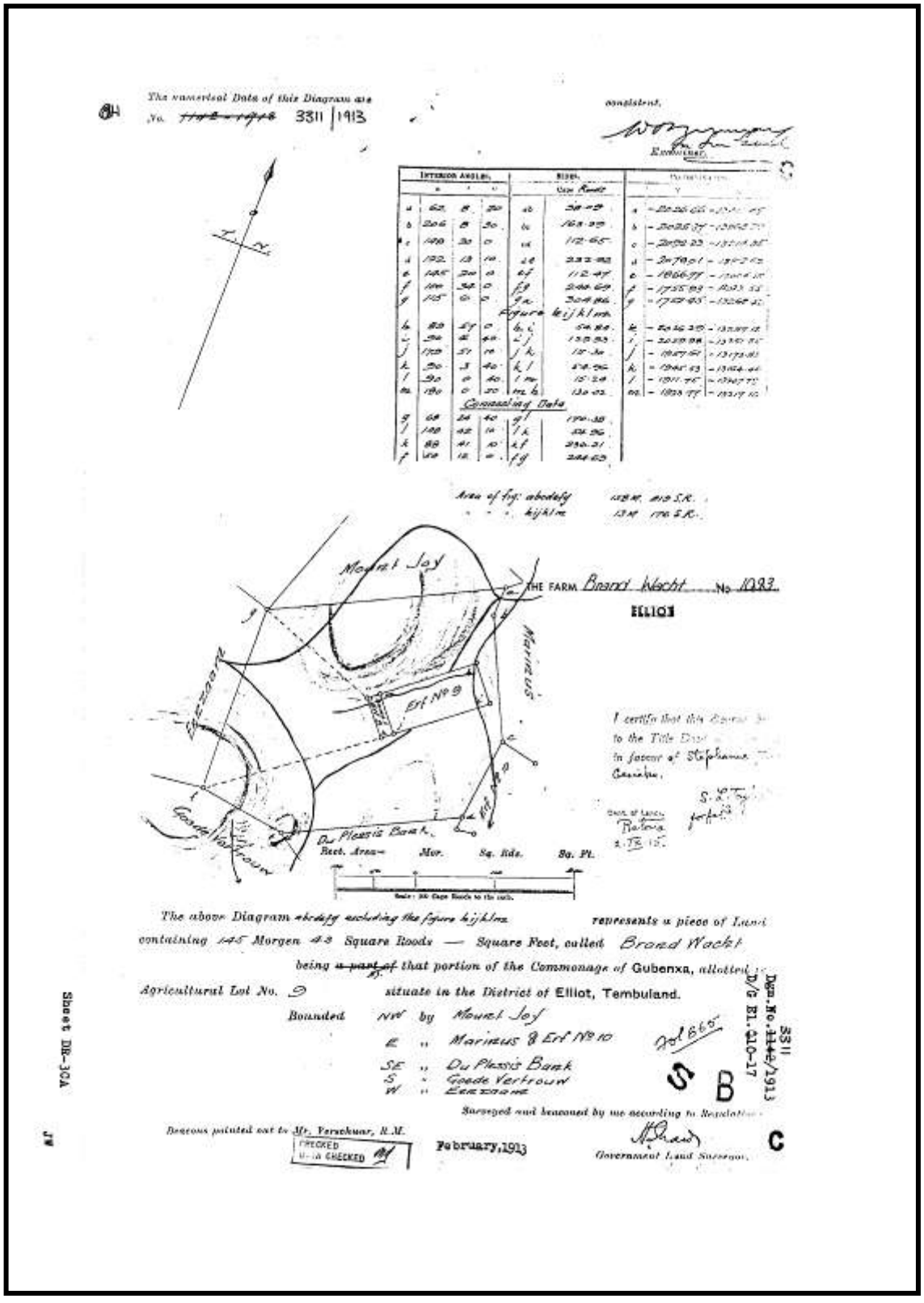


FIG. 16: DAM 14 ON FARM ALBANY AND KORTVLEI

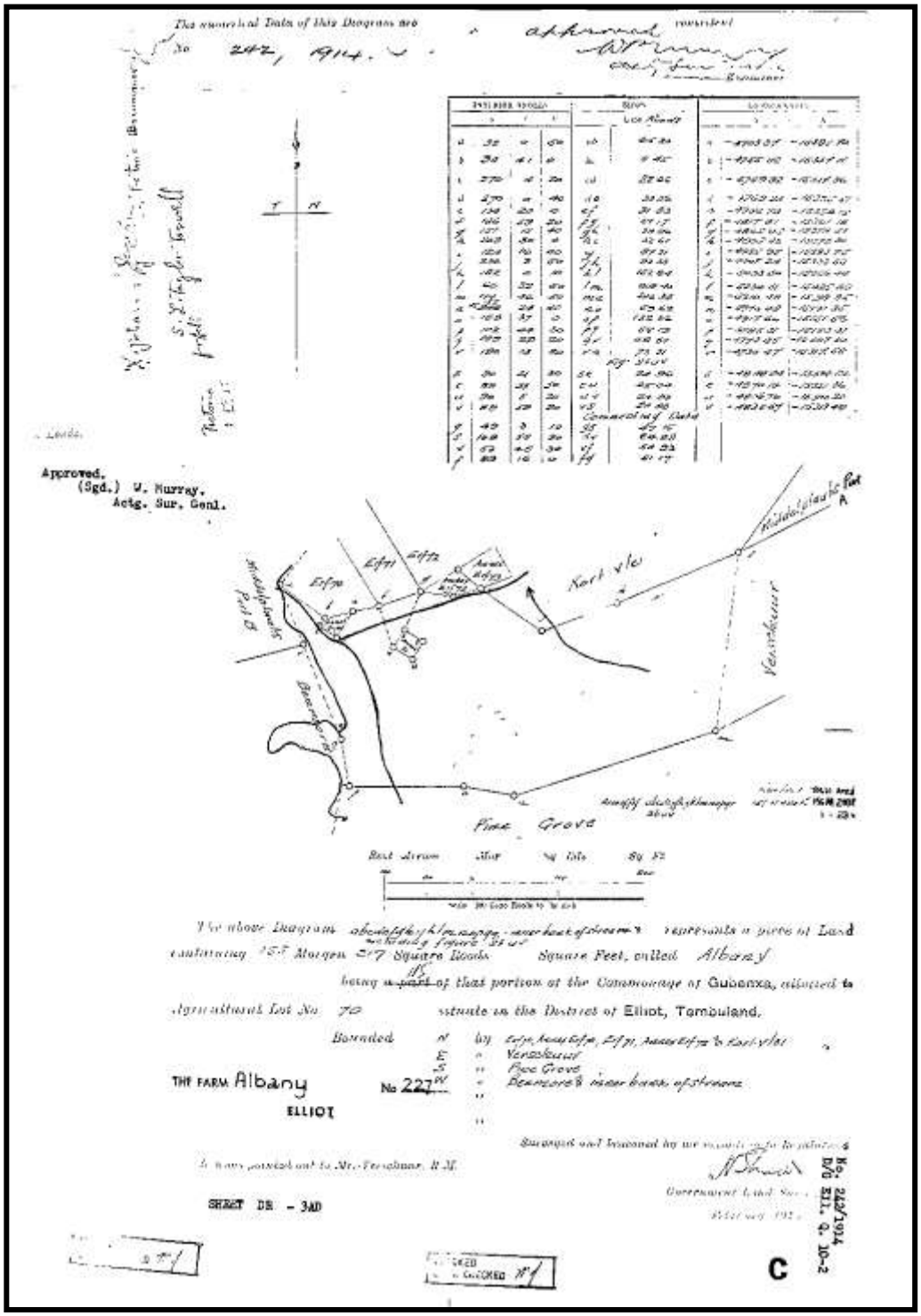


FIG. 17: DAM 14 ON FARM AFGUNST AND KORTVLEI

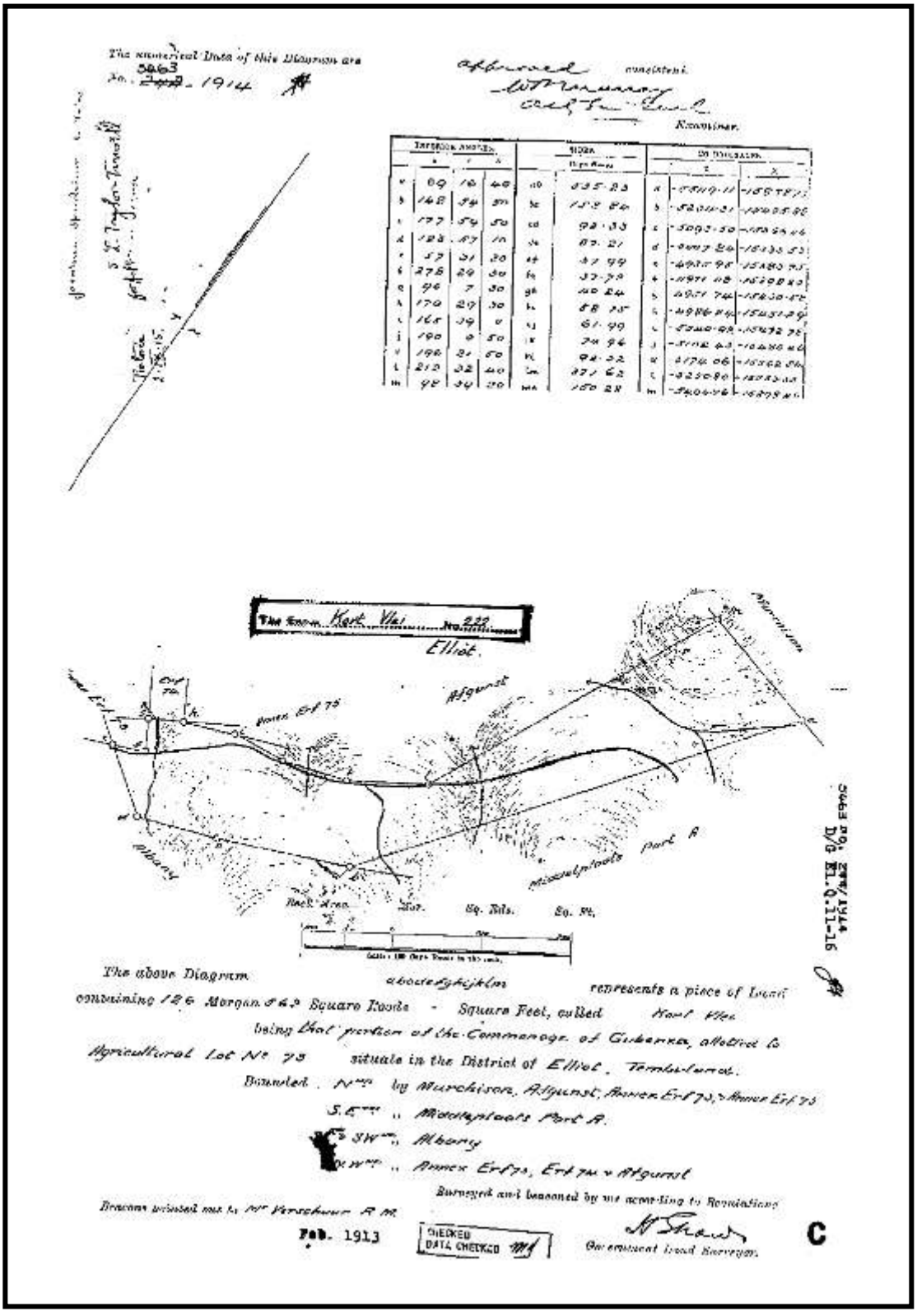
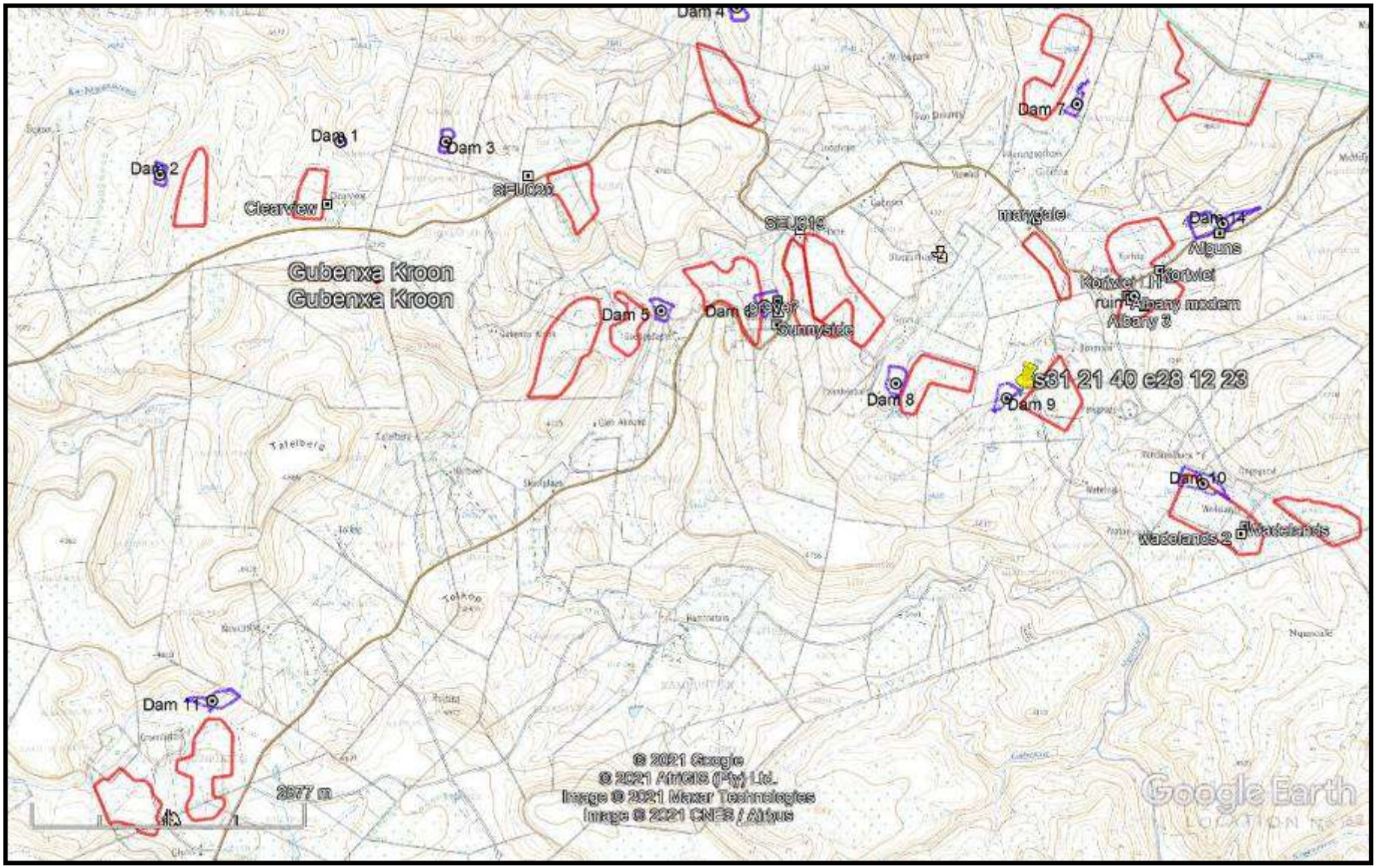


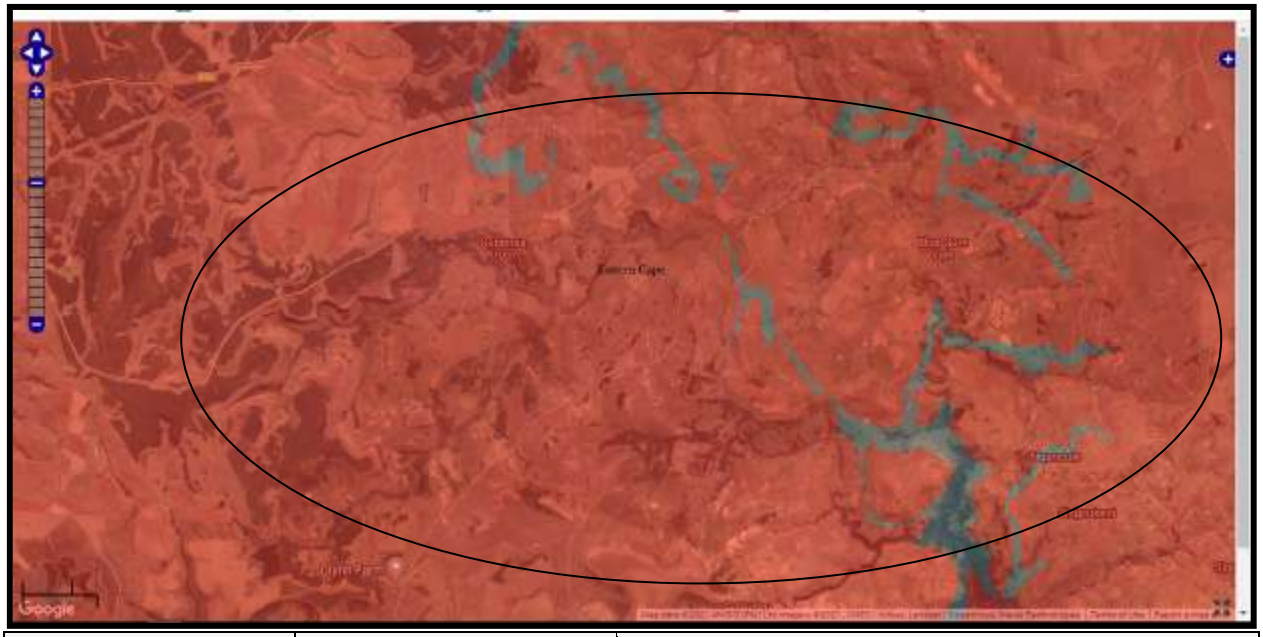
FIG. 18: 1:50 000 TOPOGRAPHICAL MAP OF THE STUDY AREA IN 1966



The area is of very high palaeontological sensitivity (fig. 19). Dr Alan Smith undertook a desktop study for the area (Appendix A). Smith states: “This project is to be constructed on soil overlying Molteno Formation. Rock will not be excavated. Soil will be scraped up for the dam walls. Loose fossils may be present in the soil, but are unlikely to be noted in a field trip; consequently a **Desk-Top PIA** is recommended. As this site is red-flagged a ***“Chance Find Protocol”*** as recommended by SAHRIS, has been inserted.

Should excavation into bedrock take place then a field visit to assess the **Palaeontology** by a suitably qualified **Palaeontologist** is required.”

FIG. 19: PALAEONTOLOGICAL SENSITIVITY OF THE STUDY AREA



.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

The field survey was undertaken in February 2021. Ground visibility was poor in most areas due to the good seasonal rains and tall grass. Isolated artefacts relating to the various Stone Ages are expected to occur throughout out the area, as well as late Iron Age artefacts. The intense cultivation of the land would have destroyed, or displaced, most of the Late Iron Age sites as well as the 19th century Gubenxa community sites.

There are two main areas of heritage concern in the area:

- Rock art
    - Sandstone caves and overhangs
    - Possible archaeological deposit
- Historical buildings and cemeteries
    - Late 19th to 20th century
    - Farm family cemeteries

Dam 1:Macingwane Dam and Tasana Entwanazana 2 Orchard

No heritage sites were noted within the dam or orchard areas (fig. 20). The farm Clearwater occurs outside of the orchard.

Significance: None
Mitigation: None
SARHIS Rating: N/A

FIG. 20: DAM 1

Dam 2:Tasana Dam and Tasana Entwanazana 1 Orchard

No heritage sites were noted within the dam or orchard areas (fig. 21). The orchard is in an existing maize field.

Significance: None
Mitigation: None
SARHIS Rating N/A

Dam 3:Hope Dam & Qwathitolo 5 Orchard

No heritage sites were noted within the dam or orchard areas (fig. 22). A historical building occurs in the one woodlot but this will not be affected.

Significance: None
Mitigation: None
SARHIS Rating N/A

Dam 4: Berg Dam & Hope 1 Orchard

No heritage sites were noted within the dam or orchard areas (fig. 23). The ruins of the Farm Geluk (fig. 24) occur 35m from the high-water mark. No graves were noticed at this farm. The stone stellae that formed the farm boundary will be flooded. The farmhouse appears to be the original farmhouse with several additions. The original fruit orchards still occur next to the house.

Significance: None, while the farmhouse and stellae are of low significance.
Mitigation: None
SARHIS Rating N/A

FIG. 21: DAM 2

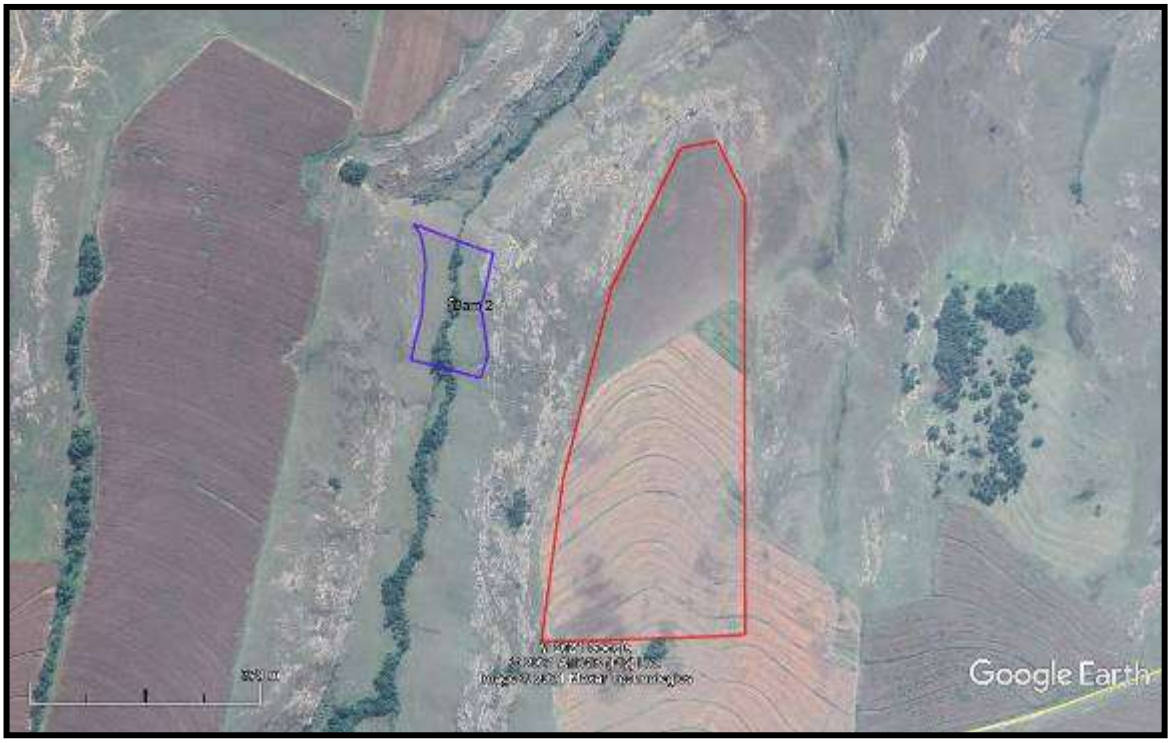


FIG. 22: DAM 3

FIG. 23: DAM 4

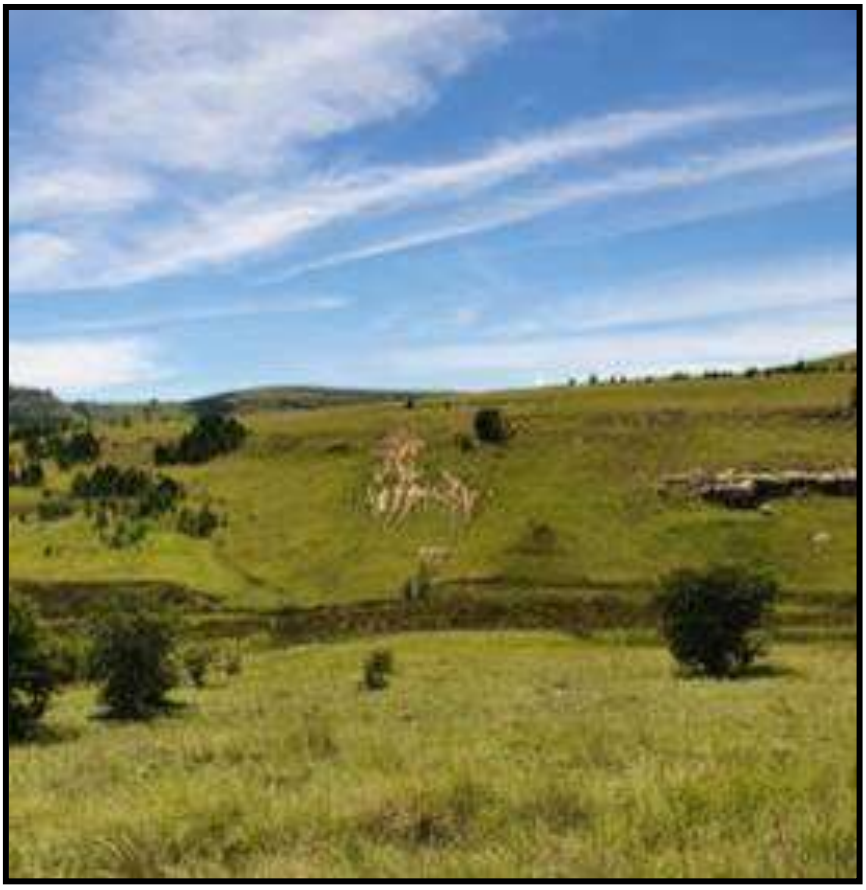
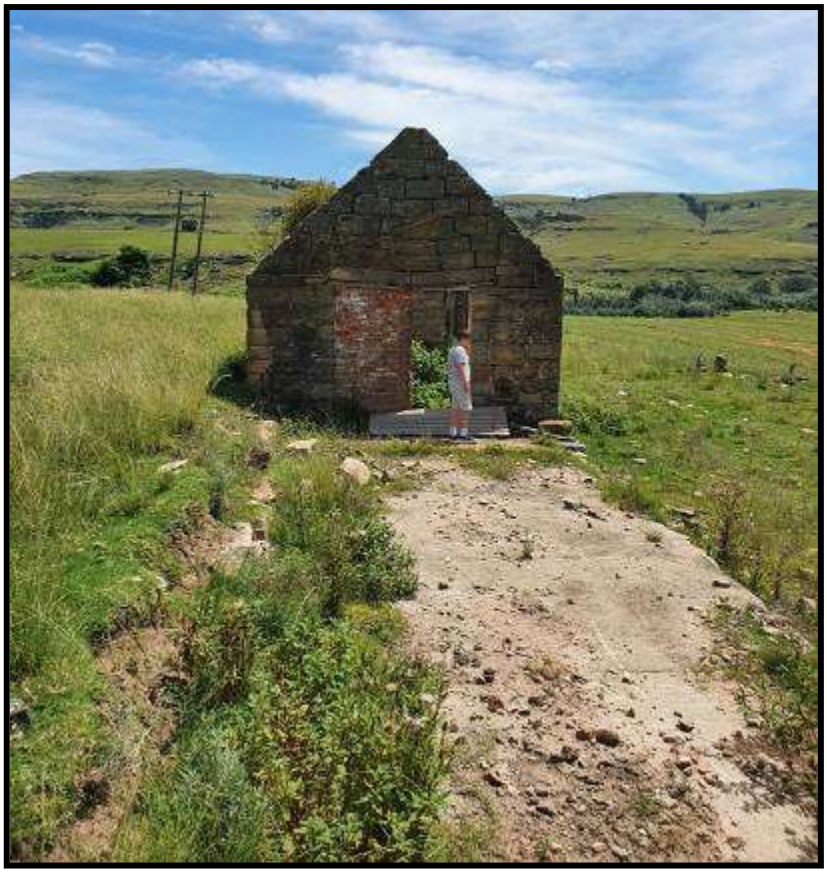


FIG. 24: GELUK FARMHOUSE



Dam 5: Qwathitolo Dam & Qwathitolo 4 – 5 Orchard

No heritage sites were noted within the dam or orchard areas (fig. 25).

Significance: None
Mitigation: None
SARHIS Rating N/A

Dam 6: Qwathitolo 2 &: Qwathitolo 1 -2 & Gubenxa Trust Orchard

No heritage sites were noted within the dam or orchard areas (fig. 26). The Ruins of the Farm Sunnyside occur out of the dam high-water mark, as do the associated buildings and walls, all which are demolished (fig. 27). The 1966 1:50 000 topographical map has a grave marked just outside of the dam boundaries. This grave could not be located in the general area. The vegetation was very thick in the area closer to the house. If a grave occurs within the farmhouse perimeter, then it will not be affected by the dam. The grave on the map could also be a cartographer error, as it omitted a family cemetery 1.4km northeast at Farm Gubenxa.

The proposed orchards have been ploughed for several decades.

Significance: None
Mitigation: None
SARHIS Rating N/A

FIG. 25: DAM 5

FIG. 26: DAM 6

FIG. 27: SUNNYSIDE FARM BUILDINGS

Dam 7: Mgedezi Dam & Mgedezi 1 & Qangule 1 Orchard

No heritage sites were noted within the dam or orchard areas (fig. 28).

The orchards have been ploughed for several decades.

Significance: None
Mitigation: None
SARHIS Rating N/A

FIG. 28: DAM 7


© 2021 Google
Image © 2021 Maxar Technologies
421 m
Google Earth

Dam 8: Paardekraal Dam & Paardekraal 1 Orchard

No heritage sites were noted within the dam or orchard areas (fig. 29).

The orchards have been ploughed for several decades.

Significance: None

Mitigation: None

SARHIS Rating N/A

Dam 9: Gubenxa Trust Dam & Gubenxa Com Trust 2 Orchard

No heritage sites were noted within the dam or orchard areas (fig. 30).

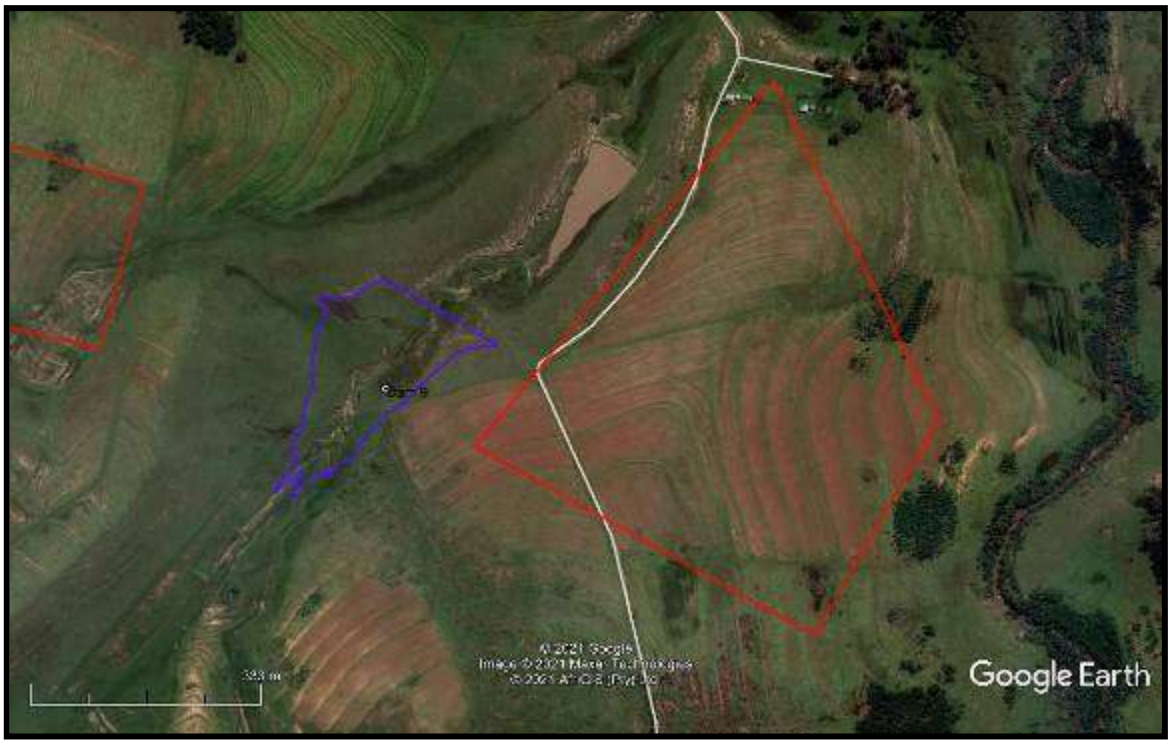
Significance: None

Mitigation: None

SARHIS Rating N/A

FIG. 29: DAM 8

FIG.30: DAM 9



Dam 10: Wadelands & Wadelands 1 & 2 Orchards

No heritage sites were noted within the dam area (fig. 31). The dam area occurs in an area of dense alien invasive tree species. In Wadelands 2 Orchard, there are four currently used buildings and three ruins (fig. 32; Table 4). The ruins belong to the original Wadelands farm buildings. The ruins will have historical middens associated with them and are thus protected by the NHRA. Wadelands probably dates to 1913/1914.

Significance: The dam area and Wadelands Orchard 1 have no significance. Wadelands 2 orchard has buildings of low – to medium historical significance.
Mitigation: A 50m buffer radius should be placed around each of the Wadelands buildings. If any orchard is placed within this 50m buffer, or if the buildings will be destroyed, then further mitigation is required. Mitigation will be in the form of accurately recording the ruins and/or sampling/excavating the historical middens. This will need to be undertaken in winter when the grass is much shorter. A permit for damaging/destroying the ruins and/or the middens will be required from ECPHRA.
SARHIS Rating 3b

Dam 11: Greenfields Dam & Greenfields 1 & 2 Orchards

No heritage sites were noted within the dam or orchard areas (fig. 33). The Greenfields Farm buildings are in ruin, but are not affected by the orchards.

Significance: None
Mitigation: None
SARHIS Rating N/A

FIG. 31: DAM 10

FIG. 32: LOCATION OF BUILT STRUCTURES AND RUINS AT DAM 10

TABLE 4: LOCATION OF BUILT STRUCTURES AT WADELANDS 2 ORCHARD

Name	Latitude	Longitude
Building 1	31°22'29.37"S	28°13'41.98"E
Building 2	31°22'23.58"S	28°13'56.36"E
Building 3	31°22'27.05"S	28°13'57.55"E
Building 4	31°22'27.96"S	28°14'0.50"E
Wadelands 1	31°22'25.58"S	28°13'55.54"E
Wadelands 2	31°22'28.22"S	28°13'53.78"E
Wadelands 3	31°22'24.84"S	28°13'56.74"E

FIG. 33: DAM 11

Dam 13: Magoda Dam & Magoda 1 Orchard

No heritage sites were noted within the dam or orchard areas (fig. 34).

Significance: None
Mitigation: None
SARHIS Rating N/A

Dam 14: Qangule Dam & Qangule Orchard

No heritage sites were noted within the dam area; however, some built structures were noted in the orchard (fig. 35). The sandstone overhangs at the dam were surveyed; however, no rock art occurs on them. The farmhouse Afguns and its structures will be 14m away from the full supply level of Dam 13. The FSL may affect the buildings.

In Qangule 1 Orchard, there are three ruins and one historical building. currently used buildings and three ruins (fig. 36; Table 5). The ruins belong to the original Albany farm buildings. The ruins will have historical middens associated with them and are thus protected by the NHRA. Albany probably dates to 1913/1914. Albany 3 appears to be the remnants of a farm labourer's settlement. It was still in use up to 2001 (see from Google maps). There are two structures just outside of the orchard.

Significance: The dam area and Qangule Orchard 1 have low significance. Qangule 1 orchard has buildings of low – to medium historical significance.
Mitigation: A 50m buffer radius should be placed around each of the Qangule buildings. If any orchard is placed within this 50m buffer, or if the buildings will be destroyed, then further mitigation is required. Mitigation will be in the form of accurately recording the ruins and/or sampling/excavating the historical middens. This will need to be undertaken in winter when the grass is much shorter. A permit for damaging/destroying the ruins and/or the middens will be required from ECPHRA.

SARHIS Rating 3b

FIG. 34: DAM 13

FIG.35: DAM 14

FIG.36: LOCATION OF BUILT STRUCUTRES ON QANGULE ORCHARD

TABLE 5: LOCATION OF BUILT STRUCTURES AT QUNGULE ORCHARD

Name	Latitude	Longitude
Albany 1	31°21'4.61"S	28°13'7.28"E
Albany 2	31°21'5.84"S	28°13'8.02"E
Albany 3	31°21'8.41"S	28°13'13.83"E
Ruins	31°21'4.76"S	28°13'10.05"E
Kortvelei (outside)	31°20'55.17"S	28°13'20.06"E
Kortvelei LH (outside)	31°20'58.59"S	28°13'24.75"E
Blue Gum Vale (outside)	31°21'1.17"S	28°12'56.33"E

MANAGEMENT PLAN

The main areas where impacts on heritage sites will occur are in two orchards. If the full extent of the orchards is used, then there will be a negative impact on historical buildings and middens. These buildings and middens probably date to at least 1913/1914 and are thus protected by the NHRA.

These features are not of such significance that they will prevent the expansion of the orchard; however, some form of mitigation is required, in addition to the permits. There are two options in the managements:

1. Create a 50m no-go buffer around each feature and the area is controlled against development.
2. Undertake mitigation and salvage the historical information before it is lost. This should be a staged approach.

The 50m buffer approach is the most practical; however, it is unlikely to be maintained if not regularly monitored/enforced. Irrigation pipes may also be excavated into the middens.

The next option is a staged approach of mitigation. I suggest the following occurs once the grass is burnt or near the end of winter when it is less dense:

1. Each built feature is accurately recorded by means of at least digital photographs.
2. The area is surveyed for the locations of the middens. These are assessed and mapped. Limited test-pit excavations are undertaken to determine the significance of each midden.
3. The aim of the excavations would be to obtain a sample from each midden.

The area is of very high palaeontological sensitivity. The Molteno Formations are renowned for fossils. However, the dam walls will be made from soil, and no bedrock will be excavated. A *Chance Find Protocol* has been initiated for earthmoving activity. If any bedrock is to be excavated, then a qualified palaeontologist will be required to visit the area.

CONCLUSION

A heritage survey was undertaken for the proposed Gubenxa Dams and orchards. The dams are part of the upgrading of the Gubenxa area in terms of agriculture. The dams tend to occur in river valleys that do not favour human occupation. There was a concern that some of the dams might affect rock art sites; however, no rock art sites were recorded in the immediate vicinity of each dam where sandstone overhangs occurred.

The other heritage issue was historical farm buildings and related infrastructures that will be affected by the proposed dams and orchards. While it appears that many of these farms originated from the Native Lands Act of 1913, they still have historical value, and are indicative of the colonisation of this area, which, unfortunately, still form part of the history. Two orchards and one dam will possibly affect the historical buildings/ I suggested that there a 50m buffer is placed around these features; however this will be difficult to monitor. The alternative is that a competent archaeologist records these structures and test pit excavations sample a few middens. This will allow for a representative sample of the area to be obtained.

The area is of very high palaeontological sensitivity. The Molteno Formations are renowned for fossils. However, the dam walls will be made from soil, and no bedrock will be excavated. A *Chance Find Protocol* has been initiated for earthmoving activity. If any bedrock is to be excavated, then a qualified palaeontologist will be required to visit the area.

REFERENCES

Prins, F & Hall, S 2010. Cultural Heritage Impact Assessment Of The Proposed 132kv Eskom Powerline From Sappi To Elliot And Ugie Substations, Eastern Cape

Maps:

3128AC Xuka Drift 1966, 1999
1167/1962
2266/1919
233/1914
242/1914
250/1914
3311/1913
3330/1914
3356/1913
4550/1960
5448/1914
5451/1914
5463/1914
5476/1914
5479/1914
5480/1914
5487/1914
5488/1914
7043/1920
790/1884

Database:

SAHRIS Database
Umlando Database

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 DESKTOP STUDY

SMALL DAMS TO BE CONSTRUCTED ON THE FARM: GUBENXA, NEAR ELLIOT.

FOR

UMLANDO: Archaeological Surveys & Heritage Management
PO Box 102532, Meerensee, KwaZulu-Natal 3901
phone (035)7531785

by

Dr Alan Smith
Alan Smith Consulting
29 Browns Grove, Sherwood, Durban, 4091, South Africa
Telephone: 031 208 6896
asconsulting@telkomsa.net

22 February 2021

Declaration of Independence This report has been compiled by Dr Alan Smith (Pr. Sc. Nat.) of Alan Smith Consulting, Durban. The views expressed in this report are entirely those of the author, if not then the source has been dully acknowledged. No other interest was displayed during the decision making process for the Project.

Specialist: Dr Alan Smith

Signature: 

EXECUTIVE SUMMARY

Alan Smith Consulting was appointed by UMLANDO: Archaeological Surveys & Heritage Management, PO Box 102532, Meerensee, KwaZulu-Natal 3901 to conduct an assessment of the potential impacts to **Palaeontology Resources** that might occur through the proposed project located on the farm Gubenxa near Elliot, E. Cape.

This project is to be constructed on soil overlying Molteno Formation. Rock will not be excavated. Soil will be scraped up for the dam walls. Loose fossils may be present in the soil, but are unlikely to be noted in a field trip, consequently a **Desk-Top PIA** is recommended. As this site is red-flagged a ***"Chance Find Protocol"*** as recommended by Sahris, has been inserted.

Should excavation into bedrock take place then a field visit to assess the **Palaeontology** by a suitably qualified **Palaeontologist** is required.

BACKGROUND

It is proposed to build 13 new farm dams on the farm: Gubenxa (Fig.1) on existing agricultural fields. No rock excavations are planned. No rock excavations are anticipated. The dam walls will be constructed by soil scraped from existing agricultural fields. Although this site is rated high Paleosensitivity, the fact that no rock excavation will take place is a mitigating factor. Consequently a desk-top PIA was considered sufficient. Should any rock excavation take place then the site should be inspected by a suitably qualified **Palaeontologist**.

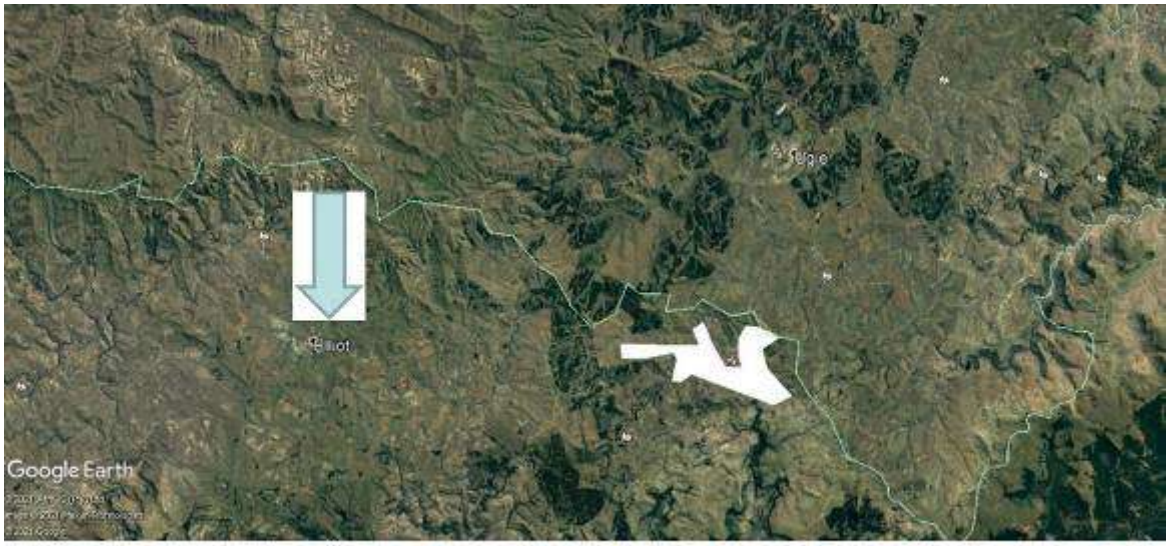


Figure 1: Location map of Proposed Project to take place at the farm Gubenxa (white), near Elliot (arrowed).

TERMS OF REFERENCE

Alan Smith Consulting was asked by UMLANDO: Archaeological Surveys & Heritage Management, PO Box 102532, Meerensee, KwaZulu-Natal 3901 to provide a **Palaeo Impact Assessment** report assessing the potential impacts of the proposed development to all Palaeontological Resources. The work was to

be based on the knowledge gained from desktop review, maps, reviewed literature and personal experience. No new fieldwork to be undertaken. The report was to meet the requirements of the National Environmental Management Act (Act 107 of 1998) [as amended] Environmental Impact Assessment (EIA) regulations, Appendix 6.

SCOPE AND PURPOSE OF REPORT

A palaeontological impact assessment (PIA) is a means of identifying any significant Palaeontological Material before development begins so that these can be managed in such a way as to allow the development to proceed (if appropriate) without undue impacts to the fragile heritage of South Africa. This Desk-Top PIA report aims to fulfill the requirements of the heritage authorities such that a comment can be issued by them for consideration by DEFF who will review the Basic Assessment (BA) and grant or refuse authorisation. The PIA report will outline any management and/or mitigation requirements that will need to be complied with from a heritage point of view and that should be included in the conditions of authorisation should this be granted.

METHODOLOGY

Geological maps, literature review and personal experience were used in this research. Geological knowledge of the area indicates what palaeontological resources are likely to be found in the rocks on which this proposed project will be erected.

GEOLOGY

The project will take place in soil overlying the Molteno Formation (Fig. 2). The Molteno is fossiliferous (Bordy et al, 2005).

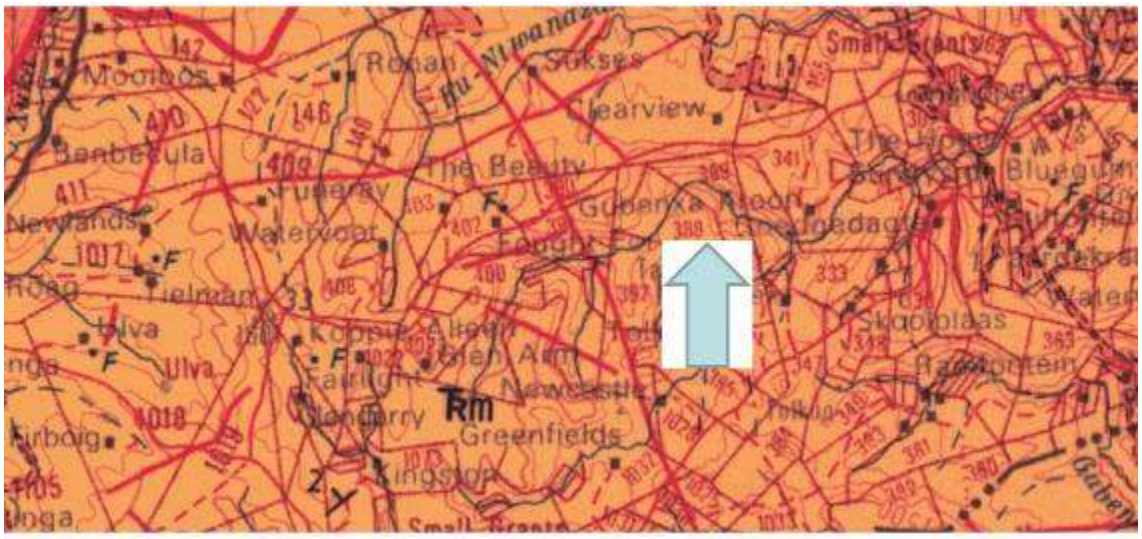


Fig. 2: Extract from the Queenstown3126 Geological map. The Molteno Formation is designated TRm. The farm Gubenxa Kroon is arrowed.

The Molteno Formation is Triassic (¬237-228 Ma) in age. This rock formed from sediment initially deposits be braided draining the rising Cape Fold Mountains to the south (Bordy et al., 2005) At their peak this mountain range was at least the height of the Himalays. Areas between the channels were characterized by swamps and marshes. Fine-grained material was able to settle here. Coal (Indwe Coal Field) formed in some of these areas (Jeffrey, 2005).

PALAEONTOLOGY

The Molteno formation is generally coarse-grained sandstones and less likely to contain fossils. However the finer-grained rocks are fossiliferous (Bordy et al., 2005) and contains plant and insect fossils (Anderson, 1974). The Molteno Formation contains fossils of 204 plant species and 333 insect species. It is one of the richest Upper Triassic-age plant and insect assemblages. The insect fauna contains well-preserved fossil insects which are very rare (Anderson and Anderson, 1997). The dominant fossil flora is associated with seven recognized habitat types, , two of these include *Dicroidium*, an extinct arboreal genus of seed fern that grew in either riparian forests or temperate woodlands (Fig. 3). Nineteen species of *Dicroidium* alone have been recovered from the Molteno Formation (Anderson & Anderson, 1997).

Fig. 3: Dicrodium (left) and Ginko (right) fossils of the type which could be found in the Molteno Formation (source Wikipedia commons).

The Molteno Formation is considered to have a high Palaeosensitivity (Fig. 4). However excavation for this project will take place in soil overlying the Molteno Formation. Plant fossils and insect fossil are very unlikely to remain intact during erosion to form soil.

Should any excavation into the underlying Molteno Formation rock take place then a Palaeontological Field Visits, by a suitably qualified Palaeontologist, must take place.

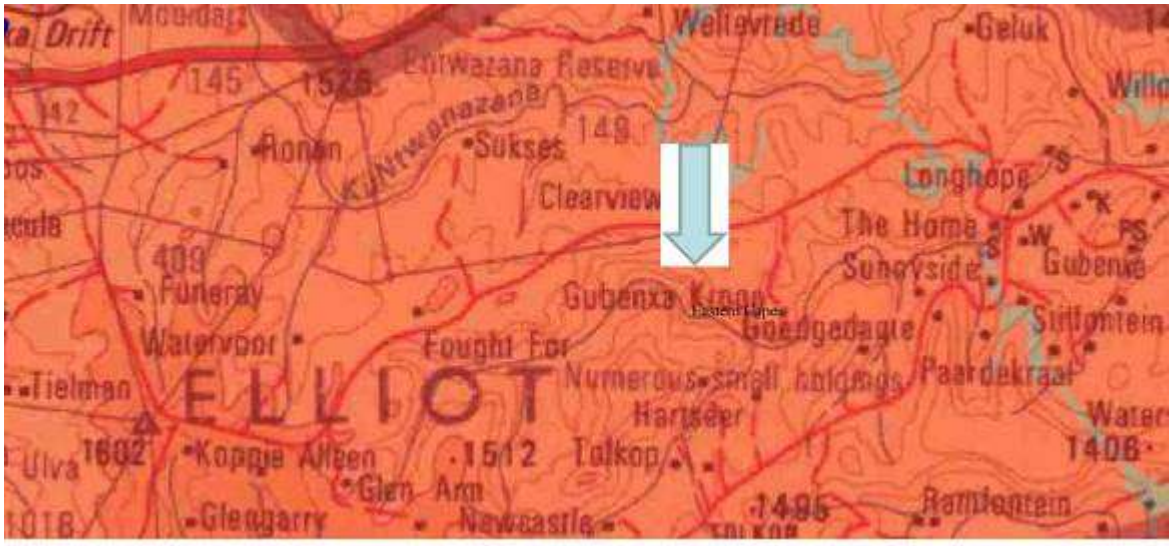


Fig. 4: Image from the Sahris Palaeosensitivity Map. It confirms the high Palaeosensitivity of the underlying Molteno Formation.

CHANCE FIND PROTOCOL

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.

CONCLUSIONS

This project will be constructed within soil formed from the Molteno Formation. The Molteno Formation is highly fossiliferous and includes plant and insect fossils. These are unlikely to survive the soil formation process. Although Paleontological Material is unlikely to be encountered in the soil. A “Chance Find Protocol” has been inserted as required by Sahris.

Should excavation into bedrock take place then a field visit to assess the Palaontology is required.

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Bordy, EM; Hancox, PJ; Rubidge, BS (2005The contact of the Molteno and Elliot formations through the main Karoo Basin, South Africa: a second-order sequence boundary. South African Journal of Geology, 2005, 108, 351-364

Jeffrey, LS (2005). The Journal of The South African Institute of Mining and Metallurgy. 2005, 99-102.

Queenstown (3126) 1: 125 000 Geological Map, Council for Geosciences, Pretoria.

Sahris Paleosensitivity Map: https://sahris.sahra.org.za/map/palaeo

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 more than 50 journal articles with 360 citations (detailed CV available on request).
- Attended and presented scientific papers and posters at numerous international and local conferences (UK, Canada, and 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.
- 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.