SURVEY OF THE PROPOSED CITY SANDS SUPPLIES QUARRY, KWAZULU-NATAL

FOR JEFFARES & GREEN

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INTRODUCTION

Terratest (Pty) Ltd were appointed by Mr K Sarupen of City Sand Supplies (Pty) Ltd to undertake a Basic Assessment Report following the lodging of an Application for a Mining Permit and an Application for Environmental Authorization in terms of the National Environmental Management Act (Act 107 of 1998). Umlando was subcontracted to undertake the HIA.

Umgeni Water SOC Limited are in the process of rolling out the uMshwathi Regional Bulk Water Supply Scheme. The project is being rolled out in three phases, with the Phase three entailing the construction of a 15.2 km long pipeline from Dalton to an existing reservoir at Ozwathini, including a booster pump station. There will also be a 14.5 km long pipeline branching off at Fawn Leas to an existing reservoir at Nadi, including a booster pump station

As the construction front has advanced, it has progressed away from commercially available material which is having an impact on project costs. Umgeni Water SOC Limited explicitly require that all construction materials be sourced from a legally compliant source.

Weathered sand stone is a sedimentary rock composed of sand-sized grains of mineral, rock or organic material. It also contains a cementing material that binds the sand grains together and may contain a matrix of silt- or clay-size particles that occupy the spaces between the sand grains.

The project involves the operation of a site borrow pit for the sourcing of weathered sandstone. The mining will be done in stages.

The establishment, operation, and closure of the site will require:

- Clearing and grubbing of the vegetative matter;
- Collection and stockpiling of topsoil;
- Collection and stockpiling of overburden (if any);
- Excavation of the weathered sandstone using an excavator and if necessary temporarily stockpiling;
- Loading the excavated material into a truck for transport to site. Loading will be done using a payloader.
- The use of a container as a store; and
- The provision of a portable chemical toilet.

Figures 1 – 3 show the location of the site. Fig. 4 shows the site.

FIG. 1 GENERAL LOCATION OF THE STUDY AREA

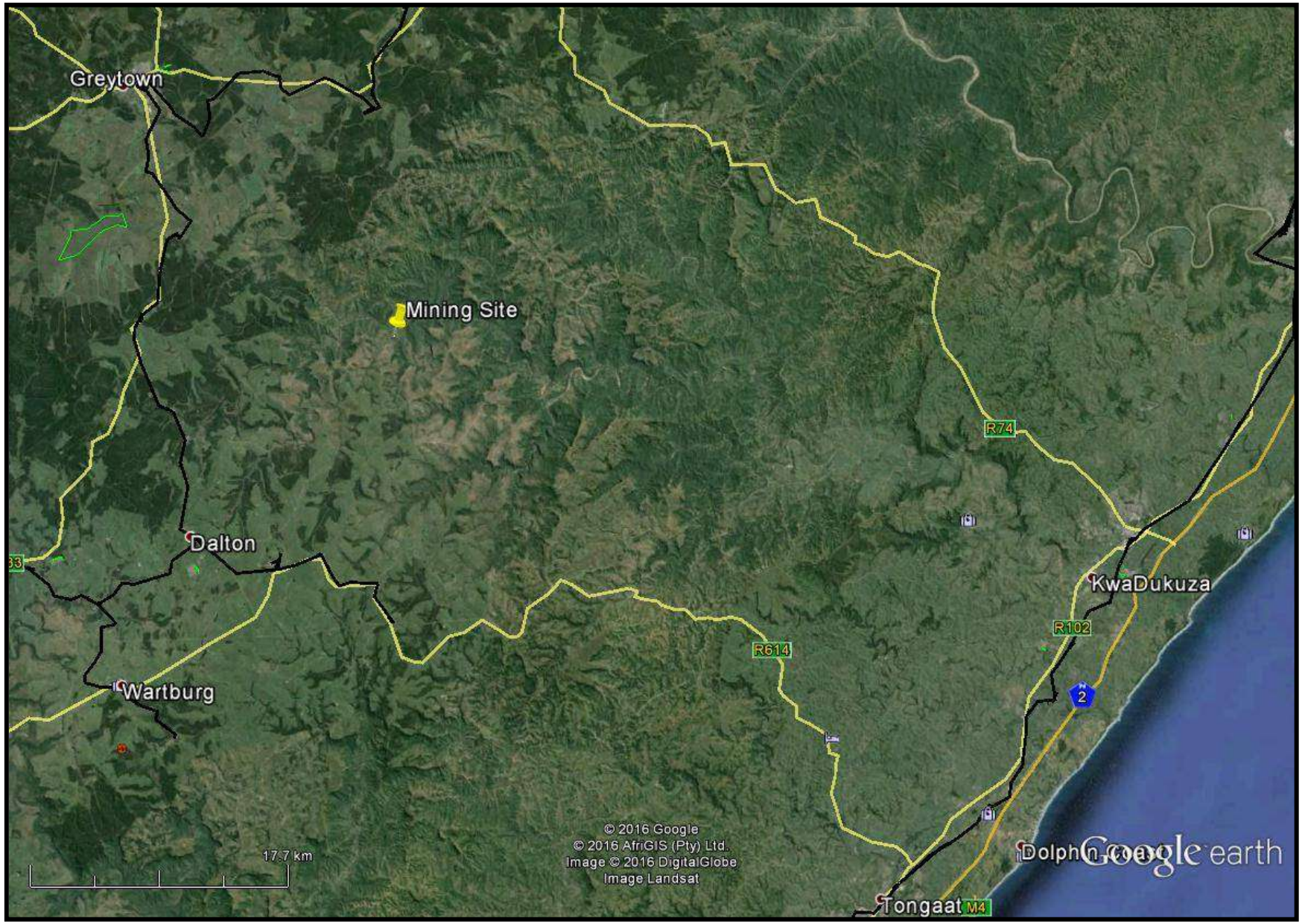


FIG. 2: AERIAL OVERVIEW OF THE STUDY AREA

FIG. 3: TOPOGRAPHICAL OVERVIEW OF THE STUDY AREA

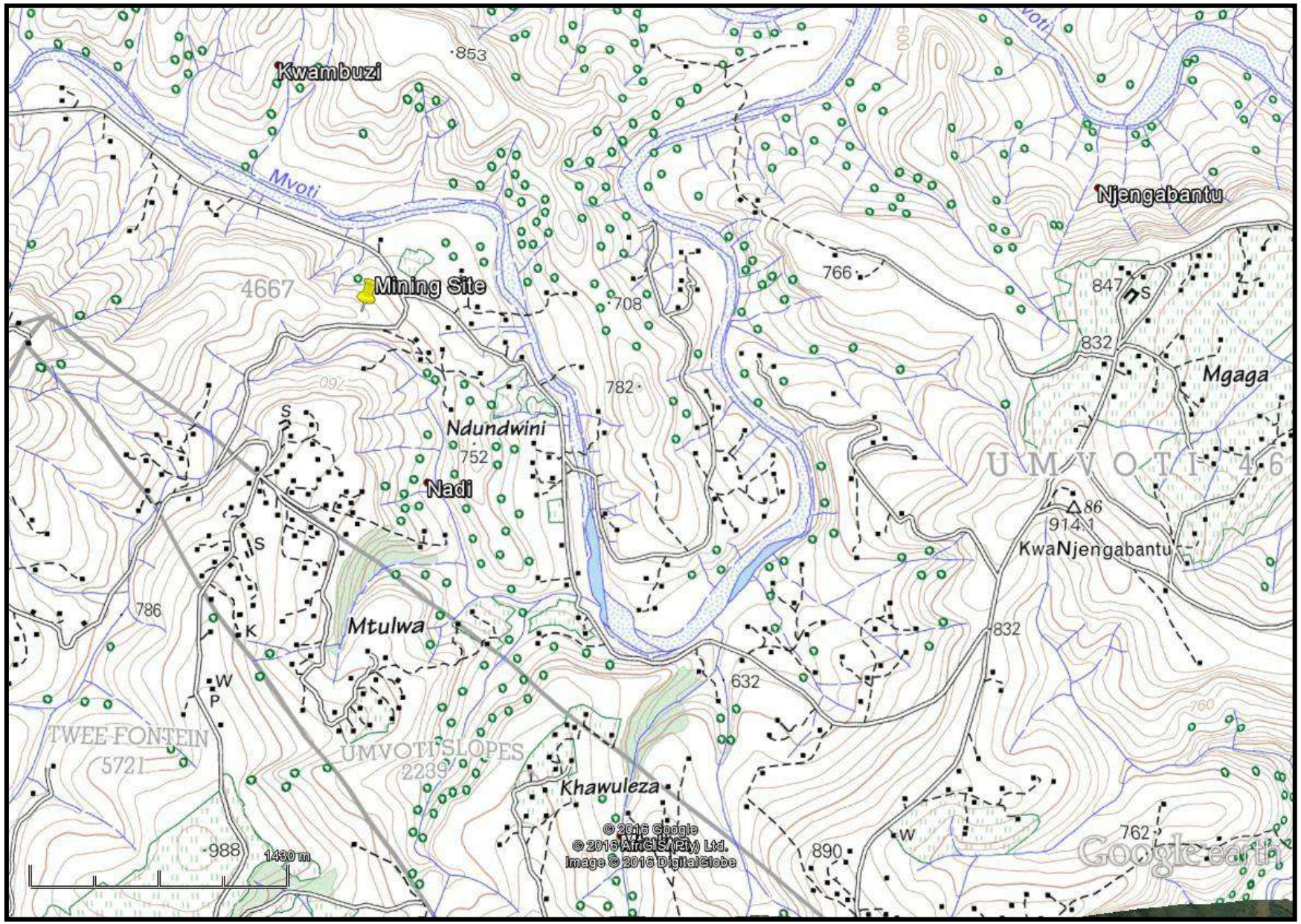


FIG. 4: SCENIC VIEWS OF THE STUDY AREA

KWAZULU-NATAL HERITAGE ACT NO. 4 OF 2008

"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." (KZN Heritage Act of 2008)

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 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.

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 archaeological database indicates that there are archaeological sites in the general area (fig. 5). These sites include all types of Stone Age and Iron Age sites. No sites occur in the study area. No national monuments, battlefields, or historical cemeteries are known to occur in the study area.

The 1937 aerial photographs indicate that there are no settlements in the study area (fig. 6). However, by 1955 there is a settlement on the outskirts of the study area (fig. 7).

FIG. 5: LOCATION OF KNOWN HERITAGE SITES NEAR THE STUDY AREA

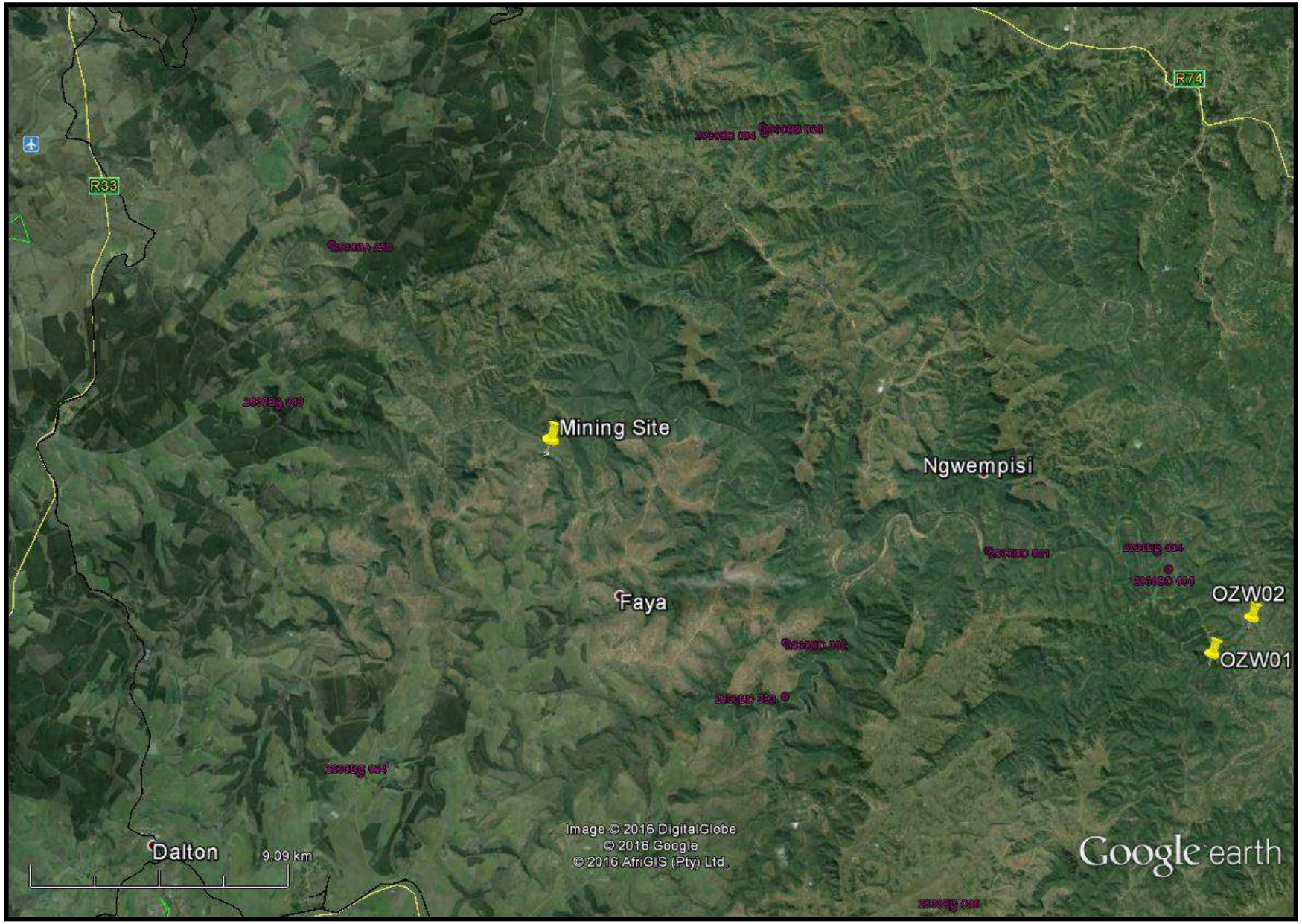
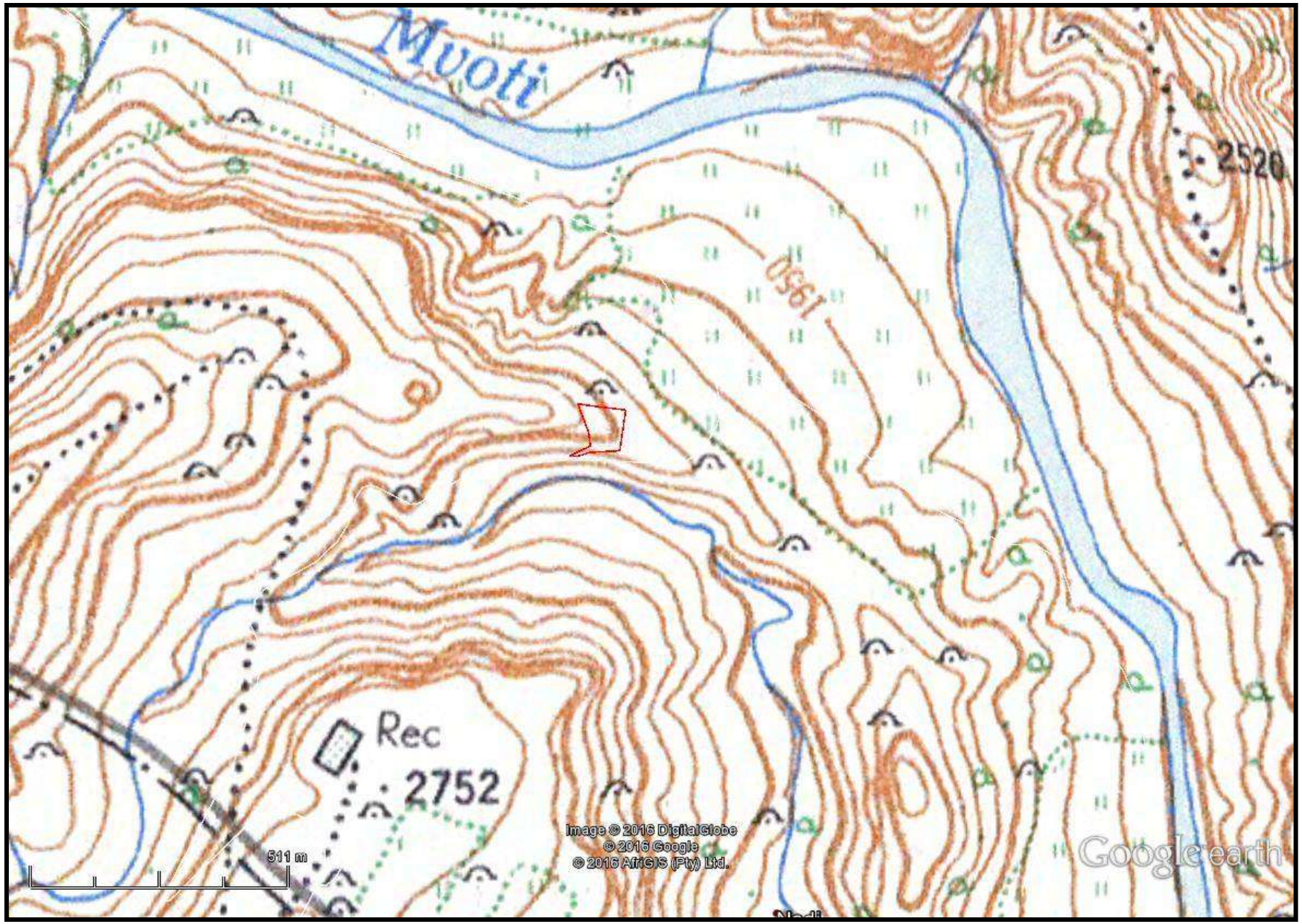


FIG. 6: STUDY AREA IN 1937

FIG. 7: STUDY AREA IN 1955



FIELD SURVEY

The field survey was undertaken in March 2016. The vegetation on the northern slope consisted of short grasses and several trees. The northeastern corner of the study area consists of more dense bush and trees.

In the northeastern corner is a series of terraces and supporting walling (fig. 8). This area is probably the settlement on the 1955 map. The settlement is overgrown with various types of vegetation and a full assessment was not possible (fig. 9). There is also a large coral tree that could be associated with a grave. The pattern for this type of settlement is one of houses in the back row and the graves would occur in the front, or downslope, in this case. Graves are very likely to occur at this site.

Significance: The site will have human graves and these are of high significance. The terracing and stone walling is of low significance.

Mitigation: The client has three options:

1. Place a 20m buffer to the southwest of the last terrace. This will be a 'no mining zone'. In this way, there will be no damage to potential graves. This buffer should be in the form of a fence.
2. Clear the vegetation around the settlement so that the site can be fully assessed in terms of human remains.
3. If human remains do occur, the client has the option of relocating the graves. This is, however, a lengthy process and can be expensive.

SAHRA Rating: 3A

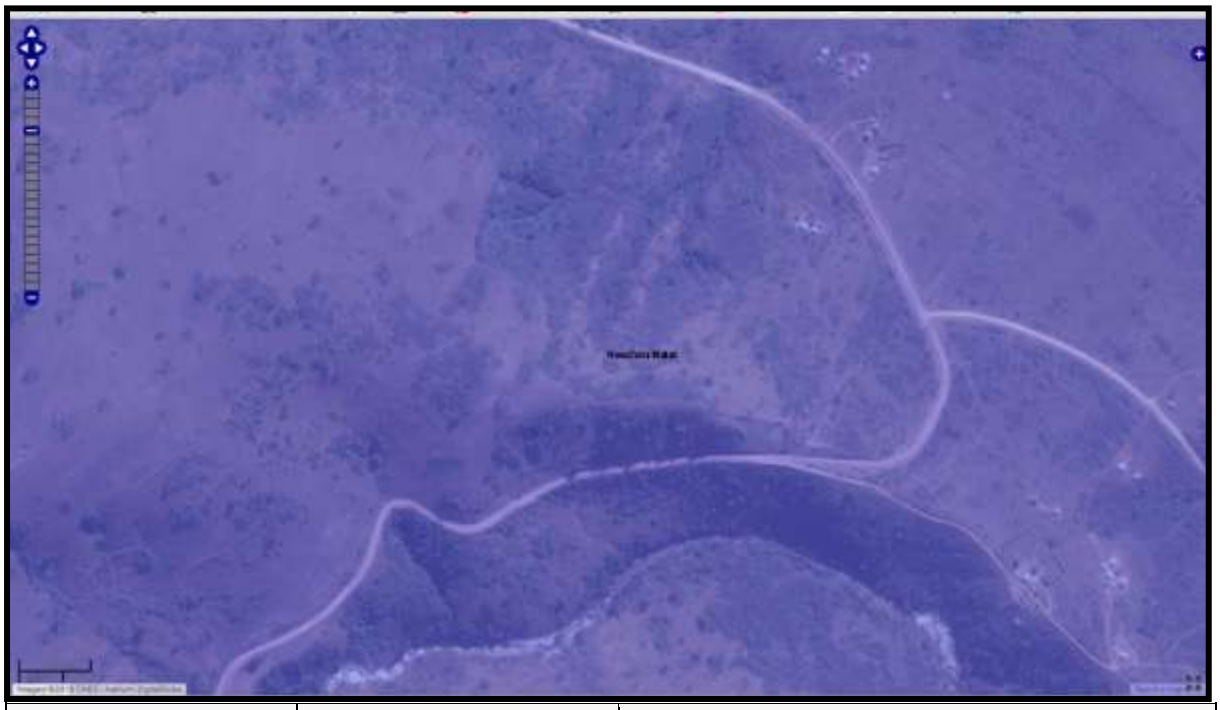
FIG. 8: LOCATION OF HUMAN SETTLEMENT IN RELATION TO THE QUARRY[1]

[1] Red polygon = extent of the site; Blue polygon = location of the buffer

FIG. 9: SETTLEMENT ON THE BORDER OF THE QUARRY

PALAEONTOLOGICAL IMPACT ASSESSMENT

The area is of low palaeontological sensitivity and no further mitigation is required.



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.

CONCLUSION

A heritage survey was undertaken for the proposed City Sands Supplies quarry. The quarry is needed to supply backfill material for a regional bulk water supply system.

No heritage sites were found within the main footprint. However, parts of an old settlement overlap the northeastern corner. This settlement probably has human graves, but the vegetation was too dense to confirm this. A 20m buffer between the settlement and the edge of the quarry must be placed to ensure that potential graves are not damaged. Alternatively, the client needs to clear the vegetation so that the possible graves can be (dis-)confirmed.

APPENDIX A

SITE RECORD FORM

UMLANDO ARCHAEOLOGICAL SITE RECORD FORM

SITE CATEGORY:

Stone Age	ESA:		MSA		ESA		ISA	
Rock Art	Paintings		Engravings		Other			
Iron Age	EIA:		LIA		IAI			
Historical	Historical Period:		Recent Past (last 60 yrs):	X				

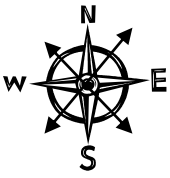
Recorder's Site No.: VOTI01

Official Name:

Local Name: Umvoti 4667

Map Sheet: 2930BB AHRENS

GPS reading: 29°13'7.40"S 30°46'18.10"E Altitude: 723m



DIRECTIONS TO SITE: SKETCH OR DESCRIPTION

From Tongaat take the R614 to Greytown. Turn right at the Fawn Lees station turnoff (D704), and continue with the road until where the D704 is a Y-junction. Take right turn and first left (D40). Continue with the D40, cross the stream and the site is at the top of the hill on the left.

SITE DESCRIPTION:

Type of Site: settlement and graves?

Merits conservation: graves

Threats: Yes What threats: Quarry

RECORDING:

Digital pictures #: X Tracings : Drawings:

Recorder/Informant: Name: Gavin Anderson

Address: PO Box 102532, Meerensee, 3901

Date: 10/3/2016

Owner: State

DESCRIPTION OF SITE AND ARTEFACTUAL CONTENT.

Recent past settlement with terracing and possible graves. Large coral tree at site.