

**HIA STUDY OF THE PROPOSED CONSTRUCTION
OF OFFTAKE 8C POTABLE WATER PIPELINE AS
PART OF THE LOWER THUKELA BULK WATER
SUPPLY, DARNALL, ILEMBE DISTRICT
MUNICIPALITY, KZN**

EDTEA REF NO: DC29/0042/2014

FOR TRIPLO4 SUSTAINABLE SOLUTIONS

DATE: 22 JANUARY 2015

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TABLE OF CONTENT

INTRODUCTION	3
KWAZULU-NATAL HERITAGE ACT NO. 4 OF 2008	7
METHOD	9
Defining significance.....	10
RESULTS	12
DESKTOP STUDY	12
PALAEONTOLOGICAL IMPACT ASSESSMENT	17
FIELD SURVEY	17
OCE01	20
OCE02	21
OCE03	22
MANAGEMENT PLAN	23
CONCLUSION	23
APPENDIX A	24
SITE RECORD FORMS	24

TABLE OF FIGURES

FIG. 1 GENERAL LOCATION OF THE STUDY AREA.....	4
FIG. 2: AERIAL OVERVIEW OF THE STUDY AREA	5
FIG. 3: TOPOGRAPHICAL MAP OF THE STUDY AREA	6
TABLE 1: LOCATION OF SITES NOTED FROM THE DESKTOP SURVEY.....	13
FIG. 4: LOCATION OF KNOWN HERITAGE SITES NEAR THE STUDY AREA	14
FIG. 6: STUDY AREA IN 1937	15
FIG. 7: STUDY AREA IN 1968	16
TABLE 2: LOCATION OF RECORDED HERITAGE SITES	17
FIG. 8: LOCATION OF RECORDED HERITAGE SITES	18
FIG. 9: SCENIC VIEWS OF THE STUDY AREA	19
FIG, 10: POTTERY SHAERDS AT OCE01	20
FIG, 11: HOUSE AT OCE02	21
FIG, 12: POTTERY SHERDS AT OCE03	22

INTRODUCTION

The proposed construction for Off Take 8C forms part of the Lower Thukela Bulk Water Supply Scheme that is a project of the iLembe District Municipality and co-funded by the Department of Water Affairs. The construction of Off Take 8C is part of the sections of the potable water pipeline that forms part of the broader Bulk Water Supply Scheme in the lower Thukela Region. The proposed pipeline is located immediately outside the road reserve and is approximately 3.02km in length with an outside diameter of approximately 600 mm. The pipeline is 3m wide with a temporary footprint of 5m – 20m.

The study site is situated approximately 4km west of Stanger central. The pipeline mostly occurs in agricultural land that has been under sugar cane cultivation since the turn of the 20th century, if not earlier. The pipeline route will follow the road reserve in most areas except where it diverts to a reservoir.

Figures 1 – 3 show the location of the pipeline.

FIG. 1 GENERAL LOCATION OF THE STUDY AREA

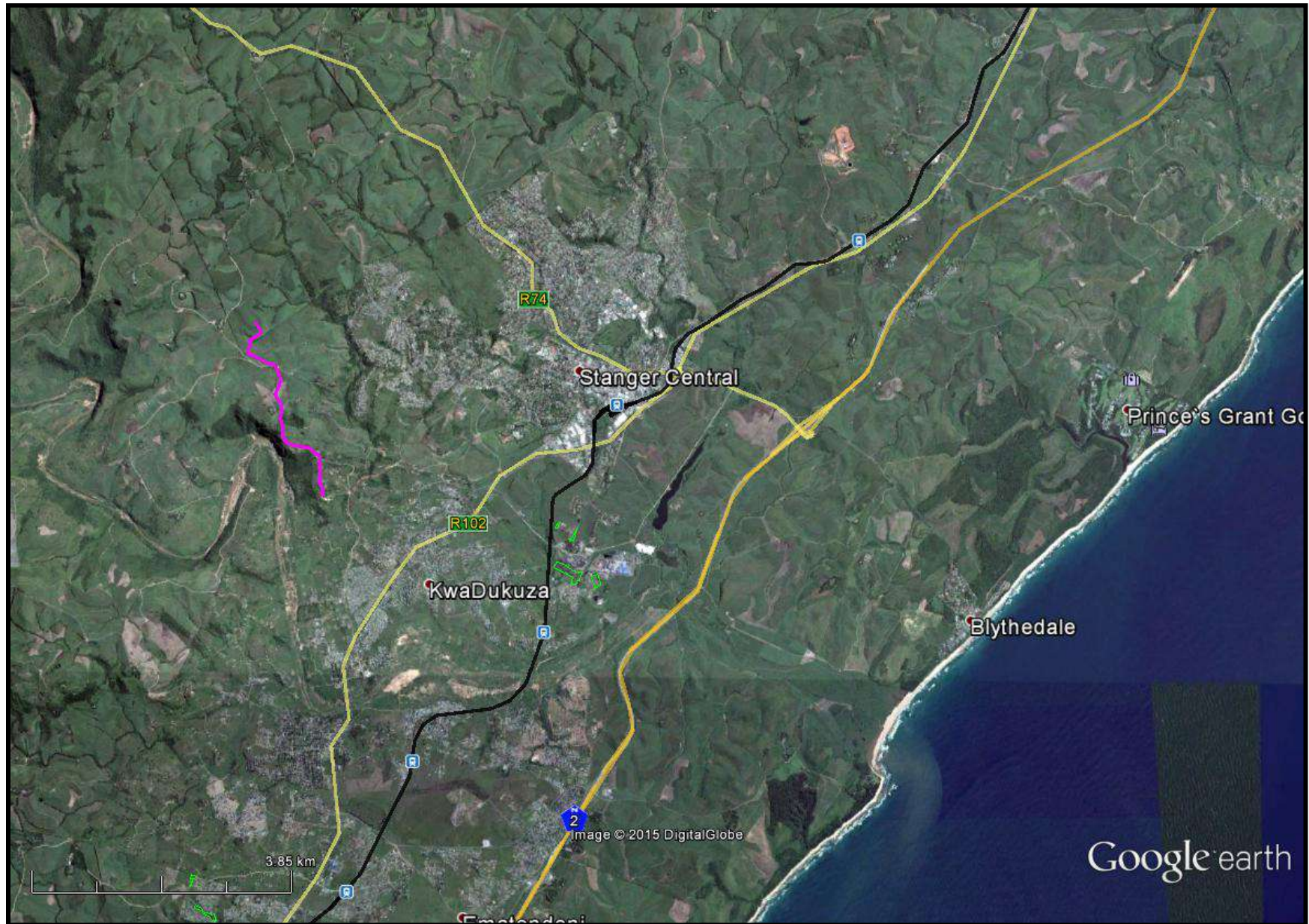


FIG. 2: AERIAL OVERVIEW OF THE STUDY AREA

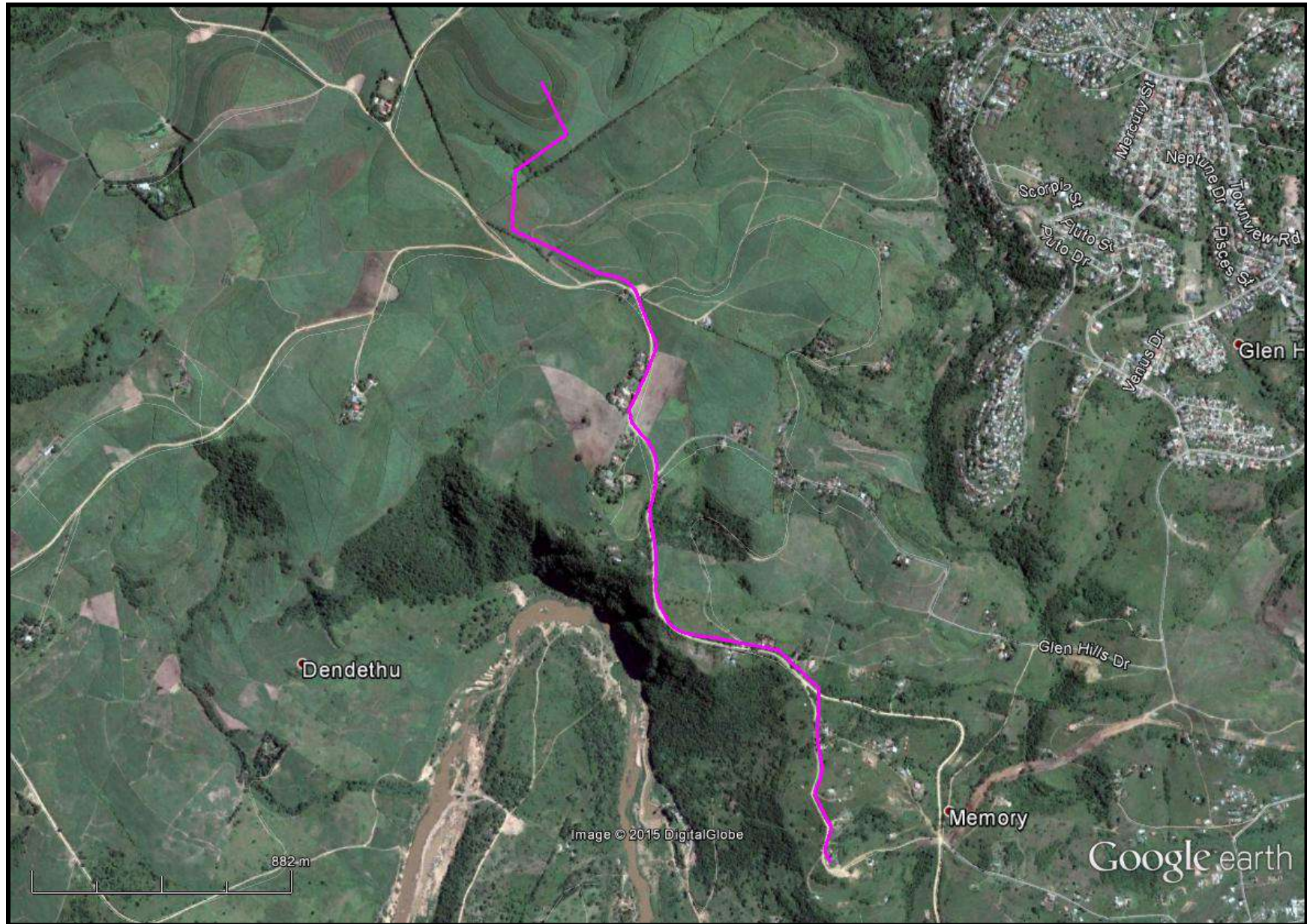
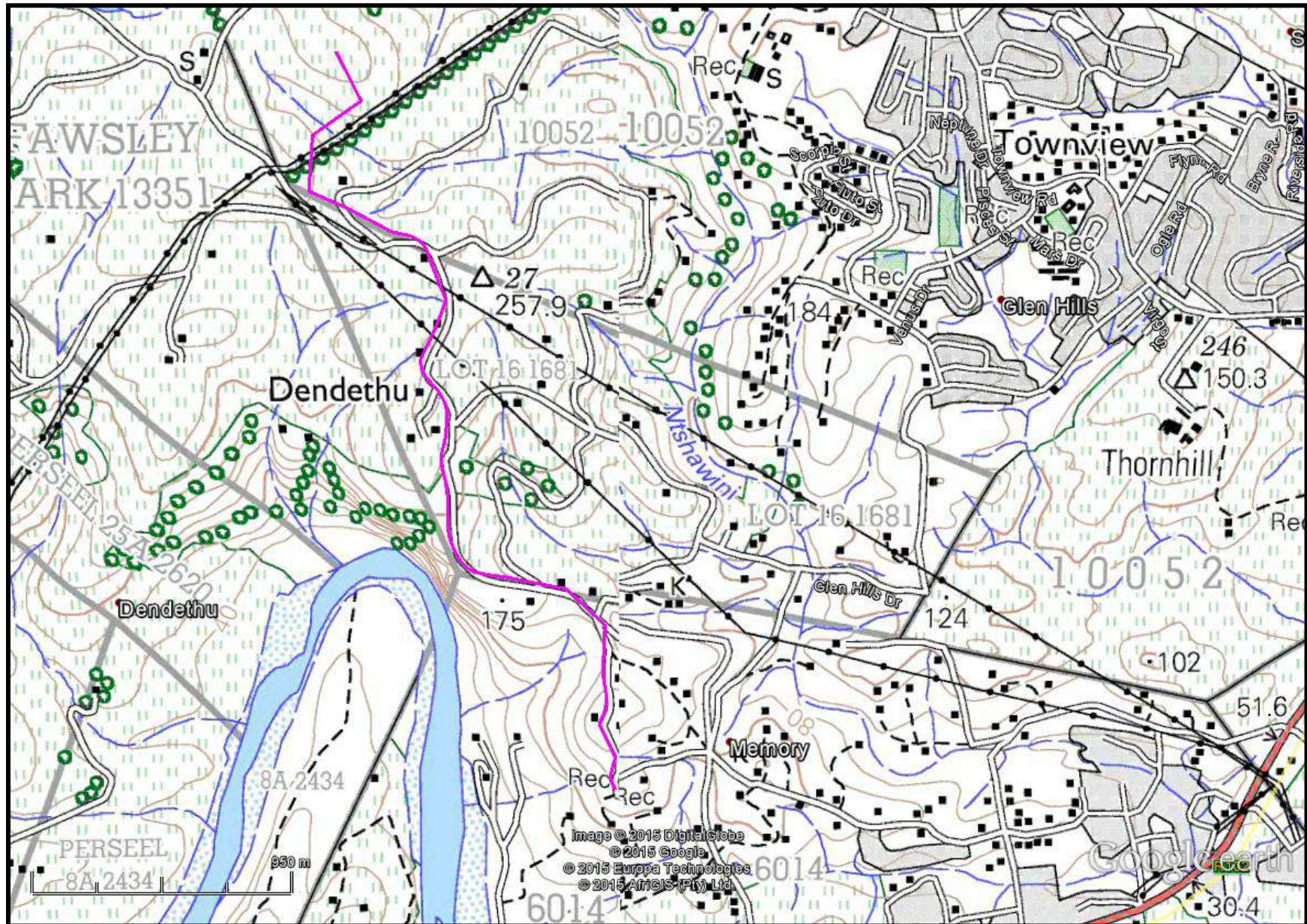


FIG. 3: TOPOGRAPHICAL MAP OF THE STUDY AREA



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. 4). These sites include all types of Stone Age and Iron Age sites. No sites occur in the study area. I would expect a Late Iron Age site to occur all of the hills along the line route, especially the reservoir. No national monuments, battlefields, or historical cemeteries are known to occur in the study area. There are several cemeteries outside of the study area.

The 1937 aerial photographs indicate that there are thirteen areas that have heritage sites within 200m of the servitude (fig. 5). All of these are settlements that would have human graves. The settlements are in a traditional Zulu settlement pattern, and thus graves are expected.

The 1968 topographical map indicates that most of the sites from the 1937 map still exist, with the exception of a12 and a13 (fig. 6). These settlements are probably from the same families from 1937, and thus more recent human graves may occur. Table 1 summarises the locations of the sites.

The recent aerial imagery suggests that most of the sites have been built over or damaged by sugar cane farming. The hill with the reservoir had several human settlements with human graves. I am concerned that there is now a reservoir on this hill and there is no record on SAHRIS that an HIA was undertaken. Amafa KZN will need to investigate if an HIA was undertaken for this reservoir.

TABLE 1: LOCATION OF SITES NOTED FROM THE DESKTOP SURVEY¹

NAME	LATITUDE	LONGITUDE	DESCRIPTION	ON 2014 GOOGLE EARTH IMAGERY	WITHIN 50M OF PIPELINE CENTER
a1	-29.335878009	31.239770945	settlement	Yes – cemetery?	No
a2	-29.338719697	31.245348433	settlement	Yes	No
a3	-29.343612498	31.243825409	settlement	Yes	Yes (11m)
a4	-29.342658753	31.242814696	settlement	No	No
a5	-29.349612193	31.250681965	settlement	No	No
a6	-29.352196989	31.250184234	settlement	No	No
a7	-29.353760412	31.249172856	settlement	Yes	Yes (38m)
a8	-29.355110854	31.250191997	settlement	No	Destroyed
a9	-29.353177461	31.250942504	settlement	Yes	No
a10	-29.354182710	31.251894660	settlement	Yes	No
a11	-29.348655672	31.248844718	settlement	No	No
a12	-29.333669046	31.237972648	settlements	No	Yes (50m)
a13	-29.332082171	31.240785934	settlements	No	No
b1	-29.345976810	31.243314886	settlement	No	No
b2	-29.345467185	31.246871553	settlement	No	No
b3	-29.349117580	31.249076591	settlement	No	No
c1	-29.351278	31.249309	Area of settlements and modern graves?	Yes	Yes

¹ A 50m radius should be placed around the co-ordinates

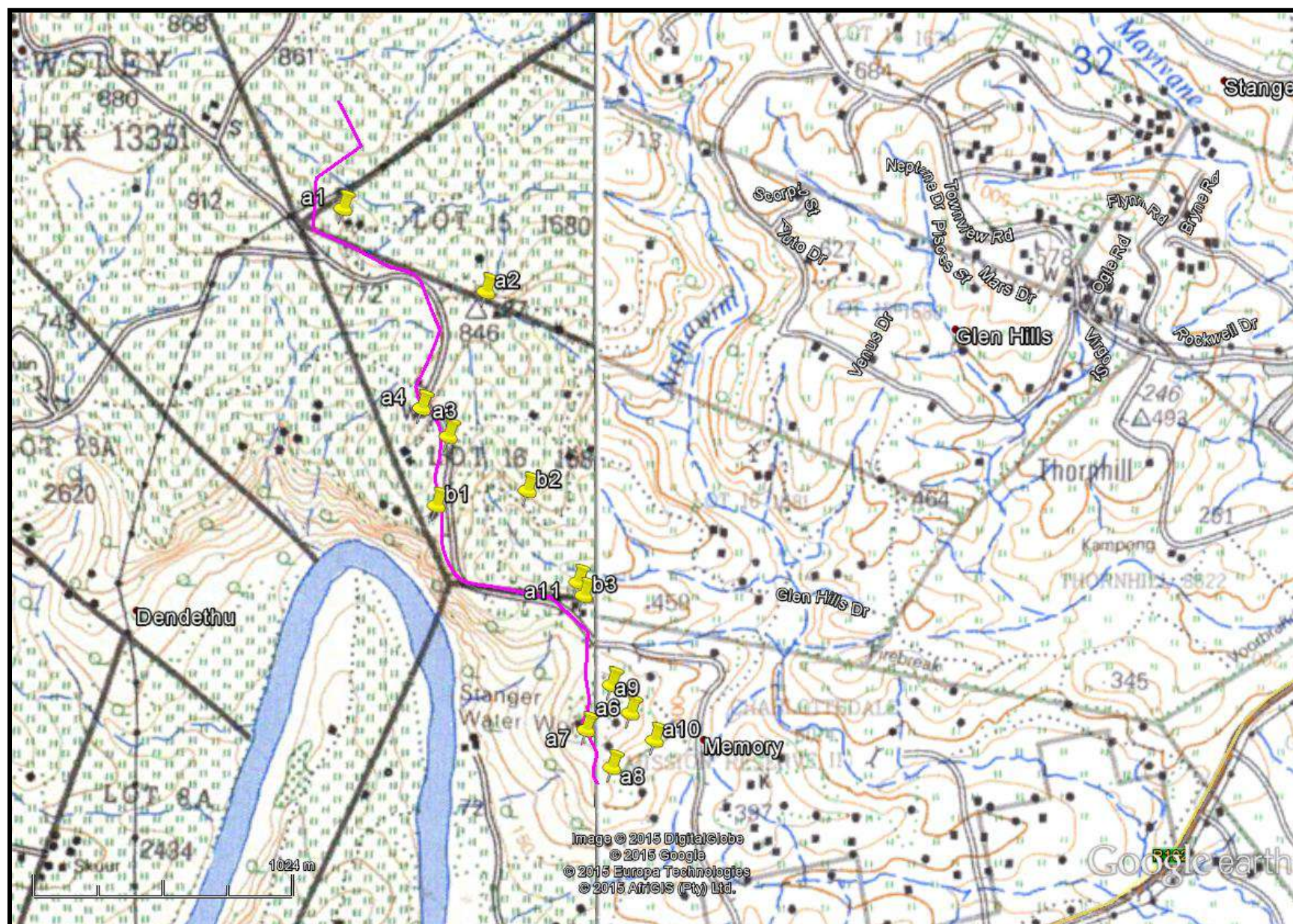
FIG. 4: LOCATION OF KNOWN HERITAGE SITES NEAR THE STUDY AREA



FIG. 6: STUDY AREA IN 1937



FIG. 7: STUDY AREA IN 1968



PALAEONTOLOGICAL IMPACT ASSESSMENT

There are falls into the 'not sensitive' area on SAHRAs paleontological map and thus would not require a desktop PIA study. Most of the line follow the gravel road and does not affect any built structures.

FIELD SURVEY

The field survey followed the line route. Most of the pipeline occurs just outside of the road reserve, and thus the main part of the pipeline is in already disturbed areas. Many of the sites noted in the desktop study no longer exist. This is due to road works, sugar cane farming and housing that is more recent. The sites from 1937 and 1968 would have occurred on or near the surface of the land when it was converted to sugar cane farming. Thus, ploughing activity would destroy these sites as opposed to the older sites that occur deeper below the soil.

All sites recorded at the desktop level should be treated as sensitive areas with the possibility of human remains occurring. If any human remains are uncovered during construction, then this will need to be reported to Amafa KZN, SAPS, and the ECO. Sites that are not mentioned in the Field Survey section have been destroyed/damaged.

Table 2 lists the locations of these sites while figure 8 shows their location.

TABLE 2: LOCATION OF RECORDED HERITAGE SITES

NAME	LATITUDE	LONGITUDE	DESCRIPTION
OCE01	-29.335744	31.238600	LIA settlement
OCE02	-29.335693	31.239784	House
OCE03	-29.332109	31.240095	LIA settlement

FIG. 8: LOCATION OF RECORDED HERITAGE SITES

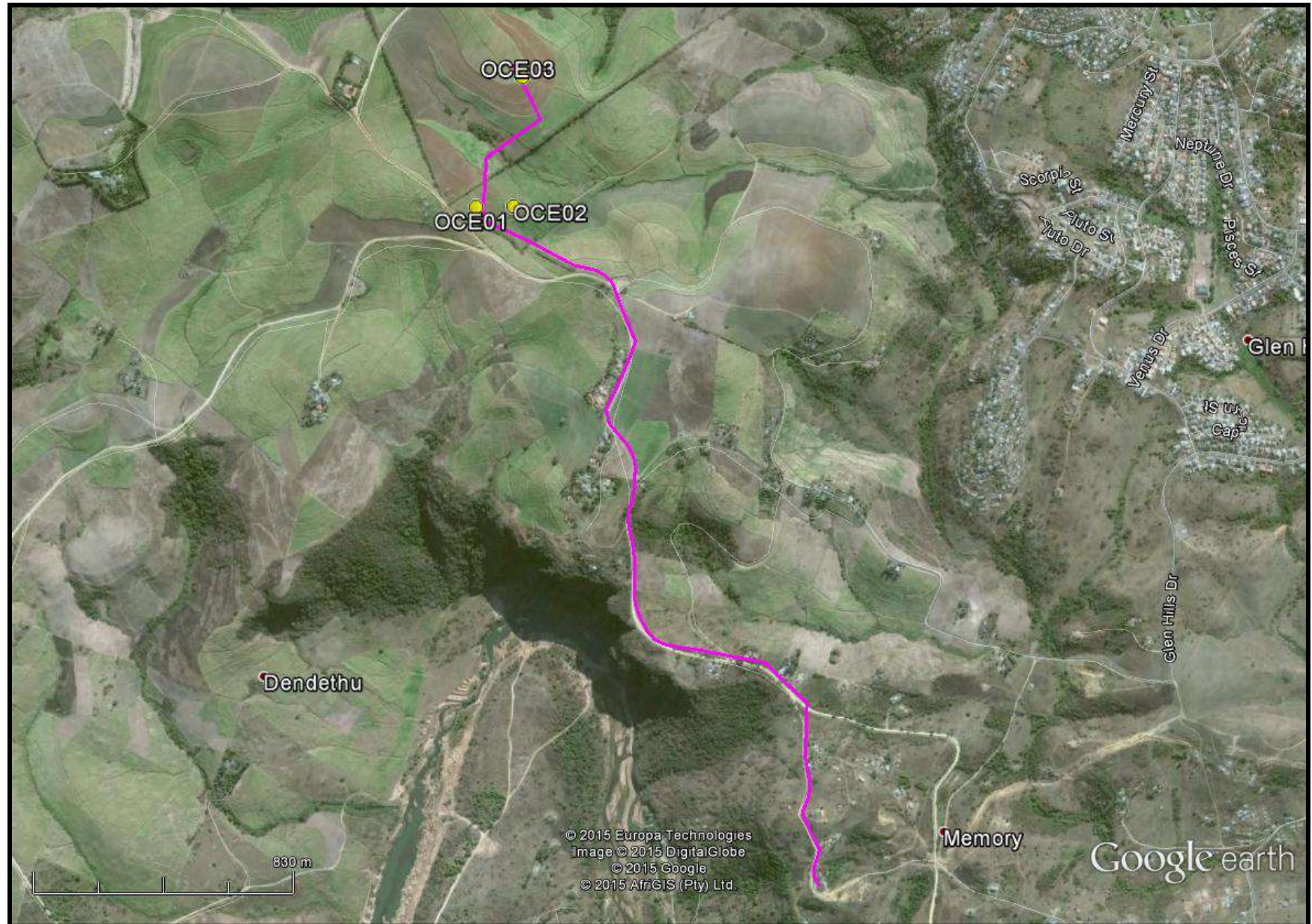


FIG. 9: SCENIC VIEWS OF THE STUDY AREA



OCE01

OCE01 is located on the top of a hill, where most of the hill has been disturbed by sugar cane farming, roads and electricity pylons. The probable area of the site is ~130m x 100m over the top of the hill. The main part of the site is located on the upper part of the hill before a steep downslope. The site consists of a scatter of Late Iron Age pottery sherds (fig. 10). The observed sherds are undecorated. There does not appear to be an archaeological deposit.

The pipeline will occur below the main site and thus not affect it.

Significance: The site is of low significance.

Mitigation: No further mitigation is required, provided that the pipeline position is not changed. A permit for the damage of the site will be required if the pipeline moves further uphill.

FIG. 10: POTTERY SHERDS AT OCE01



OCE02

OCE02 occurs ~110m downslope and to the east of OCE01. The site is a ruin of a farm labourer's house (fig. 11). The original house occurs on the 1937 aerial photographs, but not on the 1968 topographical map. This suggest that the house post-dates 1970s.

The pipeline occurs ~75m to the west of the house and will thus no affect it.

Significance: The house is of low significance and is not protected by the heritage legislation, unless human graves occur.

Mitigation: No further mitigation is required. A 20m buffer should be placed around the house during the construction phase.

FIG, 11: HOUSE AT OCE02



OCE03

OCE03 occurs on a long hill overlooking the valley towards Stanger. The site occurs over an area of 160m x 150m in size; however, the artefacts tend to be concentrated along the southeastern side of the hill. The site consists of an extensive scatter of Late Iron Age, or Historical Period, pottery sherds (fig. 12). These sherds occur in small concentrations along the hill. Fragments of possible upper grinding stones occur. The soil appears to be deep in this area and thus there is a potential archaeological deposit. This implies that undisturbed subsurface features could occur. A reservoir will be constructed on the site.

Significance: The site is of medium significance. There is a potential archaeological deposit, and a possibility of human remains.

Mitigation: The site should be monitored during the construction phase of the reservoir. The client will need to apply for a permit to damage the site.

FIG. 12: POTTERY SHERDS AT OCE03



MANAGEMENT PLAN

Only one site will be effected by the current pipeline and reservoir: OCE03. This site will need to be monitored during the construction phase in case any significant features are exposed. Any significant feature will need to be excavated or sampled.

The house at OCE02 should have a 20m buffer placed around it during construction phase.

CONCLUSION

A heritage survey was undertaken for the Off take 8C pipeline. Several heritage sites were noted to have occurred near and within the proposed pipeline footprint during the desktop study. These sites were human settlements with human graves; however, most no longer exist, or will not be affected by the pipeline.

The field survey recorded three heritage sites will determine the extent of the buildings and settlements in relation to the pipeline footprint. The main site occurs in the location of the proposed reservoir and would need to be monitored during construction.

**APPENDIX A
SITE RECORD FORMS**



UMLANDO ARCHAEOLOGICAL SITE RECORD FORM

SITE CATEGORY:

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

Recorder's Site No.: OCE01

Official Name: Ocean Lodge 1681

Local Name:

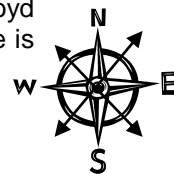
Map Sheet: 2931AC Shakaskraal

GPS reading: -29.335718S 31.238222E

Altitude: 261

DIRECTIONS TO SITE: SKETCH OR DESCRIPTION

From the R102/R74 intersection, turn left and continue along R02 for 4.8km. Turn right onto Lloyd road for 450m, and then left into Memory road for 1.2km. At the P533 drive for 3.3km and site is on top of hill on RHS, just south of the pylons.



SITE DESCRIPTION:

Type of Site: Open

Merits conservation: No

Threats: Yes

What threats: possible pipeline

RECORDING:

Digital pictures #: X

Tracings :

Drawings:

Recorder/Informant: Name: Gavin Anderson

Address: PO Box 102532, Meerensee, 3901

Date: January 2015

Owner: Private

References: -

DESCRIPTION OF SITE AND ARTEFACTUAL CONTENT.

OCE01 is located on the top of a hill, where most of the hill has been disturbed by sugar cane farming, roads and electricity pylons. The probable area of the site is ~130m x 100m over the top of the hill. The main part of the site is located on the upper part of the hill before a steep downslope. The site consists of a scatter of Late Iron Age pottery sherds. The observed sherds are undecorated. There does not appear to be an archaeological deposit. The pipeline will occur below the main site and thus not affect it. The site is of low significance.

Mitigation: No further mitigation is required, provided that the pipeline position is not changed.



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.: OCE02

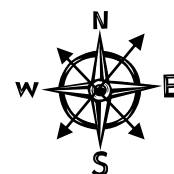
Official Name: Ocean Lodge 1681

Local Name:

Map Sheet: 2931AC Shakaskraal

GPS reading: -29.335784 E 31.240000

Altitude: 236



DIRECTIONS TO SITE: SKETCH OR DESCRIPTION

From the R102/R74 intersection, turn left and continue along R02 for 4.8km. Turn right onto Lloyd road for 450m, and then left into Memory road for 1.2km. At the P533 drive for 3.3km and site is on top of hill on RHS, just south of the pylons. Walk down the hill (south of the tree barrier) to the house.

SITE DESCRIPTION:

Type of Site: Open

Merits conservation: No

Threats: Yes

What threats: Reservoir

RECORDING:

Digital pictures #: X

Tracings :

Drawings:

Recorder/Informant: Name: Gavin Anderson

Address: PO Box 102532, Meerensee, 3901

Date: January 2015

Owner: Private

References: -

DESCRIPTION OF SITE AND ARTEFACTUAL CONTENT.

OCE02 occurs ~110m downslope and to the east of OCE01. The site is a ruin of a farm labourer's house. The original house occurs on the 1937 aerial photographs, but not on the 1968 topographical map. This suggest that the house post-dates 1970s. The pipeline occurs ~75m to the west of the house and will thus no affect it.

Significance: The house is of low significance and is not protected by the heritage legislation, unless human graves occur. Mitigation: No further mitigation is required. A 20m buffer should be placed around the house during the construction phase.



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):					

Recorder's Site No.: OCE03

Official Name: Ocean Lodge 1950

Local Name:

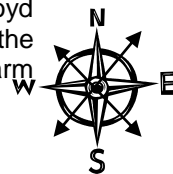
Map Sheet: 2931AC Shakaskraal

GPS reading: -29.332104 E 31.240231

Altitude: 259

DIRECTIONS TO SITE: SKETCH OR DESCRIPTION

From the R102/R74 intersection, turn left and continue along R02 for 4.8km. Turn right onto Lloyd road for 450m, and then left into Memory road for 1.2km. At the P533 drive for 3.8km to the P5331 and turn right. Drive along this road for 450m to the top of the hill and turn right along farm track to the site.



SITE DESCRIPTION:

Type of Site: Open

Merits conservation: No

Threats: Yes

What threats: Reservoir

RECORDING:

Digital pictures #: X

Tracings :

Drawings:

Recorder/Informant: Name: Gavin Anderson

Address: PO Box 102532, Meerensee, 3901

Date: January 2015

Owner: Private

References: -

DESCRIPTION OF SITE AND ARTEFACTUAL CONTENT.

OCE03 occurs on a long hill overlooking the valley towards Stanger. The site occurs over an area of 160m x 150m in size; however, the artefacts tend to be concentrated along the southeastern side of the hill. The site consists of an extensive scatter of Late Iron Age, or Historical Period, pottery sherds. These sherds occur in small concentrations along the hill. Fragments of possible upper grinding stones occur. The soil appears to be deep in this area and thus there is a potential archaeological deposit. This implies that undisturbed subsurface features could occur. A reservoir will be constructed on the site.

Significance: The site is of medium significance. There is a potential archaeological deposit, and a possibility of human remains.

Mitigation: The site should be monitored during the construction phase of the reservoir. The client will need to apply for a permit to damage the site.