

**HERITAGE SURVEY OF THE DORDRECHT WATER &  
SANITATION SERVICES UPGRADES; DORDRECHT,  
EASTERN CAPE**

**FOR AURECON (PTY) LTD  
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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 town of Dordrecht in the Eastern Cape is currently experiencing critical water shortages and there is an urgent need to secure a long-term water supply. An increased level of service delivery to full waterborne sanitation for the entire town is also planned for the near future, which will put further strain on the water supply. To provide for the necessary improvements to the level of water and sanitation delivery, the Water Services Authority (Chris Hani District Municipality) has identified a number of projects that they wish to implement. These include reinstating the existing Hogsett dam, raising the wall of the Munnik dam, upgrading the Water Treatment Works (WTW), upgrading the Waste Water Treatment Works (WTW) and upgrading and/or reconfiguring the bulk sewers. Environmental authorisations will be required, and specialist heritage input will be needed as part of the environmental impact assessment process.

The proposed activities will take place within the town of Dordrecht, Eastern Cape. Dordrecht is about 70km north-northeast of Queenstown and can be accessed via the R392 from Queenstown or from the R56 from Indwe or Molteno. It forms part of the Emalahleni Local Municipality which falls under the Chris Hani District Municipality. There are two main components to the project, one that relates to the upgrade of the water supply services and the other that relates to the upgrade of the sanitation service (fig.'s 1 – 4). This will include:

- the re-instatement of the Hogsett Dam
- the raising of the Munnik Dam
- Upgrading of the Water Treatment Works
- Upgrading and/or reconfiguration of the bulk sewers

Aurecon has been appointed by the Chris Hani District Municipality to undertake the necessary engineering and environmental studies. Umlando has been subcontracted to undertake the HIA desktop study and possible Phase 1 survey.

FIG. 1 GENERAL LOCATION OF THE STUDY AREA

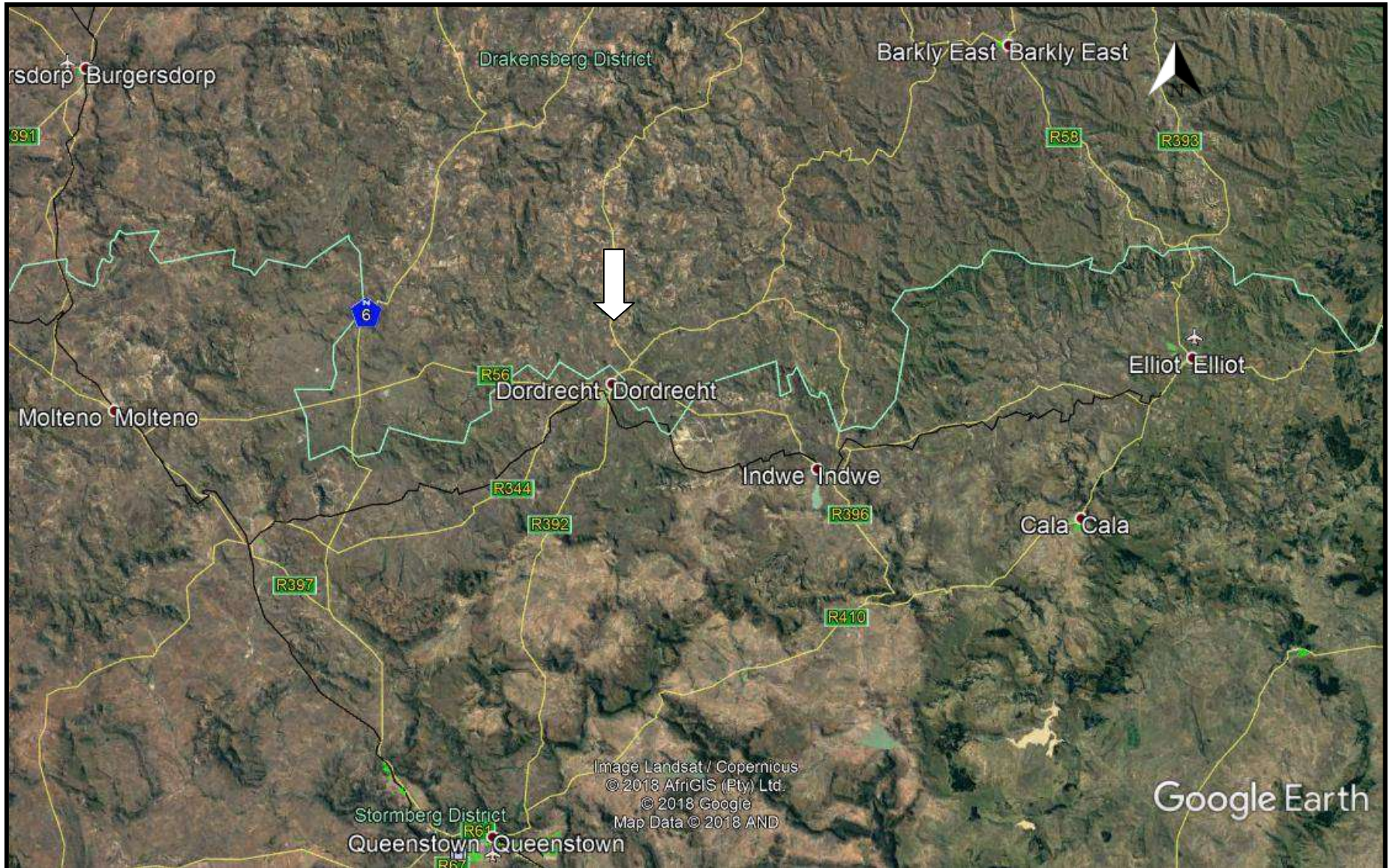


FIG. 2: AERIAL OVERVIEW OF THE STUDY AREA

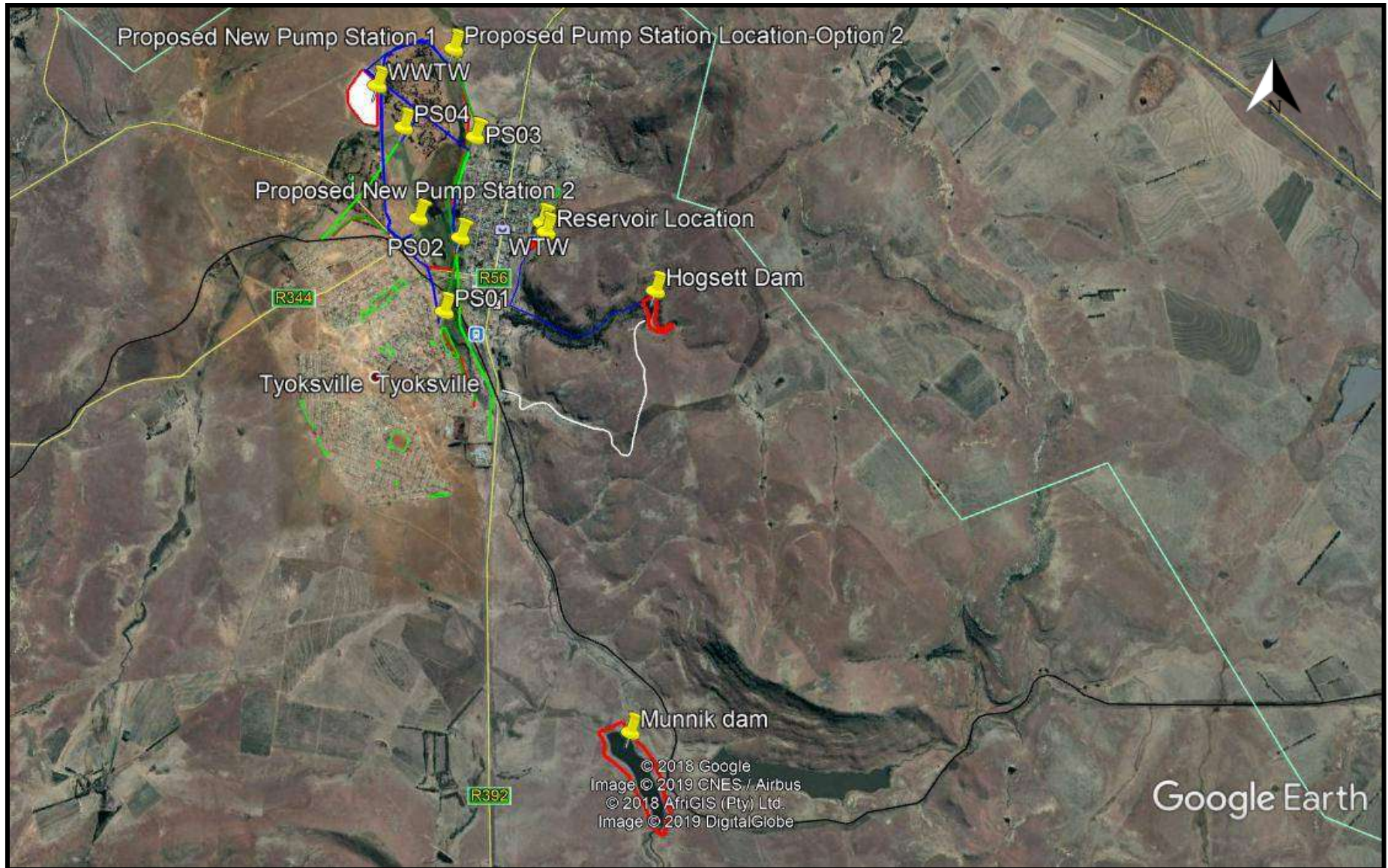


FIG. 3A: TOPOGRAPHICAL MAP OF THE STUDY AREA

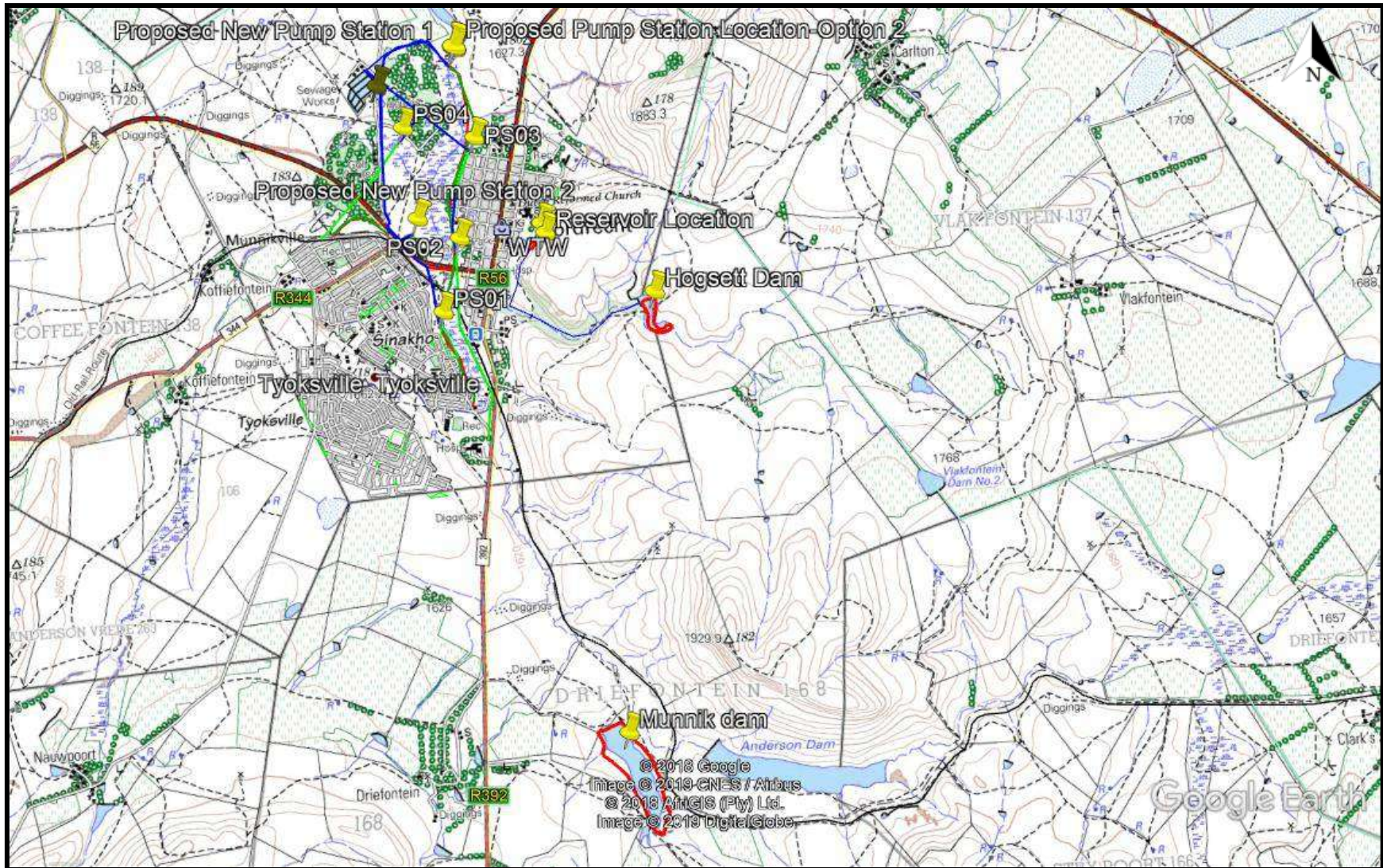
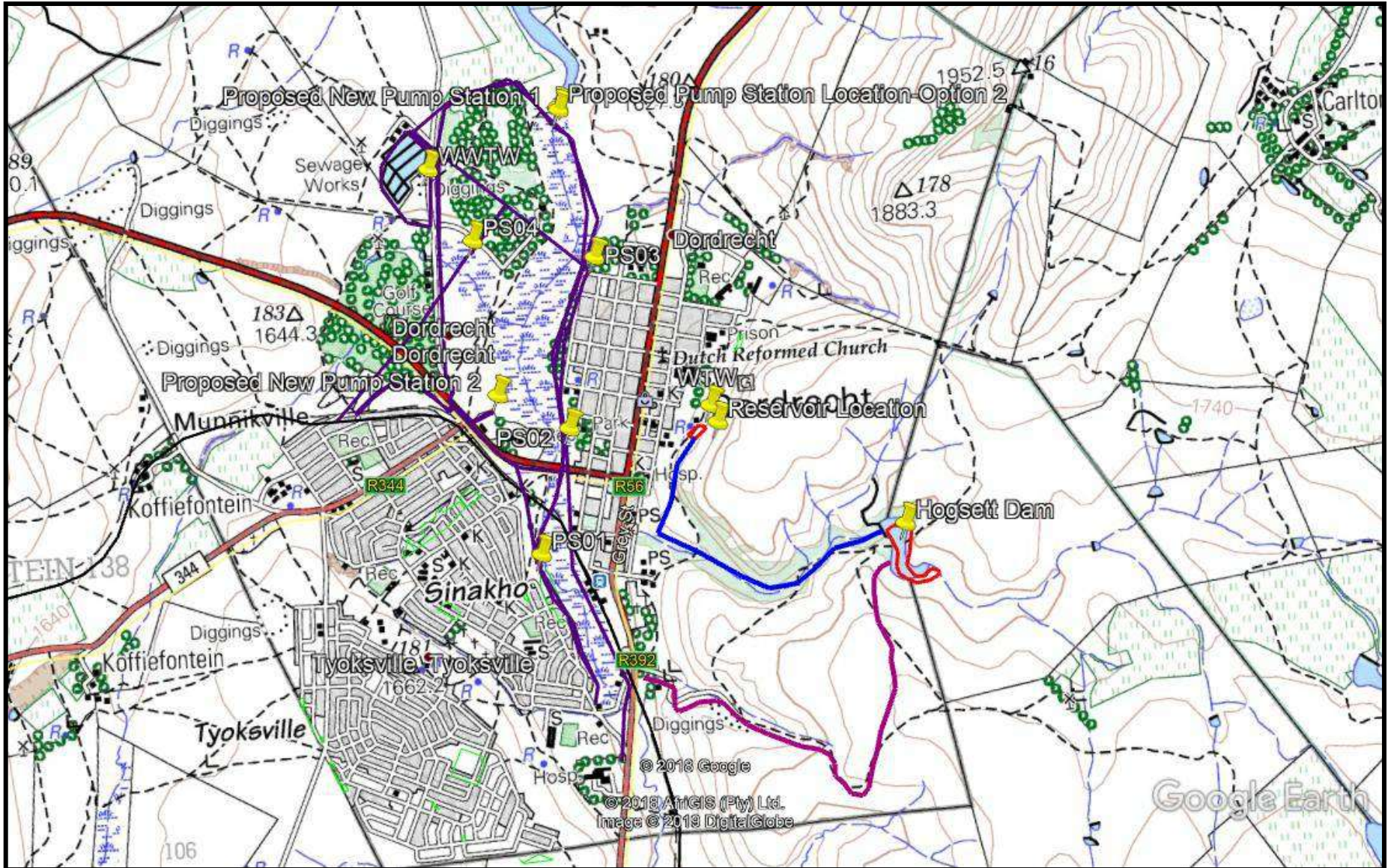


FIG. 3B: TOPOGRAPHICAL MAP OF THE STUDY AREA IN TOWN





**FIG. 4: SCENIC VIEWS 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. These 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 1<sup>st</sup> and 2<sup>nd</sup> edition 1:50 000 topographical and 1937 aerial photographs where available, to assist in general location and dating of buildings and/or graves. The database is in Google Earth format and thus used as a quick reference when undertaking desktop studies. Where required we would consult with a local data recording centre, however these tend to be fragmented between different institutions and areas and thus difficult to access at times. We also consult with an historical architect, palaeontologist, and an historian where necessary.

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

All sites are grouped according to low, medium, and high significance for the purpose of this report. Sites of low significance have no diagnostic artefacts or features. Sites of medium significance have diagnostic artefacts or features and these sites tend to be sampled. Sampling includes the collection of artefacts for future analysis. All diagnostic pottery, such as rims, lips, and decorated sherds are sampled, while bone, stone, and shell are mostly noted. Sampling usually

occurs on most sites. Sites of high significance are excavated and/or extensively sampled. Those sites that are extensively sampled have high research potential, yet poor preservation of features.

### **Defining significance**

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

These criteria are:

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

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

#### **2. Spatial arrangements:**

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

#### **3. Features of the site:**

- 3.1. Are there any unusual, unique or rare artefacts or images at the site?

3.2. Is it a type site?

3.3. Does the site have a very good example of a specific time period, feature, or artefact?

**4. Research:**

4.1. Providing information on current research projects

4.2. Salvaging information for potential future research projects

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

5.1. Can this particular site yield information regarding intra-site variability, i.e. spatial relationships between various features and artefacts?

5.2. Can this particular site yield information about a community's social relationships within itself, or between other communities?

**6. Archaeological Experience:**

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

**7. Educational:**

7.1. Does the site have the potential to be used as an educational instrument?

7.2. Does the site have the potential to become a tourist attraction?

7.3. The educational value of a site can only be fully determined after initial test-pit excavations and/or full excavations.

**8. Other Heritage Significance:**

8.1. Palaeontological sites

8.2. Historical buildings

8.3. Battlefields and general Anglo-Zulu and Anglo-Boer sites

8.4. Graves and/or community cemeteries

8.5. Living Heritage Sites

8.6. Cultural Landscapes, that includes old trees, hills, mountains, rivers, etc related to cultural or historical experiences.

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

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**

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

## **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.

### **PREVIOUS ACHAEOLOGICAL & HERITAGE SURVEYS**

A heritage screening exercise was undertaken by Cedar Towers (2016) for a related project in Dordrecht. They noted that there have been few heritage surveys in the general area. They do note that there is a Provincial Heritage Site in the town: the Dutch Reformed Church at 90 Grey Street.

There are 2nd Anglo-Boer War, World War 1 and 2 memorials in town. The town's cemetery is located on the southern side. This is probably a historical cemetery as well. The Google image suggests there are family cemeteries that would date to a few years after the formation of the town (1856). This needs to be confirmed. There is a Christian, Jewish and more recently, a Muslim cemetery at the southern end of town.

The nearest Phase 1 heritage impact assessments was undertaken by Anderson (2007) at Indwe (fig. 5). Other scoping exercises have occurred, but they remain at a desktop level. The general area is known for open Middle and Late Stone Age scatters. However, the more important sites tend to be in shelters and overhangs that might contain rock art images. These would be found in the areas with sandstone outcrops.

The 1966 topographical map indicates that the Hogsett Dam was already built (in 1932), while the Munnik Dam had not yet been built (fig. 6).



FIG. 5: KNOWN HERITAGE SITES IN THE AREA

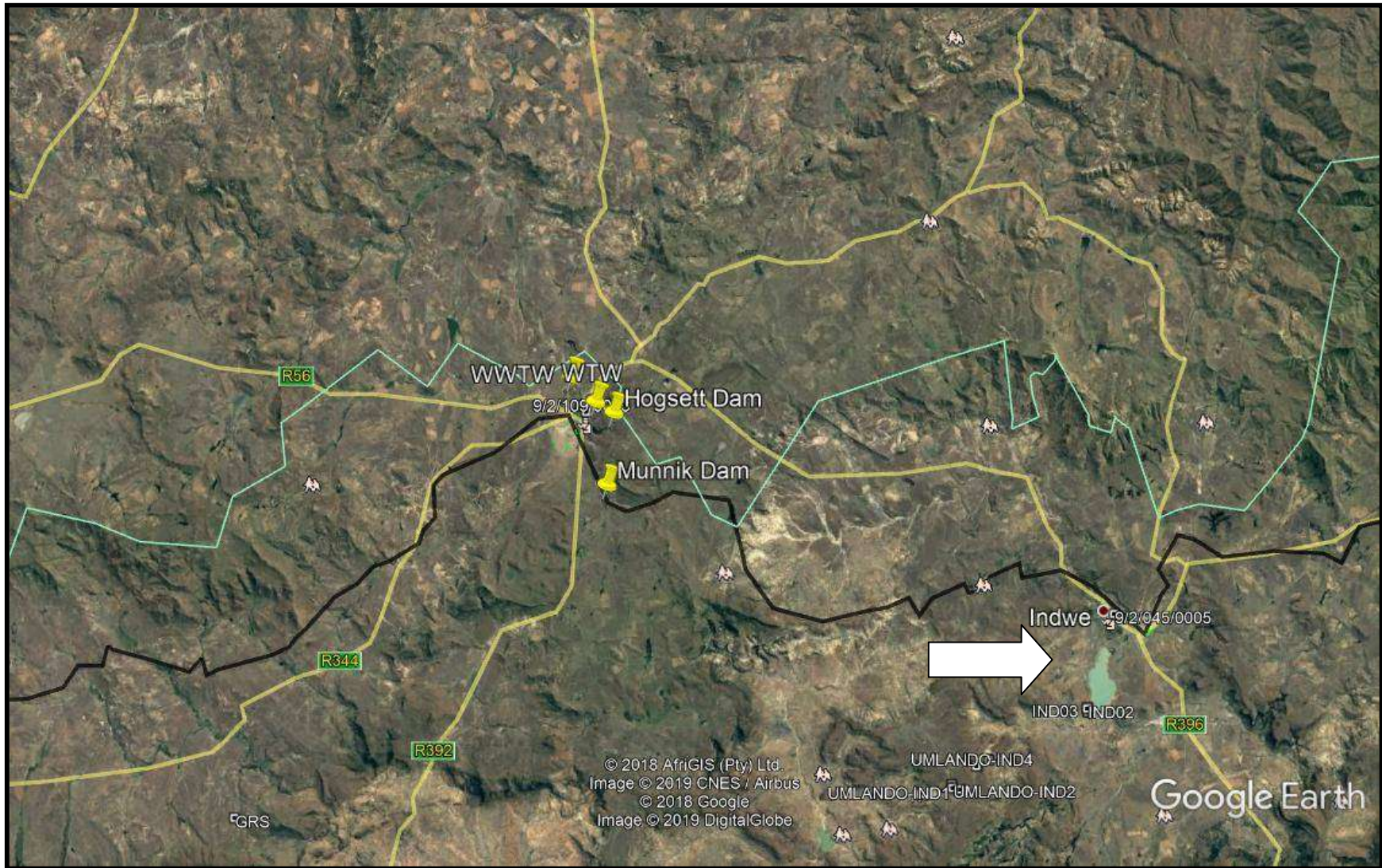
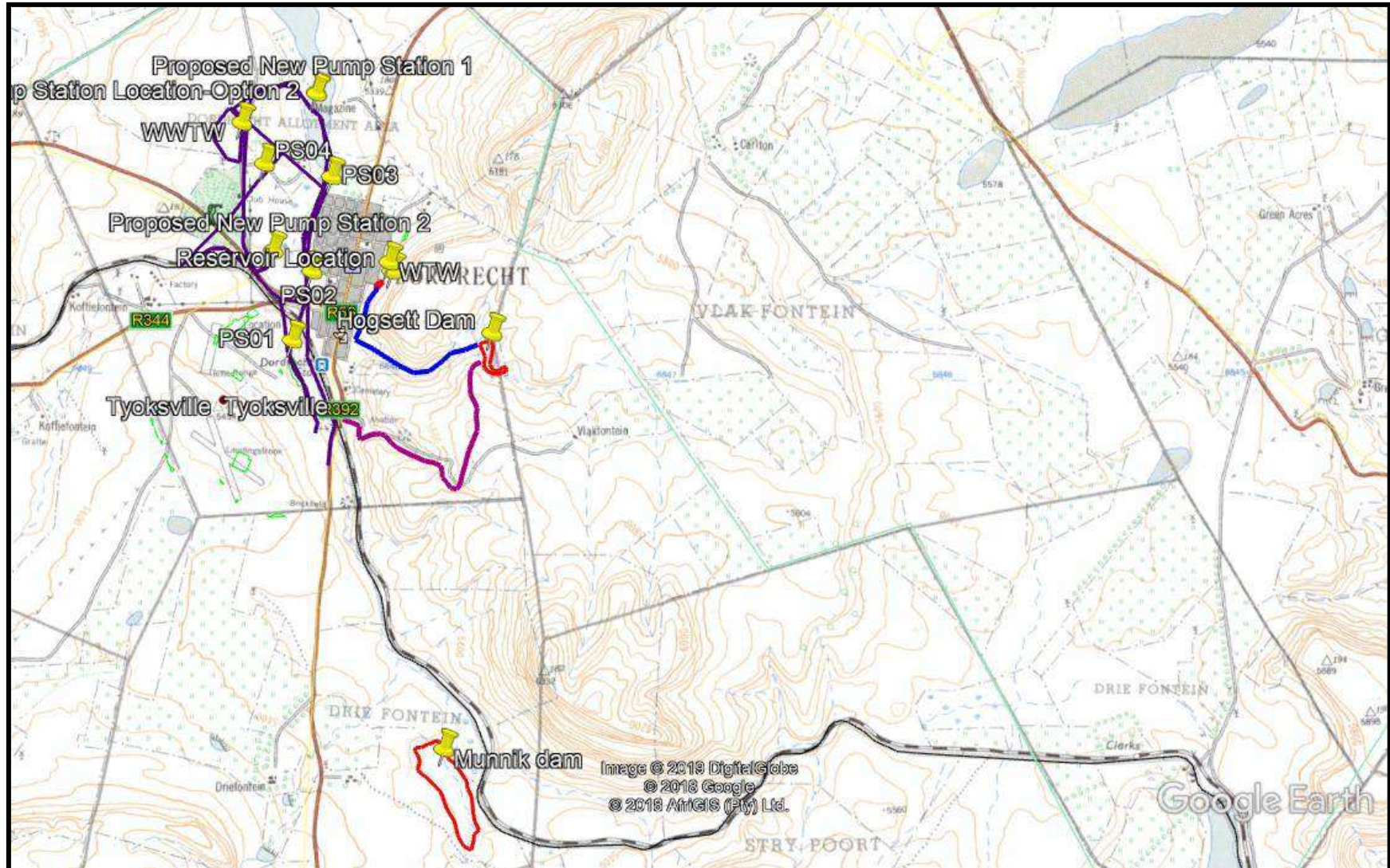


FIG. 6: STDY AREA IN 1966



## **The Re-Instatement Of The Hogsett Dam**

The Hogsett Dam was originally built in 1932. The cobbled spillway was added either at the time of building or at a later stage. This needs to be verified. The spillway and dam wall need to be removed in order to update the entire dam. The dam burst in 2011 as the original spillway was apparently too narrow to cope with the amount of water, which contributed to the dam collapsing. The proposal is to follow the line of the spillway, but it will be made deeper and wider, so the original one would need to be replaced. The dam wall will also be replaced in its entirety. Fig. 7a-b shows some of the built features. These features appear to be in various stages of disrepair.

All built structures older than 60 years in age are automatically protected by the heritage legislation. A permit will be required for the destruction of any of these features. This permit will require an assessment by a professional historical architect. It is highly unlikely that permission will not be granted for the built structures to be destroyed. The proposal should include setting the material aside as part of a materials bank. ECHPRA will need to decide where the material is to be stored.

A pipeline will occur from the Hogsett Dam, along the ravine and then veer north towards the existing WWT on the east of town. A new reservoir will be constructed above the WTW. A pipe will run from the reservoir to the WTW. This is shown in fig. 8.

The pipeline will occur just below a sandstone ridge, while the new reservoir will occur above this ridge. As stated previously these ridges are sensitive in terms of rock art and/or hunter-gatherer shelters. This route will need to be surveyed and the sandstone ridge assessed as the NHRA requires buffers from rock art sites.

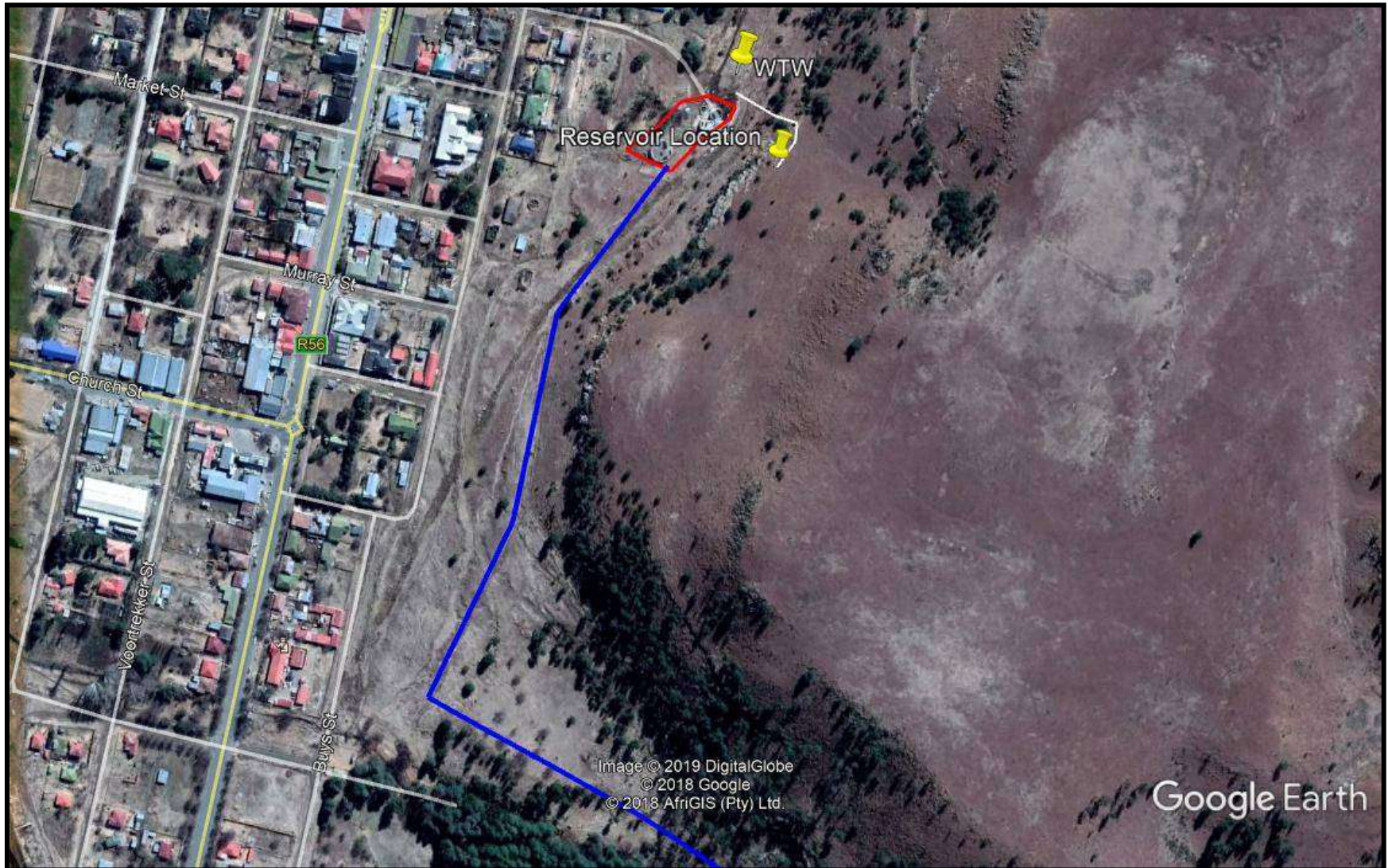
FIG. 7a: BUILT STRUCTURES AT THE HOGSETT DAM



FIG. 7b: BUILT STRUCTURES AT THE HOGSETT DAM



FIG. 8: RESERVOIR LOCATION AND PIPELINE FROM HOGSETT DAM



## **The Raising Of The Munnik Dam**

The Munnik Dam post-dates 1966 and is not protected by heritage legislation (fig. 9). The dam wall will be raised resulting in an approximate 50m extension to the dam in places. There are no known buildings in the new affected area; however, a survey would be required for potential archaeological material. If the dam wall will result in new excavations, then a palaeontological survey might be required. This is discussed below.

## **Upgrading Of The Water Treatment Works And Sewers**

There are three options for the pipelines, each with pump stations (fig. 10). Option 1 (purple on map) uses an existing system and no further work will be required provided that it does not break new ground. Option 2 (yellow on map) and 3 (red on map) are partly aligned with Option 1, and also occur as new lines. Options 2 and 3 will need to be surveyed.

## **Palaeontological Sensitivity**

The entire study area occurs in an area of very high palaeontological sensitivity (fig. 11). A PIA study ~30km southwest of Dordrecht noted that there was a high chance of finding (significant) fossil remains (Millstead 2013). All new excavations, or trenches, will require an inspection by a qualified palaeontologist. Normally a desktop PIA is required as a minimal standard, however, in this case a field survey will be required. This must be done in conjunction with construction activity. I suggest that the PIA and engineers liaise according to the timing of excavations and a suitable program is undertaken for monitoring. A permit to destroy any palaeontological material is required. The PIA specialist is responsible for obtaining this permit. This will not be required for Option 1 pipeline.

FIG. 9: MUNNIK DAM





FIG. 10: BULK WATER PIPELINE OPTIONS

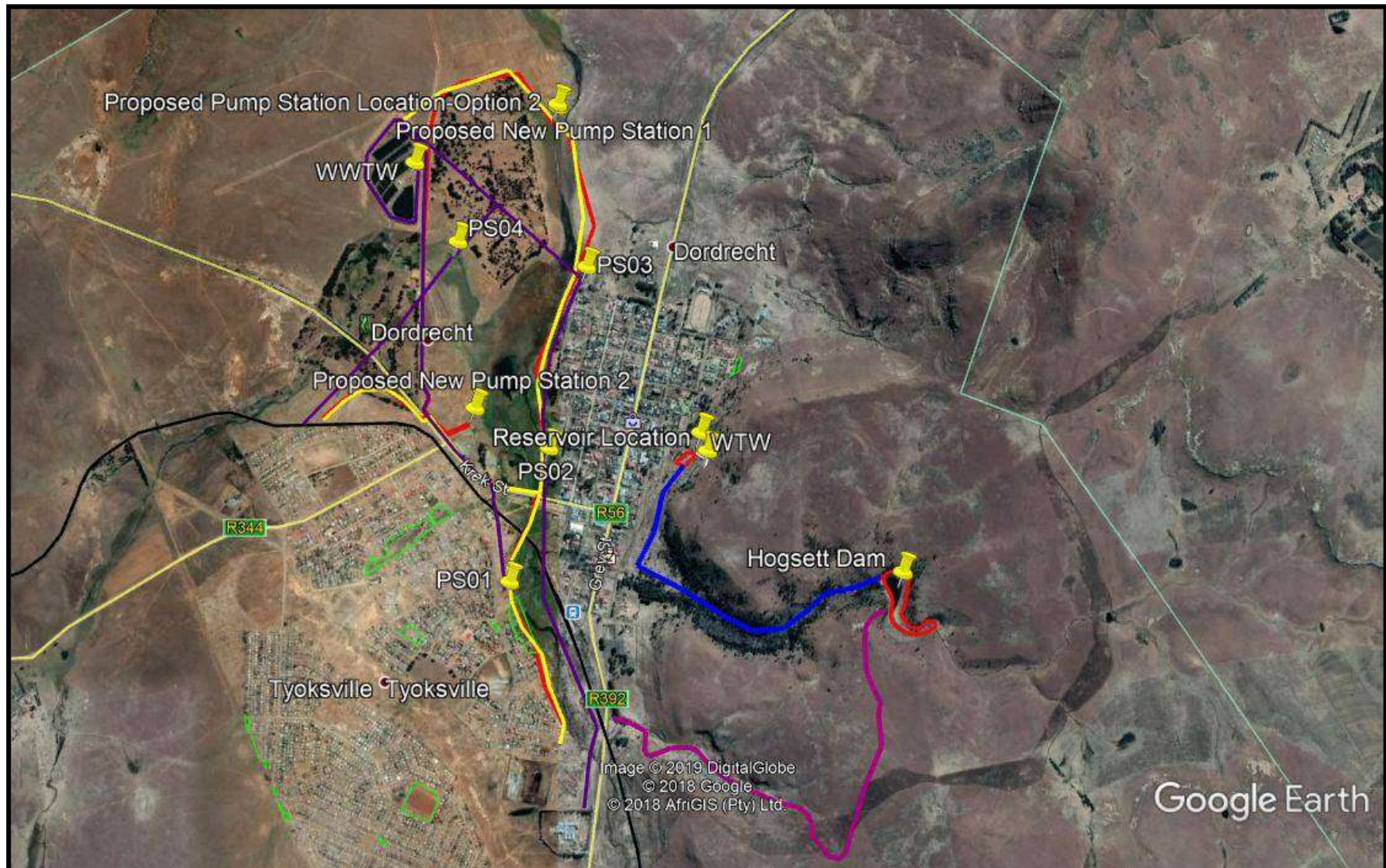
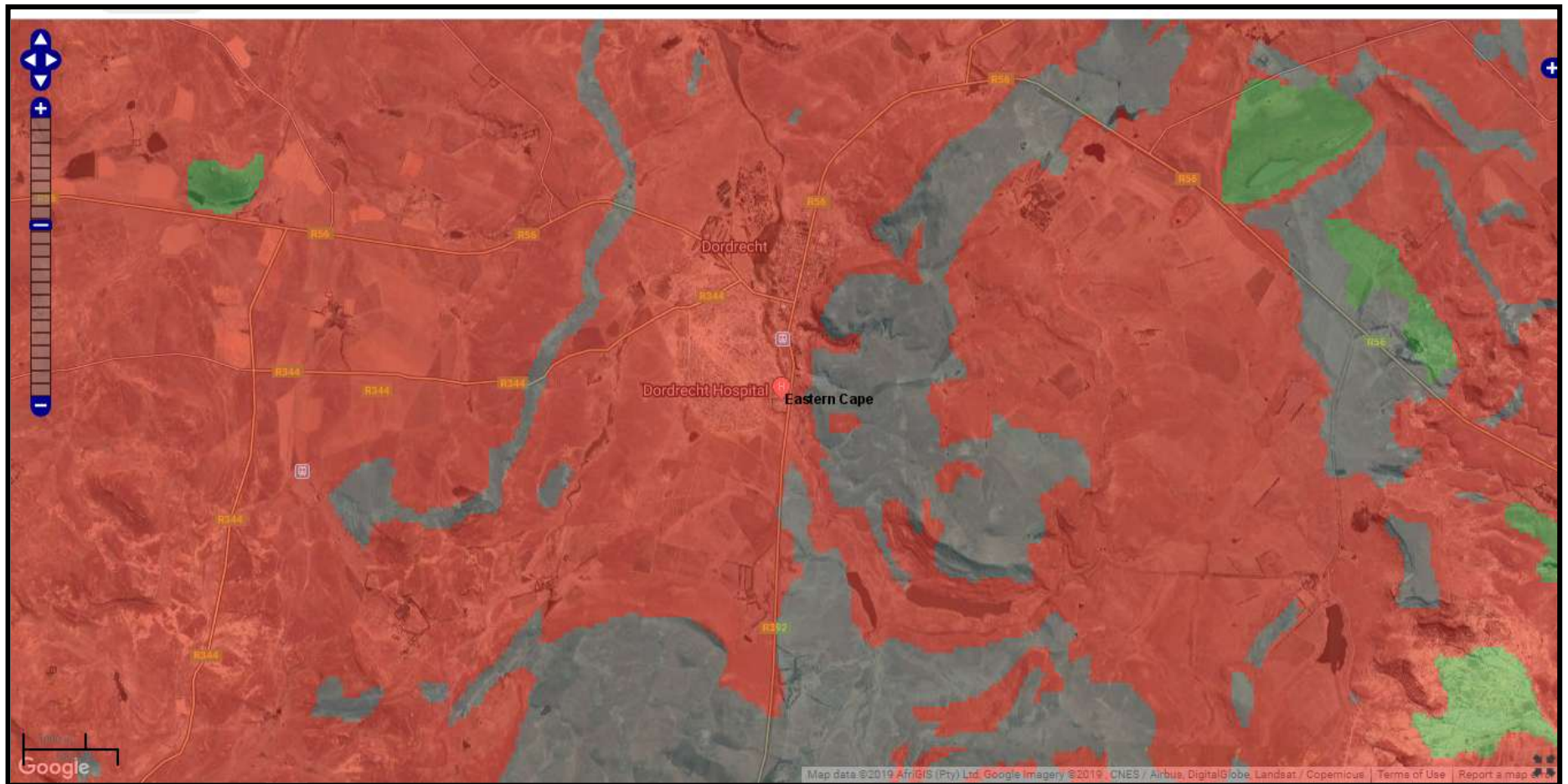


FIG. 11: PALAEOANTHROPOLOGICAL SENSITIVITY OF THE AREA



## CONCLUSION

A desktop study was undertaken for the proposed Dordrecht water and sanitation services upgrades; Dordrecht, Eastern Cape. An initial screening exercise was undertaken in 2016 for one of the proposed pipelines. This indicated that the area had potential heritage sites. A desktop survey was undertaken to determine a more precise account of the heritage resources in the study area and if any red flags occurred.

The desktop noted that the Hogsett Dam is older than 60 years in age. There are several built features at the dam that probably related to the original dam. These features will need to be assessed by a qualified architect historian and subsequently apply for a permit for their destruction. The features will need to be destroyed as the dam wall needs to be rebuilt after they collapse in 2011. The spillway is too small to handle the proposed volume of water and will need to be removed..

The pipeline from Hogsett Dam to the WTW and new reservoir will need to be surveyed as well as the sandstone ridges within 100m of this pipeline.

The Munnik Dam is recent and does not require further mitigation apart from a general survey whilst the rest of the area is surveyed.

There are three options for the proposed bulk water pipelines. Option 1 will use existing infrastructures and thus will not require further mitigation. Options 2 and 3 have new areas that will be excavated. These require both archaeological and palaeontological input. The former in terms of a preconstruction survey. The latter in terms of on-site management.

The entire study area is in an area of very high palaeontological sensitivity. A suitably qualified palaeontologist needs to be on site during construction activity.

## REFERENCES

Anderson, G. 2007. The Archaeological Survey Of The Elitheni Mine, Indwe, Eastern Cape

Cedar Towers 2016. Dordrecht Immediate Water Supply Upgrades; Dordrecht, Eastern Cape

Millstead, B. 2013. Desktop Palaeontological Heritage Impact Assessment Report on the Site of the Proposed Solar and Wind Energy Generation Facilities (Stormberg Project) to be location on various farms near Sterkstroom, Eastern Cape Province

## EXPERIENCE OF THE HERITAGE CONSULTANT

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

## DECLARATION OF INDEPENDENCE

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

A handwritten signature in black ink, appearing to read 'Anderson', with a large, stylized initial 'A'.

Gavin Anderson  
Archaeologist/Heritage Impact Assessor