

Phase 1 Archaeological and Heritage Impact Assessment in respect of the proposed construction of the Bospoort water pipeline and reservoir, located on the farms Elandsheuvel 282 JQ, Reinkoyaskraal 278 JQ and Tweedepoort 283 JQ, Rustenburg, Gauteng Province.

Compiled by:



For **Ecoleges Environmental Consultants**

Compiled by: Mr JP Celliers

29 April, 2019

I, Jean-Pierre Celliers as duly authorised representative of Kudzala Antiquity CC, hereby confirm my independence as a specialist and declare that neither I nor the Kudzala Antiquity CC have any interest, be it business, financial, personal or other, in any proposed activity, application or appeal in respect of which the client was appointed as Environmental Assessment practitioner, other than fair remuneration for work performed on this project.

SIGNATURE:

A handwritten signature in black ink, appearing to read 'J.P. Celliers', written over a horizontal line.

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Executive summary

Site name and location: A linear alignment where a proposed water pipeline and reservoir is to be constructed north east of Rustenburg in Gauteng Province.

Purpose of the study: An archaeological and heritage impact study in order to identify cultural heritage resources in respect of the proposed construction of a water pipeline and reservoir.

Topographical Maps: 1:50 000 2527(1908, 1968, 1982, 1985, 1996).

EIA Consultant: Ecoleges Environmental Consultants

Client:

Heritage Consultant: Kudzala Antiquity CC.

Contact person: Jean-Pierre (JP) Celliers Tel: +27 82 779 3748

E-mail: kudzala@lantic.net

Report date: 29 April 2019

Description and findings:

A Desktop Archaeological and Heritage Assessment was undertaken by Kudzala Antiquity CC in respect of the proposed construction of a water pipeline and reservoir located north east of Rustenburg in Gauteng Province. The desktop study was done with the aim of identifying sites or features which may be of heritage significance on the identified project area and possible impact of the proposed action. This forms part of legislative requirements as appears in section 38 of the National Heritage Resources Act (Act No. 25 of 1999) and the National Environmental Management Act (NEMA, 17 of 1998).

Archival information including scrutiny of previous heritage surveys of the area formed the baseline information against which the survey was conducted.

A total of 13 sites were recorded during the physical survey. They were numbered sites BP 1-13. Sites BP 1 and BP 2 are built environment (section 34 of the Act) sites which may be indirectly impacted upon by the proposed water pipeline. A buffer of 20 meters is proposed in order to minimize impact on these sites.

Sites BP 3-13 are all Late Iron Age stone-walled structures and associated features (section 35 of the Act). Individually they form part of a large settlement complex on top of the hill where the proposed water reservoirs are to be constructed. Most of these remains were negatively impacted upon during previous mining activity (see photos Appedix D). It is recommended that these sites and features be mitigated by means of a second phase archaeological mitigation project before they can be impacted upon or destroyed by the proposed infrastructure development.

A separate palaeontological desktop study supplements this report.

Disclaimer: *Although all possible care is taken to identify all sites of cultural importance during the investigation of study areas, it is always possible that hidden or sub-surface sites could be overlooked during the study. Kudzala Antiquity CC will not be held liable for such oversights or for costs incurred as a result of such oversights.*

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- The results of the project;
- The technology described in any report; and
- Recommendations delivered to the client.

Introduction

1.1. Terms of reference

Kudzala Antiquity CC was commissioned to conduct a desktop archaeological and heritage resources study in respect of the proposed construction of a water pipeline and reservoir near Rustenburg in Gauteng Province. The study was conducted in order to identify possible heritage sites and features in the project area. The study was conducted for Ecoleges Environmental Consultants.

1.1.1 Project overview

The client is in the process of obtaining environmental authorization to construct the water pipeline which is aligned to pass through the existing Kana residential area north east of Rustenburg and extending further north east and to the west of the Bospoort Dam. The proposed project will be located on the farms Elandsheuwel 282 JQ Reinkoyalskraal 278 JQ & Tweedepoort 283 JQ, Rustenburg, Bojanala Platinum District Municipality, North West Province.

The route of the water pipe line starts about six kilometres to the north east of Rustenburg, and runs along the western side of the R510 for about five kilometres. It then follows the route of a minor road for another three kilometres. The pipeline will then join a reservoir located on top of a hill located roughly to the north of the Bospoort dam.

1.1.2. Constraints and limitations

In some areas dense vegetation cover limited surface visibility. On the hill where the reservoirs are to be erected this was especially the case. Extensive historic mining activity also damaged the Late Iron Age stone walled complexes located on the hill. Therefore a complete layout of the stone walled complex is not currently visible. Bush clearing and mapping of the walling will make the layout of the site clearly visible.

1.1.3. Project Location

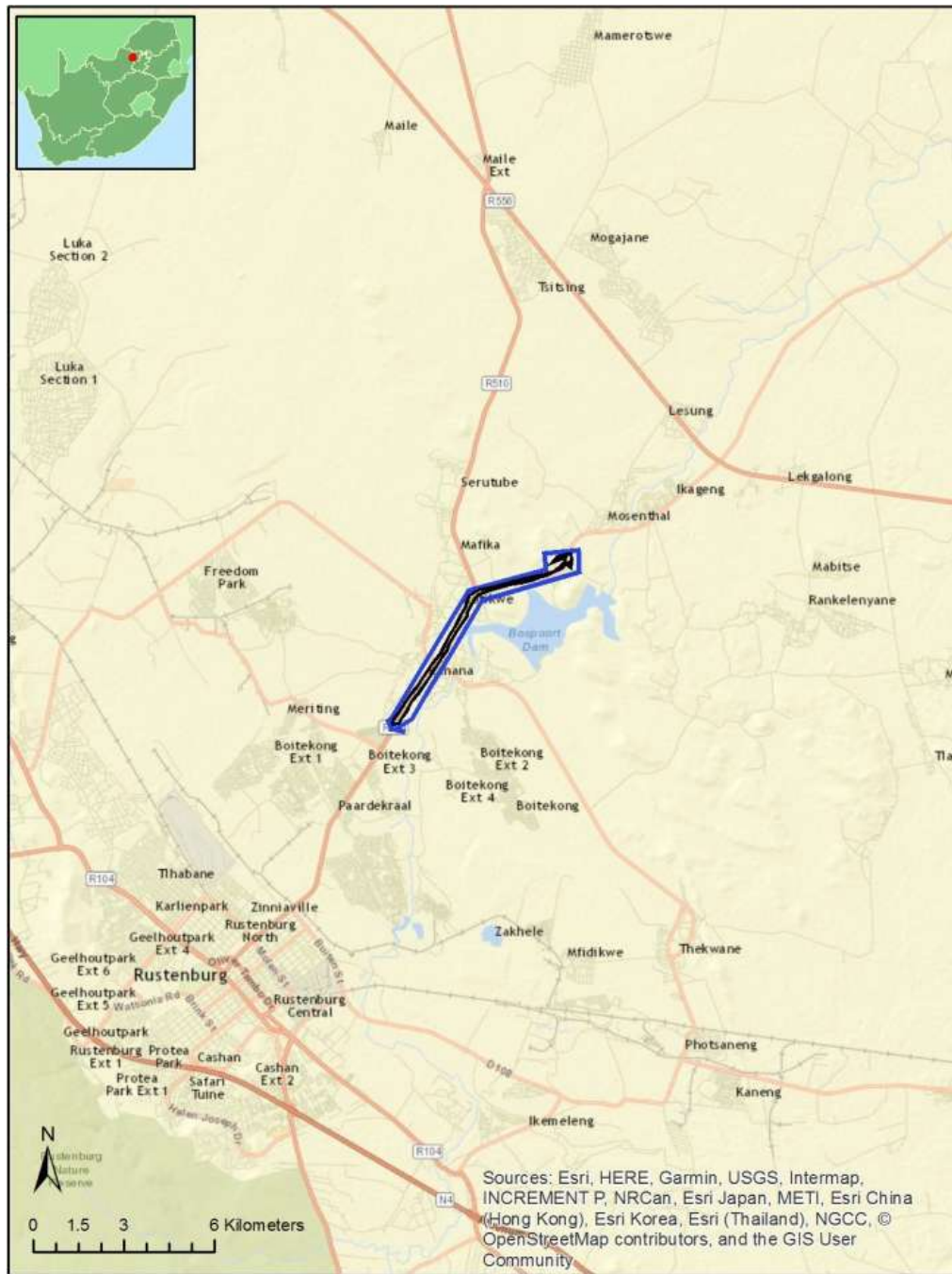


Figure 1.1. Map of the proposed water pipeline provided by Ecoleges Environmental Consultants.

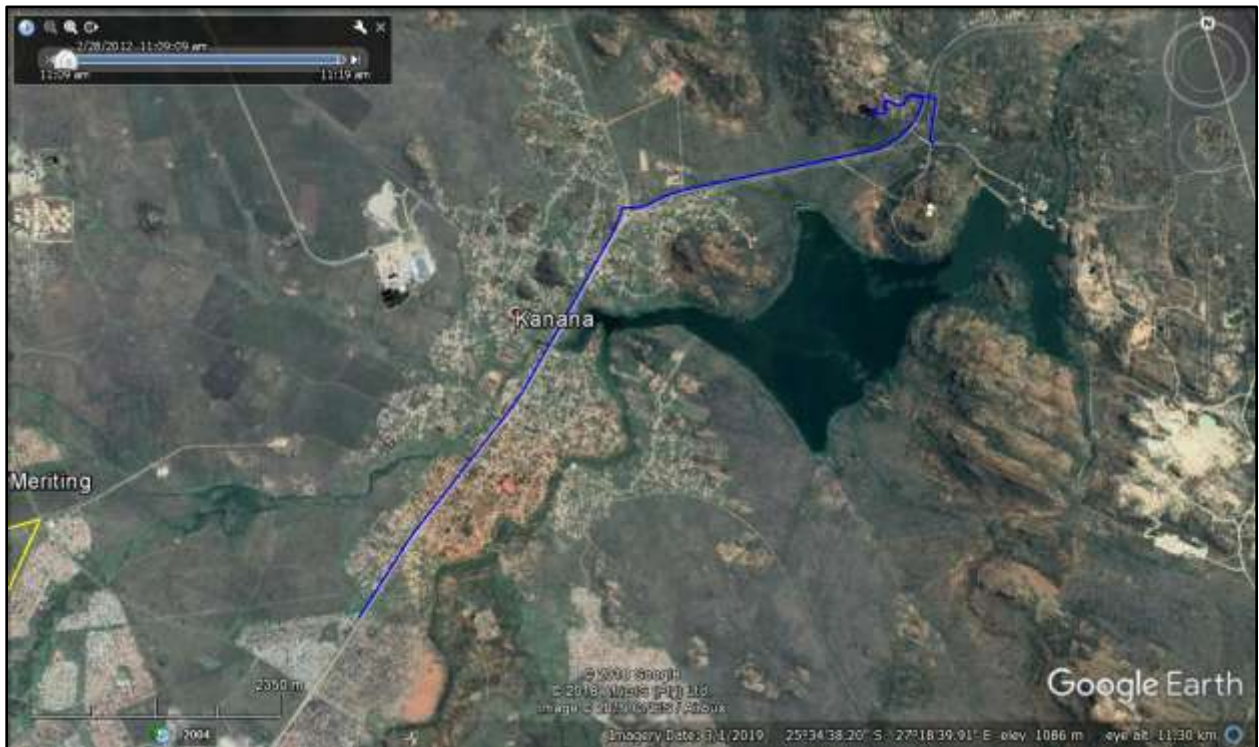


Figure 1.2. Aerial view of the proposed water pipeline near the Kekana township north east of Rustenburg.

1.2. Legislative Framework

The National Heritage Resources Act (NHRA) (Act No. 25, 1999) and the National Environmental Management Act (NEMA) (Act No. 107 of 1998) require that individuals or institutions have specialist heritage impact assessment studies undertaken whenever development activities are planned and such activities trigger activities listed in the legislation. This report is the result of an archaeological and heritage study in accordance with the requirements as set out in Section 38 (3) of the NHRA in an effort to ensure that heritage features or sites that qualify as part of the national estate are properly managed and not damaged or destroyed.

The study aims to address the following objectives:

- Analysis of heritage issues;
- Assess the cultural significance of identified places including archaeological sites and features, buildings and structures, graves and burial grounds within a specific historic context;
- Identifying the need for more research;

- Surveying and mapping of identified places including archaeological sites and features, buildings and structures, graves and burial grounds;
- A preliminary assessment of the feasibility of the proposed development or construction from a heritage perspective;
- Identifying the need for alternatives when necessary; and
- Recommending mitigation measures to address any negative impacts on archaeological and heritage resources.

Heritage resources considered to be part of the national estate include those that are of archaeological, cultural or historical significance or have other special value to the present community or future generations.

The national estate may include:

- places, buildings, structures and equipment of cultural significance;
- places to which oral traditions are attached or which are associated with living heritage;
- historical settlements and townscapes;
- landscapes and natural features of cultural significance;
- geological sites of scientific or cultural importance;
- archaeological and paleontological sites;
- graves and burial grounds including:
 - (i) ancestral graves;
 - (ii) royal graves and graves of traditional leaders;
 - (iii) graves of victims of conflict;
 - (iv) graves of individuals designated by the Minister by notice in the *Gazette*;
 - (v) historical graves and cemeteries; and other human remains which are not covered in terms of the Human Tissue Act, 1983 (Act No. 65 of 1983);
- sites of significance relating to slavery in South Africa;
- movable objects including:
 - (i) objects recovered from the soil or waters of South Africa, including archaeological and paleontological objects and material, meteorites and rare geological specimens;
 - (ii) objects to which oral traditions are attached or which are associated with living heritage
 - (iii) ethnographic art and objects;
 - (iv) military objects
 - (v) objects of decorative or fine art;
 - (vi) objects of scientific or technological interest; and

- (vii) 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 of the National Archives of South Africa Act, 1996 (Act No. 43 of 1996).

Cultural resources are unique and non-renewable physical phenomena (of natural occurrence or made by humans) that can be associated with human (cultural) activities (Van Vollenhoven 1995:3). These would be any man-made structure, tool, object of art or waste that was left behind on or beneath the soil surface by historic or pre-historic communities. These remains, when studied in their original context by archaeologists, are interpreted in an attempt to understand, identify and reconstruct the activities and lifestyles of past communities. When these items are removed from their original context, any meaningful information they possess is lost, therefore it is important to locate and identify such remains before construction or development activities commence.

1.3. Approach and statutory requirements

The SAHRA Minimum standards of 2007 guideline document, forms the background against which the survey was planned and the report compiled. An Archaeological Impact Assessment (AIA) consists of three phases. This document deals with a desktop phase which will precede a phase one physical survey of the project footprint area. This (phase 1) investigation is aimed at getting an overview of cultural resources in the project area, assigning significance to these resources, assessing the possible impact that the proposed activity may have on these resources, making recommendations pertaining to the management of heritage resources and putting forward mitigation measures where applicable.

When the archaeologist or heritage specialist encounters a situation where the planned project will lead to the destruction or alteration of an archaeological/ heritage site or feature, a second phase investigation is normally recommended. During a phase two investigation mitigation measures are put in place and detailed investigation into the nature of the cultural material is undertaken. Often at this stage, archaeological excavation and detailed mapping of a site is carried out in order to document and preserve the cultural heritage.

Phase three consists of the compiling of a management plan for the safeguarding, conservation, interpretation and utilization of cultural resources (Van Vollenhoven, 2002).

Continuous communication between the developer and heritage specialist after the initial assessment has been carried out may result in the modification of a planned route or development to incorporate or protect existing archaeological and heritage sites.

2. Description of the study area

The study area falls within the Rustenburg Local Municipality, near the town Rustenburg, Gauteng Province. The study was focused on a project footprint consisting of approximately 8,5 kilometres passing through the existing Kanana residential area.

Veld type: The vegetation forms part of the Savanna Biome and classed as Moot Plains Bushveld. This veld type occurs in North-West and Gauteng Provinces south of the Magaliesberg and proceeding east towards Hartebeestpoort Dam. It also occurs as a narrow belt immediately north of the Magaliesberg from Rustenburg in the west to east of the Crocodile River towards the east. The landscape is characterised by open to closed, low often thorny savanna dominated by various species of Acacia. The herbaceous layer is dominated by grasses. (Mucina and Rutherford, 2009).

Geology and soils: The study area is located on ancient intrusive rocks of the Pyramid Gabbro-norite, Rustenburg Layered Suite, Bushveld Complex (Mucina and Rutherford, 2009).

Limiting factors: In some areas dense vegetation cover limited surface visibility. On the hill where the reservoirs are to be erected this was especially the case. Extensive historic mining activity also damaged the Late Iron Age stone walled complexes located on the hill where the proposed reservoir is to be constructed. This is evident by the numerous large piles of dumped granite blocks as well as the obvious scarring on the landscape due to specific mining techniques. This made traversing and surveying this area very difficult.

3. Methodology

This study consists of a detailed archival study in order to understand the study area in a historical timeframe, an archaeological background study which include scrutiny of previous archaeological reports of the area, obtained through the SAHRIS database, and published as well as unpublished written sources on the archaeology of the area.

The South African Heritage Resources Agency (SAHRA) and the relevant legislation (NHRA) require that the following components be included in an archaeological impact assessment:

- Archaeology;
- Shipwrecks;
- Battlefields;
- Graves;
- Structures older than 60 years;

- Living heritage;
- Historical settlements;
- Landscapes;
- Geological sites; and
- Paleontological sites and objects.

All the above-mentioned heritage components are addressed in this report, except shipwrecks, geological sites and paleontological sites and objects.

The **purpose** of the archaeological, archival and heritage study is to establish the whereabouts and nature of cultural heritage sites should they occur on project area. This includes settlements, structures and artefacts which have value for an individual or group of people in terms of historical, archaeological, architectural and human (cultural) development.

The **aim** of this study is to locate and identify such objects or places in order to assess and rate their significance and establish if further investigation is needed. Mitigation measures can then be suggested and put in place when necessary.

3.1. Archaeological and Archival background studies

The purpose of the desktop study is to compile as much information as possible on the heritage resources of the area. This helps to provide an historical context for located sites. Sources used for this study include published and unpublished documents, archival material and maps. Information obtained from the following institutions or individuals were consulted:

- Published and unpublished archaeological reports and articles;
- Published and unpublished historical reports and articles;
- Archival documents from the National Archives in Pretoria;
- Historical maps; and
- South African Heritage Resource Information System (SAHRIS) database.

3.1.1. Previous archaeological studies in the area

Some archaeological impact assessments (AIA's) and heritage impact assessments have been done in the greater area of the proposed development area.

In 2007 Dr Julius Pistorius conducted a Phase One Heritage Impact Assessment in respect of the Eskom Matimba B-Marang power line and the upgrading of the Spitskop and Marang Substations

near Rustenburg. Identified sites included ruins, graves and stone-walled settlements which is associated with the Late Iron Age period.

In the same year (2007) Dr J. van Schalkwyk conducted a heritage resources survey in respect of the proposed Merensky Mining Project, Amandelbult Rustenburg Platinum Mine near Rustenburg. Identified archaeological resources included Stone Age remains and well as Iron Age sites.

3.1.2. Historic maps

Historical maps were scrutinized and features that were regarded as important in terms of heritage value were identified and if they were located within the boundaries of the project area they were physically visited in an effort to determine:

- (i) whether they still exist;
- (ii) their current condition; and
- (iii) significance.

3.3. Heritage site significance

The South African Heritage Resources Agency (SAHRA) formulated guidelines for the conservation of all cultural resources (sections 6 and 7 of the NHRA, 1999) and therefore also divided such sites into three main categories. These categories might be seen as guidelines that suggest the extent of protection a given site might receive. They include sites or features of local (Grade 3) provincial (Grade 2) national (Grade 1) significance, grades of *local significance* and *generally protected* sites with a variety of degrees of significance.

For practical purposes the surveyor uses his own classification for sites or features and divides them into three groups, those of low or no significance, those of medium significance and those of high significance (**Also see table 5.2. Significance rating guidelines for sites**).

Values used to assign significance and impact characteristics to a site include:

- **Types of significance**

The site's scientific, aesthetic and historic significance or a combination of these is established.

- **Degrees of significance**

The archaeological or historic site's rarity and representative value is considered. The condition of the site is also an important consideration.

- **Spheres of significance**

Sites are categorized as being significant in the international, national, provincial, regional or local context. Significance of a site for a specific community is also taken into consideration.

To arrive at the specific allocation of significance of a site or feature, the specialist considers the following:

- Historic context;
- Archaeological context or scientific value;
- Social value;
- Aesthetic value; and
- Research value.

More specific criteria used by the specialist in order to allocate value or significance to a site include:

- The unique nature of a site;
- The integrity of the archaeological deposit;
- The wider historic, archaeological and geographic context of the site;
- The location of the site in relation to other similar sites or features;
- The depth of the archaeological deposit (when it can be determined or is known);
- The preservation condition of the site;
- Quality of the archaeological or historic material of the site; and
- Quantity of sites and site features.

Archaeological and historic sites containing data, which may significantly enhance the knowledge that archaeologists currently have about our cultural heritage, should be considered highly valuable. In all instances these sites should be preserved and not damaged during construction activities. However, when development activities jeopardize the future of such a site, a second and third phase in the Cultural Resource Management (CRM) process is normally advised. This entails the excavation or rescue excavation of cultural material, along with a management plan to be drafted for the preservation of the site or sites.

Graves are considered very sensitive sites and should never under any circumstances be jeopardized by development activities. Graves and burial grounds are incorporated in the NHRA under section 36 and in all instances where graves are found by the surveyor, the recommendation would be to steer clear of these areas. If this is not possible or if construction activities have for some

reason damaged graves, specialized consultants are normally contacted to aid in the process of exhumation and re-interment of the human remains.

4. History and Archaeology

4.1. Historic period

At the start of the 19th century, there was a presence of Fokeng, Kwena and Taung settlements in the present-day Rustenburg area. The Fokeng tribe had its settlement at Phokeng, to the northwest of Rustenburg, and were able to live there up until the time of the Difaqane, when Mzilikazi's Khumalo-Ndebeles drove all other communities from the area. The Difaqane (Sotho), or Mfekane ("the crushing" in Nguni) was a time of bloody upheavals in Natal and on the Highveld, which occurred around the early 1820s until the late 1830s. It came about in response to heightened competition for land and trade, and caused population groups like gun-carrying Griquas and Shaka's Zulus to attack other tribes. The Fokeng, under the authority of Nôgê, was one of the few groups that resisted Mzilikazi, but without success (Bergh, 1999: 10-11, 14, 110-111 & 116-119).

During the time of the Difaqane, a northwards migration of white settlers from the Cape was also taking place. Some travellers, missionaries and adventurers had gone on expeditions to the northern areas in South Africa, some as early as the 1720s. In 1829, Robert Scoon and McLuckie made a journey from Mzilikazi's Kraal, along the area directly to the north of Rustenburg, to the north of Zeerust and finally down to Danielskuil. In the same year, Moffat and Archbell travelled from Mzilikazi's Kraal (to the north of Pretoria), through Rustenburg and all the way Zeerust and then to Kuruman in the southwest. In 1835, Dr. Andrew Smith, a natural and medical scientist, travelled between Mzilikazi's kraal and Rustenburg, and finally much further to the north, almost up to Mahalapye. Another early traveller to this area was the Scottish journalist, John Sanderson, who moved through the Magaliesberg region on a "trading trip", and stopped at a Tswana settlement that he called Pugeni, in 1852. This settlement, located 16 kilometres northwest of Rustenburg, was inhabited by the Pugeni community under Chief Mahata. The following description was given of the town, which consisted of some 300 huts: "The towns appear to be a series of circles originally surrounding the cattle-kraals, and added to as occasion requires. There does not seem to be any regularity of plan, but streets lead from one part to another, sometimes 30 or 40 yards in width. In Pugeni, the chief town, there are several cattle-kraals: the principal one, a well-built oval, and 93 yards in diameter between its axes. The wall is of dry stones, fully 4 feet in thickness, of equal height, and as well built as if the work of a European mason. Altogether, the cleanliness pervading these native kraals is such as ought to shame the Dutch Boers." (Bergh, 1999: 12-13; Anderson 2009: 20-21).

It was however only by the late 1820s that a mass-movement of Dutch speaking people in the Cape Colony started advancing into the northern areas. This was due to feelings of mounting dissatisfaction caused by economical and other circumstances under British rule in the Cape. This movement later became known as the Great Trek. This migration resulted in a massive increase in

the extent of that proportion of modern South Africa dominated by people of European descent (Ross 2002: 39).

The movement of whites into the Northern provinces would have a significant impact on the black people who populated the land. This was also the case in the North West Province, where the study area is located. Farms were surveyed in a large area, which included the present-day Rustenburg district, between 1839 and 1840. By 1860, the population of whites in the central Transvaal was already very dense and the administrative machinery of their leaders was firmly in place. Many of the policies that would later be entrenched as legislation during the period of apartheid had already been developed (Bergh, 1999: 15, 170).

4.1.1. History of the Anglo Boer War (1899-1902) in the area

The Anglo-Boer War, which took place between 1899 and 1902 in South Africa, was a very turbulent time in South Africa's history. Even before the outbreak of war in October 1899 British politicians, including Sir Alfred Milner and Mr. Chamberlain, had declared that should Britain's differences with the Z.A.R. result in violence, it would mean the end of republican independence. This decision was not immediately publicized, and as a consequence republican leaders based their assessment of British intentions on the more moderate public utterances of British leaders. Consequently, in March 1900, they asked Lord Salisbury to agree to peace on the basis of the status quo ante bellum. Salisbury's reply was, however, a clear statement of British war aims (Du Preez 1977).

One battalion of British troops moved through Rustenburg between February and September 1900. This was the regiment of General Major R. S. S. Baden-Powell. The Boer war-hero General Jacobus Herculaa de la Rey (more commonly known as Koos de la Rey) also moved past Rustenburg on his route between Barberton and Lichtenburg (Bergh, 1999: 51).

Rustenburg was under siege on 14 June 1900, when Colonel Herbert Plumer accepted the surrender of the Rustenburg Field Cornet Piet Kruger. Kruger, on his part, had been unable to get the Burghers to put up any resistance against the British forces. The British camped near the old goal, but on strict orders from General Baden-Powell that there would be no demonstrations. On the same day, the demoralized burghers handed 1000 rifles to the British authorities, and an equivalent number probably signed the oath of neutrality (Wulfsohn, 1992: 50-51).

In June 1900, Captain Smitheman, acting under orders from General Baden-Powell, requisitioned 50 wagons, oxen and attendants from the black tribes in the Rustenburg district. The names of the chiefs from whose tribes the wagons etc. were supplied were Jacobus Mamogalie, Philip Mabalane and August Mokhatla. Mokhatla's claim for payment for the hire of the wagons had however not been settled by 1904, due to administrative problems, and in addition most of the wagons were destroyed at Elands River by the Boer troops. Smitheman reported the following regarding tribes in the area: "I

cannot speak too highly of the manner in which the people of the Rustenburg district behaved both in supplying all my requisitions and in giving me information as to the enemy's whereabouts." It seems that Mokhatla's Bafokeng were allies to the British during the war (NARSSA TAB, GOV: 847 PS18/267/05).

4.1.2. 20th Century History

The 1913 Native Land Act and the 1936 Native Trust and Land Act ensured that "Native Areas" were proclaimed, demarcating specific areas where black people could legally settle. These were some of the early laws ensuring the segregation of blacks and whites. In 1913 a few portions of land to the north of Rustenburg were set aside for black people, and in 1936 this area was expanded. By 1933, Chief August Mokhatla of the Bafokeng tribe was the accepted authority in an area including the farms Elandsheugel, Tweedepoort and Reinkoyalskraal, though the properties were registered in the name of the Minister for Native Affairs for the Transvaal Colony (Bergh, 1999: 42-4; NARSSA SAB, BAO: 4/2286 GB6/5/2/1/R50/19/1).

As part of the government's apartheid policy, and to give black people the responsibility of running their own independent governments, a number of "Bantustans" or black homelands were proclaimed between the mid twentieth century and the mid-1990s. This also served to deprive blacks of the remaining rights they had as citizens of South Africa. In total, ten homelands were created. These were the Transkei, Bophuthatswana, Ciskei, Venda, Gazankulu, KaNgwane, KwaNdebele, KwaZulu, Lebowa, and QwaQwa. The homelands were designed for specific ethnic groups, and Bophuthatswana was assigned to the Tswana people (South African History Online, 2019).

By the 1960s, individuals and companies had to apply to the Bafokeng tribe to lease properties in the area to the north west of Rustenburg. By 1963, E. Molotlegi was the chief of this tribe. A lease contract was granted to one Petrus Johannes Bekker for Vlakfontein 276 JQ, Reinkoyalskraal 278 JQ, the Remaining Extent of Tweedepoort 283 JQ and the RE of the western portion of Elandsheugel 282 JQ in 1963. A number of lease contracts for the quarrying of stone and granite were taken out in the area during the 1960s (NARSSA SAB, BAO: 10147 D52/1596/80; NARSSA SAB, BAO: 10147 D52/1596/80/2).

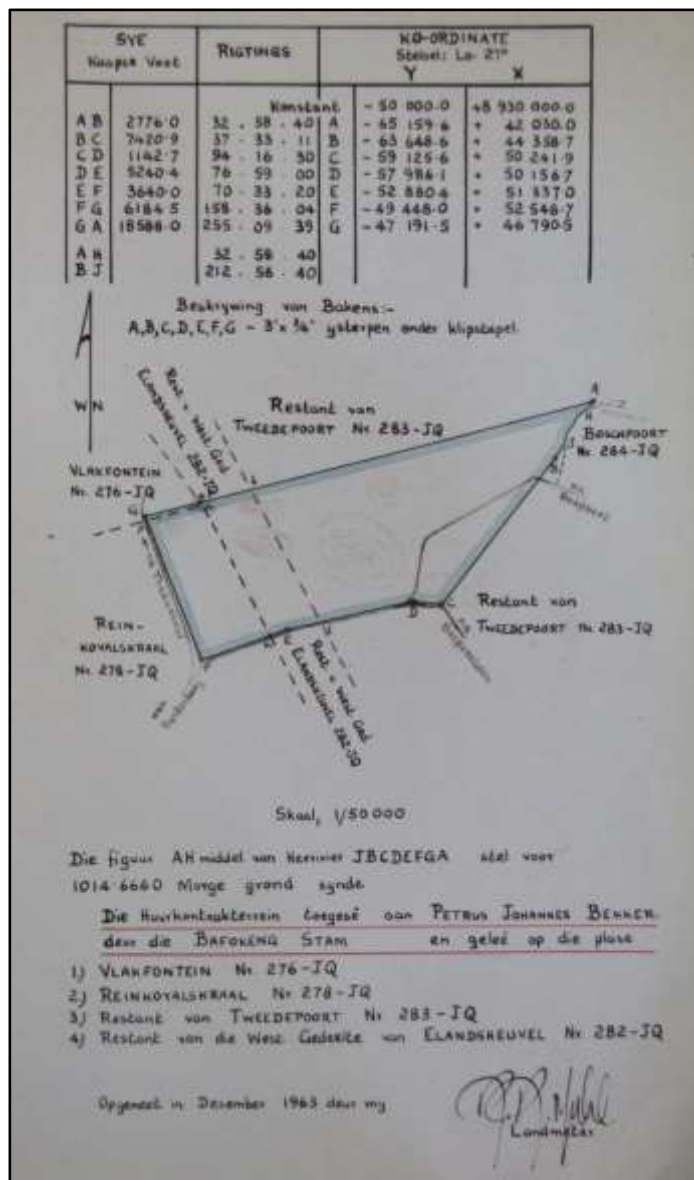


Figure 4.1. A diagram of the area leased by P. J. Bekker from the Bafokeng Tribe in 1963. This forms part of the area under investigation (NARSSA SAB, BAO: 10147 D52/1596/80).

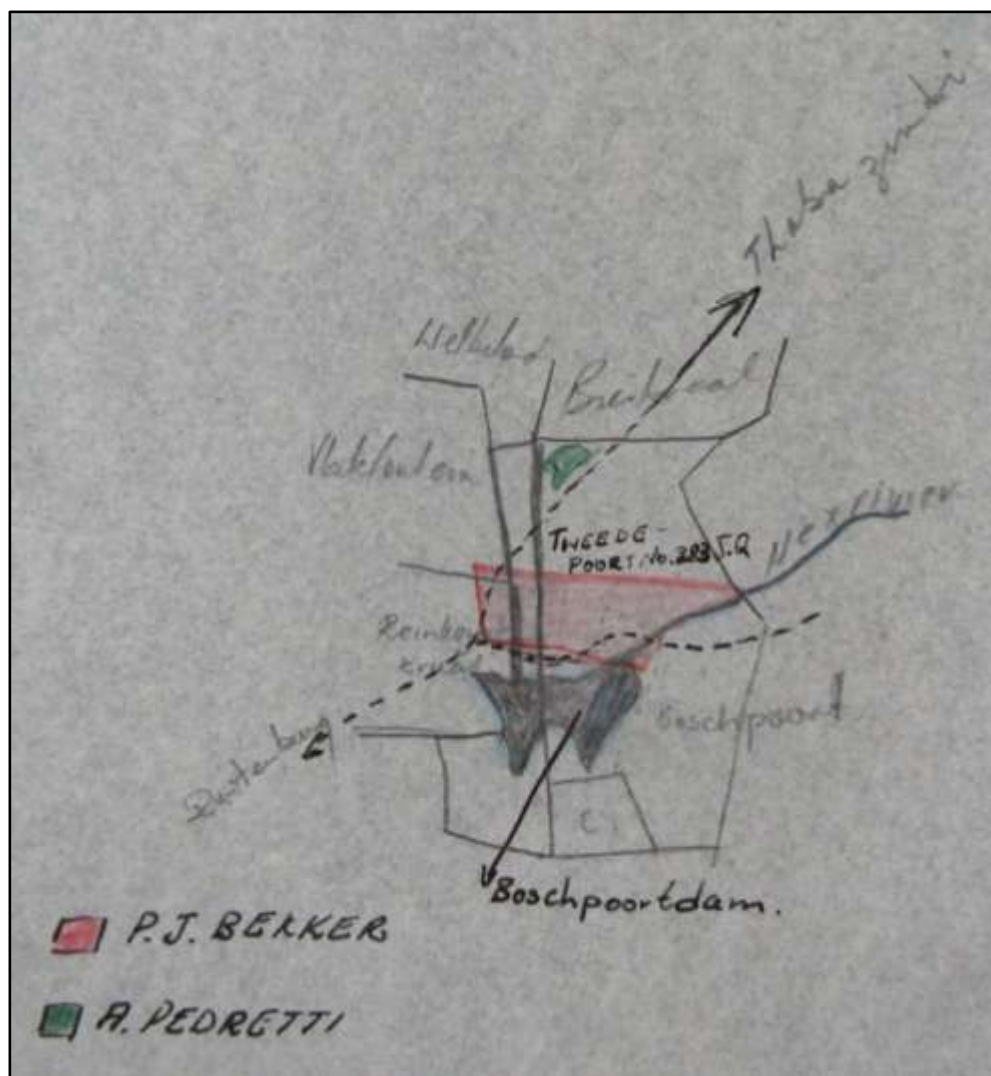


Figure 4.2. A diagram of land leased in the study area by P. J. Bekker and A. Pedretti in 1966. One can see that Bekker leased a part of the study area (NARSSA SAB, BAO: 10147 D52/1596/80/1).

In the 1970s and 1980s the South African government declared the Transkei (1976), Bophuthatswana (1977), Venda (1979) and Ciskei (1981) independent. In practice the homelands however served more as labour reservoirs than autonomous economic entities. In many cases the land was too poor for agriculture, and only about 13% of South Africa's land was owned by black people. Large numbers of people had to leave these areas daily to work in the mines, urban industries or for white farmers. All of the homelands ceased to exist on 27 April 1994, and were incorporated into the new nine provinces of democratic South Africa (South African History Online, 2019)

4.1.3. Historic maps of the study area

Since the mid-1800s up until the present, South Africa has been divided and re-divided into various districts. Since 1851, the farms under investigation formed part of the Rustenburg district. This remained the case up until 1977, when South Africa was divided into smaller magisterial districts. The area of the farm became part of the Rustenburg magisterial district. Since 1990, a large portion of the Rustenburg magisterial district fell into the Bophuthatswana Bantustan or homeland. This area was reintegrated into South Africa in 1994, and the properties under investigation are still located in the Rustenburg local district (Bergh, 1999: 17, 20-27).

By 1908 the properties under investigation were known as Tweedepoort 189, Elandsheuvel 285 and Reinkoyalskraal 333. In the late 1950s or early 1960s the farms were renamed Elandsheuvel 282 JQ Reinkoyalskraal 278 JQ and Tweedepoort 283 JQ, as they are still known today.

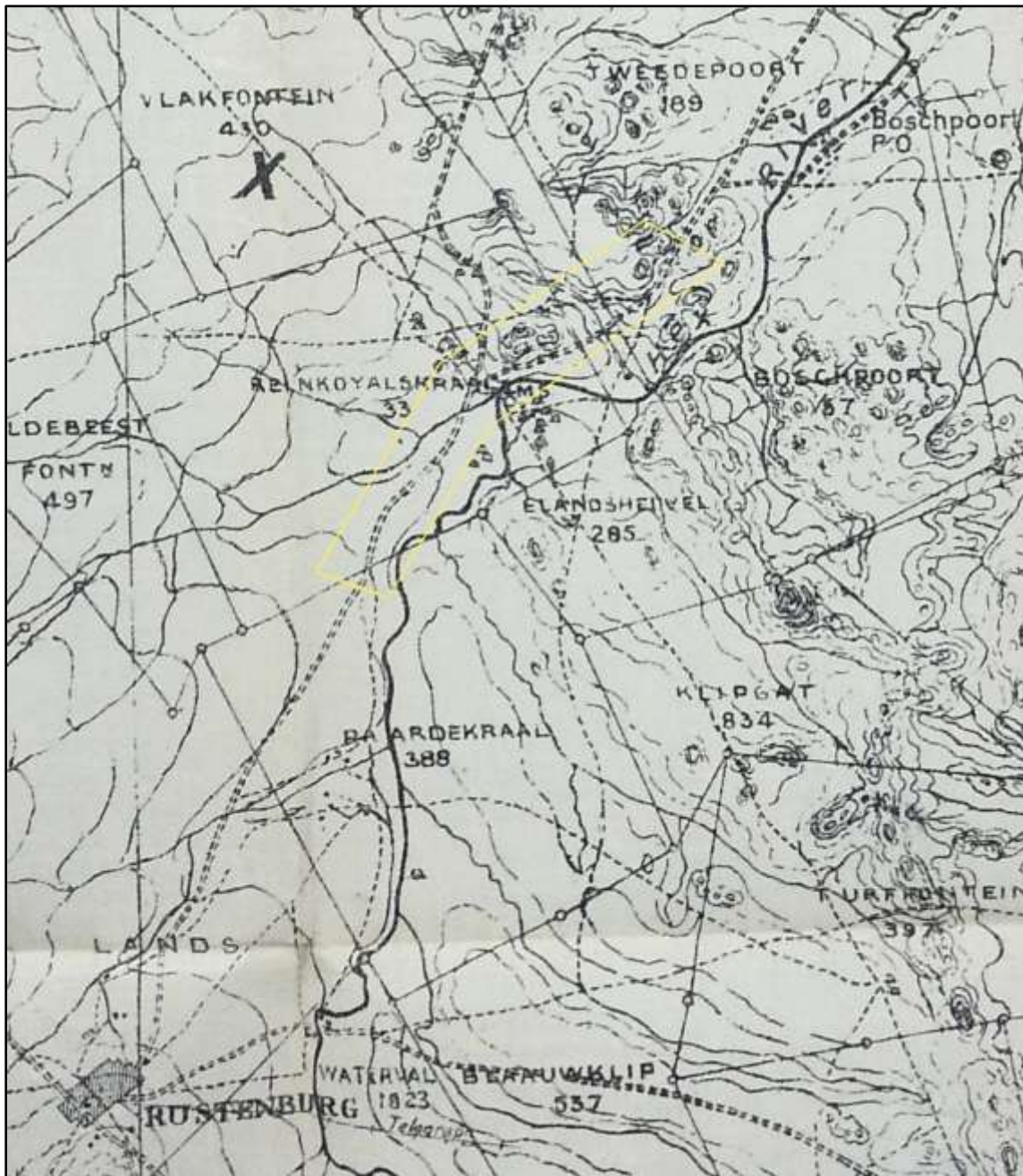


Figure. 4.3. A Map sheet of the Rustenburg district during the year 1908. The approximate study area is located within the yellow borders. The double dotted lines represent main roads that went through this area. The Hex River is visible going through the study area. The farms of interest were known as Tweedepoort 189, Elandsheivel 285 and Reinkoyalskraal 33 (more likely No. 333) at the time (Transvaal Official Maps 1908).



Figure 4.4. Magisterial district map of Rustenburg in the year 1921. The approximate study area location is within the yellow borders. The properties under investigation formed part of the Hex River ward at the time, and this river went through the study area. Main roads went through Tweedepoort 189 Elandsheuvel 285 and Reinkoyalskraal 333. The farms under investigation formed part of an area that had been proclaimed as a “Native Location”. The August Mokhatla location can be seen to the south east of the study area (NASA Maps: 2/234).



Figure. 4.5. A Map of the Rustenburg area in 1953. The approximate study area location falls within the yellow borders. This map was drawn up by a governmental ethnologist, and shows the distribution and density of indigenous tribes in the area (one mark indicates 20 persons). One can see that the properties under investigation, namely Tweedepoort 189 Elandsheuvel 285 and Reinkoyalskraal 333, formed part of August Mokgatla's Location at the time, and was a "Native-owned area". People living in the study area were described as "Mixed population on Trust farms". The population was not very dense in the study area (Breuts,1953).

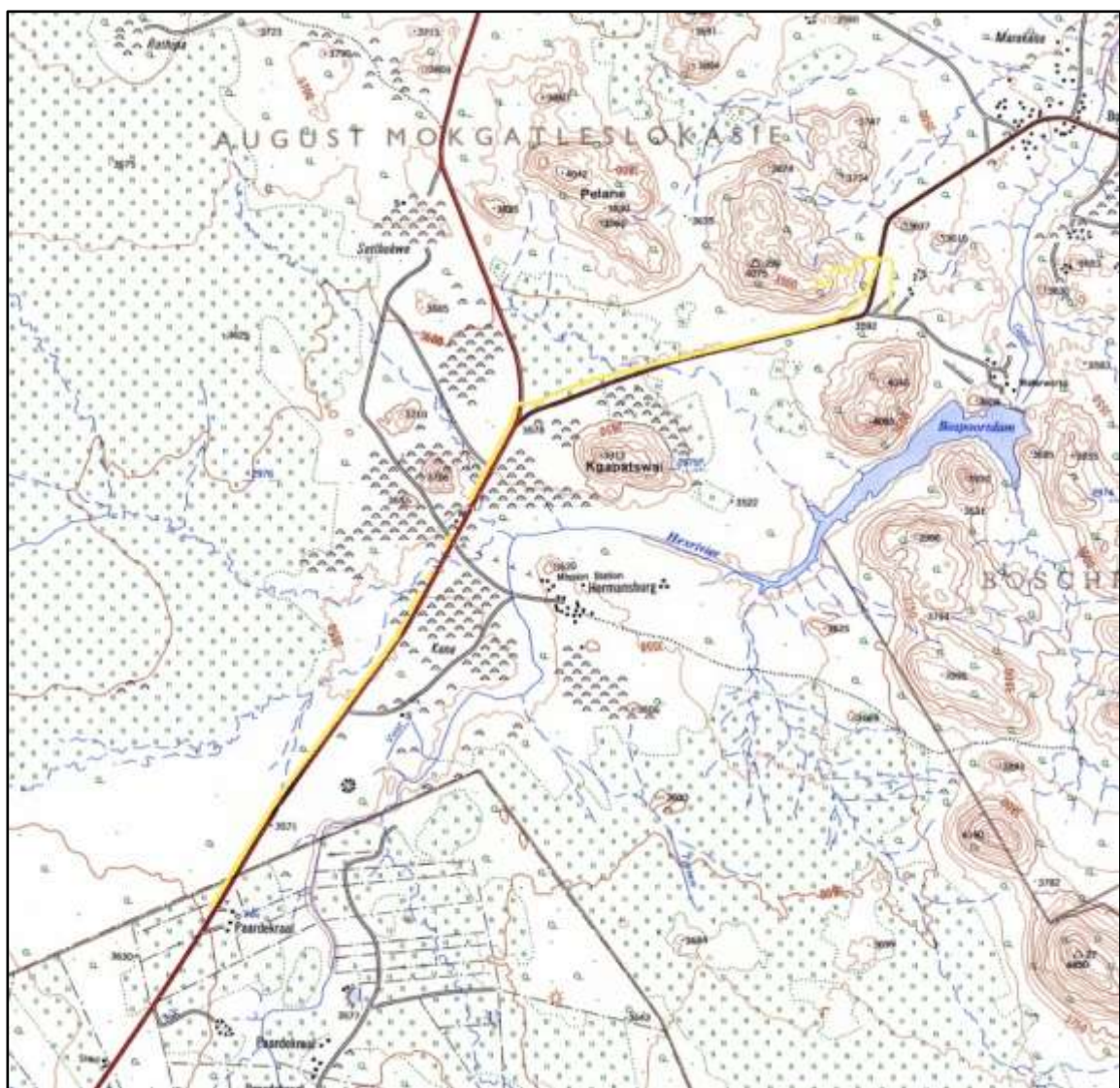


Figure 4.6. Topographical map of the study area in the year 1968. The approximate study area is indicated with a yellow border. The study area formed part of August Mokgatla's Location. The route of the proposed water pipe line is visible along the western side of a main road and a secondary road. Developments along this route included huts, a shop and cultivated lands. A bridge is visible to the south west of the shop, on the main road (Topographical Map, 1968).

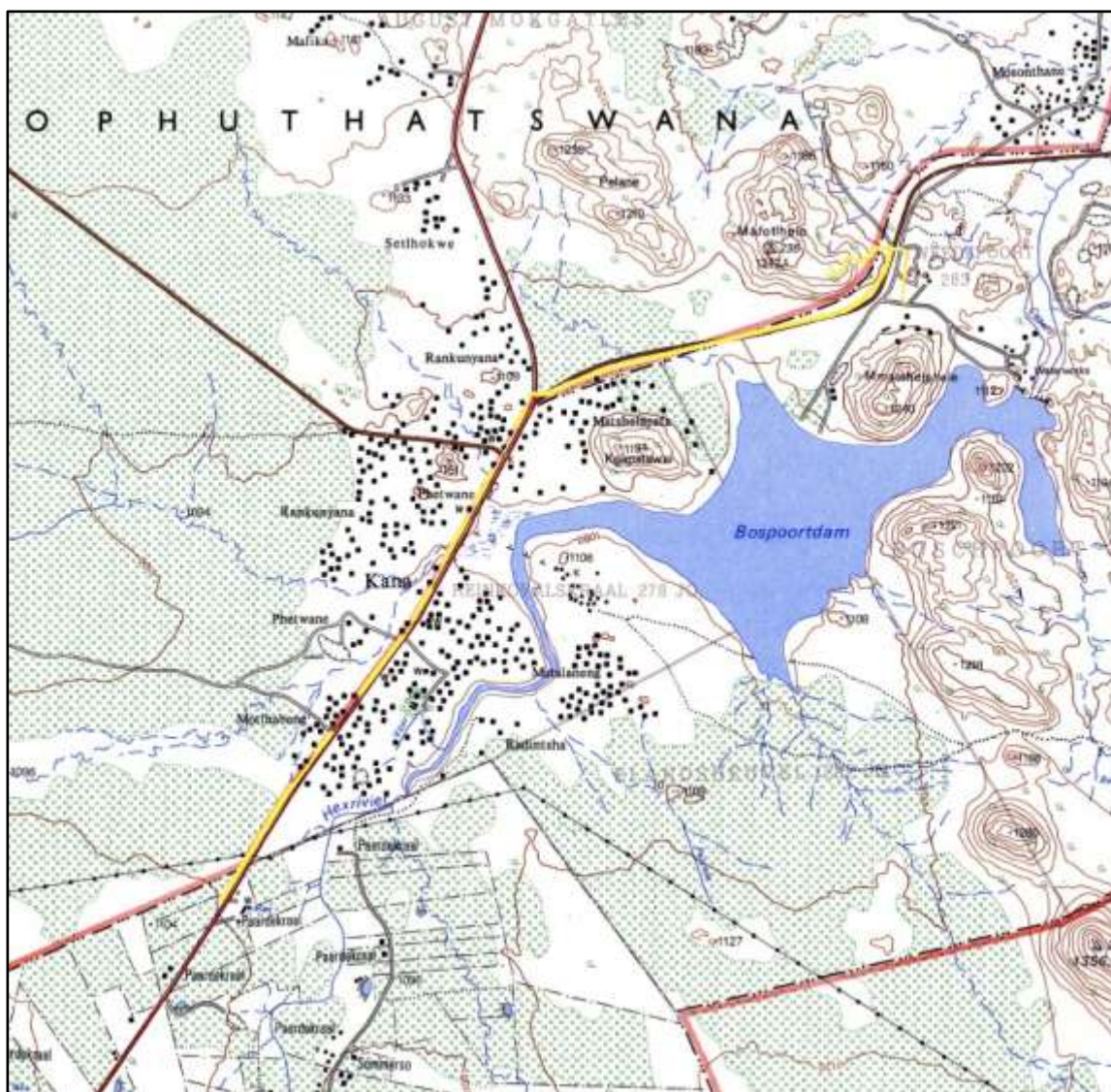


Figure. 4.7. Topographical map of the study area in 1982. The approximate route of the proposed water pipeline is indicated with a yellow line. The study area formed part of the homeland of Bophuthatswana, and August Mokgatla's Location can be seen to the north. The route of the water pipe line ran along the western side of a main road and a secondary road. Developments along this route included buildings in the villages of Motlabeng, Phetwane and Rankunyana, which formed part of an area collectively known as Kana. The shop is still visible near the road at Phetwane. One can still see the bridge to the south west of the shop. Some cultivated lands are visible near the route (Topographical Map, 1982).



Figure 4.8. Topographical map of the study area in 1985. The approximate route of the proposed water pipeline is indicated with a yellow line. August Mokatla's Location can be seen to the north. The route of the water pipe line ran along the western side of a main road and a secondary road. Developments along this route included buildings that formed part of the villages of Motlhabeng, Kana, Phetwane and Rankunyana. The shop is still visible near the road at Phetwane. One can still see the bridge to the south west of the shop. Some cultivated lands are visible near the route (Topographical Map, 1985).

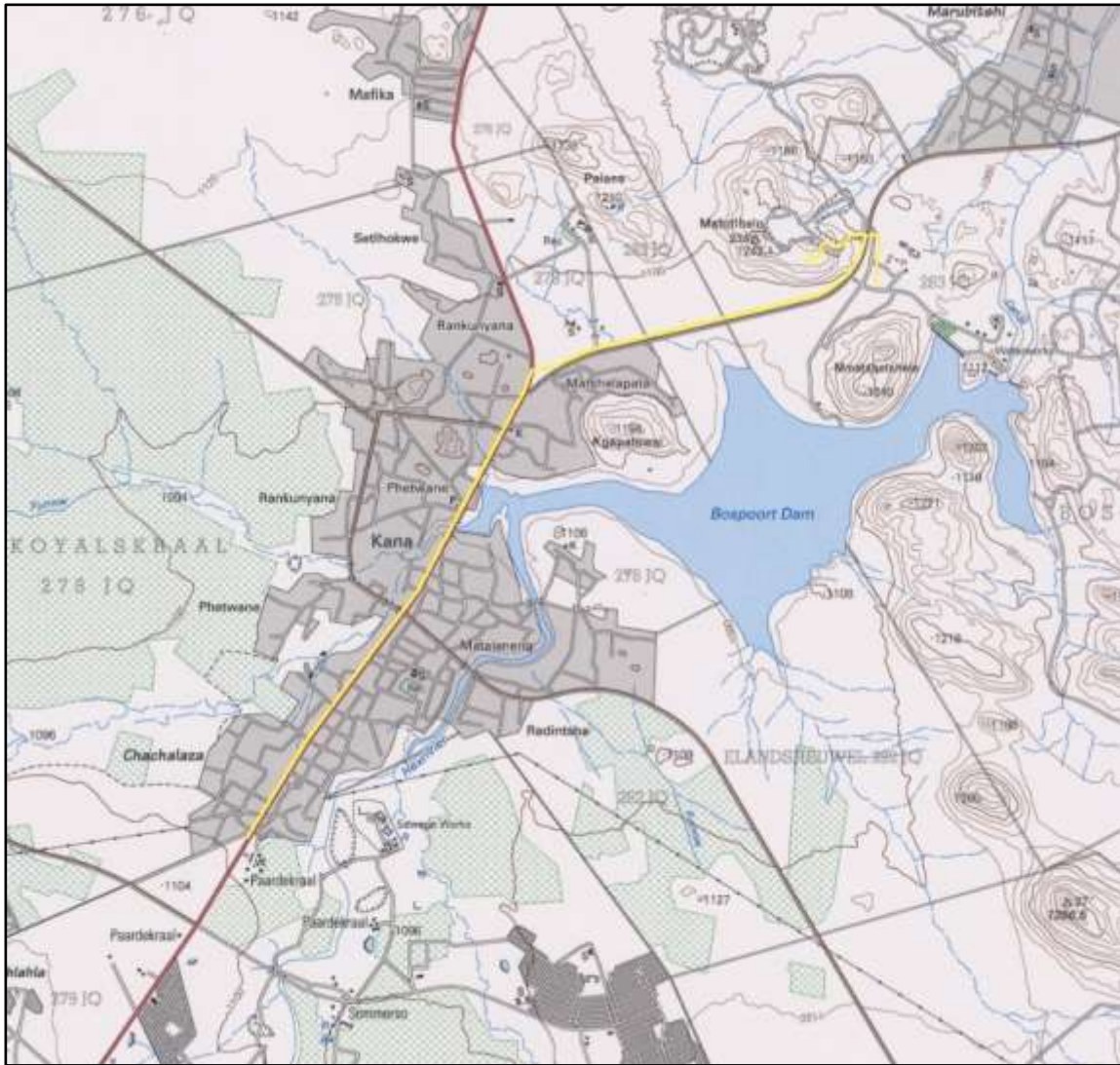


Figure 4.9. Topographical map of the study area in 1996. The approximate route of the proposed water pipeline is indicated with a yellow line. The route of the water pipe line ran along the western side of a main road and a secondary road. This route goes through the built up areas of Chachalaza, Phetwane, Kana and Rankunyana. The shop is no longer visible, but seems to have been replaced by a post office. One can still see the bridge to the south west of this building (Topographical Map,1996).

4.2. Archaeology

4.2.1. Stone Age

The Early Stone Age (ESA)

In South Africa the ESA dates from about 2 million to 250 000 years ago, in other words from the early to middle Pleistocene. The archaeological record shows that as the early ancestors progressed physically, mentally and socially, bone and stone tools were developed. One of the most influential advances was their control of fire and diversifying their diet by exploitation of the natural environment (Esterhuizen & Smith in Delius, 2007).

The earliest stone tools date to around 2.5 million years ago from the site of Gona in Ethiopia. Stone tools from this site shows that early hominids had to cognitive ability to select raw material and shape it for a specific application. Many bones found in association with stone tools like these have cut marks which lead scientists to believe that early hominids purposefully chipped cobbles to produce flakes with a sharp edge capable of cutting and butchering animal carcasses. This supplementary diet of higher protein quantities ensured that brain development of hominids took place more rapidly.

Mary Leaky discovered stone tools like these in the Olduvai Gorge in Tanzania during the 1960s. The stone tools are named after this gorge and are known as relics from the Oldowan industry. These tools, only found in Africa, are mainly simple flakes, which were struck from cobbles. This method of manufacture remained for about 1.5 million years. Although there is continuing debate about who made these tools, two hominids may have been responsible. The first of these was an early form of *Homo* and the second was *Paranthropus robustus*, which became extinct about 1 million years ago (Esterhuizen & Smith in Delius, 2007).

Some time later, around 1.7 million years ago, more specialised tools known as Acheulean tools, appeared. These are named after tools from a site in France by the name of Saint Acheul, where they were first discovered in the 1800s. It is argued that these tools had their origin in Africa and then spread towards Europe and Asia with the movement of hominids out of Africa. These tools had longer and sharper edges and shapes, which suggest that they could be used for a larger range of activities, including the butchering of animals, chopping of wood, digging roots and cracking bone. *Homo ergaster* was probably responsible for the manufacture of Acheulean tools in South Africa. This physical type was arguably physically similar to modern humans, had a larger brain and modern face, body height and proportion very similar to modern humans. *Homo ergaster* was able to flourish in a variety of habitats in part because they were dependent on tools. They adapted to drier, more open grassland settings. Because these early people were often associated with water sources such as

rivers and lakes, sites where they left evidence of their occupation are very rare. Most tools of these people have been washed into caves, eroded out of riverbanks and washed downriver. An example in Mpumalanga is Maleoskop on the farm Rietkloof where Early Stone Age (ESA) tools have been found. This is one of only a handful such sites in Mpumalanga.

Middle Stone Age (MSA)

A greater variety of tools with diverse sizes and shapes appeared by 250 000 before present (BP). These replaced the large hand axes and cleavers of the ESA. This technological advancement introduces the Middle Stone Age (MSA). This period is characterised by tools that are smaller in size but different in manufacturing technique (Esterhuizen & Smith in Delius, 2007).

In contrast to the ESA technology of removing flakes from a core, MSA tools were flakes to start with. They were of a predetermined size and shape and were made by preparing a core of suitable material and striking off the flake so that it was flaked according to a shape which the toolmaker desired. Elongated, parallel-sided blades, as well as triangular flakes are common finds in these assemblages. Mounting of stone tools onto wood or bone to produce spears, knives and axes became popular during the MSA. These early humans not only settled close to water sources but also occupied caves and shelters. The MSA represents the transition of more archaic physical type (*Homo*) to anatomically modern humans, *Homo sapiens*.

The MSA was and is currently being studied at Bushman Rock Shelter, a well-known site on the farm Klipfonteinhoek in the Ohrigstad district. This cave was excavated twice in the 1960s by Louw and later by Eloff. The MSA layers show that the cave was repeatedly visited over a long period. Lower layers have been dated to over 40 000 BP while the top layers date to approximately 27 000 BP (Esterhuizen & Smith in Delius, 2007; Bergh, 1998)

Later Stone Age (LSA)

Early hunter gatherer societies were responsible for a number of technological innovations and social transformations during this period starting at around 20 000 years BP. Hunting of animals proved more successful with the innovation of the bow and link-shaft arrow. These arrows were made up of a bone tip which was poisoned and loosely linked to the main shaft of the arrow. Upon impact, the tip and shaft separated leaving the poisoned arrow-tip imbedded in the prey animal. Additional innovations include bored stones used as digging stick weights to uproot tubers and roots; small stone tools, mostly less than 25mm long, used for cutting of meat and scraping of hides; polished bone tools such as needles; twine made from plant fibres and leather; tortoiseshell bowls; ostrich eggshell beads; as well as other ornaments and artwork (Esterhuizen & Smith in Delius, 2007).

At Bushman Rock Shelter the MSA is also represented and starts at around 12 000 BP but only lasted for some 3 000 years. The LSA is of importance in geological terms as it marks the transition

from the Pleistocene to the Holocene, which was accompanied by a gradual shift from cooler to warmer temperatures. This change had its greatest influence on the higher-lying areas of South Africa. Both Bushman Rock Shelter and a nearby site, Heuningneskrans, have revealed a greater use in plant foods and fruit during this period (Esterhuizen & Smith in Delius, 2007; Bergh, 1998).

Faunal evidence suggests that LSA hunter-gatherers trapped and hunted zebra, warthog and bovids of various sizes. They also diversified their protein diet by gathering tortoises and land snails (*Achatina*) in large quantities.

4.2.2. Early Iron Age

The period referred to as the Early Iron Age (AD 200-1000 approx.) started when farmer herder groups moved into the north eastern parts of South Africa. It is believed that these people may have been responsible for making of the famous Lydenburg Heads, ceramic masks dating to approximately 600AD.

In the Rustenburg area Early Iron Age communities belonging to the Mzonjani facies of the Urewe Tradition may have made use of the landscape between 450-750 AD.

4.2.3. Late Iron Age

The Molokwane Late Iron Age Archaeological site is located on the farm Selonskraal 317 JQ west of Rustenburg and the Magaliesberg range. These stone walls are distributed over a long and narrow area east of the Selons or Ngwaritse River and is some 3km long from north to south and average 1,5km from east to west. The total area covered by the stone walled settlements is approximately 5km² (Pistorius, 1992).

The people responsible for the establishment of the Molokwane settlement complex are known as the Bakwena Bamodimosana. The origin and history of these people are interwoven with that of the Sotho-Tswana. They are a distinct cultural and linguistic group within the South Eastern Bantu (Legassick, 1969 in Pistorius 1992).

The Sotho Tswana term is used whenever reference is made to communities sharing a common ancestry, history and culture with the Bakwena Bamodimosana.

It is believed that the Sotho-Tswana migrated southwards into South Africa from their origins in the north-eastern parts of Africa in the region of the Tanganyika and Malawi lakes (Huffman, 2007). This occurred around the early second millennium (AD 200).

Their pottery is classified as being part of the *Moloko Branch* of the *Urewe Tradition* and specifically the *Madikwe* facies with the date range being from the 16th up until the late 18th century (Huffman, 2007). However, oral tradition proved that the time of settlement by the Bamodimosana started around the advent of the 18th century under chief Sekano (Pistorius, 1992). The Bamodimosana tribes were uprooted and scattered by Mzilikazi's Matebele during the early 19th century a time known as the *difaqane*.

Early 19th century travellers and missionaries such as Moffat, Sanderson and Cornwallis Harris, all described the extensive stone-walled settlements at Molokwane while passing through the region.

The Late Iron Age (1600-1830) in the Rustenburg area is characterized by stone-walled sites which reflects Sotho Tswana settlement and expansion in the Transvaal and Orange Free State. Historical connections between the sites and the Sotho-Tswana were documented by various earlier researchers (e.g. Wells, 1933; Jones 1935; Daubenton 1938; Walton 1956; Mason 1962; Maggs 1976 and others). Oral reports which confirms that Sotho-Tswana communities built their settlements with stone was documented by researchers such as Maggs (1976) and Myburg (1956) (Pistorius, 1992).

5. Site descriptions, locations and impact significance assessment

The proposed pipeline runs through the town of Kanana about 13 km NE of Rustenburg along the R510. The proposed pipeline is located within the road reserve apart from a section that runs next to a road that turns away from the R510 towards the township of Mosonthal- Marubitchi. The north eastern section of the proposed pipeline ascends a granite hill (that was partially mined) to the area where the new reservoirs are planned to be built.

Within the road reserve the area is highly modified/disturbed because of its close proximity to the existing roads and urban areas. These areas are also characterised by erosion due to un-managed storm water runoff.

Sections of the proposed pipeline within the road reserve contain an existing pipeline that up to where the proposed pipeline turns off of the R510 towards the granite hill and proposed reservoirs.

Sites BP1 and BP2 were the only areas of interest on the section of the survey areas that run next to the road. Site BP1 is a church dating from the 70's. This building will not be impacted on by the proposed pipeline.

Site BP2 is probably a single commemorative marker as a result of a road accident. It reads "In loving memory of Jose Charlton Visser"

The survey area next to the section of road that leads to the granite hill is overgrown by young thorn trees limiting archaeological visibility. The area seems disturbed by past agricultural activity (see photos in Appendix D).

The area directly around the hill towards the Northeast of the survey area is extremely overgrown and disturbed by past mining activity. This is evident by the numerous large piles of dumped granite blocks as well as the obvious scarring on the landscape due to specific mining techniques. It is visible on the Google Earth images, see appendix C and additional photos in appendix D. This made traversing and surveying this area very difficult.

Multiple LIA stone walled features were recorded towards the top of the hill at the location of the proposed reservoirs. The site is fairly large with multiple widely scattered enclosures all around the top of the hill these were mapped as sites BP3-BP12. Along with the stone walls, a central area was located that contain archaeological deposit at site BP13 it can be interpreted as a cattle kraal or possibly refuse midden.

A few ceramic sherds were located near an erosion gully close to the stone walled sections at site BP 13. These ceramics within the eroded soils, along with a portion of an upper grinding stone were the only artefacts located. It is highly possible that large portions of the site were destroyed by past mining activity that encompasses the entire area directly North of the hill (see maps in Appendix C).

The areas impacted on by the proposed pipelines are mostly disturbed by modern human activity such as earthworks relating to the existing roads and pipeline, dumping and overgrazing.

Table 5.1. Summary of located sites and their heritage significance

Type of site	Identified sites	Significance	Significance
Graves and graveyards	None	N/A	N/A
Late Iron Age	BP 3 - 13	BP3 – 12 Multiple packed stone walled features; BP13 Kraal/Midden and Packed stone enclosure on a ledge. Ceramics and a portion of an upper grind stone were located here.	Medium GP A
Early Iron Age	None	N/A	N/A
Buildings or structures	BP 1, BP 2	Church building; marker for a road accident	Low GP B; High GP A
Historical features and ruins	None	N/A	N/A
Stone Age sites	None	N/A	N/A

Table 5.2. Significance rating guidelines for sites

Field Rating	Grade	Significance	Recommended Mitigation
National Significance (NS)	Grade 1	High Significance	Conservation, nomination as national site
Provincial Significance (PS)	Grade 2	High Significance	Conservation; Provincial site nomination
Local significance (LS 3A)	Grade 3A	High Significance	Conservation, No mitigation advised
Local Significance (LS 3B)	Grade 3B	High Significance	Mitigation but at least part of site should be retained
Generally Protected A (GPA)	GPA	High/ Medium Significance	Mitigation before destruction
Generally Protected B (GPB)	GPB	Medium Significance	Recording before destruction
Generally Protected C (GPC)	GPC	Low Significance	Destruction

5.1. Description of located sites

5.1.1. Site BP 1.

Location: See Appendix B and D (fig. 1).

Description: A community Church dating to the 1970's.

Impact of the proposed development/ activity:

The site is located outside of the proposed development areas therefore low impact expected.

Recommendation:

No recommendations.



5.1.2. Site BP 2.

Location: See Appendix B and D (fig. 2).

Description: Commemorative marker for a road accident. It reads” In loving memory of Jose Charlton Visser.

Impact of the proposed development/ activity:

It is possible that the proposed pipeline may impact on the site

Recommendation:

The proposed pipeline should pass at least 20 meters away from the site in order to minimize impact.



5.1.3. Site BP 3.

Location: See Appendix B and D (fig. 3).

Description: One of a number of stone-packed walling and features.

Impact of the proposed development/ activity: These have already extensively been impacted upon due to past granite mining activity.

Recommendation: The walling which remains are all located on the footprint area of the proposed pipeline and reservoirs should be mapped during a phase 2 mitigation project preceded by a permit application from SAHRA and application for a destruction permit afterwards.



5.1.4. Site BP 4.

Location: See Appendix B and D (fig. 4, 5).

Description: One of a number of stone-packed walling and features.

Impact of the proposed development/ activity: These have already extensively been impacted upon due to past granite mining activity.

Recommendation: The walling which remains are all located on the footprint area of the proposed pipeline and reservoirs should be mapped during a phase 2 mitigation project preceded by a permit application from SAHRA and application for a destruction permit afterwards.



5.1.5. Site BP 5.

Location: See Appendix B and D (fig. 6).

Description: One of a number of stone-packed walling and features.

Impact of the proposed development/ activity: These have already extensively been impacted upon due to past granite mining activity.

Recommendation: The walling which remains are all located on the footprint area of the proposed pipeline and reservoirs should be mapped during a phase 2 mitigation project preceded by a permit application from SAHRA and application for a destruction permit afterwards.



5.1.6. Site BP 6.

Location: See Appendix B and D (fig. 7, 8).

Description: One of a number of stone-packed walling and features.

Impact of the proposed development/ activity: These have already extensively been impacted upon due to past granite mining activity.

Recommendation: The walling which remains are all located on the footprint area of the proposed pipeline and reservoirs should be mapped during a phase 2 mitigation project preceded by a permit application from SAHRA and application for a destruction permit afterwards.



5.1.7. Site BP 7.

Location: See Appendix B and D (fig. 9).

Description: One of a number of stone-packed walling and features.

Impact of the proposed development/ activity: These have already extensively been impacted upon due to past granite mining activity.

Recommendation: The walling which remains are all located on the footprint area of the proposed pipeline and reservoirs should be mapped during a phase 2 mitigation project preceded by a permit application from SAHRA and application for a destruction permit afterwards.



5.1.8. Site BP 8.

Location: See Appendix B and D (fig. 10, 11).

Description: One of a number of stone-packed walling and features.

Impact of the proposed development/ activity: These have already extensively been impacted upon due to past granite mining activity.

Recommendation: The walling which remains are all located on the footprint area of the proposed pipeline and reservoirs should be mapped during a phase 2 mitigation project preceded by a permit application from SAHRA and application for a destruction permit afterwards.



5.1.9. Site BP 9.

Location: See Appendix B and D (fig. 12).

Description: This is a stone-packed kraal with an associated midden which contains archaeological deposit.

Impact of the proposed development/ activity: These have already extensively been impacted upon due to past granite mining activity.

Recommendation: The walling which remains are all located on the footprint area of the proposed pipeline and reservoirs should be mapped during a phase 2 mitigation project preceded by a permit application from SAHRA and application for a destruction permit afterwards.



5.1.10. Site BP 10.

Location: See Appendix B and D (fig. 13).

Description: One of a number of stone-packed walling and features.

Impact of the proposed development/ activity: These have already extensively been impacted upon due to past granite mining activity.

Recommendation: The walling which remains are all located on the footprint area of the proposed pipeline and reservoirs should be mapped during a phase 2 mitigation project preceded by a permit application from SAHRA and application for a destruction permit afterwards.



5.1.11. Site BP 11.

Location: See Appendix B and D (fig. 14-16).

Description: One of a number of stone-packed walling and features.

Impact of the proposed development/ activity: These have already extensively been impacted upon due to past granite mining activity.

Recommendation: The walling which remains are all located on the footprint area of the proposed pipeline and reservoirs should be mapped during a phase 2 mitigation project preceded by a permit application from SAHRA and application for a destruction permit afterwards.



5.1.12. Site BP 12.

Location: See Appendix B and D (fig. 17).

Description: One of a number of stone-packed walling and features.

Impact of the proposed development/ activity: These have already extensively been impacted upon due to past granite mining activity.

Recommendation: The walling which remains are all located on the footprint area of the proposed pipeline and reservoirs should be mapped during a phase 2 mitigation project preceded by a permit application from SAHRA and application for a destruction permit afterwards.



5.1.13. Site BP 13.

Location: See Appendix B and D (fig. 18).

Description: Packed stone enclosure on a ledge. Ceramics and a portion of an upper grind stone were located here.

Impact of the proposed development/ activity: The Proposed pipeline will impact on the site.

Recommendation: The walling which remains are all located on the footprint area of the proposed pipeline and reservoirs should be mapped during a phase 2 mitigation project preceded by a permit application from SAHRA and application for a destruction permit afterwards.



TABLE 5.3. General description of located sites and field rating.

Site No.	Description	Type of significance	Degree of significance	NHRA heritage resource & rating
BP 1	Church building	Built environment	Archaeological: N/A Historic: Medium	Structures (Sect. 34). Low. GP C.
BP 2	Road accident marker	Built environment/ graves	Archaeological: N/A Historic: High	Structures (Sect. 34) High. GP A.
BP 3	Late Iron Age stone walling	Archaeology	Archaeological: Medium Historic: Medium	Archaeology (Sect. 35). Medium GP A.
BP 4	Late Iron Age stone walling	Archaeology	Archaeological: Medium Historic: Medium	Archaeology (Sect. 35). Medium GP A.
BP 5	Late Iron Age stone walling	Archaeology	Archaeological: Medium Historic: Medium	Archaeology (Sect. 35). Medium GP A.
BP 6	Late Iron Age stone walling	Archaeology	Archaeological: Medium Historic: Medium	Archaeology (Sect. 35). Medium GP A.
BP 7	Late Iron Age stone walling	Archaeology	Archaeological: Medium Historic: Medium	Archaeology (Sect. 35). Medium GP A.
BP 8	Late Iron Age stone walling	Archaeology	Archaeological: Medium Historic: Medium	Archaeology (Sect. 35). Medium GP A.
BP 9	Late Iron Age stone walling	Archaeology	Archaeological: Medium Historic: Medium	Archaeology (Sect. 35). Medium GP A.
BP 10	Late Iron Age stone walling	Archaeology	Archaeological: Medium Historic: Medium	Archaeology (Sect. 35). Medium GP A.
BP 11	Late Iron Age stone walling	Archaeology	Archaeological: Medium Historic: Medium	Archaeology (Sect. 35). Medium GP A.
BP 12	Late Iron Age stone walling	Archaeology	Archaeological: Medium Historic: Medium	Archaeology (Sect. 35). Medium GP A.
BP 13	Late Iron Age stone walling	Archaeology	Archaeological: Medium Historic: Medium	Archaeology (Sect. 35). Medium GP A.
SO 13	Late Iron Age stone walling	Archaeology	Archaeological: Medium Historic: Medium	Archaeology (Sect. 35). Medium GP A.

TABLE 5.4. Site condition assessment and management recommendations.

Site no.	Type of Heritage resource	Integrity of cultural material	Preservation condition of site	Relative location	Quality of archaeological/historic material	Quantity of site features	Recommended conservation management
BP 1	Built environment	N/A	Good	Elandsheuvel 282JQ, Reinkoyalskraal 278JQ, Tweedepoort 283 JQ	Archaeology: N/A Historically: Good	1	Not located in project area. Not older than 60 years, no mitigation needed.
BP 2	Built environment	N/A	Good	Elandsheuvel 282JQ, Reinkoyalskraal 278JQ, Tweedepoort 283 JQ	Archaeology: N/A Historically: Fair-Poor	1	No impact recommended. 20 meter buffer.
BP 3	Archaeology	N/A	Poor	Elandsheuvel 282JQ, Reinkoyalskraal 278JQ, Tweedepoort 283 JQ	Archaeology: Poor Historically: Fair	1	Mitigation before destruction
BP 4	Archaeology	N/A	Poor	Elandsheuvel 282JQ, Reinkoyalskraal 278JQ, Tweedepoort 283 JQ	Archaeology: Poor Historically: Fair	1	Mitigation before destruction
BP 5	Archaeology	N/A	Poor	Elandsheuvel 282JQ, Reinkoyalskraal 278JQ, Tweedepoort 283 JQ	Archaeology: Poor Historically: Fair	1	Mitigation before destruction
BP 6	Archaeology	N/A	Poor	Elandsheuvel 282JQ, Reinkoyalskraal 278JQ, Tweedepoort 283 JQ	Archaeology: Poor Historically: Fair	1	Mitigation before destruction
BP 7	Archaeology	N/A	Poor	Elandsheuvel 282JQ, Reinkoyalskraal 278JQ, Tweedepoort 283 JQ	Archaeology: Poor Historically: Fair	1	Mitigation before destruction

BP 8	Archaeology	N/A	Poor	Elandsheuvel 282JQ, Reinkoyalskraal 278JQ, Tweedepoort 283 JQ	Archaeology: Poor Historically: Fair	1	Mitigation before destruction
BP 9	Archaeology	N/A	Poor	Elandsheuvel 282JQ, Reinkoyalskraal 278JQ, Tweedepoort 283 JQ	Archaeology: Poor Historically: Fair	1	Mitigation before destruction
BP 10	Archaeology	N/A	Poor	Elandsheuvel 282JQ, Reinkoyalskraal 278JQ, Tweedepoort 283 JQ	Archaeology: Poor Historically: Fair	1	Mitigation before destruction
BP 11	Archaeology	N/A	Poor	Elandsheuvel 282JQ, Reinkoyalskraal 278JQ, Tweedepoort 283 JQ	Archaeology: Poor Historically: Fair	1	Mitigation before destruction
BP 12	Archaeology	N/A	Poor	Elandsheuvel 282JQ, Reinkoyalskraal 278JQ, Tweedepoort 283 JQ	Archaeology: Poor Historically: Fair	1	Mitigation before destruction
BP 13	Archaeology	N/A	Poor	Elandsheuvel 282JQ, Reinkoyalskraal 278JQ, Tweedepoort 283 JQ	Archaeology: Poor Historically: Fair	1	Mitigation before destruction

TABLE 5.5. Significance Rating Scales of Impact

Site No.	Nature of impact	Type of site	Extent	Duration	Intensity	Probability	Score total
BP 1	Infrastructure development	Building	Site	Short term	High	Possible	5
BP 2	Infrastructure development	Road accident marker	Site	Short term	High	Possible	5
BP 3	Infrastructure development	Archaeology	Site	Short term	High	Probable	6
BP 4	Infrastructure development	Archaeology	Site	Short term	High	Probable	6
BP 5	Infrastructure development	Archaeology	Site	Short term	High	Probable	6
BP 6	Infrastructure development	Archaeology	Site	Short term	High	Probable	6
BP 7	Infrastructure development	Archaeology	Site	Short term	High	Probable	6
BP 8	Infrastructure development	Archaeology	Site	Short term	High	Probable	6
BP 9	Infrastructure development	Archaeology	Site	Short term	High	Probable	6
BP 10	Infrastructure development	Archaeology	Site	Short term	High	Probable	6
BP 11	Infrastructure development	Archaeology	Site	Short term	High	Probable	6
BP 12	Infrastructure development	Archaeology	Site	Short term	High	Probable	6
BP 13	Infrastructure development	Archaeology	Site	Short term	High	Probable	6

*Notes: Short term ≥ 5 years, Medium term 5-15 years, Long term 15-30 years, Permanent 30+ years

Intensity: Very High (4), High (3), Moderate (2), Low (1). **Probability:** Improbable (1), Possible (2), Probable (3), Definite (4)

TABLE 5.6. Site current status and future impact scores

Site No.	Current Status	Low impact (4-6 points)	Medium impact (7-9 points)	High impact (10-12 points)	Very high impact (13-16 points)	Score Total
BP 1	Neutral	-	7	-	-	7
BP 2	Neutral	-	7	-	-	7
BP 3	Neutral	-	-	10	-	10
SO 4	Neutral	-	-	10	-	10
SO 5	Neutral	-	-	10	-	10
SO 6	Neutral	-	-	10	-	10
SO 7	Neutral	-	-	10	-	10
SO 8	Neutral	-	-	10	-	10
SO 9	Neutral	-	-	10	-	10
SO 10	Neutral	-	-	10	-	10
SO 11	Neutral	-	-	10	-	10
SO 12	Neutral	-	-	10	-	10
SO 13	Neutral	-	-	10	-	10

5.2. Cumulative impacts on the heritage landscape

Cumulative impacts can occur when a range of impacts which result from several concurrent processes have impact on heritage resources. The importance of addressing cumulative impacts is that the total impact of several factors together is often greater than one single process or activity that may impact on heritage resources. There are no other impacts than those described in the project overview, therefore no additional developments which will have additional impacts. Correct mitigation measures as suggested in this report will minimize any cumulative impacts on the identified sites as sufficient data will be recorded for future research. Past mining activities resulted in the destruction of a large portion of the Late Iron Age complex located near the proposed reservoirs (sites BP 3-13). A positive impact of the proposed water pipeline and reservoirs is that its construction will trigger mitigation of the sites and thereby ensure that they be recorded academically which would not have been possible otherwise. Also see section 6.1. Recommended management measures.

6. Summary of findings and recommendations

A total of 13 sites were recorded during the physical survey. They were numbered sites BP 1-13. Sites BP 1 and BP 2 are built environment (section 34 of the Act) sites which will be indirectly impacted upon by the proposed water pipeline. A buffer of 20 meters is proposed in order to minimize impact on these sites.

Sites BP 3-13 are all Late Iron Age stone-walled structures and associated features (section 35 of the Act). Individually they form part of a large settlement complex on top of the hill where the proposed water reservoirs are to be constructed. Most of these remains were negatively impacted upon during previous mining activity. It is recommended that these sites and features be mitigated by means of a second phase archaeological mitigation project before they can be impacted upon or destroyed by the proposed infrastructure development.

6.1. Recommended management measures

Management objectives include not to impact on sites of heritage significance. Monitoring programmes which should be followed when a “chance find” of a heritage object or human remains occur, include the following:

- The contractors and workers should be notified that archaeological sites might be exposed during the construction work.
- Should any heritage artefacts be exposed during excavation, work on the area where the artefacts were discovered, shall cease immediately and the Environmental Control Officer shall be notified as soon as possible;
- All discoveries shall be reported immediately to a museum, preferably one at which an archaeologist is available, so that an investigation and evaluation of the finds can be made. Acting upon advice from these specialists, the Environmental Control Officer will advise the necessary actions to be taken;
- Under no circumstances shall any artefacts be removed, destroyed or interfered with by anyone on the site; and
- Contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the National Heritage Resources Act (Act No. 25 of 1999).

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Appendix A

Terminology

“Alter” means any action affecting the structure, appearance or physical properties of a place or object, whether by way of structural or other works, by painting, plastering or other decoration or any other means.

“Archaeological” means –

- Material remains resulting from human activity which are in a state of disuse and are in or on land and which are older than 100 years, including artifacts, human and hominid remains and artificial features or structures;
- Rock Art, being any form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and which is older than 100 years, including any area within 10m of such representation;
- Wrecks, being any vessel or aircraft, or any part thereof, which was wrecked in South Africa, whether on land, in the internal waters, the territorial waters or in the maritime culture zone of the Republic, as defined respectively in sections 3, 4 and 6 of the Maritime Zones Act, 1994 (Act No. 15 of 1994), and any cargo, debris or artifacts found or associated therewith, which is older than 60 years or which SAHRA considers to be worthy of conservation; and
- Features, structures and artefacts associated with military history which are older than 75 years and the sites on which they are found;

“Conservation”, in relation to heritage resources, includes protection, maintenance, preservation and sustainable use of places or objects so as to safeguard their cultural significance;

“Cultural significance” means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance;

“Development” means any physical intervention, excavation, or action, other than those caused by natural forces, which may in the opinion of a heritage authority in any way result in a change to the nature, appearance or physical nature of a place, or influence its stability and future well-being, including –

- construction, alteration, demolition, removal or change of use of a place or a structure at a place;
- carrying out any works on or over or under a place;

- subdivision or consolidation of land comprising, a place, including the structures or airspace of a place;
- constructing or putting up for display signs or hoardings;
- any change to the natural or existing condition or topography of land; and
- any removal or destruction of trees, or removal of vegetation or topsoil;

“Expropriate” means the process as determined by the terms of and according to procedures described in the Expropriation Act, 1975 (Act No. 63 of 1975);

“Foreign cultural property”, in relation to a reciprocating state, means any object that is specifically designated by that state as being of importance for archaeology, history, literature, art or science;

“Grave” means a place of internment and includes the contents, headstone or other marker of such a place, and any other structure on or associated with such place;

“Heritage resource” means any place or object of cultural significance;

“Heritage register” means a list of heritage resources in a province;

“Heritage resources authority” means the South African Heritage Resources Agency, established in terms of section 11, or, insofar as this Act (25 of 1999) is applicable in or in respect of a province, a provincial heritage resources authority (PHRA);

“Heritage site” means a place declared to be a national heritage site by SAHRA or a place declared to be a provincial heritage site by a provincial heritage resources authority;

“Improvement” in relation to heritage resources, includes the repair, restoration and rehabilitation of a place protected in terms of this Act (25 of 1999);

“Land” includes land covered by water and the air space above the land;

“Living heritage” means the intangible aspects of inherited culture, and may include –

- cultural tradition;
- oral history;
- performance;
- ritual;
- popular memory;
- skills and techniques;
- indigenous knowledge systems; and
- the holistic approach to nature, society and social relationships;

“Management” in relation to heritage resources, includes the conservation, presentation and improvement of a place protected in terms of the Act;

“Object” means any moveable property of cultural significance which may be protected in terms of any provisions of the Act, including –

- any archaeological artifact;
- palaeontological and rare geological specimens;
- meteorites;
- other objects referred to in section 3 of the Act;

“Owner” includes the owner’s authorized agent and any person with a real interest in the property and –

- in the case of a place owned by the State or State-aided institutions, the Minister or any other person or body of persons responsible for the care, management or control of that place;
- in the case of tribal trust land, the recognized traditional authority;

“Place” includes –

- a site, area or region;
- a building or other structure which may include equipment, furniture, fittings and articles associated with or connected with such building or other structure;
- a group of buildings or other structures which may include equipment, furniture, fittings and articles associated with or connected with such group of buildings or other structures;
- an open space, including a public square, street or park; and
- in relation to the management of a place, includes the immediate surroundings of a place;

“Site” means any area of land, including land covered by water, and including any structures or objects thereon;

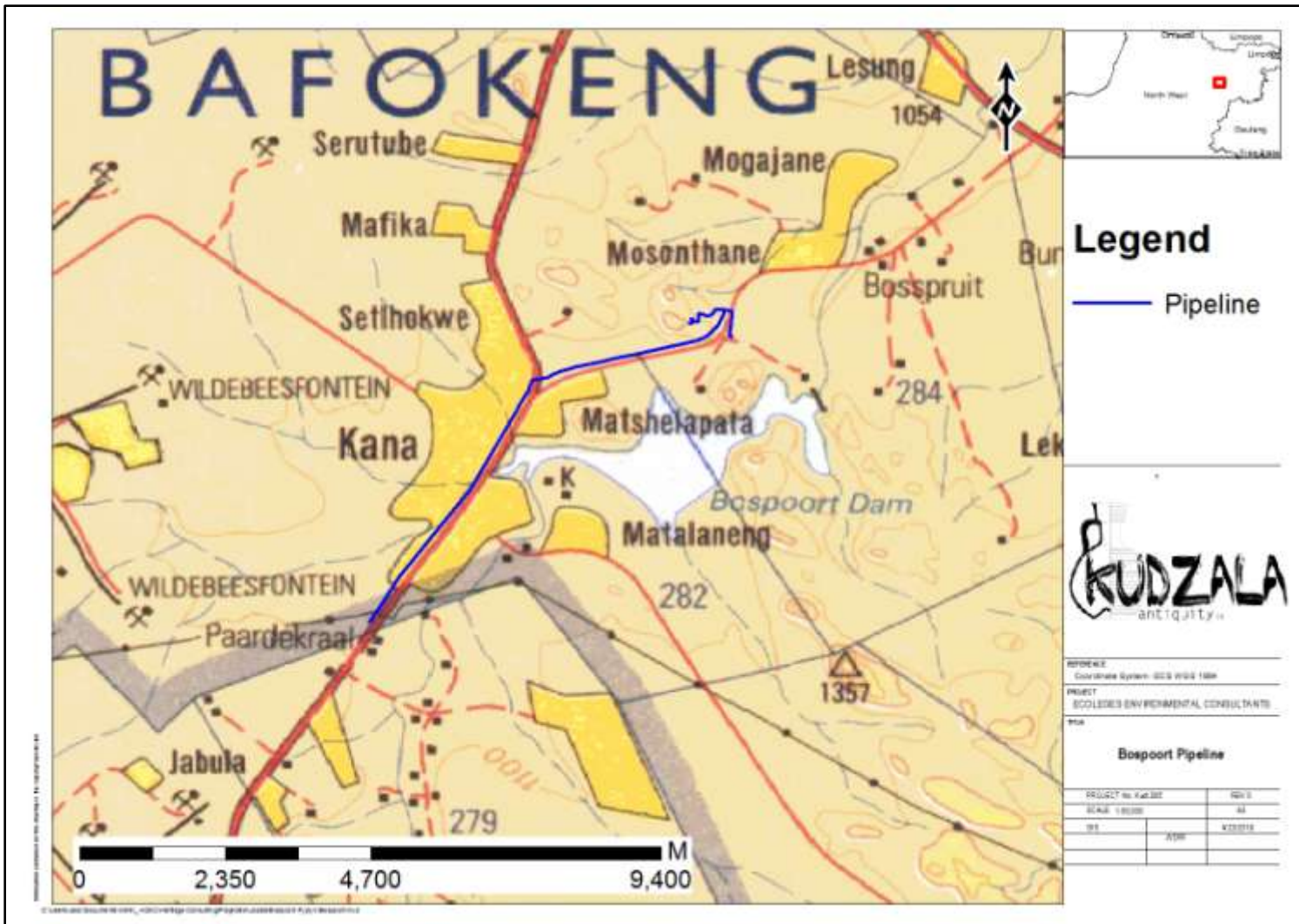
“Structure” means any building, works, device or other facility made by people and which is fixed to land, and includes any fixtures, fittings and equipment associated therewith.

Appendix B

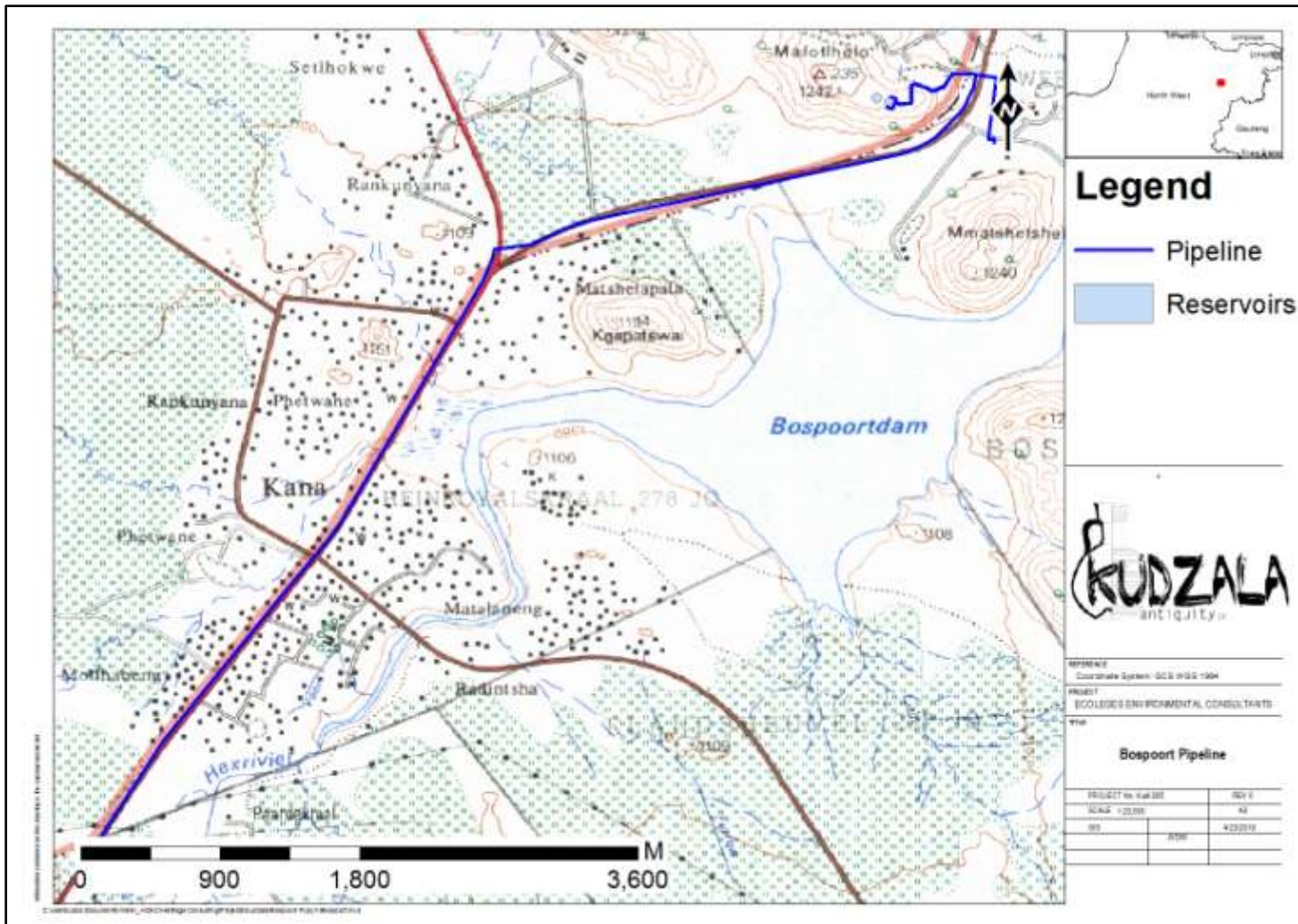
Table A. Recorded sites.

Site Name	Date of compilation	GPS Coordinates		Photo figure No.
BP 1	11/04/2019	S25°35'04.05"	E027°17'46.20"	1
BP 2	11/04/2019	S25°34'19.99"	E027°18'16.60"	2
BP 3	11/04/2019	S25°33'13.93"	E027°20'01.66"	3
BP 4	11/04/2019	S25°33'14.89"	E027°20'01.17"	4, 5
BP 5	11/04/2019	S25°33'14.97"	E027°20'01.96"	6
BP 6	11/04/2019	S25°33'15.75"	E027°20'01.68"	7, 8
BP 7	11/04/2019	S25°33'16.14"	E027°19'59.91"	9
BP 8	11/04/2019	S25°33'15.97"	E027°19'59.67"	10, 11
BP 9	11/04/2019	S25°33'15.83"	E027°19'58.44"	12
BP 10	11/04/2019	S25°33'14.14"	E027°19'57.03"	13
BP 11	11/04/2019	S25°33'13.86"	E027°19'54.63"	14-16
BP 12	11/04/2019	S25°33'14.79"	E027°19'54.54"	17
BP 13	11/04/2019	S25°33'16.64"	E027°20'04.15"	18

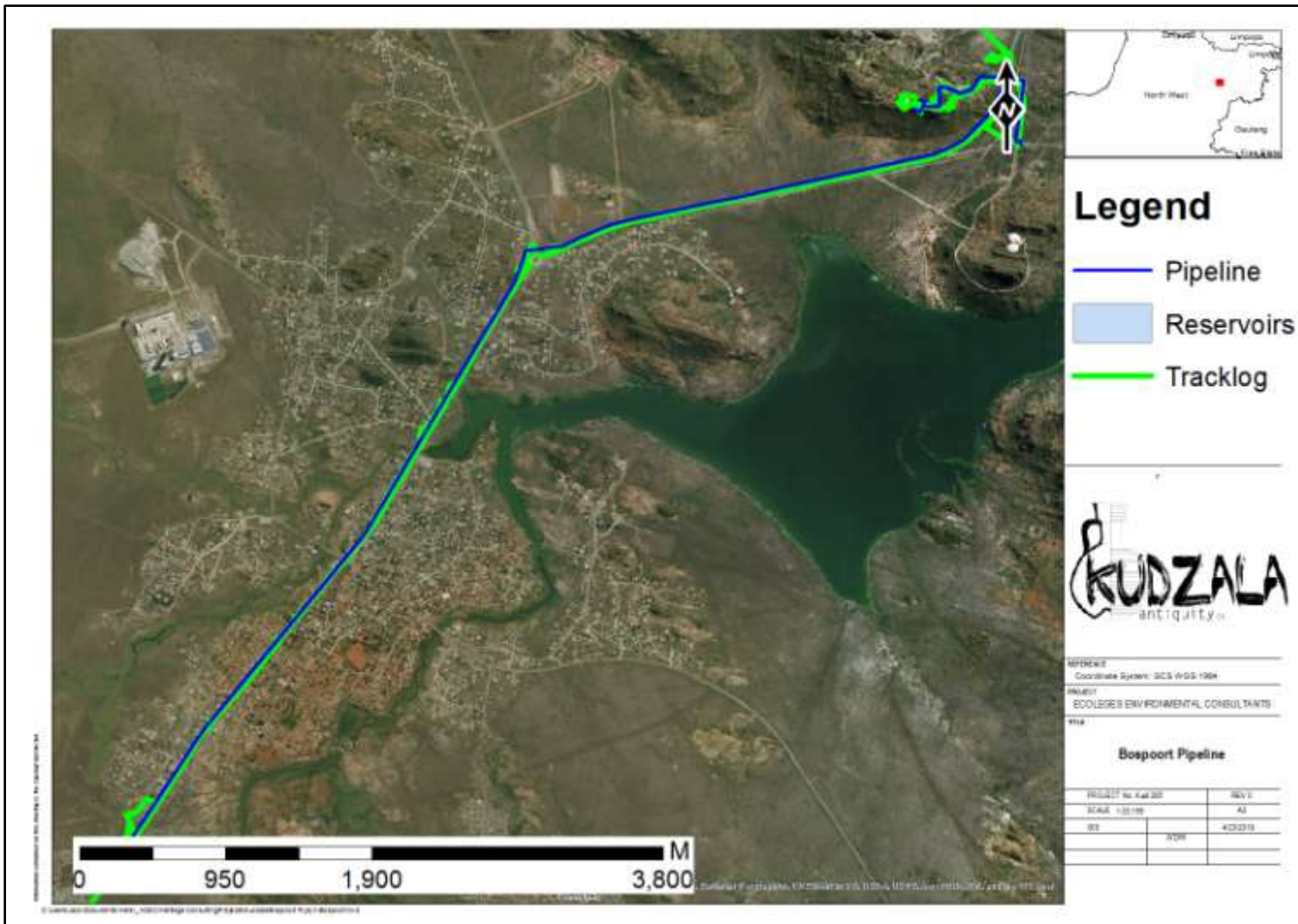
Appendix C



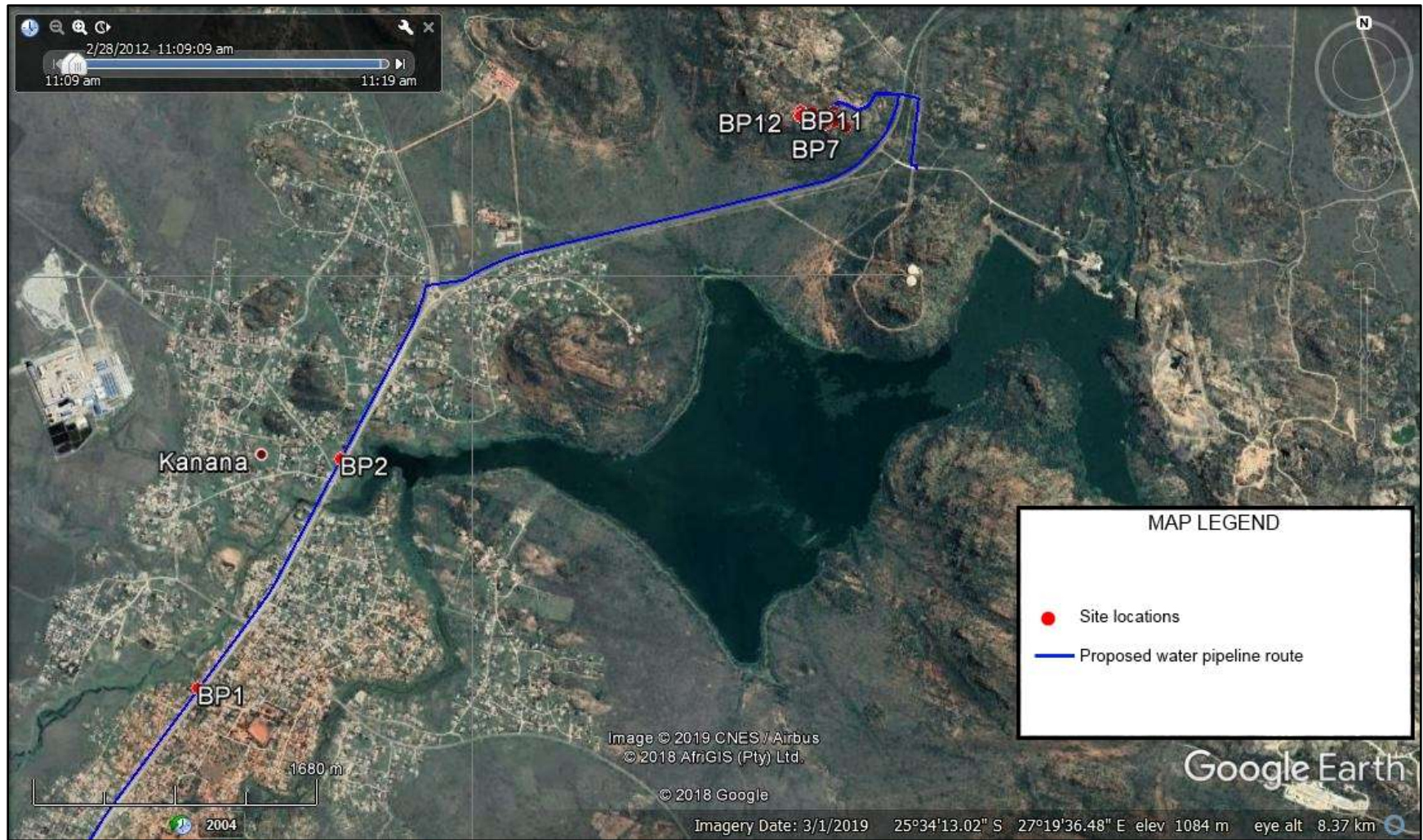
Regional Locality Map of the project area.



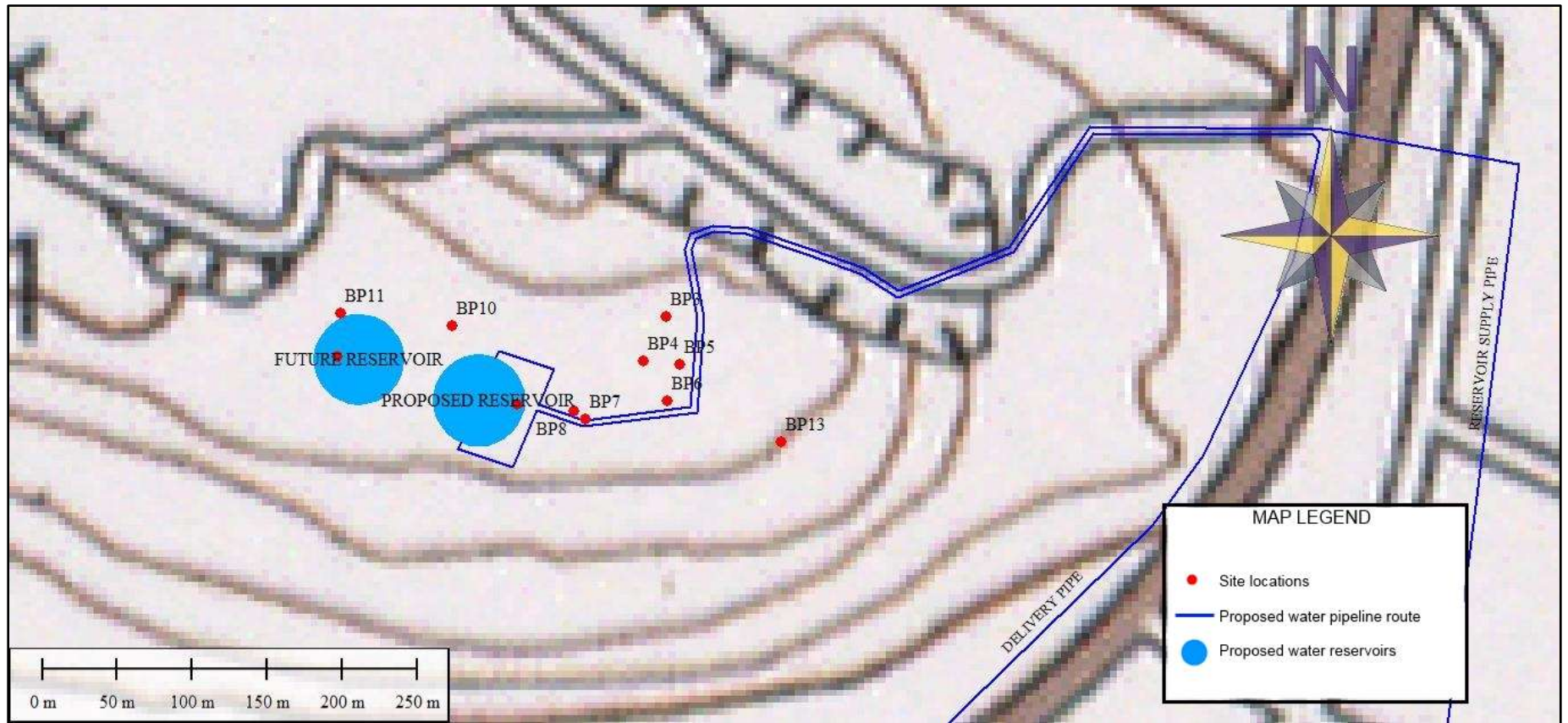
Topographical Map of the locality of the study area 1:50 000 2527 CB (1982).



Survey tracklog map on Google Earth.



Heritage site locations at the proposed project area



Heritage site locations at the proposed water reservoirs and pipeline junction. Topographical map scale 1:50 000 2527 CB (1996).





Appendix D



Figure 1. Site BP 1. A church building dating to the 1970's.



Figure 2. Site BP 2. A roadside marker in memory of Jose Visser who probably succumbed to a road accident here.



Figure 3. Site BP 3. Late Iron Age stone walling.



Figure 4. Site BP 4. Late Iron Age stone walling.



Figure 5. Site BP 4. Late Iron Age stone walling.



Figure 6. Site BP 5. Late Iron Age stone walling.



Figure 7. Site BP 6. Late Iron Age stone walling.



Figure 8. Site BP 6. Late Iron Age stone walling.



Figure 9. Site BP 7. Late Iron Age stone walling.



Figure 10. Site BP 8. Late Iron Age stone walling.



Figure 11. Site BP 8. Late Iron Age stone walling.



Figure 12. Site BP 9. The location of a midden at this site.



Figure 13. Site BP 10. Late Iron Age stone walling mostly collapsed.



Figure 14. Site BP 11. Late Iron Age stone walling mostly collapsed.



Figure 15. Site BP 11. Late Iron Age stone walling.



Figure 16. Site BP 11. Late Iron Age stone walling.



Figure 17. Site BP 12. Late Iron Age stone walling.



Figure 18. Site BP 13. Pottery pieces discovered here.

General photos of the surveyed area



Figure 19. Mining activity visible which impacted on sites BP 3-13.



Figure 20. Drainage area next to the road at the southern part of the proposed pipeline.

Kudzala Antiquity cc | Bospoort Water Pipeline Kud/285



Figure 21. Existing pipeline running alongside the proposed water pipeline.



Figure 22. Existing pipeline running alongside the proposed water pipeline.



Figure 23. Existing pipeline running alongside the proposed water pipeline.



Figure 24. Existing pipeline running alongside the proposed water pipeline.



Figure 25. A general view of sections alongside the the road where the proposed water pipeline is planned.



Figure 26. A general view of sections alongside the the road where the proposed water pipeline is planned.



Figure 27. A general view of sections alongside the the road where the proposed water pipeline is planned.



Figure 28. A general view of sections alongside the the road where the proposed water pipeline is planned.



Figure 29. A general view of sections alongside the the road where the proposed water pipeline is planned.



Figure 30. A general view of sections alongside the the road where the proposed water pipeline is planned.



Figure 31. General view around the hill where the reservoirs are to be erected. Past mining activity is clear.



Figure 32. General view around the hill where the reservoirs are to be erected. Past mining activity is clear.



Figure 33. General view around the hill where the reservoirs are to be erected. Past mining activity is clear.



Figure 34. General view around the hill where the reservoirs are to be erected. Past mining activity is clear.



Figure 35. General view around the hill where the reservoirs are to be erected. Past mining activity is clear.



Figure 36. General view around the hill where the reservoirs are to be erected.



Figure 37. General view around the hill where the reservoirs are to be erected. Dense vegetation cover limits visibility.



Figure 38. Some sections next to the road and on top of the hill are inaccessible due to dense vegetation cover which also limits surface visibility.



Figure 39. Some sections next to the road and on top of the hill are inaccessible due to dense vegetation cover which also limits surface visibility.



Figure 40. The pipeline route planned east of the hill and existing road.



Figure 41. The pipeline route planned east of the hill and existing road. Note granite block from previous mining.



Figure 42. The pipeline route planned east of the hill and existing road.



Figure 43. The pipeline route planned east of the hill and existing road.



Figure 44. The pipeline route planned east of the hill and existing road.