Cultural Heritage Impact Assessment:

Phase 1 Investigation of the Application for the Extension of an Existing Mining Right and Associated Waste Management License, Doornrandje 386 JR, City of Tshwane Metropolitan Municipality, Gauteng Province

For

Project Applicant	**Environmental Consultant**
Bundu Mining (Pty) Ltd	Umhlaba Environmental Consulting CC PO Box 731504 Fairland 2030 Tel: 011 791 3389 Fax: 011791 3384 preesha@umhlaba.co.za

By

Francois P Coetzee
Heritage Consultant
ASAPA Professional Member No: 028
99 Van Deventer Road, Pierre van Ryneveld,
Centurion, 0157
Tel: (012) 429 6297
Fax: (012) 429 6091
Cell: 0827077338
coetzfp@unisa.ac.za

Date:	**February 2018**
Updated:	**March 2018**
Version:	**2 (Final Report)**

Executive Summary

This report contains a comprehensive heritage impact assessment investigation in accordance with the provisions of Sections 38(1) and 38(3) of the *National Heritage Resources Act* (Act No. 25 of 1999) (NHRA) and focuses on the survey results from a cultural heritage survey as requested by Umhlaba Environmental Consulting CC. The survey forms part of an Environmental Authorisation (EA) and an associated Waste Management License (WML) for the mining of sand and stone on a portion of the remainder of the Farm Doornrandje 386 JR. Note that Bundu Mining (Pty) Ltd (the client) has an existing mining right on the adjacent Portion 15 of the farm Doornrandje 386 JR. The mine is situated approximately 25 km south-west of Pretoria along the N14 towards Krugersdorp and roughly 7 km east of Lanseria Airport, City of Tshwane Metropolitan Municipality, Gauteng.

Please note that no Stone Age, Iron Age or historical settlements, structures, features, assemblages or artefacts were recorded during the survey. However one historical graveyard (Site 1) was recorded outside the area of expansion.

Site No	Site Type	Field Rating of Significance	Direct Impacts	Significance of Impact before Mitigation	Significance of Impact after Mitigation	Proposed Mitigation
1	Graveyard	Generally protected A: High significance	None	6 (Low)	6 (Low)	• Maintain a buffer zone of 50 metres during mining phase

It is therefore recommended, from a cultural heritage perspective, that the Environmental Authorization (EA) and associated Waste Management License (WML) for the mining of sand may proceed.

Also, please note:

Archaeological deposits usually occur below ground level. Should archaeological artefacts or skeletal material be revealed in the area during development activities, such activities should be halted, and a university or museum notified in order for an investigation and evaluation of the find(s) to take place **(*cf*. NHRA (Act No. 25 of 1999)**, Section 36 (6)).

Definitions and abbreviations

Midden:	Refuse that accumulates in a concentrated heap.
Stone Age:	An archaeological term used to define a period of stone tool use and manufacture
Iron Age:	An archaeological term used to define a period associated with domesticated livestock and grains, metal working and ceramic manufacture
LIA:	Late Iron Age sites are usually demarcated by stone-walled enclosures
NHRA:	National Heritage Resources Act (Act No. 25 of 1999)
SAHRA:	South African Heritage Resources Agency
SAHRIS:	South African Heritage Resources Information System
PHRA-G:	Provincial Heritage Resources Authority - Gauteng
GDARD:	Gauteng Department of Agriculture and Rural Development
HIA:	Heritage Impact Assessment
DMR:	Department of Minerals and Resources
I&APs:	Interested and Affected Parties
CoH WHS	Cradle of Humankind World Heritage Site
NEM:WA	National Environmental Management: Waste Act (Act No. 59 of 2008)
WML	Waste Management Licence

I, Francois Coetzee, hereby confirm my independence as a cultural heritage specialist and declare that I do not have any interest, be it business, financial, personal or other, in any proposed activity, application or appeal in respect of the listed environmental processes, other than fair remuneration for work performed on this project.

_____

Francois P Coetzee
Cultural Heritage Consultant
Accredited Archaeologist for the SADC Region
Professional Member of ASAPA (CRM Section) Reg no: 28

Contents

Figures

Tables

1. Introduction and Terms of Reference

Umhlaba Environmental Consulting CC an independent environmental consultant was contracted by Bundu Mining (Pty) Ltd to undertake an Environmental Authorisation (EA) and an associated Waste Management License (WML) in terms of the 2014 EIA Regulations, as amended, published under the NEMA (Act 107 of 1998) for Environmental Authorisation. Specifically EIA Regulations 2014 promulgated under the NEMA (Listing Notice 1, 2 and 3 of the EIA Regulations of 4 December 2014, as amended; and List of Waste Management Activities, 2013 promulgated under the NEM:WA, as amended). Both sets of listed activities require a scoping and environmental impact reporting (S&EIR) process to be carried out as part of the authorisation process, hence this application will be run as an integrated one (i.e. covering both NEMA and NEM:WA). The proposed project relates to the extension of an existing mining right, hence the existing reference number GP 30/5/1/2/2 (296) MR remains applicable.

The survey forms part of an Environmental Authorisation (EA) and an associated Waste Management License (WML) for the mining of sand and stone on a portion of the remainder of the Farm Doornrandje 386 JR. Note that Bundu Mining (Pty) Ltd (the client) has an existing mining right on the adjacent Portion 15 of the farm Doornrandje 386 JR. The mine is situated approximately 25 km south west from Pretoria along the N14 towards Krugersdorp and roughly 7 km east of Lanseria Airport, City of Tshwane Metropolitan Municipality, Gauteng.

2. Objectives

The general objective of the cultural heritage survey is to record and document cultural heritage remains consisting of both tangible and intangible archaeological and historical artefacts, structures (including graves), settlements and oral traditions of cultural significance.

As such the terms of reference of this survey are as follows:

- Identify and provide a detailed description of all artefacts, assemblages, settlements and structures of an archaeological or historical nature (cultural heritage sites) located on the study area,
- Estimate the level of significance/importance of these remains in terms of their archaeological, historical, scientific, social, religious, aesthetic and tourism value,
- Assess any impact on the archaeological and historical remains within the area emanating from the development activities, and
- Propose recommendations to mitigate heritage resources where complete or partial conservation may not be possible and thereby limit or prevent any further impact.

3. Description of Physical Environment of Study Area

The heritage survey focussed on a portion of the remainder of the Farm Doornrandje 386 JR (which is directly adjacent to Portion 15) situated approximately 7 km east of Lanseria Airport, Gauteng.

Farm Name(s) and Portions	The following portions and farms: • Doornrandje 386 JR (portion of the remainder of the farm)
Size of Survey Area	16.3 hectares
Magisterial District	City of Tshwane Metropolitan Municipality
1:50 000 Map Sheet	2528CC

1:250 0000 Map Sheet	2526 & 2528
Central Coordinates of the Development	28.0125766°E 25.9135243°S

Table 1: Physical Environment

The survey area falls within the Grassland Biome, particularly the Mesic Highveld Grassland Bioregion and more specifically the Egoli Granite Grassland (Gm 10) (Mucina & Rutherford 2006).

In the Gauteng Province this veld type extends in the region between northern Johannesburg in the south, and from near Lanseria Airport and Centurion (south of Pretoria) to the north, westwards to about Muldersdrif and eastwards to Tembisa.

Only about 3% of this unit is conserved in statutory reserves (Diepsloot and Melville Koppies Nature Reserves) and a number of private conservation areas including Motsetse and Isaac Stegmann Nature Reserves, Kingskloof Natural Heritage Site, Melrose and Beaulieu Bird Sanctuaries as well as the Walter Sisulu National Botanical Garden. More than two thirds of the unit has already undergone transformation mostly by urbanisation, cultivation or by building of roads. Current rates of transformation threaten most of the remaining unconserved areas. There is no serious alien infestation in this unit, although species such as *Eucalyptus grandis, E. camaldulensis* and *E. sideroxylon* are commonly found. Erosion is moderate and very low.

The survey area is located north of the Diepsloot settlement and borders Pretorius Street at the eastern boundary. Generally the survey area has been used as agricultural fields (as indicated on 1980s topographic maps) and extensively disturbed due to sand mining since 2006. Infrastructure consists of formal residential houses, several dirt and tarred roads, power lines, fences, and extensive agricultural fields (both used and fallow). Several settlements are located in the area such as Diepsloot West to the south and Laezonia Agricultural Holdings to the east. The N14 (Pretoria – Krugersdorp) road is located to the south of the survey area.

Lanseria normally receives about 552 mm of rain per year, with most rainfall occuring mainly during mid-summer. The region receives the lowest rainfall (0 mm) in June and the highest (105 mm) in January. The monthly distribution of average daily maximum temperatures shows that the average midday temperatures for Lanseria range from 18°C in June to 27.8°C in January. The region is the coldest during July when the mercury drops to 1.2°C on average during the night (SA Explorer 2018).

Current Zoning	Undetermined
Economic activities	Farming and Mining
Soil and basic geology	The general area is underlined by Archaean granite and gneiss of the Halfway House Granite with typical leached, shallow, coarsely grained, sandy soil which is poor in nutrients (Tshwane IDP 2016).
Prior activities	Livestock farming and agriculture
Socio Economic Environment	From a socio-economic demographic perspective Tshwane has seen some improvements, despite the fact that it continues to face serious challenges. The City's population has grown slower than the national average, and in 2004 was estimated to be around 2,2 million people, of which 40,6% of the population fell within the 15-34 year age bracket. Compared to the national

	average, the City's residents are better skilled, reflect high levels of literacy, the City provides employment for a larger percentage of its residents, its human development ranking is high and it has a per capita income above the national average. These figures have resulted in employment, and wage per capita value added improvements, although, poverty and unemployment remain problematic. In addition unemployment is spatially referenced with the larger proportion of unemployed living in the north of Tshwane. Whilst average monthly income figures have increased, the gap between the highest and lowest paid person is projected to have increased, implying that the rich are becoming richer and the poor poorer. The surrounding social environment is a mixture of high income, low density residential areas with a good social infrastructure and a low income, high density township with a poor social infrastructure. To the west of the proposed site is the existing Diepsloot West Township. To the east of the proposed site are agricultural holdings which are mainly used for equestrian activities (Tshwane IDP 2006 - 2011).
Evaluation of Impact	An evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits NHRA (Act No. 25 of 1999, Section 38(3d)): **Positive**

Table 2: Socio-economic environment

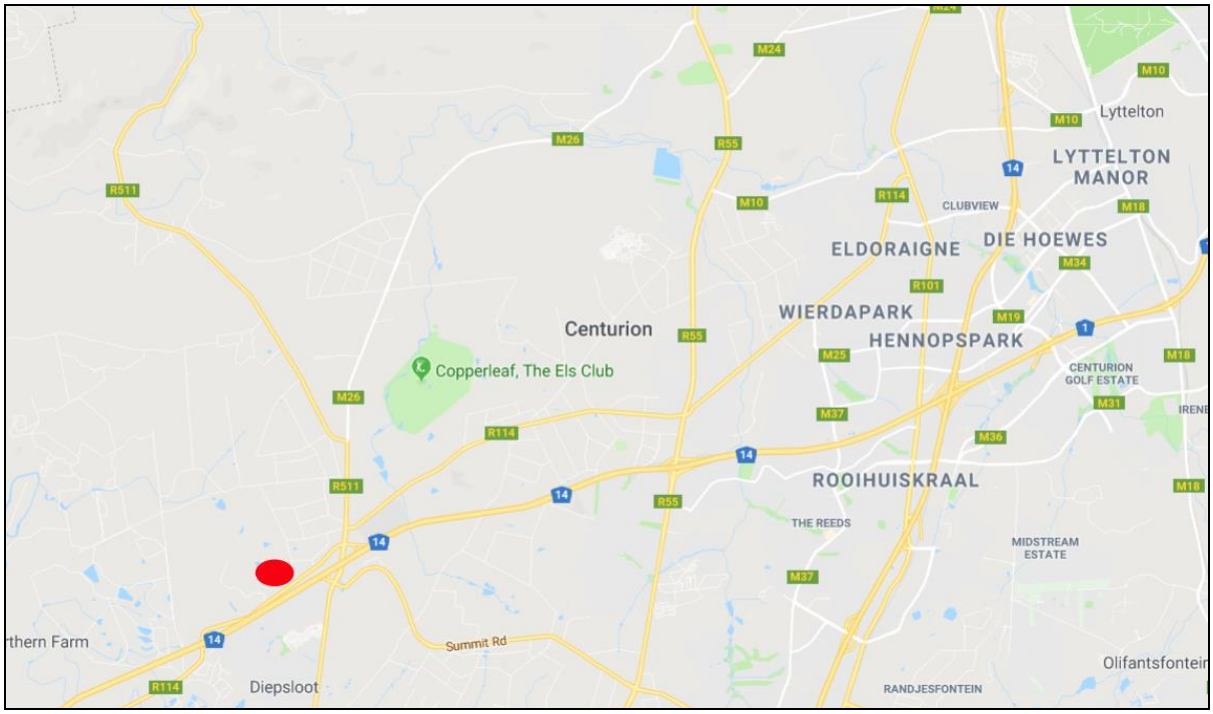

Figure 1: Regional context of the survey footprint located north of Diepsloot (indicated by the red area)

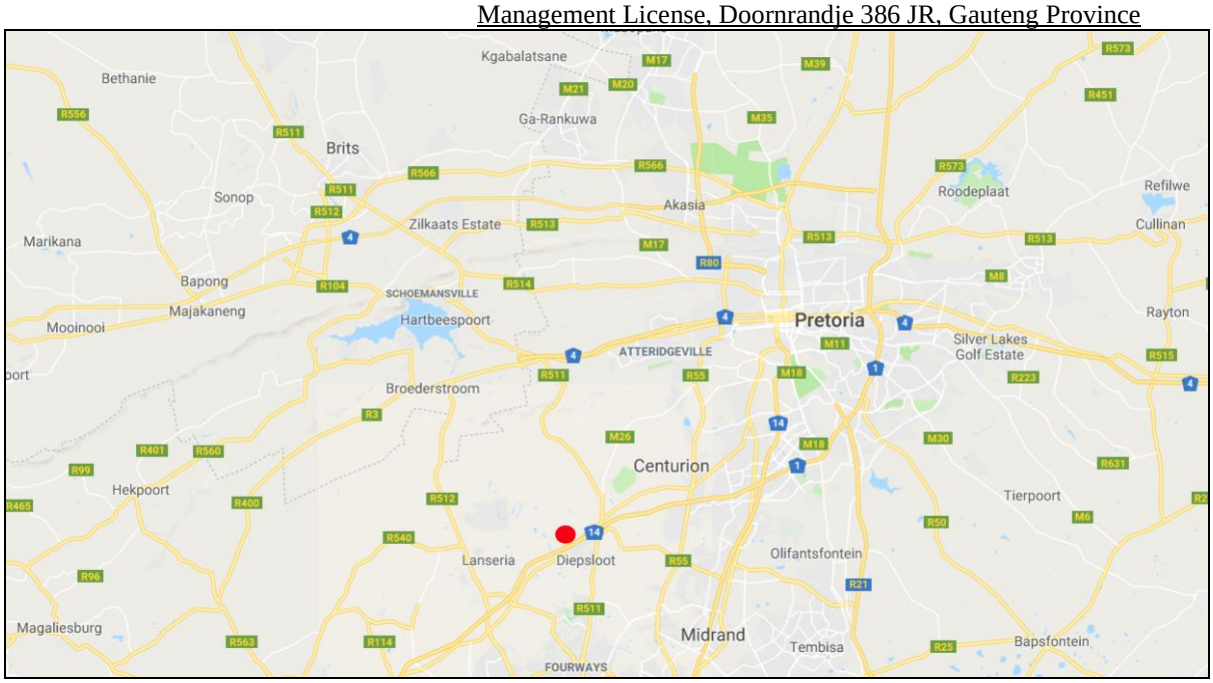

Figure 2: Local context of the survey area located north of Diepsloot (indicated by red area)

Figure 3: Existing mining right area (Portion 15) and the extended area (portion of the remainder of the Farm Doornrandje 386 JR) as indicated on Google Earth Pro (2018)

Figure 4: Regional context of the mining footprint as indicated on the 1:250 000 maps (2526 & 2528)

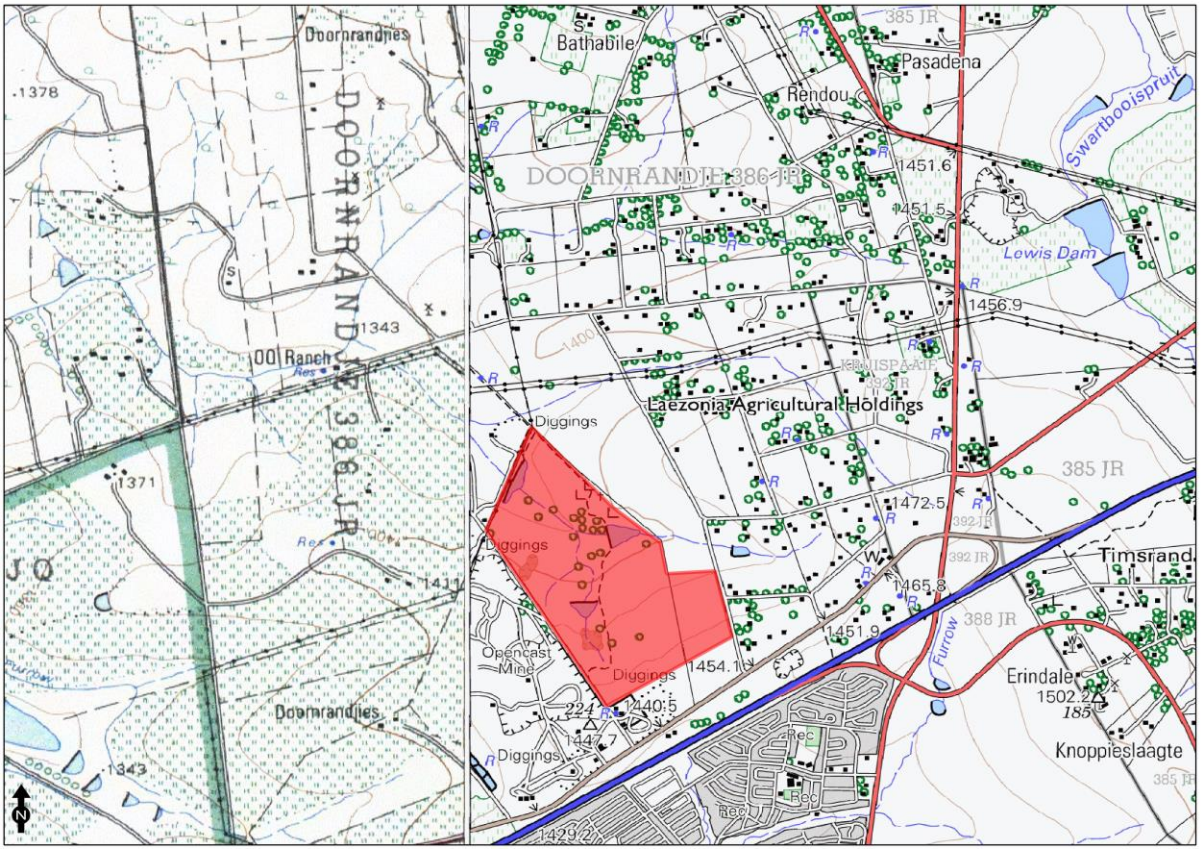

Figure 5: The survey area as indicated on the 1:50 000 topographic map 2528CC

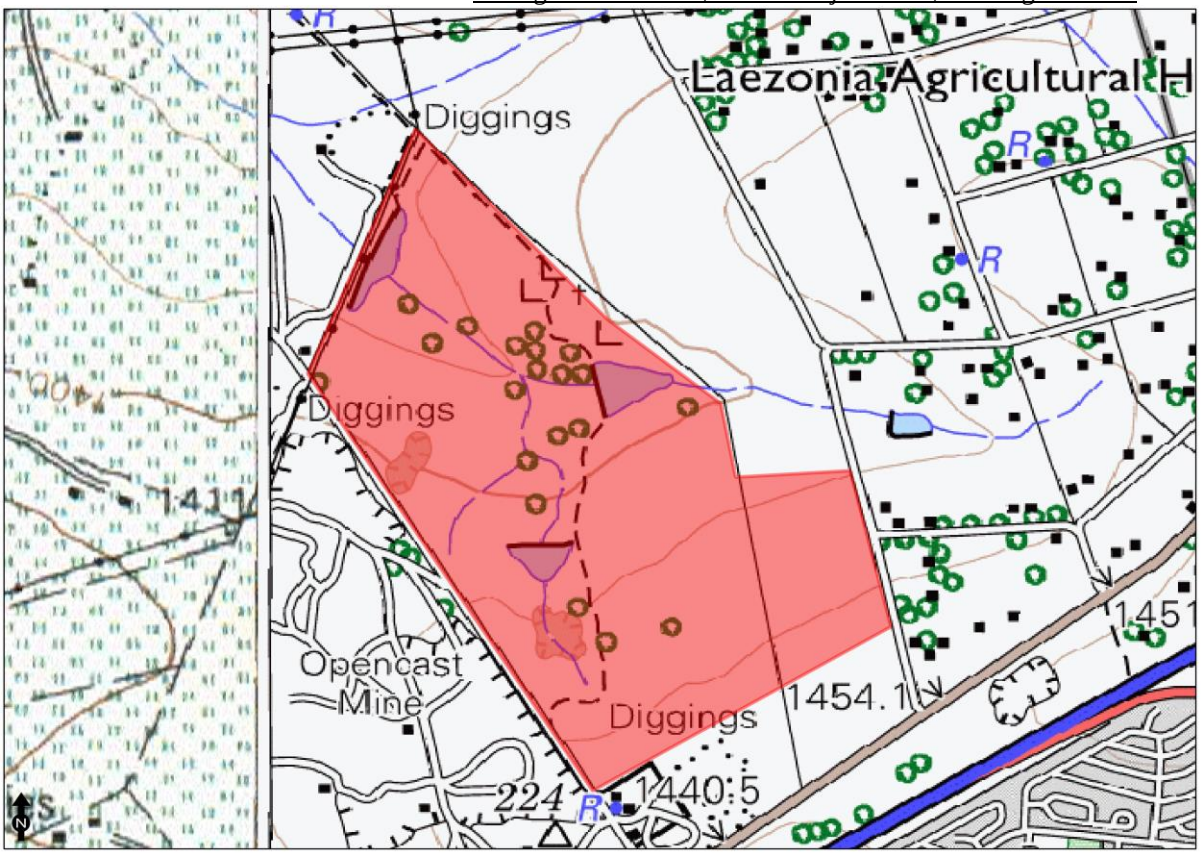

Figure 6: Existing mining right area (Portion 15) and the extended area (portion of the remainder of the Farm Doornrandje 386 JR) as indicated on the 1:50 000 topographic map 2528CC

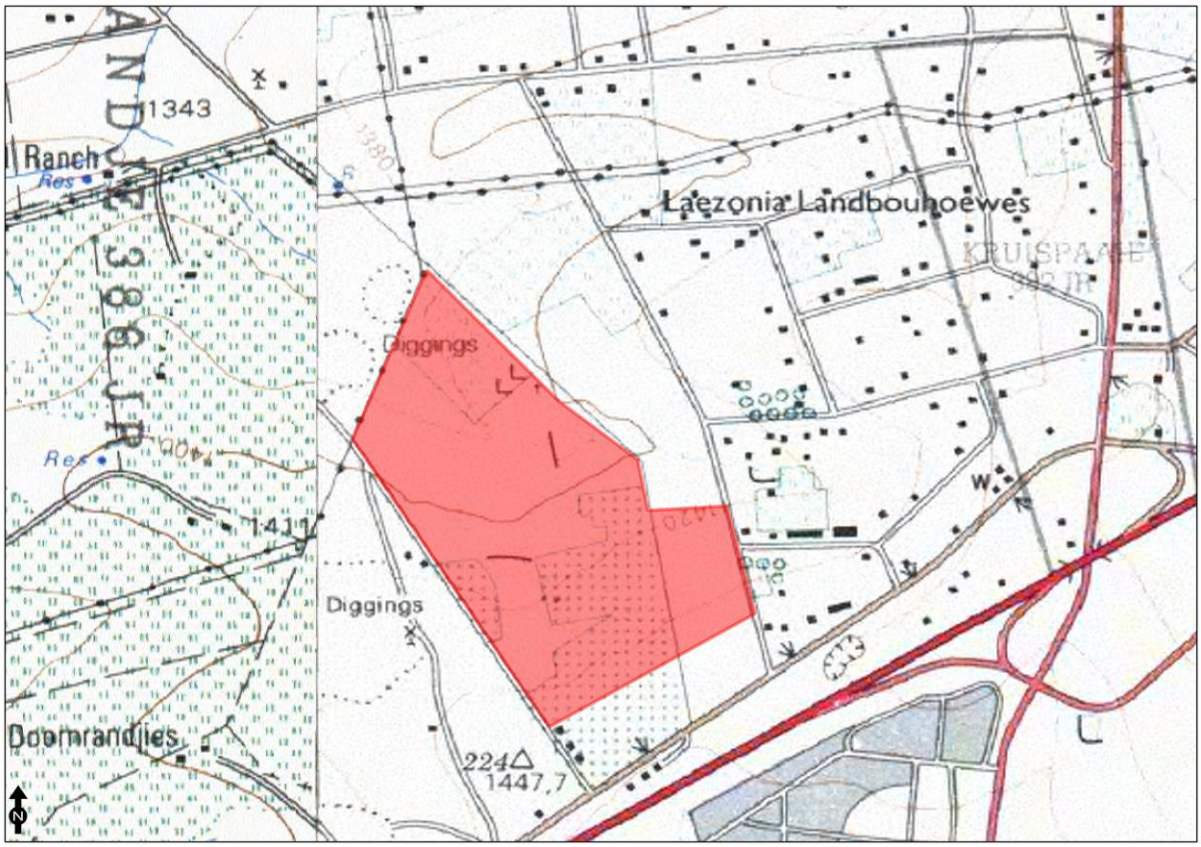

Figure 7: The southern section of the survey area was used as agricultural fields as indicated on the 1:50 000 topographic map 2528CC (1986)

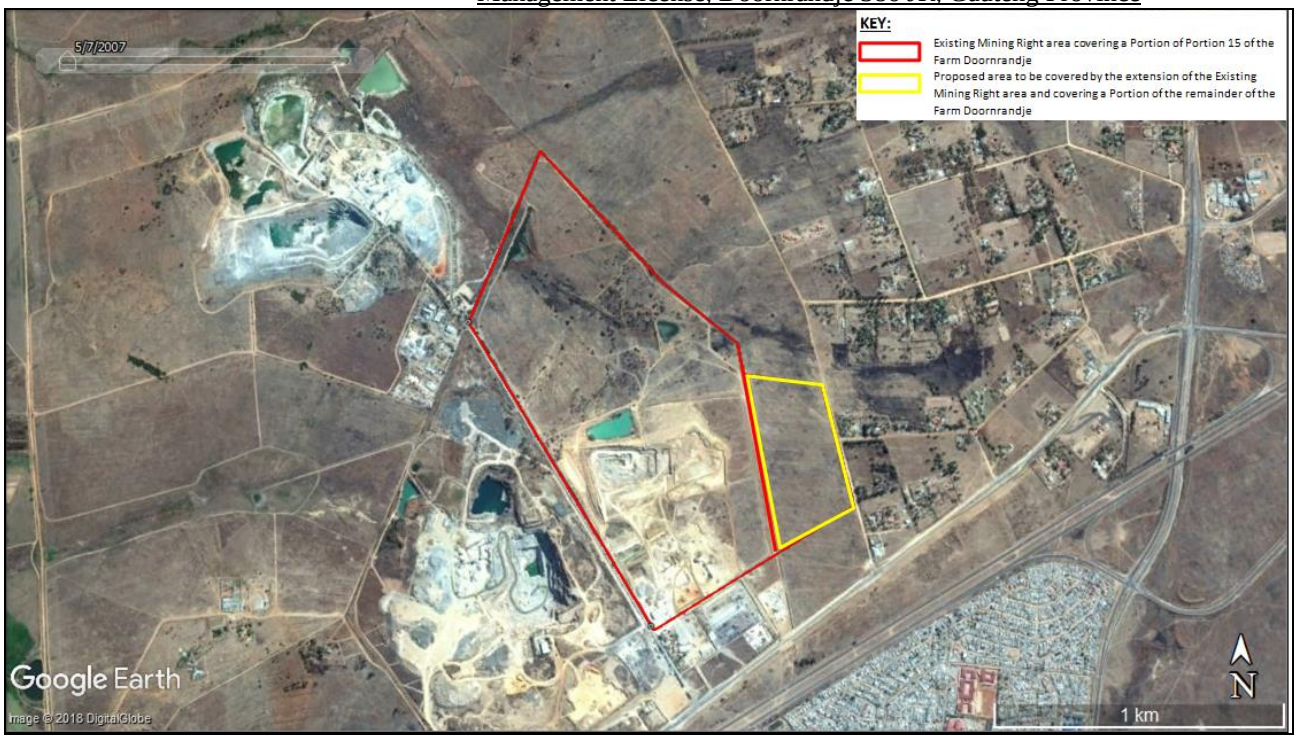

Figure 8: The relative positions of the existing mining right area (Portion 15) and the extended area (portion of the remainder of the Farm Doornrandje 386 JR) as indicated on Google Earth Pro (2018)

Figure 9: General view of the proposed mining area (portion of the remainder of the Farm Doornrandje 386 JR)

Figure 10: General view of the proposed mining area (portion of the remainder of the Farm Doornrandje 386 JR)

Figure 11: General view of the proposed mining area (portion of the remainder of the Farm Doornrandje 386 JR)

4. Proposed Project Description

The proposed area covered by the extension and situated to the east of the existing mining right area will only be mined in a free dig manner for sand and decomposed brown rock. Where topsoil is encountered, it is stripped ahead of the mining face and either;

- Stored in berms along the perimeter of the mining right area; or
- Used in concurrent rehabilitation

Once topsoil is stripped, the material from the surface to an average of 10m below the surface can be mined using an excavator only. Material is loaded onto a haul truck and transferred to a plant for processing. The extended area will only be subject to sand mining. Once the loose material is removed, the area will be sloped and levelled. Levelling activities could include drilling activities or setting off minor blasts.

Figure 12: Site layout of the existing mining operation, and the proposed area of the extension

5. Legal Framework

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE APPLIED
The Constitution of the Republic of South Africa (Act No. 108 of 1996)	
The National Environmental Management Act (Act No. 107 of 1998)	
The National Water Act (Act No. 36 of 1998)	
Regulation 2, Appendix 2 of Governmental Notice Regulation (GNR) 982	
Air Quality Act (Act No. 39 of 2004)	-
National Forests Act, Act of 84 of 1998	
The National Heritage Resources Act (Act No. 25 of 1999)	Section 38, 34, 35, 36
Conservation of Agricultural Resources Act (Act No. 85 of 1983)	-
Mineral and Petroleum Resources Development Act (Act No. 28 of 2002)	-
The National Water Act (Act No. 36 of 1998)	-
Mine Health and Safety Act (Act No. 29 of 1996) (MHSA)	
National Environmental Management: Waste Act (Act No. 59 of 2008)	
Biodiversity Act (Act 10 of 2004)	
World Heritage Convention Act (Act No. 49 of 1999)	
National Environmental Management: Protected Areas Act (Act No. 57 of 2003)	
National Infrastructure Plan	
City of Tshwane Metropolitan Municipality Integrated Management Plan 2006-2011	

Table 3: Legal framework

Section 38 of the NHRA (Act No. 25 of 1999) stipulates that the following activities trigger heritage survey:

Development criteria in terms of Section 38(1a-e) of the NHRA (Act No. 25 of 1999)	Yes/No
Construction of road, wall, powerline, pipeline, canal or other linear form of development or barrier exceeding 300m in length	Yes
Construction of bridge or similar structure exceeding 50m in length	No
Development exceeding 5000 m^2 in extent	Yes
Development involving three or more existing erven or subdivisions	No

Development involving three or more erven or divisions that have been consolidated within past five years	No
Rezoning of site exceeding 10 000 m^2	Yes
Any other development category, public open space, squares, parks, recreation grounds	No

Table 4: Activities that trigger Section 38 of the NHRA

As mentioned above, a mining right application triggers listed activities that may not commence without an environmental authorisation in terms of the:

- EIA Regulations, 2014 promulgated under the NEMA; as amended; and
- List of Waste Management Activities, 2013 promulgated under the NEM:WA, as amended.

Regulation 4 of the *List of Waste Management Activities, 2013* states that a person who wishes to commence, undertake or conduct a waste management activity listed in Category B of the List of Waste Management Activities (GN R 921 of 29 November 2013) must conduct a S&EIR process as set out in terms of the EIA Regulations made in terms of Section 24(5) of the NEMA as part of the waste management licence application contemplated in Section 20(b) of the NEM:WA.

Hence, this application will be run as an integrated one (i.e. covering both NEMA and NEM:WA). The proposed project triggers the following listed activities:

NO.	LISTED ACTIVITY	SITE ACTIVITY
NEMA		
Listing Notice 1 of the EIA Regulations of 4 December 2014		
27	The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for – (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.	Clearing the land over which the sand mining is proposed
Listing Notice 2 of the EIA Regulations of 4 December 2014		
17	Any activity including the operation of that activity which requires a mining right in terms of Section 22 of the Mineral & Petroleum Resources Development Act (MPRDA), Act No. 28 of 2002, including – (a) associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource, or (b) the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing; but excluding the secondary processing of a mineral resource, including the smelting, beneficiation, reduction, refining, calcining or gasification of the mineral resource in which case activity 6 in this Notice applies.	Mining of sand
Listing Notice 3 of the EIA Regulations of 4 December 2014		
12	The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan. **c. Gauteng** i. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004; ii. Within Critical Biodiversity Areas or Ecological Support Areas identified in the Gauteng Conservation Plan or bioregional plans; or iii. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning.	
15	The transformation of land bigger than 1000 square metres in size, to residential, retail, commercial, industrial or institutional use, where, such land was zoned open space, conservation or had an equivalent zoning, on or after 02 August 2010.	

NEM:WA		
Category B of GN R 633 List of Waste Management Activities (24 July 2015)		
4(11)	The establishment or reclamation of a residue stockpile or residue deposit resulting from activities which require a mining right……..in terms of the Mineral and Petroleum Resources Development Act (Act No. 28 of 2002).	Topsoil stockpiles

Table 5: Listed activities

- Field rating system as recommended by SAHRA:

Field Rating	Grade	Significance	Recommended Mitigation
National Significance	Grade I	High significance	Conservation by SAHRA, national site nomination, mention any relevant international ranking. No alteration whatsoever without permit from SAHRA.
Provincial Significance	Grade II	High significance	Conservation by provincial heritage authority, provincial site nomination. No alteration whatsoever without permit from provincial heritage authority.
Local Significance	Grade III-A	High significance	Conservation by local authority, no alteration whatsoever without permit from provincial heritage authority. Mitigation as part of development process not advised.
Local Significance	Grade III-B	High significance	Conservation by local authority, no external alteration without permit from provincial heritage authority. Could be mitigated and (part) retained as heritage register site.
Generally Protected A	Grade IV-A	High/medium significance	Conservation by local authority. Site should be mitigated before destruction. Destruction permit required from provincial heritage authority.
Generally Protected B	Grade IV-B	Medium significance	Conservation by local authority. Site should be recorded before destruction. Destruction permit required from provincial heritage authority.
Generally Protected C	Grade IV-C	Low significance	Conservation by local authority. Site has been sufficiently recorded in the Phase 1 HIA. It requires no further recording before destruction. Destruction permit required from provincial heritage authority.

Table 6: Field rating system to determine site significance

- Heritage resources have lasting value in their own right and provide evidence of the origins of South African society and they are valuable, finite, non-renewable and irreplaceable.

- All archaeological remains, features, structures and artefacts older than 100 years and historic structures older than 60 years are protected by the relevant legislation, in this case the **National Heritage Resources Act (NHRA) (Act No. 25 of 1999, Section 34 & 35)**. The Act makes an archaeological impact assessment as part of an EIA and EMPR mandatory (see **Section 38**). No archaeological artefact, assemblage or settlement (site) may be moved or destroyed without the necessary approval from the **South African Heritage Resources Agency (SAHRA)**. Full cognisance is taken of this Act in making recommendations in this report.

- Cognisance will also be taken of the Mineral and Petroleum Resources Development Act (Act No 28 of 2002) and the National Environmental Management Act (Act No 107 of 1998) when making any recommendations.

- Human remains older than 60 years are protected by the NHRA, with reference to Section 36. Human remains that are less than 60 years old are protected by the Regulations Relating to the Management of Human Remains (GNR 363 of 22 May 2013) made in terms of the National Health Act No. 61 of 2003 as well as local Ordinances and regulations.

- With reference to the evaluation of sites, the certainty of prediction is definite, unless stated otherwise.

- The guidelines as provided by the NHRA (Act No. 25 of 1999) in Section 3, with special reference to subsection 3, and the Australian ICOMOS (International Council on Monuments and Sites) Charter (also known as the Burra Charter) are used when determining the cultural significance or other special value of archaeological or historical sites.

- A copy of this report will be submitted on SAHRIS as stipulated by the National Heritage Resources Act (NHRA) (Act No. 25 of 1999), Section 38 (especially subsection 4) and the relevant Provincial Heritage Resources Authority (PHRA).

- Note that the final decision for the approval of permits, or the removal or destruction of sites, structures and artefacts identified in this report, rests with the SAHRA (or relevant PHRA).

- World Heritage Convention Act (Act No. 49 of 1999), the National Environmental Management: Protected Areas Act (Act No. 57 of 2003) and the associated regulations for the proper administration of special Nature Reserves, National Parks and World Heritage Sites are taken into account when making recommendations.

6. Study Approach/Methodology

Geographical information on the proposed mining areas was supplied by Umhlaba Environmental Consulting CC. The most up-to-date Google Earth images and topographic maps were used to indicate the survey area. Topographic maps were sources from the Surveyor General. Please note that all maps are orientated with north facing upwards (unless stated otherwise).

The strategy during this survey was to record the development footprint completely on foot. The survey area is characterised by open fields and existing mining activities and infrastructure.

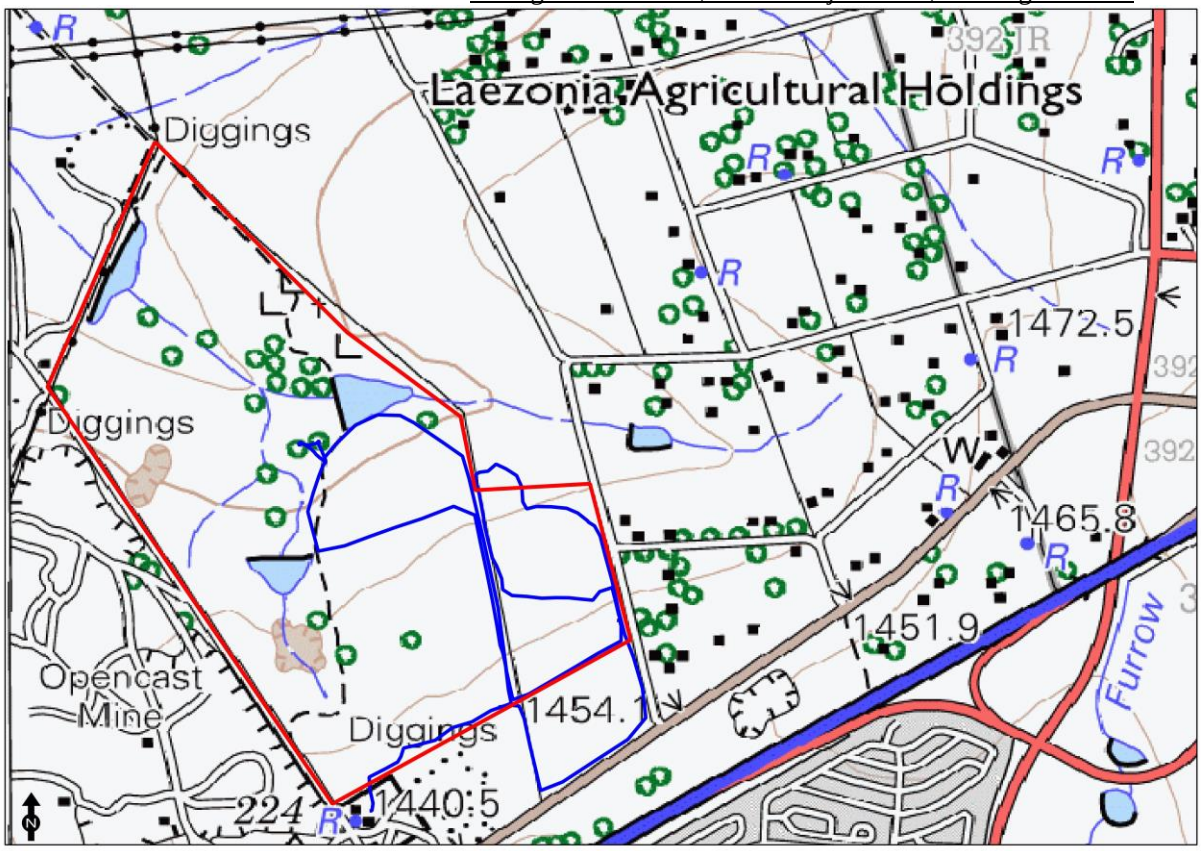

Figure 13: Recorded survey tracks for the project

6.1 Review of existing information/data

Additional information on the cultural heritage of the area was sourced from the following records:

- National Mapping Project by SAHRA (which lists heritage impact assessment reports submitted for South Africa);
- Environmental Potential Atlas (ENPAT);
- Online SAHRIS database;
- National Automated Archival Information retrieval System (NAAIRS);
- Maps and information documents supplied by the client; and
- Published and unpublished material on the area

Two major regional aerial archaeological surveys were conducted in the 1960s by archaeologists Revil Mason and JD Seddon both of which were published in 1968. Although the focal point of these surveys falls in the general area of the current survey area they also provide an indication of the type and number of sites that occur in the general region (Mason 1968 & Seddon 1968). Also note that none of the listed heritage sites on the SAHRIS system (2018) are located near the survey footprint. This is substantiated by the various heritage surveys completed by other researchers.

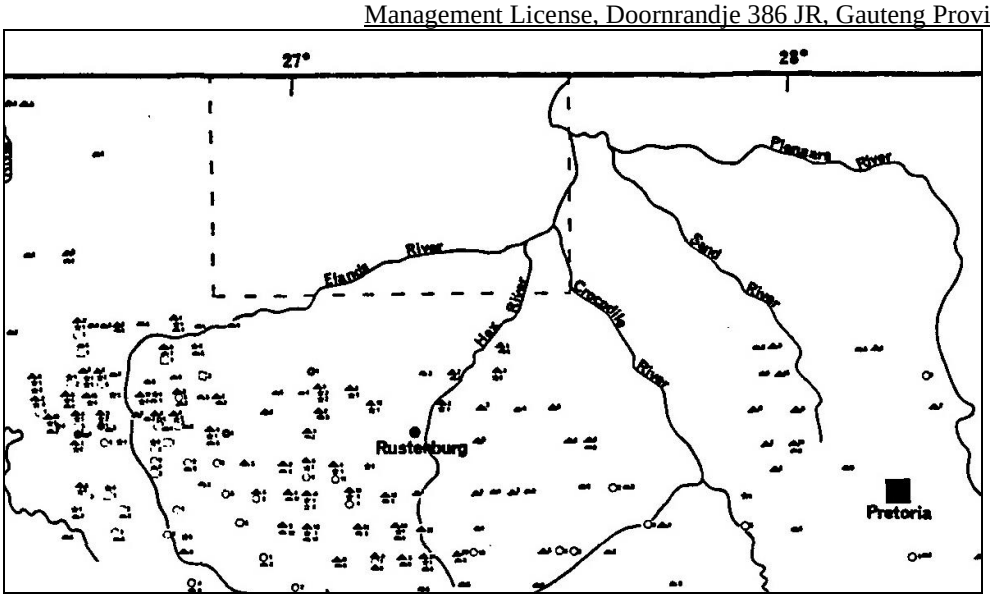

Figure 14: The location of sites recorded by Mason's aerial survey (1968)

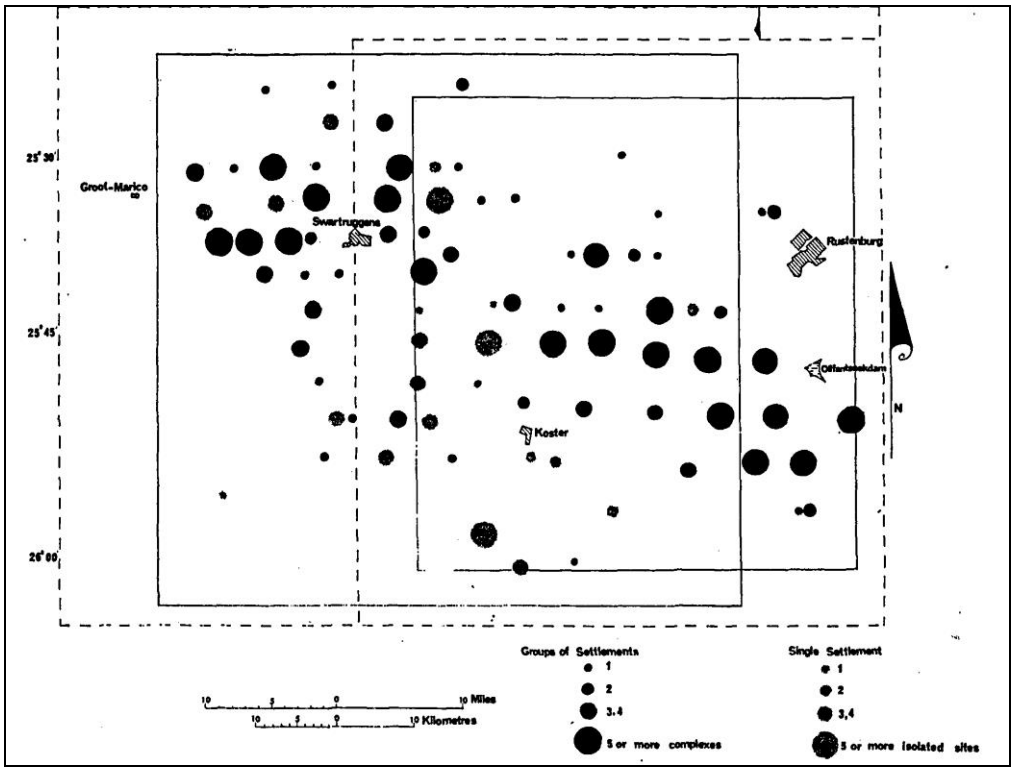

Figure 15: The location of sites recorded by Seddon's aerial survey (1968)

According to the Surveyor General's database the farm Doornrandje 386 JR was first surveyed in December 1903 and have since been subdivided into various portions. The farm was originally granted to DJJ Oosthuizen on 28 October 1859. No historical structures were recorded on the relevant section of the farm as the farm was probably used for livestock grazing (also see Addendum 3).

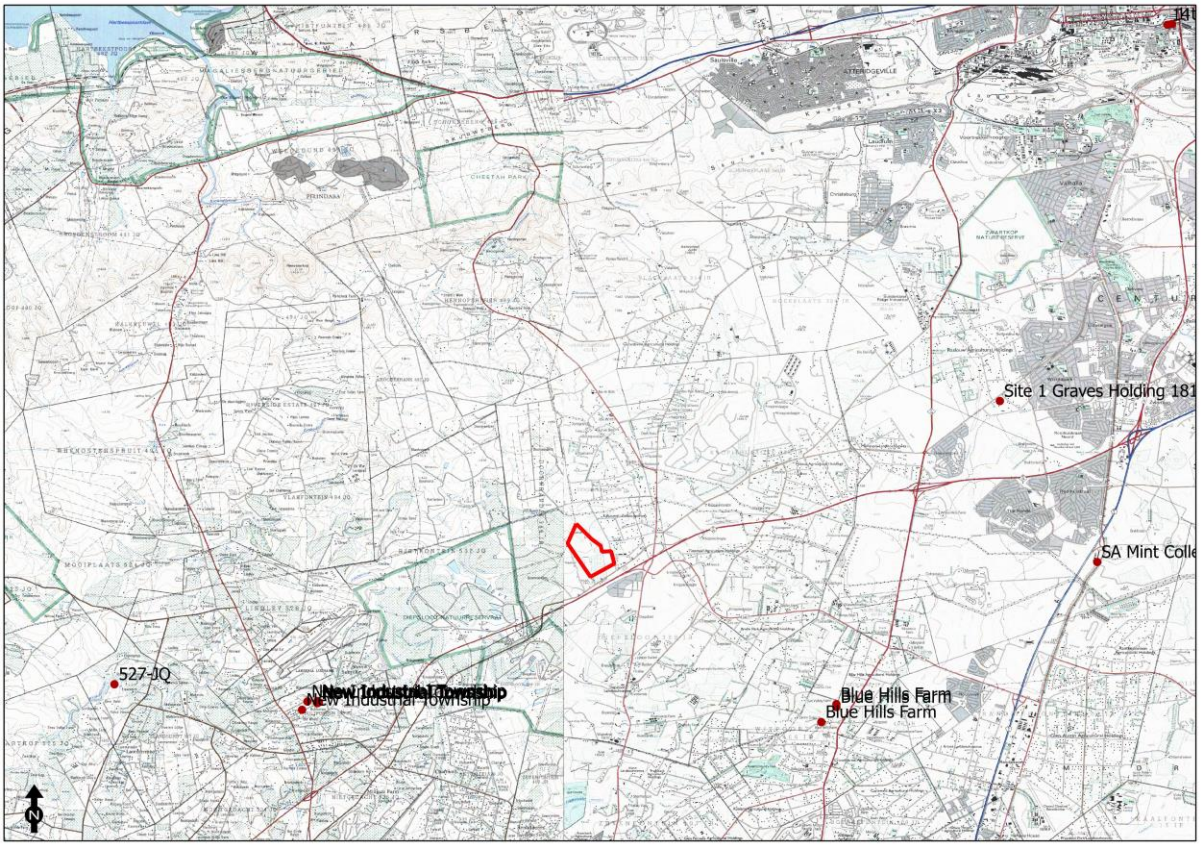

Figure 16: Recorded heritage sites near the survey footprint (SAHRIS 2018)

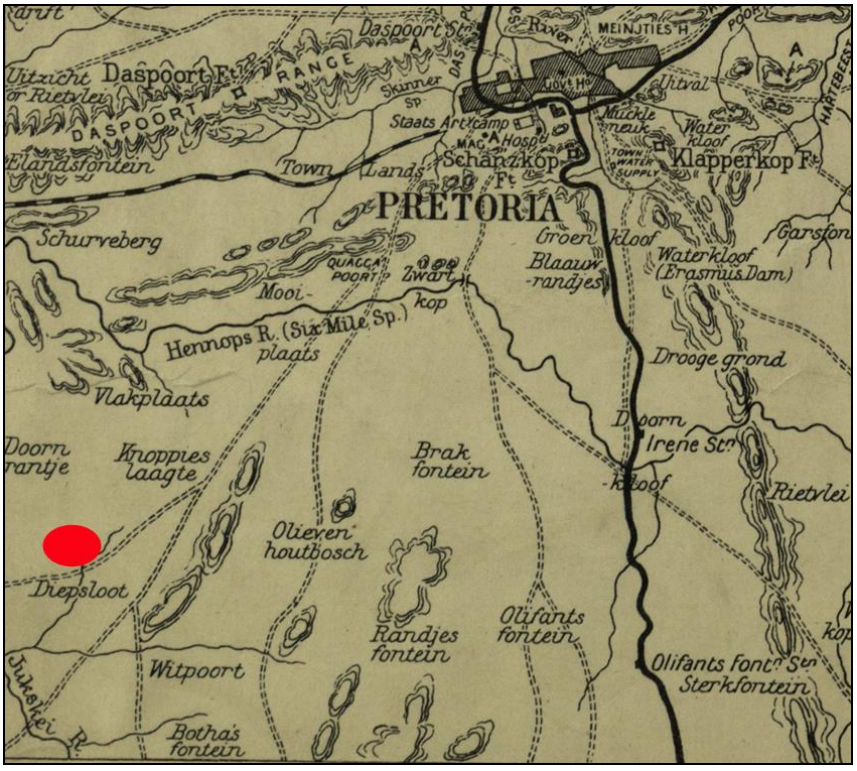

Figure 17: General view of the area in 1900 as recorded by the War Intelligence Office

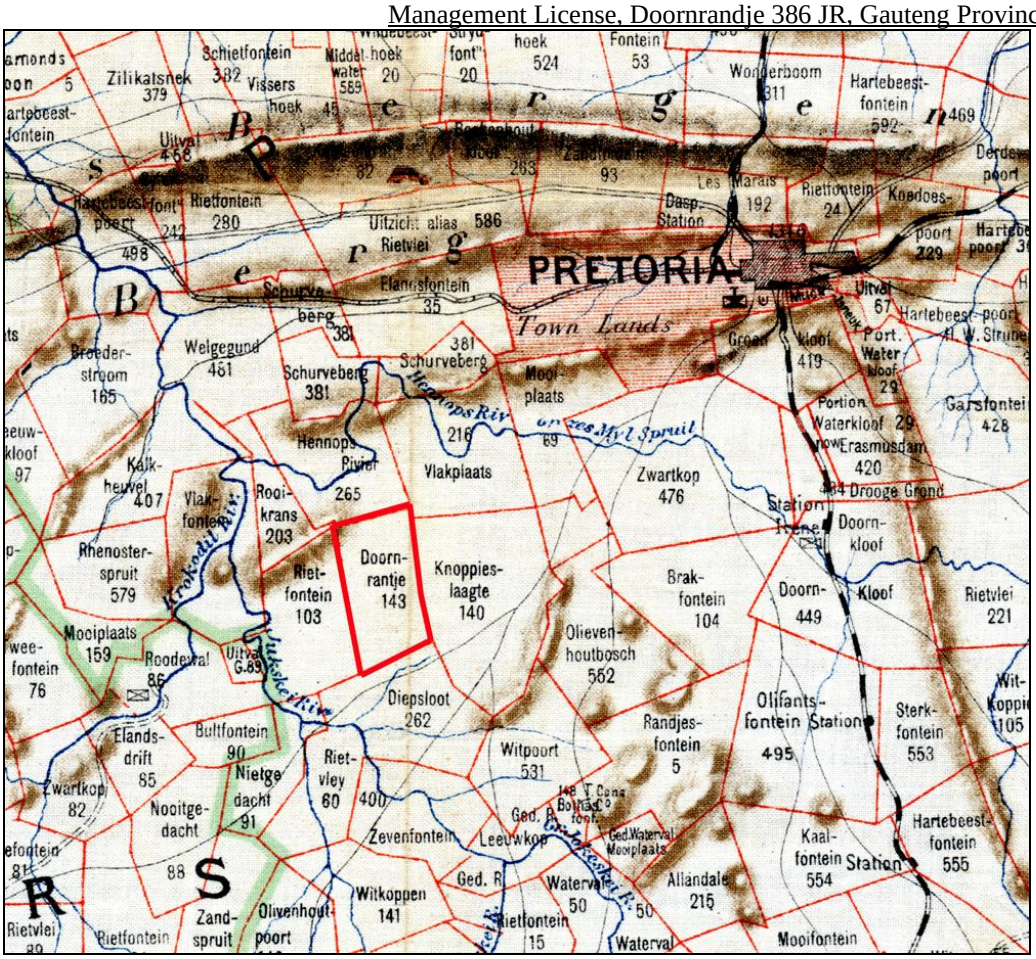

Figure 18: Jeppe's Map dating to 1899 indicates the boundaries and features of the survey footprint

6.2 Palaeontological sensitivity

The geology of the area is relatively stable and underlined by Archaean granite and gneiss of the Halfway House Granite. The SAHRIS rating for the site is insignificant/zero (grey) with a recommendation of no palaeontological remains.

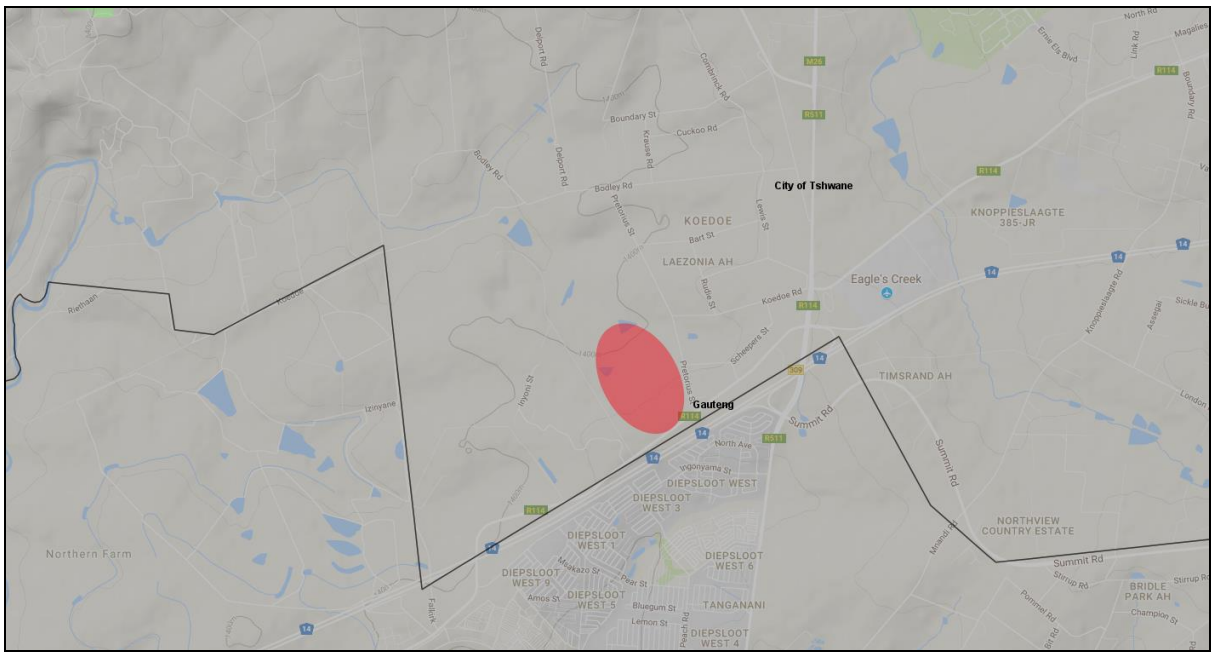

Figure 19: Palaeontological sensitivity is rated insignificant/zero (grey) as indicated on SAHRIS 2018

6.3 Site visits

The field survey was conducted on 10 November 2017.

6.4 Social interaction and current inhabitants

The mine managers were aware of the survey and were consulted on known heritage sites (including graveyards).

6.5 Public Consultation and Stakeholder Engagement

The public participation process is currently in process and will be conducted as part of the EIA process. The registration of Interested and Affected Parties is awaited.

6.6 Assumptions, restrictions, gaps and limitations

No severe physical restrictions were encountered as the survey area was fairly accessible. The survey area is however severely disturbed due to the existing mining activities and associated infrastructure.

6.7 Methodology for assessment of potential impacts

All impacts identified during the EIA stage of the study will be classified in terms of their significance. Issues were assessed in terms of the following criteria:

- The **nature**, a description of what causes the effect, what will be affected and how it will be affected;
- The **physical exten**t, wherein it is indicated whether:
    - 1 - the impact will be limited to the site;
    - 2 - the impact will be limited to the local area;
    - 3 - the impact will be limited to the region;
    - 4 - the impact will be national; or
    - 5 - the impact will be international.
- The **duration**, wherein it is indicated whether the lifetime of the impact will be:
    - 1 - of a very short duration (0–1 years);
    - 2 - of a short duration (2-5 years);
    - 3 - of a medium-term (5–15 years);
    - 4 - of a long term (> 15 years); or
    - 5 - permanent.
- The **magnitude** of impact, quantified on a scale from 0-10, where a score is assigned:
    - 0 - small and will have no effect;
    - 2 - minor and will not result in an impact;
    - 4 - low and will cause a slight impact;
    - 6 - moderate and will result in processes continuing but in a modified way;
    - 8 - high, (processes are altered to the extent that they temporarily cease); or
    - 10 - very high and results in complete destruction of patterns and permanent cessation of processes;
- The **probability** of occurrence, which describes the likelihood of the impact actually occurring and is estimated on a scale where:
    - 1 - very improbable (probably will not happen);

  - 2 - improbable (some possibility, but low likelihood);
  - 3 - probable (distinct possibility);
  - 4 - highly probable (most likely); or
  - 5 - definite (impact will occur regardless of any prevention measures);
- The **significance**, which is determined through a synthesis of the characteristics described above (refer formula below) and can be assessed as low, medium or high;
- The **status**, which is described as either positive, negative or neutral;
  - The degree to which the impact can be reversed;
  - The degree to which the impact may cause irreplaceable loss of resources; and
  - The degree to which the impact can be mitigated.

The significance is determined by combining the criteria in the following formula:

S = (E+D+M) x P; where:
S = Significance weighting
E = Extent
D = Duration
M = Magnitude
P = Probability

Points	Significance Weighting	Discussion
< 30 points	Low	Where this impact would not have a direct influence on the decision to develop in the area.
31-60 point	Medium	Where the impact could influence the decision to develop in the area unless it is effectively mitigated.
> 60 points	High	Where the impact must have an influence on the decision process to develop in the area.

7. The Cultural Heritage Sites

7.1 Isolated occurrences

Isolated occurrences are artefacts or small features recorded on the surface with no contextual information. No other associated material culture (in the form of structures or deposits) was noted that might provide any further context. This can be the result of various impacts and environmental factors such as erosion and modern developments. By contrast archaeological sites are often complex sites with evidence of archaeological deposit and various interrelated features such as complex deposits, stone walls and middens. However, these isolated occurrences are seen as remains of erstwhile complex or larger sites and they therefore provide a broad indication of possible types of sites or structures that might be expected to occur or have occurred in the survey footprint.

None were recorded during the survey.

7.2 Heritage sites

No Stone Age, Iron Age or other historical settlements, structures, features, assemblages or artefacts were recorded during the survey. One graveyard (Site 1) was recorded (which contains at least 7 graves) and is located outside the current mining areas and is fenced off.

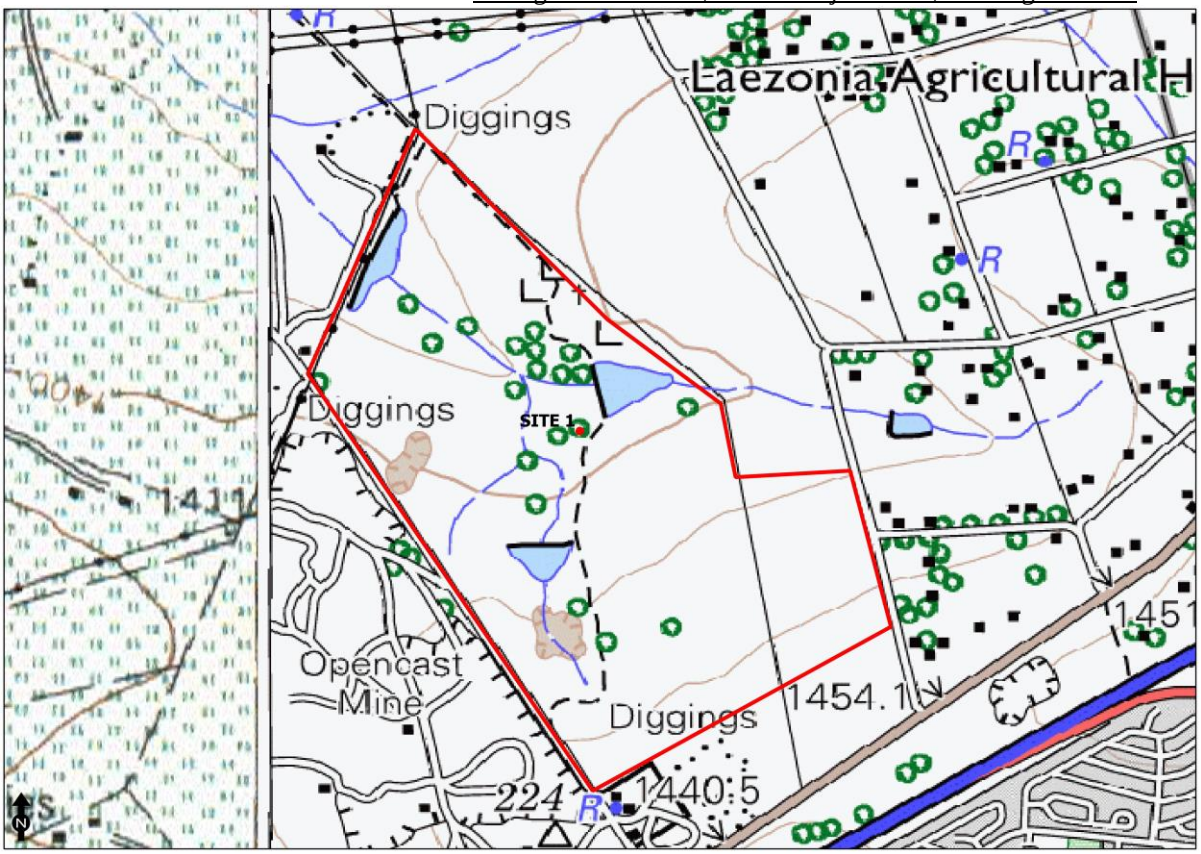

Figure 20: The location of the recorded graveyard (Site 1)

8. Locations and Evaluation of Sites

Site No	Coordinates	Site Type	Field Rating of Significance	Impact	Proposed Mitigation
1	25.910578°S 28.007346°E	Graveyard	Generally protected A: High significance	None	• Maintain a buffer zone of 50 metres during construction phase

Table 7: Location and evaluation of sites

9. Management Measures

Heritage sites are fixed features in the environment, occurring within specific spatial confines. Any impact upon them is permanent and non-reversible. Those resources that cannot be avoided and that are directly impacted by the proposed development can be excavated/recorded and a management plan can be developed for future action. Those sites that are not impacted on can be written into the management plan, whence they can be avoided or cared for in the future.

9.1 Objectives

- Protection of archaeological, historical and any other site or land considered being of cultural value within the project boundary against vandalism, destruction and theft.
- The preservation and appropriate management of new discoveries in accordance with the NHRA, should these be discovered during construction activities

The following shall apply:

- Known sites should be clearly marked in order that they can be avoided during construction activities.
- The contractors and workers should be notified that archaeological sites might be exposed during the construction activities.
- 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 heritage practitioner 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 NHRA (Act No. 25 of 1999), Section 51. (1).

9.2 Control

In order to achieve this, the following should be in place:

- A person or entity, e.g. the Environmental Control Officer, should be tasked to take responsibility for the heritage sites and should be held accountable for any damage.
- Known sites should be located and isolated, e.g. by fencing them off. All construction workers should be informed that these are no-go areas, unless accompanied by the individual or persons representing the Environmental Control Officer as identified above.
- In areas where the vegetation is threatening the heritage sites, e.g. growing trees pushing walls over, it should be removed, but only after permission for the methods proposed has been granted by SAHRA. A heritage official should be part of the team executing these measures.

10. Recommendations and Conclusions

Please note that no Stone Age, Iron Age or historical settlements, structures, features, assemblages or artefacts were recorded during the survey. However one historical graveyard (Site 1) was recorded outside the area of expansion. No impact is envisaged.

It is therefore recommended, from a cultural heritage perspective, that the Environmental Authorization (EA) and associated Waste Management License (WML) for the mining of sand may proceed.

Nature: Proposed expansion of the existing sand mining areas (Portions 209, 210 & 211)		
	Without mitigation	**With mitigation**
Pre-Operational Phase		
Probability	Very Improbable (1)	Very Improbable (1)
Duration	Very short term (1)	Very short term (1)
Extent	Limited to the site (1)	Limited to the site (1)
Magnitude	Small (0)	Small (0)
Significance of Impact	**2 (Low)**	**2 (Low)**
Status (positive or negative)	Neutral	Neutral
Operational Phase		

Probability	Very Improbable (1)	Very Improbable (1)
Duration	Permanent (5)	Permanent (5)
Extent	Limited to the site (1)	Limited to the site (1)
Magnitude	Small (0)	Small (0)
Significance of Impact	**6 (Low)**	**6 (Low)**
Status (positive or negative)	Neutral	Neutral
Reversibility	Low	Low
Irreplaceable loss of resources?	None	None
Cumulative impacts and indirect impacts	Construction and operational phase activities will result in vibrations and dust which will also indirectly affect the heritage remains.	
Can impacts be mitigated?	Yes, buffer zones are recommended (50 metres)	

Table 8: Significance of the impact

Also, please note:

Archaeological deposits usually occur below ground level. Should archaeological artefacts or skeletal material be revealed in the area during development activities, such activities should be halted, and a university or museum notified in order for an investigation and evaluation of the find(s) to take place **(*cf*. NHRA (Act No. 25 of 1999)**, Section 36 (6)).

11. References

Bergh, J.S. (ed.) 1998. *Geskiedenis Atlas van Suid-Afrika: Die Vier Noordelike Provinsies*. Pretoria: Van \Schaik Publishers

Huffman, T. N. 2007. *Handbook to the Iron Age: the Archaeology of Pre-Colonial Farming Societies in Southern Africa*. University of KZN Press: Pietermaritzburg.

Jeppe, F. 1899. Jeppe's Map of the Transvaal. London: Edward Stanford.

Lombard, M., Wadley, L., Deacon, J., Wurz, S., Parsons, I., Mohapi, M. Swart, J. & Mitchell, P. 2012. South African and Lesotho Stone Age sequence updated. *South African Archaeological Bulletin* 67: 123-44.

Mason, RJ. 1968. Transvaal and Natal Iron Age Settlement revealed by aerial photography and excavation. *African Studies.* 27(4): 167-180.

Mason, R.J. 1962. *Prehistory of the Transvaal*. Johannesburg. Witwatersrand University Press.

Mason, R.J. 1986. *The origins of black people of Johannesburg and the southern western central Transvaal, AD350 – 1880*. Johannesburg. University of the Witwatersrand Archaeological Research Unit, Occasional Paper 16.

Mucina, L. & Rutherford, M.C. 2010. The Vegetation of South Africa, Lesotho and Swaziland. *Strelitzia 19*. Pretoria: South African National Biodiversity Institute.

National Heritage Resources Act. Act no 25 of 1999. Government Printer: Pretoria.

Office of the President. 27 November 1998. National Environmental Management Act (Act No. 107 of 1998). Government Gazette Vol 401 (19519). Pretoria: Government Printer.

Ordnance Survey Office (Intelligence Division). 1900. Transvaal and Orange Free State: Pretoria. War Office No. 1367. Southampton: War Office.

SAHRA, 2005. Minimum Standards for the Archaeological and the Palaeontological Components of Impact Assessment Reports, Draft version 1.4.

SAHRIS Website: www.sahra.org.za (accessed January 2015)

Seddon, JD. 1968. An aerial survey of settlement and living patterns in the Transvaal Iron Age: preliminary report. *African Studies.* 27: 189-194

South African Heritage Resources Agency (SAHRA). Report Mapping Project. Version 1.0, 2009

Transvaal Native Affairs Department (TNAD). 1968. *Short History of the Native Tribes of the Transvaal*. Pretoria: The State Library.

Other Sources

Google Earth Pro 2018 (Images: January 2018)

http://samilitaryhistory.org (Accessed: January 2018)

National Archives (NAAIRS) (Accessed January 2018)

SA Explorer http://www.saexplorer.co.za/south-africa/climate/brits_climate.asp (Accessed January 2018)

Addendum 1: Archaeological and Historical Sequence

The table provides a general overview of the chronological sequence of the archaeological periods in South Africa.

PERIOD	APPROXIMATE DATES
Earlier Stone Age	more than 2 million years ago to >200 000 years ago
Middle Stone Age	<300 000 years ago to >20 000 years ago
Later Stone Age (Includes hunter-gatherer rock art)	<40 000 years ago up to historical times in certain areas
Early Iron Age	c. AD 200 - c. AD 900
Middle Iron Age	c. AD 900 – c. AD 1300
Late Iron Age (Stonewalled sites)	c. AD 1300 - c. AD 1840 (c. AD 1640 - c. AD 1840)

< = less than; > = greater than

Archaeological Context

Stone Age Sequence

Concentrations of Early Stone Age (ESA) sites are usually present on the flood-plains of perennial rivers and may date to over 2 million years ago. These ESA open sites may contain scatters of stone tools and manufacturing debris and secondly, large concentrated deposits ranging from pebble tool choppers to core tools such as handaxes and cleavers. The earliest hominins who made these stone tools, probably not always actively hunted, instead relying on the opportunistic scavenging of meat from carnivore fill sites.

Middle Stone Age (MSA) sites also occur on flood plains, but are also associated with caves and rock shelters (overhangs). Sites usually consist of large concentrations of knapped stone flakes such as scrapers, points and blades and associated manufacturing debris. Tools may have been hafted but organic materials, such as those used in hafting, seldom preserve. Limited drive-hunting activities are also associated with this period.

Sites dating to the Later Stone Age (LSA) are better preserved in rock shelters, although open sites with scatters of mainly stone tools can occur. Well-protected deposits in shelters allow for stable conditions that result in the preservation of organic materials such as wood, bone, hearths, ostrich eggshell beads and even bedding material. By using San (Bushman) ethnographic data a better understanding of this period is possible. South African rock art is also associated with the LSA.

The following chronological sequence was recently established by prominent Stone Age archaeologists (Lombard et al 2012):

Later Stone Age

- Age Range: recent to 20-40 thousand years ago

- General characteristics: expect variability between assemblages, a wide range of formal tools, particularly scrapers (microlithic and macrolithic), backed artefacts, evidence of hafted stone and bone tools, borers, bored stones, upper and lower grindstones, grooved stones, ostrich eggshell (OES) beads and other orna ments, undecorated/decorated OES fragments, flasks/flask fragments, bone tools (sometimes with decoration), fishing equipment, rock art, and ceramics in the final phase.

    - **Ceramic or Final Later Stone Age**
        - Generally < 2 thousand years ago
        - MIS 1
        - Contemporaneous with, and broadly similar to, final Later Stone Age, but includes ceramics
        - Economy may be associated with hunter-gatherers or herders

      Technological characteristics
        - Stone tool assemblages are often microlithic
        - In some areas they are dominated by long end scrapers and few backed microliths; in others formal tools are absent or rare
        - Grindstones are common, ground stone artefacts, stone bowls and boat-shaped grinding grooves may occur
        - Includes grit- or grass-tempered pottery
        - Ceramics can be coarse, or well-fired and thin-walled; some times with lugs, spouts and conical bases; sometimes with decoration; sometimes shaped as bowls
        - Ochre is common
        - Ostrich eggshell (OES) is common
        - Metal objects, glass beads and glass artefacts also occur

    - **Final Later Stone Age**
        - 100 – 4000 years ago
        - MIS 1
        - Hunter-gatherer economy

      Technological characteristics
        - Much variability can be expected
        - Variants include macrolithic (similar to Smithfield [Sampson 1974]) and/or microlithic (similar to Wilton) assemblages
        - Assemblages are mostly informal (Smithfield)
        - Often characterised by large untrimmed flakes (Smithfield)
        - Sometimes microlithic with scrapers, blades and bladelets, backed tools and adzes (Wilton-like)
        - Worked bone is common
        - OES is common
        - Ochre is common
        - Iron objects are rare
        - Ceramics are absent

    - **Wilton**
        - 4000 – 8000 years ago
        - MIS 1

- At some sites continues into the final Later Stone Age as regional variants (e.g. Wilton Large Rock Shelter and Cave James)

Technological characteristics

- Fully developed microlithic tradition with numerous formal tools
- Highly standardised backed microliths and small convex scrapers (for definition
- of standardisation see Eerkens & Bettinger 2001)
- OES is common
- Ochre is common
- Bone, shell and wooden artefacts occur

- **Oakhurst**
  - 7000 – 12 000 years ago
  - MIS 1
  - Includes Albany, Lockshoek and Kuruman as regional variants

Technological characteristics

- Flake based industry
- Characterised by round, end, and D-shaped scrapers and adzes
- Wide range of polished bone tools
- Few or no microliths

- **Robberg**
  - 12 000 to 18 000 years ago
  - MIS 2

Technological characteristics

- Characterised by systematic bladelet (<26mm) production and the occurance of outils ecailles or scaled pieces
- Significant numbers of unretouched bladelets and bladelet cores
- Few formal tools
- Some sites have significant macrolithic elements

- **Early Late Stone Age**
  - 18 000 – 40 000 years ago
  - MIS 2-3
  - Informal designation
  - Also known as transitional MSA-LSA
  - Overlapping in time with final Middle Stone Age

Technological Characteristics

- Characterised by unstandardised, often microlithic, pieces and includes the bipolar technique
- Described at some sites, but not always clear whether assemblages represent a real archaeological phase or a mixture of LSA/MSA artefacts

Middle Stone Age

- Age Range: 20 000 – 30 000 years ago

- General characteristics: Levallois or prepared core techniques (for definitions see Van Peer 1992; Boeda 1995; Pleurdeau 2005) occur in which triangular flakes with convergent dorsal scars, often with faceted striking platforms, are produced. Discoidal systems (for definition see Inizan et al. 1999) and intentional blade production from volumetric cores (for definition see Pleurdeau 2005) also occur; formal tools may include unifacially and bifacially retouched points, backed artefacts, scrapers, and denticulates (for definition see Bisson 2000); evidence of hafted tools; occasionally includes marine shell beads, bone points, engraved ochre nodules, engraved OES fragments, engraved bone fragments, and grindstones.
- In the sequence below we highlight differences or characteristics that may be used to refine interpretations depending on context.

- **Final Middle Stone Age**
  - 20 000 – 40 000 years ago
  - MIS 3
  - Informal designation partly based on the Sibudu sequence

Technological characteristics
- Characterised by high regional variability that may include, e.g. bifacial tools, bifacially retouched points, hollow-based points
- Triangular flake and blade industries (similar to Strathalan and Melikane)
- Small bifacial and unifacial points (similar to Sibudu and Rose Cottage Cave)
- Sibudu point characteristics: short, stout, lighter in mass com pared to points from the Sibudu technocomplex, but heavier than those from the Still Bay
- Can be microlithic
- Can include bipolar technology
- Could include backed geometric shapes such as segments, as well as side scrapers

Sibudu
- 45 000 – 58 000 years ago
- MIS 3
- Previously published as informal late Middle Stone Age and post-Howieson's Poort at Sibudu
- Formerly known post-Howieson's Poort, MSA 3 generally, and MSA III at Klasies River

Technological characteristics
- Most points are produced using Levallois technique
- Most formal retouch aimed at producing unifacial points
- Sibudu unifacial point (type fossil) characteristics: faceted platform; shape is somewhat elongated with a mean length of 43.9 mm), a mean breadth of 26.8 mm and mean thickness of 8.8 mm (L/B ratio 1.7); their mean mass is 11.8 g (Mohapi, 2012)
- Some plain butts
- Rare bifacially retouched points
- Some side scrapers are present
- Backed pieces are rare

- **Howieson’s Poort**
- 58 000 – 66 000 years ago
- MIS 3-4

Technological characteristics

- Characterised by blade technology
- Includes small (<4 cm) backed tools, e.g. segments, scrapers, trapezes and backed blades
- Some denticulate blades
- Pointed forms are rare or absent

- **Still Bay**
  - 70 000 – 77 000 years ago
  - MIS 4-5a

Technological characteristics

- Characterised by thin (<10 mm), bifacially worked foliate or lanceolate points
- Semi-circular or wide-angled pointed butts
- Could include blades and finely serrated points (Lombard et al. 2010)

- **Pre-Still Bay**
  - 72 000 – 96 000 years ago
  - MIS 4-5

Technological characteristics

- Characteristics currently being determined / studied

- **Mossel Bay**
  - 77 000 to —105 000 years ago
  - MIS 5a-4
  - Also known as MSA II at Klasies River or MSA 2b generally

Technological characteristics

- Characterised by recurrent unipolar Levallois point and blade reduction
- Products have straight profiles; percussion bulbs are prominent and often splintered or ring-cracked
- Formal retouch is infrequent and restricted to sharpening the tip orshaping the butt

- **Klasies River**
  - 105 000 to —130 000 years ago
  - MIS 5d-5e
  - Also referred to as MSA I at Klasies River or MSA 2a generally

Technological characteristics

- Recurrent blade and convergent flake production
- End products are elongated and relatively thin, often with curved profiles
- Platforms are often small with diffused bulbs
- Low frequencies of retouch
- Denticulate pieces

- **Early Middle Stone Age**
  - Suggested age MIS 6 to MIS 8 (130 000 to —300 000 years ago)
  - Informal designation

Technological characteristics

- This phase needs future clarification regarding the designation of cultural material and sequencing
- Includes discoidal and Levallois flake technologies, blades from volumetric cores and a generalised toolkit

- **Earlier Stone Age**
  - Age range: >200 000 to 2 000 000 years ago
  - General characteristics: early stages include simple flakes struck from cobbles, core and pebble tools; later stages include intentionally shaped handaxes, cleavers and picks; final or transitional stages have tools that are smaller than the preceding stages and include large blades.
  - In the sequence below we highlight differences or characteristics that may be used to refine interpretations depending on context.

- **ESA-MSA transition**
- 200 to —600 thousand years ago
- MIS 7-15

Technological characteristics

- Described at some sites as Fauresmith or Sangoan
- Relationships, descriptions, issues of mixing and ages yet to be clarified
- Fauresmith assemblages have large blades, points, Levallois technology, and the remaining ESA components have small bifaces
- The Sangoan contains small bifaces (<100 mm), picks, heavy and light-duty denticulated and notched scrapers
- The Sangoan is less well described than the Fauresmith

- **Acheulean**
  - 300 thousand to —1.5 million years ago
  - MIS 8-50

Technological characteristics

- Bifacially worked handaxes and cleavers, large flakes > 10 cm
- Some flakes with deliberate retouch, sometimes classifiedas scrapers
- Gives impression of being deliberately shaped, but could indicate result of knapping strategy
- Sometimes shows core preparation
- Generally found in disturbed open-air locations

- **Oldowan**
  - 1.5 to >2 million years ago
  - MIS 50-75

Technological characteristics

- Cobble, core or flake tools with little retouch and no flaking to predetermined patterns
- Hammerstones, manuports, cores
- Polished bone fragments/tools

Iron Age Sequence

In the northern regions of South Africa at least three settlement phases have been distinguished for early prehistoric agropastoralist settlements during the **Early Iron Age** (EIA). Diagnostic pottery assemblages can be used to infer group identities and to trace movements across the landscape. The first phase of the Early Iron Age, known as **Happy Rest** (named after the site where the ceramics were first identified), is representative of the Western Stream of migrations, and dates to AD 400 - AD 600. The second phase of **Diamant** is dated to AD 600 - AD 900 and was first recognized at the eponymous site of Diamant in the western Waterberg. The third phase, characterised by herringbone-decorated pottery of the **Eiland** tradition, is regarded as the final expression of the Early Iron Age (EIA) and occurs over large parts of the North West Province, Northern Province, Gauteng and Mpumalanga. This phase has been dated to about AD 900 - AD 1200. These sites are usually located on low-lying spurs close to water.

The **Late Iron Age** (LIA) settlements are characterised by sites without stone walls (Early Moloko settlements such as Icon (AD 1350 – 1500) and stone-walled sites such as Madikwe (AD 1500 – 1700) and Buispoort (AD 1700 – 1800) situated on defensive hilltops. This occupation phase has been linked to the arrival of ancestral Tswana speakers and in the northern regions of South Africa with associated sites dating between the sixteenth and seventeenth centuries AD. The terminal LIA is represented by late 18th/early 19th century settlements with multichrome Moloko pottery commonly attributed to the Sotho-Tswana. These settlements can in many instances be correlated with oral traditions on population movements during which African farming communities sought refuge in mountainous regions during the processes of disruption in the northern interior of South Africa, resulting from the so-called *difaqane* (or m*fecane*).

Most of the archaeological sites occurring in the region are dated to the later (stone walled) phase of the Late Iron Age (c. AD 1640 - AD 1830s) also known as the Late Moloko. These sites all conform to a general settlement layout that forms part of a certain worldview. As such, the livestock enclosures are situated in the central area of a settlement. The court (kgotla) is also located in this central area and is associated with men (men are usually also buried here). The surrounding scalloped walling is where the houses are situated and is associated with women. This type of settlement layout is generally known as the Central Cattle Pattern (CCP).

Addendum 2: Description of the Recorded Sites

A system for grading the significance of heritage sites was established by the NHRA (Act No. 25 of 1999) and further developed by the South African Heritage Resources Agency (SAHRA 2007) and has been approved by ASAPA for use in southern Africa and was utilised during this assessment.

Site 1

A. GENERAL SITE DESCRIPTION			
Site type	Historical Grave		
Site Period	Late 19th , early 20th centuries		
Physical description	The site comprises a graveyard which contains at least seven graves. All the graves are indicated with a headstone (both granite and soapstone) although some have some damaged and/or moved. The orientation of the graves is east-west with the headstone on the western side. The following inscriptions were recoded: • Johan Christian Gert Coetzee (Born: 19/02/1894; Died: 10/09/1901) • Catharina Elizabeth Coetzee (Born: 23/08/1895; Died: 13/09/1901) • Susann Catharina Coetzee (nee Pretorius) (Born: 2/8/1864; Died: 10/05/1959) • Martha Elizabeth Coetzee (Born: 3/07/1898; Died: 22/08/1898) • Daniel Benjamin Coetzee (Born: 1884; Died: 23/05/1934) Please note that unmarked graves are by default regarded as older than 60 years and are therefore protected by the NHRA (Act No 25 of 1999, Section 36).		
Integrity of deposits or structures	Stable and fenced off		
Site extent	Approximately 20 x 20 metres		
B. SITE EVALUATION			
B1. HERITAGE VALUE		**Yes**	**No**
Historic Value			
It has importance to the community or pattern of South Africa's history or precolonial history.			X
It has strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa.			X
It has significance relating to the history of slavery in South Africa.			X
Aesthetic Value			
It has importance in exhibiting particular aesthetic characteristics valued by a particular community or cultural group.			X
Scientific Value			
It has potential to yield information that will contribute to an understanding of South Africa's natural and cultural heritage.			X
It has importance in demonstrating a high degree of creative or technical achievement at a particular period.			X
It has importance to the wider understanding of the temporal change of cultural landscapes, settlement patterns and human occupation.		X	
Social Value			
It has strong or special association with a particular community or cultural group for social, cultural or spiritual reasons (sense of place).		X	
Tourism Value			
It has significance through its contribution towards the promotion of a local sociocultural identity and can be developed as tourist destination.			X
Rarity Value			
It possesses unique, uncommon, rare or endangered aspects of South Africa's natural or cultural heritage.			X
Representative Value			
It is importance in demonstrating the principle characteristics of a particular class of South Africa's natural or cultural places or objects.			X
B2. REGIONAL CONTEXT			

Other similar sites in the regional landscape.			X
C. SPHERE OF SIGNIFICANCE	**High**	**Medium**	**Low**
International			X
National			X
Provincial		X	
Local	X		
Specific community	X		
D. FIELD REGISTER RATING			
National/Grade 1 [should be registered, retained]			
Provincial/Grade 2 [should be registered, retained]			
Local/Grade 3A [should be registered, mitigation not advised]			
Local/Grade 3B [High significance; mitigation, partly retained]			
Generally Protected A [High/Medium significance, mitigation]			X
Generally protected B [Medium significance, to be recorded]			
Generally Protected C [Low significance, no further action]			
E. GENERAL STATEMENT OF SITE SIGNIFICANCE			
Low			
Medium			
High			X
F. RATING OF POTENTIAL IMPACT OF DEVELOPMENT			
None			X
Peripheral			
Destruction			
Uncertain			

G. RECOMMENDED MITIGATION

- Maintain a buffer zone of 50 metres during mining phase

H. APPLICABLE LEGISLATION AND LEGAL REQUIREMENTS

- National Heritage Resources Act (Act No. 25 of 1999, Section 36)
- Regulations Relating to the Management of Human Remains, in terms of the National Health Act No. 61 of 2003
- Removal of Graves and Dead Bodies Ordinance (Ordinance No. 7 of 1925)
- Ordinance on Exhumations (Ordinance No. 12 of 1980)
- Local and regional provisions, laws and by-laws

I. PHOTOGRAPHS

Figure 21: General view of the graveyard

Addendum 3: Surveyor General Farm Diagram

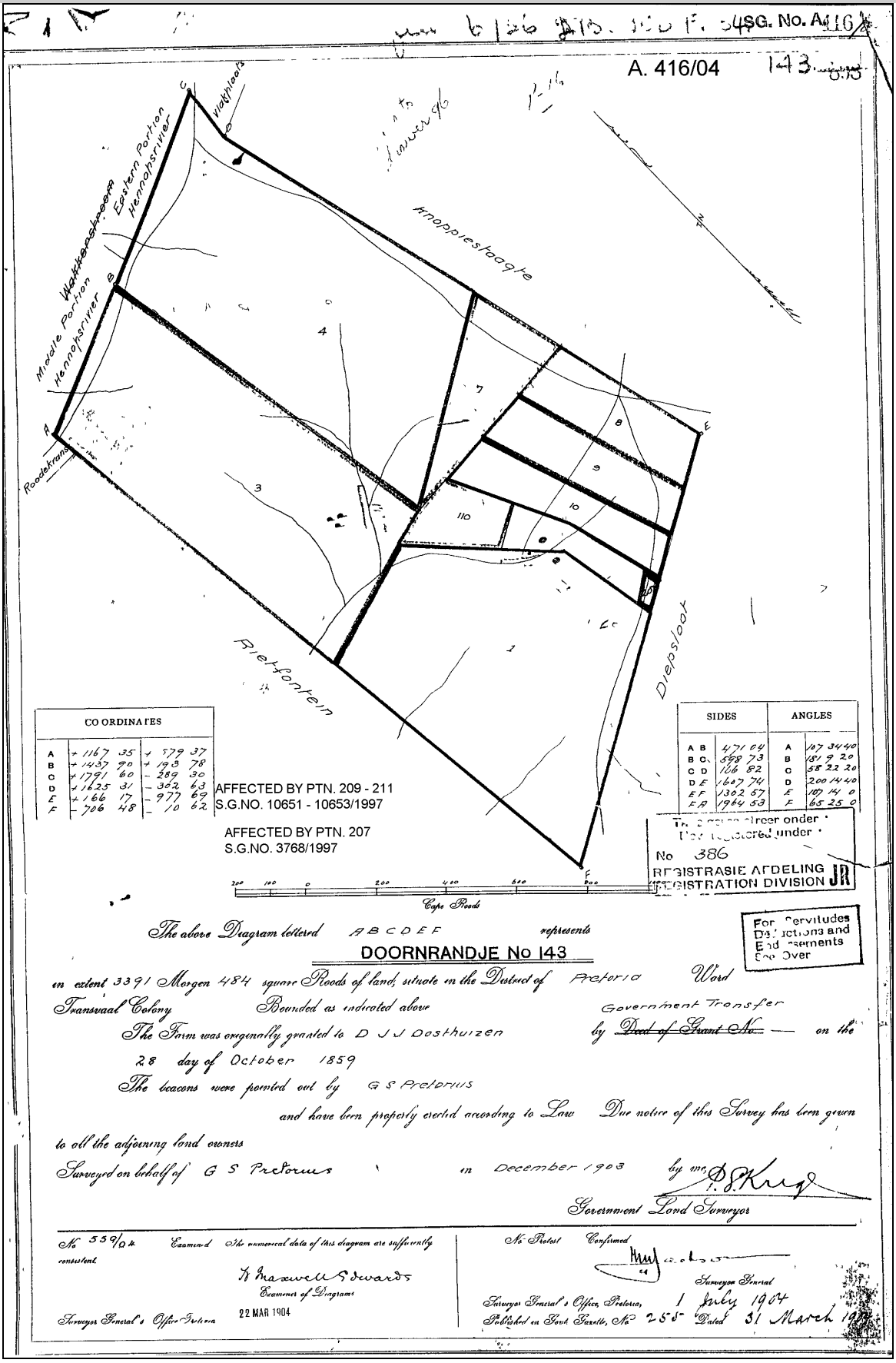

Figure 22: Surveyor General's sketch of the farm Doornrandje 386 JR which was first surveyed in 1903

Addendum 4: Relocation of Graves

Marked graves younger than 60 years do not fall under the protection of the NHRA (Act No. 25 of 1999) with the result that exhumation, relocation and reburial can be conducted by an undertaker. This will include logistical aspects such as social consultation, purchasing of plots in cemeteries, procurement of coffins, etc. Other legislative measures which may be pertinent include the Removal of Graves and Dead Bodies Ordinance (Ordinance No. 7 of 1925), Regulations Relating to the Management of Human Remains (GNR 363 of 22 May 2013) made in terms of the National Health Act No. 61 of 2003, Ordinance on Exhumations (Ordinance No. 12 of 1980) as well as any local and regional provisions, laws and by-laws that may be in place.

Marked graves older than 60 years are protected by the NHRA (Act No. 25 of 1999) an as a result an archaeologist must be in attendance to assist with the exhumation and documentation of the graves. Note that unmarked graves are by default regarded as older than 60 years and therefore also falls under the NHRA (Act No. 25 of 1999, Section 36).

The relocation of graves entails the following procedure:

- Notices of intent to relocate the graves must be put up at the burial site for a period of 60 days. This should contain contact information where communities and family members can register as interested and affected parties. All information pertaining to the identification of the graves must be documented for the application of a SAHRA permit. All notices must be in at least 3 languages, of which English is one. This is a requirement by law.
- These notices of intention must also be placed in at least two local newspapers and have the same information as above.
- Local radio stations can also be used to try contact family members. This is not required by law, but can be helpful.
- During this time (60 days) a suitable cemetery must be identified near to the development or otherwise one specified by the family of the deceased.
- An open day for family members should be arranged after the period of 60 days so that they can gather to discuss the way forward, and to sort out any problems. The developer needs to take the families requirements into account.
- Once the 60 days have passed and all the information from the family members have been received, a permit can be requested from SAHRA. This is a requirement by law.
- Once the permit has been issued, the graves may be exhumed and relocated.
- All headstones must be relocated with the graves as well as any remains and any additional objects found in the grave.

Information needed for the SAHRA permit application

- The permit application must be done by an archaeologist.
- A map of the area where the graves have been located.
- A survey report of the area prepared by an archaeologist.
- All the information on the families that have identified graves.
- A letter of permission from the landowner granting permission to the developer to exhume and relocate the graves.

- A letter (or proof of purchase of the plots) from the new cemetery confirming that the graves will be reburied there.
- Details of the farm name and number, magisterial district and GPS coordinates of the gravesite.

Graves are generally be classified into four categories. These are:

- Graves younger than 60 years;
- Graves older than 60 years, but younger than 100 years;
- Graves older than 100 years; and
- Graves of victims of conflict or of individuals of royal descent.