HERITAGE IMPACT ASSESSMENT

(REQUIRED UNDER SECTION 38(8) OF THE NHRA (No. 25 OF 1999)

FOR THE PROPOSED ESTABLISHMENT OF A MIXED-USE RESIDENTIAL TOWNSHIP ON THE REMAINDER OF PORTION 62 OF THE FARM WITPOORTJIE 117 IR IN BRAKPAN KNOWN AS HELDERWYK WITHIN THE CITY OF EKURHULENI, GAUTENG PROVINCE

Type of development:

Township Development

Client:

Leap

Client info:

Candy Mahlangu

E – mail: env@leapenviro.co.za

Developer: Purple Moss 19 (Pty) Ltd

HCAC - Heritage Consultants

Private Bag X 1049

Suite 34

Modimolle

0510

Tel: 082 373 8491

Fax: 086 691 6461

E-Mail: jaco.heritage@gmail.com

Report Author:

Mr. J. van der Walt

Project Reference:

HCAC Project number 2181002

Report date:

October 2018

APPROVAL PAGE

Project Name	**Helderwyk Township**
Report Title	Heritage Impact Assessment Helderwyk Township
Authority Reference Number	TBC
Report Status	Draft Report
Applicant Name	Purple Moss 19 (Pty) Ltd

	Name	**Qualification**	**Date**
Archaeologist	Mr. J. van der Walt	MA Archaeology	Oct 2018
Archaeologist	Ruan van der Merwe	BA Hons Archaeology	Oct 2018
Archival Specialist	Liesl Bester	BHCS Honours	Oct 2018

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Date	Report Reference Number	Description of Amendment

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REPORT OUTLINE

Appendix 6 of the GNR 326 EIA Regulations published on 7 April 2017 provides the requirements for specialist reports undertaken as part of the environmental authorisation process. In line with this, Table 1 provides an overview of Appendix 6 together with information on how these requirements have been met.

Table 1. Specialist Report Requirements.

Requirement from Appendix 6 of GN 326 EIA Regulation 2017	Chapter
(a) Details of - (i) the specialist who prepared the report; and (ii) the expertise of that specialist to compile a specialist report including a curriculum vitae	Section a Section 12
(b) Declaration that the specialist is independent in a form as may be specified by the competent authority	*Declaration of Independence*
(c) Indication of the scope of, and the purpose for which, the report was prepared	Section 1
(cA)an indication of the quality and age of base data used for the specialist report	Section 3.4 and 7.1.
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	9
(d) Duration, Date and season of the site investigation and the relevance of the season to the outcome of the assessment	Section 3.4
(e) Description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used	Section 3
(f) details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives;	Section 8 and 9
(g) Identification of any areas to be avoided, including buffers	Section 8 and 9
(h) Map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers	Section 8
(I) Description of any assumptions made and any uncertainties or gaps in knowledge	Section 3.7
(j) a description of the findings and potential implications of such findings on the impact of the proposed activity **including identified alternatives on the environment** or activities;	Section 9
(k) Mitigation measures for inclusion in the EMPr	Section 9
(I) Conditions for inclusion in the environmental authorisation	Section 9
(m) Monitoring requirements for inclusion in the EMPr or environmental authorisation	Section 9
(n) Reasoned opinion - (i) as to whether the proposed activity, activities or portions thereof should be authorised; (iA) regarding the acceptability of the proposed activity or activities; and (ii) if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan	Section 9.2
(o) Description of any consultation process that was undertaken during the course of preparing the specialist report	Section 6
(p) A summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	Refer to EIA report
(q) Any other information requested by the competent authority	Section 10

Executive Summary

Purple Moss 19 (Pty) Ltd appointed Leap Environmental to conduct an Environmental Impact Assessment for the proposed establishment of a mixed-use residential township on the Remainder of Portion 62 of the Farm Witpoortjie 117 IR in Brakpan known as Helderwyk within the City of Ekurhuleni, Gauteng Province**.**

HCAC was appointed to conduct a Heritage Impact Assessment to determine the presence of cultural heritage sites and the impact of the proposed development on these non-renewable resources. The study area was assessed both on desktop level and by a field survey. The field survey was conducted as a non-intrusive pedestrian survey to cover the extent of the Remainder of Portion 62 as development plans are not available at this stage.

During the survey 11 features, consisting of Stone tools and historical industrial artefacts, a ruin as well as a large cemetery and stone cairns (that could mark informal graves) were identified. No public monuments are located within or close to the study area. The surrounding area has been developed and the proposed project is in line with the surrounding land use and will not impact negatively on significant cultural landscapes or viewscapes. During the public participation process conducted for the project no heritage concerns was raised.

The impacts on heritage resources can be mitigated to an acceptable level and it is recommended that the proposed project can commence on the condition that the site-specific recommendations made in Table 2 of this report are implemented as part of the EMPr and based on approval from SAHRA together with the recommendations below:

- Implementation of a chance find procedure.
- An independent paleontological assessment should be conducted prior to development.

Table 2. Site specific recommendations

Site No.	Description	Mitigation
Witp 1	Small Dry pan with Stone Age Artefacts	Retain Stone Age Artefacts *in situ*
Witp 2	Two circular features with sandstone blocks, carved sandstone, slag, metal and blowpipe elements.	Assessment by an industrial archaeologist prior to construction.
Witp 3	More circular sandstone features containing metal, slag and blowpipe features. Linear sandstone wall foundations.	Assessment by an industrial archaeologist prior to construction.
Witp 4	Thicket of eucalyptus trees containing more carved sandstone blocks, blowpipe elements, slag and metal artefacts.	Assessment by an industrial archaeologist prior to construction.
Witp 5	Large dry pan towards the centre of the survey area with multiple locations where stone cores, tools and flakes were identified.	Retain Stone Age Artefacts *in situ*
Witp 6	Stone tools found near the side of a gravel road on the edge of a smaller pan.	Retain Stone Age Artefacts *in situ*
Witp 7	Graveyard containing 50+ graves	Graves should be retained *in situ* if this is not possible as a last resort the graves can be relocated adhering to legal requirements
Witp 8	Rock outcrop with LSA	Retain Stone Age Artefacts *in situ*

Witp 9	Stone cairns X3	It should be confirmed whether the stone cairns identified represent graves. If the features are confirmed to be graves the graves should be retained *in situ*. If the features relate to clearing activities they are of no importance and no further action is required.
Witp 10	Ruin	No mitigation is required; however, the site should be monitored during construction as sites like these are known to contain unmarked graves.
Witp 11	Stone Cairns X 5	It should be confirmed whether the stone cairns identified represent graves. If the features are confirmed to be graves the graves should be retained *in situ*. If the features relate to clearing activities they are of no importance and no further action is required.

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Declaration of Independence

Specialist Name	Jaco van der Walt
Declaration of Independence	I declare, as a specialist appointed in terms of the National Environmental Management Act (Act No 108 of 1998) and the associated 2014 Environmental Impact Assessment (EIA) Regulations, that I: • I act as the independent specialist in this application; • I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant; • I declare that there are no circumstances that may compromise my objectivity in performing such work; • I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity; • I will comply with the Act, Regulations and all other applicable legislation; • I have no, and will not engage in, conflicting interests in the undertaking of the activity; • I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority; • All the particulars furnished by me in this form are true and correct; and • I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.
Signature	
Date	24/11/2018

a) Expertise of the specialist

Jaco van der Walt has been practising as a CRM archaeologist for 15 years. He obtained an MA degree in Archaeology from the University of the Witwatersrand focussing on the Iron Age in 2012 and is a PhD candidate at the University of Johannesburg focussing on Stone Age Archaeology with specific interest in the Middle Stone Age (MSA) and Later Stone Age (LSA). Jaco is an accredited member of ASAPA (#159) and have conducted more than 500 impact assessments in Limpopo, Mpumalanga, North West, Free State, Gauteng, KZN as well as he Northern and Eastern Cape Provinces in South Africa.

Jaco has worked on various international projects in Zimbabwe, Botswana, Mozambique, Lesotho, DRC Zambia and Tanzania. Through this he has a sound understanding of the IFC Performance Standard requirements, with specific reference to Performance Standard 8 – Cultural Heritage.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ABBREVIATIONS

AIA: Archaeological Impact Assessment
ASAPA: Association of South African Professional Archaeologists
BGG Burial Ground and Graves
BIA: Basic Impact Assessment
CFPs: Chance Find Procedures
CMP: Conservation Management Plan
CRR: Comments and Response Report
CRM: Cultural Resource Management
DEA: Department of Environmental Affairs
EA: Environmental Authorisation
EAP: Environmental Assessment Practitioner
ECO: Environmental Control Officer
EIA: Environmental Impact Assessment*
EIA: Early Iron Age*
EIA Practitioner: Environmental Impact Assessment Practitioner
EMP: Environmental Management Programme
ESA: Early Stone Age
ESIA: Environmental and Social Impact Assessment
GIS Geographical Information System
GPS: Global Positioning System
GRP Grave Relocation Plan
HIA: Heritage Impact Assessment
LIA: Late Iron Age
LSA: Late Stone Age
MEC: Member of the Executive Council
MIA: Middle Iron Age
MPRDA: Mineral and Petroleum Resources Development Act
MSA: Middle Stone Age
NEMA National Environmental Management Act, 1998 (Act No. 107 of 1998)
NHRA National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NID Notification of Intent to Develop
NoK Next-of-Kin
PRHA: Provincial Heritage Resource Agency
SADC: Southern African Development Community
SAHRA: South African Heritage Resources Agency

**Although EIA refers to both Environmental Impact Assessment and the Early Iron Age both are internationally accepted abbreviations and must be read and interpreted in the context it is used.*

GLOSSARY

Archaeological site (remains of human activity over 100 years old)
Early Stone Age (~ 2.6 million to 250 000 years ago)
Middle Stone Age (~ 250 000 to 40-25 000 years ago)
Later Stone Age (~ 40-25 000, to recently, 100 years ago)
The Iron Age (~ AD 400 to 1840)
Historic (~ AD 1840 to 1950)
Historic building (over 60 years old)

1 Introduction and Terms of Reference:

Heritage Contracts and Archaeological Consulting CC (**HCAC)** has been contracted by Leap to conduct a heritage impact assessment of the proposed Helderwyk Township Development. The report forms part of the Environmental Impact Assessment Report (EIA) and Environmental Management Programme Report (EMPR) for the development. The site is located on the Remainder of Portion 62 of the Farm Witpoortjie 117 IR in Brakpan known as Helderwyk within the City of Ekurhuleni, Gauteng Province (Figure 1 -3).

The aim of the study is to survey the proposed development footprint to identify cultural heritage sites, document, and assess their importance within local, provincial and national context. It serves to assess the impact of the proposed project on non-renewable heritage resources, and to submit appropriate recommendations with regard to the responsible cultural resources management measures that might be required to assist the developer in managing the discovered heritage resources in a responsible manner. It is also conducted to protect, preserve, and develop such resources within the framework provided by the National Heritage Resources Act of 1999 (Act No 25 of 1999). The report outlines the approach and methodology utilized before and during the survey, which includes: Phase 1, review of relevant literature; Phase 2, the physical surveying of the area on foot and by vehicle; Phase 3, reporting the outcome of the study.

During the survey, 11 features were identified. General site conditions and features on sites were recorded by means of photographs, GPS locations, and site descriptions. Possible impacts were identified and mitigation measures are proposed in the following report. SAHRA as a commenting authority under section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) require all environmental documents, complied in support of an Environmental Authorisation application as defined by NEMA EIA Regulations section 40 (1) and (2), to be submitted to SAHRA. As such the Basic Assessment report and its appendices must be submitted to the case as well as the EMPr, once it's completed by the Environmental Assessment Practitioner (EAP).

1.1 Terms of Reference

Field study
Conduct a field study to: (a) locate, identify, record, photograph and describe sites of archaeological, historical or cultural interest; b) record GPS points of sites/areas identified as significant areas; c) determine the levels of significance of the various types of heritage resources affected by the proposed development.

Reporting
Report on the identification of anticipated and cumulative impacts the operational units of the proposed project activity may have on the identified heritage resources for all 3 phases of the project; i.e., construction, operation and decommissioning phases. Consider alternatives, should any significant sites be impacted adversely by the proposed project. Ensure that all studies and results comply with the relevant legislation, SAHRA minimum standards and the code of ethics and guidelines of ASAPA.
To assist the developer in managing the discovered heritage resources in a responsible manner, and to protect, preserve, and develop them within the framework provided by the National Heritage Resources Act of 1999 (Act No 25 of 1999).

Table 3: Project Description

Size of farm and portions	460 Hectares on the Remainder of Portion 62 of the Farm Witpoortjie 117 IR in Brakpan within the City of Ekurhuleni, Gauteng Province.
Magisterial District	Ekhuruleni Municipality
1: 50 000 map sheet number	1:50 000 topographical map 2628AD Springs 1:250 000 geological map 2628 East Rand
Central co-ordinate of the development	26°17'3.10"S 28°17'48.71"E

Table 4: Infrastructure and project activities

Type of development	Township Development
Project size	460 hectares
Project Components	Township Development with associated infrastructure including water and sanitation as well as electrical infrastructure and access and internal roads.

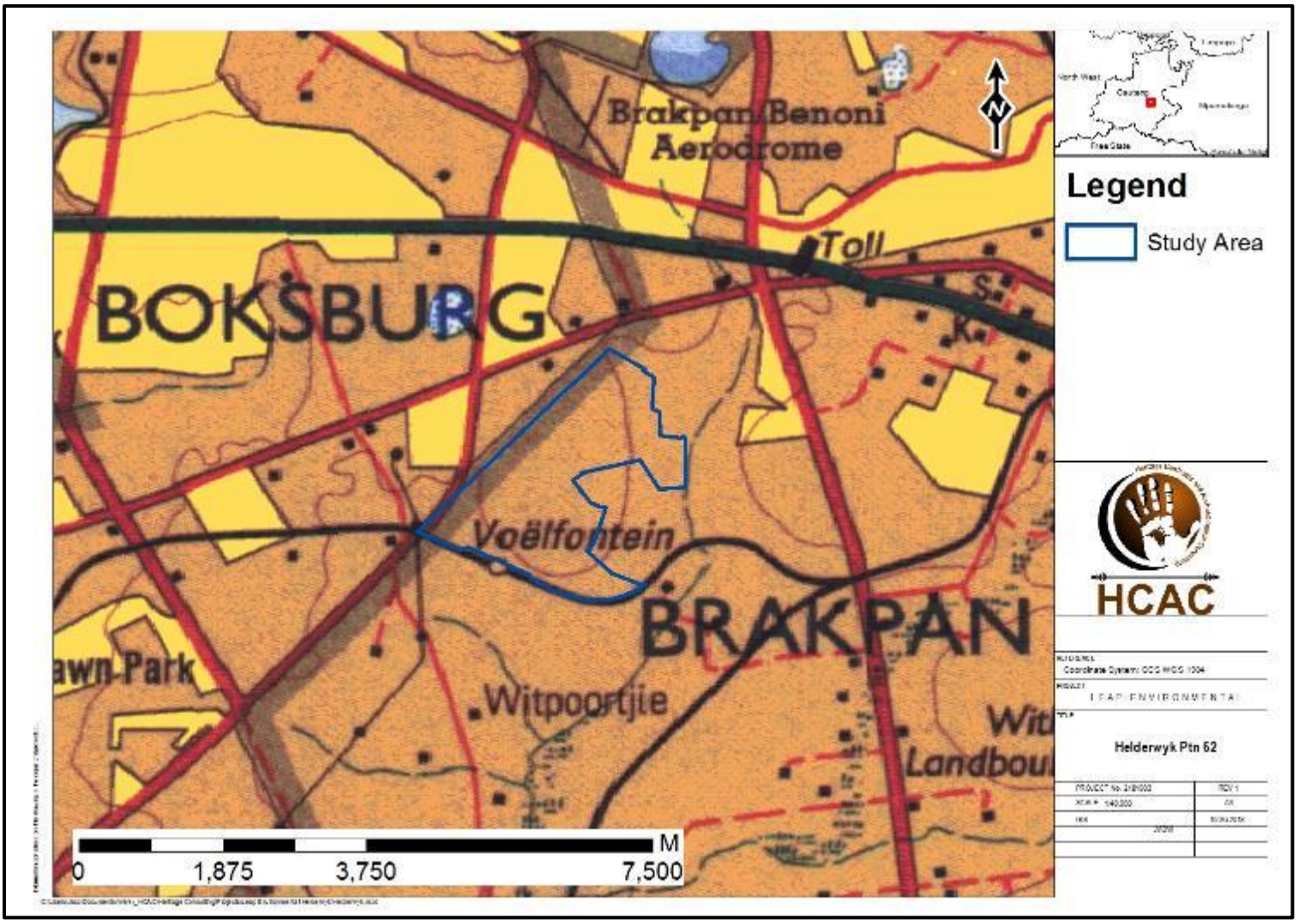

Figure 1. Locality map of the larger area indicating the study area in blue.

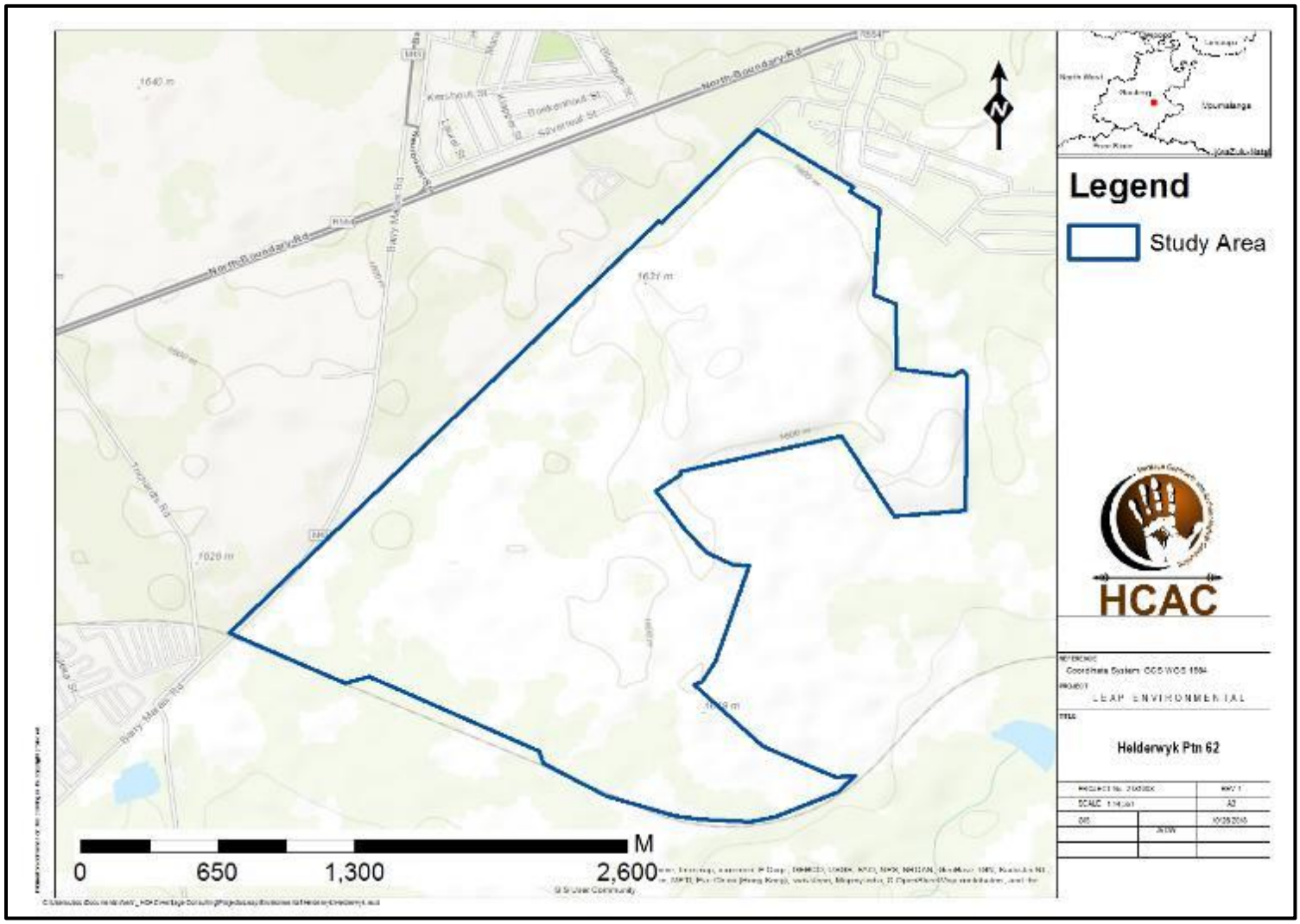

Figure 2. Provincial locality map (1: 250 000 topographical map)

Figure 3. Satellite image indicating the development footprint (Google Earth 2018).

2 Legislative Requirements

The HIA, as a specialist sub-section of the EIA, is required under the following legislation:

- National Heritage Resources Act (NHRA), Act No. 25 of 1999)
- National Environmental Management Act (NEMA), Act No. 107 of 1998 - Section 23(2)(b)
- Mineral and Petroleum Resources Development Act (MPRDA), Act No. 28 of 2002 - Section 39(3)(b)(iii)

A Phase 1 HIA is a pre-requisite for development in South Africa as prescribed by SAHRA and stipulated by legislation. The overall purpose of heritage specialist input is to:

- Identify any heritage resources, which may be affected;
- Assess the nature and degree of significance of such resources;
- Establish heritage informants/constraints to guide the development process through establishing thresholds of impact significance;
- Assess the negative and positive impact of the development on these resources; and
- Make recommendations for the appropriate heritage management of these impacts.

The HIA should be submitted, as part of the impact assessment report or EMPr, to the PHRA if established in the province or to SAHRA. SAHRA will ultimately be responsible for the professional evaluation of Phase 1 AIA reports upon which review comments will be issued. 'Best practice' requires Phase 1 AIA reports and additional development information, as per the impact assessment report and/or EMPr, to be submitted in duplicate to SAHRA after completion of the study. SAHRA accepts Phase 1 AIA reports authored by professional archaeologists, accredited with ASAPA or with a proven ability to do archaeological work.

Minimum accreditation requirements include an Honours degree in archaeology or related discipline and 3 years post-university CRM experience (field supervisor level). Minimum standards for reports, site documentation and descriptions are set by ASAPA in collaboration with SAHRA. ASAPA is based in South Africa, representing professional archaeology in the SADC region. ASAPA is primarily involved in the overseeing of ethical practice and standards regarding the archaeological profession. Membership is based on proposal and secondment by other professional members.

Phase 1 AIA's are primarily concerned with the location and identification of heritage sites situated within a proposed development area. Identified sites should be assessed according to their significance. Relevant conservation or Phase 2 mitigation recommendations should be made. Recommendations are subject to evaluation by SAHRA.

Conservation or Phase 2 mitigation recommendations, as approved by SAHRA, are to be used as guidelines in the developer's decision-making process.

Phase 2 archaeological projects are primarily based on salvage/mitigation excavations preceding development destruction or impact on a site. Phase 2 excavations can only be conducted with a permit, issued by SAHRA to the appointed archaeologist. Permit conditions are prescribed by SAHRA and includes (as minimum requirements) reporting back strategies to SAHRA and deposition of excavated material at an accredited repository.

In the event of a site conservation option being preferred by the developer, a site management plan, prepared by a professional archaeologist and approved by SAHRA, will suffice as minimum requirement.

After mitigation of a site, a destruction permit must be applied for with SAHRA by the applicant before development may proceed.

Human remains older than 60 years are protected by the National Heritage Resources Act, with reference to Section 36. Graves older than 60 years, but younger than 100 years fall under Section 36 of Act 25 of 1999 (National Heritage Resources Act), as well as the Human Tissues Act (Act 65 of 1983), and are the jurisdiction of SAHRA. The procedure for Consultation Regarding Burial Grounds and Graves (Section 36[5]) of Act 25 of 1999) is applicable to graves older than 60 years that are situated outside a formal cemetery administrated by a local authority. Graves in this age category, located inside a formal cemetery administrated by a local authority, require the same authorisation as set out for graves younger than 60 years, in addition to SAHRA authorisation. If the grave is not situated inside a formal cemetery, but is to be relocated to one, permission from the local authority is required and all regulations, laws and by-laws, set by the cemetery authority, must be adhered to.

Human remains that are less than 60 years old are protected under Section 2(1) of the Removal of Graves and Dead Bodies Ordinance (Ordinance No. 7 of 1925), as well as the Human Tissues Act (Act 65 of 1983), and are the jurisdiction of the National Department of Health and the relevant Provincial Department of Health and must be submitted for final approval to the office of the relevant Provincial Premier. This function is usually delegated to the Provincial MEC for Local Government and Planning; or in some cases, the MEC for Housing and Welfare. Authorisation for exhumation and reinternment must also be obtained from the relevant local or regional council where the grave is situated, as well as the relevant local or regional council to where the grave is being relocated. All local and regional provisions, laws and by-laws must also be adhered to. To handle and transport human remains, the institution conducting the relocation should be authorised under Section 24 of Act 65 of 1983 (Human Tissues Act).

3 METHODOLOGY

3.1 Literature Review

A brief survey of available literature was conducted to extract data and information on the area in question to provide general heritage context into which the development would be set. This literature search included published material, unpublished commercial reports and online material, including reports sourced from the South African Heritage Resources Information System (SAHRIS).

3.2 Genealogical Society and Google Earth Monuments

Google Earth and 1:50 000 maps of the area were utilised to identify possible places where sites of heritage significance might be located; these locations were marked and visited during the field work phase. The database of the Genealogical Society was consulted to collect data on any known graves in the area.

3.3 Public Consultation and Stakeholder Engagement:

Stakeholder engagement is a key component of any BAR process, it involves stakeholders interested in, or affected by the proposed development. Stakeholders are provided with an opportunity to raise issues of concern (for the purposes of this report only heritage related issues will be included). The aim of the public consultation process was to capture and address any issues raised by community members and other stakeholders during key stakeholder and public meetings. The process involved:

- Placement of advertisements and site notices
- Stakeholder notification (through the dissemination of information and meeting invitations);
- Stakeholder meetings undertaken with I&APs;
- Authority Consultation
- The compilation of a Basic Assessment Report (BAR).

Please refer to section 6 for more detail.

3.4 Site Investigation

Conduct a field study to: a) systematically survey the proposed project area to locate, identify, record, photograph and describe sites of archaeological, historical or cultural interest; b) record GPS points of sites/areas identified as significant areas; c) determine the levels of significance of the various types of heritage resources recorded in the project area.

Table 5: Site Investigation Details

	Site Investigation
Date	18 and 19 October 2018
Season	Summer. The development footprint was adequately surveyed to record the presence of heritage sites (Figure 5).

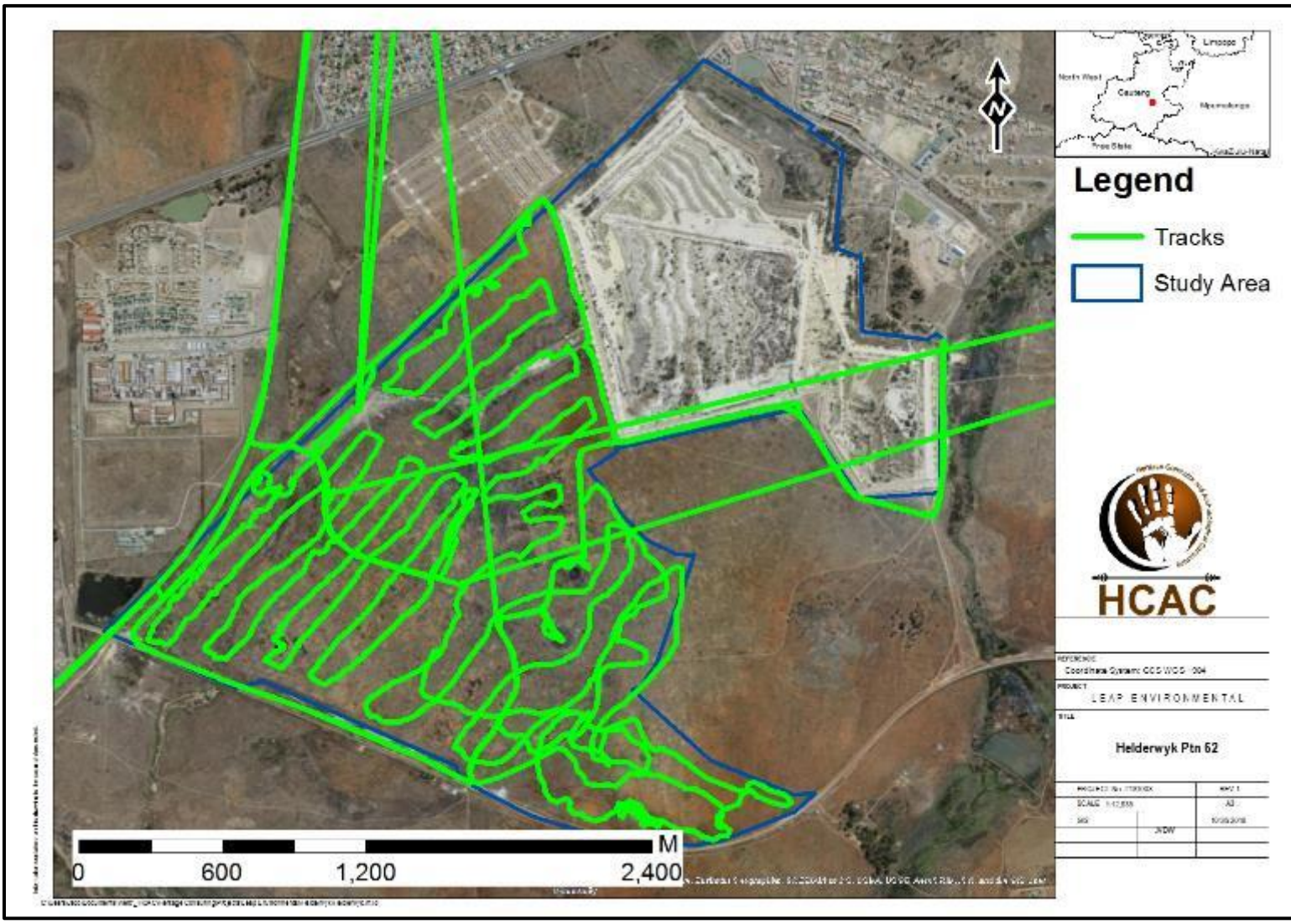

Figure 4: Track logs of the survey in green

3.5 Site Significance and Field Rating

Section 3 of the NHRA distinguishes nine criteria for places and objects to qualify as 'part of the national estate' if they have cultural significance or other special value. These criteria are:

- Its importance in/to the community, or pattern of South Africa's history;
- Its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;
- Its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;
- Its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;
- Its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
- Its importance in demonstrating a high degree of creative or technical achievement at a particular period;
- Its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;
- Its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa;

- Sites of significance relating to the history of slavery in South Africa.

The presence and distribution of heritage resources define a 'heritage landscape'. In this landscape, every site is relevant. In addition, because heritage resources are non-renewable, heritage surveys need to investigate an entire project area, or a representative sample, depending on the nature of the project. In the case of the proposed project the local extent of its impact necessitates a representative sample and only the footprint of the areas demarcated for development were surveyed. In all initial investigations, however, the specialists are responsible only for the identification of resources visible on the surface. This section describes the evaluation criteria used for determining the significance of archaeological and heritage sites. The following criteria were used to establish site significance with cognisance of Section 3 of the NHRA:

- The unique nature of a site;
- The integrity of the archaeological/cultural heritage deposits;
- 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/is known);
- The preservation condition of the sites; and
- Potential to answer present research questions.

In addition to this criteria field ratings prescribed by SAHRA (2006), and acknowledged by ASAPA for the SADC region, were used for the purpose of this report. The recommendations for each site should be read in conjunction with section 10 of this report.

FIELD RATING	***GRADE***	***SIGNIFICANCE***	***RECOMMENDED MITIGATION***
National Significance (NS)	Grade 1	-	Conservation; national site nomination
Provincial Significance (PS)	Grade 2	-	Conservation; provincial site nomination
Local Significance (LS)	Grade 3A	High significance	Conservation; mitigation not advised
Local Significance (LS)	Grade 3B	High significance	Mitigation (part of site should be retained)
Generally Protected A (GP.A)	-	High/medium significance	Mitigation before destruction
Generally Protected B (GP.B)	-	Medium significance	Recording before destruction
Generally Protected C (GP.C)	-	Low significance	Destruction

3.6 Impact Assessment Methodology

The criteria below are used to establish the impact rating on sites:

- The **nature**, which shall include a description of what causes the effect, what will be affected and how it will be affected.
- The **extent**, wherein it will be indicated whether the impact will be local (limited to the immediate area or site of development) or regional, and a value between 1 and 5 will be assigned as appropriate (with 1 being low and 5 being high):
- The **duration**, wherein it will be indicated whether:
  - the lifetime of the impact will be of a very short duration (0-1 years), assigned a score of 1;
  - the lifetime of the impact will be of a short duration (2-5 years), assigned a score of 2;
  - medium-term (5-15 years), assigned a score of 3;
  - long term (> 15 years), assigned a score of 4; or
  - permanent, assigned a score of 5;

- The **magnitude**, quantified on a scale from 0-10 where; 0 is small and will have no effect on the environment, 2 is minor and will not result in an impact on processes, 4 is low and will cause a slight impact on processes, 6 is moderate and will result in processes continuing but in a modified way, 8 is high (processes are altered to the extent that they temporarily cease), and 10 is very high and results in complete destruction of patterns and permanent cessation of processes.
- The **probability of occurrence**, which shall describe the likelihood of the impact actually occurring. Probability will be estimated on a scale of 1-5 where; 1 is very improbable (probably will not happen), 2 is improbable (some possibility, but low likelihood), 3 is probable (distinct possibility), 4 is highly probable (most likely) and 5 is definite (impact will occur regardless of any prevention measures).
- The **significance**, which shall be determined through a synthesis of the characteristics described above and can be assessed as low, medium or high; and
- the **status**, which will be 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.
- the *degree* to which the impact can be mitigated.

The **significance** is calculated by combining the criteria in the following formula:
S=(E+D+M)P
S = Significance weighting
E = Extent
D = Duration
M = Magnitude
P = Probability

The **significance weightings** for each potential impact are as follows:

- < 30 points: Low (i.e., where this impact would not have a direct influence on the decision to develop in the area),
- 30-60 points: Medium (i.e., where the impact could influence the decision to develop in the area unless it is effectively mitigated),
- 60 points: High (i.e., where the impact must have an influence on the decision process to develop in the area).

3.7 Limitations and Constraints of the study

The authors acknowledge that the brief literature review is not exhaustive on the literature of the area. Due to the subsurface nature of archaeological artefacts, the possibility exists that some features or artefacts may not have been discovered/recorded during the survey and the possible occurrence of unmarked graves and other cultural material cannot be excluded. Similarly, the depth of the deposit of heritage sites cannot be accurately determined due its subsurface nature. This report only deals with the footprint area of the proposed development and consisted of non-intrusive surface surveys. This study did not assess the impact on medicinal plants and intangible heritage as it is assumed that these components would have been highlighted through the public consultation process if relevant. It is possible that new information could come to light in future, which might change the results of this Impact Assessment.

4 Description of Socio Economic Environmental

The 2012 – 2013 Integrated Development Plan highlighted the following Socio-Economic issues in the Ekhuruleni Metropolitan Municipality, the poverty rate was at 28.3% and the unemployment rate was at 30.7%. Reports also suggest that only 8% of Ekurhuleni's population has a post-matric qualification. This suggests a mismatch between the demand for labour and the skills available in the economy. Basic services such as water and sanitation as well as the provision of housing will provide much needed improvement of conditions as well as create employment opportunities.

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5 Description of the Physical Environment

The survey area is situated about 7km SSE of the centre of Boksburg and about 1,5km South of the N17, running along the eastern side of Barry Marais Rd. Barry Marais Rd was also used to access the survey area along with multiple gravel roads crossing the entire survey area. The SW edge of the survey area runs parallel with a railroad. The study area is mostly flat with short grass and heavily disturbed marked by dumping etc.

A large slime dam (Figure 6) is situated inside the survey area and takes up about 25 % of the Northern part of the survey area. The area around the slimes dam is highly disturbed.

A small landing strip for hobby planes with a small roof for shade and prefab walls are situated to the western edge of the survey area. The grass has been continually cut to allow for easy access. The north western boundary of the site is marked by several water pipeline servitudes (Figure 7).

Figure 5. General Site conditions

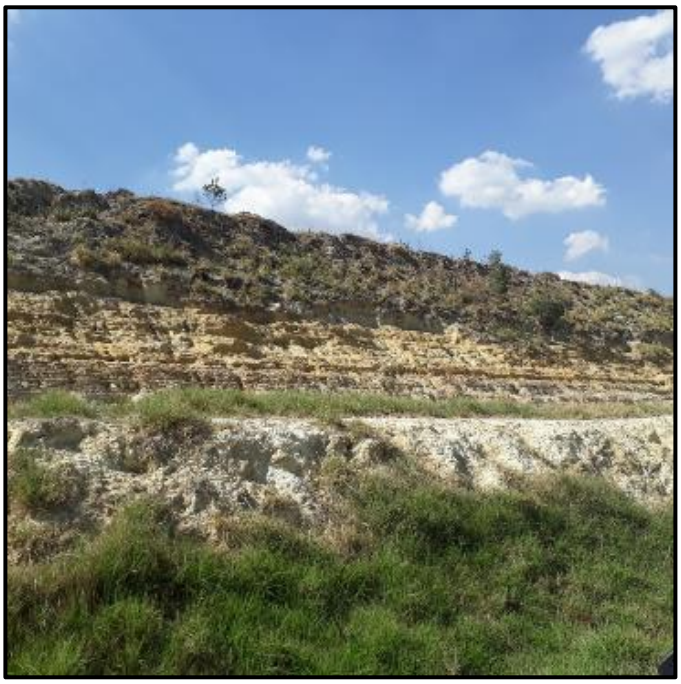


Figure 6. Slimes dam

Figure 7. Road and pipelines

Figure 8. Powerlines and road

Figure 9. Disturbances

6 Results of Public Consultation and Stakeholder Engagement:

6.1.1 Stakeholder Identification

Adjacent landowners and the public at large were informed of the proposed activity as part of the EIA process. Site notices and advertisements notifying interested and affected parties were placed at strategic points and in local newspapers as part of the process.

7 Literature / Background Study:

7.1 Literature Review (SAHRIS)

The following reports were conducted in the general vicinity of the study area and were consulted for this report:

Author	Year	Project	Findings
Van Schalkwyk, J.	1995	A Survey Of Cultural Resources Along The Proposed Pwv 16 Road Corridor, Brakpan District	No Sites were identified
Huffman, TN and Van der Merwe, HD.	1995	Archaeological Survey of Withoekspruit, Brakpan	Stone Age finds and historical sites
Van der Walt, J.	2008	Archaeological Impact Assessment For The Proposed Simunye Primary School, Simunye Extension 2, Gauteng Province	No sites were identified.
Gaigher, S.	2015	Heritage Impact Assessment for the Proposed Helderwyk Township Development	Ruins
Gaigher, S.	2015	Heritage Impact Assessment for the Proposed Van Dyk Park Mixed Housing Project Development	Historic Structures.

7.1.1 Genealogical Society and Google Earth Monuments

No known grave sites are indicated in the study area.

7.2 General History of the area

7.2.1 Archaeology of the area

The archaeological record for the greater study area consists of the Stone Age and Iron Age.

7.2.1.1 Stone Age

The Stone Age can be divided in three main phases as follows;

- Later Stone Age; associated with Khoi and San societies and their immediate predecessors. Recently to ~30 thousand years ago
- Middle Stone Age; associated with Homo sapiens and archaic modern humans. 30-300 thousand years ago.
- Earlier Stone Age; associated with early Homo groups such as Homo habilis and Homo erectus. 400 000-> 2 million years ago.

Although there are no well-known Stone Age sites located on or around the study area there is evidence of the use of the larger area by Stone Age communities for example along the Kliprivier where ESA and MSA tools where recorded. LSA material is recorded along ridges to the south of the current study area (Huffman 2008). Petroglyphs occur at Redan as well as along the Vaal River (Berg 1999).

7.2.1.2 The Iron Age

The Iron Age as a whole represents the spread of Bantu speaking people and includes both the pre-Historic and Historic periods. It can be divided into three distinct periods:

- The Early Iron Age: Most of the first millennium AD.
- The Middle Iron Age: 10th to 13th centuries AD
- The Late Iron Age: 14th century to colonial period.

The Iron Age is characterised by the ability of these early people to manipulate and work Iron ore into implements that assisted them in creating a favourable environment to make a better living. Extensive Stone walled sites are recorded at Klipriviers Berg Nature reserve belonging to the Late Iron Age period. A large body of research is available on this area. These sites (Taylor's Type N, Mason's Class 2 & 5) are now collectively referred to as Klipriviersberg (Huffman 2007).

These settlements are complex in that aggregated settlements are common, the outer wall sometimes includes scallops to mark back courtyards, there are more small stock kraals, and straight walls separate households in the residential zone. These sites dates to the 18th and 19th centuries and was built by people in the Fokeng cluster.
In this area the Klipriviersberg walling would have ended at about AD 1823, when Mzilikazi entered the area (Rasmussen 1978). This settlement type may have lasted longer in other areas because of the positive interaction between Fokeng and Mzilikazi.

7.3 Historical Information

Brakpan was first named in 1886, and grew rapidly after the discovery of coal (in 1888) and gold (in 1905). Brakpan officially became a town in 1919.

7.3.1 Anglo-Boer War

The Anglo-Boer War was the greatest conflict that had taken place in South Africa up to date. One Skirmish is listed fort the Brakpan area on the Farm Hartebeesfontein on 18th February 1901 (http://www.boerenbrit.com/archives/9658)

7.3.1. Cultural Landscape

The site under investigation is located to the east of the M43 and to the south of the R554, just to the south west of Dalpark in Brakpan, Gauteng Province.

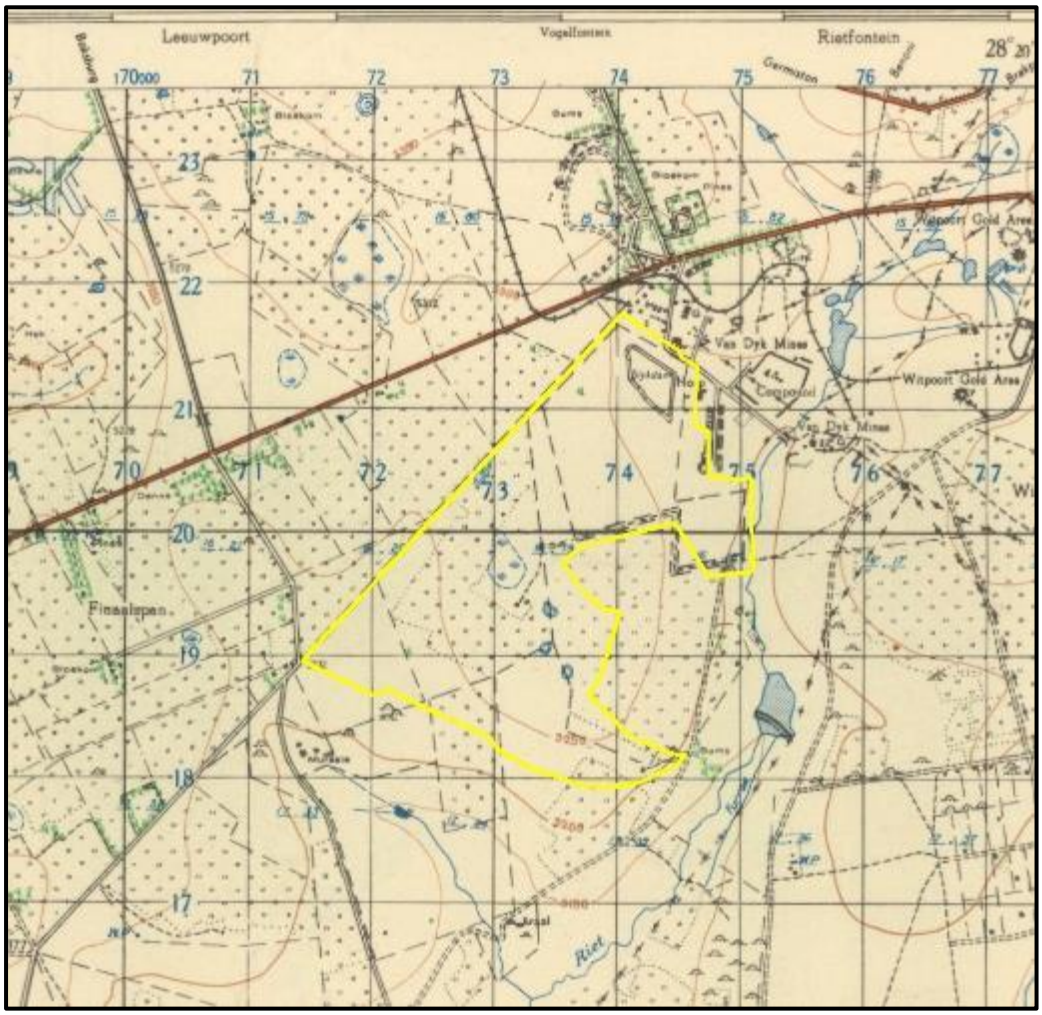


Figure 10. 1945 Topographical map of the site under investigation. The approximate study area is indicated with a yellow border. One can see a slimes dam in the northern part of the property, and what seems to be buildings (possibly part of the Van Dyk Mines development) can be seen to the east thereof. Some sections of the study area were used as cultivated lands, and five dams are visible. A track / road went through an eastern part of the property. (Topographical Map 1945)

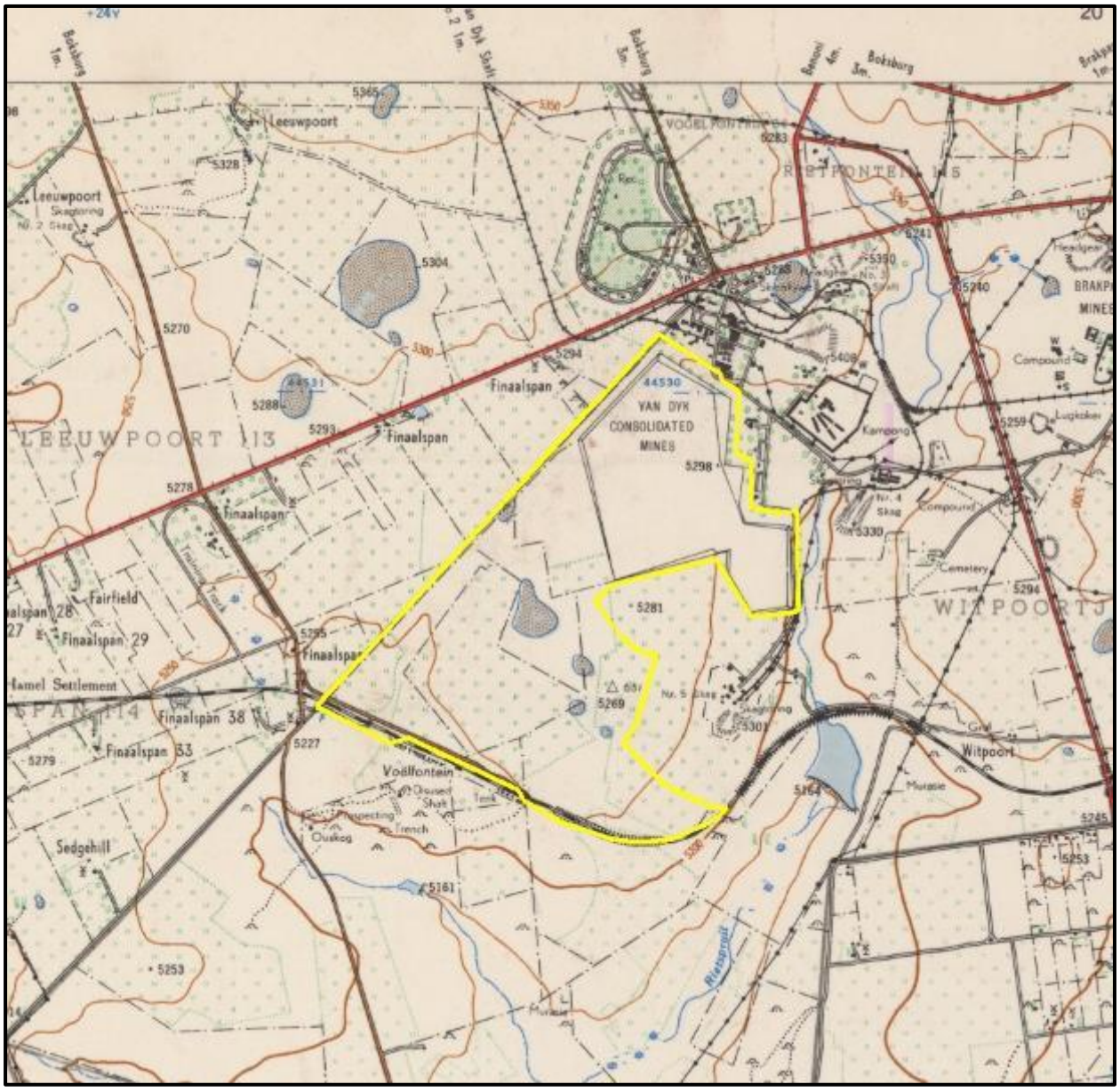


Figure 11. 1960 Topographical map of the site under investigation. The approximate study area is indicated with a yellow border. The Van Dyk Consolidated Mines development can be seen in the northern part of the study area. To the south west thereof, some sections of the property were used as cultivated lands, and five dams are visible. A secondary road and a railway line formed the southern boundary of the area under investigation. (Topographical Map 1960)

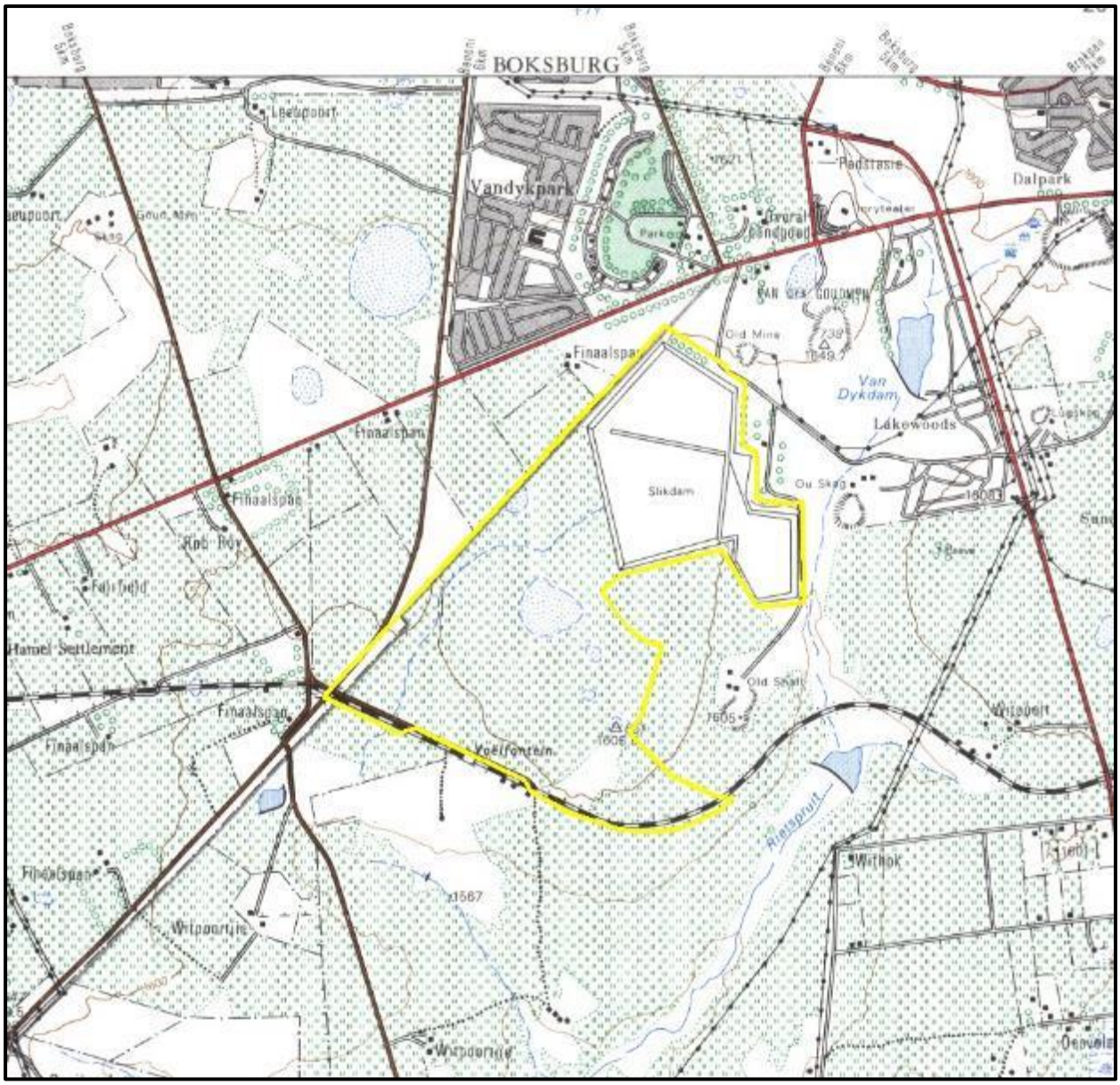


Figure 12. 1976 Topographical map of the site under investigation. The approximate study area is indicated with a yellow border. The Van Dyk Gold Mine slimes dam can be seen in the northern part of the study area. To the south west thereof, most of the property was used as cultivated lands, and five dams are visible. A secondary road and a railway line formed the southern boundary of the area under investigation. (Topographical 1976)

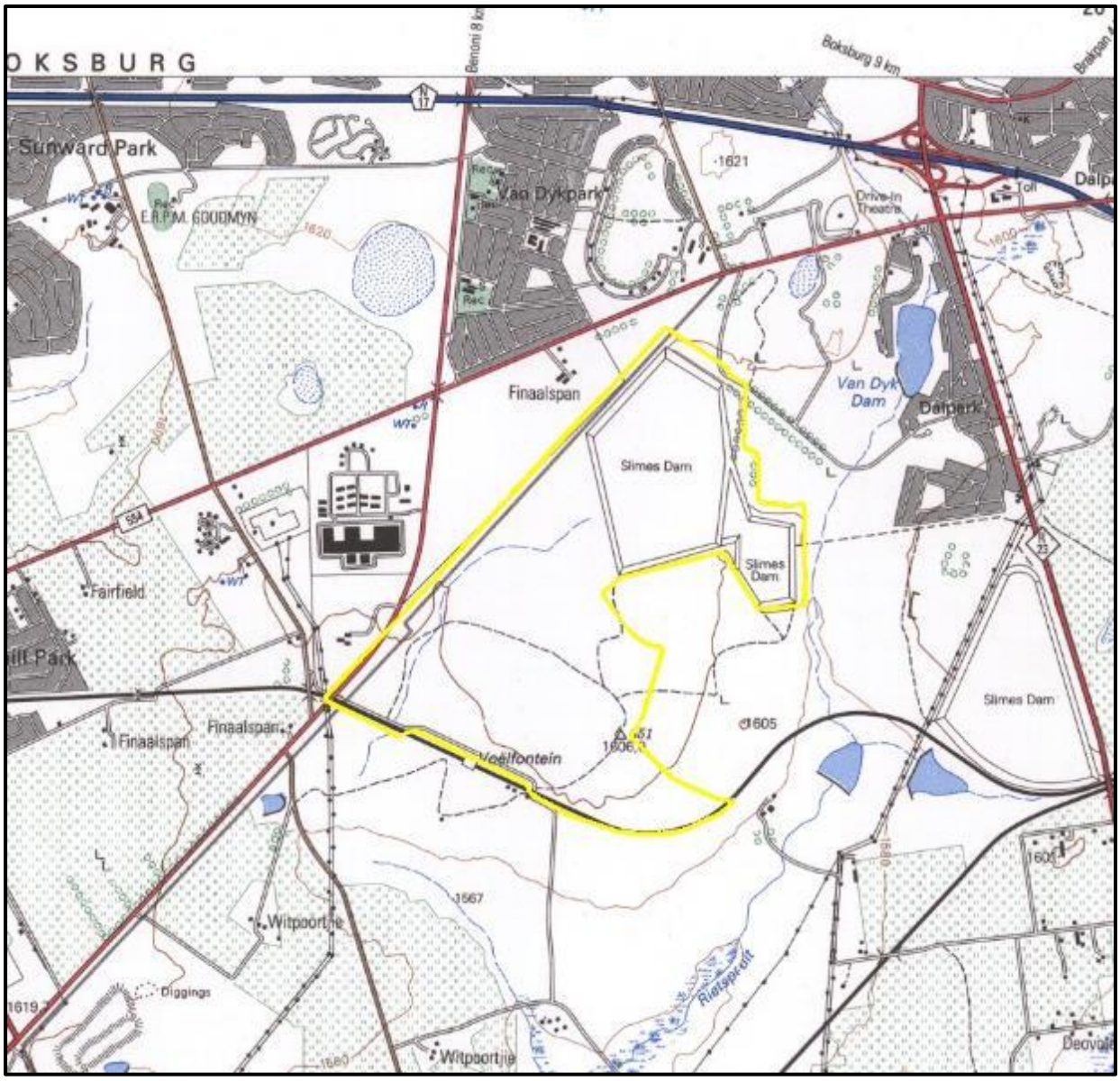


Figure 13. 1995 Topographical map of the site under investigation. The approximate study area is indicated with a yellow border. A slimes dam can be seen in the northern part of the study area. A few tracks / footpaths went through the property. A railway line and a minor road ran along the southern boundary of the area under investigation, and a main road is visible along its western border. (Topographical 1995)

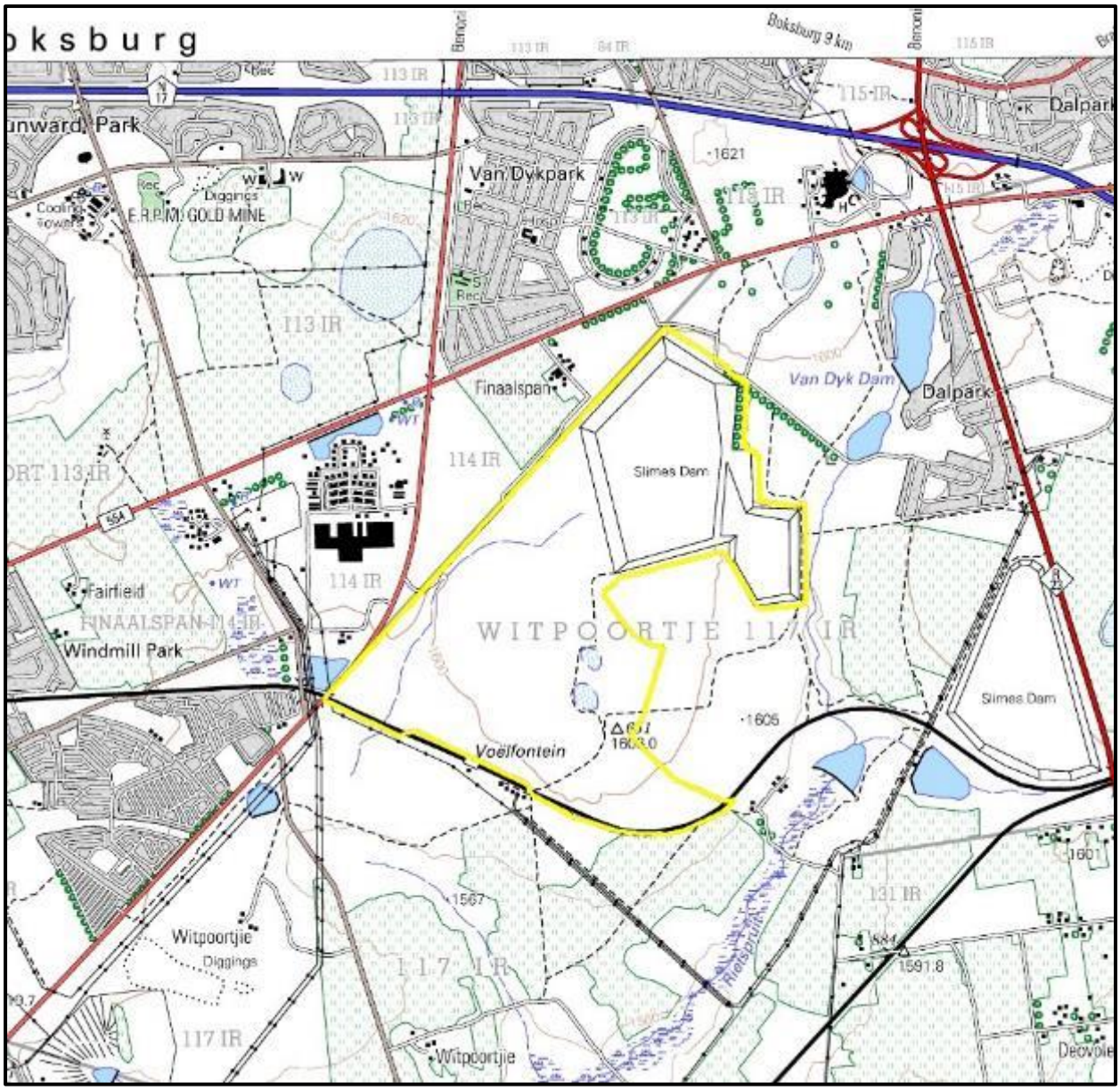


Figure 14. 2002 Topographical map of the site under investigation. The approximate study area is indicated with a yellow border. A slimes dam can be seen in the northern part of the study area. Two tracks / footpaths went through the property, and two small dams are visible. A railway line formed the southern boundary of the area under investigation, and a main road is visible along its western border. (Topographical 2002)

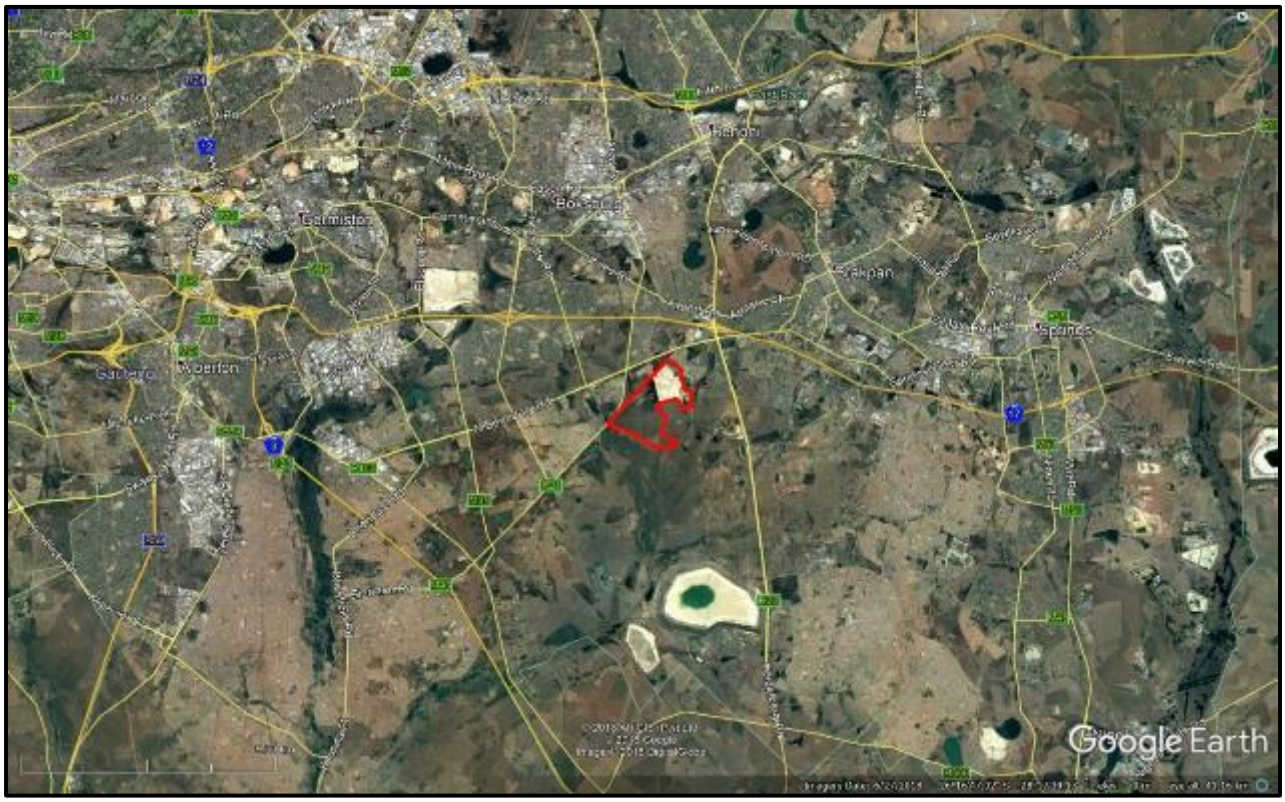


Figure 15. 2018 Google Earth image showing the study area in relation to the R21, Boksburg, Benoni, Brakpan and other sites. (Google Earth 2018)

7.3.2 Historical Overview of The Ownership and Development Of The Study Area

Mainly information found at the National Archives Repository of South Africa will be discussed in this section. Firstly, a record of historical landowners will be provided. Thereafter follows a discussion of how the property was historically used and developed.

Record of historical landowners

An enquiry on the Windeed Search Engine provided the following ownership information on Portion 62 of Witpoortje 117 IR:

Date	Portion	Transported from	Transported to	Sale Price
1969	62	-	Helderwyk Developments Pty. Ltd.	Unknown
1997	62	Helderwyk Developments Pty. Ltd.	S. M. H. Land Development Pty. Ltd.	R938,000
2005	62	-	S. M. H. Land Development Pty. Ltd.	R895,285

(Windeed Search Engine 2018)

The portion under investigation is currently owned by the company Purple Moss 19 Pty. Ltd, which bought the property in July 2005 for the sum of R2,600,000. (Windeed Search Engine 2018)

History of land use

Some details regarding early mining and other developments in the study area could be found at the National Archives and Records Service of South Africa (NARSSA). This will now be discussed.

An early application was found at NARSSA for prospecting licences on Witpoortje by one Godfrey Levyne. In 1906 he applied for a licence for 50 claims on this farm. This request was however denied, as no prospecting licence could be issued for Witpoortje by the District Registrar of Mining Rights. (NARSSA *TAB, MMB: 54 DRK 673/06*)

By 1906 a Mining Lease (*Mynpacht* 523 of Witpoortje 162) had been registered in the name of Van Dyk Proprietary Mines Limited. The lease was extended for several years after that. (NARSSA *TAB, MMB: 59 DRK1140/06;* NARSSA *TAB, MMB: 80 DRK882/07*; NARSSA *TAB, MMB: 145 MCK1394/09;* NARSSA *TAB, MMB: 167 MCK894/10;* NARSSA *TAB, MMB: 199 MCK 15/12*)

In 1909 Van Dyk Mines applied for water rights on Mynpacht 523, Witpoortje 162. They submitted the diagram below with the request. (NARSSA *TAB, MMB: 143 MCK1265/09*)

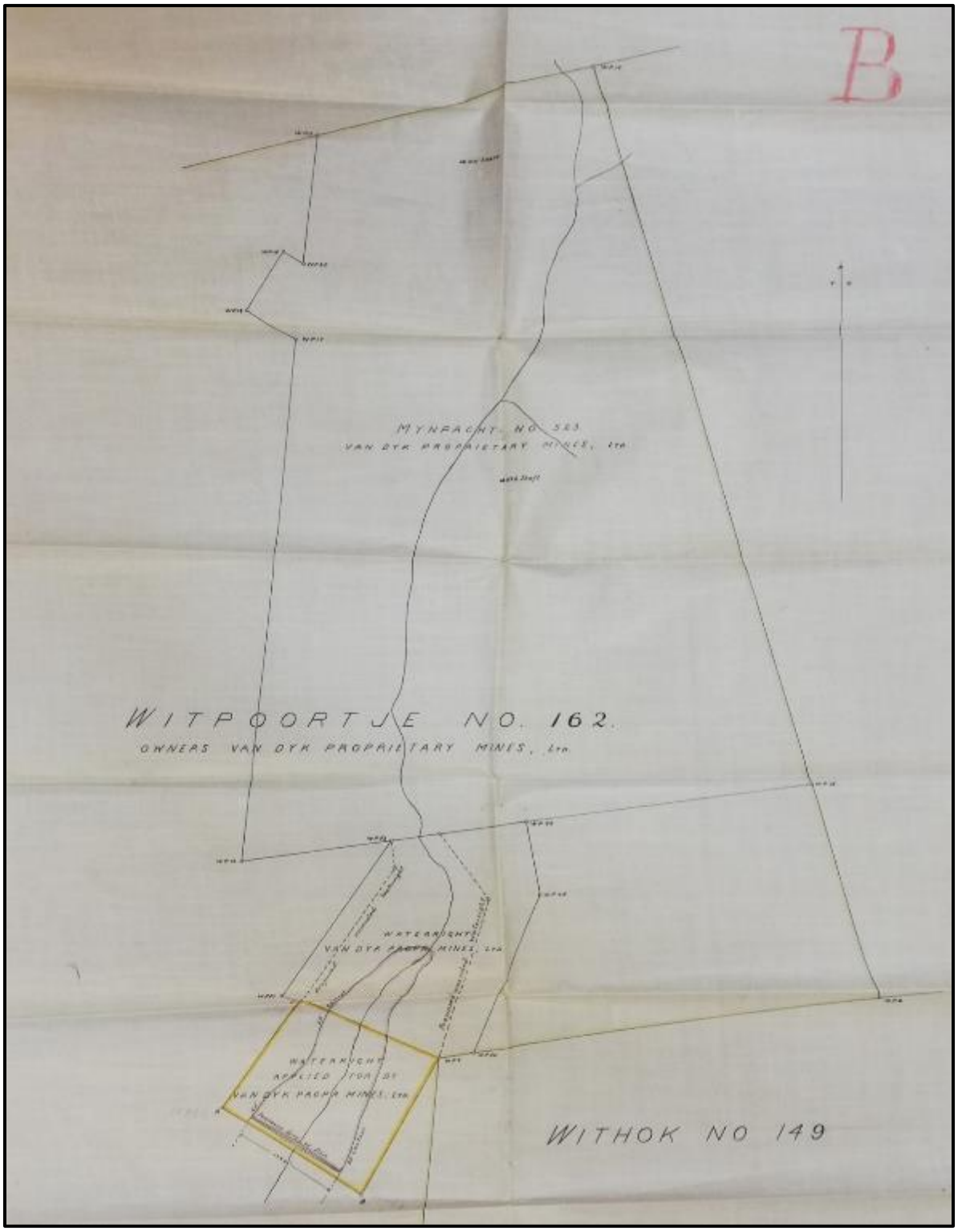


Figure 16. 1909 diagram showing Mynpacht 523 on Witpoortje 162, as well as the area where water rights were applied for (yellow border). The proposed site for a dam is also indicated. The water was to be used for general mining purposes and operations of reduction work. (NARSSA *TAB, MMB: 143 MCK1265/09*)

The company's request was granted in 1910, though the application was made with the idea of protecting their own interest by obtaining unassailable title thereto, rather than commencing the construction of the dam wall immediately. The Acting Secretary for Mines believed that it would be a considerable time before the dam was built. (NARSSA *TAB, MMB: 143 MCK1265/09*)

In 1910 Van Dyk Mines applied for Bezitrecht over the water rights attached to their mining lease. It is not known whether this right was granted or not. (NARSSA *TAB, MMB: 167 MCK918/10*)

By 1913 one Mr Kapp Senior was cultivating about two and a half square miles of proclaimed ground (not open for pegging) on Witpoortje 12. The owners of the farm, including this section, was Van Dyk Proprietary Mines Ltd. Mr Kapp was paying rent for the land and had erected a large kraal and outbuildings at the spot marked x on the map below (on Mynpacht 523), also owned by Van Dyk Mines. (NARSSA *TAB, MMB: 223 MCK1020/13*)

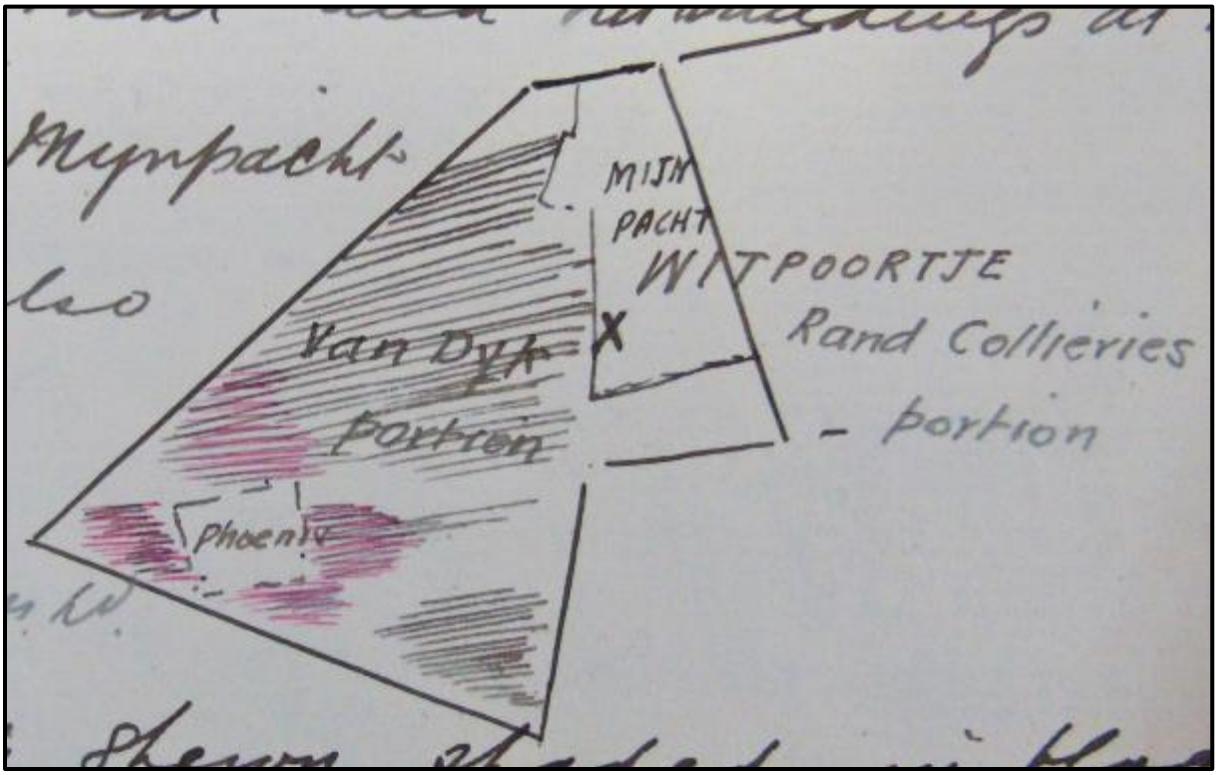


Figure 17. 1913 map, showing Van Dyk Mines' portion of Witpoortje, as well as the Mynpacht. The area shaded in black was leased and cultivated by Kapp, and the area shaded in red was being cultivated by one Mr Holl, the caretaker of Phoenix G. M. Co. (NARSSA *TAB, MMB: 223 MCK1020/13*)

The Mining Commissioner at Boksburg however wrote to the Secretary of Van Dyk Proprietary Mines Ltd. in September 1913, noting that the cultivation of land on this property constituted a breach of the Precious and Base Metals Act. If the cultivation was to be continued an application for a property permit had to be made. The company wished to apply for a permit in that year. (NARSSA *TAB, MMB: 223 MCK1020/13*)

By December 1936 an area of land on the farm Witpoortje 2, owned by Van Dyk Mines, had been set apart as a trading site by the Mining Commissioner of Johannesburg. This area had to be surveyed by the Beacon Inspector. A survey was done in 1937, but no map is provided. (NARSSA *SAB, DOW: 196 32259*)

On 21 August 1941, it was recommended by the office of the Prime Minister that Van Dyk Consolidated Mines Ltd. would be permitted to use the surface of an area of proclaimed land, held under mining title, situate on the farm Witpoortje 2 for the purpose of a cemetery with fencing. The same recommendation was made again on 14 November 1949. It is not known if this was for two separate cemeteries or for the same cemetery. (NARSSA *SAB, URU: 1978 2515;* NARSSA *SAB, URU: 2717 417*)

By November 1970 the Remaining Extent of Portion 62 of Witpoortje was registered in the name of Moria Mynbou (Edms) Bpk. This portion measured 789.6586 morgen. This land was being leased and was used exclusively for farming purposes. (NARSSA TAB, MBP: 2/2/1268 20/6/47)

By 1970, Portion 62 (RE) of Witpoortje 117 IR was approximately 790 morgen in extent, of which 180 morgen was taken up by a slimes dam. Application was being made to establish a township on this portion, and it would consist of nearly 3000 residential erven varying in size between 800 and 1000 square metres, and would include business and general residential development. This township was the first of five that would cover some 670 hectares of ground within the Brakpan Municipal area. Other townships in the works were Libradene, Parkrand, Finaal and Van Dyk Park, as well as Dalpark Extension 1 and 2. (NARSSA TAB, MBP: 2/2/1268 20/6/47)

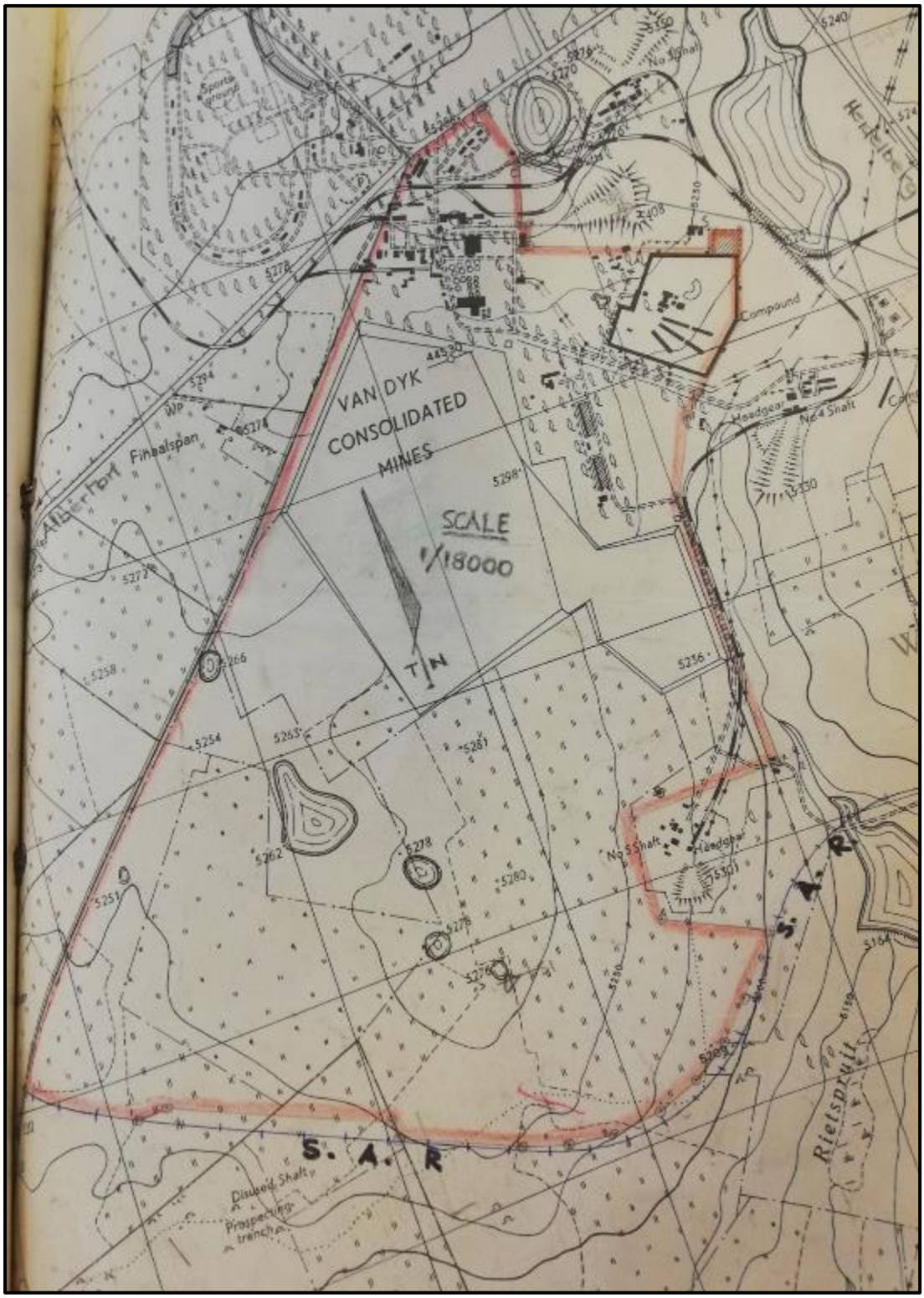


Figure 18. 1970 map of Portion 62 (RE) of Witpoortje 117 IR, owned by Van Dyk Mines. (NARSSA TAB, MBP: 2/2/1268 20/6/47)

A notice was published in the Provincial Paper on 5 May 1971, for the proposed establishment of the town Welgelegen on a portion of the RE of Portion 62 of Witpoortje 117 IR. This application was made by Moria Mynbou (Edms.) Bpk., who specified that the town would consist of 513 special residential lots, 12 general residential lots, and a business lot. The town would be located south of the border of the Provincial Road P58/1 and about 250 meters south west of the Brakpan Drive-in Theatre. (NARSSA TAB, MBP: 2/2/1268 20/6/47)

By December 1972 the names Welgelegen and subsequently Kramerton had been rejected by the Brakpan Town Council and the name Dalpark Extension 3 was proposed. By 1972 the newly proposed name Helderwyk had however been accepted by the Town Council. On 28 March 1972 a memorandum of agreement regarding the establishment of Helderwyk on the Remaining Extent of Portion 62 of Witpoortje was entered into between the Town Council of Brakpan and Moria Mynbou. Planning commenced for the layout and naming of streets, sewerage development, electricity and water provision etc. (NARSSA TAB, MBP: 2/2/1268 20/6/47)

On 19 July 1974 a notice was officially published in the Government Gazette that the RE of Portion 62 of Witpoortje was reserved for the purposes of a township. (NARSSA TAB, MBP: 2/2/1268 20/6/47)

No information could be found at the National Archives regarding historical smelting of metal on the property under investigation.

8 Findings of the Survey

Although the area has been extensively disturbed, mostly by cultivation in the 1970's (Figure 12), 11 features including Stone tools and historical industrial artefacts as well as a large cemetery and stone cairns (that could mark informal graves) were identified (Figure 16 & Table 6). Sites numbers were given thee pre-fix Witp as an abbreviation of Witpoortjie.

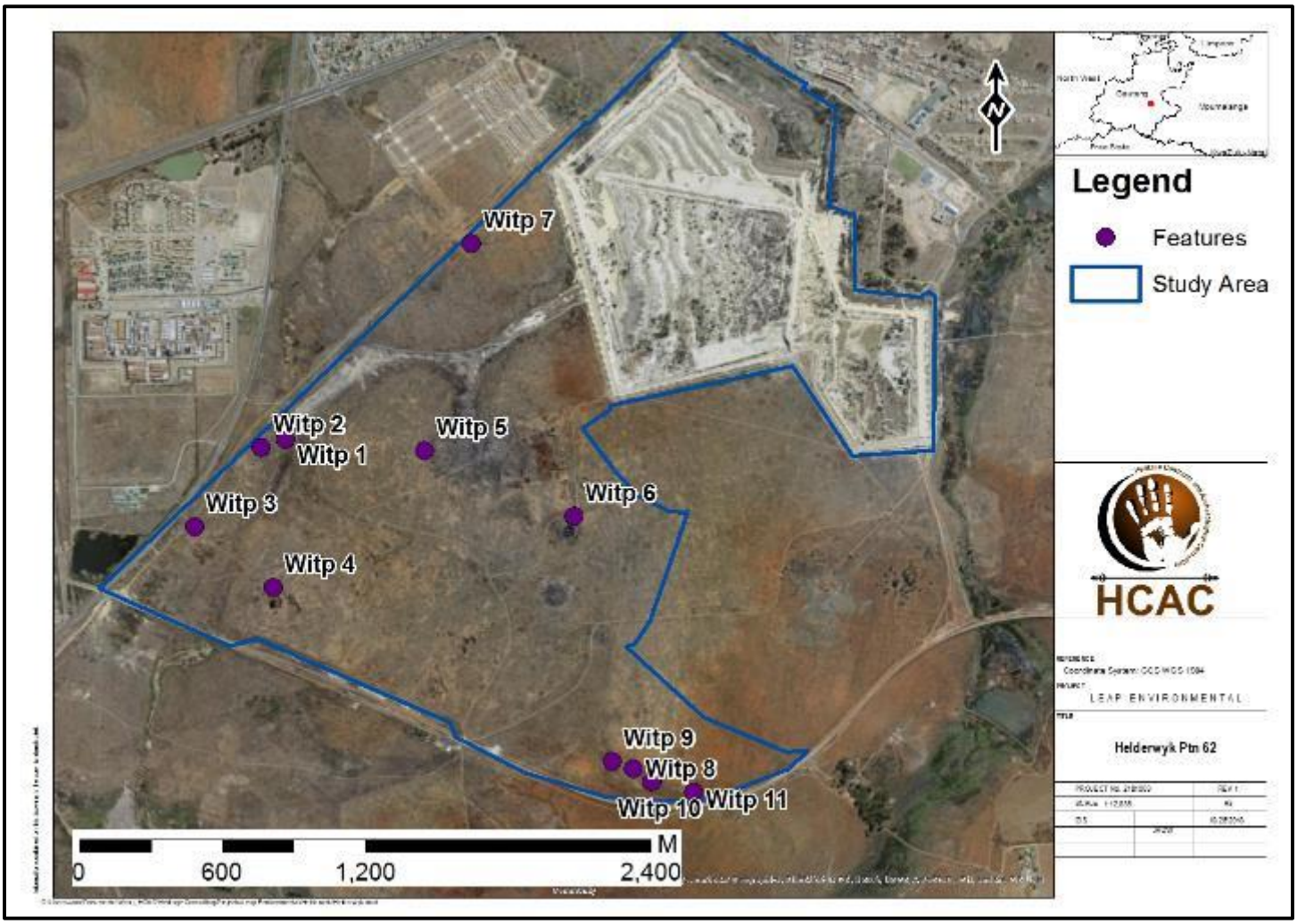


Figure 19. Site distribution map

Table 6. Identified sites in study area

Site No.	Description	Longitude	Latitude
Witp 1	Small Dry pan with Stone Age Artefacts	28° 17' 19.1579" E	26° 16' 55.3691" S
Witp 2	Two circular features with sandstone blocks, carved sandstone, slag, metal and blowpipe elements.	28° 17' 15.8209" E	26° 16' 56.5103" S
Witp 3	More circular sandstone features containing metal, slag and blowpipe features. Linear sandstone wall foundations.	28° 17' 06.7633" E	26° 17' 07.2671" S
Witp 4	Thicket of eucalyptus trees containing more carved sandstone blocks, blowpipe elements, slag and metal artefacts.	28° 17' 17.4552" E	26° 17' 15.4933" S
Witp 5	Large dry pan towards the centre of the survey area with multiple locations where stone cores, tools and flakes were identified.	28° 17' 38.0507" E	26° 16' 56.9243" S
Witp 6	Stone tools found near the side of a gravel road on the edge of a smaller pan.	28° 17' 58.3189" E	26° 17' 05.7659" S
Witp 7	Graveyard containing 50+ graves	28° 17' 44.4553" E	26° 16' 28.8083" S
Witp 8	Rock outcrop with LSA	28° 18' 06.3973" E	26° 17' 40.1027" S
Witp 9	Stone cairns X3	28° 18' 03.4993" E	26° 17' 39.1344" S
Witp 10	Ruin	28° 18' 08.9063" E	26° 17' 41.9208" S
Witp 11	Stone Cairns X 5	28° 18' 14.6809" E	26° 17' 43.3607" S

8.1 Built Environment (Section 34 of the NHRA)

Three separate areas were identified (Witp 2,3,4) comprising circular or dumped features containing high amounts of sandstone blocks, carved sandstone features, slag, metal fragments that seem melted as well as some elements of blowpipes used in a smelting process. Although not directly relating to the built environment these features are historical in nature and is included here due to the sandstone features that relate to structures.

Feature 2 is only two circular features close to the NW edge of the survey area and is marked by waypoint 080. These features seem to have been outlined with sandstone blocks. These are visible on google earth. The soil inside the features seem burnt and contain high numbers of slag, metal and blowpipe artefacts. There are very few glass and plastic remains within this feature.

Figure 20. Artefacts identified at Feature 2

Figure 21. Artefacts identified at Feature 2

Figure 22. General site conditions Witp 2

Figure 23. Feature at Witp 2

Witp 3 contains similar artefacts to Witp 2 but is spread out over a larger area to the SW of Witp 2. This site seems more like a trash dump however still contains a high number of carved sandstones, slag, metal and blowpipe artefacts.

Figure 24. Stone wall foundation at Witp 3

Figure 25. Artefact found at Witp 3.

Figure 26. Artefact found at Witp 3

Figure 27. Artefact found at Witp 3

Witp 4 is situated in a thicket of eucalyptus trees ESE of Witp 3. This site contains scattered sandstone blocks and carved sandstone features along with slag, metal and blowpipe artefacts similar to Witp 2 and 3.

This area was owned by the Van Dyk Mines and has a mining history dating to 1910 and these artefacts are most probably related to historic mining activities. Therefore the features are most probably older than 60 years and protected by the NHRA.

Figure 28. General site conditions at Witp 4

Figure 29. Artefact identified at Witp 4

Figure 30. Artefact identified at Witp 4.

Figure 31. Artefact identified at Witp 4.

Significance Rating: Low to Medium Significance
Field rating: Generally Protected C

The foundations of a single rectangular stone built structure were recorded as Site Witp 10. The foundations measures 10 meters long by 5 meters wide. No other artefacts were recorded here. This feature is according to the historical maps not older than 60 years (Figure 11 – 14). It should be noted that sites like these could contain unmarked graves.

Figure 32. Witp 10 – General site conditions

Figure 33. Witp 10 General site conditions

Significance Rating: Low Significance
Field rating: Generally Protected C

8.2 Archaeological and palaeontological resources (Section 35 of the NHRA)

A large pan (Witp 5) is situated towards the centre of the survey area, where irregular and blade cores, together with flakes were identified in and around the outer edges of the pan. The pan covers an area of about 33 hectares where outcrops of small stones and pebbles contain a scatter of artefacts (artefact ratio 2 per m²) mostly on Crypto Crystalline Silica (CCS) and quartz. Two other smaller pans (Witp 1 and 6) also yielded artefact scatters along the edge of the pan on the same raw material. Miscellaneous flakes and cores were also recorded at a rocky outcrop at Witp 8. These artefacts are mostly micro lithic and therefore ascribed to the Later Stone Age.

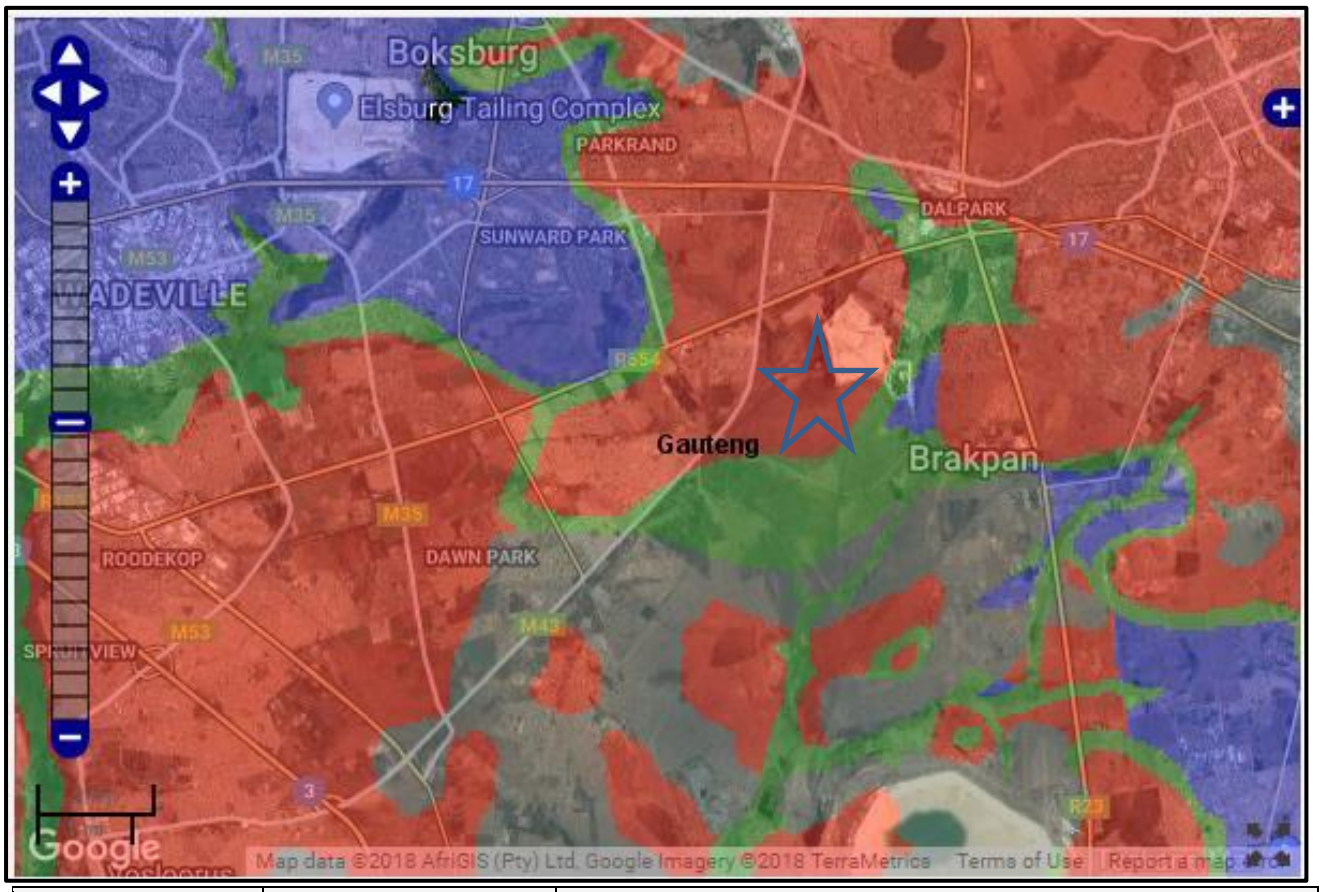
Figure 34. Quartz flake

Figure 35. Bladelet core

Figure 36. Dorrsal view of artefacts

Figure 37. Artefacts on CCS

In terms of the paleontological aspect of Section 35 of the NHRA the study area is of moderate to very high paleontological significance and additional studies will be required.



Colour	Sensitivity	Required Action
RED	VERY HIGH	Field assessment and protocol for finds is required
ORANGE/YELLOW	HIGH	Desktop study is required and based on the outcome of the desktop study, a field assessment is likely
GREEN	MODERATE	Desktop study is required
BLUE	LOW	No palaeontological studies are required however a protocol for finds is required
GREY	INSIGNIFICANT/ZERO	No palaeontological studies are required
WHITE/CLEAR	UNKNOWN	These areas will require a minimum of a desktop study. As more information comes to light, SAHRA will continue to populate the map

Figure 38. SAHRA Paleontological map with the approximate location of the study area indicated in blue, the area is of moderate to very high paleontological sensitivity.

8.3 Burial Grounds and Graves (Section 36 of the NHRA)

A large graveyard containing 50 + graves (Witp 7) was identified on the NW edge of the survey area about 400m from the corner of the slimes dam. These graves are all orientated E to W and marked by stone packed grave dressings. Only one gravestone was identified however it had no visible markings.

Figure 39. Graves in study area

Figure 40. Graves in study area

Figure 41. Graves in study area

Figure 42. Graves in study area

At Witp 9 and 11 respectively 3 and 5 elongated stone cairns were recorded. It is not certain what the purpose of these stone cairns are and could be the result of clearing of agricultural fields but could also mark informal graves.

Figure 43. Stone cairn at Witp 9

Figure 44. General site conditions Witp 9

Figure 45. Stone Cairn at Witp 11

Figure 46. General site conditions at Witp 11

Significance Rating: High Social Significance
Field rating: Generally Protected A

8.4 Cultural Landscapes, Intangible and Living Heritage.

Long term impact on the cultural landscape is considered to be low as the surrounding area is marked by mining activities and residential developments. Visual impacts to scenic routes and sense of place are also considered to be low as the development is in line with the residential character of the area.

8.5 Battlefields and Concentration Camps

There are no battlefields or concentration camp sites in the study area.

8.6 Potential Impact

The chances of impacting unknown archaeological sites in the study area is considered to be negligible. Any direct impacts that did occur would be during the construction phase only and would be of very low significance. Cumulative impacts occur from the combination of effects of various impacts on heritage resources. The importance of identifying and assessing cumulative impacts is that the whole is greater than the sum of its parts. In the case of the development, it will, with the recommended mitigation measures and management actions, not impact any heritage resources directly. However, this and other projects in the area could have an indirect impact on the larger heritage landscape. The lack of any heritage resources in the immediate area and the extensive existing development surrounding the study area minimises additional impact on the landscape.

8.6.1 Pre-Construction phase:

It is assumed that the pre-construction phase involves the removal of topsoil and vegetation as well as the establishment of infrastructure needed for the construction phase. These activities can have a negative and irreversible impact on heritage sites. Impacts include destruction or partial destruction of non-renewable heritage resources.

8.6.2 Construction Phase

During this phase, the impacts and effects are similar in nature but more extensive than the pre-construction phase. These activities can have a negative and irreversible impact on heritage sites. Impacts include destruction or partial destruction of non-renewable heritage resources.

8.6.3 Operation Phase:

No impact is envisaged during this phase.

Table 7. Impact Assessment table.

Nature: During the construction phase activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position archaeological material or objects.		
	Without mitigation	**With mitigation (Preservation/ excavation of site)**
Extent	Local (1)	Local (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Moderate (6)	Low (4)
Probability	Probable (4)	Probable (3)
Significance	**48 (Medium)**	**30 (Low to medium)**
Status (positive or negative)	Negative	Negative
Reversibility	Not reversible	Not reversible
Irreplaceable loss of resources?	No resources were recorded	No resources were recorded.
Can impacts be mitigated?	Yes, a chance find procedure should be implemented.	Yes

Mitigation:

- Implementation of a chance find procedure.
- It is recommended that Site 2,3 and 4 should be assessed by an industrial archaeologist prior to construction.
- It should be confirmed whether the stone cairns identified represent graves. If the features are confirmed to be graves the graves should be retained *in situ*. If the features relate to clearing activities they are of no importance and no further action is required.
- Graves should be retained *in situ* if this is not possible as a last resort the graves can be relocated adhering to legal requirements.
- Stone Age Sites – the sites are located on the edges of pans and due to ecological reasons, it is not expected that the area will be developed. It is recommended that these sites should be retained *in situ.*
- An independent paleontological assessment should be conducted prior to development.

Cumulative impacts:

Cumulative impacts are considered to be low due to the densely developed surrounding area.

Residual Impacts:

If sites are destroyed this results in the depletion of archaeological record of the area. However, if sites are recorded and preserved or mitigated this adds to the record of the area.

9 Conclusion and recommendations

HCAC was appointed to conduct a Heritage Impact Assessment to determine the presence of cultural heritage sites and the impact of the proposed development on these non-renewable resources. The study area was assessed both on desktop level and by a field survey. The field survey was conducted as a non-intrusive pedestrian survey to cover the extent of the Remainder of Portion 62 as development plans are not available at this stage.

A large slime dam is situated inside the survey area and takes up about 25 % of the Northern part of the survey area. The study area is further disturbed by waterline servitudes and cultivation from the 1970's (Figure 12). Although these activities would have impacted on surface indications of heritage sites 11 features including Stone tools and historical industrial artefacts, a ruin as well as a large cemetery and stone cairns (that could mark informal graves) were identified.

In terms of the built environment of the area (Section 34), no standing structures older than 60 years occur within the study areas.

Stone Age artefacts were recorded during the survey. The features comprise dispersed scatters of a low density and are located on the edges of pans. Due to ecological reasons it is not expected that these areas will be developed and this will ensure that the features are preserved. No further mitigation prior to construction is recommended in terms of the archaeological components of Section 35 for the proposed development to proceed. Based on the SAHRA sensitivity map the area is of very high significance and additional studies are required prior to development. In terms of Section 36 of the Act 1 cemetery and two areas with three and five stone cairns respectively were recorded.

If any graves are located in future they should ideally be preserved in-situ or alternatively relocated according to existing legislation. No public monuments are located within or close to the study area. The surrounding area has been developed and the proposed project is in line with the current land use and will not impact negatively on significant cultural landscapes or viewscapes. During the public participation process conducted for the project no heritage concerns was raised.

The impacts on heritage resources can be mitigated to an acceptable level and it is recommended that the proposed project can commence on the condition that the following recommendations are implemented as part of the EMPr and based on approval from SAHRA:

- Implementation of a chance find procedure.
- It is recommended that Site 2,3 and 4 should be assessed by an industrial archaeologist prior to construction.
- It should be confirmed whether the stone cairns identified represent graves. If the features are confirmed to be graves the graves should be retained *in situ.* If the features relate to clearing activities they are of no importance and no further action is required.
- Graves should be retained *in situ* if this is not possible as a last resort the graves can be relocated adhering to legal requirements.
- Stone Age Sites – the sites are located on the edges of a pan and due to ecological reasons, it is not expected that the area will be developed. It is recommended that these sites should be retained *in situ.*
- An independent paleontological assessment should be conducted prior to development.

9.1. Chance Find Procedures

The possibility of the occurrence of subsurface finds cannot be excluded. Therefore, if during construction any possible finds such as stone tool scatters, artefacts or bone and fossil remains are made, the operations must be stopped and a qualified archaeologist must be contacted for an assessment of the find and therefor chance find procedures should be put in place as part of the EMP. A short summary of chance find procedures is discussed below.

This procedure applies to the developer's permanent employees, its subsidiaries, contractors and subcontractors, and service providers. The aim of this procedure is to establish monitoring and reporting procedures to ensure compliance with this policy and its associated procedures. Construction crews must be properly inducted to ensure they are fully aware of the procedures regarding chance finds as discussed below.

- If during the pre-construction phase, construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance or heritage site, this person must cease work at the site of the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager.
- It is the responsibility of the senior on-site Manager to make an initial assessment of the extent of the find, and confirm the extent of the work stoppage in that area.
- The senior on-site Manager will inform the ECO of the chance find and its immediate impact on operations. The ECO will then contact a professional archaeologist for an assessment of the finds who will notify the SAHRA.

9.2 Reasoned Opinion

The impact of the proposed project on heritage resources is considered low and no further pre-construction mitigation in terms of archaeological resources is required based on approval from SAHRA. Furthermore, the socio-economic benefits also outweigh the possible impacts of the development if the correct mitigation measures (i.e. chance find procedure) are implemented for the project.

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MAPS

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11. Appendices:

Curriculum Vitae of Specialist

Jaco van der Walt
Archaeologist

jaco.heritage@gmail.com
+27 82 373 8491
+27 86 691 6461

Education:

Particulars of degrees/diplomas and/or other qualifications:

Name of University or Institution:		University of Pretoria
Degree obtained	**:**	BA Heritage Tourism & Archaeology
Year of graduation	**:**	2001
Name of University or Institution:		University of the Witwatersrand
Degree obtained	**:**	BA Hons Archaeology
Year of graduation	**:**	2002
Name of University or Institution	**:**	University of the Witwatersrand
Degree Obtained	**:**	MA (Archaeology)
Year of Graduation	:	2012
Name of University or Institution	**:**	University of Johannesburg
Degree	**:**	PhD
Year	:	Currently Enrolled

EMPLOYMENT HISTORY:

2011 – Present:	**Owner – HCAC (Heritage Contracts and Archaeological Consulting CC)**.
2007 – 2010 :	**CRM Archaeologist,** Managed the Heritage Contracts Unit at the University of the Witwatersrand.
2005 - 2007:	**CRM Archaeologist**, Director of Matakoma Heritage Consultants
2004:	**Technical Assistant**, Department of Anatomy University of Pretoria
2003:	**Archaeologist**, Mapungubwe World Heritage Site
2001 - 2002:	**CRM Archaeologists,** For R & R Cultural Resource Consultants, Polokwane
2000:	**Museum Assistant**, Fort Klapperkop.

Countries of work experience include:

Republic of South Africa, Botswana, Zimbabwe, Mozambique, Tanzania, The Democratic Republic of the Congo, Lesotho and Zambia.

SELECTED PROJECTS INCLUDE:

Archaeological Impact Assessments (Phase 1)

Heritage Impact Assessment Proposed Discharge Of Treated Mine Water Via The Wonderfontein Spruit Receiving Water Body Specialist as part of team conducting an Archaeological Assessment for the Mmamabula mining project and power supply, Botswana

Archaeological Impact Assessment Mmamethlake Landfill

Archaeological Impact Assessment Libangeni Landfill

Linear Developments

Archaeological Impact Assessment Link Northern Waterline Project At The Suikerbosrand Nature Reserve

Archaeological Impact Assessment Medupi – Spitskop Power Line,

Archaeological Impact Assessment Nelspruit Road Development

Renewable Energy developments

Archaeological Impact Assessment Karoshoek Solar Project

Grave Relocation Projects

Relocation of graves and site monitoring at Chloorkop as well as permit application and liaison with local authorities and social processes with local stakeholders, Gauteng Province.

Relocation of the grave of Rifle Man Maritz as well as permit application and liaison with local authorities and social processes with local stakeholders, Ndumo, Kwa Zulu Natal.

Relocation of the Magolwane graves for the office of the premier, Kwa Zulu Natal

Relocation of the OSuthu Royal Graves office of the premier, Kwa Zulu Natal

Phase 2 Mitigation Projects

Field Director for the Archaeological Mitigation For Booysendal Platinum Mine, Steelpoort, Limpopo Province. Principle investigator Prof. T. Huffman

Monitoring of heritage sites affected by the ARUP Transnet Multipurpose Pipeline under directorship of Gavin Anderson.

Field Director for the Phase 2 mapping of a late Iron Age site located on the farm Kameelbult, Zeerust, North West Province. Under directorship of Prof T. Huffman.

Field Director for the Phase 2 surface sampling of Stone Age sites effected by the Medupi – Spitskop Power Line, Limpopo Province

Heritage management projects

Platreef Mitigation project – mitigation of heritage sites and compilation of conservation management plan.

MEMBERSHIP OF PROFESSIONAL ASSOCIATIONS:

- Association of Southern African Professional Archaeologists. Member number 159

  Accreditation:
  - Field Director Iron Age Archaeology
  - Field Supervisor Colonial Period Archaeology, Stone Age Archaeology and Grave Relocation
- Accredited CRM Archaeologist with SAHRA
- Accredited CRM Archaeologist with AMAFA
- Co-opted council member for the CRM Section of the Association of Southern African Association Professional Archaeologists (2011 – 2012)

PUBLICATIONS AND PRESENTATIONS

- A Culture Historical Interpretation, Aimed at Site Visitors, of the Exposed Eastern Profile of K8 on the Southern terrace at Mapungubwe.
  - J van der Walt, A Meyer, WC Nienaber
  - Poster presented at Faculty day, Faculty of Medicine University of Pretoria 2003
- 'n Reddingsondersoek na Anglo-Boereoorlog-ammunisie, gevind by Ifafi, Noordwes-Provinsie. South-African Journal for Cultural History 16(1) June 2002, with A. van Vollenhoven as co-writer.
- Fieldwork Report: Mapungubwe Stabilization Project.
  - WC Nienaber, M Hutten, S Gaigher, J van der Walt
  - Paper read at the Southern African Association of Archaeologists Biennial Conference 2004
- A War Uncovered: Human Remains from Thabantšho Hill (South Africa), 10 May 1864.
  - M. Steyn, WS Boshoff, WC Nienaber, J van der Walt
  - Paper read at the 12th Congress of the Pan-African Archaeological Association for Prehistory and Related Studies 2005
- Field Report on the mitigation measures conducted on the farm Bokfontein, Brits, North West Province .
  - J van der Walt, P Birkholtz, W. Fourie
  - Paper read at the Southern African Association of Archaeologists Biennial Conference 2007
- Field report on the mitigation measures employed at Early Farmer sites threatened by development in the Greater Sekhukhune area, Limpopo Province. J van der Walt
  - Paper read at the Southern African Association of Archaeologists Biennial Conference 2008
- Ceramic analysis of an Early Iron Age Site with vitrified dung, Limpopo Province South Africa.
  - J van der Walt. Poster presented at SAFA, Frankfurt Germany 2008

- Bantu Speaker Rock Engravings in the Schoemanskloof Valley, Lydenburg District, Mpumalanga (*In Prep)*
    - J van der Walt and J.P Celliers
- Sterkspruit: Micro-layout of late Iron Age stone walling, Lydenburg, Mpumalanga. W. Fourie and J van der Walt. A Poster presented at the Southern African Association of Archaeologists Biennial Conference 2011
- Detailed mapping of LIA stone-walled settlements' in Lydenburg, Mpumalanga. J van der Walt and J.P Celliers
    - Paper read at the Southern African Association of Archaeologists Biennial Conference 2011
- Bantu-Speaker Rock engravings in the Schoemanskloof Valley, Lydenburg District, Mpumalanga. J.P Celliers and J van der Walt
    - Paper read at the Southern African Association of Archaeologists Biennial Conference 2011
- Pleistocene hominin land use on the western trans-Vaal Highveld ecoregion, South Africa, Jaco van der Walt.
    - J van der Walt. Poster presented at SAFA, Toulouse, France. Biennial Conference 2016

REFERENCES:

1. Prof Marlize Lombard Senior Lecturer, University of Johannesburg, South Africa
   E-mail: mlombard@uj.ac.za
2. Prof TN Huffman Department of Archaeology Tel: (011) 717 6040
   University of the Witwatersrand
3. Alex Schoeman University of the Witwatersrand
   E-mail:Alex.Schoeman@wits.ac.za