

HERITAGE IMPACT ASSESSMENT

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

FOR THE PROPOSED SKY CITY FILLING STATION ON ERF 7258 OF
WATERVALSPRUIT X38, EKURHULENI METROPOLITAN MUNICIPALITY

Type of development:

Commercial

Client:

Isquare Environmental Planning and GIS

Developer:

Cosmopolitan Projects Johannesburg (Pty) Ltd



Beyond Heritage

Private Bag X 1049

Suite 34

Modimolle

0510

Tel: 082 373 8491

Fax: 086 691 6461

E-Mail: jaco@heritageconsultants.co.za

Report Author:

Mr. J. van der Walt

Project Reference:

Project number 2207

Report date:

January 2022

APPROVAL PAGE

Project Name	Sky City Filling Station
Report Title	Heritage Impact Assessment for the Proposed Sky City Filling Station on Erf 7258 Of Watervalspruit X38, Ekurhuleni Metropolitan Municipality
Authority Reference Number	TBC
Report Status	Final Report
Applicant Name	Cosmopolitan Projects Johannesburg (Pty) Ltd

Responsibility	Name	Qualifications and Certifications	Date
Fieldwork and reporting	Jaco van der Walt - Archaeologist	MA Archaeology ASAPA #159 APHP #114	January 2022
Fieldwork	Ruan van der Merwe - Archaeologist	BA Hons Archaeology	January 2022

DOCUMENT PROGRESS**Distribution List**

Date	Report Reference Number	Document Distribution	Number of Copies
26 January 2022	2207	Exigent Engineering Consultants	Electronic Copy

Amendments on Document

Date	Report Reference Number	Description of Amendment

INDEMNITY AND CONDITIONS RELATING TO THIS REPORT

The findings, results, observations, conclusions and recommendations given in this report are based on the author's best scientific and professional knowledge as well as available information. The report is based on survey and assessment techniques which are limited by time and budgetary constraints relevant to the type and level of investigation undertaken. Beyond Heritage reserves the right to modify aspects of the report including the recommendations if and when new information becomes available from ongoing research or further work in this field or pertaining to this investigation.

Although Beyond Heritage exercises due care and diligence in rendering services and preparing documents Beyond Heritage accepts no liability, and the client, by receiving this document, indemnifies Beyond Heritage against all actions, claims, demands, losses, liabilities, costs, damages and expenses arising from or in connection with services rendered, directly or indirectly by Beyond Heritage and by the use of the information contained in this document.

This report must not be altered or added to without the prior written consent of the author. This also refers to electronic copies of this report which are supplied for the purposes of inclusion as part of other reports, including main reports. Similarly, any recommendations, statements or conclusions drawn from or based on this report must make reference to this report. If these form part of a main report relating to this investigation or report, this report must be included in its entirety as an appendix or separate section to the main report.

COPYRIGHT

Copyright on all documents, drawings and records, whether manually or electronically produced, which form part of the submission and any subsequent report or project document, shall vest in Beyond Heritage.

The client, on acceptance of any submission by Beyond Heritage and on condition that the client pays to Beyond Heritage the full price for the work as agreed, shall be entitled to use for its own benefit:

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

Should the applicant wish to utilise any part of, or the entire report, for a project other than the subject project, permission must be obtained from Beyond Heritage to do so. This will ensure validation of the suitability and relevance of this report on an alternative project.

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	<i>Declaration of Independence</i>
(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 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
(l) 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 1.3
(k) Mitigation measures for inclusion in the EMPr	Section 10.1
(l) Conditions for inclusion in the environmental authorisation	Section 10. 1.
(m) Monitoring requirements for inclusion in the EMPr or environmental authorisation	Section 10. 5.
(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 10.3
(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 BAR report
(q) Any other information requested by the competent authority	N.A

Executive Summary

Isquare Environmental Planning and GIS was appointed as the Environmental Assessment Practitioner (EAP) by Cosmopolitan Projects Johannesburg (Pty) Ltd to undertake the required Environmental Authorisation Process for the proposed Sky City Filling Station. The Project is located on Erf 7258 Of Watervalspruit X38, Ekurhuleni Metropolitan Municipality. Beyond Heritage was appointed to conduct a Heritage Impact Assessment (HIA) for the project and the study area was assessed on desktop level and by a non-intrusive pedestrian field survey. Key findings of the assessment include:


- Large sections of the study area have been disturbed by surrounding developments and illegal dumping in the study area. These activities would have impacted on heritage features if any ever occurred in these areas and the Project area is considered to be of low heritage potential;
- This was confirmed during the field survey and no surface indicators of heritage resources were noted;
- The palaeontological sensitivity of the study area is moderate, and an independent study was conducted for this aspect (Bamford 2022). The study concluded that the chances of finding fossils is extremely low and that no further preconstruction palaeontological assessment is required

The impact on heritage resources is low and the project can commence provided that the recommendations in this report are adhered to, based on the South African Heritage Resource Authority (SAHRA) 's approval.

Recommendations:

- Implementation of a chance find procedure for the project.

Declaration of Independence

Specialist Name	Jaco van der Walt
Declaration of Independence	<p>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:</p> <ul style="list-style-type: none"> • 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	24/01/2022

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, Guinea 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

REPORT OUTLINE	4
EXECUTIVE SUMMARY	5
DECLARATION OF INDEPENDENCE	6
A) EXPERTISE OF THE SPECIALIST.....	6
ABBREVIATIONS	10
GLOSSARY	10
1 INTRODUCTION AND TERMS OF REFERENCE:	11
1.1 TERMS OF REFERENCE.....	11
1.2 PROJECT DESCRIPTION	12
1.3 ALTERNATIVES	12
2 LEGISLATIVE REQUIREMENTS	16
3 METHODOLOGY	17
3.1 LITERATURE REVIEW.....	17
3.2 GENEALOGICAL SOCIETY AND GOOGLE EARTH MONUMENTS.....	17
3.3 PUBLIC CONSULTATION AND STAKEHOLDER ENGAGEMENT:.....	18
3.4 SITE INVESTIGATION.....	18
3.5 SITE SIGNIFICANCE AND FIELD RATING.....	20
3.6 IMPACT ASSESSMENT METHODOLOGY.....	21
3.7 LIMITATIONS AND CONSTRAINTS OF THE STUDY	22
4 DESCRIPTION OF SOCIO-ECONOMIC ENVIRONMENT	22
5 RESULTS OF PUBLIC CONSULTATION AND STAKEHOLDER ENGAGEMENT:	23
6 LITERATURE / BACKGROUND STUDY:	23
6.1 LITERATURE REVIEW (SAHRIS)	23
6.2 ARCHAEOLOGICAL BACKGROUND.....	24
7 DESCRIPTION OF THE PHYSICAL ENVIRONMENT	25
8 FINDINGS OF THE SURVEY	27
8.1 HERITAGE RESOURCES.....	27
8.2 CULTURAL LANDSCAPE.....	27
8.3 PALEONTOLOGICAL HERITAGE	31
9 POTENTIAL IMPACT	32
10 CONCLUSION AND RECOMMENDATIONS	33

10.1	RECOMMENDATIONS FOR CONDITION OF AUTHORISATION.....	33
10.2	CHANCE FIND PROCEDURES	33
10.3	REASONED OPINION	34
10.4	POTENTIAL RISK	34
10.5	MONITORING REQUIREMENTS	35
10.6	MANAGEMENT MEASURES FOR INCLUSION IN THE EMPR	37
10.7	KNOWLEDGE GAPS	38
11	REFERENCES.....	39

LIST OF FIGURES

FIGURE 1.1.	REGIONAL SETTING OF THE PROJECT (1: 250 000 TOPOGRAPHICAL MAP)	13
FIGURE 1.2.	LOCAL SETTING OF THE PROJECT (1: 50 000 TOPOGRAPHICAL MAP)	14
FIGURE 1.3.	AERIAL IMAGE OF THE STUDY AREA	15
FIGURE 3.1.	TRACKLOG OF THE SURVEY IN GREEN	19
FIGURE 6.1:	MOVEMENT OF BANTU SPEAKING FARMERS (HUFFMAN 2007).....	25
FIGURE 7.1.	GENERAL SITE CONDITIONS.	26
FIGURE 7.2.	GENERAL SITE CONDITIONS.	26
FIGURE 8.1.	1944 TOPOGRAPHIC MAP OF THE STUDY AREA INDICATING NO DEVELOPMENTS IN THE STUDY AREA.....	27
FIGURE 8.2.	1957 TOPOGRAPHIC MAP OF THE STUDY AREA INDICATING NO DEVELOPMENTS IN THE STUDY AREA.....	28
FIGURE 8.3.	1964 TOPOGRAPHIC MAP INDICATING A EXCAVATION ACTIVITIES CLOSE TO THE STUDY AREA.	29
FIGURE 8.4.	1995 TOPOGRAPHIC MAP – NO DEVELOPMENTS OCCUR IN THE STUDY AREA, BUT AN EXCAVATION IS VISIBLE TO THE SOUTH.	30
FIGURE 8.5.	2021 GOOGLE IMAGE INDICATING CURRENT SITE CONDITIONS.....	30
FIGURE 8.6.	PALEONTOLOGICAL SENSITIVITY OF THE APPROXIMATE STUDY AREA (YELLOW POLYGON) AS INDICATED ON THE SAHRA PALAEONTOLOGICAL SENSITIVITY MAP.	31

LIST OF TABLES

TABLE 1. SPECIALIST REPORT REQUIREMENTS.....	4
TABLE 2: PROJECT DESCRIPTION	12
TABLE 3: INFRASTRUCTURE AND PROJECT ACTIVITIES	12
TABLE 4: SITE INVESTIGATION DETAILS	18
TABLE 5. HERITAGE SIGNIFICANCE AND FIELD RATINGS.....	21
TABLE 6. CRM REPORTS CONSULTED FOR THE STUDY.....	23
TABLE 7. IMPACT ASSESSMENT OF THE PROPOSED PROJECT.....	32
TABLE 8. MONITORING REQUIREMENTS FOR THE PROJECT.....	35
TABLE 9. HERITAGE MANAGEMENT PLAN FOR EMPR IMPLEMENTATION	37

ABBREVIATIONS

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
EMPr: 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, 2002 (Act No. 28 of 2002)
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:

Beyond Heritage was appointed to conduct a HIA for the Sky City Filling Station on Erf 7258 Of Watervalspruit X38, Ekurhuleni Metropolitan Municipality (Figure 1-1 to 1-4). The report forms part of the Basic Assessment (BA) and Environmental Management Programme Report (EMPr) for the development.

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, no sites were recorded. 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, compiled in support of an Environmental Authorisation application as defined by NEMA EIA Regulations section 40 (1) and (2), to be submitted to SAHRA for commenting. Upon submission to SAHRA the project will be automatically given a case number as reference. As such the EIA 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).

1.2 Project Description

Project components and the location of the proposed filling station are outlined under Table 2 and 3.

Table 2: Project Description

Project area	Approximately 0,46 hectares on Erf 7528 of Watervalspruit X38
Magisterial District	Ekurhuleni Metropolitan Municipality
Central co-ordinate of the development	26°24'55.66"S and 28° 7'22.29"E
Topographic Map Number	2628 AC

Table 3: Infrastructure and project activities

Type of development	Filling Station
Size of development	0,46 hectares
Project Components	The project involves the establishment of a filling station on approximately 0,4542 ha with containers with a combined storage capacity of 80 cubic metres or more but less than 500 cubic metres with ancillary facilities that will typically include islands with dispensing pumps; an oil separator/interceptor/sump; a car wash facility; workers dressing room with kitchenette; a convenience store; a fast food outlet, etc.

1.3 Alternatives

No alternatives were provided to be assessed as this is the preferred alternative as identified through the environmental process based on the following criteria: Landownership, Land use And Feasibility.

- The proposed filling station site is privately owned.
- The Applicant is also the registered owner of the land.
- The development of a filling station with associated facilities is considered by the Applicant as the preferred development for this site.
- The proposed development site is almost completely transformed and is currently a vacant site.
- The current zoning of the site is for a public garage.

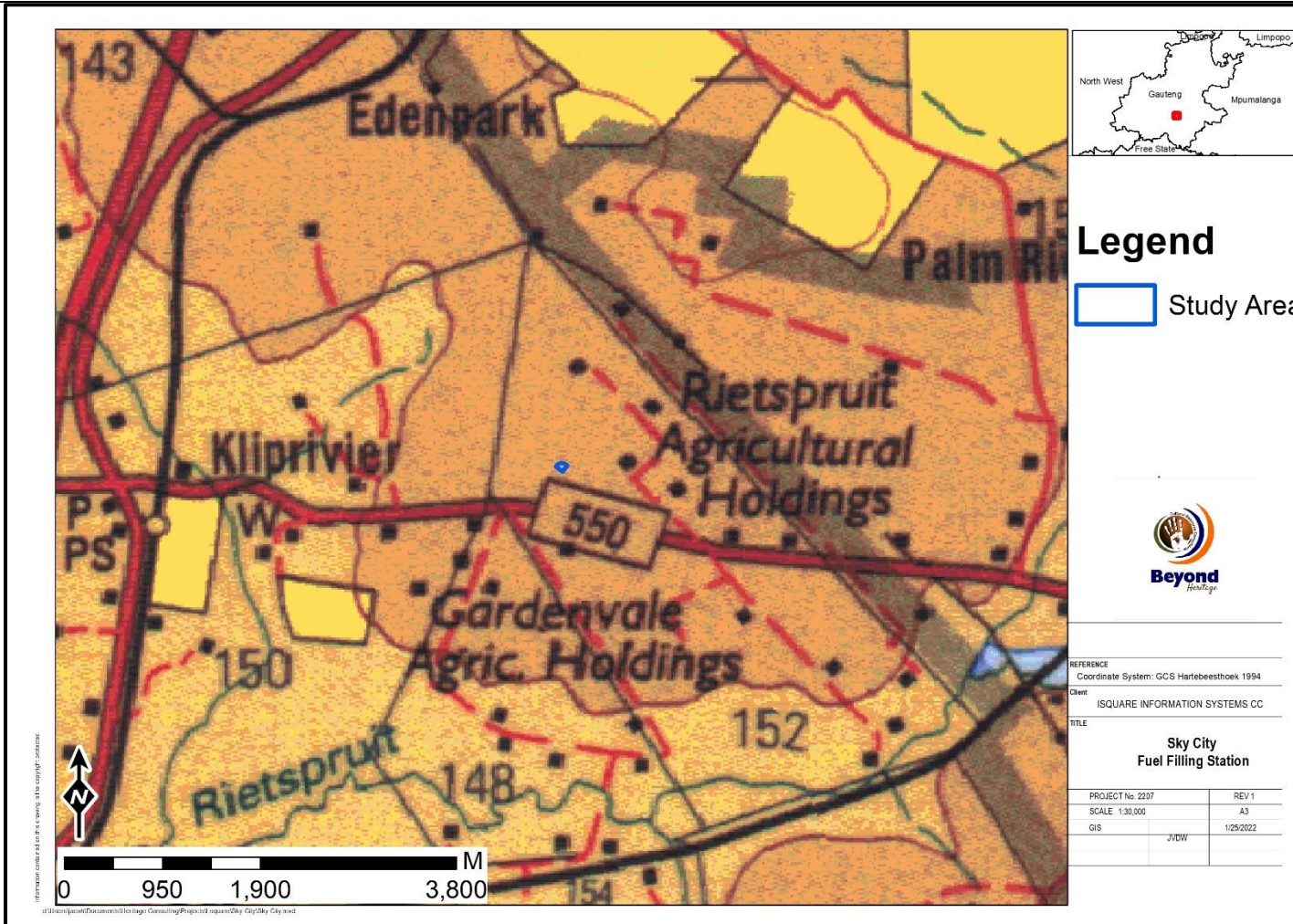


Figure 1.1. Regional setting of the project (1: 250 000 topographical map).

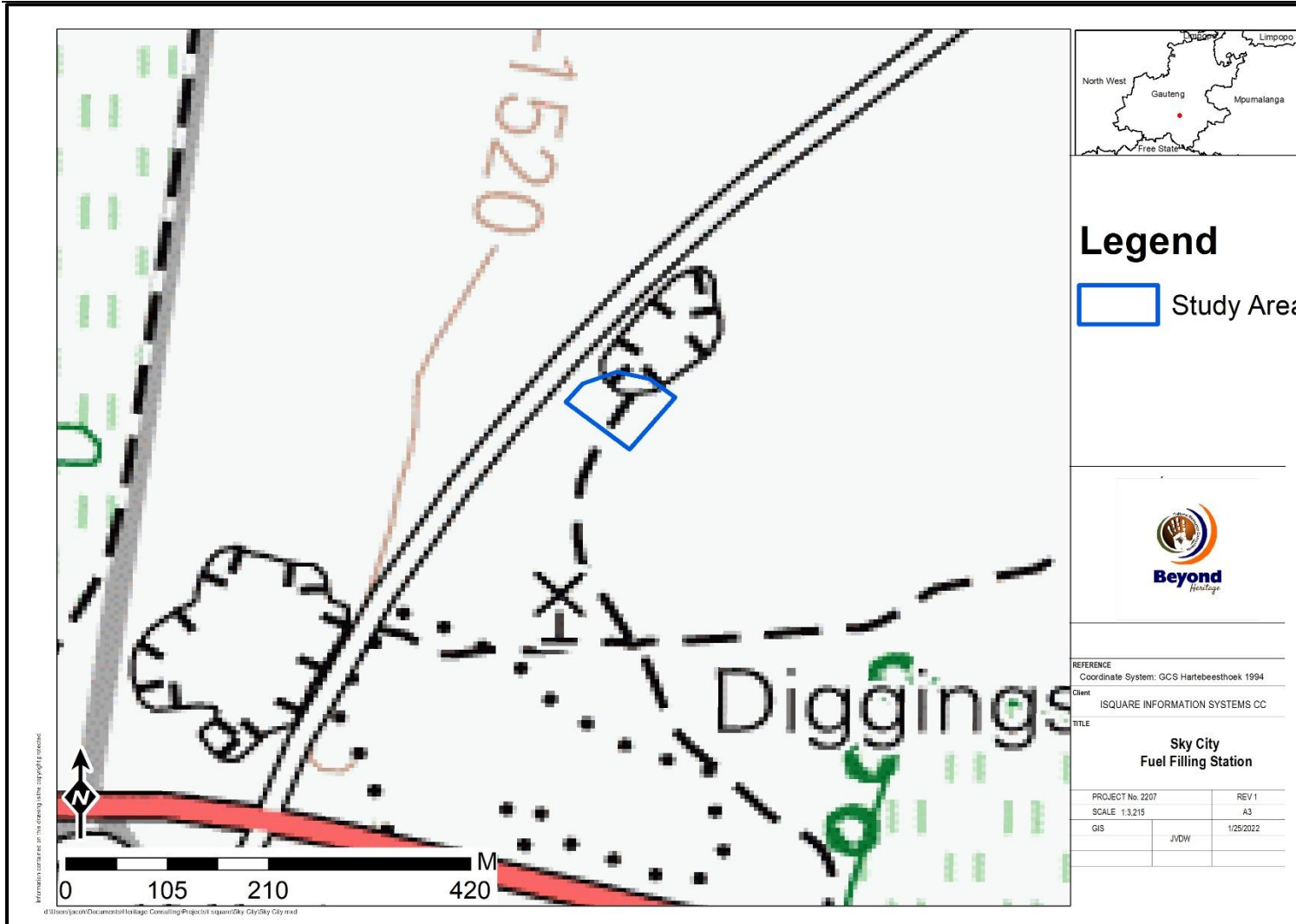


Figure 1.2. Local setting of the project (1: 50 000 topographical map).

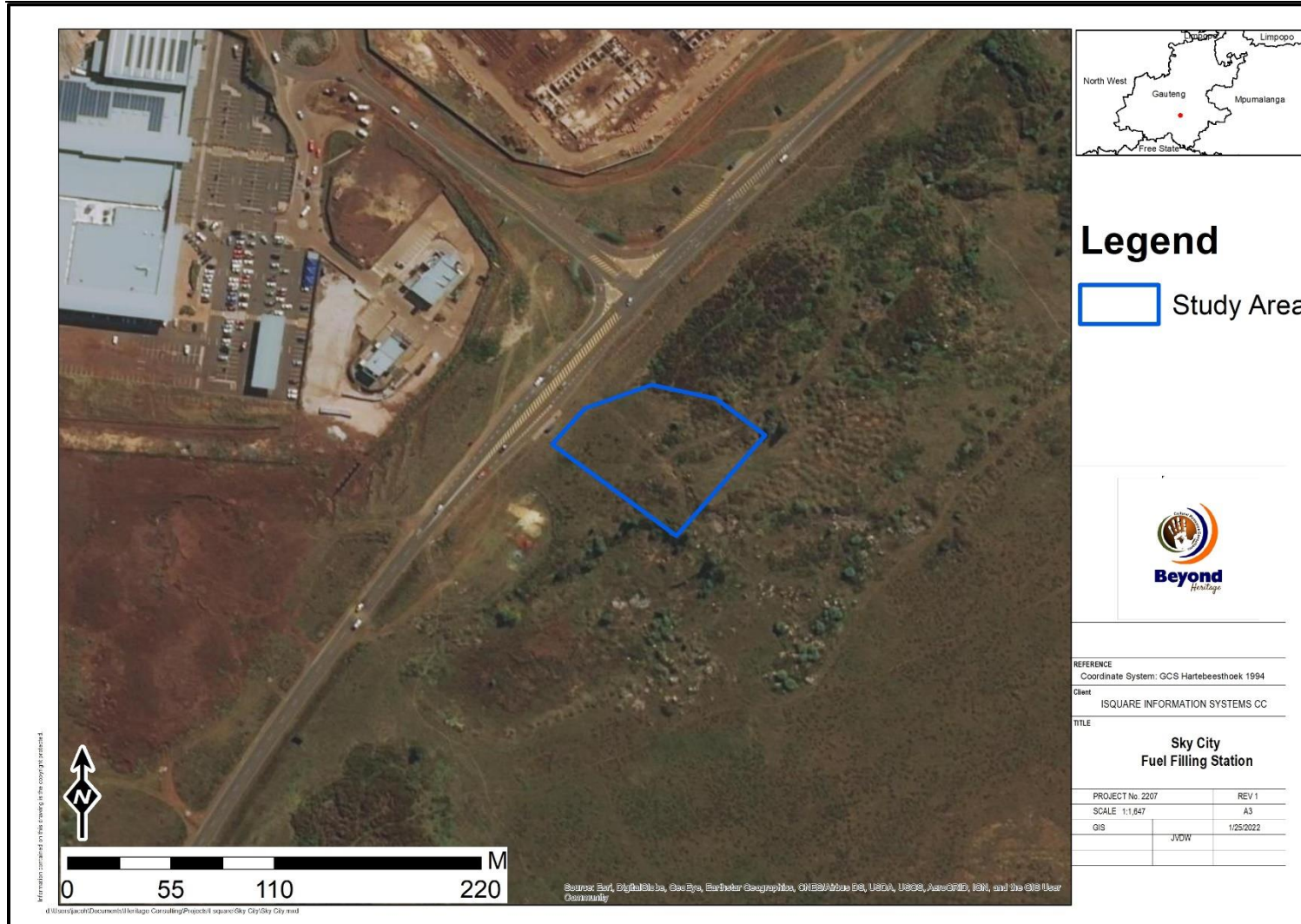


Figure 1.3. Aerial image of the study area.

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 evaluation of Phase 1 HIA reports upon which review comments will be issued. 'Best practice' requires Phase 1 HIA 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 HIA 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 HIA'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 fieldwork 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 EA 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 (conducted by the EAP) process was to capture and address any issues raised by community members and other stakeholders during key stakeholder and public meetings. The following approach was followed:

The process followed in the Public Participation Process undertaken for this project involves the following:

Initial Advertising Process

- Two laminated A2 site notification had been placed on site on 25 August 2021. A 37-day advertising period for registration as a stakeholder was stated on the notice.
- An advertisement was placed in the Citizen Newspaper on 3 September 2021 for a 37-day commenting period.
- A list of Interested & Affected Parties (IAPs) had been compiled and is included as Appendix E(8) of the Basic Assessment Report.
- Communication of the Draft Basic Assessment Report
- All the stakeholders on the Register of IAPs have now been notified of the availability of the Draft BAR for comment.
- A 37-day commenting period is applicable.

Final Basic Assessment Report

All communication received on the Draft BAR will be included in the Final BAR to be submitted to GDARD for their consideration for Environmental Authorisation.

Notification of Environmental Authorisation

All registered stakeholders will be informed of the decision of the Gauteng Department of Agriculture and Rural Development (GDARD) as soon as Environmental Authorisation had been received. All stakeholders will also be notified of the relevant appeal procedure.

3.4 Site Investigation

The aim of the site visit was to:

- a) 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 4: Site Investigation Details

	Site Investigation
Date	17 January 2022
Season	Summer – Although overgrown and disturbed by illegal dumping, the development footprint was sufficiently covered to understand the heritage character of the area (Figure 3-1).

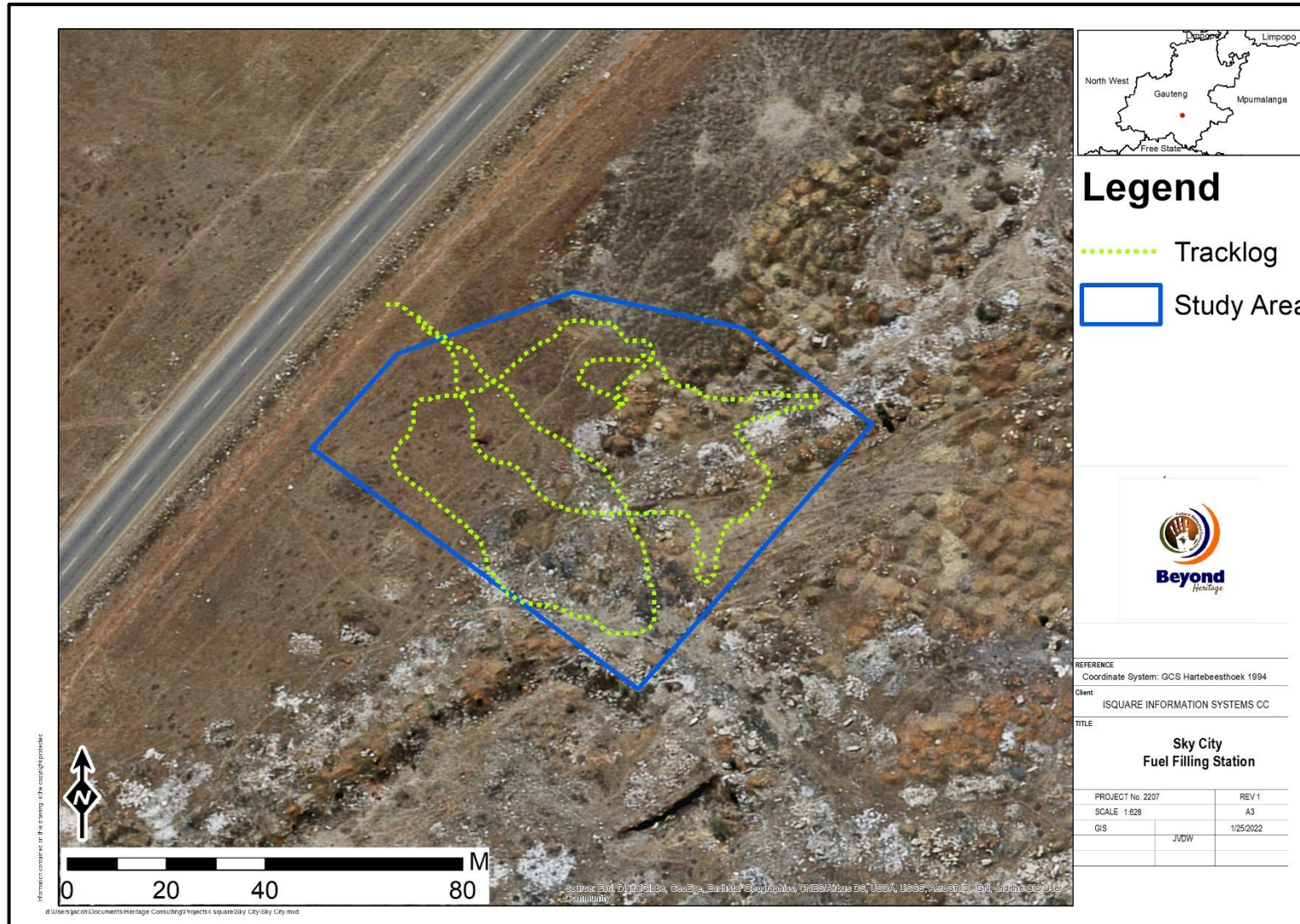


Figure 3.1. Tracklog of the survey in green.

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.

Table 5. Heritage significance and field ratings

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 nature of heritage resources and pedestrian surveys, the possibility exists that some features or artefacts may not have been discovered/recorded and the possible occurrence of graves and other cultural material cannot be excluded. 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 Environment

According to Census 2011, the Ekurhuleni municipality has a total population of just under 3,2 million individuals, 78,7% of whom are black African. Whites make up 15,8%, and other race groups comprise the remaining 5,5%. Of those aged 20 years and older, 3,3% have completed primary school, 35,3% have some secondary education, 35,5% have completed matric and 14,6% have some form of higher education. Due to the presence of OR Tambo International airport, a number of airline company headquarters are located within the municipality, such as South African Airways, Comair and Kulula.com.

In terms of employment, there are about 1,6 million economically active individuals (i.e. those who are employed or unemployed but looking for work) residing within the municipality. Of these, 28,8% are unemployed. When the youth (15–34 years) are considered, there are about 840 000 economically active individuals, 36,9% of whom are unemployed (www.statssa.gov.za).

5 Results of Public Consultation and Stakeholder Engagement:

5.1.1 Stakeholder Identification

Adjacent landowners and the public at large were informed of the proposed activity as part of the BA process by the EAP. Site notices and advertisements notifying interested and affected parties were placed at strategic points and in local newspapers as part of the process. Tebogo Molokomme from PRHA-G requested that an HIA should be conducted for the project and submitted to them. The request was made on 10 November 2021 via email.

6 Literature / Background Study:

6.1 Literature Review (SAHRIS)

Google Earth and 1:50 000 maps of the area were utilised to identify possible places where archaeological and historical sites might be located. Few sites are known for the area. The sites recorded consist mostly of graves and late Iron Age sites. The following Cultural Resource Management (CRM) assessments (Table 6) were consulted for this report:

Table 6. CRM reports consulted for the study.

Author	Year	Project	Findings
Van der Walt, J.	2017	Heritage Impact Assessment Magagula Heights	No Sites
Van Vollenhoven, A. C.	2015	Heritage Statement and Letter for HIA Exemption Request: Waterval Solar Park, Gauteng Province.	No Sites
Van der Walt, J.	2015	Archaeological Impact Assessment for The Proposed AMD Pipeline, Western Basin, Randfontein Estates Area	No Sites
Mathoho, E. N.	2013	Archaeological Impact Assessment Relating To The Demarcation Of Rietfontein-Rietspruit Mixed Residential Development On Farms Rietfontein 152ir And Rietspruit 153 IR Near Palm Ridge Within Ekurhuleni Metropolitan Municipality, Gauteng Province:	No Sites
Seliane, M	2013	Erwat Wastewater Care Works: Module 5 Phase I Cultural Heritage Impact Assessment	No Sites
Huffman, T.N.	2007	Archaeological assessment for the Graceview Industrial Park Gauteng.	No sites
Van Schalkwyk, J.	2007	Heritage Survey of A Portion Of The Farm Tamboekiesfontein 173IR, Heidelberg Magisterial District, Gauteng Province	Cemeteries and a farmstead
Van der Walt, J.	2007	Archaeological Impact Assessment Link Northern Waterline Project At The Suikerbosrand Nature Reserve	Iron Age sites
Van Schalkwyk, J.	2003	Heritage Sites: Proposed Vosloorus Cultural Village	No heritage features were identified.

6.1.1 Google Earth and The Genealogical Society of South Africa (Graves and burial sites)

Google Earth and 1:50 000 maps of the area were utilised to identify possible places where archaeological and historical sites might be located. The database of the Genealogical Society of South Africa indicated no known grave sites within the study area

6.2 Archaeological Background

The archaeology of the area can be divided in three main periods namely the Stone Age, Iron Age and Historical period.

6.2.1 Stone Age

South Africa has a long and complex Stone Age sequence of more than 2 million years. The broad sequence includes the Later Stone Age, the Middle Stone Age and the Earlier Stone Age. Each of these phases contains sub-phases or industrial complexes, and within these we can expect regional variation regarding characteristics and time ranges. For (CRM) purposes it is often only expected/ possible to identify the presence of the three main phases.

Yet sometimes the recognition of cultural groups, affinities or trends in technology and/or subsistence practices, as represented by the sub-phases or industrial complexes, is achievable. The three main phases can be divided 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 human - . 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.

There is evidence of the use of the larger area by Stone Age communities for example along the Kliprivier where ESA and MSA tools were recorded. The greater study area is in the vicinity of the Linksfield and Primrose Middle Stone Age terrains (Bergh 1999: 4-8). For the Later Stone Age some petroglyphs occur to the south at Redan as well as along the Vaal River (Bergh 1999).

6.2.2 Iron Age and historical period

Bantu-speaking people moved into Eastern and Southern Africa about 2,000 years ago (Mitchell, 2002). These people cultivated sorghum and millets, herded cattle and small stock and manufactured iron tools and copper ornaments. Because metalworking represents a new technology, archaeologists call this period the Iron Age. Characteristic ceramic styles help archaeologists to separate the sites into different groups and time periods. 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.

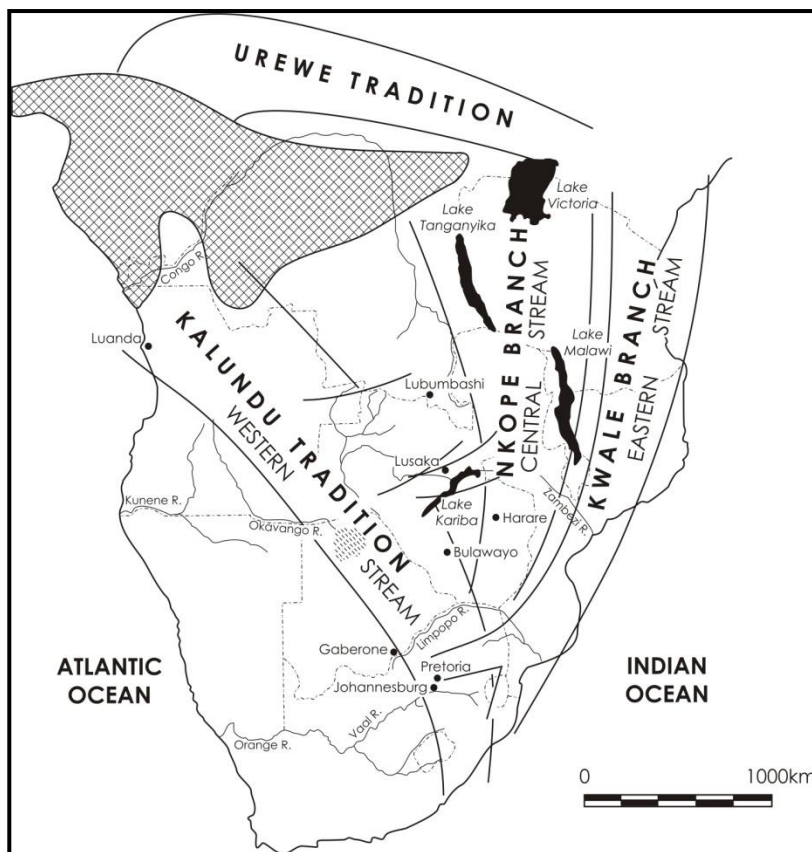


Figure 6.1: Movement of Bantu speaking farmers (Huffman 2007).

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 Description of the Physical Environment

The study area is overgrown by invader plants after the recent rains and is characterised by dumping of construction material and general waste. The study area is surrounded by new roads that form the basic infrastructure of a new residential development in the area. General site conditions are illustrated in Figure 7.1 and 7.2. The vegetation and landscape are described by Mucina and Rutherford (2006) as Klipriver Highveld Grassland and Tsakane Clay Grassland. The landscape of the Tsakane Clay Grassland vegetation type consists of flat to slightly undulating plains and low hills. Vegetation is short, dense grassland dominated by a mixture of common Highveld grasses such as *Themedatriandra*, *Heteropogoncontortus*, *Elionurusmusticus* and a number of *Eragrostis* species. Due to extensive past cultivation very little of the original vegetation occurs in the study area.

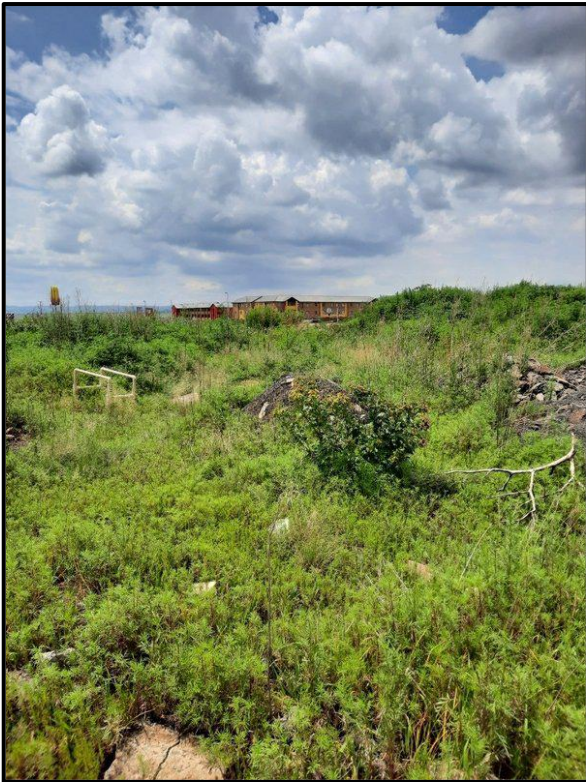


Figure 7.1. General site conditions.

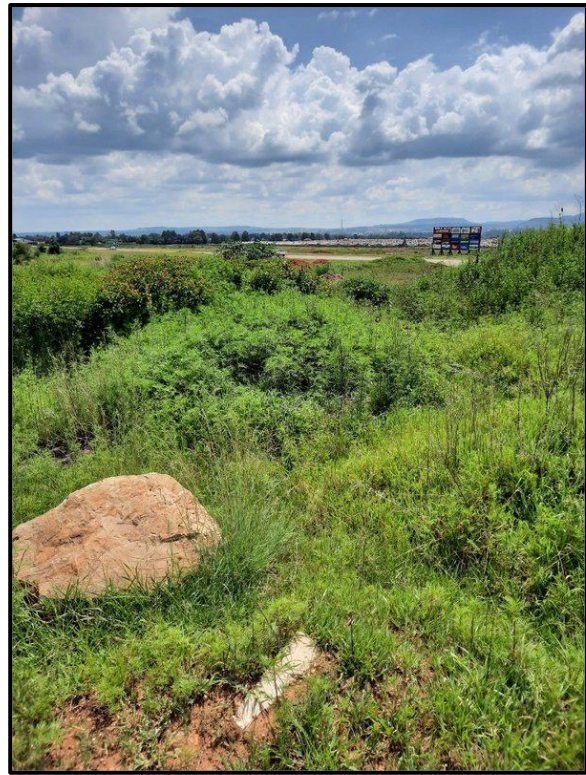


Figure 7.2. General site conditions.

8 Findings of the Survey

8.1 Heritage Resources

The study area is flat without focal points that would have attracted human occupation in antiquity. The study area consists of fallow land amidst dense residential and commercial developments. Parts of the study area and the immediate surrounds have been disturbed by clearing, construction and earth moving as well as dumping activities that altered the landscape and no surface evidence of heritage resources were noted.

8.2 Cultural Landscape

The cultural landscape is changed from a rural landscape marked by farming activities to an urban site marked by dense residential and commercial developments in the surrounding area that altered the project site (Figure 8.1 to 8.5).

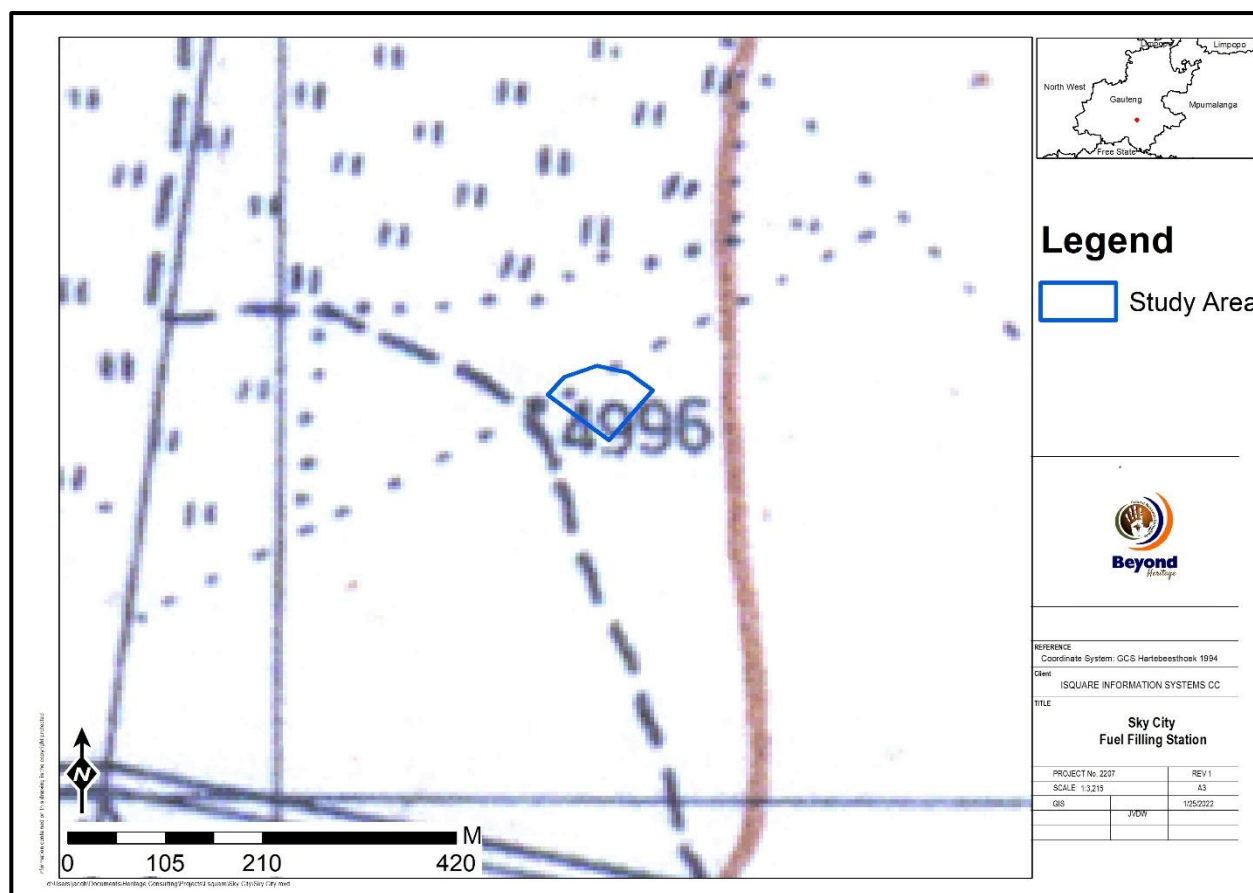


Figure 8.1. 1944 Topographic map of the study area indicating no developments in the study area.

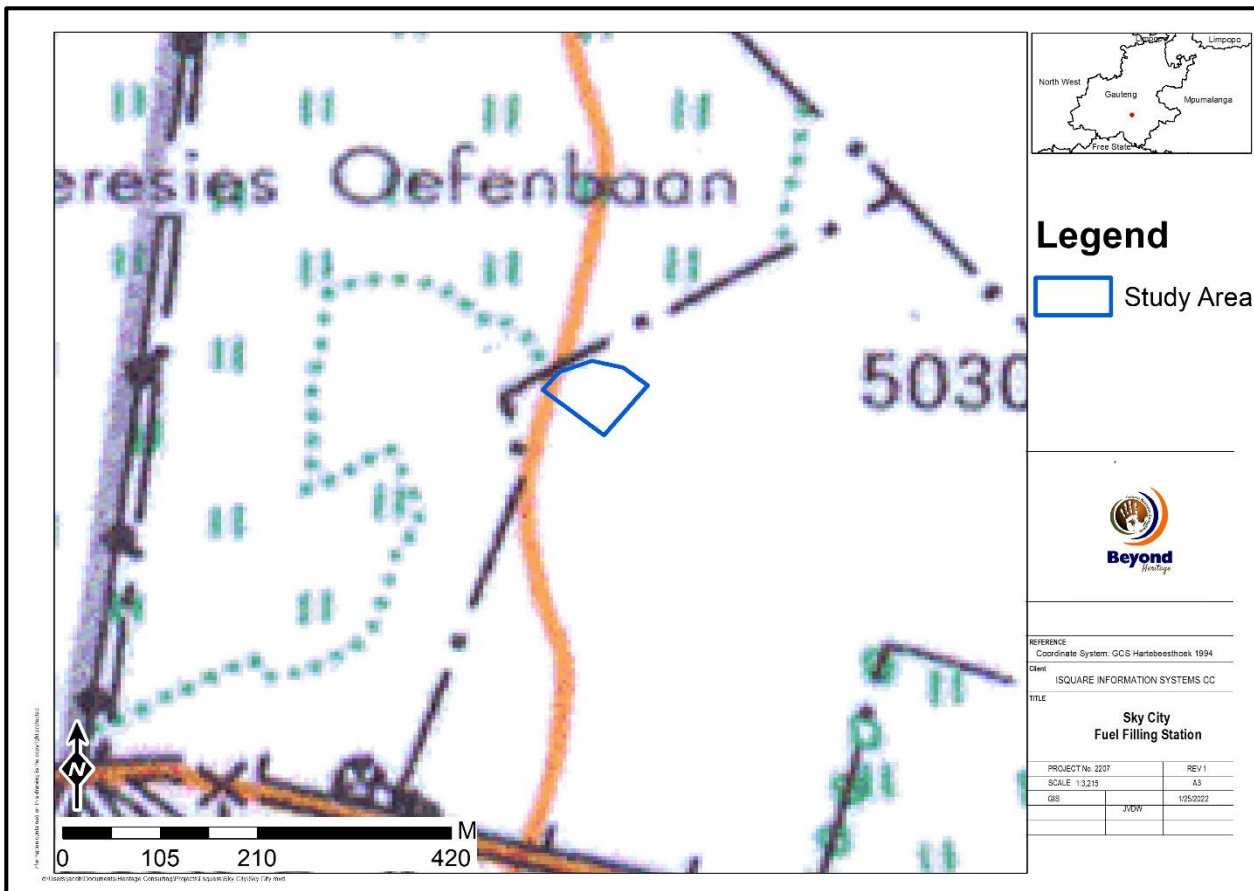


Figure 8.2. 1957 Topographic map of the study area indicating no developments in the study area.

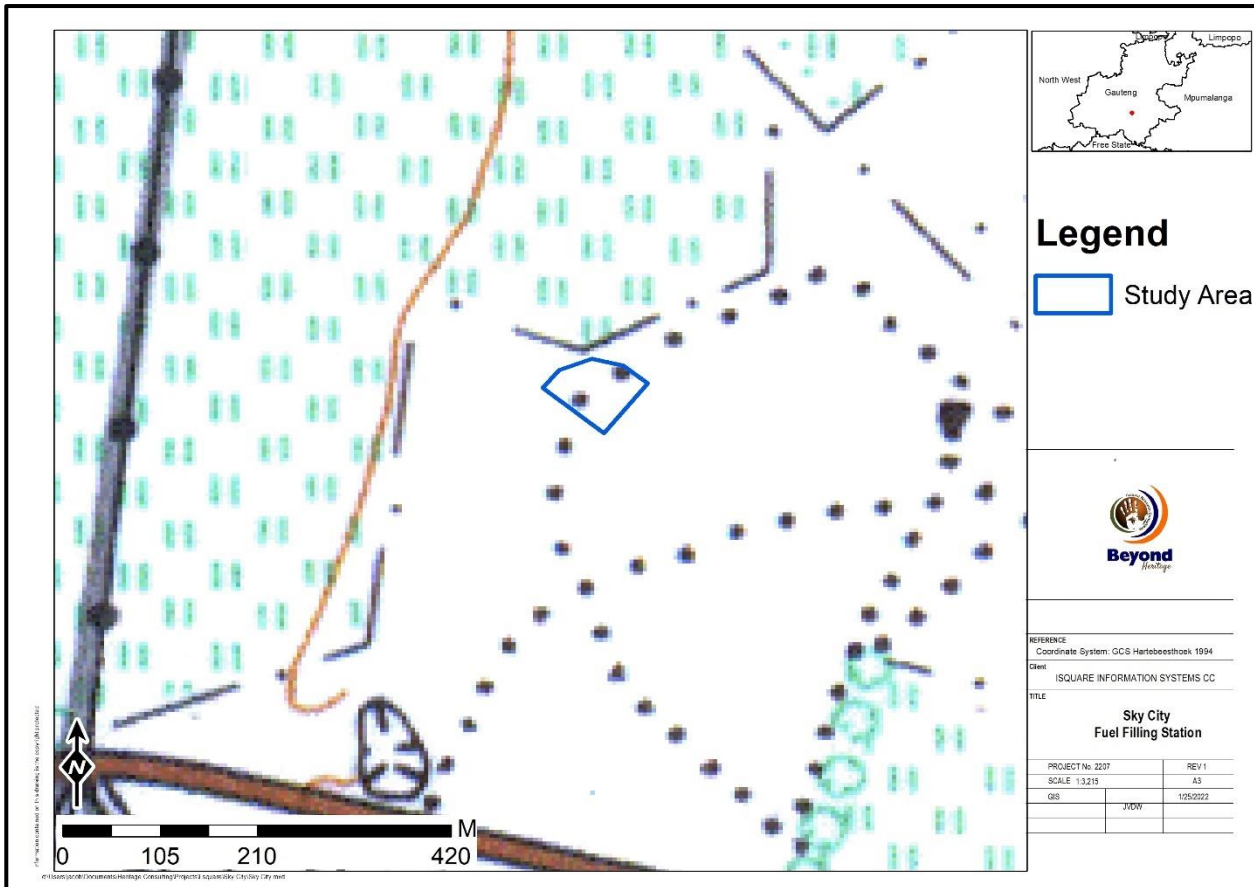


Figure 8.3. 1964 Topographic map indicating a excavation activities close to the study area.

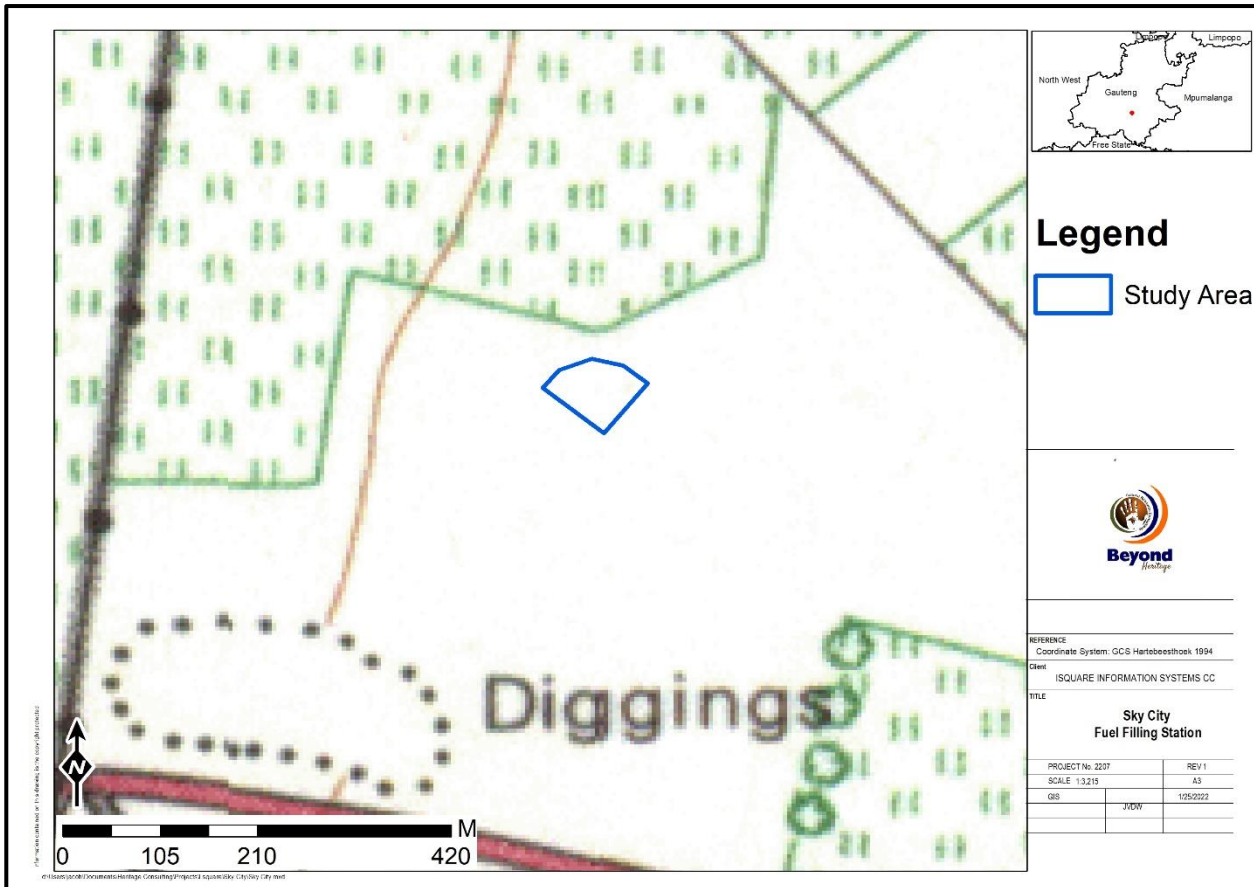


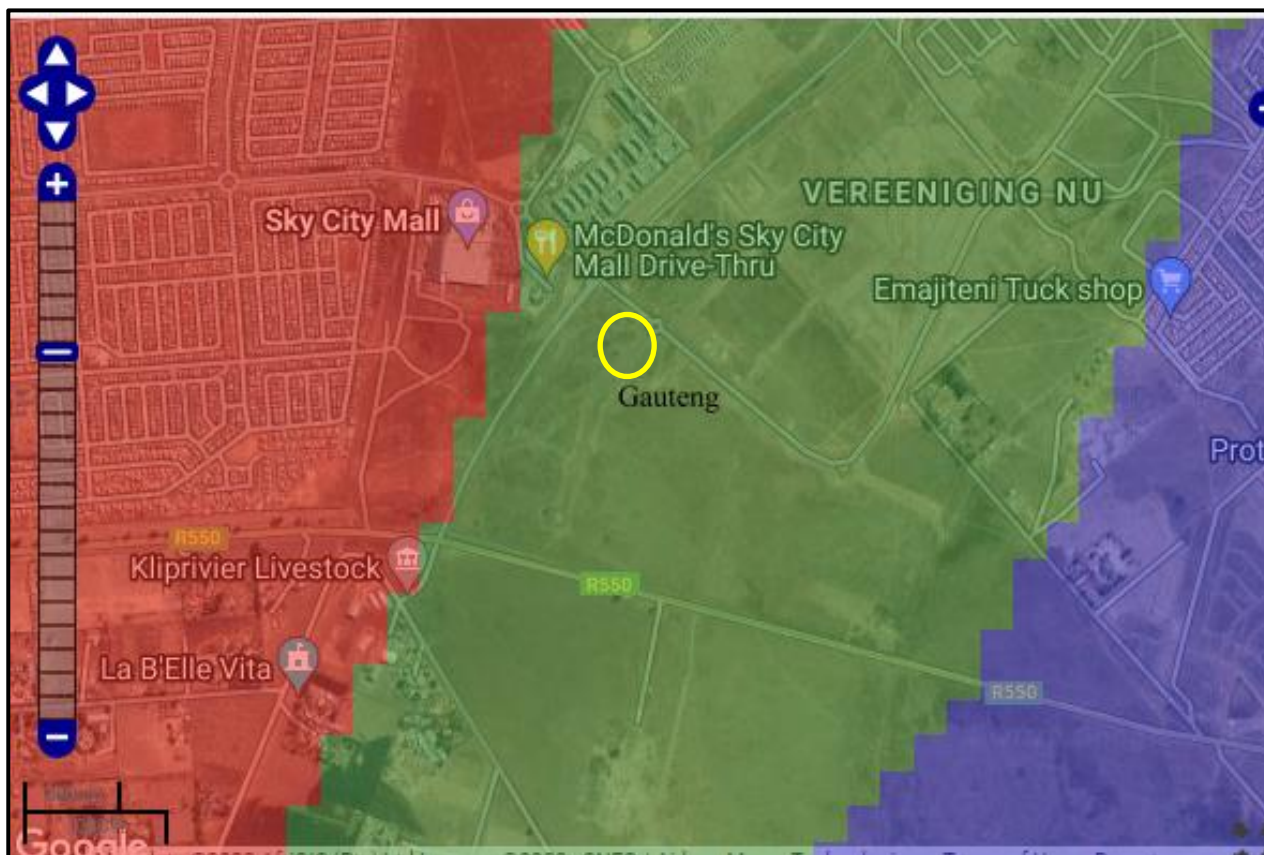
Figure 8.4. 1995 Topographic map – no developments occur in the study area, but an excavation is visible to the South.



Figure 8.5. 2021 Google image indicating current site conditions.

8.3 Paleontological Heritage

The study area indicated as moderate on the SAHRA Paleontological map (Figure 8.6) and an independent study (Bamford 2022) was commissioned for this aspect. The proposed site lies on the moderately sensitive rocks of the Black Reef formation (basal Transvaal Supergroup) that is unlikely to have any fossils.



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 8.6. Paleontological sensitivity of the approximate study area (yellow polygon) as indicated on the SAHRA Palaeontological sensitivity map.

9 Potential Impact

No heritage sites of significance occur within project footprint and no adverse impact to heritage resources is expected. Any additional effects to subsurface heritage resources can be successfully mitigated by implementing a chance find procedure. Mitigation measures as recommended in this report should be implemented during all phases of the project. Impacts of the project on heritage resources is expected to be low during all phases of the development (Table 7).

9.1.1 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. These activities can have a negative and irreversible impact on heritage features if any occur. Impacts include destruction or partial destruction of non-renewable heritage resources.

9.1.2 Construction Phase

During this phase, the impacts and effects are similar in nature but more extensive than the pre-construction phase. Potential impacts include destruction or partial destruction of non-renewable heritage resources.

9.1.3 Operation Phase

No impacts are expected during the operation phase.

9.1.4 Impact Assessment for the Project

Table 7. Impact assessment of the proposed project.

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 and paleontological material or objects.		
	Without mitigation	With mitigation (Preservation/excavation of site)
Extent	Local (2)	Local (2)
Duration	Permanent (5)	Permanent (5)
Magnitude	Minor (2)	Minor (2)
Probability	Improbable (2)	Improbable (2)
Significance	18 (Low)	18 (Low)
Status (positive or negative)	Negative	Negative
Reversibility	Not reversible	Not reversible
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	NA	NA
Mitigation:		
<ul style="list-style-type: none"> Implementation of a chance find procedure for the project; 		
Cumulative impacts:		
The proposed project will have a low cumulative impact as no known heritage resources will be adversely affected.		
Residual Impacts:		
Although surface sites can be avoided or mitigated, there is a chance that completely buried sites would still be impacted on, but this cannot be quantified.		

10 Conclusion and recommendations

From a heritage perspective the study area is altered by surrounding developments and illegal dumping. Cumulatively these activities would have impacted on surface indicators of heritage resources if any ever occurred in these areas and no heritage resources were recorded during the study. The palaeontological sensitivity of the study area is moderate, and an independent study was conducted by Marion Bamford for this aspect. The study concluded that the chances of finding such fossils is extremely low, nonetheless, a Fossil Chance Find Protocol should be added to the EMPr. Based on this information it is recommended that no further palaeontological assessment is required unless the responsible person on site finds fossils once excavations for foundations have commenced. As far as the palaeontology is concerned, the project may be authorised. The impact to heritage resources is low and the project can commence provided that the recommendations in this report are adhered to, based on the South African Heritage Resource Authority (SAHRA) 's approval

No adverse impact to heritage resources is expected by the project and it is recommended that the project can commence on the condition that the following recommendations (Section 10) are implemented as part of the EMPr and based on approval from SAHRA.

10.1 Recommendations for condition of authorisation

The following recommendations for Environmental Authorisation apply and the project may only proceed based on approval from SAHRA:

Recommendations:

- Implementation of a chance find procedure for the project (as outlined in Section 10.2).

10.2 Chance Find Procedures

10.2.1 Heritage Resources

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 therefore chance find procedures should be put in place as part of the EMP. A short summary of chance find procedures is discussed below and monitoring guidelines applicable to the Chance Find procedure are included in Section 10.5.

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.

10.3 Reasoned Opinion

The overall impact of the project is considered to be low and residual impacts can be managed to an acceptable level through implementation of the recommendations made in this report. The socio-economic benefits also outweigh the possible impacts of the development if the correct mitigation measures are implemented for the project.

10.4 Potential risk

Potential risks to the proposed project are the occurrence of intangible features and unrecorded cultural resources (of which graves are the highest risk). This can cause delays during construction, as well as additional costs involved in mitigation, as well as additional layout changes.

10.5 Monitoring Requirements

Day to day monitoring can be conducted by the Environmental Control Officers (ECO). The ECO or other responsible persons should be trained along the following lines:

- *Induction training:* Responsible staff identified by the developer should attend a short course on heritage management and identification of heritage resources.
- *Site monitoring and watching brief:* As most heritage resources occur below surface, all earth-moving activities need to be routinely monitored in case of accidental discoveries. The greatest potential impacts are from pre-construction and construction activities. The ECO should monitor all such activities daily. If any heritage resources are found, the chance finds procedure must be followed as outlined above.

Table 8. Monitoring requirements for the project

Heritage Monitoring					
Aspect	Area	Responsible for monitoring and measuring	Frequency	Proactive or reactive measurement	Method
Entire site	Entire project area	ECO	Weekly (Pre construction and construction phase)	Proactively	<ul style="list-style-type: none"> • If risks are manifested (accidental discovery of heritage resources) the chance find procedure should be implemented: <ol style="list-style-type: none"> 1. Cease all works immediately; 2. Report incident to the Sustainability Manager; 3. Contact an archaeologist/ palaeontologist to inspect the site; 4. Report incident to the competent authority; and 5. Employ reasonable mitigation measures in accordance with the requirements of the relevant authorities.

Heritage Monitoring					
Aspect	Area	Responsible for monitoring and measuring	Frequency	Proactive or reactive measurement	Method
					<ul style="list-style-type: none"> • Only recommence operations once impacts have been mitigated.

10.6 Management Measures for inclusion in the EMPr

Table 9. Heritage Management Plan for EMPr implementation

Area	Mitigation measures	Phase	Timeframe	Responsible party for implementation	Target	Performance indicators (Monitoring tool)
General project area	Implement chance find procedures in case possible heritage finds are uncovered	Construction	Throughout the project	Applicant EAP	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 35, 36 and 38 of NHRA	ECO Checklist/Report

10.7 Knowledge Gaps

Due to the subsurface nature of heritage resources, the possibility of discovery of heritage resources during the construction phase cannot be excluded. Also, thick grass cover and illegal dumping hampered ground visibility and although unlikely informal graves could have been undetected during the field survey. This limitation is successfully mitigated with the implementation of a chance find procedure and monitoring of the study area by the ECO.

11 References

- Geskiedenisatlas van Suid-Afrika. Die vier noordelike provinsies.* Edited by J. S. Bergh. 1999. Pretoria: J. L. van Schaik Uitgewers.
- Bamford, M. 2021. Palaeontological Impact Assessment for the proposed Township development on Portion 8 of Farm Rietspruit 152-IR, Midvaal, Gauteng Province. Unpublished report.
- Bonner, P.L. 2001. *Kathorus: A History.* Maskew Miller Longman.
- Huffman, T.N. 2007. Handbook to the Iron Age: The Archaeology of Pre-Colonial Farming Societies in Southern Africa. University of KwaZulu-Natal Press, Scottsville.
- Huffman, T.N. 2007. Archaeological assessment for the Graceview Industrial Park Gauteng. Unpublished report.
- Mathoho, E. N. 2013. Archaeological Impact Assessment Relating To The Demarcation Of Rietfontein-Rietspruit Mixed Residential Development On Farms Rietfontein 152ir And Rietspruit 153 IR Near Palm Ridge Within Ekurhuleni Metropolitan Municipality, Gauteng Province. Unpublished report.
- NHRA Act 25 of 1999
- Rasmussen, R.K. 1978 Migrant kingdom: Mzilikazi's Ndebele in South Africa. London: Rex Collings
- Ross, R. 2002. *A concise history of South Africa.* Cambridge: Cambridge University Press.
- SAHRA Report Mapping Project Version 1.0, 2009
- Seliane, M. 2013. Erwat Waste Water Care Works: Module 5 Phase I Cultural Heritage Impact Assessment. Unpublished report.
- South African Heritage Information System (SAHRIS)
- Van der Walt, J. 2007. Archaeological Impact Assessment Link Northern Waterline Project At The Suikerbosrand Nature Reserve. Unpublished report.
- Van der Walt, J. 2015. Archaeological Impact Assessment For The Proposed AMD Pipeline, Western Basin, Randfontein Estates Area. Unpublished report.
- Van der Walt, J. 2017. Heritage Impact Assessment Magagula Heights. Unpublished report.
- Van Schalkwyk, J. 2007. Heritage Survey Of A Portion Of The Farm Tamboekiesfontein 173IR, Heidelberg Magisterial District, Gauteng Province. Unpublished report.
- Van Schalkwyk, J. 2003. Heritage Sites: Proposed Vosloorus Cultural Village. Unpublished report.
- Van Vollenhoven, A. C. 2015 Heritage Statement And Letter For HIA Exemption Request: Waterval Solar Park, Gauteng Province. Unpublished report.
- Wallace, R.J. 1976. *The Australians at the Boer War.* Australian War Memorial. Canberra