



An EOH Company

**THE PROPOSED REPROCESSING THE ST AUGUSTINE
MINE DUMPS ON TWO PORTIONS OF ERF 8622 IN
KIMBERLEY, KIMBERLEY MAGISTERIAL DISTRICT,
NORTHERN CAPE PROVINCE**

Archaeological Impact Assessment

A 3D rendering of a globe with water splashing over it, symbolizing sustainability and environmental impact.

**Innovation in
Sustainability**

The logo for EOH, consisting of the letters "EOH" in a bold, white, sans-serif font with a small triangle above the letter 'O'.

Prepared for **Craig Raymond Lubbe & Mosala James Brits**
Prepared by: **Exigo Sustainability**

ARCHAEOLOGICAL IMPACT ASSESSMENT (AIA) OF TWO PORTIONS OF ERF 8622 IN KIMBERLEY FOR THE PROPOSED REPROCESSING THE ST AUGUSTINE MINE DUMPS, KIMBERLEY MAGISTERIAL DISTRICT, NORTHERN CAPE PROVINCE

June 2014

Conducted on behalf of:

Craig Raymond Lubbe and Mosala James Brits
Exigo Sustainability

Compiled by:

Nelius Kruger (BA, BA Hons. Archaeology Pret.)

Reviewed by:

Lelani Stolp (EAP)

Document History

Document Version 1 (Draft) – 21 June 2015



An EOH Company

Email info@exigo3.com
Tel +27 012 751 2160
Fax +27 086 607 2406

The Village Office Park (Block E),
309 Glenwood Road, Faerie Glen,
Pretoria, 0043

Postnet Suite 74,
Private Bag X07,
Arcadia, 0007

Innovation in
Sustainability

www.exigo3.com

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

This document contains confidential and proprietary information equally shared between Exigo Sustainability and Craig Raymond Lubbe and Mosala James Brits, and is protected by copyright in favour of these companies and may not be reproduced, or used without the written consent of these companies, which has been obtained beforehand. This document is prepared exclusively for Craig Raymond Lubbe and Mosala James Brits and is subject to all confidentiality, copyright and trade secrets, rules, intellectual property law and practices of South Africa.

Exigo Sustainability promotes the conservation of sensitive archaeological and heritage resources and therefore uncompromisingly adheres to relevant Heritage Legislation (National Heritage Resources Act no. 25 of 1999, Human Tissue Act 65 of 1983 as amended, Removal of Graves and Dead Bodies Ordinance no. 7 of 1925, Excavations Ordinance no. 12 of 1980). In order to ensure best practices and ethics in the examination, conservation and mitigation of archaeological and heritage resources, Exigo Sustainability follows the Minimum Standards: Archaeological and Palaeontological Components of Impact Assessment as set out by the South African Heritage Resources Agency (SAHRA) and the Culture Resources Management (CRM) section of the Association for South African Professional Archaeologists (ASAPA).

DECLARATION

I, Nelius Le Roux Kruger, declare that –

- I act as the independent specialist;
- I am conducting any work and activity relating to the proposed St Augustine Reprocessing Project in an objective manner, even if this results in views and findings that are not favourable to the client;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have the required expertise in conducting the specialist report and I will comply with legislation, including the relevant Heritage Legislation (National Heritage Resources Act no. 25 of 1999, Human Tissue Act 65 of 1983 as amended, Removal of Graves and Dead Bodies Ordinance no. 7 of 1925, Excavations Ordinance no. 12 of 1980), the Minimum Standards: Archaeological and Palaeontological Components of Impact Assessment (SAHRA and the CRM section of ASAPA), regulations and any guidelines that have relevance to the proposed activity;
- I have not, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the client / 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 declaration are true and correct.



Signature of specialist

Company: Exigo Sustainability

Date: 21 June 2015

EXECUTIVE SUMMARY

This report details the results of an Archaeological Impact Assessment (AIA) study on ERF 8622, subject to the application for an environmental management plan in respect of a mining permit for diamonds by means of reprocessing approximately 8ha of the old St Augustine mine dumps in Kimberley, Northern Cape Province. The report includes background information on the area's archaeology, its representation in southern Africa, and the history of the larger area under investigation, survey methodology and results as well as heritage legislation and conservation policies. A copy of the report will be supplied to the South African Heritage Resources Agency (SAHRA) and recommendations contained in this document will be reviewed.

A large number of archaeological and historical studies have been conducted in the Kimberly area. These studies all infer a rich and diverse archaeological landscape around the town and the Northern Cape Province, which encompasses a significant heritage legacy, mostly dominated by a rich historical Industrial frontier. The abundance of locally available raw material implies a prominent Stone Age presence and specifically Earlier Stone Age (ESA) and Middle Stone Age (MSA) artefacts occur widely in the area. A wealth of Later Stone Age rock art sites, most of which are in the form of rock engravings are also to be found in the larger landscape e.g. at Wildebeestkuil. Sites dating to the Iron Age occur in the north eastern part of the Province but environmental factors delegated that the spread of Iron Age farming westwards from the 17th century was constrained mainly to the area east of the Langeberg Mountains. However, evidence of an Iron Age presence as far as the Upington area in the eighteenth century occurs in this area. Moving into recent times, the archaeological record reflects the development of a rich colonial frontier, characterised by, amongst others, a complex industrial archaeological landscape such as mining developments at Kimberley, which herald the modern era in South African history. Similarly, heritage resources occur in the St Augustine Reprocessing Project area:

- Single fragments of dated bottles and bottle necks, porcelain and glass occur randomly at the site in low densities in association with mining debris. No heritage objects seem to occur in sub-surface deposits. Considering the state of preservation of the site and the recurring alteration of surface deposits the local site context of the artefacts has probably been lost. This aspect, combined with the low artefact density and general absence of diagnostic material implies a low heritage significance of the material. However, the former St Augustine Mine is situated within the larger Kimberley Mine Complex historical landscape and on a regional scale associated material within intact site contexts might be of some importance. It is therefore recommended that all planned activities be carefully monitored by an archaeologist familiar with the archaeology and history of Kimberley. In addition, an informed ECO should inspect the construction site on regular basis in order to monitor possible impact on heritage resources. Should any subsurface paleontological, archaeological or historical material or heritage resources be exposed during construction activities, all activities should be suspended and the archaeological specialist should be notified immediately

A small number of Historical Period artefacts were noted in the proposed St Augustine Reprocessing Project area. These features are of limited significance in terms of heritage value even though impact on these heritage receptors is foreseen. In the opinion of the author of this Archaeological Impact Assessment Report, the proposed St Augustine Reprocessing Project may proceed from a culture resources management perspective, provided that all mitigation measures supplied in this Report are implemented prior to the commencement of construction on the infrastructure, and subject to the necessary approval from the relevant Heritage Resources Agency (SAHRA / PHRA).

St Augustine Reprocessing Project

Archaeological Impact Assessment Report

It is essential that cognisance be taken of the larger archaeological landscape of the Northern Cape Province and the Kimberley region in order to avoid the destruction of previously undetected heritage sites. Water sources such as pans, drainage lines and rivers should also be regarded as potentially sensitive in terms of possible Stone Age deposits. Should any previously undetected heritage resources be exposed or uncovered during construction phases of the proposed project, these should immediately be reported to the South African Heritage Resource Authority (SAHRA). Since the intrinsic heritage and social value of graves and cemeteries are highly significant, these resources require special management measures. Should human remains be discovered at any stage, these should be reported to the Heritage Specialist and relevant authorities (SAHRA) and development activities should be suspended until the site has been inspected by the Specialist. The Specialist will advise on further management actions and possible relocation of human remains in accordance with the Human Tissue Act (Act 65 of 1983 as amended), the Removal of Graves and Dead Bodies Ordinance (Ordinance no. 7 of 1925), the National Heritage Resources Act (Act no. 25 of 1999) and any local and regional provisions, laws and by-laws pertaining to human remains. A full social consultation process should occur in conjunction with the mitigation of cemeteries and burials.

NOTATIONS AND TERMS/TERMINOLOGY

Absolute dating:

Absolute dating provides specific dates or range of dates expressed in years.

Archaeology:

The study of the human past through its material remains.

Archaeological record:

The archaeological record minimally includes all the material remains documented by archaeologists. More comprehensive definitions also include the record of culture history and everything written about the past by archaeologists.

Artefact:

Entities whose characteristics result or partially result from human activity. The shape and other characteristics of the artefact are not altered by removal of the surroundings in which they are discovered. In the southern African context examples of artefacts include potsherds, iron objects, stone tools, beads and hut remains.

Assemblage:

A group of artefacts recurring together at a particular time and place, and representing the sum of human activities.

¹⁴C or radiocarbon dating:

The ¹⁴C method determines the absolute age of organic material by studying the radioactivity of carbon. It is reliable for objects not older than 70 000 years by means of isotopic enrichment. The method becomes increasingly inaccurate for samples younger than ±250 years.

Ceramic Facies:

In terms of the cultural representation of ceramics, a facies is denoted by a specific branch of a larger ceramic tradition. A number of ceramic facies thus constitute a ceramic tradition.

Ceramic Tradition:

In terms of the cultural representation of ceramics, a series of ceramic units constitutes as ceramic tradition.

Context:

An artefact's context usually consists of its immediate *matrix*, its *provenience* and its *association* with other artefacts. When found in *primary context*, the original artefact or structure was undisturbed by natural or human factors until excavation and if in *secondary context*, disturbance or displacement by later ecological action or human activities occurred.

Culture:

A contested term, "culture" could minimally be defined as the learned and shared things that people have, do and think.

Cultural Heritage Resource:

The broad generic term *Cultural Heritage Resources* refers to any physical and spiritual property associated with past and present human use or occupation of the environment, cultural activities and history. The term includes sites, structures, places, natural features and material of palaeontological, archaeological, historical, aesthetic, scientific, architectural, religious, symbolic or traditional importance to specific individuals or groups, traditional systems of cultural practice, belief or social interaction.

Cultural landscape:

A cultural landscape refers to a distinctive geographic area with cultural significance.

Cultural Resource Management (CRM):

A system of measures for safeguarding the archaeological heritage of a given area, generally applied within the framework of legislation designed to safeguard the past.

Ecofact:

Non artefactual material remains that has cultural relevance which provides information about past human activities. Examples would include remains or evidence of domesticated animals or plant species.

St Augustine Reprocessing Project

Archaeological Impact Assessment Report

Excavation:

The principal method of data acquisition in archaeology, involving the systematic uncovering of archaeological remains through the removal of the deposits of soil and the other material covering and accompanying it.

Feature:

Non-portable artefacts, in other words artefacts that cannot be removed from their surroundings without destroying or altering their original form. Hearths, roads, and storage pits are examples of archaeological features

GIS:

Geographic Information Systems are computer software that allows layering of various types of data to produce complex maps; useful for predicting site location and for representing the analysis of collected data within sites and across regions.

Historical archaeology:

Primarily that aspect of archaeology which is complementary to history based on the study of written sources. In the South African context it concerns the recovery and interpretation of relics left in the ground in the course of Europe's discovery of South Africa, as well as the movements of the indigenous groups during, and after the "Great Scattering" of Bantu-speaking groups – known as the *mfecane* or *difaqane*.

Impact: A description of the effect of an aspect of the development on a specified component of the biophysical, social or economic environment within a defined time and space.

Iron Age:

Also known as "Farmer Period", the "Iron Age" is an archaeological term used to define a period associated with domesticated livestock and grains, metal working and ceramic manufacture.

Lithic:

Stone tools or waste from stone tool manufacturing found on archaeological sites.

Management / Management Actions:

Actions – including planning and design changes - that enhance benefits associated with a proposed development, or that avoid, mitigate, restore, rehabilitate or compensate for the negative impacts.

Matrix:

The material in which an artefact is situated (sediments such as sand, ashy soil, mud, water, etcetera). The matrix may be of natural origin or human-made.

Megalith:

A large stone, often found in association with others and forming an alignment or monument, such as large stone statues.

Midden:

Refuse that accumulates in a concentrated heap.

Microlith:

A small stone tool, typically knapped of flint or chert, usually about three centimetres long or less.

Monolith:

A geological feature such as a large rock, consisting of a single massive stone or rock, or a single piece of rock placed as, or within, a monument or site.

Oral Histories:

The historical narratives, stories and traditions passed from generation to generation by word of mouth.

Phase 1 CRM Assessment:

An Impact Assessment which identifies archaeological and heritage sites, assesses their significance and comments on the impact of a given development on the sites. Recommendations for site mitigation or conservation are also made during this phase.

Phase 2 CRM Study:

In-depth studies which could include major archaeological excavations, detailed site surveys and mapping / plans of sites, including historical / architectural structures and features. Alternatively, the sampling of sites by collecting material, small test pit excavations or auger sampling is required. Mitigation / Rescue involves planning the protection of significant sites or sampling through excavation or

collection (in terms of a permit) at sites that may be lost as a result of a given development.

Phase 3 CRM Measure:

A Heritage Site Management Plan (for heritage conservation), is required in rare cases where the site is so important that development will not be allowed and sometimes developers are encouraged to enhance the value of the sites retained on their properties with appropriate interpretive material or displays.

Prehistoric archaeology:

That aspect of archaeology which concerns itself with the development of humans and their culture before the invention of writing. In South Africa, prehistoric archaeology comprises the study of the Early Stone Age, the Middle Stone Age and the greater part of the Later Stone Age and the Iron Age.

Probabilistic Sampling:

A sampling strategy that is not biased by any person's judgment or opinion. Also known as statistical sampling, it includes systematic, random and stratified sampling strategies.

Provenience

Provenience is the three-dimensional (horizontal and vertical) position in which artefacts are found. Fundamental to ascertaining the provenience of an artefact is *association*, the co-occurrence of an artefact with other archaeological remains; and *superposition*, the principle whereby artefacts in lower levels of a matrix were deposited before the artefacts found in the layers above them, and are therefore older.

Random Sampling:

A probabilistic sampling strategy whereby randomly selected sample blocks in an area are surveyed. These are fixed by drawing coordinates of the sample blocks from a table of random numbers.

Relative dating:

The process whereby the relative antiquity of sites and objects are determined by putting them in sequential order but not assigning specific dates.

Remote Sensing:

The small or large-scale acquisition of information of an object or phenomenon, by the use of either recording or real-time sensing device(s) that is not in physical or intimate contact with the object (such as by way of aircraft, spacecraft or satellite). Here, ground-based geophysical methods such as Ground Penetrating Radar and Magnetometry are often used for archaeological imaging.

Rock Art Research:

Rock art can be "decoded" in order to inform about cultural attributes of prehistoric societies, such as dress-code, hunting and food gathering, social behaviour, religious practice, gender issues and political issues.

Scoping Assessment:

The process of determining the spatial and temporal boundaries (i.e. extent) and key issues to be addressed in an impact assessment. The main purpose is to focus the impact assessment on a manageable number of important questions on which decision making is expected to focus and to ensure that only key issues and reasonable alternatives are examined. The outcome of the scoping process is a Scoping Report that includes issues raised during the scoping process, appropriate responses and, where required, terms of reference for specialist involvement.

Sensitive:

Often refers to graves and burial sites although not necessarily a heritage place, as well as ideologically significant sites such as ritual / religious places. *Sensitive* may also refer to an entire landscape / area known for its significant heritage remains.

Site (Archaeological):

A distinct spatial clustering of artefacts, features, structures, and organic and environmental remains, as the residue of human activity. These include surface sites, caves and rock shelters, larger open-air sites, sealed sites (deposits) and river deposits. Common functions of archaeological sites include living or habitation sites, kill sites, ceremonial sites, burial sites, trading, quarry, and art sites,

Slag:

The material residue of smelting processes from metalworking.

St Augustine Reprocessing Project

Archaeological Impact Assessment Report

Stone Age:

An archaeological term used to define a period of stone tool use and manufacture.

Stratigraphy:

This principle examines and describes the observable layers of sediments and the arrangement of strata in deposits

Stratified Sampling:

A probabilistic sampling strategy whereby a study area is divided into appropriate zones – often based on the probable location of archaeological areas, after which each zone is sampled at random.

Systematic Sampling:

A probabilistic sampling strategy whereby a grid of sample blocks is set up over the survey area and each of these blocks is equally spaced and searched.

Tradition:

Artefact types, assemblages of tools, architectural styles, economic practices or art styles that last longer than a phase and even a horizon are describe by the term *tradition*. A common example of this is the early Iron Age tradition of Southern Africa that originated ± 200 AD and came to an end at about 900 AD.

Trigger: A particular characteristic of either the receiving environment or the proposed project which indicates that there is likely to be an *issue* and/or potentially significant *impact* associated with that proposed development that may require specialist input. Legal requirements of existing and future legislation may also trigger the need for specialist involvement.

Tuyère:

A ceramic blow-tube used in the process of iron smelting / reduction.

LIST OF ABBREVIATIONS

Abbreviation	Description
ASAPA	Association for South African Professional Archaeologists
AIA	Archaeological Impact Assessment
BP	Before Present
BCE	Before Common Era
CRM	Culture Resources Management
EIA	Early Iron Age (also Early Farmer Period)
EIA	Environmental Impact Assessment
EFP	Early Farmer Period (also Early Iron Age)
ESA	Earlier Stone Age
GIS	Geographic Information Systems
HIA	Heritage Impact Assessment
ICOMOS	International Council on Monuments and Sites
K2/Map	K2/Mapungubwe Period
LFP	Later Farmer Period (also Later Iron Age)
LIA	Later Iron Age (also Later Farmer Period)
LSA	Later Stone Age
MIA	Middle Iron Age (also Early later Farmer Period)
MRA	Mining Right Area
MSA	Middle Stone Age
NHRA	National Heritage Resources Act No.25 of 1999, Section 35
PHRA	Provincial Heritage Resources Authorities
SAFA	Society for Africanist Archaeologists
SAHRA	South African Heritage Resources Association
YCE	Years before Common Era (Present)

TABLE OF CONTENTS

EXECUTIVE SUMMARY	4
1 BACKGROUND.....	14
1.1 SCOPE AND MOTIVATION	14
1.2 PROJECT DIRECTION	14
1.3 PROJECT BRIEF	14
1.4 TERMS OF REFERENCE	17
1.5 CRM: LEGISLATION, CONSERVATION AND HERITAGE MANAGEMENT.....	17
1.5.1 <i>Legislation regarding archaeology and heritage sites</i>	17
1.5.2 <i>Background to HIA and AIA Studies</i>	19
1.6 ASSESSING THE SIGNIFICANCE OF HERITAGE RESOURCES.....	20
1.7 - CATEGORIES OF SIGNIFICANCE	21
2 REGIONAL CONTEXT.....	22
2.1 GENERAL LOCATION	22
2.2 AREA DESCRIPTION: RECEIVING ENVIRONMENT	24
2.3 SITE DESCRIPTION.....	24
3 METHOD OF ENQUIRY.....	27
3.1 SOURCES OF INFORMATION	27
3.1.1 <i>Desktop Study</i>	27
3.1.2 <i>Aerial Representations and Survey</i>	29
3.1.3 <i>Field Survey</i>	29
3.2 LIMITATIONS.....	30
3.2.1 <i>Access</i>	30
3.2.2 <i>Visibility</i>	30
3.2.3 <i>Limitations and Constraints</i>	36
3.3 IMPACT ASSESSMENT	36
4 ARCHAEO-HISTORICAL CONTEXT.....	37
4.1 THE ARCHAEOLOGY OF SOUTHERN AFRICA.....	37
4.1.1 <i>The Stone Ages</i>	37
4.1.2 <i>The Iron Age Farmer Period</i>	38
4.1.3 <i>Historical and Colonial Times and Recent History</i>	39
4.2 THE KIMBERLEY HERITAGE LANDSCAPE: SPECIFIC THEMES.....	39
4.2.1 <i>Early History and the Stone Age</i>	40
4.2.2 <i>Rock Markings</i>	41
4.2.3 <i>Iron Age / Farmer Period</i>	42
4.2.4 <i>Later History: Colonial Period</i>	42
4.2.5 <i>The Anglo-Boer War</i>	43
4.2.6 <i>The Kimberley and St Augustines Mines</i>	44
4.2.7 <i>Burial Sites / Human Remains</i>	49
5 RESULTS: ARCHAEOLOGICAL SURVEY.....	49
5.1 THE STONE AGE	49
5.2 THE IRON AGE FARMER PERIOD	49
5.3 HISTORICAL / COLONIAL PERIOD & INDUSTRIAL ARCHAEOLOGY	49
5.4 GRAVES / HUMAN BURIALS	51
6 RESULTS: STATEMENT OF SIGNIFICANCE AND IMPACT RATING	52
6.1 POTENTIAL IMPACTS AND SIGNIFICANCE RATINGS	52

6.2	GENERAL ASSESSMENT OF IMPACTS ON RESOURCES	52
6.2.1	<i>Direct impact rating</i>	52
6.3	DISCUSSION: EVALUATION OF RESULTS AND IMPACTS	53
6.4	MANAGEMENT ACTIONS	53
7	RECOMMENDATIONS	54
8	GENERAL COMMENTS AND CONDITIONS	54
9	BIBLIOGRAPHY	56
10	ADDENDUM 1: SAHRA INTERIM COMMENT	59
11	ADDENDUM 2: CONVENTIONS USED TO ASSESS THE SIGNIFICANCE OF HERITAGE	61
11.1	SITE SIGNIFICANCE MATRIX	61
11.2	IMPACT ASSESSMENT CRITERIA.....	61
11.3	DIRECT IMPACT ASSESSMENT CRITERIA	63
11.4	MANAGEMENT AND MITIGATION ACTIONS.....	64

LIST OF FIGURES

Figure 1-1: Site plan for Mining Right Application 10290MP on ERF 8622, part of the proposed St Augustine Reprocessing Project area.....	15
Figure 1-2: Site plan for Mining Right Application 10291MP on ERF 8622, part of the proposed St Augustine Reprocessing Project area.....	16
Figure 2-1: 1:50 00 Map representation of the location of the proposed St Augustine Reprocessing Project (2824DB).....	23
Figure 2-2: General surroundings in the Study Area at the time of the field survey (June 2015). The historical Kimberly Mine Complex is visible in the middle on the eyeline.....	24
Figure 2-3: Aerial representation of the proposed St Augustine Reprocessing Project area.....	25
Figure 2-4: Aerial representation providing a historical and regional setting of proposed St Augustine Reprocessing Project (courtesy of Lubbe & Brits).	26
Figure 3-1: Garmin GPS tracklog of the foot survey.....	30
Figure 3-2: View of general surroundings along an eastern section of the study area. Note building rubble.	31
Figure 3-3: View of large degraded mine dumping areas along an eastern section of the study area.	31
Figure 3-4: View of degraded mine dumping areas along an eastern section of the study area.	32
Figure 3-5: View of general surroundings along a southern section of the study area. Note building rubble.	32
Figure 3-6: View of general surroundings along a southern section of the study area.	33
Figure 3-7: View of general surroundings along a central section of the study area where refuse has been dumped.	33
Figure 3-8: View of general surroundings along the northern periphery of the study area.	34
Figure 3-9: Large erosion gullies towards the west of the study area.	34
Figure 3-10: View of general surroundings along the western southern section of the study area.	35
Figure 3-11: View of cleared surface areas along the western periphery of the study area.	35
Figure 3-12: Detail image of a section of an erosion gully where mining debris is visible in the stratigraphy.	36
Figure 4-1: Intrusive breccia containing a Late Stone Age industry. Note the high density of lithics.	40
Figure 4-2: Rock engravings at the Wildebeest Kuil Rock Art Site.	41
Figure 4-3: Map indicating main events surrounding the siege of Kimberley.	44
Figure 4-4: Historical photo dating to the last decade of the 10 th century, of the big hole excavation at the Kimberly Mine.....	45
Figure 4-5: Historical plan of mine digging holdings at the Kimberly Mine c. 1883.	46
Figure 4-6: Summary of diamond production at St Augustines Mine in 1887 (Mitchell 1888).....	46
Figure 4-7: Summary of diamond production at St Augustines Mine from 1886 – 1887 (Mitchell 1888).	47
Figure 4-8: Series of photographs of the Kimberley mine area dating to the early 1990’s (top), the 1930’s (middle) and a recent image (bottom). The original location of the St Augustines Mine is indicated by the yellow arrow and the study area ins indicated in faded white.....	48
Figure 5-1: Large degraded mine dumps where scattered glass and porcelain were noted.	50
Figure 5-2: A glass bottle top (left), porcelain fragment (middle) and glass fragment (right) from the study area.....	50
Figure 5-3: Glass fragments and vitrified charcoal from the study area.....	51
Figure 5-4: Glass bottle top from the study area.	51

1 BACKGROUND

1.1 Scope and Motivation

Exigo Sustainability was commissioned by Craig Raymond Lubbe and Mosala James Brits for an Archaeological Impact Assessment (AIA) study on ERF 8622, subject to the application for an environmental management plan in respect of a mining permit for diamonds by means of reprocessing of the old St Augustine mine dumps in Kimberley, Northern Cape Province. The rationale of this AIA is to determine the presence of heritage resources such as archaeological and historical sites and features, graves and places of religious and cultural significance in previously unstudied areas; to consider the impact of the proposed project on such heritage resources, and to submit appropriate recommendations with regard to the cultural resources management measures that may be required at affected sites / features.

1.2 Project Direction

Exigo Sustainability's expertise ensures that all projects be conducted to the highest international ethical and professional standards. As archaeological specialist for Exigo Sustainability, Mr Neels Kruger acted as field director for the project; responsible for the assimilation of all information, the compilation of the final consolidated AIA report and recommendations in terms of heritage resources on the demarcated project areas. Mr Kruger is an accredited archaeologist and Culture Resources Management (CRM) practitioner with the Association of South African Professional Archaeologists (ASAPA), a member of the Society for Africanist Archaeologists (SAFA) and the Pan African Archaeological Association (PAA) as well as a Master's Degree candidate in archaeology at the University of Pretoria.

1.3 Project Brief

The mining of diamonds by means of reprocessing the St Augustine mine dumps is envisaged for the project. The area demarcated for mining covers approximately 8.5ha. Mining at the St Augustine mine ceased in 1902 and subsequently the tailings of the nearby Kimberley Mine were deposited over the St Augustine kimberlite. A non-invasive gravimetric survey was undertaken in 2007 at the site to confirm the exact position of the known kimberlite and to determine whether other kimberlites occurred in the Prospecting Right. Subsequently, application was made for mining permits for the area by Craig Raymond Lubbe (Mining Permit 10290MP) and Mosala James Brits (Mining Permit 10291MP) (see Figure 1-1 and Figure 1-2).

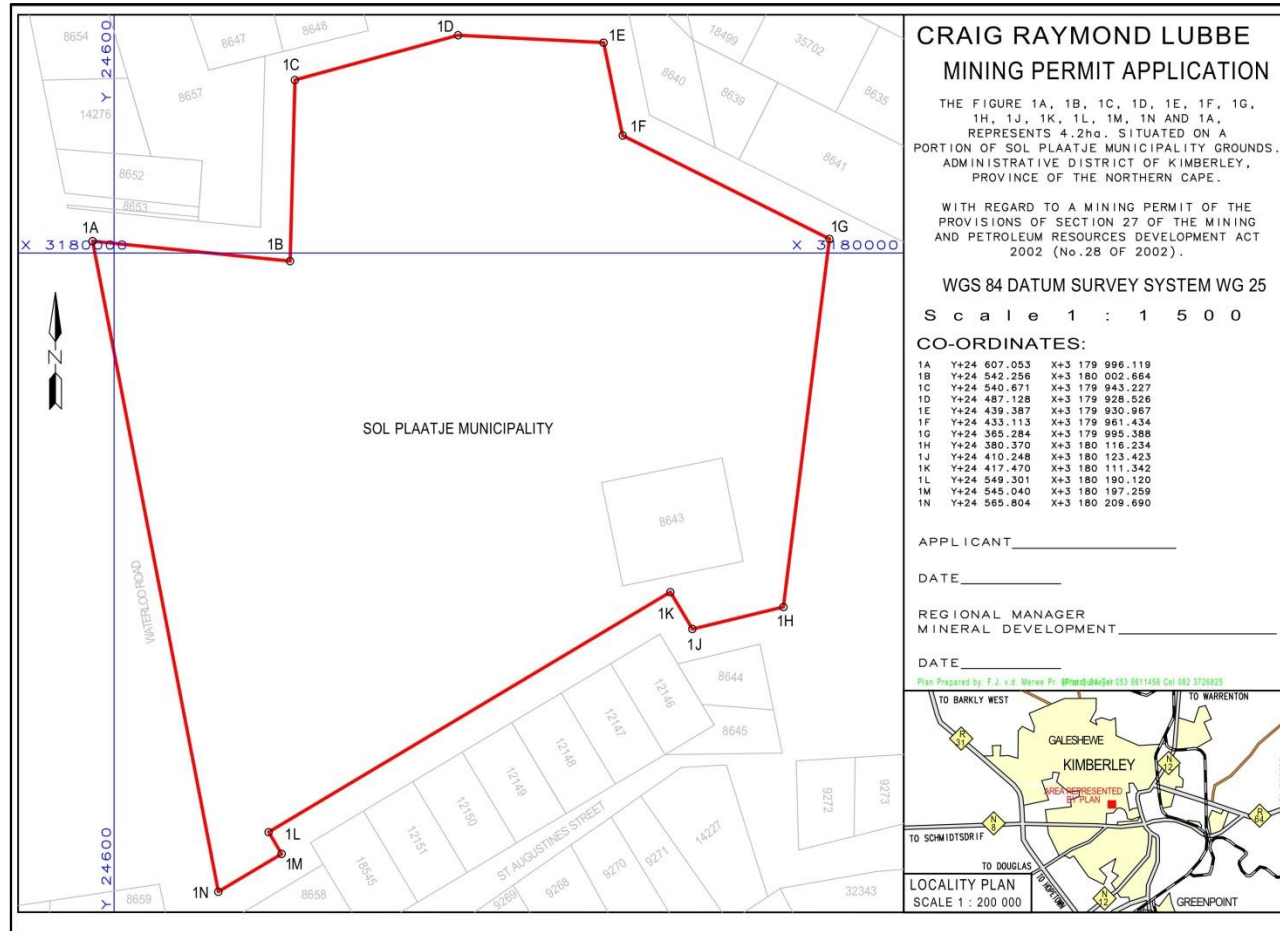


Figure 1-1: Site plan for Mining Right Application 10290MP on ERF 8622, part of the proposed St Augustine Reprocessing Project area.

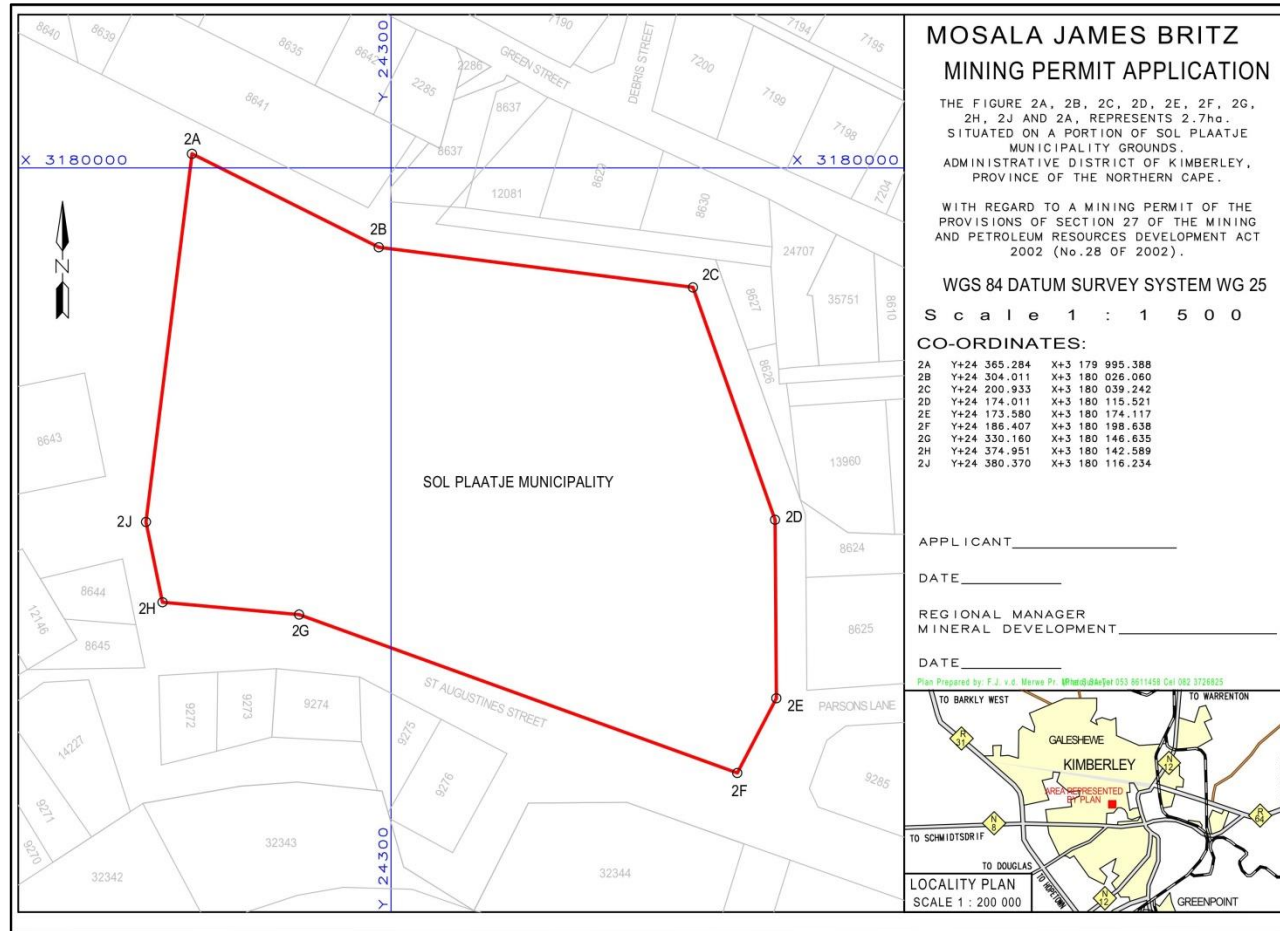


Figure 1-2: Site plan for Mining Right Application 10291MP on ERF 8622, part of the proposed St Augustine Reprocessing Project area.

1.4 Terms of Reference

Heritage specialist input into the Environmental Impact Assessment (EIA) process is essential to ensure that through the management of change, developments still conserve our heritage resources. Heritage specialist input in EIA processes can play a positive role in the development process by enriching an understanding of the past and its contribution to the present. It is also a legal requirement for certain development categories which may have an impact on heritage resources. Thus, EIAs should always include an assessment of Heritage Resources. The heritage component of the EIA is provided for in the **National Environmental Management Act, (Act 107 of 1998)** and endorsed by section 38 of the **National Heritage Resources Act (NHRA - Act 25 of 1999)**. In addition, the NHRA protects all structures and features older than 60 years (see Section 34 of the NHRA), archaeological sites and material (see Section 35 of the NHRA) and graves as well as burial sites (see Section 36 of the NHRA). The objective of this legislation is to ensure that developers implement measures to limit the potentially negative effects that the development could have on heritage resources.

Based hereon, this project functioned according to the following **terms of reference for** heritage specialist input:

- *Provide a detailed description of all archaeological artefacts, structures (including graves) and settlements which may occur in the project area, if any.*
- *Assess the nature and degree of significance of such resources within the area.*
- *Establish heritage informants/constraints to guide the development process through establishing thresholds of impact significance.*
- *Assess any possible impact on the archaeological and historical remains within the area emanating from the proposed development activities.*
- *Propose possible heritage management measures provided that such action is necessitated by the development.*
- *Obtain a comment from the relevant Heritage Resources Authority (SAHRA / PHRA).*

1.5 CRM: Legislation, Conservation and Heritage Management

The broad generic term *Cultural Heritage Resources* refers to any physical and spiritual property associated with past and present human use or occupation of the environment, cultural activities and history. The term includes sites, structures, places, natural features and material of palaeontological, archaeological, historical, aesthetic, scientific, architectural, religious, symbolic or traditional importance to specific individuals or groups, traditional systems of cultural practice, belief or social interaction.

1.5.1 Legislation regarding archaeology and heritage sites

The South African Heritage Resources Agency (SAHRA) and their provincial offices aim to conserve and control the management, research, alteration and destruction of cultural resources of South Africa. It is therefore vitally important to adhere to heritage resource legislation at all times.

a. National Heritage Resources Act No 25 of 1999, section 35

According to the National Heritage Resources Act of 1999 a historical site is any identifiable building or part thereof, marker, milestone, gravestone, landmark or tell older than 60 years. This clause is commonly known as the "60-years clause". Buildings are amongst the most enduring features of human occupation, and this definition therefore includes all buildings older than 60 years, modern architecture as well as ruins,

fortifications and Iron Age settlements. "Tell" refers to the evidence of human existence which is no longer above ground level, such as building foundations and buried remains of settlements (including artefacts).

The Act identifies heritage objects as:

- objects recovered from the soil or waters of South Africa including archaeological and palaeontological objects, meteorites and rare geological specimens
- visual art objects
- military objects
- numismatic objects
- objects of cultural and historical significance
- objects to which oral traditions are attached and which are associated with living heritage
- objects of scientific or technological interest
- any other prescribed category

With regards to activities and work on archaeological and heritage sites this Act states that:

"No person may alter or demolish any structure or part of a structure which is older than 60 years without a permit by the relevant provincial heritage resources authority." (34. [1] 1999:58)

and

"No person may, without a permit issued by the responsible heritage resources authority-

- (a) destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;*
- (b) destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;*
- (c) trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or palaeontological material or object, or any meteorite; or*
- (d) bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assist in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites. (35. [4] 1999:58)."*

and

"No person may, without a permit issued by SAHRA or a provincial heritage resources agency-

- (a) destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves;*
- (b) destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority;*

- (c) *bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) and excavation equipment, or any equipment which assists in the detection or recovery of metals (36. [3] 1999:60)."*

b. Human Tissue Act of 1983 and Ordinance on the Removal of Graves and Dead Bodies of 1925

Graves 60 years or older are heritage resources and fall under the jurisdiction of both the National Heritage Resources Act and the Human Tissues Act of 1983. However, graves younger than 60 years are specifically protected by the Human Tissues Act (Act 65 of 1983) and the Ordinance on the Removal of Graves and Dead Bodies (Ordinance 7 of 1925) as well as any local and regional provisions, laws and by-laws. Such burial places also fall under the jurisdiction of the National Department of Health and the Provincial Health Departments. Approval for the exhumation and re-burial must be obtained from the relevant Provincial MEC as well as the relevant Local Authorities.

1.5.2 Background to HIA and AIA Studies

South Africa's unique and non-renewable archaeological and palaeontological heritage sites are 'generally' protected in terms of the National Heritage Resources Act (Act No 25 of 1999, section 35) and may not be disturbed at all without a permit from the relevant heritage resources authority. Heritage sites are frequently threatened by development projects and both the environmental and heritage legislation require impact assessments (Heritage Impact Assessments - HIAs & AIAs) that identify all heritage resources in areas to be developed. Particularly, these assessments are required to make recommendations for protection or mitigation of the impact of the sites. HIAs and AIAs should be done by qualified professionals with adequate knowledge to (a) identify all heritage resources including archaeological and palaeontological sites that might occur in areas to be developed and (b) make recommendations for protection or mitigation of the impact on the sites.

The National Heritage Resources Act (Act No. 25 of 1999, section 38) provides guidelines for Cultural Resources Management and prospective developments:

"38. (1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as:

- (a) *the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;*
- (b) *the construction of a bridge or similar structure exceeding 50m in length;*
- (c) *any development or other activity which will change the character of a site:*
 - (i) *exceeding 5 000 m² in extent; or*
 - (ii) *involving three or more existing erven or subdivisions thereof; or*
 - (iii) *involving three or more erven or divisions thereof which have been consolidated within the past five years; or*
 - (iv) *the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;*
- (d) *the re-zoning of a site exceeding 10 000 m² in extent; or*
- (e) *any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority,*

must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.”

And:

“The responsible heritage resources authority must specify the information to be provided in a report required in terms of subsection (2)(a): Provided that the following must be included:

- (a) The identification and mapping of all heritage resources in the area affected;*
- (b) an assessment of the significance of such resources in terms of the heritage assessment criteria set out in section 6(2) or prescribed under section 7;*
- (c) an assessment of the impact of the development on such heritage resources;*
- (d) an evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development;*
- (e) the results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources;*
- (f) if heritage resources will be adversely affected by the proposed development, the consideration of alternatives; and*
- (g) plans for mitigation of any adverse effects during and after the completion of the proposed development (38. [3] 1999:64).”*

Consequently, section 35 of the Act requires Heritage Impact Assessments (HIAs) or Archaeological Impact Assessments (AIAs) to be done for such developments in order for all heritage resources, that is, all places or objects of aesthetics, architectural, historic, scientific, social, spiritual, linguistic or technological value or significance to be protected. Thus any assessment should make provision for the protection of all these heritage components, including archaeology, shipwrecks, battlefields, graves, and structures older than 60 years, living heritage, historical settlements, landscapes, geological sites, palaeontological sites and objects.

1.6 Assessing the Significance of Heritage Resources

Archaeological sites, as previously defined in the National Heritage Resources Act (Act 25 of 1999) are places in the landscape where people have lived in the past – generally more than 60 years ago – and have left traces of their presence behind. In South Africa, archaeological sites include hominid fossil sites, places where people of the Earlier, Middle and Later Stone Age lived in open sites, river gravels, rock shelters and caves, Iron Age sites, graves, and a variety of historical sites and structures in rural areas, towns and cities. Palaeontological sites are those with fossil remains of plants and animals where people were not involved in the accumulation of the deposits. The basic principle of cultural heritage conservation is that archaeological and other heritage sites are valuable, scarce and *non-renewable*. Many such sites are unfortunately lost on a daily basis through development for housing, roads and infrastructure and once archaeological sites are damaged, they cannot be re-created as site integrity and authenticity is permanently lost. Archaeological sites

have the potential to contribute to our understanding of the history of the region and of our country and continent. By preserving links with our past, we may not be able to revive lost cultural traditions, but it enables us to appreciate the role they have played in the history of our country.

1.7 - Categories of significance

Rating the significance of archaeological sites, and consequently grading the potential impact on the resources is linked to the significance of the site itself. The significance of an archaeological site is based on the amount of deposit, the integrity of the context, the kind of deposit and the potential to help answer present research questions. Historical structures are defined by Section 34 of the National Heritage Resources Act, 1999, while other historical and cultural significant sites, places and features, are generally determined by community preferences. The guidelines as provided by the NHRA (Act No. 25 of 1999) in Section 3, with special reference to subsection 3 are used when determining the cultural significance or other special value of archaeological or historical sites. In addition, ICOMOS (the Australian Committee of the International Council on Monuments and Sites) highlights four cultural attributes, which are valuable to any given culture:

- *Aesthetic value:*

Aesthetic value includes aspects of sensory perception for which criteria can and should be stated. Such criteria include consideration of the form, scale, colour, texture and material of the fabric, the general atmosphere associated with the place and its uses and also the aesthetic values commonly assessed in the analysis of landscapes and townscape.

- *Historic value:*

Historic value encompasses the history of aesthetics, science and society and therefore to a large extent underlies all of the attributes discussed here. Usually a place has historical value because of some kind of influence by an event, person, phase or activity.

- *Scientific value:*

The scientific or research value of a place will depend upon the importance of the data involved, on its rarity, quality and on the degree to which the place may contribute further substantial information.

- *Social value:*

Social value includes the qualities for which a place has become a focus of spiritual, political, national or other cultural sentiment to a certain group.

It is important for heritage specialist input in the EIA process to take into account the heritage management structure set up by the NHR Act. It makes provision for a 3-tier system of management including the South Africa Heritage Resources Agency (SAHRA) at a national level, Provincial Heritage Resources Authorities (PHRAs) at a provincial and the local authority. The Act makes provision for two types or forms of protection of heritage resources; i.e. formally protected and generally protected sites:

Formally protected sites:

- Grade 1 or national heritage sites, which are managed by SAHRA
- Grade 2 or provincial heritage sites, which are managed by the provincial HRA.
- Grade 3 or local heritage sites.

Generally protected sites:

- Human burials older than 60 years.
- Archaeological and palaeontological sites.
- Shipwrecks and associated remains older than 70 years.

- Structures older than 60 years.

With reference to the evaluation of sites, the certainty of prediction is definite, unless stated otherwise and if the significance of the site is rated high, the significance of the impact will also result in a high rating. The same rule applies if the significance rating of the site is low. The significance of archaeological sites is generally ranked into the following categories.

Significance	Rating Action
No significance: sites that do not require mitigation.	None
Low significance: sites, which may require mitigation.	2a. Recording and documentation (Phase 1) of site; no further action required 2b. Controlled sampling (shovel test pits, augering), mapping and documentation (Phase 2 investigation); permit required for sampling and destruction
Medium significance: sites, which require mitigation.	3. Excavation of representative sample, C14 dating, mapping and documentation (Phase 2 investigation); permit required for sampling and destruction [including 2a & 2b]
High significance: sites, where disturbance should be avoided.	4a. Nomination for listing on Heritage Register (National, Provincial or Local) (Phase 2 & 3 investigation); site management plan; permit required if utilised for education or tourism
High significance: Graves and burial places	4b. Locate demonstrable descendants through social consulting; obtain permits from applicable legislation, ordinances and regional by-laws; exhumation and reinterment [including 2a, 2b & 3]

Furthermore, the significance of archaeological sites is based on six main criteria:

- Site integrity (i.e. primary vs. secondary context),
- Amount of deposit, range of features (e.g., stonewalling, stone tools and enclosures),
- Density of scatter (dispersed scatter),
- Social value,
- Uniqueness, and
- Potential to answer current and future research questions.

A fundamental aspect in assessing the significance and protection status of a heritage resource is often whether or not the sustainable social and economic benefits of a proposed development outweigh the conservation issues at stake. When, for whatever reason the protection of a heritage site is not deemed necessary or practical, its research potential must be assessed and mitigated in order to gain data / information, which would otherwise be lost.

2 REGIONAL CONTEXT

2.1 General Location

The St Augustine Reprocessing Project study area occurs directly north-west of the historical Kimberley Mine complex on ERF 8622 in the town of Kimberley in the Northern Cape Province, generally at **S28.736012° E24.750383° (1:50 000 Map reference 2824DB)**. The project area, which occurs in the West End is bordered to the south by St Augustines Road, and to the west by Waterloo Road. Suburban houses and properties occur along the northern and eastern peripheries of the site. The Kimberley CBD is situated approximately 1.5km south-east of the study area.

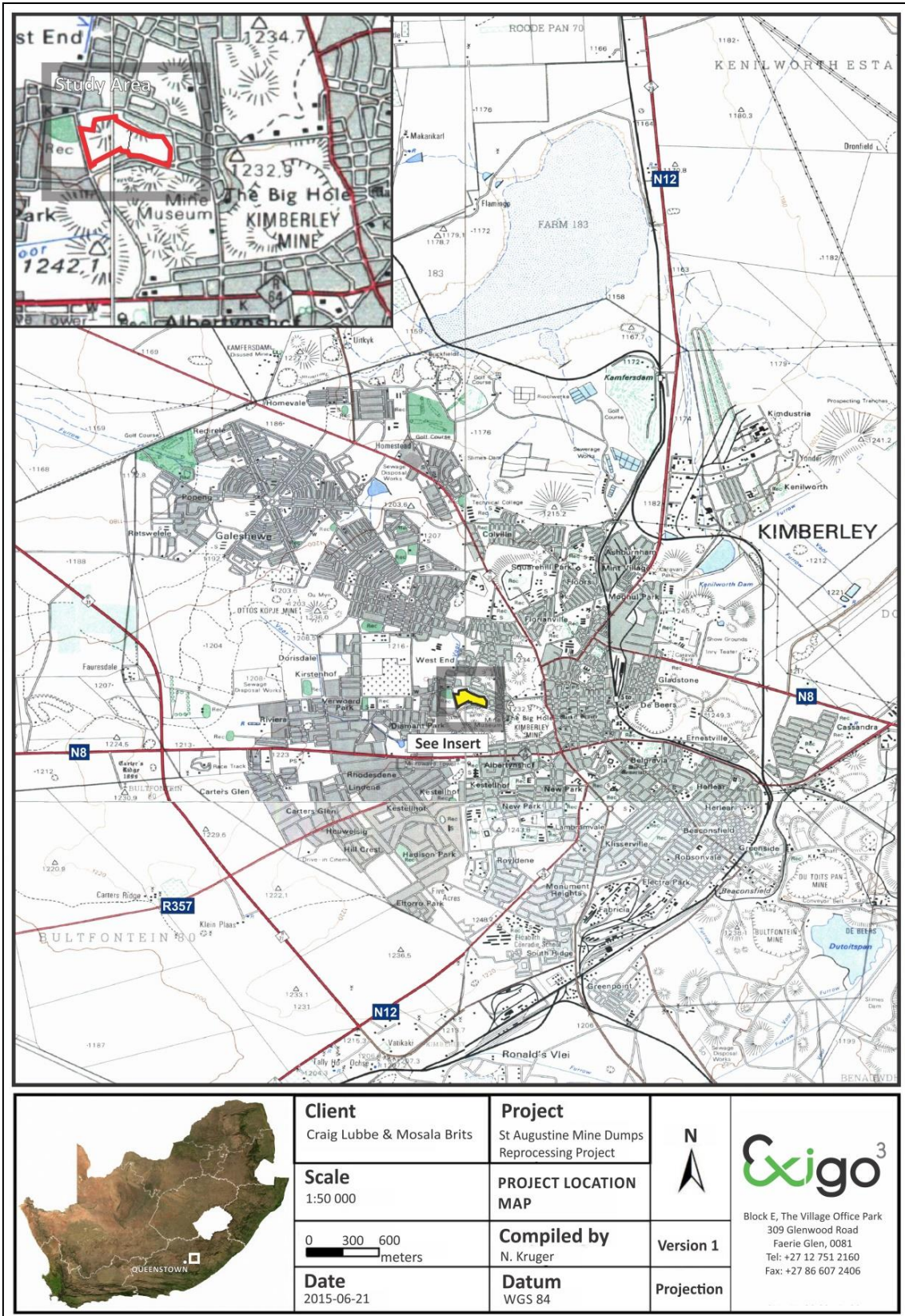


Figure 2-1: 1:50 00 Map representation of the location of the proposed St Augustine Reprocessing Project (2824DB).

2.2 Area Description: Receiving Environment

Kimberley lies within the Savanna biome which is the largest biome in Southern Africa. It is characterized by a grassy ground layer and a distinct upper layer of woody plants (trees and shrubs). The environmental factors delimiting the biome are complex and include altitude, rainfall, geology and soil types, with rainfall being the major delimiting factor. Fire and grazing also keep the grassy layer dominant. The most recent classification of the area by Mucina & Rutherford shows that the northern mountainous section of the site is classified as Ghaap Plateau Vaalbosveld, while the remainder of the site is classified as Schmidtsdrif Thornveld. The landscape features of the Schmidtsdrif Thornveld vegetation type are mostly a closed shrubby thornveld dominated by *Acacia mellifera* and *A. tortilis*. Apart from grasses, bulbous and annual herbaceous plant species are also prominent. The vegetation is sometimes very disturbed due to overgrazing. Surface limestone of Tertiary to Recent age and fine and coarse-grained dolomite, chert and dolomitic limestone with prominent interbedded chert, limestone and banded ironstone (Ghaap Plateau Formation, Campbell Group Soils associated with the site are mostly shallow Mispah or Glenrosa soil forms associated with dolomitic limestone, chert or calcrete.



Figure 2-2: General surroundings in the Study Area at the time of the field survey (June 2015). The historical Kimberley Mine Complex is visible in the middle on the eyeline.

2.3 Site Description

The St Augustine Reprocessing Project extends in a north-west orientation along St Augustine Rd in Kimberley's West End. Recurring and considerable historical and recent surface disturbances has left little to no original surface cover on the terrain and surface deposits are made up of a mix of mine debris, ash-heaps and domestic waste. Natural vegetation in the form of trees and surface grass occur in small pockets some areas. Large erosion gullies are prevalent towards the west of the study area and surfaces across the area have generally been degraded. The Historical Kimberley Mine and many other historical monuments are situated within a radius of approximately 2km of the study area (See Section 4.2.8). Other archaeological occurrences have been documented at a number of locales in the landscape immediately surrounding the Project.



Figure 2-3: Aerial representation of the proposed St Augustine Reprocessing Project area.



Figure 2-4: Aerial representation providing a historical and regional setting of proposed St Augustine Reprocessing Project (courtesy of Lubbe & Brits).

3 METHOD OF ENQUIRY

3.1 Sources of Information

Data from detailed desktop, aerial and field studies were employed in order to sample surface areas systematically and to ensure a high probability of heritage site recording.

3.1.1 Desktop Study

A desktop study was prepared in order to contextualize the proposed project within a larger historical milieu. The study focused on relevant previous studies, archaeological and archival sources, aerial photographs, historical maps and local histories, all pertaining to the Kimberley area and the larger landscape of this section of the Northern Cape Province. A large number of heritage studies have been conducted in the larger Kimberley area. Many of these studies have emanated from Impact Assessment measures for EIA purposes commissioned by the private sector. Some of the studies include:

- Beaumont, P.B. 2002. Archaeological Report: Construction of a Temporary Bridge across the Vaal River at Windsorton, Erf 1, for Floodplain (Island) Diamond Reclamation.
- Beaumont, P.B. 2005a. Archaeological Impact Assessment of a Portion of the Remnant of Farm 225, near Barkly West, Northern Cape.
- Beaumont, P.B. 2005b. Archaeological Impact Assessment of a Portion of the Delportshoop Commonage, Northern Cape.
- Beaumont, P.B. 2006. Phase 1 Heritage Assessment Report on Portion 4 of the Farm Slypklip North 32, Frances Baard District Municipality, Northern Cape Province.
- Beaumont, P.B. 2007a. Phase 1 Heritage Impact Assessment Report on Parts of Portion 2 and the Remainder of the Farm Holsdam 229 near Barkly West, Frances Baard District Municipality, Northern Cape Province.
- Beaumont, P.B. 2007b. Phase 1 Heritage Impact Assessment Report on the Farm Eureka 200 near Kimberley, Francis Baard District Municipality, Northern Cape Province.
- Beaumont, P.B. 2008. Phase 1 Heritage Impact Assessment Report on the Proposed Northgate Housing development on Portions of the Original Farm Roode Pan 70, near Kimberley in the Sol Plaatjie Municipality of the Northern Cape Province.
- Dreyer, C.2003. Archaeological and Historical Investigation of the Proposed Pipeline Installed at Hanover, Northern Cape.
- Dreyer, C. 2005a. Archaeological and Historical Investigation of the Proposed Diamond Mining Activities at the Farm Riverside 208, Barkly West, Northern Cape.
- Dreyer, C. 2005b. Archaeological and Historical Investigation of the Proposed Diamond Mining Activities at the Farms Melkvlei 221 and Longlands 231, Barkly West, Northern Cape.
- Dreyer, C. 2005c. First Phase Archaeological and Cultural Heritage Assessment of the Proposed Residential Development on Erven 687 and 711, Barkly West, Northern Cape.
- Dreyer, C. 2006a. First Phase Archaeological and Cultural Heritage Assessment of the Proposed Developments at the Big Hole, Kimberley, Northern Cape.
- Dreyer, C. 2006b. Archaeological and Historical Investigation of the Proposed Diamond Mining Activities at the Farm Winter's Rush (Longlands 350), Barkly West, Northern Cape.
- Dreyer, C. 2006c. Archaeological and Historical Investigation of the Proposed Diamond Mining Activities at the Farm Holpan 161, Barkly West, Northern Cape.
- Dreyer, C. 2008. Archaeological and Culture Historical Assessment of the proposed Residential Developments at Kimberley, Northern Cape.
- Henderson, Z.L. 2003. Archaeological Survey of Van Aswegenshoek 134.

- Morris, D. 2001. Report on Historical Rubbish Midden at Kamfersdam.
- Morris, D. 2002. Report on an Inspection of Cemeteries at Sydney-on-Vaal.
- Morris, D. 2003a. Archaeological Survey of the Farm Koodoosberg No 141.
- Morris, D. 2003b. Archaeological Impact Assessment Rietputs 15, Windsorton.
- Morris, D. 2005a. Phase 1 Archaeological Impact Assessment of the so-called 'Kemo Dump' (National Site Number 2824DB039) on Remainder of Erf 5024, Erf 6376 and Erf 5058, Vooruitzicht 81, Kimberley, Northern Cape.
- Morris, D. 2005b. Site Visit to Inspect Cultural Material on the Mine Debris Dumps adjacent to the Kimberley Mine at the Site of the Proposed Hotel.
- Morris, D. 2005c. Phase 1 Archaeological Impact Assessment for De Beers Consolidated Mines Ltd (Contract 0616-AC-244-05) to evaluate Heritage Resources on properties as Indicated.
- Morris, D. 2005d. Archaeological Impact Assessment of Abrahamoos Fontein near Plooyburg, Northern Cape
- Morris, D. 2005e. Archaeological Impact Assessment at Taaibosch Fontein near Plooyburg, Northern Cape.
- Morris, D. 2005f. Archaeological Impact Assessment on the Claim of Mr. Medwyn Jacobs, Erf 86, near Barkley West.
- Morris, D. 2005g. Archaeological Impact Assessment on Windsorton, Erf 1, Northern Cape.
- Morris, D. 2006a. Report on a Phase 1 Archaeological Impact Assessment of a Proposed Clay Quarry at Roodepan 70, Kimberley, Northern Cape, NC30/5/1/3/3/2/1/358EM.
- Morris, D. 2006b. Site Visit to Inspect an Area of Proposed Debris Washing along Kenilworth Road, on Erven 14741, in the Magisterial District of Kimberley.
- Morris, D. 2006c. Report on a Phase 1 Archaeological Impact Assessment of Proposed Prospecting on Uityk 106, Locks Verdriet 105 and Brakpan 107, West of Kimberley, Northern Cape.
- Morris, D. 2006d. Archaeological and Heritage Impact Assessment on Portion 20 Mosesberg, near Schmidtsdrift, Northern Cape.
- Morris, D. 2006e. Archaeological Impact Assessment on the Claim of Mr. Setlhabi at Waldeck's Plant, Pniel, near Barkley West, Northern Cape.
- Morris, D. 2007. Archaeological Impact Assessment at Longlands 350 near Barkly West, Northern Cape: Collective Application List of E. Nyanyywa.
- Morris, D. 2009. Report on a Phase 1 Archaeological Assessment of a proposed mining site at the Eddie Williams Oval, Kimberley, Northern Cape.
- Nel, J. (Archaic Heritage Project Management). 2008. Final Report: Heritage Resources Scoping and Preliminary Assessment. Transnet Freight Line EIA, Eastern Cape and Northern Cape.
- Nelson, C. 2007. Upgrading of the TR502 Road, Barkly West Magisterial District, Northern Cape Province.
- Rossouw, L. 2006. A Preliminary Evaluation of Archaeological and Palaeontological Impact with regard to the Application for Prospecting Rights on the Farms Doornfontein 12, Grasbult 5, Schoolplaats 3, Schoolplaats Annex 4 and Pontdrift 2 in the Warrenton District, Northern Cape.
- Rossouw, L. (National Museum, Bloemfontein). 2008. Phase 1 Archaeological Impact Assessment of Farm Fourteen Streams, Warrenton District, Northern Cape Province.
- Van Ryneveld, K. 2005a. Cultural Resources Management Impact Assessment: Portion 1 of Roode Pan 146, Kimberley District, Northern Cape, South Africa.
- Van Ryneveld, K. 2005b. Cultural Resources Management Impact Assessment: Portions of Paardeberg 154, Kimberley District, Northern Cape, South Africa.

- Van Ryneveld, K. 2005c. Cultural Resources Management Impact Assessment: (Portions of) Leeuwpoort 161, Kimberley District, Northern Cape, South Africa.
- Van Ryneveld, K. 2005d. Cultural Resources Management Impact Assessment: (Portions of) Paardeberg 12, Paardeberg-East, Kimberley District, Northern Cape, South Africa.
- Van Ryneveld, K. 2005e. Cultural Resources Management Impact Assessment: Rooipoort – (Portions of) Klipfontein 99, Berg Plaats 100, Vogelstruispan 98, Vogelstruispan 101 and Zand Plaas 102, Kimberley District, Northern Cape, South Africa.
- Van Ryneveld, K. 2005f. Cultural Heritage Impact Assessment: (Southern Portion of) Camp 3, Erf 1, Windsorton, Barkly West District, Northern Cape, South Africa.
- Van Ryneveld, K. 2006a. Stamper Claim on a Portion of the Farm Longlands, Barkly West, Northern Cape, South Africa.
- Van Ryneveld, K. 2006c. Cultural Resources Management Impact Assessment: A 400ha Portion of Van Zoelen’s Laagte 158, Windsorton District, Northern Cape, South Africa.
- Van Ryneveld, K. . 2007a. Archaeological Site Inspection – Mining Impact on Two Graveyard Sites, Schmidtsdrift Mining Area, Boomplaats 21, Schmidtsdrift District, Northern Cape, South Africa
- Van Ryneveld, K. 2007b. Proposed Phase 2 Archaeological Mitigation and Management for the Residential Development, Remainder of Portion 1 of the Farm van Zoelen’s Laagte 158, Windsorton, Barkly-West District, Northern Cape, South Africa.
- Van Ryneveld, K. . 2007c. Phase 1 Archaeological Impact Assessment – Sewer Purification Plant, Ikutseng Township, Warrenton, Northern Cape, South Africa.
- Van Ryneveld, K. . 2007d. Phase 1 Archaeological Impact Assessment: Portion of the farm Platfontein 68, Kimberley District, Northern Cape, South Africa.
- Van Schalkwyk, J.A. 2008. Heritage Impact Survey Report for the Development of Visitor Facilities in the Makala National Park, Northern Cape Province.
- Van Schalkwyk, J.A. 2011. Heritage impact assessment for the proposed development of photovoltaic power plants on five different locations in Northwest and Northern Cape Provinces

3.1.2 Aerial Representations and Survey

Aerial photography is often employed to locate and study archaeological sites, particularly where larger scale area surveys are performed. This method was applied in the foot survey for the project where depressions, variation in vegetation, soil marks and landmarks were examined. Specific attention was given to shadow sites (shadows of walls or earthworks which are visible early or late in the day), crop mark sites (crop mark sites are visible because disturbances beneath crops cause variations in their height, vigour and type) and soil marks (e.g. differently coloured or textured soil (soil marks) might indicate ploughed-out burial mounds). Attention was also given to moisture differences, as prolonged dampening of soil as a result of precipitation frequently occurs over walls or embankments. By superimposing high frequency aerial photographs with images generated with Google Earth, potential sensitive areas were subsequently identified, geo-referenced and transferred to a handheld GPS device. These areas served as referenced points from where further vehicular and pedestrian surveys were carried out.

3.1.3 Field Survey

Archaeological survey implies the systematic procedure of the identification of archaeological sites. An archaeological survey of the St Augustine Reprocessing Project area was conducted in June 2015. The process encompassed a systematic field survey in accordance with standard archaeological practice by which heritage resources are observed and documented. In order to sample surface areas systematically and to ensure a high probability of site recording, the entire project area was systematically surveyed on foot, GPS reference points were visited and random spot checks were made (see detail in previous

section). Using a Garmin Montana 650 GPS objects and structures of archaeological / heritage value were recorded and photographed with a Canon 450D Digital camera. Real time aerial orientation, by means of a mobile Google Earth application was also employed to investigate possible disturbed areas during the survey.

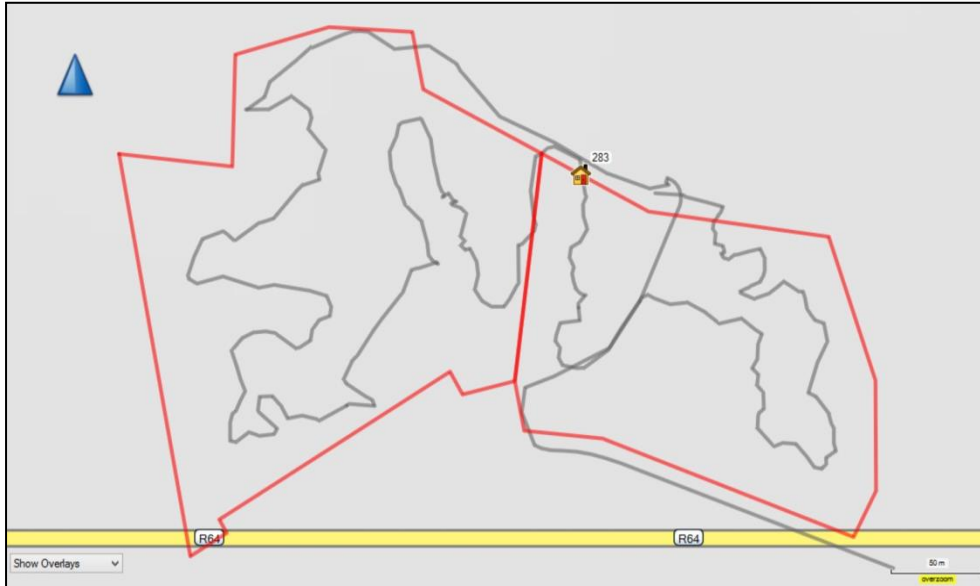


Figure 3-1: Garmin GPS track log of the foot survey.

As most archaeological material occur in single or multiple stratified layers beneath the soil surface, special attention was given to disturbances, both man-made such as roads and clearings, as well as those made by natural agents such as burrowing animals and erosion.

3.2 Limitations

3.2.1 Access

The study area is essentially an open field which is accessed directly via St Augustines Road and Waterloo Road. Access control is not applied and no restrictions were encountered.

3.2.2 Visibility

The entire study area has been degraded and altered substantially where mining debris, household waste and rubbish have been dumped at the site. In addition, natural agents such as erosion have contributed to the loss of site preservation. Vegetation in the study area is composed out of pockets of tall grass, trees and shrubs. Generally, the visibility at the time of the AIA site inspection (June 2015) was high (see Figures 3-2 to 3-11). In single cases during the survey sub-surface inspection or erosion gullies and diggings was possible. Where applied, this revealed no archaeological deposits but rather a dense stratigraphy of mining rubble compromised out of fragmented rock and ashy soil (see Figure 3-12).



Figure 3-2: View of general surroundings along an eastern section of the study area. Note building rubble.



Figure 3-3: View of large degraded mine dumping areas along an eastern section of the study area.



Figure 3-4: View of degraded mine dumping areas along an eastern section of the study area.



Figure 3-5: View of general surroundings along a southern section of the study area. Note building rubble.



Figure 3-6: View of general surroundings along a southern section of the study area.



Figure 3-7: View of general surroundings along a central section of the study area where refuse has been dumped.



Figure 3-8: View of general surroundings along the northern periphery of the study area.



Figure 3-9: Large erosion gullies towards the west of the study area.



Figure 3-10: View of general surroundings along the western southern section of the study area.



Figure 3-11: View of cleared surface areas along the western periphery of the study area.



Figure 3-12: Detail image of a section of an erosion gully where mining debris is visible in the stratigraphy.

3.2.3 Limitations and Constraints

The foot survey for the St Augustine Reprocessing AIA Project primarily focused around areas tentatively identified as sensitive and of high heritage probability (i.e. those noted during the aerial survey) as well as areas of high human settlement catchment.

- **Visibility:** Visibility proved to be a minor constraint where surface vegetation remains and surface features proved to be somewhat overgrown and obstructed by surface vegetation.

Even though it might be assumed that survey findings are representative of the heritage landscape of the project area for the St Augustine Reprocessing Project, it should be stated that the possibility exists that individual sites could be missed due to the localised nature of some heritage remains as well as the possible presence of sub-surface archaeology. Therefore, maintaining due cognisance of the integrity and accuracy of the archaeological survey, it should be stated that the heritage resources identified during the study do not necessarily represent all the heritage resources present in the project area. The subterranean nature of some archaeological sites, dense vegetation cover and visibility constraints sometimes distort heritage representations and any additional heritage resources located during consequent development phases must be reported to the Heritage Resources Authority or an archaeological specialist.

3.3 Impact Assessment

For consistency among specialists, impact assessment ratings by Exigo Specialist are generally done using the Plomp¹ impact assessment matrix scale supplied by Exigo. According to this matrix scale, each heritage receptor in the study area is given an impact assessment. A cumulative assessment for the proposed project is also included.

¹ Plomp, H., 2004

4 ARCHAEO-HISTORICAL CONTEXT

4.1 The archaeology of Southern Africa

Archaeology in southern Africa is typically divided into two main fields of study, the **Stone Age** and the **Iron Age** or **Farmer Period**. The following table provides a concise outline of the chronological sequence of periods, events, cultural groups and material expressions in Southern African pre-history and history.

Table 1 Chronological Periods across southern Africa

Period	Epoch	Associated cultural groups	Typical Material Expressions
Early Stone Age 2.5m – 250 000 YCE	Pleistocene	Early Hominins: <i>Australopithecines</i> <i>Homo habilis</i> <i>Homo erectus</i>	Typically large stone tools such as hand axes, choppers and cleavers.
Middle Stone Age 250 000 – 25 000 YCE	Pleistocene	First <i>Homo sapiens</i> species	Typically smaller stone tools such as scrapers, blades and points.
Late Stone Age 20 000 BC – present	Pleistocene / Holocene	<i>Homo sapiens sapiens</i> including San people	Typically small to minute stone tools such as arrow heads, points and bladelets.
Early Iron Age / Early Farmer Period 300 – 900 AD	Holocene	First Bantu-speaking groups	Typically distinct ceramics, bead ware, iron objects, grinding stones.
Middle Iron Age (Mapungubwe / K2) / early Later Farmer Period 900 – 1350 AD	Holocene	Bantu-speaking groups, ancestors of present-day groups	Typically distinct ceramics, bead ware and iron / gold / copper objects, trade goods and grinding stones.
Late Iron Age / Later Farmer Period 1400 AD -1850 AD	Holocene	Various Bantu-speaking groups including Venda, Thonga, Sotho-Tswana and Zulu	Distinct ceramics, grinding stones, iron objects, trade objects, remains of iron smelting activities including iron smelting furnace, iron slag and residue as well as iron ore.
Historical / Colonial Period ±1850 AD – present	Holocene	Various Bantu-speaking groups as well as European farmers, settlers and explorers	Remains of historical structures e.g. homesteads, missionary schools etc. as well as, glass, porcelain, metal and ceramics.

4.1.1 The Stone Ages

- The Earlier Stone Age (ESA)

Earlier Stone Age deposits typically occur on the flood-plains of perennial rivers and may date to between 2 million and 250 000 years ago. These ESA open sites sometimes contain stone tool scatters and manufacturing debris ranging from pebble tool choppers to core tools such as handaxes and cleavers. These stone tools were made by the earliest hominins. These groups seldom actively hunted and relied heavily on the opportunistic scavenging of meat from carnivore kill sites.

- The Middle Stone Age (MSA)

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

- **The Later Stone Age (LSA)**

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

4.1.2 The Iron Age Farmer Period

- **Early Iron Age (Early Farming Communities)**

The Early Iron Age (also Early Farmer Period) marks the movement of Bantu speaking farming communities into South Africa at around 200 A.D. These groups were agro-pastoralists that settled in the vicinity of water in order to provide subsistence for their cattle and crops. Artefact evidence from Early Farmer Period sites is mostly found in the form of ceramic assemblages and the origins and archaeological identities of this period are largely based upon ceramic typologies and sequences, where diagnostic pottery assemblages can be used to infer group identities and to trace movements across the landscape. Early Farmer Period ceramic traditions are classified by some scholars into different “streams” or trends in pot types and decoration that, over time emerged in southern Africa. These “streams” are identified as the Kwale Branch (east), the Nkope Branch (central) and the Kalundu Branch (west). More specifically, in the northern regions of South Africa at least three settlement phases have been distinguished for prehistoric Bantu-speaking agropastoralists. The first phase of the Early Iron Age, known as Happy Rest (named after the site where the ceramics were first identified), is representative of the Western Stream of migrations, and dates to AD 400 - AD 600. The second phase of Diamant is dated to AD 600 - AD 900 and was first recognized at the eponymous site of Diamant in the western Waterberg. The third phase, characterised by herringbone-decorated pottery of the Eiland tradition, is regarded as the final expression of the Early Iron Age (EIA) and occurs over large parts of the North West Province, Northern Province, Gauteng and Mpumalanga. This phase has been dated to about AD 900 - AD 1200. Early Farmer Period ceramics typically display features such as large and prominent inverted rims, large neck areas and fine elaborate decorations. The Early Iron Age continued up to the end of the first millennium AD.

- **Middle Iron Age / K2 Mapungubwe Period (early Later Farming Communities)**

The onset of the middle Iron Age dates back to ±900 AD, a period more commonly known as the Mapungubwe / K2 phase. These names refer to the well known archaeological sites that are today the pinnacle of South Africa’s Iron Age heritage. The inhabitants of K2 and Mapungubwe, situated on the banks of the Limpopo, were agriculturalists and pastoralists and were engaged in extensive trade activities with local and foreign traders. Although the identity of this Bantu-speaking group remains a point of contestation, the Mapungubwe people were the first state-organized society southern Africa has known. A considerable amount of golden objects, ivory, beads (glass and gold), trade goods and clay figurines as well as large amounts of potsherds were found at these sites and also appear in sites dating back to this phase of the Iron Age. Ceramics of this tradition take the form of beakers with upright sides and decorations around the base (K2) and shallow-shouldered bowls with decorations as well as globular pots with long necks. (Mapungubwe). The site of Mapungubwe was deserted at around 1250 AD and this also marks the relative conclusion of this phase of the Iron Age.

- **Later Iron Age (Later Farming Communities)**

The late Iron Age of southern Africa marks the grouping of Bantu speaking groups into different cultural units. It also signals one of the most influential events of the second millennium AD in southern Africa, the difaqane. The difaqane (also known as “the scattering”) brought about a dramatic and sudden ending to

centuries of stable society in southern Africa. Reasons for this change was essentially the first penetration of the southern African interior by Portuguese traders, military conquests by various Bantu speaking groups primarily the ambitious Zulu King Shaka and the beginning of industrial developments in South Africa. Different cultural groups were scattered over large areas of the interior. These groups conveyed with them their customs that in the archaeological record manifest in ceramics, beads and other artefacts. This means that distinct pottery typologies can be found in the different late Iron Age groups of South Africa.

- **Bantu Speaking Groups in the South African interior**

It should be noted that terms such as “Nguni”, “Sotho”, “Venda” and others refer to broad and comprehensive language groups that demonstrated similarities in their origins and language. It does not imply that these Nguni / Sotho groups were homogeneous and static; they rather moved through the landscape and influenced each other in continuous processes marked by cultural fluidity.

Ethnographers generally divide major Bantu-speaking groups of southern Africa into two broad linguistic groups, the Nguni and the Sotho with smaller subdivisions under these two main groups. Nguni groups were found in the eastern parts of the interior of South Africa and can be divided into the northern Nguni and the southern Nguni. The various Zulu and Swazi groups were generally associated with the northern Nguni whereas the southern Nguni comprised the Xhosa, Mpondo, Thembu and Mpondomise groups. The same geographically based divisions exist among Sotho groups where, under the western Sotho (or Tswana), groups such as the Rolong, Hurutshe, Kwena, Fokeng and Kgatla are found. The northern Sotho included the Pedi and amalgamation of smaller groups united to become the southern Sotho group or the Basutho. Other smaller language groups such as the Venda, Lemba and Tshonga Shangana transpired outside these major entities but as time progressed they were, however to lesser or greater extent influenced and absorbed by neighbouring groups.

4.1.3 Historical and Colonial Times and Recent History

The Historical period in southern Africa encompass the course of Europe's discovery of South Africa and the spreading of European settlements along the East Coast and subsequently into the interior. In addition, the formation stages of this period are marked by the large scale movements of various Bantu-speaking groups in the interior of South Africa, which profoundly influenced the course of European settlement. Finally, the final retreat of the San and Khoekhoen groups into their present-day living areas also occurred in the Historical period in southern Africa.

4.2 The Kimberley Heritage Landscape: Specific Themes.

The history of the Northern Cape Province is reflected in a rich archaeological landscape, mostly dominated by Stone Age occurrences. Numerous sites, documenting Earlier, Middle and Later Stone Age habitation occur across the province, mostly in open air locales or in sediments alongside rivers or pans. In addition, a wealth of Later Stone Age rock art sites, most of which are in the form of rock engravings are to be found in the larger landscape. These sites occur on hilltops, slopes, rock outcrops and occasionally in river beds. Sites dating to the Iron Age occur in the north eastern part of the Province but environmental factors delegated that the spread of Iron Age farming westwards from the 17th century was constrained mainly to the area east of the Langeberg Mountains. However, evidence of an Iron Age presence as far as the Uppington area in the eighteenth century occurs in this area. Moving into recent times, the archaeological record reflects the development of a rich colonial frontier, characterised by, amongst others, a complex industrial archaeological landscape such as mining developments at Kimberley, which herald the modern era in South African history. Finally, the Northern Cape Province saw a number of war conflicts, particularly the Anglo Boer War (or the South African War) left behind the remnants of battlefields, skirmishes and

concentration camps

4.2.1 Early History and the Stone Age

The Northern Cape has traces of various types of archaeological sites inclusive of fossil, prehistoric and historical sites. Of palaeontological and Stone Age significance is a major fossil-bearing and archaeological complex of karstic deposits at Groot Kloof in the escarpment of the Ghaap Plateau, around 100 km southwest of Taung. The region is known for open fluvial and lacustrine sites sampling Lower and Middle Pleistocene tool types and the long, but discontinuous sequence of Wonderwerk Cave. Small pockets of Later Stone Age artefact-bearing breccia and rock art also occur. The significance of Groot Kloof is underscored by current debate about the emergence of modern humans in which the appearance of modern behaviour is posited to have occurred in this and other regions (Curnoe et al. 2005).

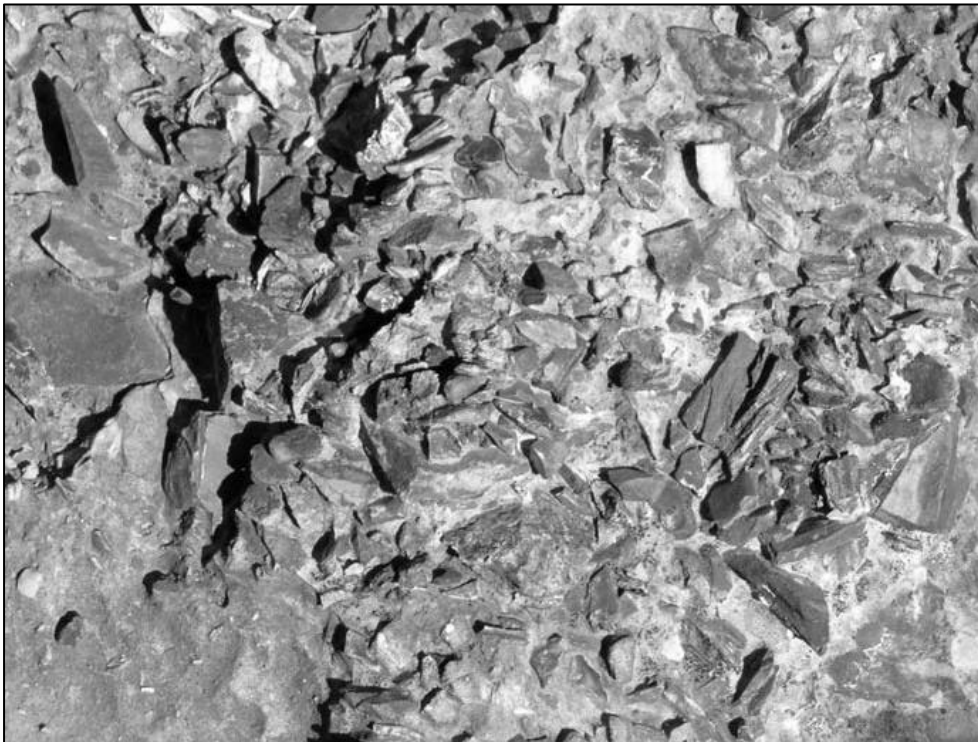


Figure 4-1: Intrusive breccia containing a Late Stone Age industry. Note the high density of lithics.

The Stone Age archaeological wealth of the Northern Cape is unequalled by any of the other provinces in South Africa. Stone Age sites are not randomly scattered within the landscape and they occur either near water sources or close to local sources of two highly-prized raw materials, specularite and jaspillite. As such, tools dating to all phases of the Stone Age are mostly found in the vicinity of larger watercourses. Surveys around Kimberley have documented Acheullian industries and continuity between Earlier Stone Age (ESA) and Middle Stone Age (MSA) lithic technologies in the same area. Excavations at other well-known sites in the wider region attest to further ESA and MSA occupation, some of which have yielded significant Stone Age assemblages that all inform on our general understanding of the technological sequences of the Stone Age in the Northern Cape and the Northwest (e.g. see Beaumont 2008, 2009; Morris 2006; Morris 2007; Dreyer 2007). Within the greater Kimberley region ESA and MSA sites with long research histories include Doornlaagte, Pniel, Canteen Koppie and Rooidam (Beaumont & Morris 1990). Open air ESA and MSA sites are often associated with raw material outcrops, dolines, playas (palaeo-lakes) and palaeo-river channels. In addition low density ESA, MSA and Later Stone Age (LSA) occurrences remain regular phenomena characterizing the cultural landscape of the region. LSA use of the more immediate region is most prominently evidenced by the Wildebeest Kuil Rock Art

Center and adjoining Rock Art site (see later reference) . Here, a number of lithic artefacts with spatial distribution indicative of separate residential and knapping areas occur around the hill

The landscape around the town of Kimberley is rich in archaeological material dating to Earlier and Middle Stone Ages. These are subject to on-going archaeological research Sites such as Wonderwerk Cave, Historical Kimberley Mine and Kathu Townlands have yielded significant Stone Age assemblages that all inform on our general understanding of the technological sequences of the Stone Age in the Northern Cape (e.g. see Beaumont 2008, 2009; Morris 2006; Morris 2007; Dreyer 2007). In addition, a large amount of Middle and Later Stone Age sites have been documented across the landscape on calcrete lined pans and road cuttings.

4.2.2 Rock Markings

Rock engravings are mostly found in the interior plateau of South Africa for example in Kimberley and the Karoo. Evidence exists of rock art paintings occurring in caves and shelters at the Wonderwerk Caves, Kuruman Hills, Ghaap Escarpment and scattered sites in the Karoo. Rock engravings have also been identified at Driekopseiland that is positioned in the close vicinity of Kimberley Town. Driekopseiland is evident of more than ninety percent of geometric engraving sites (Morris 1988). Geometrics have been identified at the Kuruman valley and the middle Orange area (Morris 1988). Engravings tend to be found at rock walls, low outcrops, or clusters of surface stone.



Figure 4-2: Rock engravings at the Wildebeest Kuil Rock Art Site.

The Wildebeest Kuil 1 Rock Art site, a declared Provincial Heritage Site (2008), is characterized by a fairly prominent hill surrounded by a number of 'kuils' or non-perennial water holes and wetlands. The hill itself is host to more than 400 petroglyphs, including both naturalistic and abstract engravings, in fine-line and pecked technique. LSA deposits are scattered about the immediate terrain with deposits closer to the hill indicative of residential outlines and activity or knapping areas. Extensive LSA use of the landscape is evidenced by even more engravings on the glacial pavements of the farm Nooitgedacht, just north of Platfontein. Further afield the Driekopseiland site, one of the most prolific engraving sites in the country is host to more than 3,600 images, engraved into the glaciated andesite of the

Riet River's banks (Morris 1990a). Closer to the Vaal River, at the Bushmans' Fountain site, Klipfontein, more than 4,500 engravings have been recorded across the approximate 9ha site (Morris 1990b). The many petroglyph sites across the Northern Cape signal an aesthetic and spiritual expression of a modern LSA cognition. The LSA archaeological record is directly associated with San history, dating conservatively back to around 40-27kya, whilst the Khoe is reported to have entered the country around 2kya (Mitchell 2002). Both groups are known to have traded with Later Iron Age communities and Colonial settlers. Rock engravings are mostly situated in the semi-arid plateau with most of these engravings situated at the Orange – Vaal basin, Karoo and Namibia. The upper Vaal, Limpopo basin and eastern Free State regions have a small quantity of rock engravings as well. Generally, rock paintings exist at cave areas and rock engravings at open surface areas. The Cape interior consists of a technical, formal and thematic variation between and within sites (Morris 1988). Two major techniques existed namely the incised and pecked engravings. Morris (1988) indicated technical and formal characteristics through space and a sharp contrast exists between engravings positioned north of the Orange River that are mostly pecked and those in the Karoo where scraping was mostly used. According to Morris (1988) hairline engravings occur at the North and the South, but they are rare at the Vryburg region. Finger painting techniques mostly occur at the Kuruman Hills, Asbestos Mountains, Ghaap Escarpment, Langeberg, Koranaberg ranges, scattered sites at the Karoo and the Kareeberge (Morris 1988). The development petroglyphs (i.e. carving or line drawing on rock) were associated with three different types of techniques, namely incised fine lines, pecked engravings and scraped engravings. According to Peter Beaumont the pecked and scraped engravings at the Upper Karoo are coeval (i.e. having the same age or date of origin) (Beaumont P B et al. 1989). Dating of rock art includes the use of carbonate fraction dating of ostrich eggshell pieces, dating of charcoal and ostrich eggshell at various rock art shelters. Unifacial points, double segments and thin – walled sherds may indicate the presence of the Khoikhoi at the Northern Cape during 2500 BP (years Before the Present) (Beaumont 1989).

4.2.3 Iron Age / Farmer Period

The beginnings of the Iron Age (Farmer Period) in southern Africa are associated with the arrival of a new Bantu speaking population group at around the third century AD. These newcomers introduced a new way of life into areas that were occupied by Later Stone Age hunter-gatherers and Khoekhoe herders. Distinctive features of the Iron Age are a settled village life, food production (agriculture and animal husbandry), metallurgy (the mining, smelting and working of iron, copper and gold) and the manufacture of pottery. Stone ruins indicate the occurrence of Iron Age settlements in the Northern Cape specifically at sites such as Dithakong where evidence exists that the Thlaping used to be settled in the Kuruman – Dithakong areas prior to 1800 (Humphreys 1976). Here, the assessment of the contact between the Stone Age, Iron Age and Colonial societies are significant in order to understand situations of contact and assimilation between societies. As an example, Trade occurred between local Thlaping Tswana people and the Khoikhoi communities. It means that the Tswana traded as far south as the Orange River at least the same time as the Europeans at the Cape (Humphreys 1976).

4.2.4 Later History: Colonial Period

The 18th century was defined as a period of conflict when the Griqua, Korana and white settlers were competing for the availability of land. This period is also known for the occurrence of the Mfecane or the so called Difaqane that resulted in a time period of instability that started in the middle 1820's. The conflict time period related to the Mfecane or Difaqane was the result of the influx of the then displaced people. The continuous conflict resulted in tribal groups migrating to hilltop areas in the need of finding safe environments. From early Colonial times interest in the Northern Cape was firmly vested in its mineral wealth; early settlers speculated about mountains rich in copper towards the north-west. However, the landscape was permanently transformed after Erasmus Jacobs discovered a 'brilliant pebble'

on the farm De Kalk near Hopetown in 1866. The 'pebble' was sold to Schalk van Niekerk, who again sold it, only to turn out to be the 21.25 carat world famous 'Eureka' diamond. Three years later van Niekerk sold another diamond from the De Kalk region, this time to become known as the 'Star of South Africa', resold on the London market for .25,000. In 1871 an even larger diamond was found on the slopes of Colesberg Kopje, on the farm Vooruitzicht, belonging to the De Beers brothers and so the 'New Rush' was started resulting in a literal stampede to the area; more than 3,000 men working almost 800 claims. Soon the Colesberg hillock lowered into the Kimberley Mine (the Big Hole).

4.2.5 The Anglo-Boer War

The Anglo-Boer War saw Kimberley besieged by the *Boers* on the 14th of October 1899, with British forces suffering heavy losses. The Boers moved quickly to try to capture the British enclave when war broke out between the British and the two Boer republics in October 1899. The town was ill-prepared but the defenders organised an energetic and effective improvised defense that was able to prevent it from being taken. Cecil John Rhodes, who had made his fortune in the town, and who controlled all the mining activities, moved into the town at the onset of the siege. His presence was controversial, as his involvement in the Jameson Raid made him one of the primary protagonists behind war breaking out. Rhodes was constantly at loggerheads with the military, but he was nonetheless instrumental in organising the defense of the town. The Boers shelled the town with their superior artillery in an attempt to force the garrison to capitulate. Engineers of the De Beers company manufactured a one-off gun named Long Cecil, however the Boers soon countered with a much larger siege gun that terrified the residents, forcing many to take shelter in the Kimberley Mine. The British military had to change its strategy for the war as public opinion demanded that the sieges of Kimberley, Ladysmith and Mafeking be relieved before the Boer capitals were assaulted. The first attempt at relief of Kimberley under Lord Methuen was stopped at the battles of Modder River and Magersfontein. The 124-day siege was finally relieved on 15 February 1900 by a cavalry division under Lieutenant-General John French, part of a larger force under Lord Roberts. The battle against the Boer general Piet Cronjé continued at Paardeberg immediately after the town itself was relieved.

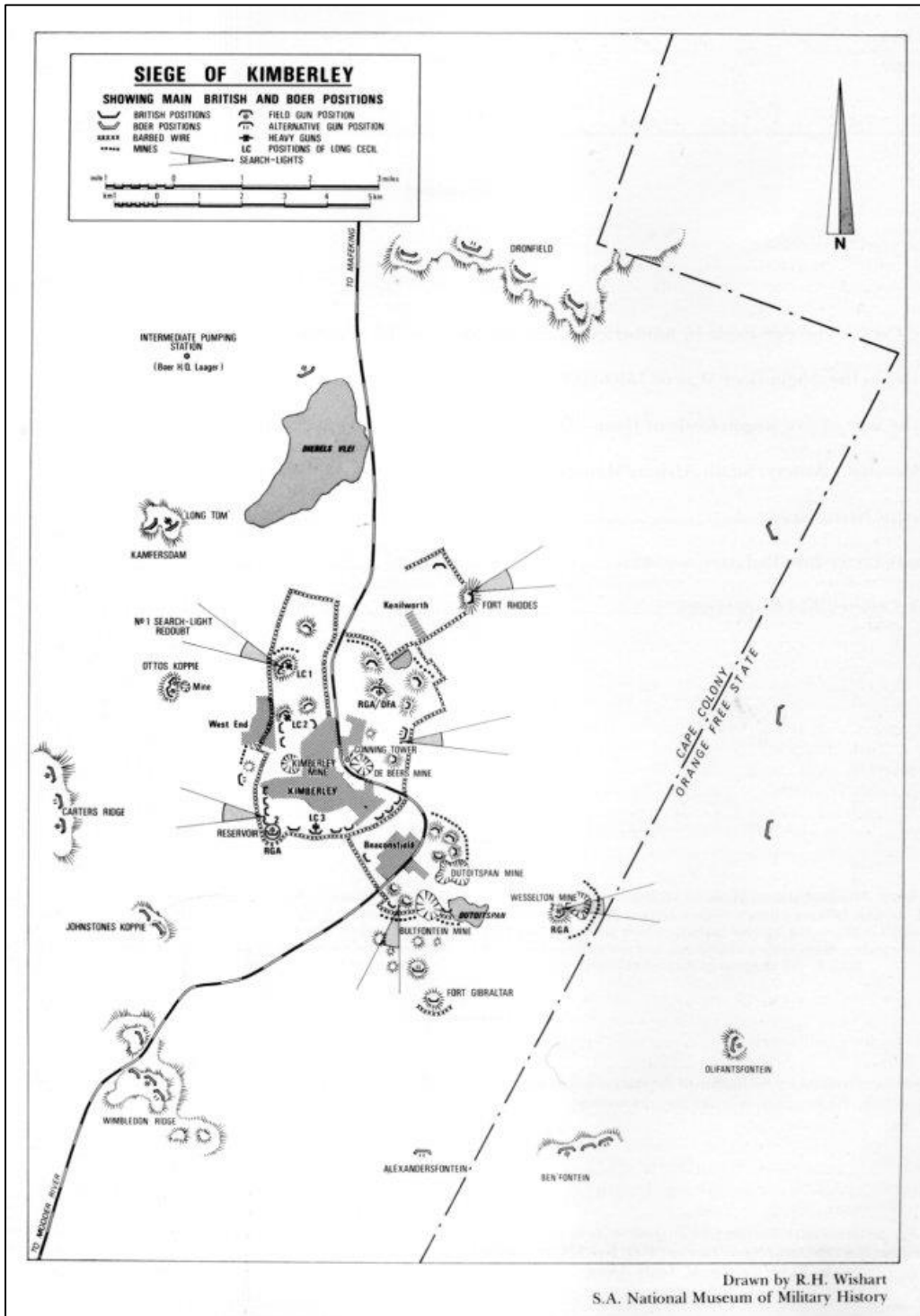


Figure 4-3: Map indicating main events surrounding the siege of Kimberley.

4.2.6 The Kimberley and St Augustines Mines

The first diamonds here were found on Colesberg Kopje by members of the "Red Cap Party" from Colesberg on the farm Vooruitzicht belonging to the De Beers brothers, in 1871. The ensuing scramble for claims led to the place being called New Rush, later renamed Kimberley. From mid-July 1871 to 1914 up to 50,000 miners dug the hole with picks and shovels, yielding 2,720 kilograms (6,000 lb) of diamonds. The Big Hole has a surface of 17 hectares (42 acres) and is 463 metres (1,519 ft) wide. It was excavated to a depth of 240 metres (790 ft), but then partially infilled with debris reducing its depth to about 215 metres (705

ft). Since then it has accumulated about 40 metres (130 ft) of water, leaving 175 metres (574 ft) of the hole visible. Once above-ground operations became too dangerous and unproductive, the kimberlite pipe of the Kimberley Mine was also mined underground by Cecil Rhodes' De Beers company to a depth of 1,097 metres (3,599 ft). In 1872, one year after digging started, the population of the camp of diggers grew to around 50,000. As digging progressed, many men met their deaths in mining accidents. The unsanitary conditions, scarcity of water and fresh vegetables as well as the intense heat in the summer, also took their toll. On 13 March 1888 the leaders of the various mines decided to amalgamate the separate diggings into one big mine and one big company known as De Beers Consolidated Mines Limited, with life governors such as Cecil John Rhodes, Alfred Beit and Barney Barnato. This massive company further worked on the Big Hole until it came to the depth of 215 meters, with a surface area of about 17 hectares and perimeter of 1.6 kilometers. By 14 August 1914, when over 22 million tons of earth had been excavated, yielding 3,000 kilograms (14,504,566 carats) of diamonds, work on the mine ceased after it was considered the largest hand-dug excavation on earth. By 2005, however, it was reported that a researcher had re-examined mine records and found that the hand-dug portions of the Jagersfontein and Bultfontein diamond mines, also in South Africa, may have been deeper and/or larger in excavated volume.

The St. Augustines Mine located directly north-west of the Kimberley Mine was in operation from the late 1890s until 1902 to a depth of approximately 240 meters. Historical reference to the mine is few and far between but geological records indicate that the diamond quality of minerals from St. Augustines Mine was considered identical and the grade similar to that of the Big Hole, which, until 1914, produced 14.5 million carats of diamonds from 22.5 million tonnes at a grade of 64 carats per hundred tonnes. Records also indicate that the kimberlite pipes of the Big Hole and St Augustines are located on the same structure and are connected by a kimberlite fissure. Mining at St Augustines ceased in 1902 and records indicate that that the 240m deep St Augustines was only partially mined. It is said that the mine was closed in a strategic move to monopolise diamond production and limit diamond mining to the Kimberley Mine. Subsequently the tailings of the Kimberley Mine were deposited over the St Augustines kimberlite and all indications of the mine disappeared.



Figure 4-4: Historical photo dating to the last decade of the 10th century, of the big hole excavation at the Kimberly Mine.

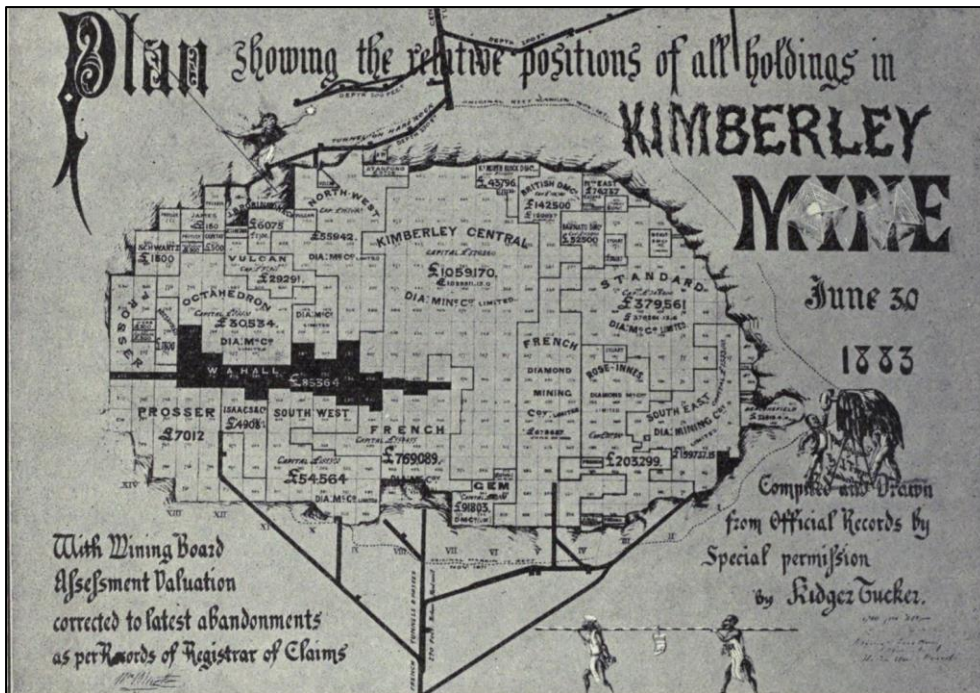


Figure 4-5: Historical plan of mine digging holdings at the Kimberley Mine c. 1883.

PRODUCTION OF DIAMONDS.

ST. AUGUSTINE'S MINE.

From January 1st to December 31st, 1887.

DATE.	CARATS.	VALUATION.	AVERAGE PER CARAT.
January ...	Nil.	Nil.	Nil.
February ...	"	"	"
March ...	"	"	"
April ...	135	£200	29/7½
May ...	62	£50	16/1½
June ...	Nil.	Nil.	Nil.
July ...	"	"	"
August ...	"	"	"
September ...	"	"	"
October ...	"	"	"
November ...	"	"	"
December ...	"	"	"
TOTALS ...	197	£250 0 0	25/4½

Figure 4-6: Summary of diamond production at St Augustines Mine in 1887 (Mitchell 1888).

PRODUCTION OF DIAMONDS.

—————

ST. AUGUSTINE MINE.

—————

From January 1st, 1886, to December 31st, 1887.

DATE.	NO. CARATS.	VALUATION.	AVERAGE PER CARAT.
1886	239½	£324 6 6	27/1
1887	197	250 0 0	25/4½
TOTALS ...	436½	£574 6 6	26/4½

Figure 4-7: Summary of diamond production at St Augustines Mine from 1886 – 1887 (Mitchell 1888).



Figure 4-8: Series of photographs of the Kimberley mine area dating to the early 1990's (top), the 1930's (middle) and a recent image (bottom). The original location of the St Augustines Mine is indicated by the yellow arrow and the study area ins indicated in faded white.

4.2.7 Burial Sites / Human Remains

Human remains and burials are commonly found close to archaeological sites; they may be found in "lost" graveyards, or occur sporadically anywhere as a result of prehistoric activity, victims of conflict or crime. If any human bones are found during the course of construction work then they should be reported to an archaeologist and work in the immediate vicinity should cease until the appropriate actions have been carried out by the archaeologist. Where human remains are part of a burial they would need to be exhumed under a permit from either SAHRA (for pre-colonial burials as well as burials later than about AD 1500).

5 RESULTS: ARCHAEOLOGICAL SURVEY

During the heritage survey for the St Augustine Reprocessing Project a small number of heritage objects dating to the Historical Period were noted, scattered randomly across the site. Visual impacts should be considered, particularly alongside heritage landscapes.

5.1 The Stone Age

Previous studies in the area noted that the terrain on the north eastern and northern outskirts of Kimberley is likely to include a generally low density and widespread occurrence of mainly Pleistocene Stone Age material, including what has been defined as Fauresmith, mainly based on hornfels as raw material. It would tend to occur on calcrete where exposed, or in the lower margins of Hutton sands that veneer the landscape (Morris 2008). However, Stone Age occurrences of significance have most likely not survived the impacts of mining and urban/industrial development in the study area and no Stone Age occurrences were observed in the survey area.

5.2 The Iron Age Farmer Period

No Iron Age (Farmer Period) occurrences were observed in the survey area.

5.3 Historical / Colonial Period & Industrial Archaeology

In this landscape, Industrial archaeological traces may occur in all instances of former mining activity, in this case associated mainly with the diamond retrieval process up to 1908 and 1914 with respect to the De Beers and Kimberley Mines. Also associated are mine dumps, some of which were used for redoubts (forts) in the Defence of Kimberley during the Siege, 1899-1900. Some discarded mining areas subsequently became dumping areas for industrial and domestic waste which is also the case with the St Augustine Mine area. However, cultural history remains are to be found in Kimberley ash-heaps spread as landfill and similarly, single objects dating to this time period were noted in the study area. As such, single fragments of dated bottles and bottle necks, porcelain and glass were documented. These artefacts occur randomly at the site in low densities in association with mining debris but no heritage objects were noted in exposed sub-surface deposits. Considering the state of preservation of the site and the recurring alteration of surface deposits the local site context of the artefacts has probably been lost. This aspect, combined with the low artefact density and general absence of diagnostic material implies a low heritage significance of the material. However, the former St Augustine Mine is situated within the larger Kimberley Mine Complex historical landscape and on a regional scale associated material within intact site contexts might be of some importance.



Figure 5-1: Large degraded mine dumps where scattered glass and porcelain were noted.



Figure 5-2: A glass bottle top (left), porcelain fragment (middle) and glass fragment (right) from the study area.



Figure 5-3: Glass fragments and vitrified charcoal from the study area.



Figure 5-4: Glass bottle top from the study area.

5.4 Graves / Human Burials

No graves or human burials were observed in the study area.

6 RESULTS: STATEMENT OF SIGNIFICANCE AND IMPACT RATING

6.1 Potential Impacts and Significance Ratings²

The following section provides a background to the identification and assessment of possible impacts and alternatives, as well as a range of risk situations and scenarios commonly associated with heritage resources management. A guideline for the rating of impacts and recommendation of management actions for areas of heritage potential within the study area is supplied in Section 10.2 of the Addendum.

6.2 General assessment of impacts on resources

Generally, the value and significance of archaeological and other heritage sites might be impacted on by any activity that would result immediately or in the future in the destruction, damage, excavation, alteration, removal or collection from its original position, any archaeological material or object (as indicated in the National Heritage Resources Act (No 25 of 1999)). Thus, the destructive impacts that are possible in terms of heritage resources would tend to be direct, once-off events occurring during the initial construction period. However, in the long run, the proximity of operations in any given area could result in secondary indirect impacts. The EIA process therefore specifies impact assessment criteria which can be utilised from the perspective of a heritage specialist study which elucidates the overall extent of impacts.

6.2.1 Direct impact rating

Direct or primary effects on heritage resources occur at the same time and in the same space as the activity, e.g. loss of historical fabric through demolition work. **Indirect effects or secondary effects** on heritage resources occur later in time or at a different place from the causal activity, or as a result of a complex pathway, e.g. restriction of access to a heritage resource resulting in the gradual erosion of its significance, which is dependent on ritual patterns of access (refer to Section 10.3 in the Addendum for an outline of the relationship between the significance of a heritage context, the intensity of development and the significance of heritage impacts to be expected). Significant archaeological material was found within the study area and the potential impacts to archaeology are generally considered to be moderate. The following table summarizes impacts to archaeological material anticipated for the St Augustine Reprocessing Project:

NATURE OF IMPACT: Impacts could involve displacement or destruction of Historical Period heritage material in the study area.		
	Without mitigation	With mitigation
EXTENT	Local	Local
DURATION	Permanent	Permanent
MAGNITUDE	Minor	Minor
PROBABILITY	Probable	Very improbable
SIGNIFICANCE	Low	Negligible
STATUS	Negative	Neutral
REVERSIBILITY	Non-reversible	Non-reversible
IRREPLACEABLE LOSS OF RESOURCES?	Yes	No

² Based on: Winter, S. & Baumann, N. 2005. *Guideline for involving heritage specialists in EIA processes: Edition 1.*

CAN IMPACTS BE MITIGATED?	Yes
MITIGATION: Site monitoring by ECO.	
CUMULATIVE IMPACTS: No cumulative impact is anticipated if site is mitigated.	
RESIDUAL IMPACTS: n/a	

6.3 Discussion: Evaluation of Results and Impacts

Previous studies conducted in the larger Kimberley area suggest a significantly rich and diverse archaeological landscape and cognisance should be taken of archaeological material that might be present in surface and sub-surface deposits along drainage lines, along hills and sources of water.

Single fragments of dated bottles and bottle necks, porcelain and glass are of low heritage value within its local site context due to the general loss of context and site integrity for the artefacts at the quarry, and the low density of diagnostic material. However, the St Augustine Mine was is situated within the larger Kimberley Mine Complex historical landscape and on a regional scale these artefacts might be of some importance. The artefacts occur within the proposed reprocessing area and impact on the resources by the proposed activity is anticipated to be direct and permanent duration where in essence, the impact will result in the loss of the artefacts. **The significance of the impact on the heritage resources is considered LOW but the threshold of the impact can be limited to a NEGLIBLE impact by the implementation of mitigation measures (site monitoring in order to avoid the destruction of previously undetected heritage remains) for the sites, if / when required**

A small number of Historical Period artefacts were noted in the proposed St Augustine Reprocessing Project area. These features are of limited significance in terms of heritage value even though impact on these heritage receptors is foreseen. In the opinion of the author of this Archaeological Impact Assessment Report, the proposed St Augustine Reprocessing Project may proceed from a culture resources management perspective, provided that all mitigation measures supplied in this Report are implemented prior to the commencement of construction on the infrastructure, and subject to the necessary approval from the relevant Heritage Resources Agency (SAHRA / PHRA).

6.4 Management actions

Recommendations for relevant heritage resources management actions are vital to the conservation of heritage resources. A general guideline for recommended management actions is included in Section 10.4 of the Addendum. The following management measures would be required before, and during implementation of the proposed St Augustine Reprocessing Project.

OBJECTIVE: prevent unnecessary disturbance and/or destruction of previously undetected archaeological material.

PROJECT COMPONENT/S	All phases of construction and operation.
POTENTIAL IMPACT	Damage/disturbance to surface and subsurface archaeology.
ACTIVITY RISK/SOURCE	Digging foundations and trenches into sensitive deposits that are not visible at the surface.
MITIGATION:	To locate heritage resources as soon as possible after disturbance so as to

TARGET/OBJECTIVE	maximize the chances of successful rescue/mitigation work.		
MITIGATION: ACTION/CONTROL	RESPONSIBILITY	TIMEFRAME	
Fixed Mitigation Procedure			
Site Monitoring: Regular examination of trenches and excavations.	QUALIFIED HERITAGE SPECIALIST, ECO, DEVELOPER	Monitor frequently as practically possible.	
PERFORMANCE INDICATOR	Archaeological sites are discovered and mitigated with the minimum amount of unnecessary disturbance.		
MONITORING	Successful location and recording of sites by means of monitoring.		

7 RECOMMENDATIONS

The heritage landscape around Kimberley contains rich and significant heritage which spans from 1.5 million years to the recent Historical and Industrial Periods. Notable National Heritage sites such as the Historical Kimberley Mine occur in the area. The following recommendations provide an outline for the conservation and management of the heritage landscape in the proposed St Augustine Reprocessing Project Area, cognisant of this sensitive landscape:

- Single fragments of dated bottles and bottle necks, porcelain and glass is of low heritage value within its local site context due to the general loss of context and site integrity for the artefacts at the quarry, and the low density of diagnostic material. However, the former St Augustine Mine is situated within the larger Kimberley Mine Complex historical landscape and on a regional scale associated material within intact site contexts might be of some importance. It is therefore recommended that all planned activities be carefully monitored by an archaeologist familiar with the archaeology and history of Kimberley. In addition, an informed ECO should inspect the construction site on regular basis in order to monitor possible impact on heritage resources. Should any subsurface paleontological, archaeological or historical material or heritage resources be exposed during construction activities, all activities should be suspended and the archaeological specialist should be notified immediately
- It is essential that cognisance be taken of the larger archaeological landscape of the area in order to avoid the destruction of previously undetected heritage sites. Should any subsurface paleontological / archaeological / historical material and /or graves/human remains be uncovered, all activities should be suspended and the archaeological specialist should be alerted immediately.
- It should be noted that mitigation measures are valid for the duration of the development process, and mitigation measures might have to be implemented on additional features of heritage importance not detected during this Phase 1 assessment (e.g. uncovered during the construction process).

8 GENERAL COMMENTS AND CONDITIONS

This AIA report serves to confirm the extent and significance of the heritage landscape of the proposed St Augustine Reprocessing Project Development area. The larger heritage horizon encompasses rich and diverse archaeological landscapes and cognisance should be taken of heritage resources and archaeological material that might be present in surface and sub-surface deposits. If, during construction, any possible archaeological material culture discoveries are made, the operations must be stopped and a qualified archaeologist be contacted for an assessment of the find. Such material culture might include:

- Formal Earlier Stone Age stone tools.
- Formal Middle Stone Age stone tools.
- Formal Later Stone Age stone tools.
- Potsherds
- Iron objects.
- Beads made from ostrich eggshell and glass.
- Ash middens and cattle dung deposits and accumulations.
- Faunal remains.
- Human remains/graves.
- Stone walling or any sub-surface structures.
- Historical glass, tin or ceramics.
- Fossils.

If such site were to be encountered or impacted by any proposed developments, recommendations contained in this report, as well as endorsement of mitigation measures as set out by SAHRA, the National Resources Act and the CRM section of ASAPA will be required.

It must be emphasised that the conclusions and recommendations expressed in this archaeological heritage sensitivity investigation are based on the visibility of archaeological sites/features and may not therefore, represent the area's complete archaeological legacy. Many sites/features may be covered by soil and vegetation and might only be located during sub-surface investigations. If subsurface archaeological deposits, artefacts or skeletal material were to be recovered in the area during construction activities, all activities should be suspended and the archaeological specialist should be notified immediately (**cf. NHRA (Act No. 25 of 1999), Section 36 (6)**).

It must also be clear that Archaeological Specialist Reports will be assessed by the relevant heritage resources authority (SAHRA). A permit may be required for the destruction of archaeological remains.

9 BIBLIOGRAPHY

Acocks, J.P.H. 1988. Veld types of South Africa, 3rd ed. Memoirs of the Botanical Survey of South Africa. 57: 1–146.

Beaumont, P & Morris, D. 1990. Guide to archaeological sites in the Northern Cape. McGregor Museum, Kimberley

Beaumont, P.B., 2004. Kathu Pan and Kathu Townlands/Uitkoms. In: Morris, D. & Beaumont, P.B. (Eds.), Archaeology in the Northern Cape: Some Key Sites. Southern African Association for Archaeologists Postconference Excursion, Kimberley, McGregor Museum: pp. 50–53;

Bergh, J.S. 1999. Geskiedenisatlas van Suid-Afrika: die vier noordelike provinsies. Pretoria: J.L. van Schaik

Birkholtz, P. 2011. Heritage Impact Assessment: Proposed Pering Mining Project, Located on the Farm Pering Mine 1023 HN, Reivilo, North West Province. Pretoria: PGS

Breutz, P. L. 1959. The tribes of Vryburg district. Ethnological Publications No. 46. Pretoria: Government Printer.

Curnoe, D et al. 2005. Beyond Taung: Palaeoanthropological research at Groot Kloof, Ghaap Escarpment, Northern Cape Province, South Africa. Nyame Akuma Bulletin of the Society of Africanist Archaeologists, December 2005:64

Curnoe, D et al. 2006. Discovery of Middle Pleistocene fossil and stone tool-bearing deposits at Groot Kloof, Ghaap escarpment, Northern Cape province. South African Journal of Science 102, May/June 2006

Deacon, J. 1996. Archaeology for Planners, Developers and Local Authorities. National Monuments Council. Publication no. P021E.

Deacon, J. 1997. Report: Workshop on Standards for the Assessment of Significance and Research Priorities for Contract Archaeology. In: Newsletter No 49, Sept 1998. Association for Southern African Archaeologists.

Hall, M. 1987. The Changing Past :Farmers, Kings & Traders in Southern Africa 200 – 1860 Cape Town, Johannesburg: David Philip

Hall, M. 1996. Archaeology Africa. Cape Town, Johannesburg: David Philip

Henning, B. 2013. An Environmental Report on the Ecology (flora and fauna) for the for the proposed Renewable Energy Generation Project on Portion 1 of the Farm Machorogan 106. Pretoria: AGES Gauteng (Pty)Ltd.

Dr. A J Humphreys. (2009 reproduced). A Prehistoric Frontier in the Northern Cape and the Western Orange Free State Archaeological Evidence in Interaction and Ideological Change.

- Mitchell, H. 1888. *Diamonds and Gold of South Africa*. Harvard College: Godfret Lowell Cabot Science Library.
- Morris, D & Beaumont, P. 2004. *Archaeology in the Northern Cape: some key sites*: 50–52. Kimberley: McGregor Museum.
- Morris, D. 1990a. Driekopseiland. In Beaumont, P.B. & Morris, D. (eds.) *Guide to Archaeological Sites in the Northern Cape*. Kimberley: McGregor Museum.
- Morris, D. 1990b. Klipfontein: Bushman's Fountain Rock Engraving Site. In Beaumont, P.B. & Morris, D. (eds.) *Guide to Archaeological Sites in the Northern Cape*. Kimberley: McGregor Museum.
- Morris, D. 2004. Tsantsabane: the Blinkklipkop specularite mine, and Doornfontein. In: Morris, D and Beaumont, P. *Archaeology in the Northern Cape: some key sites*. Kimberley: McGregor Museum, 54 – 60.
- Morris, D. 2005. Report on a Phase 1 Archaeological Assessment of proposed mining areas on the farms Ploegfontein, Klipbankfontein, Welgevonden, Leeuwfontein, Wolhaarkop and Kapsteviel, west of Postmasburg, Northern Cape. Unpublished Report.
- Morris, D. 2006. Archaeological and Heritage Impact Assessment at the claim of Mr M.M. Nyaba, Erf 687 near Barkly West, Northern Cape. Unpublished Report.
- Phillipson, D.W. 1985. *African Archaeology* (second edition). Cambridge: Cambridge University Press
- Renfrew, C & Bahn, P. 1991. *Archaeology: Theories, Methods and Practice USA*: Thames & Hudson
- Sharer, A.J & Ashmore, W 1979. *The Nature of Archaeological Data California*: Benjamin/Cummings Publishing
- Swanepoel, N. et al (Eds.) 2008. *Five hundred years rediscovered*. Johannesburg: Wits University Press
- Soriano, S, Villa, P & Wadley, L. 2007. Blade technology and tool forms in the Middle Stone Age of South Africa: the Howiesons Poort and post-Howiesons Poort at Rose Cottage Cave. *Journal of Archaeological Science* 34:681-703.
- Tawana Resources. 2009. *Quarterly Activities and Cash Flow Report 1 January – 31 March 2009*.
- Van der Ryst, M.M & Küsel, S. 2012. Phase 2 Report on Middle Stone Age localities on the farm Zandkopsdrift 357, Garies District, Northern Cape Province. Pretoria: Habitat Landscape Architects.
- Van Ryneveld, K., *Richard, F. Dinku, V. & Morris, D. (Mc Gregor Museum and *University of Lund, Sweden). 2004. Announcing Wildebeest Kuil 2: Salvage at a Newly Discovered Fauresmith Site. Poster Presentation – Presented at the SA3 Conference, Kimberley, Northern Cape.

Van Ryneveld, K. 2009. Phase 2 Archaeological Mitigation – Middle Stone Age sequences at excavations DKE8 and DKE13, Diamond Koppie, Vogelstruispan 101, Francis Baard District, Northern Cape, South Africa (Unpublished report to De Beers Consolidated Mines)

Van Schalkwyk. J. 2011. Heritage impact assessment for the proposed development of photovoltaic power plants on five different locations in Northwest and Northern Cape Provinces. Pretoria: NCHM

Wilkins, J. & Chazan, M. 2012. Blade production ~500 thousand years ago at Kathu Pan 1, South Africa: support for a multiple origins hypothesis for early Middle Pleistocene blade technology. Journal of Archaeological Science

Williams, G. F. 1902. The Diamond Mines of South Africa: Some Account of Their Rise and Development. New York : Macmillan company.

Human Tissue Act and Ordinance 7 of 1925, Government Gazette, Cape Town

National Resource Act No.25 of 1999, Government Gazette, Cape Town

<http://csg.dla.gov.za/index.html>

Accessed 2015-06-20

http://www.forgottenbooks.com/readbook_text/Annual_Report_1907_1000764833/147

Accessed 2015-06-20

10 ADDENDUM 1: SAHRA INTERIM COMMENT**ERF 8622 Kimberley EMP 10142****Our Ref: 9/2/049/0001**

Enquiries: Kathryn Smuts
Tel: 021 462 4502
Email: ksmuts@sahra.org.za
CaseID: 3198

Date: Monday August 12, 2013

Page No: 1

**Interim Comment****In terms of Section 38(8) of the National Heritage Resources Act (Act 25 of 1999)**Attention: Mr Craig Raymond Lubbe

PO Box 110142
Hadison Park
Kimberley
8306

Consultation in terms of section 40 of the Mineral and Petroleum Resources Development Act 2002, (Act 28 of 2002) for the approval of an environmental management plan for a mining permit on a certain piece of ERF 8622, situated in the Magisterial District of Kimberley, Northern Cape Region.

We have received notification of your application for an environmental management plan in respect of mining permit for diamonds in Kimberley by means of reprocessing the St Augustine mine dumps on Erf 8622.

In terms of the National Heritage Resources Act (NHRA), no 25 of 1999, heritage resources, including archaeological or palaeontological sites over 100 years old, graves older than 60 years, structures older than 60 years are protected. They may not be disturbed without a permit from the relevant heritage resources authority. This means that before such sites are disturbed by development it is incumbent on the developer (or mine) to ensure that a Heritage Impact Assessment is done. This must include the archaeological component (Phase 1) and any other applicable heritage components. Appropriate (Phase 2) mitigation, which involves recording, sampling and dating sites that are to be destroyed, must be done as required.

Although it is stated in section 1.3 of the EMP form that no sites of cultural/historical significance are located within the affected environment, no indication of a professional assessment is given. This is of particular concern, given the proposed refilling of the mine shaft on site. If this mine is linked to the St Augustine mine and related historical mining activities, the hole is considered a protected archaeological feature in terms of Section 35 of the National Heritage Resources Act (Act 25 of 1999). SAHRA therefore requests that a full Heritage Impact Assessment is conducted prior to any mining related activities occurring on site.

Consequently, the quickest process to follow for the archaeological component would be to contract a specialist (see www.asapa.org.za) to provide a Phase 1 Archaeological Impact Assessment Report. This must be done before any prospecting drilling, trenching or mining takes place. The Phase 1 Impact Assessment Report will identify the archaeological sites and assess their significance. It should also make recommendations (as indicated in section 38 of the NHRA) about the process to be followed. For example, there may need to be a mitigation phase (Phase 2) where the specialist will collect or excavate material and date the site. At the end of the process the heritage authority may give permission for destruction of the sites.



The South African Heritage Resources Agency

Street Address: 111 Harrington Street, Cape Town 8000 * Postal Address: PO Box 4637, Cape Town 8000
* Tel: +27 21 462 4502 * Fax: +27 21 462 4509 * Web: <http://www.sahra.org.za>

ERF 8622 Kimberley EMP 10142

Our Ref: 9/2/049/0001

Enquiries: Kathryn Smuts
Tel: 021 462 4502
Email: ksmuts@sahra.org.za
CaseID: 3198

Date: Monday August 12, 2013
Page No: 2



Where bedrock is to be affected, or where there are coastal sediments, or marine or river terraces and in potentially fossiliferous superficial deposits, a Palaeontological study must be undertaken to assess whether or not the development will impact upon palaeontological resources - or at least a letter from a Palaeontologist motivating for an exemption to indicate that this is unnecessary. If the area is deemed sensitive, a full Phase 1 Palaeontological Impact Assessment will be required and if necessary a Phase 2 rescue operation might be necessary (see www.palaeontologicalsociety.co.za).

Any other heritage resources that may be impacted such as built structures over 60 years old, sites of cultural significance associated with oral histories, burial grounds and graves, graves of victims of conflict, and cultural landscapes or viewsapes must also be assessed.

Should you have any further queries, please contact the designated official using the case number quoted above in the case header.

Yours faithfully

Kathryn Smuts
Heritage Officer: Archaeology
South African Heritage Resources Agency

Colette Scheermeyer
SAHRA Head Archaeologist
South African Heritage Resources Agency

ADMIN:

Direct URL to case: <http://www.sahra.org.za/node/126931>
(DMR, Ref: NC 30/5/1/3/2/1/10142) (DMR, Ref: NC 30/5/1/3/2/10141 MP)



The South African Heritage Resources Agency
Street Address: 111 Harrington Street, Cape Town 8000 * Postal Address: PO Box 4637, Cape Town 8000
* Tel: +27 21 462 4502 * Fax: +27 21 462 4509 * Web: <http://www.sahra.org.za>

11 ADDENDUM 2: CONVENTIONS USED TO ASSESS THE SIGNIFICANCE OF HERITAGE

11.1 Site Significance Matrix

According to the NHRA, Section 2(vi) the **significance** of heritage sites and artefacts is determined by its aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technical value in relation to the uniqueness, condition of preservation and research potential. It must be kept in mind that the various aspects are not mutually exclusive, and that the evaluation of any site is done with reference to any number of these. The following matrix is used for assessing the significance of each identified site/feature.

2. SITE EVALUATION			
2.1 Heritage Value (NHRA, section 2 [3])	High	Medium	Low
It has importance to the community or pattern of South Africa's history or pre-colonial history.			
It possesses unique, uncommon, rare or endangered aspects of South Africa's natural or cultural heritage.			
It has potential to yield information that will contribute to an understanding of South Africa's natural and cultural heritage.			
It is of importance in demonstrating the principle characteristics of a particular class of South Africa's natural or cultural places or objects.			
It has importance in exhibiting particular aesthetic characteristics valued by a particular community or cultural group.			
It has importance in demonstrating a high degree of creative or technical achievement at a particular period.			
It has marked or special association with a particular community or cultural group for social, cultural or spiritual reasons (sense of place).			
It has strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa.			
It has significance through contributing towards the promotion of a local sociocultural identity and can be developed as a tourist destination.			
It has significance relating to the history of slavery in South Africa.			
It has importance to the wider understanding of temporal changes within cultural landscapes, settlement patterns and human occupation.			
2.2 Field Register Rating			
National/Grade 1 [should be registered, retained]			
Provincial/Grade 2 [should be registered, retained]			
Local/Grade 3A [should be registered, mitigation not advised]			
Local/Grade 3B [High significance; mitigation, partly retained]			
Generally Protected A [High/Medium significance, mitigation]			
Generally protected B [Medium significance, to be recorded]			
Generally Protected C [Low significance, no further action]			
2.3 Sphere of Significance	High	Medium	Low
International			
National			
Provincial			
Local			
Specific community			

11.2 Impact Assessment Criteria

The following table provides a guideline for the rating of impacts and recommendation of management actions for sites of heritage potential.

Significance of the heritage resource

This is a statement of the nature and degree of significance of the heritage resource being affected by the activity. From a heritage management perspective it is useful to distinguish between whether the significance is embedded in the physical fabric or in associations with events or persons or in the experience of a place; i.e. its visual and non-visual qualities. This statement is a primary informant to the nature and degree of significance of an impact and thus needs to be thoroughly considered. Consideration needs to be given to the significance of a heritage resource at different scales (i.e. sitespecific, local, regional, national or international) and the relationship between the heritage resource, its setting and its associations.

Nature of the impact

This is an assessment of the nature of the impact of the activity on a heritage resource, with some indication of its positive and/or negative effect/s. It is strongly informed by the statement of resource significance. In other words, the nature of the impact may be historical, aesthetic, social, scientific, linguistic or architectural, intrinsic, associational or contextual (visual or non-visual). In many cases, the nature of the impact will include more than one value.

Extent

Here it should be indicated whether the impact will be experienced:

- On a site scale, i.e. extend only as far as the activity;
- Within the immediate context of a heritage resource;
- On a local scale, e.g. town or suburb
- On a metropolitan or regional scale; or
- On a national/international scale.

Duration

Here it should be indicated whether the lifespan of the impact will be:

- Short term, (needs to be defined in context)
- Medium term, (needs to be defined in context)
- Long term where the impact will persist indefinitely, possibly beyond the operational life of the activity, either because of natural processes or by human intervention; or
- Permanent where mitigation either by natural process or by human intervention will not occur in such a way or in such a time span that the impact can be considered transient.

Of relevance to the duration of an impact are the following considerations:

- Reversibility of the impact; and
- Renewability of the heritage resource.

Intensity

Here it should be established whether the impact should be indicated as:

- Low, where the impact affects the resource in such a way that its heritage value is not affected;
- Medium, where the affected resource is altered but its heritage value continues to exist albeit in a modified way; and
- High, where heritage value is altered to the extent that it will temporarily or permanently be damaged or destroyed.

Probability

This should describe the likelihood of the impact actually occurring indicated as:

- Improbable, where the possibility of the impact to materialize is very low either because of design or historic experience;
- Probable, where there is a distinct possibility that the impact will occur;
- Highly probable, where it is most likely that the impact will occur; or
- Definite, where the impact will definitely occur regardless of any mitigation measures

Confidence

This should relate to the level of confidence that the specialist has in establishing the nature and degree of impacts. It relates to the level and reliability of information, the nature and degree of consultation with I&AP's and the dynamic of the broader socio-political context.

- High, where the information is comprehensive and accurate, where there has been a high degree of consultation and the socio-political context is relatively stable.

- Medium, where the information is sufficient but is based mainly on secondary sources, where there has been a limited targeted consultation and socio-political context is fluid.
- Low, where the information is poor, a high degree of contestation is evident and there is a state of socio-political flux.

Impact Significance

The significance of impacts can be determined through a synthesis of the aspects produced in terms of the nature and degree of heritage significance and the nature, duration, intensity, extent, probability and confidence of impacts and can be described as:

- Low; where it would have a negligible effect on heritage and on the decision
- Medium, where it would have a moderate effect on heritage and should influence the decision.
- High, where it would have, or there would be a high risk of, a big effect on heritage. Impacts of high significance should have a major influence on the decision;
- Very high, where it would have, or there would be high risk of, an irreversible and possibly irreplaceable negative impact on heritage. Impacts of very high significance should be a central factor in decision-making.

11.3 Direct Impact Assessment Criteria

The following table provides an outline of the relationship between the significance of a heritage context, the intensity of development and the significance of heritage impacts to be expected

	TYPE OF DEVELOPMENT			
HERITAGE CONTEXT	CATEGORY A	CATEGORY B	CATEGORY C	CATEGORY D
CONTEXT 1 High heritage Value	Moderate heritage impact expected	High heritage impact expected	Very high heritage impact expected	Very high heritage impact expected
CONTEXT 2 Medium to high heritage value	Minimal heritage impact expected	Moderate heritage impact expected	High heritage impact expected	Very high heritage impact expected
CONTEXT 3 Medium to low heritage value	Little or no heritage impact expected	Minimal heritage impact expected	Moderate heritage impact expected	High heritage impact expected
CONTEXT 4 Low to no heritage value	Little or no heritage impact expected	Little or no heritage impact expected	Minimal heritage value expected	Moderate heritage impact expected
NOTE: A DEFAULT "LITTLE OR NO HERITAGE IMPACT EXPECTED" VALUE APPLIES WHERE A HERITAGE RESOURCE OCCURS OUTSIDE THE IMPACT ZONE OF THE DEVELOPMENT.				
HERITAGE CONTEXTS	CATEGORIES OF DEVELOPMENT			
<p>Context 1: Of high intrinsic, associational and contextual heritage value within a national, provincial and local context, i.e. formally declared or potential Grade 1, 2 or 3A heritage resources</p> <p>Context 2: Of moderate to high intrinsic, associational and contextual value within a local context, i.e. potential Grade 3B heritage resources.</p> <p>Context 3: Of medium to low intrinsic, associational or contextual heritage value within a national, provincial and local context, i.e. potential Grade 3C heritage resources</p> <p>Context 4: Of little or no intrinsic, associational or contextual heritage value due to disturbed, degraded conditions or extent of irreversible damage.</p>	<p>Category A: Minimal intensity development</p> <ul style="list-style-type: none"> - No rezoning involved; within existing use rights. - No subdivision involved. - Upgrading of existing infrastructure within existing envelopes - Minor internal changes to existing structures - New building footprints limited to less than 1000m2. <p>Category B: Low-key intensity development</p> <ul style="list-style-type: none"> - Spot rezoning with no change to overall zoning of a site. - Linear development less than 100m - Building footprints between 1000m2-2000m2 - Minor changes to external envelop of existing structures (less than 25%) - Minor changes in relation to bulk and height of immediately adjacent structures (less than 25%). <p>Category C: Moderate intensity development</p> <ul style="list-style-type: none"> - Rezoning of a site between 5000m2-10 000m2. 			

	<ul style="list-style-type: none"> - Linear development between 100m and 300m. - Building footprints between 2000m2 and 5000m2 - Substantial changes to external envelop of existing structures (more than 50%) - Substantial increase in bulk and height in relation to immediately adjacent buildings (more than 50%) <p>Category D: High intensity development</p> <ul style="list-style-type: none"> - Rezoning of a site in excess of 10 000m2 - Linear development in excess of 300m. - Any development changing the character of a site exceeding 5000m2 or involving the subdivision of a site into three or more erven. - Substantial increase in bulk and height in relation to immediately adjacent buildings (more than 100%)
--	--

11.4 Management and Mitigation Actions

The following table provides a guideline of relevant heritage resources management actions is vital to the conservation of heritage resources.

<p>No further action / Monitoring</p> <p>Where no heritage resources have been documented, heritage resources occur well outside the impact zone of any development or the primary context of the surroundings at a development footprint has been largely destroyed or altered, no further immediate action is required. Site monitoring during development, by an ECO or the heritage specialist are often added to this recommendation in order to ensure that no undetected heritage\ remains are destroyed.</p> <p>Avoidance</p> <p>This is appropriate where any type of development occurs within a formally protected or significant or sensitive heritage context and is likely to have a high negative impact. Mitigation is not acceptable or not possible. This measure often includes the change / alteration of development planning and therefore impact zones in order not to impact on resources.</p> <p>Mitigation</p> <p>This is appropriate where development occurs in a context of heritage significance and where the impact is such that it can be mitigated to a degree of medium to low significance, e.g. the high to medium impact of a development on an archaeological site could be mitigated through sampling/excavation of the remains. Not all negative impacts can be mitigated.</p> <p>Compensation</p> <p>Compensation is generally not an appropriate heritage management action. The main function of management actions should be to conserve the resource for the benefit of future generations. Once lost it cannot be renewed. The circumstances around the potential public or heritage benefits would need to be exceptional to warrant this type of action, especially in the case of where the impact was high.</p> <p>Rehabilitation</p> <p>Rehabilitation is considered in heritage management terms as a intervention typically involving the adding of a new heritage layer to enable a new sustainable use. It is not appropriate when the process necessitates the removal of previous historical layers, i.e. restoration of a building or place to the previous state/period. It is an appropriate heritage management action in the following cases:</p> <ul style="list-style-type: none"> - The heritage resource is degraded or in the process of degradation and would benefit from rehabilitation. - Where rehabilitation implies appropriate conservation interventions, i.e. adaptive reuse, repair and maintenance, consolidation and minimal loss of historical fabric. - Where the rehabilitation process will not result in a negative impact on the intrinsic value of the resource. <p>Enhancement</p> <p>Enhancement is appropriate where the overall heritage significance and its public appreciation value are improved. It does not imply creation of a condition that might never have occurred during the evolution of a place, e.g. the tendency to sanitize the past. This management action might result from the removal of previous layers where these layers are culturally of low significance and detract from the significance of the resource. It would be appropriate in a range of heritage contexts and applicable to a range of resources. In the case of formally protected or significant resources, appropriate enhancement action should be encouraged. Care should, however, be taken to ensure that the process does not have a negative impact on the character and context of the resource. It would thus have to be carefully monitored</p>
