

**Prepared for:**

**Adam Bennett**

**Golder Associates Africa (Pty) Ltd**

**PO Box 6001 Halfway House 1685**

**Tel 0112544970**

**Fax 0113150317**

**A PHASE I HERITAGE IMPACT ASSESSMENT STUDY FOR  
ANGLOGOLD ASHANTI (PTY) LIMITED'S PROPOSED  
SURFACE PIPELINE AND ASSOCIATED INFRASTRUCTURE  
NEAR CARLTONVILLE IN THE GAUTENG PROVINCE**

**Prepared by:**

**Dr Julius CC Pistorius**

**Archaeologist and Heritage Consultant**

**8 5<sup>th</sup> Avenue**

**Cashan x1 Rustenburg 0299**

**Cell 0825545449**

**June 2019**

**Member ASAPA**

## **ACRONYMS AND ABBREVIATIONS**

AIA Archaeological Impact Assessment

ASAPA Association of South African Professional Archaeologists

CRM Cultural Resource Management

EAP Environmental Assessment Practitioner

ECO Environmental Control Officer

EIA Environmental Impact Assessment

EMP Environmental Management Plan

EPS Environmental Performance Standards

EIA Early Iron Age

ESA Early Stone Age

GPS Global Positioning System

HIA Heritage Impact Assessment

IEM Integrated Environmental Management

I & Aps Interested and Affected Parties

LIA Late Iron Age

LSA Late Stone Age

MIA Middle Iron Age

MPRDA Mineral and Petroleum Resources Development Act No. 28 of 2002

MSA Middle Stone Age

NEMA National Environmental Management Act No. 107 of 1998

NEMBA National Environmental Management: Biodiversity Act No. 10 of 2004

NEMAQA National Environmental Management: Air Quality Act No. 39 of 2004

NEMWA National Environmental Management: Waste Act No 59 of 2008

NHRA National Heritage Resources Act No. 25 of 1999

NWA National Water Act No. 36 of 1998

OSHA Occupational Health and Safety Act No. 85 of 1993

PHRA Provincial Heritage Resource Agency

RSA Republic of South Africa

SAHRA South African Heritage Resources Agency

SAHRIS

ToR Terms of Reference

## TERMINOLOGY

Terms that may be used in this report are briefly outlined below:

- **Conservation:** The act of maintaining all or part of a resource (whether renewable or non-renewable) in its present condition in order to provide for its continued or future use. Conservation includes sustainable use, protection, maintenance, rehabilitation, restoration and enhancement of the natural and cultural environment.
- **Cultural resource management:** A process that consists of a range of interventions and provides a framework for informed and value-based decision-making. It integrates professional, technical and administrative functions and interventions that impact on cultural resources. Activities include planning, policy development, monitoring and assessment, auditing, implementation, maintenance, communication, and many others. All these activities are (or will be) based on sound research.
- **Cultural resources:** A broad, generic term covering any physical, natural and spiritual properties and features adapted, used and created by humans in the past and present. Cultural resources are the result of continuing human cultural activity and embody a range of community values and meanings. These resources are non-renewable and finite. Cultural resources include traditional systems of cultural practice, belief or social interaction. They can be, but are not necessarily identified with defined locations.
- **Heritage resources:** The various natural and cultural assets that collectively form the heritage. These assets are also known as cultural and natural resources. Heritage resources (cultural resources) include all human-made phenomena and intangible products that are the result of the human mind. Natural, technological or industrial features may also be part of heritage resources, as places that have made an outstanding contribution to the cultures, traditions and lifestyles of the people or groups of people of South Africa.
- **In-Situ Conservation:** The conservation and maintenance of ecosystems, natural habitats and cultural resources in their natural and original surroundings.

- Iron Age: Refers to the last two millennia and 'Early Iron Age' to the first thousand years AD. 'Late Iron Age' refers to the period between the 16<sup>th</sup> century and the 19<sup>th</sup> century and can therefore include the Historical Period.
- Phase I studies refer to surveys using various sources of data in order to establish the presence of all possible types and ranges of heritage resources in any given Project Area (excluding paleontological remains as these studies are done by registered and accredited palaeontologists).
- Phase II studies include in-depth cultural heritage studies such as archaeological mapping, excavating and sometimes laboratory work. Phase II work may include the documenting of rock art, engraving or historical sites and dwellings; the sampling of archaeological sites or shipwrecks; extended excavations of archaeological sites; the exhumation of human remains and the relocation of graveyards, etc. Phase II work involves permitting processes, requires the input of different specialists and the co-operation and approval of the SAHRA.
- Pre-historical: Refers to the time before any historical documents were written or any written language developed in a particular area or region of the world. The historical period and historical remains refer, for the Project Area, to the first appearance or use of 'modern' Western writing brought to the Eastern Highveld by the first Colonists who settled here from the 1840's onwards.
- Preservation: Conservation activities that consolidate and maintain the existing form, material and integrity of a cultural resource.
- Project Area: refers to the area (footprint) where the developer wants to focus its development activities.
- Protected area: A geographically defined area designated and managed to achieve specific conservation objectives. Protected areas are dedicated primarily to the protection and enjoyment of natural or cultural heritage, to the maintenance of biodiversity, and to the maintenance of life-support systems. Various types of protected areas occur in South Africa.

- Recent past: Refers to the 20<sup>th</sup> century. Remains from this period are not necessarily older than sixty years and therefore may not qualify as archaeological or historical remains. Some of these remains, however, may be close to sixty years of age and may, in the near future, qualify as heritage resources.
- Reconstruction: Re-erecting a structure on its original site using original components.
- Replication: The act or process of reproducing by new construction the exact form and detail of a vanished building, structure, object, or a part thereof, as it appeared at a specific period.
- Restoration: Returning the existing fabric of a place to a known earlier state by removing additions or by reassembling existing components.
- Stone Age: Refers to the prehistoric past, although Late Stone Age people lived in South Africa well into the Historical Period. The Stone Age is divided into an Earlier Stone Age (3 million years to 150 000 thousand years ago) the Middle Stone Age (150 000 years to 40 000 years ago) and the Late Stone Age (40 000 years to 200 years ago).
- Sustainability: The ability of an activity to continue indefinitely, at current and projected levels, without depleting social, financial, physical and other resources required to produce the expected benefits.
- Translocation: Dismantling a structure and re-erecting it on a new site using original components.

## EXECUTIVE SUMMARY

A Phase I Heritage Impact Assessment (HIA) study as required in terms of Section 38 of the National Heritage Resources Act (No. 25 of 1999) was done for AngloGold Ashanti (Pty) Limited's proposed surface pipeline and associated infrastructure near Carltonville in the Gauteng Province. The proposed surface pipeline and associated infrastructure project is hereafter referred to as the Project and the area to be affected as the project area.

The aims with the Phase I HIA study were the following:

- To establish whether any of the types and ranges of heritage resources as outlined in Section 38 of the National Heritage Resources Act (No. 25 of 1999) do occur in the project area, and if so.
- To establish the significance of the heritage resources in the project area and the level of significance of any possible impact on any of these heritage resources.
- To propose mitigation measures for those types and ranges of heritage resources that may be affected by the proposed Project.

The Phase I HIA study for the proposed Project did not reveal the presence of any of the types and ranges of heritage resources as outlined in Section 3 of the National Heritage Resources Act (No. 25 of 1999) in the Project Area. Construction, operational, decommissioning and cumulative impacts of the proposed project were assessed as low before and after mitigation. There is consequently no reason from a heritage point of view why the proposed Project cannot proceed if the chance find procures outlined in the report are followed.

### General: disclaimer

It is possible that this Phase I HIA study may have missed heritage resources in a strip along the pipeline corridor which is covered with blue gum and wattle trees and with thick clumps of vegetation along the southern part of the proposed new pipeline corridor. These areas could not be physically examined as a result of unsafe conditions caused by illegal miners (zama zama's). It is also possible that heritage resources may also occur below the surface of the earth and may only be exposed once development commences. Heritage resources may also have been missed as a result of human failure to recognise them.

If any heritage resources of significance are exposed during the Project the South African Heritage Resources Authority (SAHRA) should be notified immediately, all activities must be stopped and an archaeologist accredited with the Association for Southern African

Professional Archaeologist (ASAPA) should be notified in order to determine appropriate mitigation measures for the discovered finds. The Chance Find Procedure as outlined in the report should be followed. This may include obtaining the necessary authorisation (permits) from SAHRA to conduct the mitigation measures.

## CONTENTS

<b>Acronyms and abbreviations</b>	<b>2</b>
<b>Terminology</b>	<b>3</b>
<b>Executive summary</b>	<b>6</b>
<b>1 INTRODUCTION</b>	<b>10</b>
1.1 Background and context	10
1.2 Aims with the report	10
1.3 Assumptions and limitations	11
<b>2 DETAILS OF THE SPECIALIST</b>	<b>13</b>
<b>3 DECLARATION OF INDEPENDENCE</b>	<b>14</b>
<b>4 LEGAL FRAMEWORK</b>	<b>15</b>
4.1 Legislation relevant to heritage resources	15
4.1.1 NEMA	17
4.1.2 MPRDA	17
4.1.3 NHRA	17
4.1.3.1 Heritage Impact Assessment studies	17
4.1.3.2 Section 34 (Buildings and structures)	18
4.1.3.3 Section 35 (Archaeological and palaeontological resources and meteorites)	18
4.1.3.4 Section 36 (Burial grounds and graves)	19
4.1.3.5 Section 37 (Public monuments and memorials)	20
4.1.3.6 Section 38 (HRM)	21
4.4.4 NEMA Appendix 6 requirements	21
<b>5 THE PROPOSED ASHANTI GOLD PIPELINE PROJECT</b>	<b>24</b>
5.1 Location	24
5.2 The nature of the Project	24
5.3 The heritage character of the Project Area	26
<b>6 CONTEXTUALISING THE STUDY AREA</b>	<b>27</b>
6.1 Prehistory and early history	27
6.2 Brief historical background to towns close to the project area	28
6.2.1 Krugersdorp and Randfontein	29
6.2.2 Soweto	30
6.2.3 Westonaria and Carltonville	31



6.3	Gold mining history	32
<b>7</b>	<b>APPROACH AND METHODOLOGY</b>	<b>34</b>
7.1	Field survey	35
7.2	Databases, literature survey and maps	35
7.3	Spokespersons consulted	35
7.4	Consultation process undertaken and comments received from stakeholders	36
7.5	Significance rating	36
<b>8</b>	<b>THE PHASE I HERITAGE SURVEY AND ASSESSMENT</b>	<b>38</b>
8.1	The field survey	38
8.2	Impact assessment	41
8.2	Summary	41
<b>9</b>	<b>MITIGATING POSSIBLE HERITAGE RESOURCES</b>	<b>43</b>
9.1	Chance-find procedures	43
9.1.1	Chance-find procedures for heritage resources	43
9.1.2	Chance-Find Procedures for burials and graves	44
<b>10</b>	<b>CONCLUSION AND RECOMMENDATIONS</b>	<b>45</b>
<b>11</b>	<b>SELECT BIBLIOGRAPHY</b>	<b>46</b>
<b>12</b>	<b>BIBLIOGRAPHY RELATING TO EARLIER HERITAGE STUDIES</b>	<b>48</b>
<b>13</b>	<b>SPOKESPERSONS CONSULTED</b>	<b>49</b>

# **1 INTRODUCTION**

## **1.1 Background and context**

The AGA operations in the West Wits mining lease area are at risk of flooding due to ingress of fissure water from surrounding mining operations. About 24Mℓ/day of fissure water flows into the underground workings of the defunct Blyvooruitzicht Mine (BLV), which spans a strike of 6km along the boundary with AGA. If dewatering at the Blyvooruitzicht #4 and #6 (BLV #4 & #6) shafts were to cease, fissure water would report to the AGA operations in about 13 days, which would pose a serious risk to the health and safety of AGA personnel and the mining operations.

After the liquidation of the Blyvooruitzicht (BLV) Mine in 2013, AGA established a wholly owned subsidiary, the Covalent Water Company (CWC), to manage the BLV Mine water and the impacts thereof on the West Wits operations. AGA/CWC has a 25-year lease to maintain water management infrastructure at the BLV shafts #4 and #6. Prior to September 2016, CWC abstracted 20Mℓ/d of relatively good quality water from BLV shafts #4 and #6 and discharged it into the Wonderfontein Spruit under a directive. About 5Mℓ/d of Acid Mine Drainage (AMD) water containing elevated levels of heavy metals and salts has been accumulating in the lower, mined out areas of BLV shaft #5 (BLV #5). Pumping was initiated at the Savuka mine when this water reached a critical level. Savuka mine pumps the BLV #5 water from 81 level to surface, where it is used as make-up water in the Savuka plant circuit. In terms of the current Life of Mine (LoM) for the Savuka plant, this source of make-up water will be required for the next 10 years.

The proposed Project thus aims to construct a surface mounted pipeline and associated infrastructure to pump water from BLV #4 to the North Boundary Dam (NBD) (Figures 1 & 2).

## **1.2 Aims with the report**

This study comprises a heritage survey and a heritage impact assessment study according to Section 38 of the National Heritage Resources Act (No 25 of 1999) for AngloGold Ashanti (Pty) Limited's proposed surface pipeline and associated

infrastructure near Carltonville in the Gauteng Province. The aims with the heritage survey and impact assessment were the following:

- To establish whether any of the types and ranges of heritage resources as outlined in Section 38 of the National Heritage Resources Act (No 25 of 1999) do occur in the project area, and if so.
- To establish the significance of the heritage resources in the project area and the level of significance of any possible impact on any of these heritage resources.
- To propose mitigation measures for those types and ranges of heritage resources that may be affected by the proposed Project.

### **1.3 Assumptions and limitations**

The findings, observations, conclusions and recommendations reached in this report are based on the author's best scientific and professional knowledge, available information and the limitations which illegal mining activities and associated safety circumstances imposed on the heritage survey. The report's findings therefore are not fully based on accepted archaeological survey and assessment techniques and methodologies.

The author has a good understanding of the types and ranges of heritage resources that occur in and near the project area as was involved with several heritage impact assessment studies in the area during the last fifteen years (see Part 12, 'Bibliography relating to earlier heritage studies').

The GPS track log merely outlines the route which was travelled with an armoured Caspir vehicle along the proposed pipeline corridor.

The author reserves the right to modify aspects of the report including the recommendations if and when new information becomes available particularly if this information may have an influence on the reports final results and recommendations.

It is possible that this Phase I HIA study may have missed heritage resources in a strip along the pipeline corridor which is covered with Blue Gum and wattle trees and with thick clumps of vegetation along the southern part of the proposed new pipeline

corridor. These areas could not be physically examined as a result of unsafe conditions caused by illegal miners (zama zama's). It is also possible that heritage resources may also occur below the surface of the earth and may only be exposed once development commences. Heritage resources may also have been missed as a result of human failure to recognise them.

If any heritage resources of significance are exposed during the Ashanti Project the South African Heritage Resources Authority (SAHRA) should be notified immediately, all activities must be stopped and an archaeologist accredited with the Association for Southern African Professional Archaeologist (ASAPA) should be notified in order to determine appropriate mitigation measures for the discovered finds. The Chance Find Procedure as outlined in the report should be followed. This may include obtaining the necessary authorisation (permits) from SAHRA to conduct the mitigation measures.

## 2 DETAILS OF THE SPECIALIST

**Profession:** Archaeologist, Museologist (Museum Scientists), Lecturer, Heritage Guide Trainer and Heritage Consultant

**Qualifications:**

BA (Archaeology, Anthropology and Psychology) (UP, 1976)

BA (Hons) Archaeology (distinction) (UP, 1979)

MA Archaeology (distinction) (UP, 1985)

D Phil Archaeology (UP, 1989)

Post Graduate Diploma in Museology (Museum Sciences) (UP, 1981)

**Work experience:**

Museum curator and archaeologist for the Rustenburg and Phalaborwa Town Councils (1980-1984)

Head of the Department of Archaeology, National Cultural History Museum in Pretoria (1988-1989)

Lecturer and Senior lecturer Department of Anthropology and Archaeology, University of Pretoria (1990-2003)

Independent Archaeologist and Heritage Consultant (2003-)

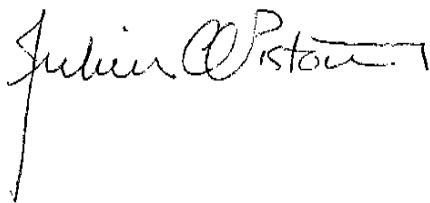
**Accreditation:** Member of the Association for Southern African Professional Archaeologists. (ASAPA)

**Summary:** Julius Pistorius is a qualified archaeologist and heritage specialist with extensive experience as a university lecturer, museum scientist, researcher and heritage consultant. His research focussed on the Late Iron Age Tswana and Lowveld-Sotho (particularly the Bamalatji of Phalaborwa). He has published a book on early Tswana settlement in the North-West Province and has completed an unpublished manuscript on the rise of Bamalatji metal workings spheres in Phalaborwa during the last 1 200 years. He has excavated more than twenty LIA settlements in North-West and twelve IA settlements in the Lowveld and has mapped hundreds of stone walled sites in the North-West. He has written a guide for Eskom's field personnel on heritage management. He has published twenty scientific papers in academic journals and several popular articles on archaeology and heritage matters. He collaborated with environmental companies in compiling State of the Environmental Reports for Ekurhuleni, Hartebeespoort and heritage management plans for the Magaliesberg and Waterberg. Since acting as an independent consultant he has done approximately 800 large to small heritage impact assessment reports. He has a longstanding working relationship with Eskom, Rio Tinto (PMC), Rio Tinto (EXP), Impala Platinum, Angloplats (Rustenburg), Lonmin, Sasol, PMC, Foskor, Kudu and Kelgran Granite, Bafokeng Royal Resources, Pilanesberg Platinum Mine (PPM) etc. as well as with several environmental companies.

### 3 DECLARATION OF INDEPENDENCE

I, Dr Julius CC Pistorius declare the following:

- I act as an independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even, if this result in views and findings that are not favourable for the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialists report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the applications;
- I will comply with the Act, Regulations and other applicable legislation;
- I will consider, to the extent possible, the matters listed in Regulation 13;
- I understand to disclose to the applicant and the competent authority all material information in my possession
- All the particulars furnished by me in this form are true and correct 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; and
- I realise that a false declaration is offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.



**12 June 2019**

## **4 LEGAL FRAMEWORK**

South Africa's heritage resources ('national estate') are protected by international, national, provincial and local legislation which provides regulations, policies and guidelines for the protection, management, promotion and utilization of heritage resources. South Africa's 'national estate' includes a wide range of various types of heritage resources as outlined in Section 3 of the National Heritage Resources Act (NHRA, Act No. 25 of 1999) (see Box 1).

At a national level heritage resources are dealt with by the National Heritage Council Act (Act No. 11 of 1999) and the National Heritage Resources Act (NHRA, Act No. 25 of 1999). According to the NHRA (Act No. 25 of 1999) heritage resources are categorized using a three-tier system, namely Grade I (national), Grade II (provincial) and Grade III (local) heritage resources.

At the provincial level, heritage legislation is implemented by Provincial Heritage Resources Agencies (PHRA's) which apply the National Heritage Resources Act (Act No. 25 of 1999) together with provincial government guidelines and strategic frameworks. Metropolitan or Municipal (local) policy regarding the protection of cultural heritage resources is also linked to national and provincial acts and is implemented by the South African Heritage Resources Agency (SAHRA) and the Provincial Heritage Resources Agencies (PHRA's).

### **4.1 Legislation relevant to heritage resources**

Legislation relevant to South Africa's national estate includes the following:

- National Environmental Management Act (NEMA) Act No. 107 of 1998
- Minerals and Petroleum Resources Development Act (MPRDA) Act No. 28 of 2002
- National Heritage Resources Act (NHRA) Act No. 25 of 1999
- Development Facilitation Act (DFA) Act No. 67 of 1995

**Box 1: Types and ranges of heritage resources (the national estate) as outlined in Section 3 of the National Heritage Resources Act, 1999 (No. 25 of 1999).**

The National Heritage Resources Act (Act No. 25 of 1999, Art 3) outlines the following types and ranges of heritage resources that qualify as part of the National Estate, namely:

- (a) places, buildings structures and equipment of cultural significance;
- (b) places to which oral traditions are attached or which are associated with living heritage;
- (c) historical settlements and townscapes;
- (d) landscapes and natural features of cultural significance;
- (e) geological sites of scientific or cultural importance;
- (f) archaeological and palaeontological sites;
- (g) graves and burial grounds including-
  - (i) ancestral graves;
  - (ii) royal graves and graves of traditional leaders;
  - (iii) graves of victims of conflict;(iv) graves of individuals designated by the Minister by notice in the Gazette;
  - (v) historical graves and cemeteries; and
  - (vi) other human remains which are not covered by in terms of the Human Tissues Act, 1983 (Act No. 65 of 1983);
- (h) sites of significance relating to the history of slavery in South Africa;
- (i) movable objects, including -
  - (i) objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens;
  - (ii) objects to which oral traditions are attached or which are associated with living heritage;
  - (iii) ethnographic art and objects;
  - (iv) military objects;
  - (v) objects of decorative or fine art;
  - (vi) objects of scientific or technological interest; and
  - (vii) books, records, documents, photographs, positives and negatives, graphic, film or video material or sound recordings, excluding those that are public records as defined in section 1(xiv) of the National Archives of South Africa Act, 1996 (Act No. 43 of 1996).

The National Heritage Resources Act (Act No. 25 of 1999, Art 3) also distinguishes nine criteria for places and objects to qualify as 'part of the national estate if they have cultural significance or other special value ...'. These criteria are the following:

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



### **4.1.1 NEMA**

The NEMA stipulates under Section 2(4)(a) that sustainable development requires the consideration of all relevant factors including (iii) the disturbance of landscapes and sites that constitute the nation's cultural heritage must be avoided, or where it cannot be altogether avoided, is minimised and remedied. Heritage assessments are implemented in terms of the NEMA Section 24 in order to give effect to the general objectives. Procedures considering heritage resource management in terms of the NEMA are summarised under Section 24(4) as amended in 2008. In addition to the NEMA, the National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003) (NEMPA) may also be applicable. This act applies to protected areas and world heritage sites, declared as such in terms of the World Heritage Convention Act, 1999 (Act No. 49 of 1999) (WHCA).

### **4.1.2 MPRDA**

The MPRDA stipulates under Section 5(4) no person may prospect for or remove, mine, conduct technical co-operation operations, reconnaissance operations, explore for and produce any mineral or petroleum or commence with any work incidental thereto on any area without (a) an approved environmental management programme or approved environmental management plan, as the case may be.

### **4.1.3 NHRA**

According to Section 3 of the NHRA (Act No. 25 of 1999) the 'national estate' comprises a wide range and various types of heritage resources (see Box 1).

#### **4.1.3.1 Heritage Impact Assessment studies**

According to Section 38 of the National Heritage Resources Act (Act No. 25 of 1999) a Heritage Impact Assessment (HIA) process must be followed under the following circumstances:

- The construction of a linear development (road, wall, power line, canal etc.) exceeding 300m in length
- The construction of a bridge or similar structure exceeding 50m in length

- Any development or activity that will change the character of a site and which exceeds 5 000m<sup>2</sup> or which involve three or more existing erven or subdivisions thereof
- Re-zoning of a site exceeding 10 000 m<sup>2</sup>
- Any other category provided for in the regulations of SAHRA, a provincial or local heritage authority or any other legislation such as NEMA, MPRDA, etc.

#### **4.1.3.2 Section 34 (Buildings and structures)**

Section 34 of the NHRA provides for general protection of structures older than 60 years. According to Section 34(1) no person may alter (demolish) any structure or part thereof which is older than 60 years without a permit issued by the relevant provincial heritage resources authority.

A structure means any building, works, device or any other facility made by people and which is fixed to land and which includes fixtures, fittings and equipment associated with such structures.

Alter means any action which affects the structure, appearance or physical properties of a place or object, whether by way of structural or any other works such as painting, plastering, decorating, etc.

Most importantly, Section 34(1) clearly states that no structure or part thereof may be altered or demolished without a permit issued by the relevant Provincial Heritage Resources Authority (PHRA). These permits will not be granted without a HIA being completed. A destruction permit will thus be required before any removal and/or demolition may take place, unless exempted by the PHRA according to Section 34(2) of the NHRA.

#### **4.1.3.3 Section 35 (Archaeological and palaeontological resources and meteorites)**

Section 35 of the NHRA provides for the general protection of archaeological and palaeontological resources, and meteorites. In the event that archaeological resources are discovered during the course of development, Section 38(3)

specifically requires that the discovery must immediately be reported to the PHRA, or local authority or museum who must notify the PHRA. Furthermore, no person may without permits issued by the responsible heritage resources authority may:

- destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or paleontological site or any meteorite
- destroy, damage, excavate, remove from its original position, collect or own any archaeological or paleontological material or object or any meteorite
- trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or paleontological material or object, or any meteorite; or bring onto or use at an archaeological or paleontological site any excavation equipment or any equipment that assists in the detection or recovery of metals or archaeological and paleontological material or objects, or use such equipment for the recovery of meteorites
- alter or demolish any structure or part of a structure which is older than 60 years.

Heritage resources may only be disturbed or moved by an archaeologist after being issued with a permit received from the South African Heritage Resources Agency (SAHRA). In order to demolish heritage resources the developer has to acquire a destruction permit by from SAHRA.

#### **4.1.3.4 Section 36 (Burial grounds and graves)**

Section 36 of the NHRA allows for the general protection of burial grounds and graves. Should burial grounds or graves be found during the course of development, Section 36(6) stipulates that such activities must immediately cease and the discovery reported to the responsible heritage resources authority and the South African Police Service (SAPS). Section 36 also stipulates that no person without a permit issued by the relevant heritage resources authority may:

- 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 or 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; or

- c) bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) any excavation, or any equipment which assists in the detection or recovery of metals.

Section 36 of the NHRA divides graves and burial grounds into the following categories:

- a. ancestral graves
- b. royal graves and graves of traditional leaders
- c. graves of victims of conflict
- d. graves designated by the Minister
- e. historical graves and cemeteries
- f. human remains

Human remains less than 60 years old are subject to provisions of the National Health Act, 2003 (Act No. 61 of 2003), Ordinance 12 of 1980 (Exhumation Ordinance) and Ordinance No. 7 of 1925 (Graves and dead bodies Ordinance, repealed by Mpumalanga). Municipal bylaws with regard to graves and graveyards may differ. Professionals involved with the exhumation and relocation of graves and graveyards must establish whether such bylaws exist and must adhere to these laws.

Unidentified graves are handled as if they are older than 60 years until proven otherwise.

Permission for the exhumation and relocation of graves older than sixty years must also be gained from descendants of the deceased (where known), the National Department of Health, Provincial Department of Health, Premier of the Province and local police. Furthermore, permission must also be gained from the various landowners (i.e. where the graves are located and where they are to be relocated) before exhumation can take place.

Human remains can only be handled by a registered undertaker or an institution declared under the Human Tissues Act (Act No. 65 of 1983 as amended).

#### 4.1.3.5 Section 37 (Public monuments and memorials)

Section 37 makes provision for the protection of all public monuments and memorials in the same manner as places which are entered in a heritage register referred to in Section 30 of the NHRA.

#### 4.1.3.6 Section 38 (HRM)

Section 38 (8): The provisions of this section do not apply to a development as described in Section 38 (1) if an evaluation of the impact of such development on heritage resources is required in terms of the Environment Conservation Act, 1989 (Act No. 73 of 1989), or the integrated environmental management guidelines issued by the Department of Environment Affairs and Tourism, or the Minerals Act, 1991 (Act No. 50 of 1991), or any other legislation. Section 38(8) ensures cooperative governance between all responsible authorities through ensuring that the evaluation fulfils the requirements of the relevant heritage resources authority in terms of Subsection (3), and any comments and recommendations of the relevant heritage resources authority with regard to such development have been taken into account prior to the granting of the consent.

The Listed Activities in terms of the Government Notice Regulations (GNRs) stipulated under NEMA for which Environmental Authorisation (EA) will be applied for will trigger a HIA as contemplated in Section 38(1) above as follows:

#### 4.4.4 NEMA Appendix 6 requirements

<b>NEMA Regulations (2014) - Appendix 6</b>	<b>Relevant section in report</b>
Details of the specialist who prepared the report	Dr Julius CC Pistorius
The expertise of that person to compile a specialist report including a curriculum vitae	Part 2. Details of the specialist
A declaration that the person is independent in a form as may be specified by the competent authority	Part 3. Declaration of independence

An indication of the scope of, and the purpose for which, the report was prepared	Part 1. Introduction
The date and season of the site investigation and the relevance of the season to the outcome of the assessment	Part 7. Approach and Methodology Part 8.1. Field survey
A description of the methodology adopted in preparing the report or carrying out the specialised process	Part 7. Approach and Methodology
The specific identified sensitivity of the site related to the activity and its associated structures and infrastructure	Part 8.1 The field survey
An identification of any areas to be avoided, including buffers	Part 8.2 Summary
A map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;	Figures 1, 2 & 5
A description of any assumptions made and any uncertainties or gaps in knowledge;	Part 1.3. Assumptions and limitations
A description of the findings and potential implications of such findings on the impact of the proposed activity, including identified alternatives, on the environment	Part 8.2 Summary Part 9. Conclusion and recommendations
Any mitigation measures for inclusion in the EMPr	Part 8.2. Summary Part 9. Conclusion and recommendations
Any conditions for inclusion in the environmental authorisation	Part 9. Conclusion and recommendations
Any monitoring requirements for inclusion in the EMPr or environmental authorisation	Part 9. Conclusion and recommendations
A reasoned opinion as to whether the proposed activity or portions thereof should	Part 9. Conclusion and recommendations

be authorised and	
If the opinion is that the proposed activity or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan	Part 9. Conclusion and recommendations
A description of any consultation process that was undertaken during the course of carrying out the study	Part 7.4 Consultation process undertaken and comments received from stakeholders
A summary and copies if any comments that were received during any consultation process	Part 7.4 Consultation process undertaken and comments received from stakeholders
Any other information requested by the competent authority.	None

## **5 THE PROPOSED PIPELINE PROJECT**

### **5.1 Location**

AngloGold Ashanti (Pty) Limited's proposed water pipeline and associated infrastructure is located approximately 80 km west of Johannesburg. The pipeline originates in the greater West Wits mining lease areas approximately 3.3 km south east of Carletonville and ends at the NBD approximately 6km south-south-west of Carletonville in Blyvooruitzicht, Merafong City Local Municipality, West Rand District Municipality in the Gauteng Province of South Africa (Figures 1).

### **5.2 The nature of the Project**

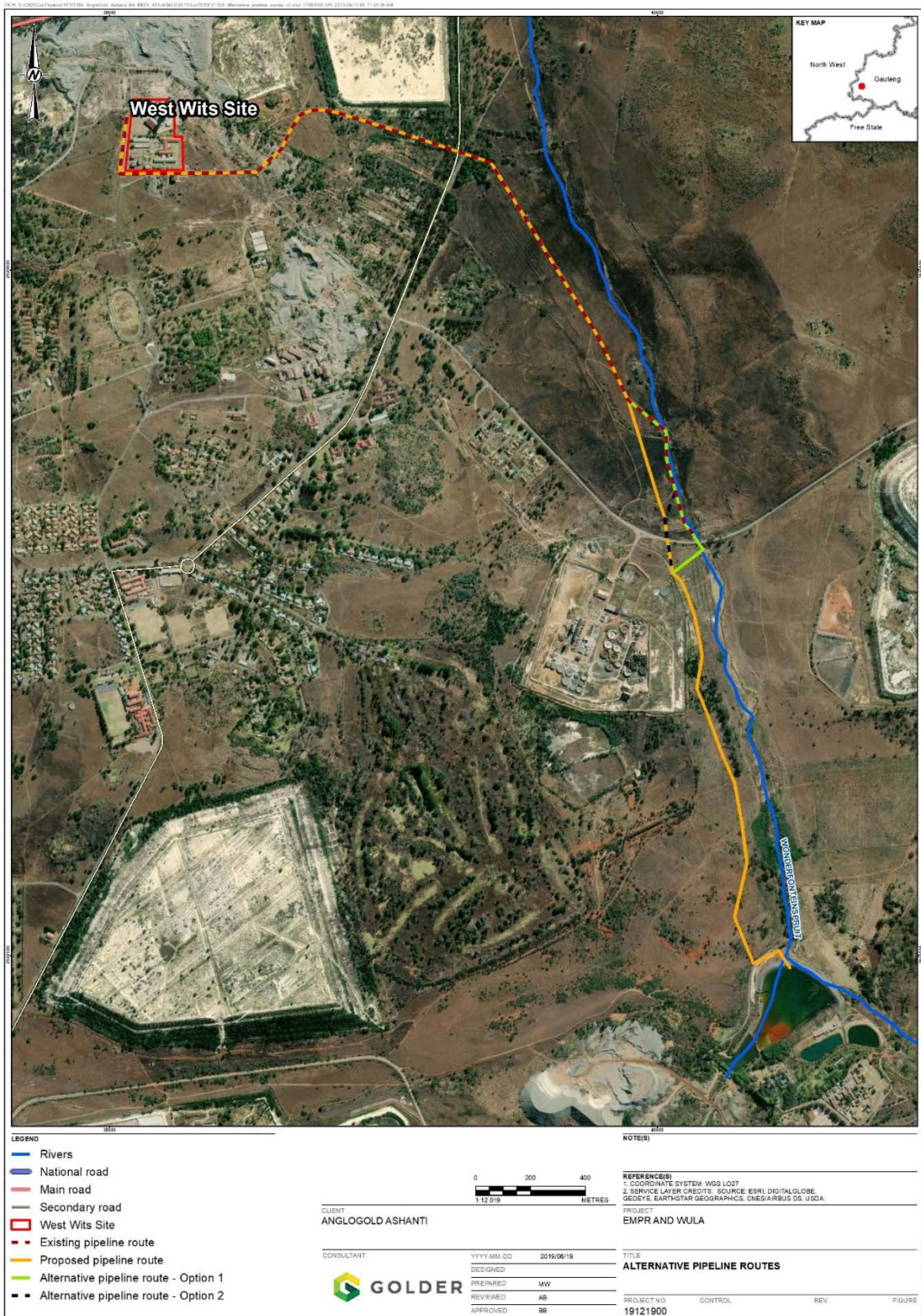
The proposed Project therefore aims to construct a surface mounted pipeline and associated infrastructure to pump water from BLV #4 to the North Boundary Dam (NBD) (Figure 1). Two alternative pipeline routes are also considered. The proposed and alternative pipeline alternative routes are illustrated in Figure1.

The northern sections of the proposed Project pipeline (i.e. north of the road bisecting the site) will be installed within the existing pipeline servitude by means of supporting the pipeline on top of the existing pipeline thus avoiding disturbance to soil or vegetation. The southern section of the pipeline will be situated within a newly registered servitude and the pipeline will be supported on 600mm X 300mm pre-cast concrete plinths spaced 9m apart (Figure 1).

No construction camp will be required. Pipes and construction equipment will either be stored on site at Covalent No.4 shaft or the AGA Mine Service yard. Simple earth cattle ramps will be installed along the route to facilitate crossing of the pipeline by any grazing animals and/or persons on foot.

For further information on the project description, please refer to the Golder Associates Basic Assessment report.





**Figure 1- AngloGold Ashanti (Pty) Limited’s proposed surface pipeline with alternative routings and associated infrastructure near Carltonville in the Gauteng Province.**

### **5.3 The heritage character of the Project Area**

The project area is part of a mining landscape which is the result of gold mining activities over a long period of time. Consequently, the area cannot be described as pristine any longer. However, heritage resources still do occur and these primarily include:

- Mine landscapes where mine infrastructure older than sixty years still occurs.
- Townscapes which comprise whole suburbs of Randfontein and other towns on the West Rand which are older than sixty years.
- Graveyards and graves dating from the nineteenth century to the recent past.

Several heritage impact assessment studies have been done in the larger project area some of whom are located in close proximity of the project area (see Part 12, 'Bibliography relating to earlier heritage studies').

## **6 CONTEXTUALISING THE PROJECT AREA**

The following is a brief outline of the pre-historical and historical background of the project area with the aim to contextualise any possible heritage resources that may be found in or near the proposed pipeline corridor.

### **6.1 Prehistory and early history**

According to archaeological research, the earliest ancestors of modern humans emerged some two to three million years ago. The remains of Australopithecine and Homo habilis have been found in dolomite caves and underground dwellings in places such as Sterkfontein and Swartkrans near Krugersdorp. Homo habilis, one of the Early Stone Age hominids, is associated with Oldowan artefacts, which include crude implements manufactured from large pebbles.

The Acheulian industrial complex replaced the Oldowan industrial complex during the Early Stone Age. This phase of human existence was widely distributed across South Africa and is associated with Homo Erectus, who manufactured hand axes and cleavers from as early as one and a half million years ago. Oldowan and Acheulian artefacts were also found four to five decades ago in some of the older gravels (ancient river beds and terraces) of the Vaal River and the Klip River in Vereeniging. The earliest ancestors of modern man may therefore have roamed the Vaal valley at the same time that their contemporaries occupied some of the dolomite caves near Krugersdorp.

Middle Stone Age sites dating from as early as two hundred thousand years ago have been found all over South Africa. Middle Stone Age hunter-gatherer bands also lived and hunted in the Orange and Vaal River valleys. These people, who probably looked like modern humans, occupied campsites near water but also used caves as dwellings. They manufactured a wide range of stone tools, including blades and points that may have had long wooden sticks as hafts and were used as spears.

The Late Stone Age commenced twenty thousand years ago or somewhat earlier. The various types of Stone Age industries scattered across the country are associated with

the historical San and Khoi-Khoi people. The San were renowned as formidable hunter-gatherers, while the Khoi-Khoi herded cattle and small stock during the last two thousand years. Late Stone Age people manufactured tools that were small but highly effective, such as arrow heads and knives.

The Late Iron Age people were also known for their rock art skills. Two rock arts sites closest to the project area are Redan near Vereeniging and Bosworth near Klerksdorp.

Early Iron Age farming communities practised a mixed economy, consisting of plant cultivation and stock herding, in the interior of South Africa during the first half of the first millennium A.D. These Bantu-Negroid people, who interbred with the local San and Khoi-Khoi, were ironworkers of some repute and they established the first permanent villages south of the Limpopo River. These communities occupied the savannah of the Limpopo Province as well as the Eastern Lowveld and coastal regions of South Africa. No traces of their existence have as yet been found on the Highveld.

During the Late Iron Age, farming was practised in the northern, central and eastern parts of the country. These farming communities built numerous stone walled settlements throughout the southern Highveld of the Orange Free State, on the Witwatersrand and numerous other places in South Africa from the 17<sup>th</sup> century onwards. These sites are associated with the predecessors of the black ethnic groups living in South Africa. Some of these sites are also situated near the Vaal valley, but eastwards of Vereeniging and outside the Vaal Triangle. Stone walled sites are also spread out along the range of hills running from Randfontein in the west through Johannesburg to Heidelberg in the east. These sites are associated with the ancestors of the Sotho-Tswana peoples.

## **6.2 Brief historical background to towns close to the project area**

The well-watered shallow valleys and numerous strong dolomitic fountains in the larger project area attracted Voortrekker farmers to this area as early as 1842. The largest of these fountains are Wonderfontein, situated approximately 10km north-east of Carltonville. It is the sources of the Mooi Rivervierloop, a tributary of Potchefstroom's Mooi River.

For nearly a half a decade, after the discovery of gold on the Witwatersrand, the production of gold was confined to the main Witwatersrand gold reef. Geologists knew that these deposits extended to the west and east but at much greater depths than on the Rand. However, the technology to exploit these reefs was not yet available at the time. In the 1930's new methods revealed reefs in the north-west, near Potchefstroom and Klerksdorp where some of the deepest mines in the world now operate.

The project area is closest to the following towns, namely Krugersdorp and Randfontein to the north-east, Soweto to the east and Westonaria and Carltonville to the south and to the west. A brief summary of the historical unfolding of these towns and significant heritage sites associated with these towns are outline below.

### **6.2.1 Krugersdorp and Randfontein**

Krugersdorp, like many other towns in the former Transvaal province, traces its origins to the discovery of gold. The Transvaal government bought 428 hectares of the farm Paardekraal on 26 April 1887 for £3 000 to serve as administrative centre for all the public gold diggings proclaimed on the remainder of this and other farms.

Some heritage sites of significance in Krugersdorp are the following:

- The foundation stone of the magistrate's court building was laid by Pres Paul Kruger on 18 September 1890.
- The Earl of Selborne, British governor to the Transvaal Crown Colony after the Anglo Boer War, laid the foundation stone of the hall on 10 May 1907.
- Coronation Park was laid out on 37ha presented to Krugersdorp by the British government in 1902 to celebrate Mark Edward's VII coronation.
- President Paul Kruger's statue in Pretorius Park is the only one in the country showing Kruger as a relatively young man.
- Krugersdorp Game Reserve (Gauteng of the town) preserves the fauna and flora indigenous to the Witwatersrand before the discovery of gold.

The town of Randfontein was established on 3 March 1890 to serve the gold mining operations of the Randfontein Gold Mining Company, at the time the largest gold mining company on the Witwatersrand. (The company still boasts the world's largest stamp mill).

The village was founded on the farm by the same name. It was bought by Sir J.B. Robinson together with other farms during the general scramble for property following the discovery of the Witwatersrand gold reef in 1886.

The railway line running from Johannesburg to Krugersdorp was extended to Randfontein in 1896.

Apart from gold and uranium the main products of the district are dairy, maize and vegetables.

### **6.2.2 Soweto**

Soweto, the largest township in the country was developed for exclusive black occupation under the apartheid system from the early 1950's. The name is an acronym for South-Western Townships established on the farms Doornkop, Klipriviersberg, Diepkloof, Klipspruit and Vogelstruisfontein.

The umbrella name Soweto includes 26 townships such as Meadowlands, Dobsonville, Diepkloof and Dube, each which was designed to be a self-sufficient entity.

The total area at the time was 6 734 hectares and was consolidated after the Second World War. By 1970 Soweto had 65 968 houses, 143 churches and 127 schools with about 100 000 pupils.

The population of Soweto entails a polygot community, open to all and includes members of all the country's indigenous groups. Dominant languages are Zulu, North and South Sotho, Tswana and Xhosa.

Much of the struggle against apartheid was fought in and from Soweto. Riots that rocked the country started on 16 June 1976.

Heritage sites in Soweto include the following:

- Hector Peterson Square in Orlando East was named for the first student that was killed in the 1976 uprising.

- Vilikazi Street runs past the former homes of two Nobel Peace Prize winners, namely Nelson Mandela and Desmond Tutu.
- Nelson Mandela's former house shared with Winnie Mandela during the 1950's and 1960's is now a museum.
- The imposing Regina Mundi Church (Roman Catholic) where many important gatherings were staged during the apartheid years today house an art museum.

Freedom Square hosted the thousands of people who gathered for the mass rally that drafted the Freedom Charter, the manifesto of the African National Congress, which was subsequently ratified at Kliptown on 26 and 27 June 1955.

### **6.2.3 Westonaria and Carltonville**

Westonaria's name is a compound of its location (West Rand) and Western Areas the gold mining company that owned much of the land. It is in fact a conglomeration of several mining towns. Significant gold mines in the wider district are Libanon, Venterspos, Westernareas, Elsburg and Kloof.

Carltonville serves several of the country's richest gold mines such as West Driefontein, East Driefontein, Western Deep Levels and Blyvooruitzicht.

It is a comparatively young urban development as most of the mines were developed after the Second World War. Carltonville was laid out by West Witwatersrand Areas gold mining company on the farm Twyfelvlakte and proclaimed on 28 January 1948. The township was named for Guy Carlton Jones, a director of Consolidated Gold Fields for 35 years and developer of the 'West Wits Line of mines'.

### **6.3 Gold mining history**

The Carltonville gold fields also known as the West Wits Line is the richest of all the Witwatersrand gold fields. Its discovery turned out to be a spectacular geological and engineering success story. Exploration drilling west of Johannesburg between 1899 and 1904 intersected several auriferous conglomerates at some depth below surface. However, development was hampered by several ground water problems. From the

1930's the subsurface geology became better understood as a result of the magnetic exploration techniques developed by Rudolph Krahman. The combination of improved geological understanding with new cementation technology enabled sub-surface ground water flow to be controlled. This facilitated drilling and subsequent shaft development which confirmed the existence of an enormous gold field.

### The West Wits Line

The West Wits Line, also known as the Carltonville gold fields, lies on the north-western edge of the Witwatersrand basin, 35 km west of Johannesburg. During the 1930's detailed prospecting took place in the region. This eventually led to the development of ten mines, some of them the biggest and certainly the richest in the entire basin.

Mines in the area included Deelkraal, Elandsrand, Doornfontein, Blyvooruitsicht, Western Deep Levels and Driefontein Consolidated (previously West and East Driefontein). These mines all occurred to the west of the Bank fault. The Kloof, Libanon and Venterspost mines all occurred to the east of the break.

Total gold production from the area amounted to a little over 7 000 tons by 1998. In addition to gold, uranium and pyrite are imported by-products from the region.

The gold fields can be divided into two sections along geological lines. The section west of the Bank fault is sedimentologically distinct and lies between Carltonville and Fochville. This section is correctly referred to as the Carltonville gold fields.

Whilst the entire region is referred to as the West Wits Line the section east of the Bank fault represents a natural sedimentological extension of the West Rand gold field and comprises the three mines centred on the town of Westonaria.

### West Rand Gold Fields

The West Rand Gold Fields lies 25 km west of Johannesburg and extends from Krugersdorp in the north eastwards to Roodepoort and then southwards towards Westonaria. Gold was discovered in the Krugersdorp area in 1887.



Amalgamation of early mining operations led to the establishment of four principal gold mines to the north of the Witpoortjie Gap, namely East Champ D 'Or, Luipaardsvlei Estates, West Rand Consolidated and Randfontein Estates.

In the 1930's the South Roodepoort Mine was established to the south of the gap. In 1998 it was referred to as the Doornkop Section of Randfontein Estates. Exploration along the eastern side of the Panvlakte fault (as a result of an interest in uranium) during the post war years led to the establishment of the Western Areas Gold Mine in the late 1950's and the Cooke Section of Randfontein Estates in the 1970's. The Panvlakte horst is now considered as the western limit to the West Rand gold fields.

## 7 APPROACH AND METHODOLOGY

This heritage survey and assessment study was conducted by means of the following:

### 7.1 Field survey

The field survey was conducted together with security personnel from AngloGold due to the threat that illegal mine workers (*zama zamas*) posed to the survey team consisting of a plant botanist and archaeologist. Both specialists were transported to site in an armoured vehicle (Caspir) with three-armed security guards and Mr. Luther Schoeman from AngloGold. The specialists were not allowed to leave the safety of the armoured vehicle and therefore were obliged to observe the pipeline corridor from the Caspir whilst travelling alongside its proposed corridor. The field survey was limited to the southern part of the pipeline as the northern part of the pipeline will be mounted on top of the existing pipeline and no further disturbances be caused along this part of the pipeline.

Archaeological visibility was not good along the southern part of the pipeline where tall grass and thick clumps with popular trees are growing along the banks of the Wonderfontein Spruit.

All coordinates for heritage resources recorded were done with a Garmin Etrex hand set Global Positioning System (instrument) with an accuracy of < 15m.

Google imagery was used as a supplementary source (*prior* to and after fieldwork) to establish the possible presence of heritage resources such as abandoned buildings or possible graveyards in the project area.

The nature and character of the project area is further illuminated with descriptions and photographs in Part 8.1 'The field survey'.



**Figure 2- Pathway outlined on Google Earth image showing route which was followed with a Caspir armoured vehicle along the proposed new pipeline corridor. At the time the survey was done the area was more vegetated than what the Google image reveals.**

## **7.2 Databases, literature survey and maps**

Databases kept and maintained at institutions such as the PHRA, the Archaeological Data Recording Centre at the National Flagship Institute (Museum Africa) in Pretoria and SAHRA's national archive (SAHRIS) were consulted by the author to determine whether any heritage resources of significance had been identified during earlier heritage surveys in or near the project area.

## **7.3 Spokespersons consulted**

Several mine officials well acquainted with the general mining area were consulted regarding the possible presence of graveyards in the project area (see Part 12, 'Spokespersons consulted').

## 7.4 Consultation process undertaken and comments received from stakeholders

No specific consultation process was undertaken for the purposes of the heritage study as the stakeholder consultation for the project is being done by Golder Associates Africa (Pty) Ltd.

## 7.5 Significance ratings

The significance of possible impacts on the heritage resources was determined using a ranking scale based on the following:

- Occurrence
  - Probability of occurrence (how likely is it that the impact may/will occur?), and
  - Duration of occurrence (how long may/will it last?)
- Severity
  - Magnitude (severity) of impact (will the impact be of high, moderate or low severity?), and
  - Scale/extent of impact (will the impact affect the national, regional or local environment, or only that of the site?).

Each of these factors has been assessed for each potential impact using the following ranking scales:

Probability: 5 – Definite/don't know 4 – Highly probable 3 – Medium probability 2 – Low probability 1 – Improbable 0 – None	Duration: 5 – Permanent 4 – Long-term 3 - Medium-term (8-15 years) 2 - Short-term (0-7 years) 1 – Immediate
Scale: 5 – International 4 – National 3 – Regional 2 – Local 1 – Site only	Magnitude: 10 - Very high/don't know 8 – High 6 – Moderate 4 – Low 2 – Minor

0 – None	
----------	--

The heritage significance of each potential impact was assessed using the following formula:

$$\text{Significance Points (SP)} = (\text{Magnitude} + \text{Duration} + \text{Scale}) \times \text{Probability}$$

The maximum value is 100 Significance Points (SP). Potential environmental impacts are rated as very high, high, moderate, low or very low significance on the following basis:

- More than 75 significance points indicates HIGH heritage significance.
- Between 30 and 75 significance points indicates MODERATE heritage significance.
- Less than 30 significance points indicates a LOW heritage significance.

## 8 THE PHASE I HERITAGE IMPACT AND ASSESSMENT

### 8.1 The field survey

The field survey which was undertaken with a Caspir armoured vehicle was limited to the southern part of the pipe line as the northern part of the pipeline will be mounted on top of the existing pipeline and no further disturbances be caused along this part of the pipeline.

The project area north and south of the tar road is flat with limited tree cover and a small outcrop north of the tar road. The Caspir armoured car therefore followed the proposed pipeline conveniently only to deviate here and there in order to avoid trenches which were dug by *zama zamas* to remove cables.

The proposed pipeline corridor is now illuminated with photographs.



**Figure 3-** The southern part of the proposed new pipeline corridor is characterised as a flat, outstretched piece of veld which is covered with sandy soil, grass and dense popular groves as well as Blue Gum trees along the bank of the Wonderfontein Spruit (above).



**Figure 4- Isolated Blue Gum Trees and grass veld along the proposed pipeline route (above).**



**Figure 5- A dirt road closely follows the proposed pipeline corridor (above).**



**Figure 6- The proposed pipeline corridor traverses severely disturbed veld close before reaching the tar road approximately in the centre of the pipeline route (above).**



**Figure 7- Disturbances and alterations along the proposed pipeline corridor include illegal mining activities by *zama zamas* in order to remove underground cables (above).**





**Figure 8- The northern part of the pipeline corridor where the proposed new pipeline will be attached on top of an existing pipeline causing no new disturbance along the existing pipeline corridor (above).**

## 8.2 Impact assessment

The table below summarises those impacts directly related to the construction, operational, decommissioning phases and the cumulative impacts of the proposed project and provides a significance rating for each impact before and after mitigation.

**Table 1: Heritage Impact Assessment matrix proposed project**

POTENTIAL ENVIRONMENTAL IMPACT:	ENVIRONMENTAL SIGNIFICANCE											
	Before mitigation						After mitigation					
	M	D	S	P	SP	Rating	M	D	S	P	SP	Rating
<i>Heritage Impacts</i>												
Construction of pipeline may damage/disturb heritage resources	2	2	1	1	5	Low	2	2	0	1	4	Low
Operation and maintenance of the pipeline may damage/disturb heritage resources	2	4	1	1	7	Low	2	4	0	1	6	Low
Decommissioning of the pipeline may damage/disturb heritage resources	2	2	1	1	5	Low	2	2	0	1	4	Low
Cumulative impacts of the pipeline may damage/disturb heritage resources	2	4	1	1	7	Low	2	4	0	1	6	Low

### **8.3 Summary**

The Phase I HIA study for the Project did not reveal the presence of any of the types and ranges of heritage resources as outlined in Section 3 of the National Heritage Resources Act (No 25 of 1999) in the Project Area.

There is consequently no reason from a heritage point of view why the proposed Project cannot proceed if the Chance Find Procedures outlined in this report are not followed.

## **9 MITIGATING POSSIBLE HERITAGE RESOURCES**

No heritage resources have been observed in the project area and it is considered highly unlikely that heritage resources would have an influence or bearing on the proposed development. Consequently, no mitigation measures are necessary. However, heritage resources may have been missed as a result of human failure to observe or to recognise them or they may be hidden beneath the earth and may only be exposed when earth works are done. Informal, undecorated and abandoned graves may also be missed during foot surveys.

If chance finds of heritage resources, including graves that have been missed during the Phase I survey, are made during the construction, operation or eventual decommissioning of the Project, the following chance find procedures must be implemented.

### **9.1 Chance find procedures**

Chance Find Procedures are applicable during the construction, operation or closure phases of the Project and apply to all contractors, subcontractors, subsidiaries or service providers. If any of the institutions' employees find any heritage resources during any developmental activity the person and institution must cease work at the site of the find. They must report this find to their immediate supervisor and through their supervisor to the senior on-site manager.

#### **9.1.1 Chance find procedures for heritage resources**

The initial procedure to follow when heritage resources are uncovered during development is aimed at avoiding any further possible damage to the heritage resources. The following procedures must be followed:

- The person or group who identified or exposed the heritage resource or burial ground must cease all activity in the immediate vicinity of the site.
- The chance find must be reported to the on-site manager.
- The on-site manager must make an initial assessment of the extent of the find and confirm that further work has stopped. He must ensure that the site is secured and that controlled access is implemented.

- The on-site manager must inform the Environmental Officer (EO) and Health and Safety Officer (HSO) of the chance find and its immediate impact on the Project. The EO must contact an archaeologist registered with the Association for Southern African Professional Archaeologist (ASAPA) or the South African Heritage Resources Agency (SAHRA) who would provide the details of an archaeologist.
- The archaeologist will conduct a site inspection and confirm the significance of the discovery, recommend appropriate mitigation measures for the Project and will also notify the relevant authorities.
- Based on the comments received from the authorities the archaeologist will provide the Project with a Terms of References Report (TOR) and associated costs if mitigation measures have to be implemented. The archaeologist will also obtain the necessary permits from SAHRA to conduct the necessary mitigation measures.

### **9.1.2 Chance Find Procedures for burials and graves**

In the event that unidentified burial grounds or graves are identified and/or exposed during any of the developmental phases of the Project the following steps must be implemented subsequent to those outlined above:

- The archaeologist must confirm the presence of graveyards and graves and implement the following procedures.
- Inform the local South African Police (SAP) and traditional authority.
- The archaeologist in conjunction with the SAP and traditional authority will inspect the possible graves and make an informed decision whether the remains are of forensic, recent, cultural-historical or archaeological significance.
- Should it be concluded that the find is of heritage significance and therefore protected in terms of heritage legislation the archaeologist will notify the relevant authorities.
- The archaeologist will provide advice with regard to mitigation measures for the graves.

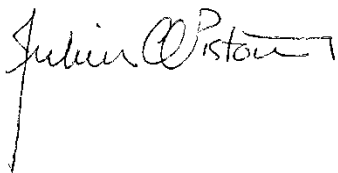
## 10 CONCLUSION AND RECOMMENDATIONS

The Phase I HIA study for the Project did not reveal the presence of any of the types and ranges of heritage resources as outlined in Section 3 of the National Heritage Resources Act (No 25 of 1999) in the Project Area.

There is consequently no reason from a heritage point of view why the proposed Project cannot proceed if the chance find procedures outlined in this report are not followed.

It is possible that this Phase I HIA study may have missed heritage resources in a strip along the pipeline corridor which is covered with blue gum and wattle trees and with thick clumps of vegetation along the southern part of the proposed new pipeline corridor. These areas could not be physically examined as a result of unsafe conditions caused by illegal miners (zama zama's). It is also possible that heritage resources may also occur below the surface of the earth and may only be exposed once development commences. Heritage resources may also have been missed as a result of human failure to recognise them.

If any heritage resources of significance is exposed during the Project the South African Heritage Resources Authority (SAHRA) should be notified immediately, all activities must be stopped and an archaeologist accredited with the Association for Southern African Professional Archaeologist (ASAPA) should be notify in order to determine appropriate mitigation measures for the discovered finds. The chance find procedures as outlined in the report should be followed. This may include obtaining the necessary authorisation (permits) from SAHRA to conduct the mitigation measures.



**DR JULIUS CC PISTORIUS**

**Member ASAPA**

## 11 SELECT BIBLIOGRAPHY

Bergh, J.S. 1992. Die vestiging van die Voortrekkers noord van die Vaalrivier tot 1840. *Historia*, 37(2), 38-42.

Deacon, H.J. & Deacon, J. 1999. *Human beginnings in South Africa. Uncovering the secrets of the Stone Age*. David Philips: Cape Town.

Erasmus, B.P.J. 1995. *Oppad in Suid Afrika. 'n Gids tot Suid Afrika, Streek vir Streek*. Jonathan Ball Uitgewers Bpk.

Leroux, V. 1992. *Reader's Digest Book of the Great South African Outdoors*. Cape Town: Reader's Digest Association South Africa.

Maggs, T.M. 'O C. 1976. *Iron Age communities of the Southern Highveld*. Pietermaritzburg: Natal Museum

Mason, R.J. 1962. *The prehistory of the Transvaal*. Johannesburg: Witwatersrand University Press.

Mason, R.J. 1986. *Origins of black people of Johannesburg and the Southern Western Central Transvaal AD 350-1880*. Archaeological Research Unit. Occasional Paper No 16. University of the Witwatersrand.

Mayhew, V. (ed.). 1982. *Reader's Digest illustrated guide to Southern Africa*. Cape Town: Reader's Digest Association South Africa.

Naude, M. 1990. Die Transvaalse Boerewoning. *Africana Society of Pretoria* (8): 46-49.

O Hagan, T. (ed.) 1995. *Places to visit in Southern Africa*. Cape Town: AA The Motorist Publications.

Rasmussen, R.K. 1978. *Migrant kingdom: Mzilikazi's Ndebele in South Africa*. Cape Town: David Philip.

TNAD 1905. *Short history of the native tribes of the Transvaal*. Pretoria: Government Printer.

Van Vollenhoven, A. 1997. *'n Kultuurhulpbronstudie van die Britse Blokhuisstelsel van die Tweede Anglo-Boere-oorlog in die voormalige Transvaal (Zuid-Afrikaansche Republiek)*. Pretoria: Nasionale Kultuurhistoriese Museum.

Wadley, L. 1987. *Later Stone Age Hunters and Gatherers of the Southern Transvaal: Social and Ecological Interpretations*. Oxford: British Archaeological Reports International Series 380.

Van Warmelo, N. J. 1930. *Transvaal Ndebele texts*. Government Printer: Pretoria.

Viljoen, M.J. & Reinhold, W.U. 1999. *An introduction to South Africa's geological and mining heritage*. Randburg: Mintek.

## 12 BIBLIOGRAPHY RELATING TO EARLIER HERITAGE STUDIES

Birkholtz, P. 2008. Heritage Inventory. AngloGold Ashanti. Wes Wits situated south of Carltonville, North West Province. Unpublished report for AngloGold Ashanti.

Pistorius, J.C.C. 2008. A Phase I Heritage Impact Assessment study for Mogale Alloys near Krugersdorp in the Gauteng Province of South Africa Unpublished report for Mogales Alloys.

Pistorius, J.C.C. 2008. A Phase I Heritage Impact Assessment study for Harmony's Gold Mining Limited Operations (Harmony) near Randfontein in the Gauteng Province of South Africa. Unpublished report for Harmony's Gold Mining Limited Operations

Pistorius, J.C.C. 2008. A Phase I Heritage Impact Assessment study for Rand Uranium's proposed Pyrite Project near the Cook Gold Plant in Randfontein in the Gauteng Province of South Africa. Unpublished report for Golder Associates.

Pistorius, J.C.C. 2009. A Phase I Heritage Impact Assessment study for Rand Uranium's Harmony's Pit Deposition Project near Randfontein in the Gauteng Province of South Africa. Unpublished report for Ezendala Environmental Solutions.

Pistorius, J.C.C. 2009. A Phase I Heritage Impact Assessment study for the Mogale Project near Krugersdorp and Randfontein in the Gauteng Province of South Africa. Unpublished report for Mintails.

Pistorius, J.C.C. 2009. A Phase I Heritage Impact Assessment study for the Cooke Uranium Project's new Uranium Plant/Acid Plant and Cooke Dump Reprocessing near Randfontein in the Gauteng Province of South Africa. Unpublished report for Golder Associates.

Pistorius, J.C.C. 2009. A Phase I Heritage Impact Assessment study for the proposed new Randfontein Mega Tailings Project near Randfontein in the Gauteng Province of South Africa. Unpublished report for Golder Associates.



### **13 SPOKESPERSON CONSULTED**

Mr. Werner Grobler. Engineering Manager. Ashanti Gold.

Mr Luther Schoeman. Employee. Ashanti Gold.