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**A PHASE I HERITAGE IMPACT ASSESSMENT (HIA) STUDY FOR  
PROPOSED NEW INFRASTRUCTURES AND PROCESSES AT  
EVRAZ VAMETCO ALLOYS (PTY) LTD NEAR MMAKAU AND  
MADIBENG IN THE BANKEVELD IN THE NORTH-WEST PROVINCE**

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## EXECUTIVE SUMMARY

This Phase I Heritage Impact Assessment (HIA) study for Evraz Vametco Alloys' (Pty) Ltd (Evraz Vametco) proposed development of additional infrastructure at the existing Evraz Vametco operation near Madibeng in the North West Province was done according to Section 38 of the National Heritage Resources Act (No 25 of 1999). The aims with the Phase I HIA study were the following, namely:

- To establish whether any of the types and ranges of heritage resources as outlined in Section 3 of the National Heritage Resources Act (No 25 of 1999) (Box 1) do occur in the Project Area and, if so, to determine the nature, the extent and the significance of these remains.
- To determine whether such remains will be affected by the proposed additional infrastructure and, if so, to determine appropriate mitigation (management) measures for those heritage resources which may be affected by the project.

An earlier Phase I HIA study was compiled for Evraz Vametco in 2011 which outlined various types and ranges of heritage resources within the premises of this vanadium mining and processing industry, namely:

- Pistorius, J.C.C. 2011. A Phase I Heritage Impact Assessment (HIA) for the Evraz Vametco operation near Madibeng in the North West Province. Unpublished report for JMA Consulting (Pty) Ltd.

The Phase I HIA for the Project Area for the additional infrastructure revealed none of the types and ranges of heritage resources as outlined in Section 38 of the NHRA (No 25 of 1999).

(Heritage resources that were identified during an earlier heritage impact assessment study for the Vametco Project Area do not occur near the present Project Area and is not discussed in this report ([Pistorius 2012]. These heritage resources will also not be affected by the proposed new infrastructure and processes to be implemented at Evraz Vametco ).

No heritage resources will be impacted by the proposed Project.

The significance of any impact on any heritage resources is low (Table 1).

No mitigation measures are required as no heritage resources exist.

**General remark**

It is possible that this Phase I HIA study may have missed heritage resources in the Project Area as heritage sites may occur in clumps of vegetation or tall grass while others may lie 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 error.

If any heritage resources of significance is exposed during the project the South African Heritage Resources Authority (SAHRA) should be notified immediately, all development 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. This may include obtaining the necessary authorisation (permits) from SAHRA to conduct the mitigation measures.

## CONTENTS

<b>Executive Summary</b>	<b>2</b>
<b>1 INTRODUCTION</b>	<b>6</b>
1.1 Project Background	6
1.2 Definitions	8
<b>2 DETAILS OF THE SPECIALIST</b>	<b>11</b>
<b>3 DECLARATION OF INDEPENDENCE</b>	<b>12</b>
<b>4 SCOPE OF WORK</b>	<b>13</b>
<b>5 LEGAL FRAMEWORK</b>	<b>15</b>
5.1 Legislation relevant to heritage resources	15
5.2 The National Heritage Resources Act (NHRA)	16
5.3 Heritage Impact Assessment studies	16
5.4 Regulations with regard to heritage resources	17
5.4.1 Buildings and structures	17
5.4.2 Graves and burial grounds	17
5.4.3 Archaeology, palaeontology and meteorites	19
<b>6 METHODOLOGY</b>	<b>20</b>
6.1 Desktop study	20
6.2 Fieldwork and research	20
6.3 Baseline description	21
6.4 Proposed activity description	22
6.5 Heritage Impact Assessment	23
6.6 Heritage management measures	24
6.7 Heritage monitoring plan	25
<b>7 ASSUMPTIONS AND LIMITATIONS</b>	<b>26</b>
7.1 Adequacy of predictive methods	26

7.2	Adequacy of under laying assumptions	26
7.3	Uncertainty of information provided	26
<b>8</b>	<b>THE BASELINE DESCRIPTION</b>	<b>27</b>
8.1	Location of the Project Area	27
8.2	Within a cultural landscape	28
8.3	The nature of the Project Area	29
8.4	Contextualising the Project Area	30
8.4.1	The Central Bankeveld	30
8.4.2	Pre-historical context	30
8.4.3	Historical context	30
8.5	Fieldwork survey	33
<b>9</b>	<b>THE PHASE I HERITAGE IMPACT ASSESSMENT</b>	<b>37</b>
9.1	Types and ranges of heritage resources	37
9.2	Possible impact on the heritage resources	37
9.3	The significance of the impact on the heritage resources	37
9.4	Mitigating and monitoring the heritage resources	37
<b>10</b>	<b>CONCLUSION AND RECOMMENDATIONS</b>	<b>38</b>
<b>11</b>	<b>SELECT BIBLIOGRAPHY</b>	<b>39</b>
<b>12</b>	<b>BIBLIOGRAPHY RELATING TO EARLIER HERITAGE STUDIES</b>	<b>41</b>

# **1 INTRODUCTION**

## **1.1 Project Background**

This Phase I Heritage Impact Assessment (HIA) study is one of several specialist study reports which are compiled in support of the terms of reference for the compilation of an Environmental Management Plan for Evraz Vametco Alloys' (Pty) Ltd (Evraz Vametco) proposed development of additional infrastructure at the existing Evraz Vametco operation near Madibeng in the North West Province. An earlier Phase I HIA study was compiled for Evraz Vametco in 2011 which outlined various types and ranges of heritage resources within the premises of this vanadium mine and processing industry, namely:

- Pistorius, J.C.C. 2011. A Phase I Heritage Impact Assessment (HIA) for the Evraz Vametco operation near Madibeng in the North West Province. Unpublished report for JMA Consulting (Pty) Ltd.

This Phase I HIA study, however, only focusses on the establishment of additional infrastructure and processes within the existing Evraz Vametco operation.

Previous heritage surveys that were conducted for developers in the in the North-West Province indicated that the most common types and ranges of heritage resources which exist in this part of the province consists of stone walled sites which date from the Late Iron Age. However, various types and ranges of heritage resources that qualify as part of South Africa's 'national estate' as outlined in Section 3 of the National Heritage Resources Act (No 25 of 1999) do occur across the North-West Province (see Box 1, next page).

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

The National Heritage Resources Act (Act 25 of 1999, Section 3) outlines the following types and ranges of heritage resources that qualify as part of the national estate:

- 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 in terms of the Human Tissue Act (Act 65 of 1983);
- h. Sites of significance relating to the history of slavery in South Africa;
- i. Moveable objects, including -
  - i. Objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects, 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 (Act 43 of 1996).

The National Heritage Resources Act (Act 25 of 1999, Sec 3) also distinguishes nine criteria for a place and/or object 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;
- b. Its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;
- c. Its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;
- d. 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. Its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa; and/or
- i. Its significance relating to the history of slavery in South Africa.

## 1.2 Definitions

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.
- Conservation (*in-situ*): The conservation and maintenance of ecosystems, natural habitats and cultural resources in their natural and original surroundings.
- Cultural (heritage) 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.
- Cultural (heritage) 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.
- Heritage resources: The various natural and cultural assets that collectively form the heritage. These assets are also known as cultural and natural resources. Heritage (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.



- Stone Age: Refers to the prehistoric past, although Late Stone Age peoples 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 300 years ago).
- 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.
- Historical period: Refers to the first appearance or use of 'modern' Western writing in a particular area or region of the world.
- 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.
- 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.
- Maintenance: Keeping something in good health or repair.
- Preservation: Conservation activities that consolidate and maintain the existing form, material and integrity of a cultural resource.
- 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.
- 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.

- 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.
- Project Area: refers to the area (footprint) where the developer wants to focus its development activities (refer to plan).
- 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.
- 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 involve permitting processes, require the input of different specialists and the co-operation and approval of SAHRA.

## 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 etc. as well as with several environmental companies.

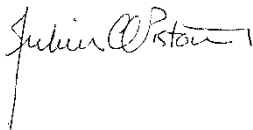
### 3 DECLARATION OF INDEPENDENCE

I, Julius CC Pistorius, declare that:

- I act as the independent environmental practitioner in this application
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting environmental impact assessments, including knowledge of the National Heritage Resources Act (No 25 of 1999) and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations and all other applicable legislation;
- I will take into account, to the extent possible, the matters listed in regulation 8 of the regulations when preparing the application and any report relating to the application;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- I will ensure that information containing all relevant facts in respect of the application is distributed or made available to interested and affected parties and the public and that participation by interested and affected parties is facilitated in such a manner that all interested and affected parties will be provided with a reasonable opportunity to participate and to provide comments on documents that are produced to support the application;
- I will ensure that the comments of all interested and affected parties are considered and recorded in reports that are submitted to the competent authority in respect of the application, provided that comments that are made by interested and affected parties in respect of a final report that will be submitted to the competent authority may be attached to the report without further amendment to the report;
- I will keep a register of all interested and affected parties that participated in a public participation process; and
- I will provide the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not
- all the particulars furnished by me in this form are true and correct;
- I will perform all other obligations as expected from an environmental assessment practitioner in terms of the Regulations; and
- I realise that a false declaration is an offence in terms of regulation 71 and is punishable in terms of section 24F of the Act.

**Disclosure of Vested Interest**

I do not have and will not have any vested interest (either business, financial, personal or other) in the proposed activity proceeding other than remuneration for work performed in terms of the Environmental Impact Assessment Regulations, 2010.



Signature of the environmental practitioner:  
Private Consultant

Name of company:  
15 August 2014

Date:

Signature of the Commissioner of Oaths:

Date:

Designation:

#### 4 SCOPE OF WORK

Evraz Vametco proposes to develop additional surface infrastructure with associated processes at the existing Evraz Vametco operation. The proposed surface infrastructure with associated activities includes the following:

- The import and storage of Vanadium rich slag waste material from Russia and the subsequent recovery of Vanadium from the slag through the existing Vanadium extraction process at Vametco.
- The installation of a new Scrubber System at the Rotary Kiln to improve air quality management at the Plant.
- The installation of a new Bag Filter Unit at the Shaft furnaces to improve air quality management at the Plant.
- The construction of a new Slimes Return Water Dam for the existing Slimes Dam.
- The construction and operation of a new Class A Waste Disposal Facility for the disposal of magnetite (including residual slag) as well as the gypsum from the new Scrubber System.
- The construction of a new Pollution Control Dam for the proposed new Class-A Waste Disposal Facility (Figure 01).

The above-mentioned surface infrastructure changes are proposed on the farm Uitvalgrond 431 within Evraz Vametco's existing mining rights areas and may have an influence on any of the types and ranges of heritage resources which are outlined in Section 38 of the National Heritage Resources Act (No 25 of 1999). JMA Consulting (Pty) Ltd, who is responsible for compiling the Environmental Management Program (EMP) report commissioned the author to undertake a Phase I HIA study for the additional surface infrastructure at the Evraz Vametco operation.

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

- To establish whether any of the types and ranges of heritage resources as outlined in Section 3 of the National Heritage Resources Act (No 25 of 1999) (Box 1) do occur in the Project Area and, if so, to determine the nature, the extent and the significance of these remains.

- To determine whether such remains will be affected by the proposed additional infrastructure and, if so, to determine appropriate mitigation (management) measures for those heritage resources which may be affected by the proposed project.

## **5 LEGAL FRAMEWORK**

South Africa's heritage resources ('national estate') are protected by international, national and regional 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 Table 1).

According to the NHRA (Act No 25 of 1999) heritage resources are categorised 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 (PHRAs) which apply the National Heritage Resources Act (Act 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 acts and is implemented by the South African Heritage Resources Agency (SAHRA) and the Provincial Heritage Resources Agencies.

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 (Act No 25 of 1999).

### **5.1 Legislation relevant to heritage resources**

The identification, evaluation and assessment of heritage resources in South Africa are regulated by the following legislation:

- National Environmental Management Act (NEMA) Act 107 of 1998
- National Heritage Resources Act (NHRA) Act 25 of 1999
- Minerals and Petroleum Resources Development Act (MPRDA) Act 28 of 2002

- Development Facilitation Act (DFA) Act 67 of 1995

## **5.2 The National Heritage Resources Act (NHRA)**

According to the NHRA (Act No 25 of 1999) the 'national estate' comprises the following (see Table 1):

- Archaeological artefacts, structures and sites older than 100 years
- Ethnographic art objects (e.g. prehistoric rock art) and ethnography
- Objects of decorative and visual arts
- Military objects, structures and sites older than 75 years
- Historical objects, structures and sites older than 60 years
- Proclaimed heritage sites
- Graveyards, burial grounds and graves older than 60 years
- Meteorites and fossils
- Objects, structures and sites of scientific or technological value.

Elaborating on the above the 'national estate' also includes (Table 1):

1. Places, buildings, structures and equipment of cultural significance
2. Places to which oral traditions are attached or which are associated with living heritage
3. Historical settlements and townscapes
4. Landscapes and features of cultural significance
5. Geological sites of scientific or cultural importance
6. Archaeological and paleontological sites of importance
7. Sites of significance relating to the history of slavery
8. Movable objects (e.g. archaeological, paleontological, meteorites, geological specimens, military and ethnographic objects, books etc.)

## **5.3 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 or a provincial heritage authority

#### **5.4 Regulations with regard to heritage resources**

The regulations outlined below are applicable to the types and ranges of heritage resources which are the most common in the region where the heritage study was conducted, namely:

##### **5.4.1 Buildings and structures**

According to Section 34(1) of the NHRA (Act No 25 of 1999) 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..

##### **5.4.2 Graves and burial grounds**

Graves and burial grounds are divided into the following:

- 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

In terms of Section 36(3) of the NHRA (Act No 25 of 1999) 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.

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

Human remains that are less than 60 years old are subject to provisions of the Human Tissue Act (Act 65 of 1983) and to local regulations. Exhumation of graves must conform to the standards set out in the Ordinance on Excavations (Ordinance no. 12 of 1980) (replacing the old Transvaal Ordinance no. 7 of 1925).

Permission must also be gained from the descendants (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 65 of 1983 as amended).

### **5.4.3 Archaeology, palaeontology and meteorites**

Section 35(4) of the NHRA (Act No 25 of 1999) deals with archaeology, palaeontology and meteorites and states that no person without a permit issued by the responsible heritage resources authority (national or provincial) 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.

## **6 METHODOLOGY**

The Phase I HIA study was conducted by means of the following:

### **6.1 Desktop study**

Literature relating to the pre-historical and the historical unfolding of the Madibeng District was reviewed. This review provides a broad chronological overview of the region ranging from pre-historical times to the historical period including the development of platinum and chrome mining in the region. It also refers to the Kgatla and other Tswana clans who, together with the colonial Voortrekkers, were the most influential pre-historic and historical groups in the region. This contextual evidence contributes to a better understanding of the identity and meaning of heritage sites which may occur in and near the Project Area.

A number of heritage studies which were done for developers near the Project Area also provided information regarding the general heritage characteristics of the larger project area (see 'Bibliography relating to earlier heritage studies', Part 12).

The desktop study also involved consulting heritage data banks maintained at institutions such as the North-West Provincial Heritage Resources Agency in Mafekeng, the Archaeological Data Recording Centre at the National Flagship Institute (Museum Africa) in Pretoria and the national heritage resources register at the South African Heritage Resources Agency (SAHRIS) in Cape Town.

The Project Area was also studied by means of maps on which it appears (Bapong 2527DA [1: 50 000] topographical map, Rustenburg 2526 [1:250 000] map and Google imagery).

### **6.2 Fieldwork and research**

The Project Area was surveyed with a vehicle and by means of pedestrian surveys. A track log which was registered with a mounted GPS instrument outlines the main route for the field survey from where pedestrian surveys were conducted. A number

of photographs also outline the characteristics of the Project Area (see Part 8.5 'Fieldwork survey', Figures 6 – 12).

The Project Area was also surveyed during at least one occasion in the past, namely:

- Pistorius, J.C.C. 2011. A Phase I Heritage Impact Assessment (HIA) for the Evraz Vametco operation near Madibeng in the North West Province. Unpublished report for JMA Consulting (Pty) Ltd.



**Figure 02- Track pathway registered with a mounted GPS outlines the main routes that were followed during the field survey. Pedestrian surveys were conducted from these main routes (above).**

### **6.3 The baseline heritage assessment**

The baseline heritage assessment study was compiled by means of a synthesis of the evidence derived from the desktop study (heritage data bases and literature research for contextual evidence) with the fieldwork evidence (GPS recording, describing, photographing and evaluating heritage resources encountered in the veld). This evidence was used to provide a qualitative description and explanation of the various

types and ranges of heritage resources that were encountered in the larger Project Area.

#### **6.4 Proposed activity description**

The development of additional surface infrastructure with associated processes at the existing Evraz Vametco operation includes the following (Figure 3):

- The import and storage of Vanadium rich slag waste material from Russia and the subsequent recovery of Vanadium from the slag through the existing Vanadium extraction process at Vametco.
- The installation of a new Scrubber System at the Rotary Kiln to improve air quality management at the Plant.
- The installation of a new Bag Filter Unit at the Shaft furnaces to improve air quality management at the Plant.
- The construction of a Slimes Return Water Dam for the existing Slimes Dam.
- The construction and operation of a Class A Waste Disposal Facility for the disposal of magnetite (including residual slag) as well as the gypsum from the new Scrubber System.
- The construction of a Pollution Control Dam for the proposed new Class- A Waste Disposal Facility.

It is assumed that only the three following project activities will have a bearing (impact) on heritage resources if these do exist in the Project Area, namely:

- The construction of a Return Water Dam (RWD) for the existing Slimes Dam.
- The construction and operation of a new Waste Disposal Facility (WDF) for the disposal of magnetite (including residual slag) as well as the gypsum from the new Scrubber System.
- The construction of a new Pollution Control Dam (PCD) for the proposed new Class- A Waste Disposal Facility (Figure 01).

Therefore, only these three infrastructural developmental activities are discussed in this report (Figure 3).

## 6.5 The heritage impact assessment

The baseline heritage information was used together with the technical information regarding the proposed construction of a new RWD, WDF and PCD in order to establish whether any impact may occur between the heritage resources and these developmental components.

The significance of potential heritage impacts was determined using a generic ranking scale which is used in most environmental impact assessment studies and which is 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 (ceases with the operational life) 3 - Medium-term (5-15 years) 2 - Short-term (0-5 years) 1 – Immediate
Scale: 5 – International 4 – National	Magnitude: 10 - Very high/don't know 8 – High

3 – Regional	6 – Moderate
2 – Local	4 – Low
1 – Site only	2 – Minor
0 – None	

The environmental 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 80 significance points indicates VERY HIGH environmental significance.
- Between 60 and 80 significance points indicates HIGH environmental significance.
- Between 40 and 60 significance points indicates MODERATE environmental significance.
- Between 20 and 40 significance points indicates LOW environmental significance.
- Less than 20 significance points indicates VERY LOW environmental significance.

## 6.6 Heritage management measures

The significance of heritage resources in the Project Area was determined by means of stipulations derived from the NHRA (Act No 25 of 1999) as well as from criteria derived from the historical and cultural context of the heritage resources that may be impacted by the proposed project.

The impact assessment contributed to formulating mitigation (management) measures for those heritage resources which may be impacted by the proposed project. Heritage management measures are based on guidelines derived from the National Heritage



Resources Act (Act No 25 of 1999) and from guidelines provided by the South African Heritage Resources Authority SAHRA).

## **6.7 Heritage monitoring plan**

Heritage monitoring measures are based on principles associated with best practise and guidelines which are derived from practical experiences with regard to the monitoring of heritage resources. Guidelines for best practise are formulated by SAHRA and ASAPA and are recommended to and applied by heritage researchers and consultants.

## **7 ASSUMPTIONS AND LIMITATIONS**

### **7.1 Adequacy of predictive methods**

No predictive evidence (such as models) is used in this study.

### **7.2 Adequacy of under laying assumptions**

This study was not primarily based on assumptions (or hypothetical evidence) but was mainly based on empirical evidence derived from fieldwork observations.

### **7.3 Uncertainty of information provided**

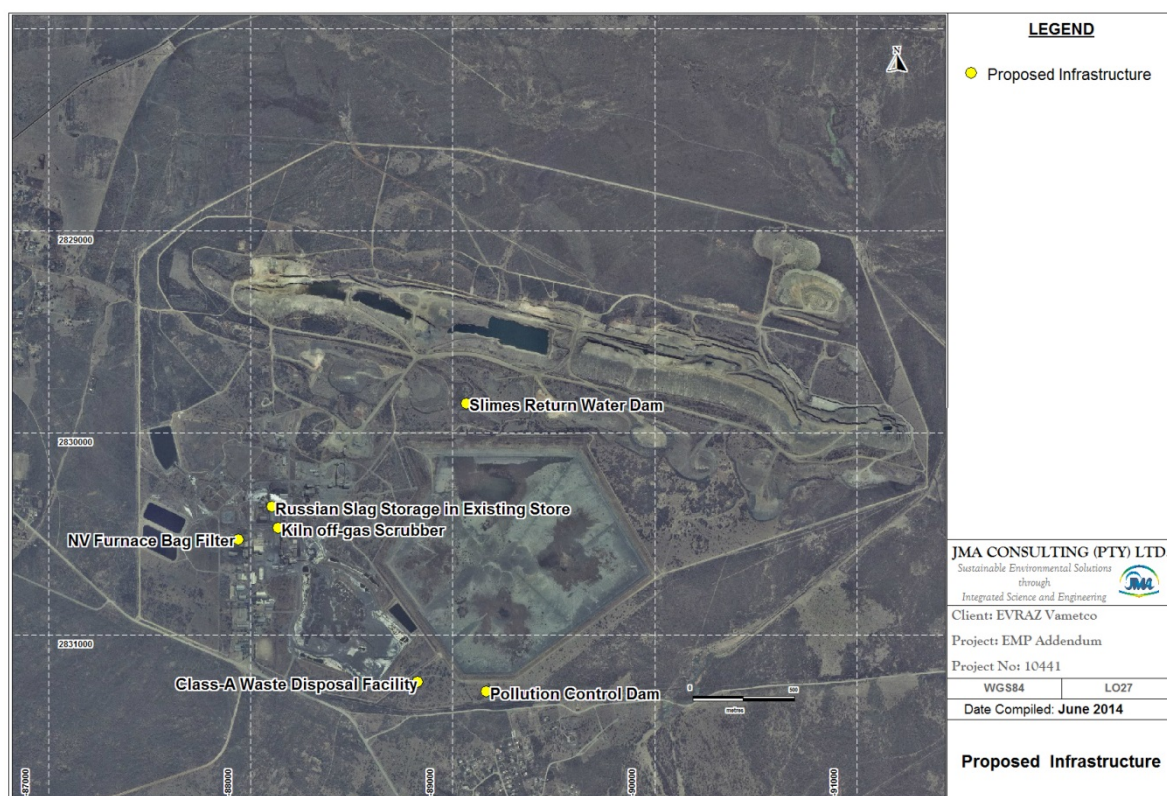
It is possible that this Phase I HIA study may have missed heritage resources in the Project Area as heritage sites may occur in clumps of vegetation or tall grass while others may lie below the surface of the earth and may only be exposed once development commences. Heritage resources may also have been missed as a result of human error.

If any heritage resources of significance is exposed during the project the South African Heritage Resources Authority (SAHRA) should be notified immediately, all development 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. This may include obtaining the necessary authorisation (permits) from SAHRA to conduct the mitigation measures.

## 8 THE BASELINE DESCRIPTION

### 8.1 Location of the Project Area

The Evraz Vametco operation is located on the farm Uitvalgrond 431 directly to the north of the series of norite hills which run from Onderstepoort near Pretoria in the east to the Pilanesberg in the west. This operation is situated on level ground near the villages of Mmakau and Mothutlung which is located along the norite hills direct to the south of the mine and approximately five kilometres to the east of the town of Madibeng (formerly known as Brits). The Project Area falls under the Madibeng Local Municipality in the Bojanala Platinum District in the North-West Province (Bapong 2527DA; 1: 50 000 and Rustenburg 2526 1:250 000 map).



**Figure 3- The Evraz Vametco Project Area near Madibeng in the North West Province (above). Note the proposed additional infrastructural developmental components at Evraz Vametco of which only three may have an influence on any possible types and ranges of heritage resources, namely the construction of the RWD, WDF and the PCD (above).**

## 8.2 Within a cultural landscape

The Project Area falls within a regional cultural landscape which houses numerous Late Iron Age settlements which are associated with the ancestors of the Tswana and the Ndebele. This cultural landscape is an elongated swath of land stretching from Rustenburg in the west to Pretoria in the east and which is sandwiched between the norite hills in the north and the Magaliesberg in the south. The chain of norite hills are composed of mountains, kopjes and knolls which are covered with stone walled villages which date from the Late Iron Age. These settlements are remnants of villages of predecessors of many of the Tswana speaking people who still live in the area today.

The Project Area therefore is part of a cultural landscape which warrants a brief description to demonstrate its place in the North-West's cultural history. Consequently, contextual evidence which illuminates the cultural-historical background of the Project Area is briefly outlined in this report (see Part 5, 'Contextualising the Project Area').



**Figure 4- The Project Area incorporates part of the series of norite hills which runs between Pretoria and the Pilanesberg. These hills are associated with stone walled sites which date from the Late Iron Age and which were occupied by ancestors of the Tswana and Ndebele. (Note stone walls on rock surfaces).**

### 8.3 The nature of the Project Area

The Project Area is not a pristine piece of land any longer as the landscape has been transformed by mining and mining related developmental activities during the last three decades. This is also true for the larger area which has been affected by granite mining which is older than fifty years and which had a severe impact on the norite hills in the region.

Residential developments such as the expansion of Mmakau, Motuthlung and Damonsville (to the south of the Project Area) have occurred to the detriment of many stone walled settlements as modern homesteads along the foot of the norite hills have ruined many of these sites. Power lines erected by Eskom also cross several of these stone walled sites whilst pylons, on which power line were strung, were constructed in some of these stone walled sites.



**Figure 5- Stone walled sites near Mothutlung and Mmakau which have been affected by granite mining activities as well as the construction of power lines (above).**

Local residents also have destroyed stone walled sites as they have turned some of these settlements into homesteads whilst enclosures have been adapted to be used as cattle pens. However, parts of the series of norite hills are still pristine and clusters of stone walled sites which have not been affected by these developments can still be found.

## **8.4 Contextualising the Project Area**

### **8.4.1 The Central Bankeveld**

The Project Area is located in the Central Bankeveld of the North-West Province of South Africa. The Bankeveld is a narrow strip of land between the northern bushveldt savannah and the centrally situated Highveld. The Central Bankeveld with its numerous centuries-old remains of ancient Tswana spheres of influence is important to this report.

The Central Bankeveld is covered by older grabbo penetrated by younger volcanic magma which formed the series and chains of pyramid-shaped norite hills from the Pilanesberg in the north-west to Ondestepoort in the east. These hills, as part of the Magaliesberg valley, represent a unique ecozone characterised by grassveld, savannah veld and near wooded valleys. The region has abundant surface water supplies. The Pienaar, the Moretele, the Hex and the Apies Rivers all drain their waters into the Crocodile River (Horn 1996).

### **8.4.2 Pre-historical context**

The Project Area is located to the north of the Magaliesberg in an area which is known for its rich and diverse range of heritage resources. Stone Age sites are scattered along the Magaliesberg and are also found in caves and rock shelters in the mountain. Rock engravings are located further towards Maanhaarrand and Rustenburg in the west. The most abundant heritage, however, are those that date from the Late Iron Age and which are associated with the numerous Tswana chiefdoms who occupied this region during the last four centuries (Mason 1968).



The interaction between the climate, geology, topography, and the fauna and flora of the Central Bankeveld established a milieu in which the first Tswana found a suitable living environment in order to practise herding, agriculture, metal working and trading. It was here that their chiefdoms flourished during AD1600 to AD1840.

The settlements of these early Tswana chiefdoms are characterised by an impressive and elaborate stone-built tradition. Hundreds and perhaps thousands of sites were built along the bases of the norite hills running between Onderstepoort and the Pilanesberg. The most formidable of these chiefdoms were the Kwena Môngôpa, Kwena Môngale (Bapô), Bakgatla and Fokeng. Further to the west, closer to Rustenburg was the Fôngeng chiefdom while several Kgatla spheres of influence emerged further to the west near Brits. The Kgatla were subjugated by Mzilikazi and were used as labourers to build one of the Ndebele's villages, probably known as emHlalandlela (Breutz 1954, De Beer 1975) (Pistorius 1995).

The Bapô, a people whose earliest ancestors were descended from the Amambô Nguni from Kwa Zulu/Natal, arrived in the Magaliesberg during the 16<sup>th</sup> or 17<sup>th</sup> centuries. One of their capitals was Tlhôngôkgôlô (Wolhuterskop). Several of the chiefs of this clan were known by the name of Môngale. The name of the Magalies Mountains (Magaliesberg) was derived from the name Môngale (Breutz 1954).

Numerous *difaqane* wars were fought during the last quarter of the 18<sup>th</sup> century and during the first quarter of the 19<sup>th</sup> century in the Central Bankeveld. These wars led to the displacement of large numbers of Tswana in the Bankeveld. The *difaqane* wars were caused by the Ndebele (Matabele) of Mzilikazi who arrived from the Vaal River region to occupy the Bankeveld in August 1827. The Ndebele destroyed the Kwena Môngôpa, the Kgatla and what had remained of the Bapô after an earlier defeat by the Pedi of Thulare. These wars exacerbated the havoc started earlier in the Bankeveld and gradually became a characteristic feature of historical events in this region during the early 19<sup>th</sup> century (Rasmussen 1978; Pistorius 1997a, 1997b & 1998).

The Ndebele established several settlement complexes in the Central Bankeveld from whence they maintained their grip on the indigenous population. Four of these Zulu/Nguni residences (*imisi*) and military kraals (*amakhanda*) have been discovered during the course of earlier archaeological surveys (Pistorius 1997a, 1997b).

Internal strife between the various Tswana chiefdoms also seems to have been on the increase from the latter half of the 18<sup>th</sup> century onwards. Paternal relatives fought against each other to attain the chieftaincy of the various Tswana chiefdoms. Succession disputes also led to the splintering of the existing chiefdoms into a growing number of independent spheres of influence in the Bankeveld.

During the early 19<sup>th</sup> century travellers, traders and missionaries visited the Central Bankeveld where they encountered the devastated Tswana chiefdoms. They also mentioned that numerous Tswana tribes were displaced. These travellers included the traders Robert Schoon and William McLuckie in August 1829. They were soon followed by the missionary Robert Moffat who visited Mzilikazi in an *umuzi* in 1829 near what is today Pretoria. In June 1835 Charles Bell and other members of Andrew Smith's expedition visited an Ndebele village near Rustenburg which Bell subsequently painted. One year later, in December 1836, Cornwallis Harris also visited the Central Bankeveld where he painted emHlalandlela near Madibeng (Brits) and the Project Area.

The Bankeveld was rich in fauna which attracted the Griqua and the first white hunters to the region. Ivory was plentiful, with herds of elephants roaming the area. Ivory and the skins of the wide variety of fauna were sought after as precious trade commodities. Although the Tswana hunted the fauna of the Bankeveld, they were more renowned as agriculturists and cattle herders than as hunters.

Complex causes led to the unfolding of the numerous Tswana chiefdoms and their spheres of influence throughout the Bankeveld during the last decades of the 18<sup>th</sup> century and during the first decades of the 19<sup>th</sup> century. These causes were multidimensional and included the ecological potential of the region, the social and



political formation and expansion of different spheres of influence, the establishment of short and long distance trade relations and local and regional wars.

### **8.4.3 Historical context**

Some of the earliest Voortrekkers who moved across the Magaliesberg in the early 19<sup>th</sup> century established themselves on the farms Kafferskraal and Witpensfontein (today Rustenburg) and Schaapkraal to the west of the Project Area. Since the second half of the 19<sup>th</sup> century, farmers and workers have occupied the Rustenburg District (including Mooinooi, Marikana, Hartebeespoort and Madibeng). Tobacco and citrus farming, as well as cattle herding, became a subsistence pattern that lasts to this day. Old farm homesteads, agricultural implements and infrastructure such as tobacco drying sheds still exist on farms in the larger area (Bergh 1992, Horn 1996).

During the Anglo Transvaal Boer War (AD1899-AD1902) British blockhouses were built along the ridge of the Magaliesburg, from Pretoria in the east to Rustenburg in the west. Several of these structures are located in Kommandonek and Pampoennek in the Magaliesberg, to the south of the Project Area.

After the discovery of the Merensky Reef in 1929, the economy of the area was gradually changed from farming into platinum and chrome mining. What started as small scale mining activities north of the Magaliesberg during the 20<sup>th</sup> century was soon eclipsed by the rise of the platinum mining complex near Rustenburg. The discovery of the Merensky Reef and the accompanying platinum boom was followed by the establishment of chrome and granite mines in the North-West. In the Madibeng area granite mining commence as early as 1960 and numerous quarries were established along the norite hills that run through the district.

### **8.5 Fieldwork survey**

The footprints for the proposed additional infrastructure were subjected to a pedestrian survey.



**Figures 6, 7 & 8- The construction of a Return Water Dam will occur in an area which has been intensely disturbed in the past and which is currently flooded with polluted water, therefore the intention to construct a new RWD (above, centre and below).**



**Figures 9 & 10- The construction of the Pollution Control Dam will occur in an area between a tailings dam and a dirt road. This area has partly been disturbed in the past. No heritage resources of significance occur on this piece of level turf veld (above and below).**





**Figures 11 & 12- The construction of the Waste Disposal Facility for the disposal of magnetite will occur next to the existing WDP. Although this area has not been disturbed in the past, no heritage resources of significance were observed on this piece of land (above and below).**



## **9 THE PHASE I HERITAGE IMPACT ASSESSMENT**

### **9.1 Types and ranges of heritage resources**

The Phase I HIA for the additional infrastructure for the Project Area revealed none of the types and ranges of heritage resources as outlined in Section 38 of the NHRA (No 25 of 1999).

(Heritage resources that were identified during an earlier heritage impact assessment study for the Vametco Project Area do not occur near the present Project Area and is not discussed in this report ([Pistorius 2012]. These heritage resources will also not be affected by the proposed new infrastructure and processes to be implemented at Evraz Vametco).

### **9.2 Possible impact on the heritage resources**

No heritage resources will be impacted by the proposed additional infrastructure.

### **9.3 The significance of the impact on the heritage resources**

The significance of any impact on any heritage resources is low (Table 1).

<b>Heritage resources</b>	<b>Probability of impact</b>	<b>Magnitude of impact</b>	<b>Duration of impact</b>	<b>Scale of impact</b>	<b>Significance points</b>	<b>Significance rating</b>
	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>Very low</b>

**Table 1- Significance of potential impacts on heritage resources in the Project Area (above).**

### **9.4 Mitigating and monitoring the heritage resources**

No mitigation measures are required as no heritage resources exist.

## 10 CONCLUSION AND RECOMMENDATIONS

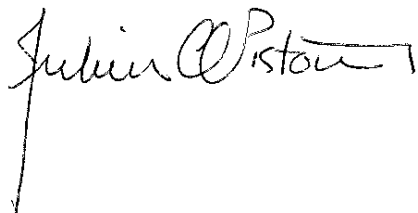
The Phase I HIA for the Project Area for the additional infrastructure revealed none of the types and ranges of heritage resources as outlined in Section 38 of the NHRA (No 25 of 1999).

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No heritage resources will be impacted by the proposed Project.

The significance of any impact on any heritage resources is low (Table 1).

No mitigation measures are required as no heritage resources exist.

A handwritten signature in black ink, appearing to read 'Julius CC Pistorius', with a long vertical line extending downwards from the end of the signature.

**Dr Julius CC Pistorius**

**Archaeologist & Heritage Consultant**

**Member ASAPA**



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