



PROVINCIAL HERITAGE RESOURCES AUTHORITY - GAUTENG

PRIVATE BAG X33, JOHANNESBURG, 2000
38 RISSIK STREET, NBS BUILDING,
JOHANNESBURG, 2000
TEL: 011 355 2500 – FAX: 011 355 2878

Ref.: H02/14

Enquiries: Ms Tebogo Molokomme

Date: 27 February 2014

Environmental Resources Management

Tel: 011 798 4300

E-mail: janet.mkhabela@erm.com

Dear Sir/Madam

**Draft Scoping Report for the proposed Acetylene Gas Production Facility,
Daleside, South Johannesburg, Gauteng**

This serves to confirm that the above-mentioned report was discussed by the PHRA-G Heritage Impact Assessment (HIA) Committee on Thursday, 27 February 2014.

After reviewing your application and the Committee has made the following recommendations:

- a) It was decided that, as per section 38 of the National Heritage Resources Act 25: 1999, a Heritage Impact Assessment (HIA) must be conducted which must amongst other things:
- clearly identify and map the heritage resources on the earmarked property/area.
 - give the historical background of the area.
 - show how the proposed work might have an impact on heritage resources
 - outline mitigation measures
 - give a report on the Public Participation process

b) Please note that the requested information will assist the Committee in making an informed decision.

Kind Regards 
Tebogo Molokomme

For the Heritage Impact Assessment (HIA) Committee
Provincial Heritage Resources Authority – Gauteng (PHRA-G)

**Environmental
Resources
Management**

1st Floor, Building 32
The Woodlands Office Park
Woodlands Drive, Woodmead
2148, Johannesburg, South Africa

Postnet Suite 624
Private Bag X29
Gallo Manor, 2052
Johannesburg, South Africa

Tel: +27 (0) 11 798 4300
Fax: +27 (0) 11 804 2289
www.erm.com



06 May 2014

Tebogo Molokomme
Heritage Officer
Provincial Heritage Resources Authority Gauteng
6th Floor NBS Building,
38 Rissik Street, Corner Market Street,
Johannesburg

**RE: Comment on the Proposed Acetylene Gas Production Facility,
Daleside, south of Johannesburg**

ERM Ref: 0220780
PHRA Ref: H02/14
GDARD Ref: Gaut:002/13-14/E0239

Dear Tebogo,

Your letter dated 27 February 2014 refers.

The Provincial Heritage Resources Authority Gauteng's request for completion of a Heritage Impact Assessment (HIA) in terms of Section 38 of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) has been acknowledged.

This letter serves to inform your Department of the compilation and submission of a Notice of Intent to Develop (NID) on the South African Heritage Resources Information System (SAHRIS) on 13 December 2013 (Case ID 4445). Please find proof of submission in *Annex A*. The complete NID and Heritage Statement has been appended to this letter as *Annex B*.

The South Africa Heritage Resources Agency (SAHRA) provided their Final Decision on 19 February 2014 (*Annex C*). SAHRA grants exemption from further heritage assessments, on condition that, if bedrock is to be affected by the proposed development, a palaeontological field assessment and protocol for finds must be conducted and submitted to SAHRA for comments prior to any development. Based on the above and attached annexures, it is understood that the request of your Department has therefore been satisfied.

Please do not hesitate to contact the undersigned, should you have any queries.

Yours sincerely,

Kasantha Moodley
Project Manager

Registered Office Address
Environmental Resources Management
Southern Africa (Pty) Ltd
1st Floor, Building 32
The Woodlands Office Park
Woodlands Drive, Woodmead
2148, Johannesburg, South Africa

Company Registration Number
2003/007404/07

Directors
Ian Bailey (UK) (Chairman)
Grant Bassingthwaite
Urmilla Bob (Non-Executive)
Jeremy Sobell
Tania Swanepoel
Bruce Walker (Managing)

**A member of the Environmental
Resources Management Group**

Annex A

Proof of NID Submission
on SAHRIS

The screenshot displays a web interface for 'Heritage Cases'. At the top left is a logo of a stylized animal head. The page title is 'ERM2556_PROPOSED ACETYLENE GAS PRODUCTION FACILITY'. Below the title are options to 'Add new comment', 'Subscribe to: This post', and '199 reads'. There are tabs for 'CaseHeader', 'LocationInfo', and 'Admin'. The main content area lists details: Status: Closed (Approved); Heritage Authority(s): SAHRA, PHRA-G; Case Type: Section 38 (8) - Statutory Comment Required; Development Type: Industrial - Light; Proposal Description: PROPOSED ACETYLENE GAS PRODUCTION FACILITY, LOCATED NEAR WTKOPDORP ON ERF 88 AND 89, DALESIDE, SOUTH OF JOHANNESBURG; Application Date: Friday, December 13, 2013 - 12:18; Case ID: 4445; Applicant: Air Products South Africa (Pty) Ltd; Consultant/Expert: Ksanthia Moodley; Other References: Heritage Reports: ERM2556_HERITAGE STATEMENT; Reference List: (empty). On the right, a table titled 'Official Decisions & Comments' shows a decision on 10/02/2014 with status 'Final Decision'. Below this are social media sharing icons for Facebook, Twitter, and Email, with a 'Tweet: 0' count and a 'Share' button. At the bottom left, an 'Additional Documents' section lists three PDF files: 1. ERM2556_MID.pdf, 2. SAHRA_BID_Comment.pdf, and 3. BID in English.pdf.

Heritage Cases

VIEW EDIT

ERM2556_PROPOSED ACETYLENE GAS PRODUCTION FACILITY

Add new comment Subscribe to: This post 199 reads

CaseHeader LocationInfo Admin

Status: Closed (Approved)

Heritage Authority(s): SAHRA
PHRA-G

Case Type: Section 38 (8) - Statutory Comment Required

Development Type: Industrial - Light

Proposal Description:
PROPOSED ACETYLENE GAS PRODUCTION FACILITY, LOCATED NEAR WTKOPDORP ON ERF 88 AND 89, DALESIDE, SOUTH OF JOHANNESBURG

Application Date: Friday, December 13, 2013 - 12:18

Case ID: 4445

Applicant(s): Air Products South Africa (Pty) Ltd

Consultant/Expert(s): Ksanthia Moodley

Other References:
Heritage Reports: ERM2556_HERITAGE STATEMENT

Reference List:

Date	DecStatus
10/02/2014	Final Decision

Share Tweet: 0 Share

Additional Documents

1. ERM2556_MID.pdf
2. SAHRA_BID_Comment.pdf
3. BID in English.pdf

Annex B

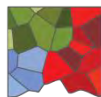
NID and Heritage Statement Report



**HERITAGE STATEMENT FOR A PROPOSED
ACETYLENE GAS PRODUCTION FACILITY,
LOCATED NEAR WITKOPDORP,
DALESIDE, SOUTH OF JOHANNESBURG**

ERM SOUTHERN AFRICA (PTY) LTD

13 DECEMBER 2013







DIGBY WELLS
ENVIRONMENTAL

This document has been prepared by **Digby Wells Environmental**.

Report Title: **Heritage Statement for a Proposed Acetylene Gas
Production Facility, located near Witkopdorp, Daleside,
south of Johannesburg**

Project Number: **ERM2556**

Name	Responsibility	Signature	Date
Shahzaadee Karodia Khan <i>Assistant Heritage Consultant: Palaeontological Specialist</i>	Specialist & Report Compiler		13 December 2013
Natasha Higgitt <i>Assistant Heritage Consultant</i>	Specialist & Report Compiler		13 December 2013
Justin du Piesanie <i>Heritage Consultant</i>	1 st Reviewer		13 December 2013
Johan Nel <i>Senior Heritage Consultant: HRM Unit Manager</i>	Project Manager		13 December 2013

This report is provided solely for the purposes set out in it and may not, in whole or in part, be used for any other purpose without Digby Wells Environmental prior written consent.



EXECUTIVE SUMMARY

Air Products South Africa (Pty) Ltd (Air Products) has commissioned Environmental Resources Management Southern Africa (Pty) Ltd (ERM) to conduct an Environmental Impact Assessment (EIA) and associated studies for the proposed acetylene gas production facility in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA). The proposed operation is referred to here as the project.

In order to comply with Section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA), a Heritage Statement Report (HSR) in support of a Notification of Intent to Develop (NID) was compiled detailing the current cultural landscape and possible sources of risk to cultural resources.

Air Products manufactures supplies and distributes a wide variety of industrial and speciality gas products and chemicals to the southern African region. In particular, Air Products are currently operating two acetylene gas production facilities. These existing facilities have been operational for more than 40 years in an area where encroachment by other industrial and residential dwellings has occurred over the years.

Air Products therefore intends to close down these existing acetylene production facilities and construct a new facility on a site that is positioned to have a reduced off-site risk to surrounding land-users.

The proposed acetylene gas production facility will produce acetylene gas from mixing raw calcium carbide with water. It is expected that the facility will produce a maximum of 14 400 m³ of acetylene gas per day.

Air Products has applied for an integrated Environmental Authorisation through an EIA in terms of the NEMA for the construction and operation of the proposed infrastructure:

The project area is situated in the Malmani Subgroup of the Chuniespoort Group of the Transvaal Supergroup. The Malmani Subgroup predominantly consists of dolomite and it is often known as the Malmani Dolomites formation.

The rocks of the Malmani Subgroup, which are of Precambrian age, are known to have extensive stromatolite fossils in the dolomite-rich stratigraphic units. Of particular importance are sinkholes and caves within the dolomitic units of the Malmani Subgroup that may contain sedimentary infill. In the Cradle of Humankind, these sedimentary infills have, over the years, yielded many important fossils such as the bones of animals and hominins.

The historical landscape was based on agriculture but the current landscape is primarily industrial and commercial with large parts having been altered through time by agriculture, industry and town development. Agricultural activities would have, over the years, destroyed most archaeological resources that may have been present. Industrial activities would further have destroyed any viable archaeological and palaeontology sites that may have existed pre-1999 and before the NHRA came into effect.

No heritage resources, including burial grounds or graves were identified within or near the project area; therefore there are no sources of risks associated with the project for heritage resources.

The first-hand results of the heritage screening assessment support the findings that no significant heritage resources exist. Digby Wells would recommend that no further heritage studies or mitigation measures are required.

Digby Wells thus proposes that a Letter for Exemption of further heritage studies/assessments with regards to the Proposed Acetylene Gas Production Facility be granted from the South African Heritage Resources Agency (SAHRA) and the Provincial Heritage Resources Authority - Gauteng (PHRA-G).

GLOSSARY OF ABBREVIATIONS AND TERMS

ASAPA	Association of Southern African Professional Archaeologists
EIA	Environmental Impact Assessment
HIA	Heritage Impact Assessment
HSS	Heritage Screening Survey
MLM	Midvaal Local Municipality
NEMA	National Environmental Management Act, 1998
NHRA	National Heritage Resources Act, 1999
PIA	Palaeontological Impact Assessment
PHRA-G	Provincial Heritage Resources Authority
SDM	Sedibeng District Municipality

TABLE OF CONTENTS

1	INTRODUCTION	1
2	BACKGROUND INFORMATION OF PROJECT	1
2.1	Project Details.....	1
2.2	Relevant Contact Details	3
3	TERMS OF REFERENCE	4
3.1	Legislative Framework	4
3.1.1	<i>National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA)</i>	4
3.1.2	<i>National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA)</i>	4
4	EXPERTISE OF THE SPECIALISTS	5
5	METHODOLOGY.....	5
5.1	Literature Review	5
5.2	Historical Layering	5
5.3	Heritage Screening Survey	5
5.4	Site Naming	6
5.4.1	<i>Confirmed Sites Identified During Desktop Study</i>	6
5.4.2	<i>Unconfirmed Sites Identified During Desktop Study</i>	6
6	STATE OF THE RECEIVING ENVIRONMENT/CULTURAL LANDSCAPE.....	6
6.1	General Description of the Affected Environment.....	6
6.1.1	<i>Location Data</i>	6
6.1.2	<i>Location Maps</i>	7
6.1.3	<i>Rezoning and / or Land Subdivision</i>	7
6.2	Literature Review	8
6.2.1	<i>Geology</i>	8
6.2.2	<i>Palaeontology</i>	8
6.2.3	<i>Stone Age</i>	8
6.2.4	<i>Iron Age</i>	9
6.2.5	<i>Historical Period</i>	10
6.3	Heritage Screening Survey Results	14

7	SOURCES OF RISK.....	17
8	DISCUSSION OF FINDINGS	17
9	RECOMMENDATIONS.....	18
10	REFERENCES	20

LIST OF FIGURES

Figure 6-1: Witkop Blockhouse (Photograph by N Higgitt, 2013)	11
Figure 6-2: An 1899 Jeppe Map of the Transvaal. Note the railway to the west of the project area... 12	12
Figure 6-3: First Edition Heidelberg (1900) Imperial Map. Note the expanded road networks. 12	12
Figure 6-4: A 1910 to 1911 map of Heidelberg Extension. Note the townships of Highbury, Henley on Klip and Meyerton as well as features such as schools, railway stations, bridges and stores..... 13	13
Figure 6-5: Historical 1938 aerial imagery of the project area. Note the main road to the east of the project area. The area lacks any major development. The only structures that can be seen are a few farmsteads to the north and north-east of the project area..... 13	13
Figure 6-6: Historical 1980 aerial image showing the project area and the construction of the house on Stand 89. Note the main road and railway to the east as well as the open pit. 14	14
Figure 6-7: Google Earth aerial image from 6/12/2006 showing the construction of the house on Stand 88. 14	14
Figure 6-8: Dilapidated structure on Stand 88 built between 2005 and 2006 (Photograph by N Higgitt, 2013)..... 15	15
Figure 6-9: Rubble dumping and foundations adjacent the structure on Stand 88. (Photograph by N Higgitt, 2013)..... 15	15
Figure 6-10: Main house on Stand 89 built in approximately 1980. (Photograph by N Higgitt, 2013).. 16	16
Figure 6-11: Adjacent outbuildings on Stand 89. (Photograph by N Higgitt, 2013)..... 16	16
Figure 6-12: Rear view of the house, lapa and pool identified on Stand 89. (Photograph by N Higgitt, 2013)..... 17	17

LIST OF TABLES

Table 2-1: Developer contact details	3
Table 2-2: Consultant contact details.....	3
Table 2-3: Specialist contact details	3
Table 2-4: Landowner contact details	4
Table 6-1: Location details for the project.....	6

LIST OF APPENDICES

Appendix A: Curriculum Vitae

Appendix B: Site list of Identified Heritage Resources in the Project and Study Areas

Appendix C: Location and Site Maps

Appendix D: Chance Find Procedures

1 INTRODUCTION

Air Products South Africa (Pty) Ltd (Air Products) has commissioned Environmental Resources Management Southern Africa (Pty) Ltd (ERM) to conduct an Environmental Impact Assessment (EIA) and associated studies for the proposed acetylene gas production facility in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA). The proposed operation is referred to here as the project.

ERM has subsequently appointed Digby Wells Environmental (Digby Wells) to complete the heritage component of the EIA in terms of Section 24(c) of the NEMA and Section 38 (8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA).

2 BACKGROUND INFORMATION OF PROJECT

2.1 Project Details

Air Products manufactures supplies and distributes a wide variety of industrial and speciality gas products and chemicals to the southern African region. In particular, Air Products are currently operating two acetylene gas production facilities. The development of the industrial area over time resulted in the encroachment on the existing facilities.

Air Products therefore intends to close down these existing acetylene production facilities and construct a new facility on a site that is positioned to have a reduced off-site risk to surrounding land-users.

The proposed acetylene gas production facility will produce acetylene gas from mixing raw calcium carbide with water. It is expected that the facility will produce a maximum of 14 400 m³ of acetylene gas per day.

A rotating screw conveyor will be used to feed calcium carbide granules (25 mm – 50 mm) into a reaction chamber which is filled with water. The feed rate of calcium carbide is determined by the withdraw rate of gas flow. The acetylene gas bubbles to the surface and is drawn off under low pressure. It is then cooled by passing through a heat exchanger where chilled water is used as the cooling medium. The acetylene gas then passes through a low pressure dryer where excess moisture is removed. The gas is then compressed to a pressure of 2 300 kPa before being filled into the cylinders which are stored on site prior to distribution.

A by-product of the production process is a slurry of calcium hydroxide (i.e. lime). This slurry is drained from the chamber and pumped into holding ponds where the calcium hydroxide settles out. Air Products intention is to sell this by-product for use in various markets (i.e. agriculture).

The proposed acetylene production facility will comprise the following components:

- Turn bins, used to store and feed the calcium carbide into the system;
- Generator tank where the reaction takes place to produce the acetylene gas;
- Ammonia scrubber to remove any particles of ammonia from the acetylene gas. This has been included in the facility design for quality control purposes;
- Chilled recycled water is used throughout the process of acetylene gas production;
- Dryer, use of silica gel to remove moisture from the gas process; and
- Compressor, used to compress the gas to an adequate pressure for filling into acetylene gas cylinders.

The reaction between calcium carbide and water produces an exothermic reaction and recycled water controls the gas temperature. Approximately 223 m³ of water will be consumed in a 24 hour shift, this is recycled process water. Water will be supplied via the Midvaal Local Municipality for domestic usage and as back up to the plant operation. The facility operation is designed to recycle 80% to 90% of water thus there is no water disposed of into stormwater drains. Furthermore, rainwater will also be harvested from surface water run-off and all roof drainage. This water will be stored and used as process or fire water.

It has been confirmed with Air Products that there will be no boilers or burners as part of the proposed facility. The proposed facility will also comprise storage vessels for the proposed site, which may be used as office space.

Access to the site is planned via Tillet Road which is an existing (dirt) road that will be re-surfaced with the appropriate aggregate for heavy duty vehicles that are expected to access and exit the proposed site. Furthermore, a ring road is also proposed around the facility to allow for effective movement of traffic around the facility (i.e. supplier and customer vehicles). The existing house and associated outbuildings located on Stand 89 will be kept intact and refurbished to serve as offices for the plant.

2.2 Relevant Contact Details

The contact details of the developer, consultant, specialist and landowner are provided in Table 2-1 to Table 2-4.

Table 2-1: Developer contact details

ITEM	COMPANY CONTACT DETAILS
Company	Air Products South Africa (Pty) Ltd
Contact person	Tom MacLean
Tel no	+27 11 570 5000
Fax no	+27 11 570 5294
Cell no	+27 82 566 6354
E-mail address	macleant@airproducts.co.za
Postal address	4 Spencer Road, Spartan Extension 1, Kempton Park, Johannesburg, 1620

Table 2-2: Consultant contact details

ITEM	COMPANY CONTACT DETAILS
Company	Environmental Resources Management Southern Africa (Pty) Ltd
Contact person	Kasantha Moodley
Tel no	011 798 4300
Fax no	011 804 2289
Cell no	082 290 1440
E-mail address	Kasantha.moodley@erm.com
Postal address	1 st Floor Building 32, The Woodlands Office Park, Woodlands Drive, Woodmead, 2148

Table 2-3: Specialist contact details

ITEM	COMPANY CONTACT DETAILS
Company	Digby Wells Environmental
Contact person	Johan Nel
Tel no	011 789 9495
Fax no	011 789 9498
Cell no	072 288 5496
E-mail address	Johan.nel@digbywells.com
Postal address	Private Bag X10046, Randburg, 2125

Table 2-4: Landowner contact details

ITEM	CONTACT DETAILS
Title Deed Owner	Air Products South Africa (Pty) Ltd
Contact person	Tom MacLean
Tel no	011 798 4300
Cell no	082 290 1440
Postal address	4 Spencer Road, Spartan Extension 1, Kempton Park, Johannesburg

3 TERMS OF REFERENCE

ERM requested Digby Wells to complete a Heritage Statement in support of a NID that will be incorporated into environmental assessment reports for the environmental authorisation of the project in accordance with Section 2 (4) a; 24 (1) c and 24 (7) b of the NEMA and Section 38 of the NHRA.

In addition, the NHRA legislative framework as well as other relevant legislation and best practice were considered. The various legislation and standards are discussed below.

3.1 Legislative Framework

3.1.1 National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA)

The NEMA stipulated 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. Section 24 (1) states that in the potential impact on (a) the environment, (b) socio-economic conditions; and (c) the cultural heritage must be considered, investigated and assessed prior to any activities that require authorisation or permission by law.

3.1.2 National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA)

Section 38(8) - The provisions of this section do not apply to a development as described in subsection (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) (*replaced by NEMA*), 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) (*replaced by the Minerals and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)*), or any other legislation: Provided that the consenting authority must ensure 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.

4 EXPERTISE OF THE SPECIALISTS

Shahzaadee Karodia Khan has completed a Bachelor of Arts (BA) degree in Archaeology and Anthropology, a Bachelor of Science (BSc) Honours degree in Palaeontology, and a Master of Science (MSc) degree in Archaeology at the University of the Witwatersrand (WITS). Mrs Khan currently holds the position of Assistant Heritage Consultant and Palaeontological Specialist at Digby Wells.

Natasha Higgitt has completed a BA Honours degree in Archaeology at the University of Pretoria. She currently holds the position of Assistant Heritage Consultant at Digby Wells, where she has worked for over two years with experience in HIA's in Limpopo and Mpumalanga. She has experience in international heritage and social projects in Liberia.

Justin du Piesanie has completed an MSc degree in Archaeology at the University of the Witwatersrand. Mr du Piesanie currently holds the position of Heritage Consultant at Digby Wells.

All of the above specialists are members of the Association of Southern African Professional Archaeologists (ASAPA) and all have Cultural Resources Management Accreditation Status. The curriculum vitae of the specialists are presented in Appendix A.

5 METHODOLOGY

5.1 Literature Review

Relevant and available published works such as academic journals, academic books, unpublished theses and reports, previous palaeontological and heritage assessments, and websites were reviewed.

5.2 Historical Layering

A review of historical maps such as the Major Jackson Series (MJS) and the Jeppes Collection maps, previous 1:50 000 topographical maps and aerial imagery was completed. Aerial imagery was overlaid to assess the changes in the receiving environment over time. Published geological maps and the new PalaeoSensitivity Map courtesy of the Council of Geoscience and available on the South African Heritage Resources Information System (SAHRIS) website were also assessed.

5.3 Heritage Screening Survey

A Heritage Screening Survey (HSS) was conducted for the project on 28th November 2013 on the directly affected stands in the project area. The aim of the HSS was to identify and record heritage resources on the site. The results of the HSS are discussed in Section 6.3 of this Heritage Statement.

5.4 Site Naming

All sites in the study area identified as part of the desktop study are presented in Appendix B.

5.4.1 Confirmed Sites Identified During Desktop Study

Sites may be identified based on previous relevant reports. The site names and / or numbering that were used in the original reports will be used but prefixed with the relevant SAHRA report number if available followed by reference to the relevant NHRA section. For example, a heritage resources identified by Roodt (1999) described as an archaeological site and numbered Site 1 in that report will be:

1999-SAHRA-0021/S.35-1

If the relevant report does not have a SAHRA report number, then the site names and / or numbering that were used in the original reports will be used, but prefixed with the relevant author followed by reference to the relevant NHRA section. For example, a heritage resource identified by Van Schalkwyk (2007) and described as an archaeological site and numbered '1' in that report will be:

Van Schalkwyk-2007/S.35-1

5.4.2 Unconfirmed Sites Identified During Desktop Study

Potential sites not previously identified but noted as a result of historical layering, desktop studies or through indicators such as vegetation, were names using the Digby Wells project number, followed by the map sheet number and reference to the relevant NHRA section suffixed with the site number:

ERM2556/2628CA/S.35-001

6 STATE OF THE RECEIVING ENVIRONMENT/CULTURAL LANDSCAPE

6.1 General Description of the Affected Environment

6.1.1 Location Data

The project falls under the jurisdiction of the Midvaal Local Municipality (MLM) and is situated in the Sedibeng District Municipality (SDM) of Gauteng. The towns are Daleside, Witkopdorp and Johannesburg. Detailed location data are provided in Table 6-1.

Table 6-1: Location details for the project

Province	Gauteng Province
Magisterial district	Midvaal Magisterial District

District municipality	Sedibeng District Municipality
Local municipality	Midvaal Local Municipality
Nearest town	Daleside
1:50 000 topographical map	2628CA Meyerton
Relative centre coordinates of project area	Latitude: -26.506757 Longitude: 28.053026
Recording method	Google Earth

The facility is proposed to be built on Stand 88 and 89 of Valley Settlements Agricultural Holdings, Witkopdorp, Daleside, south of Johannesburg. The land is bound by Tillet Road to the east, a manufacturing facility to the north, vacant and undeveloped land to the west and construction equipment maintenance and storage facility to the south.

The new proposed facility will be constructed in the centre of the two properties, which have been bought by Air Products. The proposed site selected for the facility is considered suitable in terms of space available as well as the surrounding land-use which is primarily commercial and light industrial use.

6.1.2 Location Maps

The regional settings of the project area are depicted in Plan 1, Plan 2 and Plan 3 in Appendix C.

6.1.2.1 Site Maps

The following site maps are available in Appendix C:

- Plan 4: Geological setting of the project area;
- Plan 5: Identified heritage resources in the project and study areas 1:50 000; and
- Plan 6: Infrastructure layout of the Proposed Acetylene Gas Production Facility
- Plan 7: Heritage Screening Survey

6.1.3 Rezoning and / or Land Subdivision

The project area will not require rezoning as the proposed site is largely undeveloped (one vacant residence only) and is currently zoned for industrial 3 purposes.

6.2 Literature Review

6.2.1 Geology

The project area is situated in the Malmani Subgroup of the Chuniespoort Group of the Transvaal Supergroup. The Transvaal Supergroup is an extensive geological sedimentary rock sequence extending across much of the northern part of South Africa and into Botswana (Eriksson & Altermann, 1998). The rocks of the Malmani Subgroup were formed in the Precambrian age between 2.6 and 2.5 billion years ago, making these rocks one of the oldest formations known.

The Malmani Subgroup predominantly consists of dolomite and it is often known as the Malmani Dolomites formation. Dolomite is a type of limestone rock that forms in warm, shallow seas from the slow accumulation of the remains of marine micro-organisms and fine-grained sediment. The dolomites are characterised by fossils of algae formations that are known as stromatolites that contain high levels of calcium carbonate.

Over long periods of time, ground water erodes away the calcium carbonate matrix found within the dolomite layers which results in the occurrence of underground solution cavities. When the cavities break through to the surface due to erosion or collapse, they form sinkholes and caves. Once the sinkhole or cave is exposed to the surface, it will begin to fill in with sediment and if occupied by carnivores, the infill will include animal bones.

6.2.2 Palaeontology

The rocks of the Malmani Subgroup, which are of Precambrian age, are known to have extensive stromatolite fossils in the dolomite-rich stratigraphic units. Of particular importance are sinkholes and caves within the dolomitic units of the Malmani Subgroup that may contain sedimentary infill. In the Cradle of Humankind, these sedimentary infills have, over the years, yielded many important fossils such as the bones of animals and hominins.

The fossil heritage potential of the geology corresponds with the PalaeoSensitivity Map which indicated that the area has very high sensitivity (based on the occurrence of dolomite rocks).

A Palaeontological Impact Assessment (PIA) for the installation of a water pipeline at Kliprivier was conducted by Rubidge (2008) approximately 10 km north of the project area. During the PIA, no Quaternary sinkhole and cave infill deposits were found (Rubidge, 2008). In addition, the rock outcrops of the Transvaal Supergroup were also surveyed however at most places these outcrops were covered by thick soil and scree deposits (Rubidge, 2008). No fossils were found at the outcrops.

Satellite imagery surveys of the project area showed that the area has been disturbed by development and industrial and commercial activities. No outcrops were observed.

6.2.3 Stone Age

The Stone Age is divided into the following:

- Early Stone Age (ESA) - 2.5 million years ago (mya) to about 250 000 years ago;
- Middle Stone Age (MSA) - 250 000 years ago to 22 000 years Before Present (BP); and
- Later Stone Age (LSA) - 22 000 BP to the period of contact with either Iron Age farmers or European colonialists.

The Stone Age is fairly well researched and understood in southern Africa. Within the study area, there have been numerous HIAs and Archaeological Impact Assessments (AIAs) completed in which a number of Stone Age sites have been recorded (Huffman, 2007a; Huffman, 2007b; Huffman, 2008; Huffman & Schoeman, 2004; Huffman, et al., 1991; Van Schalkwyk, 2007). ESA artefacts that may occur include cores, flakes and bifaces made from quartzite and dolerite and are scattered along hillsides or found in quarries and along roads (Huffman, et al., 1991). MSA artefacts such as prepared cores and triangular flakes can also be found in scatters along hillsides, quarries, roads and dolerite outcrops (Huffman, 2007a; Huffman, et al., 1991). At the closest identified site, approximately 8 km north-west of the project area, various Oakhurst (about 14 000 years ago) flakes were identified and recorded in a quarry (Huffman, 2008).

Stone Age sites may therefore occur all over the area however an unknown number may have been obliterated by mining activities, urbanization, industrialization, agriculture and other development activities during the past decade.

6.2.4 Iron Age

The Iron Age as a whole represents the spread of Bantu-speaking people and includes both the pre-historic and historic periods. Similar to the Stone Age, it can be divided into three periods:

- The Early Iron Age: Most of the 1st millennium Common Era (CE);
- The Middle Iron Age: 10th century to 13th century CE; and
- The Late Iron Age: 14th century CE to colonial period.

In the northern regions of South Africa, at least three settlement phases have been distinguished for early pre-historic agropastoralists settlements during the Early Iron Age. Diagnostic pottery assemblages can be used to infer group identities and to trace movements across the landscape. The first phase of the Early Iron Age, known as *Happy Rest* is representative of the Western Stream of migrations and dates from 400 CE to 600 CE. The second phase is known as *Diamant* and dates from 600 CE to 900 CE. The third phase is characterised by herringbone-decorated pottery of the *Eiland* facies and dates from 900 CE to 1 200 CE. This phase is regarded as the final expression of the Early Iron Age and occurs over large parts of the North West Province, the Northern Province, Gauteng and Mpumalanga.

Late Iron Age settlements are characterised by stonewalled enclosures situated on defensive hilltops. This occupation phase has been linked to the arrival of the ancestral

Northern Sotho, Tswana and Southern Ndebele (Nguni-speakers) in the northern and Waterberg regions and dates from 1640 to 1830. The end of the Late Iron Age is represented by the 18th and 19th century settlements with multichrome *Moloko* pottery commonly attributed to the Sotho-Tswana. The Late Iron Age settlements can, in many instances, be correlated with oral traditions on population movements in southern Africa resulting from the Difaqane (also known as the Mfecane).

In the study area, only one Iron Age settlement was previously identified and recorded. This Late Iron Age stonewalled settlement, recorded by Huffman (Huffman, 2008), is located approximately 9 km north-west of the project area. The settlement has Klipriviersberg stonewalling and consists of four homesteads with each unit equipped with its own central kraal areas surrounded by a residential zone (Huffman, 2008). Pottery belonging to the *Uitkomst facies* was found indicating that the site dates to the 1800s.

6.2.5 Historical Period

The historical period is associated with the first European and Voortrekker settlers moving into the area. These included travellers, missionaries and farmers. This is the time when the first historical documents were produced and oral histories recorded.

Today, common historical structures associated with the arrival of the European and Voortrekker travellers include historical homesteads and buildings. Many of these structures can be found across the landscape. For example, in the Klipriviersberg Nature and Archaeological Reserve which is situated approximately 26 km north of the project area, there is a historical homestead that was built in about 1850 by Sarel Marais who was one of the early Voortrekkers. Marais and his family settled just above the Bloubosspruit in the southern part of the Reserve. He built five structures characterizing a typical 1850s farmstead: a farmhouse, a waenhuis or wagonhouse, an orchard, an irrigation furrow and a cemetery (Pelser & van Vollenhoven, 2009).

Other homesteads in the area that date to the 19th century belonged to the 'bywoners' or poor whites, and then to black people in the 1930s and 1940s (Huffman, et al., 1991). These bywoner settlements typically consist of stonewalling, foundations and middens.

When gold was discovered in the Witwatersrand, hostilities between the Boers and British emerged, with the latter seeking control. In 1899, the First Anglo-Boer War (also known as the South African War) broke out. In an attempt to fortify their strongholds, the British built a number of forts, blockhouses and trenches at strategic points across the landscape. Today, numerous blockhouses can still be seen such as the remains of the British 'Witkop Blockhouse' next to the railroad link between Kliprivier and Daleside approximately 4 km north of the project area (Huffman, 2008) (See Figure 6-1). The British also burnt down many Boer homesteads in this area in about 1902 (Huffman, et al., 1991). Remnants of this aspect of the historical landscape may include graves, battlefields, historical homestead complexes and the remains thereof, as well as subsurface evidence such as middens (Huffman, 2007a; Huffman, 2007b; Huffman, 2008; Huffman & Schoeman, 2004; Huffman, et al., 1991; Van Schalkwyk, 2007).



Figure 6-1: Witkop Blockhouse (Photograph by N Higgitt, 2013)

6.2.5.1 Historical Layering

The Jeppe's Map of the Transvaal (1899), depicted in Figure 6-2 showed that farms were demarcated. The map also indicates that there is a railway line to the west of the project area. The Station Kliprivier lies to the north of the project area. The town of Meyerton is also indicated on the map. These features reflect human settlement and industrial activity in the area.

The first edition of the Heidelberg Imperial Map (1900), depicted in Figure 6-3, illustrates a significant expansion of road networks when compared to the 1899 Jeppe's map.

The 1910 edition of the Heidelberg Transvaal and Orange Free State Map, depicted in Figure 6-4, illustrates a significant expansion of commercial areas when compared to the 1899 Jeppe's map. By 1911, Highbury, Henley on Klip and Meyerton were all relatively important nodes. The importance of these townships is notable based on several features on the map such as the school, railway station, bridges and stores.

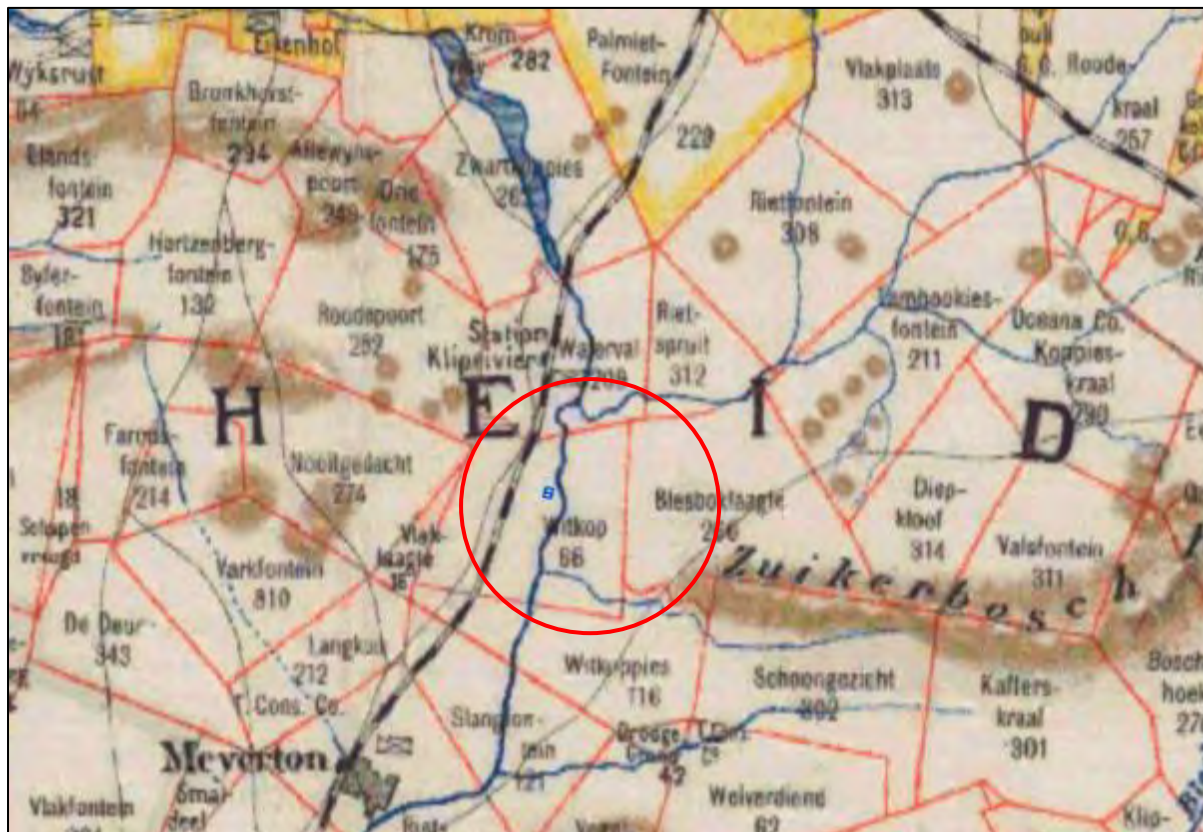


Figure 6-2: An 1899 Jeppe Map of the Transvaal. Note the railway to the west of the project area.

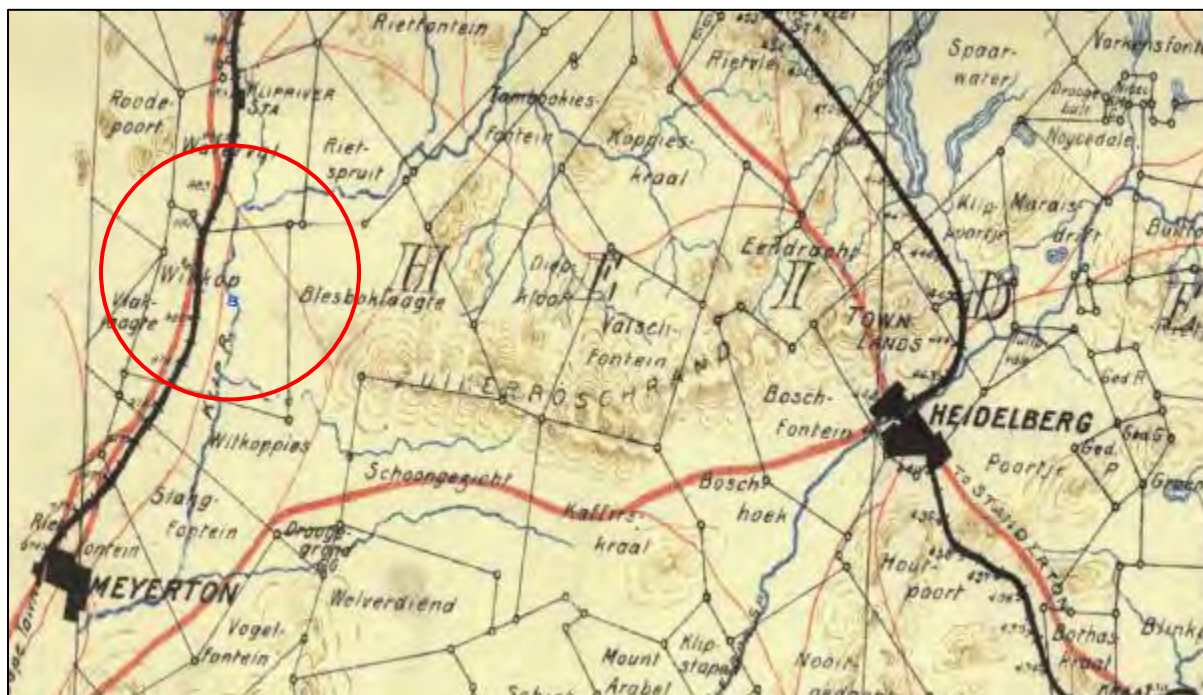


Figure 6-3: First Edition Heidelberg (1900) Imperial Map. Note the expanded road networks.



Figure 6-4: A 1910 to 1911 map of Heidelberg Extension. Note the townships of Highbury, Henley on Klip and Meyerton as well as features such as schools, railway stations, bridges and stores.

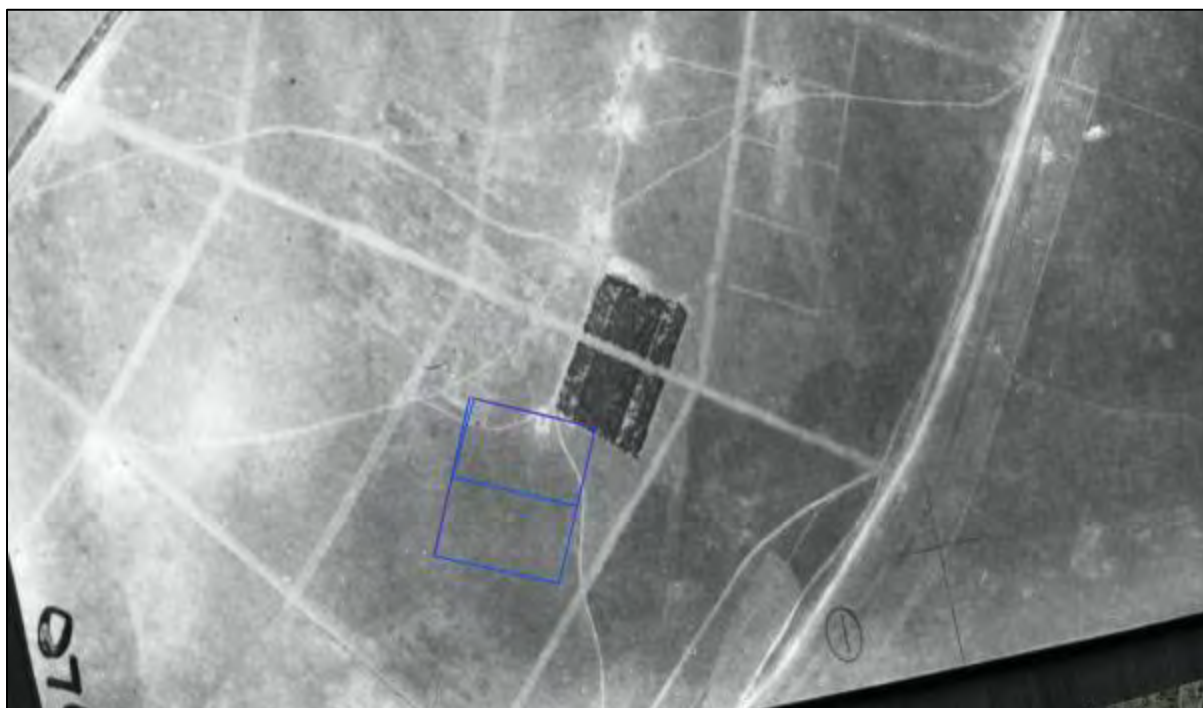


Figure 6-5: Historical 1938 aerial imagery of the project area. Note the main road to the east of the project area. The area lacks any major development. The only structures that can be seen are a few farmsteads to the north and north-east of the project area.



Figure 6-6: Historical 1980 aerial image showing the project area and the construction of the house on Stand 89. Note the main road and railway to the east as well as the open pit.



Figure 6-7: Google Earth aerial image from 6/12/2006 showing the construction of the house on Stand 88.

6.3 Heritage Screening Survey Results

A HSS was completed on the 28 November 2013 and the project area was visited and recorded by use of photographs and a GPS track log.

The structure on Stand 88, built between 2005 and 2006 is dilapidated and in ruin (Figure 6-8). The structure is constructed from modern bricks with electrical wiring and plumbing. Dumping of rubble and construction debris is evident on the plot (Figure 6-9).



Figure 6-8: Dilapidated structure on Stand 88 built between 2005 and 2006 (Photograph by N Higgitt, 2013)



Figure 6-9: Rubble dumping and foundations adjacent the structure on Stand 88. (Photograph by N Higgitt, 2013)

The house on Stand 89, built in approximately 1980 is currently vacant, but is still structurally sound and maintained (See Figure 6-10). The main house is accompanied by two smaller outbuildings, a pool and lapa (See Figure 6-11 and Figure 6-12). The main house has been remodelled and refurbished numerous times, and has had additional rooms added to the structure.



Figure 6-10: Main house on Stand 89 built in approximately 1980. (Photograph by N Higgitt, 2013)



Figure 6-11: Adjacent outbuildings on Stand 89. (Photograph by N Higgitt, 2013)



Figure 6-12: Rear view of the house, lapa and pool identified on Stand 89. (Photograph by N Higgitt, 2013)

7 SOURCES OF RISK

No heritage resources, inclusive of burial sites, surface archaeological artefacts or historical remains were identified within the project area; therefore no sources of risks to heritage resources have been identified.

8 DISCUSSION OF FINDINGS

The current cultural landscape was agricultural but today it is primarily industrial and commercial with large parts having been altered by agriculture, industry and town development. Land use in the project area has changed from agriculture to dense suburban residential development and industrial development during the past 50 years. The likelihood of any significant in situ archaeological, historical and palaeontological resources occurring is thus minimal.

The PalaeoSensitivity Map indicates that the area has a very high sensitivity (based on the occurrence of sedimentary rocks). During the HSS, no Quaternary sinkhole and cave infill deposits were found. In addition, the rock outcrops were also surveyed however at most places these outcrops were covered by thick soil and scree deposits. No fossils were found

at the outcrops. It is therefore unlikely that construction activities will impact on fossils that may exist on the surface.

Fossils can occur underground, especially in coal fields, however it is not possible to predict the buried fossil content of an area other than in general terms. Furthermore, the fossil plants associated with the underground coal seams will be poorly preserved and the most important fossil bone material is generally sparsely scattered in most deposits.

Agricultural activities in the past would have destroyed most archaeological resources that may have been present. Industrial activities would further have destroyed any viable archaeological and palaeontology sites that may have existed pre-1999 and before the NHRA came into effect. The main house on Stand 89 was built in approximately 1980 according to aerial imagery. This house has been changed and added to over the years and is now standing vacant. The structure on Stand 88 was built between 2005 and 2006, and is currently in ruins. Both of identified structures and erfs are not older than 60 years and are not in good condition therefore their heritage value is of negligible significance.

As the affected area has been disturbed by previous agricultural, industrial and commercial activities, it is unlikely that the project will impact on any palaeontological heritage. There are no outcrops of fossil-bearing rocks of the Malmani Dolomite Subgroup in the project area and therefore the construction of the acetylene gas production facility will not affect any palaeontological heritage. In addition, it is unlikely that there will be any Quaternary sinkhole or cave deposits that may be affected in the area.

A review of heritage reports relevant to the study area further indicated that typical heritage resources occurring in the region are archaeological sites with relatively low significance and historical structures and burial grounds with medium to high significance.

9 RECOMMENDATIONS

The first-hand results of the HSS support the findings that no significant heritage resources exist. It is therefore recommended that the proposed project be wholly exempted from a HIA including components such as:

- Built Environment Assessment;
- Archaeological Impact Assessment;
- Phase 1 Palaeontological Assessment;
- Burial Grounds and Graves Assessment; and
- Visual Impact Assessment.

In the event that any heritage resources are identified, Chance Finds Procedures (See Appendix D) should be implemented and SAHRA should be alerted as soon as possible so that appropriate action can be taken by a professional archaeologist/palaeontologist.

Heritage Statement for a Proposed Acetylene Gas Production Facility,
located near Witkopdorp, Daleside, south of Johannesburg

ERM2556



Digby Wells thus proposes that a Letter for Exemption of further heritage studies/assessments with regards to the Proposed Acetylene Gas Production Facility be granted from SAHRA and the PHRA-G.

10 REFERENCES

- Eriksson, P. G. & Altermann, W., 1998. An overview of the geology of the Transvaal Supergroup dolomites (South Africa). *Environmental Geology*, Volume 36, pp. 1 - 2.
- Huffman, T. N., 2007a. *Montebelo Development, Gauteng: archaeological and historical survey*, Johannesburg: Archaeological Resources Management.
- Huffman, T. N., 2007b. *Woodacres Equestrian Estate, Gauteng: archaeological and historical survey*, Johannesburg: Archaeological Resources Management.
- Huffman, T. N., 2008. *Mountain View heritage assessment, Gauteng*, Johannesburg: Archaeological Resources Management.
- Huffman, T. N., Kruger, G., Steel, R. & Hall, S. L., 1991. *PWV - 18 Archaeological Impact Report*, Johannesburg: University of the Witwatersrand.
- Huffman, T. N. & Schoeman, M. H., 2004. *Eye of Africa Project: archaeological survey*, Johannesburg: Archaeological Resources Management.
- Pelser, A. J. & van Vollenhoven, A. C., 2009. *A report on a Heritage Impact Assessment study for the powerline from Glockner-Kookfontein substations Vereeniging, Gauteng*, Pretoria: Archaetnos.
- Rubidge, B., 2008. *Installation of water pipeline at Kliprivier - Palaeontological Impact Assessment*, Johannesburg: Bernard Price Institute for Palaeontological Research.
- Van Schalkwyk, J. A., 2007. *Heritage Impact Assessment for the planned development on the farm Doornkuil 369 IQ, Vereeniging Municipal District, Gauteng Province*, Pretoria: National Cultural History Museum.

Heritage Statement for a Proposed Acetylene Gas Production Facility,
located near Witkopdorp, Daleside, south of Johannesburg

ERM2556



Appendix A: Curriculum Vitae



DIGBY WELLS
ENVIRONMENTAL

SHAHZAADEE KARODIA KHAN

Mrs Shahzaadee Karodia Khan

Assistant Heritage Consultant: Palaeontological Specialist

Social Science Department

Digby Wells Environmental

1 EDUCATION

- 2006 BA Anthropology & Archaeology, University of the Witwatersrand
- 2007 BSc Honours. Palaeontology, University of the Witwatersrand
 - Courses included: comparative vertebrate anatomy; cladistics analysis; primate and human evolution; Karoo biostratigraphy; dinosaurs and the origins of birds; Cenozoic mammals; taphonomy; and palaeoecology
 - Honours Thesis: "Encephalization and its relationship to orbit size in modern humans and a small bodied population from Palau, Micronesia".
- 2012 MSc Archaeology, University of the Witwatersrand
 - MSc Thesis: "Naturally mummified human remains from Historic Cave, Limpopo, South Africa".
 - Skills obtained during MSc included: stereo microscopy; light microscopy; scanning electron microscopy; and histology

2 LANGUAGE SKILLS

- English (read, write, speak)
- Currently completing French training for beginners

3 EMPLOYMENT

2012:	Archaeology consultant, Digby Wells Environmental
April 2012 – June 2012:	External archaeology research consultant, EcoAfrica
April 2011 – November 2011:	Archaeology intern, University of Pretoria
2007 – 2008:	Palaeontology collections assistant, BPI University of the Witwatersrand
2006 – 2007:	Tour guide, Sterkfontein Caves

4 EXPERIENCE

- Archaeology Field School in Klipriviersberg with Dr Karim Sadr, University of the Witwatersrand
- Archaeology Field School in Swartkrans and Maropeng with Dr Kathy Kuman, University of the Witwatersrand
- Archaeology Field School in Ottosdaal with Dr Thembi Russell, University of the Witwatersrand
- Palaeontology Field School in the Karoo with Professor Bruce Rubidge, University of the Witwatersrand
- Palaeontology Field School in Gladysvale with Professor Lee Berger, University of the Witwatersrand
- Palaeontology Field School in Wonderkrater with Dr Lucinda Backwell, University of the Witwatersrand



5 PROJECT EXPERIENCE

Project Title	Client	Role
Heritage Statement for the Central Basin, Witwatersrand AMD Project	AECOM	Heritage Specialist & Report Writer
Heritage Impact Assessment for the Witwatersrand Gold Fields Acid Mine Drainage Project (Western Basin)	AECOM	Heritage Specialist & Report Writer
Heritage Statement for the Dalyshope Project: Phase 1 NEMA Application, Lephalale, Limpopo Province	Anglo American Thermal Coal	Heritage Specialist & Report Writer
Archaeological Watching Brief on Access Road	Bokoni Platinum Mine	Heritage Specialist & Report Writer
Heritage Impact Assessment for the Proposed Bokoni Klipfontein Opencast Mine Project, Klipfontein 465 KS, Sekhukhune, Limpopo Province	Bokoni Platinum Mine	Heritage Specialist & Report Writer
Heritage Statement for Rhodium Reef Limited Platinum Operation, Limpopo Province	EastPlats Group	Palaeontological Specialist
Heritage Screening Assessment for the Kangra Coal Project	ERM	Palaeontological Specialist
Heritage Impact Assessment for the Kangra Coal Project	ERM	Heritage Specialist & Report Writer
Heritage Statement for the Thabametsi Project, Lephalale, Limpopo Province	Exxaro Coal	Heritage Specialist & Report Writer
Heritage Impact Assessment for the Proposed Thabametsi Project, Lephalale, Limpopo Province	Exxaro Coal	Heritage Specialist & Report Writer
Heritage Statement for Eskom Transmission Division – Roodepoort Strengthening Project	Fourth Element	Heritage Specialist & Report Writer



Project Title	Client	Role
Phase 1 Heritage Impact Assessment of the Proposed Geluksdal Tailings Storage Facility and Pipeline	Gold One International Limited	Heritage Specialist & Report Writer
Heritage Statement Report for the Kosmosdal Sewer Pipe Bridge Upgrade	Iliso Consulting	Palaeontological Specialist
Heritage Statement Report for the Wilgespruit Bridge Upgrade	Iliso Consulting	Palaeontological Specialist
Heritage Statement for Atcom And Tweefontein Dragline Relocation Project	Jones and Wagener Consulting Civil Engineers	Palaeontological Specialist
Heritage Statement for the Consbrey Colliery	Msobo Coal	Heritage Specialist & Report Writer
Heritage Statement for the Harwar Colliery	Msobo Coal	Heritage Specialist & Report Writer
Heritage Impact Assessment for the Consbrey Colliery Project, Mpumalanga Province	Msobo Coal	Palaeontological Specialist
Heritage Impact Assessment for the Harwar Colliery Project, Mpumalanga Province	Msobo Coal	Heritage Specialist & Report Writer
Heritage Statement for the Waterberg Prospecting Rights Application, Blouberg, Limpopo Province	Platinum Group Metals	Heritage Specialist & Report Writer
Heritage Statement for the Platreef Platinum Project, Mokopane, Limpopo Province	Platreef Resources	Heritage Specialist & Report Writer
Heritage Statement for the Rhodium Reef Limited Platinum Operation, Limpopo Province	Rhodium Reefs	Palaeontological Specialist
Heritage Statement for the Vedanta IPP Project, Lephalale, Limpopo Province	Vedanta Zinc International	Heritage Specialist & Report Writer

Project Title	Client	Role
Heritage Statement for the Zandbaken Coal Mine Project, Standerton, Mpumalanga Province	Xstrata Coal South Africa	Heritage Specialist & Report Writer

6 PROFESSIONAL AFFILIATIONS

- Association of Southern African Professional Archaeologists (ASAPA)
- Geological Survey of South Africa (GSSA)
- Golden Key Society
- Palaeontological Society of Southern Africa (PSSA)
- South African Archaeology Society (SAAS)
- Society of Africanist Archaeologists (SAfA)
- South African Society for Amateur Palaeontologists (SASAP)



DIGBY WELLS
ENVIRONMENTAL

NATASHA HIGGITT

Ms Natasha Higgitt
Archaeology Consultant
Social Department
Digby Wells Environmental

1 EDUCATION

- University of Pretoria
- BA Degree (2008)
- Archaeology Honours (2009)
- Title of Dissertation- Pass the Salt: An Archaeological analysis of lithics and ceramics from Salt Pan Ledge, Soutpansberg, for evidence of salt working and interaction.

2 LANGUAGE SKILLS

- English - Excellent (read, write and speak)
- Afrikaans - Fair (read, write and speak)
- Italian – Poor (Speaking only)

3 EMPLOYMENT

- July 2011 to Present: Archaeology Consultant at Digby Wells Environmental
- April 2011 to June 2011: Lab assistant at the Albany Museum Archaeology Department, Grahamstown, Eastern Cape
- April 2010 to March 2011: Intern at the Archaeology Department, Albany Museum, Grahamstown, Eastern Cape under the Department of Sports, Recreation, Arts and Culture, Eastern Cape Government, South Africa (DSRAC)

4 EXPERIENCE

- Human remains rescue excavation at St Francis Bay, Eastern Cape
- Human remains rescue excavation at Wolwefontein, Eastern Cape

Digby Wells & Associates (Pty) Ltd. Co. Reg. No. 1999/05985/07. Fern Isle, Section 10, 359 Pretoria Ave Randburg Private Bag X10046, Randburg, 2125, South Africa

Tel: +27 11 789 9495, Fax: +27 11 789 9498, info@digbywells.com, www.digbywells.com

Directors: A Sing*, AR Wilke, LF Koeslag, PD Tanner (British)*, AJ Reynolds (Chairman) (British)*, J Leaver*, GE Trusler (C.E.O)

*Non-Executive



- Recorded two rock art sites at Blaauwbosch Private Game Reserve, Eastern Cape
- Attended a 2 week excavation/study tour in the Friuli Region in Italy, organised by the *Società Friulana di Archeologia*, sponsored by *Ente Friuli nel Mondo*, and excavated a 12th century medieval castle
- Attended a 2 week excavation in Limpopo, Waterpoort Archaeological Project organised by Xander Antonites (Yale PhD Candidate)
- A total of 5 University of Pretoria Archaeology field schools in Limpopo and Gauteng spanning over 4 years

5 PROJECT EXPERIENCE

- Phase 1 Heritage Impact Assessment for the Thabametsi Coal Mine, Lephalale, Limpopo for Exxaro Coal (Digby Wells Environmental)
- Heritage Statement for the Zandbaken Coal Mine Project, Zandbaken 585 IR, Sandbaken 363 IR and Bosmans Spruit 364 IS, Standerton, Mpumalanga for Xtrata Coal South Africa (Digby Wells Environmental)
- Phase 1 Heritage Impact Assessment for the Brakfontein Thermal Coal Mine, Mpumalanga for Universal Coal (Digby Wells Environmental)
- Development of a RAP for Aureus Mining for the New Liberty Gold Mine Project, Liberia (Digby Wells Environmental)
- Phase 1 Archaeological Impact Assessment for the MBET Pipeline, Steenbokpan, Limpopo (Digby Wells Environmental)
- Notice of Intent to Develop and Cultural Resources Pre-Assessment for Orlight SA (PTY) Ltd Solar PV Project. 2012. (Digby Wells Environmental)
- Agricultural Survey for Platreef ESIA, Mokopane, Limpopo. 2011. (Digby Wells Environmental)
- Cultural Resources Pre-Assessment for the Proposed Sylvania Everest North Mining Development in Mpumalanga, near Lydenburg. 2011. (Digby Wells Environmental)
- Phase 2 Mitigation of Archaeological sites at Boikarabelo Coal Mine, Steenbokpan, Limpopo. 2011. (Digby Wells Environmental)
- Cultural Resources Pre-Assessment for Proposed Platinum Mine Prospecting in Mpumalanga, near Bethal for Anglo Platinum. 2011. (Digby Wells Environmental)
- Cultural Resources Pre-Assessment for proposed Platinum Mine at Mokopane, Limpopo for Ivanhoe Platinum. 2011. (Digby Wells Environmental)
- Phase 1 AIA Mixed-use housing Development, Kwanobuhle, Extension 11, Uitenhage, Eastern Cape. 2011.
- Phase 1 AIA Centane to Qholora and Kei River mouth road upgrade survey, Mnquma Municipality, Eastern Cape. 2011. (SRK Consulting)



- Phase 1 AIA Clidet Data Cable survey, Western Cape, Northern Cape, Free State and Eastern Cape. 2011. (SRK Consulting)
- Phase 1 AIA Karoo Renewable Energy Facility, Victoria West, Northern Cape. 2011. (Savannah Environmental)
- Phase 1 AIA Windfarm survey in Hamburg, Eastern Cape. 2010. (Savannah Environmental)
- Phase 1 AIA Windfarm survey in Molteno, Eastern Cape. 2010. (Savannah Environmental)
- Phase 1 AIA Housing Development at Motherwell, P.E. 2010. (SRK Consulting)
- Phase 1 AIA Sand quarry survey in Paterson, Eastern Cape. 2010. (SRK Consulting)
- Phase 1 AIA Quarry Survey at Victoria West. 2010. (Acer [Africa] Environmental Management Consultants)
- Phase 1 AIA Quarry Survey at Port Elizabeth. 2010. (E.P Brickfields)

6 PROFESSIONAL AFFILIATIONS

- Association of Southern African Professional Archaeologists (ASAPA): Professional member
- Association of Southern African Professional Archaeologists (ASAPA): CRM Practitioner (Field Supervisor: Stone Age, Iron Age and Rock Art)
- South African Museums Association: Member



DIGBY WELLS
ENVIRONMENTAL

JUSTIN DU PIESANIE

Mr. Justin du Piesanie
Archaeology Consultant
Social Sciences Department
Digby Wells Environmental

1 EDUCATION

University of the Witwatersrand

- BA Degree (2004)
- BA Honours Degree (2005) - Archaeology
 - Title of Dissertation - Seal Skeletal Distribution of Herder and Forager Sites at Kasteelberg, Western Cape Province of South Africa.
- Master of Science (MSc) Degree (2008) – Archaeology
 - Title of Dissertation – Understanding the Socio-Political Complexity of Leokwe Society during the Middle Iron Age in the Shashe-Limpopo Basin through a Landscape Approach

2 LANGUAGE SKILLS

English First Language
Afrikaans Second Language

3 EMPLOYMENT

2011 to Present: Archaeology Consultant at Digby Wells Environmental

2009 to 2011: Archaeology Collections Manager at the University of the Witwatersrand.

2009 to 2011: Freelance Archaeologist for Archaeology Resource Management (ARM), Matakoma Heritage Consultants, Wits Heritage Contracts Unit & Umlando Heritage Consultants.

2006 to 2007: Tour Guide at Sterkfontein Caves World Heritage Site.

Digby Wells & Associates (Pty) Ltd. Co. Reg. No. 1999/05985/07. Fern Isle, Section 10, 359 Pretoria Ave Randburg Private Bag X10046, Randburg, 2125, South Africa

Tel: +27 11 789 9495, Fax: +27 11 789 9498, info@digbywells.com, www.digbywells.com

Directors: A Sing*, AR Wilke, LF Koeslag, PD Tanner (British)*, AJ Reynolds (Chairman) (British)*, J Leaver*, GE Trusler (C.E.O)

*Non-Executive



4 EXPERIENCE

- Wits Fieldschool - Excavation at Meyersdal, Klipriviersberg Johannesburg (Late Iron Age Settlement).
- Wits Fieldschool - Phase 1 Survey of Prentjiesberg in Ugie / Maclear area, Eastern Cape.
- Wits Fieldschool – Excavation at Kudu Kopje, Mapungubwe National Park Limpopo Province.
- Wits Fieldschool – Excavation of Weipe 508 (2229 AB 508) on farm Weipe, Limpopo Province.
- Survey at Meyersdal, Klipriviersberg Johannesburg.
- Mapping of Rock Art Engravings at Klipbak 1 & 2, Kalahari.
- Survey at Sonop Mines, Windsorton Northern Cape (Vaal Archaeological Research Unit).
- Excavation of Kudu Kopje, Mapungubwe National Park Limpopo Province.
- Excavation of KK (2229 AD 110), VK (2229 AD 109), VK2 (2229 AD 108) & Weipe 508 (2229 AB 508) (Origins of Mapungubwe Project)
- Phase 1 Survey of farms Venetia, Hamilton, Den Staat and Little Muck, Limpopo Province (Origins of Mapungubwe Project)
- Excavation of Canteen Kopje Stone Age site, Barkley West, Northern Cape
- Excavation of Khami Period site AB32 (2229 AB 32), Den Staat Farm, Limpopo Province

5 PROJECT EXPERIENCE

- Phase 2 Mitigation at Meyersdal, Klipriviersberg Johannesburg (ARM)
- Phase 1 Mitigation – Mapping of Late Iron Age Site in Pilansberg, Sun City (ARM)
- Phase 1 Mitigation – Survey of Witbank dam development (ARM)
- Phase 1 Mitigation – Survey of Glen Austin AH, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Modderfontein AH Holding 34, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Modderfontein AH Holding 38, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Modderfontein AH Holding 44, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Modderfontein AH Holding 46, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Modderfontein AH Holding 47, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Modderfontein AH Holding 48, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Modderfontein AH Holding 49, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Modderfontein AH Holding 50, Johannesburg (Matakoma)



- Phase 1 Mitigation – Survey of Modderfontein AH Holding 61, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Modderfontein AH Holding 62, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Modderfontein AH Holding 71, Johannesburg (Matakoma).
- Phase 1 Mitigation – Survey of Modderfontein AH Holding 72, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Modderfontein 35IR Portion 40, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Rhino Mines, Thabazimbi Limpopo Province (ARM)
- Phase 1 Mitigation – Survey of Moddergat 389KQ, Schilpadnest 385KQ, Swartkop 369KQ, Cronimet Project, Thabazimbi Limpopo Province (Matakoma)
- Desktop Study – Desktop study for the Eskom Thohoyandou SEA Project, Limpopo Province (Matakoma)
- Phase 2 Mitigation – Excavation of Iron Age site on Wenzelrust, Shoshanguve Gauteng (Heritage Contracts Unit)
- Phase 1 Mitigation – Mapping of Late Stone Age shelter, Parys, Free State
- Phase 1 Mitigation – Survey of Vaalkrans Battlefield for the Transnet NMPP Line (Umlando)
- Phase 1 Mitigation – Survey of Portion 222 of Mindale Ext 7 Witpoortjie 254 IQ & Portion 14 of Nooitgedacht 534 IQ, Johannesburg (ARM)
- Phase 2 Mitigation – Excavation of Site 19 for the Anglo Platinum Mines Der Brochen & Booyensdal, Steelpoort, Mpumalanga (Heritage Contracts Unit)
- Phase 1 Mitigation – Mapping of sites 23, 26, 27, 28a & b for the Anglo Platinum Mines Der Brochen & Booyensdal, Steelpoort, Mpumalanga (Heritage Contracts Unit)
- Desktop Study - Desktop study for the inclusion into the Thohoyandou Electricity Master Network for Eskom, Limpopo Province (Strategic Environmental Focus)
- Phase 1 Mitigation – Mapping of historical sites as part of the mitigation for the expansion of the Bathlako Mine's impact area (Heritage Contracts Unit).
- Phase 2 Mitigation – Kibali Grave Relocation Project (KGRP) for the Kibali Gold Project, Democratic Republic of Congo (Digby Wells)
- Phase 1 Mitigation – Heritage Assessment and Survey for the proposed Kibali Hydro Power Stations, Democratic Republic of Congo (Digby Wells)
- Phase 1 Mitigation – Heritage Impact Assessment & Survey of the farm Vygenhoek for Aquarius Resources Everest North Mining Project, Steelpoort, Mpumalanga (Digby Wells)
- Phase 1 Mitigation – Heritage Impact Assessment for the Gold One International Ltd Proposed Geluksdal Tailings Storage Facility and Pipeline Infrastructure, Johannesburg, Gauteng Province (Digby Wells)
- Phase 1 Mitigation – Burial Grounds and Graves Survey (BGGS) for Platreef Resources, Mokopane, Limpopo Province (Digby Wells)
- Phase 2 Mitigation – Archaeological Impact Assessment of sites for Resource Generation Boikarabelo Mine, Steenbokpan, Limpopo Province (Digby Wells)



JOHAN NEL

Mr Johan Nel

Unit manager: Heritage Resources Management

Social Sciences

Digby Wells Environmental

1 EDUCATION

2002 BA Honours - Archaeology

2001 BA Anthropology & Archaeology

1997 Matriculated Brandwag Hoërskool

2 LANGUAGE SKILLS

Fluent in English and Afrikaans

3 EMPLOYMENT

2011 to present Unit manager: Heritage Resources Management, Digby Wells Environmental

2010-2011 Archaeologist, Digby Wells Environmental

2005-2010 Manager and co-owner, Archaic Heritage Project Management

2003-2005 Freelance archaeologist

Resident archaeologist, Rock Art Mapping Project, Ndidima, Ukhahlamba-Drakensberg World Heritage Site

2002-2003 Special Assistant: Anthropology, Department of Anatomy, University of Pretoria

2001-2002 Technical Assistant: Department of Anatomy, University of Pretoria

1999-2001 Assistant: Mapungubwe Project, National Cultural History Museum & Department of Anthropology and Archaeology, UP

4 EXPERIENCE

I have 13 years of combined experience in the field of cultural heritage resources management (HRM) including archaeological and heritage assessments, grave relocation, social consultation and mitigation of archaeological sites. I have gained experience both within urban settings and remote rural landscapes. Since 2010 I have been actively involved in environmental management that has allowed me to investigate and implement the integration of heritage resources management into environmental impact assessments (EIA). Many of the projects since have

Digby Wells & Associates (Pty) Ltd. Co. Reg. No. 1999/05985/07. Fern Isle, Section 10, 359 Pretoria Ave Randburg Private Bag X10046, Randburg, 2125, South Africa

Tel: +27 11 789 9495, Fax: +27 11 789 9498, info@digbywells.com, www.digbywells.com

Directors: A Sing*, AR Wilke, LF Koeslag, PD Tanner (British)*, AJ Reynolds (Chairman) (British)*, J Leaver*, GE Trusler (C.E.O)

*Non-Executive

required compliance with International Finance Corporation (IFC) requirements and other World Bank standards. This exposure has allowed me to develop and implement a HRM approach that is founded on international best practice and leading international conservation bodies such as UNESCO and ICOMOS. I have worked in most South African Provinces, as well as Swaziland, the Democratic Republic of the Congo and Sierra Leone. I am fluent in English and Afrikaans, with excellent writing and research skills.

5 PROJECT EXPERIENCE

PHASE 1 ARCHAEOLOGICAL IMPACT ASSESSMENTS:

- Above Ground Storage Tanks survey, SASOL Oil (Pty) Ltd, Free State Province, South Africa
- Access road establishment , AGES-SA, Tzaneen, South Africa
- Boikarabelo Railway Link, Resgen South Africa, Steenbokpan, South Africa
- Conversion of prospecting rights to mining rights, Georock Environmental, Musina, South Africa
- Galaxy Gold Agnes Mine, Barberton, South Africa
- HCI Khusela Palesa Extension, Bronkhorstspuit, South Africa
- Kennedy's Vale township establishment, AGES-SA, Steelpoort, South Africa
- Koidu Diamond Mine, Koidu Holdings, Koidu, Sierra Leone
- Lonmin Platinum Mine water pipeline survey, AGES-SA, Lebowakgomo, South Africa
- Mining right application, DERA Environmental, Hekpoort, South Africa
- Mogalakwena water pipeline survey, AGES-SA, Limpopo Province, South Africa
- Nzoro Hydropower Station, Environmental and Social Impact Assessment, DRC
- Randgold Kibali Gold Project, Environmental and Social Impact Assessment, Kibali, Democratic Republic of the Congo
- Randwater Vlakfontein-Mamelodi water pipeline survey, Archaeology Africa cc, Gauteng, South Africa
- Residential and commercial development, GO Enviroscience, Schoemanskloof, South Africa
- Temo Coal, Limpopo, South Africa
- Transnet Freight Line survey, Eastern Cape and Northern Cape, ERM, South Africa
- Van Reenen Eco-Agri Development Project, GO Enviroscience, South Africa
- Platreef Platinum Mine, Ivanhoe Nickel & Platinum, Mokopane, South Africa

MITIGATION PROJECTS:

- Mitigation of Iron Age archaeological sites: Kibali Gold Project, DRC

- Mitigation of Iron Age metalworking site: Koidu Diamond Mine, Sierra Leone
- Mitigation of Iron Age sites: Boikarabelo Coal Mine, South Africa
- Exploratory test excavations of alleged mass burial site: Rustenburg, Bigen Africa Consulting Engineers, South Africa
- Mitigation of Old Johannesburg Fort: Johannesburg Development Agency (JDA), South Africa
- Site monitoring and watching brief: Department of Foreign Affairs Head Office, Imbumba-Aganang Design & Construction Joint Venture, South Africa

GRAVE RELOCATION

- Du Preezhoek-Gautrain Construction, Bombela JV, Pretoria, South Africa
- Elawini Lifestyle Estate social consultation, PGS (Pty) Ltd, Nelspruit, South Africa;
- Motaganeng social consultation, PGS (Pty) Ltd Burgersfort, South Africa
- Randgold Kibali Mine, Relocation Action Plan, Kibali, DRC
- Repatriation of Mapungubwe National Park and World Heritage Site, DEAT, South Africa
- Smoky Hills Platinum Mine social consultation, PGS (Pty) Ltd Maandagshoek South Africa
- Southstock Colliery, Doves Funerals, Witbank, South Africa
- Tygervallei. D Georgiades East Farm (Pty) Ltd, Pretoria, South Africa
- Willowbrook Ext. 22, Ruimsig Manor cc, Ruimsig, South Africa
- Zondagskraal social consultation, PGS (Pty) Ltd, Ogies, South Africa
- Zonkezizwe Gautrain, PGS, (Pty) Ltd, Midrand, South Africa

OTHER HERITAGE ASSESSMENTS AND REVIEWS:

- Heritage Scoping Report on historical landscape and buildings in Port Elizabeth: ERM South Africa
- Heritage Statement and Cultural Resources Pre-assessment scoping report on Platreef Platinum Mine, Mokopane: Platreef Ltd
- Heritage Statement and Scoping Report on five proposed Photo Voltaic Solar Power farms, Northern Cape and Western Cape: Orlight SA
- Land claim research Badenhorst family vs Makokwe family regarding Makokskraal, Van Staden, Vorster & Nysschen Attorneys, Ventersdorp South Africa
- Research report on Cultural Symbols, Ministry for Intelligence Services, Pretoria, South Africa
- Research report on the location of the remains of kings Mampuru I and Nyabela, National Department of Arts and Culture, Pretoria, South Africa
- Review of Archaeological Assessment: Resources Generation, Coal Mine Project in the Waterberg area, Limpopo Province



- Review of CRM study and compilation of Impact Assessment report, Zod Gold Mine, Armenia

6 PROFESSIONAL AFFILIATIONS

Society for Africanist Archaeologists (SAfA)

7 PROFESSIONAL REGISTRATION

Association for Southern African Professional Archaeologists (ASAPA)

Accredited by ASAPA Cultural Resources Management section

International Association of Impact Assessors (IAIA)

8 PUBLICATIONS

Nel, J. 2001. Cycles of Initiation in Traditional South African Cultures. *South African Encyclopaedia* (MWEB).

Nel, J. 2001. *Social Consultation: Networking Human Remains and a Social Consultation Case Study*. Research poster presentations at the Bi-annual Conference (SA3) Association of Southern African Professional Archaeologists: National Museum, Cape Town.

Nel, J. 2002. *Collections policy for the WG de Haas Anatomy museum and associated Collections*. Unpublished. Department of Anatomy, School of Medicine: University of Pretoria.

Nel, J. 2004. Research and design of exhibition for Eloff Belting and Equipment CC for the Institute of Quarrying 35th Conference and Exhibition on 24 – 27 March 2004.

Nel, J. 2004. *Ritual and Symbolism in Archaeology, Does it exist?* Research paper presented at the Bi-annual Conference (SA3) Association of Southern African Professional Archaeologists: Kimberley

Nel, J & Tiley, S. 2004. The Archaeology of Mapungubwe: a World Heritage Site in the Central Limpopo Valley, Republic of South Africa. *Archaeology World Report*, (1) United Kingdom p.14-22.

Nel, J. 2007. *The Railway Code: Gautrain, NZASM and Heritage*. Public lecture for the South African Archaeological Society, Transvaal Branch: Roedean School, Parktown.

Nel, J. 2009. *Un-archaeologically speaking: the use, abuse and misuse of archaeology in popular culture*. *The Digging Stick*. April 2009. 26(1): 11-13: Johannesburg: The South African Archaeological Society.

Nel, J. 2011. 'Gods, Graves and Scholars' returning Mapungubwe human remains to their resting place.' In: *Mapungubwe Remembered*. University of Pretoria commemorative publication: Johannesburg: Chris van Rensburg Publishers.

Nel, J. 2012. *HIAs for EAPs*. Paper presented at IAIA annual conference: Somerset West.

Heritage Statement for a Proposed Acetylene Gas Production Facility,
located near Witkopdorp, Daleside, south of Johannesburg

ERM2556



Appendix B: Site list of Identified Heritage Resources in the Project and Study Areas

Site ID	Site type	Description	Latitude	Longitude	Reference
1991-SAHRA-0005	S.34 & S.35	Numerous ESA, MSA, and LSA scatters; two historical house foundations possible occupied by bywoners in the 19th century; and several historical houses.	-26.454410	27.943851	Huffman, et al. 1991
2004-SAHRA-0102/S.35-1	S.35	An MSA scatter of three flakes on a rocky ridge.	-26.377222	28.051389	Huffman & Schoeman, 2004
2004-SAHRA-0102/S.35-2	S.35	An MSA scatter of stone flakes along a low ridge marked by upright dolerite monoliths.	-26.375556	28.016389	Huffman & Schoeman, 2004
2004-SAHRA-0102/S.34-3	S.34	A stonewalled kraal and a rectangular house with stonewalls and associated middens. The complex could date to the late 19th or early 20th century.	-26.369722	28.017500	Huffman & Schoeman, 2004
2004-SAHRA-0102/S.35-4	S.35	A kraal next to a deep gully.	-26.385556	28.008056	Huffman & Schoeman, 2004
2004-SAHRA-0102/S.35-5	S.35	A small area demarcated by stones.	-26.385833	28.005556	Huffman & Schoeman, 2004
2004-SAHRA-0102/S.34-6	S.34	Homestead remains of black labourers employed on the farm Alewynspoort homestead.	-26.379444	28.003889	Huffman & Schoeman, 2004
2007-SAHRA-0286/S.36-1	S.36	A cemetery with 25 graves. Some of the graves are older than 60 years.	-26.464460	27.915600	Van Schalkwyk, 2007
2007-SAHRA/0286/S.34-2	S.34	A house that is possibly historical. The core section of the house is made of bricks and cement but the other sections of the house are made of asbestos sheeting. There are no outbuildings.	-26.475830	27.908130	Van Schalkwyk, 2007
2007-SAHRA-0286/S.34-3	S.34	The ruins of an old farmstead that was built from sandstone and other types of rocks. Some outbuildings occur but they are in a ruined state.	-26.505440	27.889110	Van Schalkwyk, 2007
2007-SAHRA-0286/S.35-4	S.35	Small circles of packed stone.	-26.482640	27.888310	Van Schalkwyk, 2007
2007-SAHRA-0286/S.34-5	S.34	The ruins of a number of farm labourer homesteads. One of them is quite extensive and also has a substantial kitchen midden. It is probably older than 60 years	-26.479050	27.906330	Van Schalkwyk, 2007
2007-SAHRA-0191/S.35-1	S.35	A few MSA flakes scattered near a small pass that runs through a ridge along the longest hill.	-26.435750	28.034917	Huffman, 2007a
2007-SAHRA-0191/S.35-2	S.35	A cluster of early LSA stone flakes scattered among a small dolomite outcrop. The flakes were made from chert incorporated in the dolomite.	-26.436111	28.043806	Huffman, 2007a
2007-SAHRA-0191/S.35-3	S.35	A few early LSA artefacts around a dolomite outcrop.	-26.435444	28.041722	Huffman, 2007a
2007-SAHRA-0191/S.35-4	S.35	A small scatter of stone flakes, possibly dating to the LSA, just below the top of the longest hill.	-26.433333	28.033333	Huffman, 2007a
2007-SAHRA-0191/S.36-5a	S.36	A historic cemetery that contains about nine graves with eight headstones. One of the graves is of Jurgens Jacobus Greef, 1868 - 1917. It is associated with the house at 2007-SAHRA-0191/S.34-5b.	-26.451750	28.057167	Huffman, 2007a
2007-SAHRA-0191/S.34-5b	S.34	An old house to the west was the original homestead. It is now occupied by the foreman, Thomas Khutsoane.	-26.453389	28.055417	Huffman, 2007a
2007-SAHRA-0191/S.34-5c	S.34	In the 1960s, Thomas Khutsoane lived in a four-roomed longhouse about 100 m behind the main house (2007-SAHRA-0191/S.35-5b).	-26.452917	28.053806	Huffman, 2007a
2007-SAHRA-0191/S.34-5d	S.34	Workers once lived on a terrace above the floodplains to the south of the main house (2007-SAHRA-0191/S.35-5b).	-26.454056	28.056028	Huffman, 2007a
2007-SAHRA-0191/S.34-6	S.34	The Nooitgedacht farm complex with buildings possibly older than 60 years.	-26.431667	28.020833	Huffman, 2007a
2007-SAHRA-0191/S.34-7	S.34	Black labourer households identified during a review of a 1950s map. During the survey, house mounds and other debris were noted where the houses should have been.	-26.419444	28.033333	Huffman, 2007a
2007-SAHRA-0191/S.34-8	S.34	Black labourer households identified during a review of a 1950s map. During the survey, house mounds and other debris were noted where the houses should have been.	-26.419444	28.033333	Huffman, 2007a
2007-SAHRA-0191/S.34-9	S.34	Black labourer households identified during a review of a 1950s map.	-26.433333	28.033333	Huffman, 2007a
2007-SAHRA-0191/S.34-10	S.34	Black labourer households identified during a review of a 1950s map.	-26.433333	28.033333	Huffman, 2007a
2007-SAHRA-0189/S.35-1	S.35	ESA material found eroding out of an old road. The artefacts include a small hand axe, as well as polyhedral cores and flakes made from quartzite and dolerite.	-26.429389	27.981611	Huffman, 2007b
2007-SAHRA-0189/S.34-2	S.34	Two European homesteads on either side of a small stream on the property. Woodcare stood on the north side. At one time it operated as a dairy. One shed bears a date of 1925 and the Manager's house is probably equally as old.	-26.420694	27.979611	Huffman, 2007b
2007-SAHRA-0189/S.34-3	S.34	Mornhill farm stood on the south side. A few outbuildings appear old, particularly the chicken hatchery. Some of the labourer housing is probably equally as old.	-26.427324	27.981048	Huffman, 2007b

2007-SAHRA-0189/S.36.4	S.36	A black cemetery for the Mornhill farm lays on the edge of a gum tree plantation some distance uplope from the compound. There are about 53 graves arranged in about six lines orientated east-west. The cemetery was still used in the 1960s.	-26.426611	27.981306	Huffman, 2007b
2008-SAHRA-0106/S.34-1	S.34	The site consists of a multi-room brick house with a corrugated iron roof. A small outbuilding and a cement feature were also recorded in association. The house and associated structures are not older than 60 years.	-26.488917	27.934000	Coetzee, 2008a
2008-SAHRA-0106/S.34-2	S.34	The site consists of a demolished multi-room brick house. Apart from a carport, no other structures were recorded. The house was not older than 60 years.	-26.489500	27.928417	Coetzee, 2008a
2008-SAHRA-0108/S.34-1	S.34	The site consists of a house and several associated outbuildings and structures. The house is a multi-room brick structure with a thatched roof and is still occupied. The other structures consist of a large shed and a one-room brick house with a corrugated iron roof. The house and the associated structures are not older than 60 years.	-26.598183	27.984333	Coetzee, 2008b
2008-SAHRA-0108/S.34-2	S.34	The site consists of a demolished brick structure. Apart from a few walls, only the foundations still remain and the roof and fittings have been removed. The structure is not older than 60 years.	-26.595983	27.984650	Coetzee, 2008b
2008-SAHRA-0195/S.35-1	S.35	Isolated ESA and MSA artefacts found on the slopes of a hill. The site is an Oakhurst quarry on the lower terrace of the hill. Typical Oakhurst flake scars occur on a thin putcrop on the edge of the terrace. Various flakes and cores lay on the surface.	-26.447222	27.996278	Huffman, 2008
2008-SAHRA-0195/S.35-2a	S.35	Stonewalling within a larger complex. There is a central kraal surrounded by a residential zone. This site also has an ash midden next to the front entrance.	-26.443417	27.995750	Huffman, 2008
2008-SAHRA-0195/S.35-2b	S.35	Stonewalling within a larger complex. There is a central kraal surrounded by a residential zone. This site has the largest central area.	-26.443722	27.995250	Huffman, 2008
2008-SAHRA-0195/S.35-2c	S.35	Stonewalling within a larger complex. There is a central kraal surrounded by a residential zone. This site is well-preserved.	-26.444333	27.995361	Huffman, 2008
2008-SAHRA-0195/S.35-2d	S.35	Stonewalling within a larger complex. There is a central kraal surrounded by a residential zone. Some stones from this site may have been removed in antiquity as the population expanded.	-26.444750	27.995528	Huffman, 2008
2008-SAHRA-0195/S.35-3	S.35	Klipriviersberg-type stonewalling on a ledge on the east of a hill. The site is well-preserved but there appears to be little deposit.	-26.435972	27.996806	Huffman, 2008
2008-SAHRA-0195/S.35-4	S.35	The remains of two separate clusters along the basal road. Farming and other activities have removed much of the stone from the site.	-26.435583	28.000528	Huffman, 2008
2008-SAHRA-0195/S.35-5a	S.35	The remains of two separate clusters along the basal road. Farming and other activities have removed much of the stone from the site.	-26.431278	27.998694	Huffman, 2008
2008-SAHRA-0195/S.35-5c	S.35	The remains of two separate clusters along the basal road. Farming and other activities have removed much of the stone from the site.	-26.432722	27.999278	Huffman, 2008
2008-SAHRA-0195/S.35-6a	S.35	A cluster that stands on the north end. The site contains a lower maize grindstone in one of the back courtyards.	-26.429472	27.992750	Huffman, 2008
2008-SAHRA-0195/S.35-6b	S.35	A cluster that stands on the north end. There is an isolated kraal behind the site.	-26.430028	27.993194	Huffman, 2008
2008-SAHRA-0195/S.36-7	S.36	One black cemetery stands next to the fence line between two agricultural lands. There are nine graves marked by stone piles that are aligned east-west along the fence.	-26.452250	28.002861	Huffman, 2008
2008-SAHRA-0195/S.34-8	S.34	One historical house dating to the 1880s is still in use. President Paul Kruger is said to have used this house as a stop over on various trips.	-26.454194	27.992361	Huffman, 2008
2008-SAHRA-0195/S.34-9	S.34	The remains of an earlier Trek Boer house dating to the 1840s. The clay walls still stand on top of the stone foundation.	-26.454972	27.993083	Huffman, 2008
Wits-Database/S.35-2627DB-12	S.35	A LSA engraving site	-26.610833	27.968333	Wits Database
Wits-Database/S.35-2628CA-1	S.35	A Late Iron Age stonewalled site.	-26.500833	28.150000	Wits Database
Wits-Database/S.35-2628CA-2	S.35	A Late Iron Age stonewalled site.	-26.544444	28.186111	Wits Database
Wits-Database/S.35-2628CA-3	S.35	A Late Iron Age cattle station.	-26.544444	28.202500	Wits Database
Wits-Database/S.35-2628CA-4	S.35	A Late Iron Age site.	-26.548889	28.174122	Wits Database
ERM2556/2628CA/S.34-001	S.34	Witkop Blockhouse	-26.467811	28.069598	HSS