ANNEXURE 'S'

CULTURAL HERITAGE RESOURCES IMPACT ASSESSMENT & PALAEONTOLOGICAL DESKTOP ASSESSMENT

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APAC
APELSER ARCHAEOLOGICAL CONSULTING

Comprehensive and Professional Solutions for all Heritage Related Matters

CK 2006/014630/23 VAT NO.: 4360226270

APAC020/115 **2021-01-05**

To: **Platinum Mile Investments 542 (Pty) Ltd**

P O Box 608
LA MONTAGNE
0184

RE: SHORT REPORT ON THE ASSESSMENT OF THE GRAVE SITE & HISTORICAL WATER FURROW SITUATED ON PORTIONS OF THE FARM MOOIPLAATS 367JR – MOOIPLAATS CAMPUS DEVELOPMENT

APelser Archaeological Consulting cc (APAC cc) was appointed by Platinum Mile Investments 542 (Pty) Ltd to undertake the Phase 2 Archaeological Assessment of various historical & archaeological sites on Portions 287-297 of the farm Mooiplaats 367JR. The study area is located to the east of Pretoria and the sites will be impacted by their Campus Development here. This short report focuses on the December 2020 assessment of a known grave site and historical water furrow.

Background to the Project

In 2007 African Heritage Consultants cc undertook a Cultural Heritage Resources Impact Assessment on the Remainder of Portion 13 and Portions 287 - 296 of the farm Mooiplaats 367 JR in Tshwane, Gauteng. During this assessment a total of 30 sites were identified and recorded, including 27 stonewalled Late Iron Age sites, a recent historical cemetery and the remains of a water furrow (See Kusel 2007).

Kusel recommended the following:

- A Phase II investigation of the archaeological sites should be conducted. For this purpose the veld will have to be burned in the spring to get rid of the tall grass. Some bush clearing will also have to take place so that individual sites can be recorded.
- Two or possible three of the most important sites should be preserved in a heritage park in the new development and be properly restored in a phase III investigation.
- The possibility to declare these preserved sites; provincial heritage sites should be investigated.

- After the Phase II investigation an application for mitigation and destruction of the rest of the sites can be made.

- A Heritage Management Plan must be compiled for the preserved heritage sites after the completion of the phase II and III mitigation.

- The cemetery should be cleaned the graves recorded and a decision must be taken to either preserve the cemetery or to move the graves to a new locality in accordance with present provincial legislation.

- The old water canal should be recorded in detail and be preserved as a feature in the new development if possible. If not a permit for destruction must be applied for.

In October 2019 APAC cc was requested to undertake a secondary assessment of these sites and to determine the way forward regarding the recommended mitigation measures (**See Short Report APAC019/104**). After consideration of the recommended mitigation measures on the way forward, APAC was eventually appointed to conduct the required Archaeological/Historical work in December 2020.

The following Terms of Reference was agreed upon:

1. Detailed documentation of the Grave Site for inclusion in a Graves Management Plan. The site will be preserved in situ.

2. Mapping and documentation of the historical water furrow. It is intended that a section of the furrow will be demolished, while the rest will be preserved in situ

3. Archaeological investigation of the LIA Stone-walled sites. This will include detailed mapping and drawing as well as archaeological excavations on certain sections and at some features associated with these sites.

The December 2020 assessment focused on the Grave Site and Water Furrow. The results of this assessment will be discussed in short below, while the way forward regarding the work on these two sites will also be provided.

Relevant Legalisation

Aspects concerning the conservation of cultural resources are dealt with mainly in two acts. These are the National Heritage Resources Act (Act No. 25 of 1999) and the National Environmental Management Act (Act No.107 of 1998), as amended.

The National Heritage Resources Act

According to the above-mentioned act the following is protected as cultural heritage resources:

a. Archaeological artefacts, structures and sites older than 100 years;
b. Ethnographic art objects (e.g. prehistoric rock art) and ethnography;
c. Objects of decorative and visual arts;
d. Military objects, structures and sites older than 75 years;
e. Historical objects, structures and sites older than 60 years;
f. Proclaimed heritage sites;
g. Grave yards and graves older than 60 years;
h. Meteorites and fossils; and
i. Objects, structures and sites of scientific or technological value.

The National Estate includes the following:

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 features of cultural significance;
e. Geological sites of scientific or cultural importance;
f. Sites of Archaeological and palaeontological importance;
g. Graves and burial grounds;
h. Sites of significance relating to the history of slavery; and
i. Movable objects (e.g. archaeological, palaeontological, meteorites, geological specimens, military, ethnographic, books etc.).

A Heritage Impact Assessment (HIA) is the process to be followed in order to determine whether any heritage resources are located within the area to be developed as well as the possible impact of the proposed development thereon. An Archaeological Impact Assessment (AIA) only looks at archaeological resources.

According to Section 38 (1) of the Act, an HIA must be done under the following circumstances:

a. The construction of a linear development (road, wall, power line, canal etc.) exceeding 300m in length.
b. The construction of a bridge or similar structure exceeding 50m in length.
c. Any development or other activity that will change the character of a site and exceed 5 000m² or involve three or more existing erven or subdivisions thereof.
d. Re-zoning of a site exceeding 10 000m².
e. Any other category provided for in the regulations of the SAHRA or a provincial heritage authority.

Description of the Study Area

The larger study area on which these sites are located is on Portions 287-296 of the farm Mooiplaats 3675JR, to the east of Pretoria and within the Greater Tshwane Municipal area of Gauteng.

The general topography of the area is relatively flat and open, although there are some rocky outcrops and ridges present in sections. The grave site and water furrow is situated in fairly flat and open portions of the study area, although dense vegetation during the December 2020 fieldwork hampered visibility in both instances.

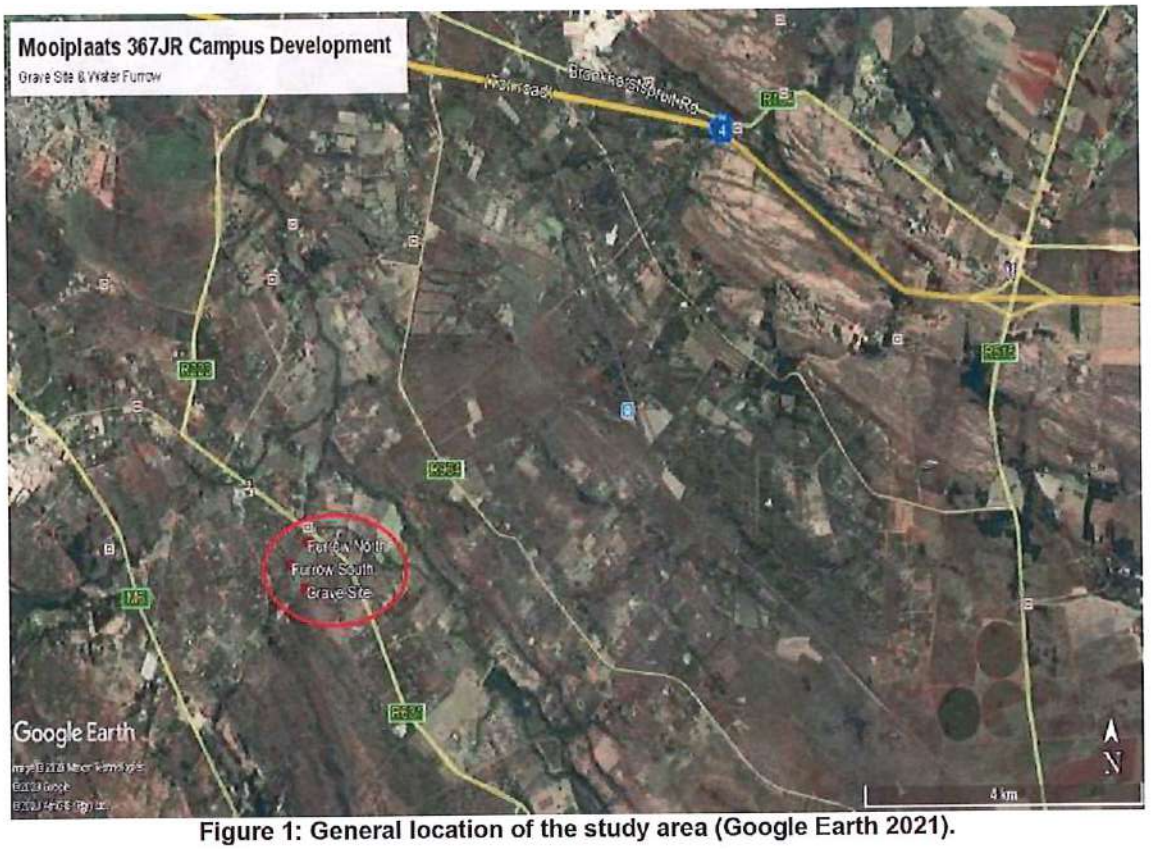


Figure 1: General location of the study area (Google Earth 2021).

Figure 2: Closer view of the location of the Grave Site & Water Furrow in the study and development area (Google Earth 2021).

Results of the December 2020 Assessment

Grave Site – S25 49 36.50 E28 24 54.60

The 1st site assessed was the Grave Site. In his 2007 report Kusel mentions that the site contained around **40** graves that are mostly just heaps of stones. Some were difficult to see because of the vegetation and stones, which have over the years been scattered. From the grave goods it seemed that these graves were not older than sixty years and thus fell outside the jurisdiction of Act 25 of 1999, but is protected by Provincial legislation. At the time two of the graves were in a good condition and according to one of the present farm workers were still visited by family members.

The October 2019 assessment found that there are around **59** graves located on the site. Most were only stone-packed, with only a few containing formal headstones. It was only possible to read the inscription on one of the headstones, with the others either illegible or fallen over. The inscription on the readable headstone indicated that the grave was that of one Phangwabo Thubana who was born in 1872 and died in 1962.

In December 2020 the site and graves on it was less visible due to dense vegetation, but at least **50** graves could be counted. Most of the graves are stone-packed without any headstones, although there were two with formal granite headstones and a few with metal plaques used as headstones. Besides Phanwabo Thubana that was identified in 2019, the name of Koos Thubana (born in 1943 and died in 1964) could also be seen on the 2nd granite headstone. A cement headstone on another grave did have an inscription but it was difficult to read and only the date 1935 could be seen. It is unsure if this is a birth date or date of death. On another grave a metal plaque contained the surname Mahlangu. A low stone wall demarcating the grave site was identified in December 2020 and although the dense vegetation made it difficult to record completely it does provide an interim boundary for the site that can be used when the formal fencing is erected at a later stage. Damage to the site and some of the graves is visible, with cattle seemingly walking through the site and over the graves. Some headstones and stones demarcating the graves have been pushed over as a result.

Stone Wall Coordinates: (1) **S25 49 36.30 E28 24 54.10** (2) **S25 49 35.50 E28 24 54.10** (3) **S25 49 35.40 E28 24 55.10** (4) **S25 49 36.30 E28 24 54.70**

It is recommended that the site be properly cleaned and the vegetation cut under supervision of the Heritage Specialist. Once this has been done all the graves on the site can be finally counted and recorded individually for inclusion in a Grave Site Register as part of the Grave Site Management Plan. Once the cleaning has been completed a proper fence with access gate needs to be erected as a matter of urgency to protect the graves against any further damage.

Figure 3: View of the Grave Site in December 2020.

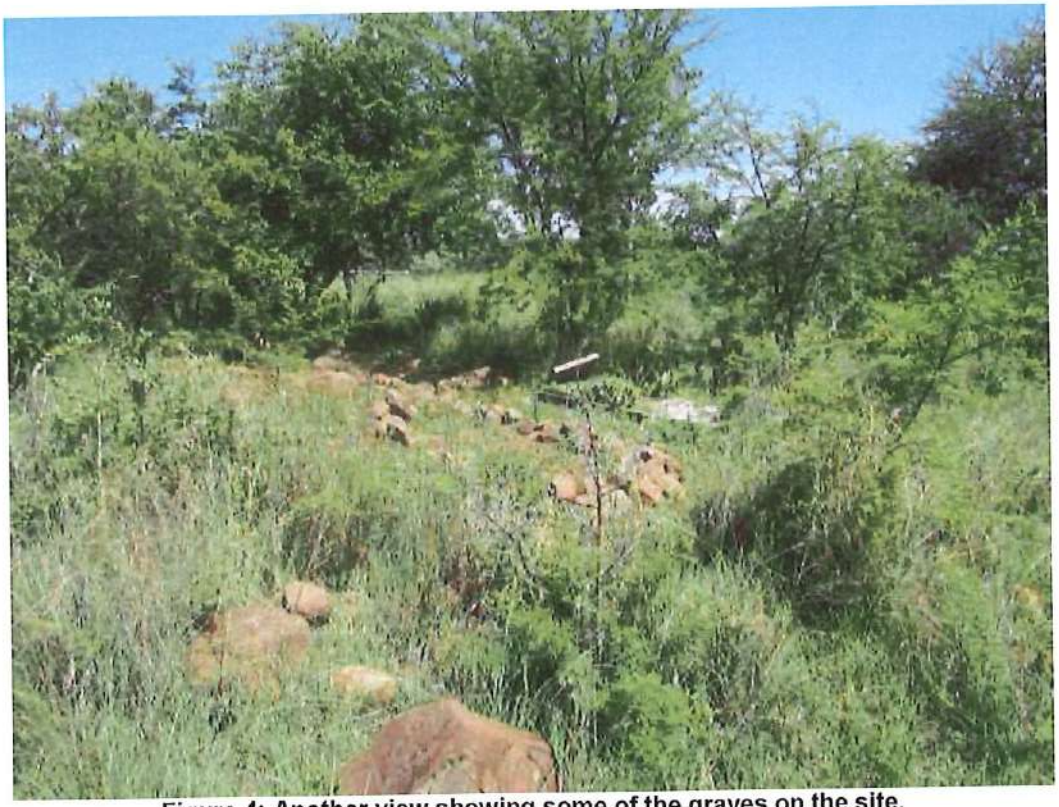


Figure 4: Another view showing some of the graves on the site.

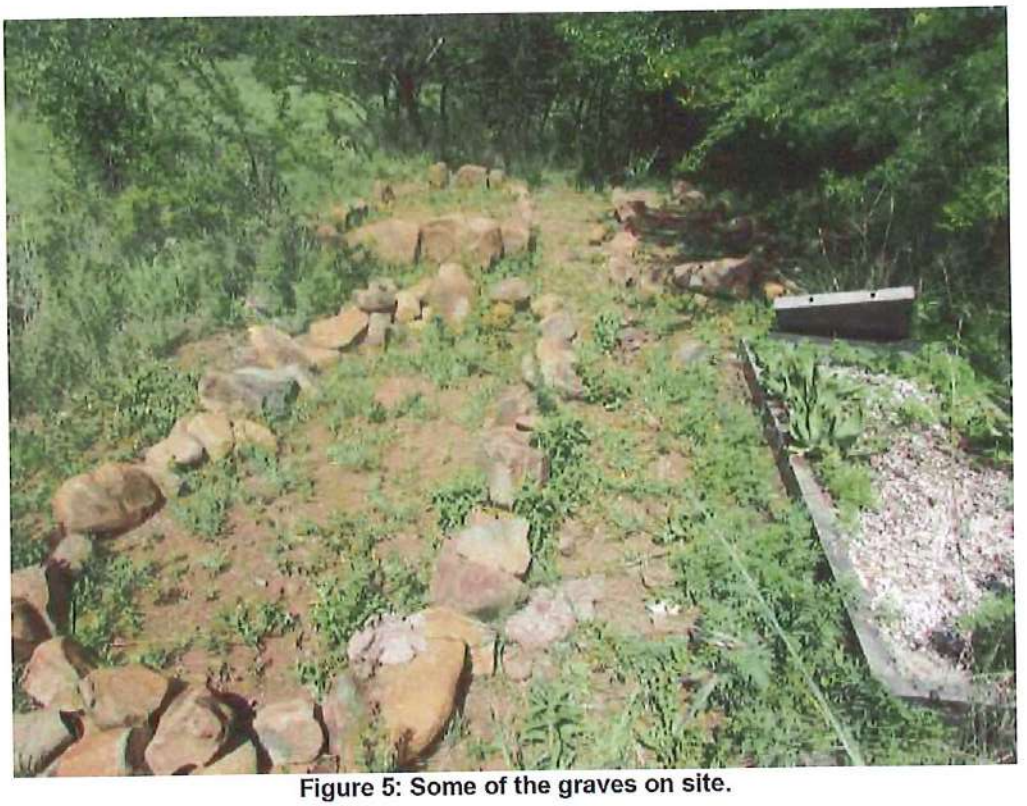


Figure 5: Some of the graves on site.

Figure 6: The headstone on the grave of Phangwabo Thubana.

Figure 7: Headstone on the grave of Koos Thubana.

Figure 8: Cement headstone with the date 1935 visible.

Figure 9: Metal plaque with the surname Mahlangu.

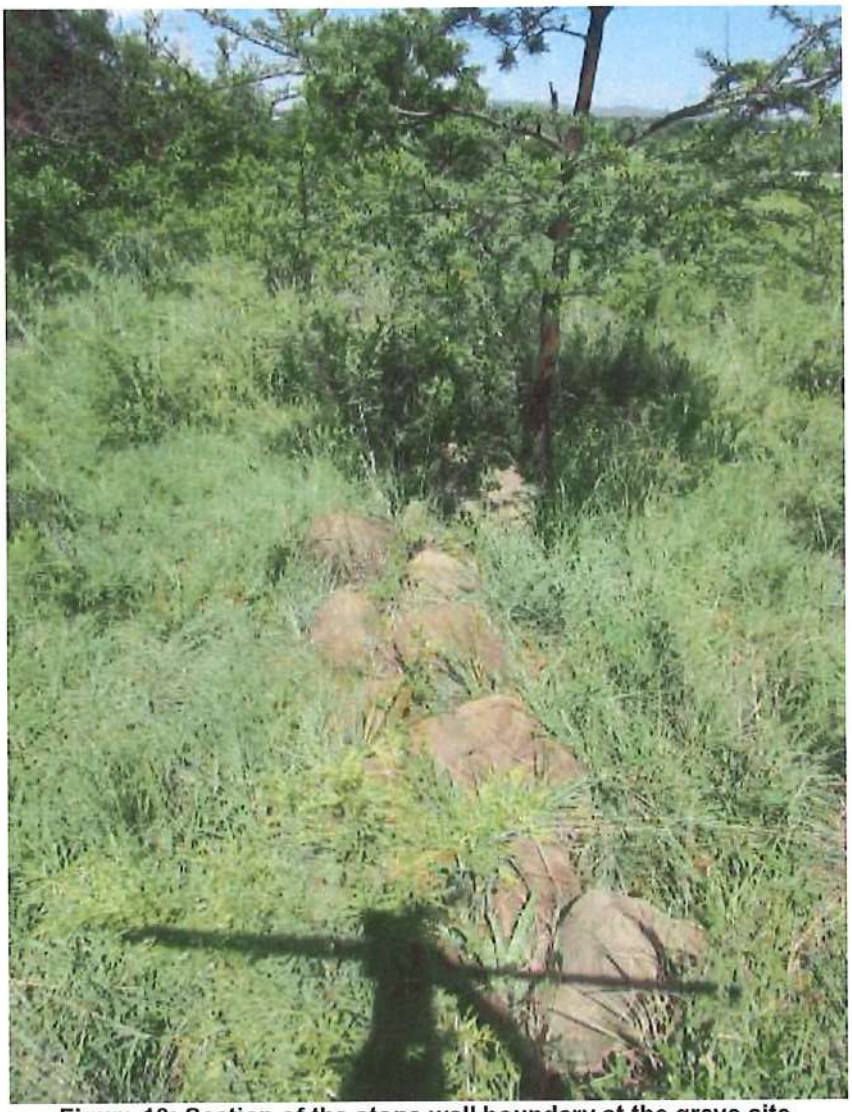


Figure 10: Section of the stone wall boundary at the grave site.

Figure 11: Cattle track through/across the grave site.

Figure 12: Aerial view of Grave Site showing approximate boundary based on the low stone wall around it (Google Earth 2021).

Water Furrow – S25 49 27.80 E28 24 47.00 (South); S25 49 19.20 E28 24 55.40 (North)

According to Kusel this furrow (or canal) is typical of Boer farm settlements and probably dates to around 1860. He was able to provide two coordinates for the feature (North & South ends), but during the December 2020 it was not possible to follow the furrow route in total due to grass and vegetation cover obscuring sections of it. From what was visible it seems as if it was constructed of stones and earth and might have been covered in sections.

The following is recommended for the detailed assessment and recording of the water furrow to be completed:

1. Removing grass and other vegetation around and on the feature under supervision of the Heritage Specialist.

2. Once the features has been thoroughly cleared the feature will be mapped and photographed in detail and a report on it submitted

3. A final decision on the sections of the furrow that will be preserved and/or demolished will then be taken

Figure 13: Part of the water furrow in the Northern section.

Figure 14: Sections of the furrow is covered by grass and other vegetation.

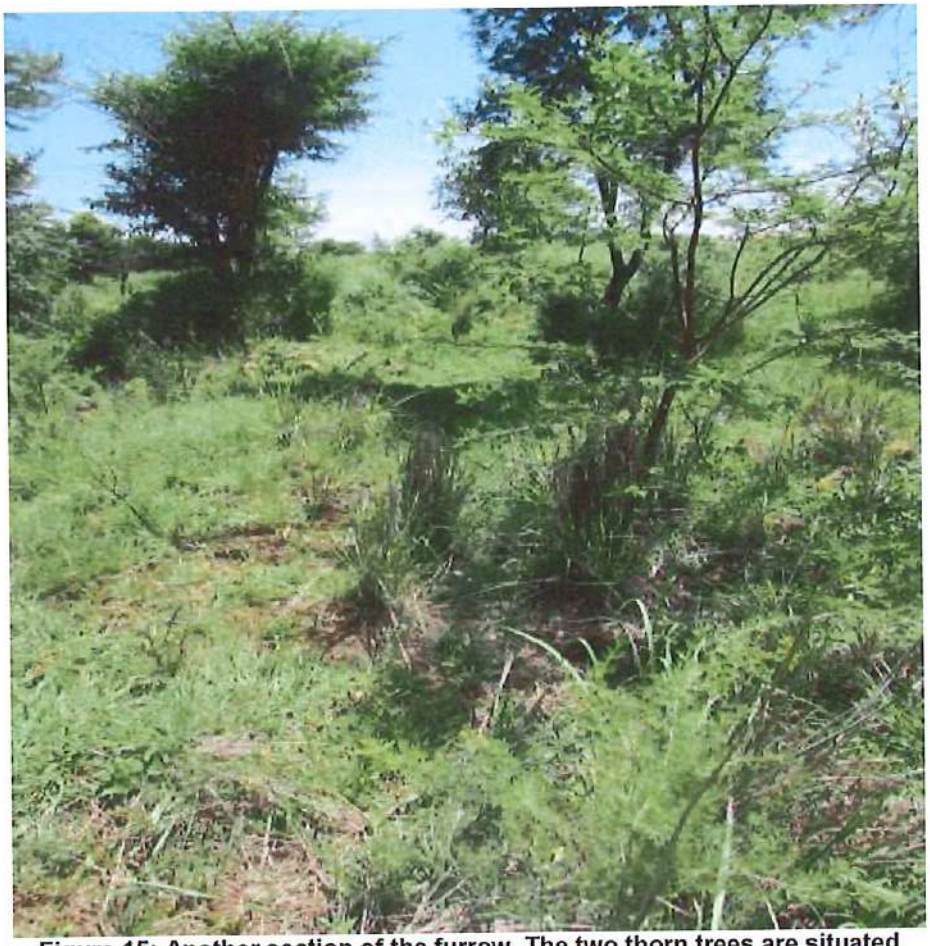


Figure 15: Another section of the furrow. The two thorn trees are situated on the edges of the feature.

Figure 16: A section showing the stone and earth construction of the furrow.

Conclusions & Recommendations

APelser Archaeological Consulting cc (APAC cc) was appointed by Platinum Mile Investments 542 (Pty) Ltd to undertake the Phase 2 Archaeological Assessment of various historical & archaeological sites on Portions 287-297 of the farm Mooiplaats 367JR. The study area is located to the east of Pretoria and the sites will be impacted by their Campus Development here.

In 2007 African Heritage Consultants cc undertook a Cultural Heritage Resources Impact Assessment on the Remainder of Portion 13 and Portions 287 - 296 of the farm Mooiplaats 367 JR in Tshwane, Gauteng. During this assessment a total of 30 sites were identified and recorded, including 27 stonewalled Late Iron Age sites, a recent historical cemetery and the remains of a water furrow.

The December 2020 assessment focused on the Grave Site and Water Furrow.

The October 2019 assessment found that there are around 59 graves located on the site. In December 2020 the site and graves on it was less visible due to dense vegetation, but at least 50 graves could be counted. Most of the graves are stone-packed without any headstones, although there were two with formal granite headstones and a few with metal plaques used as headstones. A low stone wall demarcating the grave site was identified in December 2020 and although the dense vegetation made it difficult to record completely it does provide an interim boundary for the site that can be used when the formal fencing is erected at a later stage. Damage to the site and some of the graves is visible, with cattle seemingly walking through the site and over the graves. Some headstones and stones demarcating the graves have been pushed over as a result.

It is recommended that the site be properly cleaned and the vegetation cut under supervision of the Heritage Specialist. Once this has been done all the graves on the site can be finally counted and recorded individually for inclusion in a Grave Site Register as part of the Grave Site Management Plan. Once the cleaning has been completed a proper fence with access gate needs to be erected as a matter of urgency to protect the graves against any further damage.

The water furrow (or canal) is typical of Boer farm settlements and could date to around 1860. During the December 2020 it was not possible to follow the furrow route in total due to grass and vegetation cover obscuring sections of it. From what was visible it seems as if it was constructed of stones and earth and might have been covered in sections.

The following is recommended for the detailed assessment and recording of the water furrow to be completed:

1. **Removing grass and other vegetation around and on the feature under supervision of the Heritage Specialist.**

2. **Once the features has been thoroughly cleared the feature will be mapped and photographed in detail and a report on it submitted**

3. **A final decision on the sections of the furrow that will be preserved and/or demolished will then be taken**

Should there be any questions or comments on the contents of this document please contact the author as soon as possible.

Kind regards

Anton Pelser

References

1. General and Closer views of study area and Heritage Sites: Google Earth 2021.

2. Kusel, U. 2007. **CULTURAL HERITAGE RESOURCES IMPACT ASSESSMENT OF REMAINDER 13 AND PORTION 287 - 296 OF THE FARM MOOIPLAATS 367 JR TSHWANE GAUTENG.** Unpublished Report AFRICAN HERITAGE CONSULTANTS CC. For: African EPA. August 2007.

3. Pelser, A.J. 2019. **SHORT REPORT ON THE ASSESSMENT OF STONE-WALLED LATE IRON AGE NDEBELE SITES AND A HISTORICAL CEMETERY ON PORTIONS 287-296 OF THE FARM MOOIPLAATS 367JR, NEAR PRETORIA, GAUTENG.** Unpublished Report APELSER ARCHAEOLOGICAL CONSULTING cc APAC019/104. For Kanton. October 2019.

4. Republic of South Africa. 1998. National Environmental Management Act (no 107 of 1998). Pretoria: The Government Printer.

SOUTH AFRICAN HERITAGE RESOURCES AGENCY
41 DE KORTE, SABLE CENTRE, 11TH FLOOR, BRAAMFONTEIN, 2001
P.O. BOX 87552, HOUGHTON, 2041
TEL: 011 403 0683. FAX: 011 403 2609

DATE: 21 August 2008
ENQUIRIES: Mrs Portia Ramalamula

OUR REF: 9/2/213/0001
YOUR REF:

Attention: Ms Leandré Janse van Rensburg

P.O. Box 11522
Hatfield
0028

By Fax: 086 684 1263

Dear Madam

RE: CULTURAL HERITAGE IMPACT ASSESSMENT OF REMAINDER 13 AND PORTION 287-296 OF THE FARM MOOIPLAATS 367 JR TSHWANE GAUTENG PROVINCE

Thank you for your HIA report requesting our comments.

Kindly be informed that our office and Archaeology, Palaeontology and Meteorite Units have already commented on the report. If you don't have copies of such comments, please find attached copies of our comments.

Should you have any queries, please do not hesitate to contact the undersigned at the above telephone and / or facsimile numbers.

Yours sincerely

Vhonani P Ramalamula
Cultural Heritage Officer
For the Manager
SAHRA Gauteng Office

Attention:
Portia Ramalamula

SOUTH AFRICAN HERITAGE RESOURCES AGENCY

41 DE KORTE STREET, SABLE CENTRE, 11TH FLOOR, BRAAMFONTEIN, 2001
P.O. BOX 87552, HOUGHTON, 2041
TEL: (011) 403 0683 - FAX: (011) 403 2609

Date: 25 October 2007

Dr. Udo S Kusel
African Heritage Consultants cc
P O Box 652
Magalieskruin, 0150

Fax: 012 567 6046

Dear Sir

Re: CULTURAL HERITAGE IMPACT ASSESSMENT OF REMAINDER 13 AND PORTION 287-296 OF THE FARM MOOIPLAATS 367 JR TSHWANE GAUTENG PROVINCE.

We are hereby acknowledging receipt of your heritage report in relation to the above subject.

We have noted that in your survey, a number of heritage resources were identified which prompts us to support your recommendation that phase II investigation be conducted. Plans are underway to re-grade Komjekejeke, which is also, associated with the Ndzundza Ndebele and as such the suggestion of preserving and declaring these sites, as heritage resources are most welcomed.

On that note, we conclude by recommending that all the suggested recommendations be undertaken as such, and then SAHRA will take a decision after having sight of the comprehensive heritage report which will also give alternative on what to do with the identified cemetery, etc.

Should you require any clarifications, please contact us at the above telephone and/or facsimile numbers.

Regards,

Nyelisani Amos Mulaudzi
Cultural Heritage Officer
amulaudzi@jhb.sahra.org.za
SAHRA Gauteng

S.A.H.R.A
GAUTENG OFFICE
19 AUG 2008
RECEIVED

SAHRA

SAHRA AIA Review Comment FORM A

FOR ATTENTION: SAHRA: Gauteng OR PHRA: Gauteng

SOUTH AFRICAN HERITAGE RESOURCES AGENCY
111 HARRINGTON STREET, CAPE TOWN, 8001
PO BOX 4637, CAPE TOWN, 8000
TEL: 021 462 4502 FAX: 021 462 4509

FOR OFFICIAL USE ONLY:
SAHRA File No: 9/2/258/0005
Date Received: 19 October 2007
Date of Comment: 29 January 2008
Sent to Peer Review:
Date to Peer Review:
SAHRA Contact Person: Mr Andrew Salomon
DMS Ref No:

REVIEW COMMENT ON

ARCHAEOLOGICAL IMPACT ASSESSMENT

BY ARCHAEOLOGY/ PALAEONTOLOGY UNIT OF THE HERITAGE RESOURCES AGENCY

South Africa has a unique and non-renewable archaeological and palaeontological heritage. Archaeological and palaeontological sites are protected in terms of the National Heritage Resources Act (Act No 25 of 1999) and may not be disturbed without a permit. Archaeological Impact Assessments (AIAs) and Palaeontological Impact Assessments (PIAs) identify and assess the significance of the sites, assess the potential impact of developments upon such sites, and make recommendations concerning mitigation and management of these sites. On the basis of satisfactory specialist reports SAHRA or the relevant heritage resources agency can assess whether or not it has objection to a development and indicate the conditions upon which such development might proceed and assess whether or not to issue permission to destroy such sites.
AIAs and PIAs often form part of the heritage component of an Environmental Impact Assessment or Environmental Management Plan. They may also form part of a Heritage Impact Assessment called for in terms of section 38 of the National Heritage Resources Act, Act No. 25, 1999. They may have other origins. In any event they should comply with basic minimum standards of reporting as indicated in SAHRA Regulations and Guidelines.
This form provides review comment from the Archaeologist of the relevant heritage resources authority for use by Heritage Managers, for example, when informing authorities that have applied to SAHRA for comment and for inclusion in documentation sent to environmental authorities. It may be used in conjunction with Form B, which provides relevant peer review comment.

A. PROVINCIAL HERITAGE RESOURCES AUTHORITY: *SAHRA GAUTENG*

B. SAHRA PROVINCIAL MANAGER : *GAUTENG: Mr Neo January*

C. AUTHOR(S) OF REPORT: *Dr U. Küsel*

D. ARCHAEOLOGY CONTRACT GROUP: *African Heritage Consultants*

E. CONTACT DETAILS: *P.O. Box 652, Magaliesbrug 0150, Tel: 012 5676046, E-mail: udo.heritage@absamail.co.za*

F. DATE OF REPORT: *August 2007*

G. TITLE OF REPORT: **Cultural Heritage Resources Impact Assessment of Remainder 13 and Portions 287-296 of the farm Mooiplaats 367 JR Tshwane, Gauteng**

H. Please circle as relevant: Archaeological component of EIA / EMP/ HIA / CMP Other (Specify).....

I. REPORT COMMISSIONED BY (CONSULTANT OR DEVELOPER): *African EPA (Pty) Ltd*

J. CONTACT DETAILS: *African EPA (Pty) Ltd P. O. Box 13776, Hatfield, 0028, tel 012 366 0100, fax: 012 366 0111, E-mail: aepa@aepa.co.za*

K. COMMENTS:

Please see comments on next page

REVIEW COMMENT ON ARCHAEOLOGICAL IMPACT ASSESSMENT

U, Küsel
28 August 2007, Received 19 October 2007

Cultural Heritage Resources Impact Assessment of Remainder 13 and Portions 287-296 of the farm Mooiplaats 367 JR Tshwane, Gauteng

The area consists of a small hill and low-laying grassland and dense thorn tree veldt. The proposed development entails the construction of approximately 150 residential units on 210 ha.

The assessment revealed the following archaeological heritage resources:

- Late Iron Age sites described as Ndzundza Ndebele sites dating to ± 1800 and probably associated with a headman and his followers. These sites typically consist of an outer stone circle and an inner stone circle, which is often again sub-divided. Some of the sites measure 10 metres in diameter, while others are 50 to 100 metres and more in diameter. Some of the sites have been reused, possibly during the Diamond Hill Battle or by later White farmers.
- A cemetery of possibly up to 40 graves, most represented by heaps of stones. Grave goods indicate that the graves are not older than sixty years.
- The remains of a canal on the north-western portion of the site near a river, typical of early Boer farm settlements and probably dating to around 1860.

The author recommends that:

- A Phase II investigation of the archaeological site be conducted, after which an application for mitigation and destruction of the rest of the sites can be made.
- Two or possibly three of the most important sites should be preserved in a heritage park in the new development and properly restored in a Phase III investigation.
- The possibility of declaring these preserved sites as provincial heritage sites should be investigated.
- A heritage management plan must be compiled for the preserved heritage sites after the completion of the Phase II and Phase III mitigation.
- The cemetery should be cleaned and the graves recorded, and a decision made to either preserve the cemetery or move the graves to a new locality in accordance with provincial legislation.
- The water canal should be recorded in detail and preserved as a feature in the new development if possible. If not, a destruction permit should be applied for.

The SAHRA Archaeology, Palaeontology and Meteorite unit supports the recommendations of the author. Please note that human remains that are less than 60 years old are subject to the provisions of the National Health Act (No. 61 of 2003) and to provincial regulations.

Where the development involves disturbance of an archaeological or palaeontological site of some significance and Phase 2 mitigation has been asked for, SAHRA will require that, in terms of s.38(4)(b&c) of the National Heritage Resources Act, the provisions of ss 35 & 36 apply, as appropriate. The specialist will require a mitigation permit from the relevant Heritage Resources Authority. On receipt of a satisfactory mitigation (Phase 2) permit report from the archaeologist, the heritage authority will make further recommendations in terms of the report. Very often permission is given for the destruction of the remainder of the archaeological or palaeontological sites. Very rarely, if a site has high heritage significance the authority may request that it be conserved, that mini-site management plans, interpretive

material and possibly protective infrastructure be established.

If the recommendations made in the specialist report and in this comment are adhered to, the SAHRA Archaeology, Palaeontology and Meteorite Unit has no objection to the development (in terms of the archaeological component of the heritage resources). If any new evidence of archaeological sites or artefacts, palaeontological fossils, graves or other heritage resources are found during development, construction or mining, SAHRA or an archaeologist must be alerted immediately.

Where bedrock is to be affected, or where there are coastal sediments, or marine or river terraces and in potentially fossiliferous superficial deposits, the developer must ensure that a professional Palaeontological Desk Top study is undertaken to assess whether or not the development will impact upon palaeontological resources. If this is deemed unnecessary, at least a letter of exemption from a Palaeontologist is needed. If the area is deemed sensitive, a full Phase 1 Palaeontological Impact Assessment will be required and if necessary a Phase 2 rescue operation might be necessary.

Decisions on Built Environment (e.g. structures over 60 years) and Cultural Landscapes must be made by the *Gauteng* SAHRA Provincial Heritage office *(Mr Neo January: njanuary@jhb.sahra.org.za, JenniferKitto: jkitto@jhb.sahra.org.za, Amos(Nyelisani)Mulaudzi :amulaudzi@jhb.sahra.org.za)* to whom we will send the Impact Assessment Report and this Comment before it is sent to you. (We understand that the SAHRA Provincial Heritage office is managing the Built Environment and Cultural Landscape Issues for the PHRA).

SIGNATURE OF ARCHAEOLOGIST PROCESSING REPORT: .....

EMAIL: *asalomon@sahra.org.za* .....

SIGNATURE OF SAHRA HEAD ARCHAEOLOGIST: p.p. .....

EMAIL: *mleslie@sahra.org.za* .....

NAME OF HERITAGE RESOURCES AGENCY: *SAHRA* .....

PLEASE NOTE THAT THE COMMENT (ABOVE OR APPENDED) CONSTITUTES THE COMMENT OF THE HERITAGE RESOURCES AGENCY ARCHAEOLOGIST AND THAT ANY DEVELOPMENT THAT INVOLVES DESTRUCTION OF ANY ARCHAEOLOGICAL/PALAEONTOLOGICAL SITE IS STILL SUBJECT TO A PERMIT/PERMISSION FOR DESTRUCTION OF SUCH SITE GIVEN TO THE DEVELOPER BY THE RELEVANT HERITAGE RESOURCES AGENCY ARCHAEOLOGICAL AND PALAEONTOLOGICAL PERMIT COMMITTEE (THIS WILL BE SUBJECT TO APPROVAL OF THE PHASE 2 OR ARCHAEOLOGICAL/ PALAEONTOLOGICAL MITIGATION AS NECESSARY). THIS REPORT MAY BE TAKEN ONLY AS APPROVAL, IN PRINCIPLE, IN TERMS OF SECTION 38 OF THE NATIONAL HERITAGE RESOURCES ACT. THE PROVINCIAL MANAGER OF THE HERITAGE RESOURCES AUTHORITY MUST ADVISE AS TO APPROVAL IN TERMS OF HERITAGE ISSUES ENCOMPASSED BY OTHER ASPECTS OF THE LEGISLATION, SUCH AS ISSUES OF THE BUILT ENVIRONMENT (STRUCTURES (E.G. FARM HOUSES), OVER 60 YEARS), INDIGENOUS KNOWLEDGE SYSTEMS OR OF CULTURAL LANDSCAPES AS THIS IS NOT WITHIN THE SCOPE OF THE ARCHAEOLOGIST.

PLEASE NOTE THAT SAHRA IS NOW RESPONSIBLE FOR GRADE I HERITAGE RESOURCES (AND EXPORT) AND THE PROVINCIAL HERITAGE RESOURCES ARE RESPONSIBLE FOR GRADE II AND GRADE III HERITAGE RESOURCES, EXCEPT WHERE THERE IS AN AGENCY ARRANGEMENT WITH THE PROVINCIAL HERITAGE RESOURCES AUTHORITY.

AFRICAN HERITAGE CONSULTANTS CC

2001/077745/23

DR. UDO S KÜSEL

Tel/fax: (012) 567 6046
Cell: 082 498 0673
E-mail: udo.heritage@absamail.co.za

P.O. Box 652
Magalieskruin
0150

28 August 2007

CULTURAL HERITAGE RESOURCES IMPACT ASSESSMENT OF REMAINDER 13 AND PORTION 287 - 296 OF THE FARM MOOIPLAATS 367 JR TSHWANE GAUTENG

1. DEFINITION

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

2. PROTECTED SITES IN TERMS OF THE NATIONAL HERITAGE RESOURCES ACT, ACT NO. 25 OF 1999

The following are the most important sites and objects protected by the National Heritage Act:

a. Structures or parts of structures older than 60 years.
b. Archaeological sites and objects.
c. Palaeontological sites.
d. Meteorites.
e. Ship wrecks.
f. Burial grounds.

g. Graves of victims of conflict.
h. Public monuments and memorials.
i. Structures, places and objects protected through the publication of notices in the Gazette and Provincial Gazette.
j. Any other places or object, which are considered to be of interest or of historical or cultural significance.
k. Geological sites of scientific or cultural importance.
l. Sites of significance relating to the history of slavery in South Africa.
m. Objects to which oral traditions are attached.
n. Sites of cultural significance or other value to a community or pattern of South African history.

3. METHODOLOGY

All relevant maps and documents on the site were studied. The site was visited and visually inspected.

4. RESULTS

The area consists of a small hill and low laying areas of grassland and dense thorn tree veld. The visibility in most areas is very bad because of the dense vegetation, which made the finding of archaeological sites difficult.

At the following localities Late Iron Age sites and historic sites were recorded.

1	Late Iron Age site	S25° 50' 33.6"	E28° 25' 24.5"
2	Late Iron Age site	S25° 50' 34.0"	E28° 25' 23.6"
3	Late Iron Age site	S25° 50' 30.1"	E28° 25' 24.1"
4	Late Iron Age site	S25° 50' 28.4"	E28° 25' 23.3"
5	Late Iron Age site	S25° 50' 25.3"	E28° 25' 21.8"
6	Late Iron Age site	S25° 50' 22.1"	E28° 25' 18.8"
7	Late Iron Age site	S25° 50' 24.0"	E28° 25' 15.1"
8	Late Iron Age site	S25° 50' 27.3"	E28° 25' 17.2"
9	Late Iron Age site	S25° 50' 26.5"	E28° 25' 15.6"
10	Late Iron Age site	S25° 50' 25.3"	E28° 25' 14.8"
11	Late Iron Age site	S25° 50' 20.7"	E28° 25' 12.2"
12	Late Iron Age site	S25° 50' 17.3"	E28° 25' 11.0"
13	Late Iron Age site	S25° 50' 17.1"	E28° 25' 09.1"
14	Late Iron Age site	S25° 50' 11.2"	E28° 25' 05.2"
15	Late Iron Age site	S25° 50' 29.2"	E28° 25' 13.2"
16	Late Iron Age site	S25° 50' 40.3"	E28° 25' 14.9"
17	Late Iron Age site	S25° 50' 08.9"	E28° 25' 03.8"
18	Square kraal	S25° 50' 07.2"	E28° 25' 05.9'
19	Late Iron Age site	S25° 50' 05.3"	E28° 25' 05.9"
20	Late Iron Age Site	S25° 50' 07.0"	E28° 25' 03.8"
21	Late Iron Age Site	S25° 50' 03.7"	E28° 25' 00.3"

22	Late Iron Age Site	S25° 50' 00.6"	E28° 24' 54.8"
23	Late Iron Age Site	S25° 49' 57.4"	E28° 24' 53.9"
24	Late Iron Age Site	S25° 49' 54.8"	E28° 24' 51.7"
25	Late Iron Age Site	S25° 49' 51.2"	E28° 24' 51.9"
26	Late Iron Age Site	S25° 49' 51.4"	E28° 24' 51.3"
27	Late Iron Age Site	S25° 49' 47.7"	E28° 24' 50.2"
28	Cemetery	S25° 49' 35.6"	E28° 24' 54.6"
29	Furrow South	S25° 49' 27.8"	E28° 24' 47.0"
30	Furrow North	S25° 49' 19.2"	E28° 24' 55.4"

4.1 Late Iron Age Sites

The Late Iron Age Sites are most probably Ndzundza Ndebele Sites dating to the period ± 1800. The Ndzundza Ndebele was concured in this area in the 1820s by Mzilikazi and incorporated into his tribe (see Küsel 2002 and Van Vuuren 1992).

The Ndzundza Ndebele sites are concentrated in the area west of Donkerhoek (Diamond Hill) and the Bronberg up to the present Mamelodi southern border. This whole area is under severe pressure from township development. The present site investigation lies halfway between Donkerhoek and the Bromberg (Küsel 2002 and Database of the National Cultural History Museum).

A typical site consists of an outer stone circle and an inner stone circle. In many cases the inner stone circle is again sub-divided. Some of the sites are only 10 metres in diameter while others are 50 to 100 metres and more in diameter (see photographs 1 – 4).

On average the stonewalling is les than one meter high though some stonewalls are nearly two metres high. It is also clear that some of the stonewall have been reused for modern cattle kraals (square) while others may even have been used as redoubts during the battle of Diamond Hill in the Second Anglo Boer War (see Berg 1999 p 52 – 53).

From an archaeological point of view many sites have been recorded but nothing has been published on these early Ndebele sites (National Cultural History Museum Database). Prof. Chris van Vuuren of Unisa who has mainly worked on oral history of the Ndebele has done the most extensive work on these sites. According to him the main settlement of the Ndzandza Ndebele was more or less where the Silver Lakes Golf Estate is today. The sites on Mooiplaats would thus form part of the Ndzundza settlements in the area, most probably associated with a headman and his followers (Van Vuuren 1992).

At present it is impossible to assess the sites interrelation ship to each other because of the dense vegetation. From the fieldwork it seems that most sites are relatively small (one family unit) but a number of the sites are much larger (up to 100 metres in diameter and more). From this it can be conducted that a large site most probably has up to ten smaller sites associated with it. This can possibly be a settlement of a headman with a number of families under his jurisdiction. Some of the sites as

already mentioned have been reused possible during the Diamond Hill Battle or by later White farmers (Berg 1999 p 51 –52).

4.2 Cemetery

At S25° 49' 35.6" and E28° 24' 54.6 a large cemetery of fairly recent times was found. The graves are mostly just heaps of stones. Some are difficult to see because of the vegetation and stones, which have over the years been scattered. There might be up to forty graves. From the grave goods it is clear that these graves are not older than sixty years and thus fall outside the jurisdiction of Act 25 of 1999, but are protected by Provincial legislation (for detail see annexure A).

Two of the graves are in a good condition and according to one of the present farm workers are still visited by family members.

4.3 Canal

The remains of a canal was found on the north-western portion of the site near the river. This canal is typical of early Boer farm settlements.

A Furrow was dug to bring water to the house and for irrigating fields and orchards. Farming and the new road have destroyed the northern portion of the canal. The original farm settlement most probably was north of the present road. The canal will most probably date to the 1860 when the first farms were allocated to White farmers in the area (see photograph 5).

5. CONCLUSION

The Ndzundza sites in the area are all under threat and many have already been destroyed by township development and farming activities. The sites on Mooiplaats 367 JR (Remainder 13 and portion 287 - 296) are still in a relative good state of preserving and most probably are of a Field Rating Grade II. This would not necessary apply to all the sites but at least two or three of them with nearby associated sites. Dense vegetation made proper recording and evaluation difficult. For this reason a detailed phase II investigation and even a phase III development might be necessary.

The graves are important and should be properly cleaned and protected or mitigated.

The old canal is typical of early Boer pioneer settlements. A canal was essential for bringing water for household and irrigation purposes to the farm settlement.

6. RECOMMENDATIONS

It is recommended that:

- A phase II investigation of the archaeological site be conducted. For this purpose the veld will have to be burned in the spring to get rid of the tall grass. Some bush clearing will also have to take place so that individual sites can be recorded.
- Two or possible three of the most important sites should be preserved in a heritage park in the new development and be properly restored in a phase III investigation.
- The possibility to declare these preserved sites; provincial heritage sites should be investigated.
- After the phase II investigation an application for mitigation and destruction of the rest of the sites can be made.
- A heritage management plan must be compiled for the preserved heritage sites after the completion of the phase II and III mitigation.
- The cemetery should be cleaned the graves recorded and a decision must be taken to either preserve the cemetery or to move the graves to a new locality in accordance with present provincial legislation.
- The old water canal should be recorded in detail and be preserved as a feature in the new development if possible. If not a permit for destruction must be applied for

7. SITE INFORMATION

Owners contact details: **Platinum Mile Investments 542 (Pty) Ltd** **PO Box 608, La Montagne 0184** **Tel (012) 802 1128 Fax (012) 802 1227**
Developers contact details: **Same as above**
Consultants contact details: **African EPA** **PO Box 13776** **Hatfield, 0028** **Tel (012) 366 0100 Fax (012) 366 0111**
Type of development (e.g. low cost housing project, mining etc.) **App 150 residential units on 210 ha**
Whether rezoning and/or subdivision of land is involved: **Agricultural to residential**

Full location of Province, Magisterial District/Local Authority, property (e.g. farm, erf name and number: **Portions R/13 and 287 – 296 of the Farm Mooiplaats 367 JR**
Location map must have the polygon of the area to be surveyed on it and full geographical coordinates for all relevant points and where applicable indication of the area to be developed (footprint):
If possible an aerial photograph of the specific area showing the location of all site.

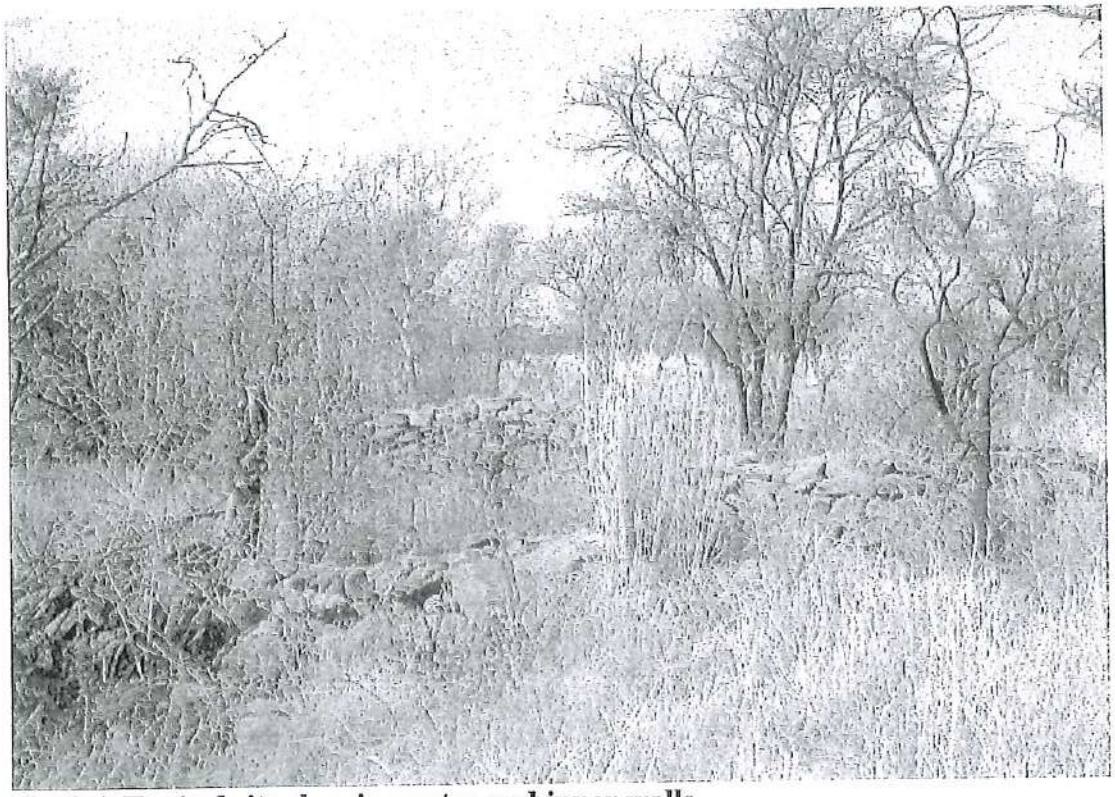
8. REFERENCES

- National Heritage Resources Act No. 25 of 1999
- Bergh J.S. Geskiedenis Atlas van Suid Afrika Die vier Noordelike Provinsies 1999
- A.E. Breytenbach. Die Slag van Donkerhoek 11 – 12 Junie 1900 MA Unisa 1979
- J.C. Visagie Voortrekker stam ouers 1835 – 1845 Universiteit van Suid Afrika Pretoria Bl. 151
- C.J. van Vuuren Die aard en betekenis van Etnisiteit onder die Suid-Ndebele DPhil, Universiteit van Pretoria 1992
- 1/50 000 Map 2528 CD
- Küsel 2002 Unpublished report – Bronberg project – Cultural Heritage Resources
- Archaeological database of the National Cultural History Museum Pretoria

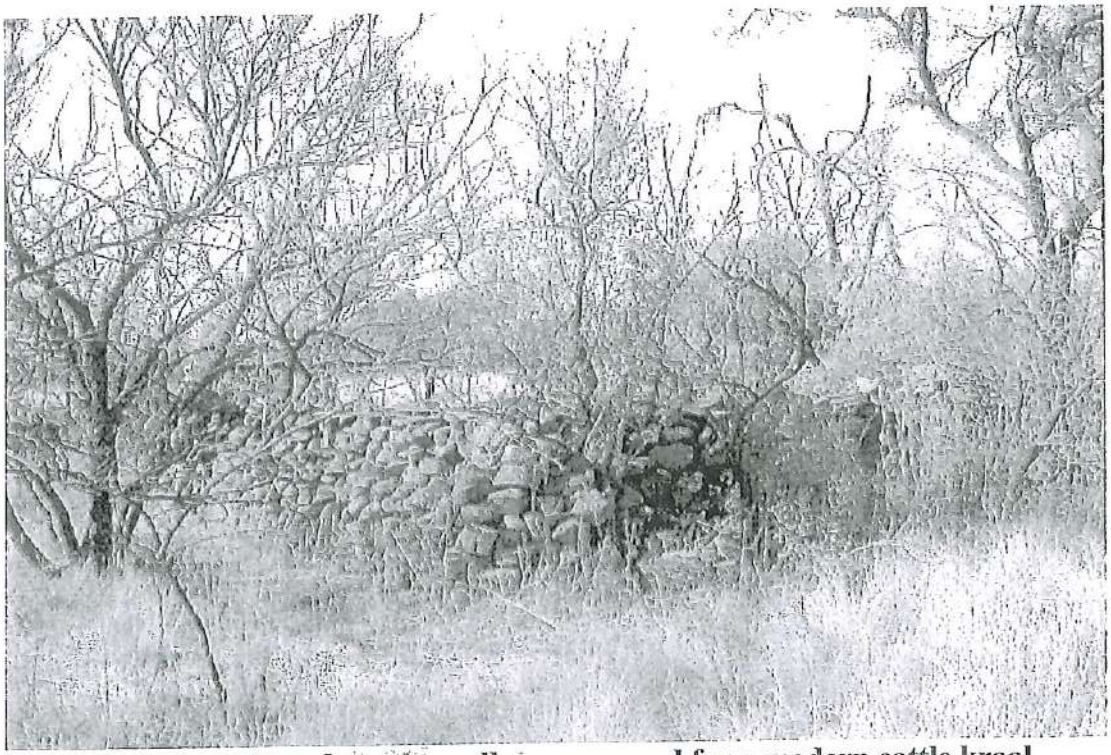
PHOTOGRAPH

No. 1 Typical stonewalled site with dense vegetation

No. 2 One of the sites with high walling

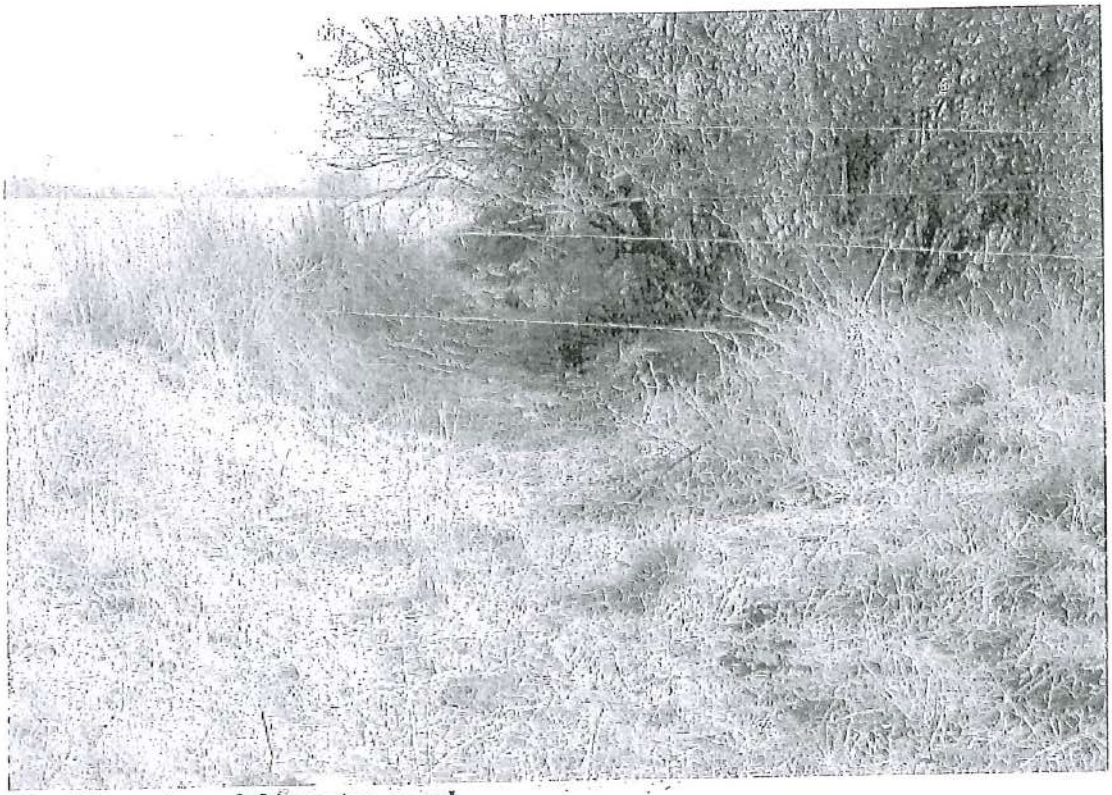


No. 3 A Typical site showing outer and inner walls

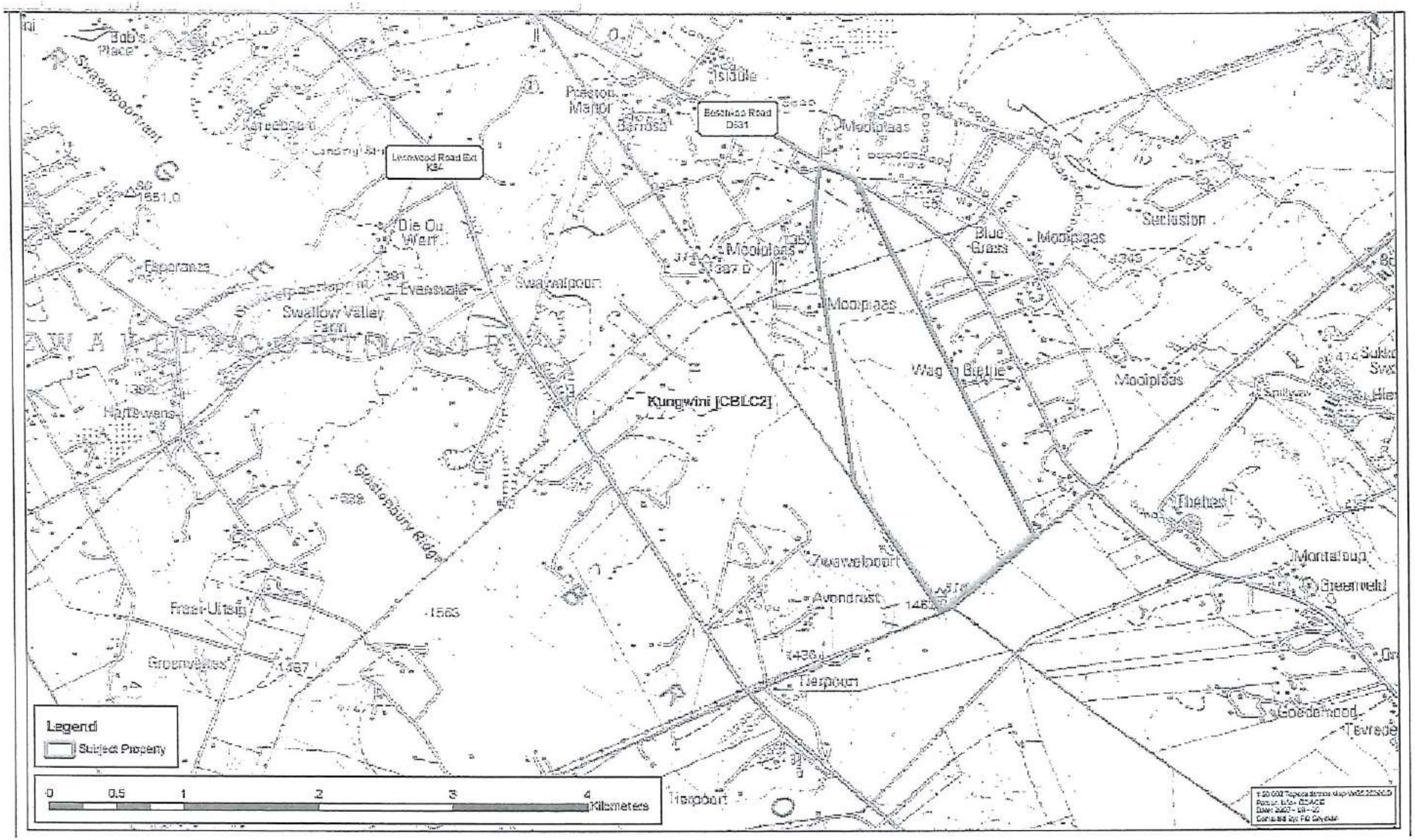


No. 4 One of the sites where the walls were reused for a modern cattle kraal

No 5 General view of the cemetery

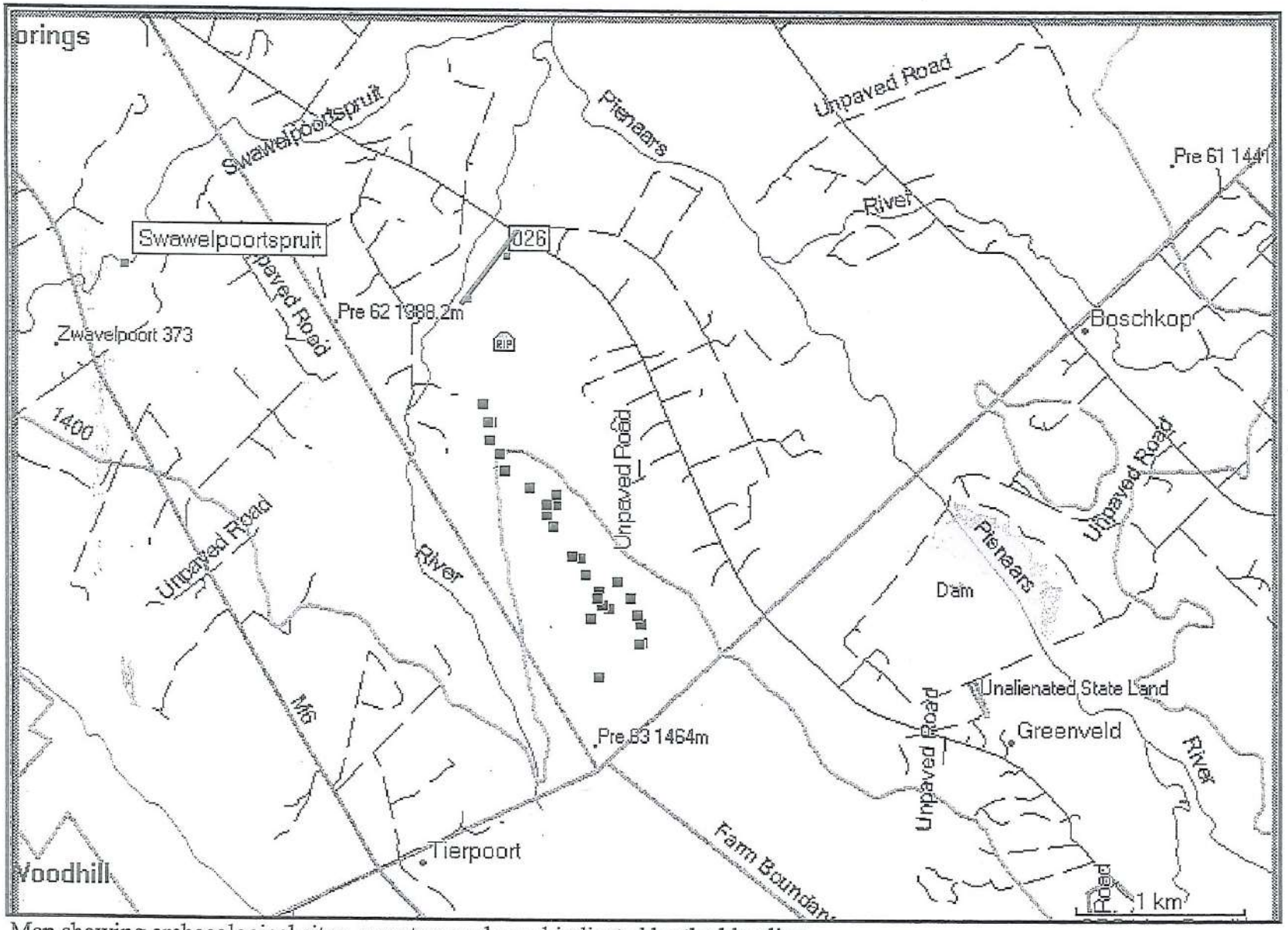


No. 6 Remains of the water canal



Bob's Place
Swawelpoortrant
Karreeboom
Lynnwood Road Ext K34
Preston Manor
Barnosa
Bronkhorstspruit Road D631
Mooiplaas
Die Ou Werf
Esperanza
Swallow Valley Farm
Eversmore
Swawelpoort
Mooiplaas
Blue Grass
Suclusion
Wag 'n Bietjie
Kungwini [CBLC2]
Glastonbury Ridge
Zwavelpoort
Avondrust
Tierpoort
Frost-Uitsig
Greenvines
Montaloup
Greenveld
Goedehoop
Tevrede
Thebes
1563
1467
Legend
Subject Property
0
0.5
1
2
3
4
Kilometers

MAP



Map showing archaeological sites, cemetery and canal indicated by the blue line.

ANNEXURE A

ARCHAEOLOGY, GRAVES AND THE LAW

- In terms of Section 36(3) of the National Heritage Resources Act, no person may, without a permit issued by the relevant heritage resources authority:

  (a) destroy, damage, alter, exhume or remove from its original position of 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.

- 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.

- A registered undertaker can only handle human remains or an institution declared under the Human Tissues Act (Act 65 of 1983 as amended).

- Unidentified/unknown graves are also handled as older than 60 until proven otherwise

THE PROCESS/STEPS THAT ARE TAKEN

SITE VISIT: WHAT IS DONE DURING THIS SITE VISIT?

Physical documentation of graves prior to exhumation: Photographic, GPS, Site Maps, Final counting etc…

Determining context of graves: If any, are they associated with other sites such as farmhouses/structures etc…

SITE SIGNS AND ADVERTISEMENTS

Notices (in compliance with the National Heritage Resources Act) must be placed on the site/s, indicating the intent of relocation. This must be in at least 3 languages and has to be up for a minimum of 60 days.
As part of the preliminary social consultation, newspaper ads as well as radio announcements has to be made as well

This is in order that family members/descendants, if any, can reply/come forward to indicate if any of the graves belong to them

SOCIAL CONSULTATION

If any individuals responded during initial consultation/public participation, then full social consultation undertaken. This will include speaking to individuals regarding graves, their family wishes, getting consent for relocation/reburial etc…

It could also include an Open Day/Traditional Ceremony (or more than one if necessary)

PERMIT APPLICATIONS

Undertakers permits applied for and obtained during social consultation
Only after all necessary documents, family consent obtained, landowner letter, can SAHRA Permit be applied for and obtained. A few weeks should be budgeted for this

EXHUMATION & RELOCATION

When permits obtained physical exhumation, investigation and reburial commences

THE ARCHAEOLOGICAL INVESTIGATION OF BURIALS: DOCUMENTATION FORM

This form contains the following information for each burial:

Feature/Burial No **Site Name/No** **GPS Reading** **Farm Name/No**
Province **Location of new cemetery**

It also includes information on the
Burial Type
Burial Dimensions
Grave Type
Grave Dimensions
Associated sites/features
Specimens or grave goods found
The state of preservation and percentage completeness of the human skeletal material
Sex and Age of the individual
Further Remarks
Information on the headstone and grave dressing (if any)

Photographs of each grave, headstone (if any), the skeletal remains, grave goods etc… are also taken and used in the final documentation

PALAEONTOLOGICAL DESKTOP ASSESSMENT FOR THE PROPOSED MOOIPLAATS EDUCATIONAL FACILITY, GAUTENG PROVINCE

Compiled for:

Bokamoso Landscape Architects & Environmental Consultants CC

PO Box 11375

Maroelana

0161

Prepared by

Banzai Environmental

25 January 2020

Declaration of Independence

I, Elize Butler, declare that –

General declaration:

- I act as the independent palaeontological specialist in this application
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favorable to the applicant
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting palaeontological impact assessments, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I will take into account, to the extent possible, the matters listed in section 38 of the NHRA 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 provide the competent authority with access to all information at my disposal regarding the application, whether such information is favorable 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 a palaeontological specialist in terms of the Act and the constitutions of my affiliated professional bodies; and
- I realize that a false declaration is an offense in terms of regulation 71 of the Regulations and is punishable in terms of section 24F of the NEMA.

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 Regulations.

PALAEONTOLOGICAL CONSULTANT: Banzai Environmental (Pty) Ltd

CONTACT PERSON: Elize Butler

Tel: +27 844478759

Email: elizebutler002@gmail.com

SIGNATURE: 

The heritage impact assessment report has been compiled considering the National Environmental Management Act 1998 (NEMA) and Environmental Impact Regulations 2014 as amended, requirements for specialist reports, Appendix 6, as indicated in the table below.

Table 1: NEMA table

NEMA Regs (2014) - Appendix 6	**Relevant section in report**
1. (1) A specialist report prepared in terms of these Regulations must contain- a) details of- i. the specialist who prepared the report; and ii. the expertise of that specialist to compile a specialist report including a curriculum vitae;	Page ii -iii of Report – Contact details and company and Appendix A
b) a declaration that the specialist is independent in a form as may be specified by the competent authority;	Page ii-iii
c) an indication of the scope of, and the purpose for which, the report was prepared;	Section 4 – Objective
(cA) an indication of the quality and age of base data used for the specialist report;	Section 5 – Geological and Palaeontological history
(B) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	Section 9
d) the date, duration and season of the site investigation and the relevance of the season to the outcome of the assessment;	N/A
e) a description of the methodology adopted in preparing the report or carrying out the specialized process inclusive of equipment and modeling used;	Section 7 Approach and Methodology
f) details of an assessment of the specifically identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives;	Section 1 and 10
g) an identification of any areas to be avoided, including buffers;	Not identified, Section 10
h) a map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;	Section 5 – Geological and Palaeontological history

NEMA Regs (2014) - Appendix 6	Relevant section in report
i) a description of any assumptions made and any uncertainties or gaps in knowledge;	Section 7.1 – Assumptions and Limitation
j) a description of the findings and potential implications of such findings on the impact of the proposed activity, including identified alternatives on the environment or activities;	Section 9
k) any mitigation measures for inclusion in the EMPr;	Section 11
l) any conditions for inclusion in the environmental authorization;	Section 11
m) any monitoring requirements for inclusion in the EMPr or environmental authorization;	N/A
n) a reasoned opinion- i. as to whether the proposed activity, activities or portions thereof should be authorized; (iA) regarding the acceptability of the proposed activity or activities; and ii. if the opinion is that the proposed activity, activities or portions thereof should be authorized, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan;	Section 11
o) a description of any consultation process that was undertaken during the course of preparing the specialist report;	Not applicable.
p) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	Not applicable.
q) any other information requested by the competent authority.	Not applicable.
2) Where a government notice *gazetted* by the Minister provides for any protocol or minimum information requirement to be applied to a specialist report, the requirements as indicated in such notice will apply.	Section 3 compliance with SAHRA guidelines

EXECUTIVE SUMMARY

Banzai Environmental was appointed by Bokomaso Landscape Architects & Environmental Consultants CC to conduct the **Palaeontological Desktop Assessment** (DIA) to assess the proposed Mooiplaats Educational Facility within the Jurisdiction of the City of Tshwane Metropolitan Municipality, Gauteng Province. The proposed Mooiplaats Educational Development will be located on Portions 287 to 296 of the Farm Mooiplaats 367 JR. A possible new access road will cut across Portion 631 of the Farm Mooiplaats 367 JR to provide access off the Boschkop Road (R631), which will require an intersection upgrade which may affect Portion 437 and 438 of Mooiplaats 367. The National Heritage Resources Act (No 25 of 1999, section 38) (NHRA), states that a Palaeontological Impact Assessment (PIA) is key to the discovery of fossil material within the planned development. This PIA is thus necessary to evaluate the effect of the construction on the palaeontological resources.

The proposed development is underlain by diabase igneous rocks, as well as sedimentary rocks of the Silverton Formation (Pretoria Group, Transvaal Supergroup). According to the PalaeoMap of South African Heritage Resources Information System (SAHRIS) the Palaeontological Sensitivity of the diabase rocks, which is igneous/volcanic in origin is zero and that of the Silverton Formation (Pretoria Group, Transvaal Supergroup) is high. (Almond et al, 2013, SAHRIS website).

The carbon-rich mudrocks of the Silverton Formation may contain organic-walled microfossils while the chert horizons may preserve other microbial assemblages. Nevertheless, the Silverton Formation is not known to contain macrofossils. The diabase is igneous rocks and are thus considered to have no palaeontological significance. However, the presence of the diabase would have had a thermal metamorphic effect on the adjoining Silverton Formation that would decrease the chance of fossils preservation in this formation.

If fossil remains are discovered during any phase of construction, either on the surface or exposed by excavations the **Chance Find Protocol** must be implemented by the ECO/site manager in charge of these developments. These discoveries ought to be protected and the ECO/site manager must report to SAHRA (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za) so that mitigation (recording and collection) can be carry out by a paleontologist.

TABLE OF CONTENT

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Appendix A: CV

1 INTRODUCTION

Bokamoso Landscape Architects and Environmental Consultants CC was employed to conduct an Environmental Impact Assessment and Water Use Licence Application (WULA) for the Mooiplaats Educational Facility (Figure 1-3). Banzai Environmental was in turn appointed to conduct the Palaeontological Desktop Assessment for the project.

The proposed Mooiplaats Educational Development will be located on Portions 287 to 296 of the Farm Mooiplaats 367 JR. A possible new access road will cut across Portion 631 of the Farm Mooiplaats 367 JR to provide access off the Boschkop Road (R631), which will require an intersection upgrade which may affect Portion 437 and 438 of the Farm Mooiplaats 367.

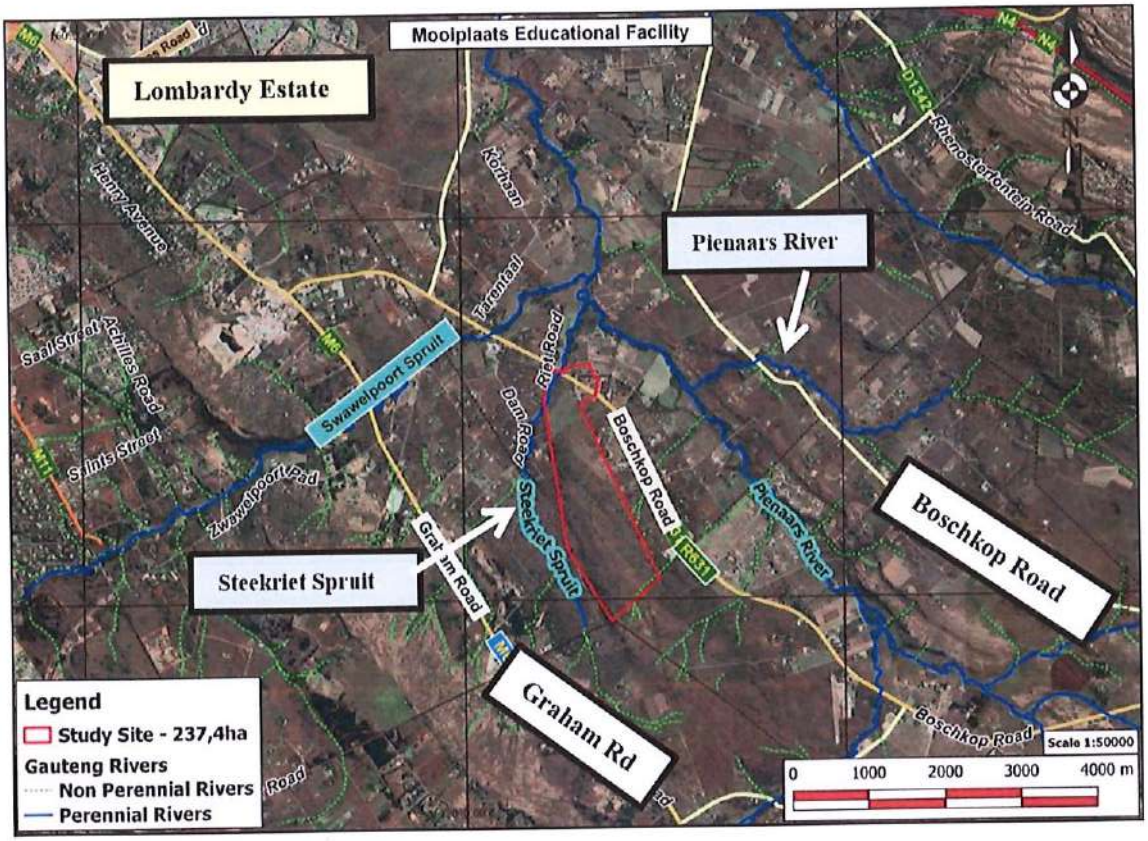


Figure 1: Locality map of the proposed Mooiplaats Educational Facility within the Jurisdiction of the City of Tshwane Metropolitan Municipality, Gauteng Province. Map provided by Bokamoso.

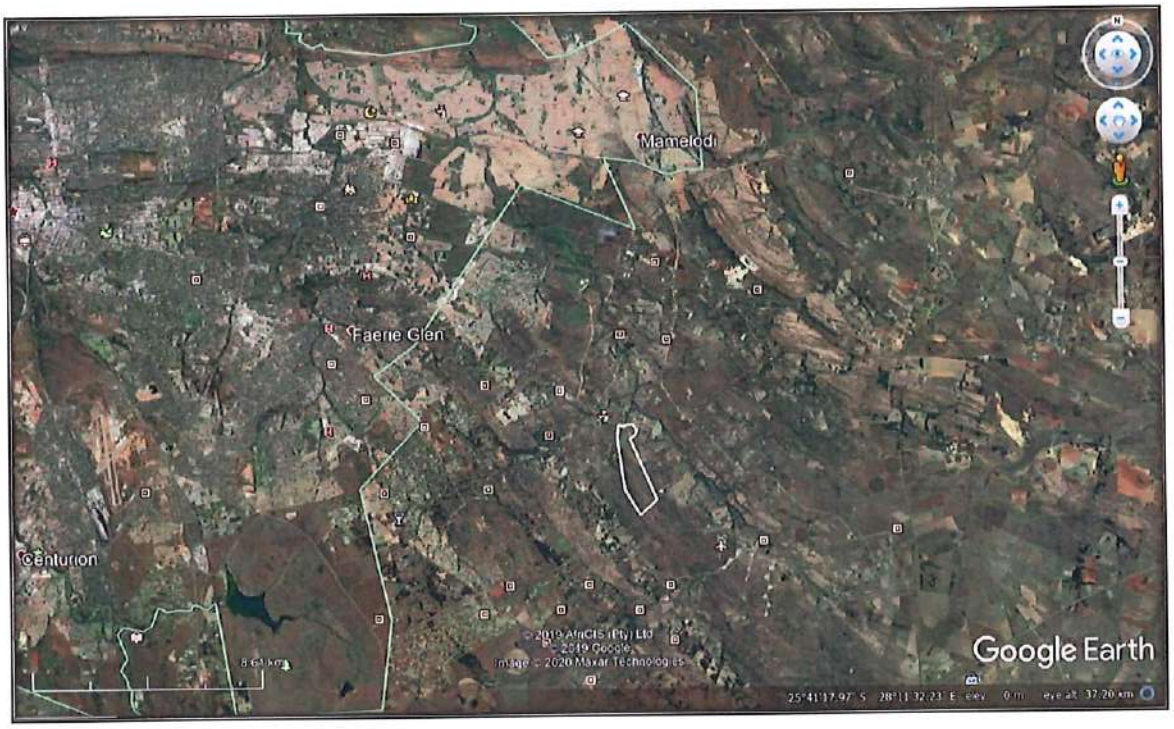


Figure 2:Overview of the general locality of the Mooiplaats Educational Facility indicated by the white polygon.

2 QUALIFICATIONS AND EXPERIENCE OF THE AUTHOR

The author (Elize Butler) has an MSc in Palaeontology from the University of the Free State, Bloemfontein, South Africa. She has been working in Palaeontology for more than twenty-six years. She has experience in locating, collecting and curating fossils, including exploration field trips in search of new localities in the Karoo Basin. She has been a member of the Palaeontological Society of South Africa for 14 years. She has been conducting PIAs since 2014.

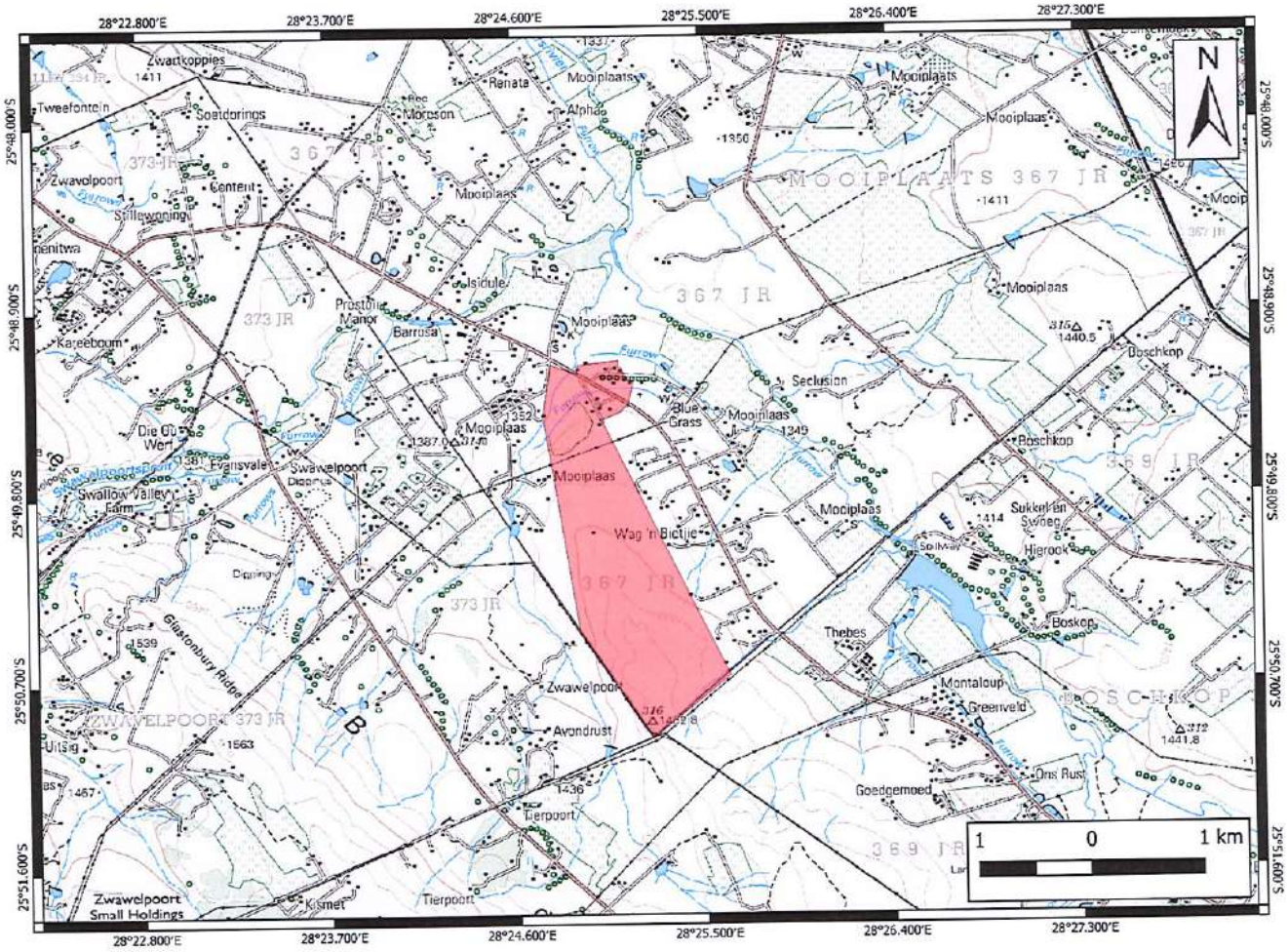


Figure 3: Extract of the 1:50 000 topographic map (2528 CD Rietvlei Dam) indicating the proposed Mooiplaats Educational Facility (in red) within the Jurisdiction of the City of Tshwane Metropolitan Municipality, Gauteng Province.

3 LEGISLATION

3.1 National Heritage Resources Act (25 of 1999)

Cultural Heritage in South Africa, includes all heritage resources, is protected by the National Heritage Resources Act (Act 25 of 1999) (NHRA). Heritage resources as defined in Section 3 of the Act include **"all objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens**".

Palaeontological heritage is unique and non-renewable and is protected by the NHRA. Palaeontological resources may not be unearthed, broken moved, or destroyed by any development without prior assessment and without a permit from the relevant heritage resources authority as per section 35 of the NHRA.

This Palaeontological Desktop Assessment forms part of the Heritage Impact Assessment (HIA) and adhere to the conditions of the Act. According to **Section 38 (1)**, a HIA is required to assess any potential impacts to palaeontological heritage within the development footprint where:

- the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
- the construction of a bridge or similar structure exceeding 50m in length;
- any development or other activity which will change the character of a site—
    a. (exceeding 5 000 m^2 in extent; or
    b. involving three or more existing erven or subdivisions thereof; or
    c. involving three or more erven or divisions thereof which have been consolidated within the past five years; or
    d. the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority
    e. the re-zoning of a site exceeding 10 000m^2 in extent;
- or any other category of development provided for in regulations by SAHRA or a Provincial heritage resources authority.

4 OBJECTIVE

The objective of a Palaeontological Impact Assessment (PIA) is to determine the impact of the development on potential palaeontological material at the site.

According to the "SAHRA APM Guidelines: Minimum Standards for the Archaeological and Palaeontological Components of Impact Assessment Reports" the aims of the PIA are: 1) to **identify** the palaeontological status of the exposed as well as rock formations just below the surface

in the development footprint 2) to estimate the **palaeontological importance** of the formations 3) to determine the **impact** on fossil heritage; and 4) to recommend how the developer ought to protect or mitigate damage to fossil heritage.

The terms of reference of a PIA are as follows:

General Requirements:

- Adherence to the content requirements for specialist reports in accordance with Appendix 6 of the EIA Regulations 2014, as amended;
- Adherence to all applicable best practice recommendations, appropriate legislation and authority requirements;
- Submit a comprehensive overview of all appropriate legislation, guidelines;
- Description of the proposed project and provide information regarding the developer and consultant who commissioned the study;
- Description and location of the proposed development and provide geological and topographical maps;
- Provide Palaeontological and geological history of the affected area;
- Identification sensitive areas to be avoided (providing shapefiles/kmls) in the proposed development;
- Evaluation of the significance of the planned development during the Pre-construction, Construction, Operation, Decommissioning Phases and Cumulative impacts. Potential impacts should be rated in terms of the direct, indirect and cumulative:
    a. **Direct impacts** are impacts that are caused directly by the activity and generally occur at the same time and at the place of the activity.
    b. **Indirect impacts** of an activity are indirect or induced changes that may occur as a result of the activity.
    c. **Cumulative impacts** are impacts that result from the incremental impact of the proposed activity on a common resource when added to the impacts of other past, present or reasonably foreseeable future activities.
- Fair assessment of alternatives (infrastructure alternatives have been provided);
- Recommend mitigation measures to minimise the impact of the proposed development; and
- Implications of specialist findings for the proposed development (such as permits, licenses etc).

5 GEOLOGICAL AND PALAEONTOLOGICAL HISTORY

The geology of the proposed Mooiplaats Educational Facility within the Jurisdiction of the City of Tshwane Metropolitan Municipality, Gauteng Province is depicted on the 1:250 000, 2528 Pretoria Geological map (Council of Geoscience). The proposed development is underlain by diabase

igneous rocks, as well as sedimentary rocks of the Silverton Formation (Pretoria Group, Transvaal Supergroup) (Figure 4). According to the PalaeoMap of South African Heritage Resources Information System (SAHRIS) the Palaeontological Sensitivity of the diabase rocks, which is igneous/volcanic in origin is zero and that of the Silverton Formation (Pretoria Group, Transvaal Supergroup) is high (Figure 5) (Almond et al, 2013, SAHRIS website).

The Transvaal Supergroup is preserved in three structural basins on the Kaapvaal Craton of South Africa namely the Griqualand West Basin, Transvaal Basin, as well as the Kanye Basin in Botswana. The Griqualand West Basin can be subdivided into the Ghaap Plateau and Prieska sub basins. The geometry of the three basins is mostly stratiform with the exclusion of the volcanic precursor of the Kanye Basin and parts of the Griqualand West Basin. Extensive deformation has taken place in the south-western portion of the Griqualand West Basin. Rocks of the Transvaal Supergroup in the Transvaal Basin were intruded by the Bushveld Complex approximately 2060 million years ago. The Transvaal Supergroup overlays the Archaean basement as well as the Witwatersrand and Ventersdorp Supergroups. In the far western and Kanye Basins rocks belonging to the Kanye Formation and Gaborone Granite Suite is also overlain by the Transvaal Supergroup.

The Precambrian Transvaal Supergroup is approximately 2550-2050 Ma years old (Bekker *et al.* 2008; Catuneanu et al 1999),) (Late Archaean to Early Proterozoic) and is about 15 km thick. This Supergroup consists of sedimentary, volcanic and unmetamorphosed clastic rocks. The sandstone dominated Magaliesberg Formation overlies the mudrocks of the Silverton Formation, and in turn the Silverton Formation overlies the sandstone dominated Daspoort Formation. The Silverton Formation is a lithologically varied, mudrock-dominated sequence that was deposited on an offshore shelf along the borders of the Kaapvaal Craton (Eriksson *et al.* 2002, 2009). Volcanic ash-rich intervals are common as well as minor beds of carbonate and chert. Sandstones become more regular in the upper part of the sequence and was deposited under shallower conditions. In the eastern part of the Pretoria Basin, the Machadodorp Member lies in the middle of the Silverton Formation and is represented by a conspicuous interval of volcanic rocks (including agglomerates basaltic lavas as well as tuffs). The presence the volcanic pillow lavas and water-lain tuffs indicates that they were formed beneath the sea. The deep-water Silverton mudrocks were deposited in high sea levels and was followed by shallowing fluvial and deltaic sandstones in low sea levels of the overlying Magaliesberg Formation.

In the eastern part of the Transvaal Basin the Silverton Formation is approximately 1-3 km thick and consists of recessive weathering producing a topography of rolling hills and valleys (Visser 1989). Carbonate rocks are present at the top of the Silverton Formation. Research indicated that microbial activity under low oxygen conditions causes organic carbon within the shales (Eriksson et al. 1989). Organic-walled microfossils thus may be present in these carbon-rich mudrocks of the Silverton Formation while the chert horizons may contain other microbial assemblages. However, the Silverton Formation is not known to contain macrofossils.

The diabase is igneous rocks and are thus considered to have no palaeontological significance. However, the existence of the diabase rocks would have had a thermal metamorphic effect on the adjoining Silverton Formation and would decrease the chance of fossil preservation in this formation.

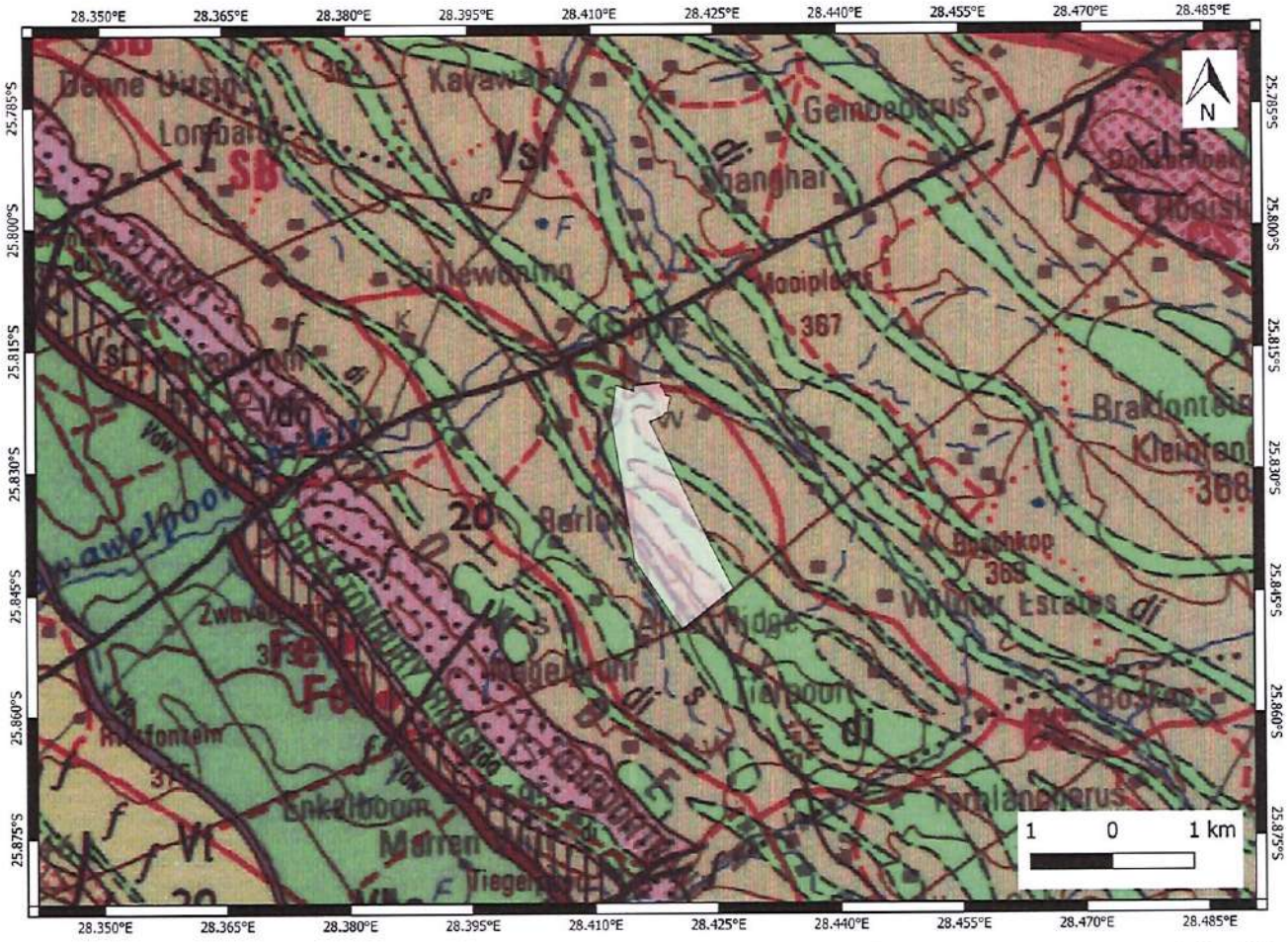
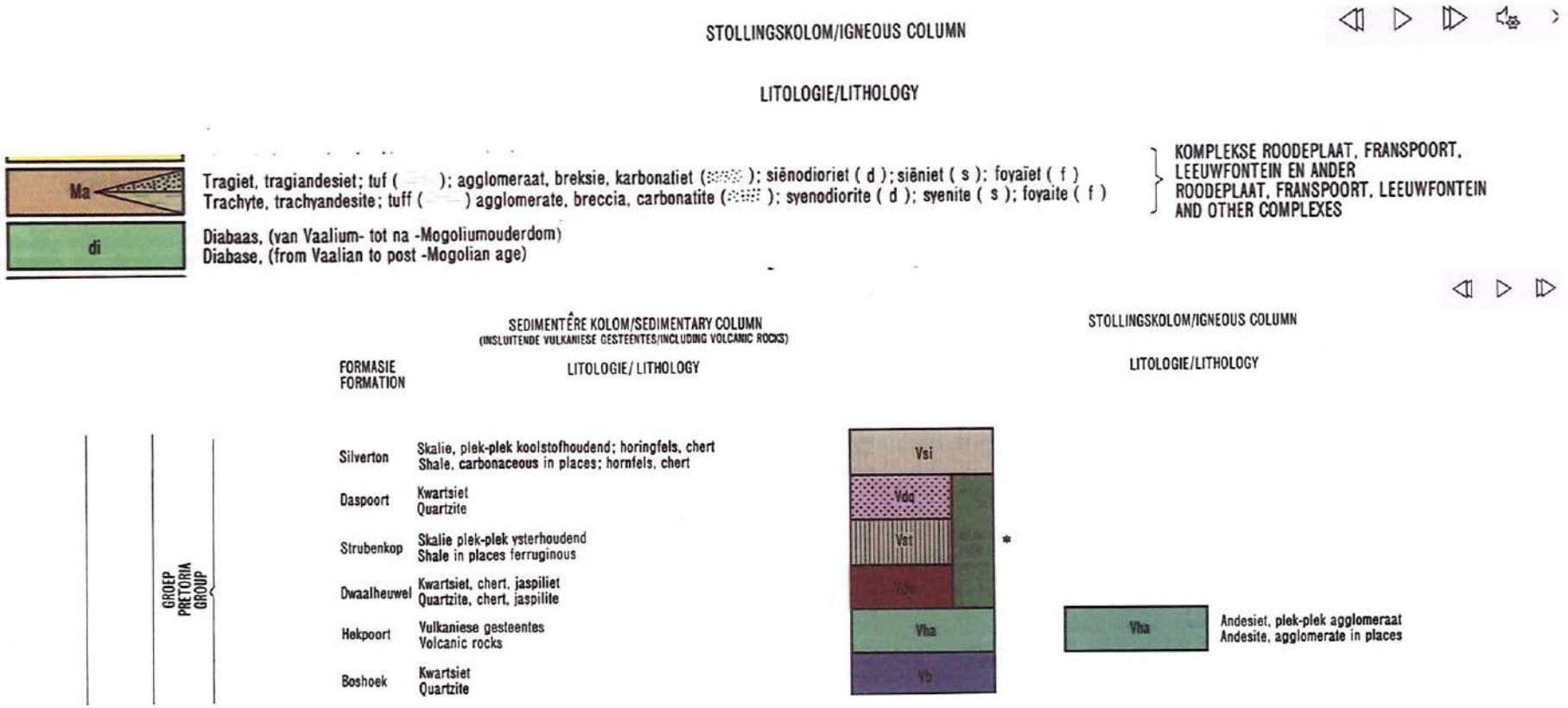


Figure 4: Extract of the 1:250 000 2528 Pretoria Geological map (Council of Geoscience) of the proposed Mooiplaats Educational Facility within the Jurisdiction of the City of Tshwane Metropolitan Municipality, Gauteng Province (development footprint indicated in white). The proposed development is underlain by diabase igneous rocks, and sedimentary rocks of the Silverton Formation (Pretoria Group, Transvaal Supergroup). Map drawn by QGIS 2.18.28.



LEGEND

di- diabase (Vaalian to post Mogolian age)

Vsi - Silverton Formation (Pretoria Group, Transvaal Supergroup)

Mining-Fe-Iron

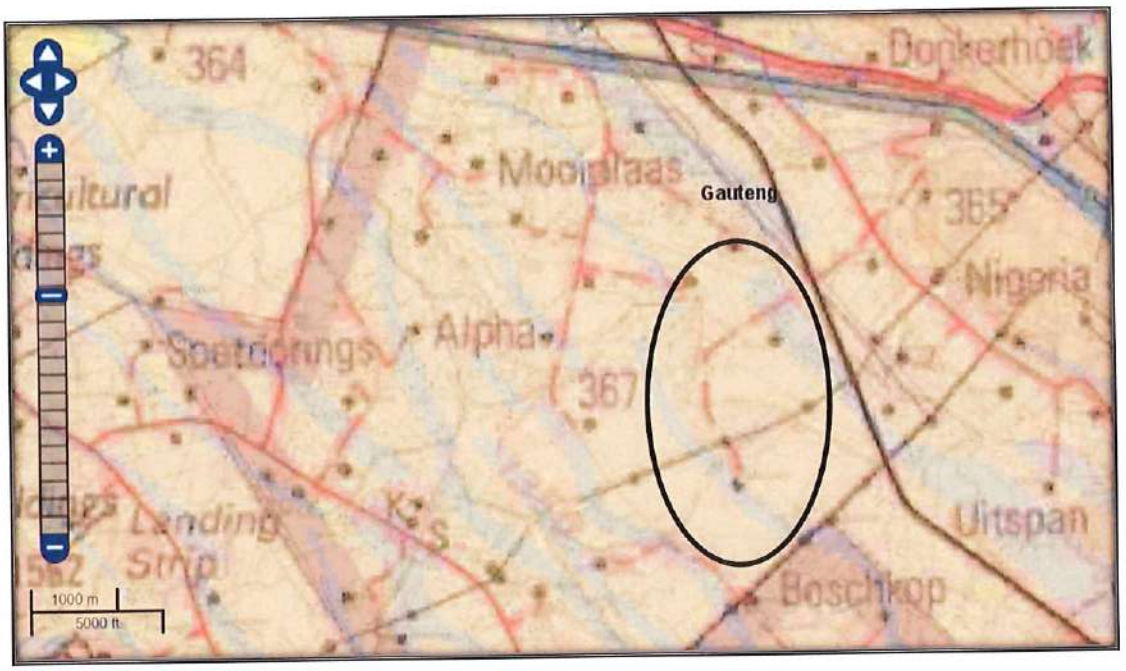


Figure 5: Extract of the 1 in 250 000 SAHRIS PalaeoMap map (Council of Geosciences). Approximate location of the proposed development is indicated in black.

Colour	Sensitivity	Required Action
RED	VERY HIGH	field assessment and protocol for finds is required
ORANGE/YELLOW	HIGH	desktop study is required and based on the outcome of the desktop study, a field assessment is likely
GREEN	MODERATE	desktop study is required
BLUE	LOW	no palaeontological studies are required however a protocol for finds is required
GREY	INSIGNIFICANT/ZERO	no palaeontological studies are required
WHITE/CLEAR	UNKNOWN	these areas will require a minimum of a desktop study. As more information comes to light, SAHRA will continue to populate the map.

According to the SAHRIS palaeo sensitivity map (Figure 5) there is a high chance of finding fossils in the Silverton Formation in this area.

6 GEOGRAPHICAL LOCATION OF THE SITE

The proposed Mooiplaats development site is located between the R631/ Boschkop Road and Steekriet Spruit. Assess to the site is in the north-eastern end of the site via Boschkop Road (R631) (Figure 1-3). The development footprint is located about 4km from Graham Road (Lynnwood Road extension)/Boschkop Road intersection. The development site borders the Mooiplaats Smallholdings in the east, Boschkop Smallholdings in the south-east and the Tierpoort Smallholdings to the south, while the Zwavelpoort Agricultural Holdings lies to the west.

7 METHODS

The aim of a desktop study is to evaluate the risk to palaeontological heritage in the proposed development. This include all trace fossils and fossils. All available information is consulted to compile a desktop study and includes: Palaeontological Impact Assessment reports in the same area; aerial photos and Google Earth images, topographical as well as geological maps.

7.1 Assumptions and Limitations

The focal point of geological maps is the geology of the area and the sheet explanations were not meant to focus on palaeontological heritage. Many inaccessible regions of South Africa have never been reviewed by palaeontologists and data is generally based on aerial photographs alone. Locality and geological information of museums and universities databases have not been kept up to date or data collected in the past have not always been accurately documented.

Comparable Assemblage Zones in other areas is sourced to provide information on the existence of fossils in an area which was not documented in the past. When using similar Assemblage Zones and geological formations for Desktop studies it is generally **assumed** that exposed fossil heritage is present within the footprint. A field-assessment will thus improve the accuracy of the desktop assessment.

8 ADDITIONAL INFORMATION CONSULTED

In compiling this report the following sources were consulted:

- Geological map 1:100 000, Geology of the Republic of South Africa (Visser 1984);
- 1: 250 000 2528 Pretoria Geological map (Council of Geoscience);
- A Google Earth map with polygons of the proposed development was obtained from Bokamoso;
- 1:50 000 Topographical Map 2528 CD Rietvlei Dam; and

- PIAs near the development site consulted include Almond 2010, Du Randt 2018 (See references).

9 IMPACT ASSESSMENT METHODOLOGY

Impact assessment must take account of the nature, scale and duration of impacts on the environment whether such impacts are positive or negative. Each impact is also assessed according to the following project phases:

- Construction;
- Operation; and
- Decommissioning.

Where necessary, the proposal for mitigation or optimisation of an impact should be detailed. A brief discussion of the impact and the rationale behind the assessment of its significance should also be included. The rating system is applied to the potential impacts on the receiving environment and includes an objective evaluation of the mitigation of the impact. In assessing the significance of each impact, the following criteria is used:

Table 2: The rating system

NATURE		
The Nature of the Impact is the possible destruction of fossil heritage		
GEOGRAPHICAL EXTENT		
This is defined as the area over which the impact will be experienced.		
1	Site	The impact will only affect the site.
2	Local/district	Will affect the local area or district.
3	Province/region	Will affect the entire province or region.
4	International and National	Will affect the entire country.
PROBABILITY		
This describes the chance of occurrence of an impact.		
1	Unlikely	The chance of the impact occurring is extremely low (Less than a 25% chance of occurrence).
2	Possible	The impact may occur (Between a 25% to 50% chance of occurrence).
3	Probable	The impact will likely occur (Between a 50% to 75% chance of occurrence).
4	Definite	Impact will certainly occur (Greater than a 75% chance of occurrence).
DURATION		

This describes the duration of the impacts. Duration indicates the lifetime of the impact as a result of the proposed activity.		
1	Short term	The impact will either disappear with mitigation or will be mitigated through natural processes in a span shorter than the construction phase (0 – 1 years), or the impact will last for the period of a relatively short construction period and a limited recovery time after construction, thereafter it will be entirely negated (0 – 2 years).
2	Medium term	The impact will continue or last for some time after the construction phase but will be mitigated by direct human action or by natural processes thereafter (2 – 10 years).
3	Long term	The impact and its effects will continue or last for the entire operational life of the development, but will be mitigated by direct human action or by natural processes thereafter (10 – 30 years).
4	Permanent	The only class of impact that will be non-transitory. Mitigation either by man or natural process will not occur in such a way or such a time span that the impact can be considered indefinite.
INTENSITY/ MAGNITUDE		
Describes the severity of an impact.		
1	Low	Impact affects the quality, use and integrity of the system/component in a way that is barely perceptible.
2	Medium	Impact alters the quality, use and integrity of the system/component but system/component still continues to function in a moderately modified way and maintains general integrity (some impact on integrity).
3	High	Impact affects the continued viability of the system/ component and the quality, use, integrity and functionality of the system or component is severely impaired and may temporarily cease. High costs of rehabilitation and remediation.
4	Very high	Impact affects the continued viability of the system/component and the quality, use, integrity and functionality of the system or component permanently ceases and is irreversibly impaired. Rehabilitation and remediation often impossible. If possible rehabilitation and remediation often unfeasible due to extremely high costs of rehabilitation and remediation.
REVERSIBILITY		

This describes the degree to which an impact can be successfully reversed upon completion of the proposed activity.		
1	Completely reversible	The impact is reversible with implementation of minor mitigation measures.
2	Partly reversible	The impact is partly reversible but more intense mitigation measures are required.
3	Barely reversible	The impact is unlikely to be reversed even with intense mitigation measures.
4	Irreversible	The impact is irreversible and no mitigation measures exist.
IRREPLACEABLE LOSS OF RESOURCES		
This describes the degree to which resources will be irreplaceably lost as a result of a proposed activity.		
1	No loss of resource	The impact will not result in the loss of any resources.
2	Marginal loss of resource	The impact will result in marginal loss of resources.
3	Significant loss of resources	The impact will result in significant loss of resources.
4	Complete loss of resources	The impact is result in a complete loss of all resources.
CUMULATIVE EFFECT		
This describes the cumulative effect of the impacts. A cumulative impact is an effect which in itself may not be significant but may become significant if added to other existing or potential impacts emanating from other similar or diverse activities as a result of the project activity in question.		
1	Negligible cumulative impact	The impact would result in negligible to no cumulative effects.
2	Low cumulative impact	The impact would result in insignificant cumulative effects.
3	Medium cumulative impact	The impact would result in minor cumulative effects.
4	High cumulative impact	The impact would result in significant cumulative effects
SIGNIFICANCE		
Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The calculation of the significance of an impact uses the following formula: **(Extent + probability + reversibility + irreplaceability + duration + cumulative effect) x magnitude/intensity.** The summation of the different criteria will produce a non-weighted value. By multiplying this value with the magnitude/intensity, the resultant value acquires a weighted characteristic which can be measured and assigned a significance rating.		
Points	Impact significance rating	Description

6 to 28	Negative low impact	The anticipated impact will have negligible negative effects and will require little to no mitigation.
6 to 28	Positive low impact	The anticipated impact will have minor positive effects.
29 to 50	Negative medium impact	The anticipated impact will have moderate negative effects and will require moderate mitigation measures.
29 to 50	Positive medium impact	The anticipated impact will have moderate positive effects.
51 to 73	Negative high impact	The anticipated impact will have significant effects and will require significant mitigation measures to achieve an acceptable level of impact.
51 to 73	Positive high impact	The anticipated impact will have significant positive effects.
74 to 96	Negative very high impact	The anticipated impact will have highly significant effects and are unlikely to be able to be mitigated adequately. These impacts could be considered "fatal flaws".
74 to 96	Positive very high impact	The anticipated impact will have highly significant positive

9.1 Summary of Impact Tables

The proposed Mooiplaats Educational Facility within the Jurisdiction of the City of Tshwane Metropolitan Municipality, Gauteng Province is underlain by diabase igneous rocks, as well as sedimentary rocks of the Silverton Formation (Pretoria Group, Transvaal Supergroup) (Figure 4). According to the PalaeoMap of South African Heritage Resources Information System (SAHRIS) the Palaeontological Sensitivity of the diabase rocks, which is igneous/volcanic in origin is zero and that of the Silverton Formation (Pretoria Group, Transvaal Supergroup) is high (Figure 5) (Almond *et al,* 2013, SAHRIS website).

The expected duration of the impact is assessed as potentially permanent to long term. In the absence of mitigation procedures (should fossil material be present within the affected area) the damage or destruction of any palaeontological materials will be permanent. Impacts on palaeontological heritage during the construction phase could potentially occur but are regarded as having a low probability. The significance of the impact occurring will be low.

10 FINDINGS AND RECOMMENDATIONS

The proposed development is underlain by diabase igneous rocks, as well as sedimentary rocks of the Silverton Formation (Pretoria Group, Transvaal Supergroup). According to the PalaeoMap of South African Heritage Resources Information System (SAHRIS) the Palaeontological Sensitivity

of the diabase rocks, which is igneous/volcanic in origin is zero and that of the Silverton Formation (Pretoria Group, Transvaal Supergroup) is high. (Almond et al, 2013, SAHRIS website).

Organic-walled microfossils may be present in the carbon-rich mudrocks of the Silverton Formation while the chert horizons may contain other microbial assemblages. However, the Silverton Formation is not known to contain macrofossils. The diabase is igneous rocks and are thus considered to have no palaeontological significance. However, the presence of the diabase would have had a thermal metamorphic impact on the adjoining Silverton Formation that would decrease the chance of fossils preservation in this formation.

If fossil remains are discovered during any phase of construction, either on the surface or exposed by excavations the **Chance Find Protocol** must be implemented by the ECO/site manager in charge of these developments. These discoveries ought to be protected (if possible *in situ*) and the ECO/site manager must report to SAHRA (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za) so that mitigation (recording and collection) can be carry out by a paleontologist.

11 CHANCE FINDS PROTOCOL

A following procedure will only be followed if fossils are uncovered during excavation.

11.1 Legislation

Cultural Heritage in South Africa (includes all heritage resources) is protected by the **National Heritage Resources Act (Act 25 of 1999) (NHRA).** According to Section 3 of the Act, all Heritage resources include **"all objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens"**.

Palaeontological heritage is unique and non-renewable and is protected by the NHRA and are the property of the State. It is thus the responsibility of the State to manage and conserve fossils on behalf of the citizens of South Africa. Palaeontological resources may not be excavated, broken, moved, or destroyed by any development without prior assessment and without a permit from the relevant heritage resources authority as per section 35 of the NHRA.

11.2 Background

A fossil is the naturally preserved remains (or traces) of plants or animals embedded in rock. These plants and animals lived in the geologic past millions of years ago. Fossils are extremely rare and irreplaceable. By studying fossils, it is possible to determine the environmental conditions that existed in a specific geographical area millions of years ago.

11.3 Introduction

This informational document is intended for workmen and foremen on construction sites. It describes the actions to be taken when mining or construction activities accidentally uncovers fossil material.

It is the responsibility of the Environmental Site Officer (ESO) or site manager of the project to train the workmen and foremen in the procedure to follow when a fossil is accidentally uncovered. In the absence of the ESO, a member of the staff must be appointed to be responsible for the proper implementation of the chance find protocol as not to compromise the conservation of fossil material.

11.4 Chance Find Procedure

- If a chance find is made the person responsible for the find must immediately **stop working** and all work that could impact that finding must cease in the immediate vicinity of the find.
- The person who made the find must immediately **report** the find to his/her direct supervisor which in turn must report the find to his/her manager and the ESO or site manager. The ESO or site manager must report the find to the relevant Heritage Agency (South African Heritage Research Agency, SAHRA). (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za). The information to the Heritage Agency must include photographs of the find, from various angles, as well as the GPS co-ordinates.
- A preliminary report must be submitted to the Heritage Agency within **24 hours** of the find and must include the following: 1) date of the find; 2) a description of the discovery and a 3) description of the fossil and its context (depth and position of the fossil), GPS co-ordinates.
- Photographs (the more the better) of the discovery must be of high quality, in focus, accompanied by a scale. It is also important to have photographs of the vertical section (side) where the fossil was found.

Upon receipt of the preliminary report, the Heritage Agency will inform the ESO (or site manager) whether a rescue excavation or rescue collection by a palaeontologist is necessary.

- The site must be secured to protect it from any further damage. **No attempt** should be made to remove material from their environment. The exposed finds must be stabilized and covered by a plastic sheet or sand bags. The Heritage agency will also be able to advise on the most suitable method of protection of the find.
- In the event that the fossil cannot be stabilized the fossil may be collected with extreme care by the ESO (site manager). Fossils finds must be stored in tissue paper and in an appropriate box while due care must be taken to remove all fossil material from the rescue site.
- Once Heritage Agency has issued the written authorization, the developer may continue with the development on the affected area.

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Appendix A – Elize Butler CV

CURRICULUM VITAE

ELIZE BUTLER

PROFESSION: Palaeontologist

YEARS' EXPERIENCE: 26 years in Palaeontology

EDUCATION:

B.Sc Botany and Zoology, 1988
University of the Orange Free State

B.Sc (Hons) Zoology, 1991
University of the Orange Free State

Management Course, 1991
University of the Orange Free State

M. Sc. *Cum laude* (Zoology), 2009
University of the Free State

Dissertation title: The postcranial skeleton of the Early Triassic non-mammalian Cynodont *Galesaurus planiceps*: implications for biology and lifestyle

Registered as a PhD fellow at the Zoology Department of the UFS
2013 to current

Dissertation title: A new gorgonopsian from the uppermost D*aptocephalus Assemblage Zone*, in the Karoo Basin of South Africa

MEMBERSHIP

Palaeontological Society of South Africa (PSSA) 2006-currently

EMPLOYMENT HISTORY

Part-time Laboratory assistant — Department of Zoology & Entomology University of the Free State Zoology 1989-1992

Part-time laboratory assistant — Department of Virology University of the Free State Zoology 1992

Research Assistant	National Museum, Bloemfontein 1993 – 1997
Principal Research Assistant and Collection Manager	National Museum, Bloemfontein 1998–currently

TECHNICAL REPORTS

Butler, E. 2014. Palaeontological Impact Assessment for the proposed upgrade of existing water supply infrastructure at Noupoort, Northern Cape Province. 2014. Bloemfontein.

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