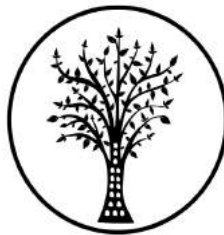


HERITAGE IMPACT ASSESSMENT

In terms of Section 38(8) of the NHRA for a

Proposed egg-layer facility on Portion 4 of Farm Waterval 34 JS,
Mpumalanga

Prepared by



CTS HERITAGE

In Association with

CSIR

April 2018



CTS HERITAGE

THE INDEPENDENT PERSON WHO COMPILED A SPECIALIST REPORT OR UNDERTOOK A SPECIALIST PROCESS

I Jenna Lavin, as the appointed independent specialist hereby declare that I:

- act/ed as the independent specialist in this application;
- regard the information contained in this report as it relates to my specialist input/study to be true and correct, and
- do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the NEMA, the Environmental Impact Assessment Regulations, 2010 and any specific environmental management Act;
- have and will not have no vested interest in the proposed activity proceeding;
- have disclosed, to the applicant, EAP and competent authority, any material information that have or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the NEMA, the Environmental Impact Assessment Regulations, 2010 and any specific environmental management Act;
- am fully aware of and meet the responsibilities in terms of NEMA, the Environmental Impact Assessment Regulations, 2010 (specifically in terms of regulation 17 of GN No. R. 543) and any specific environmental management Act, and that failure to comply with these requirements may constitute and result in disqualification;
- have ensured that information containing all relevant facts in respect of the specialist input/study was distributed or made available to interested and affected parties and the public and that participation by interested and affected parties was facilitated in such a manner that all interested and affected parties were provided with a reasonable opportunity to participate and to provide comments on the specialist input/study;
- have ensured that the comments of all interested and affected parties on the specialist input/study were considered, recorded and submitted to the competent authority in respect of the application;
- have ensured that the names of all interested and affected parties that participated in terms of the specialist input/study were recorded in the register of interested and affected parties who participated in the public participation process;
- have provided the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not; and
- am aware that a false declaration is an offence in terms of regulation 71 of GN No. R. 543.

Signature of the specialist

CTS Heritage
Name of company

05 April 2018
Date

The table below **must be included in the specialist report and completed**:

COMPLIANCE WITH THE APPENDIX 6 OF THE 2014 EIA REGULATIONS

Requirements of Appendix 6 – GN R982	Addressed in the Specialist 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;	✓
b) a declaration that the specialist is independent in a form as may be specified by the competent authority;	✓
c) an indication of the scope of, and the purpose for which, the report was prepared;	✓
d) the date and season of the site investigation and the relevance of the season to the outcome of the assessment;	✓
e) a description of the methodology adopted in preparing the report or carrying out the specialised process;	✓
f) the specific identified sensitivity of the site related to the activity and its associated structures and infrastructure;	✓
g) an identification of any areas to be avoided, including buffers;	✓
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;	✓
i) a description of any assumptions made and any uncertainties or gaps in knowledge;	✓
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;	✓
k) any mitigation measures for inclusion in the EMPr;	✓
l) any conditions for inclusion in the environmental authorisation;	✓
m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;	✓
n) a reasoned opinion-	
i. as to whether the proposed activity or portions thereof should be authorised; and	
ii. if the opinion is that the proposed activity or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan;	✓
o) a description of any consultation process that was undertaken during the course of preparing the specialist report;	✓
p) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	✓
q) any other information requested by the competent authority.	✓

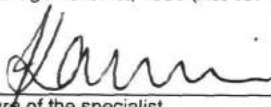
I, JENNA LAVIN, as the appointed specialist hereby declare/affirm the correctness of the information provided as part of the application, and that I:

- in terms of the general requirement to be independent (tick which is applicable):

☒ other than fair remuneration for work performed/to be performed in terms of this application, have no business, financial, personal or other interest in the activity or application and that there are no circumstances that may compromise my objectivity; or

☐ am not independent, but another EAP that is independent and meets the general requirements set out in Regulation 13 has been appointed to review my work (Note: a declaration by the review specialist must be submitted);

- have expertise in conducting specialist work as required, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- will ensure compliance with the EIA Regulations 2014;
- will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the application;
- will take into account, to the extent possible, the matters listed in regulation 18 of the regulations when preparing the application and any report, plan or document relating to the application;
- will disclose to the proponent or applicant, registered interested and affected parties 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 or the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority (unless access to that information is protected by law, in which case I will indicate that such protected information exists and is only provided to the competent authority);
- declare that all the particulars furnished by me in this form are true and correct;
- am aware that it is an offence in terms of Regulation 48 to provide incorrect or misleading information and that a person convicted of such an offence is liable to the penalties as contemplated in section 49B(2) of the National Environmental Management Act, 1998 (Act 107 of 1998).


Signature of the specialist

CTS HERITAGE
Name of company

16 / 05 / 2018
Date



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EXECUTIVE SUMMARY

1. Site Name:

Proposed Lungile Poultry Farm

2. Location:

Farm Waterval 34 JS, Mpumalanga

3. Locality Plan:

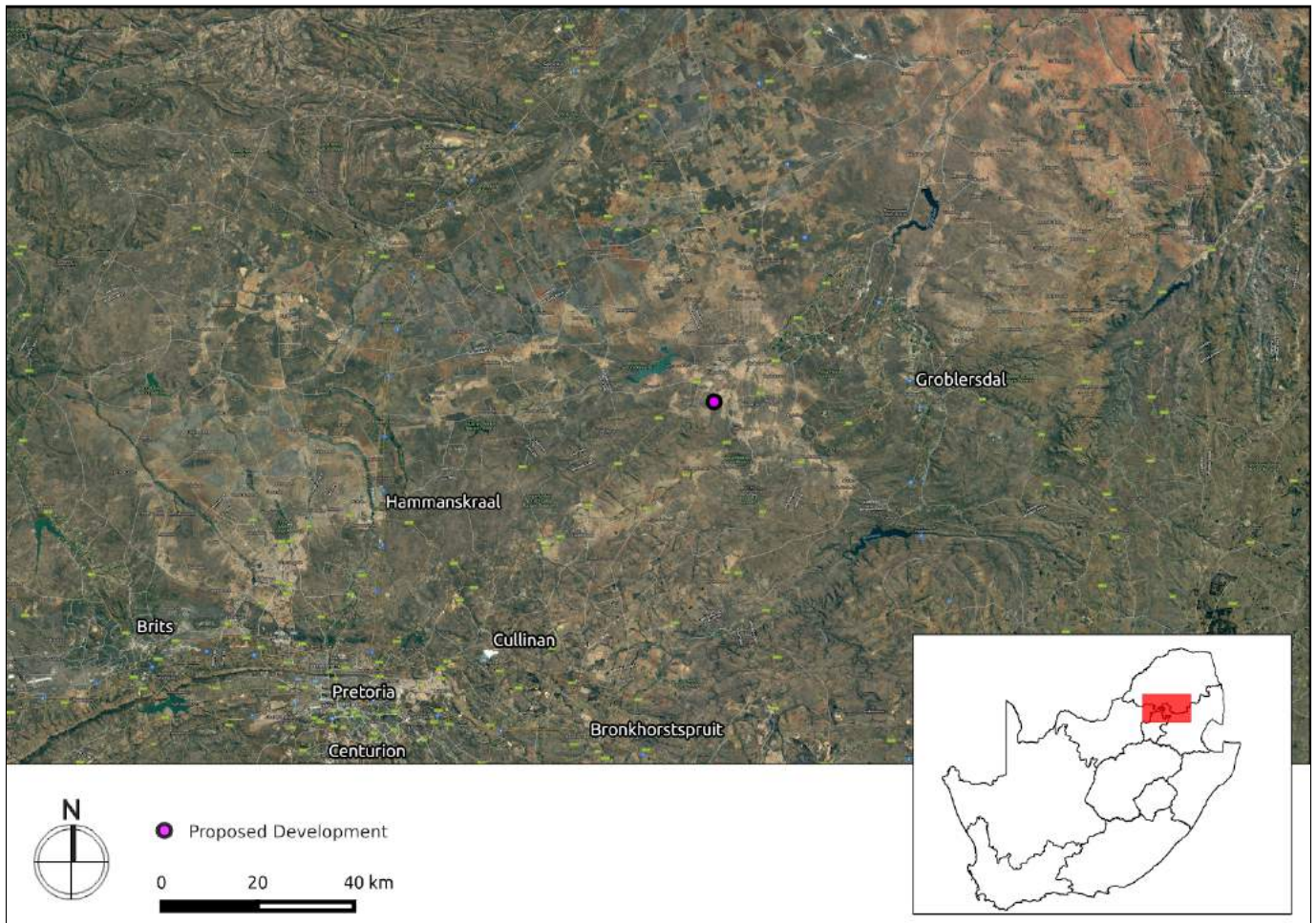


Figure 1: Location of the proposed development site

4. Description of Proposed Development:

The application is for a proposed egg-layer facility in Dr JS Moroka Local Municipality Mpumalanga.

5. Heritage Resources Identified:

None

6. Anticipated Impacts on Heritage Resources:

None



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7. Recommendations:

While it is unlikely that the proposed development will impact on any significant heritage resources, there is a very small chance that trace fossils (ripple marks and microbial mats) could be discovered when excavations for the roads and buildings commence. As such, it is recommended that the proposed Monitoring Program included in the Desktop Palaeontological Assessment (Appendix 2) be implemented.

Monitoring Programme for Palaeontology – to commence once the excavations begin.

The following procedure is only required if fossils are seen on the surface and when excavations commence.

1. When excavations begin the rocks and must be given a cursory inspection by the environmental officer or designated person. Any fossiliferous material (trace fossils, plants, insects, bone, coal) should be put aside in a suitably protected place. This way the construction activities will not be interrupted.
2. Photographs of similar fossil plants must be provided to the developer to assist in recognizing the fossil plants in the shales and mudstones. This information will be built into the EMP's training and awareness plan and procedures. Please see attached Fossil Finds Procedure for the Western Cape as an example (Appendix 4).
3. Photographs of the putative fossils can be sent to the palaeontologist for a preliminary assessment.
4. If there are fossils of interest then the qualified palaeontologist sub-contracted for this project should visit the site to inspect the selected material and check the dumps where feasible.
5. Fossil plants or vertebrates that are considered to be of good quality or scientific interest by the palaeontologist must be removed, catalogued and housed in a suitable institution where they can be made available for further study. Before the fossils are removed from the site a SAHRA permit must be obtained. Annual reports must be submitted to SAHRA as required by the relevant permits.
6. If no good fossil material is recovered then the site inspections by the palaeontologist can cease. A report by the palaeontologist must be sent to SAHRA.
7. If no fossils are found and the excavations have finished then no further monitoring is required.

Author/s and Date:

Jenna Lavin

05 April 2018



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1. INTRODUCTION

1.1 Background Information on Project

The application is for a proposed egg-layer facility in Dr JS Moroka Local Municipality, Mpumalanga. The proposed site is located on Portion 4 of Farm Waterval 34 JS across the road (in a southwest direction) from the main Waterval Township. The project falls under the Special Needs Programme of the CSIR and DEA in assisting small scale agricultural initiatives to obtain Environmental Authorisation. The project will be developed on land that is currently vacant. The project will specialize in the production and sale of eggs. The project will essentially purchase 'ready to lay' pullets and raise them through their productive cycle. The start-up enterprise plans to build an environmentally controlled chicken layer facility with supporting infrastructure and a 5ha vegetable crop field.

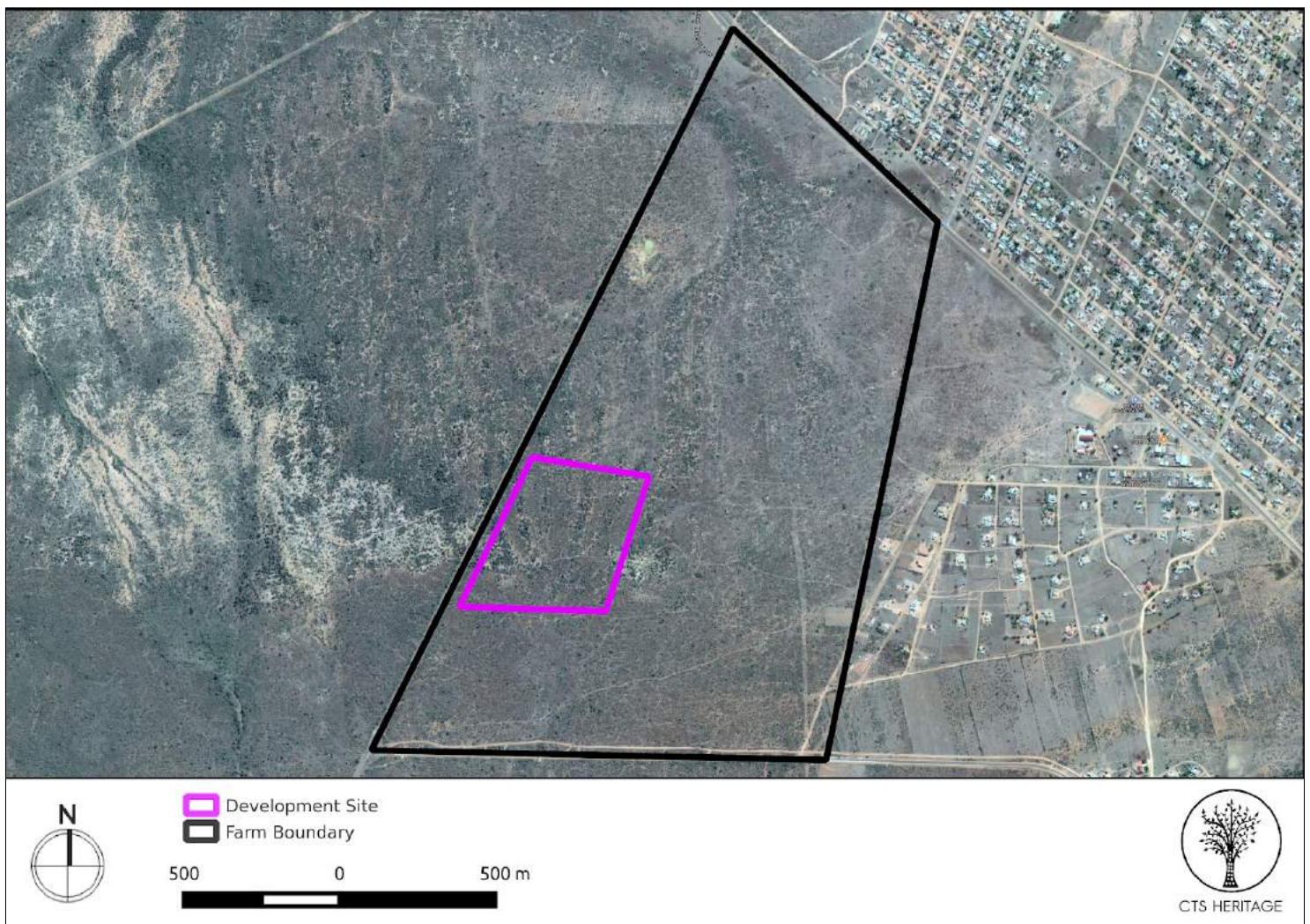


Figure 1: Close up satellite image indicating proposed location of development

2. METHODOLOGY

2.1 Purpose of HIA

The purpose of this HIA is to satisfy the requirements of section 38(8), and therefore section 38(3) of the National Heritage Resources Act (Act 25 of 1999).



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2.2 Summary of steps followed

- An archaeologist conducted a survey of the site and its environs on 26 March 2018 to determine what heritage resources are likely to be impacted by the proposed development (Appendix 1), and a Desktop Palaeontological Assessment was completed to assess likely impacts to palaeontology (Appendix 2)..
- The identified resources were assessed to evaluate their heritage significance in terms of the grading system outlined in section 3 of the NHRA (Act 25 of 1999).
- Alternatives and mitigation options were discussed with the Environmental Assessment Practitioner.

3. HISTORY AND EVOLUTION OF THE SITE AND CONTEXT

3.1 Definition of the property

The proposed development falls within a portion of the Farm Waterval 34 JS, Mpumalanga (Figure 1).

3.2 Geology, geomorphology, climate and vegetation

The Lungile Poultry Farm will be located on ancient rocks of possibly three types. The Lebowa Granite Suite comprises a number of granite types, and the Verena type (has prominent coarse-grained mantled alkali feldspar phenocrysts) is thought to have a different origin from the rest of the granites in this suite (Cawthorn et al., 2006). Nonetheless being of igneous origin it does not contain fossils.

The Rashoop Granophyre Suite is made up of three main magmatic and metamorphic types: the Zwartbank Pseudogranophyre, the Diepkloof Granophyre and the Rooikop Porphyritic Granite (Cawthorn et al., 2006). They are geochemically distinct and are included in the upper part of the Bushveld Complex as they overlie the Rustenburg Layered Suite.

The Selons River Formation is considered redundant (Cawthorn et al., 2006) based on the work of Schweitzer et al. (1995) and the equivalent terminology is the Kwaggasnek Formation and Schrikkloof Formation. These are all volcanic units and are composed of a fine-grained groundmass with variable proportions of phenocrysts, porphyroblasts and amygdales (Cawthorn et al., 2006).

Other rocks in the region are those of the Pretoria Group which range in age from about 2400 to 2100 million years ago and comprise a variety of sandstones, shales, quartzites, breccia and conglomerates with some contemporaneous volcanic rocks. The mafic rocks of the Bushveld Complex are thought to be formed by a number of episodes of sill- like intrusions into the upper crust, i.e. the Pretoria group sedimentary and volcanic rocks (Cawthorn et al., 2006). The hot magma altered (metamorphosed) the host rocks up to a distance of 50km (Cawthorn et al., 2006) and formed, for example, quartzites from the arenaceous (sandy) sediments.



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The oldest rocks in the area are the Black Reef Formation (quartzite) and Bloempoot Group which is made up of alternating cycles of carbonaceous claystone-siltstone and sandstone cycles with some carbonates and volcanic rocks (Erikssen et al., 2006) and represents a marginal basin with deltaic and shoreline deposits.

The younger Karoo-aged rocks (Dwyka and Eccca Groups) are distant from the proposed development, more than 20km to the northwest, and will not be considered further.

3.3 Historical Background of the Area

According to Pistorius (2010 NID 6194), "Focused archaeological research has been conducted in the Mpumalanga and Limpopo Provinces of South Africa for more than four decades. This research consists of surveys and of excavations of Stone Age and Iron Age sites as well as the recording of rock art and historical sites." However, very few archaeological or built environment sites of significance are known from the area surrounding the proposed development (Figures 2 and 3). The nearest HIA conducted in the vicinity of the proposed development is located approximately 5km away by Pistorius in 2003 (SAHRIS NID 5047). While he did not find any archaeological or built environment heritage resources, he noted the presence of burial grounds and graves. Only eight heritage resources are known to exist within a 30km buffer of the proposed development area - some archaeological resources of low heritage significance and burial grounds and graves.

The site proposed for development is underlain by the Eccca Group of high palaeontological sensitivity according to the SAHRIS Palaeosensitivity map. This group is known for non-marine trace fossils, vascular plants (including petrified wood) and palynomorphs of *Glossopteris* flora, mesosaurid reptiles, fish (including microvertebrate remains, coprolites), crustaceans, sparse marine shelly invertebrates (molluscs, brachiopods), microfossils (radiolarians etc) and insects.

The Lebowa Granite Suite would not preserve any fossils as it is igneous in origin. Similarly the Rashoop Granophyre Suite which comprises various intrusive granitic material would not preserve any fossils. In contrast the Selons River Formation (Kwaggasnek and Schrikkloof Formations; Rooiberg Group) is made up of finer grained sediments that have been deposited in a marginal basin context and may preserve ripple marks. It is slightly younger than the Daspoort and Magaliesberg Formations (Pretoria Group) where trace fossils have been found. It is too old for body fossils but there is a very small chance that microbial mats could be preserved, although these are very poor and hard to recognize in the Daspoort Formation. Trace fossils, in the form of microbial mats that have formed on or have helped to preserve ripple marks, have been found in the Daspoort and Magaliesberg Formations (underlying and overlying the Silverton Formation, respectively; Erikssen et al., 2012) but they do not provide localities. According to the authors the trace fossils would have formed on the shores of the sea (Erikssen et al., 2012), but no body fossils have been found as the rocks are too old. To date, no microbial mats have been reported from the Selons River Formation.



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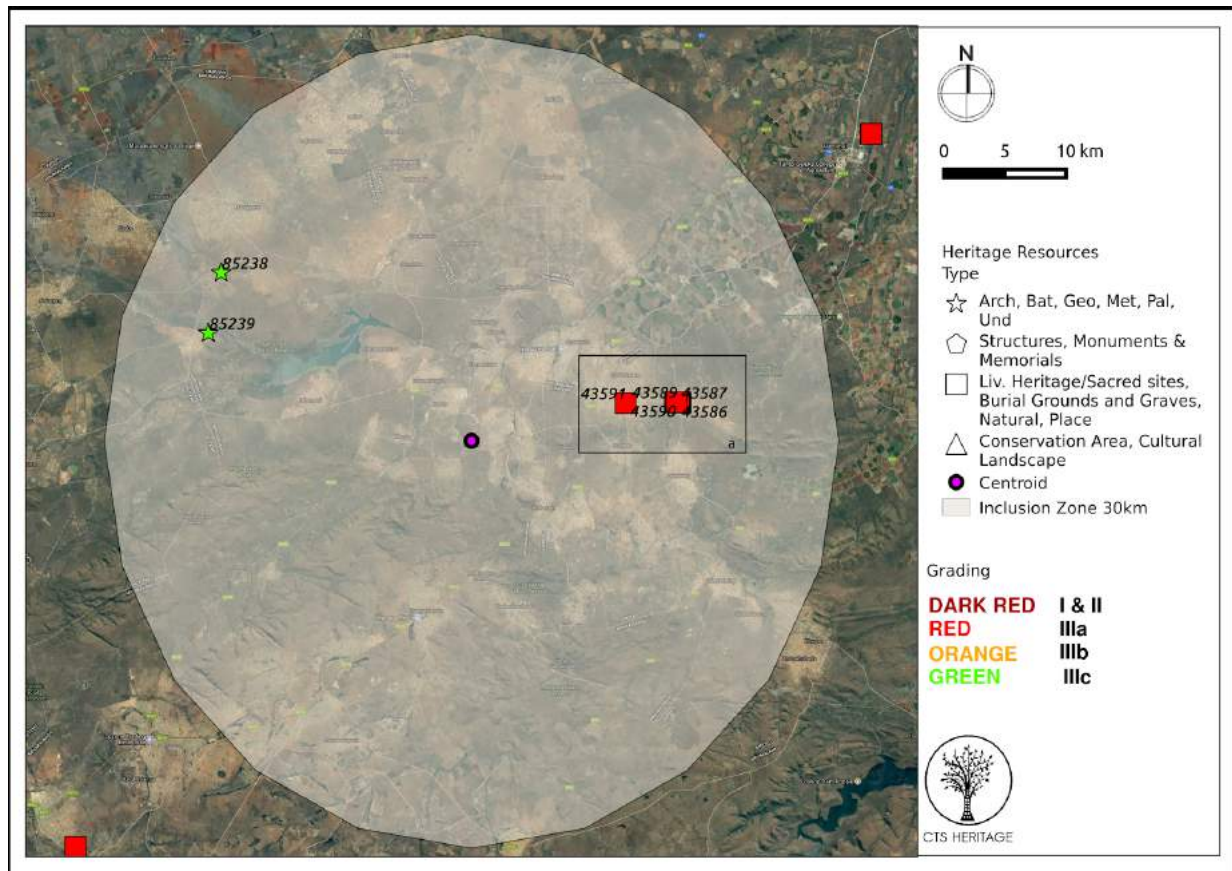


Figure 3: Spatialisation of known heritage resources within 30km of the development area

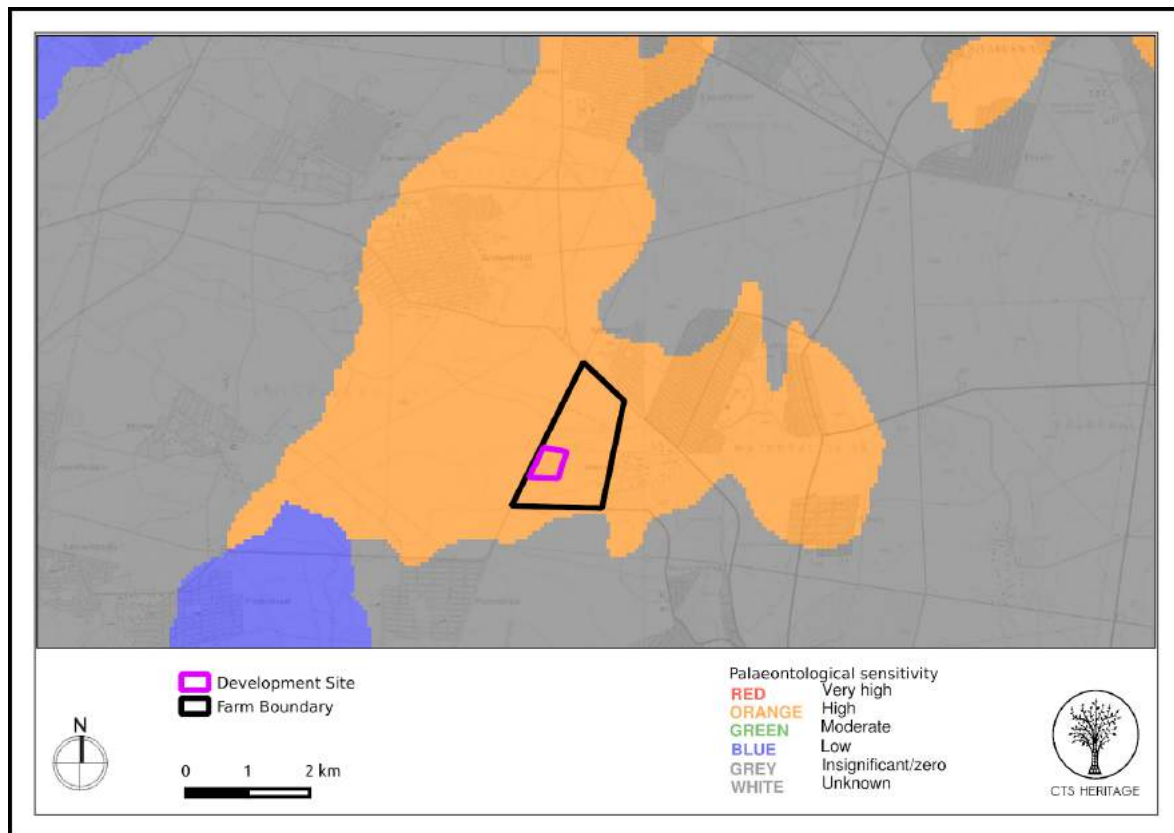


Figure 4. Palaeosensitivity Map. Indicating high fossil sensitivity underlying the study area.



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4.2 Heritage Resources identified

Structures and Places

None

Living Heritage

None

Archaeology

None

Palaeontology

The underlying rocks are of the ancient Lebowa Granite Suite and the Rashoop Granophyre Suite which are volcanic in origin and do not preserve fossils. The third rock type is the Selons Formation of the Palaeoproterozoic Rooiberg Group which are predominantly poorly sorted sandstones.

4.3 Field Assessment

No heritage resources were identified during the field assessment.

4.4 Selected photographic record



Figures 7 and 8: General context of development site



Figures 9 and 10: General context of development site



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Figures 10 and 11: General context of development site

5. ASSESSMENT OF THE IMPACT OF THE DEVELOPMENT

5.1 Assessment of impact to Heritage Resources

No impact to heritage resources is anticipated. There is a very small chance that trace fossils (ripple marks and microbial mats) could be discovered when excavations for the roads and buildings commence and a Chance Find Protocol and Monitoring Programme has therefore been added to the report. The specialist palaeontological study concluded that the project may continue as far as the palaeontological resources are concerned.

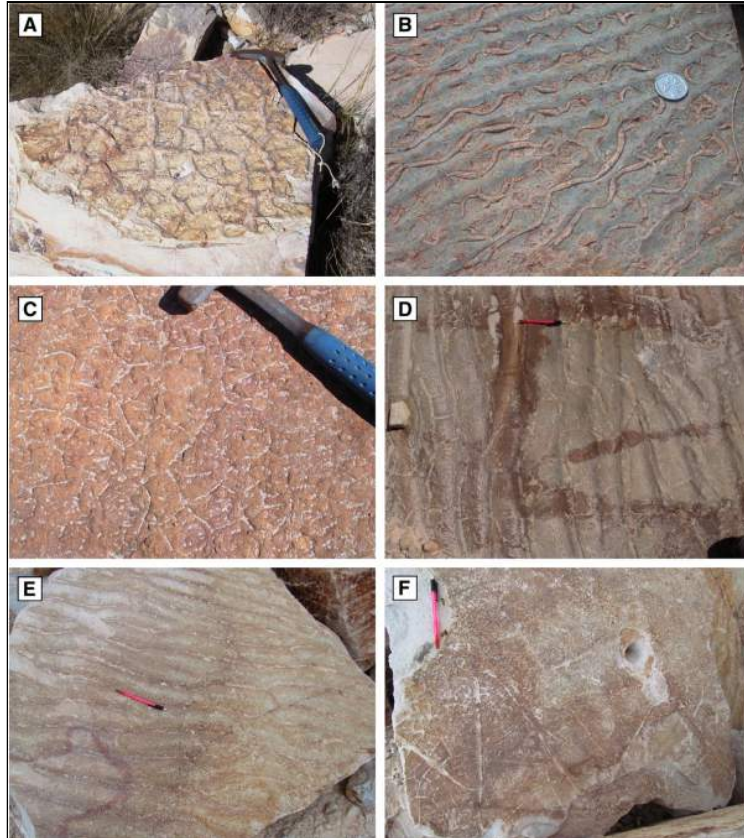


Figure 12: Examples of trace fossils such as ripple marks and microbial mats that could be found in the Daspoort or Magaliesberg Formations, or others of the Pretoria Group. (Figure copied from Erikssen et al., 2012, their figure 6).



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5.2 Social and Economic Benefit

The project falls under the Special Needs Programme of the CSIR and DEA in assisting small scale agricultural initiatives to obtain Environmental Authorisation.

5.3 Proposed development alternatives

No project alternatives have been provided.

6. RESULTS OF PUBLIC CONSULTATION

The public consultation for this project will take place as part of the broader consultation required for EA.

7. CONCLUSION AND RECOMMENDATIONS

While it is unlikely that the proposed development will impact on any significant heritage resources, there is a very small chance that trace fossils (ripple marks and microbial mats) could be discovered when excavations for the roads and buildings commence. As such, it is recommended that the proposed Monitoring Program included in the Desktop Palaeontological Assessment (Appendix 2) be implemented.

Monitoring Programme for Palaeontology – to commence once the excavations begin.

The following procedure is only required if fossils are seen on the surface and when excavations commence.

1. When excavations begin the rocks must be given a cursory inspection by the environmental officer or designated person. Any fossiliferous material (trace fossils, plants, insects, bone, coal) should be put aside in a suitably protected place. This way the construction activities will not be interrupted.
2. Photographs of similar fossil plants must be provided to the developer to assist in recognizing the fossil plants in the shales and mudstones. This information will be built into the EMP's training and awareness plan and procedures. Please see attached Fossil Finds Procedure for the Western Cape as an example (Appendix 4).
3. Photographs of the putative fossils can be sent to the palaeontologist for a preliminary assessment.
4. If there are fossils of interest then the qualified palaeontologist sub-contracted for this project, should visit the site to inspect the selected material and check the dumps where feasible.
5. Fossil plants or vertebrates that are considered to be of good quality or scientific interest by the palaeontologist must be removed, catalogued and housed in a suitable institution where they can be made available for further study. Before the fossils are removed from the site a SAHRA permit must be obtained. Annual reports must be submitted to SAHRA as required by the relevant permits.
6. If no good fossil material is recovered then the site inspections by the palaeontologist can cease. A report by the palaeontologist must be sent to SAHRA.
7. If no fossils are found and the excavations have finished then no further monitoring is required.



8. REFERENCES

Heritage Impact Assessments				
Nid	Report Type	Author/s	Date	Title
7818	AIA Phase 1	Richard Munyai	01/08/2011	Phase 1 Archaeological Scoping Study: An archaeological investigation for the proposed upgrading of 11.8km (gravel to tar) of road D2740 Rust de Winter - Moloto in the Nkangala Region of the Mpumalanga District Province
7818	AIA Phase 1	Richard Munyai	01/08/2011	Phase 1 Archaeological Scoping Study: An archaeological investigation for the proposed upgrading of 11.8km (gravel to tar) of road D2740 Rust de Winter - Moloto in the Nkangala Region of the Mpumalanga District Province
117772	AIA Phase 1	Eric Ndivhuho Mathoho	01/08/2012	ARCHAEOLOGICAL IMPACTS ASSESSMENT PROCESS: PROPOSED NEW 132KV POWER LINE FROM GEMSBOK SUBSTATION TO BIG TREE SUBSTATION VIA THE KWAMHLANGA SUBSTATION, THEMBISILE HANI LOCAL MUNICIPALITY IN MPUMALNGA PROVINCE.
166113	HIA Phase 1	Anton van Vollenhoven	20/08/2012	A REPORT ON A CULTURAL HERITAGE IMPACT ASSESSMENT FOR THE PROPOSED CANYON SPRINGS COAL PROJECT, SIYABUSWA DISTRICT, MPUMALANGA PROVINCE
6194	AIA Phase 1	Julius CC Pistorius	01/06/2010	Phase 1 Heritage Impact Assessment (HIA) study for the proposed new 132KV power line running between Kwaggafontein and Amandla substations in the Mpumalanga and Limpopo Provinces of South Africa
7818	AIA Phase 1	Richard Munyai	01/08/2011	Phase 1 Archaeological Scoping Study: An archaeological investigation for the proposed upgrading of 11.8km (gravel to tar) of road D2740 Rust de Winter - Moloto in the Nkangala Region of the Mpumalanga District Province
117772	AIA Phase 1	Eric Ndivhuho Mathoho	01/08/2012	ARCHAEOLOGICAL IMPACTS ASSESSMENT PROCESS: PROPOSED NEW 132KV POWER LINE FROM GEMSBOK SUBSTATION TO BIG TREE SUBSTATION VIA THE KWAMHLANGA SUBSTATION, THEMBISILE HANI LOCAL MUNICIPALITY IN MPUMALNGA PROVINCE.
145847	AIA Phase 1	Jean-Pierre Celliers	14/10/2013	Phase 1 Archaeological Impact Assessment in respect of the Proposed Funda Mlimi Poultry Abattoir on the farm Gemsbokfontein 231 JR, Gauteng Province.
152831	AIA Phase 1	Jaco van der Walt	04/11/2013	Archaeological Impact Assessment For the Proposed Libangeni and Mmamethlake Landfill Sites, Located within the Dr JS Moroka Local Municipality, Limpopo Province
152833	Exemption Letter	John E Almond	04/11/2013	RECOMMENDED EXEMPTION FROM FURTHER PALAEOLOGICAL STUDIES: PROPOSED LIBANGENI LANDFILL SITE, FARM LEEUWFFONTEIN NO. 188JR, DR JS MOROKA LOCAL MUNICIPALITY, MPUMALANGA
165359	HIA Letter of Exemption	Christine Van Wyk Rowe	02/06/2014	Letter of recommendation for the exemption from a phase 1 archaeological and Heritage investigation for the proposed township establishment on portion 3 Riekerts Laager 165 JR Siyabuswa, Mpumalanga



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179223	Heritage Scoping	Wouter Fourie	01/09/2014	Nokukhanya Solar Facility: Heritage Scoping Report
311484	Heritage Impact Assessment Specialist Reports	Wouter Fourie	20/03/2015	Nokukhanya Solar Facility: Heritage Impact Assessment Report
5042	HIA Letter of Exemption	Frans Roodt	24/11/2006	Phase 1 Heritage Resource Impact Assessment (Scoping & Evaluation) Ntwane/Elandsdoorn Groblersdal, Mpumalanga Letter of Recommendation for Exemption
5047	AIA Phase 1	Julius CC Pistorius	01/07/2003	Heritage Impact Assessment Study for a Proposed New 22 kV Powerline on the Farm Kameelrivier 160 JR near Siyabuswa, Mpumalanga
5048	AIA Phase 1	Johnny Van Schalkwyk	01/12/2007	Heritage Impact Assessment Report for the Proposed Siyabuswa Water Augmentation Scheme, Moutse Magisterial District, Mpumalanga Province
5180	AIA Phase 1	McEdward Murimbika	01/03/2005	The Makgadimeng Water Supply, Marble Hall, Mpumalanga Province
7472	AIA Phase 1	McEdward Murimbika	01/03/2005	Naganeng Road Upgrade, Marble Hall, Mpumalanga Province, Cultural and Archaeological Heritage Assessment, Specialist Study
7473	AIA Phase 1	McEdward Murimbika	01/03/2005	Naganeng Water Supply, Marble Hall, Mpumalanga Province, Cultural and Archaeological Heritage Assessment, Specialist Study
92616	AIA Phase 1	Anton van Vollenhoven	01/08/2012	A REPORT ON A CULTURAL HERITAGE IMPACT ASSESSMENT FOR THE PROPOSED CANYON SPRINGS COAL PROJECT, SIYABUSWA DISTRICT, MPUMALANGA PROVINCE
104395	AIA Phase 1	Christine Van Wyk Rowe	01/07/2012	SPECIALIST REPORT FOR PHASE 1 ARCHEOLOGICAL / HERITAGE IMPACT ASSESSMENT: PROPOSED RESIDENTIAL TOWNSHIP (MORIPE GARDEN): REMAINING EXTENT OF PORTION 7 OF THE FARM KAMEELRIVIER 160JR, SIYABUSWA MPUMALANGA
130624	PIA Desktop	Marion Bamford	06/09/2013	SAHRA's request for a Palaeontological Impact Assessment for development of an opencast mine by Canyon Springs Investments 82 (Pty) Ltd, near Bela-Bela, Mpumalanga – on behalf of Prime Resources, Parktown North, Johannesburg (Ms Zoë Gebhardt)
163767	AIA Phase 1	Christine Van Wyk Rowe	14/05/2014	Phase 1 AIA / HIA for a proposed township development on portion 1, 4 & 5 of Vlaklaagte 221 JR, Vlaklaagte Mpumalanga
166113	HIA Phase 1	Anton van Vollenhoven	20/08/2012	A REPORT ON A CULTURAL HERITAGE IMPACT ASSESSMENT FOR THE PROPOSED CANYON SPRINGS COAL PROJECT, SIYABUSWA DISTRICT, MPUMALANGA PROVINCE
166451	AIA Phase 1	Christine Van Wyk Rowe	17/06/2014	Phase 1 Archaeological and Heritage Impact assessment for a proposed township development on portion 36 of the farm Vlaklaagte, Mpumalanga
181586	AIA Phase 1	Francois P Coetzee	31/10/2014	Cultural Heritage Assessment for the Proposed Expansion of the Bhundu Inn Hotel, Portion 174 of the Farm Goederede 60 JS, Thembisile Hani Local Municipality, Nkangala District, Mpumalanga
192124	PIA Desktop	Marion Bamford	10/09/2014	Palaeontological Impact Assessment for the proposed Hotel (Bhundu Inn) upgrade adjacent to the SS Skosana Nature reserve, Mpumalanga



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APPENDICES



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APPENDIX 1:

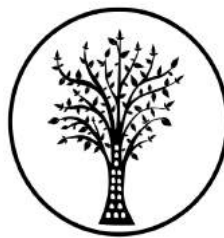
Archaeological Specialist Report

ARCHAEOLOGICAL SPECIALIST STUDY

In terms of Section 38(8) of the NHRA for a

Proposed egg-layer facility on Portion 4 of Farm Waterval 34 JS,
Mpumalanga

Prepared by



CTS HERITAGE

In Association with

CSIR

April 2018



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THE INDEPENDENT PERSON WHO COMPILED A SPECIALIST REPORT OR UNDERTOOK A SPECIALIST PROCESS

I Nkosinathi Tomose, as the appointed independent specialist hereby declare that I:

- act/ed as the independent specialist in this application;
- regard the information contained in this report as it relates to my specialist input/study to be true and correct, and
- do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the NEMA, the Environmental Impact Assessment Regulations, 2010 and any specific environmental management Act;
- have and will not have no vested interest in the proposed activity proceeding;
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- am fully aware of and meet the responsibilities in terms of NEMA, the Environmental Impact Assessment Regulations, 2010 (specifically in terms of regulation 17 of GN No. R. 543) and any specific environmental management Act, and that failure to comply with these requirements may constitute and result in disqualification;
- have ensured that information containing all relevant facts in respect of the specialist input/study was distributed or made available to interested and affected parties and the public and that participation by interested and affected parties was facilitated in such a manner that all interested and affected parties were provided with a reasonable opportunity to participate and to provide comments on the specialist input/study;
- have ensured that the comments of all interested and affected parties on the specialist input/study were considered, recorded and submitted to the competent authority in respect of the application;
- have ensured that the names of all interested and affected parties that participated in terms of the specialist input/study were recorded in the register of interested and affected parties who participated in the public participation process;
- have provided the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not; and
- am aware that a false declaration is an offence in terms of regulation 71 of GN No. R. 543.

Nkosinathi G. Tomose

Signature of the specialist

CTS Heritage

Name of company

05 April 2018

Date



CTS HERITAGE

EXECUTIVE SUMMARY

The application is for a proposed egg-layer facility in Dr JS Moroka Local Municipality Mpumalanga. The proposed site is located on Portion 4 of Farm Waterval 34 JS across the road (southwest direction) from the main Waterval Township. The project falls under the Special Needs Programme of the CSIR and DEA in assisting small scale agricultural initiatives to obtain Environmental Authorisation. The project will be developed on land that is currently vacant. The project will specialize in the production and sale of eggs. The project will essentially purchase 'ready to lay' pullets and raise them through their productive cycle. The start-up enterprise plans to build an environmentally controlled chicken layer facility with supporting infrastructure and a 5ha vegetable crop field.

No archaeological resources were identified during the site visit. A pile of rocks was noted, however this occurrence has no archaeological or heritage significance.

There is no objection to the proposed development for archaeological reasons. It is unlikely that any significant heritage resources will be impacted by the proposed development.



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1. INTRODUCTION

1.1 Background Information on Project

The application is for a proposed egg-layer facility in Dr JS Moroka Local Municipality Mpumalanga. The proposed site is located on Portion 4 of Farm Waterval 34 JS across the road (southwest direction) from the main Waterval Township. The project falls under the Special Needs Programme of the CSIR and DEA in assisting small scale agricultural initiatives to obtain Environmental Authorisation. The project will be developed on land that is currently vacant. The project will specialize in the production and sale of eggs. The project will essentially purchase 'ready to lay' pullets and raise them through their productive cycle. The start-up enterprise plans to build an environmentally controlled chicken layer facility with supporting infrastructure and a 5ha vegetable crop field.

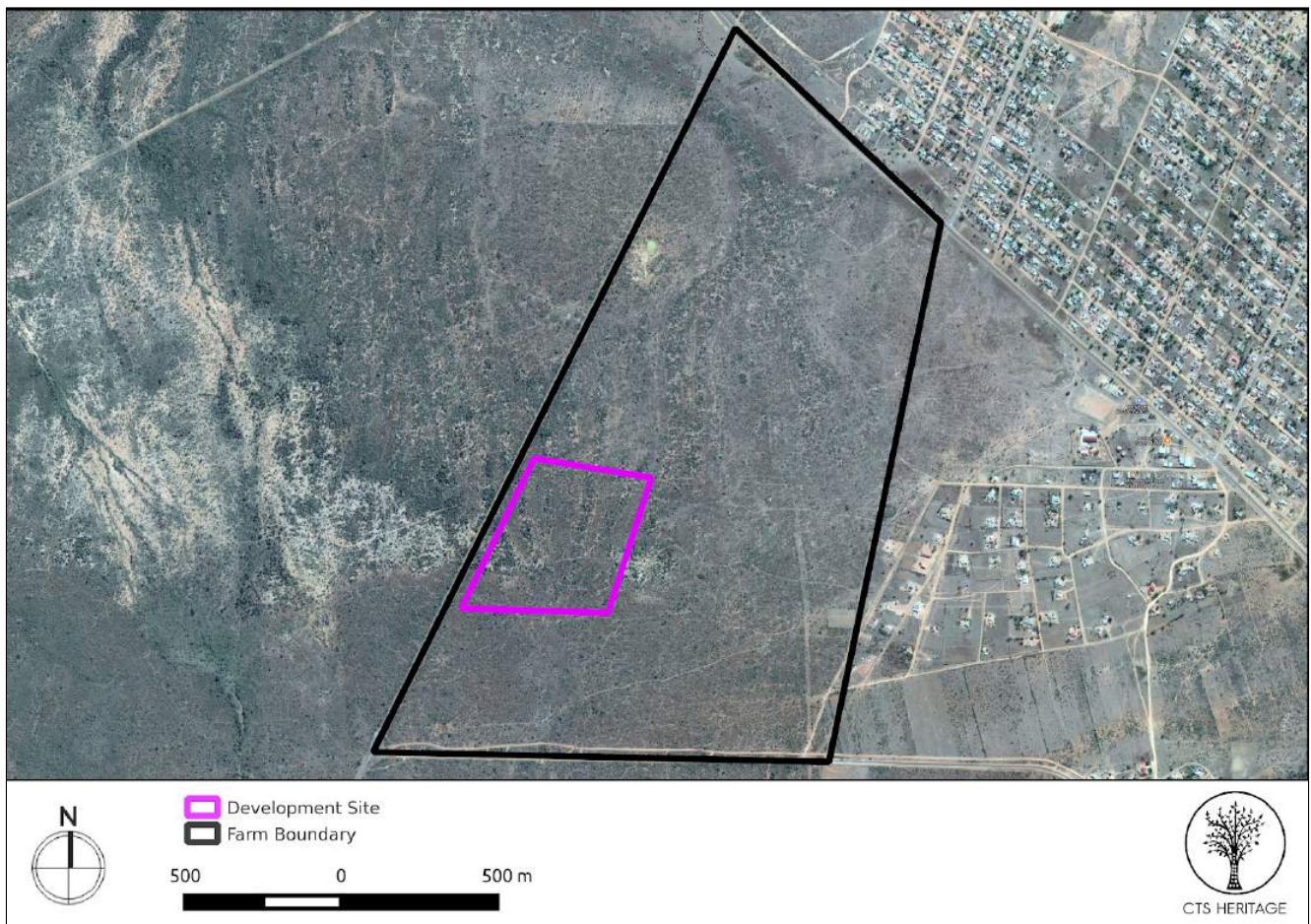


Figure 1: Close up satellite image indicating proposed location of development

2. METHODOLOGY

2.1 Purpose of Archaeological Study

The purpose of this archaeological study is to satisfy the requirements of section 38(8), and therefore section 38(3) of the National Heritage Resources Act (Act 25 of 1999) in terms of impacts to archaeological resources.



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2.2 Summary of steps followed

- An archaeologist conducted a survey of the site and its environs on 26 March 2018 to determine what archaeological resources are likely to be impacted by the proposed development.
- The identified resources were assessed to evaluate their heritage significance in terms of the grading system outlined in section 3 of the NHRA (Act 25 of 1999).
- Alternatives and mitigation options were discussed with the Environmental Assessment Practitioner.

3. HISTORY AND EVOLUTION OF THE SITE AND CONTEXT

According to Pistorius (2010 NID 6194), "Focused archaeological research has been conducted in the Mpumalanga and Limpopo Provinces of South Africa for more than four decades. This research consists of surveys and of excavations of Stone Age and Iron Age sites as well as the recording of rock art and historical sites." However, very few archaeological or built environment sites of significance are known from the area surrounding the proposed development (Figures 2 and 3). The nearest HIA conducted in the vicinity of the proposed development is located approximately 5km, by Pistorius in 2003 (SAHRIS NID 5047). While he did not find any archaeological or built environment heritage resources, he noted the presence of burial grounds and graves. Only eight heritage resources are known to exist within a 30km buffer of the proposed development area - some archaeological resources of low heritage significance and burial grounds and graves.

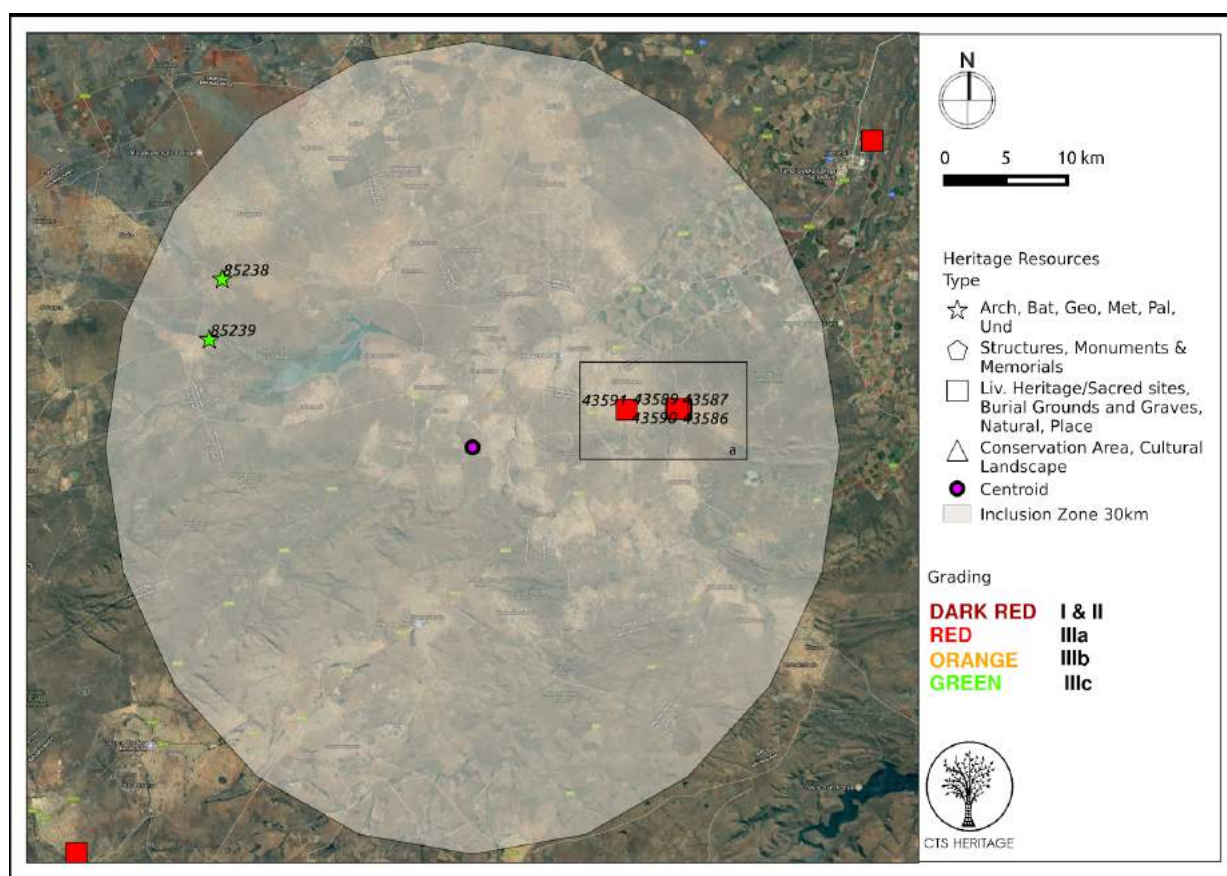


Figure 3: Spatialisation of known heritage resources within 30km of the development area



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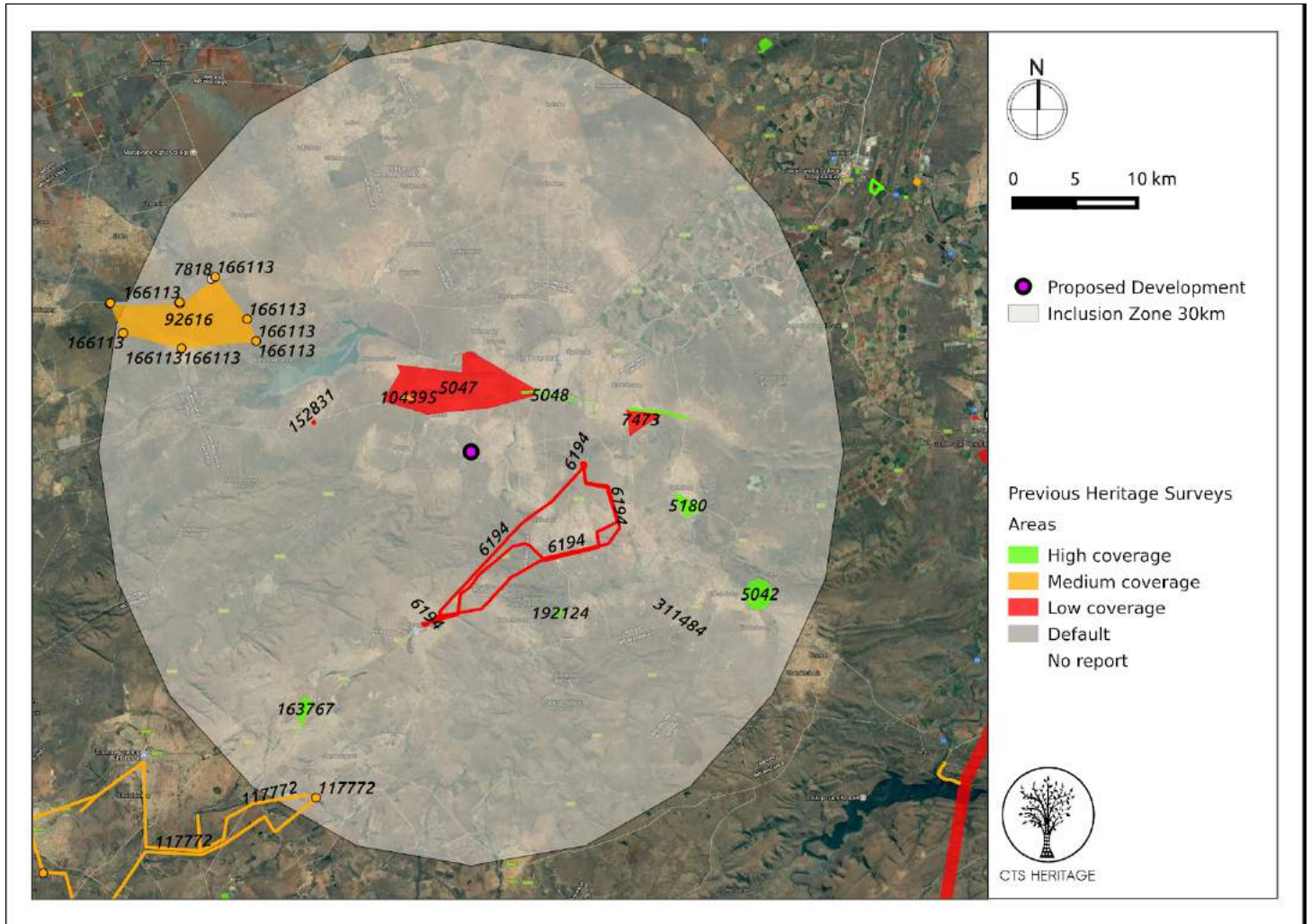


Figure 4: Previous HIAs Map. Previous Heritage Impact Assessments surrounding the proposed development area within 30km, with SAHRIS NIDS indicated.

4. IDENTIFICATION OF HERITAGE RESOURCES

4.1 Field Assessment

The site visit was undertaken on 26 March 2018. No restrictions were encountered. Visibility was moderate due to dense vegetation, however the researcher believes that a thorough assessment of the likely archaeological resources to be found on the property was achieved.

4.2 Archaeological Resources identified

No archaeological resources were identified during the site visit. A pile of rocks was noted, however this occurrence has no archaeological or heritage significance.



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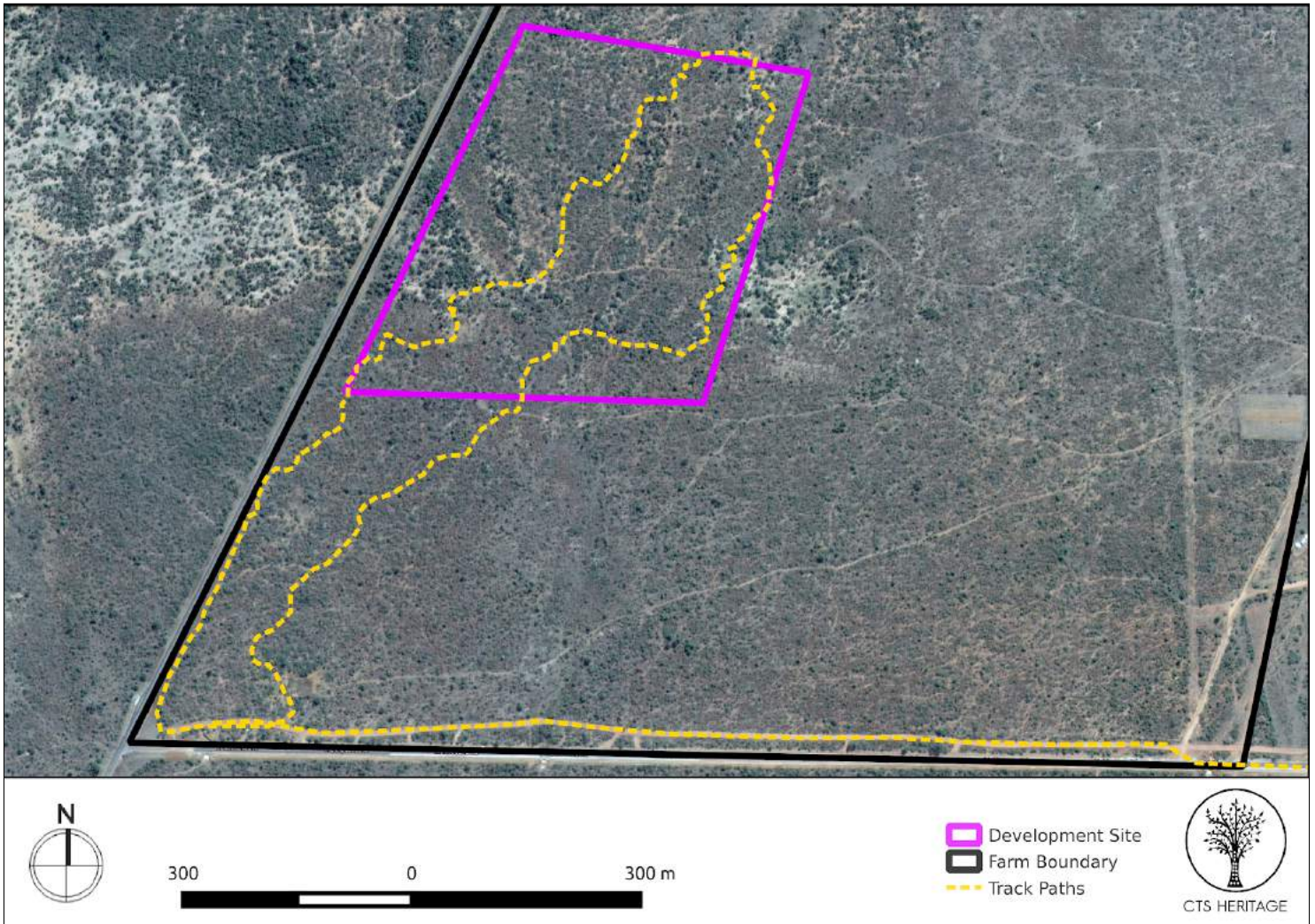


Figure 5: Track paths of foot survey

4.3 Selected photographic record



Figures 6 and 7: General context of development site



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Figures 8 and 9: General context of development site



Figures 6 and 7: General context of development site

5. ASSESSMENT OF THE IMPACT OF THE DEVELOPMENT

5.1 Assessment of impact to Archaeological Resources

None. It is unlikely that any significant archaeological resources will be impacted by the proposed development.

6. CONCLUSION AND RECOMMENDATIONS

There is no objection to the proposed development for archaeological reasons. It is unlikely that any significant heritage resources will be impacted by the proposed development.



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7. REFERENCES

Heritage Impact Assessments				
Nid	Report Type	Author/s	Date	Title
7818	AIA Phase 1	Richard Munyai	01/08/2011	Phase 1 Archaeological Scoping Study: An archaeological investigation for the proposed upgrading of 11.8km (gravel to tar) of road D2740 Rust de Winter - Moloto in the Nkangala Region of the Mpumalanga District Province
7818	AIA Phase 1	Richard Munyai	01/08/2011	Phase 1 Archaeological Scoping Study: An archaeological investigation for the proposed upgrading of 11.8km (gravel to tar) of road D2740 Rust de Winter - Moloto in the Nkangala Region of the Mpumalanga District Province
117772	AIA Phase 1	Eric Ndivhuho Mathoho	01/08/2012	ARCHAEOLOGICAL IMPACTS ASSESSMENT PROCESS: PROPOSED NEW 132KV POWER LINE FROM GEMSBOK SUBSTATION TO BIG TREE SUBSTATION VIA THE KWAMHLANGA SUBSTATION, THEMBISILE HANI LOCAL MUNICIPALITY IN MPUMALNGA PROVINCE.
166113	HIA Phase 1	Anton van Vollenhoven	20/08/2012	A REPORT ON A CULTURAL HERITAGE IMPACT ASSESSMENT FOR THE PROPOSED CANYON SPRINGS COAL PROJECT, SIYABUSWA DISTRICT, MPUMALANGA PROVINCE
6194	AIA Phase 1	Julius CC Pistorius	01/06/2010	Phase 1 Heritage Impact Assessment (HIA) study for the proposed new 132KV power line running between Kwaggafontein and Amandla substations in the Mpumalanga and Limpopo Provinces of South Africa
7818	AIA Phase 1	Richard Munyai	01/08/2011	Phase 1 Archaeological Scoping Study: An archaeological investigation for the proposed upgrading of 11.8km (gravel to tar) of road D2740 Rust de Winter - Moloto in the Nkangala Region of the Mpumalanga District Province
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145847	AIA Phase 1	Jean-Pierre Celliers	14/10/2013	Phase 1 Archaeological Impact Assessment in respect of the Proposed Funda Mlimi Poultry Abbatoir on the farm Gemsbokfontein 231 JR, Gauteng Province.
152831	AIA Phase 1	Jaco van der Walt	04/11/2013	Archaeological Impact Assessment For the Proposed Libangeni and Mmamethlake Landfill Sites, Located within the Dr JS Moroka Local Municipality, Limpopo Province
152833	Exemption Letter	John E Almond	04/11/2013	RECOMMENDED EXEMPTION FROM FURTHER PALAEOLOGICAL STUDIES: PROPOSED LIBANGENI LANDFILL SITE, FARM LEEUWFFONTEIN NO. 188JR, DR JS MOROKA LOCAL MUNICIPALITY, MPUMALANGA
165359	HIA Letter of Exemption	Christine Van Wyk Rowe	02/06/2014	Letter of recommendation for the exemption from a phase 1 archaeological and Heritage investigation for the proposed township establishment on portion 3 Riekers Laager 165 JR Siyabuswa, Mpumalanga



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179223	Heritage Scoping	Wouter Fourie	01/09/2014	Nokukhanya Solar Facility: Heritage Scoping Report
311484	Heritage Impact Assessment Specialist Reports	Wouter Fourie	20/03/2015	Nokukhanya Solar Facility: Heritage Impact Assessment Report
5042	HIA Letter of Exemption	Frans Roodt	24/11/2006	Phase 1 Heritage Resource Impact Assessment (Scoping & Evaluation) Ntwane/Elandsdoorn Groblersdal, Mpumalanga Letter of Recommendation for Exemption
5047	AIA Phase 1	Julius CC Pistorius	01/07/2003	Heritage Impact Assessment Study for a Proposed New 22 kV Powerline on the Farm Kameelrivier 160 JR near Siyabuswa, Mpumalanga
5048	AIA Phase 1	Johnny Van Schalkwyk	01/12/2007	Heritage Impact Assessment Report for the Proposed Siyabuswa Water Augmentation Scheme, Moutse Magisterial District, Mpumalanga Province
5180	AIA Phase 1	McEdward Murimbika	01/03/2005	The Makgadimeng Water Supply, Marble Hall, Mpumalanga Province
7472	AIA Phase 1	McEdward Murimbika	01/03/2005	Naganeng Road Upgrade, Marble Hall, Mpumalanga Province, Cultural and Archaeological Heritage Assessment, Specialist Study
7473	AIA Phase 1	McEdward Murimbika	01/03/2005	Naganeng Water Supply, Marble Hall, Mpumalanga Province, Cultural and Archaeological Heritage Assessment, Specialist Study
92616	AIA Phase 1	Anton van Vollenhoven	01/08/2012	A REPORT ON A CULTURAL HERITAGE IMPACT ASSESSMENT FOR THE PROPOSED CANYON SPRINGS COAL PROJECT, SIYABUSWA DISTRICT, MPUMALANGA PROVINCE
104395	AIA Phase 1	Christine Van Wyk Rowe	01/07/2012	SPECIALIST REPORT FOR PHASE 1 ARCHEOLOGICAL / HERITAGE IMPACT ASSESSMENT: PROPOSED RESIDENTIAL TOWNSHIP (MORIPE GARDEN): REMAINING EXTENT OF PORTION 7 OF THE FARM KAMEELRIVIER 160JR, SIYABUSWA MPUMALANGA
130624	PIA Desktop	Marion Bamford	06/09/2013	SAHRA's request for a Palaeontological Impact Assessment for development of an opencast mine by Canyon Springs Investments 82 (Pty) Ltd, near Bela-Bela, Mpumalanga – on behalf of Prime Resources, Parktown North, Johannesburg (Ms Zoë Gebhardt)
163767	AIA Phase 1	Christine Van Wyk Rowe	14/05/2014	Phase 1 AIA / HIA for a proposed township development on portion 1, 4 & 5 of Vlaklaagte 221 JR, Vlaklaagte Mpumalanga
166113	HIA Phase 1	Anton van Vollenhoven	20/08/2012	A REPORT ON A CULTURAL HERITAGE IMPACT ASSESSMENT FOR THE PROPOSED CANYON SPRINGS COAL PROJECT, SIYABUSWA DISTRICT, MPUMALANGA PROVINCE
166451	AIA Phase 1	Christine Van Wyk Rowe	17/06/2014	Phase 1 Archaeological and Heritage Impact assessment for a proposed township development on portion 36 of the farm Vlaklaagte, Mpumalanga
181586	AIA Phase 1	Francois P Coetzee	31/10/2014	Cultural Heritage Assessment for the Proposed Expansion of the Bhundu Inn Hotel, Portion 174 of the Farm Goederede 60 JS, Thembisile Hani Local Municipality, Nkangala District, Mpumalanga
192124	PIA Desktop	Marion Bamford	10/09/2014	Palaeontological Impact Assessment for the proposed Hotel (Bhundu Inn) upgrade adjacent to the SS Skosana Nature reserve, Mpumalanga



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APPENDIX 2:

Desktop Palaeontological Specialist Report

**Palaeontological Impact Assessment
for the proposed
Lungile Poultry Farm Egg-layer facility
on Portion 4 of Farm Waterval 34 JS,
Mpumalanga Province**

Desktop Study

For

**CTS Heritage
(CTS Project: CTS18_040)**

28 March 2017

Prof Marion Bamford

Palaeobotanist

P Bag 652, WITS 2050

Johannesburg, South Africa

Marion.bamford@wits.ac.za

Expertise of Specialist

The Palaeontologist Consultant is: Prof Marion Bamford
Qualifications: PhD (Wits Univ, 1990); FRSSAf, ASSAf
Experience: 30 years research; 20 year PIA studies

Declaration of Independence

This report has been compiled by Professor Marion Bamford, of the University of the Witwatersrand, sub-contracted by CTS Heritage, Cape Town, South Africa. The views expressed in this report are entirely those of the author and no other interest was displayed during the decision making process for the project.

Specialist: Prof Marion Bamford.....

Signature:



Executive Summary

The desktop Palaeontological Impact Assessment for the area southwest of Groblersdal, on Portion 4 of Farm Waterval 34 JS, Mpumalanga Province, where CSIR proposes to construct an egg-layer facility for Lungile Poultry Farm, is presented here.

The underlying rocks are of the ancient Lebowa Granite Suite and the Rashoop Granophyre Suite which are volcanic in origin and do not preserve fossils. The third rock type is the Selons Formation of the Palaeoproterozoic Rooiberg Group which are predominantly poorly sorted sandstones. There is a very small chance that trace fossils (ripple marks and microbial mats) could be discovered when excavations for the roads and buildings commence so a Chance Find Protocol and Monitoring Programme has been added to the report. It is concluded that the project may continue as far as the paleontology is concerned.

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1. Background

An application has been made for a proposed egg-layer facility in Dr JS Moroka Local Municipality Mpumalanga. The proposed site is located on Portion 4 of Farm Waterval 34 JS across the road (southwest direction) from the main Waterval Township. The project falls under the Special Needs Programme of the CSIR and DEA in assisting small scale agricultural initiatives to obtain Environmental Authorisation. The project will be developed on land that is currently vacant. The project will specialize in the production and sale of eggs. The project will essentially purchase 'ready to lay' pullets and raise them through their productive cycle. The start-up enterprise plans to build an environmentally controlled chicken layer facility with supporting infrastructure and a 5ha vegetable crop field.

The proposed infrastructure development is in the form of:

- 2 x Chicken Layer housing (12m Wide, 81m Long and 3.1m High)
- Maize and Vegetables (5ha Production)
- Office
- Housing
- Borehole

This report complies with the requirements of the NEMA and environmental impact assessment (EIA) regulations (GNR 982 of 2014). The table below provides a summary of the requirements, with cross references to the report sections where these requirements have been addressed.

Table 1: Specialist report requirements in terms of Appendix 6 of the EIA Regulations (2014)

A specialist report prepared in terms of the Environmental Impact Regulations of 2014 must contain:	Relevant section in report
Details of the specialist who prepared the report (CV in Appendix A)	Prof Marion Bamford
The expertise of that person to compile a specialist report including a curriculum vitae	Palaeontologist (PhD Wits 1990)
A declaration that the person is independent in a form as may be specified by the competent authority	Page 2
An indication of the scope of, and the purpose for which, the report was prepared	Section 1
The date and season of the site investigation and the relevance of the season to the outcome of the assessment	n/a Seasons make no difference to fossils
A description of the methodology adopted in preparing the report or carrying out the specialised process	Section 2,
The specific identified sensitivity of the site related to the activity and its associated structures and infrastructure	See table 2
An identification of any areas to be avoided, including buffers	n/a
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;	n/a
A description of any assumptions made and any uncertainties or gaps in knowledge;	Section 6,
A description of the findings and potential implications of such findings on the impact of the proposed activity, including identified alternatives, on the environment	n/a

Any mitigation measures for inclusion in the EMPr	n/a
Any conditions for inclusion in the environmental authorisation	n/a
Any monitoring requirements for inclusion in the EMPr or environmental authorisation	Section 8,
A reasoned opinion as to whether the proposed activity or portions thereof should be authorised and	n/a
If the opinion is that the proposed activity or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan	n/a
A description of any consultation process that was undertaken during the course of carrying out the study	Section 3
A summary and copies if any comments that were received during any consultation process	n/a
Any other information requested by the competent authority.	n/a

2. Methods and Terms of Reference

1. In order to determine the likelihood of fossils occurring in the affected area geological maps, literature, palaeontological databases and published and unpublished records must be consulted.
2. If fossils are likely to occur then a site visit must be made by a qualified palaeontologist to locate and assess the fossils and their importance.
3. Unique or rare fossils should either be collected (with the relevant South African Heritage Resources Agency (SAHRA) permit) and removed to a suitable storage and curation facility, for example a Museum or University palaeontology department or protected on site.
4. Common fossils can be sacrificed if they are of minimal or no scientific importance but a representative collection could be made if deemed necessary.

The published geological and palaeontological literature, unpublished records of fossil sites, catalogues and reports housed in the Evolutionary Studies Institute, University of the Witwatersrand, and SAHRA databases were consulted to determine if there are any records of fossils from the sites and the likelihood of any fossils occurring there.



Figure 1: Locality of the proposed Lungile Poultry Farm near Groblersdal, between Waterval Township and Borolo, on Portion 4 of Farm Waterval 34 JS. Google Earth map supplied by CTS.

3. Consultation Process

No consultations were carried out during the desktop study. Apart from reviewing interested and/or affected party (IAP) comments received by the EIA consultant during the EIA process, no other consultation took place as part of the paleontological study.

4. Geology and Palaeontology

Project location and geological setting

The site for the proposed egg-laying facility of Lungile Poultry Farm is between Waterval Township to the east and Borolo to the northwest, which is west-southwest of Groblersdal. The land is currently vacant.

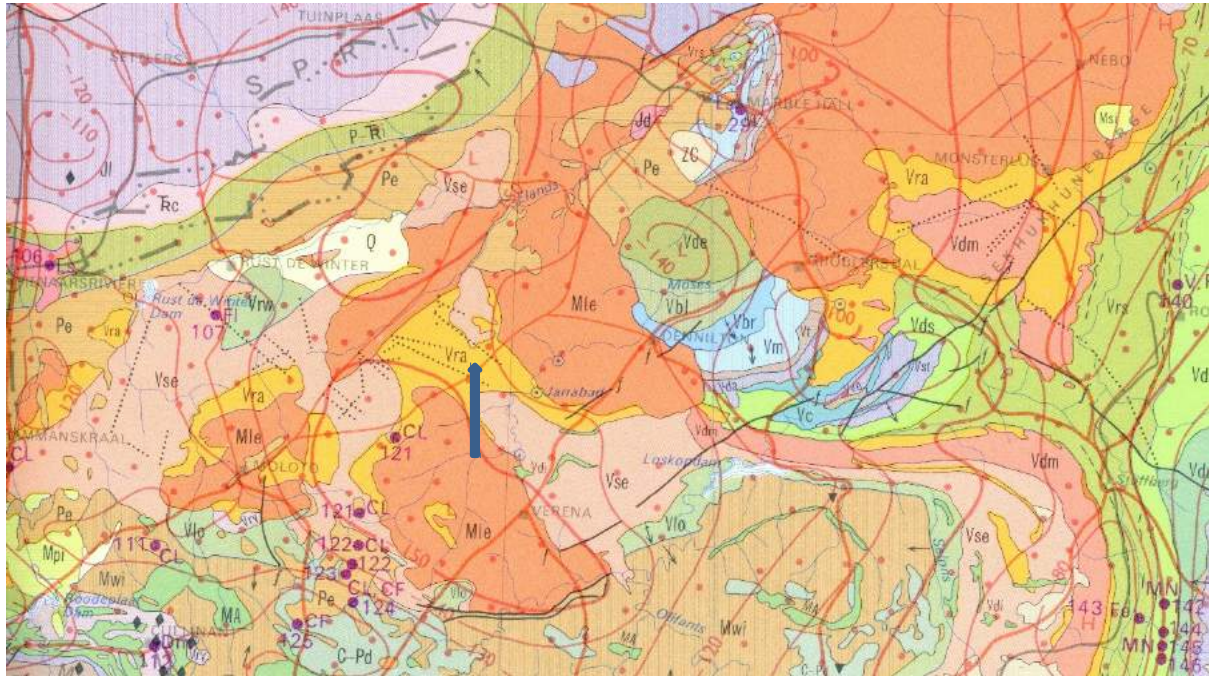


Figure 2: Geological map of the area between Hammanskraal and Groblersdal. The approximate location of the proposed project is indicated with the arrows. Abbreviations of the rock types are explained in Table 2. Map enlarged from the Geological Survey 1: 1 000 000 map 1984.

Table 2: Explanation of symbols for the geological map and approximate ages (Cawthorn, et al., 2006; Barker et al., 2006; Schweitzer et al., 1995). SG = Supergroup; Fm = Formation. The shaded symbols represent the geological units that are most relevant to the project.

Symb ol	Group/Formation	Lithology	Approximate Age
Q	Quaternary	Aeolian sands	Last 2.5 Ma
Pe	Ecca Group, Permian	Sandstone, shale, coal	Ca 290-260 Ma
C-Pd	Dwyka	Tillite, sandstone, mudstone, shale	>290 Ma
Mwi	Wilge River Fm, Waterberg Group	Sandstone, conglomerate	
Mle	Lebowa Granite Suite, Bushveld Complex	Hornblende and biotite granites	2052 Ma
Vds	Dsjate subsuite,	Gabbro, norite	
Vdr	Dwars River subsuite, critical zone of Rustenburg Layered Suite; Bushveld Complex	Anorthosite, pyroxenite	>2050 Ma
Vc	Croyden subsuite, Lower zone of	Harzburgite, bronzitite	>2050 Ma

Symb ol	Group/Formation	Lithology	Approximate Age
	Rustenburg Layered Suite; Bushveld Complex		
Vra	Rashoop Granophyre Suite	Granophyre	Ca 2050 Ma
Vlo	Loskop Fm, uppermost Transvaal Sequence	Shale, sandstone, conglomerate, volcanic rocks	2100 Ma
Vse	Selons River, Rooiberg Group	Red porphyritic rhyolite	Ca 2017 Ma
Vdm	Damwal Fm, Rooiberg Group	Black porphyritic and amygdaloidal rhyolite	Ca 2071 Ma
Vve	Vermont Fm, Pretoria Group	Mudrock, hornfels	
Vda	Daspoort Fm, Pretoria Group	Quartzite	
Vt	Timeball Hill Fm, Pretoria Group	Shale, quartzite, conglomerate, breccia, diamictite	
Vbr	Black Reef Fm,	Quartzite, conglomerate, shale, basalt	>2642 Ma
Vbl	Bloempoot Group; pre-Transvaal Supergroup	Slate, andesite, quartzite, shale	
Vde	Dennilton inlier	Acid lava, tuff, schist, gneiss	2830 - 2770 Ma

Geology

The Lungile Poultry Farm will be located on ancient rocks of possibly three (shaded in Table 2). The Lebowa Granite Suite comprises a number of granite types, and the Verena type (has prominent coarse-grained mantled alkali feldspar phenocrysts) is thought to have a different origin from the rest of the granites in this suite (Cawthorn et al., 2006). Nonetheless being of igneous origin it does not contain fossils.

The Rashoop Granophyre Suite is made up of three main magmatic and metamorphic types: the Zwartbank Pseudogranophyre, the Diepkloof Granophyre and the Rooikop Porphyritic Granite (Cawthorn et al., 2006). They are geochemically distinct and are included in the upper part of the Bushveld Complex as they overlie the Rustenburg Layered Suite.

The Selons River Formation is considered redundant (Cawthorn et al., 2006) based on the work of Schweitzer et al. (1995) and the equivalent terminology is the Kwaggasnek Formation and Schrikkloof Formation. These are all volcanic units and are composed of a fine-grained groundmass with variable proportions of phenocrysts, porphyroblasts and amygdales (Cawthorn et al., 2006).

Other rocks in the region are those of the Pretoria Group which range in age from about 2400 to 2100 million years ago and comprise a variety of sandstones, shales, quartzites, breccia and conglomerates with some contemporaneous volcanic rocks. The mafic rocks of the Bushveld Complex are thought to be formed by a number of episodes of sill-like intrusions into the upper crust, i.e. the Pretoria group sedimentary and volcanic rocks (Cawthorn et al., 2006). The hot magma altered (metamorphosed) the host rocks up to a distance of 50km (Cawthorn et al., 2006) and formed, for example, quartzites from the arenaceous (sandy) sediments.

The oldest rocks in the area are the Black Reef Formation (quartzite) and Bloemfontein Group which is made up of alternating cycles of carbonaceous claystone-siltstone and sandstone cycles with some carbonates and volcanic rocks (Erikssen et al., 2006) and represents a marginal basin with deltaic and shoreline deposits.

The younger Karoo-aged rocks (Dwyka and Ecca Groups) are distant from the proposed development, more than 20km to the northwest, and will not be considered further.

Palaeontology

(Refer to Figure 4 for SAHRIS palaeosensitivity)

The Lebowa Granite Suite would not preserve any fossils as it is igneous in origin. Similarly the Roshoop Granophyre Suite which comprises various intrusive granitic material would not preserve any fossils.



Figure 4: SAHRIS palaeosensitivity map. The site is within the blue rectangle. Colours indicate the following degrees of sensitivity: red = very highly sensitive; orange/yellow = high; green = moderate; blue = low; grey = insignificant/zero.

In contrast the Selons River Formation (Kwaggasnek and Schrikkloof Formations; Rooiberg Group) is made up of finer grained sediments that have been deposited in a marginal basin context and may preserve ripple marks. It is slightly younger than the Daspoort and Magaliesberg Formations (Pretoria Group) from where trace fossil have been found. It is too old for body fossils but there is a very small chance that microbial mats could be preserved although these are very poor and hard to recognize in the Daspoort Formation.

Trace fossils, in the form of microbial mats that have formed on or have helped to preserve ripple marks, have been found in the Daspoort and Magaliesberg Formations (underlying and overlying the Silverton Formation, respectively; Erikssen et al., 2012) but they do not provide localities. According to the authors the trace fossils would have formed on the shores of the sea (Erikssen et al., 2012), but no body fossils have been found as the rocks are too old. To date no microbial mats have been reported from the Selons River Formation.

5. Impact assessment

Using the criteria in the table below, the impact of the Lungile Poultry Farm egg-laying facility and associated infrastructure has been assessed.

TABLE 3: CRITERIA FOR ASSESSING IMPACTS

PART A: DEFINITION AND CRITERIA		
Criteria for ranking of the SEVERITY/NATURE of environmental impacts	H	Substantial deterioration (death, illness or injury). Recommended level will often be violated. Vigorous community action.
	M	Moderate/ measurable deterioration (discomfort). Recommended level will occasionally be violated. Widespread complaints.
	L	Minor deterioration (nuisance or minor deterioration). Change not measurable/ will remain in the current range. Recommended level will never be violated. Sporadic complaints.
	L+	Minor improvement. Change not measurable/ will remain in the current range. Recommended level will never be violated. Sporadic complaints.
	M+	Moderate improvement. Will be within or better than the recommended level. No observed reaction.
	H+	Substantial improvement. Will be within or better than the recommended level. Favourable publicity.
Criteria for ranking the DURATION of impacts	L	Quickly reversible. Less than the project life. Short term
	M	Reversible over time. Life of the project. Medium term
	H	Permanent. Beyond closure. Long term.
Criteria for ranking the SPATIAL SCALE of impacts	L	Localised - Within the site boundary.
	M	Fairly widespread – Beyond the site boundary. Local
	H	Widespread – Far beyond site boundary. Regional/ national
PROBABILITY (of exposure to impacts)	H	Definite/ Continuous
	M	Possible/ frequent
	L	Unlikely/ seldom

The surface activities would not impact on the fossil heritage as the rocks are ancient and volcanic so there are no fossils present. The IMPACT is nil (according to the scheme in Table 3).

Excavation for the roads, housing structures and other infrastructure would penetrate only a few metres below ground surface so there would be minor deterioration of the surface of sites and an impact on any potential fossils. Therefore the SEVERITY/NATURE of the environmental impact would be L.

DURATION of the impact would be permanent: H.

Since only the possible fossils within the area would be trace fossils such as microbial mats and ripple marks where any new roads or buildings are built, the SPATIAL SCALE will be localised within the site boundary: L.

There is no chance of finding fossils in the Lebowa Grante suite or the Rashoop Granophyre Suite, but there is a very small chance of finding trace fossils on the surface as of the Silverton Formation if the project occurs on these rocks. Trace and microfossils have been reported from older and younger Formations, but not the Silverton Formation which is

present in the area. However, the PROBABILITY of affecting any fossils is unlikely or seldom: L.

6. Assumptions and uncertainties

Based on the geology of the area and the palaeontological record as we know it, it can be assumed that the formation and layout of the volcanic rocks, basement rocks, dolomites, sandstones, shales, quartzites, granites basalts and gabbros are typical for the country and do not contain any fossil material. The sediments of the Selons River Formation could contain trace fossils of algal mats and ripple marks, however, they have yet to be recorded from the proposed site for prospecting.

7. Recommendation

It is unlikely that any fossils occur in the sites for the proposed access to boreholes and water pipes to the west and east of because mostly the rocks are much too old and volcanic in origin. There is an extremely small chance that there are unexplored exposures of the Selons River Formations at the sites. As there is a chance find, a monitoring protocol is recommended.

As far as the palaeontology is concerned the proposed development can go ahead. Any further palaeontological assessment would only be required after excavations and drilling have commenced and if fossils are found by the geologist or environmental personnel. The procedure can be added to the EMP.

8. Monitoring Programme for Palaeontology - to commence once the excavations begin.

1. The following procedure is only required if fossils are seen on the surface and when excavations commence.
2. When excavations begin the rocks and must be given a cursory inspection by the environmental officer or designated person. Any fossiliferous material (trace fossils, plants, insects, bone, coal) should be put aside in a suitably protected place. This way the construction activities will not be interrupted.
3. Photographs of similar fossil plants must be provided to the developer to assist in recognizing the fossil plants in the shales and mudstones (for example see Figure 5). This information will be built into the EMP's training and awareness plan and procedures.
4. Photographs of the putative fossils can be sent to the palaeontologist for a preliminary assessment.

5. If there are fossils of interest then the qualified palaeontologist sub-contracted for this project, should visit the site to inspect the selected material and check the dumps where feasible.
6. Fossil plants or vertebrates that are considered to be of good quality or scientific interest by the palaeontologist must be removed, catalogued and housed in a suitable institution where they can be made available for further study. Before the fossils are removed from the site a SAHRA permit must be obtained. Annual reports must be submitted to SAHRA as required by the relevant permits.
7. If no good fossil material is recovered then the site inspections by the palaeontologist can cease. A report by the palaeontologist must be sent to SAHRA.
8. If no fossils are found and the excavations have finished then no further monitoring is required.

9. References

Cawthorn, R.G., Eales, H.V., Walraven, F., Uken, R., Watkeys, M.K., 2006. The Bushveld Complex. In: Johnson, M.R., Anhaeusser, C.R. and Thomas, R.J., (Eds). The Geology of South Africa. Geological Society of South Africa, Johannesburg / Council for Geoscience, Pretoria. pp 261-281.

Erikssen, P.G., Altermann, W., Hartzler, F.J., 2006. The Transvaal Supergroup and its pre-cursors. In: Johnson, M.R., Anhaeusser, C.R. and Thomas, R.J., (Eds). The Geology of South Africa. Geological Society of South Africa, Johannesburg / Council for Geoscience, Pretoria. pp 237-260.

Eriksson, P.G., Bartman, R., Catuneanu, O., Mazumder, R., Lenhardt, N., 2012. A case study of microbial mats-related features in coastal epeiric sandstones from the Palaeoproterozoic Pretoria Group, Transvaal Supergroup, Kaapvaal craton, South Africa); the effect of preservation(reflecting sequence stratigraphic models) on the relationship between mat features and inferred palaeoenvironment. *Sedimentary Geology* 263, 67-75.

Schweitzer, J.K., Hatton, C.J., De Waal, S.A., 1995. Regional lithochemical stratigraphy of the Rooiberg Group, upper Transvaal Supergroup: a proposed new subdivision. *South African Journal of Geology* 98, 245-255.

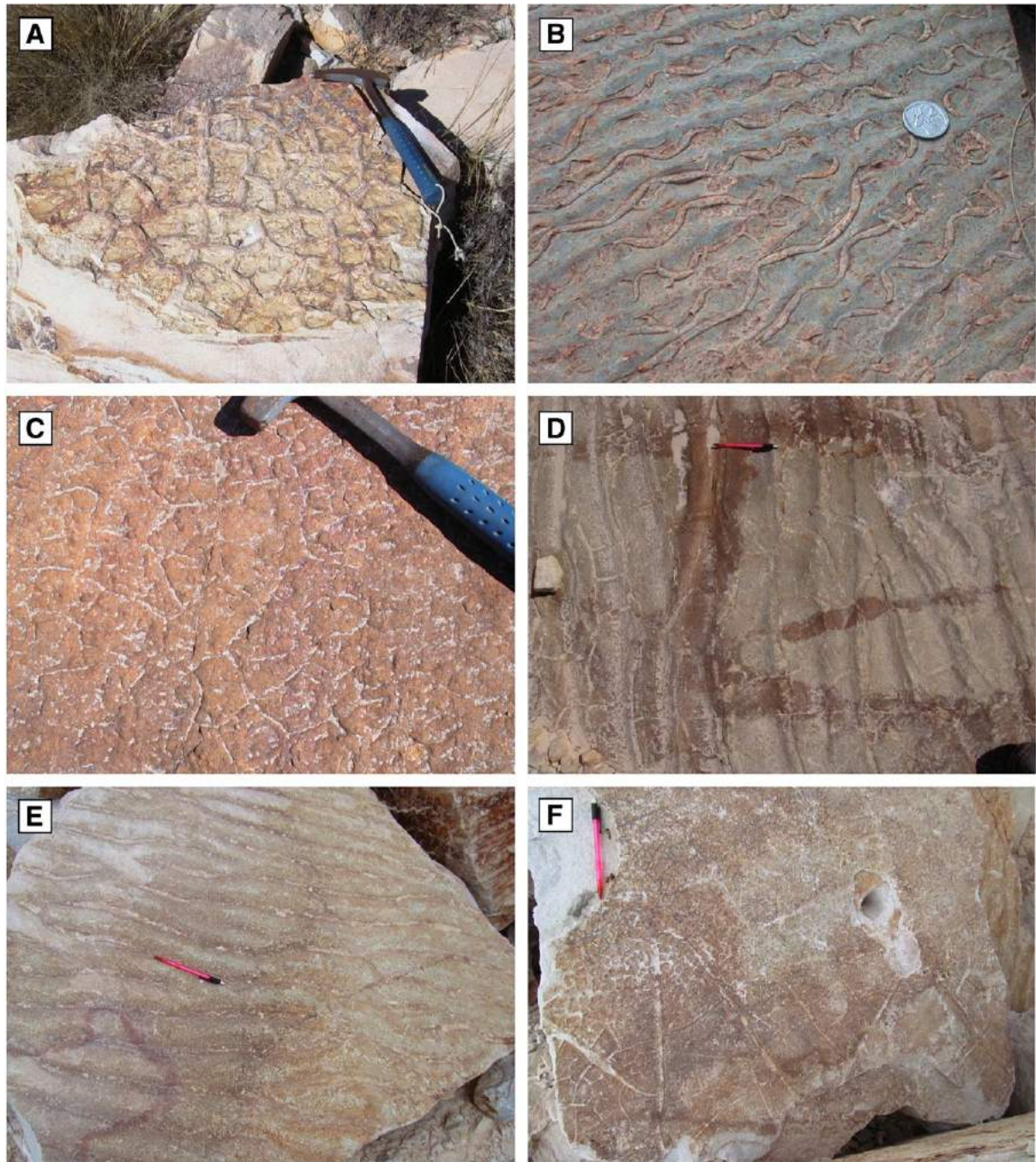


Figure 5: Examples of trace fossils such as ripple marks and microbial mats that could be found in the Daspoort or Magaliesberg Formations, or others of the Pretoria Group. (Figure copied from Erikssen et al., 2012, their figure 6).

Appendix A - Details of specialist

Curriculum vitae (short) - Marion Bamford
PhD
January 2018

I) Personal details

Surname : **Bamford**
First names : **Marion Kathleen**
Present employment : Professor; Director of the Evolutionary
Studies Institute.
Member Management Committee of the NRF/DST
Centre of
Excellence Palaeosciences, University of the
Witwatersrand,
Johannesburg, South Africa-
Telephone : +27 11 717 6690
Fax : +27 11 717 6694
Cell : 082 555 6937
E-mail : marion.bamford@wits.ac.za ;
marionbamford12@gmail.com

ii) Academic qualifications

Tertiary Education: All at the University of the Witwatersrand:
1980-1982: BSc, majors in Botany and Microbiology. Graduated April 1983.
1983: BSc Honours, Botany and Palaeobotany. Graduated April 1984.
1984-1986: MSc in Palaeobotany. Graduated with Distinction, November
1986.
1986-1989: PhD in Palaeobotany. Graduated in June 1990.

iii) Professional qualifications

Wood Anatomy Training (overseas as nothing was available in South Africa):

1994 - Service d'Anatomie des Bois, Musée Royal de l'Afrique Centrale, Tervuren, Belgium, by Roger Dechamps

1997 - Université Pierre et Marie Curie, Paris, France, by Dr Jean-Claude Koeniguer

1997 - Université Claude Bernard, Lyon, France by Prof Georges Barale, Dr Jean-Pierre Gros, and Dr Marc Philippe

iv) Membership of professional bodies/associations

Palaeontological Society of Southern Africa

Royal Society of Southern Africa - Fellow: 2006 onwards

Academy of Sciences of South Africa - Member: Oct 2014 onwards

International Association of Wood Anatomists - First enrolled: January 1991

International Organization of Palaeobotany - 1993+

Botanical Society of South Africa

South African Committee on Stratigraphy – Biostratigraphy - 1997 - 2016
 SASQUA (South African Society for Quaternary Research) – 1997+
 PAGES - 2008 –onwards: South African representative
 ROCEEH / WAVE – 2008+
 INQUA – PALCOMM – 2011+onwards

vii) Supervision of Higher Degrees

All at Wits University

Degree	Graduated/completed	Current
Honours	5	2
Masters	6	3
PhD	9	3
Postdoctoral fellows	5	3

viii) Undergraduate teaching

Geology II – Palaeobotany GEOL2008 – average 65 students per year
 Biology III – Palaeobotany APES3029 – average 25 students per year
 Honours – Evolution of Terrestrial Ecosystems; African Plio-Pleistocene
 Palaeoecology; Micropalaeontology – average 2-8 students per year.

ix) Editing and reviewing

Editor: *Palaeontologia africana*: 2003 to 2013; 2014 – Assistant editor
 Guest Editor: *Quaternary International*: 2005 volume
 Member of Board of Review: *Review of Palaeobotany and Palynology*: 2010 –
Cretaceous Research: 2014 –

Review of manuscripts for ISI-listed journals: 25 local and international journals

x) Palaeontological Impact Assessments

Selected – list not complete:

- Thukela Biosphere Conservancy 1996; 2002 for DWAF
- Vioolsdrift 2007 for Xibula Exploration
- Rietfontein 2009 for Zitholele Consulting
- Bloeddrift-Baken 2010 for TransHex
- New Kleinfontein Gold Mine 2012 for Prime Resources (Pty) Ltd.
- Thabazimbi Iron Cave 2012 for Professional Grave Solutions (Pty) Ltd
- Delmas 2013 for Jones and Wagener
- Klipfontein 2013 for Jones and Wagener
- Platinum mine 2013 for Lonmin
- Syferfontein 2014 for Digby Wells
- Canyon Springs 2014 for Prime Resources
- Kimberley Eskom 2014 for Landscape Dynamics
- Yzermyne 2014 for Digby Wells
- Matimba 2015 for Royal HaskoningDV

- Commissiekraal 2015 for SLR
- Harmony PV 2015 for Savannah Environmental
- Glencore-Tweefontein 2015 for Digby Wells
- Umkomazi 2015 for JLB Consulting
- Ixia coal 2016 for Digby Wells
- Lambda Eskom for Digby Wells
- Alexander Scoping for SLR
- Perseus-Kronos-Aries Eskom 2016 for NGT
- Mala Mala 2017 for Henwood
- Modimolle 2017 for Green Vision
- Klippoortjie and Finaalspan 2017 for Delta BEC

xi) Research Output

Publications by M K Bamford up to January 2018 peer-reviewed journals or scholarly books: over 110 articles published; 5 submitted/in press; 8 book chapters.

Scopus h index = 22; Google scholar h index = 24;

Conferences: numerous presentations at local and international conferences.

xii) NRF Rating

NRF Rating: B-2 (2016-2020)

NRF Rating: B-3 (2010-2015)

NRF Rating: B-3 (2005-2009)

NRF Rating: C-2 (1999-2004)



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APPENDIX 3:

Heritage Screening Assessment



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HERITAGE SCREENER

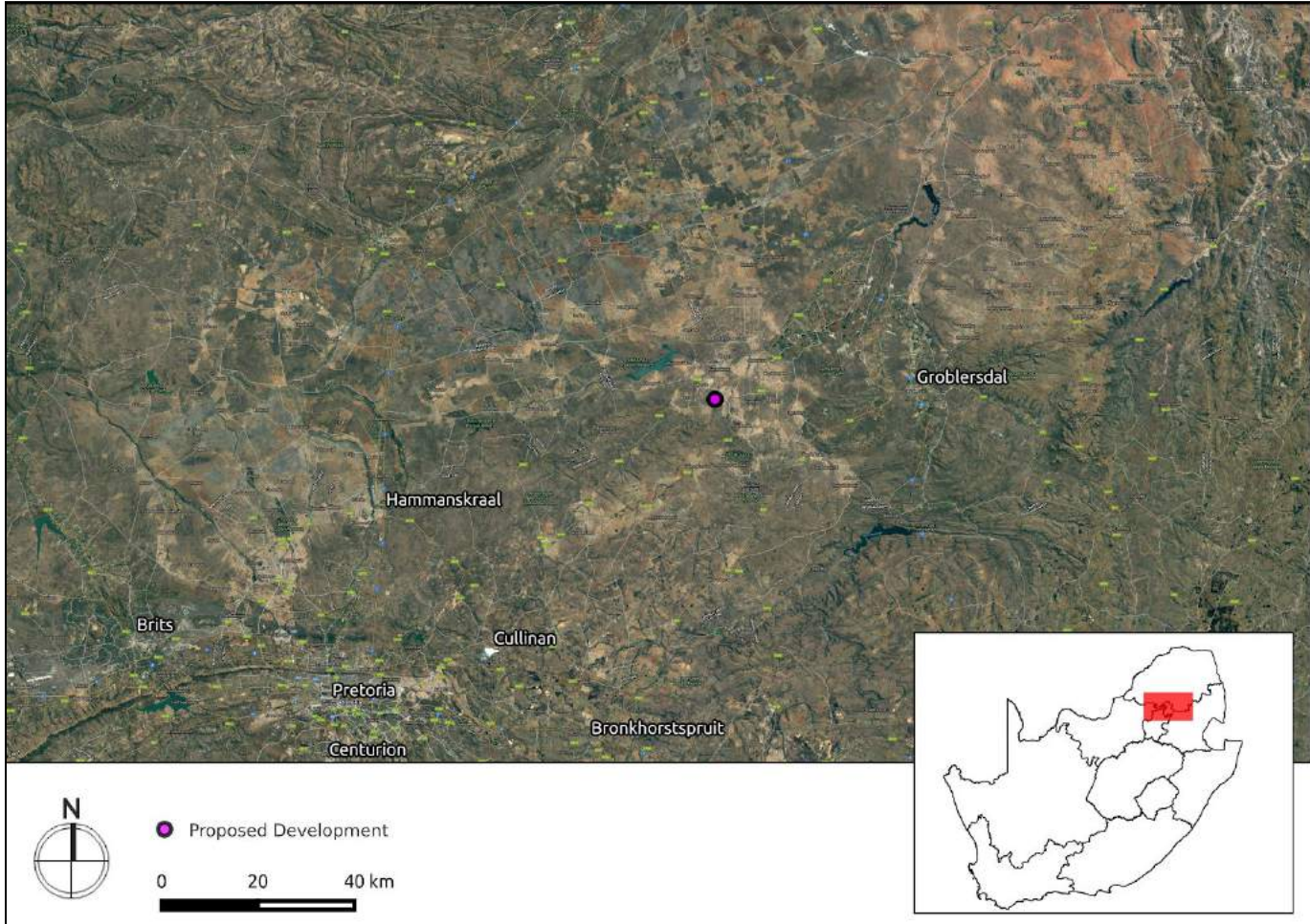
CTS Reference Number:	CTS18_040	
SAHRIS CASE ID:		
Client:	CSIR	
Date:	5 March 2018	
Title:	Proposed egg-layer facility on Portion 4 of Farm Waterval 34 JS, Mpumalanga	
Recommendation by CTS Heritage Specialists: (Type 2)	RECOMMENDATION: The heritage resources along the routes proposed for development are only partially recorded See Section 8 for full recommendations.	

Figure 1a. Satellite map indicating the location of the proposed development in the Eastern Cape Province



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1. Proposed Development Summary

The application is for a proposed egg-layer facility in Dr JS Moroka Local Municipality Mpumalanga. The proposed site is located on Portion 4 of Farm Waterval 34 JS across the road (southwest direction) from the main Waterval Township. The project falls under the Special Needs Programme of the CSIR and DEA in assisting small scale agricultural initiatives to obtain Environmental Authorisation. The project will be developed on land that is currently vacant. The project will specialize in the production and sale of eggs. The project will essentially purchase 'ready to lay' pullets and raise them through their productive cycle. The start-up enterprise plans to build an environmentally controlled chicken layer facility with supporting infrastructure and a 5ha vegetable crop field.

2. Application References

Name of relevant heritage authority(s)	SAHRA
Name of decision making authority(s)	Mpumalanga Provincial Department of Agriculture, Rural Development, Land & Environmental Affairs

3. Property Information

Latitude / Longitude	3226543.07171 -2898190.10776
Erf number / Farm number	Portion 4 of Farm Waterval 34 JS
Local Municipality	Dr JS Moroka
District Municipality	Nkangala
Previous Magisterial District	Mdutjane
Province	Mpumalanga
Current Use	Vacant
Current Zoning	Agricultural
Total Extent	2.4km ²

4. Nature of the Proposed Development

Total Surface Area	20ha
Depth of excavation (m)	Estimated 1.5 metres
Height of development (m)	Estimated 3.9 metres
Expected years of operation before decommission	NA

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5. Category of Development

Triggers: Section 38(8) of the National Heritage Resources Act	X
Triggers: Section 38(1) of the National Heritage Resources Act	
1. Construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier over 300m in length.	
2. Construction of a bridge or similar structure exceeding 50m in length.	
3. Any development or activity that will change the character of a site-	
a) exceeding 5 000m ² in extent	X
b) involving three or more existing erven or subdivisions thereof	
c) involving three or more erven or divisions thereof which have been consolidated within the past five years	
4. Rezoning of a site exceeding 10 000m ²	
5. Other (state):	

6. Additional Infrastructure Required for this Development

<p>The proposed infrastructure development is in the form of:</p> <ul style="list-style-type: none">• 2 x Chicken Layer housing (12m Wide, 81m Long and 3.1m High)• Maize and Vegetables (5ha Production)• Office• Housing• Borehole
--

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7. Mapping (please see Appendix 3 and 4 for a full description of our methodology and map legends)

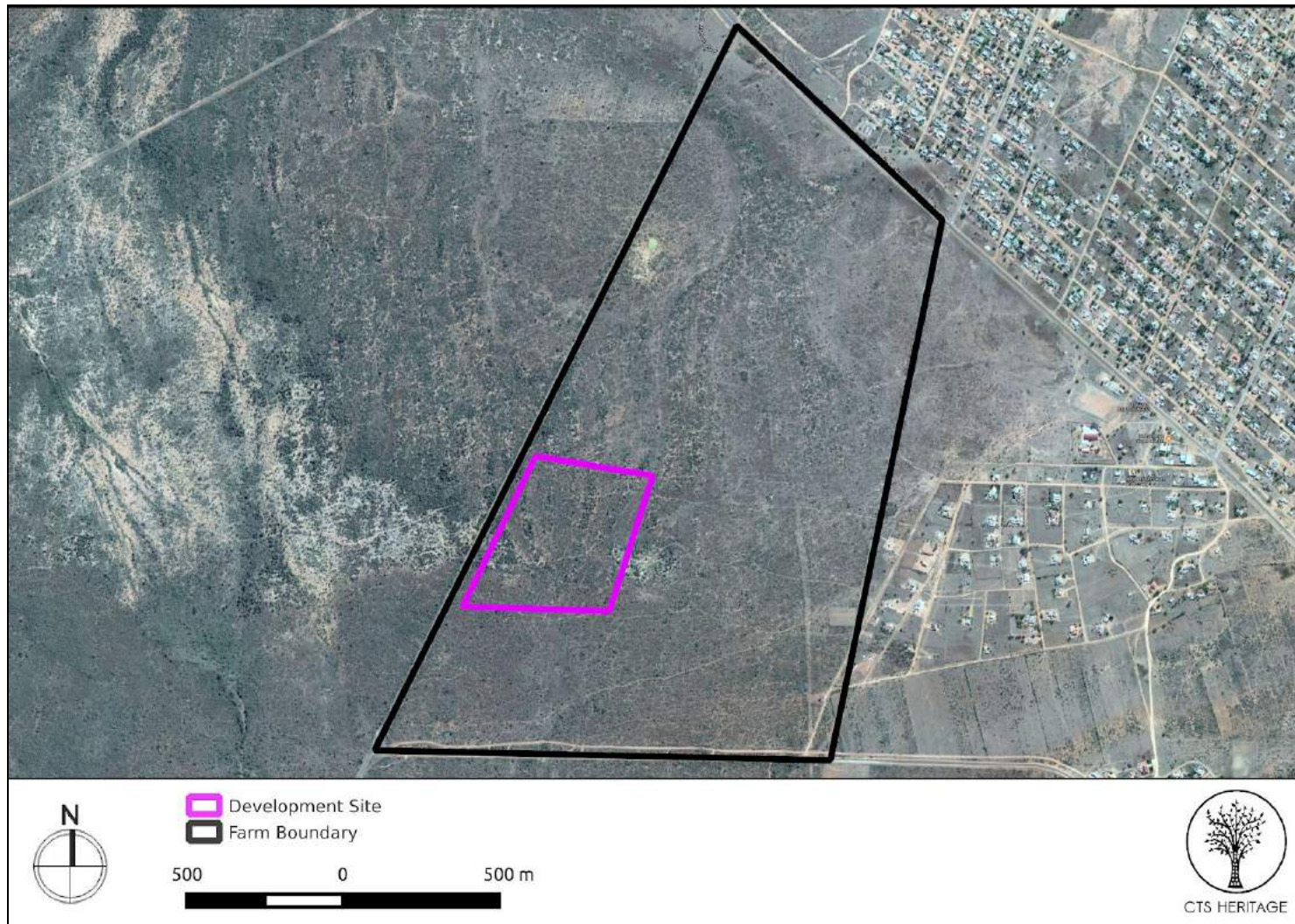


Figure 1b. Overview Map. Satellite image (2018) indicating the proposed development area at closer range.



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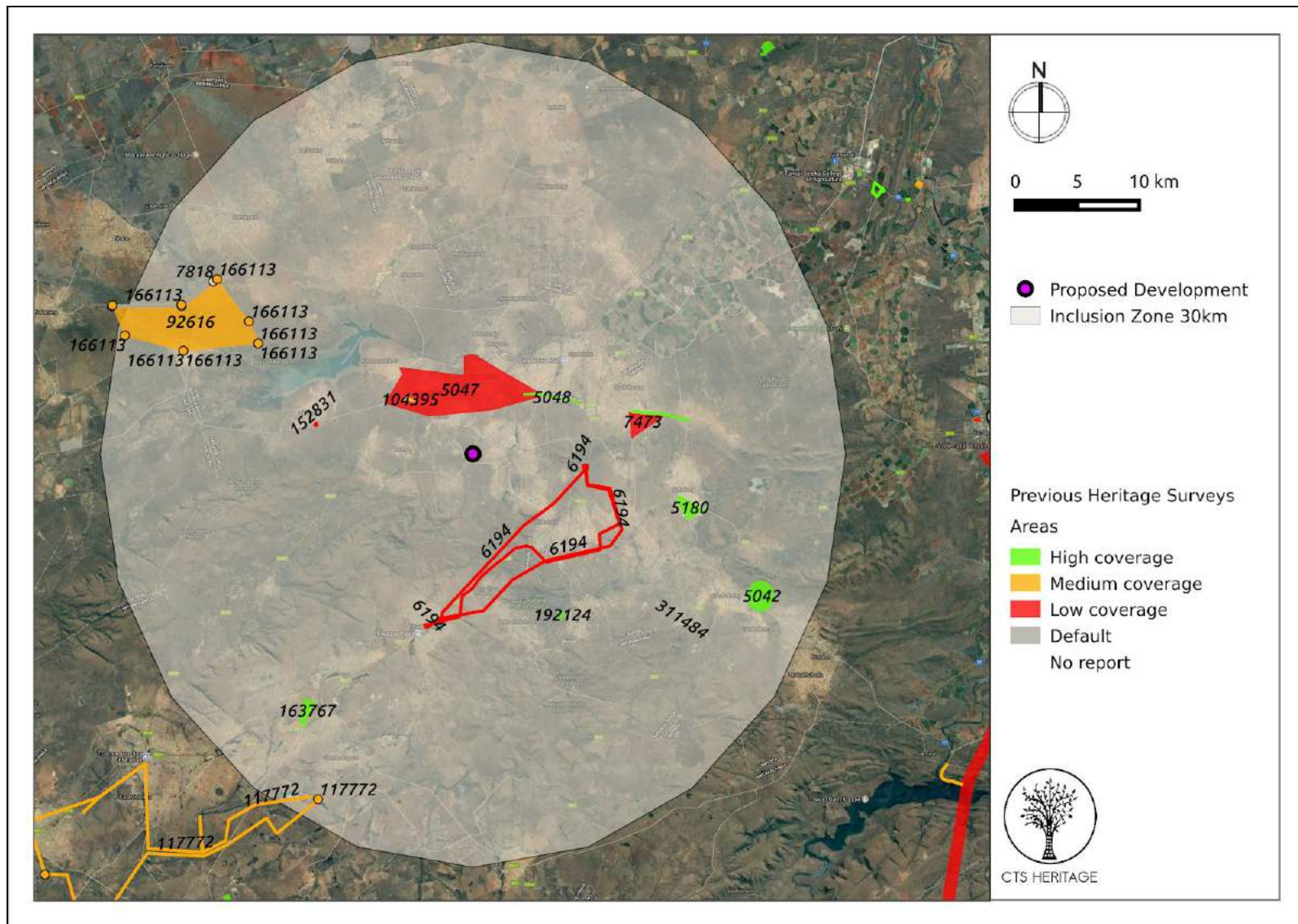


Figure 2a. Previous HIAs Map. Previous Heritage Impact Assessments surrounding the proposed development area within 30km, with SAHRIS NIDS indicated. Please see Appendix 2 for full reference list.



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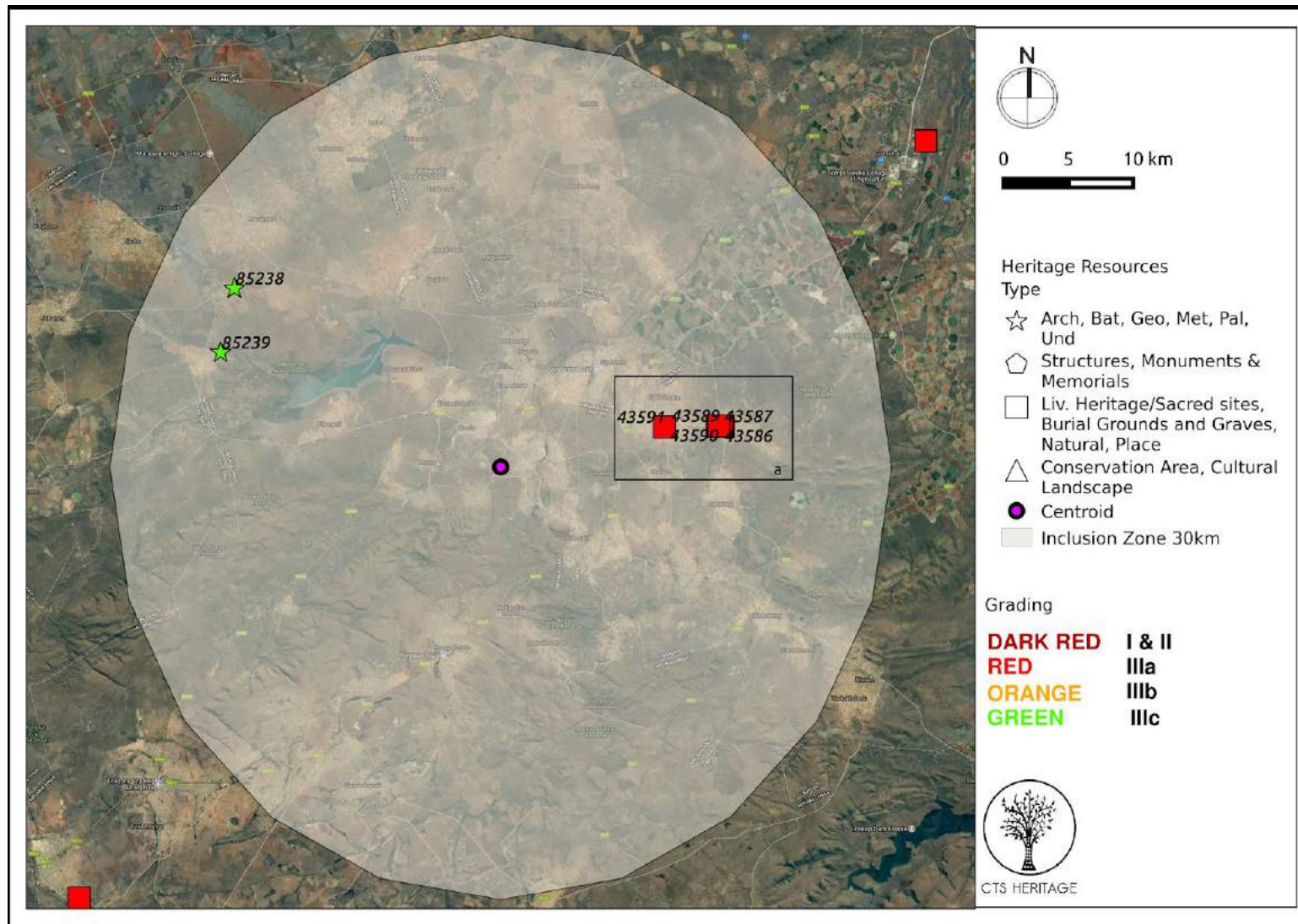


Figure 3. Heritage Resources Map. Heritage Resources previously identified in and near the study area, with SAHRIS Site IDs indicated (see Figure 3b for inset). Please See Appendix 4 for full description of heritage resource types.



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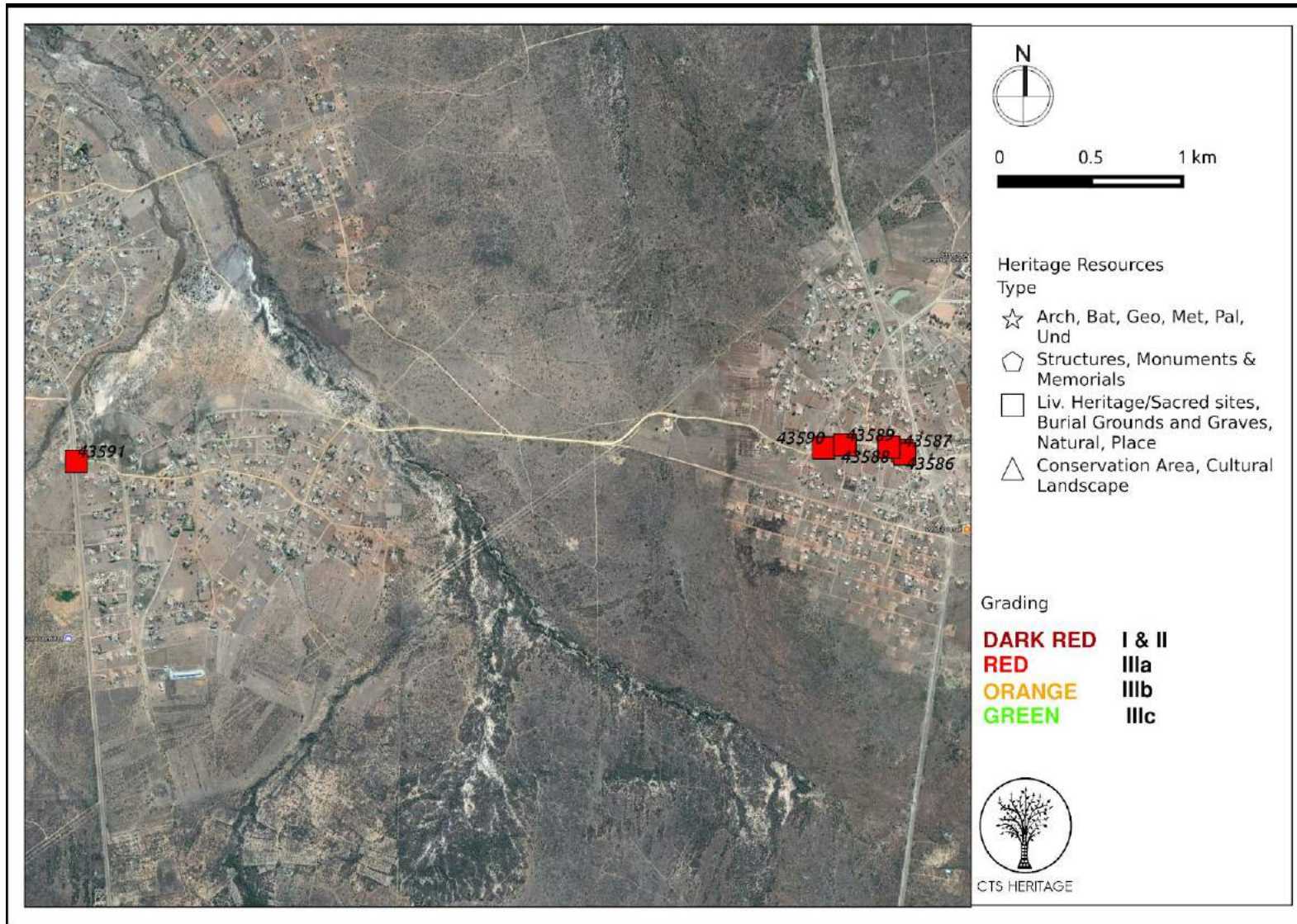


Figure 3a. Inset Map. Indicating spatial layout of sites in this region. Please see Appendix 1 for all Site IDs.



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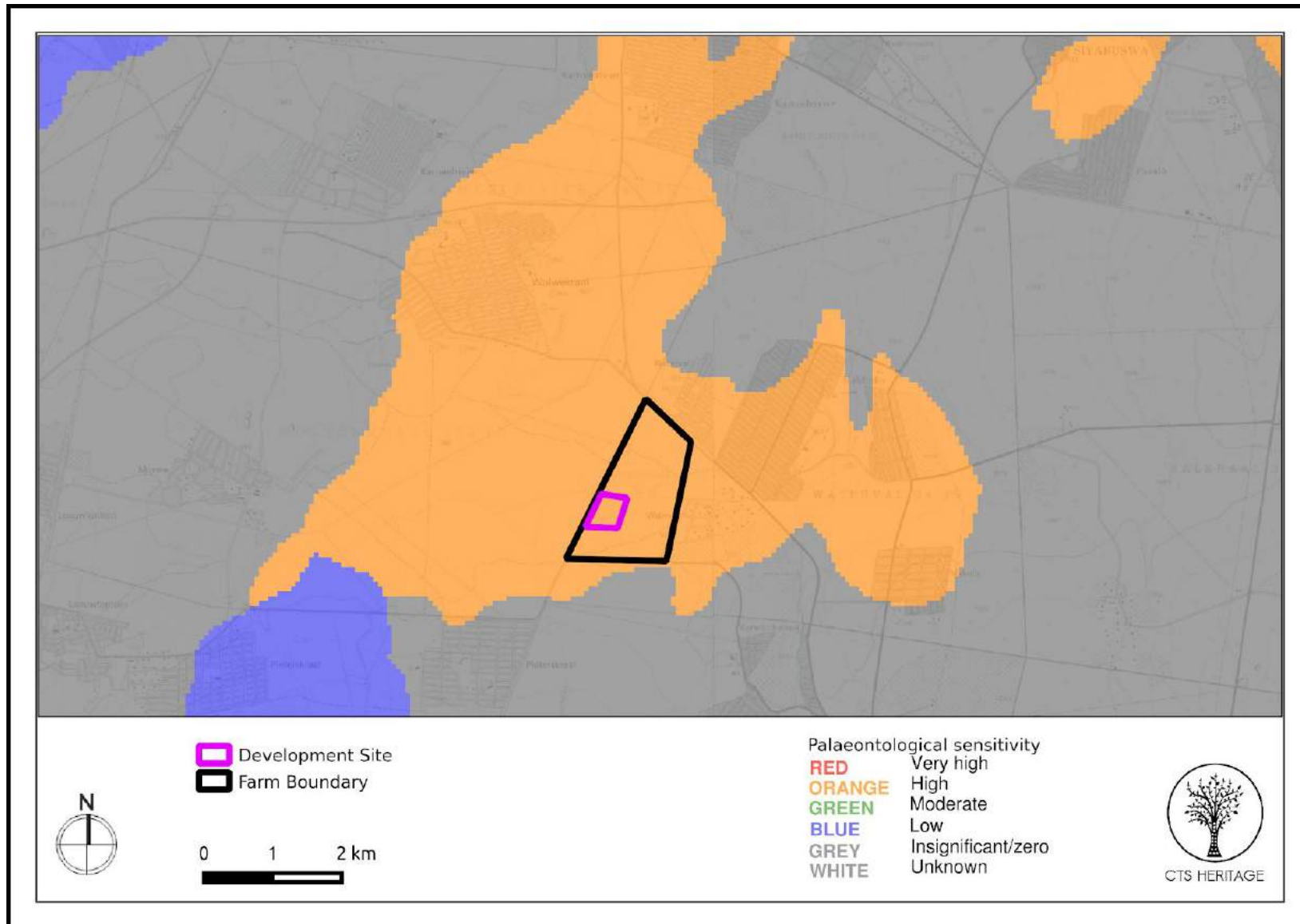


Figure 4. Palaeosensitivity Map. Indicating high fossil sensitivity underlying the study area. Please See Appendix 3 for full guide to the legend.



8. Heritage statement and character of the area

The application is for a proposed egg-layer facility in Dr JS Moroka Local Municipality Mpumalanga. The proposed site is located on Portion 4 of Farm Waterval 34 JS across the road (southwest direction) from the main Waterval Township. The project falls under the Special Needs Programme of the CSIR and DEA in assisting small scale agricultural initiatives to obtain Environmental Authorisation. The project will be developed on land that is currently vacant. The project will specialize in the production and sale of eggs. The project will essentially purchase 'ready to lay' pullets and raise them through their productive cycle. The start-up enterprise plans to build an environmentally controlled chicken layer facility with supporting infrastructure and a 5ha vegetable crop field.

According to Pistorius (2010 NID 6194), "Focused archaeological research has been conducted in the Mpumalanga and Limpopo Provinces of South Africa for more than four decades. This research consists of surveys and of excavations of Stone Age and Iron Age sites as well as the recording of rock art and historical sites." However, very few archaeological or built environment sites of significance are known from the area surrounding the proposed development (Figures 2 and 3). The nearest HIA conducted in the vicinity of the proposed development is located approximately 5km, by Pistorius in 2003 (SAHRIS NID 5047). While he did not find any archaeological or built environment heritage resources, he noted the presence of burial grounds and graves. Only eight heritage resources are known to exist within a 30km buffer of the proposed development area - some archaeological resources of low heritage significance and burial grounds and graves. Despite the low impact nature of the proposed development, there is a chance that unmarked burials may be impacted by the proposed development and as such, it is recommended that a heritage impact assessment be conducted.

The site proposed for development is underlain by the Eccra Group of high palaeontological sensitivity according to the SAHRIS Palaeosensitivity map. This group is known for non-marine trace fossils, vascular plants (including petrified wood) and palynomorphs of *Glossopteris* flora, mesosaurid reptiles, fish (including microvertebrate remains, coprolites), crustaceans, sparse marine shelly invertebrates (molluscs, brachiopods), microfossils (radiolarians etc) and insects. Despite the low impact nature of the proposed development, there is a chance that significant fossil material may be impacted by the proposed development. To our knowledge, SAHRA is currently requiring a minimum desktop PIA in areas of high palaeontological sensitivity (orange) on the Palaeosensitivity Map. Given the low impact nature of the proposed development and the tight budgetary constraints within a Special Needs Programme application, a desktop PIA should suffice.

RECOMMENDATION:

The heritage resources along the routes proposed for development are only partially recorded

Based on the available information, the proposed development is likely to impact on heritage resources and as such, it is recommended that a complete Heritage Impact Assessment is required that consists of a one day field assessment to assess impacts to possible burial grounds and graves. The HIA will also need a desktop PIA.



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APPENDIX 1

List of heritage resources within the 30km Inclusion Zone

Site ID	Site no	Full Site Name	Site Type	Grading
85238	CANY002	Canyon Springs 002	Artefacts	Grade IIIc
85239	CANY003	Canyon Springs 003	Artefacts	Grade IIIc
43587	NAG02	Naganeng Road 02	Structures, Burial Grounds & Graves	Grade IIIa
43590	NAG05	Naganeng Road 05	Structures, Burial Grounds & Graves	Grade IIIa
43586	NAG01	Naganeng Road 01	Burial Grounds & Graves	Grade IIIa
43588	NAG03	Naganeng Road 03	Burial Grounds & Graves	Grade IIIa
43589	NAG04	Naganeng Road 04	Burial Grounds & Graves	Grade IIIa
43591	NAG06	Naganeng Road 06	Burial Grounds & Graves	Grade IIIa

APPENDIX 2

Reference List

Heritage Impact Assessments				
Nid	Report Type	Author/s	Date	Title
7818	AIA Phase 1	Richard Munyai	01/08/2011	Phase 1 Archaeological Scoping Study: An archaeological investigation for the proposed upgrading of 11.8km (gravel to tar) of road D2740 Rust de Winter - Moloto in the Nkangala Region of the Mpumalanga District Province
7818	AIA Phase 1	Richard Munyai	01/08/2011	Phase 1 Archaeological Scoping Study: An archaeological investigation for the proposed upgrading of 11.8km (gravel to tar) of road D2740 Rust de Winter - Moloto in the Nkangala Region of the Mpumalanga District Province
117772	AIA Phase 1	Eric Ndivhuho Mathoho	01/08/2012	ARCHAEOLOGICAL IMPACTS ASSESSMENT PROCESS: PROPOSED NEW 132KV POWER LINE FROM GEMSBOK SUBSTATION TO BIG TREE SUBSTATION VIA THE KWAMHLANGA SUBSTATION, THEMBSILE HANI LOCAL MUNICIPALITY IN MPUMALNGA PROVINCE.

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166113	HIA Phase 1	Anton van Vollenhoven	20/08/2012	A REPORT ON A CULTURAL HERITAGE IMPACT ASSESSMENT FOR THE PROPOSED CANYON SPRINGS COAL PROJECT, SIYABUSWA DISTRICT, MPUMALANGA PROVINCE
6194	AIA Phase 1	Julius CC Pistorius	01/06/2010	Phase 1 Heritage Impact Assessment (HIA) study for the proposed new 132KV power line running between Kwaggafontein and Amandla substations in the Mpumalanga and Limpopo Provinces of South Africa
7818	AIA Phase 1	Richard Munyai	01/08/2011	Phase 1 Archaeological Scoping Study: An archaeological investigation for the proposed upgrading of 11.8km (gravel to tar) of road D2740 Rust de Winter - Moloto in the Nkangala Region of the Mpumalanga District Province
117772	AIA Phase 1	Eric Ndivhuho Mathoho	01/08/2012	ARCHAEOLOGICAL IMPACTS ASSESSMENT PROCESS: PROPOSED NEW 132KV POWER LINE FROM GEMSBOK SUBSTATION TO BIG TREE SUBSTATION VIA THE KWAMHLANGA SUBSTATION, THEMbisILE HANI LOCAL MUNICIPALITY IN MPUMALNGA PROVINCE.
145847	AIA Phase 1	Jean-Pierre Celliers	14/10/2013	Phase 1 Archaeological Impact Assessment in respect of the Proposed Funda Mlimi Poultry Abbatoir on the farm Gemsbokfontein 231 JR, Gauteng Province.
152831	AIA Phase 1	Jaco van der Walt	04/11/2013	Archaeological Impact Assessment For the Proposed Libangeni and Mmamethlake Landfill Sites, Located within the Dr JS Moroka Local Municipality, Limpopo Province
152833	Exemption Letter	John E Almond	04/11/2013	RECOMMENDED EXEMPTION FROM FURTHER PALAEONTOLOGICAL STUDIES: PROPOSED LIBANGENI LANDFILL SITE, FARM LEEUWFFONTEIN NO. 188JR, DR JS MOROKA LOCAL MUNICIPALITY, MPUMALANGA
165359	HIA Letter of Exemption	Christine Van Wyk Rowe	02/06/2014	Letter of recommendation for the exemption from a phase 1 archaeological and Heritage investigation for the proposed township establishment on portion 3 Riekerts Laager 165 JR Siyabuswa, Mpumalanga
179223	Heritage Scoping	Wouter Fourie	01/09/2014	Nokukhanya Solar Facility: Heritage Scoping Report
311484	Heritage Impact Assessment Specialist Reports	Wouter Fourie	20/03/2015	Nokukhanya Solar Facility: Heritage Impact Assessment Report
5042	HIA Letter of Exemption	Frans Roodt	24/11/2006	Phase 1 Heritage Resource Impact Assessment (Scoping & Evaluation) Ntwane/Elandsdoorn Groblersdal, Mpumalanga Letter of Recommendation for Exemption
5047	AIA Phase 1	Julius CC Pistorius	01/07/2003	Heritage Impact Assessment Study for a Proposed New 22 kV Powerline on the Farm Kameelrivier 160 JR near Siyabuswa, Mpumalanga
5048	AIA Phase 1	Johnny Van	01/12/2007	Heritage Impact Assessment Report for the Proposed Siyabuswa Water Augmentation Scheme, Moutse

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		Schalkwyk		Magisterial District, Mpumalanga Province
5180	AIA Phase 1	McEdward Murimbika	01/03/2005	The Makgadimeng Water Supply, Marble Hall, Mpumalanga Province
7472	AIA Phase 1	McEdward Murimbika	01/03/2005	Naganeng Road Upgrade, Marble Hall, Mpumalanga Province, Cultural and Archaeological Heritage Assessment, Specialist Study
7473	AIA Phase 1	McEdward Murimbika	01/03/2005	Naganeng Water Supply, Marble Hall, Mpumalanga Province, Cultural and Archaeological Heritage Assessment, Specialist Study
92616	AIA Phase 1	Anton van Vollenhoven	01/08/2012	A REPORT ON A CULTURAL HERITAGE IMPACT ASSESSMENT FOR THE PROPOSED CANYON SPRINGS COAL PROJECT, SIYABUSWA DISTRICT, MPUMALANGA PROVINCE
104395	AIA Phase 1	Christine Van Wyk Rowe	01/07/2012	SPECIALIST REPORT FOR PHASE 1 ARCHEOLOGICAL / HERITAGE IMPACT ASSESSMENT: PROPOSED RESIDENTIAL TOWNSHIP (MORIEPE GARDEN): REMAINING EXTENT OF PORTION 7 OF THE FARM KAMEELRIVIER 160JR, SIYABUSWA MPUMALANGA
130624	PIA Desktop	Marion Bamford	06/09/2013	SAHRA's request for a Palaeontological Impact Assessment for development of an opencast mine by Canyon Springs Investments 82 (Pty) Ltd, near Bela-Bela, Mpumalanga – on behalf of Prime Resources, Parktown North, Johannesburg (Ms Zoë Gebhardt)
163767	AIA Phase 1	Christine Van Wyk Rowe	14/05/2014	Phase 1 AIA / HIA for a proposed township development on portion 1, 4 & 5 of Vlaklaagte 221 JR, Vlaklaagte Mpumalanga
166113	HIA Phase 1	Anton van Vollenhoven	20/08/2012	A REPORT ON A CULTURAL HERITAGE IMPACT ASSESSMENT FOR THE PROPOSED CANYON SPRINGS COAL PROJECT, SIYABUSWA DISTRICT, MPUMALANGA PROVINCE
166451	AIA Phase 1	Christine Van Wyk Rowe	17/06/2014	Phase 1 Archaeological and Heritage Impact assessment for a proposed township development on portion 36 of the farm Vlaklaagte, Mpumalanga
181586	AIA Phase 1	Francois P Coetzee	31/10/2014	Cultural Heritage Assessment for the Proposed Expansion of the Bhundu Inn Hotel, Portion 174 of the Farm Goederede 60 JS, Thembisile Hani Local Municipality, Nkangala District, Mpumalanga
192124	PIA Desktop	Marion Bamford	10/09/2014	Palaeontological Impact Assessmentfor the proposed Hotel (Bhundu Inn) apgrade adjacent to the SS Skosana Nature reserve, Mpumalanga

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APPENDIX 3 - Keys/Guides

Key/Guide to Acronyms

AIA	Archaeological Impact Assessment
DARD	Department of Agriculture and Rural Development (KwaZulu-Natal)
DEA	Department of Environmental Affairs (National)
DEADP	Department of Environmental Affairs and Development Planning (Western Cape)
DEDEAT	Department of Economic Development, Environmental Affairs and Tourism (Eastern Cape)
DEDECT	Department of Economic Development, Environment, Conservation and Tourism (North West)
DEDT	Department of Economic Development and Tourism (Mpumalanga)
DEDTEA	Department of economic Development, Tourism and Environmental Affairs (Free State)
DENC	Department of Environment and Nature Conservation (Northern Cape)
DMR	Department of Mineral Resources (National)
GDARD	Gauteng Department of Agriculture and Rural Development (Gauteng)
HIA	Heritage Impact Assessment
LEDET	Department of Economic Development, Environment and Tourism (Limpopo)
MPRDA	Mineral and Petroleum Resources Development Act, no 28 of 2002
NEMA	National Environmental Management Act, no 107 of 1998
NHRA	National Heritage Resources Act, no 25 of 1999
PIA	Palaeontological Impact Assessment
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
VIA	Visual Impact Assessment

Full guide to Palaeosensitivity Map legend

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/PURPLE:	LOW - no palaeontological studies are required however a protocol for chance finds is required
GREY:	INSIGNIFICANT/ZERO - no palaeontological studies are required
WHITE/CLEAR:	UNKNOWN - these areas will require a minimum of a desktop study.

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APPENDIX 4 - Methodology

The Heritage Screener summarises the heritage impact assessments and studies previously undertaken within the area of the proposed development and its surroundings. Heritage resources identified in these reports are assessed by our team during the screening process.

The heritage resources will be described both in terms of **type**:

- Group 1: Archaeological, Underwater, Palaeontological and Geological sites, Meteorites, and Battlefields
- Group 2: Structures, Monuments and Memorials
- Group 3: Burial Grounds and Graves, Living Heritage, Sacred and Natural sites
- Group 4: Cultural Landscapes, Conservation Areas and Scenic routes

and **significance** (Grade I, II, IIIa, b or c, ungraded), as determined by the author of the original heritage impact assessment report or by formal grading and/or protection by the heritage authorities.

Sites identified and mapped during research projects will also be considered.

DETERMINATION OF THE EXTENT OF THE INCLUSION ZONE TO BE TAKEN INTO CONSIDERATION

The extent of the inclusion zone to be considered for the Heritage Screener will be determined by CTS based on:

- the size of the development,
- the number and outcome of previous surveys existing in the area
- the potential cumulative impact of the application.

The inclusion zone will be considered as the region within a maximum distance of 50 km from the boundary of the proposed development.

DETERMINATION OF THE PALAEOONTOLOGICAL SENSITIVITY

The possible impact of the proposed development on palaeontological resources is gauged by:

- reviewing the fossil sensitivity maps available on the South African Heritage Resources Information System (SAHRIS)
- considering the nature of the proposed development
- when available, taking information provided by the applicant related to the geological background of the area into account

DETERMINATION OF THE COVERAGE RATING ASCRIBED TO A REPORT POLYGON

Each report assessed for the compilation of the Heritage Screener is colour-coded according to the level of coverage accomplished. The extent of the surveyed coverage is labeled in

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three categories, namely low, medium and high. In most instances the extent of the map corresponds to the extent of the development for which the specific report was undertaken.

Low coverage will be used for:

- desktop studies where no field assessment of the area was undertaken;
- reports where the sites are listed and described but no GPS coordinates were provided.
- older reports with GPS coordinates with low accuracy ratings;
- reports where the entire property was mapped, but only a small/limited area was surveyed.
- uploads on the National Inventory which are not properly mapped.

Medium coverage will be used for

- reports for which a field survey was undertaken but the area was not extensively covered. This may apply to instances where some impediments did not allow for full coverage such as thick vegetation, etc.
- reports for which the entire property was mapped, but only a specific area was surveyed thoroughly. This is differentiated from low ratings listed above when these surveys cover up to around 50% of the property.

High coverage will be used for

- reports where the area highlighted in the map was extensively surveyed as shown by the GPS track coordinates. This category will also apply to permit reports.

RECOMMENDATION GUIDE

The Heritage Screener includes a set of recommendations to the applicant based on whether an impact on heritage resources is anticipated. One of three possible recommendations is formulated:

(1) The heritage resources in the area proposed for development are sufficiently recorded - The surveys undertaken in the area adequately captured the heritage resources. There are no known sites which require mitigation or management plans. No further heritage work is recommended for the proposed development.

This recommendation is made when:

- enough work has been undertaken in the area
- it is the professional opinion of CTS that the area has already been assessed adequately from a heritage perspective for the type of development proposed

(2) The heritage resources and the area proposed for development are only partially recorded - The surveys undertaken in the area have not adequately captured the heritage resources and/or there are sites which require mitigation or management plans. Further specific heritage work is recommended for the proposed development.

This recommendation is made in instances in which there are already some studies undertaken in the area and/or in the adjacent area for the proposed development. Further studies in a limited HIA may include:

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- improvement on some components of the heritage assessments already undertaken, for instance with a renewed field survey and/or with a specific specialist for the type of heritage resources expected in the area
- compilation of a report for a component of a heritage impact assessment not already undertaken in the area
- undertaking mitigation measures requested in previous assessments/records of decision.

(3) The heritage resources within the area proposed for the development have not been adequately surveyed yet - Few or no surveys have been undertaken in the area proposed for development. A full Heritage Impact Assessment with a detailed field component is recommended for the proposed development.

Note:

The responsibility for generating a response detailing the requirements for the development lies with the heritage authority. However, since the methodology utilised for the compilation of the Heritage Screeners is thorough and consistent, contradictory outcomes to the recommendations made by CTS should rarely occur. Should a discrepancy arise, CTS will immediately take up the matter with the heritage authority to clarify the dispute.

The compilation of the Heritage Screener will not include any field assessment. The Heritage Screener will be submitted to the applicant within 24 hours from receipt of full payment. **If the 24-hour deadline is not met by CTS, the applicant will be refunded in full.**

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APPENDIX 4:

HWC Fossil Finds Procedure as an example for the EMPr

HWC PROCEDURE: CHANCE FINDS OF PALAEOLOGICAL MATERIAL

June 2016

Introduction

This document is aimed to inform workmen and foremen working on a construction and/or mining site. It describes the procedure to follow in instances of accidental discovery of palaeontological material (please see attached poster with descriptions of palaeontological material) during construction/mining activities. This protocol does not apply to resources already identified under an assessment undertaken under s. 38 of the National Heritage Resources Act (no 25 of 1999).

Fossils are rare and irreplaceable. Fossils tell us about the environmental conditions that existed in a specific geographical area millions of years ago. As heritage resources that inform us of the history of a place, fossils are public property that the State is required to manage and conserve on behalf of all the citizens of South Africa. Fossils are therefore protected by the National Heritage Resources Act and are the property of the State. Ideally, a qualified person should be responsible for the recovery of fossils noticed during construction/mining to ensure that all relevant contextual information is recorded.

Heritage Authorities often rely on workmen and foremen to report finds, and thereby contribute to our knowledge of South Africa's past and contribute to its conservation for future generations.

Training

Workmen and foremen need to be trained in the procedure to follow in instances of accidental discovery of fossil material, in a similar way to the Health and Safety protocol. A brief introduction to the process to follow in the event of possible accidental discovery of fossils should be conducted by the designated Environmental Control Officer (ECO) for the project, or the foreman or site agent in the absence of the ECO

It is recommended that copies of the attached poster and procedure are printed out and displayed at the site office so that workmen may familiarise themselves with them and are thereby prepared in the event that accidental discovery of fossil material takes place.

Actions to be taken

One person in the staff must be identified and appointed as responsible for the implementation of the attached protocol in instances of accidental fossil discovery and must report to the ECO or site agent. If the ECO or site agent is not present on site, then the responsible person on site should follow the protocol correctly in order to not jeopardize the conservation and well-being of the fossil material.

Once a workman notices possible fossil material, he/she should report this to the ECO or site agent.

Procedure to follow if it is likely that the material identified is a fossil:

- i. The ECO or site agent must ensure that all **work ceases** immediately in the vicinity of the area where the fossil or fossils have been found;
- ii. The ECO or site agent must **inform HWC of the find immediately**. This information must include photographs of the findings and GPS co-ordinates;
- iii. The ECO or site agent must compile a **Preliminary Report and fill in the Fossil Discoveries: HWC Preliminary Record Form** within 24 hours without removing the fossil from its original position. The **Preliminary Report** records basic information about the find including:
 - The date
 - A description of the discovery
 - A description of the fossil and its context (e.g. position and depth of find)
 - Where and how the find has been stored
 - Photographs to accompany the preliminary report (the more the better):
 - A scale must be used
 - Photos of location from several angles
 - Photos of vertical section should be provided
 - Digital images of hole showing vertical section (side);
 - Digital images of fossil or fossils.

Upon receipt of this **Preliminary Report**, HWC will inform the ECO or site agent whether or not a rescue excavation or rescue collection by a palaeontologist is necessary.

- v. **Exposed finds must be stabilised where they are unstable and the site capped, e.g. with a plastic sheet or sand bags.** This protection should allow for the later excavation of the finds with due scientific care and diligence. HWC can advise on the most appropriate method for stabilisation.
- vi. If the find cannot be stabilised, **the fossil may be collect with extreme care** by the ECO or the site agent and put aside and protected until HWC advises on further action. Finds collected in this way must be safely and securely stored in tissue paper and an appropriate box. Care must be taken to remove the all fossil material and any breakage of fossil material must be avoided at all costs.

No work may continue in the vicinity of the find until HWC has indicated, in writing, that it is appropriate to proceed.

FOSSIL DISCOVERIES: HWC PRELIMINARY RECORDING FORM

Name of project:		
Name of fossil location:		
Date of discovery:		
Description of situation in which the fossil was found:		
Description of context in which the fossil was found:		
Description and condition of fossil identified:		
GPS coordinates:	Lat:	Long:
If no co-ordinates available then please describe the location:		
Time of discovery:		
Depth of find in hole		
Photographs (tick as appropriate and indicate number of the photograph)	Digital image of vertical section (side)	
	Fossil from different angles	
	Wider context of the find	
Temporary storage (where it is located and how it is conserved)		
Person identifying the fossil	Name: Contact:	
Recorder	Name: Contact:	
Photographer	Name: Contact:	

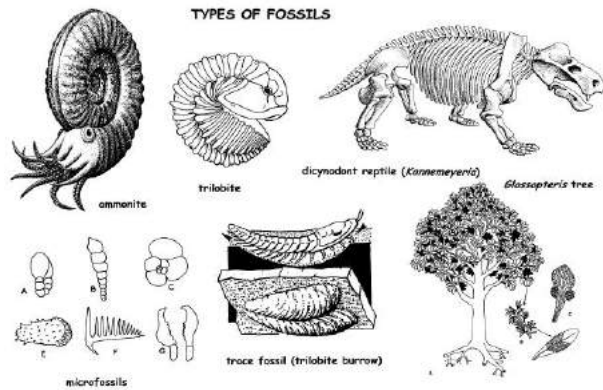


iLifa leMveli leNtshona Koloni
Erfenis Wes-Kaap
Heritage Western Cape

Palaeontology: what is a fossil?

Fossils are the traces of ancient life (animal, plant or microbial) preserved within rocks and come in two forms:

- Body fossils preserve parts, casts or impressions of the original tissues of an organism (e.g. bones, teeth, wood, pollen grains); and
- Trace fossils such as trackways and burrows record ancient animal behaviour.



How to report chance fossil finds: What should I do if I find a fossil during construction/mining?

If you think you have identified a fossil:

Immediately inform the ECO or Site Agent.
He/she will then contact HWC and write a report
and if necessary operations will stop in that
specific area until the fossil is recovered

Heritage Western Cape
ceoheritage@westerncape.gov.za

021 483 5959

www.hwc.org.za



Types of palaeontological finding - What does a fossil look like?

Fossils vary in size, from fossilised tree trunks and dinosaur bones down to very small animals or plants.
Finds can be **individual fossils** (one isolated wood log or bone) or **clusters and beds** (several bones, teeth, animal or plant remains, trace fossils in close proximity or bones resembling part of a skeleton). A bed of fossils is a layer with many fossil remains.

Below there is a list of few examples of fossils which may be identified during excavations in the Western Cape.

Image	Description	Image	Description
	Leaves		Snail shells and other shells
	Fossil wood		Bones of larger animals
	The remains of fish and marine life (e.g. teeth, scales, starfish)		Large burrows made by moles and other animals
	Stromatolites		Traces made by burrowing insects (ants, wasps, dung-beetles etc.).
	Animal footprints		

Images provided by Dr John Almond

Text by HWC's Archaeology, Palaeontology & Meteorites Committee June 2016





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APPENDIX 5:

CVs of Specialists

CURRICULUM VITAE

Jenna Lavin

Tel: 083 619 0854 (c)

E-mail address: jenna.lavin@gmail.com

ID number: 8512050014089

Address: 7 Carey Street, Woodstock, cape Town

EDUCATION:

Tertiary

- 2014 M.Phil in Conservation of the Built Environment (University of Cape Town)
- Not completed as of 2017
- 2011 Continued Professional Development Course in Urban Conservation
Management (University of Cape Town) Part I and Part II
- 2010 M.Sc. with Distinction in Archaeology (University of Cape Town)
Title: *Palaeoecology of the KBS member of the Koobi Fora Formation: Implications for Pleistocene Hominin Behaviour.*
- 2007 B.Sc. Honours in Archaeology (University of Cape Town)
Title: *The Lost Tribes of the Peninsula: An Investigation into the historical distribution of Chacma baboons (*Papio ursinus*) at the Cape Peninsula, South Africa.*
Koobi Fora Field School, Rutgers University (U.S.A.)/ National Museums of Kenya
- 2006 B.Sc. Archaeology (University of Cape Town)
B.Sc. Environmental and Geographic Science (University of Cape Town)

Secondary

- 1999-2003 Rustenburg High School for Girls
Firsts in English, Afrikaans, Mathematics HG, Biology HG, History HG, Entrepreneurship.

EMPLOYMENT HISTORY:

PROFESSIONAL DEVELOPMENT

Environmental and Heritage Management:

Director: Heritage for CTS heritage and member of OpenHeritage NPC.

July 2016 to present

I am a member of the senior management of the company. I am responsible for project management and quality control on all of our heritage-related projects. I provide specialist heritage expertise when required and assist with the drafting of management plans, impact assessments and other specialist reports. I liaise with clients, authorities and other specialists to ensure the highest quality product from CTS Heritage. I manage the budgets and financial compliance for all our projects and for the business in general. In addition, I manage a specialist team of two archaeologists. Through OpenHeritage, I have been intimately involved with the development, and successful implementation of, of a digital heritage objects management system for the National Museum in Kenya as well as Tristan da Cunha.

Assistant Director for Policy, Research and Planning at Heritage Western Cape (HWC).
August 2014 to June 2016

As a member of the management structure of HWC, I was responsible for the drafting of new heritage related policy, the grading and declaration of Provincial Heritage Sites, the development of Conservation Management Plans, facilitating the development of inventories of heritage resources through local authorities as well as managing the development of the Western Cape's Heritage Information Management System (HIMS). I was also responsible for managing the project to nominate the Modern Human Origins proposed World Heritage Site.

I performed the role of Acting Deputy Director for HWC from April to December 2015, including financial management responsibilities, problem solving and the training of new staff.

Heritage Officer for Palaeontology and for the Mpumalanga Province at the South African Heritage Resources Agency (SAHRA).
January 2013 to June 2014

Responsibilities include managing palaeontological permit applications in terms of Section 35 of the NHRA and development applications in terms of Section 38 of the NHRA. Projects included the development of a National Palaeotechnic Report identifying significant palaeontological deposits throughout SA, as well as developing professional relationships between SAHRA and the Palaeontological Society of South Africa (PSSA) and the Geological Society of South Africa (GSSA). During this time, I was part of the team that developed the digitised National Palaeontological Sensitivity Map, the first of its kind in the world.

Heritage Officer for Archaeology, Palaeontology and Meteorites at Heritage Western Cape (HWC).
September 2010 to December 2012

HWC is a Public Entity that forms part of the Heritage Resource Management Component of the Provincial Governments' Department of Cultural Affairs and Sport (DCAS). Projects included the declaration of Pinnacle Point and the West Coast Fossil Park as Provincial Heritage Sites (PHSs), the management of the development of the Baboon Point PHS Conservation Management Plan as well as an educational outreach program as part of the DCAS MOD Centre Project.

Heritage Officer for the Archaeology, Palaeontology and Meteorites Unit of the South African Heritage Resources Agency (SAHRA) as part of a three month contract.
January 2010 to March 2010

Environmental Control Officer, Amathemba Environmental Management Consulting
Part time: 2007 to 2009

Field Work Experience:

2008-2009 Field Assistant, Dr. D. Braun, Elandsfontein Excavation Locality, University of Cape Town (UCT)
Field Assistant, Dr. D. Braun, Koobi Fora Research Project (Kenya), Rutgers University, New Jersey

2006	Field Assistant, Damiana Ravasi (PhD), Zoology Department, University of Cape Town.
2005	Research Assistant, Dr. Becky Ackerman, Archaeology Department, University of Cape Town
2004	Field Assistant, Prestwich Place Excavation Locality, Archaeology Contracts Office, UCT

Teaching Positions:

2017	Guest Lecturer, South African Heritage Legislation, George Washington University Heritage Management Field School
2016	Guest Lecturer, South African Heritage Legislation, Archaeology Honours Course, University of Cape Town
2015	Guest Lecturer, South African Heritage Legislation, Archaeology Honours Course, University of Cape Town
2014	Guest Lecturer, South African Heritage Legislation, Archaeology Honours Course, University of Cape Town
2013	Guest Lecturer, South African Heritage Legislation, Archaeology Honours Course, University of Cape Town
2010	Teaching Assistant, Langebaanweg Field School, Arizona State University
2009	Demonstrator, Archaeology in Practice, University of Cape Town (AGE3013H) Demonstrator, Introduction to Geography, Earth and Environmental Science, University of Cape Town (GEO1009F) Teaching Assistant, Koobi Fora Field School (Kenya), Rutgers University, New Jersey
	Lecturer, Introduction to Geography, Earth and Environmental Science: Supplementary Course, University of Cape Town (EGS1004S)
	Demonstrator, Elandsfontein Honours Field School, University of Cape Town (AGE4000W)
2008	Demonstrator, Introduction to Geography, Earth and Environmental Science, University of Cape Town (ERT1000F) Demonstrator, Elandsfontein Honours Field School, University of Cape Town (AGE4000W) Teaching Assistant, Koobi Fora Field School (Kenya), Rutgers University, New Jersey

Conferences and Papers

2017	ASAPA, Pretoria, RSA: <i>“Using Heritage Data to Guide Responsible Development: Tools to ensure high quality recording of heritage sites”</i> ICAHM, Bagomoyo, Tanzania: <i>“OpenHeritage: Development and implementation of national heritage management systems - Lessons from South Africa, Namibia and Kenya”</i>
2016	ICAHM, Salalah, Oman: <i>“Straight to the (Baboon) Point: A look at the Conservation of Archaeological Landscapes in South Africa using Baboon Point as a Case Study”</i>
2015	Leakey Foundation, Sonoma County, San Francisco, USA: <i>““Straight to the (Baboon) Point: A look at the Conservation of Archaeological Landscapes in South Africa using Baboon Point as a Case Study”</i>
2012	PSSA, Johannesburg, RSA: <i>“SAHRIS Palaeosensitivity Map - Methodology and Implementation”</i>

Other

In 2013 I was asked to join the panel of judges for the Ministerial awards for Heritage in the Western Cape. From 2013 to July 2014, I was a member of the Heritage Western Cape Archaeology, Palaeontology and Meteorites Committee and I currently sit on the Heritage Western Cape Inventories, Gradings and Interpretations Committee.

In November 2013, I was awarded a bursary from the Department of Arts and Culture to complete a Masters in Philosophy in Conservation of the Built Environment through the UCT Faculty of Engineering and the Built Environment in 2014 and 2015. I was in the process of finalising this degree in 2017, however the arrival of my son has temporarily halted my progress.

I am a paid up member of the Association for Southern African Professional Archaeologists (ASAPA), the Association of Professional Heritage Practitioners (APHP) and I have been a member of the Executive Council of APHP since 2014. In June 2017, I was selected as Chair of APHP. I am a member of the Palaeontological Society of South Africa (PSSA) and ICOMOS South Africa, for which I am Vice-President of the Board. I am also a member of the International Committee for Archaeological Heritage Management (ICAHM), a committee of UNESCO.

My private experience as a traveler in South Africa, Tanzania, Kenya, Namibia, Zambia, Malawi and Mozambique has inspired a passion for the conservation of environmental and heritage resources. I am passionate about sustainable living, with my Bachelor of Science in Environmental and Geographical Science providing a framework on which to base my values.

With a friend, I established the fundraising initiative, Chicks4Change, through which we managed to organize a number of successful events and raise R40 000 for Project Rhino to assist with anti-poaching initiatives in 2012.

I am an active participant in a not-for-profit company called OpenHeritage which is dedicated to opening access to heritage resources through digital innovation. To this end, we have been involved in a number of projects including Wikipedia Training with Africa Centre, the development and implementation of a Collections Management System for the National Museums of Kenya and the development of a digital Inventory of the Vernacular Architecture of the Eastern Cape.

Referees

Mary Leslie
mleslie.za@gmail.com
082 733 2611

Janette Deacon
janette@conjunction.co.za
082 491 5067

Antonia Malan
antonia.malan@gmail.com
083 797 5672

Andrew Hall
waitabout191@gmail.com
(Currently based in Oman)

Wendy Black
wblack@iziko.org.za

CURRICULUM VITAE



- 1. Name and Surname:** Nkosinathi Tomose
- 2. Proposed Role in the Team:** Principal Heritage Consultant
- 3. Biop:** Nkosinathi (affectionately known as Nathi by his peers) is an experienced consultant with 11 years' experience in the predevelopment and development sector. He specialises in environmental and sustainability matters and is an accredited archaeologist and heritage resources management resources management specialist. In his 11 years' involvement in the predevelopment and development sector, he has managed environmental and sustainability projects relating to turnkey linear development such as water augmentation, Eskom power transmission and distribution, as well as urban development and sustainability projects.

Nathi holds a Masters in Science (MSc) from the Wits University and is currently enrolled for **Master of Architecture in Sustainable Cities (Wits) (2018 to 2019)**.

Nathi began his career in the predevelopment and development sector facilitating stakeholder relations for mine development programme in KwaNongoma, KwaZulu-Natal for **Synergistics Environmental Services** (2004). He was later appointed by Sumo Coal (a Turkish mining company in SA) and its Turkish associates as the lead **Public Participation and Community Liaison Officer** in the **Environmental Impact Assessment** for the construction of Nizamiye Turkish Masjid in Midrand (2005). Among other private companies that he has worked for are: Nzumbululo Holdings (Pty) Ltd (**Division Manager: Environment and Sustainability Department**); PGS Heritage (Lead Heritage Consultant and Community Liaison); Kanya College (**Associated Researcher**). He has worked on projects such as Environmental and Heritage Impact Assessments, Namoya SALR – Gold Mine, Maniema Province in the eastern Democratic Republic of Congo.

Within the public sector Nathi has worked for the South African Heritage Resources Agency (SAHRA) in various capacities and as a lead project manager for the Cradle of Humankind World Heritage Site (COWHS), and for the University of the Witwatersrand in the School of Geography, Archaeology & Environmental Studies.

4. Major Projects Involved in 2015 – 2017

A) Basic Assessment Report (BAR), Environmental Management Programme, Environmental Audit for the Proposed Bela-Bela 132kV Substation, Bela-Bela, Waterberg District, Limpopo Province. Status: Approved – Environmental Authorisation (EA) Issued in April 2017 (Annexure A) (Power and Energy)

Role: Lead Consultant and Author:

Client: GKB Design and Associates (Pty) Ltd on Behalf of Bela-Bela Local Municipality

Referee: Mr Gaylord Mupona (gmupona@gkbgroup.co.za/ 0825276969)

Project Proponent: Bela-Bela Local Municipality

B) Integrated Heritage Resources Management report for the Proposed Elim District Hospital Redevelopment, Limpopo Province Inclusive of Baseline Social Impact Assessment and Biodiversity Study (Built Environment)

Role: Lead Consultant and Author:

Client: Ngonyama Okpanum and Associates (Pty) Ltd

Referee: Mr Hammond Dendere, Project Architect & Development Planner

Project Proponent: Limpopo Department of Health

Role: Lead Consultant and Co-Author:

Client: Moditi Consulting (Pty) Ltd and Ngonyama Okpanum and Associates (Pty) Ltd

Referee: Mr Hammond Dendere (hammond@noact.co.za / tshepom@moditi.co.za)

Project Proponent: National Department of Health

C) Integrated Heritage Resources Management Report and Social Impact Assessment Study for the Proposed Medupi Power Station Flue Gas Desulphurisation (FGD) Project, Limpopo Province, South Africa (Power and Energy).

Role: Lead Consultant and Author:

Client: Zithole Consulting (Pty) Ltd

Referee: Mrs. Sharon Meyer-Douglas (sharonm@zitholele.co.za / +27 11 207 2073)

Project Proponent: Eskom Holdings

Referee: Mrs. Sharon Meyer-Douglas, Head of Environmental service

Project Proponent: Eskom Holdings

D) Heritage and Social Impact Assessment and Social Impact Assessment Study for Study for the Proposed Ariadne-Eros 400kv/132kV Multi-Circuit Power Transmission Line, KwaZulu-Natal Province, South Africa (Power and Energy).

Role: Lead Consultant and Author:
Client: Mokgope Consulting CC, Director
Referee: Dr Mpho Nenweli (mphonenweli@gmail.com /082 256 73099)
Project Proponent: Eskom Holdings and African Development Bank

E) Heritage and Socio-Economic Studies for the Proposed Passenger Rail Agency South Africa (PRASA) for the following Stations (Built Environment):

- HIA and SIA for Wonderboom PRASA Station, Pretoria Gauteng Province, South Africa
- HIA and SIA for and SIA for Lellara PRASA Station, Tembisa, Gauteng Province, South Africa
- HIA and SIA for Limindlela PRASA, Tembisa, Gauteng Province, South Africa
- HIA and SIA for Kempton Park PRASA Station, Kempton Park, Gauteng Province, South Africa
- HIA and SIA for for Germiston Junction PRASA Station, Germiston, Gauteng Province, South Africa
- HIA and SIA for Roodepoort PRASA Station, Roodepoort, Gauteng Province, South Africa
- HIA and SIA for Vereeniging PRASA Station, Vereeniging, Gauteng Province, South Africa
- HIA and SIA for Duffs Road PRASA Station, KwaMashu, KwaZulu-Natal Province, South Africa
- HIA and SIA for Merebank PRASA Station, Durban South, KwaZulu-Natal Province, South Africa
- HIA and SIA for Rossburgh PRASA Station, Durban South, KwaZulu-Natal Province, South Africa

Role: Lead Consultant and Author:
Client: Ecosolve Environmental Consulting (Pty) Ltd
Referee: Mr Tsepo Lepono, Managing Director (tsepo@ecosolve.co.za / 083 339 9103)
Project Proponent: Passenger Rail Agency South Africa

F. Scoping, Environmental Impact Assessment, Environmental Management Programme for Mathanjane Bulk Water Augmentation, Limpopo and Mpumalanga Province (Water Infrastructure)

Role: Lead Consultant and Author:
Client: GKB Design and Associates (Pty) Ltd
Referee: Mr Gaylord Mupona (gmupona@gkbgroup.co.za / 0825276969)
Project Proponent: Rand Water on behalf of National Department of Water Affairs.

- | | |
|-------------------------|---------------|
| 5. Demographic | Black Youth |
| 6. Gender | Male |
| 7. Nationality | South African |
| 8. Date of Birth | 05 May 1983 |

9. Education

Name of Institution	Degree Obtained	Dates Attended
University of Witwatersrand	M.Sc. Degree	2007 – 2008
University of Witwatersrand	B.S.C Honours (Landscape and GIS)	2006
University of Witwatersrand	BA Geography & Archaeology	2003 – 2005

10. Other Qualifications (Further Education and Skills Improvement)

Name of Institution	Training Details	Dates Obtained
University of Witwatersrand	Master of Architecture in Sustainable Cities	Current - 2019

11. Professional Registration/Licensure *(do not include memberships of industry associations)*

Registration/Licensing Body	Type of Registration	Date Obtained
ASAPA	Cultural Resources Management: Industrial Archaeology, Built Environment, Iron Age, Rock Art and Burial Grounds and Graves	2006 to date
Amafa KwaZulu-Natal	General Heritage Consultant (Archaeology, Rock Art, Built Environment and Landscape, Burial Grounds and Graves)	2010 to date
Eastern Cape PHRA	General Heritage Consultant (Archaeology, Rock Art, Built Environment and Landscape, Burial Grounds and Graves)	2010 to date
SACNASP	Currently Applied for Environmental Management	2018

12. Countries of Work Experience

Country	Start and End Date
South Africa	2008- to present (BAR, EMPs, Environmental Audits, Social Impact Assessment Studies, Community Participation, Relocation Action Plan and ICRMs, Public Participation and Social Consultation)
Democratic Republic of Congo	2012 -2012 (HIA, Namoya SALR – Gold Mine, Maniema Province)
Peoples Republic of China	2010-2010 (Cultural Resources Management)
United States (Smithsonian Institute)	2007-2007 (Operational Models, Funding and Marketing of Cultural Heritage Institutions in South Africa)
France (<i>Centre National de la Recherche Scientifique</i>)	2004-2004 (Recording, documentation and dating of rock art)

13. Languages (Scale of 1 – 5: Poor; 5 and above: Excellent)

Language	Speaking	Reading	Writing
IsiXhosa	5	4	4
English	5	5	5
Afrikaans	3	3	3
SeSotho	4	4	4
SeTswana	3	3	3
IsiZulu	5	5	5

14. Employment Record *Starting with current position, list in reverse order every employment held by the candidate since graduation, giving dates of employment, name of employing organisation, positions and responsibilities held.*

Employer	Date:
A) NGT Holdings (Pty) Ltd:	September 2012 to date
Position Held:	Founder and Director
Location:	Victory Park, Johannesburg
Responsibilities:	<ul style="list-style-type: none"> • Strategic Leadership • Governance • Financial Accounting • Risk Management
	Professional Technical Work <ul style="list-style-type: none"> • Basic Assessment Reports, EMPs, Environmental Scoping and EIRs • Water Use License Applications (WULA); • Waster License Application (WLA); • Social and Socio-Economic Impacts Consulting • Integrated Cultural Resources Management • Development of Community Participation Strategies in Developmental Projects • Project Management and Administration
B) Freelancer	May to September 2012
Responsibilities:	BAR, Consulting Project Manager, Heritage and Social Impact Specialist
C) Nzumbululo Holdings (Pty) Ltd	April to May 2012
Position Held:	Division Manager: Environment and Sustainability Department
Location:	Midrand, Johannesburg, South Africa
Responsibilities:	<ul style="list-style-type: none"> • Business development (marketing, tendering and responding to RFQs) • Managing department budget and team specialist • Coordination and management of Basic Assessments and EMPs for road development for Limpopo Road Agency • Coordination and management of heritage projects - including grave relocation projects • Coordination and management of social impact projects

issues the management of heritage and social issues in environment and engineering projects - processes and legislation

- Management of document pathway with authorities.

Employer	Dates:
D) PGS Heritage (Pty) Ltd	October 2010 to February 2012

Position Held: Heritage Consultant and Community Liaison Officer

Location: Waverley, Pretoria, South Africa

Responsibilities:

- Management of heritage and grave relocation projects
- Community Liaison – consulting and facilitating multi-stakeholder relations in projects that involve community and grave relocation in Mpumalanga Province i.e. clients included **Eskom Kusile Power Station (clearing ground for Kusile Power Station), Xstrata, Glencoe, Anglo, BHP Billiton and Anglo Coal.**
- Management of document pathway with authorities.

E) Khanya College (NPO)	April to October 2010
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Position Held Associate Researcher and History Programs Facilitator

Location Johannesburg, South Africa

Responsibilities

- This job formed part of Khanya College and Workers Museum History Programme; it involved researching socio-cultural and socio-economic issues affecting previously disadvantage communities in South Africa with a particular focus on Migrant Labour (ML) issues; their forms of social organization, resistance, their socio-cultural and economic dynamics e.g. disruption of their pattern of life and livelihoods as the result of migration and political system in South Africa.
- Assisting Khanya College with capacity building in community empowerment workshops.
- Assisted Khanya College with the development and administration of a Monitoring and Evaluation Programme (MEP) for its Annual Winter School (NGO conference & workshops).

Assisting with field research/interviews in socio-cultural and economic programmes as part of Khanya College and the Workers Museum History Programme aimed at conserving and promoting histories and heritage of migrant labour in South Africa.

F) South Africa Heritage March 2009 to March 2010

**Resources Agency
(SAHRA)**

Position Held Cultural Heritage Officer (**Built Environment**)

Location Johannesburg (80%) and Cape Town (20%)

Responsibilities

- Adjudication of heritage Impact assessment (HIAs), archaeological impact assessments (AIAs), palaeontological impact assessments (PIAs) and environmental impact assessments (EIAs) studies submitted to the SAHRA.
- Adjudication of heritage permits and grave relocation permits.
- Fostering relations between SAHRA, developers and Civic organisations on the management of cultural resources in South Africa.
- Advising developers to strategically incorporate heritage resources into their projects as a form of conservation measure e.g. development of integrated heritage management plans and/or conservation management plans.
- Managing the Cradle of Humankind World Heritage Site (COHWHS) in association with the Management Authority, the Gauteng Department of Economic Development and the Gauteng Department Agriculture and Rural Development.

Employer	Date:
G) School of Geography, Archaeology & Environmental Studies	April 2008 to February 2009

Position Held	Collections Manager
Location	Johannesburg, South Africa
Responsibilities	<ul style="list-style-type: none"> • Development and management of archaeology collections database/repository using Vernon Collection Management System. • Development of Archaeology Department collections management policies • Establishment and implementation of safety and security measures for the protection and conservation of Wits archaeology collections by liaising with different stakeholders. • Preparation of collection for education and research purposes.

H) Synergistics Environmental Services (Pty) Ltd	2004 to 2006 (Part-time basis)
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Position Held	Community Liaison Officer
Location	Johannesburg, South Africa
Responsibilities	<ul style="list-style-type: none"> • Management of multi-stakeholder relations in application of mining rights, environmental impact assessments and public participation in kwaNongoma, South Africa.

I) Sumo Coal (Pty) Ltd	2006 to 2006 (Part-time basis)
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Position Held	Public Participation and Community Liaison Officer
Location	Johannesburg, South Africa
Responsibilities	<ul style="list-style-type: none"> • Management of multi-stakeholder relations in the environmental management process for the development of application of mining rights, environmental impact assessments and public participation in Midrand, South Africa.

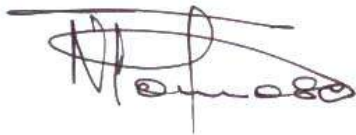
15. Conference Papers Presented And Manuscripts Published:

Nkosinathi, G. Tomose, 2010. Challenges and Opportunities in Managing Multi-Stakeholder Interests in World Heritage Site: *A Case of the Cradle of Humankind World Heritage, South Africa*. Conference Presentation in Beijing, Peoples Republic of China.

15. Certification

- I, the undersigned, certify that to the best of my knowledge and belief, this CV correctly describes my qualifications and my experience. Furthermore, I understand that any willful misstatement described herein may lead to my disqualification or dismissal, if engaged on projects with the client.
- Finally, I hereby confirm my availability to commence work on any of your projects, from

08/January/2018

A handwritten signature in dark ink, appearing to read 'G. Tomose', with a horizontal line drawn above it.

Signature