# Phase 1 Heritage Impact Assessment of the Proposed Development of a Hydroponics Tunnel Farming, Molote City, North West Province.

Report prepared by Paleo Field Services PO Box 38806 Langenhovenpark Bloemfontein, 9330 12 / 10 / 2018

#### Summary

A Phase 1 Heritage Impact Assessment was carried out in the proposed development of hydroponics tunnel farming, Molote City, North West Province. Visibility of Timeball Hill Formation outcrop was very limited given the generally low topography terrain and presence of a well-developed superficial overburden. Although bedrock sediments in within the proposed study area consists of potentially fossil-bearing, sedimentary strata (stromatolites), the site is capped by superficial (Quaternary) deposits of low to very low palaeontological sensitivity, the latter being that the impact area is not situated within or near pan, well-developed alluvial or spring deposits (considered to be potentially fossiliferous in the region).. Investigation of agricultural land immediately surrounding the site suggests that potential impact on *in situ* Stone Age archaeological material, graves, rock engravings, prehistoric structures or historically significant building structures older than 60 years within the study area was most probably insignificant. In accordance with the types and ranges of heritage resources as outlined in Section 3 of the National Heritage Resources Act (No 25 of 1999) there is no above-ground evidence to suggest that building structures older than 60 years or material of cultural significance or archaeological sites were affected within the demarcated area. The terrain in general is regarded as of low archaeological significance and is assigned a rating of Generally Protected C (GP.C). As far as the archaeological and palaeontological heritage is concerned, the proposed development may proceed with no additional heritage assessments necessary, provided that all excavation activities are restricted to within the boundaries of the development footprint.

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# Introduction

A Phase 1 Heritage Impact Assessment was carried out in the proposed development of a hydroponics tunnel farming on plot 133-136, Molote City, North West Province (**Fig. 1**). The survey is required as a prerequisite for new development in terms of the National Heritage Resources Act 25 of 1999. In terms of Section 38 of the National Heritage Resources Act 25 of 1999, the survey is required as a prerequisite for any development that will change the character of a site exceeding 5 000 m2 in extent. The task involved identification of possible archaeological and paleontological sites or occurrences in the proposed zone, an assessment of their significance, possible impact by the proposed development and recommendations for mitigation where relevant.

In this regard, categories relevant to the proposed development are listed in Section 34 (1), Section 35 (4), Section 36 (3) and Section 38 (1) of the NHR Act and are as follows:

34. (1) No person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority.

35 (4) No person may, without a permit issued by the responsible heritage resources authority—

- destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;
- *b*) destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;

36 (3) No person may, without a permit issued by SAHRA or a provincial heritage resources authority—

- (a) destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves;
- (b) destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or
- (c) bring onto or use at a burial ground or grave referred to in paragraph (a) or
   (b) any excavation equipment, or any equipment which assists in the detection or recovery of metals.

38 (1) Subject to the provisions of subsections (7), (8) and (9), any person who

intends to undertake a development categorised as-

- The construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
- The construction of a bridge or similar structure exceeding 50m in length;
- Any development or other activity which will change the character of the site
- a) exceeding 5000 m<sup>2</sup> in extent; or
- b) involving three or more existing erven or subdivisions thereof; or
- c) involving three or more subdivisions thereof which have been consolidated within the past five years;

- The rezoning of a site exceeding 10 000 m<sup>2</sup>; or
- Any other category of development provided for in regulations by the South African Heritage Resources Agency (SAHRA).

## Terms of Reference

The task involved the following:

- Identify and map possible heritage sites and occurrences using available resources.
- Determine and assess the potential impacts of the proposed development on potential heritage resources;
- Recommend mitigation measures to minimize potential impacts associated with the proposed development.

## Methodology

The heritage significance of the affected area was evaluated on the basis of existing field data, database information and published literature. This was followed by a field assessment by means of a pedestrian survey. A Garmin Etrex Vista GPS hand model (set to the WGS 84 map datum) and a digital camera were used for recording purposes. Maps and aerial photographs (incl. Google Earth) were consulted and integrated with data acquired during the on-site inspection.

## Field Rating

Site significance classification standards prescribed by SAHRA (2005) were used to indicate overall significance and mitigation procedures where relevant (**Table 1**).

# **Site Information**

1 to 50 000 topographical map 2627 AA Mathopestad

1: 125 000 geological map 2626 Wes Rand

Site coordinates: 26° 1'51.31"S;27°14'27.37"E

## Geology

According to the 1:250 000 scale geological map 2626 Wes Rand, the proposed development footprint is underlain by Precambrian sedimentary rocks of the Early Proterozoic Timeball Hill Formation (*Vt*, Pretoria Group, Transvaal Supergroup) (**Fig. 4**). The Timeball Hill is ascribed to a fluvio-deltaic basin-fill sedimentation system and is composed of quartzite, lacustrine and fluvio-deltaic mudrocks, conglomerates and finely-laminated ferruginous shale with thin stromatolitic carbonate interbeds (Eriksson 1973; Erikson *et al.* 2006; Cateneu and Erikson 2002).

### Background

The Timeball Hill is composed of quartzite, lacustrine and fluvio-deltaic mudrocks, conglomerates and finely-laminated ferruginous shale with thin stromatolitic carbonate interbeds (Eriksson 1973; Erikson *et al.* 2006; Cateneu and Erikson 2002). Stromatolites are >2.5 Ga old fossilized algal colonies (microbial mounds) made up of single-celled organisms that functioned as the earliest oxygen producers and is actually quite common in the underlying Malmani dolomites (subgroup at the base of the Transvaal Supergroup). There is currently no record of Quaternary vertebrate fossils or sites found in the area.

The archaeological heritage in the region is largely represented by uncapped Stone Age assemblages, rock engraving sites and the stonewalled Iron Age structures. Stone Age sites in the region are mostly concentrated near the watercourses. MSA and LSA artefacts have been found on the surface of the Schoonspruit gravels north of Klerksdorp (farms Beentjeskraal and Elandsheuwel). In addition to artefacts found on the surface, several ESA artefacts were discovered within in the gravel terraces that are located about 10 - 13 m above the present level of the Schoonspruit. ESA and MSA artifacts were also found on the surface along the northern slope of a stream at Doornlaagte, located some 64 km northwest of Klerksdorp on the watershed of the Schoonspruit, Harts and Vaal Rivers.

Several rock engraving sites have been recorded on least 21 farms between Klerksdorp, Rustenburg and Krugersdorp.

Iron Age sequences, associated with early Sotho-Tswana speakers, dominate the archaeology of the region and are associated with extensive stonewalled settlements, such as Kaditshwene near Zeerust, Molokwane east of Rustenburg and the Olifantspoort

Complex near Koster. This is often characterized by a broad distribution of stonewalled settlements on flat-topped hills and mountainsides. The region east of the study area, especially between Klerksdorp and Ventersdorp is relatively rich in late Iron Age sites, particularly in the Lemoenfontein-Palmietfontein region, which also includes the ancient Rolong capital of Thabeng (Buisfontein) (White 1977) (Fig 5 A). Major stonewalled settlements near Klerksdorp include sites at Palmietfontein, Platberg, Hartbeesfontein and Grootkop (Fig. 6). The architecture of these Iron Age sites has many of the traits of the Type Z bilobial hut settlement pattern found in neighbouring parts of the Free State Province, and is attributed to ancestral Tswana people, who settled in the region from the 17<sup>th</sup> century to the early 19<sup>th</sup> century (Maggs 1976). Northwest of Molote, stone-walled complexes have been recorded on the farms Honingkrans, Rietvlei, Syferfontein, Bronkhorstfontein and Vergenoegd in the Marico district, including the megasite of Kaditshwane (Fig 5 B). Stone-walled settlements mainly associated with the Bakwena, Bahurutshe and Barolong people have been recorded west and south of Rustenburg and North of Molote on the farms Grootwagensdrift, Rhenosterfontein, Shylock, Moedwil and Olifantspoort (Fig 5 C). Another megasite, which covers several square kilometers, has been recorded on the farm Selonskraal fifteen kilometers west of Rustenburg (Fig 5 **C**).

The first Voortrekkers to settle in the area led to the establishment of a Boer settlement at Klerksdorp in 1837 and in 1838 Potchefstroom, the capital city of the Zuid Afrikaansche Republiek. Several heritage sites exist from this period, including a fortification near Fochville.

### **Field Assessment**

Visibility of Timeball Hill Formation outcrop was very limited given the generally low topography terrain and presence of a well-developed superficial overburden (**Fig. 7**). However, investigation of agricultural land immediately surrounding the site suggests that potential impact on *in situ* Stone Age archaeological material, graves, rock engravings, prehistoric structures or historically significant building structures older than 60 years within the study area was most probably insignificant.

## **Impact Statement & Recommendation**

Although bedrock sediments in within the proposed study area consists of potentially fossil-bearing, Transvaal Supergroup sedimentary strata (stromatolites) of the early Proterozoic Timeball Hill Formation (Pretoria Group), the site is capped by superficial (Quaternary) deposits of low to very low palaeontological sensitivity, the latter being that the impact area is not situated within or near pan, well-developed alluvial or spring deposits (considered to be potentially fossiliferous in the region). Palaeontologically sensitive cave breccias are not anticipated in the study area, as opposed to the more caverich karst environment provided by the underlying Malmani Subgroup dolomites outcropping to the south of the study area (Vmd, see Fig. 4). In accordance with the types and ranges of heritage resources as outlined in Section 3 of the National Heritage Resources Act (No 25 of 1999) there is no above-ground evidence to suggest that building structures older than 60 years or material of cultural significance or archaeological sites were affected within the demarcated area. The terrain in general is regarded as of low archaeological significance and is assigned a rating of Generally Protected C (GP.C) (Table 1). As far as the archaeological and palaeontological heritage is concerned, the proposed development may proceed with no additional heritage assessments necessary, provided that all excavation activities are restricted to within the boundaries of the development footprint.

## References

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## DECLARATION OF INDEPENDENCE

I, Lloyd Rossouw, declare that I act as an independent specialist consultant. I do not have or will not have any financial interest in the undertaking of the activity other than remuneration for work as stipulated in the terms of reference and have no interest in secondary or downstream developments as a result of the authorization of this project.

Yours truly,

12 /10 / 2018

Field Rating	Grade	Significance	Mitigation
National	Grade 1	-	Conservation;
Significance (NS)			national site
			nomination
Provincial	Grade 2	-	Conservation;
Significance (PS)			provincial site
			nomination
Local Significance	Grade 3A	High significance	Conservation;
(LS)			mitigation not
			advised
Local Significance	Grade 3B	High significance	Mitigation (part of
(LS)			site should be
			retained)
Generally Protected	-	High/medium	Mitigation before
A (GP.A)		significance	destruction
Generally Protected	-	Medium	Recording before
B (GP.B)		significance	destruction
Generally Protected	-	Low significance	Destruction
C (GP.C)			

**Table .** Field rating categories as prescribed by SAHRA.



Figure 1 Location of study area (yellow star) in relation to position of Ventersdorp, Koster and Krugersdorp.













Figure 5. Map of Iron Age settlement complex concentrations recorded in the region.



Figure 6. Examples of widespread stonewalled kraals and enclosures located at Grootkop near Klerksdorp.