The classification index is represented in the Table below that show grading and rating systems of heritage resources in South Africa.

FIELD RATING	GRADE	SIGNIFICANCE	RECOMMENDED MITIGATION
National Significance (NS)	Grade 1	-	Conservation; National Site nomination
Provincial Significance (PS)	Grade 2	-	Conservation; Provincial Site nomination
Local Significance (LS)	Grade 3A	High Significance	Conservation; Mitigation not advised
Local Significance (LS)	Grade 3B	High Significance	Mitigation (Part of site should be retained)
Generally Protected A (GP.A)	Grade 4A	High / Medium Significance	Mitigation before destruction
Generally Protected B (GP.B)	Grade 4B	Medium Significance	Recording before destruction
Generally Protected C (GP.C)	Grade 4C	Low Significance	Destruction

6.2 Impact Rating

VERY HIGH

These impacts would be considered by society as constituting a major and usually permanent change to the (natural and/or cultural) environment, and usually result in severe or very severe effects, or beneficial or very beneficial effects.

Example: The loss of a species would be viewed by informed society as being of VERY HIGH significance.

Example: The establishment of a large amount of infrastructure in a rural area, which previously had very few services, would be regarded by the affected parties as resulting in benefits with VERY HIGH significance.

HIGH

These impacts will usually result in long term effects on the social and /or natural environment. Impacts rated as HIGH will need to be considered by society as constituting an important and usually long-term change to the (natural and/or social) environment. Society would probably view these impacts in a serious light.

Example: The loss of a diverse vegetation type, which is common elsewhere, would have a significance rating of HIGH over the long term, as the area could be rehabilitated.

Example: The change to soil conditions will impact the natural system, and the impact on affected parties (e.g. farmers) would be HIGH.

MODERATE

These impacts will usually result in medium- to long-term effects on the social and/or natural environment. Impacts rated as MODERATE will need to be considered by the public or the specialist as constituting a unimportant and usually short-term change to the (natural and/or social) environment. These impacts are real, but not substantial.

Example: The loss of a sparse, open vegetation type of low diversity may be regarded as MODERATELY significant.

Example: The provision of a clinic in a rural area would result in a benefit of MODERATE significance.

LOW

These impacts will usually result in medium to short term effects on the social and/or natural environment. Impacts rated as LOW will need to be considered by society as constituting an important and usually medium-term change to the (natural and/or social) environment. These impacts are not substantial and are likely to have little real effect.

Example: The temporary changes in the water table of a wetland habitat, as these systems are adapted to fluctuating water levels.

Example: The increased earning potential of people employed because of a development would only result in benefits of LOW significance to people living some distance away.

NO SIGNIFICANCE

There are no primary or secondary effects at all that are important to scientists or the public.

Example: A change to the geology of a certain formation may be regarded as severe from a geological perspective, but is of NO SIGNIFICANCE in the overall context.

6.3 Certainty

DEFINITE: More than 90% sure of a fact. Substantial supportive data exist to verify the assessment.

PROBABLE: Over 70% sure of a fact, or of the likelihood of an impact occurring.

POSSIBLE: Only over 40% sure of a fact, or of the likelihood of an impact occurring.

UNSURE: Less than 40% sure of a fact, or of the likelihood of an impact occurring.

6.4 Duration

SHORT TERM : 0 – 5 years

MEDIUM: 6 – 20 years

LONG TERM: more than 20 years

DEMOLISHED: site will be demolished or is already demolished

6.5 Mitigation

Management actions and recommended mitigation, which will result in a reduction in the impact on the sites, will be classified as follows:

- ✓ A – No further action necessary
- ✓ B – Mapping of the site and controlled sampling required
- ✓ C – Preserve site, or extensive data collection and mapping required; and
- ✓ D – Preserve site

7. Data sources and methodology

According to the South African Heritage Resources Agency Minimum Standards for Specialist heritage studies: *"HIA reports must identify, assess and record current conditions and locations of all heritage resources in the area proposed for development*

and impact zone, the impact of the development on the identified heritage resources or landscapes and make recommendations for protection or mitigation to reduce the impact on the resources". The approach and methodology adopted in this report was meant to achieve this.

A. Literature review: Background to the heritage resources of the of the research area

i. .The fossil record

The study relied on unpublished and published sources of information including online databases such as Google Earth and Google Scholar. Previous impact assessment reports were also consulted together with academic literature such as Brandl (1980), Loubser (1994), Huffman (2007) South Africa is richly endowed with palaeontological heritage which has illuminated in varying ways biological evolution in the entire world (Durand 2018). Geological, the rocks of the study area belong to the Irrigasie Formation that is composed of siltstones with overlying sands and soil. Very little research has been done on this formation and only the sedimentology has been described (Johnson et al., 2006, p 487). It has the correct sedimentology and age for preserving fossils. It overlies a narrow coal seam but this belongs to the Hammanskraal Formation. In the Main Karoo Basin the Molteno formation is very rich in fossil plants of the *Dicroidium* flora, and the Elliot Formation has a patchy distribution of vertebrate fossils of dicynodonts and early dinosaurs, as well as but very rarely, silicified wood (Johnson et al., 2006; Plumstead, 1969).

ii. 7.1. The Stone Age Period.

Conventionally speaking, the Stone Age period has been divided into the Early Stone Age (ESA) (3.5 million and 250 000 BP), the Middle Stone Age (MSA) (250 000 – 25000 BP) and the Later Stone Age (25000 – 2000 BP) (Phillipson 2005). Early Stone Age stone tool assemblages are made up of the earlier Oldowan and later Acheulian types. The Oldowan tools were very crude and were used for chopping and butchering. These were replaced by Acheulian ESA tools dominated by hand axes and cleavers which are remarkably standardized (Wadley, 2007; Sharon, 2009). Evidence presented from Sterkfontein, Swartkrans and Makapansgat caves shows that the first tool making hominids belong to either an early species of the Homo or an immediate ancestor which is yet to be discovered here in South Africa (Phillipson 2005; Esterhuysen, 2007). Both the Oldwan and Acheulian industries are well represented in the archaeology of northern South Africa as shown by studies in the Mapungubwe National Park (Kuman et al. 2005; Sumner and Kuman 2014).

The Middle Stone Age dates to between 250 000 ago and 25 000 years ago. In general, Middle Stone Age tools are characterized by a size reduction in tools such as hand axes, cleavers, and flake and blade industries. The period is marked by the emergence of modern humans and was accompanied by change in technology, behavior, physical appearance, art, and symbolism (Phillipson 2005). A variety of MSA tools includes blades, flakes, scraper and pointed tools that may have been hafted onto shafts or handles and used as pear heads. Surface scatters of these flake and blade industries occur widespread across southern Africa (Klein 2000; Thompson & Marean, 2008). Residue analyses on some of the stone tools indicate that these tools were certainly used as spear heads (Wadley, 2007). From about 25 000 BP, stone tool assemblages generally

attributed to the Later Stone Age emerged. This period is marked by a reduction in stone tool sizes. Typical stone tools include microliths and bladelets. Later Stone Age stone tools were recovered in the Mapungubwe National Park area (Forsman 2011). This period is also associated with the development of rock art whose distribution is known across southern Africa (Deacon and Deacon 1999; Phillipson 2005).

iii. Farming communities and Colonial Period

Iron Age communities moved into southern Africa by c. AD 200, entering Limpopo and North West Provinces either by moving down via Botswana, Zimbabwe or via coastal plains route. Their movement followed various rivers inland. Being cultivators, they preferred the rich alluvial soils to settle on. It is believed that as Iron Age people moved they encountered hunter-gatherers (Klatzow, 1994). Current evidence indicates that the first Iron Age communities were established in the Limpopo Province at 280 AD (Klapwijk 1974; Huffman 2007). These landscapes, drainage systems and good climatic conditions could have influenced diverse societies including wildlife and farming communities to settle within the region. It is indisputable that the natural environment has played the dominant part; nevertheless, it is not deterministic (Katsamudanga, 2007). The introduction of farming communities in southern Africa early in the first millennium AD is characterised by the appearance of distinctive pottery wares (Huffman, 2007), metal working (Friede, 1979), agriculture and sedentism (Maggs, 1980; Phillipson, 2005). Mining and metallurgy were largely limited to the reduction of iron and copper ore for the manufacturing of utilitarian and decorative implements.

Iron Age occupation of the region seems to have taken place on a significant scale and at least different phases of occupation have been identified, however the last period of pre-colonial occupation consisted of Bakgatla cultural group who entered South Africa across the Limpopo River from Botswana and proceeded into the interior. Generally, Bakgatla group occupied areas near Rustenburg, Belabela and Thabazimbi. Some of the Bakgatla chiefdoms which originated from Botswana belonged to the same family as those found in South Africa. However, major tribal split occurred after the death of Kgosi Mogale, due to family disagreements on who should succeed the king. Some faction were infavour of his daughter Mosethla, who originated from the great house while the second factions was infavour of his son Kgafela from the second house. Those who supported Kgafela broke away while those who supported Mosethla remain. The people of Mosethla are said to have settled in the present location under Kgosi Nchaupe, Kgosi Mokopane, Kgosi Thipe etc. Another phase of occupation is well represented by the Ndebele cultural group. The Ndebele chiefdoms had Zulu origin from Natal. This group were Sothonized as they infiltrated the northern Sotho groups.

The 18th century's period is marked by the presence of white, where land was taken from African chiefs and redistributed to the Boers; this was followed by demarcation of portions of land into farms. Many of these farms have been in the ownership of families for generations. As a result, they possess a large corpus of information with regarding to the area and its history (Van Schalkwyk, 2011).

8. SITE LOCATION AND PROJECT DESCRIPTION

The proposed Makapanstad Agripark project is situated on portion 2 of the farm Geodgewaag 60 JR within the Moretele Local Municipality of the Bojanala Capricorn District, North West Province. The study area is situated on the outskirts of Makapanstad village, roughly 500meters from Nchaupe High School. The village lies 28.02 kilometers Northeast of Hammanskraal Central Business District (CBD). The proposed study area stretches for roughly 75 hectares of flat section located on the following global positioning system co-ordinates (GPS S25°.13. 49. 01 "& E 28°.05. 44. 09").

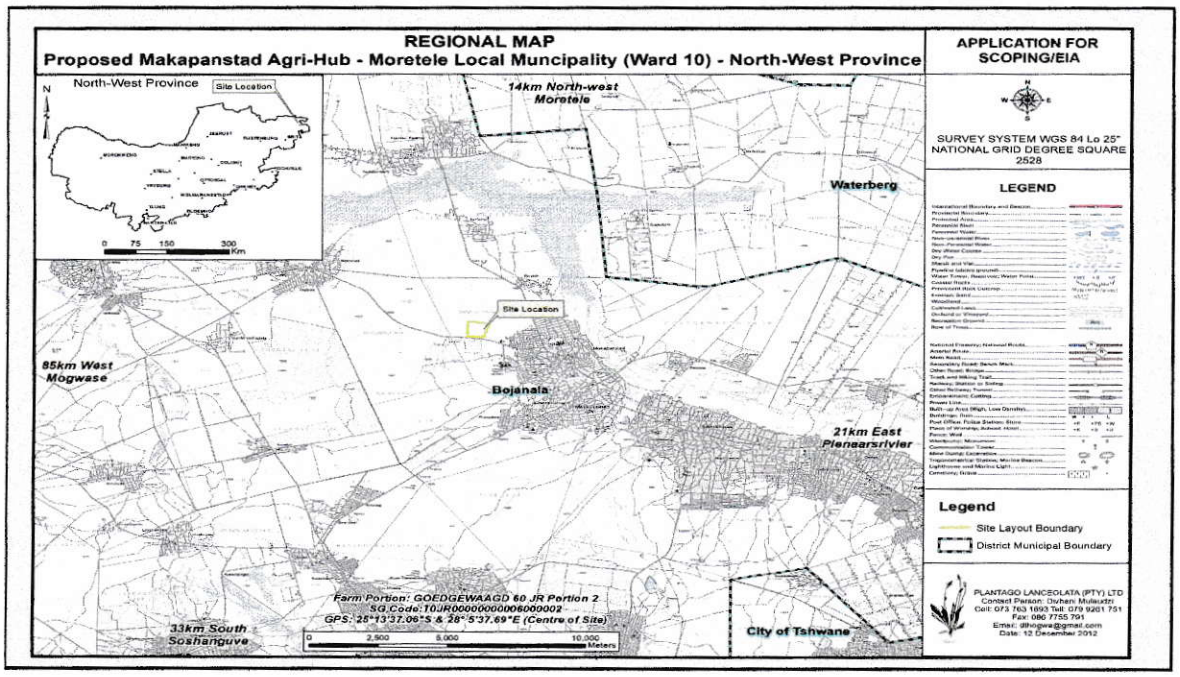


Figure 2: Proposed study area.

The area fall within the bushveld complex that dominated the flats and undulating plains. This vegetation stretch from the North West province covering section of the Limpopo and Gauteng provinces. The vegetation varies from tall open woodland to low woodland

dominated by broad leaved as well as microphylous trees species tree species prominent. Riparian vegetation occurs in some reaches of the rivers and may consist of tall standing trees. The dominant species in this vegetation type includes *Acacia erubescens* on flat areas. Some of the identifiable plant taxa include: *Acacia Erioloba, Acacia negrences, Acacia mellifera, Acacia Nilotica, Acacia tortillis, Peltoforum africanum, Eucle undulata, Dichrostychys cineria and Grewia flava, ziziphus mucronata, Ficus Indica.* Graminoids comprised of different tufted grass species that includes: *Aristida congesta, Aristida diffusa,Eragrostis superba, panicum maximum.* The geological properties of soils vary according to existing bedrock certain areas are dominated by sand and clayey materials from the parent conglomerate siltstone and shale of the Kransberg subgroup (Mokolian Waterberg group).

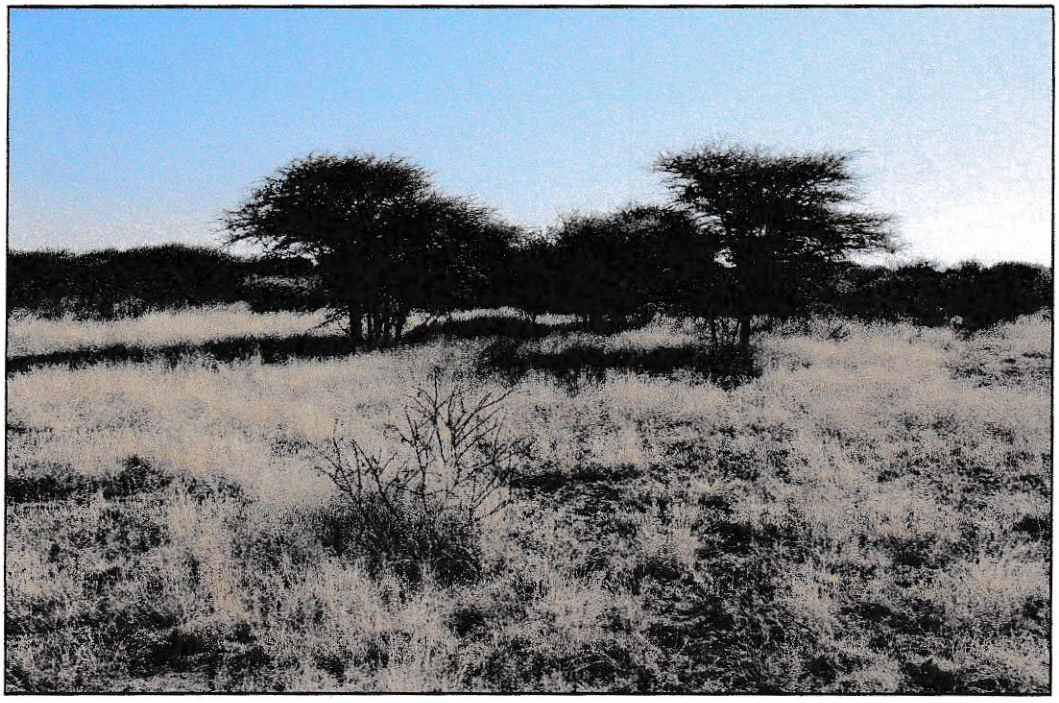


Figure 3: View of the study area dominated by Acacia species and grass species

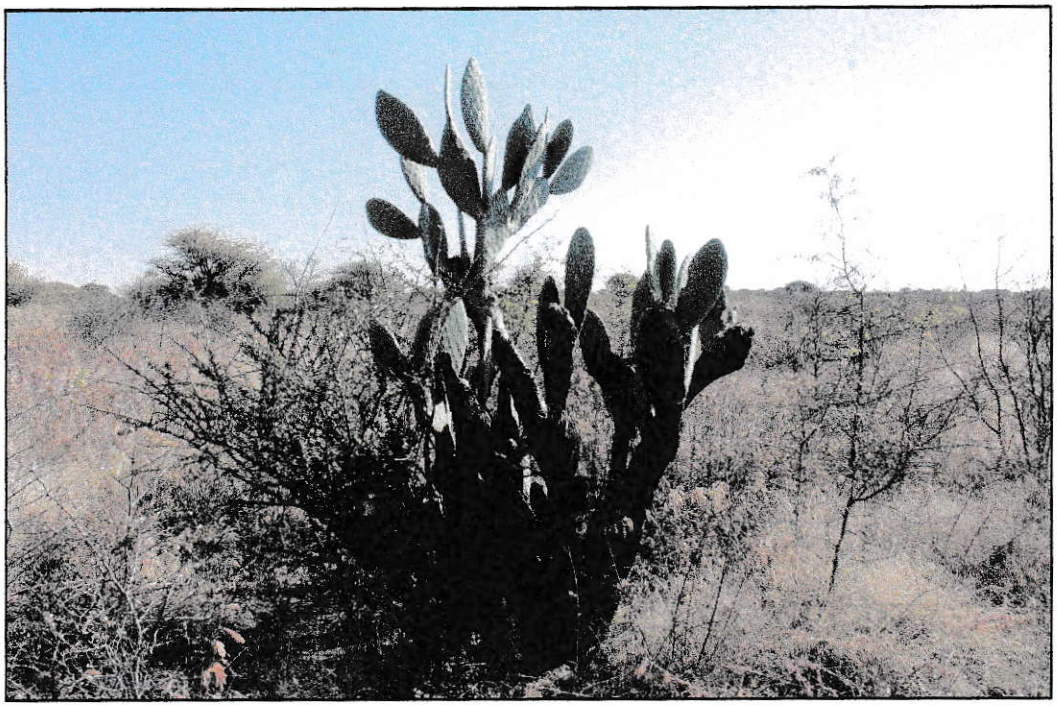


Figure 4: *Opuntia ficus indica* plant noted on site

Figure 5: View of the study section dominated by *Dichrostachys cineria* plant

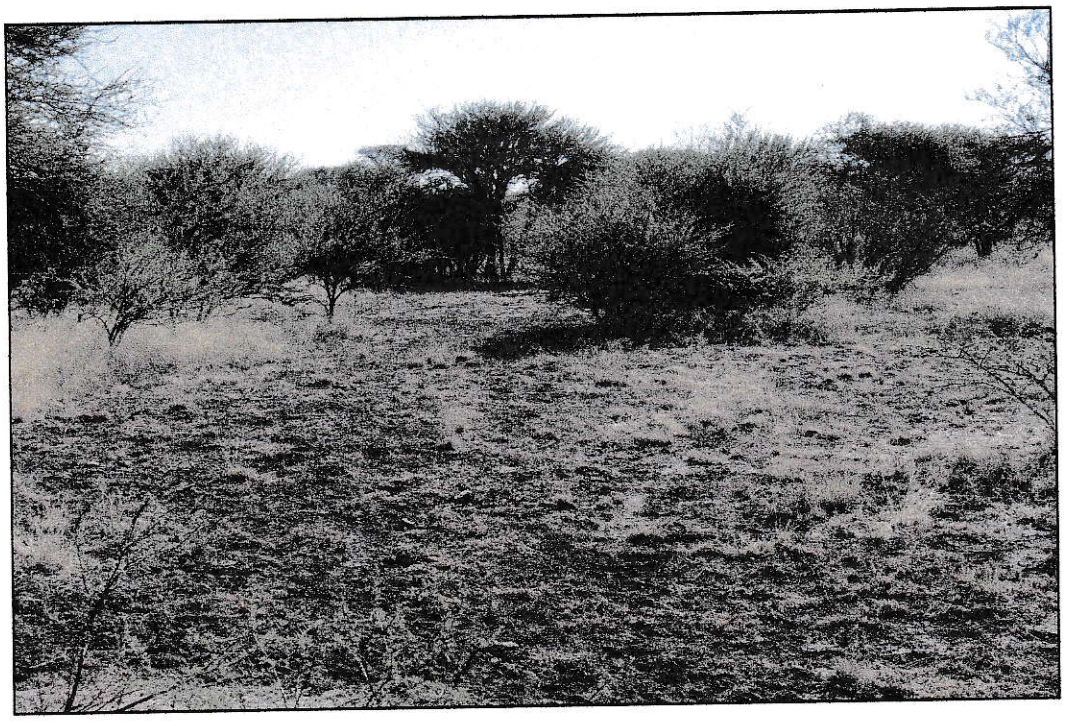


Figure 6: Flat plain dominated by grayish Clayey

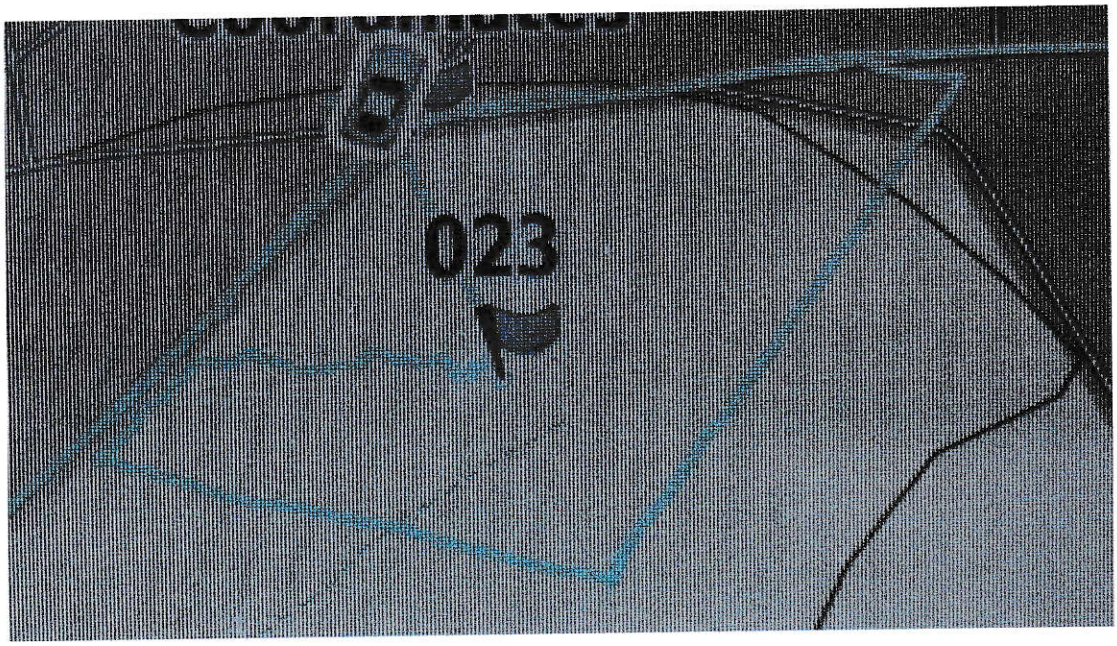


Figure 7: Snapshot of the study area

9. ASSESSMENT OF SITES AND FINDS

This section contains the results of the heritage sites/finds assessment. The phase 1 heritage scoping assessment program as required in terms of the Section 38 of the National Heritage Resource Act (Act 25 of 1999) done for the proposed Phase 1 Makapanstad Agripark near Hammaskraal area.

There are no primary or secondary effect at all that are important to scientist or the general public that will be impacted by the proposed project activities.

Heritage Significance:	No significance
Impact:	Negative
Impact Significance:	High
Certainty:	Probable
Duration:	Permanent
Mitigation:	A

10. CONCLUSION AND RECOMMENDATIONS

Based on the Archaeological and Palaeontological study, the following conclusions were reached:

- ✓ Ground truthing of the area and its subsequent infrastructures found no archaeological materials or heritage remains.
- ✓ The proposed site lies on the shales, mudstones, sandstones and marls of the Irrigasie Formation, Springbok Flats Basin Group, Karoo Supergroup. No fossils and no shales were observed throughout the site, only sandy and loamy soils, scattered thorn bushes and small trees with a variable coving on grasses. Soils do not preserve fossils but

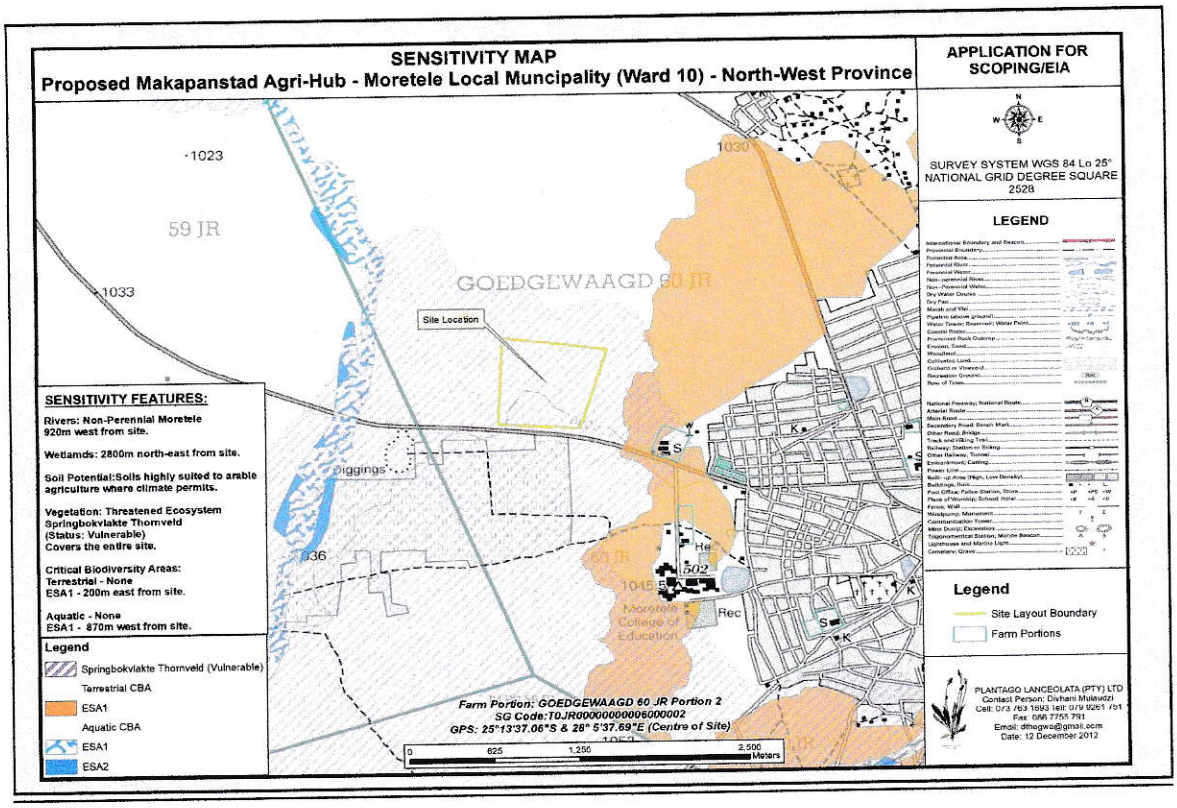
there is a very small chance that shales and sandstones below the surface could preserve fossils of the *Dicroidium* flora or vertebrates of dicynodonts or early dinosaurs. None has been reported from the Irrigasie Formation.

- Although no archaeological or Paleontological remains were found, it is possible that some significant features may be buried beneath the ground. Should buried archaeological/Paleontological materials and burials be encountered during the process of development, the following must apply:
- Work must stop immediately

A professional archaeologist or nearest heritage authority must be contacted.

Based on this assessment which found no archaeological resources in the study area, we recommend that the heritage authorities approve the project as planned.

11. TOPOGRAPHICAL AND GOOGLE EARTH MAPS



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