Heritage survey report for the development of a

WATER RESERVOIR AND PIPELINES FOR THE NEW MEDUPI POWER STATION, LEPHALALE (ELLISRAS MAGISTERIAL DISTRICT), LIMPOPO PROVINCE

THE PROJECT:
Development of a water reservoir and pipelines

THIS REPORT:
HERITAGE SURVEY REPORT FOR THE DEVELOPMENT OF A WATER RESERVOIR AND PIPELINES FOR THE NEW MEDUPI POWER STATION, LEPHALALE (ELLISRAS MAGISTERIAL DISTRICT), LIMPOPO PROVINCE

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EXECUTIVE SUMMARY

HERITAGE SURVEY REPORT FOR THE DEVELOPMENT OF A WATER RESERVOIR AND PIPELINES FOR THE NEW MEDUPI POWER STATION, LEPHALALE (ELLISRAS MAGISTERIAL DISTRICT), LIMPOPO PROVINCE

The aim of the survey was to locate, identify, evaluate and document sites, objects and structures of cultural significance found within the area in which it is proposed to develop a water reservoir and pipeline.

Two different alternatives were identified for the pipeline. Both of these follow, for most of the distance, alignments where impacts have already occurred, i.e. next to existing roads, conveyor belts, railway lines or power lines.

Based on what was found and its evaluation, it is anticipated that the development can take place in any of the corridors, although the preferred corridor would be:

- Alternative 3, as it follows an existing development over the longest distance, thereby minimizing the possibility of an impact on possible unknown heritage sites.

In the case where heritage resources do occur, assessing of the potential impact of the development can only be done once a final corridor has been selected. Mitigation of heritage sites implies first of all total avoidance, or, secondly, the recovery of sufficient data from the site in order that it can be studied and understood at a later stage. This latter scenario is not necessarily negative as science stands to benefit from such actions.

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GLOSSARY OF TERMS AND ABBREVIATIONS

STONE AGE

Early Stone Age	2 000 000 - 150 000 Before Present
Middle Stone Age	150 000 - 30 000 BP
Late Stone Age	30 000 - until c. AD 200

IRON AGE

Early Iron Age	AD 200 - AD 1000
Late Iron Age	AD 1000 - AD 1830

HISTORIC PERIOD

Since the arrival of the white settlers - c. AD 1840 in this part of the country

ADRC	Archaeological Data Recording Centre
ASAPA	Association of Southern African Professional Archaeologists
EIA	Early Iron Age
ESA	Early Stone Age
GOSP	Gauteng Open Spaces Project
LIA	Late Iron Age
LSA	Late Stone Age
MSA	Middle Stone Age
NASA	National Archives of South Africa
NHRA	National Heritage Resources Act
PHRA	Provincial Heritage Resources Agency
SAHRA	South African Heritage Resources Agency

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1. INTRODUCTION

An independent heritage consultant was appointed by Savannah Environmental (Pty) Ltd to conduct a survey to locate, identify, evaluate and document sites, objects and structures of cultural importance found within the boundaries of an area in which it is proposed develop a water reservoir and associated pipelines.

The plan is to bring water, via a pipeline, from the existing reservoir at Matimba power station to a reservoir located south west of the planned Medupi power station. For this purpose two alternative pipeline routes were identified that were subjected to a heritage survey.

2. TERMS OF REFERENCE

The scope of work consisted of conducting a Phase 1 archaeological survey of the site in accordance with the requirements of Section 38(3) of the National Heritage Resources Act (Act No 25 of 1999).

This included:

- Conducting a desk-top investigation of the area
- A visit to the proposed development site

The objectives were to:

- Identify possible archaeological, cultural and historic sites within the proposed development areas;
- Evaluate the potential impacts of construction, operation and maintenance of the proposed development on archaeological, cultural and historical resources;
- Recommend mitigation measures to ameliorate any negative impacts on areas of archaeological, cultural or historical importance.

3. DEFINITIONS AND ASSUMPTIONS

The following aspects have a direct bearing on the survey and the resulting report:

- *Cultural resources* are all non-physical and physical human-made occurrences, as well as natural occurrences that are associated with human activity. These include all sites, structures and artefacts of importance, either individually or in groups, in the history, architecture and archaeology of human (cultural) development.

- The *significance* of the sites and artefacts are determined by means of their historical, social, aesthetic, technological and scientific value in relation to their uniqueness, condition of preservation and research potential. It must be kept in mind that the various aspects are not mutually exclusive, and that the evaluation of any site is done with reference to any number of these.

- Sites regarded as having low significance have already been recorded in full and require no further mitigation. Sites with medium to high significance require further mitigation.

- The latitude and longitude of archaeological sites are to be treated as sensitive information by the developer and should not be disclosed to members of the public.

4. STUDY APPROACH AND METHODOLOGY

4.1 Extent of the Study

This survey and impact assessment covers the area as presented in Section 5 and as illustrated in Figure 2.

4.2 Methodology

4.2.1 Preliminary investigation

4.2.1.1 Survey of the literature
A survey of the relevant literature was conducted with the aim of reviewing the previous research done and determining the potential of the area. In this regard, various anthropological, archaeological and historical sources, as well as survey reports, were consulted - see the list of references below.

4.2.1.2 Data bases
The *Heritage Sites Database* and the *Environmental Potential Atlas* was consulted.

4.2.1.3 Other sources
Aerial photographs and topocadastral and other maps were also studied - see the list of references below.

4.2.2 Field survey

The field survey was done according to generally accepted archaeological practices, and was aimed at locating all possible sites, objects and structures. The area that had to be investigated was identified by Savannah Environmental (Pty) Ltd by means of maps. As it is a linear development, the survey was done by travelling the total extent of the route, either by foot or by vehicle, depending on circumstances. Special attention was given to topographical occurrences such as trenches, holes, outcrops and clusters of trees.

4.2.3 Documentation

All sites, objects and structures that are identified are documented according to the general minimum standards accepted by the archaeological profession. Coordinates of individual localities are determined by means of the *Global Positioning System* (GPS)[1] and plotted on a map. This information is added to the description in order to facilitate the identification of each locality.

[1] According to the manufacturer a certain deviation may be expected for each reading. Care was, however, taken to obtain as accurate a reading as possible, and then to correlate it with reference to the physical environment before plotting it on the map.

Map datum used: Hartebeeshoek 94 (WGS84).

4.3 Limitations

Sections of the study area were densely vegetated during the field survey. This seriously affected the archaeological visibility.

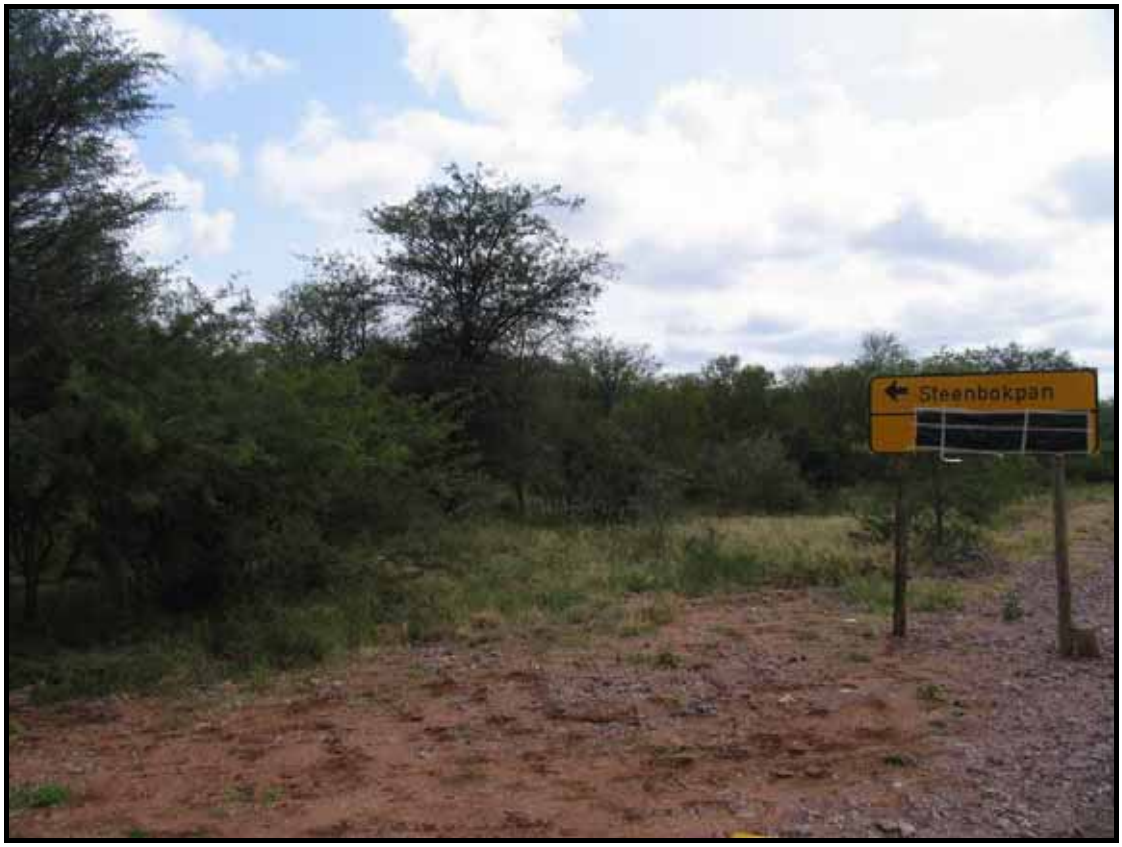

Fig. 1. The dense vegetation growth encountered at the planned reservoir position.

5. DESCRIPTION OF THE AFFECTED ENVIRONMENT

5.1 Site location

The study area, being linear in nature, follows different routes from an area west of the Matimba power station, going in a south westerly direction to a planned reservoir that would supply the new Medupi power station. As such it crosses the following farms: Zwartwater 507LQ, Hanglip 508LQ, Naauw Ontkomen 509LQ and Kuipersbult 511LQ, in the Lephalale (Ellisras) magisterial district of Limpopo Province. As such it centres around the following coordinates: S 23.69929, E 27.58442.

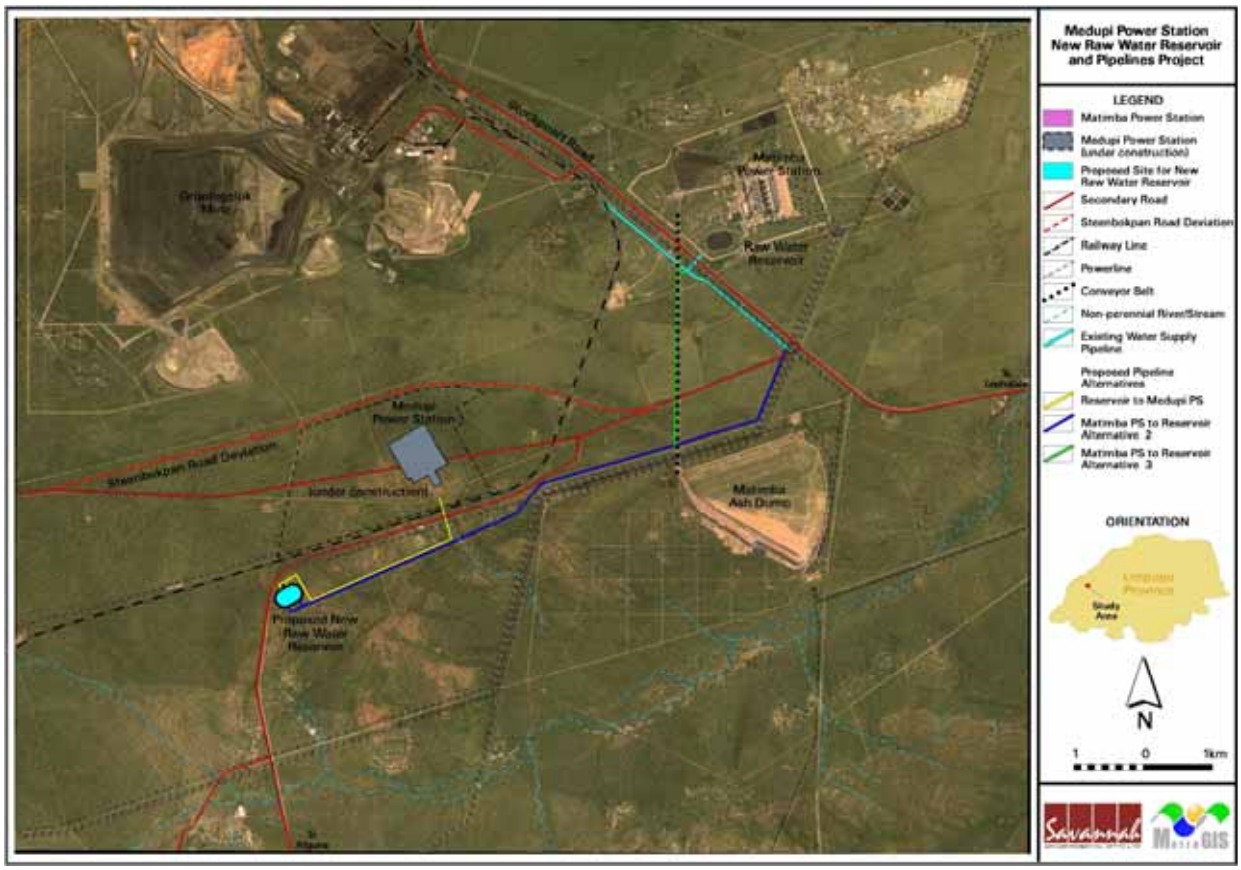

Fig. 2. Location of the reservoir and the pipeline alternatives.

5.2 Site description

The topography of the area is very flat, with very few features (e.g. hills, outcrops or rock shelters, rivers) that usually drew people to settle in its vicinity, are found in the area. Only a few small hills or outcrops occur. All the rivers crossing the area are non-perennial. The biggest river, the Makolo, passes some distance to the east of the study area, flowing from south to north.

The geology is made up of alternating bands of arenite and shale, with a basalt intrusion to the west of the study area. All is overlain by sand, probably aeolic in origin, having being laid down from the west.

The area can be described as typical savannah, with the original vegetation consisting of Mixed Bushveld, with a section to the north classified as Sweet Bushveld.

Fortunately, for most part the proposed alternatives are located in areas in which some impacts already occur, i.e. next to the railway line, powerline or conveyor belt (Fig. 2 & 3).

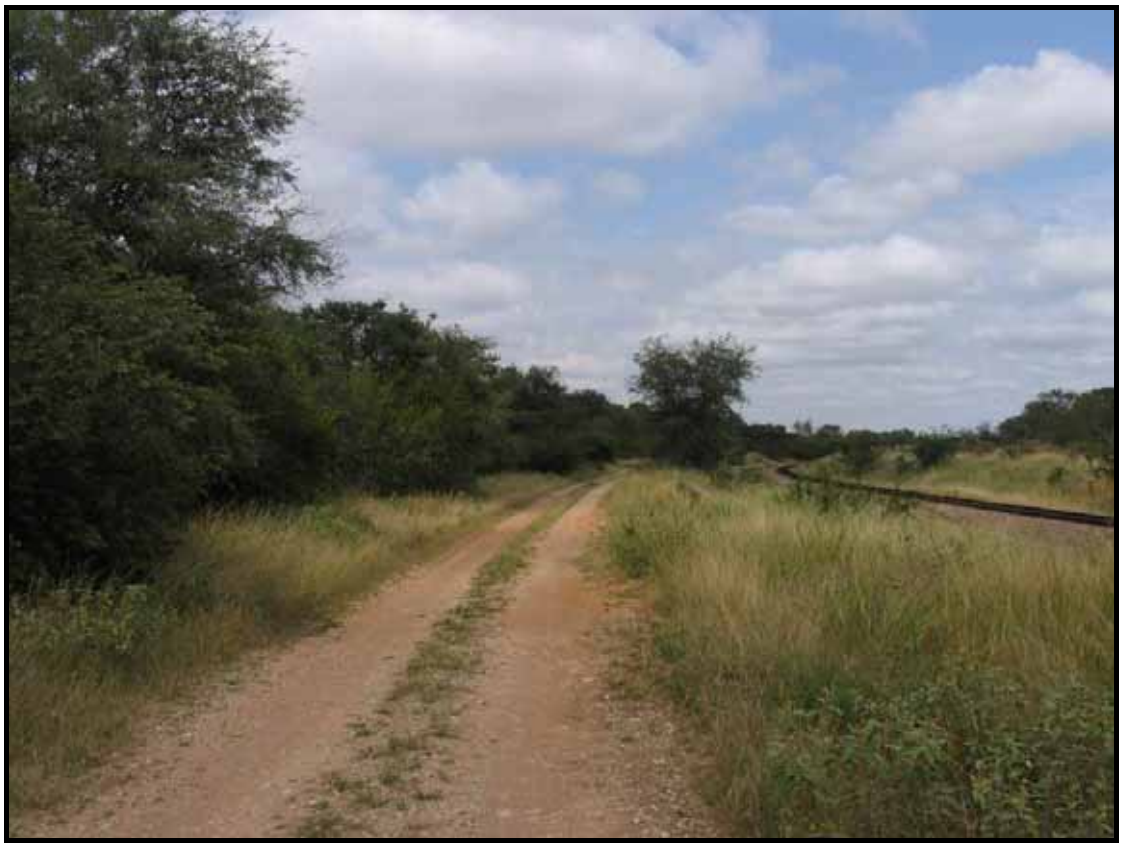

Fig. 3. Area next to the railway line, in the vicinity of the alternatives.

5.3 Regional overview

Probably because of the somewhat inhospitable environment, being very flat and with few sources of surface water, people did not settle in large numbers in the area in the past. As a result, only a few sites of cultural significance are known to occur in the larger geographical area. In areas where there are outcrops, especially close to rivers, rock art sites and sites dating to the Late Iron Age have been documented. Further a-field, to the south, some Early and Late Iron Age sites are known to exist. In the town of Lephalale (Ellisras) there is a cemetery containing the graves of some of the earliest white settlers in the area.

Two sites are known to occur in the region and are indicated in the table below. It seems as if the proposed development would not impact on any of these.

5.4 The affected environment

5.3.1 Stone Age

No sites, features or objects dating to the Stone Age were identified in the study area.

Stone tools were recorded at a few select spots, predominantly at outcrops and the small water courses. As these artefacts were found on the surface, they are not in their original context any more and can yield very little information. As a result, they are viewed to have no significance.

5.3.2 Iron Age

No sites, features or objects dating to the Iron Age were identified in the study area.

A few pieces of pottery were found at an outcrop on the farm Kuipersbult. However, these did not include any diagnostic pieces and it is therefore difficult to determine its dating or identity. They are viewed as having low significance and their occurrence here would not present any problem to the proposed development.

5.3.3 Historic period

No sites, features or objects dating to the historic period were identified in the study area.

Although a number of old farmsteads occur in the area, none are older than 60 years, or can be related to a significant event or person. Two cemeteries were identified, one of which is located on the farm Kuipersbult.

6. SITE SIGNIFICANCE AND ASSESSMENT

Impact analysis of cultural resources under threat of the proposed development, are based on the present understanding of the development.

The **significance** of a heritage site and artefacts is determined by it historical, social, aesthetic, technological and scientific value in relation to the uniqueness, condition of preservation and research potential. It must be kept in mind that the various aspects are not mutually exclusive, and that the evaluation of any site is done with reference to any number of these.

Sites regarded as having low significance are viewed as been recorded in full after identification and would require no further mitigation. Impact from the development would therefore be judged to be low. Sites with a medium to high significance would therefore require mitigation. Mitigation, in most cases the excavation of a site, is in essence destructive and therefore the impact can be viewed as high and as permanent.

The National Heritage Resources Act (Act no 25 of 1999) stipulates the assessment criteria and grading of archaeological sites. The following categories are distinguished in Section 7 of the Act:

- **Grade I**: Heritage resources with qualities so exceptional that they are of special national significance;
- **Grade II**: Heritage resources which, although forming part of the national estate, can be considered to have special qualities which make them significant within the context of a province or a region; and
- **Grade III**: Other heritage resources worthy of conservation, and which prescribes heritage resources assessment criteria, consistent with the criteria set out in section 3(3), which must be used by a heritage resources authority or a local authority to assess the intrinsic, comparative and contextual significance of a heritage resource and the relative benefits and costs of its protection, so that the appropriate level of grading of the resource and the consequent responsibility for its management may be allocated in terms of section 8.

- **The following sites, features and objects were found in the study area. If the planned development is to have an impact on them, the proposed management strategies set out in the table below should be implemented.**

No	Classification	Farm name	Latitude	Longitude	General	Management
1	Historic	Kuipersbult 511LQ	-23.71889	27.55988	Single grave	Avoid site or relocate grave
2	Iron Age	Kuipersbult 511LQ	-23.7076	27.57939	Potsherds on low outcrop, in small shelters. Probably rainmaking site	Avoid site or test excavate

6.1 Impact assessment methodology

Nature of Impact: Destruction of heritage sites		
	Without mitigation	With mitigation
Extent	Local	Local
Duration	Permanent	Permanent
Magnitude	Small	Small
Probability	Improbable	Improbable
Significance	Low	Low
Status (positive or negative)	Negative	Positive
Reversibility	No	No
Irreplaceable loss of resources?	Yes	
Can impacts be mitigated?	Yes	
Mitigation: Document and record; relocate		

The significance is calculated by a combination of criteria in the following formula:

S = (E+D+M)P = 30

7. RECOMMENDATIONS

The aim of the survey was to locate, identify, evaluate and document sites, objects and structures of cultural significance found within the area in which it is proposed to develop a water reservoir and pipeline.

No sites, features or objects dating to the Stone Age were identified in the study area.
No sites, features or objects dating to the Iron Age were identified in the study area.
No sites, features or objects dating to the historic period were identified in the study area.

No impacts to heritage resources are anticipated with the construction of the proposed reservoir on the identified demarcated site.

Two different alternatives were identified for the pipeline. Both of these follow, for most of the distance, alignments where impacts have already occurred, i.e. next to existing roads, conveyor belts, railway lines or power lines.

Based on what was found and its evaluation, it is anticipated that the development can take place in any of the corridors, although the preferred corridor would be:

- Alternative 3, as it follows an existing development over the longest distance, thereby minimizing the possibility of an impact on possible unknown heritage sites.

In the case where heritage resources do occur, assessing of the potential impact of the development can only be done once a final corridor has been selected. Mitigation of heritage sites implies first of all total avoidance, or, secondly, the recovery of sufficient data from the site in order that it can be studied and understood at a later stage. This latter scenario is not necessarily negative as science stands to benefit from such actions.

8. REFERENCES

8.1 **Data bases**

Heritage Sites Database, Pretoria.

Environmental Potential Atlas, Department of Environmental Affairs and Tourism.

National Archives of South Africa

8.2 **Literature**

Acocks, J.P.H. 1975. *Veld Types of South Africa*. Memoirs of the Botanical Survey of South Africa, No. 40. Pretoria: Botanical Research Institute.

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Van Schalkwyk, J.A. 2005. *Heritage survey report of the Kumba properties at Grootegeluk Mine, Lephalale area, Limpopo Province*. Unpublished report 2005KH090. Pretoria: National Cultural History Museum.

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8.3 **Maps**

1: 50 000 Topocadastral maps – 2327DA

APPENDIX 1: CONVENTIONS USED TO ASSESS THE IMPACT OF PROJECTS ON HERITAGE RESOURCES

Significance
The *significance* of the sites and artefacts are determined by means of their historical, social, aesthetic, technological and scientific value in relation to their uniqueness, condition of preservation and research potential. It must be kept in mind that the various aspects are not mutually exclusive, and that the evaluation of any site is done with reference to any number of these.

Matrix used for assessing the significance of each identified site/feature

1. Historic value			
Is it important in the community, or pattern of history			
Does it have strong or special association with the life or work of a person, group or organisation of importance in history			
Does it have significance relating to the history of slavery			
2. Aesthetic value			
It is important in exhibiting particular aesthetic characteristics valued by a community or cultural group			
3. Scientific value			
Does it have potential to yield information that will contribute to an understanding of natural or cultural heritage			
Is it important in demonstrating a high degree of creative or technical achievement at a particular period			
4. Social value			
Does it have strong or special association with a particular community or cultural group for social, cultural or spiritual reasons			
5. Rarity			
Does it possess uncommon, rare or endangered aspects of natural or cultural heritage			
6. Representivity			
Is it important in demonstrating the principal characteristics of a particular class of natural or cultural places or objects			
Importance in demonstrating the principal characteristics of a range of landscapes or environments, the attributes of which identify it as being characteristic of its class			
Importance in demonstrating the principal characteristics of human activities (including way of life, philosophy, custom, process, land-use, function, design or technique) in the environment of the nation, province, region or locality.			
7. Sphere of Significance	High	Medium	Low
International			
National			
Provincial			
Regional			
Local			
Specific community			
8. Significance rating of feature			
1. Low			
2. Medium			
3. High			

Significance of impact:

- low where the impact will not have an influence on or require to be significantly accommodated in the project design
- medium where the impact could have an influence which will require modification of the project design or alternative mitigation
- high where it would have a “no-go” implication on the project regardless of any mitigation

Certainty of prediction:

- Definite: More than 90% sure of a particular fact. Substantial supportive data to verify assessment
- Probable: More than 70% sure of a particular fact, or of the likelihood of that impact occurring
- Possible: Only more than 40% sure of a particular fact, or of the likelihood of an impact occurring
- Unsure: Less than 40% sure of a particular fact, or the likelihood of an impact occurring

Recommended management action:

For each impact, the recommended practically attainable mitigation actions which would result in a measurable reduction of the impact, must be identified. This is expressed according to the following:

1 = no further investigation/action necessary
2 = controlled sampling and/or mapping of the site necessary
3 = preserve site if possible, otherwise extensive salvage excavation and/or mapping necessary
4 = preserve site at all costs

Legal requirements:

Identify and list the specific legislation and permit requirements which potentially could be infringed upon by the proposed project, if mitigation is necessary.

APPENDIX 2. RELEVANT LEGISLATION

All archaeological and palaeontological sites, and meteorites are protected by the National Heritage Resources Act (Act no 25 of 1999) as stated in Section 35:

(1) Subject to the provisions of section 8, the protection of archaeological and palaeontological sites and material and meteorites is the responsibility of a provincial heritage resources authority: Provided that the protection of any wreck in the territorial waters and the maritime cultural zone shall be the responsibility of SAHRA.

(2) Subject to the provisions of subsection (8)(a), all archaeological objects, palaeontological material and meteorites are the property of the State. The responsible heritage authority must, on behalf of the State, at its discretion ensure that such objects are lodged with a museum or other public institution that has a collection policy acceptable to the heritage resources authority and may in so doing establish such terms and conditions as it sees fit for the conservation of such objects.

(3) Any person who discovers archaeological or palaeontological objects or material or a meteorite in the course of development or agricultural activity must immediately report the find to the responsible heritage resources authority, or to the nearest local authority offices or museum, which must immediately notify such heritage resources authority.

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

(a) 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;

(c) trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or palaeontological material or object, or any meteorite; or

(d) bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assist in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites.

The National Heritage Resources Act (Act no 25 of 1999) stipulates the assessment criteria and grading of archaeological sites. The following categories are distinguished in Section 7 of the Act:

- **Grade I**: Heritage resources with qualities so exceptional that they are of special national significance;
- **Grade II**: Heritage resources which, although forming part of the national estate, can be considered to have special qualities which make them significant within the context of a province or a region; and
- **Grade III**: Other heritage resources worthy of conservation, and which prescribes heritage resources assessment criteria, consistent with the criteria set out in section 3(3), which must be used by a heritage resources authority or a local authority to assess the intrinsic, comparative and contextual significance of a heritage resource and the relative benefits and costs of its protection, so that the appropriate level of grading of the resource and the consequent responsibility for its management may be allocated in terms of section 8.