

McGregor Museum Department of Archaeology



Heritage Impact Assessment of alternative routes of a proposed 132 kV power line between the existing Kimberley DS Substation and the Homestead Substation at the northern edge of Kimberley, Northern Cape.

David Morris, McGregor Museum
October 2010

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Introduction

The McGregor Museum was contacted by Vici Napier and Nelia Maritz of Strategic Environmental Focus (Pretoria Office: PO Box 74785 Lynnwood Ridge 0040 tel 012-3491307, Fax 012-3491229 and email: vici@sefsa.co.za; nelia@sefsa.co.za) to carry out a phase 1 Heritage Impact Assessment along the alternative routes for a proposed 132 kV power line between the existing Kimberley DS Substation and the Homestead Substation, along the northern edge of Kimberley, Northern Cape.

The alternative routes for the line were visited in September and October 2010. Observations made in the field, together with a review of relevant historical information and previous findings in the area, are presented and recommendations supporting use of the preferred option are given in this report.

Fieldnotes and photographs are lodged with the McGregor Museum, Kimberley.

The author of this report

The author of this report is a professional archaeologist (MA, PhD candidate, University of the Western Cape) accredited as a Principal Investigator by the Association of Southern African Professional Archaeologists. He has worked as a museum archaeologist in the Northern Cape since 1985 and has been responsible for numerous scientific reports and published works, locally and internationally, on cultural resources management and research in the area. In addition, the author has a comprehensive knowledge of Kimberley's history and built environment, and received recent UCT-accredited training at a workshop on Architectural and Urban Conservation: researching and assessing local (built) environments (S. Townsend, UCT). He is also Chairman of the Kimberley Historical Society.

The author is independent of the organization commissioning this specialist input, and provides this heritage assessment (archaeology and colonial history) within the framework of the National Heritage Resources Act (No 25 of 1999).

The National Heritage Resources Act no. 25 of 1999 (NHRA) protects heritage resources which include archaeological and palaeontological objects/sites older than 100 years, graves older than 60 years, structures older than 60 years, as well as intangible values attached to places. The Act requires that anyone intending to disturb, destroy or damage such sites/places, objects and/or structures may not do so without a permit from the relevant heritage resources authority. This means that a Heritage Impact Assessment should be performed, resulting in a specialist report as required by the relevant heritage resources authority/ies to assess whether authorisation may be granted for the disturbance or alteration, or destruction of heritage resources.

Where archaeological sites and palaeontological remains are concerned, SAHRA at national level acts on an agency basis for the Provincial Heritage Resources Agency (PHRA) in the Northern Cape. Ngwao Bošwa ya Kapa Bokone (the PHRA in the Northern Cape) is responsible for the built environment and other colonial era heritage and contemporary cultural values.

DESCRIPTION OF THE AFFECTED ENVIRONMENT

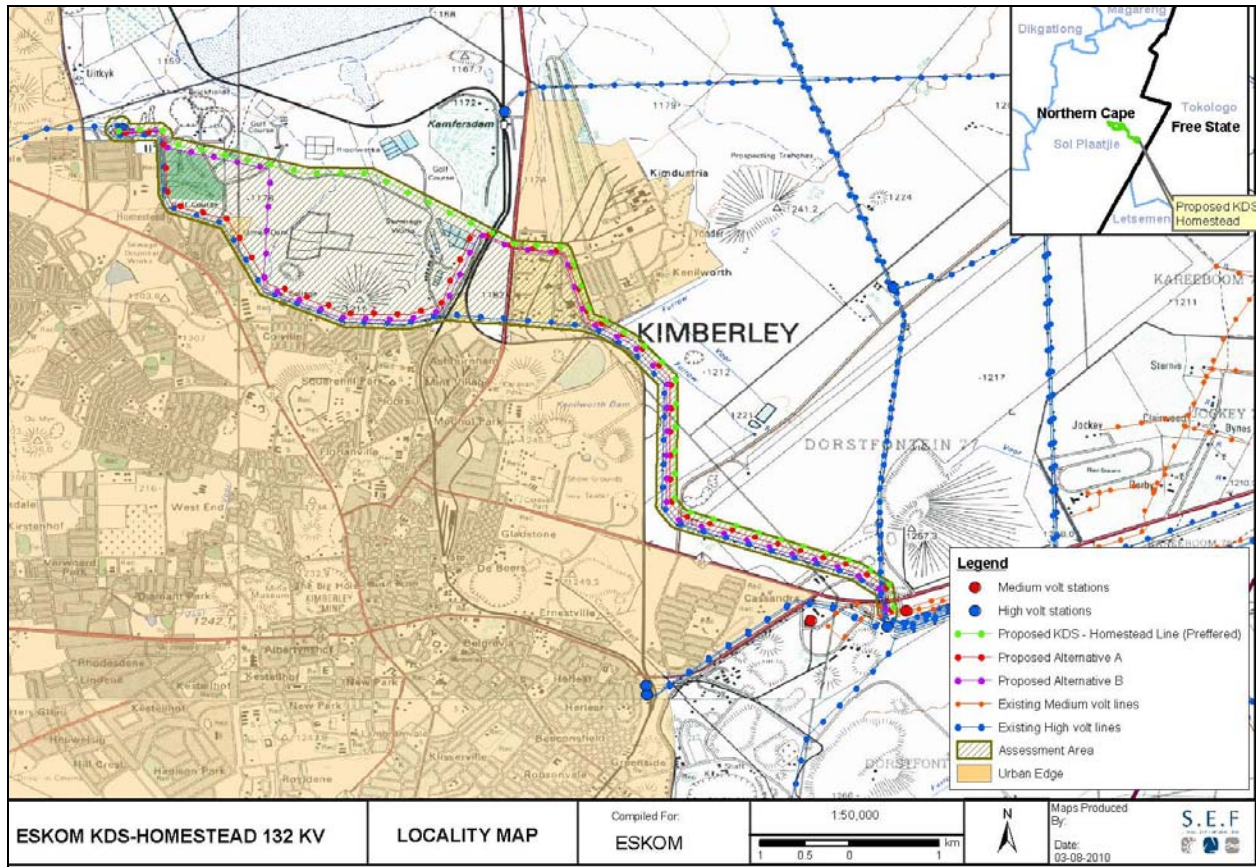
The environment to be traversed by the proposed power line skirts the northern perimeter of Kimberley, with the greater portion of the routes falling just outside the declared urban edge of the city. The routes pass through former mining areas and floors, where certain industrial heritage traces may exist, across areas of ash-heap/refuse disposal and landfill, as well as along servitudes through current industrial areas and alongside the historic village of Kenilworth.

A number of places along these routes have been subject to impact assessments and investigations in the past, referenced below.

The proposed route alignments would in most instances fall alongside existing Eskom and Municipal power lines.

The landscape is moderately to sparsely vegetated, with often shallow soils, making any surface archaeological traces, in places, relatively visible. Some areas are mantled by red

Hutton sands and others by clay and mine debris, masking both precolonial and colonial archaeological traces.



The bright green option is the preferred route.

Description of heritage features of the region

The Northern Cape has a wealth of precolonial archaeological sites (Beaumont & Morris 1990; Morris & Beaumont 2004), these often being focused along rivers such as the nearby Vaal (e.g. Gibbon *et al.* 2009), or around koppies, for example Wildebeest Kuil (e.g. Morris 1988, 2006) just west of Homestead, as well as at the verges of pans such as Alexandersfontein east of Kimberley (e.g. Morris 2002). Important Fauresmith age sites occur in the palaeodunes that flank the Samaria Road just north of the eastern part of the proposed power line alignment (Beaumont 1990; Morris 1992, 1999).

Colonial era traces are preponderantly associated with the development of the diamond mines and the evolution of the City of Kimberley and include industrial archaeology/heritage and material traces of the city's cultural history. As far as the proposed alignments are concerned the most significant features relate to the mining floors (Morris 1999), the disposal of waste to the north of the city's limits (Morris & Kaplan

2001), and the unique late nineteenth century Kenilworth village development originally for white mine workers (Roberts 1976).

Environmental issues and potential impacts

Heritage resources including archaeological sites and colonial era features are in each instance unique and non-renewable resources. Linear developments such as that envisaged can have a permanent destructive impact on such resources. The objective of this assessment is to evaluate the sensitivity of such resources where present, to assess the significance of potential impacts on these resources and, if and where appropriate, to recommend no-go areas and measures to mitigate or manage said impacts.

The destructive impacts that are possible in terms of heritage resources would tend to be direct, once-off events occurring during the initial power line construction period. The fact that the line is being aligned with existing power lines is an indication of how longer term secondary impacts may occur within the resulting servitudes.

With respect to the magnitude and extent of potential impacts, it has been noted that the erection of power lines would have a relatively small impact on Stone Age sites, in light of Sampson's (1985) observations during surveys beneath power lines in the Karoo (actual modification of the landscape tends to be limited to the *footprint* of each pylon), whereas a road or a water supply pipeline, for example, would tend to be far more destructive (modification of landscape surface within a *continuous strip*).

METHODOLOGY

Various parts of the proposed alignments were inspected on foot (some had been investigated in detail previously). Observations of heritage traces are characterised below and evaluated.

Assumptions and limitations

It was assumed that, by and large in this landscape, with its moderately sparse vegetation and shallow soil profiles, some sense of the archaeological traces to be found along the proposed alignments would be readily apparent from surface observations or could be extrapolated from nearby places. It was not considered necessary to conduct excavations as part of the assessment to establish the potential of sub-surface archaeology: in some instances previous excavations are referred to.

A proviso is routinely given, that should sites or features of significance be encountered during construction (this could include an unmarked burial or a high density of stone tools, for instance), specified steps are necessary (cease work, report immediately to relevant heritage authority).

With regard to fossils, it is not considered likely that they would be impacted by the proposed activity.

Potentially significant impacts to be assessed

Any area or linear, primary and secondary, disturbance of surfaces along the proposed power line alignment could have a destructive impact on heritage resources, where present. In the event that such resources are found, they are likely to be of a nature that potential impacts could be mitigated by documentation and/or salvage following approval and permitting by the South African Heritage Resources Agency and, in the case of any built environment features, by Ngwao Bošwa ya Kapa Bokone (the Northern Cape Heritage Authority). Although unlikely, there may be some that could require preservation *in situ* and hence modification of intended placement of development features.

Disturbance of surfaces includes any construction: of a road, erection of a pylon, or any other *clearance* of, or *excavation* into, a land surface. In the event of archaeological materials being present such activity would alter or destroy their context (even if the artefacts themselves are not destroyed, which is also obviously possible). Without context, archaeological traces are of much reduced significance. It is the contexts as much as the individual items that are protected by the heritage legislation.

It has already been noted that power line construction can have a generally lower impact than other kinds of construction on heritage resources. Sampson (1985) has shown that power lines tend to be less destructive on Stone Age sites than, for instance, roads since access along the route of the line during construction and maintenance tends to be by way of a 'twee-spoor' temporary roadway (not scraped, the surface not significantly modified). Nevertheless, individual tower positions might be of high archaeological or heritage significance (e.g. on a grave). As well, the impact of a 'twee-spoor' could be far greater on Iron Age or colonial era sites in other parts of South Africa or in urban or peri-urban situations where structures or other heritage features might need to be breached.

A number of broad expectations/concerns were expressed for assessment along the alternative alignments. Hence it was predicted that:

- Based on previous experience in the area, the terrain on the north eastern and northern outskirts of Kimberley is likely to include a generally low density and widespread occurrence of mainly Pleistocene Stone Age material, including what has been defined as Fauresmith, mainly based on hornfels as raw material. It would tend to occur on calcrete where exposed, or in the lower margins of Hutton sands that veneer the landscape here.
- There appear to be none of the features such as hills or rocky outcrops or even palaeodunes along the alignments which in other parts of this landscape provide shelter or relatively resource-rich micro-habitats that attracted people particularly of the Later Stone Age (an example being the hill at Wildebeest Kuil Rock Art Centre, or the Fauresmith site amongst the palaeodunes at Rosebery Plains on the Samaria Road). 'Off-site' distributions of artefacts would tend to be of low density and relatively lower significance.
- Considerable historical and recent surface disturbance has already occurred over much of the terrain that would be traversed by the proposed power line alternative alignments, the most obvious instances being: the nineteenth-early twentieth century mining floors between the Kimberley DS Substation and the Kenilworth Village; the modified landscape alongside the Kenilworth Village itself and through the Kimindustria area; in the vicinity of the railway; old mine debris along the northern fringes of the Floors, Colville and Homestead suburbs; and the mix of mine debris, ash-heap/waste disposal and abandoned sewerage works (former Fish Farm) situated between Floors/Colville and the Kimberley Golf Course and broadly westwards from there towards the Homestead Substation itself. Active mining/washing of old debris is occurring currently in parts of the last-mentioned vicinity. Subsistence (illegal) diggings occur currently beneath the existing Eskom line at the northern edge of Floors and Colville. The implications of this are that few *in situ* Stone Age occurrences of significance are likely to have survived the impacts of mining and urban/industrial development and city waste disposal in the areas in question.
- Industrial archaeological traces may occur in all instances of former mining activity, in this case associated mainly with the floors on which blue ground was spread out as part of the diamond retrieval process up to 1908 and 1914 (with respect to the De Beers and Kimberley Mine Floors) and to the c. 1940s (with respect to the Bultfontein and associated Floors alongside the Samaria Road). Also associated are mine dumps, some of which were used for redoubts (forts) in the Defence of

Kimberley during the Siege, 1899-1900. Some discarded mining areas subsequently became dumping areas for industrial and domestic waste (ash-heaps), e.g. near Kenilworth and alongside Collville and Homestead.

- Cultural history remains are to be found in Kimberley ash-heaps spread as landfill over an extensive area to the north of Floors Township, Collville and Homestead, some dating from around 1899.
- Significant intangible heritage values are not expected to be attached to former mining areas and waste-disposal areas. Certain contemporary commercial concerns, both formal and informal, attach to some resources in these areas, including subsistence digging for diamonds and bottles/materials for recycling.
- Visual impacts should be considered, particularly alongside heritage landscapes, in this case especially the Kenilworth Village.

Determining archaeological significance

In addition to guidelines provided by the National Heritage Resources Act (Act No. 25 of 1999), a set of criteria based on Deacon (nd) and Whitelaw (1997) for assessing archaeological significance has been developed for Northern Cape settings (Morris 2000a). These criteria include estimation of landform potential (in terms of its capacity to contain archaeological traces) and assessing the value of any archaeological traces (in terms of their attributes or their capacity to be construed as evidence, given that evidence is not given but constructed by the investigator). These significance assessment criteria are appended in table form at the conclusion of this report.

OBSERVATIONS

The proposed power line route alternatives were visited in September and October 2010 while key locales had been subject to investigation in relation to other projects previously. Archival sources provide important background relating to the evolution of mining and the city's northern edge. In summary, observations can be reported in relation to predictions made prior to fieldwork (see above):

A generally low density and widespread occurrence of mainly Pleistocene Stone Age material occurs at various places along the alignment alternatives. This includes probable Fauresmith material. Between the Kimberley DS Substation and Kenilworth the Hutton sands attain fair depth exceeding 1-2 m and exposures of underlying calcrete surfaces where the artefacts tend to occur are rare. They are evident in the edges of quarries and furrows. Similar artefacts have been noted in *disturbed* contexts in the

vicinity of the old Fish Farm/former sewerage works between Floors Township and the Golf Course. A collection of this material was made during an assessment at Vooruitzicht-81, south of the Golf Course (Morris & Kaplan 2001), while a systematic collection of Fauresmith material was made previously at the then proposed Treatment Plant adjacent to the Kimberley DS Substation (Morris 1992). None of the occurrences noted was as significant as the sites in quarries adjacent to the Samaria Road at Rosebery Plains (Beaumont 1990) and in many cases where they are found they are in already disturbed contexts.



Artefacts are typically on hornfels.

A lack of features such as hills or rocky outcrops precluded the possibility of rock engravings (an important aspect of the archaeological record in the Kimberley area – Morris 2006) at any point along the power line alignments. No convincing Later Stone Age sites were found.

Considerable historical and recent surface disturbance has already occurred over much of the terrain that would be traversed by the proposed power line routes. The implication that few *in situ* Stone Age occurrences of significance are likely to have survived the impacts of mining and urban/industrial development and city waste disposal in the areas in question is borne out by findings along the alternative routes, as already touched on above.

Industrial archaeological traces may occur in all instances of former mining activity, in this case associated mainly with the floors on which blue ground was spread out as part of the diamond retrieval process up to 1908 (De Beers Mine Depositing Floors), 1914 (Kimberley Mine Depositing Floors) and to the 1940s (Bultfontein and associated

Depositing Floors alongside the Samaria Road). Some of the layout of the depositing floors is clearly visible in Google Earth images and remnants of blue ground are still present in places.



In the area between the Kimberley DS Substation and the Samaria Road there are various limited traces of the rail haulage lines associated with the Bultfontein Depositing Floors – little remains of these since scrap metal was systematically removed by the mining company. One haulage line features in an 1893 map as a steam haulage system.

The Stables Compound site near the bend in the railway (first indicated in a map of 1900) may still be evident in the form of foundations and some scattered porcelain. Some of these traces may be impacted by the proposed power line. The nearby mine debris dump (across the railway) was the site of the Stables Redoubt during the siege, featuring in the Kimberley map of 1900.

Several of the old mine dumps have been reduced and cleared away in the last decade or so for re-treatment at the Combined Treatment Plant in order to retrieve of diamonds not found by old methods a century ago. Within the dumps, in places, refuse and industrial waste disposal areas have been found (e.g. in the Kenilworth dump east of Kenilworth and near to the Gladstone Cemetery – not areas to be impacted by the proposed power line routes). Informal diggers working alongside Collville located several cocopans buried in the base of the dump there (virtually under the existing Eskom line). All except one were recycled at the scrap metal merchant(s) – one example was purchased by the McGregor Museum.



Cocopan retrieved from dump at northern edge of Collville at approximately 28.712318° S 24.761388° E

Cultural history (other than industrial context) remains are to be found in Kimberley ash-heaps spread as landfill over an extensive area to the north of Floors Township, Collville and Homestead. In 1899 a railway was constructed northwards from the town of Kimberley to relocate scattered refuse heaps from various parts of Kimberley to a consolidated waste disposal area on the southern slope of Kamfersdam (Morris & Kaplan 2001). Ultimately a large dump north of the present Flamingo Casino was created, but ash-heaps/land-fill occur over a large area extending up to near the northern end of Floors Township and including the former Fish Farm. This area was used as a calcrete borrow pit for construction of the Flamingo Casino and in that context was subject to a detailed impact assessment and salvage excavations (Morris & Kaplan 2001) yielding a

key assemblage of early 1900s Kimberley refuse (much glass, porcelain, metal, well preserved bone and other food remains).



Known distribution of ash-heap deposits and the historic village of Kenilworth relative to the preferred power line route (black line)

Subsequently a pit was opened very near to the existing Municipal 66 kV power line, at 28.70386° S 24.76933° E, which revealed further ash heap material beginning at a depth of about 0.2 m. It is very possible that pylon construction along the preferred route may encounter similar material.



Subsurface historic ash midden material at the 'Fish Farm', Vooruitzicht-81 at 28.70386° S 24.76933° E. (Revealed by a pit for the erection of a pole). This shows how cultural material may occur below the modern seemingly sterile surface.

Further to the west, between the Homestead Sewerage Works and the Homestead Substation, a low density of domestic refuse disposal, perhaps up to a century old, was located at 28.690702° S 24.743092° E (Morris & Msawula 2010). Oral history recorded in the area indicated that this material might have been brought in as landfill and as land reclamation (debris dump clearance) at Cassandra, Kimberley, in the 1970s (Morris & Msawula 2010).



Cultural material located at 28.690702° S 24.743092° E, possibly introduced as landfill from Cassandra, 1970s.

Significant intangible heritage values are not expected to be attached to former mining areas and waste-disposal areas. However, certain contemporary commercial concerns, both formal and informal, attach to some resources in these areas, including subsistence digging for diamonds and bottles/materials for recycling.

Relatively formal mining and secondary washing activities are taking place in a few areas west of the railway up to the general vicinity of the Homestead Substation, including Pikwane Mining at 28.693598° S 24.746539° E.



Mining activity in the vicinity of the Municipal 66 kV line at 28.701599° S 24.769274° E,



Much less formal diggings are extensive on the edges of Floors Township and Collville, occasionally directly under the existing lines, as shown in the above photograph.

Visual impacts caused by industrial infrastructure including power lines are already very much in evidence over virtually the entire length of the proposed power line alternative

routes (which follow existing Eskom and Municipal power line servitudes). A strip of veld separates the proposed power line route and industrial landscape from the relatively self-contained Kenilworth Village.



View of the St Edward's Church, Kenilworth, from the vicinity of the power line route (above). North western end of Kenilworth from vicinity of power line route (below).



Summing up – recommendations

Although Stone Age material was found sparsely scattered over the areas to be traversed by the proposed power line alternative alignments, those occurrences that remain *in situ* tend to be only those in the eastern part of the area investigated. Even there it is likely that some disturbance occurred owing to mining activity, namely creation of depositing floors. The density of Stone Age material was found also to be low in comparison with more definite sites in the region. From an archaeological perspective the significance of Stone Age occurrences is low.

Industrial and cultural heritage traces have been found in areas relating to mining and landfill sites. The material is also not considered to be of major significance in the particular alignments proposed for the development, although it is possible that some material may be located when foundations are dug for towers in the area between the railway and the Homestead substation.

No graves were located and no burial grounds are indicated for any place along the alternative alignments on early maps of Kimberley that were consulted. Subsurface finds may be made and these could include unmarked graves including precolonial burials, although this is considered unlikely. In the event that any archaeological sites/traces/features of note should be found either at the surface or sub-surface in the course of transmission line development, work should halt and SAHRA and/or Ngwao Bošwa ya Kapa Bokone be contacted so that, inter alia, an archaeologist and/or heritage specialist is consulted to recommend any necessary mitigation measures.

On the basis of this study, no significant heritage traces were found that are considered to require major mitigation.

Comparison of alternative routes

Comparison of the alternative routes westwards of Kenilworth yields no reason to favour one route over the other so that this study may be said to support the preferred route parallel with the existing 66 kV Municipal power line.

DETERMINING SIGNIFICANCE

Assessment Criteria

The criteria for the description and assessment of environmental impacts were drawn from the EIA Regulations, published by the Department of Environmental Affairs and Tourism (April 1998) in terms of the National Environmental Management Act, 1998 (Act No.107 of 1998) and summarized in the Terms of Reference document, Appendix A, quoted here in full (with comments):

The level of detail was somewhat fine-tuned by assigning specific values to each impact. In order to establish a coherent framework within which all impacts could be objectively assessed it is necessary to establish a rating system, which is consistent throughout all criteria. For such purposes each aspect was assigned a value (refer to Figure below), ranging from 1-5, depending on its definition.

Potential Impact

This is an appraisal of the type of effect the proposed activity would have on the affected environmental component. Its description should include what is being affected and how it is being affected. (See relevant section above).

Extent

The physical and spatial scale of the impact is classified as:

- Local: The impacted area extends only as far as the activity, e.g. a footprint.
- Site: The impact could affect the whole, or a measurable portion of the site.
- Regional: The impact could affect the area including the neighbouring farms, the transport routes and the adjoining towns.

(In all instances the impact would be Local)

Duration

The lifetime of the impact, which is measured in relation to the lifetime of the proposed base.

- Short term: The impact will either disappear with mitigation or will be mitigated through a natural process in a period shorter than any of the phases.
- Medium term: The impact will last up to the end of the phases, where after it will be entirely negated.
- Long term: The impact will continue or last for the entire operational lifetime of the Development, but will be mitigated by direct human action or by natural processes thereafter.

Permanent: This is the only class of impact, which will be non-transitory. Mitigation either by man or natural process will not occur in such a way or in such a time span that the impact can be considered transient.

(Impacts on heritage and archaeological resources may be mitigated and hence classed as 'Short term' but the original in situ context is usually altered in a 'Permanent' way. If the archaeological or heritage significance of the resources in question is considered to be low then the significance of the permanent loss is low).

Intensity

The intensity of the impact is considered here by examining whether the impact is destructive or benign, whether it destroys the impacted environment, alters its functioning, or slightly alters the environment itself. These are rated as:

- Low:** The impact alters the affected environment in such a way that the natural processes or functions are not affected.
- Medium:** The affected environment is altered, but functions and processes continue, albeit in a modified way.
- High:** Function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases.

This will be a relative evaluation within the context of all the activities and the other impacts within the framework of the project.

(Archaeological and heritage resources being non-renewable, the intensity of any direct impact would be high but this evaluation would again be ameliorated by the significance attached to the particular resources in question – see comment under Duration above).

Probability

This describes the likelihood of the impacts actually occurring. The impact may occur for any length of time during the life cycle of the activity, and not at any given time. The classes are rated as follows:

- Improbable:** The possibility of the impact occurring is none, due either to the circumstances, design or experience.
- Possible:** The possibility of the impact occurring is very low, due either to the circumstances, design or experience.
- Likely:** There is a possibility that the impact will occur to the extent that provisions must therefore be made.

- Highly Likely: It is most likely that the impacts will occur at some stage of the Development. Plans must be drawn up before carrying out the activity.
- Definite: The impact will take place regardless of any prevention plans, and only mitigation actions or contingency plans to contain the effect can be relied on.

(With regard to this project the probability of impacts on heritage including archaeological resources is 'Possible')

Determination of Significance – Without Mitigation

Significance is determined through a synthesis of impact characteristics, and is an indication of the importance of the impact in terms of both physical extent and time scale. The significance of the impact “without mitigation” is the prime determinant of the nature and degree of mitigation required. Where the impact is positive, significance is noted as “positive”. Significance is rated on the following scale:

- No significance: The impact is not substantial and does not require any mitigation action.
- Low: The impact is of little importance, but may require limited mitigation.
- Medium: The impact is of importance and is therefore considered to have a negative impact. Mitigation is required to reduce the negative impacts to acceptable levels.
- High: The impact is of great importance. Failure to mitigate, with the objective of reducing the impact to acceptable levels, could render the entire development option or entire project proposal unacceptable. Mitigation is therefore essential.

Determination of Significance – With Mitigation

Significance is determined through a synthesis of impact characteristics. It is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. In this case the prediction refers to the foreseeable significance of the impact after the successful implementation of the suggested mitigation measures. Significance with mitigation is rated on the following scale:

- No significance: The impact will be mitigated to the point where it is regarded to be insubstantial.
- Low: The impact will be mitigated to the point where it is of limited importance.

- Low to medium: The impact is of importance, however, through the implementation of the correct mitigation measures such potential impacts can be reduced to acceptable levels.
- Medium: Notwithstanding the successful implementation of the mitigation measures, to reduce the negative impacts to acceptable levels, the negative impact will remain of significance. However, taken within the overall context of the project, the persistent impact does not constitute a fatal flaw.
- Medium to high: The impact is of great importance. Through implementing the correct mitigation measures the negative impacts will be reduced to acceptable levels.
- High: The impact is of great importance. Mitigation of the impact is not possible on a cost-effective basis. The impact continues to be of great importance, and, taken within the overall context of the project, is considered to be a fatal flaw in the project proposal. This could render the entire development option or entire project proposal unacceptable.

Nature	Construction and operational phases of power line development		Status	-
Impact source(s)	Any disturbance of the existing land surfaces may have an impact on archaeological or heritage resources where present. See also comments above on intangible values and visual impacts relative to heritage landscapes.			
Affected stakeholders	Heritage is part of the national estate: affected stakeholders are citizens at large.			
Magnitude	<i>Extent</i>	Local only		
	<i>Intensity</i>	May be high		
	<i>Duration</i>	May be high		
	<i>Reversibility</i>	Heritage resources are non-renewable – but representative examples or samples may be preserved in situ or salvaged for conservation elsewhere (e.g. in museum collection).		
	<i>Probability</i>	Possible		
Significance	<i>Without mitigation</i>	At most the significance of impact would be low, i.e. requiring limited mitigation. Limited mitigation may be recommended in the possible event that a tower position is located directly on a heritage feature such as (most possibly) a stone foundation or other feature potentially relating to the circa 1900+ Stables Compound in the vicinity of 28.715 - 28.719 S 24.790 - 24.792 E; or where tower construction encounters subsurface ash-heap cultural material, as may occur in the area near the Golf Course along the existing 66 kV Municipal line or at any point on any of the alignments westwards from the railway towards the Homestead Substation. In any given instance the archaeological and/or heritage significance may be deemed to be low so that mitigation is not necessary, but this cannot be predicted in advance.		L
	<i>With mitigation</i>	No significance.		N
Confidence	This assessment is based on engagement with the actual alternative routes of proposed power line development as well as previous surveys including excavations in the areas in question.			

Acknowledgements

I thank Ms Nelia Maritz and Ms Vici Napier for providing preliminary information. Delays with fieldwork and compilation of this report resulted from illness as well as strike action having temporary shut down of the museum at the time that project work was scheduled in August and September.

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APPENDIX 1: Tables for determining archaeological significance

In addition to guidelines provided by the National Heritage Resources Act (Act No. 25 of 1999), a set of criteria based on Deacon (nd) and Whitelaw (1997) for assessing archaeological significance has been developed for Northern Cape settings (Morris 2000a). These criteria include estimation of landform potential (in terms of its capacity to contain archaeological traces) and assessing the value of any archaeological traces (in terms of their attributes or their capacity to be construed as evidence, given that evidence is not given but constructed by the investigator).

Estimating site potential

Table 1 (below) is a classification of landforms and visible archaeological traces used for estimating the potential of archaeological sites (after J. Deacon nd, National Monuments Council). Type 3 sites tend to be those with higher archaeological potential, but there are notable exceptions to this rule, for example the renowned rock engravings site Driekopseiland near Kimberley which is on landform L1 Type 1 – normally a setting of lowest expected potential. It should also be noted that, generally, the older a site the poorer the preservation, so that sometimes *any* trace, even of only Type 1 quality, can be of exceptional significance. In light of this, estimation of potential will always be a matter for archaeological observation and interpretation.

Assessing site value by attribute

Table 2 is adapted from Whitelaw (1997), who developed an approach for selecting sites meriting heritage recognition status in KwaZulu-Natal. It is a means of judging a site's archaeological value by ranking the relative strengths of a range of attributes (given in the second column of the table). While aspects of this matrix remain qualitative, attribute assessment is a good indicator of the general archaeological significance of a site, with Type 3 attributes being those of highest significance.

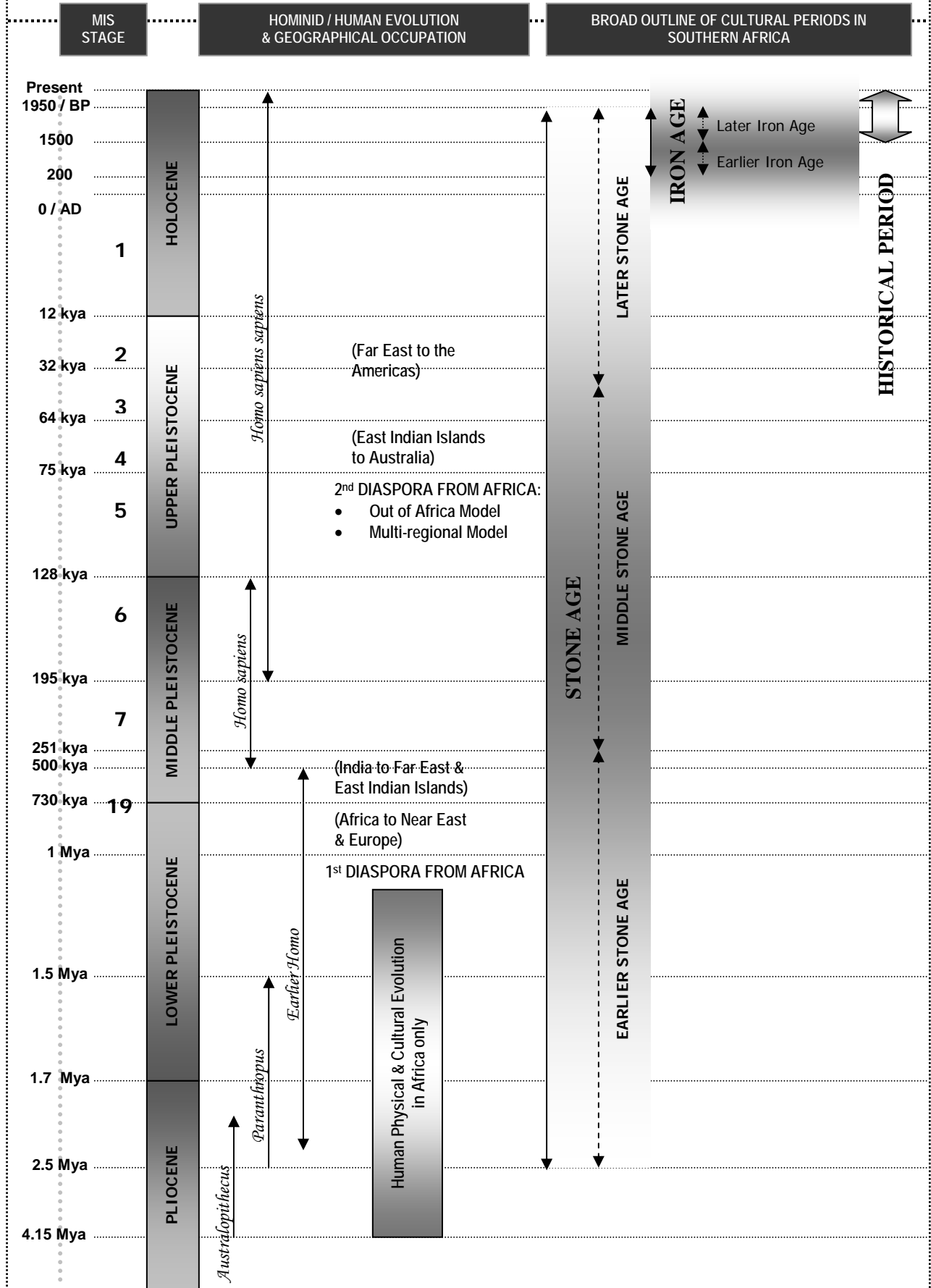
Table 1. Classification of landforms and visible archaeological traces for estimating the potential for archaeological sites (after J. Deacon, National Monuments Council).

Class	Landform	Type 1	Type 2	Type 3
L1	Rocky surface	Bedrock exposed	Some soil patches	Sandy/grassy patches
L2	Ploughed land	Far from water	In floodplain	On old river terrace
L3	Sandy ground, inland	Far from water	In floodplain or near feature such as hill	On old river terrace
L4	Sandy ground, Coastal	>1 km from sea	Inland of dune cordon	Near rocky shore
L5	Water-logged deposit	Heavily vegetated	Running water	Sedimentary basin
L6	Developed urban	Heavily built-up with no known record of early settlement	Known early settlement, but buildings have basements	Buildings without extensive basements over known historical sites
L7	Lime/dolomite	>5 myrs	<5000 yrs	Between 5000 yrs and 5 myrs
L8	Rock shelter	Rocky floor	Sloping floor or small area	Flat floor, high ceiling
Class	Archaeological traces	Type 1	Type 2	Type 3
A1	Area previously excavated	Little deposit remaining	More than half deposit remaining	High profile site
A2	Shell or bones visible	Dispersed scatter	Deposit <0.5 m thick	Deposit >0.5 m thick; shell and bone dense
A3	Stone artefacts or stone walling or other feature visible	Dispersed scatter	Deposit <0.5 m thick	Deposit >0.5 m thick

Table 2. Site attributes and value assessment (adapted from Whitelaw 1997)

Class	Attribute	Type 1	Type 2	Type 3
1	Length of sequence/context	No sequence Poor context Dispersed distribution	Limited sequence	Long sequence Favourable context High density of arte/ecofacts
2	Presence of exceptional items (incl regional rarity)	Absent	Present	Major element
3	Organic preservation	Absent	Present	Major element
4	Potential for future archaeological investigation	Low	Medium	High
5	Potential for public display	Low	Medium	High
6	Aesthetic appeal	Low	Medium	High
7	Potential for implementation of a long-term management plan	Low	Medium	High

Schematic Human Physical and Cultural Evolution in Africa



Extracts from the National Heritage Resources Act (No 25 of 1999)

DEFINITIONS

Section 2

In this Act, unless the context requires otherwise:

- ii. "*Archaeological*" means –
 - a) material remains resulting from human activity which are in a state of disuse and are in or on land and which are older than 100 years, including artefacts, human and hominid remains and artificial features and structures;
 - b) rock art, being any form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and which is older than 100 years, including any area within 10 m of such representation;
 - c) wrecks, being any vessel or aircraft, or any part thereof, which was wrecked in South Africa, whether on land, in the internal waters, the territorial waters or in the maritime culture zone of the Republic, ... and any cargo, debris, or artefacts found or associated therewith, which is older than 60 years or which SAHRA considers to be worthy of conservation.
- viii. "*Development*" means any physical intervention, excavation or action, other than those caused by natural forces, which may in the opinion of a heritage authority in any way result in a change to the nature, appearance or physical nature of a place, or influence its stability and future well-being, including –
 - a) construction, alteration, demolition, removal or change of use of a place or structure at a place;
 - b) carrying out any works on or over or under a place;
 - c) subdivision or consolidation of land comprising, a place, including the structures or airspace of a place;
 - d) constructing or putting up for display signs or hoardings;
 - e) any change to the natural or existing condition or topography of land; and
 - f) any removal or destruction of trees, or removal of vegetation or topsoil;
- xiii. "*Grave*" means a place of interment and includes the contents, headstone or other marker of such a place, and any other structure on or associated with such place;
- xxi. "*Living heritage*" means the intangible aspects of inherited culture, and may include –
 - a) cultural tradition;
 - b) oral history;
 - c) performance;
 - d) ritual;
 - e) popular memory;
 - f) skills and techniques;
 - g) indigenous knowledge systems; and
 - h) the holistic approach to nature, society and social relationships.
- xxxi. "*Palaeontological*" means any fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or trances;
- xli. "*Site*" means any area of land, including land covered by water, and including any structures or objects thereon;
- xliv. "*Structure*" means any building, works, device or other facility made by people and which is fixed to land, and includes any fixtures, fittings and equipment associated therewith;

NATIONAL ESTATE

Section 3

- 1) For the purposes of this Act, those heritage resources of South Africa which are of cultural significance or other special value for the present community and for future generations must be considered part of the national estate and fall within the sphere of operations of heritage resources authorities.
- 2) Without limiting the generality of subsection 1), the national estate may include –
 - a) places, buildings, structures and equipment of cultural significance;
 - b) places to which oral traditions are attached or which are associated with living heritage;
 - c) historical settlements and townscapes;
 - d) landscapes and natural features of cultural significance;
 - e) geological sites of scientific or cultural importance
 - f) archaeological and palaeontological sites;
 - g) graves and burial grounds, including –
 - i. ancestral graves;

- ii. royal graves and graves of traditional leaders;
 - iii. graves of victims of conflict
 - iv. graves of individuals designated by the Minister by notice in the Gazette;
 - v. historical graves and cemeteries; and
 - vi. other human remains which are not covered in terms of the Human Tissue Act, 1983 (Act No 65 of 1983)
- h) sites of significance relating to the history of slavery in South Africa;
- i) movable objects, including –
- i. objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens;
 - ii. objects to which oral traditions are attached or which are associated with living heritage;
 - iii. ethnographic art and objects;
 - iv. military objects;
 - v. objects of decorative or fine art;
 - vi. objects of scientific or technological interest; and
 - vii. books, records, documents, photographic positives and negatives, graphic, film or video material or sound recordings, excluding those that are public records as defined in section 1 xiv) of the National Archives of South Africa Act, 1996 (Act No 43 of 1996).

STRUCTURES

Section 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.

ARCHAEOLOGY, PALAEOLOGY AND METEORITES

Section 35

- 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 assists in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites.
- 5) When the responsible heritage resources authority has reasonable cause to believe that any activity or development which will destroy, damage or alter any archaeological or palaeontological site is under way, and where no application for a permit has been submitted and no heritage resources management procedure in terms of section 38 has been followed, it may –
- a) serve on the owner or occupier of the site or on the person undertaking such development an order for the development to cease immediately for such period as is specified in the order;
 - b) carry out an investigation for the purpose of obtaining information on whether or not an archaeological or palaeontological site exists and whether mitigation is necessary;
 - c) if mitigation is deemed by the heritage resources authority to be necessary, assist the person on whom the order has been served under paragraph a) to apply for a permit as required in subsection 4); and
 - d) recover the costs of such investigation from the owner or occupier of the land on which it is believed an archaeological or palaeontological site is located or from the person proposing to undertake the development if no application for a permit is received within two weeks of the order being served.
- 6) The responsible heritage resources authority may, after consultation with the owner of the land on which an archaeological or palaeontological site or meteorite is situated, serve a notice on the owner or any other controlling authority, to prevent activities within a specified distance from such site or meteorite.

BURIAL GROUNDS AND GRAVES

Section 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.
- 4) SAHRA or a provincial heritage resources authority may not issue a permit for the destruction of any burial ground or grave referred to in subsection 3a) unless it is satisfied that the applicant has made satisfactory arrangements for the exhumation and re-interment of the contents of such graves, at the cost of the applicant and in accordance with any regulations made by the responsible heritage resources authority.
- 5) SAHRA or a provincial heritage resources authority may not issue a permit for any activity under subsection 3b) unless it is satisfied that the applicant has, in accordance with regulations made by the responsible heritage resources authority –
- a) made a concerted effort to contact and consult communities and individuals who by tradition have an interest in such grave or burial ground; and
 - b) reached agreements with such communities and individuals regarding the future of such grave or burial ground.
- 6) Subject to the provision of any other law, any person who in the course of development or any other activity discovers the location of a grave, the existence of which was previously unknown, must immediately cease such activity and report the discovery to the responsible heritage resources authority which must, in co-operation with the South African Police Service and in accordance with regulations of the responsible heritage resources authority –
- a) carry out an investigation for the purpose of obtaining information on whether or not such grave is protected in terms of this Act or is of significance to any community; and
 - b) if such grave is protected or is of significance, assist any person who or community which is a direct descendant to make arrangements for the exhumation and re-internment of the contents of such grave or, in the absence of such person or community, make any such arrangements as it deems fit.

HERITAGE RESOURCES MANAGEMENT

Section 38

- 1) Subject to the provisions of subsections 7), 8) and 9), any person who intends to undertake a development categorised as –
- a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length;
 - b) the construction of a bridge or similar structure exceeding 50 m in length;
 - c) any development or other activity which will change the character of a site –
 - i. exceeding 5 000 m² in extent; or
 - ii. involving three or more existing erven or subdivisions thereof; or
 - iii. involving three or more erven or subdivisions thereof which have been consolidated within the past five years; or
 - iv. the costs which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;
 - d) the rezoning of a site exceeding 10 000 m² in extent; or
 - e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority,
- must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.
- 2) The responsible heritage resources authority must, within 14 days of receipt of a notification in terms of subsection 1) –
- a) if there is reason to believe that heritage resources will be affected by such development, notify the person who intends to undertake the development to submit an impact assessment report. Such report must be compiled at the cost of the person proposing the development, by a person or persons approved by the responsible heritage resources authority with relevant qualifications and experience and professional standing in heritage resources management; or
 - b) notify the person concerned that this section does not apply.
- 3) The responsible heritage resources authority must specify the information to be provided in a report required in terms of subsection 2a) ...
- 4) The report must be considered timeously by the responsible heritage resources authority which must, after consultation with the person proposing the development decide –
- a) whether or not the development may proceed;
 - b) any limitations or conditions to be applied to the development;
 - c) what general protections in terms of this Act apply, and what formal protections may be applied, to such heritage resources;
 - d) whether compensatory action is required in respect of any heritage resources damaged or destroyed as a result of the development; and

- e) whether the appointment of specialists is required as a condition of approval of the proposal.

APPOINTMENT AND POWERS OF HERITAGE INSPECTORS

Section 50

- 7) Subject to the provision of any other law, a heritage inspector or any other person authorised by a heritage resources authority in writing, may at all reasonable times enter upon any land or premises for the purpose of inspecting any heritage resource protected in terms of the provisions of this Act, or any other property in respect of which the heritage resources authority is exercising its functions and powers in terms of this Act, and may take photographs, make measurements and sketches and use any other means of recording information necessary for the purposes of this Act.
- 8) A heritage inspector may at any time inspect work being done under a permit issued in terms of this Act and may for that purpose at all reasonable times enter any place protected in terms of this Act.
- 9) Where a heritage inspector has reasonable grounds to suspect that an offence in terms of this Act has been, is being, or is about to be committed, the heritage inspector may with such assistance as he or she thinks necessary –
 - a) enter and search any place, premises, vehicle, vessel or craft, and for that purpose stop and detain any vehicle, vessel or craft, in or on which the heritage inspector believes, on reasonable grounds, there is evidence related to that offence;
 - b) confiscate and detain any heritage resource or evidence concerned with the commission of the offence pending any further order from the responsible heritage resources authority; and
 - c) take such action as is reasonably necessary to prevent the commission of an offence in terms of this Act.

A heritage inspector may, if there is reason to believe that any work is being done or any action is being taken in contravention of this Act or the conditions of a permit issued in terms of this Act, order the immediate cessation of such work or action pending any further order from the responsible heritage resources authority.