



**AINP**  
Archaeo-Info Northern Province  
PO Box 7296  
Tlohooyandou  
0950  
TEL/FAX: +27 (15) 963 8409  
E-mail: [stephan@laluma.com](mailto:stephan@laluma.com)

# Heritage Impact Assessment

Heritage Impact Assessment for the Proposed  
Private Resort on the Farm Brakvley 347 KQ,  
Limpopo Province.

*no layout plan of proposed development with site marked on it*

**PREPARED BY:**  
Archaeo-Info Northern Province

**PREPARED FOR:**  
Tekplan Environmental

**August 2006**



## Credit Sheet

### **Project Director**

Stephan Gaigher (BA Hons, Archaeology, UP)  
Principal Investigator for AINP  
Member of ASAPA (# 057)  
Tel.: (015) 963 8409  
Cell.: 083 324 2714  
E-mail: [stephan@lajuma.com](mailto:stephan@lajuma.com)

### **Fieldworker**

Eric N. Mathoho (BA, Archaeology, Univen)  
Fieldworker for AINP  
Member of ASAPA

### **Report Author**

Stephan Gaigher

*Disclaimer: Although all possible care is taken to identify all sites of cultural importance during the investigation of study areas, it is always possible that hidden or sub-surface sites could be overlooked during the study. AINP and its personnel will not be held liable for such oversights or for costs incurred as a result of such oversights.*

SIGNED OF BY: STEPHAN GAIGHER

.....

## Management Summary

**Site name and location:** Proposed Private Resort on the Farm Brakvley 347 KQ, Limpopo Province.

**Magisterial district:** Waterberg District Municipality

**Developer:** Mr. M. Schrenk

**Consultant:** AINP, PO Box 7296, Thohoyandou, 0950, South Africa

**Date development was mooted:** June 2006

**Date of Report:** 2 August 2006

**Proposed date of commencement of development:** August 2006

**Findings:** A single occupational site was found on the property. This was however not within the proposed development site. Some Middle Stone Age tools were also discovered, but the concentration is not significant enough to constitute a site. Provided the recommendations outlined in this report are followed, the Proposed Private Resort Development on the Farm Brakvley 347 KQ, can continue from a heritage point of view.

# Table of Contents

Credit Sheet .....	2
Management Summary .....	3
Table of Contents .....	4
List of Figures, Tables & Appendices.....	5
Introduction.....	6
Proposed Project.....	6
Project Area.....	6
Methodology .....	7
Inventory.....	7
Site Surveying .....	7
Survey Sampling.....	8
Systematic Survey Sampling .....	8
Judgemental Survey Sampling .....	8
Assessment.....	8
Site Evaluation .....	9
Significance Criteria .....	9
Assessing Impacts .....	9
Resource Inventory .....	14
Brakley Private Resort .....	14
Resource Evaluation.....	14
Impact Identification and Assessment.....	14
Resource Management Recommendations .....	14
References Cited .....	15



## List of Figures, Tables & Appendices

Table 1.	Site significance (Pre-Contact).....	11
Table 2.	Site significance (Post-Contact).....	11
Table 3.	Pre-contact site characteristics.....	12
Table 4.	Post-contact site characteristics.....	12
Appendix A	Photographs.....	18
	Photo 1 – Site for development	
	Photo 2 – LIA site in other area	
Appendix B	Criteria for Pre-Contact Site Evaluation.....	20
Appendix C	Criteria for Post-Contact Site Evaluation.....	23
Appendix D	Criteria for Site Evaluation.....	25
Appendix E	Location Maps.....	27





Subsurface testing is usually accomplished by shovel, although augers and core samplers are also used where conditions are suitable. Shovel test units averaging 40 square cm are generally appropriate, and are excavated to a sterile stratum (i.e. C Horizon, alluvial till, etc.). Depending on the site survey strategy, subsurface testing is conducted systematically or randomly across the survey area. Other considerations such as test unit location, frequency, depth and interval spacing will also depend on the survey design as well as various biophysical factors. (*Lightfoot, Keng G. 1989*).

#### Survey Sampling

Site survey involves the complete or partial inspection of a proposed project area for the purpose of locating archaeological or other heritage sites. Since there are many possible approaches to field survey, it is important to consider the biophysical conditions and archaeological site potential of the survey area in designing the survey strategy.

Ideally, the archaeological site inventory should be based on intensive survey of every portion of the impact area, as maximum areal coverage will provide the most comprehensive understanding of archaeological and other heritage resource density and distribution. However, in many cases the size of the project area may render a complete survey impractical because of time and cost considerations.

In some situations it may be practical to intensively survey only a sample of the entire project area.

Sample selection is approached systematically, based on accepted statistical sampling procedures, or judgementally, relying primarily on subjective criteria (*Butler, W., 1984*).

#### Systematic Survey Sampling

A systematic sample survey is designed to locate a representative sample of archaeological or heritage resources within the project area. A statistically valid sample will allow predictions to be made regarding total resource density, distribution and variability. In systematic sample surveys it may be necessary to exempt certain areas from intensive inspection owing to excessive slope, water bodies, landslides, land ownership, land use or other factors. These areas must be explicitly defined. Areas characterized by an absence of road access or dense vegetation should not be exempted. (*Dunnell, R. C., Dancy W.S. 1983*).

#### Judgemental Survey Sampling

Under certain circumstances, it is appropriate to survey a sample of the project area based entirely on professional judgement regarding the location of sites. Only those areas which can reasonably be expected to contain archaeological or heritage sites are surveyed.

However, a sufficient understanding of the cultural and biophysical factors which influenced or accounted for the distribution of these sites over the landscape is essential. Careful consideration must be given to ethnographic patterns of settlement, land use and resource exploitation; the kinds and distribution of aboriginal food sources; and restrictions on site location imposed by physical terrain, climatic regimes, soil chemistry or other factors. A judgemental sample survey is not desirable if statistically valid estimates of total heritage resource density and variability are required (*McManamon F.P. 1984*).

#### Assessment

Assessment studies are only required where conflicts have been identified between heritage resources and a proposed development. These studies require an evaluation of the heritage resource to be impacted, as well as an assessment of project impacts. The purpose of the assessment is to provide recommendations as to the most appropriate manner in which the resource may be managed in light of the identified impacts. Management options may include alteration of proposed development plans to avoid resource impact, mitigative studies directed at retrieving resource values prior to impact, or compensation for the unavoidable loss of resource values.

It is especially important to utilize specialists at this stage of assessment. The evaluation of any archaeological resource should be performed by professionally qualified individuals.

## Site Evaluation

Techniques utilized in evaluating the significance of a heritage site include systematic surface collecting and evaluative testing. Systematic surface collection is employed wherever archaeological remains are evident on the ground surface. However, where these sites contain buried deposits, some degree of evaluative testing is also required.

Systematic surface collection from archaeological sites should be limited, insofar as possible, to a representative sample of materials. Unless a site is exceptionally small and limited to the surface, no attempt should be made at this stage to collect all or even a major portion of the materials. Intensive surface collecting should be reserved for full scale data recovery if mitigative studies are required. Site significance is determined following an analysis of the surface collected and/or excavated materials (Miller, C.L. II, 1989).

## Significance Criteria

There are several kinds of significance, including scientific, public, ethnic, historic and economic, that need to be taken into account when evaluating heritage resources. For any site, explicit criteria are used to measure these values. Checklists of criteria for evaluating pre-contact and post-contact archaeological sites are provided in Appendix B and Appendix C. These checklists are not intended to be exhaustive or inflexible. Innovative approaches to site evaluation which emphasize quantitative analysis and objectivity are encouraged. The process used to derive a measure of relative site significance must be rigorously documented, particularly the system for ranking or weighting various evaluatory criteria.

Site integrity, or the degree to which a heritage site has been impaired or disturbed as a result of past land alteration, is an important consideration in evaluating site significance. In this regard, it is important to recognize that although an archaeological site has been disturbed, it may still contain important scientific information.

Heritage resources may be of scientific value in two respects. The potential to yield information which, if properly recovered, will enhance understanding of Southern African human history is one appropriate measure of scientific significance. In this respect, archaeological sites should be evaluated in terms of their potential to resolve current archaeological research problems. Scientific significance also refers to the potential for relevant contributions to other academic disciplines or to industry.

Public significance refers to the potential a site has for enhancing the public's understanding and appreciation of the past. The interpretive, educational and recreational potential of a site are valid indications of public value. Public significance criteria such as ease of access, land ownership, or scenic setting are often external to the site itself. The relevance of heritage resource data to private industry may also be interpreted as a particular kind of public significance.

Ethnic significance applies to heritage sites which have value to an ethnically distinct community or group of people. Determining the ethnic significance of an archaeological site may require consultation with persons having special knowledge of a particular site. It is essential that ethnic significance be assessed by someone properly trained in obtaining and evaluating such data.

Historic archaeological sites may relate to individuals or events that made an important, lasting contribution to the development of a particular locality or the province. Historically important sites also reflect or commemorate the historic socioeconomic character of an area. Sites having high historical value will also usually have high public value.

The economic or monetary value of a heritage site, where calculable, is also an important indication of significance. In some cases, it may be possible to project monetary benefits derived from the public's use of a heritage site as an educational or recreational facility. This may be accomplished by employing established economic evaluation methods; most of which have been developed for valuating outdoor recreation. The objective is to determine the willingness of users, including local residents and tourists, to pay for the experiences or services the site provides even though no payment is presently being made. Calculation of user benefits will normally require some study of the visitor population (Smith, L.D. 1977).

## Assessing Impacts

A heritage resource impact may be broadly defined as the net change between the integrity of a heritage site with and without the proposed development. This change may be either beneficial or adverse.



Beneficial impacts occur wherever a proposed development actively protects, preserves or enhances a heritage resource. For example, development may have a beneficial effect by preventing or lessening natural site erosion. Similarly, an action may serve to preserve a site for future investigation by covering it with a protective layer of fill. In other cases, the public or economic significance of an archaeological site may be enhanced by actions which facilitate non-destructive public use. Although beneficial impacts are unlikely to occur frequently, they should be included in the assessment.

More commonly, the effects of a project on heritage sites are of an adverse nature. Adverse impacts occur under conditions that include:

- (a) destruction or alteration of all or part of a heritage site;
- (b) isolation of a site from its natural setting; and
- (c) introduction of physical, chemical or visual elements that are out-of-character with the heritage resource and its setting.

Adverse effects can be more specifically defined as direct or indirect impacts. Direct impacts are the immediately demonstrable effects of a project which can be attributed to particular land modifying actions. They are directly caused by a project or its ancillary facilities and occur at the same time and place. The immediate consequences of a project action, such as slope failure following reservoir inundation, are also considered direct impacts.

Indirect impacts result from activities other than actual project actions. Nevertheless, they are clearly induced by a project and would not occur without it. For example, project development may induce changes in land use or population density, such as increased urban and recreational development, which may indirectly impact upon heritage sites. Increased vandalism of heritage sites, resulting from improved or newly introduced access, is also considered an indirect impact. Indirect impacts are much more difficult to assess and quantify than impacts of a direct nature.

Once all project related impacts are identified, it is necessary to determine their individual level-of-effect on heritage resources. This assessment is aimed at determining the extent or degree to which future opportunities for scientific research, preservation, or public appreciation are foreclosed or otherwise adversely affected by a proposed action. Therefore, the assessment provides a reasonable indication of the relative significance or importance of a particular impact. Normally, the assessment should follow site evaluation since it is important to know what heritage values may be adversely affected.

The assessment should include careful consideration of the following level-of-effect indicators, which are defined in Appendix D:

- magnitude
- severity
- duration
- range
- frequency
- diversity
- cumulative effect
- rate of change

The level-of-effect assessment should be conducted and reported in a quantitative and objective fashion. The methodological approach, particularly the system of ranking level-of-effect indicators, must be rigorously documented and recommendations should be made with respect to managing uncertainties in the assessment. (*Zubrow, Ezra B.A., 1984*).

Impact Effect	Score
Magnitude	0-4

Severity	0-4
Duration	0-4
Range	0-4
Frequency	0-4
Diversity	0-4
Cumulative effect	0-4
Rate of change	0-4
Total score:	0-32

Impact severity table.

Impacts will be defined along the following parameters;

Effect	Score
No effect on site	0
Insignificant impact on site	1-5
Significant impact on site	6-16
Major destruction of site and attributes	17-24
Total destruction of sites and attributes	25-32

The study area was surveyed using standard archaeological surveying methods. The area was surveyed using directional parameters supplied by the GPS and surveyed by foot. This technique has proven to result in the maximum coverage of an area. This action is defined as;

*'an archaeologist being present in the course of the carrying-out of the development works (which may include conservation works), so as to identify and protect archaeological deposits, features or objects which may be uncovered or otherwise affected by the works'* (DAHGI 1999a, 28).

Standard archaeological documentation formats were employed in the description of sites. Using standard site documentation forms as comparable medium, it enabled the surveyors to evaluate the relative importance of sites found. Furthermore GPS (Global Positioning System) readings of all finds and sites were taken. This information was then plotted using a **eTrex Legend** GPS (WGS 84- datum). Indicators such as surface finds, plant growth anomalies, local information and topography were used in identifying sites of possible archaeological importance. Test probes were done at intervals to determine sub-surface occurrence of archaeological material. The importance of sites was assessed by comparisons with published information as well as comparative collections.

*Test excavation is that form of archaeological excavation where the purpose is to establish the nature and extent of archaeological deposits and features present in a location which it is proposed to develop (though not normally to fully investigate those deposits or features) and allow an assessment to be made of the archaeological impact of the proposed development. It may also be referred to as archaeological testing'* (DAHGI 1999a, 27).

*Test excavation should not be confused with, or referred to as, archaeological assessment which is the overall process of assessing the archaeological impact of development. Test excavation is one of the techniques in carrying out archaeological assessment which may also include, as appropriate, documentary research, fieldwalking, examination of upstanding or visible features or structures,*

examination of aerial photographs, satellite or other remote sensing imagery, geophysical survey, and topographical assessment' (DAHGI 1999b, 18).

All sites or possible sites found were classified using a hierarchical system wherein sites are assessed using a scale of zero to four according to their importance. These categories are as follows:

Degree of significance	Justification	Score
Exceptional significance	Rare or outstanding, high degree of intactness. Can be interpreted easily.	13 - 16
High significance	High degree of original fabric. Demonstrates a key element of item's significance. Alterations do not detract from significance.	9 - 12
Moderate significance	Altered or modified elements. Element with little heritage value, but which contribute to the overall significance.	5 - 8
Little significance	Alterations detract from significance. One of many. Alterations detract from significance.	1 - 4
Intrusive	Damaging to the item's heritage significance.	0

Table 1. Site significance table for pre-contact sites.

Degree of significance	Justification	Score
Exceptional significance	Rare or outstanding, high degree of intactness. Can be interpreted easily.	29 - 24
High significance	High degree of original fabric. Demonstrates a key element of item's significance. Alterations do not detract from significance.	13 - 18
Moderate significance	Altered or modified elements. Element with little heritage value, but which contribute to the overall significance.	7 - 12
Little significance	Alterations detract from significance. One of many. Alterations detract from significance.	1 - 6
Intrusive	Damaging to the item's heritage significance.	0

Table 2. Site significance table for post-contact sites.

The qualitative value of a site's significance will be calculated by tabling its significance characteristics (as outlined in appendix B & C) on a sliding value scale and determining an accumulative value for the specific site. Two tables will be used:



Site significance characteristics slide scale (Pre-Contact Criteria)					
Scientific Significance	0	1	2	3	4
Public Significance	0	1	2	3	4
Ethnic Significance	0	1	2	3	4
Economic Significance	0	1	2	3	4
<b>Total Score</b>					

Table 3. Pre-contact site criteria (0- no value, 4- highest value)

Site significance characteristics slide scale (Post-Contact Criteria)					
Scientific Significance	0	1	2	3	4
Historic Significance	0	1	2	3	4
Public Significance	0	1	2	3	4
Other Significance	0	1	2	3	4
Ethnic Significance	0	1	2	3	4
Economic Significance	0	1	2	3	4
<b>Total Score</b>					

Table 4. Post-contact site criteria (0- no value, 4- highest value)

The values calculated (as specified in appendix B&C) are attributed to a category within the site significance table to provide the site with a quantifiable significance value. This will only be done for identified sites. Should an area under investigation not show any evidence of human activity this will be stated and no further qualifying will be done.

This information will be contained in a report that will strive to:

Review the purpose, approach, methodology and reporting of archaeological assessment and monitoring and propose guidelines on how to adequately address four key questions:

- i. What is the research value and potential of the archaeological remains?
- ii. What will the impact of development be?
- iii. What types of mitigation (by design modification or further investigation) would be appropriate to mitigate the impact of development and/or make a useful contribution to knowledge?
- iv. What will be the likely cost and timescale of any further investigation, analysis and reporting, given the nature of the archaeology and the type and extent of further work required?

## Resource Inventory

This section will contain the results of the heritage site inventory. Any identified sites will be indicated on the accompanying map plotted using the OzExplorer Geographic Information System (GIS).

### Brakvley Private Resort

No sites of heritage significance were identified in the direct vicinity of the study area. It should however be pointed out that the investigators identified prominent Late Iron Age ruins on the farm as well as a scattering of Middle Stone Age tools. None of these sites were close to the area proposed for development but cognisance should be taken of the existence when constructing roads on the farm in future. The area investigated was also along a very steep incline in places with heavy undergrowth. For this reason it is possible that indicators of subterranean sites could have been overlooked. It is important to realise that this area is very rich in cultural remains, such as iron smelting sites and defensive sites in the mountains. For this reason extra care should be taken when developing these areas.

*Low? monitoring?*  
*limited visibility*

### Resource Evaluation

No sites of any heritage potential were identified within the direct vicinity of the proposed area for development.

## Impact Identification and Assessment

As no sites of heritage significance were identified in the study area, no impacts on the cultural heritage of the area are being anticipated.

## Resource Management Recommendations

No direct recommendations for sites will be given as no site of heritage importance were identified within the indicated study area. It is however recommended that when the final plots are placed that a heritage investigator inspects the areas for any sites that might have been missed. This is only necessary for the site directly affected by the construction of the occupational units and the recreational facilities. This is deemed necessary due to the overall cultural sensitivity of the area and because of the fact that such sites had been identified on other areas of the farm.

## References Cited

1. Aldenderfer, Mark S., and Carolyn A. Hale-Pierce  
1984 The Small-Scale Archaeological Survey Revisited. *American Archeology* 4(1):4-5.
2. Butler, William  
1984 Cultural Resource Management: The No-Collection Strategy in Archaeology. *American Antiquity* 44(4):795-799.
3. Deacon, J. 1996. *Archaeology for Planners, Developers and Local Authorities*. National Monuments Council. Publication no. PO21E.
4. Deacon, J. 1997. *Report: Workshop on Standards for the Assessment of Significance and Research Priorities for Contract Archaeology*. In: Newsletter No. 49, Sept. 1998. South African Association of Archaeology.
5. Dincause, Dena F., H. Martin Wobst, Robert J. Hasenstab and David M. Lacy  
1984 *A Retrospective Assessment of Archaeological Survey Contracts in Massachusetts, 1970-1979*. Massachusetts Historical Commission. Survey and Planning Grant 1980. 3 volumes.
6. Dunnell, Robert C., and William S. Dancy  
1983 The Siteless Survey: A Regional Scale Data Collection Strategy. In: *Advances in Archaeological Method and Theory* 6:267-287. M.B. Schiffer, ed.
7. Evers, T.M. 1983. *Oori or Moko? The origins of the Sotho/Tswana on the evidence of the Iron Age of the Transvaal*. S. Afr. J. Sci. 79(7): 261-264.
8. Hall, M. 1987. *The changing past: Farmers, kings and traders in Southern Africa, 200-1860*. Cape Town: David Phillip.
9. Hall, S.L. 1981. *Iron Age sequence and settlement in the Rooiberg, Thabazimbi area*. Unpublished MA thesis, University of the Witwatersrand.
10. Huffman, T.N. 1989. "Zimbabwe ruins and Venda prehistory." *The Digging Stick*, 6(3), 11.
11. King, Thomas F.  
1978 *The Archaeological Survey: Its Methods and Uses*. Interagency Archaeological Services, Department of the Interior, Washington, D.C.
12. Lightfoot, Kent G.  
1989 A Defense of Shovel Test Sampling: A Reply to Shott. *American Antiquity* 54(2):413-416.
13. Maggs, T.M. O'C. 1976a. *Iron Age communities of the southern Highveld*. Pietermaritzburg: Natal Museum.
14. McManamon, F.P.  
1984 *Discovering Sites Unseen*. In *Advances in Archaeological Method and Theory* 8:223-292, edited by

15. M.B. Schiffer, Academic Press, New York.
16. Miller, C. L., II 1989 Evaluating the Effectiveness of Archaeological Surveys. *Ontario Archaeology* 49:3-12.
17. Loubser, J.H.N. 1994. *Ndebele Archaeology of the Pietersburg Area*. Navors. Nas. Mus., Bloemfontein. Volume 10, Part 2: 62-147.
18. Pistorius, J.C.C. 1992. *Molokwane, an Iron Age Bakwena Village*. Johannesburg: Perskor Printers.
19. Schiffer, Michael B., Alan P. Sullivan, and Timothy C. Klinger 1978 The Design of Archaeological Surveys. *World Archaeology* 10:1-28.
20. Smith, L.D. 1977 *Archeological Sampling Procedures For Large Land Areas: A Statistically Based Approach*. USDA Forest Service, Albuquerque.
21. Stayl, H. 1931. *The Bavenda*. London: Oxford University Press.
22. Zubrow, Ezra B.A. 1984 Small-Scale Surveys: A Problem For Quality Control. *American Archeology* 4(1):16-27.

# APPENDIX A

## PHOTOGRAPHS



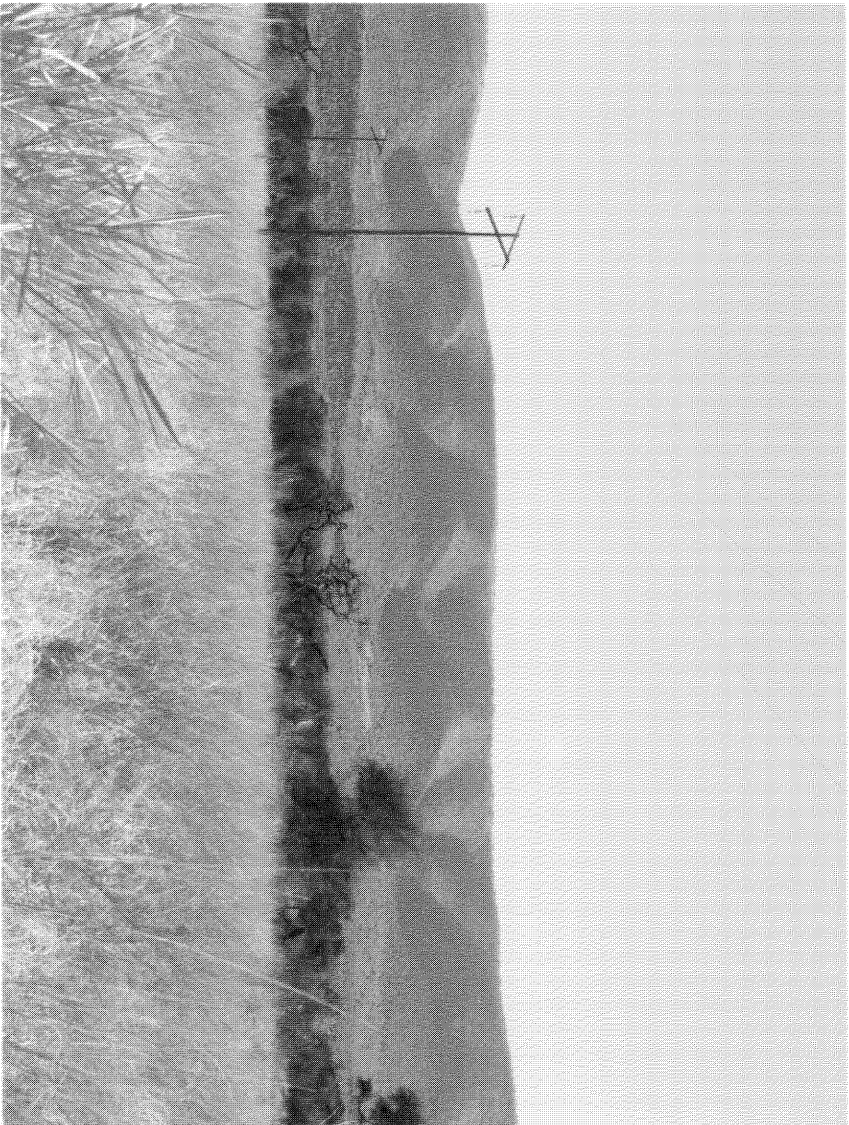


Photo 1. Proposed site for development along lower slopes of mountain.



Photo 2. LIA sites on rest of farm.

# APPENDIX B

## Pre-Contact Criteria

### **Scientific Significance**

- (a) Does the site contain evidence which may substantively enhance understanding of culture history, culture process, and other aspects of local and regional prehistory?
- internal stratification and depth
  - chronologically sensitive cultural items
  - materials for absolute dating
  - association with ancient landforms
  - quantity and variety of tool type
  - distinct intra-site activity areas
  - tool types indicative of specific socio-economic or religious activity
  - cultural features such as burials, dwellings, hearths, etc.
  - diagnostic faunal and floral remains
  - exotic cultural items and materials
  - uniqueness or representativeness of the site
  - integrity of the site
- (b) Does the site contain evidence which may be used for experimentation aimed at improving archaeological methods and techniques?
- monitoring impacts from artificial or natural agents
  - site preservation or conservation experiments
  - data recovery experiments
  - sampling experiments
  - intra-site spatial analysis
- (c) Does the site contain evidence which can make important contributions to paleoenvironmental studies?
- topographical, geomorphological context
  - depositional character
  - diagnostic faunal, floral data
- (d) Does the site contain evidence which can contribute to other scientific disciplines such as hydrology, geomorphology, pedology, meteorology, zoology, botany, forensic medicine, and environmental hazards research, or to industry including forestry and commercial fisheries?

### **Public Significance**

- (a) Does the site have potential for public use in an interpretive, educational or recreational capacity?
- integrity of the site
  - technical and economic feasibility of restoration and development for public use
  - visibility of cultural features and their ability to be easily interpreted
  - accessibility to the public
  - opportunities for protection against vandalism
  - representativeness and uniqueness of the site



aesthetics of the local setting  
proximity to established recreation areas  
present and potential land use  
land ownership and administration  
legal and jurisdictional status  
local community attitude toward development

(b) Does the site receive visitation or use by tourists, local residents or school groups?

### **Ethnic Significance**

(a) Does the site presently have traditional, social or religious importance to a particular group or community?

ethnographic or ethno-historic reference  
documented local community recognition or, and concern for, the site

### **Economic Significance**

(a) What value of user-benefits may be placed on the site?

visitors' willingness-to-pay  
visitors' travel costs

# APPENDIX C

## Post-Contact Criteria

### **Scientific Significance**

- (a) Does the site contain evidence which may substantively enhance understanding of historic patterns of settlement and land use in a particular locality, regional or larger area?
- (b) Does the site contain evidence which can make important contributions to other scientific disciplines or industry?

### **Historic Significance**

- (a) Is the site associated with the early exploration, settlement, land use, or other aspect of southern Africa's cultural development?
- (b) Is the site associated with the life or activities of a particular historic figure, group, organization, or institution that has made a significant contribution to, or impact on, the community, province or nation?
- (c) Is the site associated with a particular historic event whether cultural, economic, military, religious, social or political that has made a significant contribution to, or impact on, the community, province or nation?
- (d) Is the site associated with a traditional recurring event in the history of the community, province, or nation, such as an annual celebration?

### **Public Significance**

- (a) Does the site have potential for public use in an interpretive, educational or recreational capacity?
  - visibility and accessibility to the public
  - ability of the site to be easily interpreted
  - opportunities for protection against vandalism
  - economic and engineering feasibility of reconstruction, restoration and maintenance
  - representativeness and uniqueness of the site
  - proximity to established recreation areas
  - compatibility with surrounding zoning regulations or land use
  - land ownership and administration
  - local community attitude toward site preservation, development or destruction
  - present use of site
- (b) Does the site receive visitation or use by tourists, local residents or school groups?

### **Ethnic Significance**

- (a) Does the site presently have traditional, social or religious importance to a particular group or community?

### **Economic Significance**

- (a) What value of user-benefits may be placed on the site?
  - visitors' willingness-to-pay
  - visitors' travel costs
  - Integrity and Condition
- (a) Does the site occupy its original location?
- (b) Has the site undergone structural alterations? If so, to what degree has the site maintained its original structure?

- (c) Does the original site retain most of its original materials?
- (d) Has the site been disturbed by either natural or artificial means?

**Other**

- (a) Is the site a commonly acknowledged landmark?
- (b) Does, or could, the site contribute to a sense of continuity or identity either alone or in conjunction with similar sites in the vicinity?
- (c) Is the site a good typical example of an early structure or device commonly used for a specific purpose throughout an area or period of time?
- (d) Is the site representative of a particular architectural style or pattern?

# APPENDIX D

## Indicators for Assessing Impact

**Magnitude**

The amount of physical alteration or destruction which can be expected. The resultant loss of heritage value is measured either in amount or degree of disturbance.

**Severity**

The irreversibility of an impact. Adverse impacts which result in a totally irreversible and irretrievable loss of heritage value are of the highest severity.

**Duration**

The length of time an adverse impact persists. Impacts may have short-term or temporary effects, or conversely, more persistent, long-term effects on heritage sites.

**Range**

The spatial distribution, whether widespread or site-specific, of an adverse impact.

**Frequency**

The number of times an impact can be expected. For example, an adverse impact of variable magnitude and severity may occur only once. An impact such as that resulting from cultivation may be of recurring or ongoing nature.

**Diversity**

The number of different kinds of project-related actions expected to affect a heritage site.

**Cumulative Effect**

A progressive alteration or destruction of a site owing to the repetitive nature of one or more impacts.

**Rate of Change**

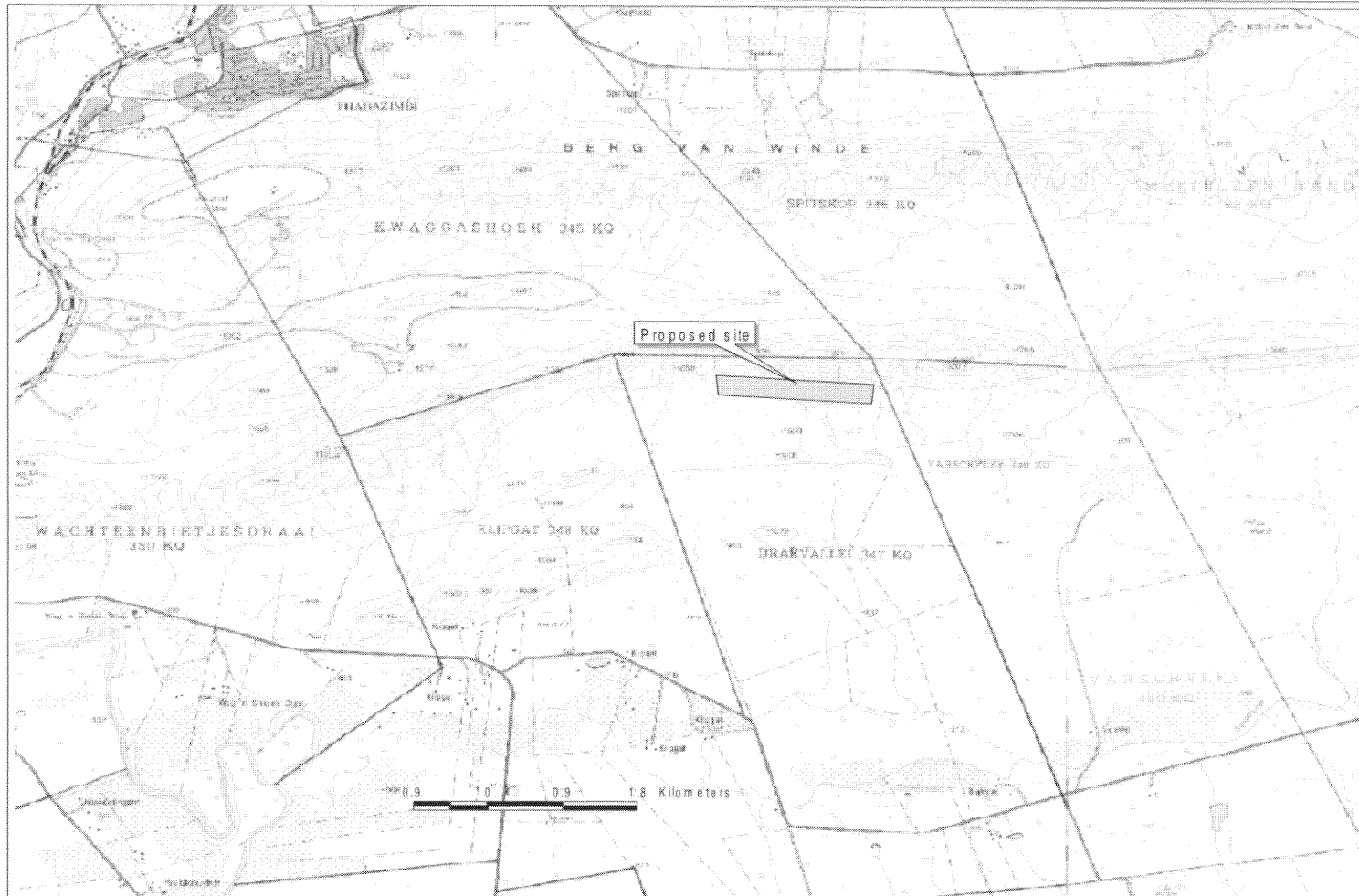
The rate at which an impact will effectively alter the integrity or physical condition of a heritage site. Although an important level-of-effect indicator, it is often difficult to estimate. Rate of change is normally assessed during or following project construction.

# APPENDIX E

## Location Maps



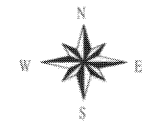
# Brakvley Township Development



02 August 2006

Compiled by AINP

Compiled for  
Tekplan  
Environmental



Compiled using  
ArcView GIS 3.2 a



**AINP**  
GIS by S. Gaigher