

Appendix E

ADDITIONAL INFORMATION

Appendix E1

EAP DECLARATION AND EXPERTISE



environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER, DECLARATION OF INTEREST AND UNDERTAKING UNDER OATH

File Reference Number:	(For official use only)
NEAS Reference Number:	DEA/EIA/
Date Received:	

Application for authorisation in terms of the National Environmental Management Act, Act No. 107 of 1998, as amended and the Environmental Impact Assessment (EIA) Regulations, 2014, as amended (the Regulations)

PROJECT TITLE

Working for Wetlands Programme

Kindly note the following:

1. This form must always be used for applications that must be subjected to Basic Assessment or Scoping & Environmental Impact Reporting where this Department is the Competent Authority.
2. This form is current as of 01 September 2018. It is the responsibility of the Applicant / Environmental Assessment Practitioner (EAP) to ascertain whether subsequent versions of the form have been published or produced by the Competent Authority. The latest available Departmental templates are available at <https://www.environment.gov.za/documents/forms>.
3. A copy of this form containing original signatures must be appended to all Draft and Final Reports submitted to the department for consideration.
4. All documentation delivered to the physical address contained in this form must be delivered during the official Departmental Officer Hours which is visible on the Departmental gate.
5. All EIA related documents (includes application forms, reports or any EIA related submissions) that are faxed; emailed; delivered to Security or placed in the Departmental Tender Box will not be accepted, only hardcopy submissions are accepted.

Departmental Details

Postal address:

Department of Environmental Affairs
Attention: Chief Director: Integrated Environmental Authorisations
Private Bag X447
Pretoria
0001

Physical address:

Department of Environmental Affairs
Attention: Chief Director: Integrated Environmental Authorisations
Environment House
473 Steve Biko Road
Arcadia

Queries must be directed to the Directorate: Coordination, Strategic Planning and Support at:
Email: EIAAdmin@environment.gov.za

1. ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP) INFORMATION

EAP Company Name:	Aurecon South Africa (Pty) Ltd		
B-BBEE	Contribution level (indicate 1 to 8 or non-compliant)	1	Percentage Procurement recognition
EAP name:	Franci Gresse		
EAP Qualifications:	BSc (Hons) Conservation Ecology		
Professional affiliation/registration:	IAIAsa		
Physical address:	Aurecon Centre, 1 Century City Drive, Waterford Precinct, Century City		
Postal address:	PO Box 494, Cape Town		
Postal code:	8000	Cell:	082 891 2384
Telephone:	021 526 6022	Fax:	
E-mail:	Franci.Gresse@aurecongroup.com		

The appointed EAP must meet the requirements of Regulation 13 of GN R982 of 04 December 2014, as amended.

2. DECLARATION BY THE EAP

I, Franci Gresse, declare that –

- I act as the independent environmental assessment practitioner in this application;
- I have expertise in conducting environmental impact assessments, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I will take into account, to the extent possible, the matters listed in Regulation 13 of the Regulations when preparing the application and any report relating to the application;
- I undertake to disclose to the applicant and the Competent Authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the Competent Authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the Competent Authority, unless access to that information is protected by law, in which case it will be indicated that such information exists and will be provided to the Competent Authority;
- I will perform all obligations as expected from an environmental assessment practitioner in terms of the Regulations; and
- I am aware of what constitutes an offence in terms of Regulation 48 and that a person convicted of an offence in terms of Regulation 48(1) is liable to the penalties as contemplated in Section 49B of the Act.

Disclosure of Vested Interest (delete whichever is not applicable)

- I do not have and will not have any vested interest (either business, financial, personal or other) in the proposed activity proceeding other than remuneration for work performed in terms of the Regulations;



Signature of the Environmental Assessment Practitioner

Aurecon South Africa (Pty) Ltd

Name of Company:

23/01/2019

Date

3. UNDERTAKING UNDER OATH/ AFFIRMATION

I, Franci Gresse, affirm that all the information submitted or to be submitted for the purposes of this application is true and correct.



Signature of the Environmental Assessment Practitioner

Aurecon South Africa (Pty) Ltd

Name of Company

23/01/2019

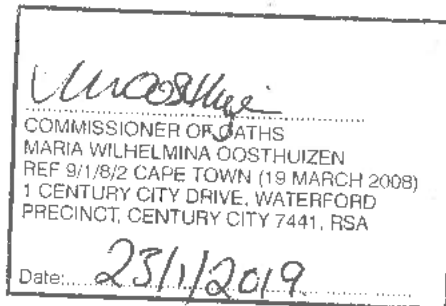
Date



Signature of the Commissioner of Oaths

23/1/2019

Date





Franci Gresse

Programme Manager

Qualifications

BSc (Hons) Conservation Ecology

Member, International Association of Impact Assessment South Africa (IAIAsa)

Specialisation

Environmental Impact Assessment Practitioner

Years in industry

10,08

Franci is a senior environmental practitioner in Aurecon's Cape Town office. She has been involved in various environmental investigations, including environmental impact assessments (EIA's), environmental management plans (EMP's), environmental management programmes (EMP's), rehabilitation plans maintenance management plans (MMP's) and fatal flaw analysis.

Franci has been involved with the Working for Wetlands rehabilitation programme for the past five years, of which she has been acting as the Team Leader for the environmental assessment practitioners (EAP's) for the last three years. The Working for Wetlands project won the 2012 Aurecon Chairman's Award for its positive contribution to the natural and social environment. In addition, Franci has also been involved with a number of projects in the renewable energy sector.

Franci served on the committee of the South African affiliate of the International Association for Impact Assessment (IAIA) for the Western Cape Branch from 2009 to 2011, and remains a member. She completed a Bachelor of Science and an Honours Degree in Conservation Ecology at the University of Stellenbosch (South Africa).

Experience

Implementation of the Hoekplaas environmental authorisation (EA), Northern Cape Province, South Africa, Mulilo Renewable Energy, 11/2013 - 05/2015, Project Leader

Aurecon assisted the holder of the environmental authorisation (EA) for the 100 MW photovoltaic (PV) facility in De Aar with the implementation of the environmental conditions to ensure compliance to all relevant environmental legislation. Responsible for the management of tasks and review of all documentation. Also assisting client with questions on the environmental impact assessment (EIA) process.

Environmental impact assessment and compilation of an environmental management plan (EMP) for the Swakopmund-Mile 7 Water Supply, Phase 2, Swakopmund, Namibia, NamWater, 11/2013 - 10/2015, Project Leader

NamWater appointed Aurecon to assist with the environmental impact assessment process for the proposed construction of a new bulk water pipeline between Swakopmund and Mile 7. Responsible for the management and review of the environmental impact assessment (EIA) reports and processes, as well as the project's finances.

Working for Wetlands plan 2014 - 2017, Regional South Africa, South African National Biodiversity Institute (SANBI), 06/2013 - Date, Task Leader

The South African National Biodiversity Institute (SANBI) appointed Aurecon to provide environmental and engineering services for the Working for Wetlands Programme which is a national wetland rehabilitation programme. Responsible for the management of the environmental authorisation component of the project,



as well as the compilation of basic assessment reports (BAR) for the country. Other responsibilities include the compilation of wetland rehabilitation plans for the Western Cape, Northern Cape, North West and Limpopo Provinces, liaison with authorities and the public (public participation process) and management of wetland specialists.

Maintenance management plans (MMP's) for flood damaged road infrastructure, Western Cape Province, South Africa, Western Cape Provincial Government Department of Transport and Public Works, 06/2013 - Date, Project Staff

The project entails the compilation of maintenance management plans (MMP's) for two local municipal areas (Laingsburg and Worcester), as well as obtaining the necessary permits/ water use authorisations. Personally involved during the project commencement with regards to strategy development, meetings with the relevant authorities and assistance with the development of the MMP's.

Environmental impact assessment (EIA) for the expansion of approved solar energy facilities located near Prieska and De Aar, Northern Cape Province, South Africa, Mulilo Renewable Energy, 03/2013 - 09/2015, Phase Leader

Mulilo Renewable Energy decided to expand the approved solar energy facilities on the farms Hoekplaas and Klipgats in Prieska, as well as on the farms Badenhorst Dam and Du Plessis Dam in De Aar. The expansion of Hoekplaas farm in Prieska includes ten additional 75 MW photovoltaic (PV) facilities and six additional PV units at Klipgats Pan farm. The expansion at Badenhorst Dam farm includes four additional 75 MW PV facilities and three additional PV units at Du Plessis Dam farm. Responsible for the management and review of the environmental impact assessment (EIA) reports and processes, as well as the project's finances.

Fatal flaw study for two potential Wind Energy Facility (WEF) sites, Northern and Western Cape Provinces, South Africa, Juwi Renewable Energies (Pty) Ltd, 03/2013 - 04/2013, Environmental Practitioner

The study entailed a fatal flaw analysis of two potential wind energy facility (WEF) sites in the Northern and Western Cape Provinces. Responsible for the assessment of the sites and compilation of the fatal flaw report.

Richtersveld wind energy facility (WEF), Northern Cape Province, South Africa, TRE Tozzi Renewable Energy S.p.A and Guma Group, 07/2012 - 09/2013, Environmental Practitioner

The project entailed a due diligence of the proposed wind energy facility (WEF) to review compliance with the requirements of the Department of Energy's independent power producer (IPP) process. Responsible for the review of the environmental reports and compilation of the due diligence report.

Three photovoltaic (PV) energy facilities near Copperton, Northern Cape Province, South Africa, Mulilo Renewable Energy (MRE), 09/2011 - 05/2015, Environmental Practitioner

The project entailed three environmental impact assessments (EIA's) for three photovoltaic (PV) energy facilities comprising 75 MW to 150 MW, located near Copperton. Responsible for the management the EIA process and project specialists, compilation of scoping and EIA reports and liaison with authorities.

Fatal flaw study for four potential wind energy facility (WEF) sites, Northern and Western Cape Provinces, South Africa, Mainstream Renewable Power South Africa, 11/2011 - 05/2012, Environmental Practitioner

The study entailed a fatal flaw analysis of four potential wind energy facility (WEF) sites across the Northern and Western Cape Provinces. Responsible for the management of specialists, review of reports, assessment of the sites and compilation of the fatal flaw report.



Implementation of the Klipgats Pan environmental authorisation (EA), Northern Cape Province, South Africa, Mulilo Renewable Energy, 09/2011 - 05/2015, Project Leader

Aurecon was appointed to undertake three environmental impact assessments (EIA's) for three proposed photovoltaic (PV) solar energy plants near Copperton. The first PV solar energy plant will generate around 100 MW (preferred alternative) or 150 MW (alternative) on the Hoekplaas Farm (Farm 146/RE). The proposed PV plant will cover approximately 300 ha (preferred alternative) or 450 ha (alternative). The second includes a PV solar energy plant to generate roughly 100 MW on the farm Klipgats Pan (Farm 117/4) near Copperton in the Northern Cape. The proposed PV plant will cover an estimated 300 ha. An alternative site for a 100 MW PV plant with a 300 ha footprint is also being considered. The third comprises a PV solar energy plant to generate about 100 MW (preferred alternative) or 300 MW (alternative) on the farm Struisbult (Farm 104, portion 1) which will cover 300 ha to 900 ha. Responsible for managing tasks and reviewing all documentation for updating the environmental management plan (EMP) and implementing the environmental authorisation (EA). Also assisted client with questions on the EIA process.

Proposed rehabilitation of Wetlands as part of the Working for Wetlands, Regional, South Africa, South African National Biodiversity Institute (SANBI), 08/2011 - 09/2013, Environmental Practitioner

Appointed by the South African National Biodiversity Institute (SANBI) to conduct environmental impact assessments (EIA's) for the rehabilitation of specific wetlands in all provinces of South Africa over a five year period. Responsible for the compilation of basic assessment reports (BAR) and Wetland Rehabilitation Plans for the Western Cape, Northern Cape, Gauteng and Limpopo Provinces. Other responsibilities included liaison with authorities, public participation process, management of specialists and general project management of the environmental component of the project.

Repair of flood damage to road structures in the Eden District Municipality, Western Cape Province, South Africa, Western Cape Provincial Department of Transport and Public Works, 01/2011 - Date, Environmental Practitioner

The project entails the compilation of maintenance management plans (MMP) for seven areas with the Eden District Management Area to repair. Responsible for compilation of MMP's, review of reports and liaison with stakeholders and authorities.

Environmental impact assessment (EIA) for the proposed extension of the Ash Dam facility at Kriel power station, Mpumalanga Province, South Africa, Eskom Holdings, 11/2009 - 12/2015, Environmental Practitioner

Appointed by Eskom to conduct an environmental impact assessment (EIA) for the proposed construction of a fourth ash dam facility at the Kriel power station. Responsible for the general project management and finances, screening process, compilation of the scoping and EIA reports, public participation and the compilation of a waste management licence application.

Environmental impact assessment (EIA) for proposed relocation of solar energy facility, Onder Rietvlei Farm, Aurora, Western Cape Province, South Africa, Solaire Direct Southern Africa, 2010 - 2011, Project Leader

Appointed by Solaire Direct to undertake a basic environmental impact assessment (EIA) process for the proposed relocation of an approved, but not yet constructed 10 MW solar energy facility. Responsible for the management and review of the EIA process and finances.



Environmental impact assessment (EIA) for proposed solar energy facility, Onder Rietvlei Farm, Western Cape Province, South Africa, Solaire Direct Southern Africa, 07/2010 - 02/2012, Environmental Practitioner

Appointed by Solaire Direct to undertake a basic environmental impact assessment process for the proposed construction of a 10 MW solar energy facility. Responsible for the compilation of the draft and final reports, public participation process, management of specialists and general project management.

Proposed Paarl Mountain and Ysterbrug pumping main upgrades, Western Cape Province, South Africa, Drakenstein Municipality, 06/2010 - Date, Environmental Advisor

The Drakenstein Municipality appointed Aurecon's engineers to investigate and plan the proposed upgrade of the Paarl Mountain and Ysterbrug Pumping Scheme. The upgrading of the pipelines feeding the Meulwater Water Treatment Works from the Bethel and Nantes dams, also part of this scheme, was also investigated. Responsible for providing advice on environmental processes required. Other responsibilities included the management of the independent environmental assessment practitioner and the review of all environmental impact assessment (EIA) documentation.

Environmental sensitivity study (ESS) for a proposed solar energy facility on a farm Near Aurora, Western Cape Province, South Africa, Solaire Direct Southern Africa, 2010, Environmental Practitioner

Appointed to provide an environmental sensitivity study (ESS) which inter alia highlights the potential constraints ('red flags') and opportunities presented by the site from an environmental perspective. Responsible for the compilation of the ESS.

Proposed erection of Eskom communication sirens and public announcement (PA) systems, Blaauwberg, Western Cape Province, South Africa, Eskom, 2009 - 2010, Environmental Practitioner

The project entailed three environmental impact assessment (EIA) processes for the (a) erection of 10 new sirens in the Parklands area, (b) the relocation of one siren in Bloubergstrand, and (c) the upgrade of five sirens on farms near Melkbosstrand. Responsible for compiling environmental impact assessment (EIA) reports, and the public participation process.

Proposed remediation, rehabilitation and restoration of the Spruit, Krom, Leeu and Palmiet Rivers, Western Cape Province, South Africa, Drakenstein Municipality, 2009 - 2010, Environmental Practitioner

Appointed by the Drakenstein Municipality to undertake the requisite environmental impact assessment (EIA) process for the rehabilitation, remediation and stabilisation of four rivers in Paarl and Wellington. Responsible for the EIA and public participation processes.

Proposed construction of a new pipeline from Bovlei Winer to Withoogte Dam, Wellington, Western Cape Province, South Africa, Drakenstein Municipality, 2009 - 2010, Environmental Practitioner

The Drakenstein Municipality proposed to replace a section of the existing pipeline extending from the Withoogte Dam to the Welvanpas Reservoir near Wellington as part of the municipality's water master plan in order to improve the overall water supply. Responsible for the compilation of the environmental impact assessment (EIA) report, management of specialists and the public participation process.

Overberg District Municipality integrated transport plan (ITP) strategic environmental informants, Western Cape Province, South Africa, Overberg District Municipality, 2009, Environmental Practitioner

Aurecon's Transportation Unit was appointed to revise the integrated transport plan (ITP). The Environmental Unit was subcontracted to provide environmental input. Responsible for identifying and describing the relevant informants.

Annandale Commercial: development of petrol filling station on portion of Erf 5561, Kuils River, Western Cape Province, South Africa, Communicate, 2009, Environmental Practitioner

Appointed to compile a construction environmental management plan (CEMP) for the construction of a filling station on the corner of Gladioli Street and Amandel Drive, Kuils River. Responsible for the compilation of the project specification document as part of the CEMP.

Overberg District Municipality integrated transport plan (ITP): strategic environmental informants, Western Cape Province, South Africa, Overberg District Municipality, 2009, Environmental Practitioner

Aurecon's Transportation Unit was appointed to revise the integrated transport plan (ITP). The Environmental Unit was subcontracted to provide environmental input. Responsible for identifying and describing the relevant informants.

Environmental impact assessment (EIA) for the proposed Langezandt Quays development in Struisbaai Harbour, Western Cape Province, South Africa, Golden Falls (Pty) Ltd, 2008 - Date, Environmental Practitioner

Aurecon was appointed to undertake an environmental impact assessment (EIA) process for the proposed development of a four storey development on Erf 848 within the Struisbaai harbour precinct. Responsible for drafting responses to the Department of Environmental Affairs' independent review report on the proposed development.

Pre-feasibility and feasibility studies for augmenting the Western Cape water supply system, South Africa, Department of Water Affairs (DWA), 2008 - 2013, Project Staff

The Department of Water Affairs commissioned pre-feasibility and feasibility studies for the augmentation of the Western Cape water supply system through the further development of the surface water resources. Surface water schemes to be investigated were identified by the Western Cape water supply system reconciliation strategy study. Responsible for the public participation process, managing environmental specialists, and compiling a socio-economic overview of the study area.

Proposed redevelopment of the Blaauwberg Conservation Area: Eersteste Node, Western Cape Province, South Africa, City of Cape Town, 2008 - 2010, Environmental Practitioner

The project entailed an environmental impact assessment (EIA) process for redeveloping the Eersteste Conservation Area on the West Coast. Responsible for compiling the EIA report, as well as managing specialists and the public participation process.

Table Mountain Group aquifer feasibility study and pilot project, Western Cape Province, South Africa, City of Cape Town, 2008 - 2010, Environmental Control Officer

The City of Cape Town initiated a study into the Table Mountain Group Aquifer as a potential water source to augment the city's supply. The feasibility and pilot project phase record of decision (RoD) required completion for site-specific environmental management plans (EMP's) for drilling sites that were assessed to be environmentally sensitive. Site-specific EMP's were designed for sensitive sites to ensure minimal environmental impact during the drilling phase. Responsible for monitoring compliance with the RoD and EMP during the drilling phase.

Application for rectification in terms of Section 24G of the National Environmental Management Act (NEMA) for the unlawful commencement of a fruit processing factory on Op de Tradouw Farm, Number 69, Barrydale, Western Cape Province, South Africa, Schoonies Family Trust, 2008 - 2009, Environmental Practitioner

The project consisted of an application for rectification in terms of Section 24G of NEMA. Responsible for compiling an environmental impact report and an environmental management plan (EMP) for the application, as well as managing the public participation process.



Proposed development of apple and pear orchards on Soetmelksvlei Farm, Western Cape Province, South Africa, BETCO, 2008 - 2009, Project Staff

This Agri-development project involved the development of 50 ha of apple and pear orchards in the Riviersonderend region. Responsible for compiling the basic assessment report, environmental management plan (EMP), and managing the specialists and public participation process.

Proposed extension of Lock Road, Kalk Bay, Western Cape Province, South Africa, Mr Rick Bartlett, 2008 - 2009, Project Staff

The project comprised an environmental impact assessment (EIA) process for extending Lock Road to an existing erf. Involved during the final stages of the application.

Water reconciliation strategy for the Algoa water supply area, Eastern Cape Province, South Africa, 2008 - 2009, Environmental Practitioner

This project provided an assessment of the environmental opportunities and constraints for a suite of water schemes in the Algoa water supply area. This was undertaken as part of a broader study in the area.

C.A.P.E. Olifants-Doring Catchment Management Agency project: Development of a catchment management strategy water resource protection sub-strategy for the Olifants-Doring Catchment, South Africa, CapeNature, 2008 - 2009, Environmental Practitioner

Appointed by CapeNature to compile a catchment management strategy water resource protection sub-strategy for the Olifants-Doorn catchment. Responsible for compiling a database that lists all institutions and their respective mandates in terms of water resource protection and biodiversity conservation decision making for the Olifants-Doring Catchment, workshop arrangements, and general project related work.

Environmental sensitivity study for the proposed Dasdrif poultry farm in Moorreesburg, Western Cape Province, South Africa, Eikenhoff Poultry Farms (Pty) Ltd, 2008, Project Staff

The project consisted of an environmental sensitivity study (ESS) which, inter alia, highlighted the potential constraints ('red flags') and opportunities presented by the site from an environmental perspective. Responsible for compiling the ESS.

Joint Maputo River Basin water resources study, Mozambique, Swaziland and South Africa, 2008, Project Staff

The project provided an environmental opportunities and constraints assessment of a suite of potential dams in South Africa and Swaziland, within the Maputo River Catchment. This was undertaken as part of a broader study into the catchment.

Department of Economic Affairs, Environment and Tourism (DEAET) decision-making support, South Africa, Department of Economic Affairs, Environment and Tourism (DEAET), 2008, Project Staff

Responsible for assisting the DEAET with the review and processing of environmental impact assessment (EIA) applications in terms of the Environment Conservation Act.

Appendix E2

SPECIALIST DECLARATION AND EXPERTISE



environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

DETAILS OF SPECIALIST AND DECLARATION OF INTEREST

File Reference Number:	(For official use only)
NEAS Reference Number:	12/12/20/ or 12/9/11/L
Date Received:	DEA/EIA

Application for integrated environmental authorisation and waste management licence in terms of the-

- (1) National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and the Environmental Impact Assessment Regulations, 2014; and
- (2) National Environmental Management Act: Waste Act, 2008 (Act No. 59 of 2008) and Government Notice 921, 2013

PROJECT TITLE

Working for Wetlands Rehabilitation Programme: Limpopo Province

Specialist:	Anton Linström		
Contact person:	Anton Linström		
Postal address:	P O Box 4442, Lydenburg,		
Postal code:	1120	Cell:	083 226 1089
Telephone:	NA	Fax:	NA
E-mail:	wetearth@telkomsa.net		
Professional affiliation(s) (if any)	Pr Sc Nat 400275/11		

Project Consultant:	Aurecon South Africa Pty (Ltd)		
Contact person:	Claire Blanché		
Postal address:	PO Box 494		
Postal code:	8000	Cell:	082 445 5438
Telephone:	021 526 6937	Fax:	021 526 9500
E-mail:	Claire.Blanche@aurecongroup.com		

AK

4.2 The specialist appointed in terms of the Regulations_

Anton Linström

I, _____, declare that --

General declaration:

I act as the independent specialist in this application;

I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;

I declare that there are no circumstances that may compromise my objectivity in performing such work;

I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;

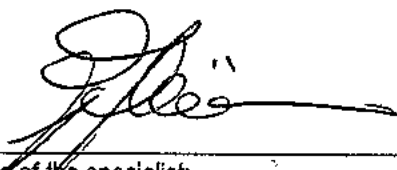
I will comply with the Act, Regulations and all other applicable legislation;

I have no, and will not engage in, conflicting interests in the undertaking of the activity;

I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;

all the particulars furnished by me in this form are true and correct; and

I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.



Signature of the specialist:

Wet Earth Eco Specs (Pty) Ltd

Name of company (if applicable):

17 January 2019

Date:

Anton Linström

Idi nr. 6303265035081

58 Church Street
Lydenburg
1120

Tel. 013 235 2889
Cell. 083 226 1089

Education

National Diploma (Nature Conservation). SA Technikon. 1989
National Higher Diploma (Environment management). Port Elizabeth Technikon.
1994
Masters Degree in Environmental Management (River Ecology). Orange Free State
University. 1999.

Affiliations

International Mire Conservation Group.
Animal Demographic Unit (ADU).
South African Wetland Society (SAWS)
The South African Council for Natural Scientific Professions (SACNASP – 400275/11)
Affiliated with the Wildlife Resource Association

Experience

June 2010 -

Free Lance Wetland Ecologist

- Undertake specialist wetland and riparian studies.
- Lecturing at the Advanced Wetland Course and the Wetland Rehabilitation Course at the University of the Free State.
- Undertook one-day course in Riparian Vegetation Response Assessment Index (VEGRAI) for the Mpumalanga Tourism and Parks Agency staff.
- Undertook a one-day course in Riparian Vegetation Response Assessment Index (VEGRAI) for the Department of Water Affairs and Sanitary.

November 2008
to May 2010

Golder Associates Africa

South Africa

Wetland Ecologist

- Undertake specialist wetland investigations as part of EIA's.
- Undertook a Wetland Biomonitoring Project at the Kusile Power Station.
- Completed two wetland scoping reports for Comprehensive Reserve Determinations for Riparian Areas.
- Specialist wetland studies further afield in the Democratic Republic of the Congo for the Frontier Mine.

1998 to 2008

Mpumalanga Tourism and Parks Agency Mpumalanga, South Africa

Wetland Scientist.

- Managed the participation of MTPA in the development application process through the evaluation of and commenting on development applications with specific reference to that of wetlands in Mpumalanga to ensure proper mitigation of possible negative environmental impacts.
- Coordinated the Bi-annual Co-ordinated Water Bird Counts in collaboration with the University of Cape Town Animal Demography Unit for several years. A total of 8 wetland sites in the province were surveyed and reported on. This took place in cooperation with Bird Clubs and private volunteers.

- Implement and manage a service of specialist aquatic wetland research for the Mpumalanga Parks Board to solve specific management problems.
- Compile and work on a Wetland Inventory for the Mpumalanga Province in South Africa.
- Was actively involved in the development of a Riparian Vegetation Index as part of the National Biomonitoring Programme on all the main rivers in the Mpumalanga Province.
- Authored the Ecological Reserve Determination for riparian vegetation in the Elands River and the Crocodile River in the Mpumalanga Province.
- Initiated and actively involve with the establishment of a “Wetlands/Riparian Habitats: A practical field procedure for identification and delineation” as a policy within the Forestry Industry and all the other major land-users in South Africa.
- Initiate and actively involve with the South African Wetland National Indaba.
- Initiate and actively involve with the Mpumalanga Wetland Forum.
- Actively involve with local communities and wetlands, i.e. Delmas Municipality, Chrissiesmeer Community, the Wakkerstroom Community, Khadishi Community and the Emhlangeni Community Wetland Project.
- Initiate and driving the Ramsar Application for Verloren Valei, Wakkerstroom Wetland and the Chrissiesmeer Pan System. International recognition was given to the Verloren Valei Wetlands during 2001. The Wakkerstroom Wetland Information Sheet is handed in for Ramsar recognition.
- Initiate and actively involve with several wetland rehabilitation projects in the Province. This is part of a Poverty Relieve project with the Working for Water programme.
- Received a Merit Award in 1998/9 for the “Best Research & Development Contribution”.
- Actively involve and contribute to the South African White-winged Flufftail (*Sarothrura ayresii*) Action Plan Workshop, 2003.
- Present and lead a wetland training session in the form of a fieldtrip and a lecture for the final students of the University of Tswane.
- Take part in the bi-annual Coordinated Avifauna Road Counts.

1996 to 1998

Mpumalanga Parks Board

Mpumalanga, South Africa

Assistant Director

Served as Sub-Regional Head in MPB.

- Supervision over three nature reserves and the Southern Drakensberg Sub-Region.
 - Managed 23 General Assistants, three Reserve Managers and a Law Enforcement Officer.
- Managed all Nature Conservation related matters in this Region.

1994 to 1996

Transvaal Provincial Administration

Transvaal, South Africa

Officer in Charge – Sterkspruit Mountain Catchment

- Officer in charge of the Sterkspruit Nature Reserve.
- Managed a 10 000 hectare Mountain Catchment Area.
- Supervise a total of 15 General Assistants.
- Chaired the Mountain Catchment Committee and the Water Quality Sub-committee

1991 to 1993

Transvaal Provincial Administration

Transvaal, South Africa

Lydenburg, South Africa

Scarce and Protected Plant Project – Technical Support

- Scarce and Protected Plant Inventory – Helicopter Aerial Surveys.
- Reestablishment of a Critical Endangered Plant – *Stapelia clavicornia*.
- Reassess all Conservation Plans of Scarce and Protected Plants in the Province.

- Monitor the conservation status of several scarce and protected plants.

1990 to 1991 **Transvaal Provincial Administration** **Transvaal, South Africa**
 Hans Hoheisen Wildlife Research Station
 Elephant Project – Technical Assistance

- Monitor movement of Elephant on two Private Nature Reserves.
- Aerial game counts on two Private Nature Reserves.

1986 to 1990 **Transvaal Provincial Administration** **Transvaal, South Africa**
 Boskopdam Nature Reserve, South Africa
 Officer in Charge – Boskopdam Nature Reserve.

- Managed a 4000 hectare grassland Nature Reserve and all related activities.
- Supervision over 25 General Assistants.
- Execute all reserve monitoring programmes: game counts, condition indexes, culling operations, burning programmes, bird programmes, etc.

PUBLICATIONS AND REPORTS

- Impesa. 2003. Classification and mapping of Peatlands in Southern Africa including Lesotho.
- Intermediate Ecological Reserve Determination for the Elands River Catchment, Incomati System, Mpumalanga. Chapter 7: Riparian Vegetation. Report no: ENV-P-C 2000-090.
- Intermediate Ecological Reserve Determination for the Crocodile River Catchment, Mpumalanga, Chapters: Wetlands and Riparian Vegetation. Report no.: ENV-P-C 200 2009.
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environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

DETAILS OF SPECIALIST AND DECLARATION OF INTEREST

File Reference Number:	(For official use only)
NEAS Reference Number:	12/12/20/ or 12/9/11/L
Date Received:	DEA/EIA

Application for integrated environmental authorisation and waste management licence in terms of the-

- (1) National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and the Environmental Impact Assessment Regulations, 2014; and
- (2) National Environmental Management Act: Waste Act, 2008 (Act No. 59 of 2008) and Government Notice 921, 2013

PROJECT TITLE

HIA for the Proposed Anti-Erosion Measures at the Baleni Salt Works Provincial Heritage Site, Limpopo Province

Specialist:	G&A Heritage Properties (Pty) Ltd		
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Project Consultant:			
Contact person:			
Postal address:			
Postal code:		Cell:	
Telephone:		Fax:	
E-mail:			

4.2 The specialist appointed in terms of the Regulations_

I, Stephan Gaigher , declare that --

General declaration:

I act as the independent specialist in this application;

I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;

I declare that there are no circumstances that may compromise my objectivity in performing such work;

I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;


I will comply with the Act, Regulations and all other applicable legislation;

I have no, and will not engage in, conflicting interests in the undertaking of the activity;

I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;

all the particulars furnished by me in this form are true and correct; and

I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.



Signature of the specialist:

G&A Heritage Properties (Pty) Ltd.

Name of company (if applicable):

2019/02/05

Date:

Appendix E3

WETLAND FORUM MEETING MINUTES



MINUTES OF THE LWF MEETING

Venue: Mopani DISTRICT Municipality, Giyani

Date :20 May 2016

Time: 09H00

1. Opening and welcome

Silima Collin opened and welcomes the attendees and opens the meeting with a prayer.

2. Roll call and apologies -

Roll call was circulated and the following were the apologies

- 1) Nozi Malteno
- 2) Norman Tshivhula
- 3) Khuthadzo Manyatsha

3. Introduction

All people that attended introduced themselves

Matters arising

ITEMS	DELIBERATIONS	RESPONSIBILITY
4. Matters arising	The following matters arose from the previous minutes.	All

<p>4.1.NWI Presentation</p>	<p><u>24-28 October 2016 - Swadini Spar (Mpumalanga)</u></p> <ul style="list-style-type: none"> • We have two target of wetlands to meet on inventory this year. • So far we have only manage to collect 10 wetlands • Namhla will release the update of wetland inventory next year in June 2017. • Target must be met by then • LEDE target wetlands within the reserve and in Waterberg Rural communities • The 200 were divide and given to stake holder • Stakeholder commit to deliver on the inventory • At least 5 wetland must be captured each month • Forms to be submitted on the next meeting • LEDET warns of the duplication • Masidndi to share the list of wetland with all LEDET officials 	<p>All</p>
<p>4.2. Community Outreach / Wetland Awareness</p>	<p><u>Wayward</u></p> <ul style="list-style-type: none"> • Awareness had been done through schools- on the 12th May kids were taken out to Wonderkop Nature reserve. • Unfortunately the outing was not very successful as the road were slippery towards the wetland side • Picture of Rietfontein wetland to be provided • There had been another celebration of wetland at Ga- Kgoroshi which went very well • Masidi had another celebration at Ga= Madisha • There had been awareness of wetland through wetland celebration at Mutale(Tshamulungwi) by Mutale Local m municipality 	<p>Prudence Lehlokgonolo Collin Masindi Sello</p>

<p>4.3 Revision of Schedule meeting for 2016</p>	<p>Meetings for 2016 were scheduled as follows:-</p> <ul style="list-style-type: none"> • 19 – 20 May 2016, Mopani District • 15-16 September 2016 Vhembe • 17-18 November 2016 Sekhukhune • 17 February 2017- Polokwane 	
<p>4.4 Mohlapiitse Wetland</p>	<ul style="list-style-type: none"> • LUI Results are out • Sekhukhune District had been awarded a tender • We had Planted R500 000. For seeding • LEDET office need to be included in order to have more funding of wetland initiatives 	
<p>4.5 Corporate Governance</p>	<p>No update</p>	
<p>4.6. Environmental pollution Challenges (How well have we done it, right track! what can be done to improve the status)</p>	<p><u>In Makhado</u></p> <ul style="list-style-type: none"> • There a sewage problem • The manage to fix one along the N1 road • One in Eltivilas not fixed <p><u>In Waterberg</u></p> <ul style="list-style-type: none"> • Acid spillage now under control • More water sample to be taken to determine the extent • Main challenge is the the stream is connected to Nylsvley • Meshack tand Prudence to provide the report on the spillage status <p><u>Sekhukhune</u></p> <ul style="list-style-type: none"> • Building wall in the wetland • Fence around the wetland and rehabilitation taking place • Illegal sand mining still continuing • This had been raised up with compliance 	<p>Prudence Daniel Collin Prudence Meshac Lehlokgonolo</p>

	<p>office</p> <ul style="list-style-type: none"> • Intervention were implemented • But the perpetrators had authorization from the Headman • No one is monitoring the process • This sans mining is reducing the surface area due to Donga <p><u>Way forward on the Environmental problems</u></p> <p><u>In Makhado Municipality</u></p> <ul style="list-style-type: none"> • They are opening a big sewage treatment which will take up huge pressure from the surrounding town • The challenge will be the height of flow and the structural design • The plant is working well regardless if this challenge • There had been complaining of contamination of the drinking water. Daniel to bring the results of the test conducted(10 June 2016) • Collin to follow it up 	
4.8. Training	<ul style="list-style-type: none"> • Collin to follow up on Certificates • There will be training on the 12th July 2015 on wetland Mapping use of GIS install open source • Collin to send a training reminder to Namhla 	All
5. Wetland Task team	<p>Allocation of task/ target given to the task team</p> <p>LEDET -15 (Netshiozwi)</p> <p>DEA EPIP capricon – 5</p> <p>DEA EPIP Mopani- 5</p> <p>DEA EPIP Sekhukhune-5</p> <p>SANParks Mapungubwe – 2</p> <p>LEDET Waterberg- 5</p>	<p>Aprudence</p> <p>Eddi</p> <p>Netshiozwi</p> <p>Meshack</p> <p>Iris</p> <p>Sello</p> <p>Thabo</p>

	SANParks Skkukuza- 5 LEDET Head office – 20 Mbonelaphanda -5 DEA WfWet - 50	Daniel David Collin
6. NEW MATTERS		
NEW MATTERS	No new matters	
7. Date of the next meeting	17-18 November – Vhembe District Municipality)	All
8. Closure	Closed with a prayer	Daniel Makhado Municipality

SECRETARY

DATE

CHAIPERSON

DATE: 20 May 2016

APPENDIX E4

WETLAND FORUM MEETING MINUTES

Phase 1 Heritage Impact Assessment Report

HERITAGE IMPACT ASSESSMENT FOR THE
PROPOSED ANTI-EROSION MEASURES AT THE
BALENI SALT WORKS PROVINCIAL HERITAGE SITE,
LIMPOPO PROVINCE.

PREPARED BY:



PREPARED FOR:

aurecon

CREDIT SHEET

Project Director

STEPHAN GAIGHER (BA Hons, Archaeology, UP)

Principal Investigator for G&A Heritage

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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. G&A Heritage and its personnel will not be held liable for such oversights or for costs incurred as a result of such oversights.*

Statement of Independence

As the duly appointed representative of G&A Heritage, I Stephan Gaigher, hereby confirm my independence as a specialist and declare that neither I nor G&A Heritage have any interests, be it business or otherwise, in any proposed activity, application or appeal in respect of which the Environmental Consultant was appointed as Environmental Assessment Practitioner, other than fair remuneration for work performed on this project.

SIGNED OFF BY: STEPHAN GAIGHER



MANAGEMENT SUMMARY

Site name and location: Proposed Anti-Erosion Measures at the Baleni Salt Works.

Municipal Area: Giyani District Municipality.

Applicant: Working for Wetlands Program of the Department of Environmental Affairs.

Consultant: G&A Heritage, PO Box 522, Louis Trichardt, 0920, South Africa
38A Vorster St, Louis Trichardt, 0920

Date of Report: 04 December 2018

The purpose of the management summary is to distil the information contained in the report into a format that can be used to give specific results quickly and facilitate management decisions. It is not the purpose of the management summary to repeat in shortened format all the information contained in the report, but rather to give a statement of results for decision making purposes.

This study focuses on the proposed anti-erosion measures recommended by the planning team for the Working for Wetlands Program to limit the negative impact of concentrated water flow at the wetlands around Baleni, Limpopo Province.

This study encompasses the heritage impact investigation. A preliminary layout has been supplied to lead this phase of this study.

Scope of Work

A Heritage Impact Assessment (including Archaeological, Cultural heritage, Built Heritage and Basic Paleontological Assessment) to determine the impacts on heritage resources within the study area.

The following are required to perform the assessment as per SAHRA minimum standards:

- A desk-top investigation of the area;
- A site visit to the proposed mitigations;
- Identify possible archaeological, cultural, historic, built and paleontological sites within the study area;
- Evaluate the potential impacts of construction and operation of the project on archaeological, cultural, historical resources; built and paleontological resources; and
- Recommend mitigation measures to ameliorate any negative impacts on areas of archaeological, cultural, historical, built and paleontological importance.
- Public Participation

The purpose of this study is to determine the possible occurrence of sites with cultural heritage significance within the study area. The study is based on archival and document combined with fieldwork investigations.

Alternatives Considered

Due to the Working for Wetlands Programme not being a development proposal (but rather a rehabilitation programme), the use of alternatives as normally applied in terms of the National Environmental Management Act (Act 107 of 1998, as amended) (NEMA) is not appropriate. A comprehensive phased approach is undertaken each year to identify wetlands with a high rehabilitation priority (Phase 1), rehabilitation objectives for each wetland unit and the most appropriate interventions to achieve these objectives (Phase 2). During Phase 3, the interventions are again scrutinised during setting-out to consider changes that have occurred within the landscape since the original planning took place. Should any significant changes be required to the intervention, the Project Team will be informed by the engineer to ensure that the proposed design changes would not compromise the rehabilitation objectives identified for the specific wetland. For this reason, the mitigative measures identified in this report does not have any alternatives.

Findings & Recommendations

The area was investigated during a field visit and through archival studies.

The status of the site as a National Heritage Site in 1999 (Terblanche 1994a) already implied the heritage significance of the site. It was therefore not surprising that several areas with archaeological deposits were noted during the survey. Some of these sites are subject to degradation due to erosion activities. These sites will be discussed in this study and relevant recommendations for their preservation or mitigation given.

Fatal Flaws

No fatal flaws were identified.

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LIST OF ABBREVIATIONS

- Bp..... Before Present
- EIA Early Iron Age
- ESA..... Early Stone Age
- Fm..... Femtometre (10⁻¹⁵m)
- GPS Geographic Positioning System
- HIA Heritage Impact Assessment
- LIA..... Late Iron Age
- LSA Late Stone Age
- MYA Million Years Ago
- MSA Middle Stone Age
- NHRA..... National Heritage Resources Act no 22 of 1999
- SAHRA..... South African Heritage Resource Agency
- SANRAL South African National Roads Agency SOC Ltd
- S&EIR Scoping & Environmental Impact Reporting
- Um Micrometre (10⁻⁶ m)
- WGS 84 World Geodetic System for 1984

HERITAGE IMPACT REPORT

HERITAGE IMPACT ASSESSMENT REPORT FOR THE PROPOSED ANTI-EROSION MEASURES AT BALENI SALT WORKS, LIMPOPO PROVINCE

1. INTRODUCTION

Legislation and methodology

G&A Heritage was appointed by Aurecon South Africa (Pty) Ltd (Aurecon) to undertake a heritage impact assessment for the proposed Anti-Erosion Measures at the Baleni Salt Works in the Limpopo Province.

Section 38(1) of the South African Heritage Resources Act (25 of 1999) requires that a heritage study is undertaken if any activity triggers an HIA as per Table 2.

- (a) Construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length;
- (b) Construction of a bridge or similar structure exceeding 50 m in length; and
- (c) Any development, or other activity which will change the character of an area of land, or water –
 - (1) Exceeding 10 000 m² in extent;
 - (2) Involving three or more existing erven or subdivisions thereof; or
 - (3) Involving three or more erven, or subdivisions thereof, which have been consolidated within the past five years; or
- (d) The costs of which will exceed a sum set in terms of regulations; or
- (e) Any other category of development provided for in regulations.

While the above describes the parameters of developments that fall under this Act., Section 38 (8) of the NHRA is applicable to this development. This section states that;

- (8) *The provisions of this section do not apply to a development as described in subsection (1) if an evaluation of the impact of such development on heritage resources is required in terms of the Environment Conservation Act, 1989 (Act 73 of 1989), or the integrated environmental management guidelines issued by the Department of Environment Affairs and Tourism, or the Minerals Act, 1991 (Act 50 of 1991), or any other legislation: Provided that the consenting authority must ensure that the evaluation fulfils the requirements of the relevant heritage resources authority in terms of subsection (3), and any comments and recommendations of the relevant heritage resources authority with regard to such development have been taken into account prior to the granting of the consent.*

In regard to a development such as this that falls under Section 38 (8) of the NHRA, the requirements of Section 38 (3) applies to the subsequent reporting, stating that;

- (3) *The responsible heritage resources authority must specify the information to be provided in a report required in terms of subsection (2) (a): Provided that the following must be included:*
 - (a) *The identification and mapping of all heritage resources in the area affected;*
 - (b) *An assessment of the significance of such resources in terms of the heritage assessment criteria set out in section 6 (2) or prescribed under section 7;*
 - (c) *An assessment of the impact of the development on such heritage resources;*
 - (d) *An evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development;*

- (e) *The results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources;*
- (f) *If heritage resources will be adversely affected by the proposed development, the consideration of alternatives; and*
- (g) *Plans for mitigation of any adverse effects during and after the completion of the proposed development.*
 - (1) Ancestral graves,
 - (2) Royal graves and graves of traditional leaders,
 - (3) Graves of victims of conflict (iv) graves of important individuals,
 - (4) Historical graves and cemeteries older than 60 years, and
 - (5) Other human remains which are not covered under the Human Tissues Act, 1983 (Act No.65 of 1983 as amended);
- (h) Movable objects, including ;
 - (1) Objects recovered from the soil or waters of South Africa including archaeological and paleontological objects and material, meteorites and rare geological specimens;
 - (2) Ethnographic art and objects;
 - (3) Military objects;
 - (4) Objects of decorative art;
 - (5) Objects of fine art;
 - (6) Objects of scientific or technological interest;
 - (7) Books, records, documents, photographic positives and negatives, graphic, film or video material or sound recordings; and
 - (8) Any other prescribed categories, but excluding any object made by a living person;
- (i) Battlefields;
- (j) Traditional building techniques.

A **'place'** is defined as:

- (a) A site, area or region;
- (b) A building or other structure (which may include equipment, furniture, fittings and articles associated with or connected with such building or other structure);
- (c) A group of buildings or other structures (which may include equipment, furniture, fittings and articles associated with or connected with such group of buildings or other structures); and (d) an open space, including a public square, street or park; and in relation to the management of a place, includes the immediate surroundings of a place.

'Structures' means any building, works, device, or other facility made by people and which is fixed to land and any fixtures, fittings and equipment associated therewith older than 60 years.

'Archaeological' means:

- (a) Material remains resulting from human activity which are in a state of disuse and are in or on land and are older than 100 years, including artefacts, human and hominid remains and artificial features and structures;
- (b) Rock art, being a 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 is older than 100 years including any area within 10 m of such representation; and
- (c) Wrecks, being any vessel or aircraft, or any part thereof, which was wrecked in South Africa, whether on land or in the maritime cultural zone referred to in section 5 of the Maritime Zones Act 1994 (Act 15 of 1994), and any cargo, debris or artefacts found or associated therewith, which are older than 60 years or which in terms of national legislation are considered to be worthy of conservation;
- (d) Features, structures and artefacts associated with military history which are older than 75 years and the sites on which they are found.

'Paleontological' 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 trace.

'Grave' means a place of interment and includes the contents, headstone or other marker of and any other structures on or associated with such place. The South African Heritage Resources Agency (SAHRA) will only issue a permit for the alteration of a grave if it is satisfied that every reasonable effort has been made to contact and obtain permission from the families concerned.

The removal of graves is subject to the following procedures as outlined by the SAHRA:

- Notification of the impending removals (using English, Afrikaans and local language media and notices at the grave site);
- Consultation with individuals or communities related or known to the deceased;
- Satisfactory arrangements for the curation of human remains and / or headstones in a museum, where applicable;
- Procurement of a permit from the SAHRA;
- Appropriate arrangements for the exhumation (preferably by a suitably trained archaeologist) and re-interment (sometimes by a registered undertaker, in a formally proclaimed cemetery);
- Observation of rituals or ceremonies required by the families.

The limitations and assumptions associated with this heritage impact assessment are as follows;

- Field investigations were performed on foot and by vehicle where access was readily available.
- Sites were evaluated by means of description of the cultural landscape, direct observations and analysis of written sources and available databases.
- It was assumed that the site layout as provided by Aurecon is accurate.
- We assumed that the public participation process performed as part of the Basic Assessment process was sufficiently encompassing not to be repeated in the Heritage Assessment Phase.

Table 1. Impacts on the NHRA Sections

Act	Section	Description	Possible Impact	Action
National Heritage Resources Act (NHRA)	34	Preservation of buildings older than 60 years	No impact	None
	35	Archaeological, paleontological and meteor sites	No impact	None
	36	Graves and burial sites	Yes	Avoidance
	37	Protection of public monuments	No impact	None
	38	Does activity trigger a HIA?	Yes	HIA

Table 2. NHRA Triggers

Action Trigger	Yes/No	Description
Construction of a road, wall, power line, pipeline, canal or other linear form of development or barrier exceeding 300m in length.	Yes	Cattle fence line. Total length 535m
Construction of a bridge or similar structure exceeding 50m in length.	No	N/A
Development exceeding 5000 m ²	No	N/A
Development involving more than 3 erven or sub divisions	No	N/A
Development involving more than 3 erven or sub divisions that have been consolidated in the past 5 years	No	N/A
Re-zoning of site exceeding 10 000 m ²	No	N/A
Any other development category, public open space, squares, parks or recreational grounds	No	N/A

2. BACKGROUND INFORMATION

2.1 PROJECT DESCRIPTION

The Working for Wetlands Programme will be commencing with planning to undertake wetland rehabilitation activities at Soutini-Baleni in Limpopo. This will involve a series of Hard Interventions such as;

- Earth berms or gabion systems to block artificial channels that drain water from or divert water to the wetland;
- Concrete and gabion weirs to trap sediment and reduce the erosion potential of concentrated flow;
- Earth or gabion structure plugs to raise channel floors and reduce water velocity;
- Concrete or gabion structures to stabilise head-cut or other erosion and prevent gullies;
- Concrete and/or reno mattress strips as road crossings to address channels and erosion in wetlands from vehicles; and

A “soft intervention” is also proposed to manage grazers within the wetland and involves the use of a low fence to exclude grazers from the eye (i.e. protection measure against overgrazing and trampling).



Figure 1. The Wetland and Proposed Actions (please see list below for descriptions)

Intervention no	Origin	Type
B82G-01-201-00	New	Rock/ Gravel Pack
B82G-01-202-00	New	Rock/ Gravel Pack
B82G-01-203-00	New	Rock/ Gravel Pack
B82G-01-204-00	New	Rock/ Gravel Pack
B82G-01-205-00	New	Rock/ Gravel Pack
B82G-01-206-00	New	Rock/ Gravel Pack
B82G-01-207-00	New	Brush Pack Rock/ Gravel Pack

B82G-01-208-00	New	Rock/ Gravel Pack Brush Pack
B82G-01-209-00	New	Brush Pack
B82G-01-210-00	New	Brush Pack
	POI	
B82G-01-211-00	New	Rock/ Gravel Pack
B82G-01-212-00	New	Rock/ Gravel Pack
	New	Earth Works
B82G-01-213-00	New	Stone Masonry/ Masonry Gabions Concrete (Low strength)
B82G-02-201-00	New	Rock/ Gravel Pack
	POI	
B82G-02-202-00	New	Silt fences
B82G-02-203-00	New	Rock/ Gravel Pack
	POI	
B82G-02-204-00	New	Earth Works
B82G-02-205-00	New	Cattle fence with walkway
B82G-03-201-00	New	Eco Logs
B82G-04-201-00	New	Brush Pack
B82G-04-202-00	New	Brush Pack
B82G-04-203-00	New	Brush Pack
B82G-04-204-00	New	Brush Pack
B82G-04-205-00	New	Brush Pack
B82G-04-206-00	New	Brush Pack
B82G-04-207-00	New	Brush Pack
B82G-04-208-00	New	Brush Pack
B82G-04-209-00	New	Brush Pack
B82G-03-202-00	New	Eco Logs

2.2 PROJECT LOCATION

The name Baleni, refers to a mineral hot spring located at S23.41875°, E30.91510°, and 380m above sea level. It is located approximately 20km southeast from the town of Giyani, and also falls within the borders of the Giyani Municipal District. Situated in the Limpopo Province, the district is bordered in the east by the Kruger National Park, in the south by the Groot Letaba River and in the north by the Shingwedzi River. The study area falls within the South African Lowveld - the area geographically defined as the low-lying areas east of the South African escarpment and west of the Lebombo Mountains on the Mozambique border (Onderstal 1984). For the purposes of this study, the northern Lowveld is defined as the area north of the Olifants River and south of the Limpopo river basin region. The Baleni research area covers the entire area within 1,5km around the salt pan. This encompasses the main salt working area around the spring, as well as the area peripheral to this, up to a distance of 1,5km measured from the spring's center.

2.3 GPS TRACK PATHS

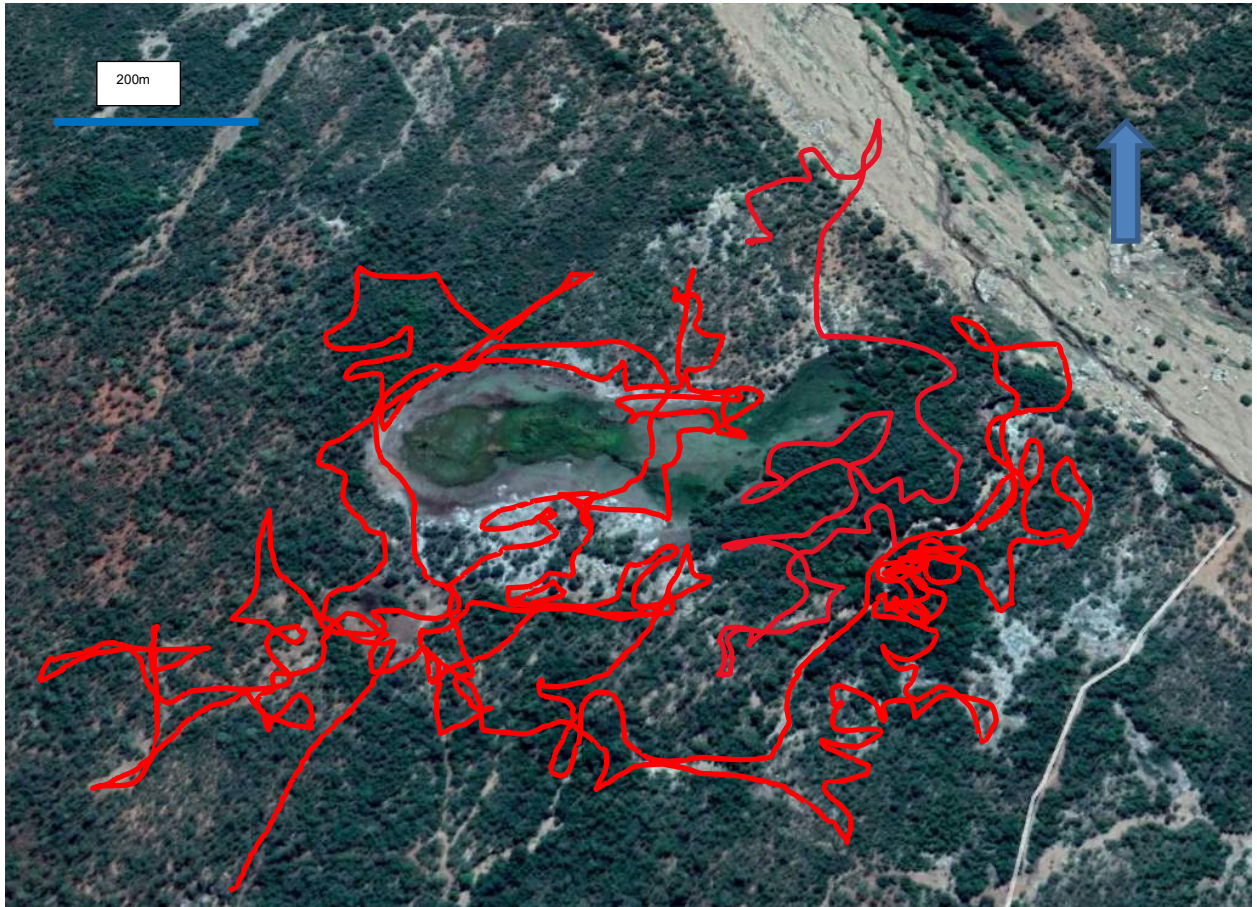


Figure 2. GPS Track Paths

HERITAGE INDICATORS WITHIN THE RECEIVING ENVIRONMENT

3. REGIONAL CULTURAL CONTEXT

3.1 PALEONTOLOGY

The areas fall within the “Grey” demarcation on the *PalaeoSensitivity Map*. SAHRA states that in this case a no further work in terms of Palaeontology is needed.

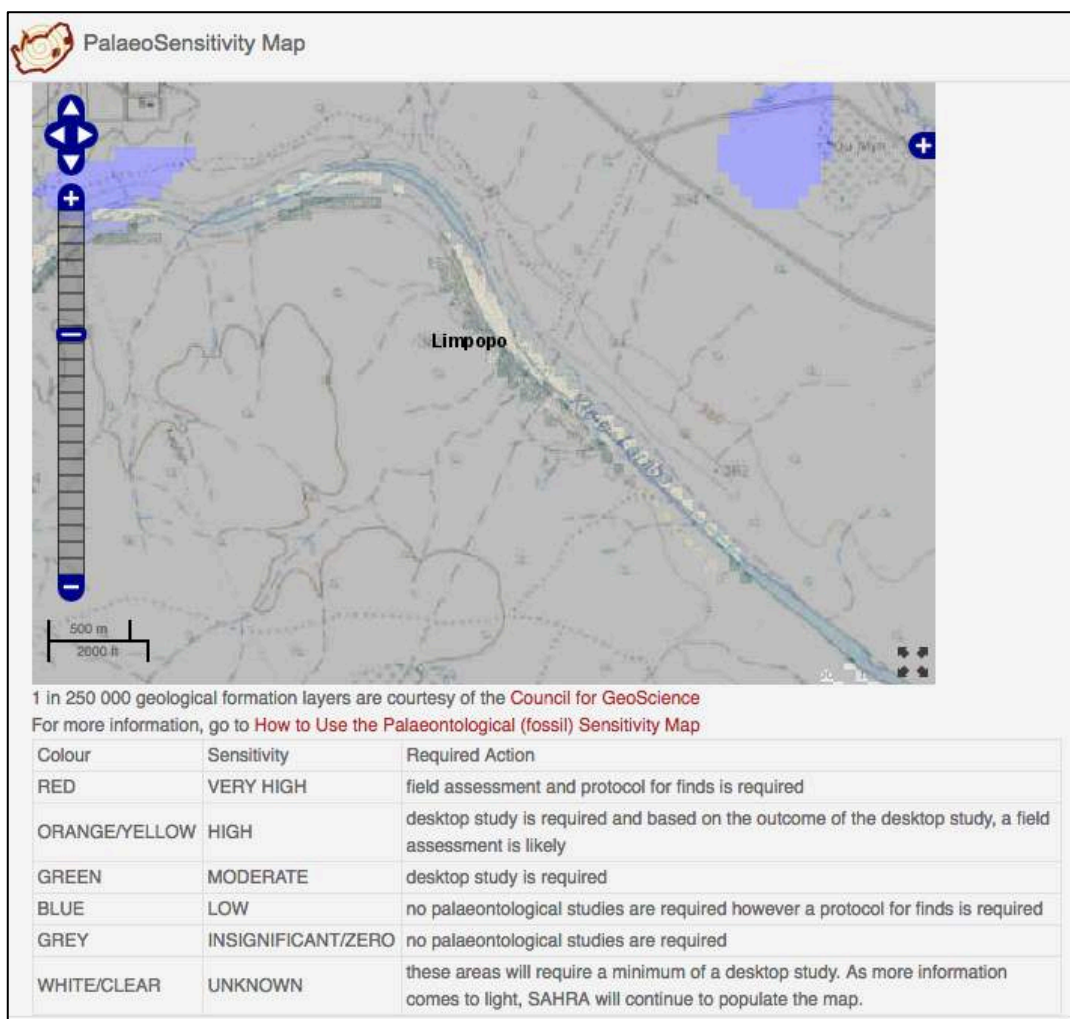


Figure 3. *PalaeoSensitivity Map*

3.2 STONE AGE

Stone implements belonging to the Early, Middle and Late Stone Age have been found in the area. These, with the rock paintings and a few engravings are evidence of the presence of hunter-gatherer communities in the past. The Sarwa, who were known to be hunters and gatherers, were still living alongside farming communities such as the Ngoni in the area during historical times after 1800 (Eastwood & Fish, 1995).

The antiquity of the Late Stone Age (LSA) south of the Limpopo was realized only recently. Until about 40 years ago it was assumed that Middle Stone Age (MSA) industries gave way to LSA ones at the beginning of the Holocene or at the end of the Pleistocene. As recently as 1974, for example, Sampson's synthesis of the southern African Stone Age placed the earliest LSA at 12,000 years before present (B.P.). Radiocarbon dating after the early 1970s dramatically altered previous ideas and showed that the LSA has its origin in the late Pleistocene, which is defined here as dating between ca. 40,000 and ca. 10,000 B.P. When Goodwin (1926) introduced the term Later Stone Age (LSA), and when the term was further developed by Goodwin and Van Riet Lowe (1929) in the late 1920s, their definition was unambiguous. The LSA was defined as several stone industries and/or cultures that included non-lithic items, such as ostrich eggshell beads and worked bone implements, and excluded Middle Stone Age (MSA) stone tools, except as recycled manuports. LSA people were explicitly linked with the biologically and behaviourally modern population of hunter gatherers, some being directly identified as Bushmen (Goodwin, 1926, p. 20; Goodwin and Van Riet Lowe, 1929, p. 171).

Today Goodwin and Van Riet Lowe's LSA definition is no longer entirely appropriate. First, ostrich eggshell beads and even a bone point have been found in MSA deposits that predate the LSA by tens of thousands of years. If the associations are reliable then these artifacts can no longer be seen as exclusively LSA. Second, fossils of anatomically modern humans, now thought to predate 100,000 B.P., have been found in MSA deposits at both Klasies River Mouth and at Border Cave (Beaumont et al, 1978; Singer and Wymer, 1982; Rightmire and Deacon, 1991). There is thus no correlation between the appearance of modern people and LSA technological evolution.

The only part of the 1920s definition that remains intact is the qualifier that LSA assemblages should lack MSA artifacts. Although LSA industries and their MSA predecessors share flaking traditions such as the bipolar technique and have some tool types in common, such as some generalized scraper types, they each have other flaking techniques and artifacts that are considered mutually exclusive.

From the 1950s onwards, archaeologists excavating MSA sites in the interior of South Africa recognised a lithic industry containing long blades, truncated blades with retouched edges, and long unifacial points. They named it after the town of Pietersburg (now Polokwane). Pietersburg Industries are located principally in the north of South Africa, but they have not yet been documented north of the Limpopo River. Most Pietersburg sites in Limpopo Province are caves or rockshelters, the best known being Cave of Hearths (Mason 1962, 1988; Sampson 1974; Sinclair 2009), Olieboomspoor (Mason 1962; Van der Ryst 2006), Bushman Rock Shelter (Plug 1981; Porraz et al. 2015) and Mwulu's Cave (Tobias 1949; Sampson 1974). The open site Blaaubank, a gravel donga near Rooiberg, has many felsite and quartzite Pietersburg tools overlying Earlier Stone Age ones (Mason 1962). Another open site, Kalkbank, also reported to have a Pietersburg industry, yielded only a few dozen lithics (Mason 1962) amongst the large faunal collection that is now known to have been accumulated predominantly by non-human agents (Hutson & Cain 2008).

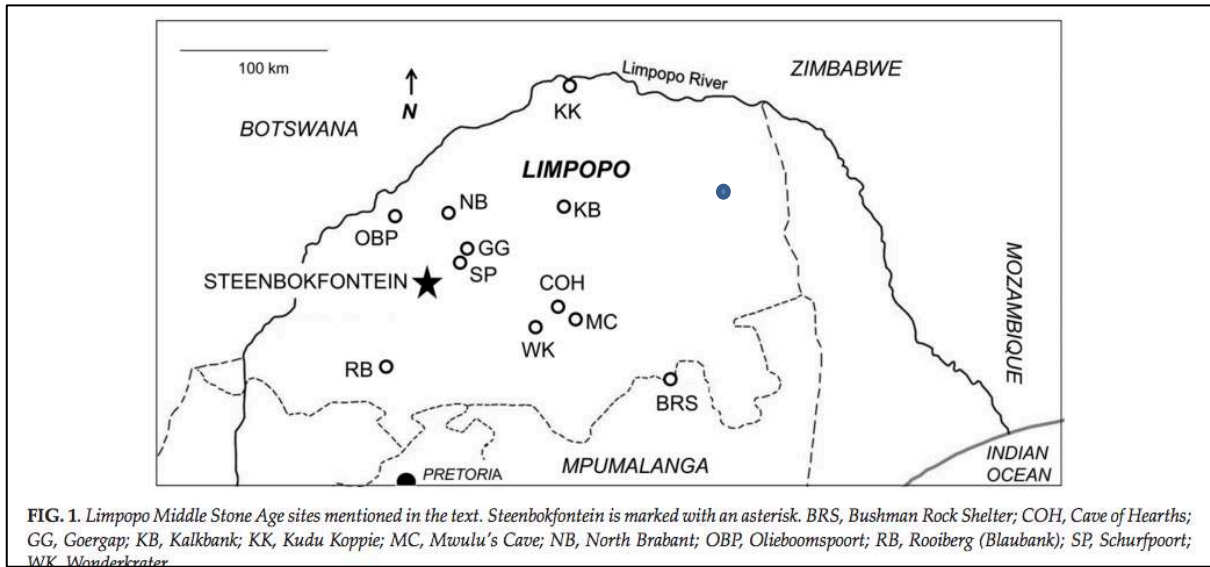


Figure 4. Limpopo Middle Stone Age sites mentioned in the text (Hutson & Cain, 2008) (Baleni in blue)

Most excavated MSA sites in Limpopo are below the escarpment, but amongst the known ones on the Waterberg plateau, is a small rock shelter, North Brabant (New Belgium 608 LR), which was excavated by Schoonraad and Beaumont (1968).

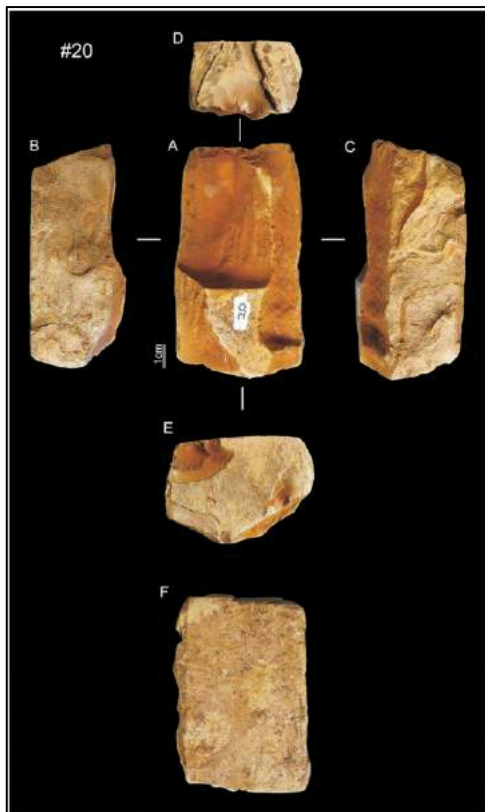


Figure 5. Middle Stone Age Tools

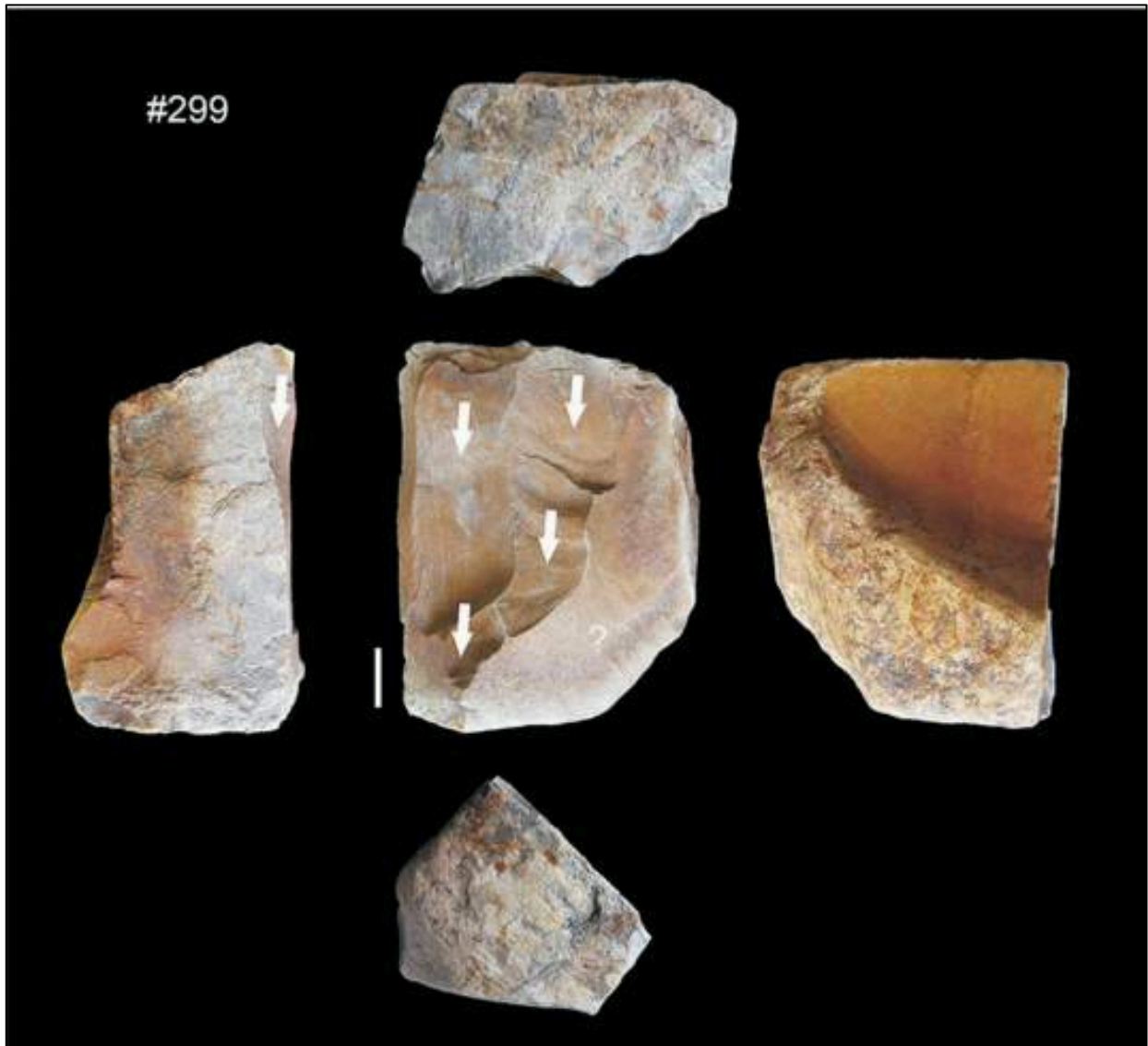


Figure 6. Middle Stone Age Tools

The Limpopo Province of South Africa has a rich archaeological heritage, not least of which is the sub-continent's first town, Mapungubwe, built a thousand years ago (Huffman 2000, 2007). The iron-using farmers who arrived here during the first millennium AD encountered indigenous, stone tool- using, 'Later Stone Age' (LSA) hunter-gatherers. The nature of this contact between two radically different ways of life, and the question of whether the hunter-gatherers survived it, has been much debated (e.g. Mazel 1989; Wilmsen 1989; Solway & Lee 1990; Wilmsen & Denbow 1990; Wadley 1996; Sadr 1997, 2002; Hall & Smith 2000; Schoeman 2006; Mitchell 2009). Where the Limpopo and Shashe Rivers meet, it seemed that the LSA hunting and gathering way of life ended with the rise of the first farmer towns (Sadr 2005; Van Doornum 2007). Recent excavations in rock shelters on the Makgabeng plateau, a hundred or so kilometres south of the Limpopo River, indicate that some hunter-gatherers found refuge there until the 19th century. [BRADFIELD, J., HOLT, S., & SADR, K. (2009).

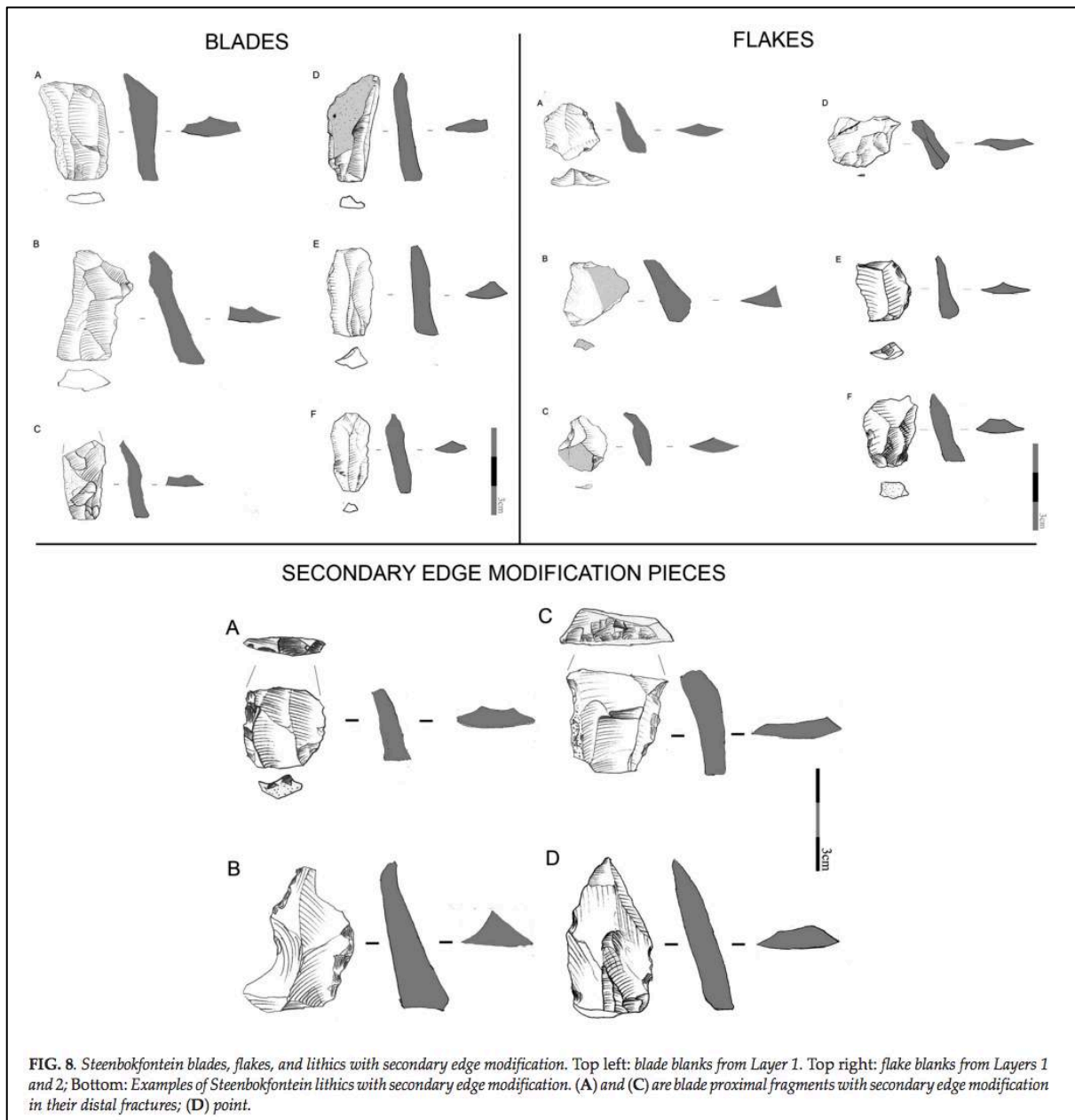


Figure 7. Steenbokfontein blades, flakes and lithics with secondary edge modification.

Rock Art

The Central Limpopo Basin (CLB) is situated nearly equidistant between the rock art concentrations of the Maloti/Drakensberg Mountains of Lesotho/South Africa and the Matopo Hills of Zimbabwe and comprises four separate and distinct rock art areas: the Limpopo-Shashe Confluence Area (LSCA), Northern Venda, the Soutpansberg and the Makgabeng Plateau (Fig. 1). The region is relatively well researched (e.g. Schoonraad 1960; Willcox 1963; Pager 1975, 1977, Eastwood 1999, 2003, 2005; Eastwood & Blundell 1999; Eastwood & Cnoops 1999; Eastwood et al. 1999; Hall & Smith 2000; Blundell & Eastwood 2001; Smith & Ouzman 2004), and since 1992 roughly 60% of the total land area has been surveyed and a total of 953 rock art sites have been located and recorded. Whilst the survey work continues, and much recording work remains to be done, the CLB data set is already amongst the most detailed in southern Africa. [Eastwood, E., & Smith, B. (2005).

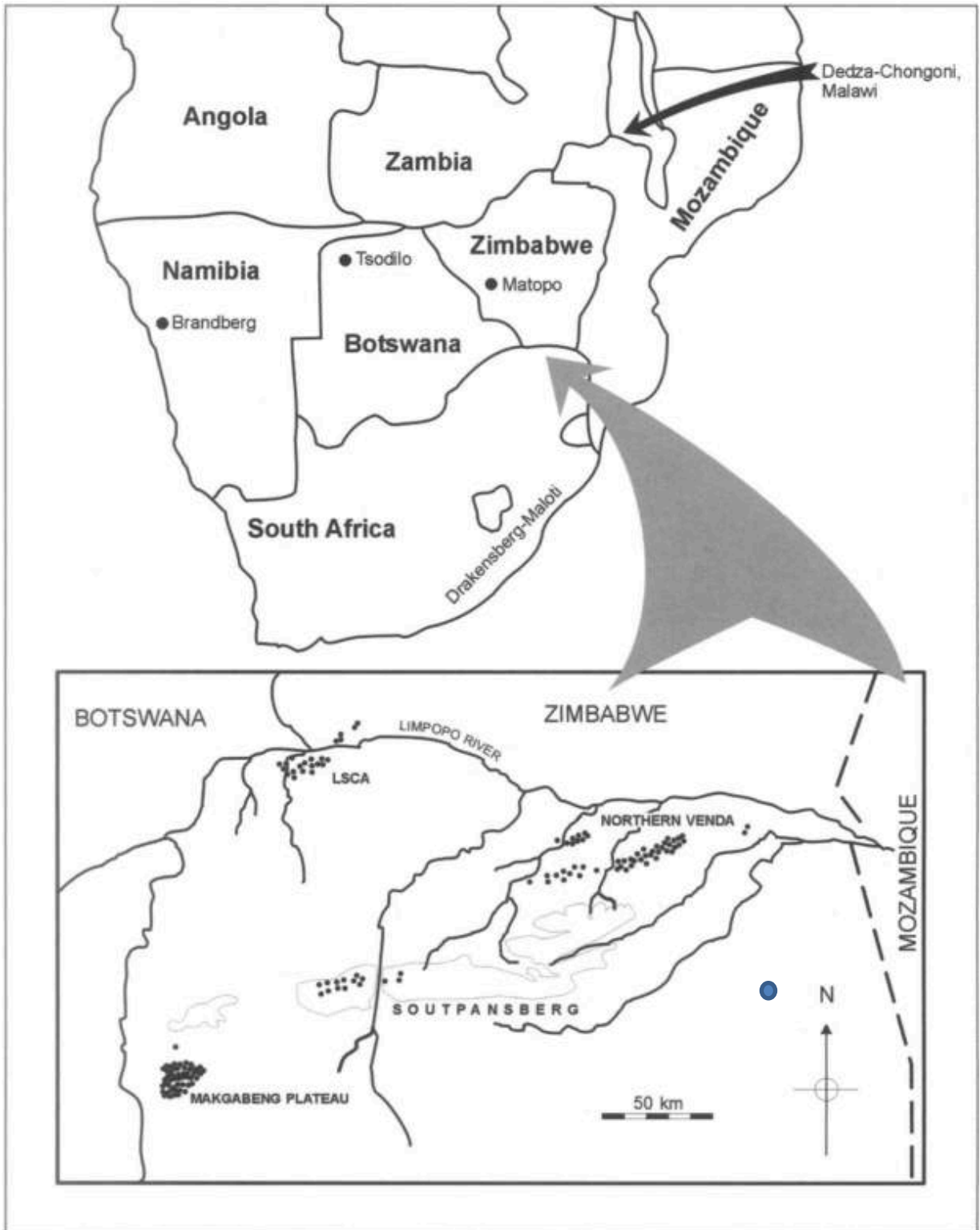


Figure 8. Rock Art Locations (Blue dot indicates Baleni)



Figure 9. Khoekhoen Geometric Patterns and Finger Dot Painting (Makgabeng Plateau)

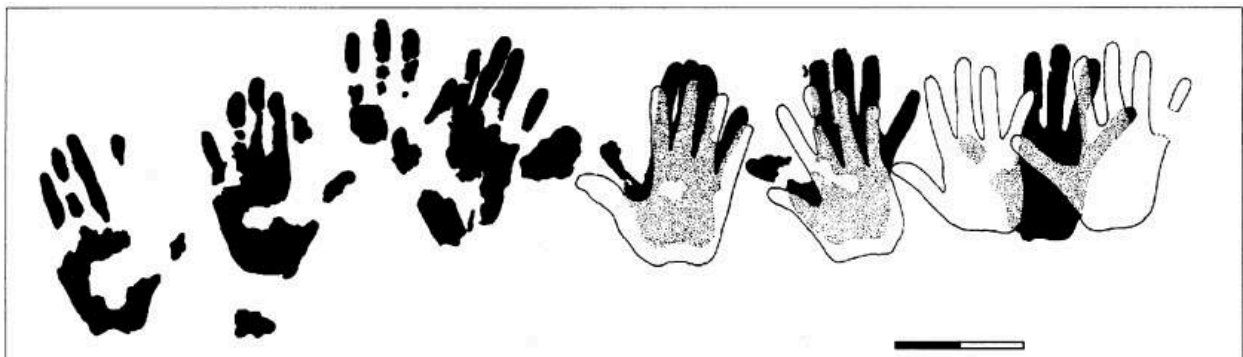


Figure 10. Red handprints overlain by white handprints, Soutpansberg, Central Limpopo Basin. Scale 200mm

3.3 IRON AGE

The Limpopo Province and especially the Shashe/Limpopo Confluence area (SLCA) and the Limpopo Basin area contains many Iron Age sites. Although Early Iron age sites are limited (when a distinction is made between Early and Middle Iron Age) there are some important sites on the Soutpansberg such as Happy Rest.

The most significant Iron Age industry in Limpopo must be the Leopards Kopje of Mapungubwe/K2 Industry. These sites are found scattered across the province, although the majority of paramount sites seems to be concentrated on the Limpopo and Levhuvhu Rivers.

Sites that are culturally related to K2 and Mapungubwe have been observed on Hamilton 41 MS, Samaria 28 MS and Den Staat 27 MS (Fig. 1). Another site related to Mapungubwe was excavated by Van Wyk (1987) on Skutwater to the east of Greefswald. Small Iron Age sites postdating Mapungubwe and K2 have been recorded on Greefswald, including some stone-walled sites on hilltops. Some of these sites have been identified by T.N. Huffman as Khami type ruins. (Huffman 2009). According to oral

tradition, communities belonging to the Lea and Twa mamba tribes, related to the Venda and the Shona-speaking people, settled in the Greefswald region in historical times. They were followed, after c. AD 1700, by Sotho-speaking people.

A few physical features distinguish Khami muzinda (plural = mizinda , the Shona word for a chief's place) from Zimbabwe centres. For example, Khami palaces often bear check patterns, and the pottery usually incorporates black and red motifs on globular vessels and tall-necked jars. The distribution of Khami markers and the linguistic history of the Zimbabwe culture area show that the Khami phase marks the distribution of Kalanga-speaking polities.

Radiocarbon dates from Khami itself (Huffman 2007: 258-259), the name site (Robinson 1959) for the phase and the largest capital (second only to Great Zimbabwe), suggest an early 15th century beginning. At about the same time, Kalanga groups began to move southwards. The Letsibogo district of Botswana (Campbell et al 1996; Huffman & Kinahan 2002/2003) provides one example. Khami settlements first appear in the Mapungubwe landscape at this same time (Fig. 2). So far, there are some 255 commoner homesteads (Level 1 – Family Head) on record. These homesteads probably housed some 50 people at any one time, 20-30 being children (following Huffman 1986). There are 10 other hilltop sites with stonewalled palaces. These royal centres are all the same size (Level 3 - Petty Chief), supporting about 350 people each. [Huffman, T., & Du Piesanie, J. (2011).

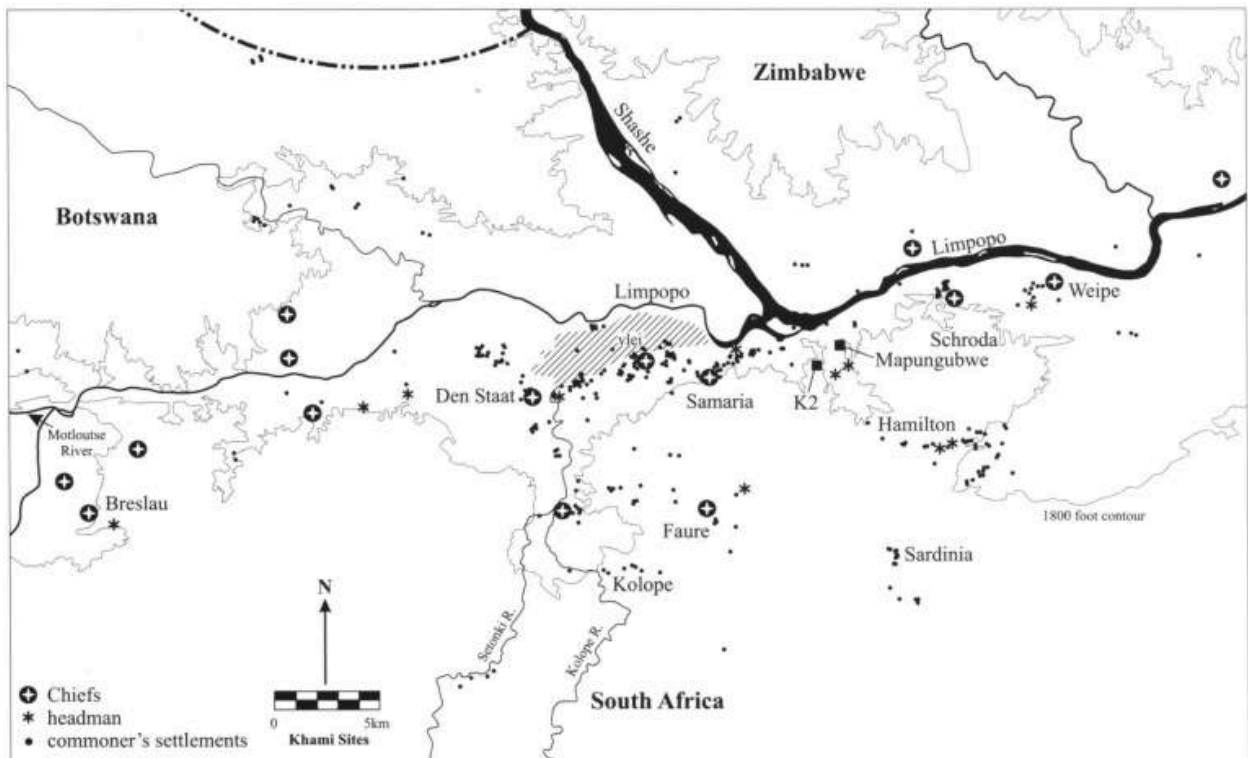


Figure 11. Khami-period sites in the Mapungubwe landscape

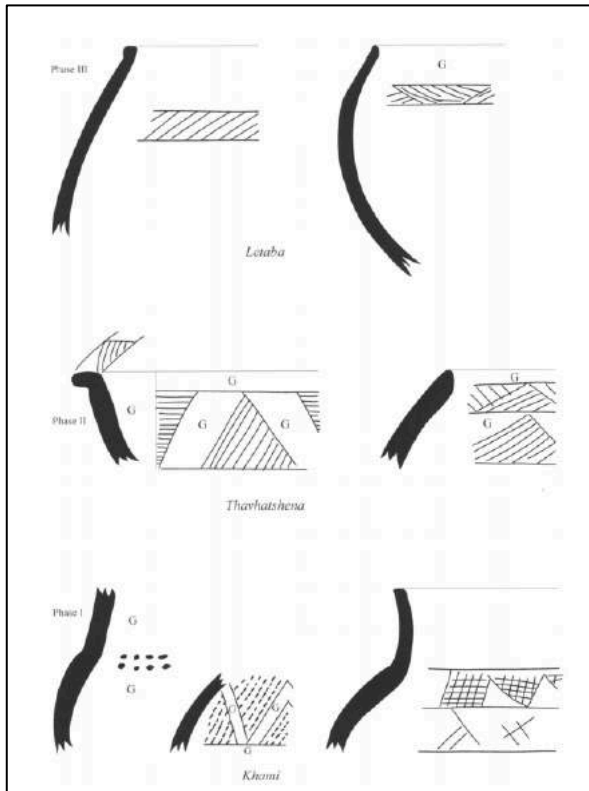


Figure 12. Ceramic facies associated with the three phases of occupation at Machedema

3.4 THE HISTORIC ERA

Louis Johannes Tregard was born on the 10th of August 1783 in Oudtshoorn in the Karoo. Very little is known of his upbringing, but the diaries he kept of these endeavours, show him to be a reasonably well-educated man. Tregard later wrote his name as Tregardt, but it must be noted that there are a number of variants of the name, i.e. Trigardt, Triegardt and the most common, Trichardt. The latter form has been used for towns named in his honour.

Tregardt started farming in Boschberg and later at Somerset East. He moved across the Fish River in 1834 and rented land near the Kei River from the Xhosa chief, Hintsá. Here, in Xhosa country, he was acknowledged as a leader among the exiled Boer community of approximately 30 families. There exists evidence to suggest that Tregardt had shown overt hostility towards the British regime and he was even accused of inciting the Xhosa to begin the frontier war of 1834-5. When he learned that the authorities had issued a warrant for his arrest, Tregardt slipped away from this farm in Hintsá's country and crossed the Orange River. There he received support and assistance from Hendrik Potgieter and Johannes van Rensburg.

Tregardt and his family, as well as Hans van Rensburg's group, started the trek into the far north and arrived at the foot of the Soutpansberg Mountain range in 1836 in two separate parties, as they had parted ways en route due to a disagreement. Van Rensburg's party continued east towards Inhambane, but his entire group was exterminated en route. Tregardt's group was joined by the first group to arrive in the area under the leadership of Coenraad De Buys (the progenitor of the De Buys / Buys people who still live in Buysdorp – a settlement west of Louis Trichardt), who came to the area in 1821. They formed an alliance and aided the Ramabulana to replace the western Venda Chief, Ramavhoya assuming control of the salt plan north of the Soutpansberg Mountain. Tregardt remained in the area for about one year, before leading reconnaissance missions into current day Zimbabwe and towards Mozambique in search of the van Rensburg clan, they made their way to Delagoa Bay 7 months after setting off in September 1837. The trek claimed the lives of many in the party, including Tregardt, who succumbed from malaria in October of 1838.

After his death other Voortrekkers settled in the area as ivory hunters but left after Chief Makhado and his vhaVenda people defeated them in 1867. Only in 1898 did the *Zuid-Afrikaansche*

Republiek take control of the region and established the town Louis Trichardt the following year in February 1899.

Along with other towns in Limpopo Province, Louis Trichardt was renamed Makhado in 2003, after the Venda King Makhado who ruled in the region from the mid-1800s until his death in 1887. However, there was local rejection to the new name, and it was claimed less than 1% of the town's population had been consulted on the change. It was not only the Afrikaans people who were opposed to the name change, many Shangaan people regarded Chief Makhado as an oppressor. A residents' association applied to Pretoria's High Court in 2005 to have the name overturned. They were rejected but rather astonishingly appealed in South Africa's Supreme Court and won, and the name was changed back to Louis Trichardt in 2007.

3.5 SALT EXTRACTION AT BALENI

Archaeologists have visited the saltworks in the past, drawing on the modern salt extraction activities for comparative data applicable to their own studies (e.g. Evers 1974).

Evers (1974; 1981) after visiting the site remarks on the similarities of the Baleni deposits with that of Eiland and Harmony. The continued extraction and the methods employed at the site have also been recorded by other observers (e.g. De Witt 1966; (Terblanche 1994)). Observations at Baleni have also been used to reconstruct traditional salt making methods at the Tsonga Kraal Open Air Museum (Terblanche 1994).

As elsewhere in Africa, present-day salt extraction at Baleni is an exclusively dry season activity. The salt-season usually starts in May, the precise day of commencement being decided on beforehand by consulting the ancestral spirits (Terblanche 1994).

The first step in the extraction process is to construct the filters through which the salt is leached. The filters are mostly made from the branches and bark of the mopane tree (*Colophospermum mopane*). These filters vary in size, but must be high enough to place a container underneath. Four forked poles are planted into the ground approximately 40cm – 60cm from each other to form a square. Four other poles are placed in the forks of the planted poles and tied together using bark from a mopane tree. A hanging sieve from bark and thin branches is woven onto this structure. This sieve is held into position by supple mopane rods and lined with dry grass. Using clay from an anthill, the inside is built up into a cone shape leaving only a small hole in the bottom through which water can drip. This hole is usually covered with dry grass or leaves (Terblanche 1994).

The next step is to scrape off the salt crust on the edge of the swamp. Terblanche (1994) mentions that the shell of a freshwater mussel is used for his practice. This mixture of soil and salt is then taken to the filter where it is mixed with an equal amount of river sand. The river sand loosens the texture of the gathered crust, which would otherwise be too clayey. A suitable quantity of this mixture is then placed in the filter. Once in the filter, water obtained from the river is poured over the mixture. This process is repeated until the receptacle underneath the filter is filled with the saltwater extraction. After water has been poured over the salt-soil mixture two or three times, the content of the filter is scraped out and discarded next to the filter (Evers 1981; Terblanche 1994). The bulk of the archaeological deposit found at Baleni are mounds formed by the scraped-out filter content.

The saltwater mixture is then placed in a container over a fire and boiled slowly so that the water evaporates, leaving only moist salt behind. The crystallized salt is then scraped into a pot, a large potsherd or calabash, again using a freshwater mussel shell. On questioning the meaning of the shell's use, Terblanche (1994) was informed that it used because it was always the practice, since iron objects will rust on contact with the salt. When there is enough, the damp salt is formed into a cone shape. This is done by pouring the content onto a flat surface and forming the cone by ladling it with the hands. Terblanche indicates that at times coals are placed on the cone to form a hard crust on the surface. Sometimes the cone is also paced on dry grass, which is then burnt in order to produce the same effect. Witt (1966) mentions a process where the cone is placed in the sun in order for it to dry, and then baked in a clay pot placed on a fire. Measurements of the cones found that the cones weighed between 1 and 2 kg (Terblanche 1994).



Figure 13. Mopane and Sand Filters



Figure 14. Salt Water Being Filtered



Figure 15. End Product



Figure 16. Salt Makers with Members of the Study Team

3.7 HISTORICAL MAPS

The following historic map-sets were consulted during the study;

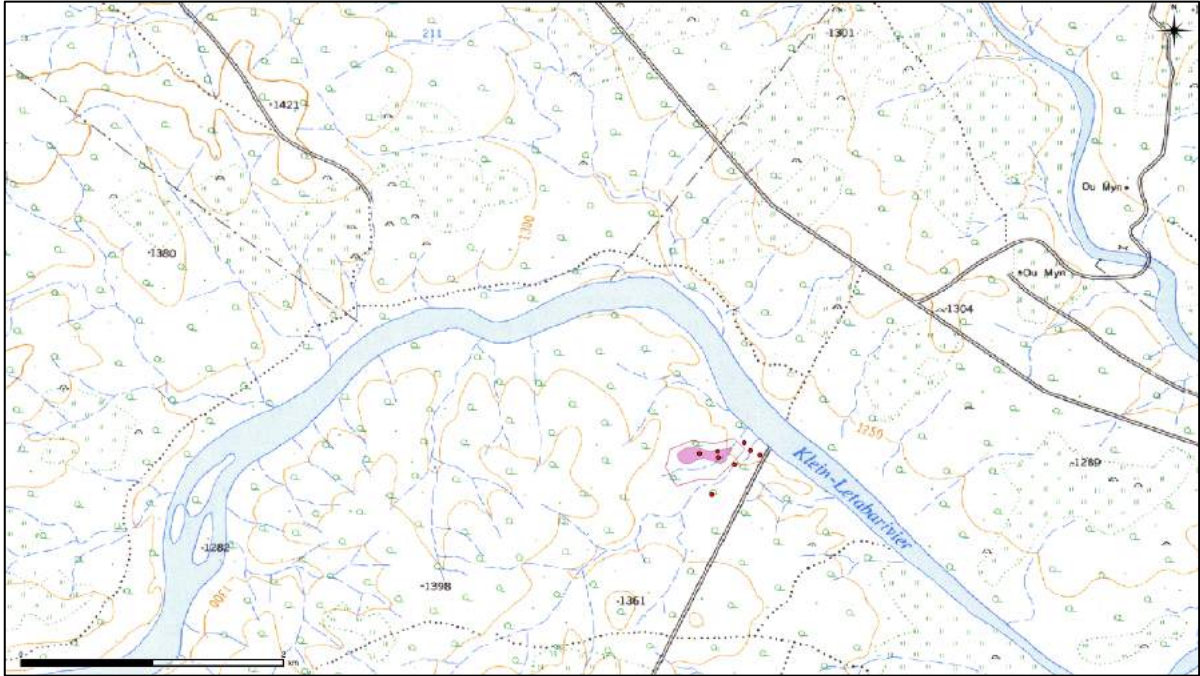


Figure 17. 1967 Map (Site location in pink as well as in all subsequent maps)

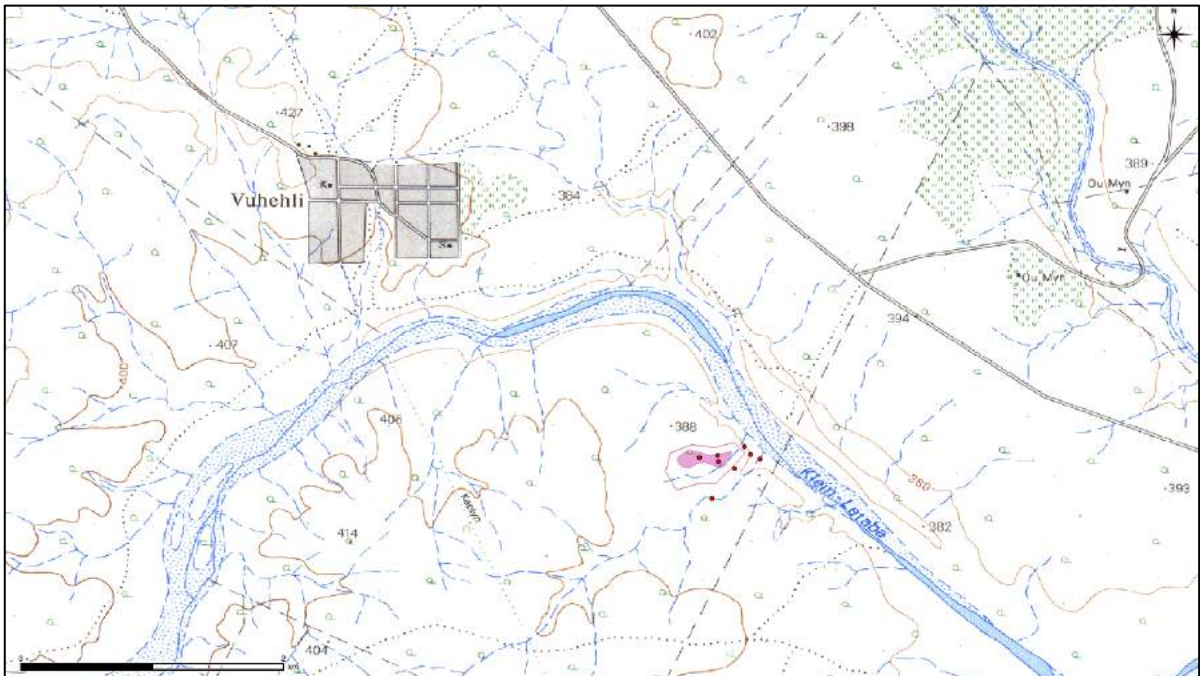


Figure 18. 1980 Map

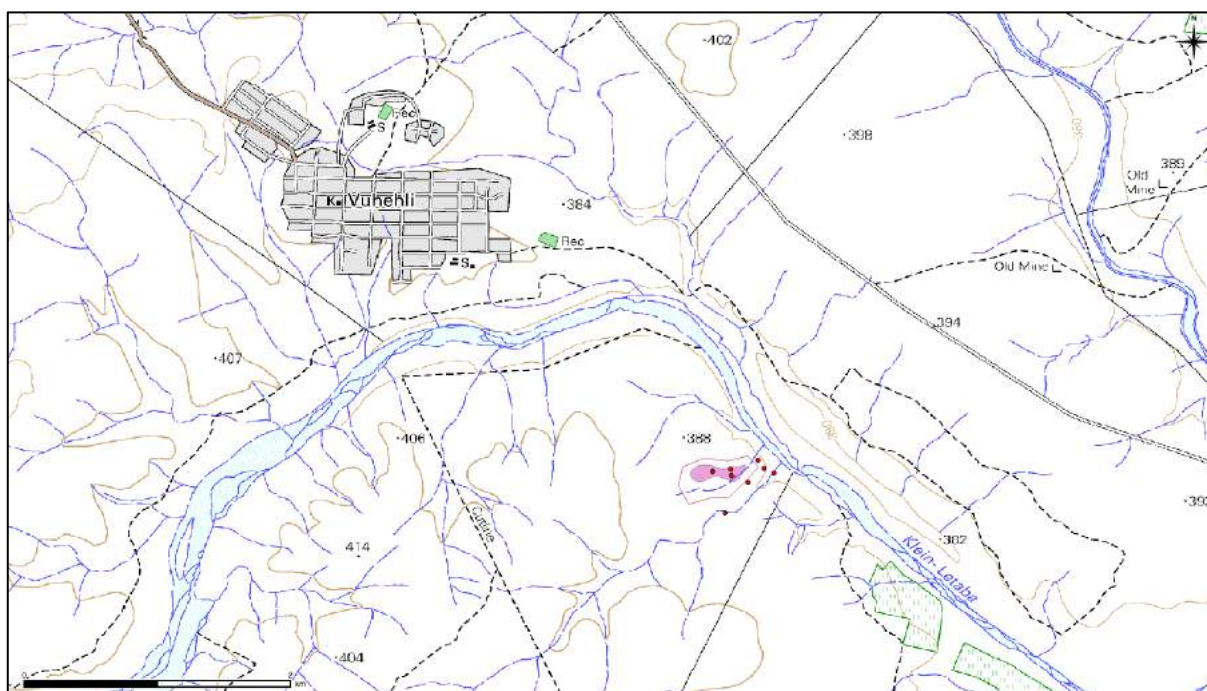


Figure 19. 1997 Map

No structures of heritage significance could be identified on the historical maps of the area.

4. FINDINGS

4.1 FIELDWORK RESULTS

Several concentrations of potsherds and ash was noticed in the areas around the Baleni Wetland. None of these sites were however to be affected by the proposed erosion mitigation measures. The only site that would potentially be affected was located on the edge of a natural drainage ditch which was earmarked for stabilization. This will be designated as Site 1 as per Fig 25.

4.1.1 SITE 1

GPS 23°25'14,6" S
30°54'46,6" E

This site contained a large concentration of potsherds (some of which was diagnostic) with ash deposits and the remains of hut rubble. It is situated on the eastern side of an erosion donga flowing north-south and draining into the Middle Letaba River. Some deposits were also noted on the western side of the donga suggesting that the site has been split by the erosion.



Figure 20. Potsherd on site



Figure 21. Potsherd on site



Figure 22. Deposits within vertical erosion wall



Figure 23. Gravel remains of a hut



Figure 24. Possible extent of Site 1 deposits.

Discussion

During 2004/2005, Alexander Antonites performed a survey and excavation at the Baleni Salt works describing sites and settlement distribution within this area. Antonites identifies a possible site (designated BS02) close to the location of Site 1. Although several different locations are both given in the text and maps for the site, the GPS coordinates indicate that it might be the same site as Site 1. The document was found to be flawed when it came to site locations, however the archaeological information was still valid and of value for this study.

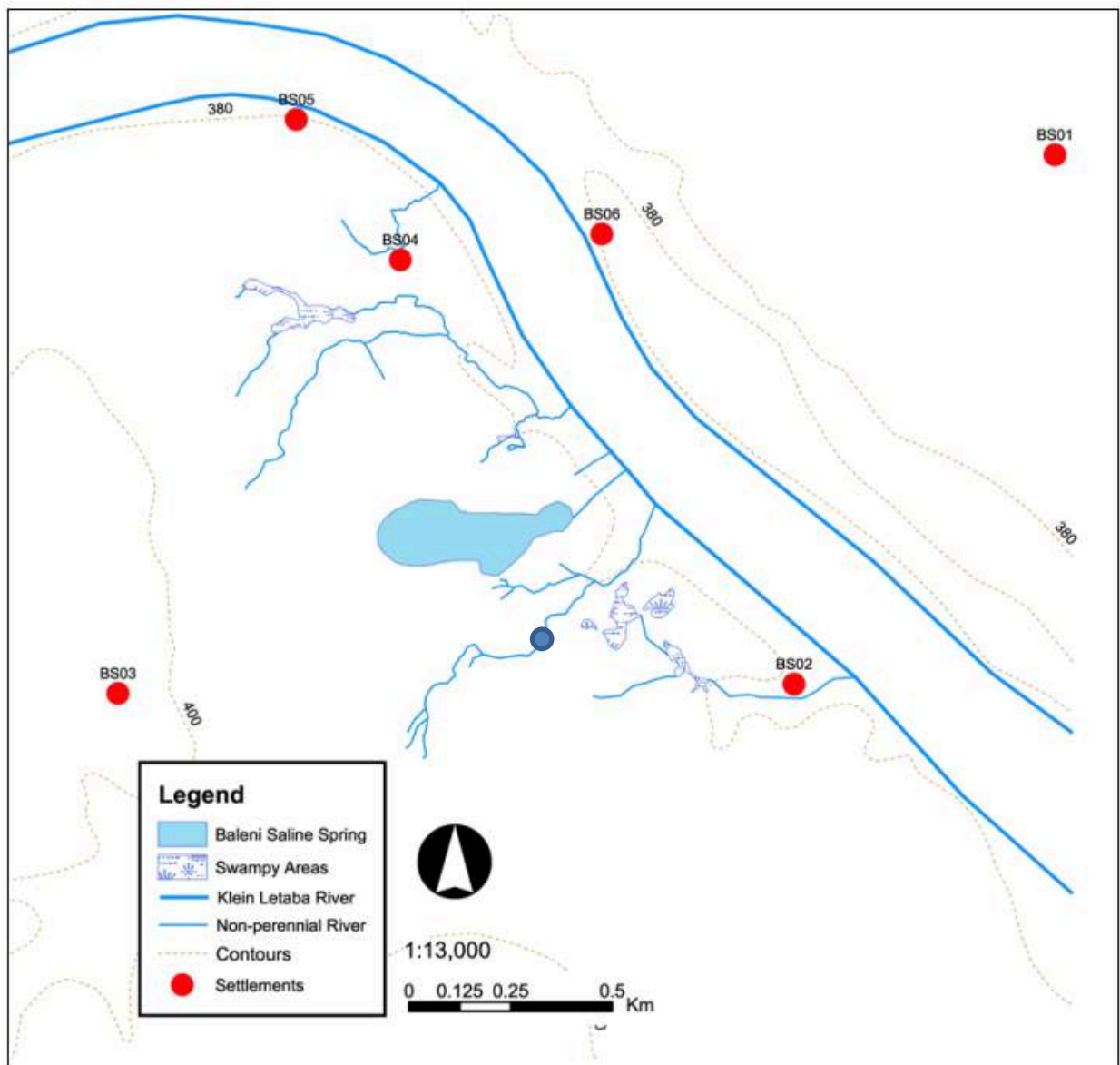


Figure 25. Sites identified by Antonites - BS02 location is incorrect (A Antonites, 2005) – Site 1 in Blue

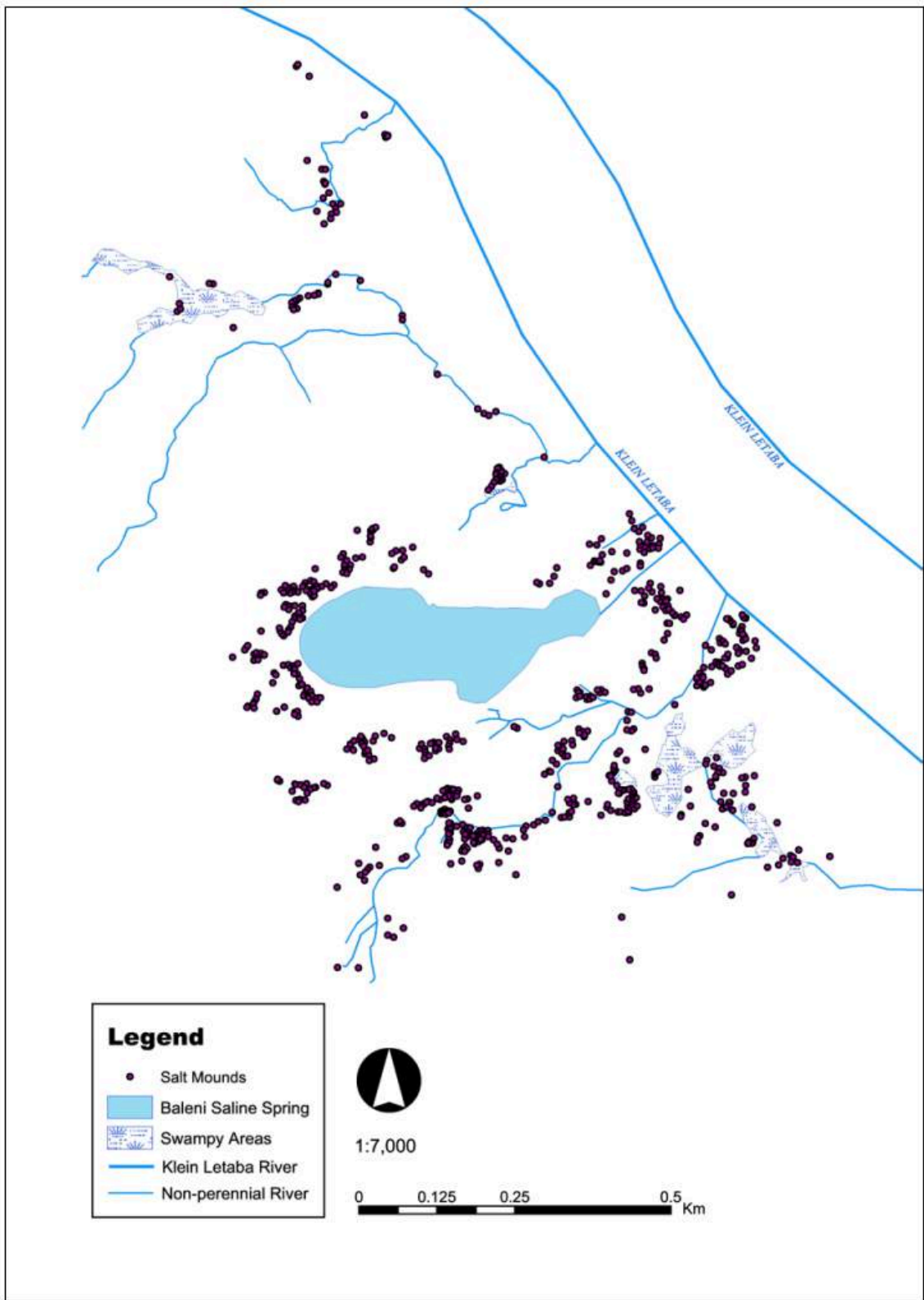


Figure 26. Locations of what is referred to as "Salt Mounds"- some of which was found to be hut remains (Antonites 2005)

The following is an abstract from the Antonites report. It refers to BS04, however (taking the glaring similarities between the two sites) it was meant to describe site BS02 or Site 1 as per this report;

BS04

This site was identified by the presence of ceramic scatters and daga. A deep donga seems to have cut through the biggest part of the site, since material was found on both edges of it, and not extending very far back. The extensive erosion made it difficult to determine the approximate size of the settlement.

Estimates indicate that it did not exceed 2000m². Preliminary analysis of the surface ceramics indicated that the site was occupied during the early first millennium. Leached out mounds of earth, possibly from a later date, were also identified on the edge of the donga. This led to the decision to excavate test pits in order to obtain ceramics which could be used for a more detailed temporal context for the settlement. (Antonites, 2005).

We believe the subsequent excavations designated as BAL 01 (unfortunately no GPS coordinates or 1:50 000 references are given for these excavations) refer to Site 1. The photographs contained in the report also seem to corroborate this.



Figure 27. Exposed wall at Site 1



Figure 28. Eroded wall from Antonites Report (Antonites, 2005)



Figure 29. Archaeological Stratigraphy from Antonites Excavation (Antonites 2005)



Figure 30. Salt Mounds as described by Antonites, rather thought to be hut remains

4.1.2. SITE 2

GPS 23°25'15,2" S
30°54'31,1" E



Figure 31. Grave Site

A single grave site was also identified; however, it is not expected to be impacted upon. The site should be avoided by at least 25m.



Figure 32. Location of Grave Site

4.2 PUBLIC PARTICIPATION

As part of the heritage orientated public participation the following steps were taken to inform local residents of the planned development.

- Notices indicating the location of the rehabilitation interventions were placed on site (See Addendum 1).
- IAP's were invited to register through the lead consultant's public participation process, to facilitate the dissemination of information and to enable them to log any queries or complains in regards the heritage of the are and how it will be affected by the proposed rehabilitation interventions.
- This HIA will be made available for public comment as part of the broader EIA report for this project.
- If a ROD in terms of the NHRA is issued for the project, IAP's will be informed of their right to log complaints within 14 days.
- Letters informing IAP's of the BAR will be circulated by the lead consultant.
- As part of the wider EIA stakeholder engagement component, advertisements regarding the development was placed in local newspapers by the lead consultant.

5. METHODOLOGY

This study defines the heritage component of the EIA process being undertaken for the proposed anti-erosion measures recommended by the Working for Water engineers to limit the impact of water flow off at the wetlands around Baleni, Limpopo Province.

It is described as a first phase (HIA). This report attempts to evaluate both the accumulated heritage knowledge of the area as well as information derived from direct physical observations.

5.1 INVENTORY

Inventory studies involve the in-field survey and recording of archaeological resources within a proposed altering action and buffer area. The nature and scope of this type of study is defined primarily by the results of the overview study. In the case of site-specific actions, direct implementation of an inventory study may preclude the need for an overview.

There are a number of different methodological approaches to conducting inventory studies. Therefore, the proponent, in collaboration with the archaeological consultant, must develop an inventory plan for review and approval by the SAHRA prior to implementation (*Dincause, Dena F., H. Martin Wobst, Robert J. Hasenstab and David M. Lacy 1984*).

5.2 EVALUATING HERITAGE IMPACTS

A combination of document research as well as the determination of the geographic suitability of areas and the evaluation of aerial photographs determined which areas could and should be accessed.

After plotting of the site on a GPS the areas were accessed using suitable combinations of vehicle access and access by foot.

Sites were documented by digital photography and geo-located with GPS readings using the WGS 84 datum.

Further techniques (where possible) included interviews with local inhabitants, visiting local museums and information centers and discussions with local experts. All this information was combined with information from an extensive literature study as well as the result of archival studies based on the SAHRA (South African Heritage Resource Agency) provincial databases.

This Heritage Impact Assessment relies on the analysis of written documents, maps, aerial photographs and other archival sources combined with the results of site investigations and interviews with effected people. Site investigations are not exhaustive and often focus on areas such as river confluence areas, elevated sites or occupational ruins.

The following sources were consulted in this study;

- South African National Archive Documents
- Government Gazette 92 of 2007
- SAHRIS (South African Heritage Resources Information System) Database of Heritage Studies
- Internet search
- Historic maps
- 1967, 1980, 1997 & 2008 Surveyor General Topographic Map series
- 1952 1:10 000 aerial photo survey
- Google Earth 2018 imagery
- Published articles and books
- JSTOR Article Archive

5.3 FIELDWORK

Fieldwork for this study was performed on the 21th of August 2018. Most of the areas were found to be accessible by vehicle. Areas of possible significance were investigated on foot. The survey was tracked using GPS and a track file in GPX format is available on request.

Where sites were identified it was documented photographically and plotted using GPS with the WGS 84 datum point as reference. GPX files are available on request from G&A Heritage.

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 **Garmin Colorado** 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.

6. ASSESSMENT OF HERITAGE POTENTIAL

6.1 ASSESSMENT MATRIX

6.1.1 DETERMINING THE ARCHAEOLOGICAL SIGNIFICANCE

In addition to guidelines provided by the National Heritage Resources Act (Act No. 25 of 1999), a set of criteria based on Whitelaw (1997) for assessing archaeological significance has been developed for Eastern Cape settings but also applies to other provinces. These criteria include estimation of landform potential (in terms of its capacity to contain archaeological traces) and assessing the value to 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 and, 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, could be of exceptional significance. In light of this, estimation of potential will always be a matter for archaeological observation and interpretation.

Table 3. Classification of landforms and visible archaeological traces for estimating the potential for archaeological sites (after J. Deacon, NMC as used in Morris)

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 features such as	On old river terrace

			hill/dune	
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	Loping 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 of 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 <0.5m thick	Deposit >0.5 m thick

Table 4. Site attributes and value assessment (adopted from Whitelaw 1997 as used in Morris)

Class	Landforms	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

6.2 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 which is now widely used in most provinces. 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.

6.3 IMPACT STATEMENT

6.3.1 ASSESSMENT OF 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 activities. This change may be either beneficial or adverse. Beneficial impacts occur wherever a proposed activity 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 below:

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

6.4 INDICATORS OF IMPACT SEVERITY

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 on-going nature.

Diversity

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

Cumulative Effect

This describes the cumulative effect of the impacts on the heritage parameter. A cumulative effect/impact is an effect, which in itself may not be significant but may become significant if added to other existing or potential impacts emanating from other similar or diverse activities as a result of the project activity in question.

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.

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*).

6.5 PRE-CONTACT SITES

As discussed in Findings – Chapter 2

6.6 POST-CONTACT SITES

No sites associated with the post-contact era will be affected by the proposed actions.

6.7 BUILT ENVIRONMENT

No structures were identified on site.

7. IMPACT EVALUATION

This HIA Methodology assists in evaluating the overall effect of a proposed activity on the heritage environment. The determination of the effect of a heritage impact on a heritage parameter is determined through a systematic analysis of the various components of the impact. This is undertaken using information that is available to the heritage practitioner through the process of heritage impact assessment. The impact evaluation of predicted impacts was undertaken through an assessment of the significance of the impacts.

7.1 DETERMINATION OF SIGNIFICANCE OF IMPACTS

Significance is determined through a synthesis of impact characteristics, which include context and intensity of an impact. Context refers to the geographical scale i.e. site, local, national or global whereas intensity is defined by the severity of the impact e.g. the magnitude of deviation from background conditions, the size of the area affected, the duration of the impact and the overall probability of occurrence.

Significance 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. The total number of points scored for each impact indicates the level of significance of the impact.

7.2 IMPACT RATING SYSTEM

An impact assessment must take account of the nature, scale and duration of effects on the heritage environment whether such effects are positive (beneficial) or negative (detrimental). Each issue / impact is also assessed according to the project stages:

- planning
- construction
- operation
- decommissioning

Where necessary, the proposal for mitigation or optimisation of an impact will be detailed. A brief discussion of the impact and the rationale behind the assessment of its significance has also been included.

7.2.1 RATING SYSTEM USED TO CLASSIFY IMPACTS

The rating system is applied to the potential impact on the receiving environment and includes an objective evaluation of the mitigation of the impact. Impacts have been consolidated into one rating. In assessing the significance of each issue the following criteria (including an allocated point system) is used:

Table 5. Classification of Impacts

NATURE		
Including a brief description of the impact of the heritage parameter being assessed in the context of the project. This criterion includes a brief written statement of the heritage aspect being impacted upon by a particular action or activity.		
GEOGRAPHICAL EXTENT		
This is defined as the area over which the impact will be expressed. Typically, the severity and significance of an impact have different scales and as such bracketing ranges are often required. This is often useful during the detailed assessment of a project in terms of further defining the determined.		
1	Site	The impact will only affect the site.
2	Local/district	Will affect the local area or district.
3	Province/region	Will affect the entire province or region.
4	International and National	Will affect the entire country.
PROBABILITY		
This describes the chance of occurrence of an impact		
1	Unlikely	The chance of the impact occurring is extremely low (Less than a 25% chance of occurrence).
2	Possible	The impact may occur (Between a 25% to 50% chance of occurrence).
3	Probable	The impact will likely occur (Between a 50% to 75% chance of occurrence).
4	Definite	Impact will certainly occur (Greater than a 75% chance of occurrence).
REVERSIBILITY		
This describes the degree to which an impact on a heritage parameter can be successfully reversed upon completion of the proposed activity.		
1	Completely reversible	The impact is reversible with implementation of minor mitigation measures.

2	Partly reversible	The impact is partly reversible but more intense mitigation measures are required.
3	Barely reversible	The impact is unlikely to be reversed even with intense mitigation measures.
4	Irreversible	The impact is irreversible and no mitigation measures exist.
IRREPLACEABLE LOSS OF RESOURCES		
This describes the degree to which heritage resources will be irreplaceably lost as a result of a proposed activity.		
1	No loss of resource.	The impact will not result in the loss of any resources.
2	Marginal loss of resource	The impact will result in marginal loss of resources.
3	Significant loss of resources	The impact will result in significant loss of resources.
4	Complete loss of resources	The impact is result in a complete loss of all resources.
DURATION		
This describes the duration of the impacts on the heritage parameter. Duration indicates the lifetime of the impact as a result of the proposed activity.		
1	Short term	The impact and its effects will either disappear with mitigation or will be mitigated through natural process in a span shorter than the construction phase (0 – 1 years), or the impact and its effects will last for the period of a relatively short construction period and a limited recovery time after construction, thereafter it will be entirely negated (0 – 2 years).
2	Medium term	The impact and its effects will continue or last for some time after the construction phase but will be mitigated by direct human action or by natural processes thereafter (2 – 10 years).
3	Long term	The impact and its effects will continue or last for the entire operational life of the development, but will be mitigated by direct human action or by natural processes thereafter (10 – 50 years).
4	Permanent	The only class of impact that will be non-transitory. Mitigation either by man or natural process will not occur in such a way or such a time span that the impact can be considered transient (Indefinite).
CUMULATIVE EFFECT		
This describes the cumulative effect of the impacts on the heritage parameter. A cumulative effect/impact is an effect, which in itself may not be significant but may become significant if added to other existing or potential impacts emanating from other similar or diverse activities as a result of the project activity in question.		
1	Negligible Cumulative Impact	The impact would result in negligible to no cumulative effects.
2	Low Cumulative Impact	The impact would result in insignificant cumulative effects.

3	Medium Cumulative impact	The impact would result in minor cumulative effects.
4	High Cumulative Impact	The impact would result in significant cumulative effects.
INTENSITY / MAGNITUDE		
Describes the severity of an impact.		
1	Low	Impact affects the quality, use and integrity of the system/component in a way that is barely perceptible.
2	Medium	Impact alters the quality, use and integrity of the system/component but system/ component still continues to function in a moderately modified way and maintains general integrity (some impact on integrity).
3	High	Impact affects the continued viability of the system/component and the quality, use, integrity and functionality of the system or component is severely impaired and may temporarily cease. High costs of rehabilitation and remediation.
4	Very high	Impact affects the continued viability of the system/component and the quality, use, integrity and functionality of the system or component permanently ceases and is irreversibly impaired (system collapse). Rehabilitation and remediation often impossible. If possible rehabilitation and remediation often unfeasible due to extremely high costs of rehabilitation and remediation.
SIGNIFICANCE		
<p>Significance is determined through a synthesis of impact characteristics. Significance 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. This describes the significance of the impact on the heritage parameter. The calculation of the significance of an impact uses the following formula:</p> <p>(Extent + probability + reversibility + irreplaceability + duration + cumulative effect) x magnitude/intensity.</p> <p>The summation of the different criteria will produce a non weighted value. By multiplying this value with the magnitude/intensity, the resultant value acquires a weighted characteristic which can be measured and assigned a significance rating.</p>		
Points	Impact Significance Rating	Description
6 to 28	Negative Low impact	The anticipated impact will have negligible negative effects and will require little to no mitigation.
6 to 28	Positive Low impact	The anticipated impact will have minor positive effects.
29 to 50	Negative Medium impact	The anticipated impact will have moderate negative effects and will require moderate mitigation measures.
29 to 50	Positive Medium impact	The anticipated impact will have moderate positive effects.

51 to 73	Negative High impact	The anticipated impact will have significant effects and will require significant mitigation measures to achieve an acceptable level of impact.
51 to 73	Positive High impact	The anticipated impact will have significant positive effects.
74 to 96	Negative Very high impact	The anticipated impact will have highly significant effects and are unlikely to be able to be mitigated adequately. These impacts could be considered "fatal flaws".
74 to 96	Positive Very high impact	The anticipated impact will have highly significant positive effects.

8. ANTICIPATED IMPACT OF THE ACTIONS

8.1 IRON AGE DEPOSIT SITE (SITE 1)

Interventions are being proposed to minimize further erosion. Although this will stabilise the archaeological deposit it will necessitate cutting into the existing deposits. The resultant structure will however be beneficial to downstream archaeological sites.

Table 6. Mitigation of Impacts: Site 1

IMPACT TABLE FORMAT		
Heritage component	<i>Iron Age Deposit Site (Site 1)</i>	
Issue/Impact/Heritage Impact/Nature	<i>Heritage sites of significance: Iron Age</i>	
<i>Extent</i>	<i>Provincial (3)</i>	
<i>Probability</i>	<i>Likely (3)</i>	
<i>Reversibility</i>	<i>Irreversible (4)</i>	
<i>Irreplaceable loss of resources</i>	<i>Significant loss of resources (3)</i>	
<i>Duration</i>	<i>Medium term (2)</i>	
<i>Cumulative effect</i>	<i>High cumulative effect (3)</i>	
<i>Intensity/magnitude</i>	<i>High (3)</i>	
<i>Significance Rating of Potential Impact</i>	<i>54 points. The impact will have a negative impact rating.</i>	
	Pre-mitigation impact rating	Post mitigation impact rating
<i>Extent</i>	3	2
<i>Probability</i>	3	1
<i>Reversibility</i>	4	2
<i>Irreplaceable loss</i>	3	1
<i>Duration</i>	2	2
<i>Cumulative effect</i>	3	1
<i>Intensity/magnitude</i>	3	1
<i>Significance rating</i>	54 (medium negative)	9 (low negative)
<i>Mitigation measure</i>	<i>It is suggested that the proposed cutting be subjected to a second phase of investigation and that a professional</i>	

	<i>archaeological excavation be performed under a permit issued by the SAHRA.</i>
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8.2 FENCE LINE

Table 12. Mitigation of Impacts: Fence Line

IMPACT TABLE FORMAT		
Heritage component	<i>Unidentified sites</i>	
Issue/Impact/Heritage Impact/Nature	<i>Heritage sites of significance: Fence Line</i>	
<i>Extent</i>	<i>Local/district (2)</i>	
<i>Probability</i>	<i>Unlikely (1)</i>	
<i>Reversibility</i>	<i>Partly reversible (2)</i>	
<i>Irreplaceable loss of resources</i>	<i>No loss of resource. (1)</i>	
<i>Duration</i>	<i>Medium term (2)</i>	
<i>Cumulative effect</i>	<i>Low cumulative effect (1)</i>	
<i>Intensity/magnitude</i>	<i>Low (1)</i>	
<i>Significance Rating of Potential Impact</i>	<i>9 points. The impact will have a low negative impact rating.</i>	
	Pre-mitigation impact rating	Post mitigation impact rating
Extent	2	2
Probability	1	1
Reversibility	2	2
Irreplaceable loss	1	1
Duration	2	2
Cumulative effect	1	1
Intensity/magnitude	1	1
Significance rating	9 (low negative)	9 (low negative)
Mitigation measure	<i>The fence line will be a low impact activity which will be placed within the wetland area and will not impact on the heritage of the site.</i>	

8.3 GRAVE SITE

Table 13. Mitigation of Impacts: Grave Site

IMPACT TABLE FORMAT	
Heritage component	<i>Iron Age Deposit Site</i>
Issue/Impact/Heritage Impact/Nature	<i>Heritage sites of significance: Iron Age</i>
<i>Extent</i>	<i>Local/district (2)</i>
<i>Probability</i>	<i>Possible (2)</i>
<i>Reversibility</i>	<i>Barely reversible (3)</i>
<i>Irreplaceable loss of resources</i>	<i>Significant loss of resources (3)</i>

<i>Duration</i>	<i>Medium term (2)</i>	
<i>Cumulative effect</i>	<i>High cumulative effect (3)</i>	
<i>Intensity/magnitude</i>	<i>High (3)</i>	
<i>Significance Rating of Potential Impact</i>	<i>45 points. The impact will have a negative impact rating.</i>	
	Pre-mitigation impact rating	Post mitigation impact rating
Extent	2	2
Probability	2	1
Reversibility	3	2
Irreplaceable loss	3	1
Duration	2	2
Cumulative effect	3	1
Intensity/magnitude	3	1
Significance rating	45 (medium negative)	9 (low negative)
Mitigation measure	<i>The grave site should be avoided by at least 25m buffer zone during the construction phase.</i>	

10. CHANCE FINDS PROTOCOL

Although unlikely, sub-surface remains of heritage sites could still be encountered during the construction activities associated with the project. Such sites would offer no surface indication of their presence due to the high state of alterations in some areas as well as heavy plant cover in other areas. The following indicators of unmarked sub-surface sites could be encountered:

- Ash deposits (unnaturally grey appearance of soil compared to the surrounding substrate);
- Bone concentrations, either animal or human;
- Ceramic fragments such as pottery shards either historic or pre-contact as per Chapter 2;
- Stone concentrations of any formal nature.



Figure 33. Photos courtesy of EON Hanisch

- The following recommendations are given should any sub-surface remains of heritage sites be identified as indicated above:
- All excavators should be made aware of the possibility of the occurrence of sub-surface heritage features and the following procedures should they be encountered.
- All construction in the immediate vicinity (50m radius of the site) should cease.
- The heritage practitioner should be informed as soon as possible.
- In the event of obvious human remains the South African Police Services (SAPS) should be notified.
- Mitigation measures (such as refilling etc.) should not be attempted.
- The area in a 50m radius of the find should be cordoned off with hazard tape.
- Public access should be limited.
- Should human remains be uncovered it is important that the site be secured until such time as the SAPS and the heritage consultant can access the site.
- No media statements should be released until such time as the heritage practitioner has had sufficient time to analyze the finds.

11. CONCLUSION

Although several sites of heritage value are located within the study area, only one site will be directly affected by the proposed anti-erosion measures, namely intervention B82G-01-213-00.

It is recommended that the proposed site be subjected to an archaeological excavation permitted by the SAHRA. Should the WFW monitoring show any new erosion or flow deviations that could impact on heritage sites, a heritage practitioner should be approached to evaluate the impact.

Due to the limited impact of the activity proposed, there are no direct heritage impacts on the local community and it is accepted that the public participation process performed by the lead consultant will be sufficient.

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Addendum 1
Measuring Impacts

Measuring Impacts

In 2003 the SAHRA compiled the following guidelines to evaluate the cultural significance of individual heritage resources:

1 Type of Resource

- Place
- Archaeological Site
- Structure
- Grave
- Paleontological Feature
- Geological Feature

2 Type of Significance

2.1 Historic Value

It is important in the community, or pattern of history

- o Important in the evolution of cultural landscapes and settlement patterns
- o Important in exhibiting density, richness or diversity of cultural features illustrating the human occupation and evolution of the nation, province, region or locality.
- o Important for association with events, developments or cultural phases that have had a significant role in the human occupation and evolution of the nation, province, region or community.
- o Important as an example for technical, creative, design or artistic excellence, innovation or achievement in a particular period.

It has strong or special association with the life or work of a person, group or organisation of importance in history

- o Importance for close associations with individuals, groups or organisations whose life, works or activities have been significant within the history of the nation, province, region or community.

It has significance relating to the history of slavery

- o Importance for a direct link to the history of slavery in South Africa.

2.2 Aesthetic Value

It is important in exhibiting particular aesthetic characteristics valued by a community or cultural group.

- o Important to a community for aesthetic characteristics held in high esteem or otherwise valued by the community.
- o Importance for its creative, design or artistic excellence, innovation or achievement.

- o Importance for its contribution to the aesthetic values of the setting demonstrated by a landmark quality or having impact on important vistas or otherwise contributing to the identified aesthetic qualities of the cultural environs or the natural landscape within which it is located.
- o In the case of an historic precinct, importance for the aesthetic character created by the individual components which collectively form a significant streetscape, townscape or cultural environment.

2.3 Scientific Value

It has potential to yield information that will contribute to an understanding of natural or cultural heritage

- o Importance for information contributing to a wider understanding of natural or cultural history by virtue of its use as a research site, teaching site, type locality, reference or benchmark site.
- o Importance for information contributing to a wider understanding of the origin of the universe or of the development of the earth.
- o Importance for information contributing to a wider understanding of the origin of life; the development of plant or animal species, or the biological or cultural development of hominid or human species.
- o Importance for its potential to yield information contributing to a wider understanding of the history of human occupation of the nation, Province, region or locality.
- o It is important in demonstrating a high degree of creative or technical achievement at a particular period
- o Importance for its technical innovation or achievement.

(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?

2.4 Social Value / Public significance

- It has strong or special association with a particular community or cultural group for social, cultural or spiritual reasons
- Importance as a place highly valued by a community or cultural group for reasons of social, cultural, religious, spiritual, symbolic, aesthetic or educational associations.
- Importance in contributing to a community's sense of place.

(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?

2.5 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

2.6 Economic Significance

- (a) What value of user-benefits may be placed on the site?
- visitors' willingness-to-pay
 - visitors' travel costs

2.7 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?

2.8 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?

2.9 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?

2.10 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?

3 Degrees of Significance

3.1 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. 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 evaluated 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).

3.2 Rarity

It possesses uncommon, rare or endangered aspects of natural or cultural heritage.

- Importance for rare, endangered or uncommon structures, landscapes or phenomena.

3.3 Representivity

- It is 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.