

Title: Heritage resources management

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Mooi-Mgeni Transfer Scheme Environmental Impact Assessment Review – Heritage Resources Management Final Report

EXECUTIVE SUMMARY

eThembeni Cultural Heritage was appointed by BKS (Pty) Ltd to undertake a review of heritage resources management recommendations for the Mooi-Mgeni Transfer Scheme Phase 2, located in the KwaZulu-Natal Midlands. eThembeni staff members inspected the area on 7 November 2006 and 5 January 2007 and reviewed a heritage study for the proposed project undertaken in 2004.

This report contains a background to the project; a summary of provincial heritage legislation; our comments on the 2004 heritage study; and a summary of heritage resources that will be affected by the project, including management recommendations.

The total of 39 heritage resources comprises:

- two structures older than sixty years, a graveyard and eight additional graves that will not be inundated; and
- one rock painting site, four archaeological sites, 22 graves, one natural feature and one landscape that will be inundated.

Heritage resources that will not be inundated require no further mitigation other than in situ conservation. Heritage resources that will be inundated require various forms of mitigation, including the removal of the rock painting sites and exhumation and relocation of all graves. The latter actions all require a permit from Amafa aKwaZulu-Natali, the provincial heritage management organisation.

We recommend that the development proceed with the proposed heritage mitigation and have submitted this report to Amafa aKwaZulu-Natali in fulfilment of the requirements of the KwaZulu-Natal Heritage Act. The client may contact Ms Wesuwe Tshabalala at Amafa's Pietermaritzburg office (telephone 033 3946 543) in due course to enquire about the Council's decision.

(ii)

If permission is granted for the development to proceed, the client is reminded that the Act requires that a developer cease all work immediately and notify Amafa should any heritage resources, as defined in the Act, be discovered during the course of development activities.

Mooi-Mgeni Transfer Scheme Environmental Impact Assessment Review – Heritage Resources Management Final Report

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1. BACKGROUND

A comprehensive Environmental Impact Assessment was conducted for the proposed Spring Grove Dam (MMTS-2A) as part of the planning investigations from 1999 to 2002. It considered social, biophysical and economic aspects of the dam and various impacts were identified for which mitigation measures were proposed.

However, no Environmental Impact Assessment has been conducted for the proposed transfer scheme (MMTS-2B). Furthermore, there have been immense transformations in the area since the studies were conducted and additional environmental aspects have emerged. Accordingly, eThembeni Cultural Heritage was appointed by BKS (Pty) Ltd to review specialist reports to identify possible constraints as well as impacts that may have been overlooked in the past that may present problems. The process will include but not be limited to:

- Evaluating the adequacy of available information;
- Identifying potential issues and concerns;
- Assessing potential impacts associated with the proposed development, including recommendations for management actions and monitoring programmes; and
- Undertaking a heritage impact assessment of the transfer scheme.

1.1 PURPOSE OF THE REPORT

This is the final Heritage Resources Management Report for the Mooi-Mgeni Transfer Scheme's Environmental Impact Assessment Review, for submission to Amafa aKwaZulu-Natali, the provincial heritage management organization.

2. LEGISLATION AND DEFINITIONS

Heritage resources are not limited to archaeological artefacts, historical buildings and graves. The category is far more encompassing and includes intangible and invisible resources such as places, oral traditions and rituals. In the KwaZulu-Natal Heritage Act No 10 of 1997 a heritage resource is defined any place or object of cultural significance i.e. of aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance. This includes the following wide range of places and objects:

- places, buildings, structures and equipment;
- places to which oral traditions are attached or which are associated with living heritage;
- historical settlements and townscapes;
- landscapes and natural features;
- geological sites of scientific or cultural importance;
- archaeological and palaeontological sites;

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- graves and burial grounds, including -
 - ancestral graves,
 - royal graves and graves of traditional leaders,
 - graves of victims of conflict,
 - graves of important individuals,
 - historical graves and cemeteries older than 60 years, and
 - other human remains which are not covered under the Human Tissues Act No 65 of 1983 as amended;
 - movable objects, including -
 - objects recovered from the soil or waters of South Africa including archaeological and palaeontological objects and material, meteorites and rare geological specimens;
 - ethnographic art and objects;
 - military objects;
 - objects of decorative art;
 - objects of fine art;
 - objects of scientific or technological interest;
 - books, records, documents, photographic positives and negatives, graphic, film or video material or sound recordings; and
 - any other prescribed categories, but excluding any object made by a living person;
 - battlefields;
 - traditional building techniques.

Section 27(1) of the KwaZulu-Natal Heritage Act 1997 requires a heritage impact assessment in case of:

- construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300 metres in length;
- construction of a bridge or similar structure exceeding 50 metres in length; and
- any development, or other activity which will change the character of an area of land, or water
 - exceeding 10 000 m² in extent;
 - involving three or more existing erven or subdivisions thereof; or
 - involving three or more erven, or subdivisions thereof, which have been consolidated within the past five years; or
- the costs of which will exceed a sum set in terms of regulations; or
- any other category of development provided for in regulations.

A 'place' is defined as:

- a site, area or region;
- a building or other structure (which may include equipment, furniture, fittings and articles associated with or connected with such building or other structure);
- 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
- 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 -

- 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;
- 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 metres of such representation; and
- 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 No 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;
- features, structures and artefacts associated with military history which are older than 75 years and the sites on which they are found.

'Palaeontological' means any fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or 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. Amafa aKwaZulu-Natali 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. Since Amafa has not yet formulated guidelines or regulations for the removal of human remains, eThembeni adheres to the following

procedures, compiled in discussion with the South African Heritage Resources Agency and used by professional colleagues:

- Notification of the impending removals (using English and Zulu 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 Amafa;
- Appropriate arrangements for the exhumation (preferably by a suitably trained archaeologist) and re-interment (sometimes by a registered undertaker, in a formally proclaimed cemetery);
- Adherence to rituals or ceremonies required by the families.

3. PROJECT DESCRIPTION

The national Department of Water Affairs and Forestry is proposing Phase 2 of the Mooi-Mgeni Transfer Scheme (MMTS-2) to augment the growing water requirements of the uMgeni system supplying the water needs of Durban, Pietermaritzburg and surrounding area. The MMTS2 will primarily encompass the construction of the proposed Spring Grove Dam and an associated transfer pipeline from the proposed dam to the Mpofana River.

Phase 1 of the Mooi-Mgeni Transfer Scheme Pre-feasibility Study recommended a high dam at Mearns on the Mooi River from where the water would be transferred via the 11 kilometre long Wellington Tunnel to the Mpofana River. From the Mpofana River outfall, water would run down to the Lions and uMgeni Rivers to be stored in Midmar Dam.

At the conclusion of Phase 1 of the Pre-feasibility Study the recommendations of Phase 1 were re-assessed. It was found that the same yield could be obtained with a new and smaller scheme configuration than with the previously proposed large Mearns Dam and Wellington Tunnel. The scheme utilised the infrastructure of the old Mearns emergency transfer scheme, namely the pipeline and the pump station. New components consisted of an eight metre high diversion weir on the Mooi River at Mearns, installation of a stand-by pump at the existing pump station (which was initially not installed) and the raising of Midmar Dam wall by 3.5 metres to provide storage for the transferred water. Servitudes for an aqueduct were registered on the receiving Mpofana, Lions and uMgeni Rivers.

The construction of the first phase (MMTS-1) was authorized by the Minister of Water Affairs and Forestry in 1999, approved by the Minister of Environmental Affairs and Tourism in 2001 and constructed in 2003.

The Phase 2 Feasibility Study commenced in 2000 with a technical study and parallel Environmental Impact Assessment process. This study recommended that the MMTS-2 be developed in two stages in order to delay capital expenditure and to minimize a severe impact on the uMngeni system water tariff. The recommendation was that as a first stage only Spring Grove Dam (MMTS-2A) should be constructed upstream of the existing Mearns Weir, about two kilometres southwest of Rosetta in the KwaZulu-Natal Midlands. During this stage water will be released from Spring Grove Dam down the Mooi River into the impoundment of the Mearns Weir (MMTS-1) from where it will be abstracted and transferred, using the spare capacity of the existing transfer infrastructure, into the uMngeni River catchment to augment the supplies of Midmar Dam.

As a second stage (MMTS-2B), it was recommended that a new pumping station be constructed at the Spring Grove Dam from where the bulk transfer from the Mooi to the uMngeni River would take place. The MMTS-2B would include the construction of a new transfer pipeline (14 kilometres long) from the Spring Grove Dam to the existing discharge point on the Mpofana River. This pipeline would follow a short route to the existing Mearns pipeline (three kilometres) and thereafter a duplicate line would run parallel to the existing line and within the existing 25 metre wide servitude of aqueduct, to the discharge point in the Mpofana River (11 kilometres downstream).

From the discharge point on the Mpofana River the water will flow into the Lions River and finally into the uMngeni River just upstream of Midmar Dam where the transferred water will finally be stored.

Once constructed, the Spring Grove Dam and new transfer infrastructure would increase the yield of the uMngeni system from the current 334 million m³ per annum by 60 million m³ to 394 million m³ per annum. The growth in water use within the uMngeni system has been extensive over the last number of years and, even with water conservation and demand management in place, the system is already severely stressed. The situation has deteriorated such that it is now necessary to construct both phases (2A and 2B) simultaneously and with further argumentation. At present there is no other project that can replace the MMTS-2 to meet the current uMngeni system demands. Hence, no viable alternative is available.

The dam will be approximately 10.3 km² (1035 hectares) in area when full and will have a capacity of 141 million m³. The dam wall will be approximately 38 metres high with the dam basin below the 1437 masl contour, which extends up into the Mooi River for about 13 kilometres to Tunga Falls, located about 1.5 kilometres upstream of Inchbrakie Falls.

The pipeline will consist of the following components:

- A new pump station at Spring Grove Dam that will pump water at a rate of 4.5m³ per second;
- 5640 metres of new rising main (uphill) pipeline (1400mm diameter) to Nottingham Road;
- 8325 metres of new gravity main (downhill) pipeline (600mm diameter) to the Mpofana River; and
- A break pressure tank on Gowrie Farm at Nottingham Road.

The MMTS-2 will encompass:

- The construction of the Spring Grove Dam and pump station;
- An Eskom switch yard at the Spring Grove pump station;
- A river flow gauging weir on the Mooi River;
- The construction of a transfer pipeline from Spring Grove Dam to the Mpofana River;
- Extension of the existing outlet works on the banks of the Mpofana River;
- A river flow gauging weir on the Mpofana River downstream of the Mpofana outlet works but upstream of the Mpofana Falls;
- A break pressure tank on Gowrie Farm at Nottingham Road;
- An artificial fish barrier weir on the Mooi River upstream of Inchbrakie Falls on the farm 'Coldstream';
- Realignment of the access roads to the Vaalekop South Smallholdings and the properties Riverholm and Inchbrakie;
- Protection of the embankment of the Nottingham Road (en route to Loteni);
- Relocation of services such as power lines, telephone lines and water and sewage reticulation;
- Off-site rehabilitation of existing degraded wetlands on properties in the Mooi, Little Mooi and uMngeni River catchments;
- Location of a construction camp, housing, site office, parking, temporary storage of fuel, and storage of plant equipment and material; and
- A potential quarry site.

3.1 PROJECT LOCATION AND RECEIVING ENVIRONMENT

The proposed Spring Grove Dam will be located about two kilometres south west of Rosetta and approximately 3.5 kilometres northwest of Nottingham Road. The dam will be on the Mooi River on portions of the farms Rosetta 2983, Vaalekop 3297, Inchbrakie 14850, Riverholm 15967, Eberburg 2210, Spring Grove 2169 and Spring Vale 2170. The dam will extend upstream to above the Inchbrakie Falls, which will be inundated.

The transfer pipeline from the Spring Grove Dam to the Mpofana River will traverse a wetland, some Rosetta smallholding properties, the R103 and the railway line before running parallel to the existing Mearns pipeline in the existing 25 metre wide servitude. At Gowrie, the pipeline will cross the access road to the N3. The water being transferred will discharge into the Mpofana River approximately 1.2 kilometres north of Balgowan. This pipeline will cross portions of the farms Spring Vale 2170, Gowrie 1930, Waterford 15964 and Wilde Als Spruit 1085. The water in the Mpofana River will flow into the Lions and uMngeni Rivers and finally into Midmar Dam.

Coarse aggregate to be used in the construction of the dam could be mined from a potential quarry site located on the properties Wellington 2212 (80% of the quarry) and Springvale 2170 (20% of the quarry). The quarry site is situated on top of the mountain to the east of the Rosetta railway station.

The main land uses in the dam basin are cattle and dairy farming, tourism and crop cultivation. Surrounding land uses are predominantly agriculture and tourism.

4. METHODOLOGY

One eThembeni staff member accompanied the project team on a site visit on 5 January 2007. The route for the site visit included the following landmarks:

- Quarry site,
- Proposed Spring Grove dam and weir and pump station sites,
- Derrick Green's property,
- View of pipeline route over wetland to east of dam site,
- Existing Mearns pipeline route with possible crossing points of new pipeline on railway line and R103,
- Rosetta smallholdings to east of dam that will be traversed by new pipeline,
- Crossing of new pipeline of road linking Nottingham Road with the N3,
- Pipeline and break pressure tank at Gowrie,
- Pipeline road crossing at Balgowan,

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- Mpofana outfall works,
 - Mpofana gauging weir site,
 - Loteni Road culverts,
 - Access road to Riverholm,
 - Access road to Vaalekop South smallholdings,
 - Inchbrakie Falls,
 - Fish barrier site,
 - Riparian development on The Bend,
 - Reekie Lyn Falls,
 - Access road at Bellina,
 - Vaalekop West smallholdings (view of dam basin, abstraction pumps, agriculture, Inchbrakie Falls).

We had inspected the rock paintings on Vaalekop 3297/16 on 7 November 2006 as part of a separate heritage impact assessment. During site visits we undertook no excavations or sampling, since a permit from Amafa aKwaZulu-Natali is required to disturb a heritage resource. We consulted the archaeology department of the Natal Museum to obtain information concerning various heritage resources, including management recommendations.

We reviewed the document referenced in this report as DWAF (2004), compiled by D Henning of Nema Consulting and Prof Revil Mason and titled 'Department of Water Affairs and Forestry: MMTS-2 Feasibility Study: Bridging Study 4 – Identification of Historical and Cultural Sites as well as Graves that maybe affected by the construction of the proposed Spring Grove Dam, Report Number 07/V20/00/0704, November 2004'.

We identified the heritage resources recorded in DWAF (2004) that will be located within the purchase line of the proposed Spring Grove Dam, along with eight ancestral graves identified during the public participation process on Riverholm farm. These resources are tabulated in Appendix A, along with proposed mitigation measures.

We assessed the value and significance of heritage resources, as defined in the KwaZulu-Natal Heritage Act 1997 and the criteria contained in Appendix B. Culturally significant landscapes were assessed according to the criteria in Appendix C. Photographs were taken with a Hulett Packard digital camera and submitted to Amafa on compact disc. Appendix D contains a statement of independence and a summary of our ability to undertake this project.

5. SPECIALIST REPORT REVIEW

We identified various shortcomings in DWAF (2004), notwithstanding recognition that the document has important merits. The shortcomings are as follows, listed in subjective order of descending merit:

- The document purports to identify all heritage resources in the study area, but no indication is given whether resources other than archaeological sites, structures and graves were considered. Accordingly, we assume that the authors did not complete a comprehensive heritage impact assessment, including the identification of places to which oral traditions are attached or which are associated with living heritage; historical settlements and townscapes; landscapes and natural features; geological sites of scientific or cultural importance; movable objects; battlefields and traditional building techniques.
- Heritage resources are not assessed in terms of their heritage significance and value (according to the criteria provided in Appendix C, for example), with the notable exception of one of the rock painting sites and one archaeological site. The document states that:

'Sites RP1 (Vaalekop rock paintings) and BS1 (stone wall) are contributors to nationally significant cultural / historical programmes. These sites provide information on Hunter Gatherer Artistic Achievements (now a World Heritage Programme, especially in Drakensberg near Spring Grove) and Pre-Colonial Farming Settlement-Metal Technology Achievements. Apart from the artistic value of RP1 and BS1, they indicate the presence of San Hunter Gatherers in the Spring Grove territory during the last 1000 years when the adjacent Tugela Basin was occupied by Pre-Colonial Settlers. Dating and excavation at RP1 and BS1 would contribute to understanding recent San-Settler relationships, i.e. was the Spring Grove area a San Hunter Gatherer territory defended by San against encroachment by Farming Pre-Colonial people?'

We do not believe that the rock painting site merits such significance, particularly since the deposits in the shelter are very likely archaeologically sterile, i.e. containing no or very few artefacts relating to human occupation. Furthermore, since hunter-gatherer settlement in this area had virtually ended by the mid-nineteenth century, and the document states that BS1 'may be as old as the terminal Iron Age (early nineteenth century) but is most likely younger than that'; there appears little justification for the hypothesis that excavation of either site could provide information about the other.

We contend that RP1 has low to medium local and low regional, provincial, national and international heritage significance due to its aesthetic, artistic and scientific values. The rock paintings should be removed and curated in an appropriate facility, as recommended in DWAF (2004). Such removal should be undertaken by a specialist in possession of a permit from Amafa aKwaZulu-Natali.

Gavin Whitelaw, an Iron Age specialist at the Natal Museum, suggests that BS1 probably has low heritage significance at all levels due to its scientific value, although he has not visited the site. He suggests that a specialist map the site in its entirety, and limit subsurface sampling to a few augur holes to determine deposit depth and artefact

presence (the latter action will require a permit from Amafa). Excavations should be considered only if significant organic remains and spatial layout are present. DWAF (2004) records that local resident Mr Paul Mhlongo claimed that his family had occupied the site from the 1890s to 1980, when they moved to a new, upslope residential site. Accordingly, BS1 might have medium to high heritage significance due to its social value for a particular family. This should be ascertained and mitigation, if any is required, negotiated with the family concerned.

- The document does not emphasise sufficiently the need to avoid the alteration of ancestral graves unless there is no alternative. Human remains have high heritage significance at all levels for their social value, and societies that bury their dead usually attach moral and ethical restrictions on the disturbance of these final resting places. While inundation is certainly a valid reason to exhume and rebury a grave, its location between the final purchase line and the full supply level is not. In the latter instance, mitigation should be limited to fencing or otherwise demarcating a grave to avoid inadvertent damage, and negotiating family access.

5.1 HERITAGE RESOURCES AFFECTED BY SPRING GROVE DAM AND APPURTENANT WORKS

Note: We identified no heritage resources that will be affected directly by this project's appurtenant works, i.e. activities occurring outside the dam basin, as listed in the methodology section above. However, soil surface visibility was often poor. For this reason, and because ancestral grave sites are often unmarked, we remind the developers the KwaZulu-Natal Heritage Act requires that a developer cease all work immediately and notify Amafa should any heritage resources, as defined in the Act, be discovered during the course of development activities.

Appendix A contains a table of known heritage resources that will be affected directly by the construction of the proposed Spring Grove Dam. We compiled this table with reference to DWAF (2004), including only those resources that are located within the purchase line of the dam; a document containing details of eight graves on the farm Riverholm that will be inundated (see Appendix B); and those resources identified during eThembeni field visits.

The total of 39 heritage resources comprises:

- two structures older than sixty years, a graveyard and eight additional graves that will not be inundated; and
- one rock painting site, four archaeological sites, 22 graves, one natural feature and one landscape that will be inundated.

Most of these resources are described and illustrated in DWAF (2004) and Appendix B and we have not duplicated that information in this report. The exceptions are the natural feature and the landscape, which we describe below:

Inchbrakie Falls – a natural feature

This waterfall is located on the Mooi River at S; E, on the property Inchbrakie 14850. Surrounding landowners have indicated that this natural feature has heritage significance due to its aesthetic, scientific and social values and have spoken out strongly against its inundation, which will effectively destroy it.

We recommend that Amafa or a qualified heritage practitioner co-ordinate a data gathering and recording exercise concerning this site, to ensure that its intangible characteristics are recorded. Such an exercise should include still and video photography; mapping; literature reviews and interviews with stakeholders. Original material should be curated appropriately, with information made available to the public at interpretive venues as close as possible to the original site.

The Spring Grove Valley – a landscape

The main land uses in the proposed Spring Grove Dam basin are cattle and dairy farming, tourism and crop cultivation. Surrounding land uses are predominantly agriculture and tourism. This landscape has been settled and cultivated by European farmers for over 150 years, prior to which it was home to black farmers and hunter-gatherers. It has acquired heritage significance for its aesthetic, historical, scientific, social and spiritual values and can be classified as a historic vernacular landscape (refer to Appendix C). This landscape will be destroyed by inundation.

We recommend that Amafa or a qualified heritage practitioner co-ordinate a data gathering and recording exercise concerning this landscape, to ensure that its character-defining features are identified and understood in relation to each other and to significant historic events, trends and persons. Data should reflect that these features are dynamic and have changed over time, with historical significance ascribed to more than one period in the landscape's physical and cultural evolution. Such an exercise should include still and video photography; mapping; literature reviews and interviews with stakeholders. Original material should be curated appropriately,

with information made available to the public at interpretive venues as close as possible to the original site.

6. CONCLUSION

We recommend that the development proceed with the proposed heritage mitigation and have submitted this report to Amafa aKwaZulu-Natali in fulfilment of the requirements of the KwaZulu-Natal Heritage Act. According to Section 27(4) of the Act:

The report shall be considered timeously by the Council which shall, after consultation with the person proposing the development, decide -

- whether or not the development may proceed;
- whether any limitations or conditions are to be applied to the development;
- what general protections in terms of this Act apply, and what formal protections may be applied to such heritage resources;
- whether compensatory action shall be required in respect of any heritage resources damaged or destroyed as a result of the development; and
- whether the appointment of specialists is required as a condition of approval of the proposal.

The client may contact Ms Wesuwe Tshabalala at Amafa's Pietermaritzburg office (telephone 033 3946 543) in due course to enquire about the Council's decision.

7. REFERENCES

DWAF 2004. Department of Water Affairs and Forestry: MMTS-2 Feasibility Study: Bridging Study 4 – Identification of Historical and Cultural Sites as well as Graves that may be affected by the construction of the proposed Spring Grove Dam, Report Number 07/V20/00/0704, November 2004.

APPENDIX A

Heritage resources affected by the proposed Spring Grove Dam and its associated infrastructure

Heritage resource number	ID number	Site type	Coordinates	Farm name	Heritage significance	Impact of development	Mitigation
DWAF (2004)							
1	BS4	Structure older than 60 years and graves – Smythe farmstead and graveyard	S29 21 00.2; E29 56 43.0	Rem Ebernberg 2210	Structure – medium to high local significance for historical, aesthetic and social values. Graves – high	No inundation	Any changes subject to a permit from Amafa.
2	BS5	Structure older than 60 years – labourers' cottage	S29 21 01.2; E29 56 46.4	Rem Ebernberg 2210	Medium to high local significance for historical, aesthetic and social values	No inundation	Any structural changes subject to a permit from Amafa.
3	RP1	Archaeological – rock paintings. Likely that shelter deposits are archaeologically sterile.	S29 20 07.4; E29 54 25.5	Vaalekop 3297/16	Low to medium local and low regional, provincial, national and international significance due to aesthetic, artistic and scientific values	Inundation	Record and remove paintings; curate appropriately. Sample shelter deposits. All interventions require permit from Amafa.
4	ARCH1_ID1	Archaeological – stone artefact scatter	S29 20 08.0; E29 54 28.0	Inchbrakie 14850/9	Low significance at all levels due to scientific value	Inundation	Sample artefacts with a permit from Amafa
5	ARCH1_ID3	Archaeological – stone walling	S29 20 00.1; E29 55 23.9	Vaalekop 3297/43	Low significance at all levels due to scientific value. Possibly medium to high local significance due to social value	Inundation	Map site, sample with permit from Amafa. Determine social significance if any, negotiate mitigation with family concerned.

Heritage resource number	ID number	Site type	Coordinates	Farm name	Heritage significance	Impact of development	Mitigation
6	ARCH1_ID4	Stone walling	S29 19 14.0; E29 57 28.0	Rosetta 2983/8	Unknown	Inundation	Record site, assess heritage significance. Obtain permit for sampling or excavation if appropriate.
7	ARCH1_D5	Stone walling	S29 19 14.0; E29 57 24.0	Rosetta 2983/8	Unknown	Inundation	Record site, assess heritage significance. Obtain permit for sampling or excavation if appropriate.
8	Grave1_ID2	Grave	S29 19 54.4; E29 55 27.5	Vaalekop 3297/39	High	Inundation	Exhume and relocate with permission of Amafa and families concerned
9	Grave1_ID3	Grave	S29 20 01.2; E29 55 25.9	Vaalekop 3297/43	High	Inundation	Exhume and relocate with permission of Amafa and families concerned
10	Grave1_ID4	Grave	S29 19 57.0; E29 55 21.9	Vaalekop 3297/40	High	No inundation	Leave in situ. Allow access to family members.
11	Grave1_ID5	Grave	S29 19 56.0; E29 55 23.7	Vaalekop 3297/40	High	No inundation	Leave in situ. Allow access to family members.
12	Grave1_ID6	Grave	S29 19 46.2; E29 55 34.5	Vaalekop 3297/38	High	Inundation	Exhume and relocate with permission of Amafa and families concerned
13	Grave1_ID8	Grave	unknown	Vaalekop 3297/46	High	No inundation	Leave in situ. Allow access to family members.
14	Grave1_ID9	Grave	S29 19 14.3; E29 57 57.0	Springvale 2170/226	High	Inundation	Exhume and relocate with permission of Amafa and families concerned

Heritage resource number	ID number	Site type	Coordinates	Farm name	Heritage significance	Impact of development	Mitigation
15	Grave1_ID11	Grave	unknown	Rosetta 2983/8	High	Inundation	Exhume and relocate with permission of Amafa and families concerned
16	Grave1_ID12	Grave	S29 20 48.0; E29 57 16.5	Rem Spring Grove 2169	High	No inundation	Leave in situ. Allow access to family members.
17	Grave1_ID14	Grave	unknown	Riverholm 15967/3	High	Inundation	Exhume and relocate with permission of Amafa and families concerned
18	Grave1_ID15	Grave	S29 20 59.9; E29 56 52.6	Rem Ebernberg 2210	High	No inundation	Leave in situ. Allow access to family members.
19	Grave1_ID16	Grave	unknown	Rem Ebernberg 2210	High	No inundation	Leave in situ. Allow access to family members.
20	Grave1_ID17	Grave	unknown	Rem Ebernberg 2210	High	No inundation	Leave in situ. Allow access to family members.
21	Grave1_ID18	Grave	unknown	Rem Ebernberg 2210	High	No inundation	Leave in situ. Allow access to family members.
22	Grave1_ID20	Grave	unknown	Rem Ebernberg 2210	High	Inundation	Exhume and relocate with permission of Amafa and families concerned
23	Grave1_ID21	Grave	unknown	Rem Ebernberg 2210	High	Inundation	Exhume and relocate with permission of Amafa and families concerned
24	G5	Grave	S29 20 02.2; E29 55 21.3	Vaalekop 3297/43	High	Inundation	Exhume and relocate with permission of Amafa and families concerned

Heritage resource number	ID number	Site type	Coordinates	Farm name	Heritage significance	Impact of development	Mitigation
25	G7	Grave	S29 20 05.0; E29 55 29.8	Vaalekop 3297/42	High	Inundation	Exhume and relocate with permission of Amafa and families concerned
26	G8	Grave	S29 19 46.3; E29 55 34.5	Vaalekop 3297/38	High	Inundation	Exhume and relocate with permission of Amafa and families concerned
27	G14	Grave	S29 21 16.4; E29 55 45.6	Rem Inchbrakie 14850	High	Inundation	Exhume and relocate with permission of Amafa and families concerned
28	G18	Grave	S29 20 01.6; E29 55 27.9	Vaalekop 3297/42	High	Inundation	Exhume and relocate with permission of Amafa and families concerned
29	G19	Grave	S29 19 47.0; E29 57 23.5	Rem Spring Grove 2169	High	Inundation	Exhume and relocate with permission of Amafa and families concerned
Riverholm graves¹							
30	Riverholm1	Grave	S29 19 58.6; E29 55 51.2	Riverholm	High	Inundation	Exhume and relocate with permission of Amafa and families concerned
31	Riverholm2	Grave	S29 19 57.9; E29 55 51.4	Riverholm	High	Inundation	Exhume and relocate with permission of Amafa and families concerned
32	Riverholm 3	Grave	S29 19 58.0; E29 55 51.7	Riverholm	High	Inundation	Exhume and relocate with permission of Amafa and families concerned

¹ = Grave1_ID14 ?

Heritage resource number	ID number	Site type	Coordinates	Farm name	Heritage significance	Impact of development	Mitigation
33	Riverholm 4	Grave	S29 19 59.8; E29 55 52.0	Riverholm	High	Inundation	Exhume and relocate with permission of Amafa and families concerned
34	Riverholm 5	Grave	S29 20 09.7; E29 55 46.9	Riverholm	High	Inundation	Exhume and relocate with permission of Amafa and families concerned
35	Riverholm 6	Grave	S29 20 10.8; E29 55 46.4	Riverholm	High	Inundation	Exhume and relocate with permission of Amafa and families concerned
36	Riverholm 7	Grave	S29 20 01.9; E29 55 45.5	Riverholm	High	Inundation	Exhume and relocate with permission of Amafa and families concerned
37	Riverholm 8	Grave	S29 20 02.0; E29 55 45.5	Riverholm	High	Inundation	Exhume and relocate with permission of Amafa and families concerned
eThembeni review							
38	Inchbrakie Falls	Natural feature		Inchbrakie 14850	Unknown	Inundation	Record intangible characteristics. Curate original material. Make information available at interpretive venues
39	Spring Grove Valley landscape	Landscape	N / a		Unknown	Inundation	Record intangible characteristics. Curate original material. Make information available at interpretive venues

APPENDIX B

Mooi Mgeni River Transfer Scheme Phase 2

Report on the Meeting Held at Nottingham Road to respond to the concern about grave sites within the proposed Spring Grove Dam purchase line.

Mr T Sokhele, committee member of Mngeni Municipality, expressed concern to Eddie Lusignea (Umgeni Water) that not all the grave sites had been picked up in the feasibility studies done for the proposed Spring Grove Dam. Mr Lusignea requested that Ms Archer further investigate the concern. It was agreed that Ms Archer (Scientist Umgeni Water) and Mr Langazane (Officer, Umgeni Water) would meet with Mr Sokhele to discuss the issue.

The meeting was held at Nottingham road on 12/05/2005. Mr Sokhele had invited the Ward 3 Umngeni Municipality committee members, Mr T Zondi (Counsellor), Mr C Mhlongo (committee member) and Mrs A. Buthelezi (committee member) to join the discussion. Due to ill health Ms Archer extended her apologies.

It was agreed that the purpose of the meeting was to address concerns of Ward 3 community regarding the construction of the Spring Grove Dam with respect to the gravesites that would be affected by the building of the Spring Grove dam. Reports on gravesites were made through Mr Zondi.

The information provided in DWAF Bridging Study No 4, "Identification of Historical and Cultural Sites as well as Graves that may be affected by the Construction of the Proposed Spring Grove Dam" (Nov 2004) was used as a reference in the discussion to assess whether the concerns were already addressed by this study.

The meeting proceeded to the gravesites that the community were concerned about. Graves that were visited were those that were thought would be affected by the construction of the dam, but were not identified in the previous assessment. The graves were all situated on Riverholme farm near the town of Rosetta, which is now owned by Mr Piet Pelser.

Owner	Mr Piet Pelser
Telephone number	033 2666281
Farm	Riverholm
Position	S 29 ^o 20' 11.6" E 029 ^o 55' 47.7"

The following gravesites were located and their positions identified using the GPS.

Number	Grave of	Year	Position	Contact Person
1	Nqobile Mabuyakhulu	2000	S 29 ^o 19'58.6" E 029 ^o 55'51.2"	Mr Zondi (counsellor)
2	Mr Ndlovu	1985	S 29 ^o 19'57.9" E 029 ^o 55'51.4"	"
3	Sthembiso Mbatha	1987	S 29 ^o 19'58.0" E 029 ^o 55'51.7"	"
4	Cupheni Nxele	1982	S 29 ^o 19'59.8" E 029 ^o 55'52.0"	"
5	Mr Hlongwane	Unknown	S 29 ^o 20'09.7" E 029 ^o 55'46.9"	"
6	Mr Nzimande	Unknown	S 29 ^o 20'10.8" E 029 ^o 55'46.4"	"
7	Mashelembe	1988	S 29 ^o 20'01.9" E 029 ^o 55'45.5"	"
8	Infant from Mnikathi Family	1972	S 29 ^o 20'02.0" E 029 ^o 55'45.5"	"

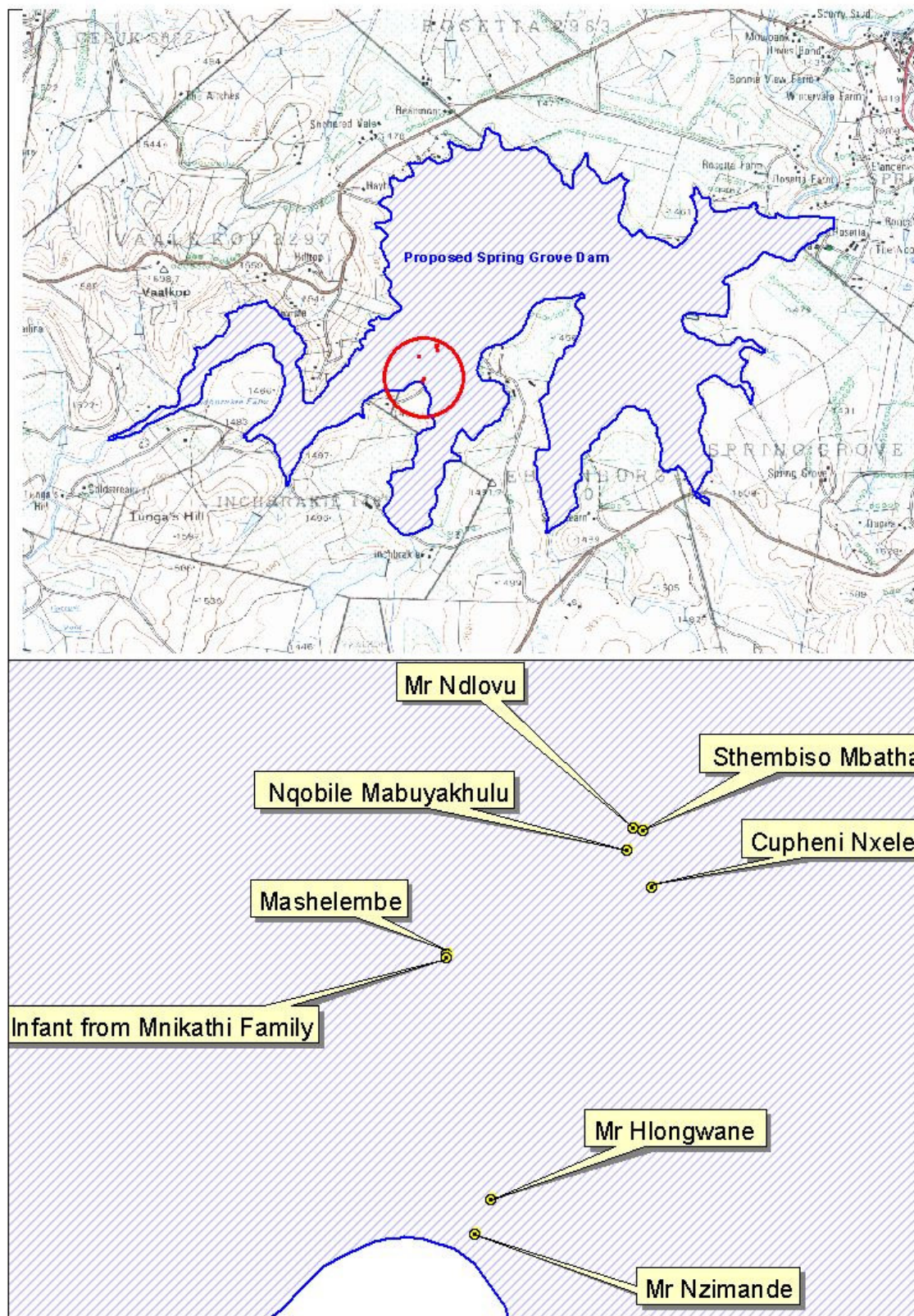


Figure 1: Map indicating location of gravesites within the proposed full supply level.

Mngeni Municipality Ward 3 committee members expressed their thanks that this matter had been given serious attention and they looked forward to meet with Umgeni Water and DWAF to get information on how the construction of the dam would benefit their communities socially and economically. They also expressed a concern that most members of the Ward 3 community had not been involved in the earlier public participation processes.

It was noted that the public participation process was conducted in 2000 and many of the governance structures in this area have been established after that date, and that further public participation would be necessary for this project.

Mr S. Langazane promised committee members that this matter would be carried forward to DWAF, who are responsible for the holistic planning of the proposed Spring Grove Dam.

APPENDIX C

Significance and value of heritage resources

The following guidelines for determining site significance were developed by the South African Heritage Resources Agency in 2003. We use them in conjunction with tables of our own formulation (see that for the Southern African Iron Age, below) when considering intrinsic site significance and significance relative to development activities, as well as when recommending mitigatory action.

Type of Resource
Place
Structure
Archaeological Site
Palaeontological Site
Geological Feature
Grave

Type of Significance

1. Historical Value

It is important in the community, or pattern of history

- Importance in the evolution of cultural landscapes and settlement patterns
- Importance in exhibiting density, richness or diversity of cultural features illustrating the human occupation and evolution of the nation, Province, region or locality.
- Importance 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.
- Importance 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

- 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

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

2. *Aesthetic Value*

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

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

3. Scientific Value

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

- 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.
- Importance for information contributing to a wider understanding of the origin of the universe or of the development of the earth.
- 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.
- 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.

It is important in demonstrating a high degree of creative or technical achievement at a particular period

- Importance for its technical innovation or achievement.

4. *Social Value*

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.

Degrees of Significance

Rarity

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

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

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.

Sphere of Significance	High	Medium	Low	
International	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
National	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Provincial	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Regional	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Local	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Specific Community	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-----

What other similar sites may be compared to this site?

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Southern African Iron Age

	Significance		
	- low	- medium	- high
Unique or type site			Yes
Formal protection			Yes
Spatial patterning	?Yes	?Yes	?Yes
Degree of disturbance	75 – 100%	25 – 74%	0 – 24%
Organic remains (list types)	0 – 5 / m ²	6 – 10 / m ²	11 + / m ²
Inorganic remains (list types)	0 – 5 / m ²	6 – 10 / m ²	11 + / m ²
Ancestral graves			Present
Horizontal extent of site	< 100m ²	101 – 1000m ²	1000 + m ²
Depth of deposit	< 20cm	21 – 50cm	51 + cm
Spiritual association			Yes
Oral history association			Yes
➤ Research potential			High
➤ Educational potential			High

Please note that this table is a tool to be used by qualified heritage practitioners who are also experienced site assessors.

APPENDIX D

CULTURAL LANDSCAPES

The American National Parks Services sets out various criteria for the identification and management of cultural landscapes:

'Cultural landscapes are complex resources that range from large rural tracts covering several thousand acres to formal gardens of less than an acre. Natural features such as landforms, soils and vegetation are not only part of the cultural landscape, they provide the framework within which it evolves. In the broadest sense, a cultural landscape is a reflection of human adaptation and use of settlement, land use, systems of circulation and the natural resources and is often expressed in the way land is organised and divided, patterns of types of structures that are built. The character of a cultural landscape is defined both by physical materials, such as roads, buildings, walls and vegetation, and by use reflecting cultural values and traditions.

'Identifying the character-defining features in a landscape and understanding them in relation to each other and to significant historic events, trends and persons allows us to read the landscape as a cultural resource. In many cases, these features are dynamic and change over time. In many cases, too, historical significance may be ascribed to more than one period in a landscape's physical and cultural evolution.

'Cultural landscape management involves identifying the type and degree of change that can occur while maintaining the character-defining features. The identification and management of an appropriate level of change in a cultural landscape is closely related to its significance. In a landscape significant for its association with a specific style, individual, trend or event, change may diminish its integrity and needs to be carefully monitored and controlled. In a landscape significant for the pattern of use that has evolved, physical change may be essential to the continuation of the use. In the latter case, the focus should be on perpetuating the use while maintaining the general character and feeling of the historic period(s), rather than on preserving a specific appearance.

'A cultural landscape is a geographic area, including both natural and cultural resources, associated with a historic event, activity or person. The National Park Services recognises four cultural landscape categories: historic designed landscapes, historic vernacular landscapes, historic sites and ethnographic landscapes. These categories are helpful in distinguishing the values that make landscapes cultural resources and in determining how they should be treated, managed and interpreted...

'The four cultural landscape categories are not mutually exclusive. A landscape may be associated with a significant event, include designed or vernacular characteristics and be significant to a specific cultural group.'

APPENDIX E

STATEMENT OF INDEPENDENCE AND ABILITY

We declare that Len van Schalkwyk, Beth Wahl and eThembeni Cultural Heritage have no financial or personal interest in the proposed development, nor its developers or any of its subsidiaries, apart from in the provision of heritage assessment and management consulting services.

Len van Schalkwyk and Beth Wahl are equal partners in eThembeni Cultural Heritage and the following synopsis of our respective qualifications and experience demonstrates our ability to complete heritage impact assessments. We are accredited by Amafa aKwaZulu-Natali to complete heritage impact assessments in KwaZulu-Natal, and by the Cultural Resources Management section of the Association of South African Professional Archaeologists to do so in the rest of South Africa.

Len has a master's degree in archaeology (specialising in the history of early farmers in southern Africa) from the University of Cape Town and sixteen years' experience in cultural heritage management. He left his position as assistant director of Amafa aKwaZulu-Natali, the provincial cultural heritage authority, to start eThembeni. Len has worked on projects as diverse as the establishment of the Ondini Cultural Museum in Ulundi, the cultural management of Chobe National Park in Botswana and various archaeological excavations and oral history recording projects. He was part of the writing team that produced the KwaZulu-Natal Heritage Act, 1997. Len has worked with many rural communities to establish integrated heritage and land use plans and speaks good Zulu.

Beth has an honours degree in African studies (majoring in archaeology and sociology) from the University of Cape Town and is completing her masters in heritage and tourism at the University of KwaZulu-Natal. Most recently she was employed by Amafa aKwaZulu-Natali as head of archaeology, which position she left to start eThembeni. Beth was a co-developer of the cultural heritage management plan for the uKhahlamba Drakensberg Park World Heritage Site and has developed and implemented training programmes for community guides and members of the public. Much of this training has focussed on the rock paintings of the uKhahlamba (Drakensberg) mountains.

❖ Heritage impact assessments

Such assessments are required as part of Environmental Impact Assessments by the KwaZulu-Natal Heritage Act 1997, the South African Heritage Resources Management Act 1999 and all national and provincial environmental legislation. We have completed numerous projects and Amafa aKwaZulu-Natali and the South African Heritage Resources Agency have supported our recommendations, without exception. The following projects are a sample of our work during 2005 and 2006:

Eskom power lines

- Braamhoek integrated power supply for PBA International
- Obanjani, Mtunzini substation and power lines for SiVEST Environment and Planning
- Majuba Mfolozi power lines for BKS Environmental Management Division
- Idwala Carbonates for Stemele Bosch Africa
- Braamhoek power lines for Ludloko Developments

Housing, office and game estate developments

- Shakaskraal residential and commercial estate for ACER (Africa)
- Bird Valley Estate, Cramond; Camdeboo, Hilton and Sundara Estate, Oliviershoek for Alletson Ecologicals
- Muluja Heights, uKhahlamba Drakensberg for Brousse-James & Associates
- Lot 938 Port Edward for Buk'Indalo Consultancy cc
- Uitvlugt equestrian and wildlife estate, Pietermaritzburg for DR A'Bear & Associates
- New Forest, Dargle for Environmental Assessments cc
- Burlington Greenfield, Queensburgh; Hillary, Durban; Umkhumbaan, Cato Manor; Rem of Lot 125 Ifafa; Lot 6417 Tongaat, Westbrook Beach
- Erf 121 Bazley Beach and Rem of Lot 1 Umzumbe for Environmental Solutions
- Intathakusa Retreat, Inanda for futureWORKS!
- Alverstone, Assagay for Gary van Wyk and Scott Gelder
- Bishopstowe; Brookdales, Howick; Himeville; Kamberg; Northington, Mooi River; Phinda Game Reserve; Rietvallei equestrian estate, Lidgetton; Rietvlei, Craigieburn; Riversdale, Himeville; Spring Grove, Nottingham Road;
- Inhluzani, Dargle / Impendle; Umdloti; Lot 535 Kloof; Meycol Farm, uThukela Mouth; New Guelderland,

- Blythedale Beach; Simbithi eco-estate, Shakas Rock
- Zinkwazi Lagoon Lodge and forest estate for Indiflora cc Environmental Services
- Umbogintwini golf course for Kerry Seppings Environmental Management Services
- Zwelisha, Bergville for McFerran & Associates
- Executive Village, Umhlanga Triangle and Umhlanga New Town Centre for Moreland Developments (Pty) Ltd
- Cherry Farm, Port Shepstone; Kingthorpe equestrian estate, Pietermaritzburg; San Marina estate, Marina Beach; Shelly Ridge, Marburg Commonage; Sunrise Bay eco-estate; The Plantation agri eco-estate, Ramsgate; Uplands, Margate for NMH Consulting
- Buffelshoek, Winterton for Peter Jewell Consulting Services
- Umdloti Lagoon Valley and KwaDabeka C, Durban for SiVEST Environment and Planning
- Garden Park residential and commercial development for Spencer Gore Construction
- Manzengwenya dive camp for Strategic Environmental Focus (Pty) Ltd
- Balcomb, Mtunzini; Braeside Farm, Umhlali; Hillside farm, Umhlali; Helmsley Farm, Umhlali; Lot 617 Sheffield Beach; Mtikini, Ulundi; Palm Lakes, Umhlali; Tara Estate, Salt Rock for Sustainable Development Projects
- Allemans Drift and Waterford, Howick for WSP Environmental
- Almond Bank, Pietermaritzburg for Afzelia Environmental Consultants cc
- Nodunga and Cele-Nhlangweni for CHS Developments
- Eendvogel Vley and Gordon Hill, Ladysmith for DEK Simpson Professional Land Surveyors
- Mhlumayo housing for Inkonjane Developments

Road upgrades

- Road 1B Mkhazeni, Mgai farm road, Esifubeni road and Sani Pass Phase 1 for ACER (Africa)
- Ncengeni road, Tugela Ferry for J Mitchell & Associates
- Vukani Phase 2, Inanda for Pravin Amar Development Planners
- P230 road, Empangeni / Eshowe and Zwelimbomvu road for Terratest Incorporated
- Hillcrest roads for WSP Environmental

Bridge construction

- Bridge 1 Batshe and Bridge 18 Diki for ACER (Africa)
- Mfule River bridge, Nkwalini for Eyethu Engineers

Water supply projects

- Fairbreeze mine and Simdlangentsha for ACER (Africa)
- Makhabeleni, Masihambisane and Ntanzu for Saunders & Wium Trust
- Ozwathini / Mathulini and Wosiyane, Emalangeneni and Cibane for SiVEST Environment and Planning
- KwaDeyi / St Faiths, KwaFodo and Stuartsville for Stemele Bosch Africa
- KwaGqungquma for Terratest Incorporated
- Albert Falls and south coast water supply system, Amanzimtoti to Umzinto / Scottburgh for Umgeni Water Amanzi

Dams

- Nsami, Molepo and Acornhoek dams, Limpopo Province for Cave Klapwijk & Associates
- Sundara, Oliviershoek for Alletson Ecologicals

Virgin soil assessments

- Ideal View and Mid-Selbourne farms, Underberg for Alletson Ecologicals

Other

- Gautrain tunnel and portal variants, Johannesburg for Bohlweki Environmental
- Gautrain route variants, Tshwane for Felehetsa Environmental (Pty) Ltd
- Ermelo Majuba rail realignments for Cave Klapwijk & Associates
- Nondabuya and Welcome agricultural development programmes for ACER (Africa) and Institute for Natural Resources
- Ntingwe tea estate, N11 and N12 borrow pits for ACER (Africa)
- Ashburton quarry, Pietermaritzburg and Idwala mining, Port Shepstone for Council for Geoscience
- King Matiwane cultural village for NDG Africa
- Alton North ferrochrome smelter, Richards Bay for CSIR Environmentek
- Chieveley, KwaDlamini, Injasuthi and Elandsdraal base stations for David Totman & Associates
- Msukeni and Lugelweni ecotourism developments, Eastern Cape for Environmental and Rural Solutions
- KwaBulawayo tourism development for ZAI Consultants
- Avon and Georgedale peaking power plants for Environmental Impact Management Services (Pty) Ltd
- Riverside industrial park, Durban for Environmental Planning & Design

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- Port Shepstone commercial development for Environmental Solutions
 - Nquthu artefact collection for Ernst Cloete & Associates
 - Braamhoek Pumped Storage Scheme impact assessment and monitoring for Eskom
 - Erf 50 Cato Ridge and Westway commercial developments for Guy Nicolson Consulting cc
 - Wellington wine estate, Rosetta for Harbour Rocks Properties (Pty) Ltd
 - Enyokeni, KwaKhangela for SiVEST Environment and Planning
 - Nanxing mining, Wartburg for Terratest Incorporated
 - Sappi Saiccor Amakhulu expansion, Umkomaas and underground cable installation, Richards Bay for WSP Environmental
 - 10 000BC filming location, Garden Castle for Brousse-James & Associates
 - Heritage resources component of the KwaDukuza Strategic Environmental Assessment for SiVEST Selatile Moloji