

Management proposals for the declaration of palaeontological and geological sites and the low impact adaptation of one of the sites on the farm Van der Merwes Kraal 972, Estcourt District.

Date visited: 27th of May 2010

Compiled by Ms. C. Rossouw

Site details:

Name of property: Van der Merwes Kraal 972

1: 50 000 map: 2829DD Frere

Erf/Farm Number: 972

Longitude: E29°59.246'

Latitude: S28°58.029'

Type of Sites: Geological

Palaeontological

Archaeological

Sphere of Significance: Of National importance – Grade 1

Important for understanding the behaviour of extant amphibians

Owner: Gongola Wildlife Trust

Contact number: 036 352 4724

Contact person: Mrs. Dorothy Green

Contact number: 036 352 4724

Researchers: Bruce Rubidge, no: 011 717 6685 (Witwatersrand University)

Mike Mostovski no: 033 345 1404 (Natal Museum)

Stakeholders:

<u>Name</u>	<u>Designation</u>	<u>Contact number:</u>
Mrs. Dorothy Green	Previous owner	036 352 4724
Gongola Wildlife Reserve	Owner Director: Mr. Nick Green	036 352 2557
Mr. James Van Vuuren	Amafa/Heritage KZN – Deputy Director Professional Services and IT	035 870 2050
Dr. Mostovski	Natal Museum – Deputy Director (Palaeontologist)	033 345 1404
Ms. Celeste Rossouw	Amafa – Senior Heritage Officer. 195 Longmarket Street, Pietermaritzburg, 3201	082 392 0495 033 394 6543
Mr. Siyabonga Mbatha	Amafa – Field Monitor 195 Longmarket Street,	079 277 2998 033 394 6543

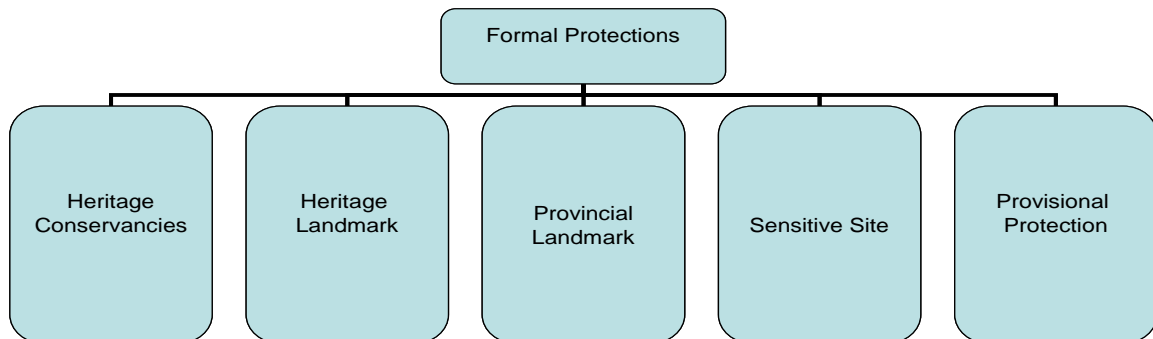
	Pietermaritzburg, 3201	
Ms. Thembeke Mveli	Intern – Eco Tourism Student	071 042 7772

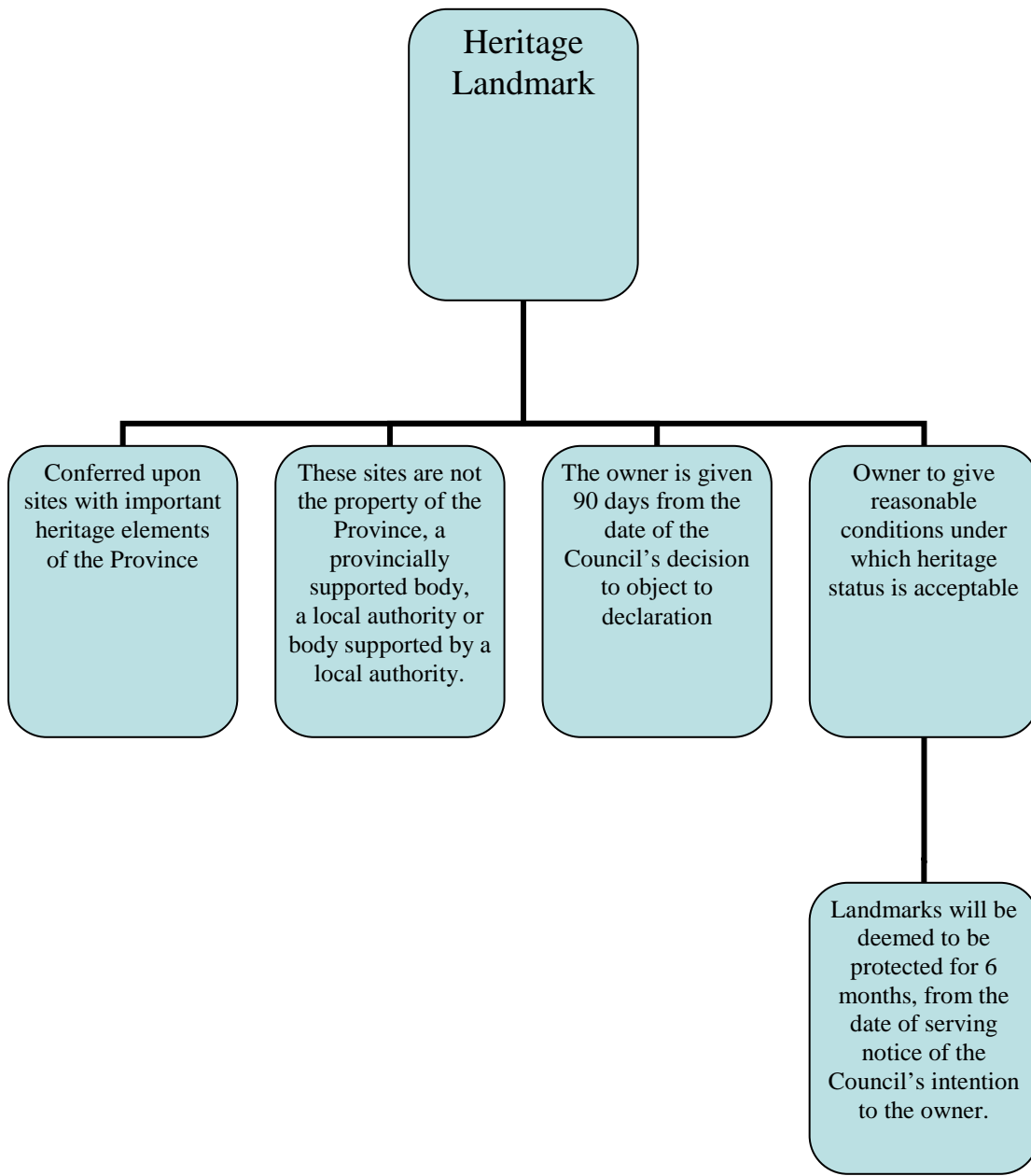
Rationale for visitation and background.

The fact that the site features internationally important features, which was supported by researchers such as Dr. Mike Mostovski and Prof. Bruce Rubidge (2008) lent it to an investigation regarding declaration thereof as a Heritage Landmark. Although lastly-mentioned is of provincial relevance, this objective will achieve the long term conservation of the site and embodies the first step to declare it as a national and even international site, at a later stage.

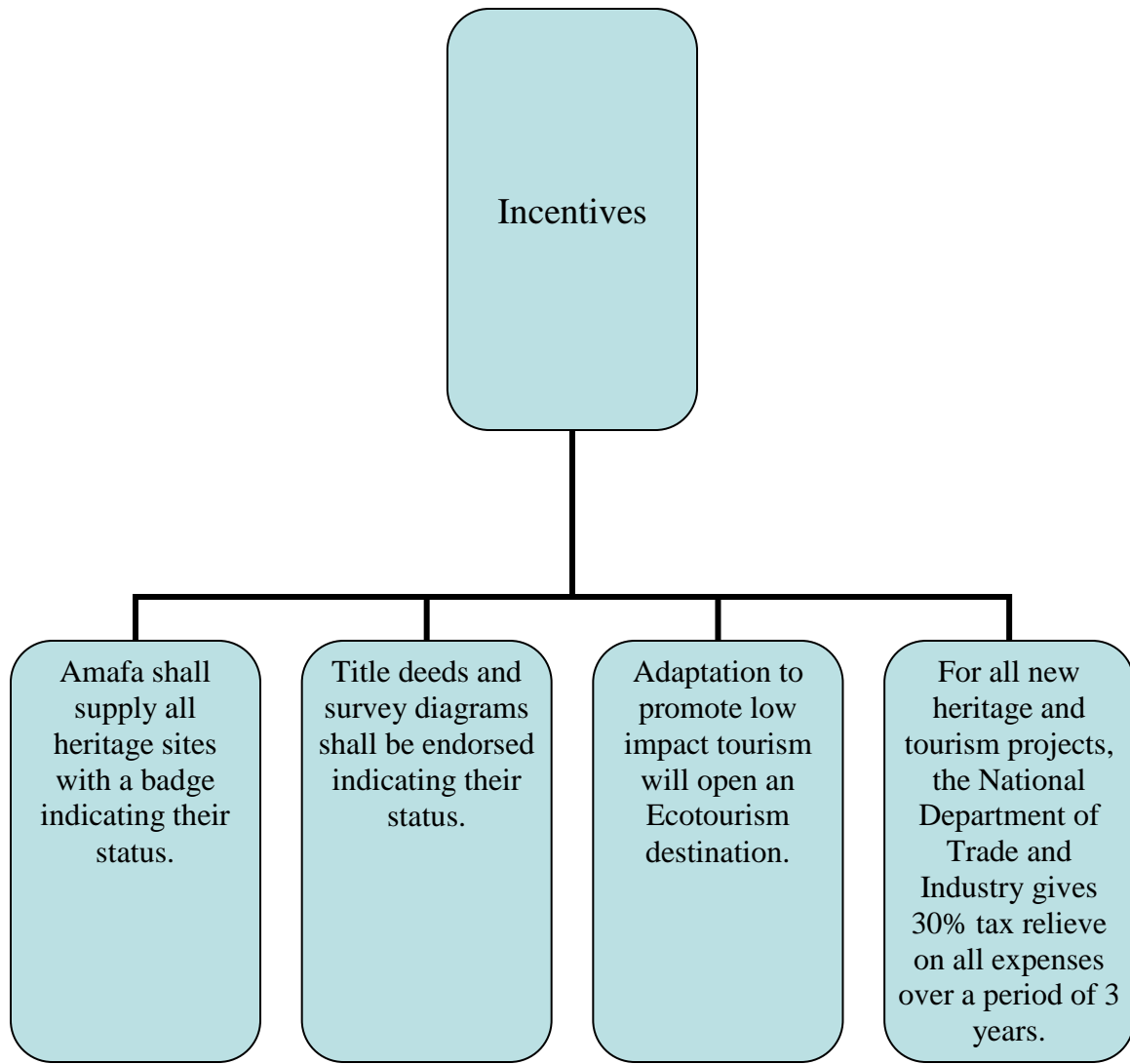
Since a variety of fossil features were found over an extensive area on the Farm “*Van der Merwes Kraal 972*” including the **Dave Green Shoreline Site** and a **Dam Site**. The first objective would be to declare these sites as part of a serial nomination.

The declaration will go hand in hand with either developing the site as a tourism destination or to preserve it for further research, depending on the attributes thereof.





Heritage Landmark: Incentives:



Site Details:

Type of site:

- a) **Dave Green Shoreline Site:** Fossil Site and Stone Age Scatter Zone on the farm “*Van der Merwes Kraal 972*”, Estcourt Area. Fossils consist of trace fossils and an extensive Permo-Triassic ripple-marked surface.
- b) **Dam Site:** Fossil Site on the farm “*Van der Merwes Kraal 972*”, Estcourt. Fossils mainly consist of fossilised plant and insect material as well as borrow marks. Extensively researched by Dawn Green.

Statement of Significance by Professor Bruce Rubidge (as part of the National Heritage Site Nomination Form, 2008) of the Dave Green Shoreline Site:

“The rocks of the Beaufort Group (Karoo Supergroup) of South Africa are internationally renowned for their wealth of tetrapod fossils. While body fossils are

relatively abundant, there is a paucity of trackways. A remarkable palaeosurface with numerous trace fossils was discovered in the Estcourt District (KwaZulu Natal) by the late Mr. Dave Green, on his farm Van der Merwes Kraal 972. This surface, which covers an area of about 500 square metres, comprises green mudstone which is covered by ripple marks and a variety of sedimentary structures.

On the palaeosurface are a variety of invertebrate and fish trackways, and tracks of large dicynodont herbivores, but the most remarkable are a unique set of tracks which have been attributed to temnospondyl amphibians. These are not simply walking tracks but appear to reflect diving and crawling actions of a large tetrapod and record unique behavioural activities attributable to rhinesuchid temnospondyl amphibians.

In at least 4 of the exposed trackway surfaces, large scale (underprinting) trackway bioturbation occurs. The consistent orientation of these tracks suggest that a group of tetrapod trackmakers transversed the area. The fact that these prints cross-cut the tracks assigned to the amphibian trackmaker shows that this even slightly postdated the tracks made by the amphibians (and suggests very shallow water or soft emergent substrate).

All the trackways (vertebrate and invertebrate) indicate that their makers were moving in the same direction. The association of these trackways (with their unique orientations), with sedimentary structures documenting very shallow water, records shallowing and subsequent subaerial exposure in tidal environment.

This remarkable palaeosurface thus records a unique moment in time 252 million years ago as the tide was receding in the Karoo Basin and the environment became subaerially exposed. Furthermore it is a manifestation of the palaeoshoreline of the Karoo Basin in the northern part of the Karoo Basin. It is important to realize that a unique set of circumstances have led to the preservation of this unique surface which reflects an important moment in the development of the Karoo Basin. No other surface like this one is known in South Africa (or in the world as far as I know) and it is essential that this surface receives national heritage protection status and is fenced off to prevent destruction by animals and people walking over it (Rubidge, Bruce, NHRA nomination form. 2008).”

LEGISLATION: KWAZULU-NATAL HERITAGE ACT NO: 4 OF 2008, SECTION 36

36. General protection: Battlefield sites, **archaeological sites, rock art sites, palaeontological sites**, historic fortifications, meteorite or meteorite impact sites.—(1) No person may destroy, damage, excavate, alter, write or draw upon, or otherwise disturb any battlefield site, archaeological site, rock art site, palaeontological site, historic fortification, meteorite or meteorite impact site without the prior written approval of the Council having been obtained on written application to the Council.

(2) Upon discovery of archaeological or palaeontological material or a meteorite by any person, all activity or operations in the general vicinity of such material or meteorite must cease forthwith and a person who made the discovery must submit a written report to the Council without delay.

- (3) The Council may, after consultation with an owner or controlling authority, by way of written notice served on the owner or controlling authority, prohibit any activity considered by the Council to be inappropriate within 50 meters of a rock art site.
- (4) No person may exhume, remove from its original position or otherwise disturb, damage, destroy, own or collect any object or material associated with any battlefield site, archaeological site, rock art site, palaeontological site, historic fortification, meteorite or meteorite impact site without the prior written approval of the Council having been obtained on written application to the Council.
- (5) No person may bring any equipment which assists in the detection of metals and archaeological and palaeontological objects and material, or excavation equipment onto any battlefield site, archaeological site, rock art site, palaeontological site, historic fortification, or meteorite impact site, or use similar detection or excavation equipment for the recovery of meteorites, without the prior written approval of the Council having been obtained on written application to the Council.
- (6) (a) The ownership of any object or material associated with any battlefield site, archaeological site, rock art site, palaeontological site, historic fortification, meteorite or meteorite impact site, on discovery, vest in the Provincial Government and the Council is regarded as the custodian on behalf of the Provincial Government.

Methodology:

Report compiled by Ms. C. Rossouw assisted by Prof. B. Rubidge (Bernard Price Institute), Dr. Mostovski (Natal Museum) - site interpretation and compiling the Statement of Significance); Mr. Van Vuuren (Amafa, on management strategies to achieve the low-impact tourism adaptation of the site), Mrs. Dorothy Green (previous owner of the farm, gave background history relating to the site) and Mr. Siyabonga Mbatha, who assisted Ms. Rossouw in doing a survey of the outstanding features of the site as well as delineating a Buffer Zone. Ms. Mweli (tourism student) also attended the field survey to gain more practical experience regarding the management of heritage sites within a natural environment (in-situ preservation).

Equipment used in the field: A Garmin “e-trex” GPS
A Kodak Easy Share Z1275 digital camera. H.D. 5X Optical Zoom and 12 mega pixels.

Three individuals from Amafa, the farm owner and a palaeontologist from Natal Museum carried out a controlled-exclusive surface survey, where *“sufficient information exists on an area to make solid and defensible assumptions and judgments about where sites may and may not be”* and *“an inspection of the surface of the ground, wherever this surface was visible, is made, with no substantial attempt to clear brush, turf, deadfall, leaves or other material that may cover the surface and with no attempt to look beneath the surface beyond the inspection of rodent burrows, cut banks and other exposures that are observed by accident”* (King 1978).

No excavation or sampling was carried out. Soil surface visibility was excellent and features could be easily identified, especially on the **Dave Green Shoreline Site** on the farm “*Van der Merwes Kraal 972*”.

Surface visibility at **Dam Site** on “*Van der Merwes Kraal 972*” was bad, since mud and soil have been covering the fossilised surface over a period of 10 years. This covering does, however, serve as natural protection to prevent cattle from trampling and damaging the fossils as well as from people collecting them.

Objectives:

- a) Proclaiming the site as a Heritage Landmark: Both sites to be proclaimed as part of a serial nomination.
- b) Ensuring the long term conservation of both sites.
- c) Opening the site as a tourism destination - Fossil Site and Stone Age Scatter Zone on the **Dave Green Shoreline Site** of “*Van der Merwes Kraal 972*”.
- d) Research goals – **Dam Site** on the farm “*Van der Merwes Kraal 972*” has a high research potential.

1) Dave Green Shoreline.

a) Proclamation:

Proclaiming the site as a Heritage Landmark: The site has already been provisionally proclaimed by the Council of Amafa.

Interested and affected parties have an opportunity to make written representations or submissions regarding the conferral of Heritage Landmark status within a period of not less than 30 days.

b) Developing the site for low-impact tourism purposes:

Since the state of conservation of the site is still excellent and many outstanding features can be seen clearly, it was decided to adapt this site to allow for the low-impact tourism purposes.

Features include the following:

- a) *Permo-Triassic* ripple-marked surface, probably a lake margin with numerous mammal-like reptile footprints. Situated on “*Van der Merwes Kraal 972*” Farm, Estcourt.



b) Trace fossils and footprints

Even in places where fossil bones are rare, footprints and dragging marks made by animals walking on soft muddy or sandy sediment are preserved.

These photos show the footprints of a herd of *dicynodonts* that crossed the river/lake when the surface was still under water.

These footprints and trails are called trace fossils.

Elevation: 1251m

S28°58'01,5"E29°59'14.1"



c) A unique set of tracks which have been attributed to *temnospondyl amphibians*. These are not simply walking tracks but appear to reflect diving and crawling actions of a large *tetrapod* and record unique behavioural activities attributable to *rhinesuchid temnospondyl* amphibians (Rubidge, Bruce 2008).

Elevation: 1254m

S28°58'01, 8"

E29°59'15.1"



Elevation: 1254m

S28°58'01, 7"

E29°59'14, 6"



d) The farm also features a museum collection, registered at the Natal Museum (National Museum). It includes magnificent finds such as a head of a *Dicynodon*, a 1m long “Early Triassic” found in SA, which resembles a sheep-sized herbivore.

Fossil



Model of the “*Dicynodon*”



e) The diversity of the site is of such an extent that even contains a Middle Stone Age Scatter Zone.



c) Conservation guidelines linked to the development of the site for the purpose of tourism.

Access Control:

- a) Identify people from the local community who will be trained by Amafa as custodians of the site. This will also allow for entrepreneurship opportunities.
- b) Bookings must be made via a central booking system to arrange for the owner and or custodians to open the gates to the sites.
- c) Be sure that opening times, fees applicable, a contact name and number are available for interested visitors.
- d) Only accompanied visitation will be allowed.
- e) An Amafa accredited fossil custodian, will inform the people of the code of conduct applicable when visiting palaeontological and geological sites:
 - i) E.g. do not walk on Fossilised sections,
 - ii) do not collect fossils or artifacts,
 - iii) respect the palaeontological integrity and research value of the site,
 - iv) stay on the formally created pathways to prevent soil erosion and safety infringements.
 - v) Do not litter, as badly managed sites are not respected by the public and infringes on good customer care and enjoying a pristine landscape.

Good Customer Care:

- a) Natal Museum can train the Fossil Custodians regarding the interpretation of such sites.
- b) Inform the visitors of customer's facilities available, e.g. shops, camping sites, ablution facilities, site museums, etc.

- c) An informative site plaque can give information regarding the significance of the fossil features, their age, etc. Use low maintenance natural materials and apply colours that suit the setting.
- d) Fossil custodian to ensure that people are aware of the distance to the site. Visitors are to be informed that they need hats, sun-screen, hiking boots, water, etc. before venturing to the site.
- e) Care takers to sweep the area with light brooms, to remove the dust and rubble – taking into consideration that dust contributes to more abrasion of the fragile surface of the site. When the site is clean visitors will also be able to see the different features more clearly.

Long Term Conservation:

- a) Delineate a 10m Buffer Zone around the shore-line to ensure that no development or other activities impact on the palaeontological integrity of the site:

Way points: Point 257: S28.57'57" E29.59'10, 7"
 Point 258: S28.57'56, 3" E29.59'11, 9"
 Point 259: S28.57' 56, 9" E29.59'12, 8"
 Point 260: S28.57'57, 9" E29.59'13, 4"
 Point 261: S28.57'58, 8" E29.59'14, 0"
 Point 262: S28.57'59, 4" E29.59'14, 7"
 Point 263: S28.58'00, 6" E29.59'14, 8"
 Point 264: S28.58'01, 0" E29.59'15, 2"
 Point 265: S28.58'01, 6" E29.59'15, 3"
 Point 266: S28.58'02, 7" E29.59'15, 6"
 Point 267: S28.58'02, 5" E29.59'15, 0"
 Point 271: S28.58'01, 9" E29.59' 14, 0"
 Point 272: S28.58'01, 6" E29.59'13, 5"
 Point 273: S28.58'00, 9" E29.59'13, 1"
 Point 275: S28.58'01, 5" E29.59' 14, 0"
 Point 276: S28.58'00, 9" E29.59'13, 4"
 Point 277: S28.57'59, 5" E29.59'12, 3"
 Point 278: S28.57'59, 2" E29.59'12, 3"
 Point 279: S28.57'58, 4" E29.59' 12, 4"
 Point 280: S28.57'58, 0" E29.59' 11, 9"

- b) Take GPS readings of the most significant fossil features within the shore-line and fence only this section. (See features a – d under the tourism section). Fencing will ensure that cattle can not walk over the fossilised riverbed and it will also force guests to use the board-walk.
- c) The rest of the delineated area can be marked via painted rocks.
- d) Only accompanied access will be allowed. This will create both a positive cultural image within the community on the ground as well as create an opportunity for entrepreneurship.

- e) Construct a non-sunken bridge over the area with all the outstanding and clearly visible fossil features. The pillars of the bridge to rest on soft rubber material (e.g. conveyor-belt) to prevent abrasion of the fragile site. Amafa staff to construct this bridge (Mr. Derrick Mhlongo). While wooden boards walk blend with the natural environment, it poses a fire-threat (even if treated with fire-resistant varnish) – accordingly it would be a better choice to use a metal mesh structure to walk over.
- f) The board walk must be broad enough to enable 2 people to walk next to each other.
- g) All installations must be removable with minimum impact.
- h) To prevent soil erosion, rock packs can be stacked at the edges of the lake margin.
- i) Sand and rubble to be swept off the surface with a soft grass broom to ensure that no abrasion occurs.

2) Fossil deposit (not clearly visible) situated within the Dam Site on Van der Merwes Kraal 972:

Statement of Significance: The site was extensively researched by Dawn Green in 1997.

Objective: This site will be part of the serial nomination, although it will not be opened for tourism purposes.

The main objective of this resource setting will be research.

Access: The site is not easily accessible and fossil features are not very clear as a mud layer is protecting the original fossilised area.





According to the owner of the site, it was excavated in 1994/95. The top-layers included insect & plant material, while the bottom layers included dinosaur footprints.

GPS co-ordinates taken in the centre of the hollow and at its edge:

Waypoint 282: Elevation: 1214m; S28°58'37,6"E29°59,16,2"

Waypoint 281: Elevation: 1223m; S28°58'37,3"E29°59'17,5"



Burrowing marks

Proposal: Best area for new excavation – will possibly be a trench starting from the basin of the hollow up to the edge, 2m wide and 5m long.

For any site to be excavated or disturbed a permit is required from Amafa/Heritage KZN.

Process: Owner to obtain a list of accredited CRM specialists from Amafa, Owner to employ a specialist. Lastly-mentioned to apply for a permit to excavate or to disturb a site. Application to be forwarded to the Permit-Review Committee.

Bibliography:

Green, Dawn. 1997. *Palaeoenvironments of the Estcourt Formation (Beaufort Group)*. KwaZulu-Natal: MSc Thesis. University of Natal: Durban.

Rubidge, Bruce. 2005 "*The Story of Life on Earth: A Southern African perspective on a 4,6 billion year journey*" Terrence McCarthy Publishers

Rubidge, Bruce 2008 "*NHRA Nomination Form*"

Visits:

Visit to Fort Dunford Museum's Fossil Exhibition.

Visits to "Van der Merwes Kraal 972" and "Rensburgspruit"

Interviews:

Green, Dorothy. 27 May 2010 – previous owner of the farm

Mostovski, Mike. 27 May 2010 – palaeontologist

Van Vuuren, James. 27 May 2010 – archaeologist