NAME AND SURNAME	DEPARTMENT/ REPRESENTATIVE/ VILLAGE	CONTACT DETAILS	SIGNATURE
THABANG NOTSHELE	NCHODU	0724502394	T.I. Notshele
Sibongeleni Mkhize	NCHODU	0833594401	Mkhize
KOLISANG LEPELLESANA	NCHODU		K. LEPELLESANA
Itholang Tsoanyane	NCHODU		T. Tsoa
Moeketsi JAFTA	NCHODU		
Lebohang Lepheana	RAMOHLAKOANA	0748207447	
Tshidiso Mokoatle	Ramohlakoana		T. Mokoatle
Teboho Dibolo	Ramohlakoana	073-1968019	T. Dibolo
KATISO MOKOATLE	RAMOHLAKOANA		Mokoatle
Nqwetazi Zulu	Makoloko	0827517109	N. Zulu
Nolwazi MPOMPOSHE	NChodu	0797993842	N. MPomposhe
Nomlungisi Daule	Disgure	0788449487	N. Daule
Nosethu Gushana	Disgure	0788449487	E.N. Gushana
Daniel Masoane	Nchodu	0764528609	D. Masoane

NAME AND SURNAME	DEPARTMENT/ REPRESENTATIVE/ VILLAGE	CONTACT DETAILS	SIGNATURE
Vuyokazi Khele	Nchodu	0783567443	V Khele
Mashudisho Thibane	Nchodu		M. Thibane
MaPaseka Moeti	Nchodu	0730126168	M. Moeti
Lemmens Hlalele	"	033 256 5361	Hlalele
Thabana SE Khosana		0787940187	TA
Koloko Motlomelo	Nchodu	0731083843	M.K
Thokoana Ranthakoana	Nchodu	0787643371	
Lekeleba Mkhwanazane	Rems	0784789331	
Lebohang Mzaro	Rams	072 304 1039	
Makopano Makhele	Nchodu	084 984 3777	M. Makhele
Moeno Makhele	Jabavu	078-3566780	M. Makhele
Bulelani Kheswa	kuTwana	078-3961313	B. Kheswa
Mabebe koloko	Naledi	" "	M. koloko
Mathabiso Dimin.	Naledi	" "	M. Dimin.

South African Heritage Resources Agency
40 KING STREET, SOUTHERN WOOD, EAST LONDON 5200
P O BOX 759, SOUTHERNWOOD, EAST LONDON 5200
TEL: 043 – 722 1740, FAX: 043 – 722 1749
WEBSITE: WWW.SAHRA.ORG.ZA
E-MAIL: TLUNGILE@EC.SAHRA.ORG.ZA

DATE: 10 JUNE 2008

ENQUIRIES: MR. T. LUNGILE, PROVINCIAL MANAGER

OUR REF: 9/2/503/0001

YOUR REF: 16 – 1667/MVR

Mr. Magnus van Rooyen
Terretest Geotechnical, Environmental & Earth Science Consultants
Cascades Crescent
P. O. Box 13009
Cascade
3202

Dear Magnus

RE: NOTICE OF ENVIRONMENTAL PROCESS FOR THE PROPOSED UPGRADING OF THE DISTRICT (DR 08012) FROM MALUTI TO QACHAS NEK NEAR MATATIELE IN THE EASTERN CAPE

Thank you for your indication that development is to take place in this area.

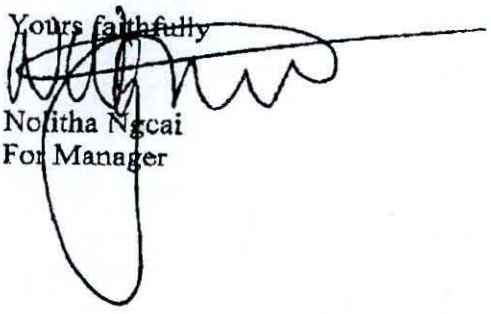
In terms of the National Heritage Resources Act (NHRA), no.25 of 1999, heritage resources including archaeological and palaeontological sites over 100 years old, graves older than 60 years, structures older than 60 years and intangible aspect of heritage resources and other protected heritage resources may not be disturbed without a permit from a relevant heritage resources authority/ agency.

In your application received by the South African Heritage Resources Agency [SAHRA], there is no clear indication of whether or not the above mentioned heritage resources were identified except for an old building, which you claim to be 100 metres away from the proposed development. SAHRA therefore request that Heritage Impact Assessment be done as there may be resources buried under and can only be recognised by a heritage specialist. We recommend that the HIA study be conducted by a heritage specialist.

Your cooperation in this matter will be highly appreciated.

Thanking you in advance.

Yours faithfully



Nolitha Ngcai
For Manager

APPENDIX C
ENVIRONMENTAL AWARENESS PLAN

ENVIRONMENTAL AWARENESS COURSE

Qachas Nek Borrow Pits

WHAT IS THE ENVIRONMENT?

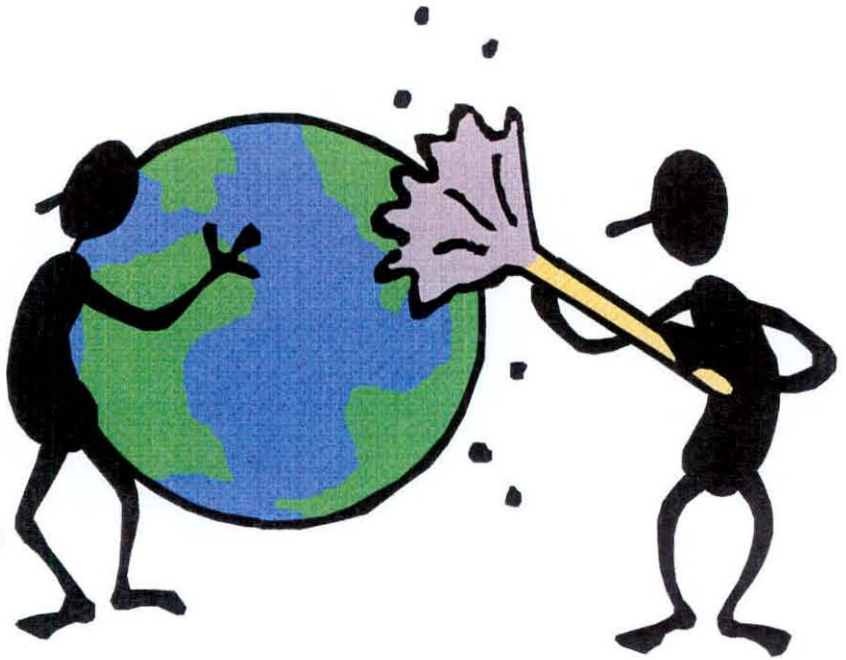
- Soil
- Water
- Plants
- People
- Animals
- Air we breathe
- Buildings, cars and houses

WHY MUST WE LOOK AFTER THE ENVIRONMENT?

- It affects us all as well as future generations
- We have a right to a healthy environment
- A contract has been signed
- Disciplinary action (e.g. construction could stop or fines issued)

HOW DO WE LOOK AFTER THE ENVIRONMENT?

- Report problems to your supervisor/ foreman
- Team work
- Follow the rules in the EMP



WORKING AREAS

Workers & equipment must stay inside the site boundaries at all times

RIVERS & STREAMS

- Do not swim in or drink from streams
- Do not throw oil, petrol, diesel, concrete or rubbish in the stream
- Do not work in the stream without direct instruction
- Do not damage the banks or vegetation of the stream

ANIMALS

- Do not injure or kill any animals on the site
- Ask your supervisor or Contract's Manager to remove animals found on site

TREES AND FLOWERS

- Do not damage or cut down any trees or plants without permission
- Do not pick flowers

SMOKING AND FIRE

- Put cigarette butts in a rubbish bin
- Do not smoke near gas, paints or petrol
- Do not light any fires without permission
- Know the positions of fire fighting equipment
- Report all fires
- Do not burn rubbish or vegetation without permission

PETROL, OIL AND DIESEL

- Work with petrol, oil & diesel in marked areas
- Report any petrol, oil & diesel leaks or spills to your supervisor
- Use a drip tray, bunded area or plastic sheeting under vehicles, machinery & under all oil, diesel or petrol drums
- Empty drip trays after rain & throw away where instructed

DUST

Try to avoid producing dust -

Use water to make ground & soil wet

NOISE

- Do not make loud noises around the site, especially near schools and homes
- Report or repair noisy vehicles

TOILETS

- Use the toilets provided
- Report full or leaking toilets

EATING

- Only eat in demarcated eating areas
- Never eat near a river or stream
- Put packaging & leftover food into rubbish bins

RUBBISH

- Do not litter – put all rubbish (especially cement bags) into the bins provided
- Report full bins to your supervisor
- The responsible person should empty bins regularly

TRUCKS AND DRIVING

- Always keep to the speed limit
- Drivers - check & report leaks and vehicles that belch smoke
- Ensure loads are secure & do not spill

EMERGENCY PHONE NUMBERS

Know all the emergency phone numbers:

- Ambulance: [10111]
- Fire: [10111]
- Police: 10111
- CMC: 107

FINES AND PENALTIES

- Spot fines of between R20 and R2000
- Your company may be fined
- Removal from site
- Construction may be stopped

PROBLEMS - WHAT TO DO!

- Report any breaks, floods, fires, leaks and injuries to your supervisor
- Ask questions!

APPENDIX D
MATERIALS TESTING RESULTS

BORROW PIT 2 Application. **POSITION:** Km 21,500: 300m right

DESCRIPTION

Large existing basalt borrow pit. Long cut extended along an east-west line. Good 'general' material but quite variable. Amygdales, vesicles and pyrope evident in the rockmass. The existing borrow pit could be extended into a relatively gentle sloping valley on the western side of the borrow or further west along contour. Other basalt areas will require drilling, blasting and crushing for excavation. In the north-east corner is a large colluvial cobble/gravel dolerite-rich talus deposit which could provide rockfill.

RESERVE QUANTITY

20 000m^3

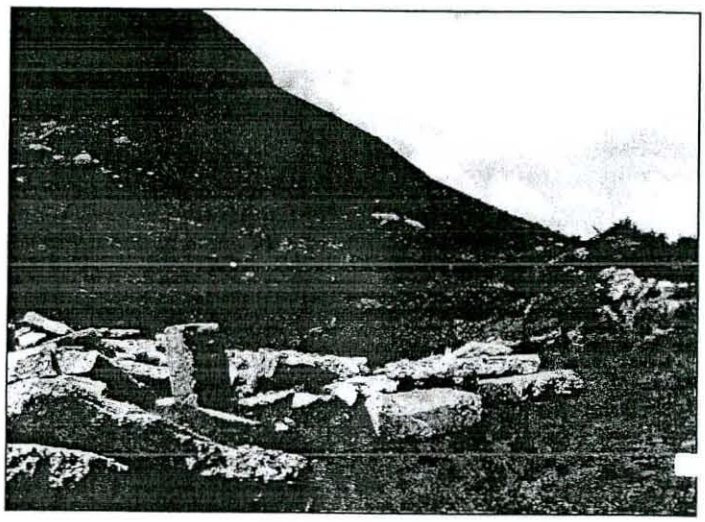
PAVEMENT POSITION

Selected Subgrade

CO-ORDINATES

S 30° 08,445' E 28° 40,811'

S 30° 08' 26.86"
E 28° 40' 48.76"

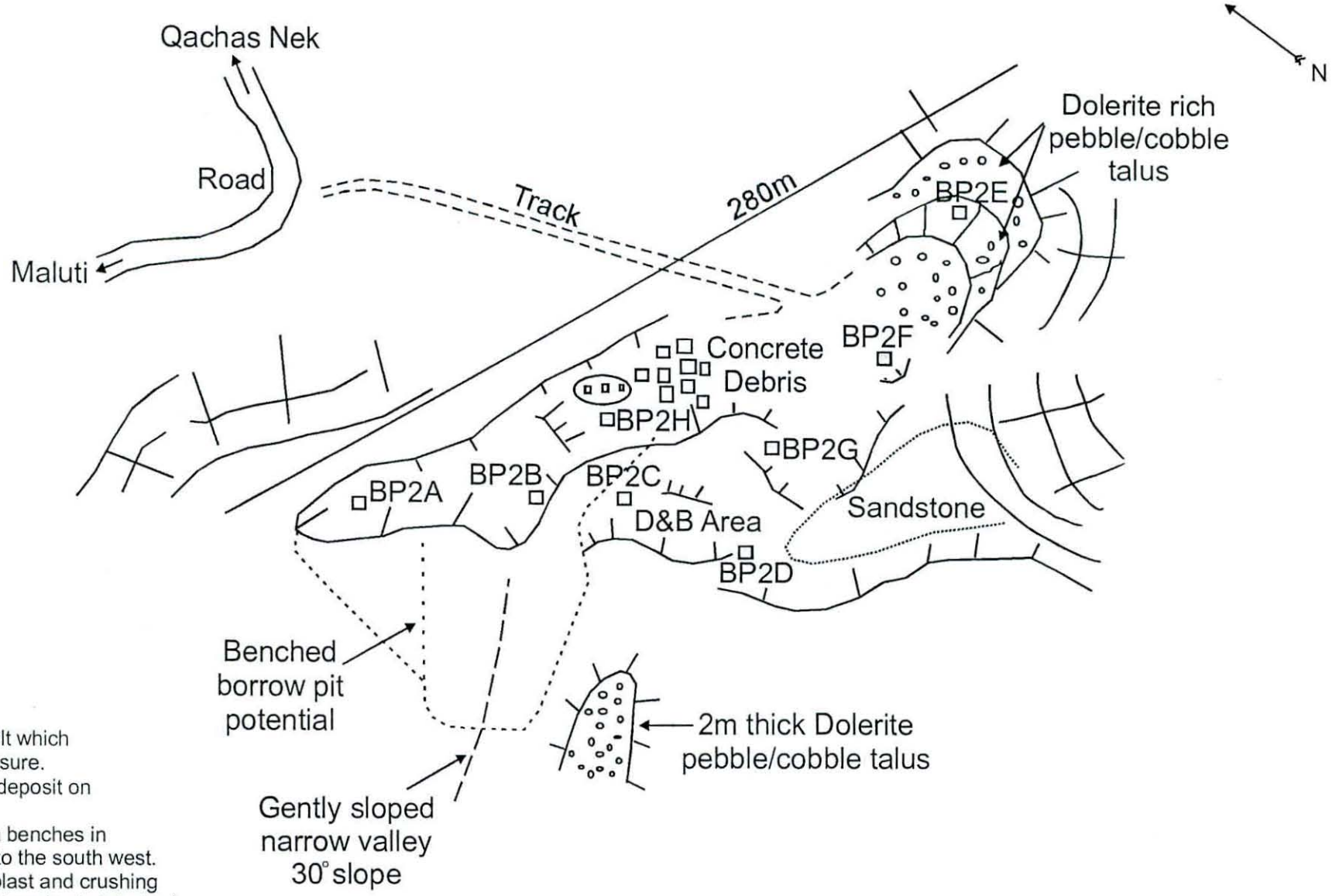


LABORATORY RESULTS

MQ Sample	Trial Hole	Depth (m)	Material	GM	PI	LS%	Mat. Class	MDD kg/m	CBR Swell %	CBR @ %			
										90	93	95	98
64	2A	5	Olive Grey Hi Wthd Basalt	2.6	9	4.0	G6	2015	0.2	14	21	27	43
65	2B	3	Olive Grey Hi Wthd Basalt	2.7	11	5.0	G7	1944	0.4	18	26	33	53
66	2C	2	Olive Grey Hi Wthd Basalt	2.8	15	7.0	G6	2238	0.2	23	38	51	79
67	2D	3	Olive Grey Hi Wthd Basalt	2.6	10	4.5	G7	2024	0.3	11	15	20	32
68	2E	6	Gry br silt cobbles colluvim	2.5	15	7.5	G7	1966	0.4	14	22	30	49

RECOMMENDATIONS

Weathered basalt qualifies as G6/ G7. Marginal to relatively high PI but qualifies with formula 3GM+10. Basalt can disintegrate on exposure but could nonetheless provide reasonably good selected subgrade material provided material is covered soon after placement and compaction. Material is though relatively hard where exposed and will require blasting for excavation. Possibly single stage crushing as well but this can only be determined during development of the borrow pit. Photograph above shows minor valley into which borrowing should be advanced. Colluvial cobble stockpile on north-east side is coarse grained and possibly gap-graded with highish LS.



NOTES:

1. Rock comprises basalt which disintegrates on exposure.
2. Dolerite cobble talus deposit on north east side.
3. Extend by machine in benches in gentle sloping valley to the south west.
4. Basalt requires drill; blast and crushing elsewhere (see D&B Area in sketch plan).
5. Relatively steep exposed area.

PROJECT: **QACHAS NEK ROAD**	**BORROW PIT 2** **SKETCH PLAN**	TERRECO cc	Scale: Not to scale Date: January 2009

BORROW PIT 3 **POSITION:** Km 17,500 100m right

DESCRIPTION

Borrow Pit 3 is located on a plateau area immediately below the overlying Clarens Formation sandstone. Material comprises of olive and maroon mudstones. There is evidence of previous borrowing but the site still has good reserves. Higher lying materials consist of maroon mudstones but the major lower areas of larger reserves consist of olive coloured mudstone.

RESERVE QUANTITY

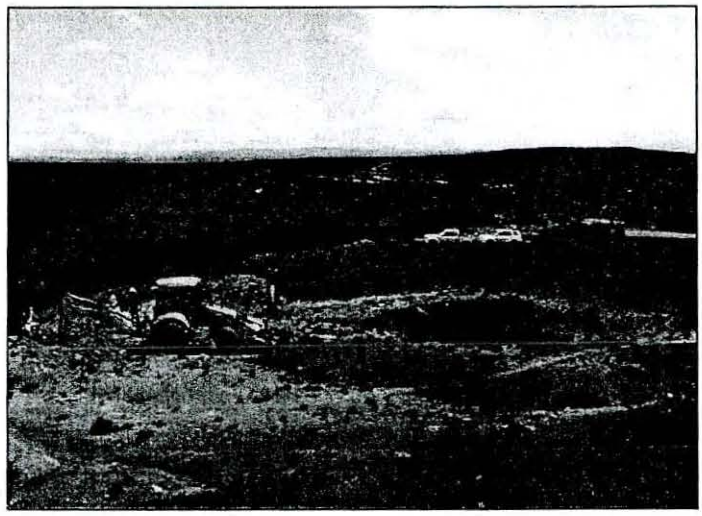
25 000m^3

PAVEMENT POSITION

Selected subgrade & fill

CO-ORDINATES

S 30° 09,827' E 28° 41,053'

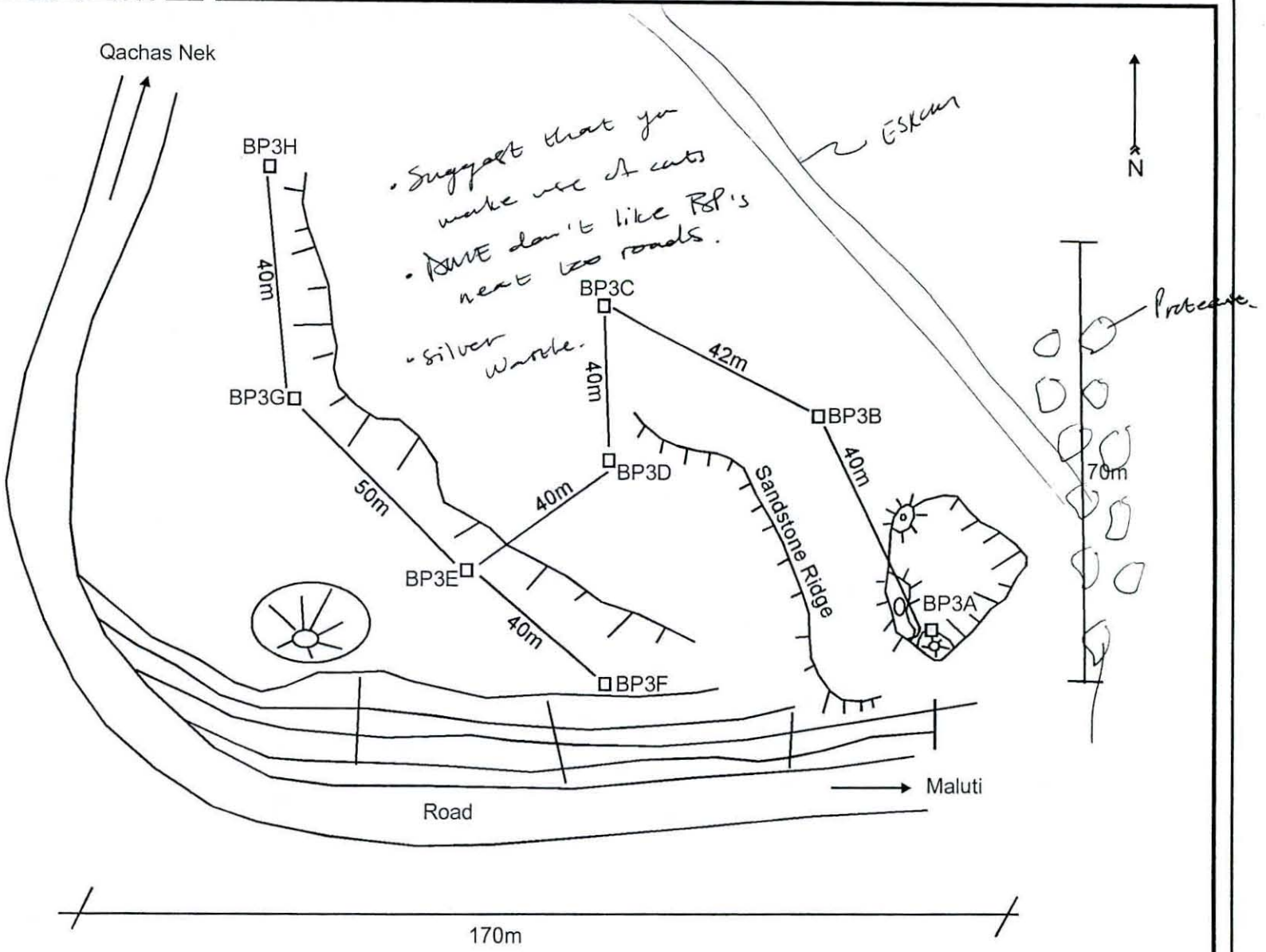


LABORATORY RESULTS

MQ Sample	Trial Hole	Depth (m)	Material	GM	PI	LS%	Mat. Class	MDD kg/m	CBR Swell %	CBR @ %			
										90	93	95	98
69	3A	1,7	Yel Ol Hi Wthd Mudstone	2.1	11	5.0	G7	1884	0.4	10	15	20	30
70	3B	0,5	Yel Ol Hi Wthd Mudstone	2.6	11	5.0	G7	2136	0.3	12	17	23	36
71	3E	1,0	Yel Ol Hi Wthd Mudstone	1.2	7	3.0	G9	1800	0.5	5	9	12	18
72	3F	1,0	Yel OL Hi Wthd Mudstone	2.5	10	5.0	G8	1935	0.4	8	12	16	24
73	3G	2,0	Maroon Hi Wthd Mudstone	2.0	11	5.0	G10	2158	0.4	3	5	7	11

RECOMMENDATIONS

Material is of variable quality from G7 to G10. Better quality harder mudstone zones should be capable of providing selected subgrade material. Variable hardness may be a problem but with careful selection this borrow pit should be capable of providing reasonably good quality selected subgrade material. Material becomes hard with depth and blasting/ crushing may be required. Realignment to remove the tight road curve in this area could be the source of quite large reserves of weathered mudstone. Undertake careful check and monitoring of CBR Swell, dispersivity and hardness consistency during construction. Remove and spoil occasional thin sandstone horizons.



NOTES:

1. Yellow olive mudstone with occasional bands of maroon mudstone.
2. Hardness and weathering vary but all trial holes indicate relatively harder material at depth.
3. Occasional thin sandstone horizons (<1m) to be removed to spoil.
4. Realignment of road could provide large material source.
5. Mudstone disintegrates on exposure.
6. Check CBR swell.
7. Blasting and crushing possibly required at depth.

PROJECT: **QACHAS NEK ROAD**	**BORROW PIT 3** **SKETCH PLAN**	TERRECO cc	Scale: Not to scale Date: January 2009

BORROW PIT 4 Application **POSITION:** Km 15,800: 20m right

DESCRIPTION

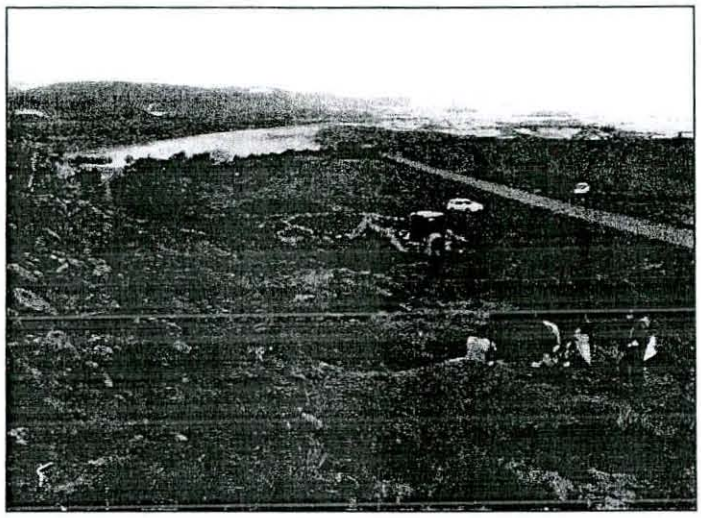
Borrow Pit 4 material comprises of maroon mudstone. Material disintegrates on exposure but is hard a few centimetres beneath the disintegrated gravel surface. Investigations indicate that excavation using a TLB is not possible in this material. A large excavator with a rock bucket may have greater success but is believed that blasting will be required for deep excavation.

RESERVE QUANTITY

20 000m^3

PAVEMENT POSITION

Selected subgrade



CO-ORDINATES

S 30° 09,961' E 28° 41,821'

S 30° 09' 57.99"

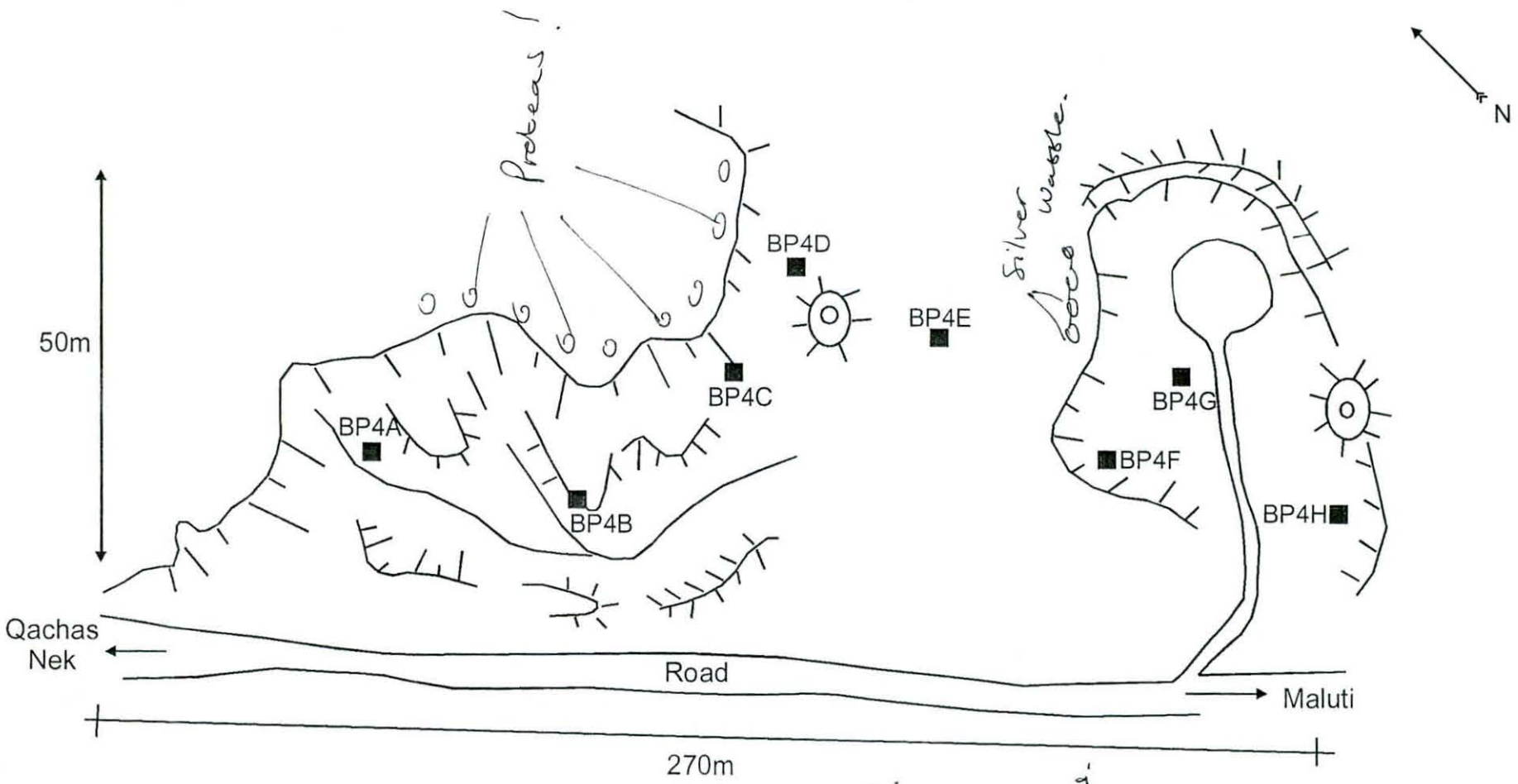
E 28° 41' 49.35"

LABORATORY RESULTS

MQ Sample	Trial Hole	Depth (m)	Material	GM	PI	LS%	Mat. Class	MDD kg/m	CBR Swell %	CBR @ %			
										90	93	95	98
74	4A	3	Maroon Hi Wthd Mudstone	0.7	11	5.0	G10	2120	0.4	6	9	12	19
75	4B	2	Maroon Hi Wthd Mudstone	2.3	7	3.0	G7	2199	0.2	13	19	24	38
76	4C	0.3	Maroon Hi Wthd Mudstone	2.8	9	4.0	G6	2120	0.2	23	35	45	68
77	4D	0.5	Maroon Hi Wthd Mudstone	2.7	7	3.5	G6	2228	0.2	30	41	51	62
78	4F	1.3	Maroon Hi Wthd Mudstone	2.1	8	4.0	G6	2234	0.2	20	30	39	6
79	4G	1.5	Y/ Ol Hi Wthd Mudstone	2.0	9	4.0	G7	2156	0.2	9	16	23	34

RECOMMENDATIONS

The maroon mudstone is of reasonable quality G6/ G7 material though with one G10 result may be somewhat variable. Results are encouraging and material could prove useful as selected subgrade. It does disintegrate on exposure and will require rapid cover after placement and compaction. Note that maroon mudstones in other parts of the Eastern Cape have high swell making them of no use in pavement layers. Although current laboratory testing does not indicate this these materials must nonetheless be tested regularly to ensure swell percent is within the COLTO requirement of a maximum of 1,5% for G7 material. Durability too to be confirmed.



NOTES:
1. Maroon mudstone borrow pit.
2. TLB struggles to penetrate previous borrow pit outcrop faces.
3. Shallow refusal.
4. Blasting required to break rock up.
5. Mudstone disintegrates on exposure.

. Blasting required!
. Crushing?
. Expansion needed to consider the proteas.

PROJECT: QACHAS NEK ROAD	BORROW PIT 4 SKETCH PLAN	TERRECO cc Geotechnical, Environmental and Waste Management	Scale: Not to scale
			Date: January 2009

BORROW PIT 5 **POSITION:** Km 5,200: 50m left

DESCRIPTION

Borrow Pit 5 is a large existing borrow pit comprising mudstone which has been intruded by a dolerite sill and has a plateau crest of hard sandstone. Dolerite is relatively soft with easy excavation. The mudstone is harder and may require blasting to loosen for excavation. A large centrally located promontory of mudstone could provide reasonably good selected material but here again blasting will be required. Possibly crushing too. Additional mudstone reserves are located on the eastern side of the road opposite though there are graves to contend with to the far west. The 1m sandstone capping will require blasting for excavation should borrowing cut deeper into the hillside.

RESERVE QUANTITY

10 000m^3

PAVEMENT POSITION

Selected subgrade & fill

CO-ORDINATES

S 30° 13,945' E 28° 45,672'

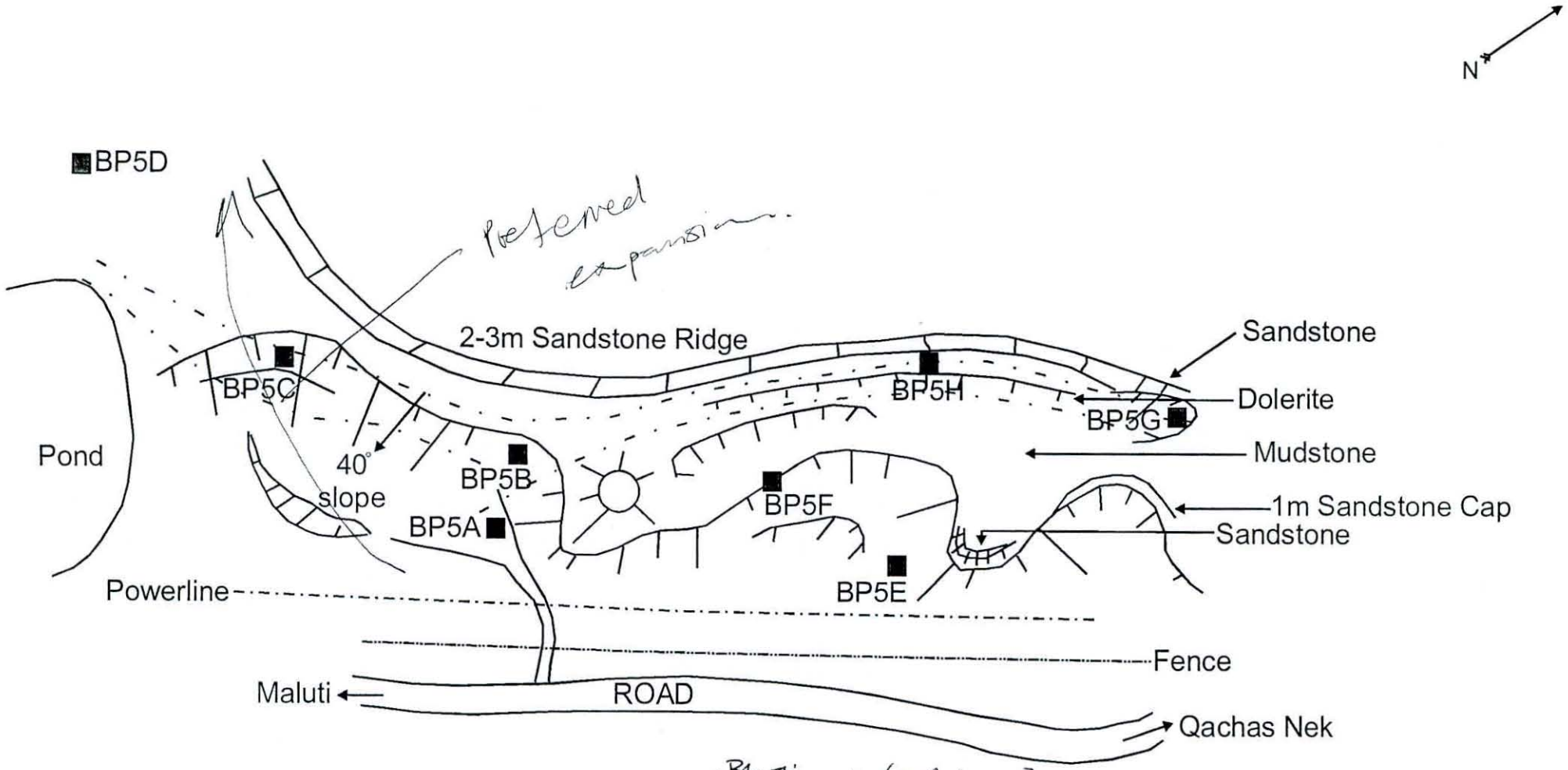
S 30° 13' 57.38" E 28° 45' 40.37"

LABORATORY RESULTS

MQ Sample	Trial Hole	Depth (m)	Material	GM	PI	LS%	Mat. Class	MDD kg/m	CBR Swell %	CBR @ %			
										90	93	95	98
80	5A	2.5	Grey mod wthd mudstone	2.4	11	5.0	G7	2075	0.3	10	15	20	33
81	5B	4	Ol br highly wthd dolerite	1.4	12	5.5	G7	1877	0.4	10	15	19	33
82	5C	3.5	Ol Br highly wthd dolerite	0.5	19	9.5	-	1636	1.8	3	5	7	8
83	5E	7	Grey mod wthd mudstone	1.8	16	8.0	-	1892	1.4	5	9	12	22
84	5F	2.5	Grey mod wthd mudstone	2.4	13	6.0	G8	1986	0.7	7	11	15	22

RECOMMENDATIONS

Laboratory results indicate very variable materials from G7 to zero usage because of high swell and low strength of some areas of the borrow pit. The borrow pit is also visually very exposed and it would be best to restrict additional activities in the existing borrow footprint. Harder less weathered mudstone (central knoll) appears capable of providing reasonably good selected subgrade material. Check durability; swell and possibility for dispersion. Blasting required for excavation. Crushing possibly also required. Dolerite is too soft and variable to be considered in the new pavement.



NOTES:
1. Mudstone borrow pit with dolerite sill.
2. Dolerite is highly weathered and relatively soft.
3. Mudstone relatively hard but will require blasting and crushing.
4. Extend borrow pit into the harder mudstone areas.

PROJECT: **QACHAS NEK ROAD**	**BORROW PIT 5** **SKETCH PLAN**	TERRECO cc Geotechnical, Environmental and Waste Management	Scale: Not to scale Date: January 2009

BORROW PIT 6 Application **POSITION:** Km 2,000 ; 2km E

DESCRIPTION

Borrow Pit 6 is an existing long 100m cut along a ridge side in olive grey, highly weathered dolerite. The cut is 15m to 20m high and adjacent ridge slopes 40° from horizontal. The weathered dolerite has a high pebble and cobble corestone content. There is a narrow outcropping lens of mudstone on the north side of the borrow and the pit floor has a mudstone base on the eastern side. The borrow pit can be advanced into the face for another 20m or extended to the south-east or north-west as indicated by weathered dolerite outcrops in nearby gullies either side. There is also a second small dolerite borrow pit of similar weathered, cobble-rich, doleritic material on the ridge plateau higher up towards the south-east.

RESERVE QUANTITY

30 000m^3

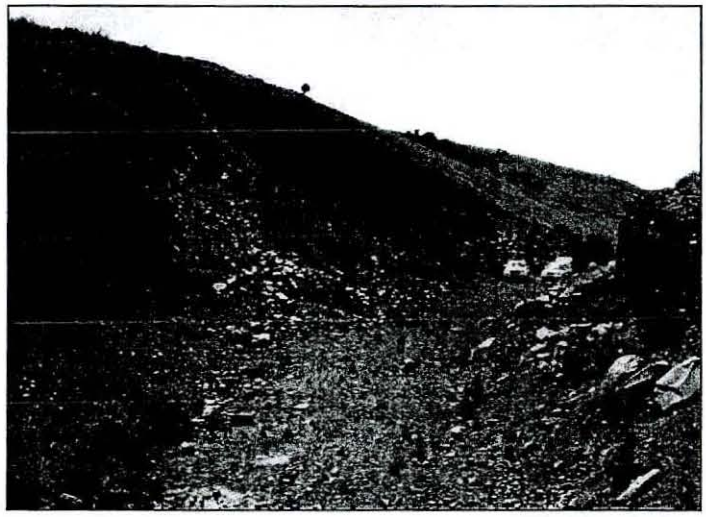
PAVEMENT POSITION

Subbase

CO-ORDINATES

S 30° 14,408' E 28° 47,837'

S 30° 14' 24.88"
E 28° 47' 49.97"



LABORATORY RESULTS

MQ Sample	Trial Hole	Depth (m)	Material	GM	PI	LS%	Mat. Class	MDD kg/m	CBR Swell %	CBR @ %			
										90	93	95	98
85	6A	3	Olive highly wthd dolerite	2.7	13	6.0	G6	2187	0.4	28	33	38	46
86	6B	16	Ol/ gry highly wthd dolerite	2.9	12	6.0	G6	2360	0.2	64	80	92	127
87	6C	10	Ol/ gry highly wthd dolerite	2.7	11	5.0	G6	2340	0.2	22	34	46	66
88	6D	12	Ol/ gry highly wthd dolerite	2.7	13	6.0	G6	2267	0.2	40	40	39	56
89	6E	7	Ol/ gry highly wthd dolerite	2.8	15	7.5	G6	2239	0.2	47	57	65	81
90	6F	14	Ol/ gry highly wthd dolerite	2.8	15	7.0	G6	2272	0.2	40	46	50	53

Information for Borrow Pit 6 continues overleaf

RECOMMENDATIONS

Materials tested are all G6/ G5 borderline quality. Strengths are consistently high and materials would qualify as G5 was it not for the relatively high PIs. PI though still qualifies for G6 using formula 2 or 3GM +10. LS is also on the high side requiring stabilisation. Addition of lime to be considered in lowering PI.

Additional samples were removed from the site for initial stabilization testing with samples to be retained to await instructions for such stabilization from the Materials Engineer. Matrocast Laboratory decided independently, however, to undertake 3% cement stabilisation on some of the highly weathered dolerite sample. The result is as follows:

MQ Sample	Trial Hole	Depth (m)	Material	Curing	UCS (Mpa)	ITS (kPa)	MDD kg/m	OMC (%)
90	6F	14	Olive grey highly wthd dolerite	Rapid	2.53	-	2252	7.6
90	6F	14	Olive grey highly wthd dolerite	7 Days	2.76	340	2252	7.6

The *maximum* UCS Colto requirement for a C4 material is 1,5MPa and the *minimum* ITS 200kPa. 3% cement stabilisation far exceeds both these requirements and a lower cement value would therefore be more applicable – especially to prevent shrinkage and block cracking. It will be required therefore to conduct a comprehensive stabilisation testing programme, with sensitivity analysis, to determine the optimum cement content.

This weathered dolerite borrow pit is the only nearby source of reasonably good quality subbase for which this material is intended even though it is some way off the road centreline. Drilling will be required to prove volumes above the eastern cutface and possibly on the south-western end of the pit. Drilling of the alternative borrow pit site on the hill plateau east of the site should also be considered since it is hidden from view and free of the cemetery problems facing the existing site although gabion protection of graves during borrow operations could possibly solve the problem. Large excavator excavations could also be utilised to determine areal extent of this second source with laboratory testing to determine quality.

APPENDIX E
HERITAGE IMPACT ASSESSMENT

HERITAGE IMPACT ASSESSMENT OF UPGRADING OF DISTRICT ROAD DR 08012 FROM MALUTI TO QACHAS NEK, MATATIELE, EASTERN CAPE PROVINCE, SOUTH AFRICA

Assessment and report by

Box 20057 Ashburton 3213
PIETERMARITZBURG South Africa
Telephone 033 326 1136
Facsimile 086 672 8557
082 655 9077 / 082 529 2656
thembeni@iafrica.com

For **Terratest (Pty) Ltd**

Telephone Magnus van Rooyen 033 3472 9920

1 September 2009

eThembeni Cultural Heritage

Management summary

eThembeni Cultural Heritage was appointed by Terratest to undertake a heritage impact assessment of a proposed road upgrade near Matatiele, in terms of the Heritage Resources Act No 25 of 1999. Two eThembeni staff members inspected the area on 14 August 2009 and completed a controlled-exclusive surface survey and database search.

We identified no heritage resources within the proposed development area.

We recommend that the development proceed with no further heritage resource mitigation and have submitted this report to the South African Heritage Resources Agency in fulfilment of the requirements of the Heritage Resources Act 1999. The relevant SAHRA personnel are Dr Antonieta Jerardino (telephone 021 462 4502) and Mr Thanduxolo Lungile (telephone 043 722 1740/2/6).

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 SAHRA should any heritage resources, as defined in the Act, be discovered during the course of development activities.

Table of contents

Introduction and legislation

eThembeni Cultural Heritage was appointed by Terratest to undertake a heritage impact assessment of a proposed road upgrade near Matatiele, in terms of the Heritage Resources Act No 25 of 1999. Section 38(1) of the Act requires such an assessment in case of:

(a) the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length;
(b) the construction of a bridge or similar structure exceeding 50 m in length;
(c) any development or other activity which will change the character of a site –
    (i) exceeding 5 000 m^2 in extent; or
    (ii) involving three or more existing erven or subdivisions thereof; or
    (iii) involving three or more erven or subdivisions thereof which have been consolidated within the past five years; or
(d) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;
(e) the re-zoning of a site exceeding 10 000m^2 in extent; or
(f) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority.

A heritage impact assessment is not limited to archaeological artefacts, historical buildings and graves. It is far more encompassing and includes intangible and invisible resources such as places, oral traditions and rituals. In the Act 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:

(a) places, buildings, structures and equipment;
(b) places to which oral traditions are attached or which are associated with living heritage;
(c) historical settlements and townscapes;
(d) landscapes and natural features;
(e) geological sites of scientific or cultural importance;
(f) archaeological and palaeontological sites;
(g) graves and burial grounds, including -
    (i) ancestral graves,
    (ii) royal graves and graves of traditional leaders,
    (iii) graves of victims of conflict,
    (iv) graves of important individuals,
    (v) historical graves and cemeteries older than 60 years, and
    (vi) other human remains which are not covered under the Human Tissues Act, 1983 (Act No.65 of 1983 as amended);
(h) sites of significance relating to the history of slavery in South Africa;
(i) movable objects, including -
    (i) objects recovered from the soil or waters of South Africa including archaeological and palaeontological objects and material, meteorites and rare geological specimens;
    (ii) ethnographic art and objects;
    (iii) military objects;
    (iv) objects of decorative art;
    (v) objects of fine art;
    (vi) objects of scientific or technological interest;
    (vii) books, records, documents, photographic positives and negatives, graphic, film or video material or sound recordings; and
    (viii) any other prescribed categories,
    but excluding any object made by a living person.

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 m 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 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;
- 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. The South African Heritage Resources Agency 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 following procedures are usually required in the event of exhumation and re-interment:

- Notification of the impending removals (using appropriate 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 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.

Nature of proposed activities (information obtained from the client)

Terratest (Pty) Ltd was approached by HHO Africa – Infrastructure Engineers (HHO) on behalf of the Eastern Cape Department of Roads and Transport (DoRT) to undertake the environmental work necessary for the application for the environmental authorisation (EA) from the Department of Economic Development and Environmental Affairs (DEDEA) for the proposed activity. The EA is necessary since the activity falls within the listing notice GN No. R 386.

The proposed project includes the upgrading of 25 kilometres of gravel road to surfaced black top, along the DR 08012 between Maluti town and the Qachas Nek South Africa - Lesotho Border Post. Currently the road between Maluti and the Lesotho Border Post at Qachas Nek is a gravel road that requires regular maintenance due to the slopes and gradients that the current road alignment traverses.

In addition to the black surfacing of the road, additional storm water structures will be put in place ensuring adequate and improved storm water drainage off the road surface. The improved drainage situation off and away from the road will contribute to the sustainability of the road in the long run.

The road passes through unspoilt natural areas north of the town of Maluti, which makes this road an attractive tourist route to gain entry into Lesotho. The road is also used for the regular trade between Lesotho and South Africa, with vehicles from Lesotho regularly transporting clientele to and from the shopping facilities in the towns of Matatiele and Kokstad.

Location and environmental issues (information obtained from the client)

The site is situated at the foothills of the Drakensberg Mountains within the boundaries of the Alfred Nzo District Municipality, as indicated below.

Figure 1. Location of District Road 09012, Maluti to Qachas Nek.

According to the Vegetation Types of South Africa, Lesotho and Swaziland (2006) the road runs through East Griqualand Grassland, Mabela Sandy Grassland, Eastern Temperate Freshwater Wetlands and Southern Drakensberg Highland Grassland.

East Griqualand Grassland is a veld type that is dominated by grass components and has a conservation classification of "vulnerable" due to only 0.2% of the distribution being protected in the Ongeluksnek Nature Reserve. The rest of the unprotected areas are under pressure from agricultural activities like the planting of plantations, the cultivation of maize and over grazing.

Similarly Mabela Grassland is a veld type that is dominated by grass components and has a conservation classification of "vulnerable" due to an unspecified low percentage of the distribution being protected within the Ongeluksnek Nature Reserve. The rest of the unprotected areas are under pressure from agricultural activities like the cultivation of maize and selective heavy overgrazing especially in communal areas.

The road crosses a typical example of Eastern Temperate Freshwater Wetlands which has a conservation classification of "vulnerable" due to only 5% being conserved in statutory and private reserves and parks. The remainder of the unprotected areas are being disturbed by heavy selective livestock grazing. In addition the use of these wetlands as water sources also place added pressure on these systems.

Southern Drakensberg Highland Grassland is dominated by grassland components and has a conservation classification of "least threatened" with approximately 9% o the total area being conserved in the uKhahlamba Drakensberg Park and the Ongeluksnek Nature Reserve. The unprotected areas are continuously being disturbed due to heavy overgrazing, especially in communal areas.

The social environment surrounding the road alignment is dominated by scattered villages and communal lands mainly used for communal grazing and subsistence crop production. The road links South Africa and Lesotho and there will have certain socio-economic impacts on the residents of both Lesotho and the towns of Matatiele and Kokstad.

As with all roads related projects there are project specific areas of environmental concerns, the following are presently identified:

- A wetland area (Eastern Temperate Freshwater Wetland) along the stretch of the road will require a sensitive approach during the project since the risk of contamination exists.
- A bridge crossing is an area of concern relating to contamination during the upgrading process.
- A relatively dense stand of *Protea subvestita* (Lip-flower Sugarbush) close to the road alignment must be treated with utmost sensitivity during the project guarding against any damage of the plants.
- Areas with large sandstone rocks formations which must be avoided along the alignment of the road.

The following recommendations will be proposed regarding the project:

- A parking area is proposed at the border post if such a facility is not yet part of the proposed project.
- The water source(s) that will be utilized during the operational phase of the project needs to be identified as early as possible and extraction permitting must be applied for through the Department of Water Affairs and Forestry (DWAF).
- The material source(s) that will be utilized during the upgrading needs to be identified as early as possible and permitted through the Department of Minerals and Energy (DME). These borrow pits should be selected in such a way that their visibility from the road will be restricted ensuring the visual and aesthetic conservation of the area.
- The locality of the Contractor's Campsite has to be done with environmental and social responsibility in mind.
- The *Acacia dealbata* (Silver Wattle) that is encroaching on the road verges must be cleared during the operational phase of the project. Measures must also be put in place minimizing the re-establishment of this specie.
- It is suggested that some form of speed-reducing measures be put in place since the black topping of the road will result in vehicles travelling at even higher speeds.

Methodology

Two eThembeni staff members inspected the area on 14 August 2009. We completed a controlled-exclusive surface survey of the road reserve and of various borrow pits, where 'sufficient information exists on an area to make solid and defensible assumptions and judgements about where [heritage resource] sites may and may not be' and 'an inspection of the surface of the ground, wherever this surface is 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[1]).

We consulted various provincial databases, including historical, archaeological and geological sources and sourced a concise account of South Africa's pre and postcolonial history (available on request). We assessed the value and significance of heritage resources, as defined in the Heritage Resources Act 1999 and the criteria contained in Appendix A. Culturally significant landscapes were assessed according to the criteria in Appendix B.

Geographic coordinates were obtained with a handheld Garmin GPS72 global positioning unit. Photographs were taken with a Nikon Coolpix S200 digital camera. A statement of independence and a summary of our ability to undertake this heritage impact assessment are available on request.

The assumptions and limitations of this heritage impact assessment are as follows:

- We have assumed that the description of the proposed project, provided by the client, is accurate.
- We have assumed that the public consultation process undertaken as part of the Environmental Impact Assessment is sufficient and adequate and does not require repetition as part of the heritage impact assessment.
- Soil surface visibility was moderate overall.
- No subsurface investigation (including excavations or sampling) were undertaken, since a permit from SAHRA is required to disturb a heritage resource. Accordingly, subsurface heritage resources might be present and we remind the client that the Act requires that a developer cease all work immediately and notify SAHRA should any heritage resources, as defined in the Act, be discovered during the course of development activities.

[1] King, T. F. 1989. The archaeological survey: methods and uses. Quoted in Canter, L. W. 1996. Environmental impact assessment. Second Edition. New York: McGraw-Hill, Inc.

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Observations and recommendations

No development activities associated with the proposed project had begun at the time of our visit, in accordance with national heritage legislation.

⇒ Places, buildings, structures and equipment

None were identified within the affected development area.

⇒ Places to which oral traditions are attached or which are associated with living heritage

None were identified within the affected development area.

⇒ Historical settlements and townscapes

None were identified within the affected development area.

⇒ Landscapes and natural features

The landscape within which the proposed development will occur comprises the townlands of Cradock, including existing power lines and a substation. The impact on this landscape will be long term to permanent, but in keeping with existing infrastructure.

⇒ Geological sites of scientific or cultural importance

None were identified within the affected development area.

⇒ Archaeological and palaeontological sites

None were identified within the affected development area.

⇒ Graves and burial grounds

None were identified within the affected development area.

⇒ Sites of significance relating to the history of slavery in South Africa

None were identified within the affected development area.

⇒ Movable objects excluding any object made by a living person

None were identified within the proposed development area.

Summary of findings in terms of the Heritage Resources Act 1999 Section 38(3)

(a) the identification and mapping of all heritage resources in the area affected

None.

(b) an assessment of the significance of such resources in terms of the heritage assessment criteria set out in regulations

Not applicable.

(c) an assessment of the impact of development on such heritage resources

Not applicable.

(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

Not applicable.

(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

The client has undertaken such consultation in terms of statutory requirements and retains the relevant documentation.

(f) if heritage resources will be adversely affected by the proposed development, the consideration of alternatives

Not applicable.

(g) plans for mitigation of any adverse effects during and after completion of the proposed development

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

Conclusion

We recommend that the development proceed with no further heritage resource mitigation and have submitted this report to SAHRA in fulfilment of the requirements of the Heritage Resources Act 1999. According to Section 38(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;
- 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 relevant SAHRA personnel are Dr Antonieta Jerardino (telephone 021 462 4502) and Mr Thanduxolo Lungile (telephone 043 722 1740/2/6).

APPENDIX A

SIGNIFICANCE AND VALUE OF HERITAGE RESOURCE SITES

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	☐	☐	☐	
National	☐	☐	☐	
Provincial	☐	☐	☐	
Regional	☐	☐	☐	
Local	☐	☐	☐	
Specific Community	☐	☐	☐	----------

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 / m²	6 – 10 / m²	11 + / m²
Inorganic remains (list types)	0 – 5 / m²	6 – 10 / m²	11 + / m²
Ancestral graves			Present
Horizontal extent of site	< 100m²	101 – 1000m²	1000 + m²
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 cultural heritage managers who are also experienced site assessors.

APPENDIX B

THE MANAGEMENT OF CULTURAL LANDSCAPES

The Cultural Landscape Foundation[2] defines cultural landscapes as follows:

A cultural landscape is a geographic area that includes resources and natural resources associated with a historic event, activity, or person. Sometimes cultural landscapes are the result of one person or group of people acting upon the land. Other times they are the result of an idea one person or a group had and then created at that time. Cultural landscapes can range from thousands of acres of rural lands to a small homestead with a front yard of less than one acre. They include grand estates, farmland, public gardens and parks, college campuses, cemeteries, scenic highways and even industrial sites.

Four general types of Cultural Landscapes, not mutually exclusive, are:

- Historic Sites
- Historic Designed Landscapes
- Historic Vernacular Landscapes
- Ethnographic Landscapes

Cultural Landscapes can:

- Be man-made expressions of visual and spatial relationships.
- Serve as texts and narratives of cultures.
- Be valuable expressions of regional identity.
- Be works of art that are part of our national heritage.
- Exist in relationship to their ecological contexts.

What are cultural landscapes? by Alice E. Ingerson, Institute for Cultural Landscape Studies[3]

Virtually all landscapes have cultural associations, because virtually all landscapes have been affected in some way by human action or perception. Therefore, the Institute for Cultural Landscape Studies does not use the phrase "cultural landscape" to mean a special type of landscape. Instead, we use "cultural landscape" to mean a way of seeing landscapes that emphasizes the interaction between human beings and nature over time. ICLS also works with many other organizations, some of which have contrasting or even conflicting definitions of "cultural landscape":

individual, special, aesthetic, collective, representative, useful, cultural, related to the arts (consciously designed objects), ideas of enduring value related to the everyday beliefs and practices of a group of people, the work of landscape architects or garden designers, scenery portrayed in a painting or photograph, or that is seen as worth painting or photographing, the land that can be seen from a single vantage point (usually larger than a "site", smaller than a "region"), "nearly everything we see when we go outdoors" — Peirce Lewis 1979

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[2] Though professional techniques for identifying, documenting, and managing cultural landscapes have evolved rapidly in the past 30 years, the results of the professionals' work often fails to reach the general public. Consequently, many of the places in which we live, work, and play often change considerably—sometimes over years and sometimes overnight! The Cultural Landscape Foundation is the only not-for-profit foundation in America dedicated to increasing the public's awareness of the importance and irreplaceable legacy of cultural landscapes. Through education, technical assistance, and outreach, the Cultural Landscape Foundation aims to broaden the support and understanding for cultural landscapes nationwide in hopes of saving our priceless heritage for future generations. The CLF achieves this mission by: (1) heightening the awareness of those who impact cultural landscapes; (2) assisting those groups and organizations who are working to increase the appreciation and recognition of cultural landscapes; and, (3) developing educational tools for young people to better connect them to their cultural landscape environs.

[3] From the website of the Institute for Cultural Landscape Studies of the Arnold Arboretum (http://www.icls.harvard.edu), © The President and Fellows of Harvard College. The Institute for Cultural Landscape Studies was formed in 1997 to support the emerging community of professionals and volunteers who manage and interpret landscapes with a significant history of human use, particularly in the northeastern United States. These practitioners work with a wide variety of places, from historic gardens and public parks to urban streetscapes, broad agricultural or industrial regions, and conservation or ecological reserves. These landscapes are neither static nor self-contained. Managing them requires active experimentation and continuous learning, to understand how past events and decisions produced today's landscapes, and how today's decisions and events are already producing tomorrow's landscapes. The Institute for Cultural Landscape Studies worked with nonprofit organizations, public agencies, and colleges and universities to capture place-based knowledge about cultural landscapes, and to respond to emerging issues.

The National Park Service and the National Register of Historic Places, as well as organizations that look to these agencies for management models and standards, use the operational definition of "cultural landscape" from the 1996 Secretary of the Interior's . . . Guidelines for the Treatment of Cultural Landscapes:

a geographic area (including both cultural and natural resources and the wildlife or domestic animals therein), associated with a historic event, activity, or person or exhibiting other cultural or aesthetic values.

Historic landscapes, unlike works of art, have to function as contemporary environments — we have literally to enter and become involved with them. — Catherine Howett 1987

Much public discussion about cultural landscapes is about preserving special or historic places. Yet the definition of "special" varies over time, among different cultures, and in different places. A landscape valued by one group may be simply invisible, or even offensive, to another. Next to an official historic district may be a neighborhood that is not eligible for any special treatment but has deep meaning and associations for the people who live there. Mobile homes may be critical to a farm economy, though they jar the sensibilities of visitors expecting to see only white clapboard houses and wooded hillsides from a "scenic overlook" in a state forest. The historic district and the ordinary neighborhood, working farms and protected forests, are all cultural landscapes.

Even when landscape preservation standards are broadened to include a wide range of landscape types, strict preservation is not always an appropriate stance. Designers and communities may also choose to transform existing landscapes or create new ones. Managing cultural landscapes thus involves planning for positive change as well as preventing negative change.