



25 April 2012

Heritage Western Cape

Protea Assurance Building, Greenmarket Square

Cape Town, 8000

For Att: Heritage Resource Management Section c/o Jenna Lavin

Re: Borrow pits for the supply of materials for regravelling: C E N T R A L K A R O O, Western Cape

The subject of the attached heritage impact assessments are the expansion of existing borrow pits, and in certain cases proposed borrow pits, in order to obtain material for the maintenance of gravel roads. Heritage impact assessments have been compiled in response to interim comments as received from Heritage Western Cape. *vidamemoria* has compiled assessments focusing on specialist palaeontological and / or archaeological specialist assessments. Notification as previously submitted to Heritage Western Cape (dated 31 May 2011) and response (dated 20 June 2011) confirmed the approach to be undertaken in submitting borrow pit notifications to Heritage Western Cape.

Dr John Almond has provided specialist paleontological input and Madelon Tunesius in conjunction with Archaeology Contracts Office has provided specialist archaeological input.

Attached please find list of sites outlining specialist assessments conducted and associated recommendations.

Ref	Borrow pit road description	Specialist study conducted	Description	Recommendation
1	Central Karoo Laingsburg DR 01445 2 sites located at km: 13.9 and 17.15	Archaeological and palaeontological	Existing sites to be expanded	Buffer zone of 10m be applied between cemetery and western boundary of the proposed expansion at km 13.9 Fossil material from pit at km 17.15 be recorded and sampled during early stages of excavation
2	Central Karoo Prince Albert DR 01721 1 site located at km 8.4	Archaeological	Existing site to be expanded	No further archaeological studies or mitigation recommended
3	Central Karoo Beaufort West DR 02308 1 site located at km 36.6	Archaeological and palaeontological	Proposed new site	No further palaeontological studies or mitigation recommended Buffer zones of 10m archaeological recommendation with no further archaeological studies or mitigation recommended for this project.
10	Central Karoo DMA DR 02404 2 sites located at km 8.5 and 29.3	Archaeological and palaeontological	Existing sites to be expanded	No further palaeontological or archaeological studies or mitigation recommended

Trust the above is in order. Please do not hesitate to contact our office should you require any further information in this regard.

Yours faithfully

Quahnita Samie for *vidamemoria*



CHECKLIST FOR MATERIALS SUBMITTED IN TERMS OF SECTION 38 OF THE NATIONAL HERITAGE RESOURCES ACT

Completion of this form is required by Heritage Western Cape for submission of all materials associated with applications in terms of Section 38 of the National Heritage Resources Act other than initiation of the process via submission of the Notice of Intent to Develop (NID) form, form HWC 002.

A minimum of four hardcopies and a digital version is required of all material submitted together with checklist. This form should be attached on the outside of the front cover of such documentation.

Has this case previously been before Heritage Western Cape? Yes No

If 'Yes' provide the following information:

Case number stemming from Notification of Intent to Develop (NID) process: **110928JB27**
(Please continue to use this number in all correspondence with regard to this case.)

Date of most recent response: 3 October 2011

If 'No' provide an explanation as to why no NID form has been submitted and/or what the purpose of submission of the accompanying material is:

The material accompanying this form is submitted for the purpose of obtaining:

- Comment or advice on how to proceed in terms of heritage resource management.
- Section 38(3): Details required for a report as requested in terms of Section 38(2).
- Section 38(4): Record of Decision (A decision on a report submitted to HWC where HWC is the decision making Authority.)

- Section 38(8): Comment on Scoping Report in terms of NEMA.
- Section 38(8): Comment on Environmental Impact Report in terms of NEMA.
- Section 38(8): Comment on Environmental Management Plan in terms of MPA.
- Section 38(8): Comment in terms of other legislation. Provide details: Environmental Management Programmes (EMProgs) in terms of the Mineral and Petroleum Resources Development Act (49 of 2008)

The material is submitted for information purposes only with no action required on the part of Heritage Western Cape.

None of the above. Specify

By the submission of this material, clients and all consultants acknowledge that they are aware that the material and/or parts thereof will be put to the following uses and consent to such use being made: Filing as a public record; presentations to committees, etc; inclusion in databases; inclusion on and downloading from websites; distribution to committee members and other stakeholders and any other use required in terms of powers, functions, duties and responsibilities allocated to Heritage Western Cape under the terms of the National Heritage Resources Act. It is further understood that should such restrictions apply or should it not be possible to copy or lift material from any part of the digital version of this material, the material will be returned unprocessed.

I confirm that I enclose with this form four hardcopies of all material submitted together with a CD ROM containing digital versions of all of the same.

Name of person submitting: Quahnita Samie

SIGNATURE _____

DATE: 28 / March /20 12

Methodology for the preparation, operation and closure of borrow pit entails:

Basic methodology for preparation, operation and closure is detailed and should be read in conjunction with the mining plan reflecting final borrow pit layout.

1. Preparation/ Operation

The site preparation for the borrow pits/ quarry would entail the establishment of temporary site infrastructure (where required), including fencing. Wherever possible existing infrastructure or existing borrow pits / quarries and other disturbed areas would be utilised. Site preparation would also involve clearing and removal of topsoil and overburden from the area to be mined.

- Demarcation of mining / expropriated area demarcated with stone beacons
- The perimeter of mining area secured with stock-proof fencing as indicated on mining plan. Proposed new mining area to be secured with a gateway and suitable lock and a key supplied to the landowner upon completion of mining activities
- Access will be via the installed gateway as per the mining plan
- Signage to include heavy vehicle crossing signage, no unauthorised access signs at borrow-pit gate and caution signs erected at regulation distance from the heavy vehicle crossing signs
- All drainage outlets armoured using rock packings where they exit the site
- Clearance of alien vegetation by hand
- Indigenous vegetation and topsoil stockpiles to be created and located in areas indicated on mine plan. Vegetation should be mixed into topsoil stockpiles to provide organic material. Gaps shall be left between stockpiles to facilitate drainage
- Period between stockpiling of topsoil and its utilisation shall be as short as possible, and ideally topsoil should be transferred to its intended site of use immediately following site clearance and stockpiling. This would also avoid double handling
- Ablution and waste facilities will be provided at site entrance, screened with shade cloth. Waste is to be removed off of site to an approved landfill, on a weekly basis
- Dust is to be managed using a water tanker as necessary. No over-watering of the mining area or road surfaces should occur.
- No realignment of services is required
- No special noise management measures are required
- Protection of flora and fauna Indigenous vegetation within the site boundary shall be preserved and not damaged as far as is practical. No domestic animals shall be permitted on site. Fauna disturbed by the mining process on the site are to be carefully and safely removed from the site to an equivalent environment
- All mining activities shall be restricted to within the fenced boundaries of the mining area, and workers and equipment shall be prohibited from undertaking any activities outside of this area
- Should any archaeological and / or palaeontological remains / artefacts be discovered during the course of mining, work shall stop and the area cordoned off until the necessary remedial steps have been implemented as authorisation has been obtained to resume activities
- Special attention should be paid to the risk of veld fires , with standard fire management measures implemented.

2. Mining of material

The borrow pits / quarry would be mechanically mined using excavators and bulldozers to produce gravel suitable for wearing course material. Material from the quarry would be blasted from the work face and then transported to the on-site crusher for processing before stockpiling. Stockpiled material would be loaded onto the haulage vehicles for transport. Should further

processing of the material be required (e.g. breaking down oversize material or blending with plastic fines), it would take place at the mine face or on the road being rehabilitated.

- Material to be mined is gravel road wearing coarse. Material processing requirements are to be implemented as required and approved by an engineer
- Mining shall be undertaken utilising a dozer, and either a front-end loader or tracked excavator to load loosened material
- Mining shall take place by advancing the face away from the existing face towards the proposed limit of mining in order to mix material from the upper and lower portions of the mining face
- Temporary batter boards are to be erected as required as mining proceeds to indicate sideways and downwards limit of mining
- Each successive mined area shall be bound by a temporary vertical slope along its edge with unmined ground and a slope of 1v:3h along its edge (not to be mined)
- Topsoil should only be cleared when the underlying material is required for re-gravelling roads and is to be stockpiled only in the indicated areas, even if the topsoil is only partially cleared.

3. Rehabilitation

For most disturbed areas, landscaping and rehabilitation shall entail the clearing, shaping, trimming and scarification of the area and replacement of the stockpiled topsoil. Rehabilitation can commence as soon as the advancing face and sufficient working/loading area moves away from an area that has been mined out.

- During general site clean up, infrastructure, equipment, plant, fencing, temporary services, foreign materials, rubble and waste shall be removed from the site. Internal access tracks are to be obliterated by breaking the surface crust and scarifying the area to a depth of 250mm and covered with stockpiled topsoil
- Landscaping would entail slopes are to be cut to the final design profile as indicated on the mining plan. Any surplus material should be spread out in designated areas of the pit and used as fill, covering remaining oversize material. The excavation slopes and floor (including previously over-excavated areas) of the borrow pit shall be finished off to create a smooth surface and neat appearance.
- Topsoil stockpiled prior to mining is to be used as topsoil during rehabilitation process.
- Revegetation should focus on the slopes rather than level areas. Alien vegetation should be removed by hand or mechanical means and set aside for use as brush packing. Slopes should be stabilised. No traffic is to be allowed on revegetated areas. Should natural revegetation establishment not commence within 30 days, planting shall be undertaken in consultation with specialist guidance
- Runnels, erosion channels or wash always developing after rehabilitation to be backfilled and consolidated and the areas restored to a proper stable condition. Brush packing can be used in erosion runnels or at drainage outlets.

During decommissioning, the working area will be rehabilitated and revegetated, as per the approach outlined in the mining plan. It is important to recognise that the WCPA's liability for the site persists until such time as a Closure Certificate has been issued by the DMR. Accordingly, once the vegetation has established, a closure report will be submitted to DMR.

HERITAGE IMPACT ASSESSMENT

submitted in terms of section 38(8) of the National Heritage Resources Act

prepared for

AURECON South Africa (Pty) Ltd

25 April 2012

vidamemoria heritage consultants

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CK 2006/049087/23



DR 2308 Central Karoo
Beaufort West – Central Karoo District Municipality, Western Cape

Executive summary

Aurecon South Africa (Pty) Ltd appointed *vidamemoria* to conduct a heritage impact assessment for a proposed borrow pit located along DR 2308 approximately 40 km southwest of Beaufort West in the Central Karoo District Municipality, Western Cape. *vidamemoria* appointed Dr John Almond (Natura Viva CC) to conduct necessary palaeontological specialist study and Madelon Tusenius (Natura Viva CC) to conduct necessary archaeological impact assessment. Heritage impact assessment is submitted for comment in terms of Section 38(8) of the NHRAct as a component of an Environmental Management Programme (EMProg in terms of Mineral and Petroleum Resources Development Act 49 of 2008) to be submitted to the Department of Mineral Resources (DMR).

Palaeontological sensitivity of this site is rated as moderate and it is likely that further vertebrate remains may be exposed during further excavation of the pit area. However, the anticipated low density of fossil material subsurface does not warrant special mitigation measures or further studies. Proposed intervention would not result in a detrimental heritage impact, yielding social and economic benefits without a negative impact on heritage resources. No further specialist palaeontological or archaeological studies or mitigation is recommended and expansion be allowed to proceed.

1. Introduction

Aurecon South Africa (Pty) Ltd on behalf of the WCPA: Department of Transport and Public Works appointed Quahnita Samie (*vidamemoria*) to conduct a Notification of Intent to Develop (NID) application in terms of Section 38(1) of the National Heritage Resources Act (Act 25 of 1999) **for a proposed borrow pit at km 36.6 along DR 2308 near Beaufort West**, in the Central Karoo District Municipality. NID dated 14 September 2011 was submitted to Heritage Western Cape (HWC) for consideration. Response dated 3 October 2011 (**case ref 110928JB27**) requested '*a heritage impact assessment limited an archaeological scoping report and a palaeontological scoping report with an integrated set of recommendations is required*' (Refer Annexure A). *vidamemoria* appointed Dr John Almond (Natura Viva CC) to conduct the necessary palaeontological specialist study (dated March 2012) and Madelon Tusenius (Natura Viva CC) to conduct necessary archaeological impact assessment (dated March 2012) under supervision of Dr Lita Webley (ACO Associates) as incorporated within this assessment.

The proposed action triggers Section 38(1) (c)(a) *activity that will change the character of a site exceeding 5 000 m²*. This assessment report is submitted for comment in terms of Section 38(8) of the NHRAct as a component of an Environmental Management Programme (EMProg) in terms of the Mineral and Petroleum Resources Development Act (49 of 2008) to be submitted to the Department of Mineral Resources (DMR). Notification as previously submitted to HWC (dated 31 May 2011) and response (dated 20 June 2011) confirmed the approach to be undertaken in submitting borrow pit notifications to HWC.

Structure of assessment

Section 1	Introduction provides background, site location, description of proposals and result of consultation	pg 2
Section 2	Identification of heritage resources, assessment of significance and heritage indicators	pg 6
Section 3	Assessment of impacts	pg 7
Section 4	Discussion and recommendations	pg 8
Annexure A	Interim comment from HWC	
Annexure B	Mine plan	
Annexure C	Methodology for the preparation, operation and closure of borrow pit	
Annexure D	Palaeontological specialist study conducted by Dr John Almond, Natura Viva CC (March 2012)	
Annexure E	Archaeological conducted by Madelon Tusenius, Natura Viva CC (March 2012)	

Site location and description

It is proposed to develop a borrow pit for road material at km 36.6 along DR 2308 approximately 40km south west of Beaufort West, Central Karoo District Municipality, Western Cape. The DR02308/36.6/0.05L borrow pit site is situated on an erosionally dissected Karoo landscape characterised by prominent ridges of Beaufort Group sandstones and intervening vlaktes and gentle slopes underlain by overbank mudrocks. Several south-flowing tributaries of the Gamka drainage system, including the Rietkuilsrivier 1 km to the east of the pit site, traverse the area. The site is located in a wide, very shallow, unsymmetrical, headwater valley of an ephemeral water course that heads downstream in a north-easterly direction. Farm Rietkuil is in private ownership of K. Mocke with borrow pit co-ordinates 32°24' 58" S, 22° 8' 25.29" E

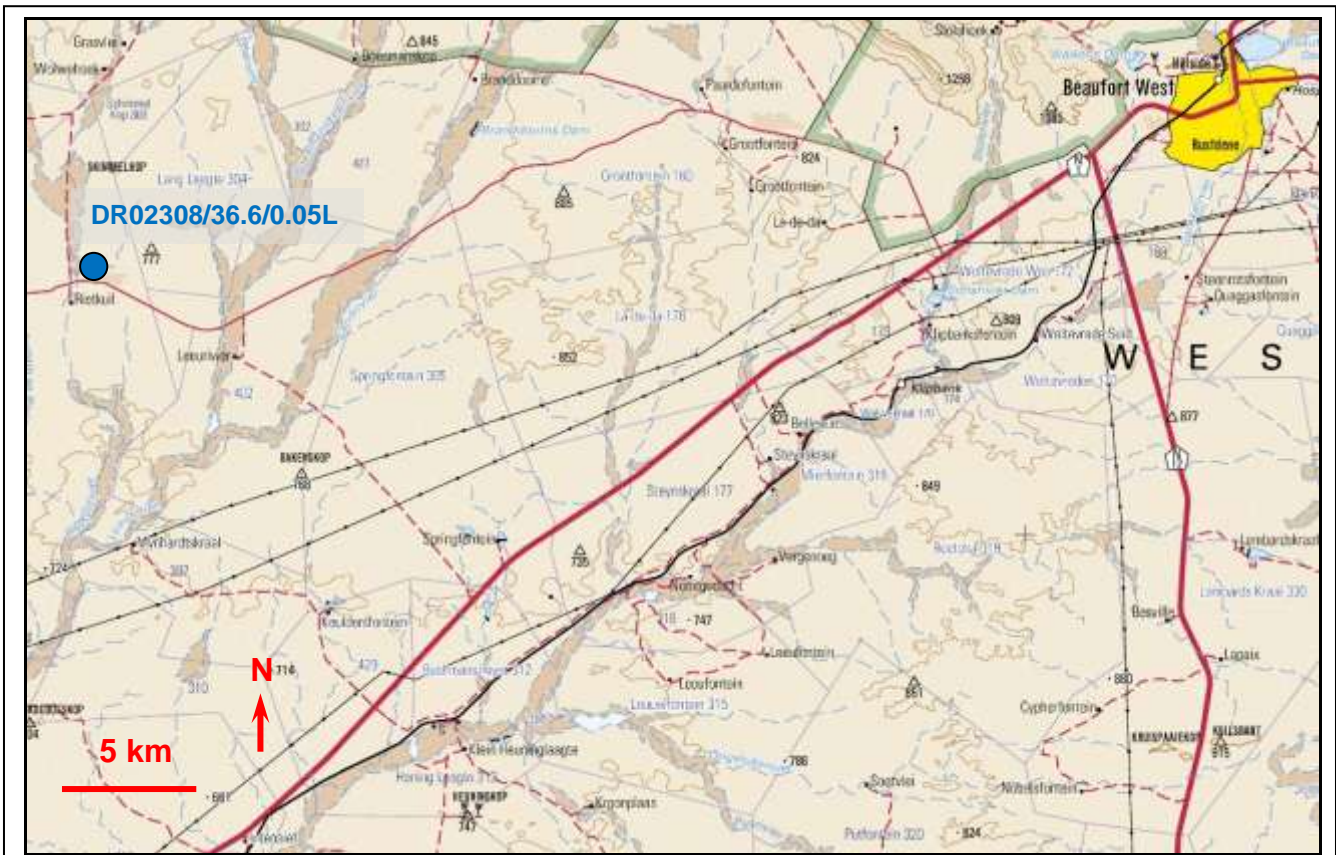


Figure 1: Extract from topographical sheet 3222 Beaufort West (extracted Almond 2012: 2)



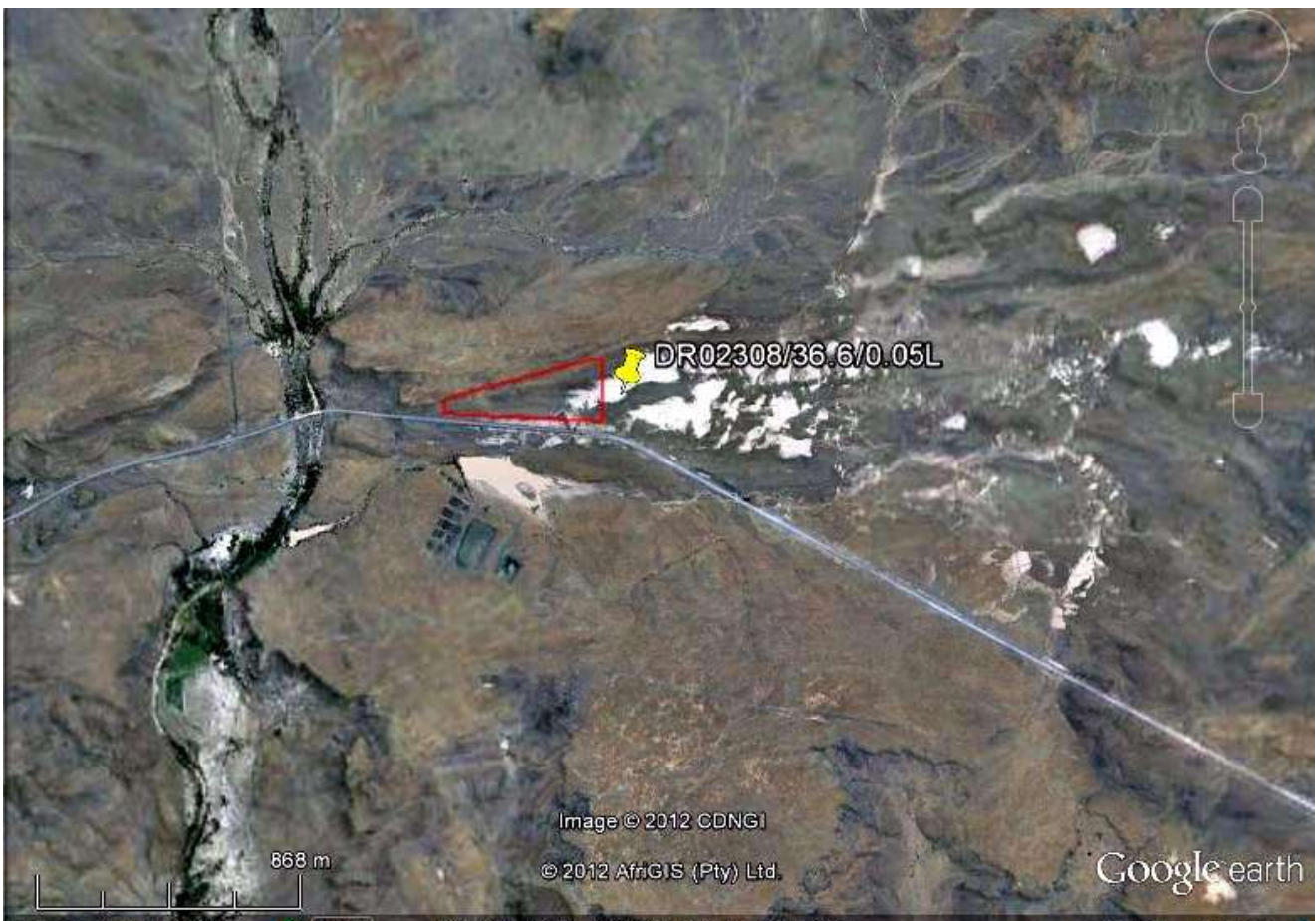
Figure 2: Looking northwest across the site of the proposed borrow pit, north of road DR02308 (April 2011)



Figure 3: Looking northeast across the site of the proposed borrow pit, north of road DR02308 (April 2011)



Figure 4: Aerial view of proposed borrow pit location (Google earth image, April 2012)



Description of proposals

In terms of the Minerals and Petroleum Resources Development Act, all mining activities including extraction of material from borrow pits and quarries requires authorisation from the Department of Mineral Resources (DMR). Where the WCPA: Dept Transport and Public Works is undertaking the maintenance and / or upgrading of roads under its control, no application needs to be submitted for a mining right or permit, however, as per provisions of Section 106(2) of the MPRDAct, they are required to prepare and submit an EMProg to DMR for their approval prior to the extraction of any material from a proposed borrow pit or quarry. According to the MPRDAct, mineral resources are in the custodianship of the State, where WCPA would temporarily acquire the right to mine the borrow pits, subject to approval by the DMR.

For a gravel road to be able to carry traffic safely and effectively an upper layer of gravel known as a wearing course, which meets specific technical requirements, has to be placed on the prepared roadbed. With time, the wearing course is eroded away by both traffic and the elements. This wearing course needs to be replaced in order to continue to deliver a safe and functional surface to road users. Implementation of regravelling activities requires extraction of suitable materials from identified material sources. During decommissioning, working areas are rehabilitated and revegetated. Material excavated from borrow pit located at **km 36.6 along DR 02308** will be used for the re-gravelling so as to benefit road users in terms of road safety and user economy as well as to minimise maintenance-related disruptions. Pit will be utilised for the sourcing of approximately 38 904 m³ of wearing course gravel for use in the regravelling. The end-use of this borrow pit would be use as a floodwater storage feature. Sufficient material is available to identify this source as a future strategic pit.

Summary of borrow pit	
Borrow pit / expropriation area	250 x 250m
Maximum depth	1.2 m
Material description	Colluvium/Alluvium and Mudstone
Proposed usage after rehabilitation	Floodwater storage feature
Volume of material to be sourced	38 904 m ³
Estimated proven material reserves	65 000 m ³

Trial pit investigations and sampling were conducted by Aurecon at four proposed borrow pits considered as potential sources of material. Three were however excluded from consideration due to environmental concerns and / or unsuitability of material for purpose of regravelling.

The mine plan outlining extent of borrow pit and mining is attached as Annexure B. Methodology for the preparation, operation and closure of borrow pit is outlined in Annexure C.

Central Karoo District Municipality is to undertake work on behalf of the WCPA. Formal agreements are to be entered into between the landowner and the WCPA, with the municipality managing the site until decommissioning and closure. During decommissioning, the working area will be rehabilitated and revegetated as per the approach outlined in the mining plan. WCPA's liability for the site persists until such time as a Closure Certificate has been issued by the DMR.

Results of consultation

DMR has outlined requirements for public participation in terms of the Minerals and Petroleum Resources Development Act (Act 28 of 2002) for exempted organs of state. This includes liaison with the landowner, notification of the immediate neighbours and either an on-site advertisement or advertisement in the local newspaper. The WCPA has indicated a commitment to developing and maintaining good relations with landowners and therefore landowners concerns are incorporated into the final agreement.

The public consultation process for this project has involved consultation with the landowners and neighbours, and the advertising of the proposed activity in the local newspaper.

No heritage related comments and / or concerns were received.

Requests / concerns of owner:

- Create a water storage feature to provide water for livestock
- Be aware of uranium mining concessions given for portions of this farm
- Ensure rills and dongas do not develop from the borrow pit into the surrounding grazing lands

2. Heritage resources

Identification of heritage resources

Proposed site and immediate context do not fall within conservation or protected heritage areas, and is not located near to or visible from any protected heritage sites. The site does not fall within a historical settlement or townscape and does not contribute towards rural or natural landscape of cultural significance. The site is therefore not considered as an integral component of the cultural landscape.

Dr John Almond conducted a palaeontological field assessment and provided a report outlining geological context, palaeontological heritage and palaeontological sensitivity. Refer to Annexure D report dated March 2012. An extensive existing pit is excavated into mudrocks of the Abrahamskraal Formation (Lower Beaufort Group) that are famous for their rich fossil record of terrestrial vertebrates (e.g. reptiles and therapsids) of Middle Permian age. A number of robust, disarticulated postcranial bones of large-bodied reptiles and / or therapsids were recorded weathered out at-surface within the pit site during field assessment. The specimens were mostly weathered and sun-cracked, and probably unidentifiable to a specific fossil animal.

Madelon Tusenius conducted archaeological field assessment and provided report identifying and assessing archaeological resources, associated impact, assessment of significance and recommendations regarding any mitigation required. Dr L Webley of ACO Associates acted as the Principal Investigator supervising the study done by M Tusenius. Low density scatters of mixed MSA and LSA artefacts were observed

The site has no known historical, social, or spiritual significance. No built environment issues and / or cultural landscape issues have been identified. Palaeontological and archaeological sensitivity has been identified as low and no further heritage resources were identified.

Heritage significance

A previous desktop basic assessment of the pit site by the author assessed its palaeontological heritage sensitivity as high due to the presence here of potentially fossiliferous sediments of the Lower Beaufort Group. However, palaeontological sensitivity of the sites is rated as moderate and it is likely that further vertebrate remains may be exposed during further excavation of the pit area. However, the anticipated low density of fossil material in the subsurface does not warrant special mitigation measures or further studies. Low density scatters of mixed MSA and LSA artefacts which were observed are in a secondary context and are therefore of low archaeological heritage significance.

The context within which the site lies is identified as possessing low intrinsic heritage value. The proposed development site is transformed and possesses no known historical, social or spiritual significance. No sensitive landscapes were identified. The site is therefore considered to possess a very low level of intrinsic heritage value.

Heritage indicators

Heritage indicators identified aim to ensure that significance would not be adversely impacted on by the proposed development. Indicators concern impact on the cultural landscape, identified heritage resources and visual impact. No sensitive landscapes, archaeological or palaeontological material of significance were identified. Landscaping and rehabilitation of the site should commence as soon as advancing face and sufficient working/loading area moves away from an area that has been mined out.

3. Assessment of impacts

An assessment of the potential development impacts on significance is undertaken using relevant assessment criteria as well as response to indicators. Assessment of impacts on palaeontological significance has been provided as well as consideration of the cultural landscape and assessment of cumulative impacts.

Cultural landscape: Expansion of existing borrow pit would not result in a negative impact on the cultural landscape. The landscape within which the site lies possesses low intrinsic heritage value and no heritage resources were identified within the immediate context. The site and its immediate context are considered as being of low heritage significance. No heritage resources will be impacted and the overall status of the impact is considered as low.

Archaeological and palaeontological impact: No impact would occur as a result of expansion. The site has been sufficiently recorded and requires no further recording before borrow pit activity occurs.

Visual impact: Low intensity visual impact is limited to the immediate surroundings and will be limited to operational phase.

Cumulative impact: The proposed moderate intensity intervention lies within a disturbed context with degraded conditions. No new roads would have to be constructed as the borrow pit is accessed directly off main / divisional roads or via existing access tracks. The borrow pit and access tracks would be fenced for the duration of the mining activities. There will be no site buildings located at the borrow pit site. No long-term traffic increase will be experienced. Low impact is associated with impact of increased personnel and cumulative impacts on borrow pit footprint and surroundings.

Site rehabilitation: It is expected that there should be an acceptable seed bank in the topsoil and this would be kept aside for rehabilitation. Topsoil from newly developed areas should be carefully stockpiled for later redistribution over all the worked out area, preferably in stages as the working area advances into un-mined ground. Landowner prefers this site to become a floodwater storage feature, topsoil should only be spread on areas above the eventual full supply level. In addition, cut slopes should be covered with gravel, to emulate natural slopes of similar steepness, to prevent rill and donga development.

Impact relative to sustainable social and economic benefits: The project will result in social and economic benefits for the local community in terms of service provision and employment opportunities.

The site is considered to possess a very low level of intrinsic heritage value and the overall status of the impact is considered as low.

4. Discussion

During the course of borrow pit excavations, operations should be planned in such a way that the amount of work that will be necessary for the finishing off of the borrow pit is reduced as far as possible. Indiscriminate excavation without due regard for the desired final shape of the borrow pit should not be permitted and should be rectified immediately. Timing of rehabilitation is important as rehabilitation of disturbed areas should ideally be programmed to occur as soon as practically possible following cessation of work in a specific area. The period between cessation of activities associated with mining of materials and the onset of rehabilitation for that area should ideally not exceed 1 month. Rehabilitation operations should ideally be conducted in parallel with extraction. Accordingly, progressive rehabilitation, in which depleted sections of a borrow pit are reclaimed while extraction is ongoing in other sections of the same pit is encouraged.

Site development, operation, mining and closure guidelines outlined with the Environmental Management Programme provides detailed guidance for the preparation, operation and decommissioning of the site. Rehabilitation of old and current working faces has been undertaken to mitigate visual impact to road users. Measures outlined should be adhered to in order to minimise potential negative impacts. It is recommended within the EMProg that an environmental control officer or suitable experienced engineer monitors the preparation, operational and decommissioning of the borrow pit so as to ensure that mitigation and rehabilitation measures are adhered to.

The palaeontological sensitivity of this site is rated as moderate and it is likely that further vertebrate remains may be exposed during further excavation of the pit area. However, the anticipated low density of fossil material in the subsurface does not warrant special mitigation measures or further studies. No further palaeontological heritage studies or mitigation are recommended for this project. (Almond 2012: 7)

Low density scatters of mixed MSA and LSA artefacts observed are in a secondary context and are of low archaeological heritage significance. No further mitigation or investigation is required (Tusenius 2012: 9).

The site is considered to possess a very low level of intrinsic heritage value and the overall status of the impact is considered as low. No further archaeological and palaeontological heritage studies or mitigation are recommended for this project. No impact on heritage resources is expected should the proposed development proceed.

Recommendations

It is therefore recommended that:

1. proposed borrow pit be supported
2. comment be issued that proposed activity may proceed in terms of Section 38(8) of the NHRAct

References:

- Almond John E PhD (March 2012): *Palaeontological specialist study: field assessment & recommendation for exemption from further studies & mitigation*
- ASAPA Aggregate and Sand Producers Association of Southern Africa (30 September 2009): *The issue of borrow pits being used in the aggregate and sand industry* accessed online
- Aurecon / Nadeson JV (July 2011): *Draft environmental management programme, summary report and mine plan*
- Galliers R M (July 2011): *Geotechnical investigations and geological strategic gravel pit summary report* for Aurecon South Africa
- Heritage Western Cape (July 2007): *Minimum Standards For Phase 1 Archaeological Impact Assessment (Aia) Reports*
- Tusenius M (2012): *Archaeological Impact Assessment*
- vidamemoria (September 2011): *Notification of Intent to Develop*

PALAEONTOLOGICAL SPECIALIST STUDY: FIELD ASSESSMENT & RECOMMENDATION FOR EXEMPTION FROM FURTHER STUDIES & MITIGATION

BORROW PIT NEAR BEAUFORT WEST, CENTRAL KAROO DISTRICT MUNICIPALITY, WESTERN CAPE

John E. Almond PhD (Cantab.)
Natura Viva cc,
PO Box 12410 Mill Street,
Cape Town 8010, RSA
naturaviva@universe.co.za

March 2012

1. EXECUTIVE SUMMARY

It is proposed to develop a borrow pit for road material situated on the north side of the DR2308 some 40 km WSW of Beaufort West, Central Karoo District Municipality, Western Cape. The extensive existing pit is excavated into mudrocks of the Abrahamskraal Formation (Lower Beaufort Group) that are famous for their rich fossil record of terrestrial vertebrates (e.g. reptiles and therapsids) of Middle Permian age.

A number of robust, disarticulated postcranial bones of large-bodied reptiles and / or therapsids were recorded weathered out at-surface within the pit site during field assessment. The specimens were mostly weathered and sun-cracked, and probably unidentifiable to a specific fossil animal.

The palaeontological sensitivity of this site is rated as MODERATE and it is likely that further vertebrate remains may be exposed during further excavation of the pit area. However, the anticipated low density of fossil material in the subsurface does not warrant special mitigation measures or further studies.

No further palaeontological heritage studies or mitigation are recommended for this project.

2. INTRODUCTION

The Department of Transport, Western Cape, is applying to the Department of Mineral Resources for approval to exploit road material from an existing borrow pit situated on the north side of the DR2303 some 40 km WSW of Beaufort West, Central Karoo District Municipality, Western Cape (Fig. 1). The pit site in question (DR02308/36.6/0.05L, located at 32°24' 58" S, 22° 8' 25.29" E) lies 1.2 km northeast of the Rietkuil farmstead and 17.75 km north of the N1 trunk road.

A previous desktop basic assessment of the pit site by the author assessed its palaeontological heritage sensitivity as high due to the presence here of potentially fossiliferous sediments of the Lower Beaufort Group. A palaeontological field assessment of the pit as part of an HIA was requested by Heritage Western Cape (HWC case ref. no. 110928JB27, Interim comment 3 October 2011) in accordance with the requirements of the National Heritage Resources Act, 1999 (Section 38).

The present palaeontological heritage field assessment and short report were accordingly commissioned by Vidamemoria Heritage Consultants, Cape Town (Address: 3rd Floor, Guarantee House, 37 Burg Street, Greenmarket Square, Cape Town; tel: 021-424 8432; e-mail: Quahnita@vidamemoria.co.za). This is Vidamemoria pit no. 35 and NID ref. no. 3. Fieldwork for this project was carried out on 17 February 2012.

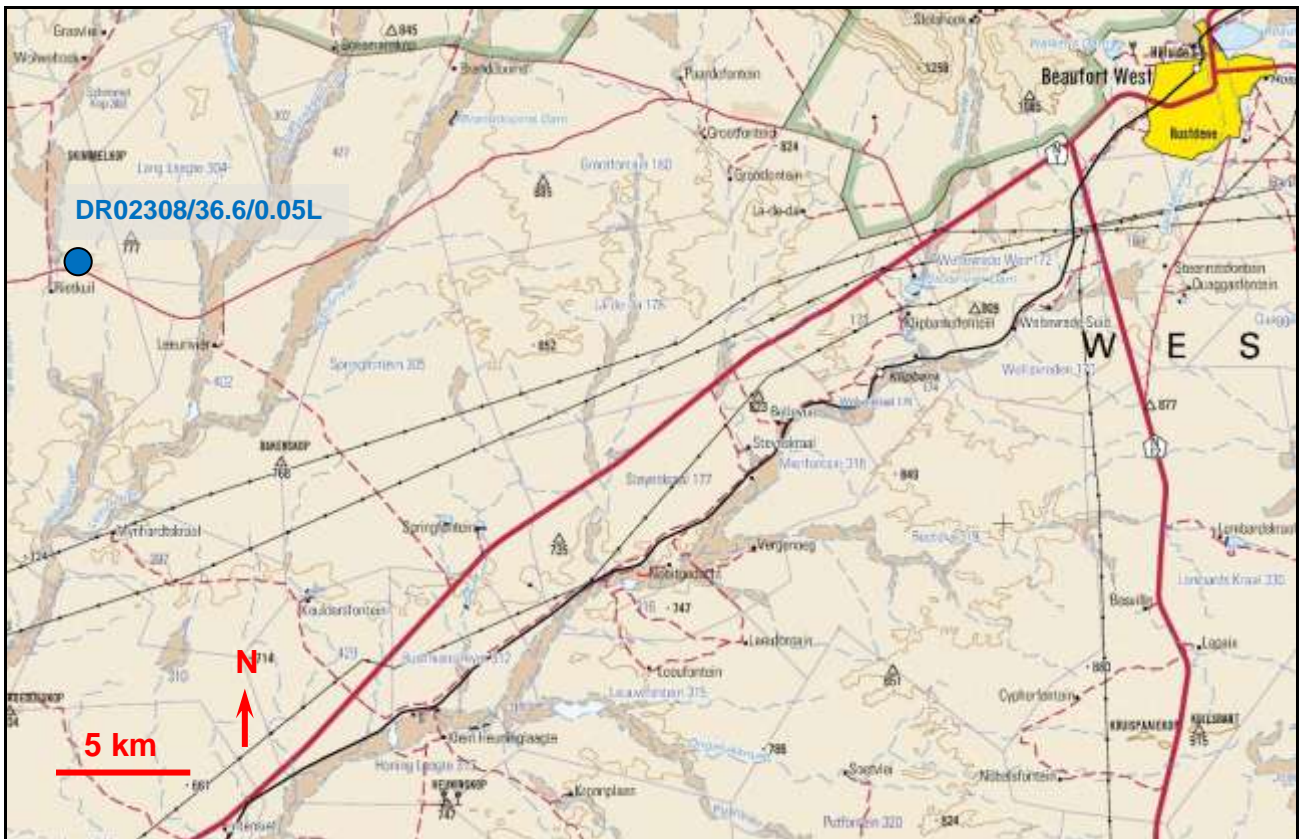


Fig. 1. Extract from topographical sheet 3222 Beaufort West (Courtesy of the Chief Directorate: National Geo-spatial Information, Mowbray) showing the location of the DR02308/36.6/0.05L borrow pit near Rietkuil farmstead c. 40 km WSW of Beaufort West, Central Karoo District Municipality, Western Cape (blue dot).

3. GEOLOGICAL CONTEXT

The DR02308/36.6/0.05L borrow pit site is situated on an erosionally dissected Karoo landscape characterised by prominent ridges of Beaufort Group sandstones and intervening *vlaktes* and gentle slopes underlain by overbank mudrocks. Several south-flowing tributaries of the Gamka drainage system, including the Rietkuilsrivier 1 km to the east of the pit site, traverse the area. The pit is underlain by mudrocks and overlooked along the north-western edge by WSW-ENE trending sandstone ridge. Hackly-weathering, grey-green and purplish mudrocks are exposed in the slopes underlying the sandstone ridge as well as in the borrow pit floor, though in the latter case they are widely obscured by recent silts, muds (current sun-cracked) and colluvial gravels. Coarse blocky sandstone gravels mantle the greater part of the ridge slopes and have been dispersed by sheet wash along and away from its foot (Fig. 3).

The geology of the study area is shown on 1: 250 000 sheet 3222 Beaufort West (Fig. 2) (Johnson & Keyser 1979). It is underlain by continental sedimentary rocks of the **Abrahamskraal Formation (Pa)** (Lower Beaufort Group / Adelaide Subgroup, Karoo Supergroup) of Middle Permian age. The Abrahamskraal succession consists of a wide range of fluvial deposits, including river channel sandstones and minor intraformational breccio-conglomerates, well-bedded floodplain mudrocks with common pedoconcrete horizons (ancient soils) and sheet-like crevasse splay sandstones, as well as more localized playa lake deposits (e.g. laminated mudrocks) (Rossouw & De Villiers 1952, Johnson & Keyser 1979, Smith & Keyser 1995, Lock *et al.*, 1994, Johnson *et al.*, 2006).

The Rietkuil Farm area is well known for the important sandstone-hosted uranium ore occurrences here that have been known since the 1970s and that are exposed in test mining pits situated south of the DR2308 and about 300m south of the study area (Cole *et al.* 1998 and ref. therein). Of

relevance for the present palaeontological assessment is that the uranium mineralisation is often associated with fossil plant debris. The uranium-hosting sandstone body at Rietkuil has been assigned to the **Moordenaars Member** of the Abrahamskraal Formation (Cole *et al.* 1998). The immediately overlying mudrocks at the study site probably belong to the same stratigraphic subunit (*cf* also Look *et al.* 1994).

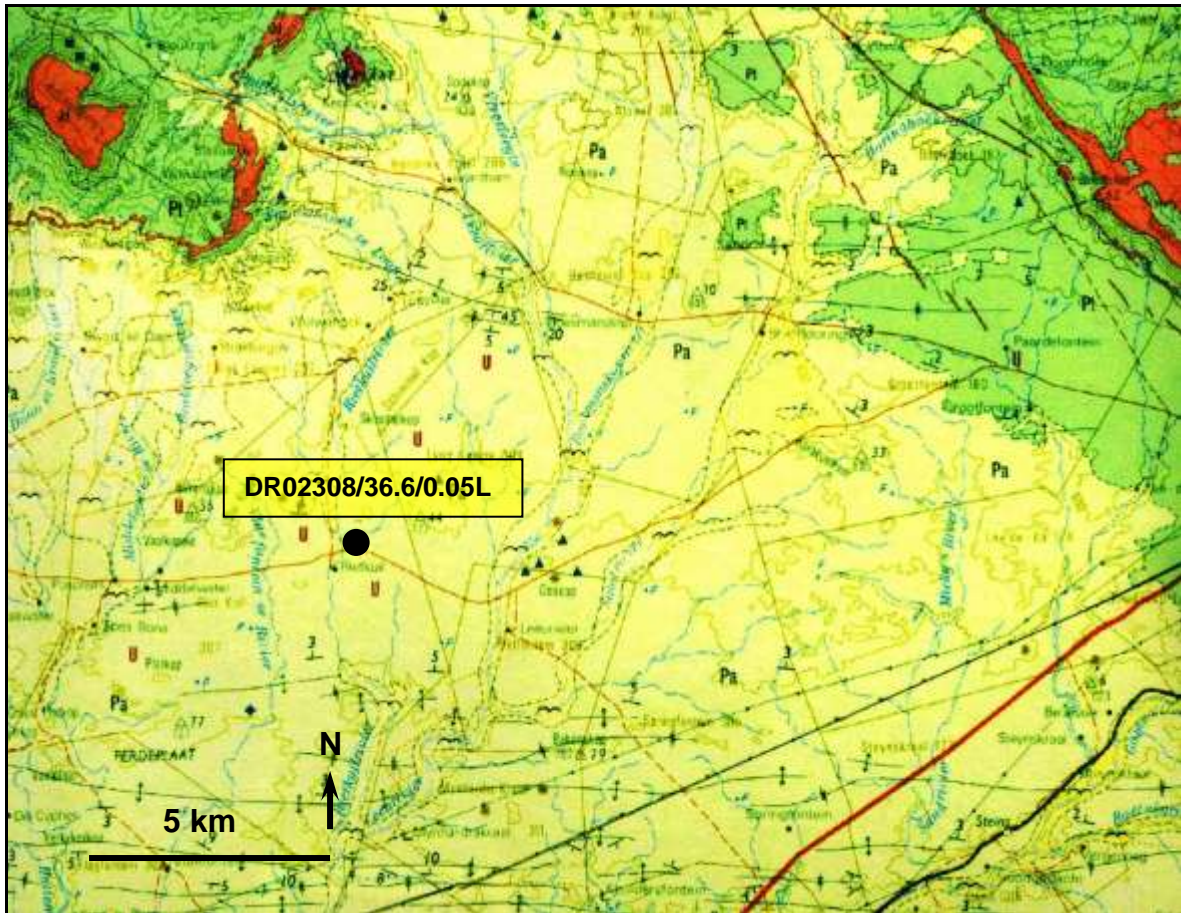


Fig. 2. Extract from 1: 250 000 geology sheet 3222 Beaufort West (Council for Geoscience, Pretoria) showing location of the borrow pit DR02308/36.6/0.05L some 40 km WSW of Beaufort West. The pit is excavated into mudrocks within the upper part of the Abrahamskraal Formation (Adelaide Subgroup, Lower Beaufort Group) (Pa, yellow-green). The map indicates fossil sites of the *Tapinocephalus* Assemblage Zone c. 7 km to the SW of the pit site (diamond symbol) and a cluster of fossil sites of the *Pristerognathus* Assemblage Zone c. 7 km to the east (triangular symbols). The brown “U” symbol refers to uranium ore localities. The uranium test mining pit on Rietkuil is situated less than half a km south of the study area.



Fig. 3. View north-westwards towards the sandstone ridge bordering the pit study area. Scattered, reworked fossil bones occur among the coarse surface gravels in this region.



Fig. 4. Detail of poorly-sorted, coarse colluvial gravels seen in previous photo with two reworked fossil limb bone fragments arrowed (Hammer = 32 cm).



Fig. 5. Close-up of collection of fragmentary fossil bones made at the locality illustrated above. Note poor preservation suggests that these specimens have been exposed for a considerable length of time and also reworked by sheetwash or stream processes.



Fig. 6. Close-up of large fossil bone fragment (8 cm long) showing distinctive lilac hue and extensive surface cracking. The latter probably reflects protracted exposure of the bone on a semi-arid flood plain before original burial in Middle Permian times, as well as recent weathering.

4. PALAEOLOGICAL HERITAGE

Apart from the uppermost 50m or so of beds directly underlying the Poortjie Member sandstones, the Abrahamskraal Formation has been assigned in biostratigraphical terms to the *Tapinocephalus* Assemblage Zone, dated to around 266-260 Ma (Rubidge 1995, 2005). The fossil biota of the *Tapinocephalus* Assemblage Zone, with particular reference to the biostatigraphically important tetrapod fauna, has been reviewed by Smith and Keyser in Rubidge (1995) as well as in earlier works by Rossouw and De Villiers (1952), Boonstra (1969), Keyser and Smith (1979) and others (See also MacRae, 1999 for a well-illustrated popular account). Many individual fossil localities are indicated on published geological maps such as 1: 125 000 sheet 198 Merweville and 1: 250 000 sheet 3222 Beaufort West, as well as maps in Keyser & Smith (1979) and Loock *et al.* (1995).

The fauna of the *Tapinocephalus* Assemblage Zone is dominated by two groups of large-bodied tetrapods. The dinocephalians are primitive therapsids that include the large-bodied, thick-skulled herbivorous or omnivorous tapinocephalids (*e.g.* *Moschops*) as well as much rarer carnivorous anteosaurs (*Anteosaurus*). Pareiasaurs are a group of heavily-armoured herbivores belonging to the primitive reptile subgroup, the Captorhinida (*e.g.* *Bradysaurus*). Some 18 genera and 30 species of dinocephalians alone have been described from this assemblage zone. However, many of these taxa are based on very incomplete or deformed material, and ongoing research is likely to whittle down their true biodiversity to more realistic levels, particularly when ontogenetic variation and sexual dimorphism are taken into account). Other important tetrapod taxa represented in the same Lower Beaufort Group assemblages are (c) two groups of carnivorous therapsids, the therocephalians and gorgonopsians, the former of which are quite common and diverse; (d) small-bodied herbivorous dicynodonts, including some primitive toothed genera as well as the long-ranging *Diictodon*, (e) rare varanopid pelycosaur (primitive synapsids, *e.g.* *Elliotsmithia*), biarmosuchians (primitive therapsids), the tortoise-like captorhinid *Eunotosaurus*, and large, crocodile-like temnospondyl amphibians (*Rhinesuchus*). Since the brief faunal review by Smith and Keyser in Rubidge (1995), a number of new tetrapod taxa have been described from the Abrahamskraal Formation, notably by Professor Bruce Rubidge of the BPI (Wits University, Johannesburg) and colleagues.

As noted above, concentrations of transported plant debris are sometimes associated with uranium minerals within the Abrahamskraal sandstones. These plant-rich zones are often also enriched in ferruginous carbonate forming a dark brown rock locally known as *koffieklip* (Cole *et al.* 1998). Well-developed *koffieklip* occurrences within or below the main sandstone ridge at the study site were associated with calcrete nodules and examined for fossil plant remains, but without success.

The palaeontology of the Moordenaars Member towards the top of the Abrahamskraal Formation has been discussed by Loock *et al.* (1994) who recorded dinocephalians, therocephalians, dicynodonts as well as pareiasaurs in the lower half of the unit but relatively few taxa higher up. The 1: 250 000 Beaufort West geology map (Fig. 2) indicates fossil sites of the *Tapinocephalus* Assemblage Zone c. 7 km to the SW of the pit site (diamond symbol) and also a cluster of fossil sites of the younger *Pristerognathus* Assemblage Zone c. 7 km to the east (triangular symbols).

During the present field assessment a number of disarticulated fossil bone specimens, mostly sun-cracked, weathered and fragmentary, were recorded along the western edge of the borrow pit area (Figs. 4 to 6). Several show a distinctive lilac hue (Fig. 6). The bones were found among coarse surface gravels of sandstone (Fig. 3) and had clearly been reworked by sheetwash and gravity processes, and / or downwasted from above. No *in situ* or articulated skeletal material or petrified wood was seen. A single occurrence of fossil bone was observed on the sandstone plateau to the north of the ridge crest, well outside the study area (M. Tusenius, pers. Comm.). The postcranial fossil bones found clearly belong to large-bodied tetrapods, perhaps dinocephalian therapsids and / or pareiasaur reptiles, but have not been identified more precisely. A few of the bones might be fragments of cranial material; this still needs to be confirmed.

Although several vertebrate fossil specimens were recorded in the pit area, these have clearly been reworked and are not of major palaeontological value. It is quite possible that further

(perhaps articulated) vertebrate fossils may be exposed once the borrow pit is excavated further. However, these remains are likely to be sparse.

The palaeontological sensitivity of this site is consequently assessed as MODERATE.

5. CONCLUSIONS & RECOMMENDATIONS

The palaeontological sensitivity of this site is rated as MODERATE and it is likely that further vertebrate remains may be exposed during further excavation of the pit area. However, the anticipated low density of fossil material subsurface does not warrant special mitigation measures or further studies.

No further palaeontological heritage studies or mitigation are recommended for this project.

6. ACKNOWLEDGEMENTS

Ms Quahnita Samie of Vidamemoria Heritage Consultants, Cape Town, is thanked for commissioning this specialist study and for kindly providing the necessary background information.

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APPENDIX: GPS LOCALITY DATA FOR FOSSIL SITES

All GPS readings were taken in the field using a hand-held Garmin GPSmap 60CSx instrument. The datum used is WGS 84.

LOC	SOUTH	EAST	COMMENT
57	32 24 59.9	22 08 07.0	Weathered bone on surface
58	32 24 59.2	22 08 06.8	Weathered bone on surface (cranial?)
59	32 24 59.2	22 08 06.8	Weathered bone on surface
60	32 24 59.7	22 08 05.5	Limb long bone
61	32 24 59.8	22 08 04.7	Limb long bone
62	32 24 59.7	22 08 04.2	Concentration of fossil bones in surface gravels

8. QUALIFICATIONS & EXPERIENCE OF THE AUTHOR

Dr John Almond has an Honours Degree in Natural Sciences (Zoology) as well as a PhD in Palaeontology from the University of Cambridge, UK. He has been awarded post-doctoral research fellowships at Cambridge University and in Germany, and has carried out palaeontological research in Europe, North America, the Middle East as well as North and South Africa. For eight years he was a scientific officer (palaeontologist) for the Geological Survey / Council for Geoscience in the RSA. His current palaeontological research focuses on fossil record of the Precambrian - Cambrian boundary and the Cape Supergroup of South Africa. He has recently written palaeontological reviews for several 1: 250 000 geological maps published by the Council for Geoscience and has contributed educational material on fossils and evolution for new school textbooks in the RSA.

Since 2002 Dr Almond has also carried out palaeontological impact assessments for developments and conservation areas in the Western, Eastern and Northern Cape under the aegis of his Cape Town-based company *Natura Viva* cc. He is a long-standing member of the Archaeology, Palaeontology and Meteorites Committee for Heritage Western Cape (HWC) and an advisor on palaeontological conservation and management issues for the Palaeontological Society of South Africa (PSSA), HWC and SAHRA. He is currently compiling technical reports on the provincial palaeontological heritage of Western, Northern and Eastern Cape, Gauteng, Limpopo and Free State for SAHRA and HWC. Dr Almond is an accredited member of PSSA and APHP (Association of Professional Heritage Assessment Practitioners – Western Cape).

Declaration of Independence

I, John E. Almond, declare that I am an independent consultant and have no business, financial, personal or other interest in the proposed borrow pit project, application or appeal in respect of which I was appointed other than fair remuneration for work performed in connection with the activity, application or appeal. There are no circumstances that compromise the objectivity of my performing such work.



Dr John E. Almond
Palaeontologist
***Natura Viva* cc**

**ARCHAEOLOGICAL IMPACT ASSESSMENT
OF A PROPOSED BORROW PIT AT RIETKUIL 307,
BEAUFORT WEST, CENTRAL KAROO DISTRICT,
WESTERN CAPE**

(Assessment conducted under Section 38 (8) of the National Heritage Resources Act as part
of a Heritage Impact Assessment)

Prepared for:

Vidamemoria Heritage Consultants
Att: Ms Quahnita Samie
E-mail: quahnita@vidamemoria.co.za

On behalf of:

Aurecon South Africa (Pty) Ltd

Prepared by:
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Under the supervision of: Dr Lita Webley, ACO Associates

MARCH 2012

EXECUTIVE SUMMARY

Natura Viva cc was appointed by Vidamemoria Heritage Consultants on behalf of Aurecon South Africa (Pty) Ltd to undertake an Archaeological Impact Assessment (AIA) for the proposed site of a new borrow pit DR2308/36.6/0.05L (Vidamemoria pit number 35), approximately 42 km to the west of Beaufort West, Central Karoo District Municipality. Dr L Webley of ACO Associates acted as the Principal Investigator supervising the study done by M Tusenius of Natura Viva cc.

This study forms part of the Heritage Impact Assessment triggered by the development. The brief for the study was a field visit and short report identifying and assessing archaeological resources and any impact on them, an assessment of significance and recommendations regarding any mitigation required. The field assessment was conducted on foot on 17 February 2012.

The proposed borrow pit is located in a wide, very shallow, headwater valley of an ephemeral water course and is affected by sheet wash. The low density scatters of mixed MSA and LSA artefacts which were observed are in a secondary context and are therefore of low archaeological heritage significance.

No dolerite boulders suitable for rock engravings were found in or near the affected area of the proposed pit.

No significant impact on archaeological resources is expected if the proposed borrow pit is developed. No further archaeological studies or mitigation are recommended for this project.

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1. INTRODUCTION

Natura Viva cc was appointed by Vidamemoria Heritage Consultants on behalf of Aurecon South Africa (Pty) Ltd to undertake an Archaeological Impact Assessment (AIA) of the proposed site of a new borrow pit DR2308/36.6/0.05L (Vidamemoria pit number 35) in the Beaufort West region of the Central Karoo District Municipality. The site lies approximately 42 km to the west of Beaufort West. Material excavated from the pit will be used for the re-gravelling of the adjoining DR02308. No new roads would have to be constructed as access can be gained via existing roads and tracks. The worked-out borrow pit will be used as a water retention facility (dam) to supply water for livestock.



Figure 1: Google earth image showing the location of the proposed new borrow pit DR2308/36.6/0.05L (Vidamemoria pit number 35) approximately 42 km to the west of Beaufort West. The relevant 1:50 000 topographical map is 3222AC Paalhuis.

2. LEGAL FRAMEWORK

Section 38 of the National Heritage Resources Act (Act 25 of 1999) is triggered by certain types of development, including changes of character to an area exceeding 5 000m², and makes provision for compulsory Heritage Impact Assessments to assess the potential impacts of such proposed developments on heritage resources. In terms of Section 38(1), a Notification of Intent to Develop (NID) form was submitted to Heritage Western Cape (HWC) by Vidamemoria. Following comment from HWC (case number 110928JB27) an AIA was included amongst the requirements according to Section 38(8) of the Act.

3. TERMS OF REFERENCE

The terms of reference for the AIA stipulated a field visit to locate and map archaeological resources, a short report dealing with the field observations, an assessment regarding the significance of the resources (in the context of other studies in the area) and any impacts on them, as well as recommendations regarding any mitigation required. The report was to be overseen by Dr Lita Webley of ACO Associates as the Principal Investigator.

4. STUDY APPROACH

4.1 Methods

Fieldwork was undertaken by the author on 17 February 2012. A site plan indicating the affected area was provided by Aurecon for the Phase 1 survey. The area was covered on foot and the tracks were recorded by a Garmin GPSMAP 60CSx set on the WGS84 datum (Figure 2). Concentrations of material and some of the more interesting isolated specimens were recorded as waypoints and photographed.

4.2 Limiting factors

Visibility of archaeological remains on the ground was good as the vegetation is sparse or non-existent.

5. DESCRIPTION OF AFFECTED ENVIRONMENT AND SITES

5.1 Archaeological background:

With the notable exception of the research done by Sampson in the Seacow Valley (1985), the rich archaeological heritage of the Karoo has not been systematically studied. Recent Archaeological Impact Assessments, for example, Kaplan (2002), Nilssen (2011), Orton (2010) and PGS (2012) have made a contribution to knowledge about the distribution of Stone Age archaeology in the area around Beaufort West. Sites and scatters of Early, Middle and Late Stone Age (ESA, MSA and LSA) material have been recorded, as well as pastoralist occurrences, historical sites, rock paintings and engravings.

A few smaller impact studies have been done in the general vicinity of the proposed borrow pit site, i.e. the area between Beaufort West and Leeu Gamka, approximately 73 km to the

southwest of the former. No archaeological material was found at Leeu Gamka during a survey done by Van Pletzen-Vos and Rust (2010), nor was any observed by Deacon (2005) in a borrow pit study at Grootfontein, approximately 20 km to the northeast of pit 35. Dreyer, however, found scattered and isolated ESA and LSA material close by, at the farms Grootfontein and Bushmaskop (2005). A desktop study of the region surrounding the pit 35 site identified various types of archaeological sites recorded in the data base of Iziko: South African Museum (Patrick and Manhire 2011).

5.2 Borrow pit DR2308/36.6/0.05L (Vidamemoria pit number 35)

Approximate area: 250 m x 250 m

Location: S 32° 24' 58" E 22° 8' 25.29"

Farm name and number: Rietkuil (Riet Kuil 307)

Environment: The proposed borrow pit is located in a wide, very shallow, unsymmetrical, headwater valley of an ephemeral water course that heads downstream in a north-easterly direction. There is a small, sandstone ridge to the northwest of the generally flat-lying terrain which forms the northern boundary of the study area (Figures 2, 3 and 6). The affected area is further bounded by the DR02308 to the south and an existing fence to the west. A breached low earth dam embankment which traverses the valley in a north-south direction was regarded as the eastern boundary for the purpose of the survey. Shallow colluvial and alluvial fine, gravelly, silty sand overlies weathered mudstone of the Abrahamskraal Formation of the Beaufort Group. An apron of coarse gravel, derived from the sandstone ridge, lies down the slope and at the foot of the ridge. A farm track from the southwestern corner of the proposed pit area runs close to the base of the rocky slope of this ridge. Visibility of archaeological material was good as the vegetation is either non-existent in some of the areas affected by sheet wash, or consists of widely dispersed, low karoo bushes. The tallest shrubs occur at the foot of the ridge.



Figure 2: Google earth image showing the proposed new borrow pit 35 and tracks of the field survey. A small ridge lies to the north of the affected area. Rows of test pits and dumps from uranium exploration activities are visible to the south of the road and irrigation dam.



Figure 3: Northward view of the study area of pit 35 showing the extensive area affected by sheet wash in the foreground and the sandstone ridge in the background.



Figure 4: View towards the south taken from the top of the ridge to the north of the study area. The irrigation dam and the signs of the uranium exploration activities to the south of the DR02308 are visible in the background.



Figures 5 and 6: View towards the east of the affected area; view of scatter of the coarser gravels and dispersed artefacts close to the ridge, north-eastern view. The ruler is 15 cm in length.



Figures 7, 8 and 9: Various degrees of weathering and patination of stone artefacts are evident in these photos. Hornfels flakes and fresh-looking quartzite flake on the left; fine-grained flaked quartzite cobble in the middle; hornfels core on the right. The scale is in cm.



Figures 10, 11 and 12: A typical MSA blade is shown on the left. Banded sandstone artefacts are shown in the other two photos. The scale is in cm.



Figures 13, 14 and 15: Quartzite flakes found on top of the ridge; metal plaque with part of an inscription ('500 yard...12...'); isolated porcelain fragments observed amongst the surface gravels. The scale is in cm.

Results of survey: Scatters of Stone Age artefacts were observed in most of the affected area, with the greater part of the material being concentrated in the low-lying area marked by waypoints 340 – 343 and 345 (Figure 2). The artefacts are obviously in a secondary context as evidence of sheet wash is ubiquitous and MSA and LSA artefacts are mixed together. Various degrees of weathering and patination on the surface of the specimens indicate that they have been transported by water and have lain on the surface of the landscape for varying lengths of time (Figures 7, 8 and 10). Hornfels is the predominant raw material used but quartzite and banded sandstone are also evident. The quartzite generally appears to be less weathered than the hornfels (Figures 7 and 13). Most of the artefacts are probably LSA but at least one typical MSA blade was observed (Figure 10). It is not certain to which period the relatively large, banded sandstone flakes and chunk belong (Figures 11 and 12). Further evidence of disturbance is provided by the occasional pieces of metal, glass and porcelain which are also found scattered amongst the gravels and flaked material (Figures 14 and 15). Scatters of artefacts and some of the more interesting isolated specimens were photographed and marked as waypoints (see the Appendix). No dolerite boulders suitable for rock engravings were found in or near the affected area of the proposed pit.

6. SIGNIFICANCE AND RECOMMENDATIONS

The low density of scattered, mixed MSA and LSA artefacts in an area affected by sheet wash indicates that the material is in a secondary context and is therefore of low archaeological heritage significance. No significant impact on such resources is expected if the proposed borrow pit is developed. No further archaeological studies or mitigation are recommended.

If any human remains are found during the development of the proposed pit, work in that area must cease and the South African Heritage Resources Agency (SAHRA) must be notified immediately.

7. REFERENCES

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8. ACKNOWLEDGEMENTS

Ms Quahnita Samie of Vidamemoria Heritage Consultants is thanked for commissioning this study and providing background information. Dr Lita Webley of ACO Associates acted as supervising Principal Investigator and provided valuable guidance regarding AIA requirements. Dr John Almond, Natura Viva cc, made helpful comments on the draft. Dr M Galimberti (SAHRA), J Orton (ACO) and W Fourie (PGS) kindly provided copies of reports.

9. APPENDIX

Table 1: Pit 35 waypoints

Waypoint (MT)	South	East	Description of material found
340	32 24 59.7	22 08 05.5	Scatter of artefacts including the flaked fine-grained quartzite piece (Figure 8)
341	32 25 00.1	22 08 06.7	Cluster of weathered flakes, including possible snapped blade, pink glass fragment, hornfels core (Figure 7)
342	32 24 58.0	22 08 08.0	Scatter with banded sandstone flakes, metal plaque, glass and porcelain fragments (Figures 11, 12, 14)
343	32 24 57.8	22 08 08.5	Scatter including weathered MSA blade (Figure 10)
344	32 24 56.3	22 08 16.0	Isolated hornfels core (Figure 9)
345	32 24 57.4	22 08 06.2	Single very weathered circular flake on a cobble
346	32 24 57.7	22 08 02.5	Isolated fresh-looking quartzite flakes, coarse sandstone flake with cortex (Figure 13)



Enquiries Troy Smuts
Tel: 021 483 9543

Date: 18/07/2012
Case No: 110928JB27
Auto IDs: 1554 - 1937

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FINAL COMMENT

**In terms of section 38(8) of the National Heritage Resources Act (Act 25 of 1999)
and the Western Cape Provincial Gazette 6061, Notice 298 of 2003**

Attention: Ms Quahnita Samie
Vidamemoria Consultants
P.O. Box 50605
Waterfront 8002
Cape Town

CASE NUMBER: 110928JB27
HIA: BORROW PIT FOR PROPOSED ROAD UPGRADE ON DR 02308

The matter above has reference.

Heritage Western Cape is in receipt of your correspondence on the above matter, dated 25 April 2012, the following was discussed:

1. Proposed new borrow pit is situated 40km south west of Beaufort West
2. In October 2011 a HIA including an archaeological and palaeontological study was required
3. Borrow pit will be used for material to re-gravel the DR 2308
4. The palaeontological study identified a number of post-cranial bones of large reptiles, however the specimens were weathered and cracked making them difficult to identify.
5. The archaeological study identified Later Stone Age and Middle Stone Age material which was determined to be of low significance.

Decision:

1. Heritage Western Cape has no objection to the proposal.

Terms and Conditions:

1. This approval does not exonerate the applicant from obtaining local authority approval or any other necessary approval for the proposed work.
2. If any heritage resources, including archaeological material, palaeontological material, graves or human remains, are encountered work must cease and they must be reported to Heritage Western Cape immediately.
3. Heritage Western Cape reserves the right to request additional information as required.

Should you have any further queries, please contact the official above and quote the case number above.

Yours faithfully

Andrew B Hall
Chief Executive Officer
Heritage Western Cape