HERITAGE IMPACT ASSESSMENT

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

prepared for

AURECON South Africa (Pty) Ltd

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DR 01445 Central Karoo

Laingsburg – Central Karoo District Municipality, Western Cape

Executive summary

Aurecon South Africa (Pty) Ltd appointed *vidamemoria* to conduct a heritage impact assessment for a expansion of existing borrow pits *located along DR01445 at km 13.9 and 17.5 approximately 35 km southeast of Laingsburg* in 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).

Bokkeveld mudrocks in pit DR01445/13.9/0.0L are highly cleaved and palaeontological sensitivity is correspondingly low. However, mudrocks at DR01445/17.15/0.01R are more massive and distinctly less cleaved containing rare, or rarely as well-preserved local concentrations of moulds of articulated to disarticulated shelly invertebrate fossils; palaeontological sensitivity of this site is therefore rated as high. A palaeontologist should thus record and sample fossil material from the pit during the early stages of excavation. Archaeological investigation revealed impact of proposed borrow pit expansion should be very low in terms of archaeological resources. Mitigation measures are however to be put in place prior to expansion. No further specialist palaeontological or archaeological studies are required and expansion should be allowed to proceed.

1. Introduction

Aurecon South Africa (Pty) Ltd on behalf of the *WCPA: Department of Transport and Pubic 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) **to expand an existing borrow pits along DR01445 near Laingsburg**, Central Karoo District Municipality. NID dated 14 September 2011 was submitted to Heritage Western Cape (HWC) for consideration. Response dated 7 October 2011 (**case ref 11928JB25**) 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 m^2*. 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

Site location and description

It is proposed to re-excavate and extend two existing borrow pits along the DR01445, situated 30-35 km southeast of Laingsburg, Western Cape, for road material. The sites lie in an east-west trending valley on the northern side of the Klein Swartberg, approximately 33 km southeast of Laingsburg. Both sites lie in or near the road reserve at the foot of rocky slopes adjacent to existing borrow pits and near disturbed agricultural land. Geology is dominated by shale of the Gydo Formation (Bokkeveld Group) deemed suitable as gravel wearing course (Galliers Jan, 2011). The sites are located within the road reserve but expansion would extend to a portion of land owned by K Theron and PJ Booysen. Borrow pit co-ordinates at km 13.9 are 33° 23' 47.41" S, 21° 6' 50.24" E and at km 17.15 are 33° 23' 18.14" S, 21° 8' 38.86" E

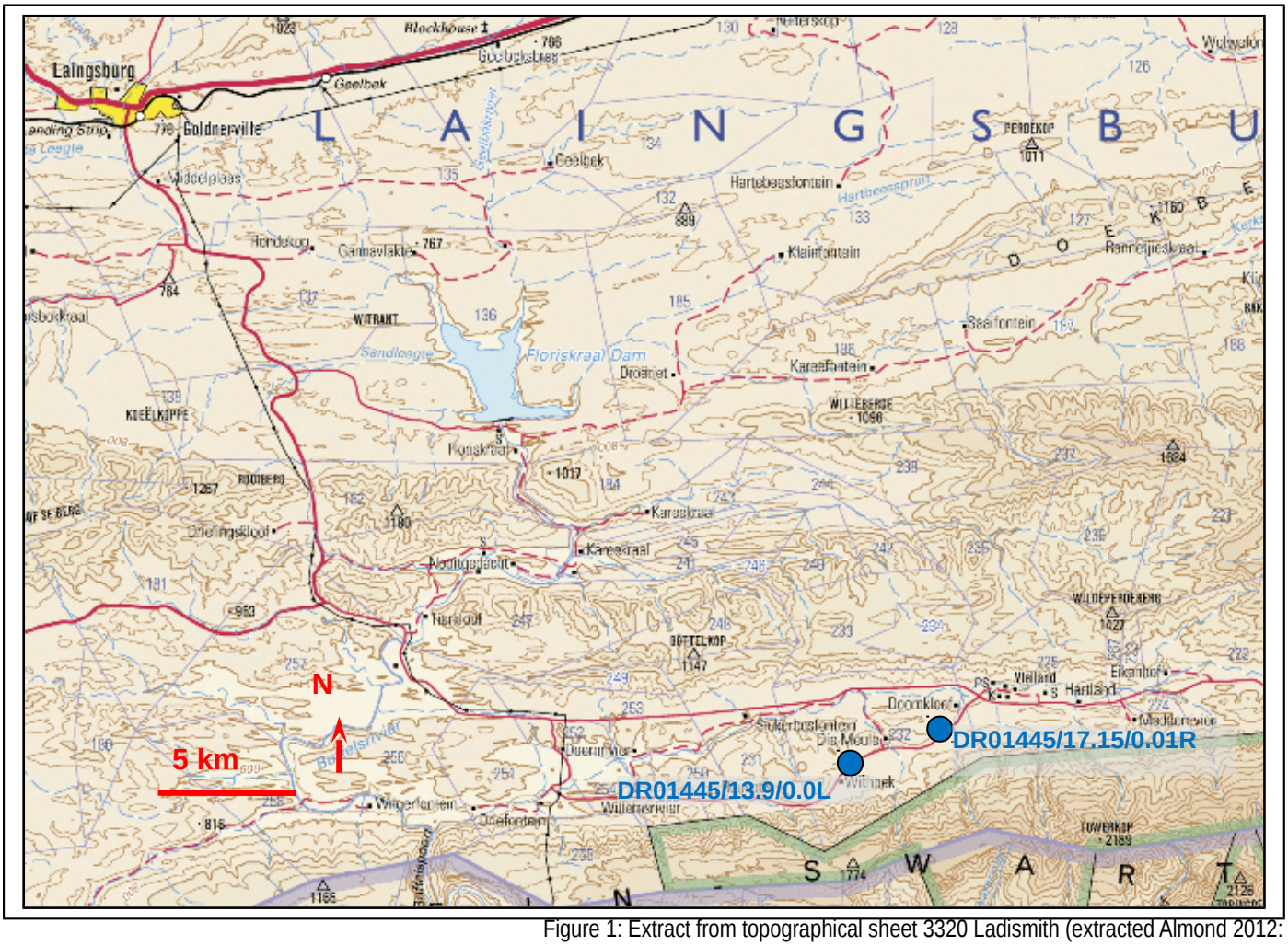

Figure 1: Extract from topographical sheet 3320 Ladismith (extracted Almond 2012: 2)

Figure 2: DR 01445 13.9 Looking northeast at the existing pit with vegetation re-establishment (July 2011)

Figure 3: DR 01445 17.15 Looking east at a test pit and the existing pit (July 2011)

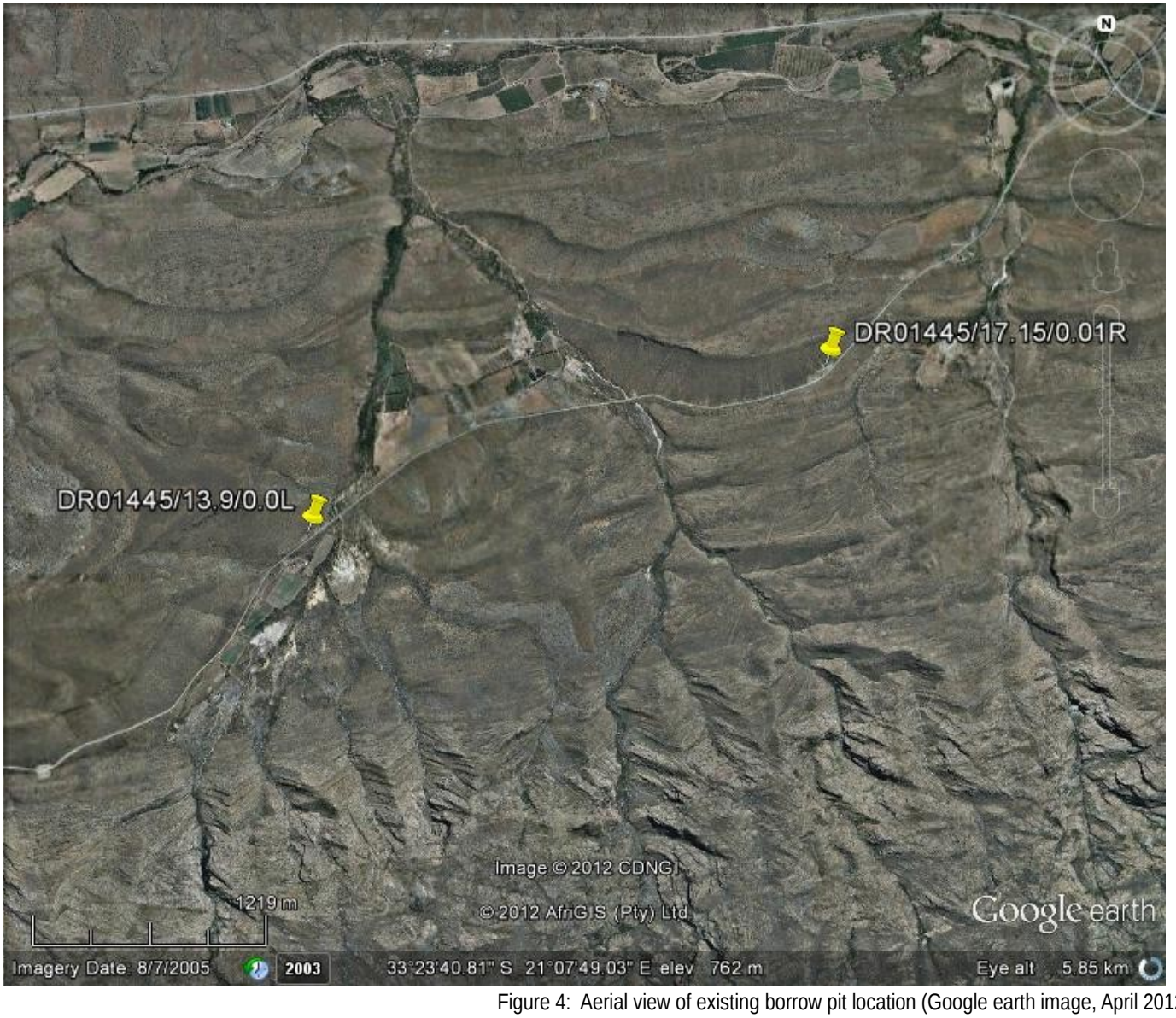

Figure 4: Aerial view of existing borrow pit location (Google earth image, April 2012)

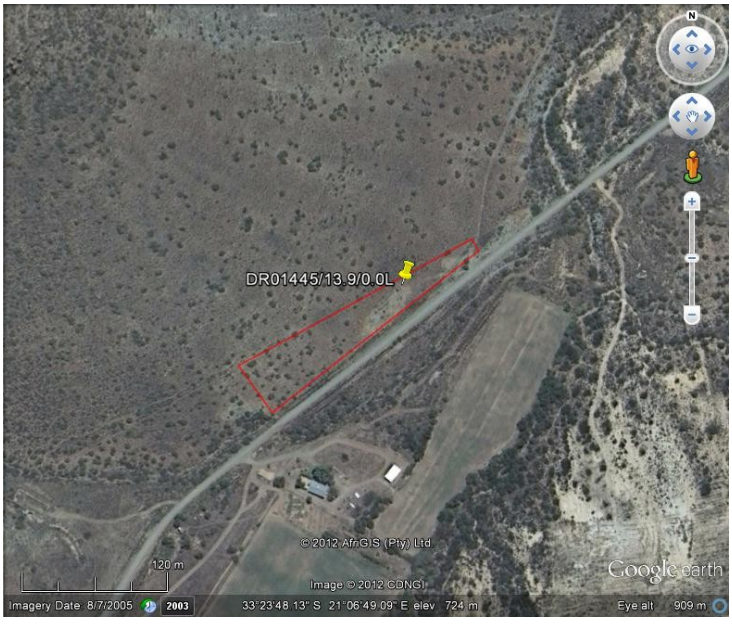

Figure 5: Aerial view of existing borrow pit at km 13.9(Google earth image, April 2012)

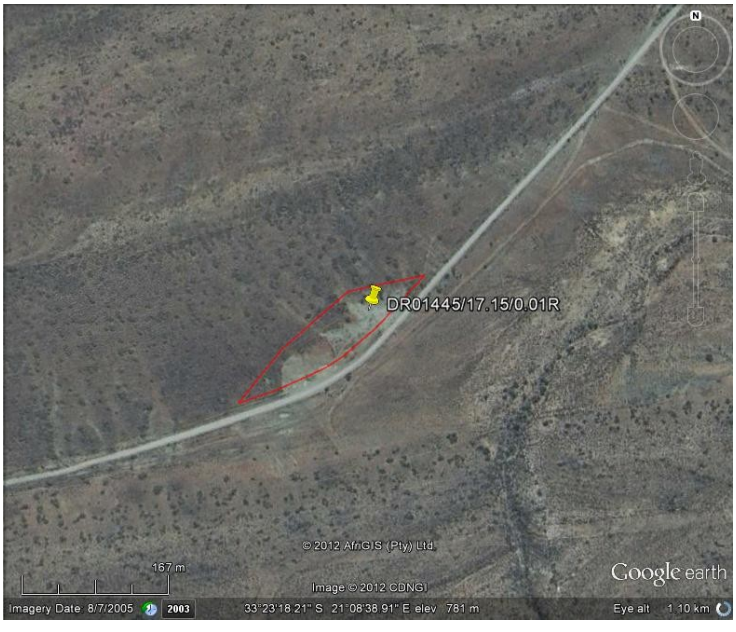

Figure 6: Aerial view of existing borrow pit at km 17.15(Google earth image, April 2012)

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 13.9 and 17.5 along DR 01445** 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. The end-use of this borrow pit would be to re-vegetation.

Summary of borrow pit		
	at km 13.9	at km 17.5
Borrow pit / expropriation area	4 000 m^2	1 500 m^2
Maximum depth	2 m	1.5 m
Material description	Karoo supergroup shale	Karoo supergroup shale
Proposed usage after rehabilitation	Re-vegetation	Re-vegetation
Volume of material to be sourced	11 200 m^3	9 000 m^3

Trial pit investigations and sampling were conducted by Aurecon at four proposed borrow pits considered as potential sources of material. Two 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:

- Re- sculpting of any excavation is top priority
- No disturbance of large indigenous plants
- Replace all topsoil over excavation
- Design must ensure no erosion must take place
- Soil and other environmental rehabilitation activities must be completed within one month of gravel excavation
- Any disturbance to fencing needs to be repaired as soon as excavation is completed

2. Heritage resources

Identification of heritage resources

Proposed site and immediate context do not fall within conservation or protected heritage areas. 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. Bokkeveld mudrocks in pit DR01445/13.9/0.0L are highly cleaved and palaeontological sensitivity is correspondingly low. However, mudrocks at DR01445/17.15/0.01R are more massive and distinctly less cleaved containing rare, or rarely as well-preserved local concentrations of moulds of articulated to disarticulated shelly invertebrate fossils. It is very likely that newly-excavated mudrock from this pit will yield rich assemblages of well-preserved shelly fossils, including examples of groups and species that are poorly represented elsewhere (Almond 2012: 6).

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. No archaeological remains of any kind were observed at borrow pit DR1445/17.15/0.0L or the surrounding area. A small neglected cemetery was observed approximately 110m to the west of DR1445/13.9/0.0L.

Heritage significance

The context within which the site lies is identified as possessing heritage value. The cemetery located near DR1445/13.9/0.0L is considered to be of high archaeological significance. Palaeontological sensitivity of mudrocks at DR01445/17.15/0.01R is rated as high (Almond 2012: 6).

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.

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.

Archaeological investigation revealed impact of proposed borrow pit expansion should be very low in terms of archaeological resources. Mitigation measures are however to be put in place prior to expansion (Tusenius 2012: 2).

Fossil material from the pit should be recorded and sampled during early stages of excavation when abundant fresh (*i.e.* unweathered) mudrock is available for examination, and before most of the material is employed for road construction (Almond 2012: 8).

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: Fossil material from the pit should be recorded and sampled during early stages of excavation. Mitigation measures are to be put in place prior to expansion to protect archaeological resources identified in close proximity to expansion sites

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. Slope changes would be finished off so that flowing curves that blend with the surrounding landscape are formed in preference to sharp angles. Topsoil and vegetation stripped during site clearance would be spread evenly across the borrow pit area. The area excavated as part of previous borrow pit activities would be ripped and also covered with a layer of topsoil.

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.

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 suitably 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 site is considered to possess intrinsic heritage value. Palaeontological sensitivity of the uncleaved Gydo Formation mudrocks at pit DR01445/17.15/0.01R is high and it is recommended that fossil material from the pit should be recorded and sampled during early stages of excavation.

The borrow pit at km 13.9 is located in close proximity to a cemetery and unmarked graves. It is therefore recommended that the cemetery be clearly marked with hazard tape and that a buffer zone of 10m be applied between the cemetery and the western boundary of the proposed expansion. Construction workers should be informed that the graveyard is strictly off-limits. (Tusenius (2012: 14). Results of the fieldwork indicate that, apart from possible impacts on the cemetery, the impact of the proposed borrow pit expansion should be very low in terms of archaeological resources (Tusenius 2012: 2).

No further archaeological and palaeontological heritage studies or mitigation are recommended and no impact on heritage resources is expected should the proposed development proceed with the above-mentioned mitigation measures applied. Overall status of the impact is considered as low.

Recommendations

It is therefore recommended that:

1. expansion of exiting borrow pits be supported
2. buffer zone of 10m be applied between cemetery and western boundary of the proposed expansion at km 13.9
3. fossil material from pit at km 17.15 be recorded and sampled during early stages of excavation
4. 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 investigationsand 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 (March 2012): *Archaeological impact assessment*
- vidamemoria (September 2011): *Notification of Intent to Develop*