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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CK 2006/049087/23

MR 00374, 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 proposed borrow pits *located along MR 000374 approximately 51 km north-east of Laingsburg* 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).

Bedrocks at all three sites are extensively mantled in Quaternary to Recent colluvial and fluvial gravels of low fossil heritage interest and thus of low palaeontological significance. Archaeological material found in a secondary context in areas affected by sheet wash is considered to be of low heritage significance. 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 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) **for proposed borrow pits at km 19.5, 29.9 and 35.8 along MR 00074 near Laingsburg,** in the Central Karoo District Municipality. NID dated 7 November 2011 was submitted to Heritage Western Cape (HWC) for consideration. Response dated 1 December 2011 (**case ref 111125JB49**) 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 June 2012) and Madelon Tusenius (*Natura Viva CC)* to conduct necessary archaeological impact assessment (dated June 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 develop borrow pits for road material at km 19.5, 29.9 and 35.8 along MR 00374 51 km north-east of Laingsburg in the Central Karoo District Municipality, Western Cape. At km **19.5** borrow pit will be expanded around an existing small dam on a rock cut stream terrace immediately alongside the MR374. The site lies on Farm Springfontein in private ownership of J.M. de Roes. Vegetation consists of scattered karoo bushes and clumps of grass, with larger *Acacia karroo* trees along the stream bed. At km **29.9** the proposed extension of an existing pit already converted into a dam is located along MR374 on a pediplain covered with a thin veneer of alluvial outwash gravels eroded from hillslopes to the west and south. Vegetation consists of scattered clumps of grass and small karoo bushes. The site lies on Farm Dikboom in private ownership of Mr K Erasmus. At km **35.8** the site lies on the left-hand bank floodplain of a intermittent stream that flows towards and crosses road MR 374 from left to right, in a narrow valley between steep side slopes. Concentrations of *Acacia karroo* occur in the central part of the site with scattered *Lycium sp*. and kraalbos predominant in the rest. The site lies on Farm Skoppelmanskraal in private ownership of A.J.J. Botes. Borrow pit co-ordinates at km 19.5 are 32° 59' 11.40" S, 21°15' 26.64" E at km 29.9 are 32° 55' 32.52" S, 21° 20' 44.88" E and at km are 32° 53' 12.48" S, 21° 20' 29.04"

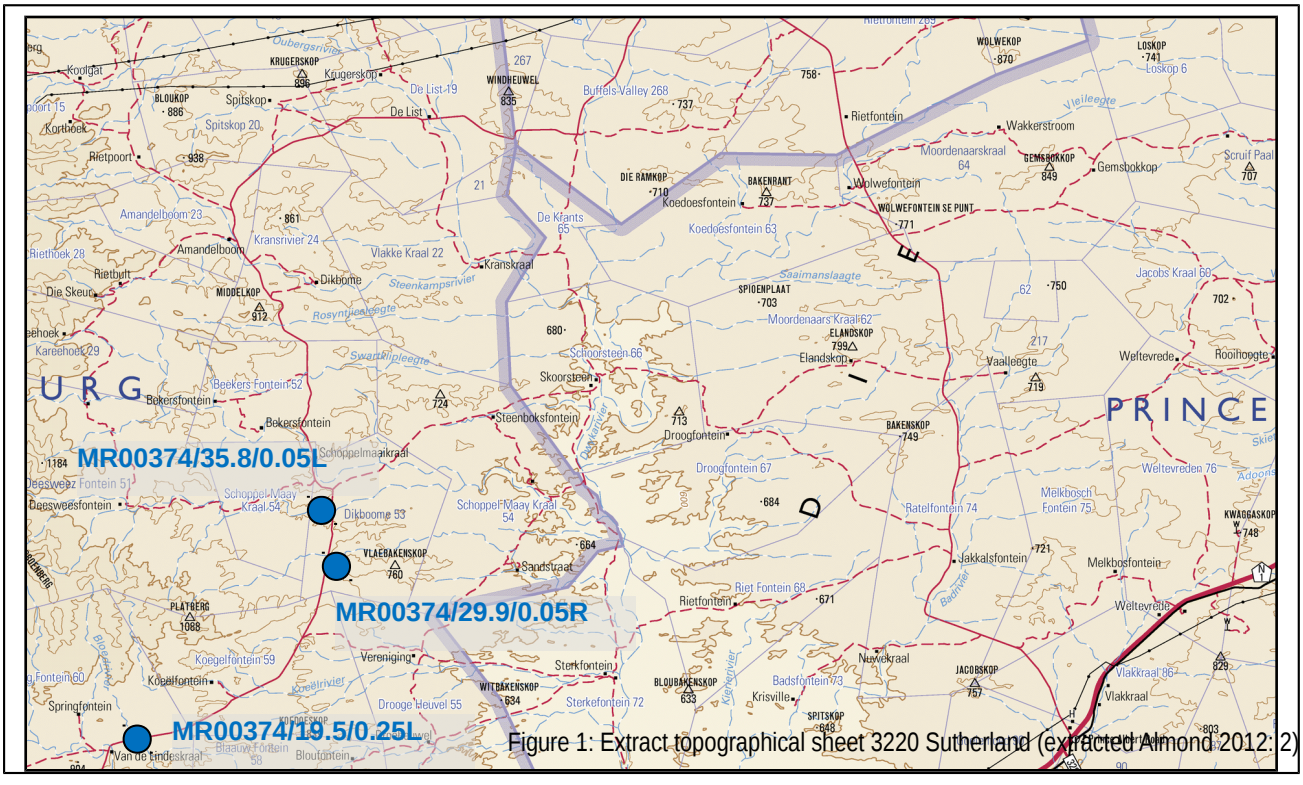

Figure 1: Extract topographical sheet 3220 Sutherland (extracted Almond 2012: 2)

Figure 2: At km 29.9 view towards the south-east over the alluvium of the southern half of the affected area (Tusenius 2012: 10)

Figure 3: At km 35.8 view towards the south-west of the affected area. The central area has denser vegetation (Tusenius 2012: 13)

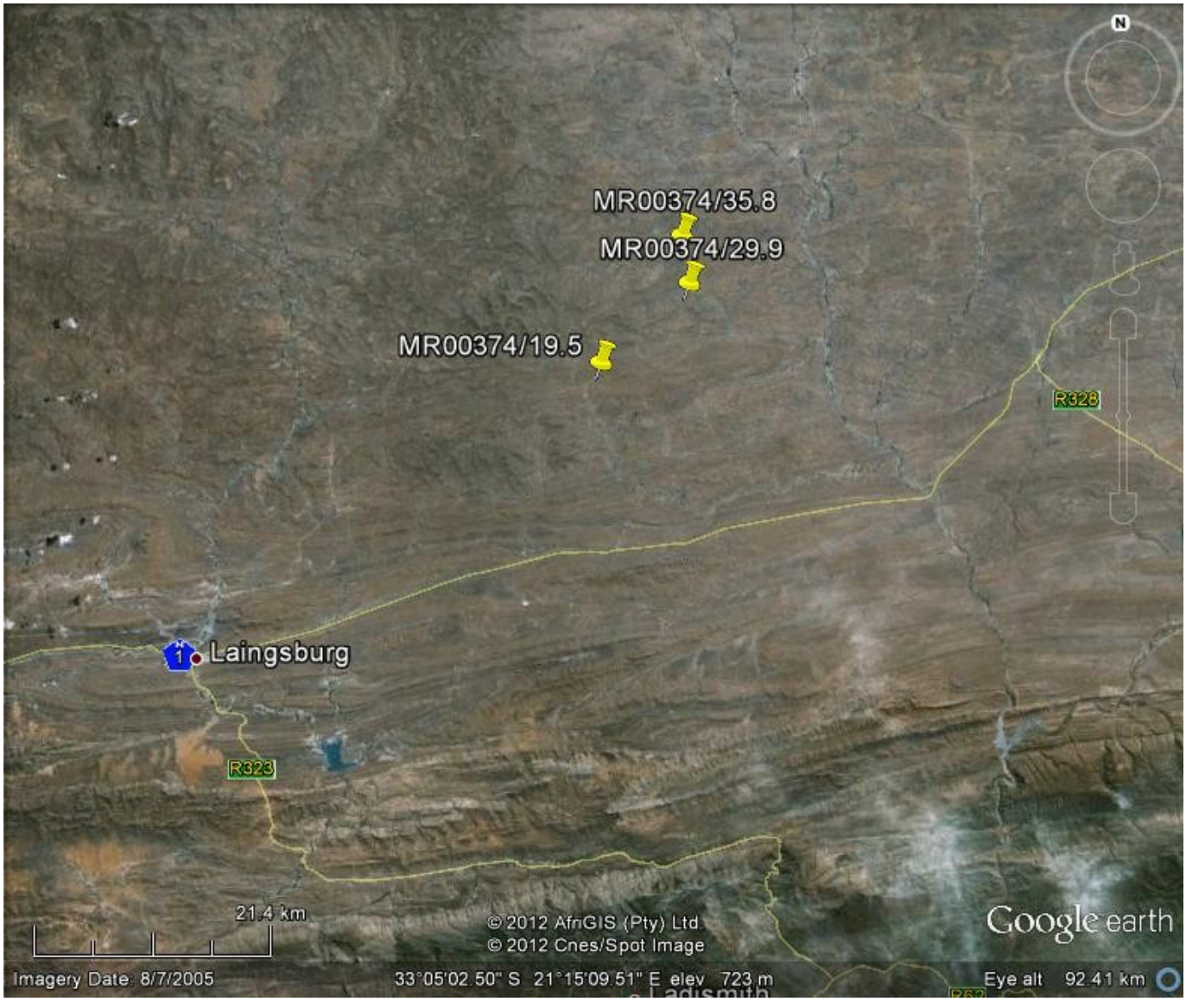

Figure 4: Aerial view of proposed borrow pit location (Google earth image, June 2012)

Figure 5: At km 19.5 Aerial view of propos borrow pit and expropriation area (Goog earth image, June 2012)

earth image, June 2012)

gure 7: At km 35.8 Aerial view of proposed orrow pit and expropriation area (Google earth image, June 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 pits located at **km 19.5, 29.9 and 35.8 along MR 000374** will be used for re-gravelling so as to benefit road users in terms of road safety and user economy as well as to minimise maintenance-related disruptions. Pits will be utilised for the sourcing of approximately 56 110 m^3 of wearing course gravel.

Summary of borrow pits			
	at km 19.5	**at km 29.9**	**at km 35.8**
Expropriation area	26 142 m^2	22 160 m^2	22 160 m^2
Borrow pit area	14 092 m^2	19 080 m^2	19 080 m^2
Maximum depth	3 m	2 m	3 m
Material description	Mudrocks of Abrahamskraal Formation (Beaufort Group, Karroo Supergroup)	Mudrocks of Abrahamskraal Formation (Beaufort Group, Karroo Supergroup)	Mudrocks of Abrahamskraal Formation (Beaufort Group, Karroo Supergroup)
Proposed usage after rehabilitation	Dam	Dam	Dam
Volume of material to be sourced	18 000 m^3	27 860 m^3	10 250 m^3

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

At km 19.5:

- re-inforce water storage feature
- rehabilitation of cut face slopes

At km 29.9:

- dam should be deepened
- pipeline that leads to a stock watering trough is not to be damaged
- erosion of cut slopes must be prohibited

At km 35.8:

- creation of a proper functioning dam (inlets and outlets)
- proper safety precautions to be put in place
- erosion of cut slopes must be prohibited

2. Heritage resources

Identification of heritage resources

Proposed sites 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. Sites do not fall within a historical settlement or townscape and do not contribute towards rural or natural landscape of cultural significance. Sites are 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 June 2012. Three borrow pit sites are to be excavated into potentially fossiliferous fluvial sediments of the Abrahamskraal Formation (Lower Beaufort Group. Bedrocks at all three sites are extensively mantled in Quaternary to Recent colluvial and fluvial gravels of low fossil heritage interest.

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. AT km 19.5 several dispersed sandstone and Matjiesfontein chert artefacts were observed in an area affected by sheet wash. The few diagnostic artefacts appear to be Middle Stone Age (MSA). At km 29.9 three isolated, large sandstone flakes noted were probably transported to the site by water. At km 35.8 a couple of sandstone flakes of doubtful anthropogenic origin were found in an area that is regularly flooded. No dolerite boulders suitable for rock engravings occur in the area and no stone features such as walls or graves were observed (Tusenius 2012, 6 – 11).

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

Given the paucity of fossil material observed during field assessment in the available exposures of Beaufort Group bedrocks, palaeontological sensitivity of all these three sites is assessed as low. While it is possible that vertebrate and other fossil remains may be exposed during excavation of the pit areas, anticipated low density of fossil material subsurface does not warrant special mitigation measures or further studies (Almond 2012: 11). Disturbed context of the stone artefacts at the proposed sites at km 19.5 and 35.8 indicates that the material is in a secondary context and is 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. The site is 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 sites 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 archaeological and palaeontological significance has been provided as well as consideration of the cultural landscape and assessment of cumulative impacts.

Cultural landscape: Propose borrow pits would not result in a negative impact on the cultural landscape. The landscape within which the sites lie possesses low intrinsic heritage value and no heritage resources were identified within the immediate context. Sites and 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.

Sites are 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. 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.

Given the paucity of fossil material observed during field assessment in the available exposures of Beaufort Group bedrocks, palaeontological sensitivity of all three sites is assessed as low. The anticipated low density of fossil material subsurface does not warrant special mitigation measures or further studies (Almond 2012: 12).

Archaeological artefacts noted were found in a secondary context in areas affected by sheet wash and considered to be of low heritage significance. No further mitigation or investigation is required (Tusenius 2012: 14).

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 pits 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 (June 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 (June 2012): *Archaeological Impact Assessment*
- vidamemoria (November 2011): *Notification of Intent to Develop*