



iLifa leMveli leNtshona Koloni
Erfenis Wes-Kaap
Heritage Western Cape

NOTIFICATION OF INTENT TO DEVELOP

Completion of this form is required by Heritage Western Cape for the initiation of all impact assessment processes under Section 38(1) & (8) of the National Heritage Resources Act.

Whilst it is not a requirement, it may expedite processes and in particular avoid calls for additional information if certain of the information required in this form is provided by a heritage specialist/s with the necessary qualifications, skills and experience.

A. BASIC DETAILS

PROPERTY DETAILS:

Name of property:

Street address or location (eg: off R44): Divisional Road 01721, Prince Albert

Erf or farm number/s:

Coordinates: 22.26'47.44"S 33.21'34.6"E
 (A logical centre point. Format based on WGS84.)

Town or District: Central Karoo

Responsible Municipality: Prince Albert Local Municipality

Extent of property:

Current use: Borrow pit

Predominant land use/s of surrounding properties: Agricultural land for grazing livestock

REGISTERED OWNER OF PROPERTY:

Name Road Reserve c/o Department Transport and Public Works

0.9: Avondrust Family Trust, 3.7: Avondrust Family Trust and 8.4: Avondrust Family Trust
 16.15: Blue Sky Mountain Farms (Pty) Ltd

Address c/o Dept. Transport & Public Works: WCPA: P O Box 2603, Cape Town, 8000

Telephone 021 483 2020

Cell

E-mail

quahnita@vidamemoria.co.za

By the submission of this form and all material submitted in support of this notification (ie: 'the material'), all applicant parties 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. Should restrictions on such use apply or if it is not possible to copy or lift information from any part of the digital version of the 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.

Signature of owner or authorised agent
(Agents must attach copy of power of attorney to this form.)

Date 14 / 09 / 2011

DEVELOPMENT DETAILS:

Please indicate below which of the following Sections of the National Heritage Resources Act, or other legislation has triggered the need for notification of intent to develop.	
<input type="checkbox"/> S38(1)(a) Construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier over 300m in length.	S38(1)(c) Any development or activity that will change the character of a site -
<input type="checkbox"/> S38(1)(b) Construction of a bridge or similar structure exceeding 50m in length.	
<input type="checkbox"/> S38(1)(d) Rezoning of a site exceeding 10 000m ² in extent.	
<input checked="" type="checkbox"/> Other triggers, eg: in terms of other legislation, (ie: National Environment Management Act, etc.) Please set out details: Environmental Management Programmes (EMProgs) as called for by the Mineral and Petroleum Resources Development Act (49 of 2008)	<input checked="" type="checkbox"/> (i) exceeding 5 000m ² in extent; <input type="checkbox"/> (ii) involving three or more existing erven or subdivisions thereof; <input type="checkbox"/> (iii) involving three or more erven or divisions thereof which have been consolidated within the past five years.
If you have checked any of the three boxes above, describe how the proposed development will change the character of the site: Borrow pits are used to obtain material for the maintenance of gravel roads	
If an impact assessment process has also been / will be initiated in terms of other legislation please provide the following information: Authority / government department (ie: consenting authority) to which information has been /will be submitted for final decision: Department of Mineral Resources Present phase at which the process with that authority stands: Submission of EMProg pending comment from Heritage Western Cape	
Provide a <u>full</u> description of the nature and extent of the proposed development or activity including its potential impacts (eg: changes in land use, envisaged timeframes, provision of additional bulk services, excavations, landscaping, total floor area, height of development, etc. etc.): As per the requirements 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. 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 the 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 the WCPA would temporarily acquire the right to mine the borrow pits, subject to approval by the DMR. Material excavated from the borrow pits will be used for the re-gravelling to portions of road DR01721 km 0 to 13 so as to benefit road users in terms of road safety and user economy as well as to minimise maintenance-related disruptions.	

DR01721 at km 0.9, 6.3km northwest of Klaarstroom is a new site located on the left hand side (southern side) of road accessed directly from DR01721. The material consists of Bokkeveld shale, of the Beaufort Group (Karoo Supergroup), which is suitable for use as gravel wearing course for the maintenance of gravel roads. This source is located on disturbed land in the road reserve adjacent to the farm Avondrust. There is evidence for past brick buildings. Estimated Proven Reserves: ~25 000 m³ over an area of about 250 m x 50 m wide to a maximum depth of about 3 m utilising 1v:3h cut face slopes. A discontinuous overburden layer consists of organic rich sandy silty gravel with a variable thickness up to about 0,2m in places.

An existing borrow pit is located 6.5km west-northwest of Klaarstroom, at kilometer 3.7 of DR01721 on the northeast side of the road accessed directly from the edge of DR01721. It is proposed to enlarge the pit upslope towards the east. The geology of the site consists of shale of the Bokkeveld Group, which is well suited for the purpose of gravel wearing course used in the maintenance of gravel roads. This is overlain by a thin horizon of gravelly silty shale and siltstone approximately 0.2m thick. This site is likely to be a strategic source of material and be used repeatedly over time. As such, mining will be phased and be carried out in a clockwise rotation. Estimated Proven Reserves: ~30 000 m³ over an area of about 150 m x 100 m wide to a maximum depth of about 2,5 m utilising 1v:3h cut face slopes. A discontinuous overburden layer consists of organic rich sandy silty gravel with a variable thickness up to about 0,1m in places.

The existing borrow pit located at kilometre 8.4 on DR01721, approximately 8.7km southwest of Klaarstroom was converted into a dam which stores water used for irrigation. The proposed borrow pit under discussion is located up-slope of the dam, and its final use would be incorporation into the existing dam. Approximately 52,400m³ of material will be mined from this pit. This site contains 0.2 to 0.3m of sandy-clayey silt and colluvial gravel which overlies weathered shale of the Bokkeveld Group. This material is suitable for use as gravel wearing course, provided the pit is worked full face in order to mix silt and colluvial gravels with the weathered shale. Estimated Proven Reserves: ~45 000 m³ over an area of about 150 m x 100 m wide to a maximum depth of about 3,5 m utilising 1v:3h cut face slopes. A discontinuous overburden layer consists of organic rich sandy silty gravel with a variable thickness up to about 0,1m in places.

An existing borrow pit located south of DR01721 at km 16.15, 5.6km southwest of Klaarstroom and 3km southwest of the intersection of DR01721 and MR00542, situated on agricultural land used for livestock grazing. It is accessed from DR01721 via a short existing farm gate and track which runs along the northern side of the borrow pit. The material consists of highly weathered and closely to mediumly fractured shale/phyllite of the Bokkeveld Group, which is suitable for use as gravel wearing course. This is overlain by a thin layer of gravelly topsoil. Estimated Proven Reserves: ~27 500 m³ over a triangular area of about 170 m long x 80 m wide to a maximum depth of about 3,5 m utilising 1v:3h cut face slopes. A partially discontinuous overburden layer consists of organic rich sandy silty gravel with a variable thickness up to about 0,1m in places.

Existing borrow pits are used as water retention facilities (dams) to supply water for livestock. The expanded borrow pits and the new borrow pits proposed will serve the same purpose and will not have a significant negative impact on the visual aesthetics of the area. No new roads would have to be constructed as borrow pits / quarries are accessed either directly off main / divisional roads or via existing access tracks. The borrow pits and access tracks would be fenced for the duration of the mining activities. There will be no site buildings located at the borrow pits / quarry sites.

The Central Karoo District Municipality will be undertaking the work on behalf of the WCPA. Formal agreements will be entered into between the landowner and the WCPA and the municipality will manage the site until decommissioning and closure.

B. HERITAGE RESOURCES AND IMPACTS THEREUPON

Section 3 of the National Heritage Resources Act sets out the following categories of heritage resource as forming part of the national estate. Please indicate the known presence of any of these by checking the box alongside and then providing a description of each occurrence, including nature, location, size, type

Failure to provide sufficient detail or to anticipate the likely presence of heritage resources on the site may lead to a request for more detailed specialist information.

(The assistance of relevant heritage professionals is particularly relevant in completing this section.)

Provide a short history of the site and its environs (Include sources where available): The town was founded in 1842 on the farm Kweekvallei, and named after Queen Victoria's husband, Albertsburg. (Fransen H 2004: 510 The Old Buildings of the Cape). Prince Albert is located at the foot of the Swatberg Pass preserving a 19th century character, partly as a result of the national road which does not pass through the town (Fransen H 2006: 292 – 293 in Old Towns and Villages of the Cape). The DR01721 does not form a historic component of the town, but does serve as an important transport link.

Please indicate which heritage resources exist on the site and in its environs, describe them and indicate the nature of any impact upon them:

<input type="checkbox"/>	<p>Places, buildings, structures and equipment of cultural significance</p> <p>Description of resource: None</p> <p>Description of impact on heritage resource: None</p>
<input type="checkbox"/>	<p>Places to which oral traditions are attached or which are associated with living heritage</p> <p>Description of resource:</p> <p>Description of impact on heritage resource:</p>
<input type="checkbox"/>	<p>Historical settlements and townscapes</p> <p>Description of resource:</p> <p>Description of impact on heritage resource:</p>
<input type="checkbox"/>	<p>Landscapes and natural features of cultural significance</p> <p>Description of resource:</p> <p>Description of impact on heritage resource:</p>
<input type="checkbox"/>	<p>Geological resources of scientific or cultural importance</p> <p>Description of resource: Material was found to be suitable for use as gravel wearing course (Aurecon geological strategic gravel pit summary report by R M Galliers Jan 2011) Geotechnical investigations were carried out by Aurecon (borrow pit exploration) and Outeniqua Lab (laboratory testing)</p> <p>Description of impact on heritage resource: None</p>
<input type="checkbox"/>	<p>Archaeological resources (Including archaeological sites and material, rock art, battlefields & wrecks):</p> <p>Description of resource: Late Stone Age sites may be present in this area. Rock paintings may exist in rocky outcrops and there is a possibility of herder sites along the drainage lines close to borrow pit 8.4 No studies are known from the immediate vicinity, however the general context is predicted to be of medium significance based on a desktop study (Manhire & Patrick September 2011) of sites known to exist in the general area.</p> <p>Description of impact on heritage resource: None</p>
<input type="checkbox"/>	<p>Palaeontological resources (ie: fossils):</p> <p>Description of resource: Key Geological Units and age are Waboomberg or Karies Formation of early middle Devonian age Gydo and Voorstehoek Formation of early Devonian age with potential shelly fossil assemblages, land plants and trace fossils as well as diverse shelly</p>

	<p>invertebrate biot, fish remains and microfossils (desktop survey conducted by Dr John Almond, August 2011)</p> <p>Description of impact on heritage resource: None</p>
<input type="checkbox"/>	<p>Graves and burial grounds (eg: ancestral graves, graves of victims of conflict, historical graves & cemeteries):</p> <p>Description of Resource:</p> <p>Description of Impact on Heritage Resource:</p>
<input type="checkbox"/>	<p>Other human remains:</p> <p>Description of resource:</p> <p>Description of impact on heritage resource:</p>
<input type="checkbox"/>	<p>Sites of significance relating to the history of slavery in South Africa:</p> <p>Description of resource:</p> <p>Description of impact on heritage resource:</p>
<input type="checkbox"/>	<p>Other heritage resources:</p> <p>Description of resource:</p> <p>Description of impact on heritage resource:</p>

Describe elements in the environs of the site that could be deemed to be heritage resources:
Description of impacts on heritage resources in the environs of the site: None

Summary of anticipated impacts on heritage resources: Sites have been identified as possessing no cultural significance and / or value and proposed expansion of existing borrow pits will result in no impact on heritage resources. Therefore no further studies are required in terms of Section 38.

If any archaeological and / or palaeontological material is discovered during earth moving activities, work should be stopped and HWC notified immediately.

ILLUSTRATIVE MATERIAL (This form will not be processed unless the following are included):

Attach to this form a minimum A4 sized locality plan showing the boundaries of the area affected by the proposed development, its environs, property boundaries and a scale. The plan must be of a scale and size that is appropriate to creating a clear understanding of the development.

Attach also other relevant graphic material such as maps, site plans, satellite photographs and photographs of the site and the heritage resources on it and in its environs. These are essential to the processing of this notification.

Please provide all graphic material on paper of appropriate size and on CD ROM in JPEG format. It is essential that graphic material be annotated via titles on the photographs, map names and numbers, names of files and/or provision of a numbered list describing what is visible in each image.

C. RECOMMENDATION

In your opinion do you believe that a heritage impact assessment is required? Yes No

Recommendation made by:

Name Quahnita Samie

Capacity Town planner and heritage consultant at vidamemoria heritage consultants

PLEASE NOTE: No Heritage Impact Assessment should be submitted with this form or conducted until Heritage Western Cape has expressed its opinion on the need for such and the nature thereof.

D. INFORMATION TO BE PROVIDED AND STUDIES TO BE CONDUCTED AS PART OF THE HERITAGE IMPACT ASSESSMENT (HIA)

If it is recommended that an HIA is required please complete this section of the form.

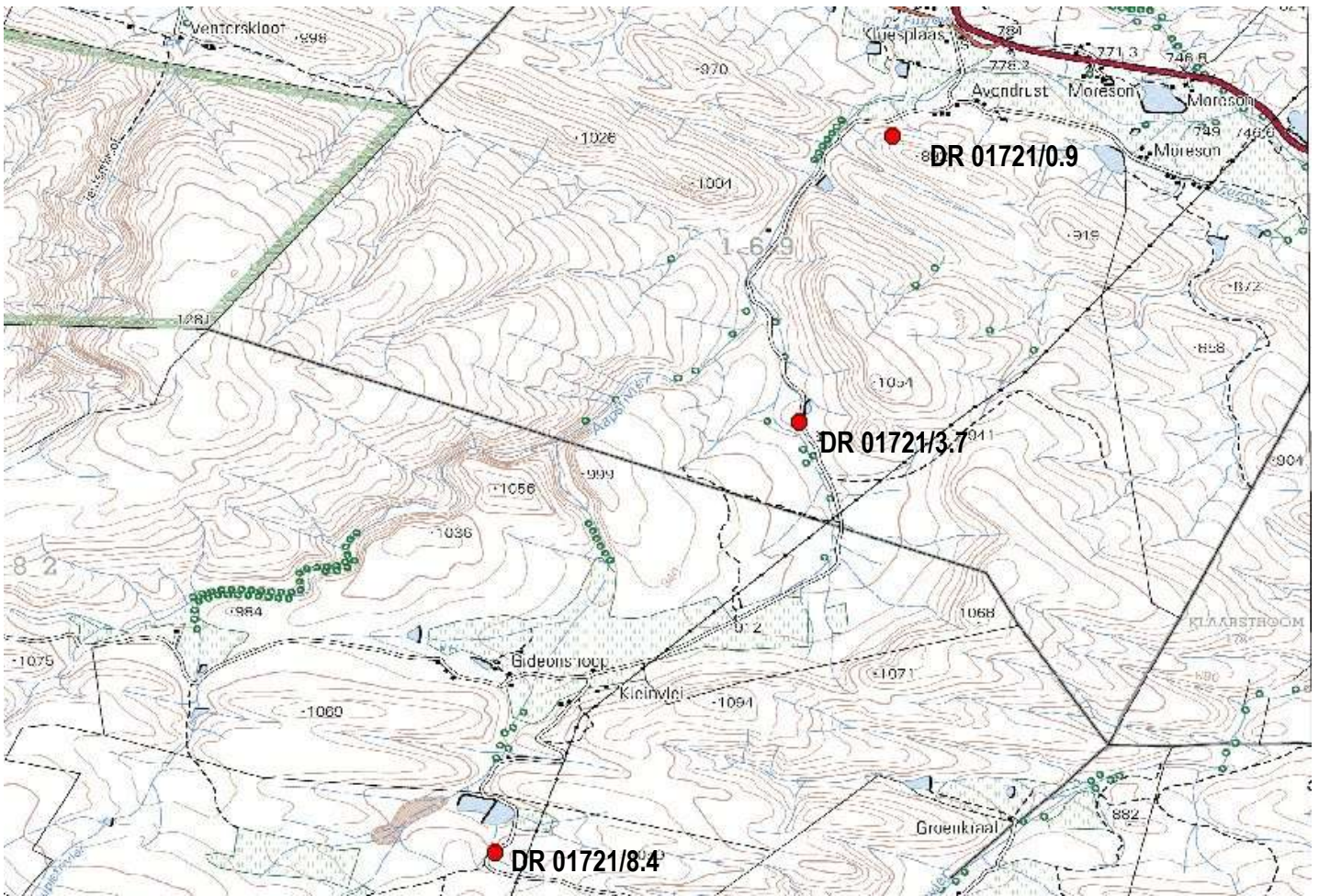
DETAILS OF HERITAGE PRACTITIONERS AND SPECIALISTS INTENDING TO CONDUCT THE HIA:

1.	<p>Name of individual: Name of Practice: Area of specialisation:</p> <p>Qualifications:</p> <p>Experience:</p> <p>Standing in heritage resource management:</p> <p>E-mail Address: Telephone: Cell:</p>
2.	<p>Name of individual: Name of Practice: Area of specialisation:</p> <p>Qualifications:</p> <p>Experience:</p> <p>Standing in heritage resource management:</p> <p>E-mail Address: Telephone: Cell:</p>
3.	<p>Name of individual: Name of Practice: Area of specialisation:</p> <p>Qualifications:</p> <p>Experience:</p> <p>Standing in heritage resource management:</p> <p>E-mail Address: Telephone: Cell:</p>
4.	<p>Name of individual: Name of Practice: Area of specialisation:</p> <p>Qualifications:</p> <p>Experience:</p> <p>Standing in heritage resource management:</p> <p>E-mail Address: Telephone: Cell:</p>

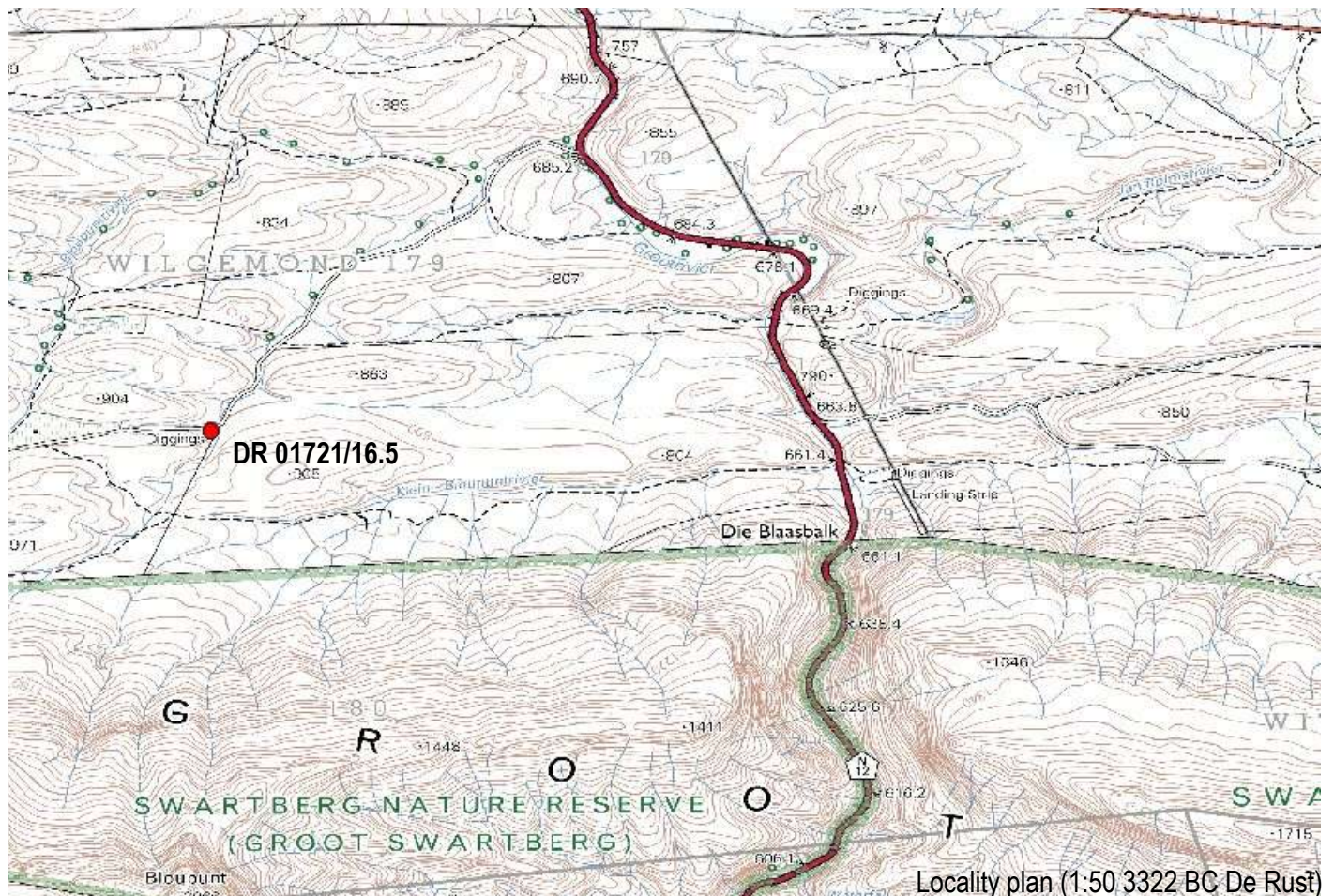
5.	Name of individual:	Name of Practice:	Area of specialisation:
	Qualifications:		
	Experience:		
	Standing in heritage resource management:		
	E-mail Address:	Telephone:	Cell:
If this submission is made in terms of Section 38(8) of the National Heritage Resources Act indicate below the particulars of the principle environmental consultant on the project.			
Name of individual:			
Name of Practice:			
Area of specialisation:			
E-mail Address:			
Telephone:			
Cell:			
Postal Address:			

DETAILS OF STUDIES TO BE CONDUCTED IN THE INTENDED HIA

In addition to the requirements set out in Section 38(3) of the NHRA, indicate envisaged studies:	
<input type="checkbox"/>	Heritage resource-related guidelines and policies.
<input type="checkbox"/>	Local authority planning and other laws and policies.
<input type="checkbox"/>	Details of parties, communities, etc. to be consulted.
<input type="checkbox"/>	Specialist studies, eg: archaeology, palaeontology, architecture, townscape, visual impact, etc. Provide details:
<input type="checkbox"/>	Other. Provide details:
PLEASE NOTE: Any further studies which Heritage Western Cape may resolve should be submitted must be in the form of a single, consolidated report with a single set of recommendations. Specialist studies must be incorporated in full, either as chapters of the report, or as annexures thereto.	



Locality plan (1:50 3322 AD Rosselerf)



Locality plan (1:50 3322 BC De Rust)



DR 01721/0.9 View stockpile of pit 4 stockpile



Looking east from the edge of road DR01721 towards the site of the proposed pit (April 2011).



Looking south across the site of the proposed borrow pit. Road DR01721 is on the right (April 2011).



Looking southwest across site with building rubble in the foreground (April 2011).



Rubble (April 2011).



DR 01721/03.7View of TP6 stockpile and up-slope extension terrain



Looking east at the existing borrow pit from the edge of DR01721 (April 2011).



Looking south from the northern edge of the existing pit towards DR01721 and the Swartberg Mountains (April 2011).



Looking southeast from the edge of the existing pit at the fynbos vegetation (April 2011). The expanded pit will lie in the foreground of the photo.



Looking east-northeast at a test pit and the area into which the pit will expand (April 2011).



DR 01721/08.4 View from TP1 across old pit towards up-slope extension terrain



Looking northwest across the site of the proposed BP, located between road DR01721 and existing dam (April 2011).



Looking west across the site of the proposed borrow pit located to the south and east of the existing farm dam (April 2011).



Looking east across the proposed site towards DR01721 is in the background (April 2011).



Looking north across the site of the proposed borrow pit at vegetation in the existing dam (April 2011).



DR 01721/016.5 Pit 4 - typical stockpile and surroundings and view towards existing pit



Looking north-east from hillock towards existing borrow pit and DR01721 (March 2011).



Looking north, onto adjacent DR01721 (March 2011).



Looking south up the nearby ephemeral watercourse, east of the existing borrow pit (March 2011).



Looking west from existing borrow pit berm with DR01721 in the background (March 2011).

GENERAL APPROACH TO PALAEOONTOLOGICAL HERITAGE SPECIALIST STUDIES

John E. Almond (PhD, Cantab.)

Natura Viva cc

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tel: (021) 462 3622

The RSA has an unusually rich fossil heritage stretching back in time for over 3.5 billion years. Fossil sites of national and international significance occur along the coast as well as throughout much of the interior, including the Karoo, the Cape Fold Mountains and elsewhere. This wealth of palaeontological heritage is protected as a valuable but vulnerable public good by the **South African Heritage Resources Act** (Act No. 25 of 1999). The various categories of heritage resources recognised as part of the National Estate in Section 3 of the Heritage Resources Act include, among others:

- geological sites of scientific or cultural importance
- palaeontological sites
- palaeontological objects and material, meteorites and rare geological specimens

According to Section 35 (Archaeology, palaeontology and meteorites) and Section 38 (Heritage Resources Management) of the South African Heritage Resources Act, palaeontological heritage studies (previously referred to as PIAs) are required by law in the case of developments in areas underlain by potentially fossiliferous (fossil-bearing) rocks, especially where substantial bedrock excavations are envisaged. Depending on the sensitivity of the fossil heritage and the scale of the development concerned, the palaeontological study required may take the form of (a) a stand-alone desktop study, or (b) a field assessment *plus* desktop study leading to a consolidated report. In some cases these studies may recommend further palaeontological mitigation, usually at the construction phase. These recommendations would normally be endorsed by the responsible heritage management authority (e.g. Heritage Western Cape or SAHRA) to whom the reports are submitted for review. Heritage Western Cape now requires that the results and recommendations of the palaeontological study be combined with those of other heritage specialists as part of an integrated heritage impact assessment report with an integrated set of recommendations.

In order to compile an authoritative **palaeontological desktop study** for a proposed development the contracted palaeontologist will need to know in advance:

- the location and extent of the development (e.g. boundaries of all land parcels concerned delineated on a map or satellite image). Note that the precise development footprint is often less critical since PIAs are essentially regional in character.
- the nature of the development (e.g. outline in BID document)
- the extent (area, depth, location) of bedrock excavations envisaged. These may include quarries or borrow pits for building materials as well as excavations for infrastructure (roads, buildings, pylons *etc*)
- the companies or organisations proposing the development and responsible for commissioning the palaeontological study
- any RODs concerning palaeontological heritage issued by the responsible heritage management authority (e.g. SAHRA, HWC). Here it is important to clarify whether a desktop study alone or a field assessment study has been required.

In preparing a palaeontological desktop study the potentially fossiliferous rock units (groups, formations *etc*) represented within the study area are determined from geological maps. The known fossil heritage within each rock unit is inventoried from the published scientific literature, previous palaeontological impact studies in the same region, and the author's field experience (Consultation with professional colleagues as well as examination of institutional fossil collections may play a role

here, or later during the compilation of the final report). This data is then used to assess the palaeontological sensitivity of each rock unit to development (Provisional tabulations of palaeontological sensitivity of all formations in the Western, Eastern and Northern Cape have already been compiled by J. Almond and colleagues). The likely impact of the proposed development on local fossil heritage is then determined on the basis of (1) the palaeontological sensitivity of the rock units concerned and (2) the nature of the development itself, most notably the extent of fresh bedrock excavation envisaged. When rock units of moderate to high palaeontological sensitivity are present within the development footprint, a field assessment study by a professional palaeontologist is usually warranted.

The focus of **palaeontological field assessment** work is *not* simply to survey the development footprint or even the development area as a whole (e.g. farms or other parcels of land concerned in the development). Rather, the palaeontologist seeks to assess the diversity, density and distribution of fossils within and beneath the study area, as well as their heritage or scientific interest. This is primarily achieved through a careful field examination of one or more representative exposures of all the sedimentary rock units present (*N.B.* Metamorphic and igneous rocks rarely contain fossils). The best rock exposures are generally those that are easily accessible, extensive, fresh (*i.e.* unweathered) and include a large fraction of the stratigraphic unit concerned (e.g. formation). These exposures may be natural or artificial and include, for example, rocky outcrops in stream or river banks, cliffs, quarries, dams, dongas, open building excavations or road and railway cuttings. Uncemented superficial deposits, such as alluvium, scree or wind-blown sands, may occasionally contain fossils and should also be included in the field assessment study where they are well-represented in the study area. It is normal practice for impact palaeontologists to collect representative, well-localized (e.g. GPS and stratigraphic data) samples of fossil material during field assessment studies. The palaeontologist concerned will require a valid collection permit from SAHRA, and all fossil material collected must be properly curated within an approved repository (usually a museum or university collection).

Note that while fossil localities recorded during field assessment work within the study area itself are obviously highly relevant, most fossil heritage here is embedded within rocks beneath the land surface or obscured by surface deposits (soil, alluvium *etc*) and by vegetation cover. In many cases where levels of fresh (*i.e.* unweathered) bedrock exposure are low, the hidden fossil resources have to be *inferred* from palaeontological observations made from better exposures of the same formations elsewhere in the region but outside the immediate study area. Therefore a palaeontologist might reasonably spend far *more* time examining road cuts and borrow pits close to, but outside, the study area than within the study area itself. Field data from localities even further afield (e.g. an adjacent province) may also be adduced to build up a realistic picture of the likely fossil heritage within the study area.

Here it is assumed that fossil heritage is fairly uniformly distributed throughout the outcrop area of a given formation. Experience shows that this assumption does not always hold, however. The original depositional setting of sediments within a formation that now stretches cross-country for hundreds of kilometres may vary significantly from place to place - e.g. from a nearshore alluvial plain across a coastline into a deeper water environment. This obviously has profound palaeoecological implications affecting the types and density of fossils preserved in different areas. Furthermore fossil organisms, like living ones, were often patchy in their occurrence. Most importantly, the levels of tectonic deformation (folding, cleavage development *etc*), as well as the intensity and nature of metamorphism and weathering experienced by a given formation may change markedly across its outcrop area. These factors, which can often only be assessed during the field assessment phase, may seriously compromise the preservation of fossil remains originally present within the sedimentary rock and hence *lower* the palaeontological sensitivity of the development concerned. Palaeontological field assessment might therefore either (a) identify and delineate areas within the development area of high palaeontological sensitivity that will trigger specialist mitigation, usually at the construction phase, or (b) exclude the need for any further mitigation concerning rock units that are often highly fossiliferous

but which are found *in this particular region* to be too weathered, metamorphosed or deformed to warrant special protection.

The **palaeontological field assessment report** provides an illustrated, fully-referenced review of the (a) actual or known as well as (b) inferred palaeontological heritage within all rock units represented in the study area based on the initial desktop study as well as new data from fieldwork and any subsequent palaeontological analysis (e.g. lab identification of fossil material). Palaeontological sensitivity is highly dependent on rock formations whose distribution is depicted on geological maps. A geological map of the study area therefore forms a standard component of a PIA report. Normally the report will also incorporate:

- identification and ranking of highlights and sensitivities to development of fossil heritage within the study area (e.g. distribution of sensitive formations and specific fossil sites)
- specific recommendations for further palaeontological mitigation (if any)
- recommendations and suggestions regarding fossil heritage management on site, including conservation measures as well as promotion of local fossil heritage (e.g. for public education, schools)

It should be emphasized that an authoritative palaeontological assessment report is not only of value to the developer who commissions the study, in terms of fulfilling the legislative requirements and outlining the need for any further palaeontological mitigation. By summarizing and updating our understanding of the palaeontological resources within a specific area a good, well-referenced and -illustrated report also fulfils a valuable archival function for heritage managers, the scientific community and the interested public.

Projects entailing large-scale excavation into potentially fossil-rich rocks will usually trigger **palaeontological mitigation** – normally at the construction phase since adverse palaeontological impacts (e.g. destruction, disturbance or sealing-in of fossils) can be expected at this time rather than during the operational phase. Mitigation by a professional palaeontologist normally involves the recording and judicious sampling of fossil material and associated geological information (e.g. sedimentological data). This work is contracted at the developer's expense and is usually most effective during the construction phase when fresh fossiliferous bedrock has been exposed by new excavations but has not yet been sealed-in. In order to carry out mitigation, the palaeontologist concerned will need to apply for a palaeontological collection permit from the relevant heritage management authority (i.e. Heritage Western Cape for the Western Cape, Amafa for Kwazulu-Natal and SAHRA for all the remaining provinces). Feedback from any mitigation work, including new palaeontological observations and any recommendations for further mitigation, will need to be provided to the developer and the responsible heritage management authorities in the form of one or more reports, culminating in a **final palaeontological assessment report**.

It should be emphasized that most developments do not trigger specialist palaeontological mitigation. Even when this is required, timely consultation between the developer and contracted palaeontologist - well before construction begins - should ensure that mitigation does not delay or otherwise interfere with the construction programme. Finally, *providing appropriate mitigation is carried out*, the majority of developments involving bedrock excavation can make a *positive* contribution to our understanding of local palaeontological heritage. A collaborative relationship between palaeontologists, heritage managers and developers is therefore the desirable norm.

WESTERN CAPE BORROW PITS – INITIAL PALAEOONTOLOGICAL HERITAGE ASSESSMENT (August 2011)

Dr John E. Almond, *Natura Viva* cc, CAPE TOWN

Borrow pit	Location (DMS)		Key Geological Units & Age	Potential fossil heritage	Palaeontological sensitivity	Recommended mitigation
	East	South				
<p>23</p> <p>Prince Albert DR01721/0.9/0.02L New</p>	22°28'22.66"	33°18'43.16"	<p>Waboomberg Formation or Karies Formation</p> <p>(Upper Bokkeveld Group)</p> <p>Middle Devonian</p>	Locally abundant shelly fossil assemblages (Waboomberg Fm) or land plants (lycopods) and trace fossils (Karies)	MEDIUM TO HIGH	Palaeontological field assessment before excavation commences
<p>24</p> <p>Prince Albert DR01721/3.7/0.02L Existing</p>	22°28'0.19"	33°19'51.53"	<p>Gydo Formation</p> <p>(Ceres Subgroup, Bokkeveld Group)</p> <p>Early Devonian</p>	Diverse shelly invertebrate biota (trilobites, molluscs, brachiopods, echinoderms <i>etc</i>) and trace fossils, rare fish remains & plants (lycopods), microfossils	HIGH	Palaeontological field assessment before further excavation commences
<p>25</p> <p>Prince Albert DR01721/8.4/0.02R Existing</p>	22°26'47.44"	33°21'34.6"	<p>Voorstehoek Formation</p> <p>(Ceres Subgroup, Bokkeveld Group)</p> <p>Early Devonian</p>	Moderately diverse shelly invertebrate biota (trilobites, molluscs, brachiopods, echinoderms <i>etc</i>) and trace fossils, rare fish remains & plants (lycopods), microfossils	MEDIUM	Palaeontological field assessment before further excavation commences
<p>19</p> <p>Prince Albert DR01721/16.15/0.01R Existing</p>	22°31'2.07"	33°22'46.67"	<p>Probably Voorstehoek Formation</p> <p>(Ceres Subgroup, Bokkeveld Group)</p> <p>Early Devonian</p>	Moderately diverse shelly invertebrate biota (trilobites, molluscs, brachiopods, echinoderms <i>etc</i>) and trace fossils, rare fish remains & plants (lycopods), microfossils	MEDIUM	Palaeontological field assessment before further excavation commences

Borrow Pit	Location (DMS)		1:50 000 Map Sheet	Key archaeological components and age	Potential archaeological heritage	Archaeological sensitivity	Recommended mitigation
	(East)	(South)					
23	22°28'22.66"	33°18'43.16"	3322 AD	The range of possibilities include:	Although this is a mountainous area	MEDIUM	As very little is known about
Prince Albert			Rosselerf	Early Stone Age artefacts	ESA & MSA artefacts are quite likely		the area and as this is a new
DR01721/0.9/0.02L				(older than 100 000 years)	to be found.		borrow pit it is recommended
New				Middle Stone Age artefacts	LSA sites may also be present.		that a Scoping Fieldwork
				(approx. 100 000 to 30 000 years)	Rock paintings may exist in rocky		Study, which includes GIS
				Later Stone Age artefacts	outcrops.		mapping and analysis, is
				(dating to within the last 30 000 years)			mapped out prior to any
				The presence of Khoekhoe herders			earthmoving or digging
				(over the last 1500 years)	These predictions are based		activities.
				Rock paintings & rock engravings	on a desktop study (Manhire &		
				(mainly within last 5000 years)	Patrick 2011) of all the sites known		
				Graves and unmarked burials	to exist in the general area.		
24	22°28'0.19"	33°19'51.53"	3322 AD	The range of possibilities include:	ESA & MSA artefacts are quite likely	MEDIUM	No archaeological
Prince Albert			Rosselerf	Early Stone Age artefacts	to be found in this area.		survey was carried out
DR01721/3.7/0.02L				(older than 100 000 years)	LSA sites may also be present.		when the existing borrow pit
Existing				Middle Stone Age artefacts	Rock paintings may exist in rocky		was excavated and no
				(approx. 100 000 to 30 000 years)	outcrops.		studies are known from the
				Later Stone Age artefacts	It is also possible that herder sites		immediate vicinity.
				(dating to within the last 30 000 years)	exist along the drainage lines		
				The presence of Khoekhoe herders	close to borrow pit 24.		It is recommended that a
				(over the last 1500 years)			Scoping Fieldwork Study,
				Rock paintings & rock engravings	These predictions are based		which includes GIS
				(mainly within last 5000 years)	on a desktop study (Manhire &		mapping and analysis,
				Graves and unmarked burials	Patrick 2011) of all the sites known		is carried out prior to any
					to exist in the general area.		further development.
25	22°26'47.44"	33°21'34.6"	3322 AD	The range of possibilities include:	ESA & MSA artefacts are quite likely	MEDIUM	No archaeological
Prince Albert			Rosselerf	Early Stone Age artefacts	to be found in this area.		survey was carried out
DR01721/8.4/0.02R				(older than 100 000 years)	LSA sites may also be present.		when the existing borrow pit
Existing				Middle Stone Age artefacts	Rock paintings may exist in rocky		was excavated and no
				(approx. 100 000 to 30 000 years)	outcrops.		studies are known from the
				Later Stone Age artefacts	It is also possible that herder sites		immediate vicinity.
				(dating to within the last 30 000 years)	exist along the drainage lines		
				The presence of Khoekhoe herders	close to borrow pit 25.		It is recommended that a
				(over the last 1500 years)			Scoping Fieldwork Study,
				Rock paintings & rock engravings	These predictions are based		which includes GIS
				(mainly within last 5000 years)	on a desktop study (Manhire &		mapping and analysis,
				Graves and unmarked burials	Patrick 2011) of all the sites known		is carried out prior to any
					to exist in the general area.		further development.
20	22°31'2.07"	33°22'46.67"	3322 BC	The range of possibilities include:	ESA & MSA artefacts are quite likely	MEDIUM	No archaeological
Prince Albert			De Rust	Early Stone Age artefacts	to be found in this area.		survey was carried out
DR01721/16.5/0.01R				(older than 100 000 years)	LSA sites may also be present.		when the existing borrow pit
Existing				Middle Stone Age artefacts	Rock paintings may exist in rocky		was excavated and no
				(approx. 100 000 to 30 000 years)	outcrops.		studies are known from the
				Later Stone Age artefacts			immediate vicinity.
				(dating to within the last 30 000 years)			
				The presence of Khoekhoe herders	These predictions are based		It is recommended that a
				(over the last 1500 years)	on a desktop study (Manhire &		Scoping Fieldwork Study,
				Rock paintings & rock engravings	Patrick 2011) of all the sites known		which includes GIS
				(mainly within last 5000 years)	to exist in the general area.		mapping and analysis,
				Graves and unmarked burials			is carried out prior to any
							further development.



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: **11928JB27**
(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



Divisional Road 01721, Klaarstroom

Prince Albert – 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 an existing borrow pit located along Divisional Road 01721 approximately 9km to the southwest of Klaarstroom in Prince Albert Municipality, Central Karoo in the Western Cape. *vidamemoria* appointed Madelon Tusenius (*Natura Viva CC*) to conduct necessary archaeological impact assessment (dated March 2012). 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).

No Stone Age or herder archaeological remains were observed on the ground or in heaps of stone from past agricultural activity and the excavation of geotechnical test pits. The site under consideration is of low archaeological heritage significance. No impact on archaeological resources is expected if expansion of existing pit proceeds. The proposed borrow pit site is also considered to be of low palaeontological 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 archaeological studies or mitigation is recommended and the proposed borrow pit should 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 **proposed expansion of an existing borrow pit located along Divisional Road 01721 near Klaarstroom, Central Karoo**. NID dated 14 September 2011 was submitted to Heritage Western Cape (HWC) for consideration. Response dated 03 October 2011 (**case ref 11928JB27**) requested 'a heritage impact assessment limited to an archaeological scoping' (Refer Annexure A). *vidamemoria* appointed 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	Archaeological specialist study conducted by Madelon Tusenius, Natura Viva CC (March 2012)	

Site location and description

Expansion of borrow pit along DR01721 at km 8.4 is located on the farm Kleinvlei approximately 8.7 km to the southwest of Klaarstroom in the Prince Albert Municipality of the Central Karoo District. Expansion site is located to the north of the Swartberg mountain range, up-slope of a dam, a converted former quarry, which stores water used for irrigation. The site lies in disturbed, agricultural land adjacent to a dam and is bounded by the road to the east and a small rocky slope adjacent to the road in the south. Farm Kleinvlei is owned by the Avondrust Family Trust. Site co-ordinates are 33° 21' 31.50"S 22° 26' 48.06"E.



Figure 2: Looking northwest across the site of proposed expansion located between road DR01721 and existing dam (April 2011)



Figure 3: Looking west across site of proposed expansion located to the south and east of existing farm dam (April 2011)



Figure 4: Aerial view of proposed borrow pit location (Tusenius, March 2012)

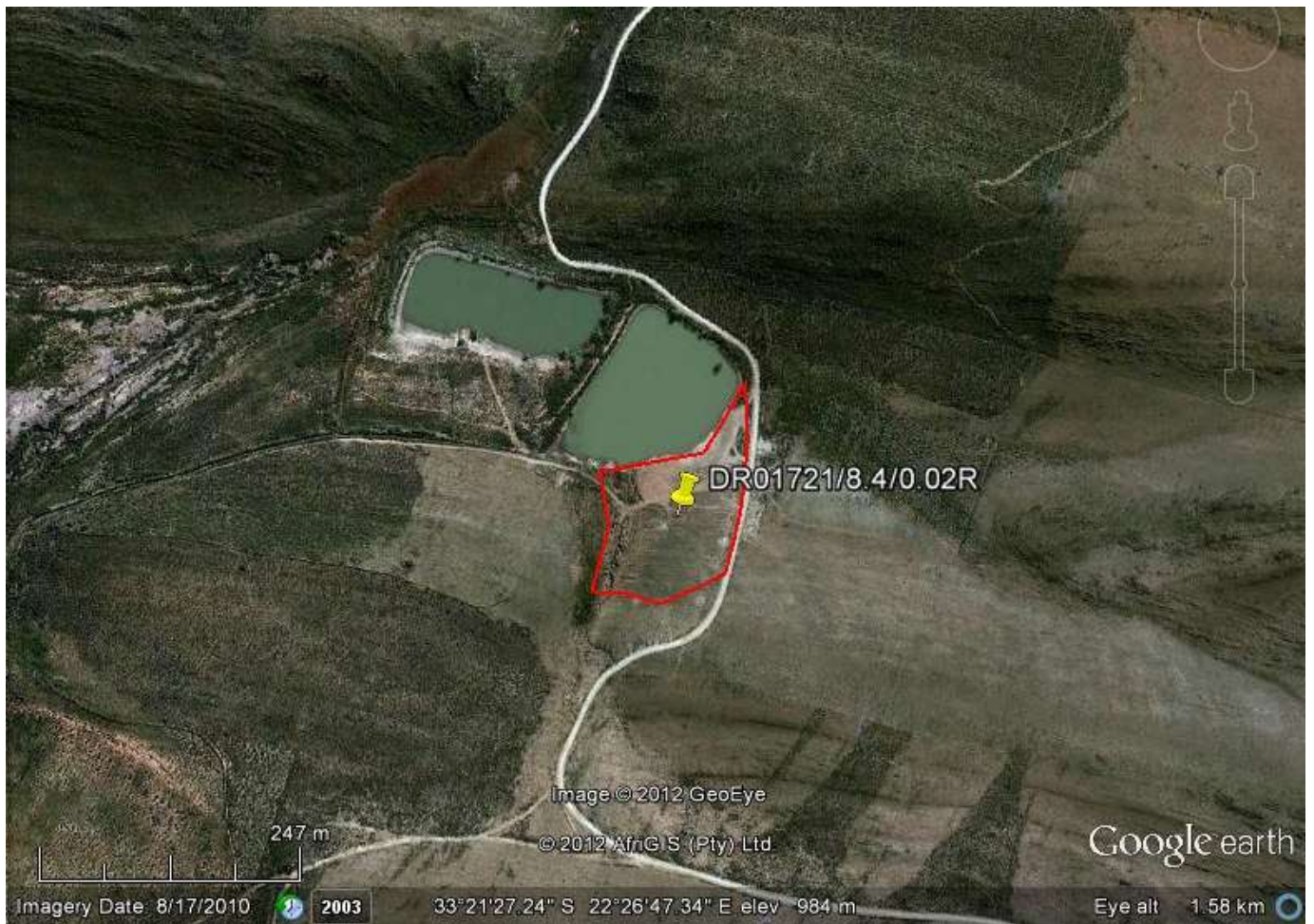


Figure 5: Aerial view of proposed borrow pit location (Google earth image, April 2012)

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 MPRDA, 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 MPRDA, 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 the **borrow pit at km 8.4 along DR 01721** 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. Proposed borrow pit will be utilised for the sourcing of approximately 1 3267m³ of wearing course gravel for use in regravelling. It is estimated that approximately 52 400m³ of gravel wearing course is available from this pit. The end-use of this borrow pit would be a dam.

Summary of borrow pit	
Borrow pit area	15 000 m ²
Maximum depth	5 m
Material description	Bokkeveld shale
Proposed usage after rehabilitation	Dam
Volume of material to be sourced at a depth of 2 m	18 300 m ³
Volume of material to be sourced at a depth of 5 m	38 500 m ³
Volume of material available	52 400 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:

- Request by farmer to enlarge dam
- Request that once borrow pit worked out to remove wall between existing dam and borrow pit to enlarge dam
- Prevent the borrowing of material resulting in loss of water or contamination

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.

Key Geological Units and age are Waboomberg or Karies Formation of early middle Devonian age Gydo and Voorstehoek Formation of early Devonian age with potential shelly fossil assemblages, land plants and trace fossils as well as diverse shelly invertebrate biot, fish remains and microfossils considered to be of low palaeontological value (desktop survey conducted by Dr John Almond, August 2011).

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 Stone Age or herder archaeological remains were observed on the ground or in heaps of stone from past agricultural activity and the excavation of geotechnical test pits. A historical dry stone wall is located approximately 70 m to the southwest of the site.

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 significance has been identified as low and no further heritage resources were identified.

Heritage significance

The site under consideration is of low archaeological heritage significance (Tusenius (2012: 10)). 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: The proposed 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 the proposed borrow pit. 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: Existing borrow pits are used as water retention facilities (dams) to supply water for livestock. The expanded borrow pits and the new borrow pits proposed will serve the same purpose.

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 proposed 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.

The site under consideration is of low archaeological heritage significance. No impact on archaeological resources is expected if expansion of existing pit proceeds (Tusenius 2012: 10). Proposed expansion will not affect the stone wall as the site will be fenced off and is located a distance away.

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 expansion of existing borrow pit proceed.

Recommendations

It is therefore recommended that:

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

References:

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- vidamemoria (September 2011): *Notification of Intent to Develop*

**ARCHAEOLOGICAL IMPACT ASSESSMENT
OF A PROPOSED BORROW PIT ON KLEINVLEI,
KLAARSTROOM, PRINCE ALBERT MUNICIPALITY,
WESTERN CAPE**

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

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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 a proposed borrow pit DR1721/8.4/0.02R (Vidamemoria pit 25) on the farm Kleinvlei, approximately 8.7 km to the southwest of Klaarstroom in Prince Albert Municipality of the Central Karoo District. No new roads will have to be constructed during the development of the site as access to the pit will be from existing roads and tracks. Pit 25 will be incorporated into the existing adjacent dam after development.

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. Dr L Webley of ACO Associates acted as the Principal Investigator supervising the study done by M Tusenius of Natura Viva cc. The field assessment was conducted on foot on 17 February 2012.

No Stone Age or herder archaeological remains were observed on the ground or in heaps of stone from past agricultural activity and the excavation of geotechnical test pits. A historical dry stone wall is located approximately 70 m to the southwest of the affected area.

The site under consideration is of low archaeological heritage significance. No impact on archaeological resources is expected if the proposed borrow pit development proceeds. No further archaeological studies or mitigation are therefore recommended.

TABLE OF CONTENTS

EXECUTIVE SUMMARY.....	2
1. INTRODUCTION.....	4
2. LEGAL FRAMEWORK.....	4
3. TERMS OF REFERENCE.....	5
4. STUDY APPROACH.....	5
4.1 Methods.....	5
4.2 Limiting factors.....	5
5. DESCRIPTION OF AFFECTED ENVIRONMENT AND SITE.....	5
5.1 Archaeological background.....	5
5.2 Borrow pit DR1721/8.4/0.02R (Vidamemoria pit no. 25).....	6
6. SIGNIFICANCE AND RECOMMENDATIONS.....	10
7. REFERENCES.....	10
8. ACKNOWLEDGEMENTS.....	10

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) at the site of a proposed borrow pit DR1721/8.4/0.02R (Vidamemoria pit 25) on the farm Kleinvlei, approximately 8.7 km to the southwest of Klaarstroom (Figure 1). Klaarstroom lies in the Prince Albert Municipality of the Central Karoo District, to the north of the Swartberg mountain range. Material excavated from the borrow pit will be used for the re-gravelling of portions of road DR01721. The proposed borrow pit is located up-slope of a dam, a converted former quarry, which stores water used for irrigation (Figure 2). Pit 25 will be incorporated into the existing dam after development. No new roads will have to be constructed as access to the pit under consideration will be from existing roads and tracks.



Figure 1: Google earth image showing the location of proposed borrow pit DR1721/8.4/0.02R (Vidamemoria pit 25), approximately 8.7 km to the southwest of Klaarstroom. The N12 cuts through the Swartberg at Meiringspoort, to the south of Klaarstroom. The relevant 1:50 000 topographical map is 3322AD Rosselserf.

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 110928JL27) 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

The field survey was undertaken by the author on 17 February 2012. Site plans indicating the affected areas were provided by Aurecon. The proposed borrow pit and the area across the road were covered on foot. Archaeological occurrences and tracks were recorded by a Garmin GPSMAP 60CSx set on the WGS84 datum. Relevant occurrences and their context were photographed.

4.2 Limiting factors

Archaeological visibility on the ground was generally good as the vegetation was fairly sparse. The only exception was in the extreme west of the affected area where there was a dense growth of shrubs.

5. DESCRIPTION OF AFFECTED ENVIRONMENT AND SITES

5.1 Archaeological background

It appears that few Archaeological Impact Assessments have been previously carried out in the Klaarstroom area. No such studies were noted on the SAHRA Archaeology, Palaeontology and Meteorite Unit Report Mapping Project DVD (2009). A few studies further to the north are not directly relevant as they deal with sites on the plains of the Great Karoo rather than the foothills of the Swartberg. There appear to be no entries for material collected or studied from Klaarstroom in the accession register of the data base housed at Iziko: South African Museum (S Ouzman, pers. comm.) I am only aware of a 2010 study undertaken at several sites in and near Klaarstroom by Van Pletzen-Vos & Rust. No archaeological remains were observed at any of the surveyed areas during this study.

During 2010 a local resident alerted Natura Viva cc to the presence of Stone Age artefacts near Kluesplaas, several kilometers to the north of the study area, and showed us some of the specimens (P Roux, pers. comm). They were quartzite Early Stone Age (ESA) bifaces and quartzite cores which may be ESA or Middle Stone Age (MSA). While doing palaeontological field work in the region to the west of Klaarstroom a very occasional

quartzite flake was observed by Natura Viva members. It is concluded that there is probably a low archaeological visibility in the general area.

5.2 Borrow pit DR1721/8.4/0.02R (Vidamemoria pit 25)

Approximate area: 150 m x 100 m

Location: S 33° 21' 31.50" E 22° 26' 48.06"

Farm name and number: Kleinvlei (Klein Valie 182)

Environment: The affected area lies in disturbed, agricultural land adjacent to a dam in a bend of the DR01721, a circular route in the foothills of the Swartberg from Klaarstroom to Meiringspoort, where the N12 runs between Beaufort West and De Rust. The dam is a converted former quarry which stores water for irrigation. The proposed borrow pit lies up-slope from the dam and is bounded by the road to the east and a small rocky slope adjacent to the road in the south (Figures 2, 3 and 4). An erosion gully (donga) lies immediately to the west (Figure 5). Colluvial gravelly, silty sand overlies weathered Bokkeveld Group shale which can be seen in the floor of the donga. Fragments and slabs of sandstone, quartzite and mudstone lie on the surface of the surveyed ground, as well as heaped next to geotechnical test pits. The quartzite originates from the old land surfaces along the Swartberg (J Almond, pers. comm.). Lumps of natural quartz occur within the gravelly sand. Heaps of rocks removed during past ploughing are also present (Figures 6 and 7). The vegetation has been disturbed by this agricultural activity and the remains of burnt shrubs provide evidence of a recent fire. The re-grown vegetation consists of low bushes, e.g. renosterbos (*Elytropappus* sp.) and sparse grass with the result that archaeological visibility on the ground is good. Visibility was only a problem in the small piece of ground to the west of the donga where there was a dense cover of indigenous shrubs and tall grass.



Figure 2: Google earth image showing the location of the proposed borrow pit 25 and the tracks recorded. The erosion gully (donga) lies immediately to the west of the study area and the closest end of the dry stone wall lies approximately 70 m to the southwest.



Figure 3: View across the affected area towards the dam in the north. The donga is visible on the left of the photo.



Figure 4: View of the affected area looking towards the Swartberg in the south. Low, fairly sparse vegetation covers the colluvial gravelly, silty sand on the surface here.



Figure 5: View northwards along the donga to the west of the affected area of pit 25. Slabs of weathered Bokkeveld shale are visible in the bottom of the donga.



Figures 6 and 7: Heaps of stone from past ploughing in the foreground and from a geotechnical pit in the background; detail of some of the heaped rocks. The ruler is 15 cm in length.

Results of survey: The affected area and some land to the east of the road were surveyed (Figure 2). No archaeological remains were observed on the ground or in the heaps of rock. This was somewhat surprising given that Stone Age tools have been found in the general area (see section 5.1) and the fact that the quartzitic boulders, deriving from the old land surfaces, would provide a good source of raw material. Several quartzite exfoliation flakes, which could be confused with artefacts, were noted.

The only feature of historical interest observed lies outside the study area. It is a dry stone wall curving down from the crest of the little ridge to southwest of the donga (Figures 2, 8 and 9). The end of the wall which lies closest to the proposed pit is approximately 70 m away.

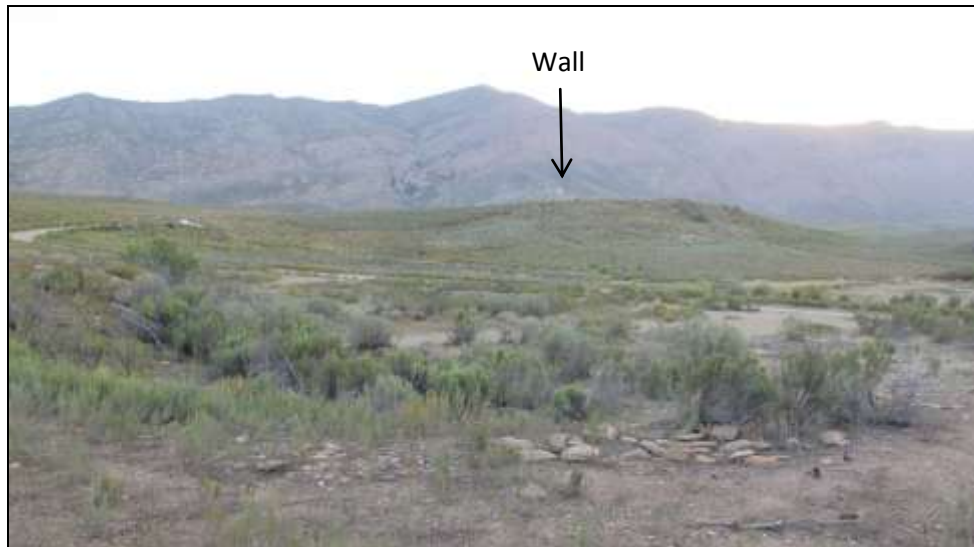


Figure 8: View to the pit 25 site from the northeast. The stone wall descends from the crest of the little ridge in the middle ground. It lies approximately 70 m from the affected area.



Figure 9: Close up of the dry stone wall viewed from the northeast.

6. SIGNIFICANCE AND RECOMMENDATIONS

No Stone Age or herder archaeological remains were observed in the area under consideration so the site is of low archaeological heritage significance. The dry stone wall observed lies outside the study area and there should be no direct impact on it, other than dust from the excavating activities. The proposed pit area is too far away from rocky outcrops where rock paintings may be found, so no impact on such heritage resources is predicted.

No impact on archaeological resources is expected if the proposed borrow pit development proceeds. No further archaeological studies or mitigation are therefore recommended.

7. REFERENCES

SAHRA. 2009. Archaeology, Palaeontology and Meteorite Unit Report Mapping Project DVD. Version 1.0.

Van Pletzen-Vos, L & Rust, R. 2010. Phase 1 Archaeological Impact Assessment on Portion 34 & 29 of Farm 178, Prince Albert, District DC5 (Klaarstroom) Western Cape. Report prepared for Cape Lowlands Environmental Services cc. Pro-Active Archaeology.

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 Sven Ouzman, Social History Department, Iziko South African Museum, kindly checked the accession register for Klaarstroom entries and Dr Liezl van Pletzen-Vos sent me a copy of the Pro-Active Archaeology report. Dr Paul Roux alerted Natura Viva cc to the presence of Stone Age material in the area.