

**DESKTOP HERITAGE IMPACT ASSESSMENT: PROPOSED 1.5 HA
EXTENSION OF GRAVEL MINE, PORTION 2 OF THE FARM
AROAMS 57, NEAR AGGENEYS, NORTHERN CAPE PROVINCE**

(Assessment conducted under Section 38 (8) of the
National Heritage Resources Act 25 of 1999)

Prepared for:
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JUNE 2012



Prepared by:

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EXECUTIVE SUMMARY

ACO Associates cc was appointed by Greenmined Environmental on behalf of the client Raumix Aggregates (Pty) Ltd to undertake a desktop heritage Impact Assessment for the extension of a gravel mine (borrow pit) by an additional 1.5ha.

The proposed mining area is within an historic gravel pit and will therefore be a continuation of the same operation. This desktop HIA forms part of a Mine Permit Application for the extension of the mine.

The mine is located on Portion 2 of the farm Aroams 57, some 3km north of the N14. Earlier fieldwork by Webley & Halkett (2012) on Portion 1 of the farm Aroams suggests that while stone artefact scatters may be found in the area, they are generally considered to be of low significance and no mitigation is required.

A desktop review of the literature for the surrounding area suggests the following:

Palaeontology:

- The bedrock under the property is unfossiliferous and of no palaeontological significance. A letter of exemption from John Pether is included in this report.

Archaeology:

- Field surveys to the west, south and north of the property have identified background scatters of stone artefacts. They are generally of low significance as there is no evidence of discrete sites, and there is no associated archaeological material;
- Fieldwork is considered unnecessary in this case.

The Built Environment:

- There are no buildings of heritage significance on the site.

Graves:

- Due care should be taken during construction of the site and if human remains are uncovered, work should stop in that area and SAHRA should be notified.

Cultural Landscape:

- The gravel mine is located 3 km to the north of the N14 and 7.5km north-west of the Gamsberg;
- The landscape of the surrounding area has been significantly impacted by mining activities;
- The size of the gravel mine (1.5 ha) means that its visual impact will be negligible.

Summary

The potential impact of the proposed extension of the gravel mine on the heritage resources of the area are considered to be of minor significance, and no further fieldwork is recommended.

SPECIALIST TEAM AND DECLARATION OF INDEPENDENCE

Lita Webley (BA, BA Hons, MA (Stellenbosch), PhD (UCT)) is an Archaeologist and member of ASAPA accredited with Principal Investigator status. She has been involved with heritage and archaeological impact assessments on a part-time basis since 1996 and full time since 2008. Her PhD thesis was concerned with the archaeology of the Namaqualand region of the Northern Cape and she is familiar with the heritage of the region.

John Pether (MSc. Pr. Sci. Nat. (Earth Sci)) is an independent consultant/researcher and authority on coastal-plain and continental-shelf palaeo-environments.

Dr Lita Webley and Mr John Pether are independent specialist consultants who are in no way connected, financially or otherwise, with the proponent, other than in the delivery of consulting services on the project.

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Geological and Palaeontological Consultant**

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SAHRA Ref. No. 9/2/066/0001

DMR Ref: NCS 30/5/1/3/3/2/1(100052)MP

12 June 2012

The Senior Heritage Officer
Archaeology, Palaeontology and Meteorite Unit
South African Heritage Resources Agency
PO Box 4637
Cape Town, 8000

**NOTE IN SUPPORT OF EXEMPTION FROM DESKTOP PALAEOLOGICAL
IMPACT ASSESSMENT: ENVIRONMENTAL MANAGEMENT PLAN FOR THE
PROPOSED EXTENSION OF EXISTING RAUMIX AGGREGATES (PTY) LTD.
QUARRY NEAR AGGENEYS, NORTHERN CAPE
Portion of Portion 2 of the Farm Aroams 57, Namaqualand**

GREENMINED ENVIRONMENTAL is managing a mining application on behalf of Raumix Aggregates (Pty) Ltd. that involves an extension to an existing quarry near Aggeneys in the Northern Cape Province. The proposed mining area will be 1.5ha.

The quarry exploits granite-gneiss bedrock which is crushed for road-making aggregate. The Koeipoort Granite is part of the highly-metamorphosed Late Precambrian rocks of the Aggeneys Subgroup (Bushmanland Group). Previously subsumed in the "Stalhoek Complex" (Figure 1). This bedrock is not fossiliferous. Quaternary aeolian sand and colluvium mantles the bedrock, but these deposits are very poorly fossiliferous. Moreover, the site of the quarry is effectively bedrock outcrop, with minor Quaternary overburden. **I respectfully submit for consideration by SAHRA that the quarry extension will not impact fossil heritage and that it be exempted from the requirement of a desktop PIA.**

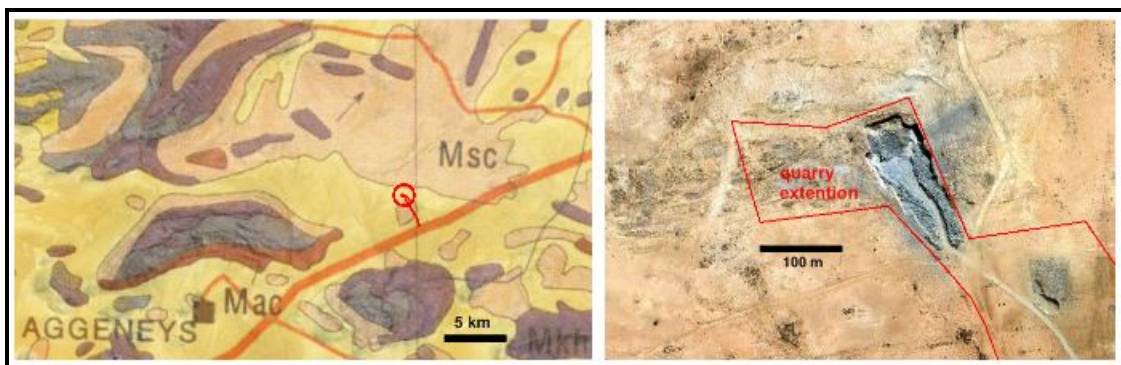
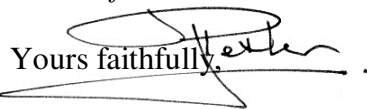


Figure 1. Left: The site (red circle), located on the 1:1000000 geological map. Msc = Stalhoek Complex schists and gneisses that includes the exploited Koeipoort Granite. Right: Detail of site.

Yours faithfully, 

John Pether

1. INTRODUCTION

ACO Associates cc was appointed by Greenmined Environmental on behalf of the client Raumix Aggregates (Pty) Ltd to undertake a desktop Heritage Impact Assessment for the 1.5 ha extension to an existing gravel pit on Portion 2 of the farm Aroams 57, located to the north of the N14 connecting Aggeneys to Pofadder.



Figure 1: The location of the proposed facility on the N14 between Aggeneys and Pofadder.



Figure 2: Location of the proposed gravel mine with respect to the Gamsberg in the south-west, and the village of Aggeneys to the west.

2. DEVELOPMENT PROPOSALS

The proposed mining area is within an historic gravel pit and this project will therefore be a continuation of the same operation.

The areas allocated for mining and stockpiling will first be stripped of all topsoil. This topsoil will be stockpiled separately for later use when the quarry is rehabilitated. Any overburden will be removed separately and either crushed for lower grade aggregates or stockpiled separately for later use when the quarry is rehabilitated. Blasting of rock will be done by in-house personnel. Material will then be fed into the primary feeder bin of the tracked mobile crusher that will travel into the pit for the crushing operation and will move out of the pit during blasting operations. Quarry operations would take cognizance of the 3 meter benching required for the final rehabilitation of the quarry.

Crushed products will be loaded with a CAT 938 H Loader onto 20ton BELL ADT's and transported to temporary stockpile area which will all be fenced off together with the quarry excavation. The estimated footprint of the excavation is 1.5 Ha.

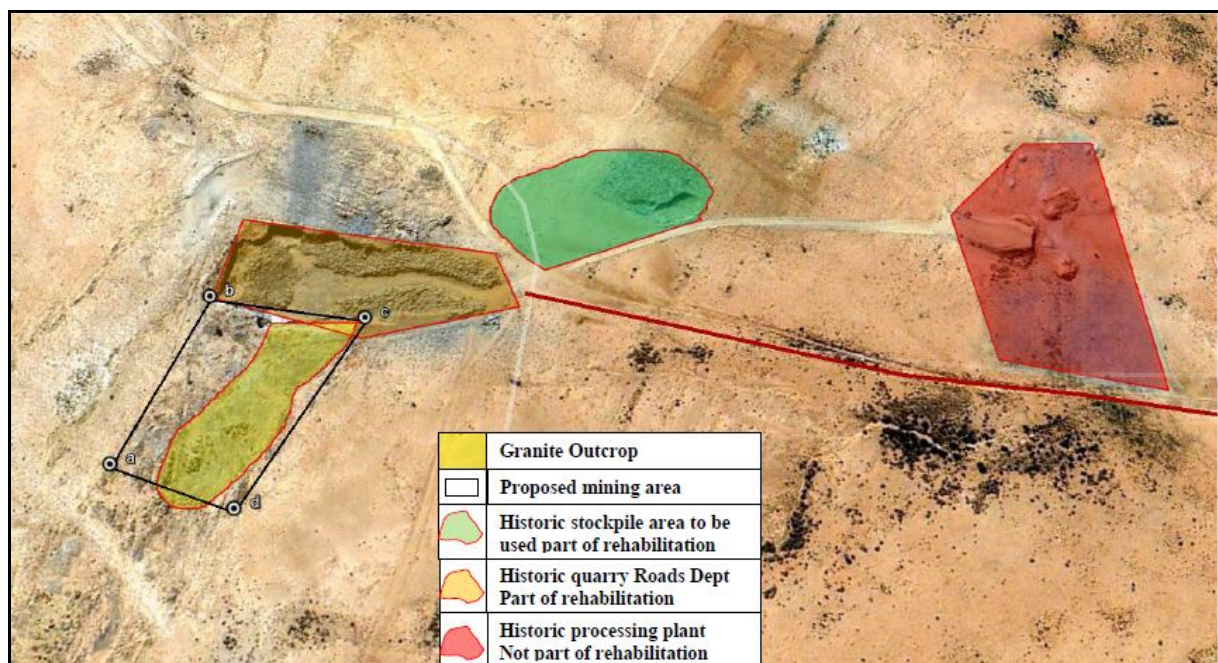


Figure 3: Landscape showing the main mining activities such as excavations, stockpiles, discard dumps and dams, water supply dams and boreholes, accommodation, buildings and processing plants. Note the extensive impact on the existing terrain.

No infrastructure will be affected due to the remote locality of the operation. Existing roads and tracks will be used and in the case of new tracks, this will be addressed at the final closure of the mining operation and rehabilitation.

3. TERMS OF REFERENCE

This assessment includes:

- A letter of exemption from further palaeontological work by Mr John Pether;
- A desk top study to determine the pre-history and history of the property;
- The rating of significance of heritage resources on the property;
- An assessment of whether the development of the property will result in a loss of significant heritage resources;

- Recommendations for mitigation if necessary.

4. LEGISLATION

The National Heritage Resources Act, No 25 of 1999 (Section 38 (1)) makes provision for a compulsory notification of the intent to development when any development exceeding 5000 m² in extent, or any road or linear development exceeding 300m in length is proposed.

The NHRA provides protection for the following categories of heritage resources:

- Cultural landscapes (Section 3(3))
- Buildings and structures greater than 60 years of age(Section 34)
- Archaeological sites greater than 100 years of age(Section 35)
- Palaeontological sites and specimens
- Shipwrecks and aircraft wrecks
- Graves and grave yards (Section 36).

Only the Western Cape and Kwa-Zulu Natal have functioning Provincial Heritage Authorities, and consequently SAHRA administers heritage in the remaining provinces particularly where archaeology and palaeontology are the dominant concerns. Heritage Northern Cape (Ngwao Boswa Kapa Bokoni) deals largely with built environment issues at this stage. Amongst other things the latter administers:

- World Heritage Sites
- Provincial Heritage Sites
- Heritage Areas
- Register Sites
- 60 year old structures
- Public monuments & memorials

Archaeology, including rock art, graves of victims of conflict and other graves not in formal cemeteries are administered by the national heritage authority, SAHRA.

5. DESCRIPTION OF THE AFFECTED ENVIRONMENT

The area is characterised by an expansive, undulating landscape of red sandy soils covered in dry grasslands and dominated by scattered ancient rocky outcrops, named inselbergs (koppies). The sands and calcretes are of Quaternary origin. No drainage channels occur within the mining area.

In general, the human impact on the environment is limited to farm fences and wind pumps. In this particular area, the land has already been used for the mining of gravel, and significance disturbance of the soil has already occurred.

The site is accessed directly from the N14 via the existing farm road (Figure 4).



Figure 4: Aerial view of existing mining area and the extent of the proposed extensions.



Plate 1: Typical landscape in this general area - flat grassy plains with the mountains in the background.



Plate 2: View of a gravel pit on the pipeline between Pofadder and Pella. This area is just to the north of Aroams 57/2.

6. BACKGROUND TO THE AREA

6.1 Palaeontology

The letter of exemption from further palaeontological work was prepared by Mr John Pether and is appended in full at the start of this report. In brief, the PIA report describes the bedrock of the area as Koeipoort Granite, which is part of the highly-metamorphosed Late Precambrian rocks of the Aggeneys Subgroup (Bushmanland Group). This bedrock is not fossiliferous.

The overlying Quaternary sand cover is very poorly fossiliferous.

6.2 Archaeological Background

Information on the pre-colonial archaeology of the area is derived from a number of impact assessment reports which have been undertaken in the last few years. In general, Morris (2011c) notes that archaeological visibility around Aggeneys and Pofadder is low.

Morris' (2010) survey of the northern slopes of the Gamsberg (7.5 km south-west of the gravel mine) has identified five significant sites on the northern rim of the mountain (Figure 2). It includes an MSA factory, two ESA (Acheulian) workshop sites, a mixed ESA and MSA site and a small cave with no deposit. Morris explains the presence of the MSA site in proximity to the Gamsberg as the need for access to suitable raw material. The appropriate raw material is not easily accessible on the plains between Aggeneys Mountain and the Gamsberg.

Pelser (2011) in his survey of an area around the Paulputs substation near Pofadder describes finding material from the Middle and Later Stone Age, although his illustrations appear to be of LSA artefacts made on quartz. He also mentions the presence of ostrich eggshell.

According to Morris (2011a) Later Stone Age (LSA) sites are the predominant archaeological trace noted in surveys in the Aggeneys-Pofadder region. However, his (2010) surveys of the northern slopes of the Gamsberg identified very few isolated LSA flakes. To the north-west of the Gamsberg he found two stone cairns which could represent graves, as well as a ceramic LSA site. These isolated LSA settlements occur on the plains rather than on the slopes of the Gamsberg itself.

These sites probably represent transient settlement by transhumant hunter-gatherers or herders, moving through the area. Morris refers to Beaumont *et al.* (1995) who have written that "virtually all the Bushmanland sites [LSA] so far located appear to be ephemeral occupations by small groups in the hinterland on both sides of the [Orange] river" (1995:263). This was in sharp contrast to the substantial herder encampments along the Orange River floodplain itself.

In his assessment for an underground pipeline between Pofadder and Pella, Halkett (2010) followed the pipeline over a distance of 15km, ending just to the north of the farm Aroams 57, and he noted that no archaeological material was noted along the pipeline corridor.

In fieldwork conducted by Webley & Halkett (2011) for a new transmission line commencing at the Aggeneys substation, it was observed that LSA sites (consisting mainly of quartz flakes) were concentrated at the base of small koppies. This information is supported by Morris (2011a, b & c) and Pelser (2011). "Surveys have located signs of human occupation

mainly in the shelter of granite koppies, on red dunes which provided clean sand for sleeping, or around the seasonal pans (Beaumont *et al.* 1995).

Finally, in a survey of Portion 1 of the farm Aroams 57, Webley & Halkett (2012) found a background scatter of predominantly quartz, and some quartzite artefacts. The material is particularly prevalent in those areas where the soil surface is covered in quartz pebbles and cobbles. The size of the artefacts suggests that they are of Middle Stone Age date. There are no distinctive features of the artefacts to categorically classify them as MSA. In general, the scatter of stone tools is very widely distributed and does not appear to be concentrated in any specific location. Webley & Halkett (2012) did not think that any mitigation was required.

6.3 Historical Background

Morris (2010) has summarised the colonial history of this frontier zone in his reports for the Aggeneys and Gamsberg areas. Early travel accounts show that “Place names were becoming fixed in this colonial frontier period (in a cadastral sense, on maps and in farm names), many such names having Khoe-San origins encapsulating vestiges of pre-colonial/indigenous social geography”.

Morris (2010) comments that place names, such as Aggeneys/Aggeneis and Gams (Gamsberg) are derived from Nama names. He reviews the various interpretations for the name Aggeneys including the oral history which suggests that a massacre of Bushmen took place in a kloof at Aggeneys (Nienaber & Raper 1977:173). Other interpretations include the possibility that it means “place of red clay” or that it is associated with reeds. Morris (2010) also refers to the thesis by Burger (1986) which links the killing of the Bushmen with the Gamsberg rather than Aggeneys. Morris (2010) comments that recently appreciation has started emerging regarding the “genocide against the Bushmen in this area, with certain mountainous areas (like Gamsberg near Aggeneys) being likely massacre sites”.

Nienaber and Raper cite a local farmer who similarly asserted that the origin of *Gams* or *Gaams* was in the word *Tha-aams*, where *Tha* means “grass” and *aams* means “mouth”. The Nama */Gâ-ams* literally means “Grasmond” or “Grasfontein” (Nienaber & Raper 1977).

According to the Surveyor General’s records, the farm Aroams 57 was surveyed and granted in 1895. This suggests a relatively recent date for the settlement of the area. Morris (2011c) explains that the name is derived from the Nama *‡aro-* meaning “wag-’n-bietjie” tree (*Ziziphus mucronatus*) and *am* or *am-s* meaning “mouth”. The name could thus be translated as “Wag-’n-bietjebosfontein” (Nienaber & Raper 1977).

6.4 Cultural Landscape

The only identified land use in this area is small stock grazing. Due to the temporary nature, and small scale, of the proposed mining operation, it is anticipated that the land will revert back to its former grazing with no impact on production. The proposed gravel mining will take place on farmland, and will not be close to any settlement. The visual impact is likely to be minimal.

The only Cultural Landscape issue which is of significance in this area is the “Cultural Heritage of the Gamsberg”, which is located at least 7.5 km to the south-west of the gravel pit.

Morris (2010) comments: “a call has been made for massacre sites to be identified and declared as Provincial Heritage Sites”. Morris notes that sites such as the Gamsberg could ultimately form part of a /Xam and Khomani Heartland World Heritage Site, already on South

Africa's tentative list. However, it is likely that the main centre for the /Xam WHS will be further south-east, between Kenhardt and Carnarvon.

It is important to point out that the Cultural Landscape of the area between Aggeneys and Pofadder has already been significantly impacted by open cast mining at Black Mountain; the excavation of mining shafts into the northern rim of the Gamsberg; the proposed construction of a solar photovoltaic facility between Gamsberg and Aggeneys and the erection of a number of high voltage transmission lines.

It could be argued that the landscape has already been significantly transformed and the impact of a gravel pit some 3 km to the north of the N14 will be negligible.

7. METHODOLOGY

This HIA report suggests that a desktop assessment is sufficient to address the requirements of the NHRA for the following reasons:

- The proposed extension of the gravel mine will occur in an area which is already disturbed by historic gravel mining;
- The total area of disturbance is only 1.5 ha;
- Contract work on adjoining farms suggests that the likelihood of finding archaeological sites of significance is very low;
- Similarly, a letter of exemption by a palaeontologist indicates that the underlying bedrock is unfossiliferous;
- No other heritage resources, such as built structures over 60 years old, burial grounds, etc occur on this particular portion of the farm, which is located a considerable distance from the main farmhouse.

8. IMPACT IDENTIFICATION AND ASSESSMENT

This impact assessment identifies and evaluates the impacts of the proposed extension of the quarry on the heritage resources of the site. The general area has already been disturbed by historic mining activities.

With respect to Palaeontology, the PIA report indicates that the bedrock under the property is unfossiliferous and of no palaeontological significance. The potential for fossils in the Quaternary sand cover is very low.

It is not anticipated that there will be an impact on *in situ* archaeological sites. While stone artefacts may occur within the proposed mining area, they will already be impacted by historic mining of the area, which is likely to have resulted in disturbance of the top soil. For this reason, the impact of the proposed development on the archaeology of the area is likely to be low.

Table 1: Summary of impacts to archaeological material

Nature of Impact: Impacts to archaeological material could involve destruction of stone artefacts		
	Pre- Mitigation	Post- Mitigation
Extent	Local	Local
Magnitude	On-site	On-site
Duration	Permanent*	Permanent*
Intensity	Negligible	Negligible
Probability	Possibly	Possibly

Significance	Low	Low
Mitigation: Although some archaeological material may be impacted, the impact is considered Low. In the <u>unlikely</u> event that unmarked graves are present and found during the construction phase, work at that location must be halted, the feature should be cordoned off and the heritage authority (SAHRA) notified. They are likely to suggest mitigation in the form of exhumation. No mitigation has been suggested.		
Cumulative Impacts: None		
Operational Phase: n/a		
Decommissioning Phase: Rehabilitation of the landscape will not have any bearing on the archaeology of the site.		

* Once archaeological material is destroyed, it cannot be renewed or replaced.

There are no buildings or structures on that portion of the property identified for the development of the facility. The impacts to the Built Environment are considered to be negligible.

Table 2: Summary of impacts to Cultural Landscape

The EMP report observes that the change in topography, as a result of the excavation, will result in an impact on the visual aspects of the landscape. However, the gravel mine is 3 km to the north of the N14 and will not result in a significant impact on the landscape.

Nature of Impact: The proposed facility may have a visual impact on the cultural landscape		
	Pre- Mitigation	Post- Mitigation
Extent	Local	Local
Magnitude	Local	Local
Duration	Life span of mine	Life span of mine
Intensity	Medium	Medium
Probability	Unlikely	Unlikely
Significance	Low	Low
Mitigation: The rehabilitation programme will result in the area being restored to its original condition		
Cumulative Impacts:		
Operational Phase: n/a		
Decommissioning Phase: n/a		

The applicant will be responsible for the rehabilitation of the historic disturbances within the application area. The goal of rehabilitation with respect to the area is to leave the area level and even, and in a natural state. All stockpiles will be re-moved and stockpiles will be backfilled into the excavation. In terms of a physical transformation of the landscape, the removal and crushing of the gravel for road building purposes will result in a trench of at least 10 m deep. After completion of the mining, the sides of the excavation will be profiled or stepped with contours to prevent erosion.

9. CONCLUSIONS

In conclusion, the following heritage indicators were considered:

Palaeontology:

- The bedrock under the property is unfossiliferous and of no palaeontological significance. The potential for fossils in the Quaternary sand cover is very low.

Archaeology:

- Fieldwork on adjoining properties suggests it is highly likely that no significant, *in situ* archaeological material is expected in the proposed mine area;
- Further field studies are considered unnecessary in this case.

The Built Environment:

- There are no buildings of heritage significance on the site.

Graves:

- Due care should be taken during construction of the site and if human remains are uncovered, work should stop in that area and SAHRA should be notified.

Cultural Landscape:

- The cultural landscape of the surrounding area has been significantly impacted by mining activities;
- The size of the gravel mine (1.5 ha) means that its visual impact will be negligible.

The potential impact of the proposed extension of the gravel mine on the heritage resources of the area are considered to be of minor significance, and no further fieldwork is recommended.

10. REFERENCES

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12 June 2012

The Senior Heritage Officer
Archaeology, Palaeontology and Meteorite Unit
South African Heritage Resources Agency
PO Box 4637
Cape Town, 8000

**NOTE IN SUPPORT OF EXEMPTION FROM DESKTOP PALAEOLOGICAL IMPACT
ASSESSMENT**

**ENVIRONMENTAL MANAGEMENT PLAN FOR THE PROPOSED EXTENSION OF EXISTING
RAUMIX AGGREGATES (PTY) LTD. QUARRY NEAR AGGENEYS, NORTHERN CAPE**

Portion of Portion 2 of the Farm Aroams 57, Namaqualand

GREENMINED ENVIRONMENTAL is managing a mining application on behalf of Raumix Aggregates (Pty) Ltd. that involves an extension to an existing quarry near Aggeneys in the Northern Cape Province. The proposed mining area will be 1.5ha.

The quarry exploits granite-gneiss bedrock which is crushed for road-making aggregate. The Koeipoort Granite is part of the highly-metamorphosed Late Precambrian rocks of the Aggeneys Subgroup (Bushmanland Group). Previously subsumed in the "Stalhoek Complex" (Figure 1). This bedrock is not fossiliferous.

Quaternary aeolian sand and colluvium mantles the bedrock, but these deposits are very poorly fossiliferous. Moreover, the site of the quarry is effectively bedrock outcrop, with minor Quaternary overburden.

I respectfully submit for consideration by SAHRA that the quarry extension will not impact fossil heritage and that it be exempted from the requirement of a desktop PIA.

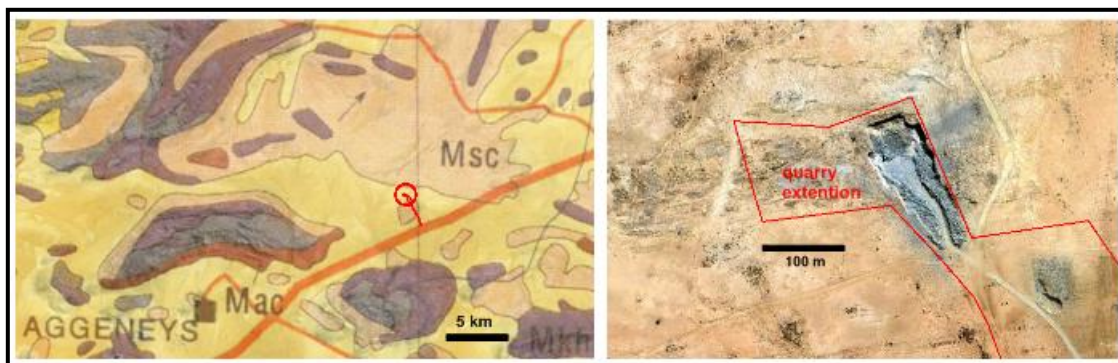


Figure 1. Left: The site (red circle), located on the 1:1000000 geological map. Msc = Stalhoek Complex schists and gneisses that includes the exploited Koeipoort Granite. Right: Detail of site.

Yours faithfully,

John Pether



an agency of the
Department of Arts and Culture

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Enquiries: Natasha Higgitt
Tel: 021 462 4502
Email: nhiggitt@sahra.org.za
CaseID: 12959

Date: Wednesday October 03, 2018
Page No: 1

Interim Comment

In terms of Section 38(3), 38(8) of the National Heritage Resources Act (Act 25 of 1999)

Attention: SPH Kundalila (Pty) Ltd

P O Box 257
MILNERTON
7435

Lime Sales Limited intends to apply for a mining permit for the mining of aggregate, 5 ha, on a portion of Portion 2 (Remaining Extent) of the farm Aroams 57, Registration Division of Namaqualand RD, Northern Cape.

Thank you for notifying SAHRA of the Environmental Authorisation (EA) and Mining Permit Application on a portion of Portion 2 (Remaining Extent) of the farm Aroams 57, Registration Division of Namaqualand RD, Northern Cape.

As the proposed development is undergoing an EA Application process in terms of the National Environmental Management Act, 107 of 1998 (NEMA), NEMA Environmental Impact Assessment (EIA) Regulations for activities that trigger the Mineral and Petroleum Resources Development Act, No 28 of 2002 (MPRDA) (As amended), it is incumbent on the developer to ensure that a **Heritage Impact Assessment (HIA)** is done as per section 38(3) and 38(8) of the National Heritage Resources Act, Act 25 of 1999 (NHRA). This must include an archaeological component, palaeontological component and any other applicable heritage components. The HIA must be conducted **as part of the** EA Application in terms of NEMA and the NEMA EIA Regulations.

The quickest process to follow for the archaeological component would be to contract a specialist (see www.asapa.org.za or www.aphp.org.za to provide an Archaeological Impact Assessment (AIA). The AIA must comply with the SAHRA 2007 Minimum Standards: Archaeological and Palaeontological Component of Impact Assessments.

The proposed prospecting area is located within an area of insignificant sensitivity in terms of palaeontological resources. No further assessment of the impact to palaeontological resources is required.

Any other heritage resources as defined in section 3 of the NHRA that may be impacted, such as maritime archaeology, built structures over 60 years old, sites of cultural significance associated with oral histories,

Our Ref:



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Date: Wednesday October 03, 2018
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burial grounds and graves, graves of victims of conflict, and cultural landscapes or viewsapes must also be assessed.

The draft Basic Assessment Report (BAR) and appendices must be submitted so that an informed comment can be issued.

Should you have any further queries, please contact the designated official using the case number quoted above in the case header.

Yours faithfully

Natasha Higgitt
Heritage Officer
South African Heritage Resources Agency

Phillip Hine
Acting Manager: Archaeology, Palaeontology and Meteorites Unit
South African Heritage Resources Agency

ADMIN:

Direct URL to case: <http://www.sahra.org.za/node/512481>

HERITAGE IMPACT ASSESSMENT

(REQUIRED UNDER SECTION 38(8) OF THE NHRA (No. 25 OF 1999))

FOR THE LIME SALES LIMITED MINING RIGHT APPLICATION ON THE FARM
AROAMS, AGGENYS, NORTHERN CAPE PROVINCE

Type of development:

Mining

Client:

Greenmined Environmental

Client info:

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Developer: Lime Sales Limited



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Report Author:

Mr. J. van der Walt

Project Reference:

HCAC Project number 219101

Report date:

January 2019

APPROVAL PAGE

Project Name	Lime Sales Mining Right Application
Report Title	Heritage Impact Assessment Lime Sales Mining Right Application
Authority Reference Number	SAHRA Case ID 12959
Report Status	Final Report
Applicant Name	Lime Sales Limited

TEAM MEMBERS

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DOCUMENT PROGRESS**Distribution List**

Date	Report Reference Number	Document Distribution	Number of Copies
14 January 2019	219101	Greenmined Environmental	Electronic Copy

Amendments on Document

Date	Report Reference Number	Description of Amendment

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REPORT OUTLINE

Appendix 6 of the GNR 326 EIA Regulations published on 7 April 2017 provides the requirements for specialist reports undertaken as part of the environmental authorisation process. In line with this, Table 1 provides an overview of Appendix 6 together with information on how these requirements have been met.

Table 1. Specialist Report Requirements.

Requirement from Appendix 6 of GN 326 EIA Regulation 2017	Chapter
(a) Details of - (i) the specialist who prepared the report; and (ii) the expertise of that specialist to compile a specialist report including a curriculum vitae	Section a Section 12
(b) Declaration that the specialist is independent in a form as may be specified by the competent authority	<i>Declaration of Independence</i>
(c) Indication of the scope of, and the purpose for which, the report was prepared	Section 1
(cA) an indication of the quality and age of base data used for the specialist report	Section 3.4 and 7.1.
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	9
(d) Duration, Date and season of the site investigation and the relevance of the season to the outcome of the assessment	Section 3.4
(e) Description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used	Section 3
(f) details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives;	Section 8 and 9
(g) Identification of any areas to be avoided, including buffers	Section 8 and 9
(h) Map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers	Section 8
(I) Description of any assumptions made and any uncertainties or gaps in knowledge	Section 3.7
(j) a description of the findings and potential implications of such findings on the impact of the proposed activity including identified alternatives on the environment or activities;	Section 9
(k) Mitigation measures for inclusion in the EMPr	Section 9
(l) Conditions for inclusion in the environmental authorisation	Section 9
(m) Monitoring requirements for inclusion in the EMPr or environmental authorisation	Section 9
(n) Reasoned opinion - (i) as to whether the proposed activity, activities or portions thereof should be authorised; (iA) regarding the acceptability of the proposed activity or activities; and (ii) if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan	Section 9.2
(o) Description of any consultation process that was undertaken during the course of preparing the specialist report	Section 6
(p) A summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	Refer to BA report
(q) Any other information requested by the competent authority	Section 10

Executive Summary

Greenmined Environmental was appointed to conduct an Basic Assessment (BA) for a proposed mining permit (quarry), on a portion of Portion 2 (Remaining Extent) of the farm Aroams 57, approximately 8.84 km East of Aggeneys, Northern Cape Province. HCAC was appointed to conduct a Heritage Impact Assessment of the impact area to determine the presence of cultural heritage sites and the impact of the proposed development on non-renewable heritage resources. The study area was assessed both on desktop level and by a field survey. The field survey was conducted as a non-intrusive pedestrian survey to cover the extent of the 5 ha earmarked for the proposed quarry. The area earmarked for the proposed mining is located adjacent to an existing quarry and the intention of this application is to expand the existing quarry.


During the survey of the area no archaeological sites or material of significance was recorded. Archaeological finds consisted of a broken Stone Age blade and a broken lower grinder, these finds are isolated and are out of context and of no heritage significance and recorded as a find spot. The SAHRA paleontological sensitivity map indicated that the footprint as a whole is located on a paleontologically insignificant area and is not considered paleontologically vulnerable, therefore no further mitigation prior to construction is recommended in terms of Section 35 of the NHRA for the proposed development to proceed.

No structures older than 60 years occur in the study area (Section 34) and no graves or burial sites were recorded (Section 36). If any additional graves are located in future they should ideally be preserved or alternatively relocated according to existing legislation. No public monuments are located within or close to the study area. The study area is characterised by an existing quarry and associated infrastructure and the proposed development will not impact negatively on significant cultural landscapes or views. During the public participation process conducted for the project no heritage concerns was raised.

The impact on heritage resources is low, and it is recommended that the proposed project can commence on the condition that the following recommendations are implemented as part of the EMP and based on approval from SAHRA:

- Implementation of a chance find procedure.

Declaration of Independence

Specialist Name	Jaco van der Walt
Declaration of Independence	<p>I declare, as a specialist appointed in terms of the National Environmental Management Act (Act No 108 of 1998) and the associated 2014 Environmental Impact Assessment (EIA) Regulations, that I:</p> <ul style="list-style-type: none"> • I act as the independent specialist in this application; • I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant; • I declare that there are no circumstances that may compromise my objectivity in performing such work; • I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity; • I will comply with the Act, Regulations and all other applicable legislation; • I have no, and will not engage in, conflicting interests in the undertaking of the activity; • I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority; • All the particulars furnished by me in this form are true and correct; and • I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.
Signature	
Date	10/01/2019

a) Expertise of the specialist

Jaco van der Walt has been practising as a CRM archaeologist for 15 years. He obtained an MA degree in Archaeology from the University of the Witwatersrand focussing on the Iron Age in 2012 and is a PhD candidate at the University of Johannesburg focussing on Stone Age Archaeology with specific interest in the Middle Stone Age (MSA) and Later Stone Age (LSA). Jaco is an accredited member of ASAPA (#159) and have conducted more than 500 impact assessments in Limpopo, Mpumalanga, North West, Free State, Gauteng, KZN as well as he Northern and Eastern Cape Provinces in South Africa.

Jaco has worked on various international projects in Zimbabwe, Botswana, Mozambique, Lesotho, DRC Zambia and Tanzania. Through this he has a sound understanding of the IFC Performance Standard requirements, with specific reference to Performance Standard 8 – Cultural Heritage.

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ABBREVIATIONS

AIA: Archaeological Impact Assessment
ASAPA: Association of South African Professional Archaeologists
BGG Burial Ground and Graves
BIA: Basic Impact Assessment
CFPs: Chance Find Procedures
CMP: Conservation Management Plan
CRR: Comments and Response Report
CRM: Cultural Resource Management
DEA: Department of Environmental Affairs
EA: Environmental Authorisation
EAP: Environmental Assessment Practitioner
ECO: Environmental Control Officer
EIA: Environmental Impact Assessment*
EIA: Early Iron Age*
EIA Practitioner: Environmental Impact Assessment Practitioner
EMP: Environmental Management Programme
ESA: Early Stone Age
ESIA: Environmental and Social Impact Assessment
GIS Geographical Information System
GPS: Global Positioning System
GRP Grave Relocation Plan
HIA: Heritage Impact Assessment
LIA: Late Iron Age
LSA: Late Stone Age
MEC: Member of the Executive Council
MIA: Middle Iron Age
MPRDA: Mineral and Petroleum Resources Development Act
MSA: Middle Stone Age
NEMA National Environmental Management Act, 1998 (Act No. 107 of 1998)
NHRA National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NID Notification of Intent to Develop
NoK Next-of-Kin
PRHA: Provincial Heritage Resource Agency
SADC: Southern African Development Community
SAHRA: South African Heritage Resources Agency

**Although EIA refers to both Environmental Impact Assessment and the Early Iron Age both are internationally accepted abbreviations and must be read and interpreted in the context it is used.*

GLOSSARY

Archaeological site (remains of human activity over 100 years old)

Early Stone Age (~ 2.6 million to 250 000 years ago)

Middle Stone Age (~ 250 000 to 40-25 000 years ago)

Later Stone Age (~ 40-25 000, to recently, 100 years ago)

The Iron Age (~ AD 400 to 1840)

Historic (~ AD 1840 to 1950)

Historic building (over 60 years old)

1 Introduction and Terms of Reference:

Heritage Contracts and Archaeological Consulting CC (**HCAC**) has been contracted by Greenmined Environmental to conduct a heritage impact assessment of the proposed mining right application on a portion of Portion 2 (Remaining Extent) of the farm Aroams 57, close to Aggenys, Northern Cape (Figure 1 – 3). The report forms part of the Basic Assessment Report (BA) and Environmental Management Programme Report (EMPR) for the development.

The aim of the study is to survey the proposed development footprint to identify cultural heritage sites, document, and assess their importance within local, provincial and national context. It serves to assess the impact of the proposed project on non-renewable heritage resources, and to submit appropriate recommendations with regard to the responsible cultural resources management measures that might be required to assist the developer in managing the discovered heritage resources in a responsible manner. It is also conducted to protect, preserve, and develop such resources within the framework provided by the National Heritage Resources Act of 1999 (Act No 25 of 1999). The report outlines the approach and methodology utilized before and during the survey, which includes: Phase 1, review of relevant literature; Phase 2, the physical surveying of the area on foot and by vehicle; Phase 3, reporting the outcome of the study.

During the survey isolated stone age finds were identified but no sites of heritage significance was recorded. General site conditions and features on sites were recorded by means of photographs, GPS locations, and site descriptions. Possible impacts were identified and mitigation measures are proposed in the following report. SAHRA as a commenting authority under section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) require all environmental documents, compiled in support of an Environmental Authorisation application as defined by NEMA EIA Regulations section 40 (1) and (2), to be submitted to SAHRA. As such the EIAR and its appendices must be submitted to the case as well as the EMPr, once it's completed by the Environmental Assessment Practitioner (EAP).

1.1 Terms of Reference

Field study

Conduct a field study to: (a) locate, identify, record, photograph and describe sites of archaeological, historical or cultural interest; b) record GPS points of sites/areas identified as significant areas; c) determine the levels of significance of the various types of heritage resources affected by the proposed development.

Reporting

Report on the identification of anticipated and cumulative impacts the operational units of the proposed project activity may have on the identified heritage resources for all 3 phases of the project; i.e., construction, operation and decommissioning phases. Consider alternatives, should any significant sites be impacted adversely by the proposed project. Ensure that all studies and results comply with the relevant legislation, SAHRA minimum standards and the code of ethics and guidelines of ASAPA.

To assist the developer in managing the discovered heritage resources in a responsible manner, and to protect, preserve, and develop them within the framework provided by the National Heritage Resources Act of 1999 (Act No 25 of 1999).

Table 2: Project Description

Size of farm and portions	Lime Sales Limited intends to apply for a mining permit for the mining of aggregate, 5 ha, on a portion of Portion 2 (Remaining Extent) of the farm Aroams 57, Registration Division of Namaqualand RD, Northern Cape.
Magisterial District	Registration Division of Namaqualand RD
1: 50 000 map sheet number	2918BB
Central co-ordinate of the development	29°10'14.29"S 18°59'35.81"E

Table 3: Infrastructure and project activities

Type of development	Mining Development
Project size	5 ha
Project Components	<p>The proposed mining area is approximately 5 ha is extent and the applicant, Lime Sales Limited, intends to win material from the area for at least 2 years with a possible extension of another 3 years. The aggregate / stone gravel to be removed from the quarry will be used for road construction in the vicinity. The proposed quarry will therefore contribute to the upgrading / maintenance of road infrastructure in and around the Aggeneys area.</p> <p>The mining activities will consist out of the following:</p> <ul style="list-style-type: none"> • Stripping and stockpiling of topsoil; • Blasting; • Excavating; • Crushing; • Stockpiling and transporting; • Sloping and landscaping upon closure of the site; and • Replacing the topsoil and vegetation the disturbed area. <p>The mining site will contain the following:</p> <ul style="list-style-type: none"> • Drilling equipment; • Excavating equipment; • Earth moving equipment; • Mobile crushing and screening plants; • Temporary office; • Site vehicles; • Parking area for visitors and site vehicles; • Site storage containers; • Generator or bunded area; • Workshop; and • Chemical ablution facilities.

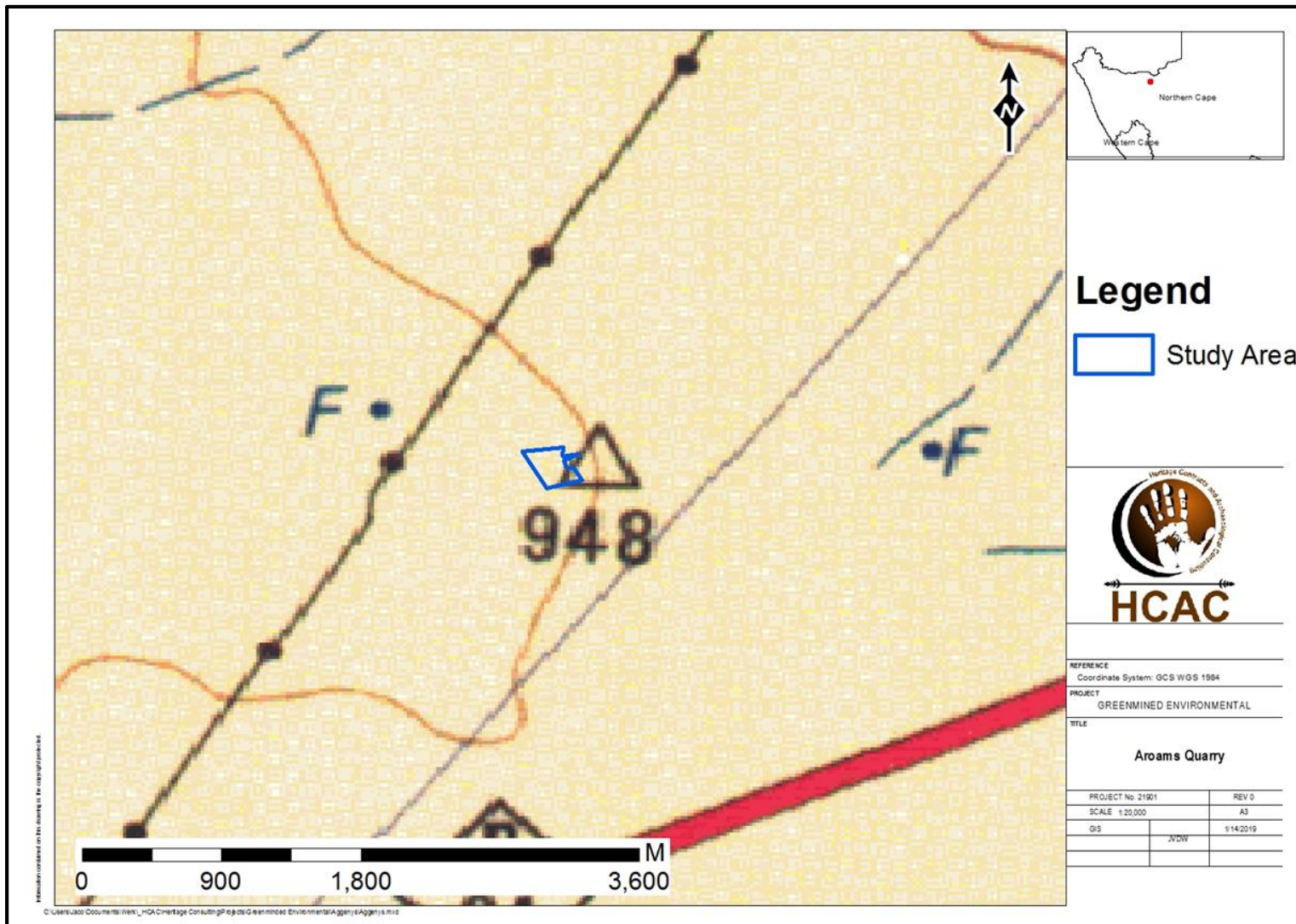


Figure 1. Provincial locality map (1: 250 000 topographical map)

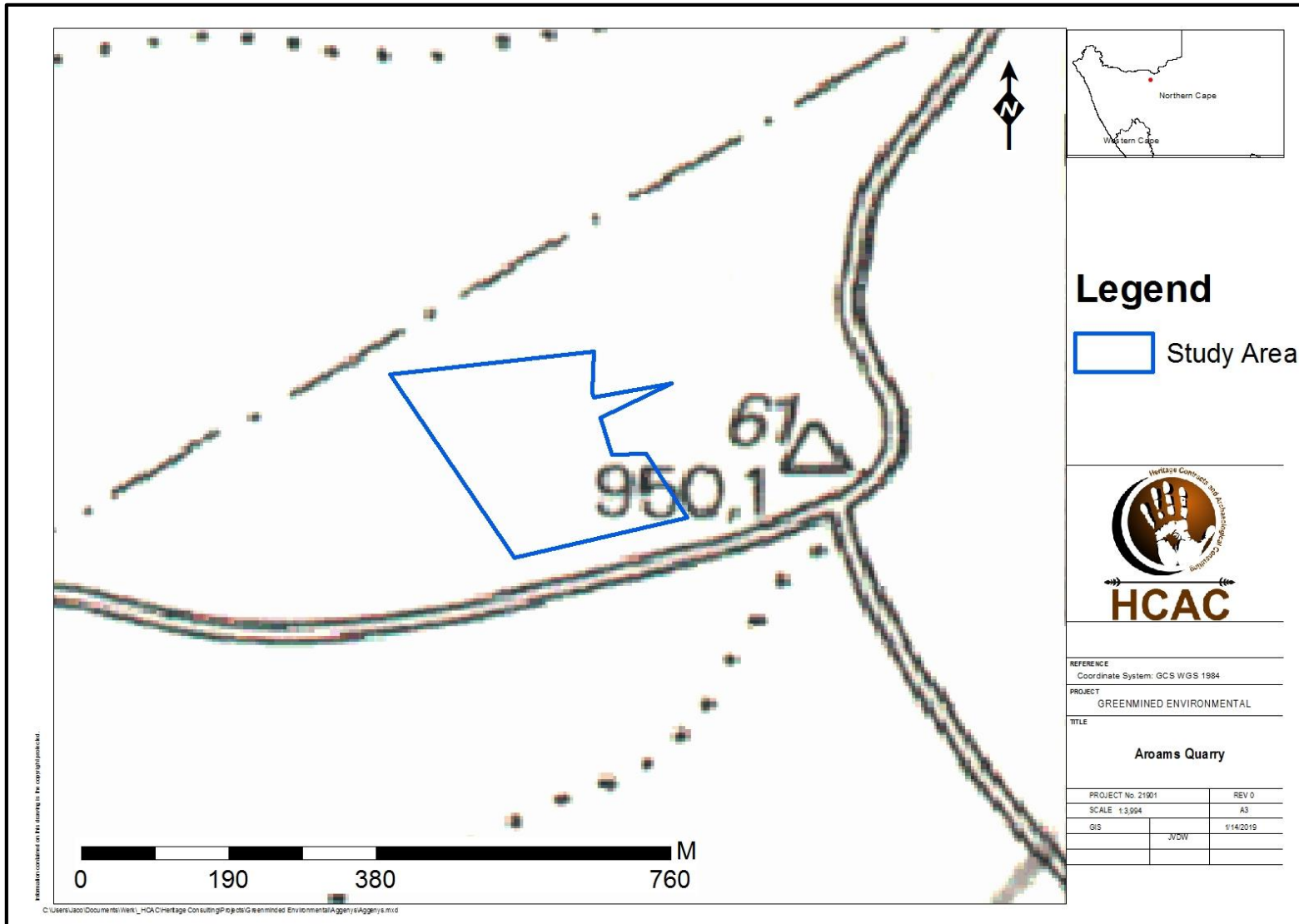


Figure 2: Regional locality map (1:50 000 topographical map).



Figure 3. Satellite image of the study area (Google Earth 2018).

2 Legislative Requirements

The HIA, as a specialist sub-section of the EIA, is required under the following legislation:

- National Heritage Resources Act (NHRA), Act No. 25 of 1999)
- National Environmental Management Act (NEMA), Act No. 107 of 1998 - Section 23(2)(b)
- Mineral and Petroleum Resources Development Act (MPRDA), Act No. 28 of 2002 - Section 39(3)(b)(iii)

A Phase 1 HIA is a pre-requisite for development in South Africa as prescribed by SAHRA and stipulated by legislation. The overall purpose of heritage specialist input is to:

- Identify any heritage resources, which may be affected;
- Assess the nature and degree of significance of such resources;
- Establish heritage informants/constraints to guide the development process through establishing thresholds of impact significance;
- Assess the negative and positive impact of the development on these resources; and
- Make recommendations for the appropriate heritage management of these impacts.

The HIA should be submitted, as part of the impact assessment report or EMPr, to the PHRA if established in the province or to SAHRA. SAHRA will ultimately be responsible for the professional evaluation of Phase 1 AIA reports upon which review comments will be issued. 'Best practice' requires Phase 1 AIA reports and additional development information, as per the impact assessment report and/or EMPr, to be submitted in duplicate to SAHRA after completion of the study. SAHRA accepts Phase 1 AIA reports authored by professional archaeologists, accredited with ASAPA or with a proven ability to do archaeological work.

Minimum accreditation requirements include an Honours degree in archaeology or related discipline and 3 years post-university CRM experience (field supervisor level). Minimum standards for reports, site documentation and descriptions are set by ASAPA in collaboration with SAHRA. ASAPA is based in South Africa, representing professional archaeology in the SADC region. ASAPA is primarily involved in the overseeing of ethical practice and standards regarding the archaeological profession. Membership is based on proposal and secondment by other professional members.

Phase 1 AIA's are primarily concerned with the location and identification of heritage sites situated within a proposed development area. Identified sites should be assessed according to their significance. Relevant conservation or Phase 2 mitigation recommendations should be made. Recommendations are subject to evaluation by SAHRA.

Conservation or Phase 2 mitigation recommendations, as approved by SAHRA, are to be used as guidelines in the developer's decision-making process.

Phase 2 archaeological projects are primarily based on salvage/mitigation excavations preceding development destruction or impact on a site. Phase 2 excavations can only be conducted with a permit, issued by SAHRA to the appointed archaeologist. Permit conditions are prescribed by SAHRA and includes (as minimum requirements) reporting back strategies to SAHRA and deposition of excavated material at an accredited repository.

In the event of a site conservation option being preferred by the developer, a site management plan, prepared by a professional archaeologist and approved by SAHRA, will suffice as minimum requirement.

After mitigation of a site, a destruction permit must be applied for with SAHRA by the applicant before development may proceed.

Human remains older than 60 years are protected by the National Heritage Resources Act, with reference to Section 36. Graves older than 60 years, but younger than 100 years fall under Section 36 of Act 25 of 1999 (National Heritage Resources Act), as well as the Human Tissues Act (Act 65 of 1983), and are the jurisdiction of SAHRA. The procedure for Consultation Regarding Burial Grounds and Graves (Section 36[5]) of Act 25 of 1999 is applicable to graves older than 60 years that are situated outside a formal cemetery administrated by a local authority. Graves in this age category, located inside a formal cemetery administrated by a local authority, require the same authorisation as set out for graves younger than 60 years, in addition to SAHRA authorisation. If the grave is not situated inside a formal cemetery, but is to be relocated to one, permission from the local authority is required and all regulations, laws and by-laws, set by the cemetery authority, must be adhered to.

Human remains that are less than 60 years old are protected under Section 2(1) of the Removal of Graves and Dead Bodies Ordinance (Ordinance No. 7 of 1925), as well as the Human Tissues Act (Act 65 of 1983), and are the jurisdiction of the National Department of Health and the relevant Provincial Department of Health and must be submitted for final approval to the office of the relevant Provincial Premier. This function is usually delegated to the Provincial MEC for Local Government and Planning; or in some cases, the MEC for Housing and Welfare. Authorisation for exhumation and reinternment must also be obtained from the relevant local or regional council where the grave is situated, as well as the relevant local or regional council to where the grave is being relocated. All local and regional provisions, laws and by-laws must also be adhered to. To handle and transport human remains, the institution conducting the relocation should be authorised under Section 24 of Act 65 of 1983 (Human Tissues Act).

3 METHODOLOGY

3.1 Literature Review

A brief survey of available literature was conducted to extract data and information on the area in question to provide general heritage context into which the development would be set. This literature search included published material, unpublished commercial reports and online material, including reports sourced from the South African Heritage Resources Information System (SAHRIS).

3.2 Genealogical Society and Google Earth Monuments

Google Earth and 1:50 000 maps of the area were utilised to identify possible places where sites of heritage significance might be located; these locations were marked and visited during the field work phase. The database of the Genealogical Society was consulted to collect data on any known graves in the area.

3.3 Public Consultation and Stakeholder Engagement:

Stakeholder engagement is a key component of any BAR process, it involves stakeholders interested in, or affected by the proposed development. Stakeholders are provided with an opportunity to raise issues of concern (for the purposes of this report only heritage related issues will be included). The aim of the public consultation process was to capture and address any issues raised by community members and other stakeholders during key stakeholder and public meetings. The process involved:

- Placement of advertisements and site notices
- Stakeholder notification (through the dissemination of information and meeting invitations);
- Stakeholder meetings undertaken with I&APs;
- Authority Consultation
- The compilation of a BAR.

Please refer to section 6 for more detail.

3.4 Site Investigation

Conduct a field study to: a) systematically survey the proposed project area to locate, identify, record, photograph and describe sites of archaeological, historical or cultural interest; b) record GPS points of sites/areas identified as significant areas; c) determine the levels of significance of the various types of heritage resources recorded in the project area.

Table 4: Site Investigation Details

	Site Investigation
Date	10 January 2019
Season	Summer –vegetation in the study area is low and archaeological visibility is high. The impact area was sufficiently covered (Figure 4) to adequately record the presence of heritage resources.

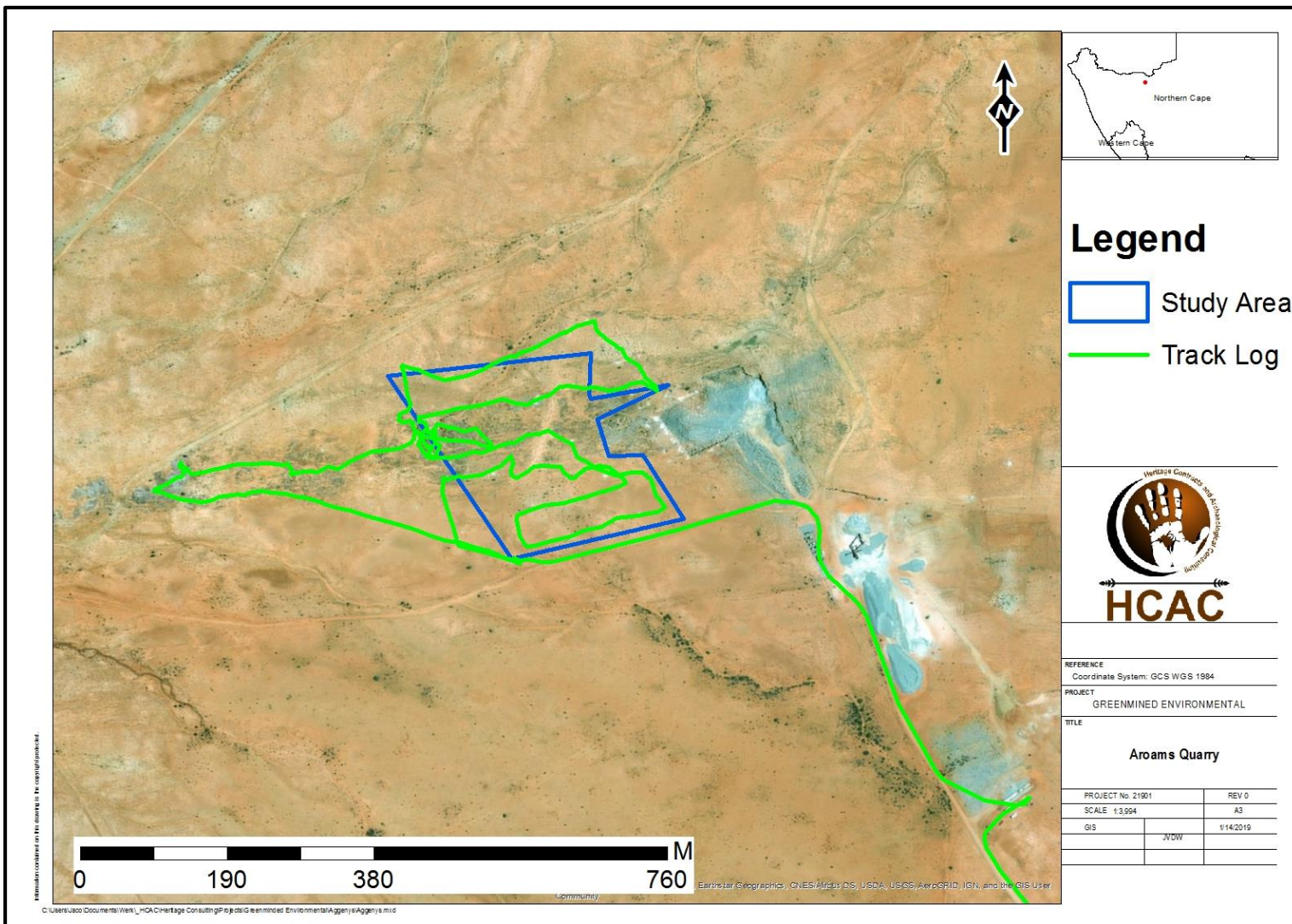


Figure 4: Track logs of the survey in green.

3.5 Site Significance and Field Rating

Section 3 of the NHRA distinguishes nine criteria for places and objects to qualify as 'part of the national estate' if they have cultural significance or other special value. These criteria are:

- Its importance in/to the community, or pattern of South Africa's history;
- Its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;
- Its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;
- Its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;
- Its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
- Its importance in demonstrating a high degree of creative or technical achievement at a particular period;
- Its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;
- Its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa;
- Sites of significance relating to the history of slavery in South Africa.

The presence and distribution of heritage resources define a 'heritage landscape'. In this landscape, every site is relevant. In addition, because heritage resources are non-renewable, heritage surveys need to investigate an entire project area, or a representative sample, depending on the nature of the project. In the case of the proposed project the local extent of its impact necessitates a representative sample and only the footprint of the areas demarcated for development were surveyed. In all initial investigations, however, the specialists are responsible only for the identification of resources visible on the surface. This section describes the evaluation criteria used for determining the significance of archaeological and heritage sites. The following criteria were used to establish site significance with cognisance of Section 3 of the NHRA:

- The unique nature of a site;
- The integrity of the archaeological/cultural heritage deposits;
- The wider historic, archaeological and geographic context of the site;
- The location of the site in relation to other similar sites or features;
- The depth of the archaeological deposit (when it can be determined/is known);
- The preservation condition of the sites; and
- Potential to answer present research questions.

In addition to this criteria field ratings prescribed by SAHRA (2006), and acknowledged by ASAPA for the SADC region, were used for the purpose of this report. The recommendations for each site should be read in conjunction with section 10 of this report.

FIELD RATING	GRADE	SIGNIFICANCE	RECOMMENDED MITIGATION
National Significance (NS)	Grade 1	-	Conservation; national site nomination
Provincial Significance (PS)	Grade 2	-	Conservation; provincial site nomination
Local Significance (LS)	Grade 3A	High significance	Conservation; mitigation not advised
Local Significance (LS)	Grade 3B	High significance	Mitigation (part of site should be retained)
Generally Protected A (GP. A)	-	High/medium significance	Mitigation before destruction
Generally Protected B (GP. B)	-	Medium significance	Recording before destruction
Generally Protected C (GP.C)	-	Low significance	Destruction

3.6 Impact Assessment Methodology

The criteria below are used to establish the impact rating on sites:

- The **nature**, which shall include a description of what causes the effect, what will be affected and how it will be affected.
- The **extent**, wherein it will be indicated whether the impact will be local (limited to the immediate area or site of development) or regional, and a value between 1 and 5 will be assigned as appropriate (with 1 being low and 5 being high):
- The **duration**, wherein it will be indicated whether:
 - * the lifetime of the impact will be of a very short duration (0-1 years), assigned a score of 1;
 - * the lifetime of the impact will be of a short duration (2-5 years), assigned a score of 2;
 - * medium-term (5-15 years), assigned a score of 3;
 - * long term (> 15 years), assigned a score of 4; or
 - * permanent, assigned a score of 5;
- The **magnitude**, quantified on a scale from 0-10 where; 0 is small and will have no effect on the environment, 2 is minor and will not result in an impact on processes, 4 is low and will cause a slight impact on processes, 6 is moderate and will result in processes continuing but in a modified way, 8 is high (processes are altered to the extent that they temporarily cease), and 10 is very high and results in complete destruction of patterns and permanent cessation of processes.
- The **probability of occurrence**, which shall describe the likelihood of the impact actually occurring. Probability will be estimated on a scale of 1-5 where; 1 is very improbable (probably will not happen), 2 is improbable (some possibility, but low likelihood), 3 is probable (distinct possibility), 4 is highly probable (most likely) and 5 is definite (impact will occur regardless of any prevention measures).
- The **significance**, which shall be determined through a synthesis of the characteristics described above and can be assessed as low, medium or high; and
- the **status**, which will be described as either positive, negative or neutral.
- the degree to which the impact can be reversed.
- the degree to which the impact may cause irreplaceable loss of resources.
- the *degree* to which the impact can be mitigated.

The **significance** is calculated by combining the criteria in the following formula:

$$S=(E+D+M) P$$

S = Significance weighting

E = Extent

D = Duration

M = Magnitude

P = Probability

The **significance weightings** for each potential impact are as follows:

- < 30 points: Low (i.e., where this impact would not have a direct influence on the decision to develop in the area),
- 30-60 points: Medium (i.e., where the impact could influence the decision to develop in the area unless it is effectively mitigated),
- 60 points: High (i.e., where the impact must have an influence on the decision process to develop in the area).

3.7 Limitations and Constraints of the study

The authors acknowledge that the brief literature review is not exhaustive on the literature of the area. Due to the subsurface nature of archaeological artefacts, the possibility exists that some features or artefacts may not have been discovered/recorded during the survey and the possible occurrence of unmarked graves and other cultural material cannot be excluded. Similarly, the depth of the deposit of heritage sites cannot be accurately determined due its subsurface nature. This report only deals with the footprint area of the proposed development and consisted of non-intrusive surface surveys. This study did not assess the impact on medicinal plants and intangible heritage as it is assumed that these components would have been highlighted through the public consultation process if relevant. It is possible that new information could come to light in future, which might change the results of this Impact Assessment.

4 Description of Socio-Economic Environment

StatsSA provide the following information applicable to the study area:

According to Census 2011, the Khâi-Ma Municipality has a total population of 12 465 people, of which 75,1% are coloured, 17,6% are black African, and 6,0% are white. Other groups make up 0,4% of the population. Of those aged 20 years and older, 46,3% have some secondary schooling, 17,5% have some primary schooling, 18,1 % completed Grade 12/matric, 5 8% have some higher education, 8,4% completed some primary schooling and 3,9% have no schooling.

Of the 5904 economically active people (employed and unemployed but looking for work), 22,1% are unemployed. 322 are classified as discouraged work-seekers. Of the youth (aged 15 – 34), 2 511 are employed, 776 are unemployed, 192 are classified as discouraged work-seekers, and 1 109 are not economically active.

5 Description of the Physical Environment:

The farm and the surrounding properties are mostly commercial farms and the area earmarked for the proposed mining falls on a section of the farm that is used as an existing quarry. The study area is situated within the Nama-Karoo Biome and the vegetation consists of Bushmanland Arid Grassland vegetation type (Mucina and Rutherford 2006). The area is characterized by an expansive, undulating landscape and the impact area is dominated by a plain of dry grasslands with scattered ancient rocky outcrops, named Inselbergs. The proposed quarry site shows features of the described vegetation types although the site is mostly transformed by the existing quarry and associated infrastructure (Figure 5 – 8).



Figure 5. Existing quarry.



Figure 6. Earthworks in the study area.



Figure 7. General site conditions.



Figure 8. Rocky outcrops in the north eastern portion of the study area.

6 Results of Public Consultation and Stakeholder Engagement:

6.1.1 Stakeholder Identification

Adjacent landowners and the public at large were informed of the proposed activity as part of the EIA process. Site notices and advertisements notifying interested and affected parties were placed at strategic points and in local newspapers as part of the process.

7 Literature / Background Study:

7.1 Literature Review

The following reports were conducted in the immediate vicinity of the study area and were consulted for this report:

Author	Year	Project	Findings
Webley, L.	2012	Desktop Heritage Impact Assessment: Proposed 1.5 Ha Extension of Gravel Mine, Portion 2 Of the Farm Aroams 57, Near Aggeneys, Northern Cape Province	No sites
Pether J.	2012	Note in Support of Exemption from Desktop Palaeontological Impact Assessment Environmental Management Plan for The Proposed Extension of Existing Raumix Aggregates (Pty) Ltd. Quarry Near Aggeneys, Northern Cape Portion of Portion 2 Of the Farm Aroams 57, Namaqualand	No Sites
Rossouw, L.	2013	Phase 1 Heritage Impact Assessment for proposed prospecting drilling on Portion 2 of Rozynbosch No.41 and Remaining Extent & Portion 1 of Wortel No. 42, Namaqualand District, NC Province	No sites
Morris, D	2017	Amendment of the Final Heritage Impact Assessment for the proposed AGGENEIS – PAULPUTS 400kV Transmission Powerline and Substations Upgrade, Northern Cape	Stone age sites (artefacts and grinding hollows) as well as historical structures.

7.1.1 Genealogical Society and Google Earth Monuments

No known grave sites are indicated in the study area.

7.2 General History of the area

7.2.1 Archaeology of the area

Section 7.2.1 and 7.2.2 was authored by Dr Jayson Orton:

Archaeological sites in the area around Aggeneys tend to be focused on three types of landscape features:

1. Places where water can be obtained – generally after rain storms. These include pans and low, flat bedrock outcrops that have hollows and crevices that trap water;
2. The bases of rocky hills and outcrops. These areas frequently reveal low stone-walled structures, either at the base of the hills or, less frequently, on the rocky hills; and
3. On and along sand dunes

Beaumont *et al.* (1995) have noted that there is a low-density background scatter of artefacts throughout Bushmanland. In the Aggeneys area, however, this scatter tends to be quite ephemeral. Several other surveys in the region support this distribution of archaeological materials (Halkett 2010; Morris 2011a, 2011b, 2013; Orton 2015, 2016; Webley & Halkett 2012). Within the Gamsberg inselberg, however, scatters of Early Stone Age (ESA) artefacts have been recorded in open, often eroding areas (Morris 2010; Orton 2014).

Morris (2010) located bedrock exposures with fissures in them that trap water after rain 3.5 km to the southwest of the study area and just north of the N14, while further examples were reported from the area to the south of Aggeneys (Morris 2013). The rocks bear grinding hollows with associated scatters of stone artefacts, pottery and ostrich eggshell located around them. To the west of Aggeneys, Orton (2016) found a very large bedrock outcrop with a pool of water collected at a low point and many grinding grooves and artefact scatters around it. Pans tend to be rare in the Aggeneys area but Orton (in prep.) did locate a small LSA scatter alongside a pan to the south of Aggeneys.

Just east of Aggeneys, Webley and Halkett (2012) examined an area to the north of the N14 and recorded many isolated artefacts and a few occurrences of light quartz and quartzite artefact scatters. Orton (2015) worked in the same area and located an isolated heavily used, grooved double-sided lower grindstone. Morris's (2011b) nearby survey found much sand cover and only a small number of isolated quartz artefacts. To the south of Aggeneys Orton (in prep.) made similar findings but also noted a few isolated lower grindstones.

Morris (2011b) notes the presence of a rock painting on a boulder at Aggeneys. The painting is a finger painting likely associated with the Khoekhoen. Similar art is found on granite outcrops throughout Namaqualand but in very low densities (Orton 2013). A small finger-painted image also lies within the Gamsberg Inselberg to the south of the study area and N14 (Morris 2010; Orton 2014). Neither of these sites has any associated archaeological deposits but a small rock shelter high on Gamsberg has been excavated and found to contain a deposit some 30 cm deep (Orton 2014). Sites with deep deposits are incredibly rare in Bushmanland and sadly excavations at this site were never completed and the deposit has not been dated.

7.2.2 Historical Information

Because it lies so far from the original Cape Colony (i.e. Cape Town), northern Bushmanland was colonised quite late with most farms only surveyed and granted in the very late 19th or even early 20th centuries. As a result, very few historical structures and features exist on the landscape. The majority of buildings date to the early-mid-20th century and tend to be of low or no heritage significance. A number of surveys in the Bushmanland area have recorded possible isolated graves represented by unusual rocks (either isolated standing rocks or unnatural clusters). Two examples occur alongside a rocky koppie to the southeast of Aggeneys (Orton, in prep.), while others were seen to the west of Aggeneys (Orton 2016). These could be related to early '*trekboers*' passing through the area. Because they lived a very nomadic lifestyle, the physical traces of these early European stock farmers are extremely ephemeral. The ruins of small stone structures that are occasionally found alongside rock outcrops in Bushmanland are likely to represent huts and small livestock enclosures built either by 19th century '*trekboers*' or by early 20th century shepherds. They may have been covered with sticks and skins or by tarpaulins.

Some of the place names in the region reflect the living heritage of the Khoekhoen. Gamsberg (also Ghaamsberg), for example, derives from the Khoekhoen word meaning 'grassy spring' (Raper n.d.). There are unconfirmed historical reports that a massacre of Bushmen may have occurred in a kloof of the Gamsberg (Robinson 1978) but surveys have failed to yield any evidence of this. Morris (2013) seems confident of this event, however, and suggests that the kloof at the south-eastern edge of the inselberg was the location where the killing occurred. The name Aroams is said by Morris (2010:9) to be "derived from the Nama \ddot{a} aro- meaning "wag-'n-bietjie" tree (*Ziziphus mucronatus*) and am or am-s meaning "mouth"." Morris concludes that this might then refer to a spring named after the wag-'n-bietjie tree.

7.3.1. Cultural Landscape

The site under investigation is located about eight kilometres north east of Aggeneys and two and a half kilometres to the north of the N14 in Northern Cape Province. The site under investigation is located in an area that was impacted on by previous mining activities. The proposed development is in line with the current land use of the site.

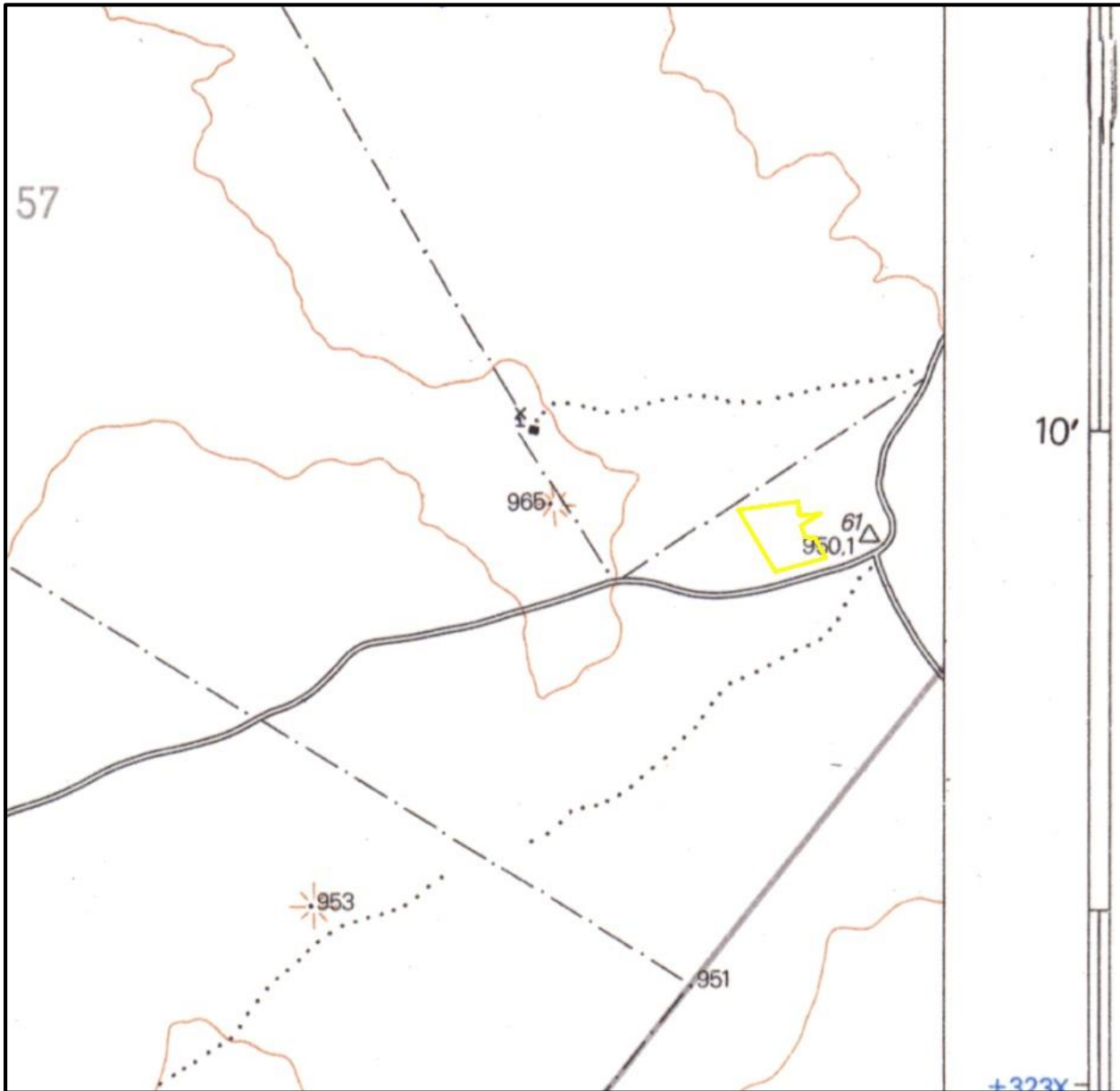


Figure 9. 1973 Topographical map of the site under investigation. The approximate study area is indicated with a yellow border. No developments are visible in the study area. To the south, one can see a minor road, and to the east a trig. beacon is visible. (Topographical Map 1973)

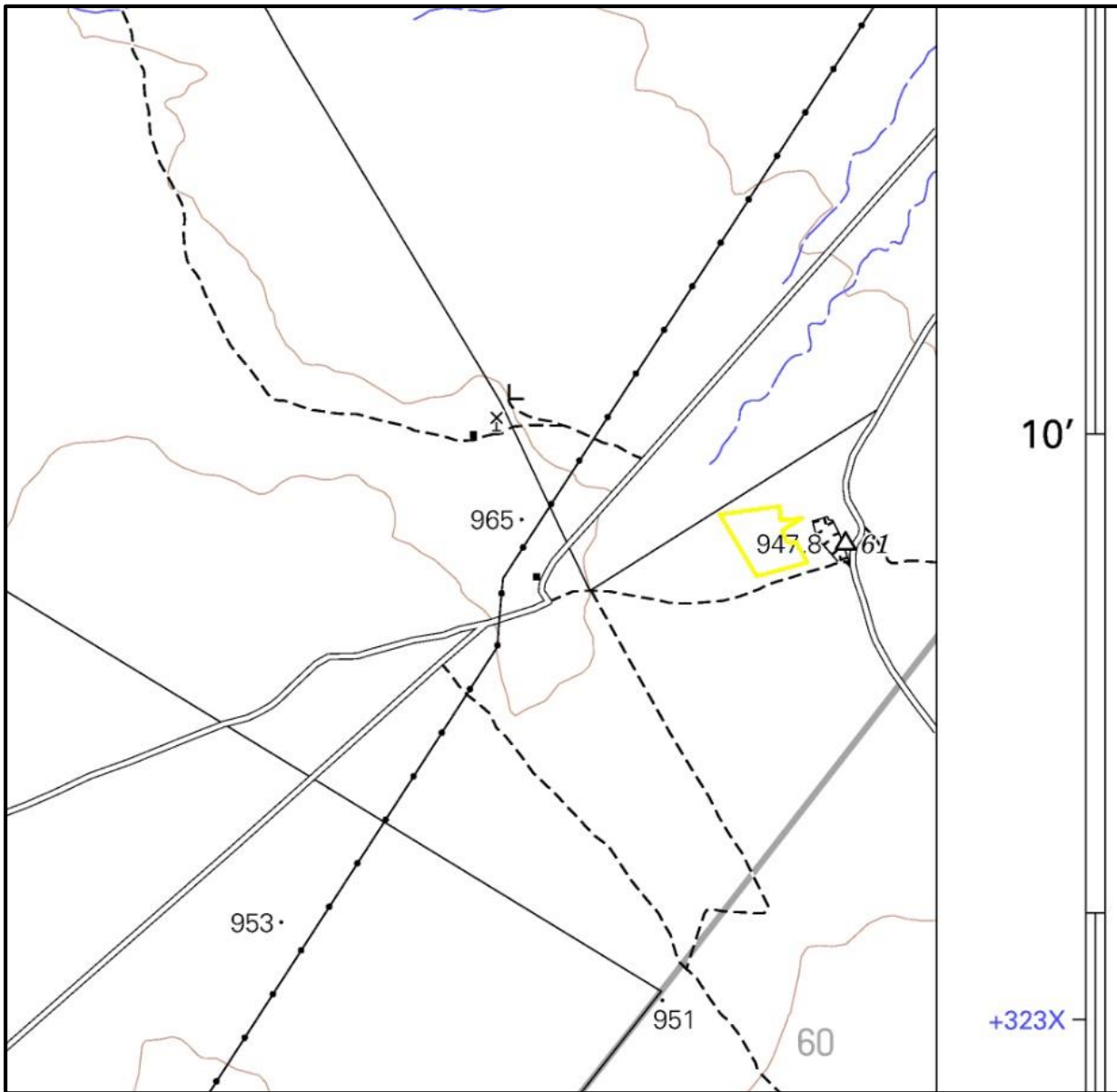


Figure 10. 2003 Topographical map of the site under investigation. The approximate study area is indicated with a yellow border. No developments are visible in the study area. To the south, one can see a track / footpath, and to the east an excavation site, a trig. beacon and a minor road are visible. (Topographical Map 2003)

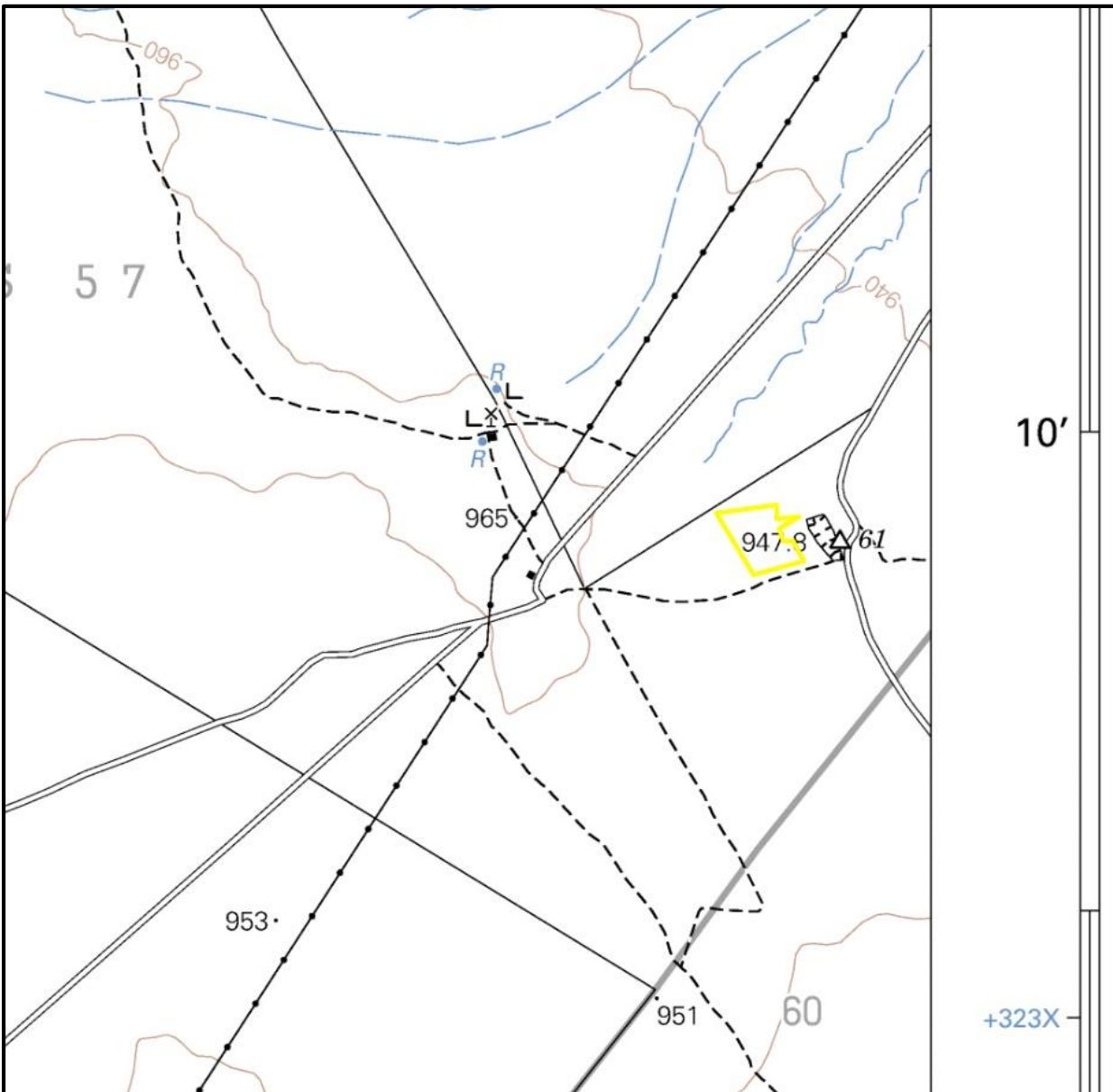


Figure 11. 2011 Topographical map of the site under investigation. The approximate study area is indicated with a yellow border. No developments are visible in the study area. To the south, one can see a track / footpath, and to the east an excavation site, a trig. beacon and a minor road are visible. (Topographical Map 2011)

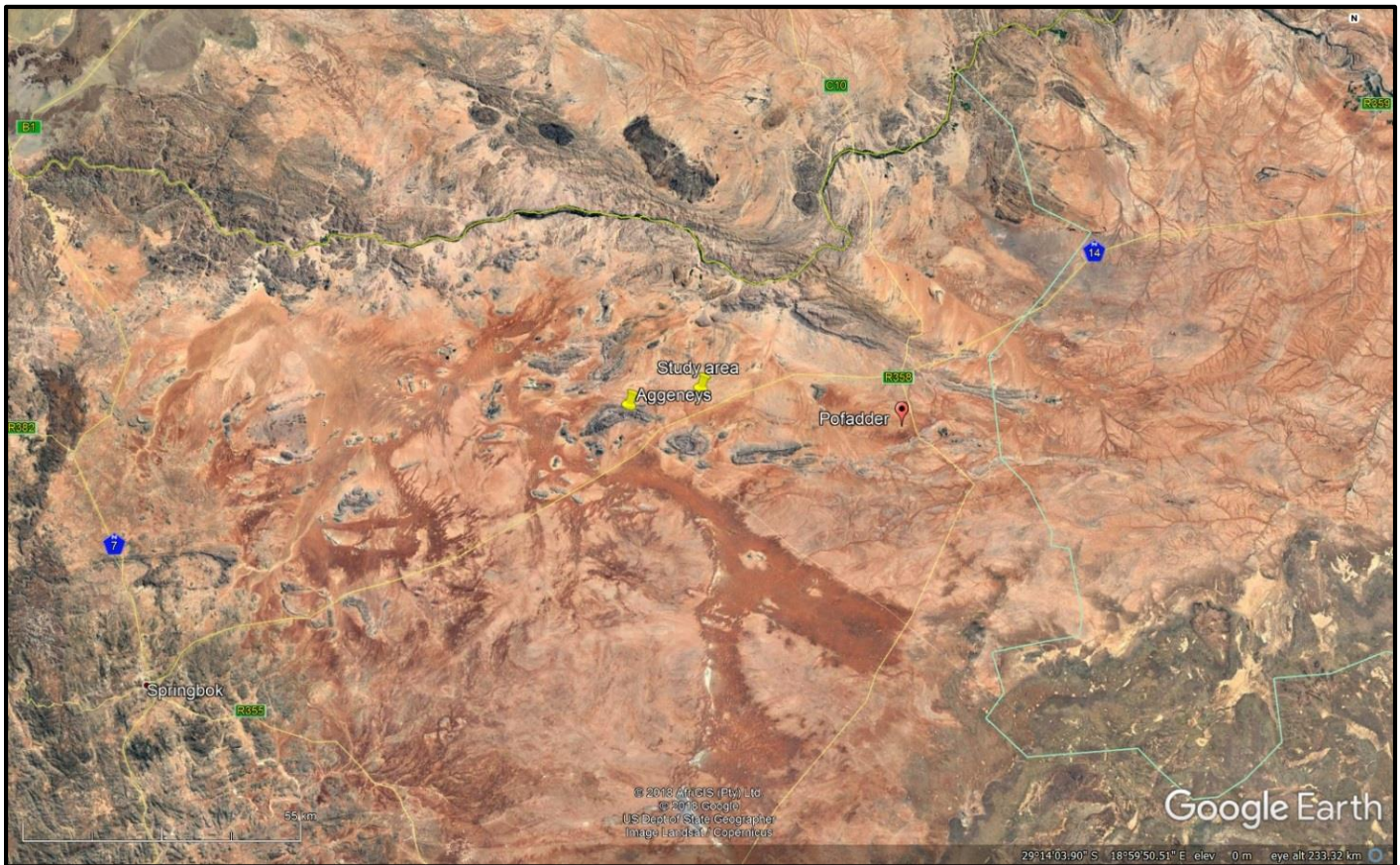


Figure 12. 2018 Google Earth image showing the study area in relation to the N14, Aggeneys, Pofadder and other sites. (Google Earth 2018)

8. Findings of the Survey

It is important to note that only the proposed mining right area was surveyed. The study area measures approximately 5,5 ha in size and is located approximately 8.84 km East of Aggeneys, Northern Cape Province and was assessed over a period of 1 day. The general area is characterised by an expansive, undulating landscape of red sandy soils dominated by scattered rocky outcrops. Within the study area several rocky outcrops occur, these were inspected for the presence of grinding hollows but none was noticed.

The site is used for the mining of gravel, and disturbance of the area has already occurred. Fly rock from the blasting of the existing quarry occur through most of the area and clearing of the fly rock resulted in several small cairns stacked to the south of proposed quarry and are of no heritage significance. In terms of the national estate as defined by the NHRA no sites of high significance were found during the survey although a find spot was recorded as described below.

8.3. Built Environment (Section 34 of the NHRA)

No standing structures older than 60 years occur in the study area and no further mitigation is required in this regard.

8.4. Archaeological and palaeontological resources (Section 35 of the NHRA)

A Stone Age blade on possibly quartzite was recorded, the blade has snapped on the proximal end and it is not possible to ascribe the artefact to a time period (i.e, LSA or MSA). At the same location (29° 10' 13.2563" S, 18° 59' 31.5923" E) a broken lower grinder was recorded (Figure 13). These finds are isolated, located on the periphery of the proposed quarry (Figure 14) and out of context. The artefacts do not constitute an archaeological site and classified as a find spot and of no significance apart from noting their presence in this report.



Figure 13. Isolated Artefacts found during the survey.

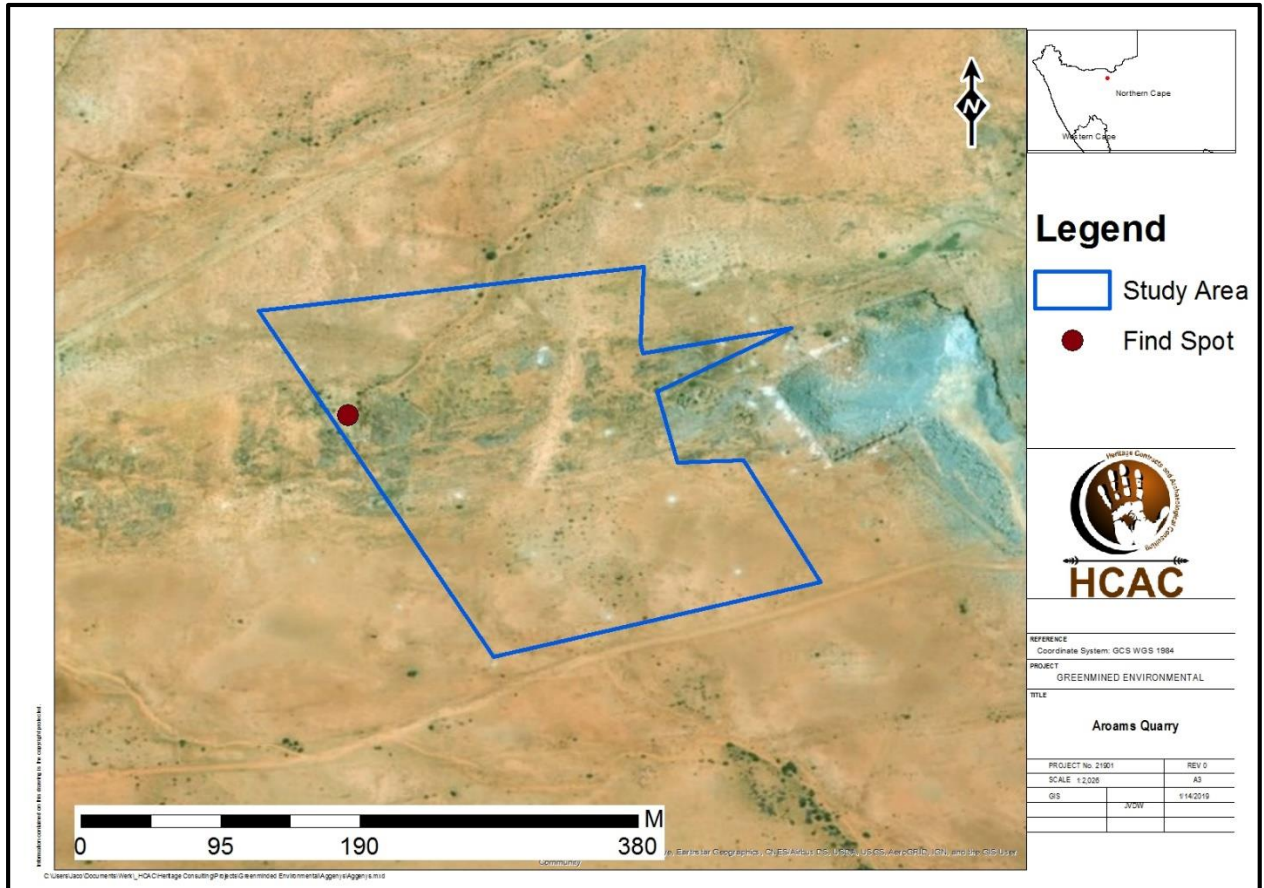
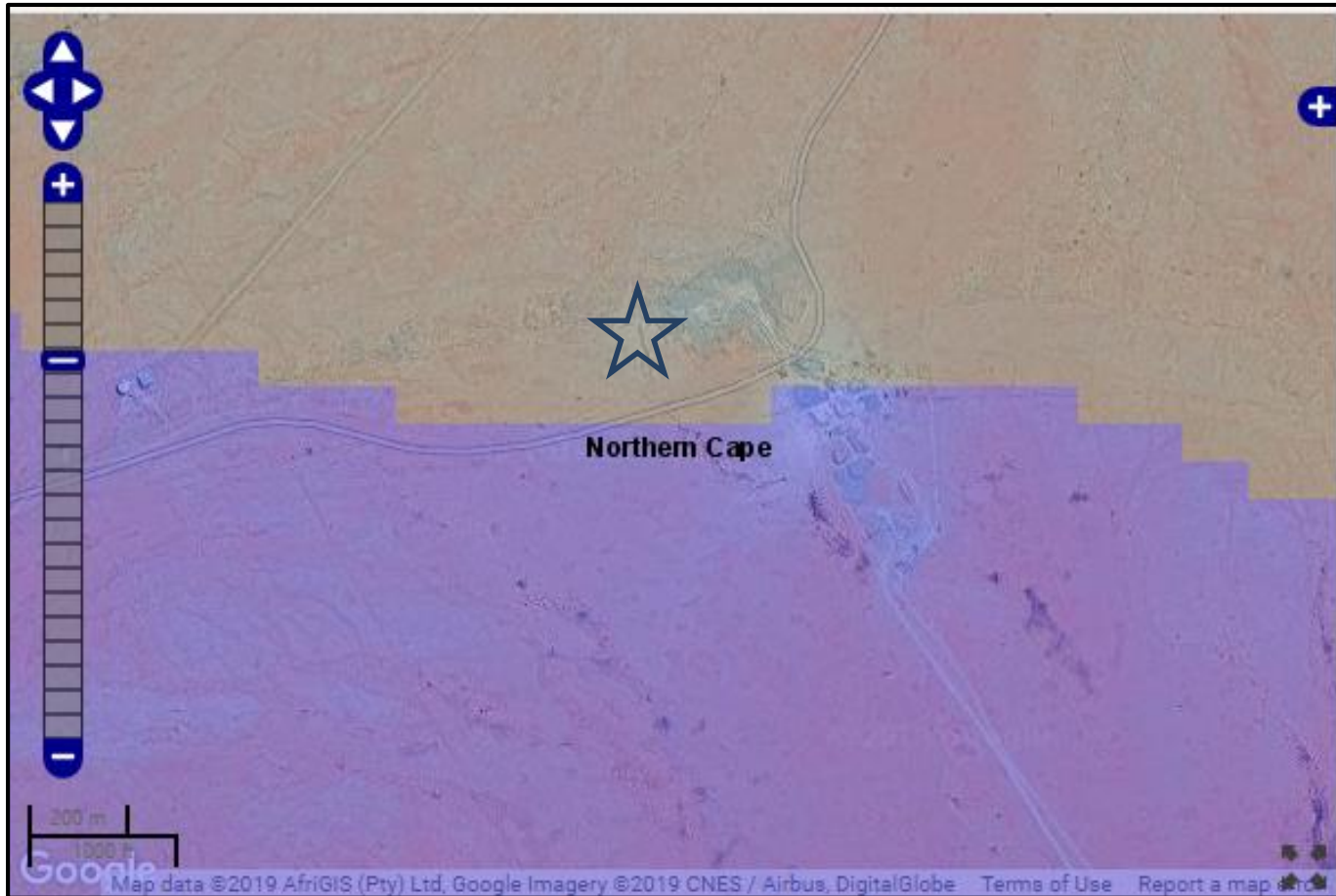


Figure 14. Location of identified artefacts.

In terms of the paleontological component the terrain is not considered paleontologically vulnerable (Figure 15), no further mitigation prior to construction is recommended in terms of Section 35 of the NHRA for the proposed development to proceed



Colour	Sensitivity	Required Action
RED	VERY HIGH	Field assessment and protocol for finds is required
ORANGE/YELLOW	HIGH	Desktop study is required and based on the outcome of the desktop study, a field assessment is likely
GREEN	MODERATE	Desktop study is required
BLUE	LOW	No palaeontological studies are required however a protocol for finds is required

Figure 15. Approximate location (star) of the study area on the SAHRIS paleontological sensitivity map.

8.5. Burial Grounds and Graves (Section 36 of the NHRA)

In terms of Section 36 of the NHRA no burial or grave sites have been identified.

8.6. Cultural Landscapes, Intangible and Living Heritage.

Long term impact on the cultural landscape is considered to be negligible as the immediate surrounding area consists of an area that has been subjected to previous mining developments (Figure 9 – 11). Visual impacts to scenic routes and sense of place are also considered to be low due to the other developments in the area.

8.7. Battlefields and Concentration Camps

There are no battlefields or concentration camp sites in the study area.

8.8. Potential Impact

The chances of impacting unknown archaeological sites in the study area is considered to be negligible. Any direct impacts that did occur would be during the construction phase only and would be of very low significance. Cumulative impacts occur from the combination of effects of various impacts on heritage resources. The importance of identifying and assessing cumulative impacts is that the whole is greater than the sum of its parts. In the case of the development, it will, with the recommended mitigation measures and management actions, not impact any heritage resources directly. However, this and other projects in the area could have an indirect impact on the larger heritage landscape. The lack of any heritage resources in the immediate area and the extensive existing development surrounding the study area minimises additional impact on the landscape.

8.8.1. Pre-Construction phase:

It is assumed that the pre-construction phase involves the removal of topsoil and vegetation as well as the establishment of infrastructure needed for the construction phase. These activities can have a negative and irreversible impact on heritage sites. Impacts include destruction or partial destruction of non-renewable heritage resources.

8.8.2. Construction Phase

During this phase, the impacts and effects are similar in nature but more extensive than the pre-construction phase. These activities can have a negative and irreversible impact on heritage sites. Impacts include destruction or partial destruction of non-renewable heritage resources.

8.8.3. Operation Phase:

No impact is envisaged for the recorded heritage resources during this phase.

Table 5. Impact Assessment table of the project on heritage resources.

Nature: During the construction phase activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position archaeological material or objects.		
	Without mitigation	With mitigation (Preservation/ excavation of site)
Extent	Local (1)	Local (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Low (2)	Low (2)
Probability	Not probable (2)	Not probable (2)
Significance	16 (Low)	16 (Low)
Status (positive or negative)	Negative	Negative
Reversibility	Not reversible	Not reversible
Irreplaceable loss of resources?	No resources were recorded	No resources were recorded.
Can impacts be mitigated?	Yes, a chance find procedure should be implemented.	Yes
Mitigation: Due to the lack of apparent significant heritage resources no further mitigation is required prior to construction. A Chance Find Procedure should be implemented for the project should any sites be identified during the construction process.		
Cumulative impacts: As the project area do not have sites of significance and has been previously impacted on by mining activities cumulative impacts of this development is considered to be negligible.		
Residual Impacts: If sites are destroyed this results in the depletion of archaeological record of the area. However, if sites are recorded and preserved or mitigated this adds to the record of the area.		

9. Conclusion and recommendations

HCAC was appointed to conduct a Heritage Impact Assessment to determine the presence of cultural heritage sites and the impact of the proposed 5 ha Aroams quarry on non-renewable heritage resources. The study area was assessed both on desktop level and by a field survey. The field survey was conducted as a non-intrusive pedestrian survey to cover the extent of the mining right footprint.

The farm and the surrounding properties are mostly commercial farms and the area earmarked for the proposed mining falls on a section of the farm that is used as an existing quarry. The general area is characterised by an expansive, undulating landscape of red sandy soils dominated by scattered rocky outcrops.

Within the study area several rocky outcrops occur, these were inspected for the presence of grinding hollows but none was noticed. The only recorded finds consists of a single broken Stone Age blade that snapped on the proximal end and it is not possible to ascribe the artefact to a time period. At the same location a broken lower grinder was recorded. These finds are isolated, located on the periphery of the proposed quarry and out of context. Although these artefacts attest to early human archaeological occurrences on the landscape, they do not constitute an archaeological site and is classified as a find spot and is of no significance apart from noting their presence in this report. The SAHRA paleontological sensitivity map indicated that the footprint as a whole is located on a paleontologically insignificant area and is not considered paleontologically vulnerable. No further mitigation prior to construction is recommended in terms of Section 35 for the proposed development to proceed.

In terms of the built environment of the area (Section 34), no structures older than 60 years occur in the study area. In terms of Section 36 of the Act no graves or burial sites were recorded. If any additional graves are located in future they should ideally be preserved or alternatively relocated according to existing legislation. No public monuments are located within or close to the study area. The study area is characterised by an existing quarry and associated infrastructure and the proposed development will not impact negatively on significant cultural landscapes or viewsapes. During the public participation process conducted for the project no heritage concerns was raised.

The impact on heritage resources in the study area is low and it is recommended that the proposed project can commence on the condition that the following recommendations are implemented as part of the EMPr and based on approval from SAHRA:

- Implementation of a chance find procedure as outlined in Section 9.1 of this report.

9.1. Chance Find Procedures

The possibility of the occurrence of subsurface finds cannot be excluded. Therefore, if during construction any possible finds such as stone tool scatters, artefacts or bone and fossil remains are made, the operations must be stopped and a qualified archaeologist must be contacted for an assessment of the find and therefor chance find procedures should be put in place as part of the EMP. A short summary of chance find procedures is discussed below.

This procedure applies to the developer's permanent employees, its subsidiaries, contractors and subcontractors, and service providers. The aim of this procedure is to establish monitoring and reporting procedures to ensure compliance with this policy and its associated procedures. Construction crews must be properly inducted to ensure they are fully aware of the procedures regarding chance finds as discussed below.

- If during the pre-construction phase, construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance or heritage site, this person must cease work at the site of the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager.
- It is the responsibility of the senior on-site Manager to make an initial assessment of the extent of the find, and confirm the extent of the work stoppage in that area.
- The senior on-site Manager will inform the ECO of the chance find and its immediate impact on operations. The ECO will then contact a professional archaeologist for an assessment of the finds who will notify the SAHRA.

9.2 Reasoned Opinion

The impact on heritage resources in the study area can be mitigated to an acceptable level and it is recommended that the proposed project can commence on the condition that the recommendations in this report are implemented as part of the EMPr and based on approval from SAHRA. Furthermore, the socio-economic benefits also outweigh the possible impacts of the development if the correct mitigation measures are implemented for the project.

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MAPS

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11. Appendices:**Curriculum Vitae of Specialist**

Jaco van der Walt
Archaeologist

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Education:

Particulars of degrees/diplomas and/or other qualifications:

Name of University or Institution: University of Pretoria
Degree obtained : BA Heritage Tourism & Archaeology
Year of graduation : 2001

Name of University or Institution: University of the Witwatersrand
Degree obtained : BA Hons Archaeology
Year of graduation : 2002

Name of University or Institution : University of the Witwatersrand
Degree Obtained : MA (Archaeology)
Year of Graduation : 2012

Name of University or Institution : University of Johannesburg
Degree : PhD
Year : Currently Enrolled

EMPLOYMENT HISTORY:

2011 – Present: **Owner – HCAC (Heritage Contracts and Archaeological Consulting CC).**
2007 – 2010 : **CRM Archaeologist**, Managed the Heritage Contracts Unit at the University of the Witwatersrand.
2005 - 2007: **CRM Archaeologist**, Director of Matakoma Heritage Consultants
2004: **Technical Assistant**, Department of Anatomy University of Pretoria
2003: **Archaeologist**, Mapungubwe World Heritage Site
2001 - 2002: **CRM Archaeologists**, For R & R Cultural Resource Consultants, Polokwane
2000: **Museum Assistant**, Fort Klapperkop.

Countries of work experience include:

Republic of South Africa, Botswana, Zimbabwe, Mozambique, Tanzania, The Democratic Republic of the Congo, Lesotho and Zambia.

SELECTED PROJECTS INCLUDE:

Archaeological Impact Assessments (Phase 1)

Heritage Impact Assessment Proposed Discharge Of Treated Mine Water Via The Wonderfontein Spruit Receiving Water Body Specialist as part of team conducting an Archaeological Assessment for the Mmamabula mining project and power supply, Botswana

Archaeological Impact Assessment Mmamethlake Landfill

Archaeological Impact Assessment Libangeni Landfill

Linear Developments

Archaeological Impact Assessment Link Northern Waterline Project At The Suikerbosrand Nature Reserve

Archaeological Impact Assessment Medupi – Spitskop Power Line,

Archaeological Impact Assessment Nelspruit Road Development

Renewable Energy developments

Archaeological Impact Assessment Karoshoek Solar Project

Grave Relocation Projects

Relocation of graves and site monitoring at Chloorkop as well as permit application and liaison with local authorities and social processes with local stakeholders, Gauteng Province.

Relocation of the grave of Rifle Man Maritz as well as permit application and liaison with local authorities and social processes with local stakeholders, Ndumo, Kwa Zulu Natal.

Relocation of the Magolwane graves for the office of the premier, Kwa Zulu Natal

Relocation of the OSuthu Royal Graves office of the premier, Kwa Zulu Natal

Phase 2 Mitigation Projects

Field Director for the Archaeological Mitigation For Booyensdal Platinum Mine, Steelpoort, Limpopo Province. Principle investigator Prof. T. Huffman

Monitoring of heritage sites affected by the ARUP Transnet Multipurpose Pipeline under directorship of Gavin Anderson.

Field Director for the Phase 2 mapping of a late Iron Age site located on the farm Kameelbult, Zeerust, North West Province. Under directorship of Prof T. Huffman.

Field Director for the Phase 2 surface sampling of Stone Age sites effected by the Medupi – Spitskop Power Line, Limpopo Province

Heritage management projects

Platreef Mitigation project – mitigation of heritage sites and compilation of conservation management plan.

MEMBERSHIP OF PROFESSIONAL ASSOCIATIONS:

- Association of Southern African Professional Archaeologists. Member number 159
Accreditation:
 - Field Director Iron Age Archaeology
 - Field Supervisor Colonial Period Archaeology, Stone Age
Archaeology and Grave Relocation
- Accredited CRM Archaeologist with SAHRA
- Accredited CRM Archaeologist with AMAFA
- Co-opted council member for the CRM Section of the Association of Southern African Association Professional Archaeologists (2011 – 2012)

PUBLICATIONS AND PRESENTATIONS

- A Culture Historical Interpretation, Aimed at Site Visitors, of the Exposed Eastern Profile of K8 on the Southern terrace at Mapungubwe.
 - J van der Walt, A Meyer, WC Nienaber
 - Poster presented at Faculty day, Faculty of Medicine University of Pretoria 2003
- 'n Reddingsondersoek na Anglo-Boereoorlog-ammunisie, gevind by Ifafi, Noordwes-Provinsie. South-African Journal for Cultural History 16(1) June 2002, with A. van Vollenhoven as co-writer.
- Fieldwork Report: Mapungubwe Stabilization Project.
 - WC Nienaber, M Hutten, S Gaigher, J van der Walt
 - Paper read at the Southern African Association of Archaeologists Biennial Conference 2004
- A War Uncovered: Human Remains from Thabantšho Hill (South Africa), 10 May 1864.
 - M. Steyn, WS Boshoff, WC Nienaber, J van der Walt
 - Paper read at the 12th Congress of the Pan-African Archaeological Association for Prehistory and Related Studies 2005
- Field Report on the mitigation measures conducted on the farm Bokfontein, Brits, North West Province .
 - J van der Walt, P Birkholtz, W. Fourie
 - Paper read at the Southern African Association of Archaeologists Biennial Conference 2007
- Field report on the mitigation measures employed at Early Farmer sites threatened by development in the Greater Sekhukhune area, Limpopo Province. J van der Walt
 - Paper read at the Southern African Association of Archaeologists Biennial Conference 2008
- Ceramic analysis of an Early Iron Age Site with vitrified dung, Limpopo Province South Africa.
 - J van der Walt. Poster presented at SAFA, Frankfurt Germany 2008

- Bantu Speaker Rock Engravings in the Schoemanskloof Valley, Lydenburg District, Mpumalanga (*In Prep*)
 - J van der Walt and J.P Celliers
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- Detailed mapping of LIA stone-walled settlements' in Lydenburg, Mpumalanga. J van der Walt and J.P Celliers
 - Paper read at the Southern African Association of Archaeologists Biennial Conference 2011
- Bantu-Speaker Rock engravings in the Schoemanskloof Valley, Lydenburg District, Mpumalanga. J.P Celliers and J van der Walt
 - Paper read at the Southern African Association of Archaeologists Biennial Conference 2011
- Pleistocene hominin land use on the western trans-Vaal Highveld ecoregion, South Africa, Jaco van der Walt.
 - J van der Walt. Poster presented at SAFA, Toulouse, France. Biennial Conference 2016

REFERENCES:

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