

Appendix C – Photographs

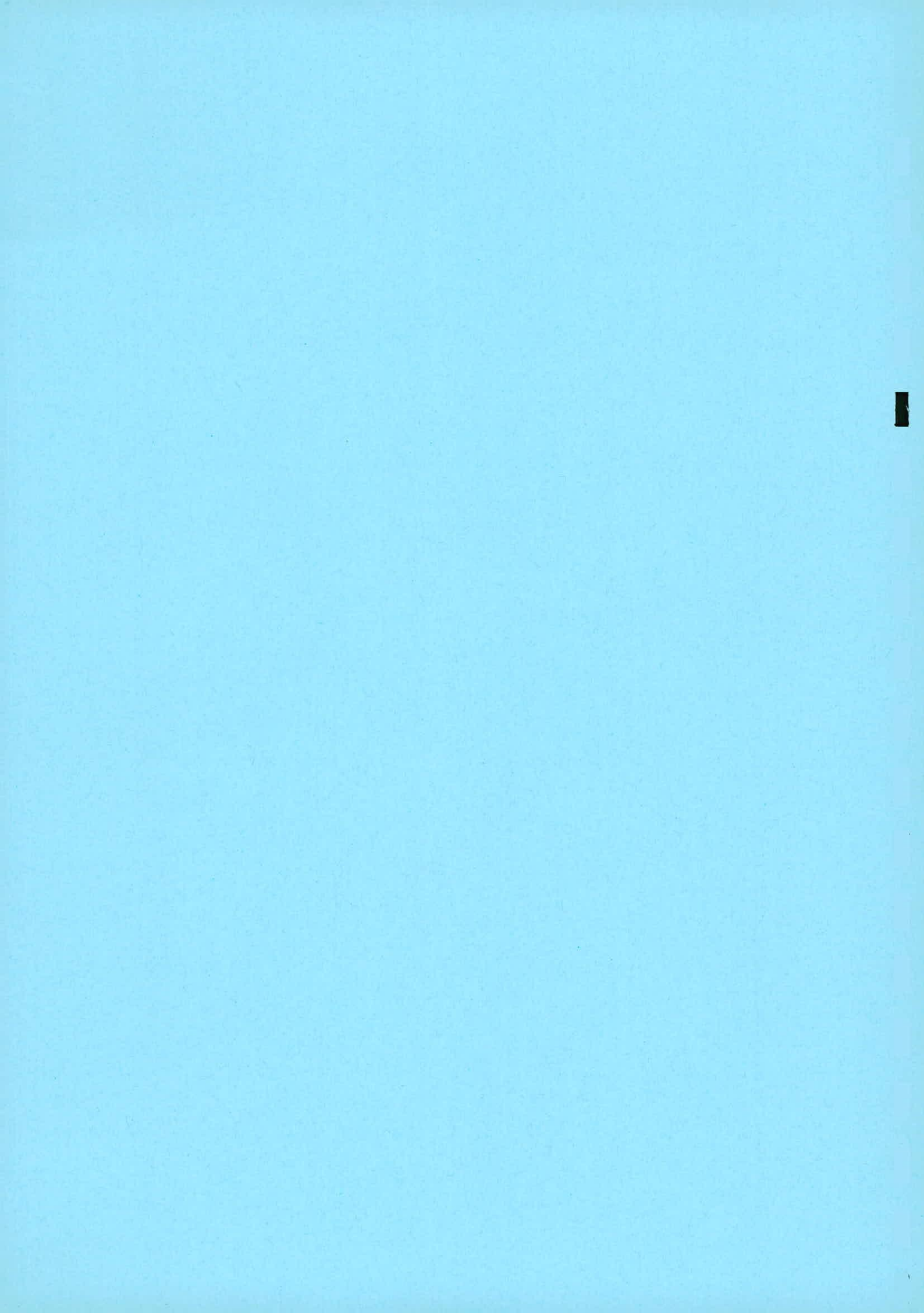




Figure C-1: Southeastern section of the proposed site



Figure C-2: Vegetation of the proposed site, also showing sand patches



Figure C-3: Vegetation of the proposed site, also showing alien vegetation



Figure C-4: Eastern section of the proposed site, also showing sand patches



Figure C-5: Sand dune on the western part of the proposed site



Figure C-6: Planted pasture on the northern half of the proposed site

Appendix D – Prospecting Works Programme

Vulani Coronation Mining Prospecting Works Program For Elva Heights

Report Prepared for
Department of Minerals & Energy

Report No 411600/2

December 2009



Vulani Coronation Mining Prospecting Works Program For Elva Heights

Department of Minerals & Energy

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23 April 2010

411600

Vulani Coronation Mining Prospecting Works Program – Paterson Silica Sand

1 Introduction

This prospecting work program has been compiled in terms of Regulation 7(1) of the Regulations under the Mineral and Petroleum Resources Development Act 2002 (Act No. 28 of 2002).

Full Particulars of the Applicant

Applicant : Vulani Coronation Mining (Pty) Ltd

Company Registration # : 2005/035032/07

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Directors AJ Barrett, JR Dixon, DJ Mahlangu, BJ Middleton, MJ Morris, PE Schmidt, PJ Terbrugge

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Consultants AC Burger, BSc (Hons); IS Cameron-Clarke, PrSci Nat, MSc; JAC Cowan, PrSci Nat, BSc (Hons), JH de Beer, PrSci Nat, MSc; GA Jones, PrEng, PhD; TR Stacey, PrEng, DSc, OKH Steffen, PrEng, PhD, RJ Stuart, PrTech Eng, GDE; DW Warwick, PrSci Nat, BSc (Hons)

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Site Plan

The application relates to the Elva Heights area listed under 'Registered Description of the Land' below and equating to a total area of 198 hectares. The requisite site plan outlining the Elva Heights is filed under Appendix A.

Registered Description of the Land

The proposed prospecting study area is known as Elva Heights with Mr Speedo Nondumo as the principal trustee. The following area constitutes Elva Heights:

<i>Farm Name</i>	<i>Area (Ha)</i>
Elva Heights 102	198.0
TOTAL AREA	198

Refer to the registered title deeds for the Elva Heights under Appendix D.

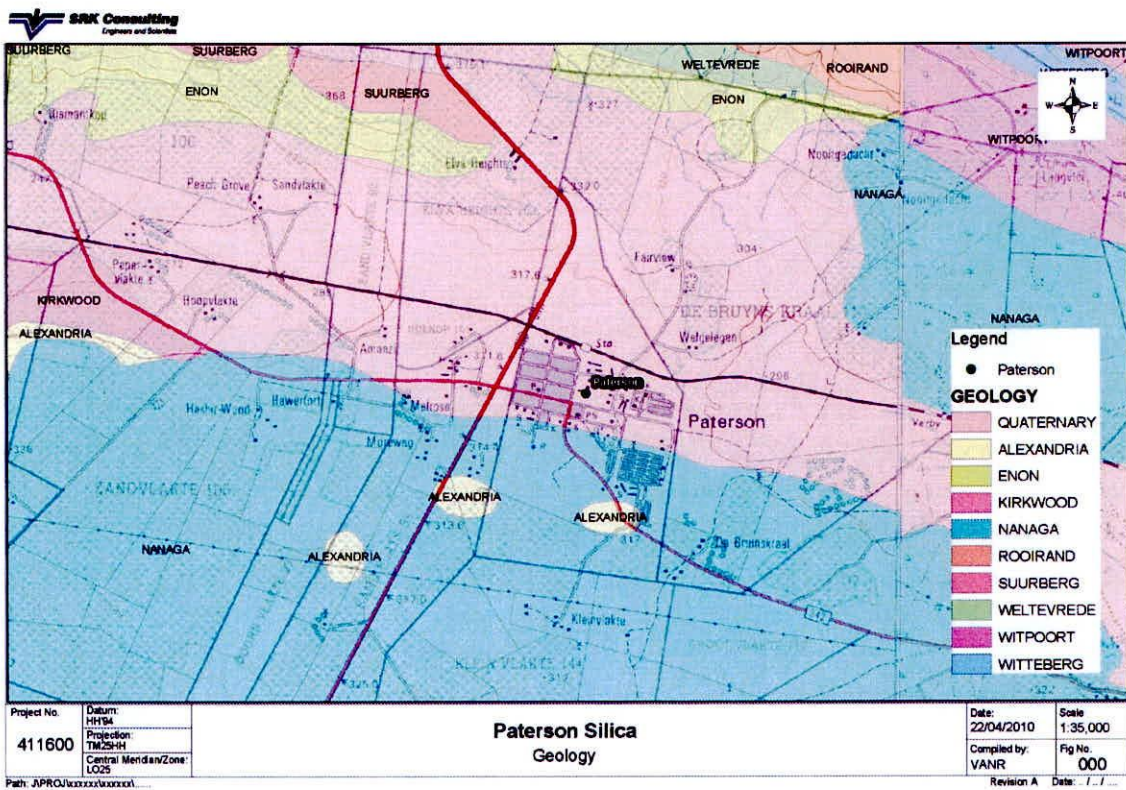
Mineral to be Prospected for

The proposed mineral to be prospected for is Silica Sand.

Geological Description

The town of Paterson is located on Quaternary aeolian (windblown) sand, which is in turn underlain mostly by the Nanaga Formation. The primary source of the Aeolian sand is the underlying Nanaga Formation, which consists of semi-consolidated to consolidated calcareous sandstone, and sandy limestone with large-scale cross-bedding. The sand has accumulated at the foot of the Suurberg mountain range.

A geological map is included below for reference.



2 Prospecting Works Program

The prospecting method will be conducted in phases with the aim to accurately define the deposit in terms of its volume and quality.

2.1 Phase 1

Phase 1 will comprise of the following tasks:

1. Desk top study utilising information from GIS sources as well as geological maps attained from the Eastern Cape Branch of the Council for Geoscience to determine;
 - a. The underlying geology of the area;
 - b. Any previous mining within the area, specifically for the commodity in question; and
 - c. Rough extent of the commodity on surface;
2. Geological mapping to confirm the findings of the desk top study and verify the presence of the potential deposit in the field;

2.2 Phase 2

Phase 2 will comprise of the following tasks:

1. Test pits excavated on a 400x400 m grid across the deposit to allow for an inferred resource to be estimated.
 - a. This equates to approximately 14 test pits across the Elva Heights area (refer to Appendix K).
2. Test pits excavated on a 200x200 m grid to accurately define the deposit and get an Indicated or Measured Resource.
 - a. The test pits will be 'infill' test pits between those excavated on the 400x400 m grid (refer to Appendix K).
 - b. The total number of test pits is approximately 48 test pits.

NOTE: The desk top study and geological mapping conducted in Phase 1 will determine the broad lateral extent of the deposit thus affecting the size of the area to be prospected and the number of test pits to be excavated.

Prospecting Methods

- The test pits will be excavated with the use of a TLB. The test pits will comprise of the following dimensions:
 - 4 m (length) x 0.75 m (breadth) x 3 m (height)
 - The estimated volume of material to be excavated is ~320 m³ (400 x 400 m grid) and ~970 m³ (200 x 200 m grid).
- Each of the test pits will be logged and photographed;

- Only selected test pits will be sampled for silica sand. A 5 kg sample will be collected and submitted to an accredited laboratory for analysis;
- All test pits will be backfilled immediately after completion of the logging and sampling. No test pits will be left open and unattended. The surface of the test pit will be neatly smoothed to limit the visual impact.
- Each test pit will be clearly marked with a bright orange flag mounted on a 1.5 m plastic PVC pipe;
- The study area is characterised by many gravel roads and tracks thus reducing the need for off road driving. However, certain test pit locations will require off road driving and every effort will be made to limit the impact on the existing vegetation;
- The TLB operator and geologist will be the only two personnel on site during the investigation.
- Refuelling (and servicing if necessary) of the TLB will be conducted off site or at a predefined location within the Elva Heights area after agreement with Mr Nondumo;

A map indicating the proposed positions of the test pits on a 400 x 400 m and 200 x 200 m grid is filed under Appendix K

Technical Ability to Conduct the Prospecting Operation

Vulani Coronation Mining (Pty) Ltd has appointed SRK Consulting (Pty) Ltd to submit a prospecting application including a prospecting works programme. SRK Consulting has assigned Mr Brent Cock to conduct the prospecting operation. Mr Cock is a geologist with 6 years experience in various geological disciplines, ranging from: resource core drilling, stream sediment sampling, geochemical soil sampling, lithostructural mapping and engineering geological investigations. Mr Cock has worked in numerous localities, namely: Bushveld Igneous Complex, Barberton Greenstone Belt, Botswana, Zambia, Democratic Republic of Congo and Burkina Faso. Mr Cock will conduct the fieldwork and reporting with the draft report to be submitted to a Principal Geologist for review prior submission.

Mr Cock's contact details are provided below:

Work Address	Groundfloor, Bay Suites 1a Humewood Road Humerail Port Elizabeth
Tel (W)	+27 (0) 41 509 4800
Tel (Fax)	+27 (0) 41 509 4800
Email Address	bcock@srk.co.za

A resume outlining Mr Cock's work experience is filed under Appendix L

Applicants Financial Ability and Project Budget

The proposed prospecting budget is included in Table 1 below:

Table 1: Budget Costing Summary

Elva Heights								
Phases	Description	Time (hrs)	Travelling (km)	Samples	Other	Rate	Amount	
Phase 1	Desktop study	4				540	R 2,160.00	
	Geological Mapping	8				540	R 4,320.00	
	Travelling		150			2.75	R 412.50	
	Field allowance				1	45	R 45.00	
						Sub-Total	R 6,937.50	
Phase 2	400 x 400 m grid:							
	Fieldwork (14 TP's)	16				540	R 8,640.00	
	TLB Hire	16				300	R 4,800.00	
	Load Bed				2	1400	R 2,800.00	
	Sampling - chemical			5		750	R 3,750.00	
	Sampling - grading			5		345	R 1,725.00	
	Travelling		150			2.75	R 412.50	
	Field allowance				1	45	R 45.00	
							Sub-total	R 22,172.50
		200 x 200 m grid:						
	Fieldwork (48 TP's)	24				540	R 12,960.00	
	TLB Hire	24				300	R 7,200.00	
	Load Bed				2	1400	R 2,800.00	
	Sampling - chemical			10		750	R 7,500.00	
	Sampling - grading			10		345	R 3,450.00	
	Travelling		500			2.75	R 1,375.00	
	Field allowance				3	45	R 135.00	
						Sub-total	R 35,420.00	
Phase 3	Topographical & TP survey	8				350	R 2,800.00	
	Travelling		150			3.6	R 540.00	
	GPS				2	1500	R 3,000.00	
	Reductions	3				350	R 1,050.00	
						Sub-total	R 7,390.00	
Phase 4	Bulk Sample				1	50000	R 50,000.00	
Phase 5	Geotechnical Report	55				540	R 21,731.90	
						TOTAL	R 143,651.90	

2.3 Phase 3

The entire Elva Heights area, including boundary fences, will be surveyed to provide an accurate DTM surface of the deposit.

Each test pit location will be surveyed to provide an accurate X, Y and Z coordinate in order to calculate the approximate volume of sand.

2.4 Phase 4

A bulk sample will need to be taken to determine whether the deposit can be mined efficiently and cost effectively. The anticipated grade and mineable volumes of silica sand will be determined.

Brent Cock Cand.Sci.Nat

SRK Consulting

Appendix E – Proof of Landowner’s Consultation

ATTENDANCE REGISTER

Department Mineral Resources Office Reference No: EC 30/5/1/1/2/0150 PR

Name of Applicant: Vulani Coronation Mining (Pty) Ltd

PUBLIC PARTICIPATION MEETING IN RESPECT OF AN APPLICATION FOR PROSPECTING RIGHT HELD AT PATERSON, ALEXANDRIA ON 15 APRIL 2010

	Name of attendee (Please print name)	Name of Company/Close Corporation/Trust etc being represented	Farm Name	Farm Number	Farm Portion	Telephone Number	Signature
1	JOHANNES		ELVA HEIGHTS	102		042 2351025	<i>[Signature]</i>
2	I.M.G (Gwenwa)	O. Fusi Lano Trust	O. Fusi Trust	De Bruyns Kraal 113	Portion 12	0781351931	<i>[Signature]</i>
3				"	Portion 4		
4				"	Remainder		
5				"	Portion 14		
6				Lang vley 118	Remainder		
7				Doorn Kloof 111	Portion 4		
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							

Regional Manager
Department of Mineral Resources
Private Bag X6076
Port Elizabeth
6000

**PROPERTY OWNER LETTER OF CONSENT: PROSPECTING ON THE FARM
ELVA HEIGHTS NO. 102, PATERSON**

I, Johannes Valentine*, the undersigned, in my capacity as property owner of the Farm Elva Heights No. 102, Paterson, confirm that I have been consulted and am aware of the proposed application for prospecting of silica sand on the relevant property.

I further confirm that I have no objection to the proposed prospecting and concede to the mentioned activity undertaken by Vulani Coronation Mining (Pty) Ltd.

Comments:

Heke uqet esb lal wear
ter allo tye .

Signed at Worcester this 7 day of Feb 2010 in the presence of the undersigned witnesses.

J. Valentine
(SIGNATURE)

[Signature]
WITNESS

N. Motel
WITNESS

Appendix F – Heritage Impact Assessment Report

A PHASE 1 ARCHAEOLOGICAL IMPACT ASSESSMENT (AIA) FOR THE PROPOSED SAND MINING ON THE ELVA HEIGHTS FARM 102 AND ON THE DIFUSI LAND TRUST PROPERTY INCORPORATING THE FARMS DE BRUYNS KRAAL, DOORN KLOOF AND LANG VLEY, PATERSON, SUNDAY'S RIVER VALLEY MUNICIPALITY, CACADU DISTRICT MUNICIPALITY, EASTERN CAPE PROVINCE

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May 2010

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A PHASE 1 ARCHAEOLOGICAL IMPACT ASSESSMENT (AIA) FOR THE PROPOSED SAND MINING ON THE ELVA HEIGHTS FARM 102 AND ON THE DIFUSI LAND TRUST PROPERTY INCORPORATING THE FARMS DE BRUYNS KRAAL, DOORN KLOOF AND LANG VLEY, PATERSON, SUNDAY'S RIVER VALLEY MUNICIPALITY, CACADU DISTRICT MUNICIPALITY, EASTERN CAPE PROVINCE

Note: This report follows the minimum standard guidelines required by the South African Heritage Resources Agency (SAHRA) for compiling a Phase 1 Archaeological Impact Assessment (AIA).

EXECUTIVE SUMMARY

Purpose of the Study

The purpose of the study was to conduct a phase 1 archaeological impact assessment (AIA) for the proposed sand mining on the Elva Heights Farm 102 and on the Difusi Land Trust Property incorporating the farms De Bruyns Kraal, Doorn Kloof and Lang Vley, Paterson, Sunday's River Valley Municipality, Cacadu District Municipality, Eastern Cape Province. The survey was conducted to establish the range and importance of the exposed and *in situ* archaeological heritage materials and features, the potential impact of the development and, to make recommendations to minimize possible damage to these sites.

Brief Summary of Findings

The proposed areas for the sand mining are situated to the north (Difusi Land Trust Property) and slightly north-west (Elva Heights) of the small town of Paterson, and are adjacent to each other on either side of the N10 main road. Three ephemeral Middle Stone Age (MSA) and Later Stone Age (LSA) stone artefact surface scatters were observed, one on Elva Heights Farm 102 and two on the Difusi Land Trust Property. However, no other associated archaeological materials were observed with the stone artefact scatters, and it is unlikely that the stone artefact would be in primary context.

No sites containing any depth of deposit or other archaeological material associated with the stone tool artefacts and archaeological material were observed within the area. The proposed area for development (sand mining) is considered as having a low cultural significance, although the following recommendations must be taken into consideration prior to the construction activities.

Recommendations

The area is of a low cultural sensitivity and development may proceed as planned, although the following recommendations must be considered:

1. It is unlikely that any *in situ* archaeological sites/remains, and human remains would be uncovered during construction. However, if concentrations of archaeological heritage material and human remains are uncovered during construction, all work must cease immediately and be reported to the Albany Museum (046 622 2312) and/or the South African Heritage Resources Agency (SAHRA) (021 642 4502) so that systematic and professional investigation/excavation can be undertaken.

2. Construction managers/foremen should be informed before construction starts on the possible types of heritage sites and cultural material they may encounter and the procedures to follow when they find sites.
3. The stone scatter occurrences should be taken into account when the areas for sand mining have been defined.

BACKGROUND INFORMATION

The phase 1 archaeological impact (AIA) assessment report is required as part of the environmental impact assessment (EIA) for the proposed mining of sand.

Developer:

Vulani Coronation Mining

Consultant:

SRK Consulting
 Contact person: Ms Nontsikelelo Martel
 P.O. Box 21842
 Port Elizabeth
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Terms of Reference

To conduct a survey of possible archaeological heritage sites within the areas of the proposed for the proposed sand mining on the Elva Heights Farm, Erf 102 and on the Difusi Land Trust Property incorporating the farms De Bruyns Kraal, Doorn Kloof and Lang Vley, Paterson, Sunday's River Valley Municipality, Cacadu District Municipality, Eastern Cape Province. The survey was conducted to establish the range and importance of the exposed and *in situ* archaeological heritage materials and features, the potential impact of the development and, to make recommendations to minimize possible damage to these sites.

Legislative requirements

Parts of sections 35(4) and 38(1) (8) of the National Heritage Resources Act 25 of 1999 apply:

35 (4) No person may, without a permit issued by the responsible heritage resources authority—

- (a) destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;*
- (b) destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;*
- (d) bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assist in the detection or recovery of*

metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites.

38. (1) *Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorized as -*
- (a) *the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;*
 - (b) *the construction of a bridge or similar structure exceeding 50m in length;*
 - (c) *any development or other activity which will change the character of the site -*
 - (i) *exceeding 5000m² in extent, or*
 - (ii) *involving three or more erven or subdivisions thereof; or*
 - (iii) *involving three or more erven or divisions thereof which have been consolidated within the past five years; or*
 - (iv) *the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial resources authority;*
 - (d) *the re-zoning of a site exceeding 10 000m² in extent; or*
 - (e) *any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must as the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.*
- (8) *The provisions of this section do not apply to a development as described in subsection (1) if an evaluation of the impact of such development on heritage resources is required in terms of the Environment Conservation Act, 1989 (Ant No.73 of 1989), or the integrated environmental management guidelines issued by the Department of Environmental Affairs and Tourism, or the Minerals Act, 1991 (Act No. 50 of 1991), or any other legislation: Provided that the consenting authority must ensure that the evaluation fulfils the requirements of the relevant heritage resources authority in terms of subsection (3), and any comments and recommendations of the relevant heritage resources authority with regard to such development have been taken into account prior to the granting of the consent.*

BRIEF ARCHAEOLOGICAL BACKGROUND

Literature review

Little is known about the archaeology of the immediate area, mainly because no systematic research has been conducted near Paterson. The closest areas where research has been conducted previously are situated approximately 35 km to the south-west around Coega just outside Port Elizabeth, and in the nearby Suurberg Mountains. The gravels of old river terraces which line most of the Coega River and estuary contain archaeological remains in the form of stone tools. Early Stone Age (ESA) (approximately 1.4 million - 250 000 years old) stone tools are found throughout the area. One of South Africa's most important Earlier Stone Age sites, Amanzi Springs, were excavated by H.J. Deacon during the 1970's (Deacon 1970) is situated within the Coega area. In a series of spring deposits a large number of stone tools were found *in situ* to a depth of 3-4 metres. Wood and seed material preserved remarkably very well within the spring deposits, and possibly date to between 800 000 to 250 000 years old.

Middle Stone Age (MSA) (250 000 - 30 000 years ago) stone tool artefacts are found throughout the region and also in the gravels along the banks of the Sunday's River. These stone artefacts, like the Earlier Stone Age handaxes are in secondary context with no other associated archaeological material.

Many marines shell middens, ceramic pot sherds (from Later Stone Age Khoekhoen pastoralist origin - last 2 000 years) and other archaeological material, are situated between the Coega and Sunday's River Mouths. These remains date mainly from Holocene Later Stone Age (last 10 000 years). Human remains have also been found in the dunes along the coast. Further inland freshwater shell middens are found along the river banks of major rivers such as the Sunday's River.

The majority of archaeological sites found in the area date from the past 10 000 years (called the Later Stone Age) and are associated with the campsites of San hunter-gatherers and Khoi pastoralists. These sites are difficult to find because they are in the open veld and often covered by vegetation and sand. Sometimes these sites are only represented by a few stone tools and fragments of bone. The preservation of these sites is poor and it is not always possible to date them Africa (Deacon & Deacon 1999). There are many San hunter-gatherers caves and rock shelter sites in the nearby Suurberg Mountains. Here caves and rock shelters were occupied by the San during the Later Stone Age and contain paintings along the walls. Wilton Large Rock Shelter and Melkhoutboom Cave, where well-preserved botanic remains were found, are two of the important Later Stone Age sites situated in and nearby this mountain range (Deacon 1999).

References:

- Deacon, H.J. 1970. The Acheulian occupation at Amanzi Springs, Uitenhage District, Cape Province. *Annals of the Cape Provincial Museums*. 8:89-189.
- Deacon, H.J. & Deacon, J. *Human beginnings in South Africa*. Cape Town: David Phillips Publishers.
- Gess, W.H.R. 1969. Excavations of a Pleistocene bone deposit at Aloes near Port Elizabeth. *South African Archaeological Bulletin* 24:31-32.
- Rudner, J. 1968. Strandloper pottery from South and South West Africa. *Annals of the South African Museum* 49:441-663.

DESCRIPTION OF THE PROPERTY

Area surveyed

Location data

The proposed areas for the sand mining are situated about 30 km inland from the nearest coastline and to the north (Difusi Land Trust Property) and slightly north-west (Elva Heights) of the small town of Paterson. Elva Heights is situated on the western side of the N10 main road and the Difusi Land Trust Property is situated to the east of the N10 main road.

Map

1:50 000 3325BD PATERSON and 3326AC ALICEDALE (Map 1)

ARCHAEOLOGICAL INVESTIGATION

Methodology

The surveys of the proposed areas (Elva Heights and the Difusi Land Trust Property) were conducted by three people on foot. GPS readings were taken using a Garmin Plus II. The GPS readings have been plotted on Maps 2,3 and 4, however, only those of relevance have been mentioned within the text. Each of the proposed sand mining areas (Elva Heights and the Difusi Land Trust Property) will be described and explained separately.

ELVA HEIGHTS FARM, NO 102 (Map 3):

Elva Heights Farm No. 102, is approximately 198.1 ha in extent. The northern half of the farm is comprised of disturbed cultivated and ploughed lands (Figs 1-2), and therefore, the survey was mainly focused on the sandy areas in the southern half of the farm. Vegetated and semi-vegetated Holocene river sand dunes occur within an area of about 1.8 km (east-west) by 900 m (north-south) marking approximately half of the proposed area for the sand mining (Figs 3-4) between the areas marked GPS5 ($33^{\circ}25'46.56''S$; $25^{\circ}57'34.56''E$) and GPS16 ($33^{\circ}25'28.29''S$; $25^{\circ}58'03.90E$). The area is covered in long and short dense grass shrubs and *Acacia karoo* trees; some planted alien trees also occur sporadically across the area, a wetland or old reservoir area was also observed by the distinct difference in vegetation of a more dense reed-like cover around the area marked GPS5 (Figs 5-6).

An existing railway line borders the southern boundary of the farm area. The area of 100 m along this boundary fence has been heavily disturbed, possibly by the construction of the railway line; underground reservoirs have also been constructed in close proximity to the railway line within the area marked GPS1 ($33^{\circ}25'55.14''S$; $25^{\circ}27'54.36''E$), these however fall outside the proposed area for the sand mining (Figs 7-8).

An isolated surface occurrence of Later Stone Age (LSA) stone artefacts were documented in one of the deflation bays at the area marked GPS15 ($33^{\circ}25'35.10''S$; $25^{\circ}57'48.96''E$). The stone artefact scatter comprised mainly of cores, flakes and one scraper made predominantly on hornfels, silcrete, quartzite, quartz and chalcedony, probably having been quarried from the nearby Suurberg Mountains (Figs 9-10). No other archaeological materials and remains were identified to be associated with the ephemeral stone artefact scatter.



Figs 1-2. View of the cultivated and ploughed lands.



Figs 3-4. View of the vegetated and semi-vegetated Holocene river sand dunes.



Figs 5-6. View of the wetland / reservoir areas.



Figs 7-8. Disturbed areas: (left) Railway line, farm boundary fence; (right) underground reservoirs.



Figs 9-10. Deflation bay with ephemeral LSA stone tool scatter (left) and examples of the stone artefacts observed (right).

DIFUSI LAND TRUST PROPERTY (Map 4):

The Difusi Land Trust Property is approximately 580.1 ha in extent and is made up of various farms including: portions 4, 12, 14 and the remainder of the farm De Bruyns Kraal 113; portions 3 and 4 of the farm Doorn Kloof 111; and remainder of the farm Lang Vley. The property is covered by short dense grass and sparsely situated trees; most of the area has been previously disturbed by the ploughing and cultivation of the land, and is currently being used as grazing areas (Figs 11-12). Two prominent sandy areas occur within the boundary of the Difusi Land Trust Property. The smaller area, approximately 950 m by 1141 m in extent, occurring to the south-west and the larger area, approximately 815 m by 1300 m in extent, occurring at the bottom of slight gradient slope to the south-east of the property. These two areas have been the focus of the archaeological investigation.



Figs 11-12. Views of the vegetation cover.

The smaller sandy area situated in the south-west corner of the property comprises of vegetated and semi-vegetated Holocene river sand dunes. Previous disturbance has been caused by the boundary fence that runs between these sand dunes (Figs 13-14). One Middle Stone Age (MSA) stone artefact surface scatter is situated at the area marked GPS14 (33°25'42.90"S; 25°58'28.02"E). The stone artefact scatter was observed on an open calcrete patch that underlies the overlying Holocene river sand dunes that may have been disturbed during previous prospecting activities. They were identified by the characteristic faceted platform 'prepared core technique' and include flakes and blades made on fine-grained quartzite and silcrete (Figs 15-16).

Another open calcrete patch was observed at the area marked GPS12 (33°25'43.50"S; 25°58'26.58"E) that had also been previously disturbed, however, no stone artefact or other archaeological remains were documented.

Calcrete mining has previously occurred within the area marked GPS4 (33°25'47.52"S; 25°58'49.02"E). No archaeological remains were identified within this area (Figs 17-18).

The area marked GPS15 (33°25'10.80"S; 26°00'21.78"E) is the furthest extent of the survey undertaken. The gravel road was followed and spot checks made, no archaeological materials were observed, the density of the short grass cover also made visibility difficult.



Figs 13-14. View of the vegetated and semi-vegetated Holocene river sand dune field and the boundary fence.



Figs 15-16. Disturbed area where MSA stone artefact scatter (right) was documented.

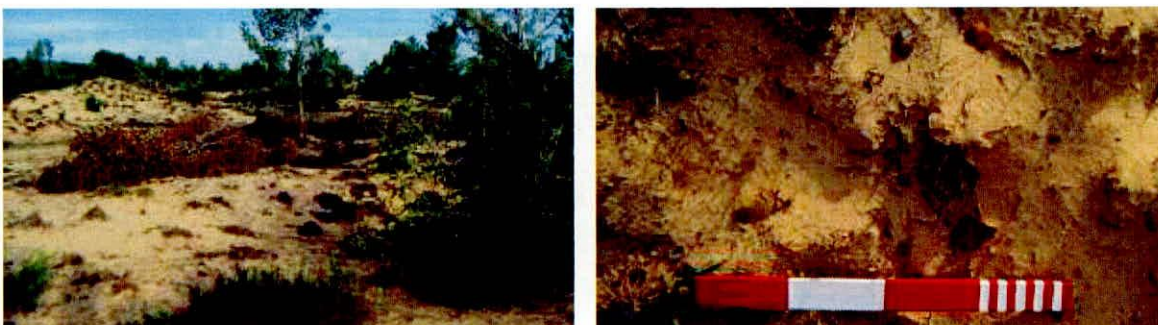


Figs 17-18. Disturbed calcrete digging area.

The larger sandy area situated within the south-east corner of the property similarly comprises of vegetated and semi-vegetated Holocene river sand dunes (Figs 19-20). One Later Stone Age (LSA) stone artefact scatter was observed within a deflation bay at the area marked GPS17 ($33^{\circ}25'42.72''S$; $25^{\circ}59'10.63''E$). The stone artefact scatter included flakes and one scraper made on fine-grained quartzite, quartz chalcedony and silcrete (Figs 21-22). The sandy areas situated at the areas marked GPS25 ($33^{\circ}25'26.20''S$; $25^{\circ}59'24.13''E$) and GPS26 ($33^{\circ}25'16.07''S$; $25^{\circ}59'24.22''E$) were also investigated for archaeological materials and remains, however, no stone tool artefacts or other archaeological materials and remains were observed within the areas.



Figs 19-20. View of the larger sandy patch.



Figs 21-22. The area where the LSA stone artefact scatter (right) was documented.

Survey/Description of sites

Isolated occurrences of ephemeral Middle Stone Age and Later Stone Age (LSA) stone artefact scatters were documented, made predominantly on fine-grained quartzite, quartz, silcrete, chalcedony and hornfels, however, it is unlikely that the artefacts are *in situ* and occur in secondary context owing to the previous and present disturbances occurring within the area. In addition, no other archaeological materials were observed to be in association with stone tool surface scatters and no depth of archaeological deposit recorded.

RECOMMENDATIONS

The area is of a low cultural sensitivity and development may proceed as planned, although the following recommendations must be considered:

1. The area has been highly disturbed in past and currently, therefore, it is unlikely that any *in situ* archaeological sites/remains, and human remains would be uncovered during construction. However, if concentrations of archaeological heritage material and human remains are uncovered during construction, all work must cease immediately and be reported to the Albany Museum (046 622 2312) and/or the South African Heritage Resources Agency (SAHRA) (021 642 4502) so that systematic and professional investigation/excavation can be undertaken.
2. Construction managers/foremen should be informed before construction starts on the possible types of heritage sites and cultural material they may encounter and the procedures to follow when they find sites.

3. The stone scatter occurrences should be taken into account when the areas for sand mining have been defined.

GENERAL REMARKS AND CONDITIONS

Note: This report is a phase 1 archaeological heritage impact assessment/investigation only and does not include or exempt other required heritage impact assessments (see below).

The National Heritage Resources Act (Act No. 25 of 1999, section 35) requires a full Heritage Impact Assessment (HIA) in order that all heritage resources, that is, all places or objects of aesthetics, architectural, historic, scientific, social, spiritual linguistic or technological value or significance are protected. Thus any assessment should make provision for the protection of all these heritage components, including archaeology, shipwrecks, battlefields, graves, and structures older than 60 years, living heritage, historical settlements, landscapes, geological sites, palaeontological sites and objects.

It must be emphasized that the conclusions and recommendations expressed in this archaeological heritage sensitivity investigation are based on the visibility of archaeological sites/features and may not therefore, reflect the true state of affairs. Many sites/features may be covered by soil and vegetation and will only be located once this has been removed. In the event of such finds being uncovered, (such as during any phase of construction work), archaeologists must be informed immediately so that they can investigate the importance of the sites and excavate or collect material before it is destroyed. The onus is on the developer to ensure that this agreement is honoured in accordance with the National Heritage Act No. 25 of 1999.

It must also be clear that Archaeological Specialist Reports (AIAs) will be assessed by the relevant heritage resources authority. The final decision rests with the heritage resources authority, which may grant a permit or a formal letter of permission for the destruction of any cultural sites.

APPENDIX A: IDENTIFICATION OF ARCHAEOLOGICAL FEATURES AND MATERIAL FROM INLAND AREAS: guidelines and procedures for developers

1. Human Skeletal material

Human remains, whether the complete remains of an individual buried during the past, or scattered human remains resulting from disturbance of the grave, should be reported. In general the remains are buried in a flexed position on their sides, but are also found buried in a sitting position with a flat stone capping and developers are requested to be on the alert for this.

2. Freshwater mussel middens

Freshwater mussels are found in the muddy banks of rivers and streams and were collected by people in the past as a food resource. Freshwater mussel shell middens are accumulations of mussel shell and are usually found close to rivers and streams. These shell middens frequently contain stone tools, pottery, bone, and occasionally human remains. Shell middens may be of various sizes and depths, but an accumulation which exceeds 1 m² in extent, should be reported to an archaeologist.

3. Stone artefacts

These are difficult for the layman to identify. However, large accumulations of flaked stones which do not appear to have been distributed naturally should be reported. If the stone tools are associated with bone remains, development should be halted immediately and archaeologists notified

4. Fossil bone

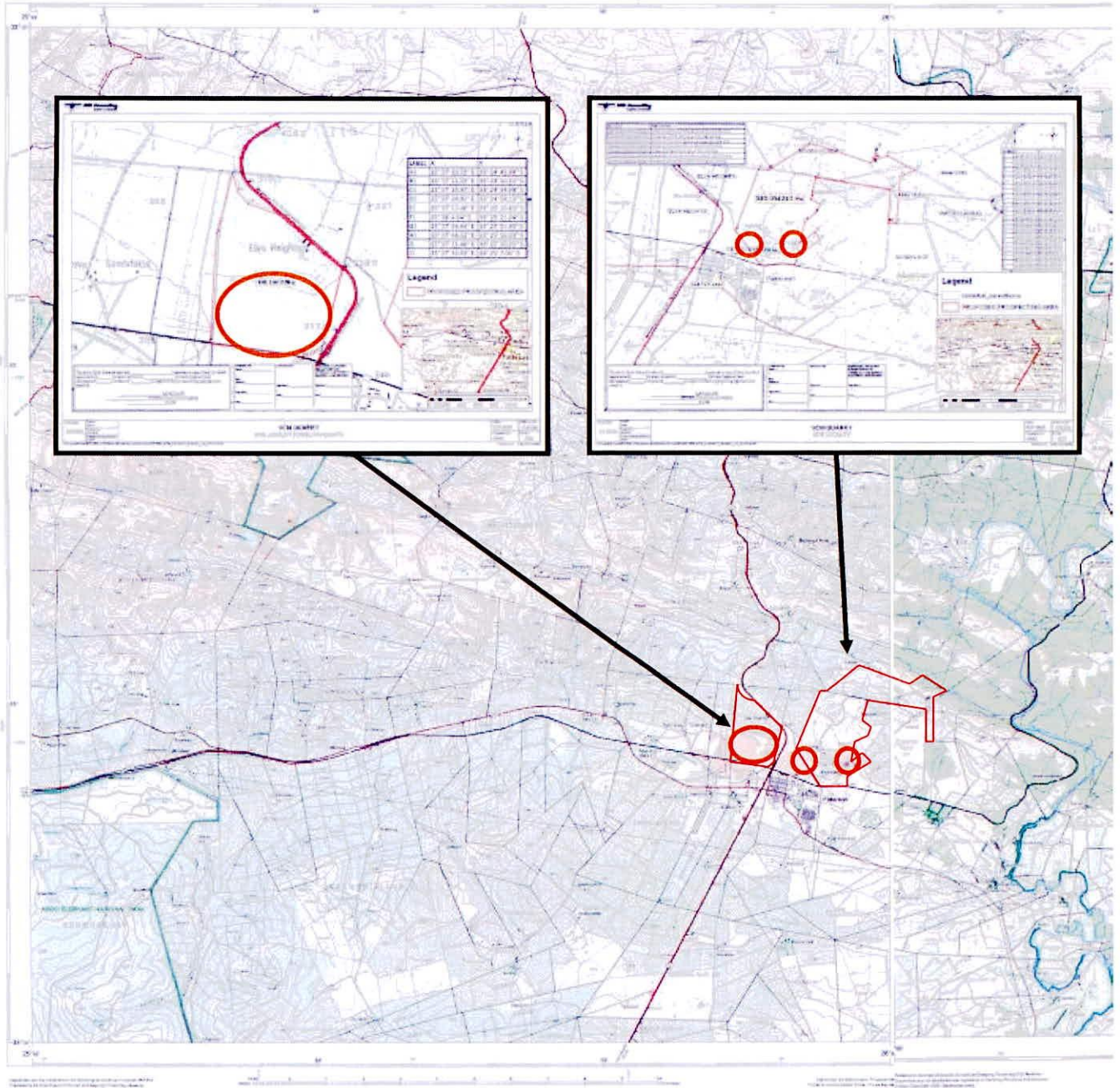
Fossil bones may be found embedded in geological deposits. Any concentrations of bones, whether fossilized or not, should be reported.

5. Large stone features

They come in different forms and sizes, but are easy to identify. The most common are roughly circular stone walls (mostly collapsed) and may represent stock enclosures, remains of wind breaks or cooking shelters. Others consist of large piles of stones of different sizes and heights and are known as *isisivane*. They are usually near river and mountain crossings. Their purpose and meaning is not fully understood, however, some are thought to represent burial cairns while others may have symbolic value.

6. Historical artefacts or features

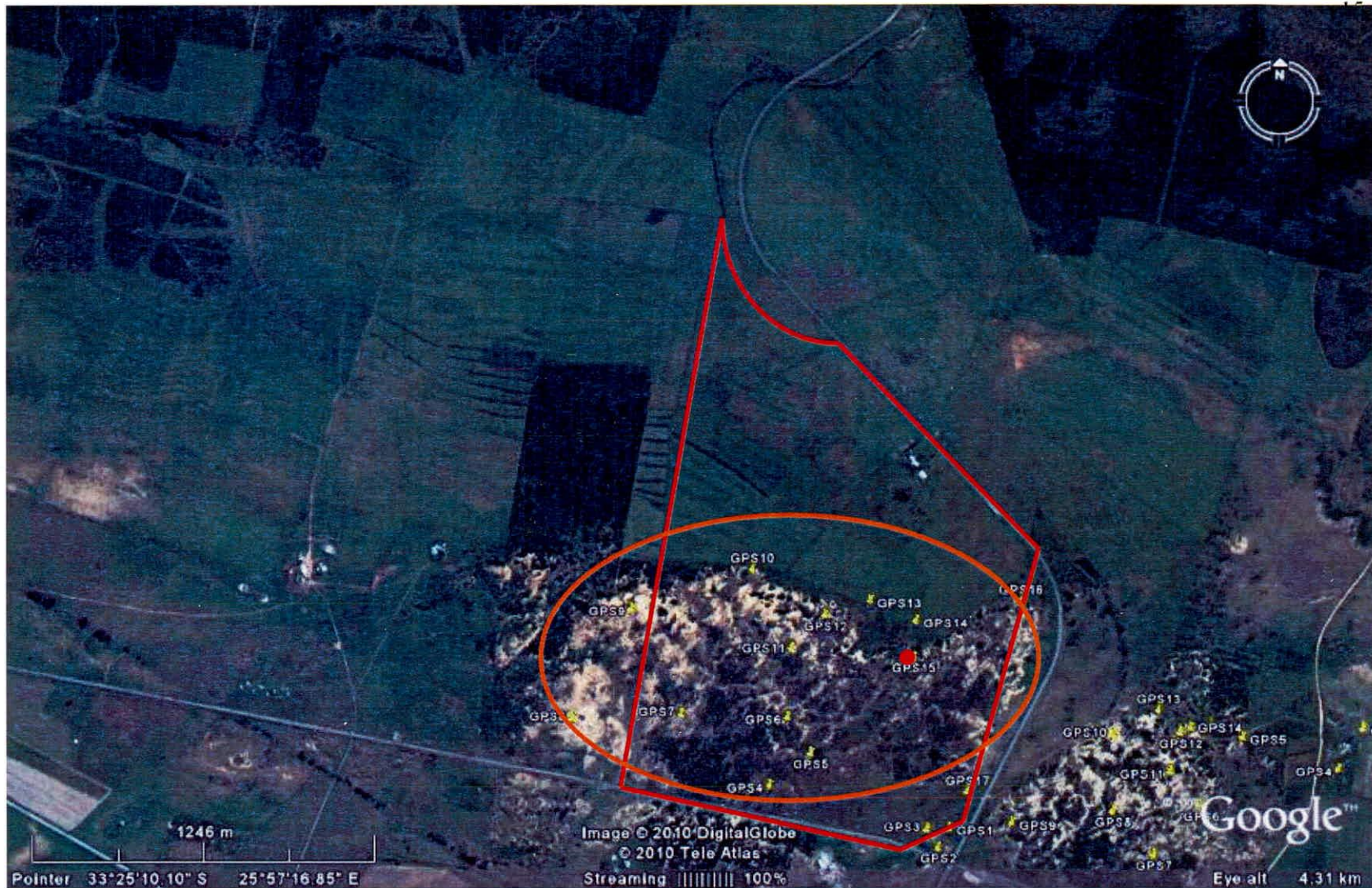
These are easy to identified and include foundations of buildings or other construction features and items from domestic and military activities.



Map 1: 1:50 000 Indicating proposed areas for the sand mining (the orange circles highlight the prominent sandy areas) [Insert maps courtesy of SRK Consulting].



Map 2. Aerial view of the areas proposed for the mining of sand.



Map 3. GPS plots and an aerial view of the Elva Heights farm 102 proposed for the mining of sand (the orange circle highlights the prominent sandy area; the red dot shows the position of the stone artefact scatter within one of the deflation bays).



Map 4. GPS plots and an aerial view of the Difusi Land Trust Property proposed for the mining of sand (the orange circles highlight the prominent sandy areas; the red dots show the positions of the stone artefact scatters).



Appendix G – Impact Rating Table & Rating Methodology

Impact	Description	Mitigation	Extent	Intensity	Duration	Consequence	Consequence	Probability	Probability	Significance	Status	Confidence
Topography	Alteration of topography through excavation of test pits and the deposition of material adjacent to the pit.	Without	1	1	1	3	Very low	3	Definite	Very Low	- ve	high
		With	1	1	1	3	Very low	1	Possible	Insignificant	- ve	high
Geology	Permanent alteration of geology through the removal of material from borrow pits.	Without	1	1	1	3	Very low	3	Definite	Very Low	- ve	high
		With	1	1	1	3	Very low	1	Possible	Insignificant	- ve	high
Soils	Potential loss of soil from test pits due to removal of topsoil and stockpiling for rehabilitation.	Without	1	2	1	4	Very low	2	Probable	Very Low	- ve	high
		With	1	1	1	3	Very low	1	Possible	Insignificant	- ve	high
Vegetation	Small scale loss of endemic vegetation associated with activities (accessing to the test pits, excavating test pits, and stockpiling of topsoil). No planned access roads will be constructed.	Without	1	2	1	4	Very low	2	Probable	Very Low	- ve	high
		With	1	1	1	3	Very low	1	Possible	Insignificant	- ve	high
Fauna	Farm stock can be scared away by heavy vehicles and prospecting activities, break out through open gates or fall into open test pits. No endangered or rare species expected on site.	Without	1	2	1	4	Very low	2	Probable	Very Low	- ve	high
		With	1	1	1	3	Very low	1	Possible	Insignificant	- ve	high
Surface water	No impacts on surface water are expected as there are no surface water bodies nearby.	Without	1	1	1	3	Very low	1	Possible	Insignificant	- ve	high
		None required				0	Not significant		Improbable	0	- ve	high
Ground water	Impacts on ground water are not expected.	Without	1	1	1	3	Very low	1	Possible	Insignificant	- ve	high
		None required				0	Not significant		Improbable	0	- ve	high
Air quality	Nuisance impact of dust generated from excavating as well as increased traffic on gravel roads.	Without	1	2	1	4	Very low	2	Probable	Very Low	- ve	high
		With	1	1	1	3	Very low	1	Possible	Insignificant	- ve	high
Land capability	No permanent or significant impact on land capability is expected.	Without	1	1	1	3	Very low	2	Probable	Very Low	- ve	high
		With	1	1	1	3	Very low	1	Possible	Insignificant	- ve	high
Noise	Nuisance impact of noise during working hours due to excavation activities. There are limited receptors for the impact as there are only a few residents near the proposed sites.	Without	1	2	1	4	Very low	3	Definite	Very Low	- ve	high
		With	1	1	1	3	Very low	1	Possible	Insignificant	- ve	high
Archaeology	No archaeological or cultural sites will be affected. Graves or archaeological material may be uncovered.	Without	1	2	1	4	Very low	1	Possible	Insignificant	- ve	high
		With	1	1	1	3	Very low	1	Possible	Insignificant	- ve	high
Visual Impacts	Potential visual impact if waste is not properly disposed of and if the test pits are not adequately rehabilitated.	Without	1	2	1	4	Very low	2	Probable	Very Low	- ve	high
		With	1	1	1	3	Very low	1	Possible	Insignificant	- ve	high
Socio-economic structure	Farming infrastructure could be damaged which would impact on residents of the farmhouse on the site.	Without	1	2	1	4	Very low	1	Possible	Insignificant	- ve	high
		With	1	1	1	3	Very low	0	Improbable	Insignificant	- ve	high
Waste management	Pollution of construction and domestic waste as well as waste water could lead to other visual impacts and loss of natural habitat.	Without	1	2	1	4	Very low	2	Probable	Very Low	- ve	high
		With	1	1	1	3	Very low	1	Possible	Insignificant	- ve	high
Stormwater & erosion	Potential erosion from excavated areas if rehabilitation is not done soon after excavation.	Without	1	2	2	5	Low	2	Probable	Low	- ve	high
		With	1	1	1	3	Very low	1	Possible	Insignificant	- ve	high

Impact Rating Methodology

A significance rating is allocated to each potential impact, based on consideration of the probability, intensity, extent, duration and possible mitigation of the potential impact. These terms are explained as follows:

- **Probability:** the likelihood of the impact occurring;
- **Intensity:** the ‘severity’ of the impact or extent to which ecological and social processes are altered;
- **Extent:** the scale of the impact on a local - national level;
- **Duration:** the length of time the impact will last, which may be anything from several days to the entire lifetime of the development; and
- **Mitigation:** ways in which an impact can be avoided, minimised or managed to reduce its environmental significance.

Each rating is based on observations made during the site visits and on professional judgement. Based on a synthesis of the above criteria, significance of an impact is rated as follows:

- **High significance:** where the impact would influence the decision to authorise the road upgrade regardless of any mitigation measures;
- **Moderate significance:** where the impact should influence the decision to upgrade the road, and where mitigation measures can, and must, be specified to reduce the overall impact; and
- **Low significance:** where the impact would not have any influence on the decision to authorise the upgrading of the road.

Appendix I – Undertaking

UNDERTAKING

I, Easley Speedo Nondumo

....., the undersigned and duly authorised thereto by

Nulani Coronation Mining

Company/~~Close Corporation~~/~~Municipality~~ (Delete that which is not applicable) have studied and understand the contents of this document in its entirety and hereby duly undertake to adhere to the conditions as set out therein.

Signed at Port Elizabeth this 13th day of May 2010

[Signature]

Director

Signature of applicant

Designation

Agency declaration: This document was completed by SRK CONSULTING on behalf of NULANI CORONATION MINING

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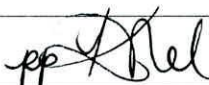
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