

McGregor Museum  
**Department of Archaeology**



**Heritage Impact Assessment Report for the  
proposed mining extensions on farm  
Nababeep 134, Namaqualand, Northern  
Cape**

David Morris and Abenicia Henderson  
June 2018

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farm Nababeep 134, Namaqualand, Northern Cape.**

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## **1. INTRODUCTION**

The McGregor Museum archaeology department was appointed by Southern African Tantalum Mining (Pty) Ltd to conduct a Heritage Impact Assessment for the proposed mining extensions of the farm Nababeep 134. The site was inspected on 29 May 2018 and relevant observations are indicated in this report.

Fieldnotes and photographs are lodged with the McGregor Museum, Kimberley.

### **1.1. Focus and Content of Specialist Report: Heritage**

This archaeology and heritage specialist study is focused on the portion of the farm where the proposed mining operation is to be developed.

This study outlines:

- Introduction, explaining the focus of the report (1.1) and introducing the author in terms of qualifications, accreditation and experience to undertake the study (1.2)
- Description of the affected environment (2) providing background to the development and its infrastructure (2.1); Heritage features of the region (2.2); and defining environmental issues and potential impacts (2.3)
- Methodology (3) including an assessment of limitations (3.1); statement of expectations or predictions (3.2) and outline of EIA procedures including criteria for assessing archaeological significance (3.3).
- Observations and assessment of impacts (4), including field observations (4.1); characterizing archaeological significance (4.2); and characterizing the overall significance of impacts (4.3).
- Summary of Significance of Impacts is stated in tabular form (4.3.1).
- Measures for inclusion in a draft Environmental Management Plan for the development are set out in tabular form (5).
- Conclusions (6).

### **1.2 The authors of this report**

The authors (both on staff of the McGregor Museum) are independent of the organization commissioning this specialist input, and provide this heritage assessment (archaeology and colonial history but not palaeontology) within the framework of the National Heritage Resources Act (No 25 of 1999).

The senior author is a professional archaeologist (PhD) accredited as a Principal Investigator by the Association of Southern African Professional Archaeologists. He has worked as a museum archaeologist and has carried out specialist research and surveys in the Northern Cape since 1985. In addition, he has a comprehensive knowledge of the Northern Cape history and built environment, and received UCT-accredited training at a workshop on Architectural and Urban Conservation; researching and assessing local (built) environments (S. Townsend, UCT). He is also Chairman of the Historical Society of Kimberley and the Northern Cape.

The National Heritage Resources Act no. 25 of 1999 (NHRA) protects heritage resources which include archaeological and palaeontological objects/sites older than

100 years, graves older than 60 years, structures older than 60 years, as well as intangible values attached to places. The Act requires that anyone intending to disturb, destroy or damage such sites/places, objects and/or structures may not do so without a permit from the relevant heritage resources authority. This means that a Heritage Impact Assessment should be performed, resulting in a specialist report as required by the relevant heritage resources authority/ies to assess whether authorisation may be granted for the disturbance or alteration, or destruction of heritage resources.

Where archaeological sites and palaeontological remains are concerned, the South African Heritage Resources Agency (SAHRA) at national level acts on an agency basis for the Provincial Heritage Resources Agency (PHRA) in the Northern Cape. The Northern Cape Heritage Resources Authority (formerly called Ngwao Bošwa ya Kapa Bokone) is responsible for the built environment and other colonial era heritage and contemporary cultural values.

## **2. DESCRIPTION OF THE AFFECTED ENVIRONMENT**

The area identified for the proposed development is 20 km north-west from Springbok and 13 km West of Okiep, situated in the Namakwa District Municipality. Nababeep is located in the arid Namaqualand region of the Northern Cape. The area is characterised by exposed bedrock granite rocks of various sizes huge granite and gneiss domes, hills steep rocky slopes and open veld with shallow soils colonized by shrubs and succulents.

As seen from the Google Earth image (Fig. 2b) the landscape south of the proposed mining extension area is substantially disturbed by previous copper mining activity. Ground surface visibility (in terms of observing archaeological and cultural heritage traces) was good, given the type of vegetation and the prevailing erosional regime in this landscape.

It was indicated that most of the development/mining would take place in areas identified in (Figure 2c), which includes the Wheat flat area and Fine residue dam.

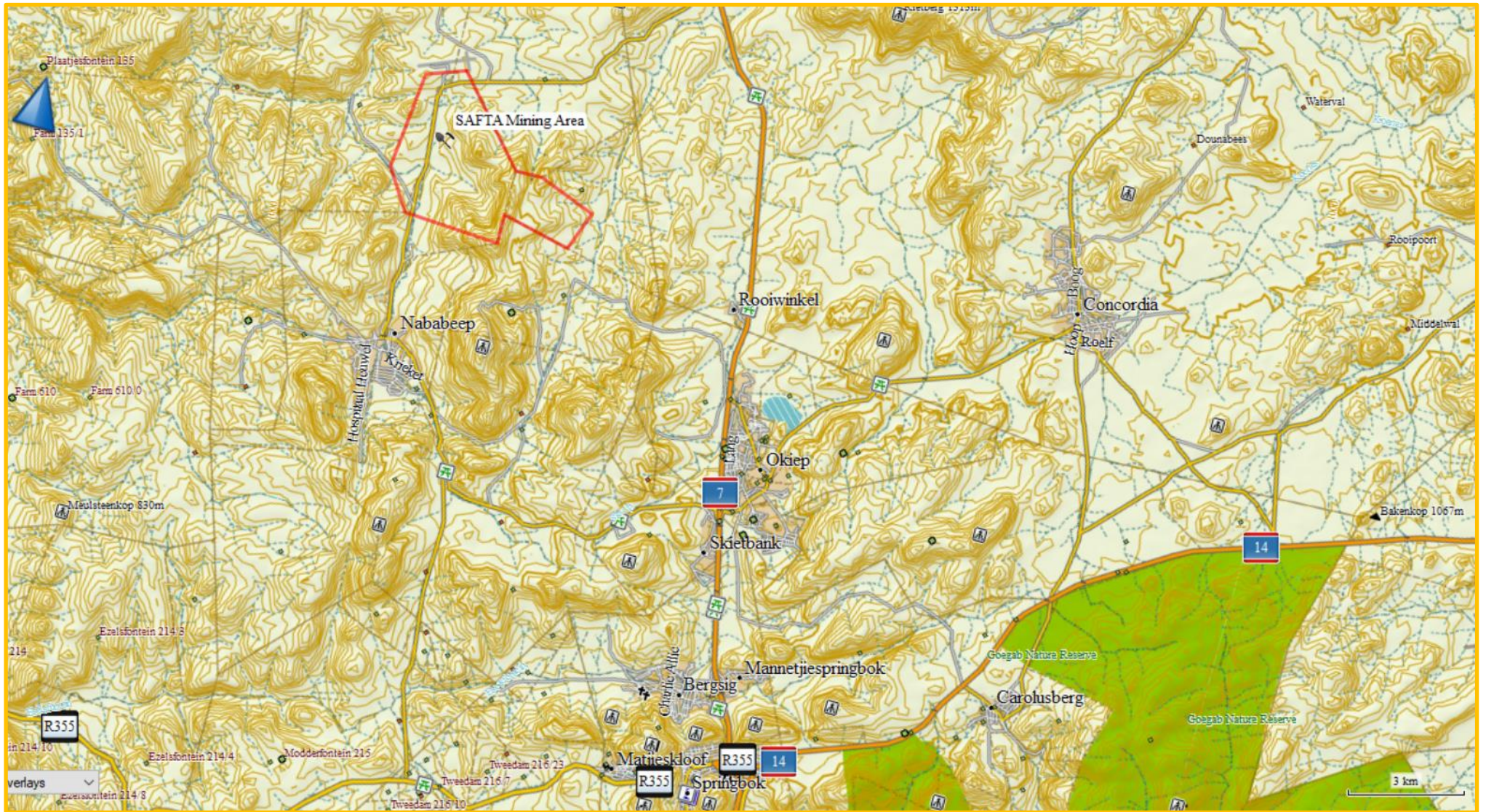


Figure 1: Mine locality showing adjacent properties and major routes and towns

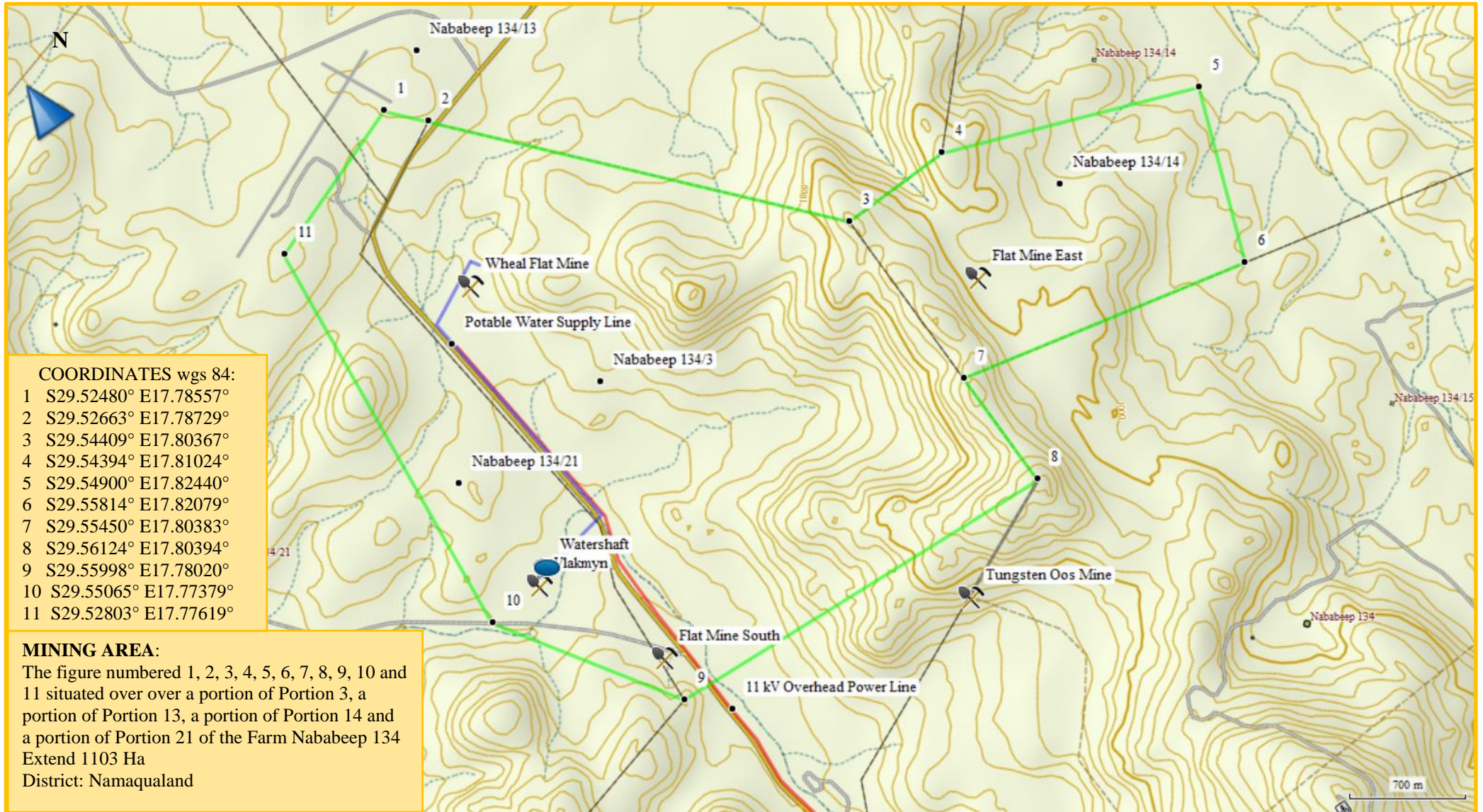


Figure 2a: Locality map showing area of interest

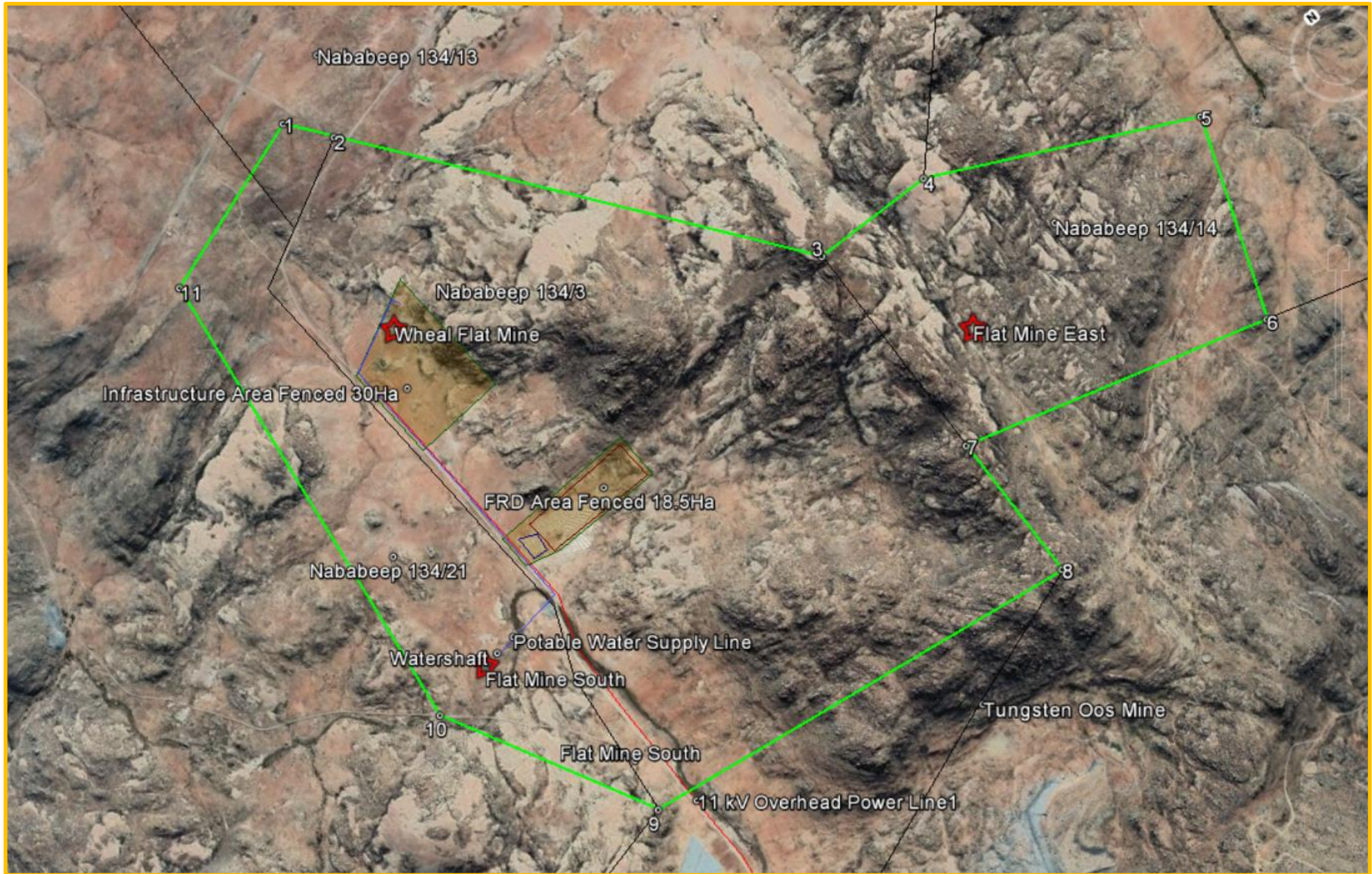


Figure 2b: Locality map showing areas identified for development

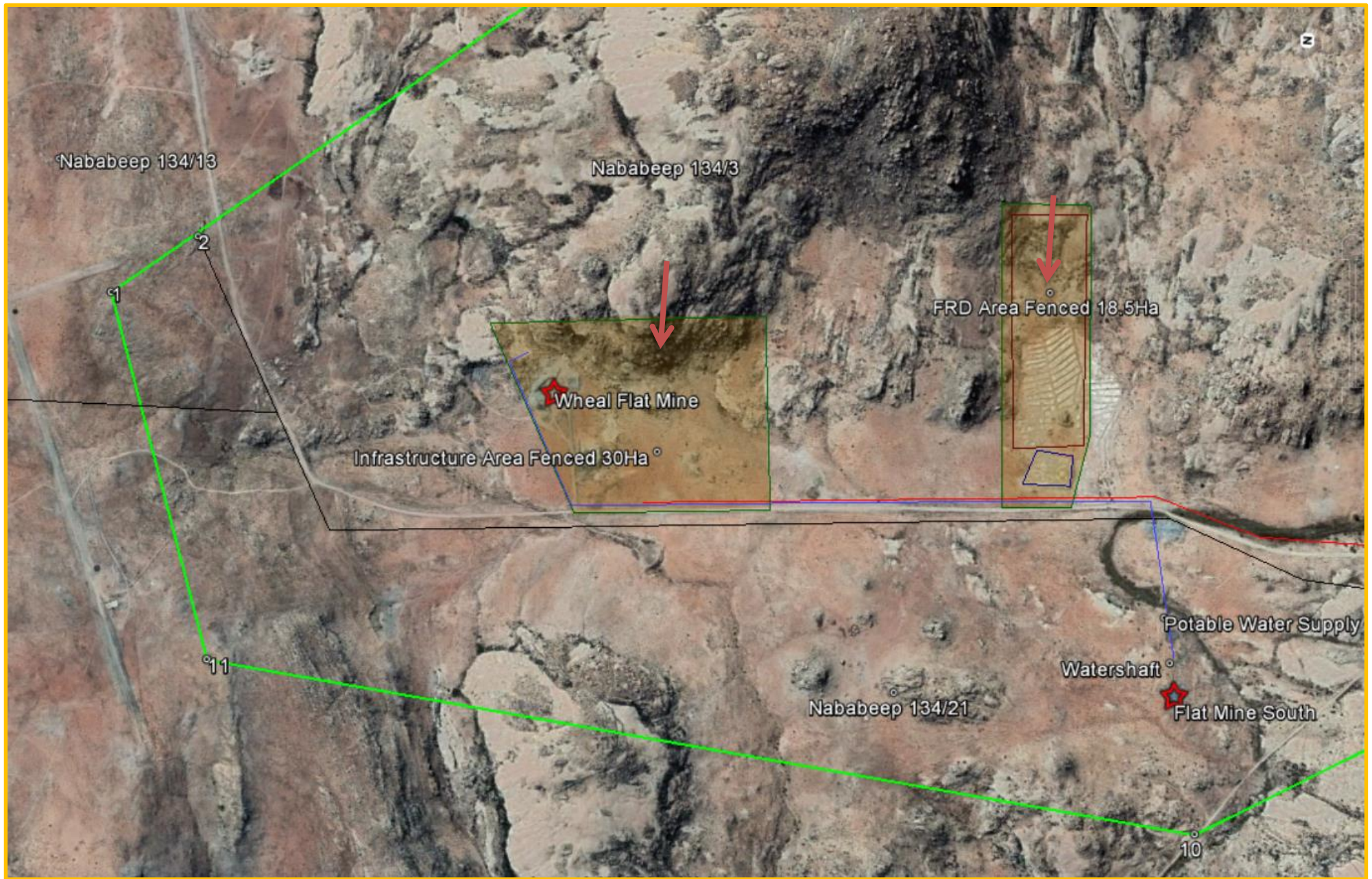


Figure 2c: Development areas



Figure 3a: Landscape of proposed area for development



Figure 3b: Landscape of proposed area for development





Figure 3c: Landscape of proposed area for development

## **2.1. Background to the development-description of proposed infrastructure**

It was indicated that the areas marked for most of infrastructure development would be done on portion 3 of the farm Nababeep 134 (Figure 2c), using historical mining markers.

## **2.2. Heritage features of the region**

### **2.2.1 Colonial frontier**

Historically, both Okiep and Nababeep are important towns in the history of copper mining in Namaqualand (Smallberger 1995). Okiep was for many years the centre of the Namaqualand copper fields and was known at the turn of the 20th century as the richest copper mining area in the world. The mining town of Nababeep developed shortly after Okiep. According to Smallberger (1995), the farm Nababeep was originally called Lelykepad (Lelike Pad). It was granted to Pieter van Zyl in 1850 and purchased by Phillips & King and John Wild in 1852. The first reference in the purchase document of Nababeep dates to 1852.

Copper was discovered by Dutch colonials in 1685 in the Northern Cape province of South Africa during an expedition led by Simon van der Stel. They discovered deposits of malachite (Miller, 1995) in an area located near the present-day towns of Okiep and Springbok. After this discovery, little development took place, mostly because of the remoteness and harsh conditions of the area and for many years the area was only prospected and explored (Cairncross, 2004).

The beginning of commercial mining in the area only commenced once The South African Mining Company started mining operations in 1846 (Smalberger, 1975). In 1852, a company called Phillips and King purchased the farm upon which the town of Springbok is located today. Phillips and King owned the Spektakel, Nababeep and Okiep mines which were later taken over by the Cape Copper Company. Another company called Namaqua Copper Company had mining operations at Concordia, an area north east of Okiep. In 1919, the Cape Copper Company ceased their operations in the area due to the post First World War economic slump. Most of the mines today are inactive with only remnants of past usage.

### **2.2.2 Stone Age**

Archaeological research in Namaqualand has largely concentrated on the Richtersveld and further south in the Kamiesberg area (Webley 1992).

Closer to the study area, Kaplan (2010a) has documented a few dispersed Later and Middle Stone Age (LSA & MSA) implements around Okiep and Nababeep during a study for a proposed wind energy farm. Historical remains such as stone ruins and graves were also recorded. Some very faded rock art was also documented (Kaplan 2010b) revised in his January 2018 report.

There were no known heritage resources on or close to the proposed areas for development/mining prior to this study.

### **2.3 Description and evaluation of environmental issues and potential impacts**

Heritage resources including archaeological sites are in each instance unique and non-renewable resources. Area and linear developments can have a permanent destructive impact on these resources. The objective of an HIA would be to assess the sensitivity of such resources where present, to evaluate the significance of potential impacts on these resources and, if and where appropriate, to recommend no-go areas and/or measures to mitigate or manage said impacts.

In relation to the proposed development area a great deal of land disturbance is anticipated especially in the immediate and surrounding areas of interest.

#### **2.3.1 Direct, indirect and cumulative impacts (in terms of nature, magnitude and extent)**

The destructive impacts that are possible in terms of the transformation of land, excavation and extraction of minerals tend to be direct, once-off events occurring during the prospecting phase. In the long term, the proximity of such mining operations in the area could result in secondary indirect impacts resulting from the movement of people or vehicles in the immediate or surrounding vicinity.

## **3. METHODOLOGY**

This study defines the heritage component of the EIA process being undertaken for the proposed mining right. The area was inspected on foot on the 29 May 2018. Heritage traces were evaluated in terms of their archaeological significance.

In preparation for this:

- An assessment was done of the development area relative to the wider known archaeological/cultural heritage landscape.
- A search was done on SAHRIS database to determine what previous Archaeological and Heritage Impact studies existed for the area.
- Based on the site's locality preliminary predictions were made which the study would test with observations made in the field.

### **3.1 Assumptions and limitations**

It was assumed that, by and large in this landscape, with its sparse vegetation where shallow soil profiles exist some sense of the archaeological traces to be found in the area would be readily apparent from surface observations (including assessment of places of erosion or past excavations that expose erstwhile below-surface features).

Given that archaeological material Due to the fact that most cultural remains may occur below surface, the possibility exists that some features or artefacts may not have been discovered/ recorded during the survey. Only the portions of impact on the farm was surveyed and not the entire area as indicated by the Location map in figure 2a. It is assumed that information obtained from the broader region is accurate and applicable to this study.

Although the McGregor Museum surveyed the area as thoroughly as possible a proviso is routinely given, that should sites or features of significance be encountered during mining on the site (this could include an unmarked burial, an ostrich eggshell water flask cache, or a high density of stone tools, for instance), specified steps are necessary (beginning with immediate suspension of work, and reporting to the heritage authority).

This study does not comment on Palaeontology.

### **3.2 Predictions**

- Based on current reports of the immediate and surrounding area the terrain on which the proposed development is set to take place may yield a low to very low significance of archaeological traces
- The rocky hill and outcrops may contain materials indicative of past human activity. The rocky outcrops, which may have afforded shelter, a vantage point above the local landscape, and available rock panels for the making of rock engravings.

#### **3.2.1 Potentially significant impacts to be assessed in the HIA process**

Any area or linear, primary and secondary, disturbance of surfaces in the proposed development locale could have a destructive impact on heritage resources, where present. In the event that such resources are found, they are likely to be of a nature that potential impacts could be mitigated by documentation and/or salvage following approval and permitting by the South African Heritage Resources Agency and, in the case of any built environment features, by the Northern Cape Heritage Resources Authority. Although unlikely, there may be some that could require preservation in situ and hence modification of intended footprint

Disturbance of surfaces includes any mining, construction or agricultural farming (including quarries, pits, roads, pipelines, pylons, sub-stations or plants, buildings), or any other clearance of, or excavation into, a land surface. In the event of archaeological materials being present such activity would alter or destroy their context (even if the artefacts themselves are not destroyed, which is also obviously possible). Without context, archaeological traces are of much reduced significance. It is the contexts as much as the individual items that are protected by the heritage legislation.

### 3.3 Determining archaeological significance

In addition to guidelines provided by the National Heritage Resources Act (Act No. 25 of 1999), a set of criteria based on Deacon (nd) and Whitelaw (1997) for assessing archaeological significance has been developed for Northern Cape settings (Morris 2000a). These criteria include estimation of landform potential (in terms of its capacity to contain archaeological traces) and assessing the value to any archaeological traces (in terms of their attributes or their capacity to be construed as evidence, given that evidence is not given but constructed by the investigator).

#### ***Estimating site potential***

Table 1 (below) is a classification of landforms and visible archaeological traces used for estimating the potential of archaeological sites (after J. Deacon nd, National Monuments Council). Type 3 sites tend to be those with higher archaeological potential, but there are notable exceptions to this rule, for example the renowned rock engravings site Driekopseiland near Kimberley which is on landform L1 Type 1 – normally a setting of lowest expected potential. It should also be noted that, generally, the older a site the poorer the preservation, so that sometimes any trace, even of only Type 1 quality, can be of exceptional significance. In light of this, estimation of potential will always be a matter for archaeological observation and interpretation.

#### ***Assessing site value by attribute***

Table 2 is adapted from Whitelaw (1997), who developed an approach for selecting sites meriting heritage recognition status in KwaZulu-Natal. It is a means of judging a site's archaeological value by ranking the relative strengths of a range of attributes (given in the second column of the table). While aspects of this matrix remain qualitative, attribute assessment is a good indicator of the general archaeological significance of a site, with Type 3 attributes being those of highest significance.

**Table 1. Classification of landforms and visible archaeological traces for estimating the potential for archaeological sites (after J. Deacon, National Monuments Council).**

| <b>Class</b> | <b>Landform</b>       | <b>Type 1</b>   | <b>Type 2</b>  | <b>Type 3</b>   |
|--------------|-----------------------|---|--|---|
| L1           | Rocky surface         | Bedrock exposed   | Some soil patches                                    | Sandy/grassy patches  |
| L2           | Ploughed land         | Far from water  | In floodplain  | On old river terrace  |
| L3           | Sandy ground, inland  | Far from water  | In floodplain or near feature such as hill           | On old river terrace  |
| L4           | Sandy ground, Coastal | >1 km from sea  | Inland of dune cordon                                | Near rocky shore  |
| L5           | Water-logged deposit  | Heavily vegetated   | Running water  | Sedimentary basin   |
| L6           | Developed urban       | Heavily built-up with no known record of early settlement | Known early settlement, but buildings have basements | Buildings without extensive basements over known historical sites |
| L7           | Lime/dolomite         | >5 myrs   | <5000 yrs  | Between 5000 yrs and 5 myrs                                       |
| L8           | Rock shelter          | Rocky floor   | Sloping floor or small area                          | Flat floor, high ceiling  |

| Class | Archaeological traces                                     | Type 1                   | Type 2                           | Type 3                                     |
|-------|---|--------------------------|----------------------------------|--|
| A1    | Area previously excavated                                 | Little deposit remaining | More than half deposit remaining | High profile site                          |
| A2    | Shell or bones visible                                    | Dispersed scatter        | Deposit <0.5 m thick             | Deposit >0.5 m thick; shell and bone dense |
| A3    | Stone artefacts or stone walling or other feature visible | Dispersed scatter        | Deposit <0.5 m thick             | Deposit >0.5 m thick                       |

**Table 2. Site attributes and value assessment (adapted from Whitelaw 1997)**

| Class | Attribute   | Type 1  | Type 2           | Type 3   |
|-------|---|---|------------------|--|
| 1     | Length of sequence/context                                  | No sequence<br>Poor context<br>Dispersed distribution | Limited sequence | Long sequence<br>Favourable context<br>High density of arte/ecofacts |
| 2     | Presence of exceptional items (incl regional rarity)        | Absent  | Present          | Major element  |
| 3     | Organic preservation  | Absent  | Present          | Major element  |
| 4     | Potential for future archaeological investigation           | Low   | Medium           | High   |
| 5     | Potential for public display                                | Low   | Medium           | High   |
| 6     | Aesthetic appeal  | Low   | Medium           | High   |
| 7     | Potential for implementation of a long-term management plan | Low   | Medium           | High   |

#### **4. OBSERVATIONS AND ASSESSMENT OF IMPACTS**

The manner in which archaeological and other heritage traces or values might be affected by the proposed development on farm Nababeep, may be summed up in the following terms: it would be any act or activity that would result immediately or in the future in the destruction, damage, excavation, alteration, removal or collection from its original position, any archaeological material or object (as indicated in the National Heritage Resources Act (No 25 of 1999)). The obvious impact in this case would be land development.

##### **4.1 Fieldwork observations**

The site was visited on 29 May 2018. The area of impact is characterized by a rugged rocky and hilly area.

##### **4.1.1 Occurrence of Stone Age traces:**

Most of the area traversed during the survey was found to have low occurrences of colonial and archaeological traces. The areas of immediate impact were the focus of the assessment and were as follows:

*On Portion 3 of the farm Nababeep 134: Fine Residue dam*

In light of this area many surface scatters in terms of archaeology and pre-colonial traces were found. Three ovens- “bak oonde” were found in isolated areas across the terrain (co-ordinates indicated in Table 3); in close proximity to this were marked and unmarked porcelain, glass and ceramic sherds. From what could be identified from one marked piece was the Royal Staffordshire Pottery: Wilkinson LTD England dinnerware symbol which was in use during the early 19<sup>th</sup> century. Finding ceramic pieces in close proximity to the burnt oven is indicative of occupation during that time.

Stonewalling structures which might have been used as a dwelling or kraal have also been found near the ovens as well as a 20<sup>th</sup> century homestead foundation. Surface scatters of lithics occur across the terrain in sparse isolated frequencies.

Upslope on the hilly area an MSA quartzite handaxe was found near what is perceived as the quartz source with no flaked nodules. Water slopes running downhill indicate that the surface scatters found in the plateau might have been washed down, from this possible platform of habitation. No rock art sites were found during a search of any of the rocky overhangs and shelters

Further north from the dam the landscape changes exposing a sandier area, which indicates that the area has been disturbed; it is also seen by the Mica piles (mining dumps) and demolished infrastructure that used to be there.

*On portion 3 of the farm Nababeep 134 Wheat Flat Incline*

No significant archaeological observations were made in this area. Isolated Stone Age and sparse scatters were recorded throughout the study area. The raw material used consists mostly of quartzite and quartz. Previous studies have mentioned similar landscapes to be either bereft of Stone Age traces or to have a very low frequency of occurrences (Kaplan 2010; Janeker & Mosajee 2010). From the small and isolated sample, it is difficult to comment definitively on typology but the material ranges from Pleistocene to Holocene.

This area has been previously disturbed and is indicated by the prospecting drill holes, bore hole, ventilation shaft and copper pegs- past remnants of mining activities which have already taken place.

Artefact densities were generally low and sporadic and therefore recorded as occurrences of low to very low archaeological significance. Quartz clusters in isolated areas could contain possible lithics but it is difficult to tell by the way quartz naturally breaks. It is therefore maintained that the proposed development will not have an impact of great significance on archaeological remains.

However, against this background of paucity, the following sites were found (Table 3)

**Table 3. Plotted artefact scatters and observations made.**

|    | <b>Latitude (S)</b> | <b>Longitude (E)</b> | <b>Comment</b>   | <b>Significance</b> |
|----|---------------------|----------------------|--|---------------------|
| 1  | 29°32'55.8"         | 017°47'36.9"         | 20 <sup>th</sup> century pre-colonial structure foundation (Fig.5) | LOW                 |
| 2  | 29°32'55.7"         | 017°47'37.9"         | Pre-colonial oven - "bak oond" (Fig. 6).                           | LOW                 |
| 3  | 29°33'55.1"         | 017°47'37.5"         | Stonewalling of possible dwelling/kraal (Fig. 7).                  | LOW                 |
| 4  | 29°32'55.5"         | 017°47'39.2"         | Isolated quartz flake (Fig. 8).                                    | LOW                 |
| 5  | 29°33'06.7"         | 017°47'36.8"         | Low density lithics and MSA quartzite handaxe (Fig. 9)             | LOW                 |
| 6  | 29°32'04.7"         | 017°47'30.6"         | Possible quartz source (non-flaked nodules)                        | LOW                 |
| 7  | 29°32'04.4"         | 017°47'28.1"         | Quartzite flake (Fig. 10).   | LOW                 |
| 8  | 29°32'54.0"         | 017°47'17.0"         | Quartz flake   | LOW                 |
| 10 | 29°32'51.5"         | 017°47'16.9"         | Unused oven - "bak oond" (Fig. 11).                                | LOW                 |
| 11 | 29°32'51.5"         | 017°47'15.8"         | Colonial marked ceramic pieces                                     | LOW                 |
| 12 | 29°32'50.3"         | 017°47'16.8"         | Structure of homestead/dwelling                                    | LOW                 |
| 13 | 29°32'44.7"         | 017°47'06.0"         | Lithic flakes and ceramic pieces                                   | LOW                 |
| 14 | 29°32'45.4"         | 017°47'04.2"         | Crystal quartz flake   | LOW                 |
| 15 | 29°32'50.4"         | 017°47'04.2"         | Codd bottle piece (Fig. 13).                                       | LOW                 |
| 16 | 29°32'50.3"         | 017°47'03.6"         | Porcelain and glass pieces   | LOW                 |
| 17 | 29°32'16.6"         | 017°47'58.8"         | Porcelain and glass pieces (Fig. 14).                              | LOW                 |
| 18 | 29°32'16.5"         | 017°47'58.8"         | Porcelain and glass  | LOW                 |
| 19 | 29°32'20.4"         | 017°47'04.5"         | Broken glass pieces  | LOW                 |
| 20 | 29°32'19.9"         | 017°47'05.9"         | Lithic quartz site (Fig. 12).                                      | LOW                 |
| 21 | 29°32'15.7"         | 017°47'03.2"         | Cement platform  | LOW                 |
| 22 | 29°32'14.0"         | 017°47'02.0"         | Cement platform  | LOW                 |
| 23 | 29°32'12.4"         | 017°47'00.6"         | Porcelain  | LOW                 |
| 24 | 29°32'11.2"         | 017°47'00.3"         | Banded iron stone flake and screw                                  | LOW                 |
| 25 | 29°32'10.4"         | 017°47'01.4"         | Poles in linear position an indication of previous farm boundaries | LOW                 |
| 26 | 29°32'56.4"         | 017°47'56.3"         | Cement platform  | LOW                 |

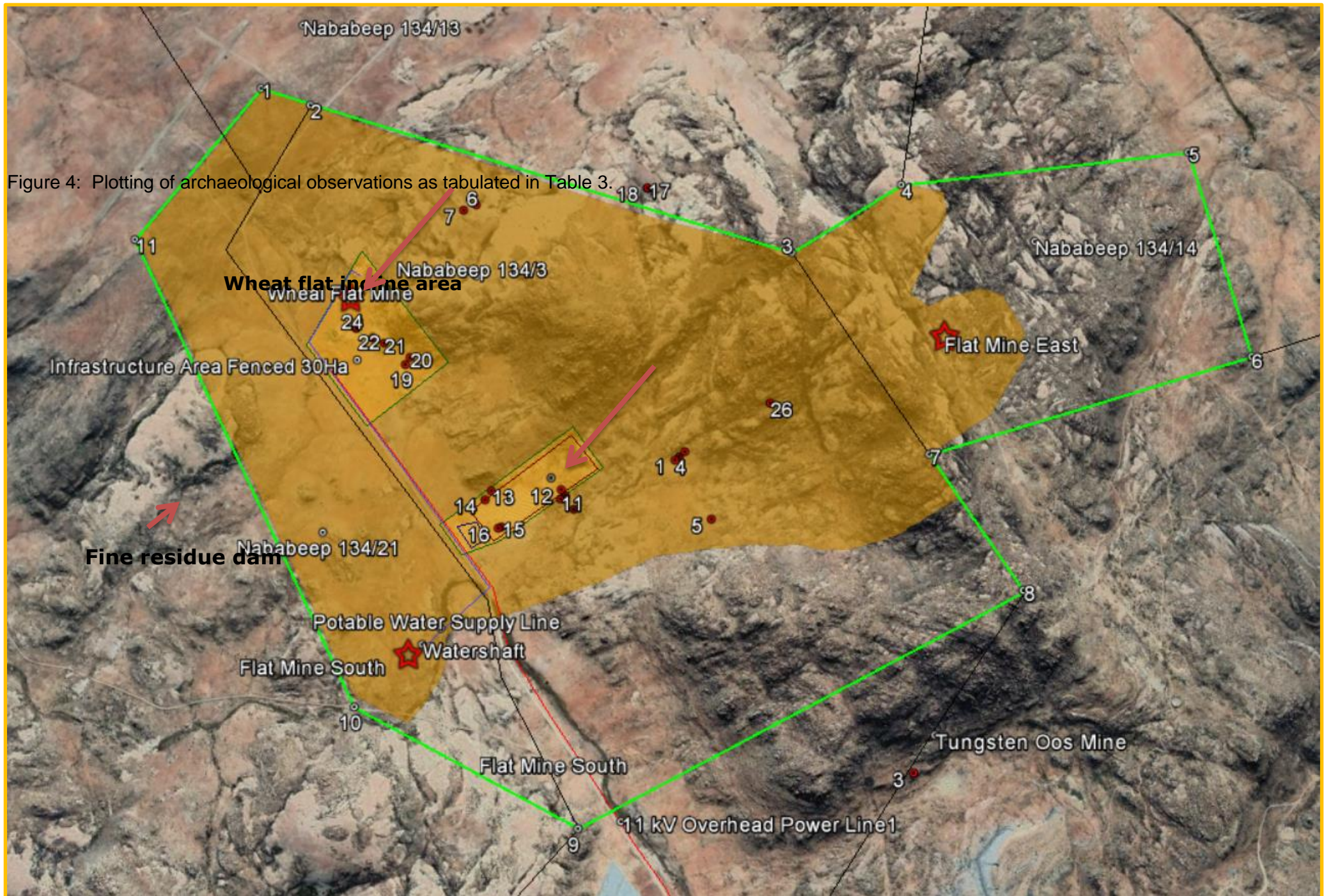


Figure 4: Plotting of archaeological observations as tabulated in Table 3.





Figure 5: oven found near 20<sup>th</sup> century homestead foundation: Observation 1



Figure 6: Utilised oven with porcelain, glass and ceramic pieces in close proximity: Observation 2.



Figure 7: Stonewalling. Observation 3



Figure 8: Isolated quartz flake: Observation 4.



Figure 9: MSA quartzite handaxe found in close proximity to lithic scatter: Observation 5.



Figure 10: Quartzite flake: Observation 7



Figure 11. Unused oven: Observation 10



Figure 12: Quartz flake : Observation 20.



Figure 13: Codd glass bottle piece: Observation 15



Figure 14: Porcelain and glass fragments: Observation 17.

#### 4.1.2 Colonial era traces

Colonial era traces are seen in the historic fences/boundary marker as well as the 50-meter cement platforms and pegs associated with the haulage systems of copper mining.

#### 4.2 Characterising the archaeological significance (Refer to 3.4 above)

In terms of the significance matrices in Tables 1 and 2 under 3.4 above, the archaeological observations fall under Landform L3, generally Type 2 or 3, i.e. of medium to low potential. In terms of archaeological traces, they all fall under Class A3 Type 1. These ascriptions (Table 1) reflect low potential for these criteria. For site attribute and value assessment (Table 2), the observations may be characterised as Type 1 for Classes 1-7.

On archaeological grounds, the Stone Age occurrences, generally sparse, can be said to be of mainly low significance.

For colonial era context, the site has a low to medium significance of occurrences in terms of physical heritage traces.

#### 4.3 Characterising the significance of impacts

The criteria on which significance of impacts is based include **nature**, **extent**, **duration**, **magnitude** and **probability of occurrence**, with quantification of significance being grounded and calculated as follows:

- The **nature**, namely a description of what causes the effect, what will be affected, and how it will be affected.
- The **extent**, indicating the geographic distribution of the impact:
  - local extending only as far as the development site area – assigned a score of 1;
  - limited to the site and its immediate surroundings (up to 10 km) – assigned a score of 2;
  - impact is regional – assigned a score of 3;

- impact is national – assigned a score of 4; or
- impact across international borders – assigned a score of 5.
- The **duration**, measuring the lifetime of the impact:
  - very short duration (0–1 years) – assigned a score of 1;
  - 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:
  - 0 is small and will have no affect on the environment;
  - 2 is minor and will not result in an impact on environmental processes;
  - 4 is low and will cause a slight impact on environmental processes;
  - 6 is moderate and will result in environmental processes continuing but in a modified way;
  - 8 is high (environmental 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 environmental processes.
- The **probability of occurrence**, indicating the likelihood of the impact actually occurring (scale of 1-5)
  - 1 is highly 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**, determined by a synthesis of the characteristics described above and expressed as low, medium or high. Significance is determined by the following formula:  
 $S = (E+D+M) P$ ; where S = Significance weighting; E = Extent; D = Duration; M = Magnitude; P = Probability.
- The **status**, either positive, negative or neutral, reflecting:
  - 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 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).

#### 4.3.1 SUMMARY OF THE SIGNIFICANCE OF IMPACTS

Table 4. Significance of Impacts, with and without mitigation – based on the worst-case scenario – for all area investigated.

|   |                              |   |
|---|------------------------------|---|
| <b>Nature:</b><br>Acts or activities resulting in disturbance of surfaces and/or sub-surfaces containing artefacts (causes) resulting in the destruction, damage, excavation, alteration, removal or collection from its original position (consequences), of any archaeological or other heritage material or object (what affected).<br>The following assessment refers to impact on physical archaeological/heritage traces. |                              |   |
|   | <b>Without mitigation</b>    | <b>With mitigation</b>                    |
| <b>Extent</b>   | 1                            | Not needed                                |
| <b>Duration</b>   | 5                            | Not needed                                |
| <b>Magnitude</b>  | 6                            | Not needed                                |
| <b>Probability</b>  | 2                            | Not needed                                |
| <b>Significance</b>   | <b>22</b>                    |   |
| <b>Status (positive or negative)</b>  | WEAKLY NEGATIVE              | But locally low to very low significance  |
| <b>Reversibility</b>  | No                           |   |
| <b>Irreplaceable loss of resources?</b>   | Low density and significance | Loss of context but possible to mitigate. |
| <b>Can impacts be mitigated?</b>  | Not needed                   | Not needed                                |
| <b>Mitigation:</b> Not needed at this stage however, note need for monitoring in management plan recommendations, there is a probability that although highly unlikely in this case; artefacts occur subsurface. Other possible occurrences are burials and ostrich eggshell on pottery caches.   |                              |   |
| <b>Cumulative impacts:</b> Cumulative Impacts: where any archaeological contexts occur, direct impacts are once-off permanent destructive events. Secondary cumulative impacts may occur with the increase in development and operational activity associated with the life of the proposed development area.   |                              |   |
| <b>Residual Impacts:</b> -  |                              |   |

### 5. MEASURES FOR INCLUSION IN THE DRAFT ENVIRONMENTAL MANAGEMENT PLAN

#### The objective

Archaeological or other heritage materials that may occur in the path of any surface or sub-surface disturbances associated with any aspect of the Prospecting/ mining are likely to be subject to destruction, damage, excavation, alteration, or removal. The objective is to limit such impacts to the primary activities associated with the mining and hence to limit secondary impacts during the medium and longer-term operational life of the operation.

|  |   |   |  |
|--|---|---|--|
| <b>Project component/s</b>   | Any road or other infrastructure construction over and above what is outlined in respect of the proposed mining area.   |   |  |
| <b>Potential Impact</b>  | The potential impact if this objective is not met is that wider areas or extended linear developments may result in further destruction, damage, excavation, alteration, removal or collection of heritage objects (minimal as they are) from their current context along the route.  |   |  |
| <b>Activity/risk source</b>  | Activities which could impact on achieving this objective include deviation from any planned development without taking heritage impacts into consideration.  |   |  |
| <b>Mitigation: Target/Objective</b>  | An environmental management plan that takes cognizance of heritage resources in the event of any future extensions of infrastructure.<br><br>Mitigation (based on present observations and development proposal as communicated) is not considered to be necessary.   |   |  |
| <b>Mitigation: Action/control</b>  | <b>Responsibility</b>   | <b>Timeframe</b>  |  |
| <b>Provision for on-going heritage monitoring</b> in an environmental management plan which also provides guidelines on what to do in the event of any major heritage feature being encountered during any phase of mining.<br><br>Should unexpected finds be made during development (e.g. precolonial burials; ostrich eggshell container cache; or localised Stone Age sites with stone tools, pottery), the relevant Heritage Authority should be contacted. | Environmental management provider with on-going monitoring role set up by the mining company for the mining phase and for any instance of periodic or on-going land surface modification thereafter.<br><br>Environmental Control Officer should become acquainted at a basic level with the kinds of heritage resources potentially occurring in the area and should report to the Heritage Authority as needed (see next column). | Environmental management plan to be in place before commencement of mining.<br><br>In the event of finding any of the features mentioned in column 1, reporting by the developer to relevant heritage authority should be immediate. Contact: SAHRA Ms N. Higgins 021-4624502 or NC Heritage Resources Authority Mr Andrew Timothy 053-8312537/8074700. |  |
| <b>Performance Indicator</b>   | Inclusion of further heritage impact consideration in any future extension of mining or any infrastructural elements.   |   |  |
| <b>Monitoring</b>  | Officials from relevant heritage authorities (National, Provincial or Local) to be permitted to inspect the site at any time in relation to the heritage component of the management plan.  |   |  |

## 6. CONCLUSIONS

Precolonial/Stone Age material noted and investigated on farm Nababeep 134 was found to be of generally low significance.

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