

HERITAGE IMPACT ASSESSMENT FOR A PROPOSED EXTENSION OF THE KAOLIN MINE ON PORTION 1 OF THE FARM RONDAWEL 638, NAMAQUALAND DISTRICT, NORTHERN CAPE

(Assessment conducted under Section 38 (8) of the
National Heritage Resources Act (No. 25 of 1999) as part of a Basic Assessment)

Prepared for

Rondawel Kaolien (Pty) Ltd

January 2018



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1. INTRODUCTION

ACO Associates cc has been requested by Green Direction Sustainability Consulting (Pty) Ltd on behalf of Rondawel Kaolien (Pty) Ltd to undertake a Heritage Impact Assessment (HIA), pertaining to the proposed extension of the existing kaolin mine on Portion 1 of the farm Rondawel 638, west of the N7 on the west coast of South Africa (**Figure 1**).

An archaeological survey was undertaken to determine if any pre-colonial or more recent, historical heritage resources would be impacted by the extension of the area covered by mining activities. The survey was undertaken by David Halkett and John Gribble of ACO Associates on 28 and 29 November 2018 and this report was written by John Gribble.



Figure 1: The location of the property (blue polygon) on which the mining occurs in local geographical context. The Groenrivier is clearly visible to the north while the N7 can be seen to the east.

2. PROJECT BACKGROUND

2.1. Background to the Mine

During the early 1970's a kaolin deposit was discovered on the farm Rondawel (638) when a borehole was drilled for water. Preliminary prospecting was done by the landowner and an ore body of good quality kaolin was confirmed. At that time, mineral rights belonged to landowners and subsequently the owners of Rondawel secured a market for the kaolin and delivered their product to SAPPI for a period of eight years.

The kaolin was mined on the farm, transported in its raw state by truck to the nearest railway station and delivered by rail to its final destination. Kaolin in its natural form includes a certain percentage of rock but for it to be profitable it needs to be beneficiated to a refined form before being transported.

Beneficiation of kaolin at the time could only be done by "washing" to remove the rock, but in a water scarce area like Namaqualand this was not a viable option in the long term. In addition, government rebates for the transport of this raw material were halted and it became too expensive for the landowner to transport material by rail. As a result all activities on the mine ceased.

In the early 2000's the government changed the legislation and policy regarding minerals, which saw landowners lose ownership of the mining rights. The owner of the kaolin mine on Rondawel, however, applied for the relevant rights and was awarded such and through experimentation created and patented a dry beneficiation process for separating rock from the kaolin. This made it possible for kaolin to be extracted from the mine and sold commercially again.

2.2. Previous Applications and Approvals

SAHRA was notified on 5 October 2017, via an upload of project details, including a Draft Basic Assessment Report (BAR) to SAHRIS¹ (SAHRA Case 11756 / DMR CASE: NCS30/5/1/1/2/1 (10638) MP), of a proposal to mine a 5 hectare (Ha) area to the east of the existing mine area, under a new mining right (**Figure 2**).

An interim comment was issued by SAHRA on 21 November 2017 requesting a HIA in terms of section 38(8) and 38(3) of the National Heritage Resource Act (No. 25 of 1999) (NHRA). SAHRA indicated that a final comment would be issued for inclusion in the Final Basic Assessment Report (FBAR) once the requested HIA had been uploaded to SAHRIS.

To satisfy section 38(3), an archaeological impact assessment was produced by ACO Associates in November 2017, based on site visits undertaken on 27 October and 7 November 2017 to identify and map heritage resources in the 5 Ha mining extension area. These surveys and reporting were undertaken by David Halkett, assisted by Jess Mclver and John Gribble (**Figure 2**).

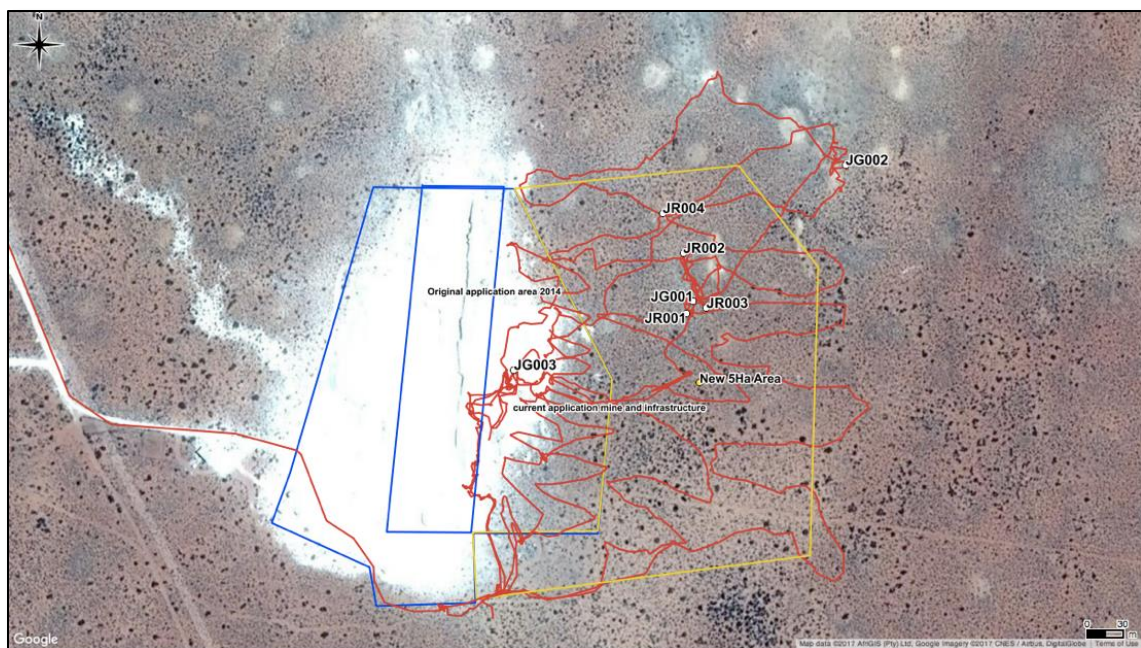


Figure 2: Original mine extent (blue) with 5 Ha mine extension proposed in 2017 (yellow). The November 2017 ACO survey trackplots are shown in red, with the heritage resources noted marked as waypoints.

A Heritage Impact Assessment (HIA) for the proposed mining was loaded onto SAHRIS on 23 November 2017 (Halkett, Mclver and Gribble 2017). This included email correspondence from Dr John Almond, dated 4 October 2017, that a palaeontological assessment was not deemed to be necessary due to the small size of the development and the lack of nearby major watercourses.

SAHRA responded to the HIA with a further interim comment on 9 January 2018 in which it indicated that it required a formal letter of exemption for further palaeontological studies and that a final comment would be issued on receipt of this.

¹ An earlier case was created on SAHRIS for a proposal to expand the original mine to a 1.5 Ha area on 31 October 2014 (DMR Case number NC30/5/1/3/2/10423MP). It appears, however, that no final comment/decision was issued against this case. This submission was not done by ACO.

The required letter of exemption was obtained from Dr Almond on 30 January 2018 and SAHRA issued its final comment on the proposed 5 Ha extension of the mining area on 12 February 2018. SAHRA indicated that it had no objections to the proposed extension of the mining area and supported the recommendations in the HIA, the most important of which were:

- A once off monitoring visit must take place to record the presence (or not) of buried surfaces containing stone artefacts during the expansion of the mine into the vicinity of the exposed silcrete outcrop (S30.80829 E17.80289). A report must be compiled by a qualified archaeologist and submitted to SAHRA; and
- Any finds of archaeological sites or materials, unmarked human burials and/or palaeontological material must be reported to both SAHRA and a suitable heritage specialist who would be required to inspect the find.

2.3. Details of Proposed 2018 Mine Expansion

A new application is now being made to expand the size and depth of the mine and to establish a number of topsoil and waste dump areas on the land surrounding the mine. The site, showing the original mining area, the 5 Ha extension and the 2018 proposed expansion and topsoil and ore stockpile areas is illustrated in **Figure 3. Error! Reference source not found.** shows the proposed new locations and extents of the Phase 1C and 2 waste dumps and temporary low grade ore stockpile, revised on the basis of the 2018 archaeological survey described in this report.

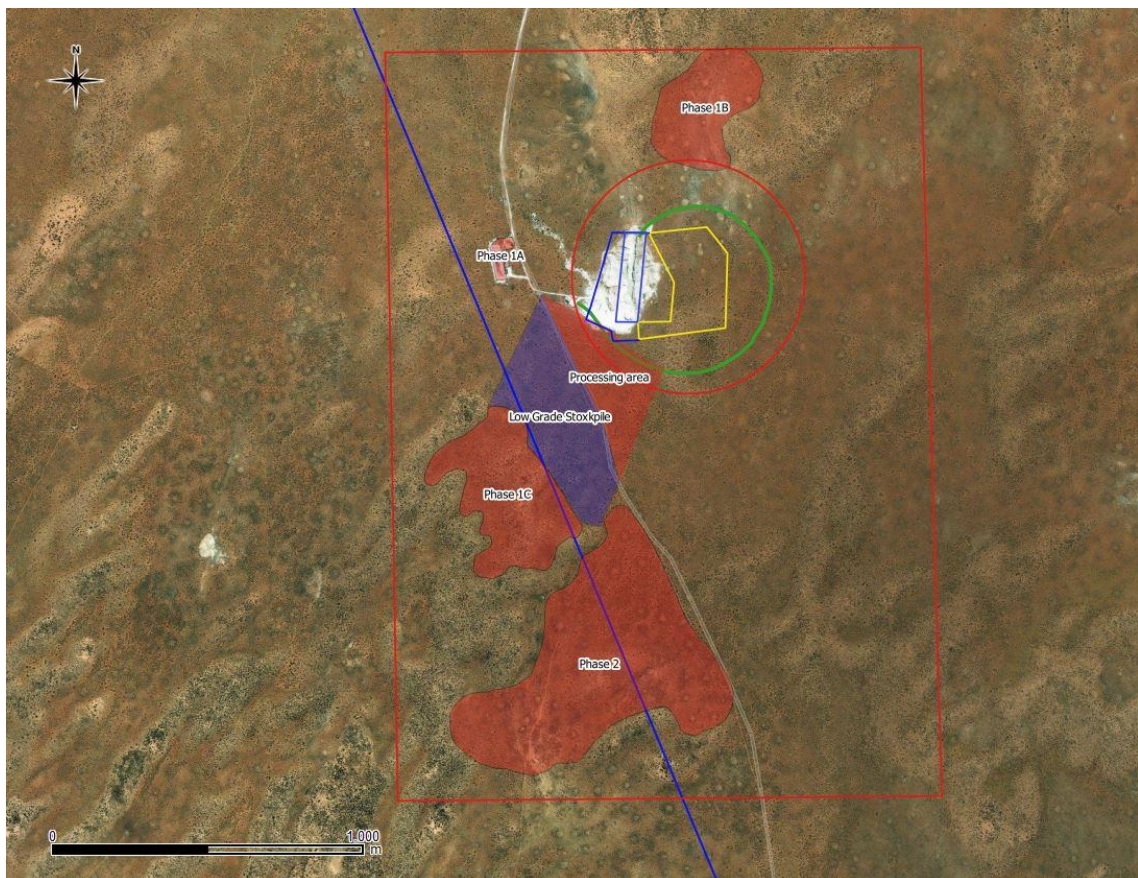


Figure 3: A detail of the site showing the existing kaolin mine area (blue polygon), the previous 5 Ha extension (yellow polygon) and the new proposed expansion area within the red circle. The proposed haul road into the mine is shown in green, and topsoil and ore stockpile areas are shaded red and blue. Note the farm boundary (blue) which runs across the original Phase 1C and Phase 2 waste dump areas. The “red line” mining area referred to in the report text is represented by the large red square.

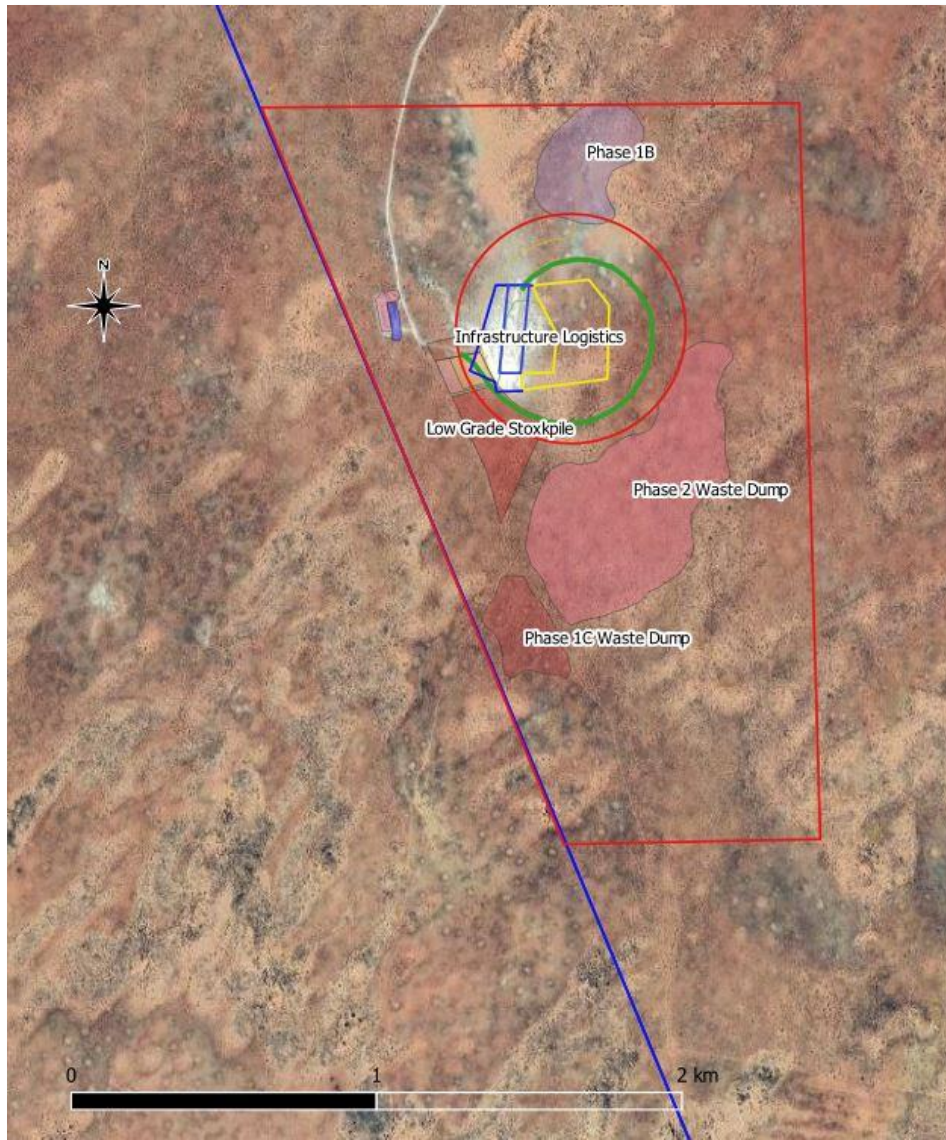


Figure 4: A detail of the site showing the existing kaolin mine area (blue polygon), the previous 5 Ha extension (yellow polygon) and the new proposed expansion area within the red circle. The proposed haul road into the mine is shown in green. Note the amended mine boundary (red box) according to the farm boundary (blue) with the new location of the Phase 1C and Phase 2 waste dump areas.

3. PALAEOLOGICAL ASSESSMENT

A desktop palaeontological impact assessment for the “red line” mining extension area covered by this report (see **Figure 3** above) was carried out by Professor Marion Bamford, Director of the WITS Evolutionary Studies Institute in September 2018 (Bamford 2018) (attached as **Appendix 3**).

Professor Bamford states that the proposed site “lies on the sands of the Quaternary group with underlying kaolin of unknown origin. In the vicinity are ancient volcanic rocks, mostly granites of some form that do not contain fossils. Nearby are mudstones and shales of the Knersvlakte Subgroup, Vanrhynsdorp Group, of Early Cambrian age and these could potentially preserve trace fossils of invertebrate burrows, stromatolites and shells, although they have not been reported from this site”.

Based on this information Professor Bamford recommended that no palaeontological site visit is required and permission to extend the kaolin mine be granted”.

This echoes the conclusion reached by Dr John Almond in his letter of exemption for the 5 Ha extension of the mining area dated 30 January 2018 and referred to above (Almond 2018). Dr Almond stated that the kaolin deposits are covered by “reddish aeolian sands of the Late Cenozoic (probably

Pleistocene) Koekenaap and Hardevlei Formations [and] represent highly weathered underlying basement rocks of Precambrian age (Namaqualand Metamorphic Province) [which] are entirely unfossiliferous and the mining project ... is consequently of no palaeontological heritage significance”.

4. ARCHAEOLOGICAL ASSESSMENT

4.1. Details of Base Data

The SAHRIS² database was examined prior to the 2017 site visits to determine if any previous archaeological assessments of the property were available. None were found at the site or in the near vicinity.

The data used for this report is thus field-based information collected during the site visits in October/November 2017 and November 2018.

4.2. Field Assessment Procedure

The co-ordinates of the proposed kaolin mine extension area were loaded onto handheld GPS devices to assist with accurately identifying the extent of the area on the ground during the survey.

The November 2018 field assessment consisted of an intensive walkover of the proposed mine extension areas to identify any indications of surface or sub-surface archaeological resources (where these could be detected in disturbed areas or through bioturbation). Waypoints were entered into the GPS at the location of identified heritage resources and photographs were taken of the resource and surrounding landscape. Relevant landscape features were also recorded as waypoints and photographed.

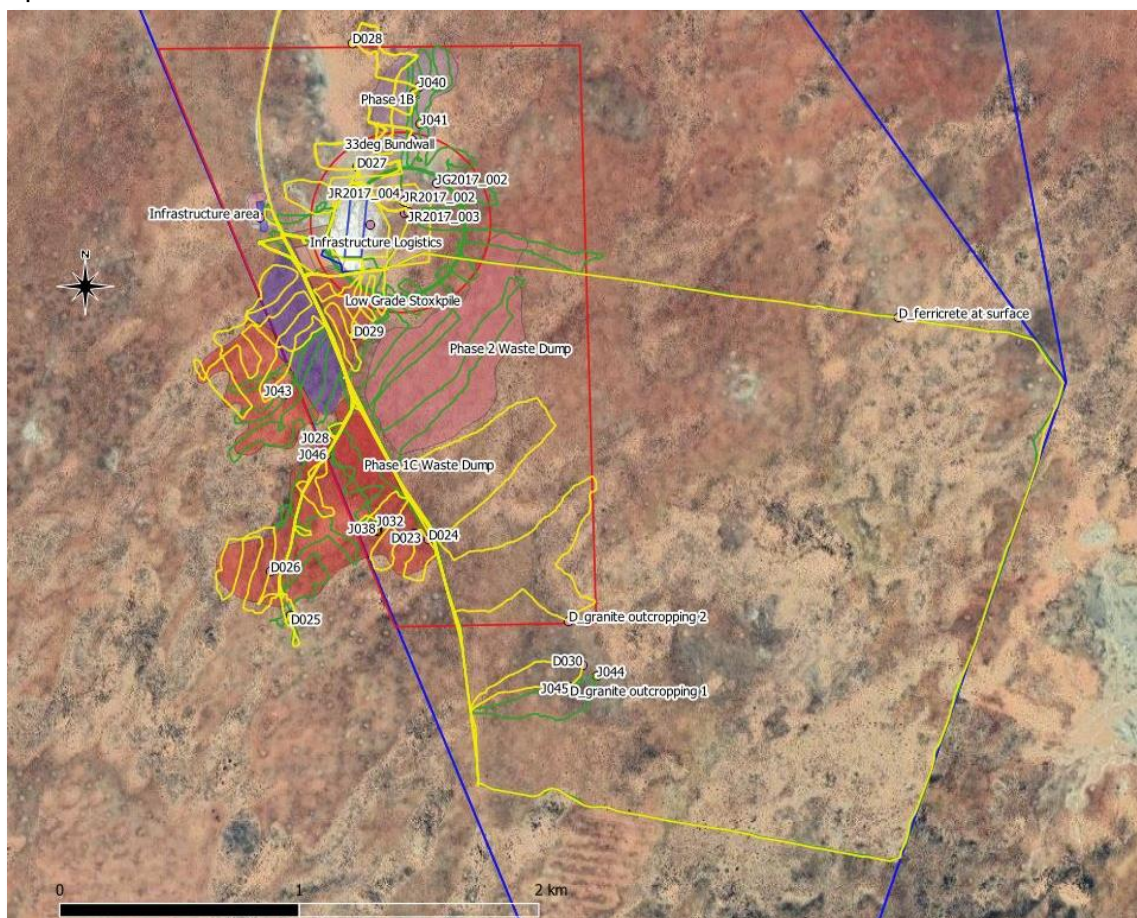


Figure 5: Trackplots (yellow and green) and waypoints generated by November 2018 walkover survey, overlaid on the proposed and revised mining extension areas and “red line” area.

² A database maintained by the South African Heritage Resources Agency containing, inter alia, information about development-led heritage projects

The season had no impact on the outcome of the assessment and surface visibility was excellent due to sparse Namaqualand vegetation.

The GPS track plots and waypoint locations generated by this walkover survey are shown on Figure 4.

ACO was met on site on 29 November by the director of Rondawel Kaolien, Elma Nieuwoudt. In conversation with her it became apparent that most of the Phase 1C and about two thirds of the Phase 2 spoil heap areas shown on the KMLs to which we were working, and which had already been surveyed (see **Figure 6**), were located on the neighbouring farm.

To compensate for the loss of these areas to the proposed mining activities, ACO carried out a walkover survey of the land east of the road and up to the eastern edge of the “red line” (see **Figure 5** and **Figure 6**).

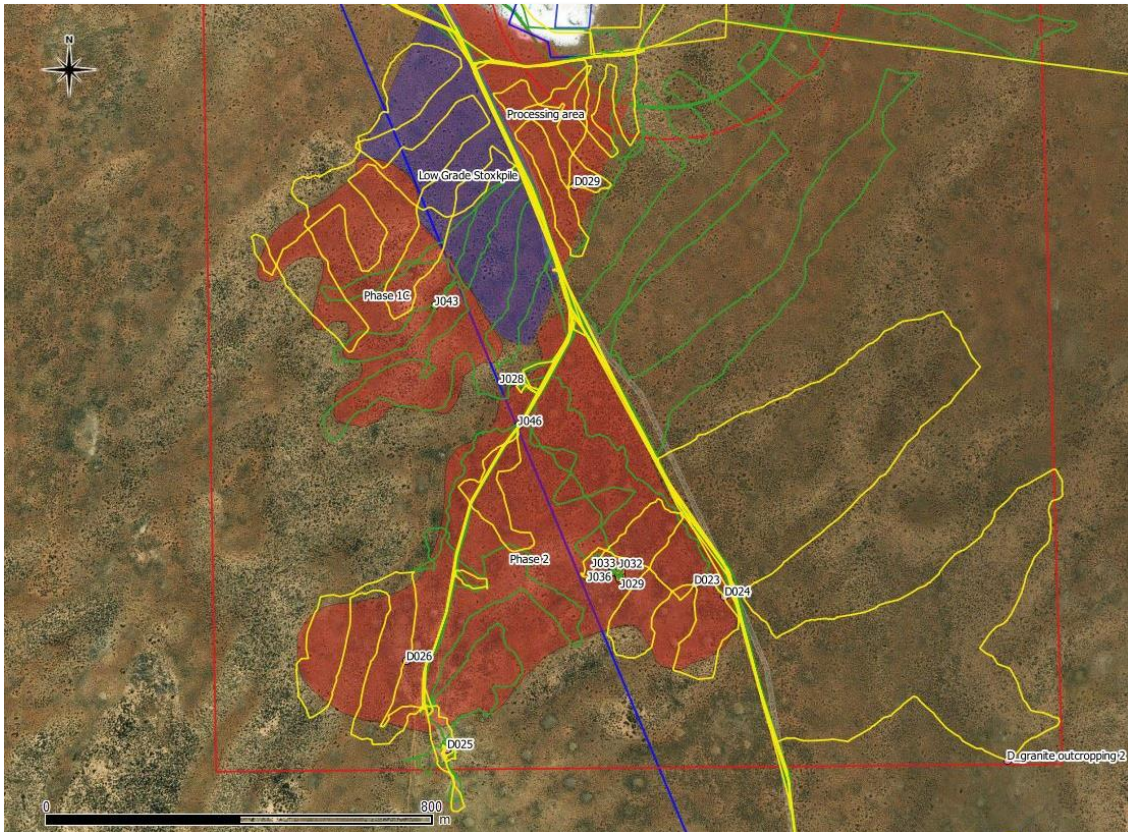


Figure 6: The portions of Phase 1C and Phase 2 areas to the left of the blue farm boundary are located on the neighbouring farm and can thus not be utilised in the proposed mine expansion. To compensate for the loss of these areas, ACO surveyed the stretch of land between the road (thick yellow line) and the edge of the “red line” area to the east (yellow and green track lines).

4.3. OBSERVATIONS

A total of 26 occurrences of heritage resources were identified during the November 2018 fieldwork (see **Table 1** below) of which six can be disregarded in relation to the proposed mine expansion because they are located outside of the mining area “red box” or are on the neighbouring farm. These occurrences are highlighted in the table below.

Table 1: Heritage resources identified in November 2018 survey

Waypoint	Lat	Long	Description	Grading
J028	-30.815384	17.800058	Large Earlier Stone Age (ESA) side-struck flake on silcrete found in spoil from a prospecting hole against the farm boundary fence	NCW *
J029	-30.818529	17.801861	Scatter of Middle Stone Age (MSA) lithics - flakes, cores, chunks on silcrete and quartz – on low rise. Located in deflated area in red sand with outcropping and scatter of haematite nodules. Similar in nature to D025 J029-J039 together represent the rough extent of this artefact scatter	NCW
J030	-30.818455	17.801886		
J031	-30.818382	17.801886		
J032	-30.818341	17.801832		
J033	-30.818330	17.801769		
J034	-30.818329	17.801708		
J035	-30.818393	17.801712		
J036	-30.818417	17.801687		
J037	-30.818410	17.801733		
J038	-30.818443	17.801811		
J039	-30.818494	17.801834		
J040	-30.804209	17.803424	3 x MSA flakes on olive brown silcrete and quartz flakes noted in dense exposure of natural quartz in blowout and erosion gully	NCW
J041	-30.805413	17.803497	Small exposure of outcropping olive brown silcrete upslope of JG040	NCW
J042	-30.804391	17.803249	2 x MSA flakes and 1 x chunk on olive brown silcrete. In exposure of natural quartz. Lithics worn.	NCW
J043	-30.814141	17.798407	1 x quartz flake in deflation hollow In portion of proposed Phase 1C spoil heap area outside the farm boundary	NCW
J044	-30.823189	17.810114	1 x MSA silcrete flake in animal burrow casting Outside ‘red box’ area	NCW
J045	-30.823594	17.809040	Small number of scattered MSA flakes on quartz, quartzite and silcrete in erosion gully below granite outcrop on hillside Outside ‘red box’ area	NCW
D023	-30.81860002	17.80323501	Isolated MSA(?) flake in silcrete/quartzite. Lying on top of a low mound (termite/meerkat?)	NCW
D024	-30.81878501	17.80380104	Isolated quartz chunk	NCW
D025	-30.82122901	17.79863703	ESA/MSA artefact scatter in blowout/pan on a variety of raw materials including silcrete, quartz, quartzite, ccs. The surface is carpeted with nodules of haematite (?). On neighbouring farm and no longer threatened by mining	IIIC
D026	-30.81982101	17.79787696	Isolated silcrete disc core on surface On neighbouring farm and no longer threatened by mining	NCW
D027	-30.80679797	17.80111296	Vein of quarzitic rock outcropping on surface immediately north of existing mine pit. ~50m in extent. There appear to be occasional big flake removal scars on the outcrop but no significant artefact production debitage build up in surroundings	NCW
D028	-30.80279502	17.80094499	A series of deflation hollows with quartz artefacts (flakes, cores, chunks) in very low densities. Probably MSA though no distinctive forms identified. This is beyond the overburden dump. Will be subjected to windblown sand once/during establishment of the dump	NCW
D029	-30.81222299	17.80100500	Isolated quartz cobble with hammerstone damage on a few surfaces	NCW
D030	-30.82284202	17.80956804	Ephemeral and patchy quartz MSA scatter on prominent hill beyond the southern end of the mining area. There is granite outcropping in places. Flakes and some chunks and cores. Quartz and silcrete Outside “red box” area	NCW

* NCW – Not conservation worthy. A resource that, after appropriate investigation, has been determined to not have enough heritage significance to be retained as part of the National Estate (see Appendix 4 for grading categories)

The November 2018 finds are in addition to the seven occurrences recorded in the 2017 archaeological surveys of the 5 Ha mine extension area (see **Table 2** below).

Table 2: Heritage resources identified in October/November 2017 surveys

Waypoint	Lat	Long	Description	Grading
JG001	-30.80821	17.80294	Scatter of artefacts surrounding the silcrete outcrop. Silcrete core (ESA), a silcrete flake and two possible flakes on quartz (MSA).	NCW *
JG002	-30.80733	17.80408	Large ESA side-struck flake found embedded in the soil, amongst quartz exposure on the hillside. Located outside of the eastern edge of the mining area	NCW
JG003	-30.80865	17.80160	Collection of ESA and MSA stone artefacts on old spoil heaps alongside mining pit. The material is out of context, having been excavated out of the mine pit. Included are two core-like ESA pieces, a large ESA flaked piece, and a broken blade. The material appears to be lying on an old deflated surface that may have been exposed along with a silcrete outcrop in the past	NCW
JR001	-30.80829	17.80289	Naturally occurring exposed outcrop of silcrete in primary position, (Plate 4). Probably similar to buried silcrete outcrops that have previously been found in the existing mining pit. Flaked silcrete found lying around the outcrop, flaked quartz	NCW
JR002	-30.80790	17.80287	Evidence of possible utilisation of the silcrete as seen on the northern extremity of the outcrop as flaking damage	NCW
JR003	-30.80825	17.80304	Evidence of possible utilisation of the silcrete as seen on the southern extremity of the outcrop as flaking damage	NCW
JR004	-30.80764	17.80271	Single quartz flake Later Stone Age (LSA)	NCW

* NCW – Not conservation worthy. A resource that, after appropriate investigation, has been determined to not have enough heritage significance to be retained as part of the National Estate (see Appendix 4 for grading categories)

The surface of the landscape surveyed in both 2017 and 2018 is dominated, for the most part, by red sand of likely aeolian origin and potentially Holocene in age. In places this sand is as much as 2 m thick, such as, for example, within the prospecting pit at J028 (**Plate 1**). The sand is underlain variously by quartz, silcrete, ferricrete and granite, all of outcropped in places within the area surveyed.



Plate 1: Prospecting pit (J028) showing depth (approximately 2 m) of the red aeolian sand. The white underlying kaolin surface is visible in the centre foreground

The archaeological material noted during the surveys was generally associated with these harder geological surface exposures and only a minority of material was found in areas dominated by sand. For example, the scatters of stone artefacts recorded as JG001 and JR001 in October/November 2017 were found around silcrete and quartz outcrops within the 5 Ha mining extension area (**Plate 2**). The material consisted of cores, blades, flakes and chunks, predominantly on silcrete, which usually appears stratigraphically above the kaolin deposit. Similarly, the silcrete MSA flakes recorded as J040 in November 2018 were found on a dense exposure of natural quartz (**Plate 3**).



Plate 2: Silcrete outcrop associated with stone artefacts recorded in 2017 within the 5 Ha mining extension area.



Plate 3: View of J040 showing a dense surface exposure of quartz on which the silcrete MSA flakes were found.

November 2018 survey was based around a number of proposed mine related activity areas, each of which is addressed below.

4.3.1. Mine Pit

The November 2018 survey covered the area beyond the 5-ha extension area surveyed in November 2017, but within the proposed safety wall (red circle) around the mining pit (**Figure 7**). The area is dominated by thick sand with occasional outcrops of particularly quartz and quartzite. With the exception of D027, no other archaeological sites or material were noted within this area.

D027 is a linear outcropping vein of quartzitic rock running roughly north to south up the slope above the existing mining area (**Plate 4**). The outcropping is visible for approximately 50 m and occasional large stone flakes of indeterminate age were recorded in association.

Heritage significance of the archaeological material noted during this survey is low. However, the significance of the ESA lithic material at the buried interface between the aeolian and silcrete, overlying the kaolin resource may be moderate.

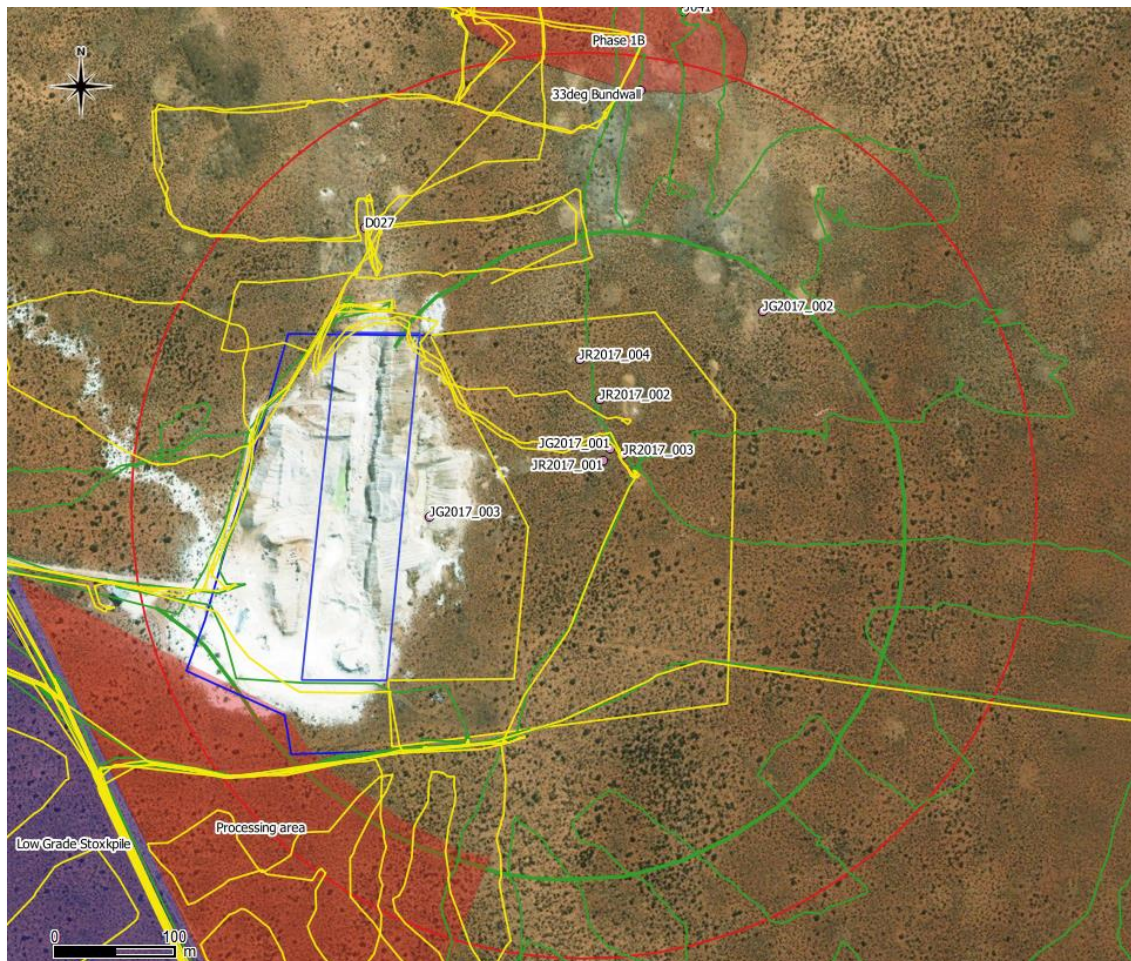


Figure 7: Expanded mine area (red circle). A proposed haul road is the green circular line and the original and 5 Ha mining extension areas are the blue and yellow polygons respectively. November 2017 finds are clustered within the 5 Ha extension area. The single 2018 findspot (D027) is visible in the north west of the area.



Plate 4: View to the south across the quartzitic rock outcrop recorded as D027 with the existing mining area in the background.

4.3.2. Processing Area

The proposed kaolin processing area is located southwest of the mining pit (**Figure 8**). The single archaeological find in this area was an isolated quartz cobble with hammerstone damage on a few surfaces (**Plate 5**).

Heritage significance of the archaeological material noted in this area is low.

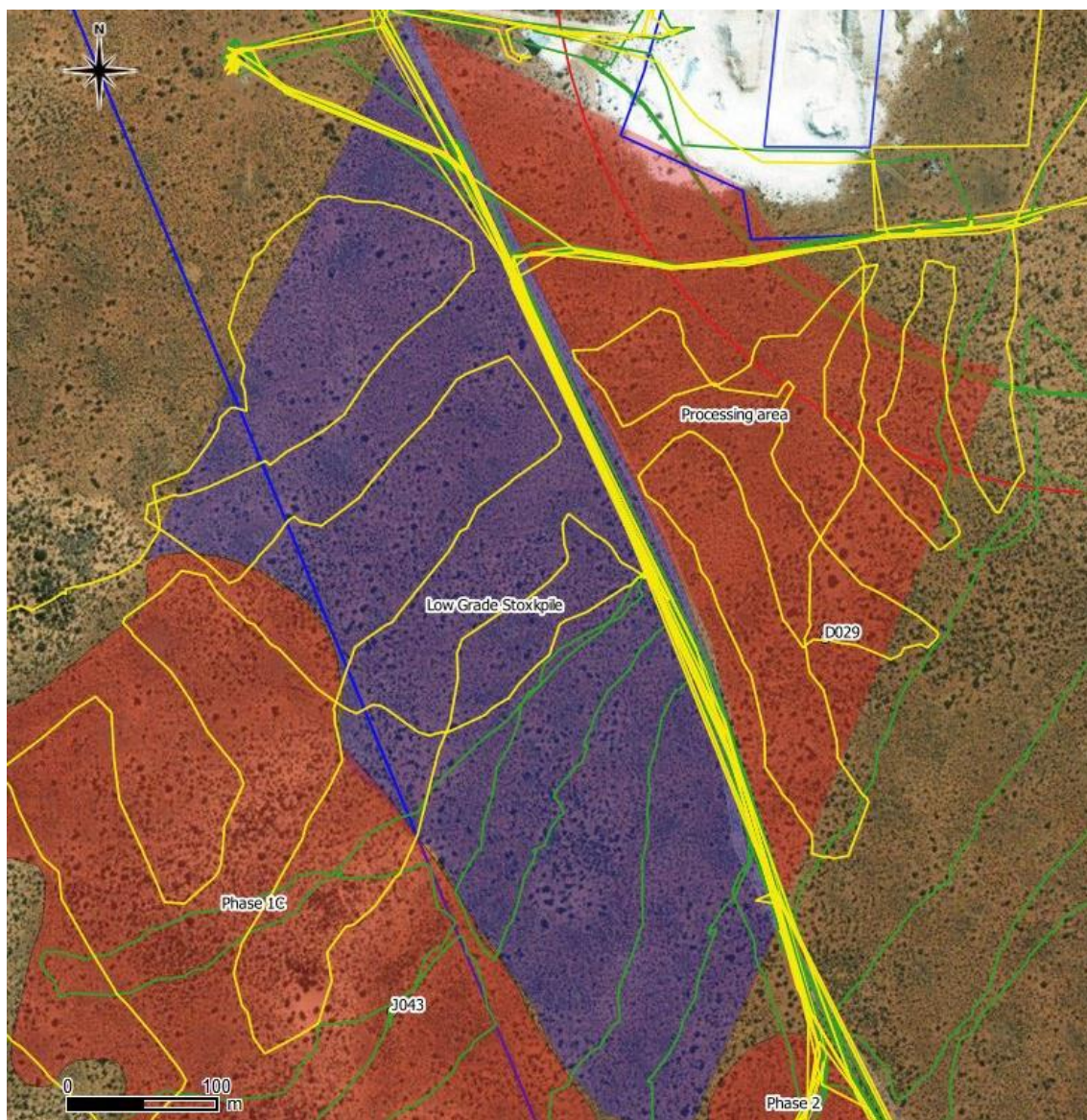


Figure 8: Location of proposed processing and low-grade stockpile areas.



Plate 5: D029, a quartz cobble with hammerstone damage

4.3.3. Low Grade Stockpile Area

No archaeological material was encountered in the proposed low-grade stockpile area (Figure 7).

4.3.4. Phase 1A (Infrastructure Area)

This area has already been developed into laydown and/or loading area and was therefore not surveyed. However, an inspection of the spoil heaps from a possible prospecting pit between the infrastructure area and the road revealed the presence of silcrete ESA lithics, possibly from a similar context to those previously found within the active mine (**Figure 9**).

Heritage significance of the archaeological material noted in this area is low.

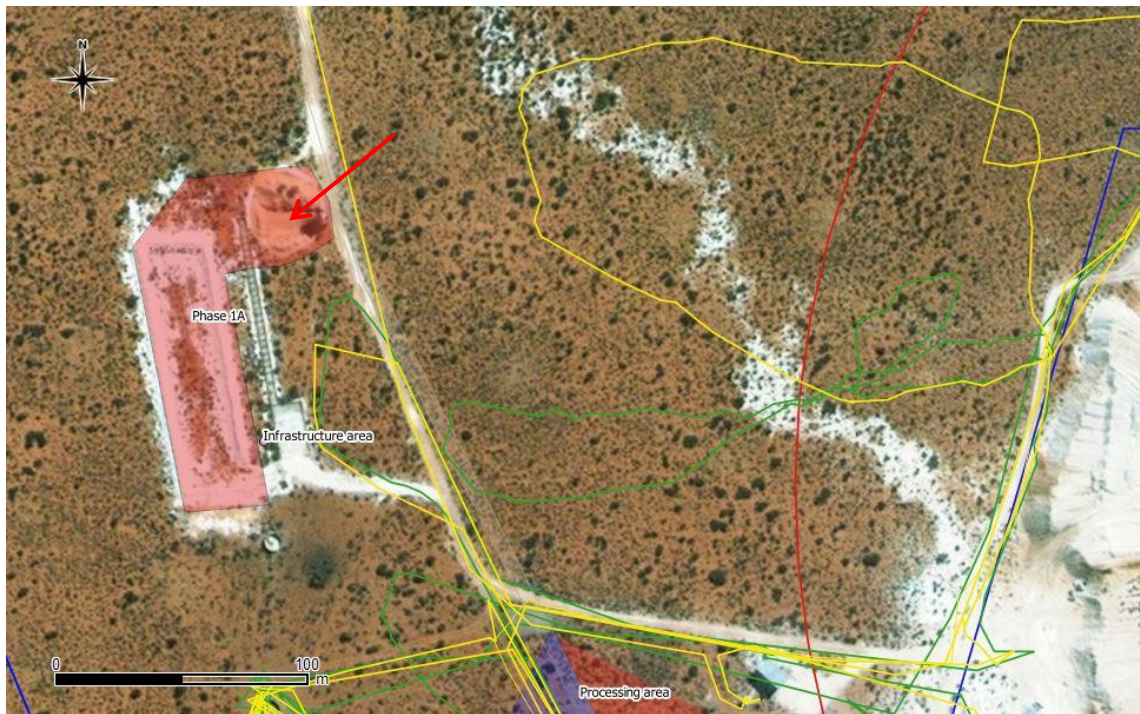


Figure 9: Infrastructure area adjacent to access road. The prospecting pit referred to in the text is marked with an arrow.

4.3.5. Phase 1B (Stockpile Area)

Located over the brow of the hill behind the mine, this is proposed as a stockpile area.

Five MSA flakes and a chunk on an olive brown silcrete were noted at two locations (J040 and J042) roughly 35 m apart amongst the quartz exposure referred to above (**Plate 3**) which runs approximately north-south through the centre of the Phase 1B area. A small outcrop of olive brown silcrete with some possible flaking damage (J041) was noted approximately 200 m upslope of these two findspots (**Figure 10** and **Plate 6**).

Northwest of and outside the proposed stockpile area is a series of deflation hollows. These contain quartz artefacts in patches, particularly on the western edge (D028) where flakes, cores and chunks were noted. The artefact density throughout is very low.

Heritage significance of the archaeological material noted in this area is low.

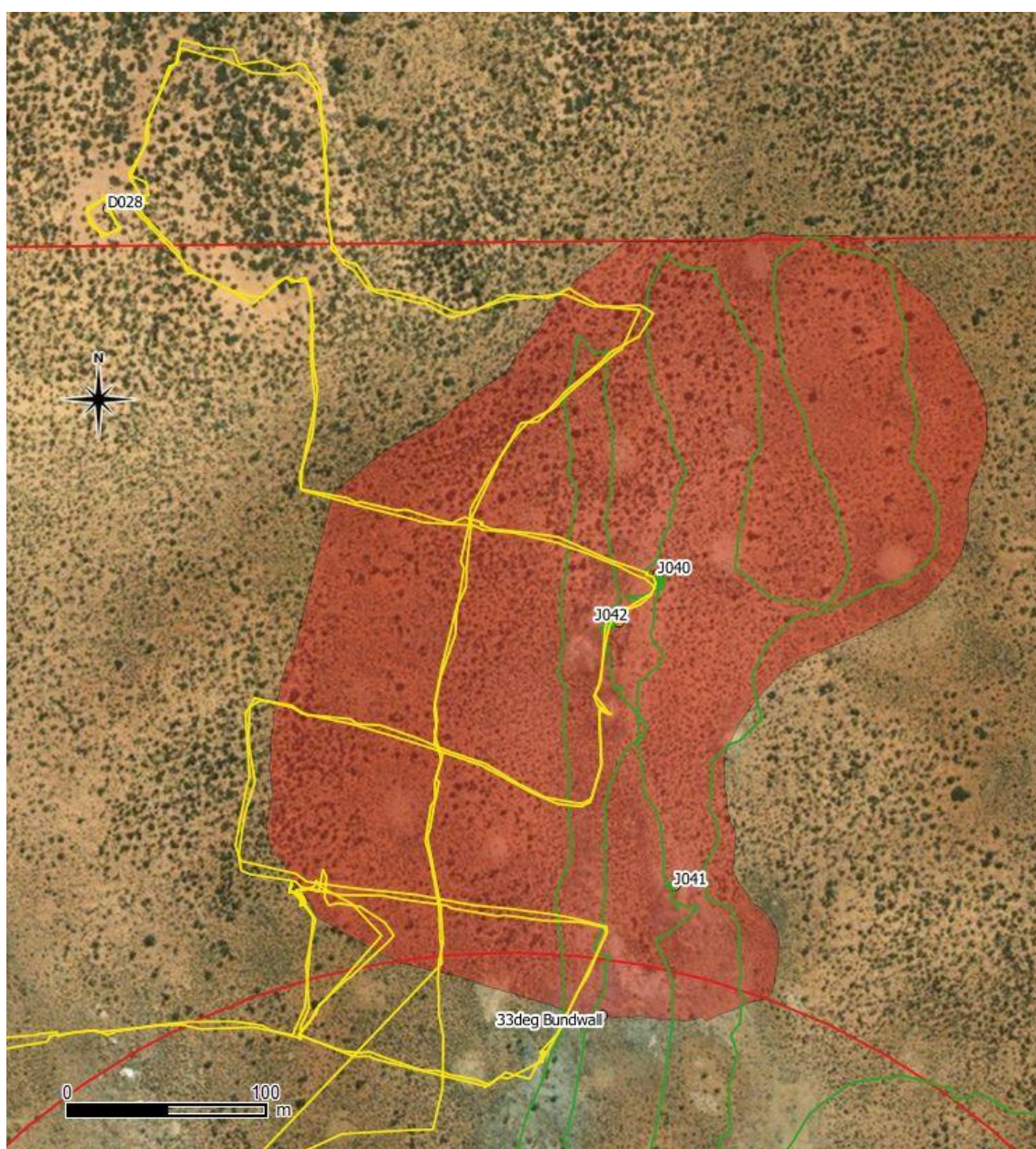


Figure 10: Phase 1B stockpile area showing walkover tracks and the archaeological findspots referred to in the report text.



Plate 6: Small surface outcropping of silcrete with showing possible flaking damage (J041).

4.3.6. Phase 1C and Phase 2 (Spoil Heap Areas)

As already indicated above, it was discovered after these areas had already been surveyed by ACO that almost the entirety of the Phase 1C area and about two thirds of the Phase 2 area are located on the neighbouring farm and thus cannot form part of the mine expansion proposal.

The survey did record the occurrence of a pan, characterised by an exposure of haematite nodules on the land surface, with associated MSA lithic material (D025 on **Figure 6** above). Because this site lies on the neighbouring farm it is not included in this assessment. However, its presence is important to note because it is illustrative of the fact that wherever pans occur on the landscape, archaeological material is likely to be encountered in association.

On that portion of the Phase 2 area that does fall within the Rondawel boundary, four archaeological occurrences were recorded. J028, which has been referred to already, is a prospecting pit next to the farm fence whose section showed more than 2 m of red aeolian sand above a harder substrate, possibly kaolin. A large ESA silcrete flake was recorded on the spoil heap associated with this prospecting pit (**Plate 7**).



Plate 7: large ESA flake (J028) found on the spoil heap from the prospecting pit in the Phase 2 area.

Waypoints J029 - J039 represent the approximate visible limit of a scatter of probably MSA silcrete, quartz and quartzite flakes, cores and chunks located on a low rise between the road and the farm boundary. The artefacts occur in a deflated area in the red sand and are associated with an outcropping and scatter of haematite nodules (**Plate 8** and **Plate 9**). This material is very similar in make-up and context to that found at D025 (see **Table 1**) on that portion of the Phase 2 area beyond the farm boundary.



Plate 8: outcropping of haematite nodules in blowout in red sand (J029 – J039)



Plate 9: Selection of stone artefacts recorded at J029 – J039.

The other two archaeological occurrences noted in the Phase 2 area were an isolated MSA flake on silcrete/quartzite found on a low mound (D023) and an isolated quartz chunk (D024).

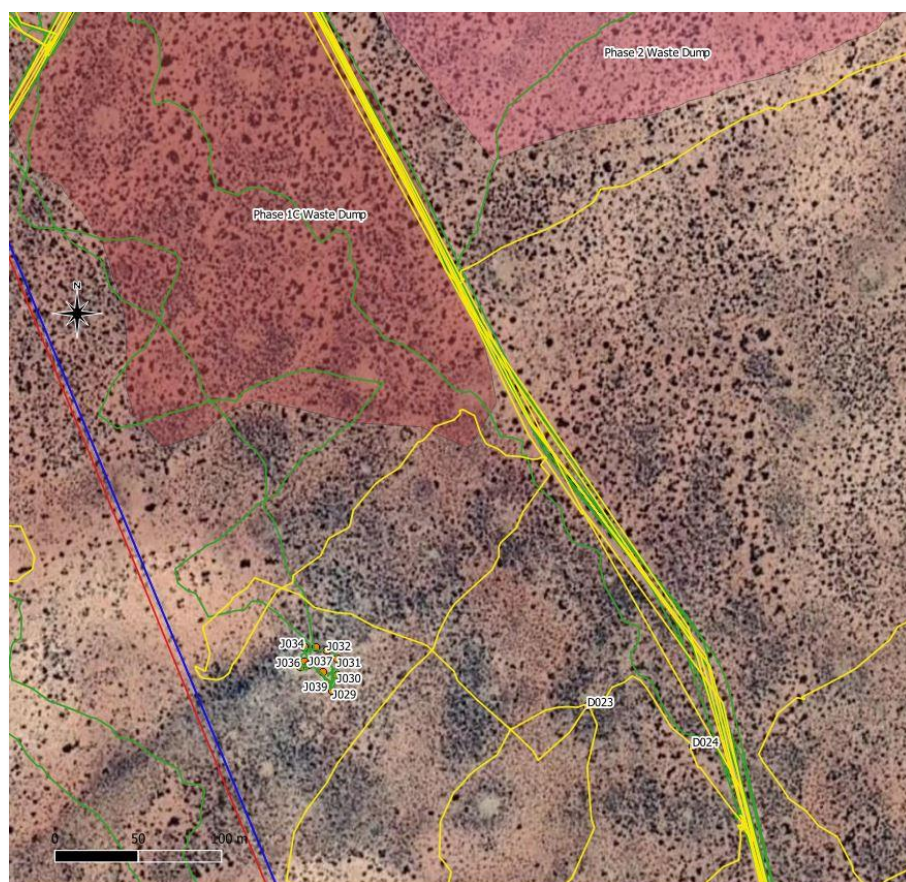


Figure 11: The new proposed position of the Phase 1C spoil heap avoids sites D023 and D024, and cluster J029-J039.

On the basis of the revised proposed position of the Phase 1C spoil heaps, shown on **Figure 11** above, sites D023 and D024, and the artefacts cluster bounded by J029-J039 are avoided.

Heritage significance of the archaeological material noted in this area is low.

4.3.7. Phase 1C and Phase 2 (Spoil Heap Areas) alternative

Following the discovery that most of the Phase 1C and 2 areas were located on the neighbouring farm, the area between the farm road and the eastern edge of the “alternative” area was surveyed by ACO as an alternative (see **Figure 6** above and **Plate 10**).

No archaeological material was noted during the walkover of this area, which is dominated by thick aeolian sand.



Plate 10: Approximate extent of additional survey area within “red line” area denoted by red box. Note the low hill to the right of the marked area where outcrops of granite were noted.

An outcropping of granite was noted on the hillside in the extreme south eastern edge of the “alternative” area (see **Figure 6**) and further granite outcrops on the flank of the same hill, south of the “alternative” area, were found to be associated with ephemeral scatters of MSA flakes and chunks/cores on quartz and silcrete (D030 and J044 – J045) (**Error! Reference source not found.**).

This archaeological material is outside the “alternative” area, beyond the limit of impacts from mining activities and its heritage significance is thus not assessed.

4.4. Built Environment

There is no historic built environment in the identified mining area.

5. IMPACT ASSESSMENT

The impacts of the proposed mining activities on archaeological resources in each of the areas described above have been assessed as follows using the impact assessment methodology summarised in **Appendix 5**:

Table 3: Potential Impact: Mine Pit – impacts on archaeological resources during mining activities

	<i>Extent</i>	<i>Intensity</i>	<i>Duration</i>	<i>Consequence</i>	<i>Probability</i>	<i>Significance</i>	<i>Status</i>	<i>Confidence</i>
Without mitigation	Local 1	Medium 2	Long-term 3	Medium 6	Probable	MEDIUM	-ve	Moderate
Essential mitigation measures:								
<ul style="list-style-type: none"> Archaeological resources noted on the surface are of low significance and no mitigation is proposed; However, the ESA lithic material known to occur at the buried interface between the aeolian and silcrete, overlying the kaolin resource is of moderate significance and mitigation in the form of archaeological monitoring is proposed. If any significant unknown archaeological resources (eg human remains) are uncovered during the activity, these must be avoided and reported to the archaeologist for assessment. 								
With mitigation	1	1	3	Low 5	Probable	LOW	-ve	Moderate

Table 4: Potential Impact: Processing Area – impacts on archaeological resources during mining activities

	<i>Extent</i>	<i>Intensity</i>	<i>Duration</i>	<i>Consequence</i>	<i>Probability</i>	<i>Significance</i>	<i>Status</i>	<i>Confidence</i>
Without mitigation	Local 1	Low 1	Short-term 1	Very low 3	Improbable	INSIGNIFICANT	Neutral	High
Essential mitigation measures:								
<ul style="list-style-type: none"> Archaeological resources are of low significance and no mitigation is proposed; If any significant unknown archaeological resources (eg human remains) are uncovered during the activity, these should be avoided and reported to the archaeologist for assessment. 								
With mitigation	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Table 5: Potential Impact: Low Grade Stockpile Area – impacts on archaeological resources during mining activities

	<i>Extent</i>	<i>Intensity</i>	<i>Duration</i>	<i>Consequence</i>	<i>Probability</i>	<i>Significance</i>	<i>Status</i>	<i>Confidence</i>
Without mitigation	Local 1	Low 1	Short-term 1	Very low 3	Improbable	INSIGNIFICANT	Neutral	High
Essential mitigation measures:								
<ul style="list-style-type: none"> No archaeological resources were encountered in this area. No mitigation is proposed; If any significant unknown archaeological resources (eg human remains) are uncovered during the activity, these should be avoided and reported to the archaeologist for assessment. 								
With mitigation	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Table 6: Potential Impact: Phase 1A Infrastructure Area – impacts on archaeological resources during mining activities

	<i>Extent</i>	<i>Intensity</i>	<i>Duration</i>	<i>Consequence</i>	<i>Probability</i>	<i>Significance</i>	<i>Status</i>	<i>Confidence</i>
Without mitigation	Local 1	Low 1	Short-term 1	Very low 3	Improbable	INSIGNIFICANT	Neutral	High
Essential mitigation measures:								
<ul style="list-style-type: none"> Archaeological resources are of low significance and no mitigation is proposed; If any significant unknown archaeological resources (eg human remains) are uncovered during the activity, these should be avoided and reported to the archaeologist for assessment. 								
With mitigation	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Table 7: Potential Impact: Phase 1B Stockpile Area – impacts on archaeological resources during mining activities

	<i>Extent</i>	<i>Intensity</i>	<i>Duration</i>	<i>Consequence</i>	<i>Probability</i>	<i>Significance</i>	<i>Status</i>	<i>Confidence</i>
Without mitigation	Local 1	Low 1	Short-term 1	Very low 3	Improbable	INSIGNIFICANT	Neutral	High
Essential mitigation measures:								
<ul style="list-style-type: none"> Archaeological resources are of low significance and no mitigation is proposed; If any significant unknown archaeological resources (eg human remains) are uncovered during the activity, these should be avoided and reported to the archaeologist for assessment. 								
With mitigation	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Table 8: Potential Impact: Phase 1C and 2 Spoil Heap Areas (Revised) – impacts on archaeological resources during mining activities

	<i>Extent</i>	<i>Intensity</i>	<i>Duration</i>	<i>Consequence</i>	<i>Probability</i>	<i>Significance</i>	<i>Status</i>	<i>Confidence</i>
Without mitigation	Local 1	Low 1	Short-term 1	Very low 3	Improbable	INSIGNIFICANT	Neutral	High
Essential mitigation measures:								
<ul style="list-style-type: none"> No archaeological resources were encountered in this area. No mitigation is proposed; If any significant unknown archaeological resources (eg human remains) are uncovered during the activity, these should be avoided and reported to the archaeologist for assessment. 								

With mitigation	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
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Table 9: Potential Impact: "Red Line" Area – impacts on archaeological resources during mining activities

	<i>Extent</i>	<i>Intensity</i>	<i>Duration</i>	<i>Consequence</i>	<i>Probability</i>	<i>Significance</i>	<i>Status</i>	<i>Confidence</i>
Without mitigation	Local 1	Low 1	Short-term 1	Very low 3	Improbable	INSIGNIFICANT	Neutral	High
Essential mitigation measures: <ul style="list-style-type: none"> No archaeological resources were encountered in this area. No mitigation is proposed; If any significant unknown archaeological resources (eg human remains) are uncovered during the activity, these should be avoided and reported to the archaeologist for assessment. 								
With mitigation	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

6. CONCLUSIONS AND RECOMMENDATIONS

The archaeological material recorded during the November 2017 and November 2018 surveys on the farm Rondawel consisted of a handful of isolated MSA lithics and a single LSA flake found on the aeolian sand, and a small number of occurrences of MSA and ESA lithics associated with exposed rocky outcrops or with the buried interface between the aeolian sand, silcrete and the kaolin deposits respectively. No non-lithic material was observed during the surveys.

The lithics noted at J028, at the prospecting pit adjacent to the Infrastructure Area and previously within the existing mine suggest that ESA archaeological material may be widely distributed across the area at the interface between the sand and the harder kaolin or rocky substrate which underlies it.

With the exception of the mine pit, the impacts of mining activities on archaeological resources are assessed to be **insignificant**. Impacts within the mine pit are assessed to be **medium**.

According to the palaeontological impact assessment the likelihood of fossils being encountered during mining operations is **extremely low**.

No historic built environment resources were identified in the area surveyed.

The following recommendations are made:

- Archaeological monitoring of the mine pit to record the presence (or not) of buried surfaces containing stone artefacts must take place when topsoil stripping reaches the buried aeolian/silcrete interface. This monitoring to take place at intervals to be agreed with the mine;
- A Fossil Chance Find Protocol should be implemented in the unlikely event of fossil material being encountered;
- Should any archaeological material, including human burials, be accidentally exposed during the course of mining, work must cease in that area until the project archaeologist and SAHRA have been notified, the find has been assessed by the archaeologist, and agreement has been reached on how to deal with it; and
- These proposed mitigation measures must be included in the Environmental Management Plan for the mine.

6.1. Acceptability of the Proposed Activity with Respect to Heritage Resources

It is our reasoned opinion that the proposed activities may be authorised. The archaeological resources are not highly significant in themselves, although their relationship to silcrete outcrops is of interest. There are no areas that need to be avoided or buffer zones that need to be implemented.

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APPENDIX 1: SPECIALIST CV

Name: John Gribble
Profession: Archaeologist
Date of Birth: 15 November 1965
Parent Firm: ACO Associates cc
Position in Firm: Senior Archaeologist
Years with Firm: <2
Years of experience: 27
Nationality: South African
HDI Status: n/a

Education:

1979-1983 Wynberg Boys' High School (1979-1983)
1986 BA (Archaeology), University of Cape Town
1987 BA (Hons) (Archaeology), University of Cape Town
1990 Master of Arts, (Archaeology) University of Cape Town

Employment:

- ACO Associates, Senior Archaeologist and Consultant, September 2017 – present
- South African Heritage Resources Agency, Manager: Maritime and Underwater Cultural Heritage Unit, 2014 – 2017 / Acting Manager: Archaeology, Palaeontology and Meteorites Unit, 2016-2017
- Sea Change Heritage Consultants Limited, Director, 2012 – present
- TUV SUD PMSS (Romsey, United Kingdom), Principal Consultant: Maritime Archaeology, 2011-2012
- EMU Limited (Southampton, United Kingdom), Principal Consultant: Maritime Archaeology, 2009-2011
- Wessex Archaeology (Salisbury, United Kingdom), Project Manager: Coastal and Marine, 2005-2009
- National Monuments Council / South African Heritage Resources Agency, Maritime Archaeologist, 1996-2005
- National Monuments Council, Professional Officer: Boland and West Coast, Western Cape Office, 1994-1996

Professional Qualifications and Accreditation:

- Member: Association of Southern African Professional Archaeologists (No. 043)
- Principal Investigator: Maritime and Colonial Archaeology, ASAPA CRM Section
- Field Director: Stone Age Archaeology, ASAPA CRM Section
- Member: Chartered Institute for Archaeologists (CIfA), United Kingdom
- Class III Diver (Surface Supply), Department of Labour (South Africa) / UK (HSE III)

Experience:

I have nearly 30 years of combined archaeological and heritage management experience. After completing my postgraduate studies, which were focussed on the vernacular architecture of the West Coast, and a period of freelance archaeological work in South Africa and abroad, I joined the National Monuments Council (NMC) (now the South African Heritage Resources Agency (SAHRA)) in 1994. As the Heritage Officer: the Boland I was involved in day to day historical building control and heritage resources management across the region. In 1996 I become the NMC's first full-time maritime archaeologist in which role was responsible for the management and protection of underwater cultural heritage in South Africa under the National Monuments Act, and subsequently under the National Heritage Resources Act.

In 2005 I moved to the UK to join Wessex Archaeology, one of the UK's biggest archaeological consultancies, as a project manager in its Coastal and Marine Section. In 2009 I joined Fugro EMU Limited, a marine geosurvey company based in Southampton to set up their maritime archaeological section. I then spent a year at TUV SUD PMSS, an international renewable energy consultancy based

in Romsey, where I again provided maritime archaeological consultancy services to principally the offshore renewable and marine aggregate industries.

In August 2012 I set up Sea Change Heritage Consultants Limited, a maritime archaeological consultancy. Sea Change provides archaeological services to a range of UK maritime sectors, including marine aggregates and offshore renewable energy. It also actively pursues opportunities to raise public awareness and understanding of underwater cultural heritage through educational and research projects and programmes, including some projects being developed in South Africa.

Projects include specialist archaeological consultancy for more than 15 offshore renewable energy projects and more than a dozen offshore aggregate extraction licence areas.

In addition to managing numerous UK development-driven archaeological projects, I have also been involved in important strategic work which developed guidance and best practice for the offshore industry with respect to the marine historic environment. This has included the principal authorship of two historic environment guidance documents for COWRIE and the UK renewable energy sector, and the development of the archaeological elements of the first Regional Environmental Assessments for the UK marine aggregates industry. In 2013-14 I was lead author and project co-ordinator on the Impact Review for the United Kingdom of the 2001 UNESCO Convention on the Protection of the Underwater Cultural Heritage. In 2016 I was co-author of a Historic England / Crown Estate / British Marine Aggregate Producers Association funded review of marine historic environment best practice guidance for the UK offshore aggregate industry.

I returned to South African in mid-2014 where I was re-appointed to my earlier post at SAHRA: Manager of the Maritime and Underwater Cultural Heritage Unit. In July 2016 I was also appointed Acting Manager of SAHRA's Archaeology, Palaeontology and Meteorites Unit.

I left SAHRA in September 2017 to join ACO Associates as Senior Archaeologist and Consultant. I have been a member of the ICOMOS International Committee for Underwater Cultural Heritage since 2000 and have served as a member of its Bureau since 2009. I am currently the secretary of the Committee.

I have been a member of the Association of Southern African Professional Archaeologists for more than twenty years and am accredited by ASAPA's CRM section. I have been a member of the UK's Chartered Institute for Archaeologists (CIfA) since 2005, and served on the committee of its Maritime Affairs Group between 2008 and 2010. Since 2010 I have been a member of the UK's Joint Nautical Archaeology Policy Committee.

I am currently a member of the Advisory Board of the George Washington University / Iziko Museums of South Africa / South African Heritage Resources Agency / Smithsonian Institution 'Southern African Slave Wrecks Project' and serve on the Heritage Western Cape Archaeology, Palaeontology and Meteorites Committee.

Books and Publications:

Gribble, J. and Scott, G., 2017, *We Die Like Brothers: The sinking of the SS Mendi*, Historic England, Swindon

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APPENDIX 2: SPECIALIST DECLARATION

I, John Gribble, declare that:

- 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;
- 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 24(F) of the Act.



Signature of the specialist

ACO Associates cc

Name of company (if applicable):

31 January 2019

Date

APPENDIX 3: PALAEOLOGICAL IMPACT ASSESSMENT

See attached report:

Bamford, M., 2018, *Palaeontological Impact Assessment for the proposed extension of the 5 ha kaolin mine on portion 1 of the farm Rondawel 638, Namaqualand District, Northern Cape Province.*

APPENDIX 4: GRADING CATEGORIES

Grading	Description of Resource	Examples of Possible Management Strategies	Heritage Significance
I	Heritage resources with qualities so exceptional that they are of special national significance. Current examples: Robben Island	May be declared as a National Heritage Site managed by SAHRA.	Highest Significance
II	Heritage resources with special qualities which make them significant in the context of a province or region, but do not fulfil the criteria for Grade I status. Current examples: St George's Cathedral, Community House	May be declared as a Provincial Heritage Site managed by HWC.	Exceptionally High Significance
III		Such a resource contributes to the environmental quality or cultural significance of a larger area and fulfils one of the criteria set out in section 3(3) of the Act but that does not fulfill the criteria for Grade II status. Grade III sites may be formally protected by placement on the Heritage Register. These resources are currently managed by HWC <i>unless the local authority has been found competent and has been granted delegated authority.</i>	
IIIA	Such a resource must be an excellent example of its kind or must be sufficiently rare. These are heritage resources which are significant in the context of an area .	This grading is applied to buildings and sites that have sufficient intrinsic significance to be regarded as local heritage resources; and are significant enough to warrant that any alteration, both internal and external, is regulated. Such buildings and sites may be representative, being excellent examples of their kind, or may be rare. In either case, they should receive maximum protection at local level.	High Significance
IIIB	Such a resource might have similar significances to those of a Grade III A resource, but to a lesser degree. These are heritage resources which are significant in the context of a townscape , neighbourhood, settlement or community.	Like Grade IIIA buildings and sites, such buildings and sites may be representative, being excellent examples of their kind, or may be rare, but less so than Grade IIIA examples. They would receive less stringent protection than Grade IIIA buildings and sites at local level.	Medium Significance
IIIC	Such a resource is of contributing significance to the environs These are heritage resources which are significant in the context of a streetscape or direct neighbourhood .	This grading is applied to buildings and/or sites whose significance is contextual, i.e. in large part due to its contribution to the character or significance of the environs. These buildings and sites should, as a consequence, only be regulated if the significance of the environs is sufficient to warrant protective measures, regardless of whether the site falls within a Conservation or Heritage Area. Internal alterations should not necessarily be regulated.	Low Significance
NCW	A resource that, after appropriate investigation, has been determined to not have enough heritage significance to be retained as part of the National Estate.	No further actions under the NHRA are required. This must be motivated by the applicant and approved by the authority. Section 34 can even be lifted by HWC for structures in this category if they are older than 60 years.	No research potential or other cultural significance

APPENDIX 5: IMPACT ASSESSMENT METHODOLOGY

Impact Assessment Methodology for EIAs - Instructions to Specialists

The significance of all potential impacts that would result from the proposed Project is determined in order to assist decision-makers. The significance rating of impacts is considered by decision-makers, as shown below.

- **INSIGNIFICANT:** the potential impact is negligible and will not have an influence on the decision regarding the proposed activity.
- **VERY LOW:** the potential impact is very small and should not have any meaningful influence on the decision regarding the proposed activity.
- **LOW:** the potential impact may not have any meaningful influence on the decision regarding the proposed activity.
- **MEDIUM:** the potential impact should influence the decision regarding the proposed activity.
- **HIGH:** the potential impact will affect a decision regarding the proposed activity.
- **VERY HIGH:** The proposed activity should only be approved under special circumstances.

The significance of an impact is defined as a combination of the consequence of the impact occurring and the probability that the impact will occur. The significance of each identified impact¹ must be rated according to the methodology set out below:

Step 1 – Determine the consequence rating for the impact by determining the score for each of the three criteria (A-C) listed below and then adding them². The rationale for assigning a specific rating, and comments on the degree to which the impact may cause irreplaceable loss of resources and be irreversible, must be included in the narrative accompanying the impact rating:

Rating	Definition of Rating	Score
A. Extent– the area over which the impact will be experienced		
Local	Confined to project or study area or part thereof (the Setback)	1
Regional	The region, which may be defined in various ways, e.g. vegetation type, district, catchment, etc.	2
(Inter) national	Nationally or beyond	3
B. Intensity– the magnitude of the impact in relation to the sensitivity of the receiving environment, taking into account the degree to which the impact may cause irreplaceable loss of resources		
Low	Site-specific and/or wider natural and/or social functions and processes are negligibly altered	1
Medium	Site-specific and/or wider natural and/or social functions and processes continue albeit in a modified way	2
High	Site-specific and/or wider natural and/or social functions or processes are severely altered	3
C. Duration– the timeframe over which the impact will be experienced and its reversibility		
Short-term	Up to 2 years (i.e. reversible impact)	1
Medium-term	2 to 15 years (i.e. reversible impact)	2
Long-term	More than 15 years (state whether impact is irreversible)	3

Example 5:

<i>Extent</i>	<i>Intensity</i>	<i>Duration</i>	<i>Consequence</i>	<i>Probability</i>	<i>Significance</i>	<i>Status</i>	<i>Confidence</i>
Regional 2	Medium 2	Long-term 3	High 7	Probable	HIGH	- ve	High

Step 6 – Identify and describe practical mitigation and optimisation measures that can be implemented effectively to reduce or enhance the significance of the impact. Mitigation and optimisation measures must be described as either:

- **Essential:** best practice measures which must be implemented and are non-negotiable; and.
- **Best Practice:** recommended to comply with best practice, with adoption dependent on the proponent's risk profile and commitment to adhere to best practice, and which must be shown to have been considered and sound reasons provided by the proponent if not implemented.

Essential mitigation and optimisation measures must be inserted into the completed impact assessment table. The impact should be re-assessed with mitigation, by following Steps 1-5 again to demonstrate how the extent, intensity, duration and/or probability change after implementation of the proposed mitigation measures.

Example 6: A completed impact assessment table

	<i>Extent</i>	<i>Intensity</i>	<i>Duration</i>	<i>Consequence</i>	<i>Probability</i>	<i>Significance</i>	<i>Status</i>	<i>Confidence</i>
Without mitigation	Regional 2	Medium 2	Long-term 3	High 7	Probable	HIGH	- ve	High
Essential mitigation measures:								
<ul style="list-style-type: none"> • Xxx1 • Xxx2 • Xxx3 								
With mitigation	Local 1	Low 1	Long-term 3	Low 5	Improbable	VERY LOW	- ve	High

Best practice measures (which are assumed not to affect impact significance ratings) must be presented in the text, in bullet format.

Step 7 – Summarise all impact significance ratings as follows in your executive summary:

<i>Impact</i>	<i>Consequence</i>	<i>Probability</i>	<i>Significance</i>	<i>Status</i>	<i>Confidence</i>
Impact 1: XXXX	Medium	Improbable	LOW	-ve	High
With Mitigation	Low	Improbable	VERY LOW		High
Impact 2: XXXX	Very Low	Definite	VERY LOW	-ve	Medium
With Mitigation:	<i>Not applicable</i>				

The combined score of these three criteria corresponds to a Consequence Rating, as follows:

Combined Score (A+B+C)	3 – 4	5	6	7	8 – 9
Consequence Rating	Very low	Low	Medium	High	Very high

Example 1:

Extent	Intensity	Duration	Consequence
Regional 2	Medium 2	Long-term 3	High 7

Step 2 – Assess the probability of the impact occurring according to the following definitions:

Probability– the likelihood of the impact occurring	
Improbable	< 40% chance of occurring
Possible	40% - 70% chance of occurring
Probable	> 70% - 90% chance of occurring
Definite	> 90% chance of occurring

Example 2:

Extent	Intensity	Duration	Consequence	Probability
Regional 2	Medium 2	Long-term 3	High 7	Probable

Step 3 – Determine the overall significance of the impact as a combination of the consequence and probability ratings, as set out below:

		Probability			
		Improbable	Possible	Probable	Definite
Consequence	Very Low	INSIGNIFICANT	INSIGNIFICANT	VERY LOW	VERY LOW
	Low	VERY LOW	VERY LOW	LOW	LOW
	Medium	LOW	LOW	MEDIUM	MEDIUM
	High	MEDIUM	MEDIUM	HIGH	HIGH
	Very High	HIGH	HIGH	VERY HIGH	VERY HIGH

Example 3:

Extent	Intensity	Duration	Consequence	Probability	Significance
Regional 2	Medium 2	Long-term 3	High 7	Probable	HIGH

Step 4 – Note the status of the impact (i.e. will the effect of the impact be negative or positive?)

Example 4:

Extent	Intensity	Duration	Consequence	Probability	Significance	Status
Regional 2	Medium 2	Long-term 3	High 7	Probable	HIGH	- ve

Step 5 – State your level of confidence in the assessment of the impact (high, medium or low).

Depending on the data available, you may feel more confident in the assessment of some impact than others. For example, if you are basing your assessment on extrapolated data, you may reduce the confidence level to low, noting that further groundtruthing is required to improve this.