

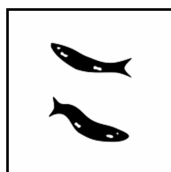
**REPORT ON AN ARCHAEOLOGICAL ASSESSMENT OF  
17 PROPOSED DRILLING SITES FOR THE PROPOSED  
PROSPECTING OF PHOSPHATE ON PORTION 4 AND 2  
OF THE FARM ELANDSFONTYN 349 NEAR HOPEFIELD,  
WESTERN CAPE**

Prepared for:

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## Executive summary

ACRM was appointed to inspect 17 drilling sites for the proposed prospecting of phosphate on Portion 2 and 4 of the Farm Elandsfontyn 349 near Hopefield in the Western Cape.

Phosphate is a 'strategic mineral resource' and is used mainly for the production of chemical fertilizer in the agricultural industry. Prospecting by SAMANCOR in the 1970s on Portion 4 of Elandsfontyn 349 established that significant high grade phosphate deposits occur over this portion of the farm.

Elandsfontyn farm is also recognised world-wide for producing Middle and Early Stone Age tools with associated fauna (bone) more than 200 000 years old, and the 'Saldanha Man' skull from the Elandsfontyn fossil site (nearly 3 kms to the east of the proposed prospecting area), is the oldest known human in the Cape, with a date between 700 000 and 400 000 years ago. Archaeological and palaeontological research on the farm began in the 1950s continuing till the present, and has seen more than 20 scientific reports/published papers dedicated to the site. Internationally, it is one of the most recognised heritage sites in South Africa.

In 2010 the Archaeology Contracts Office at the University of Cape Town was commissioned to undertake a Heritage Scoping Study for the proposed prospecting programme on Farm 349. The report stressed the importance of the farm in terms of Pleistocene and Pliocene palaeontology, and Pleistocene archaeology.

The report concluded that given the method of drilling and the very small diameter area of the boreholes, the negative impacts associated with the prospecting phase 'will be low, but potentially informative with respect to gauging future impact of mining'.

As recently as July 2013, an archaeological survey of the proposed development site was undertaken by J. Plasket, who logged a handful of Middle Stone Age flakes, fossil bone and coprolites. The study, however, was constrained by extremely dense vegetation cover, resulting in poor visibility.

The applicant (Elandsfontein Exploration and Mining Limited (Pty) Ltd ) has identified 17 potential drilling sites (Phase 1 of planned drilling) within a footprint area covering about 350 ha in extent, in order to test the underlying deposits for potential, mineable, phosphate deposits.

Following a Stop Works Order by Heritage Western Cape, ACRM was commissioned by the applicant to inspect the 17 proposed drilling sites for the presence of surface archaeological and palaeontological material.

It is important to note that this report addresses only potential impacts related to proposed, prospecting and a new application for a mining right licence will need to be made, if full scale mining were to proceed in the future.

A site visit and assessment took place on the 23 July, 2013 in which the following observations were made:

- No archaeological or palaeontological material was found during an inspection of 15 of the proposed 17 drill sites.
- One silcrete Middle Stone Age flake was encountered while walking between drill sites

The assessment has shown that proposed prospecting for phosphate, on Portion 4 and a Portion of Portion 2 of Farm 349 will not impact on, any surface archaeological or palaeontological material and that proposed prospecting should be allowed to proceed, subject to the following conditions:

1. An archaeologist must be on site during prospecting operations and all deposits must be sieved for archaeological and palaeontological remains such as stone implements, ostrich eggshell and bone.

This condition is also contained in the Department of Mineral Energy approval of the Environmental Management Plan for prospecting on Farm 349.

It is recommended that Ms J. Plasket (who is currently employed to curate heritage remains from the fossil site), be appointed to undertake this task, under the supervision of Dr David Braun from the University of Cape Town who holds the excavation permit for the Elandsfontyn fossil site.

2. An archaeological and palaeontological monitoring and recovery plan must be submitted to Heritage Western Cape prior to any drilling/prospecting take place.
3. An archaeological and palaeontological monitoring report must be submitted to Heritage Western Cape within 30 days of completion of the prospecting/drilling programme
4. A Heritage Impact Assessment (HIA) must be undertaken in the proposed mining application area, including the proposed mine infrastructure area.

It is noted that a HIA was recommended by ACO in their 2010 Heritage Scoping Study for proposed prospecting on the Farm 349. A HIA has also previously been requested by the Provincial Heritage Authority, Heritage Western Cape.

5. The HIA should take place after prospecting when a final decision on future mining is made.
6. A Heritage Management Plan must form part of the required Environmental Management Plan (EMP) for any future proposed mining on the property. The Heritage Management Plan must also be approved by Heritage Western Cape.
7. Any future planned drilling sites on the affected property must be inspected for archaeological and palaeontological material.

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## 1. Introduction

Following a Stop Works Order by Heritage Western Cape, ACRM was appointed by Elandsfontein Exploration and Mining Limited to inspect 17 drilling sites (Phase 1 of planned drilling) for the proposed prospecting of phosphate on Portion 2 and 4 of the Farm Elandsfontyn 349 near Hopefield in the Western Cape (Figures 1 & 2).

Phosphate, has been identified by the International Strategic Minerals Inventory (of which South Africa is a member), as a 'strategic mineral resource' which is used mainly as a chemical fertilizer in the agricultural industry. Prospecting by SAMANCOR in the 1970s on Portion 4 of Farm 349 established that significant high grade phosphate deposits occur over this portion of the property (Pepler 2010).

It is intended that proposed prospecting will take place over an area covering about 350 ha in extent and will be done by drilling boreholes over a 400m grid (Figure 3). Prospecting is designed to test underlying deposits for potential grade quality phosphate. Prospecting methods entail drilling to a depth of between 30 and 50m, and the coring of samples at between 1.0 and 1.5m intervals (Bertie Pepler pers comm.). A drill rig, transported on a flatbed truck with water inflated tyres (to minimise environmental impact) will be used in the drilling operations. A  $\pm 3\text{m}^2$  area will be cleared in order to set the drill rig up (refer to Figures 4 & 5 for an example of the type of drilling envisaged). The maximum hard footprint area for drilling is 8.6 cm in diameter. The drilling activity will therefore entail very little disturbance of the top surface other than the initial clearing of vegetation, and the size of the borehole. No more clearing on the site will take place. All drill sites and the surrounding area will be rehabilitated after prospecting.

Should Phase 1 of the drilling programme prove to be successful, the applicant intends reducing the drilling grid in some areas, which may result in the drilling of an additional 25 holes.

It is important to note that this report addresses only impacts related to proposed, prospecting and a new application for a mining right licence will need to be made, if mining were to proceed in the future.

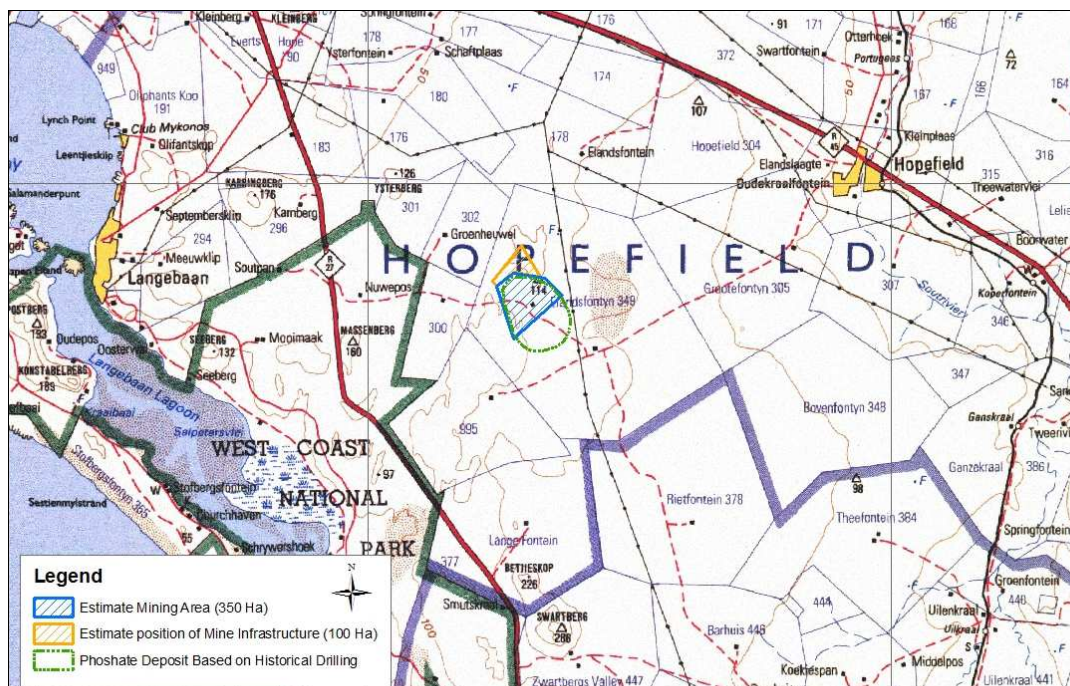


Figure 1. Locality map indicating the proposed mining application area (blue hatched polygon).



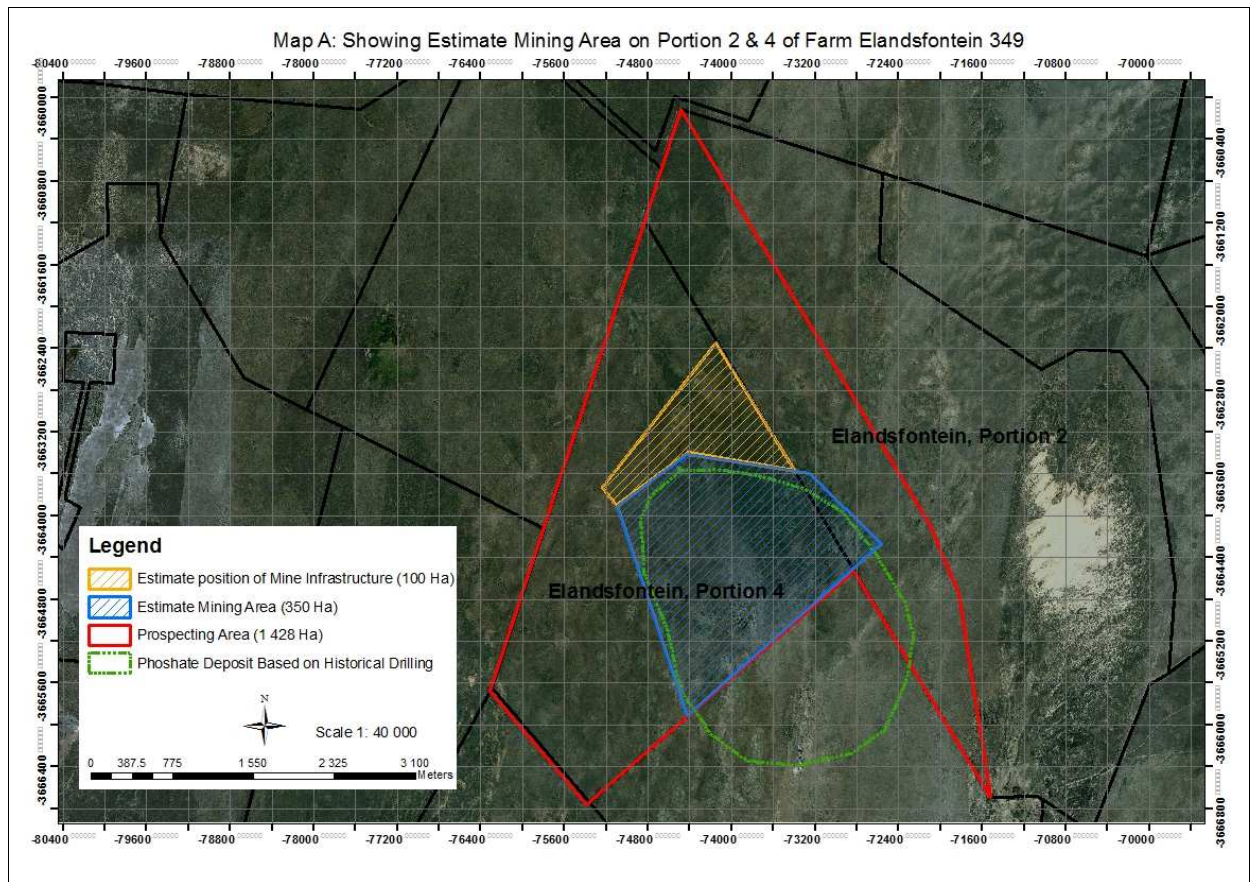


Figure 2. Elandsfontyn Farm 349/4 & 2. Footprint area for proposed mining and infrastructure.

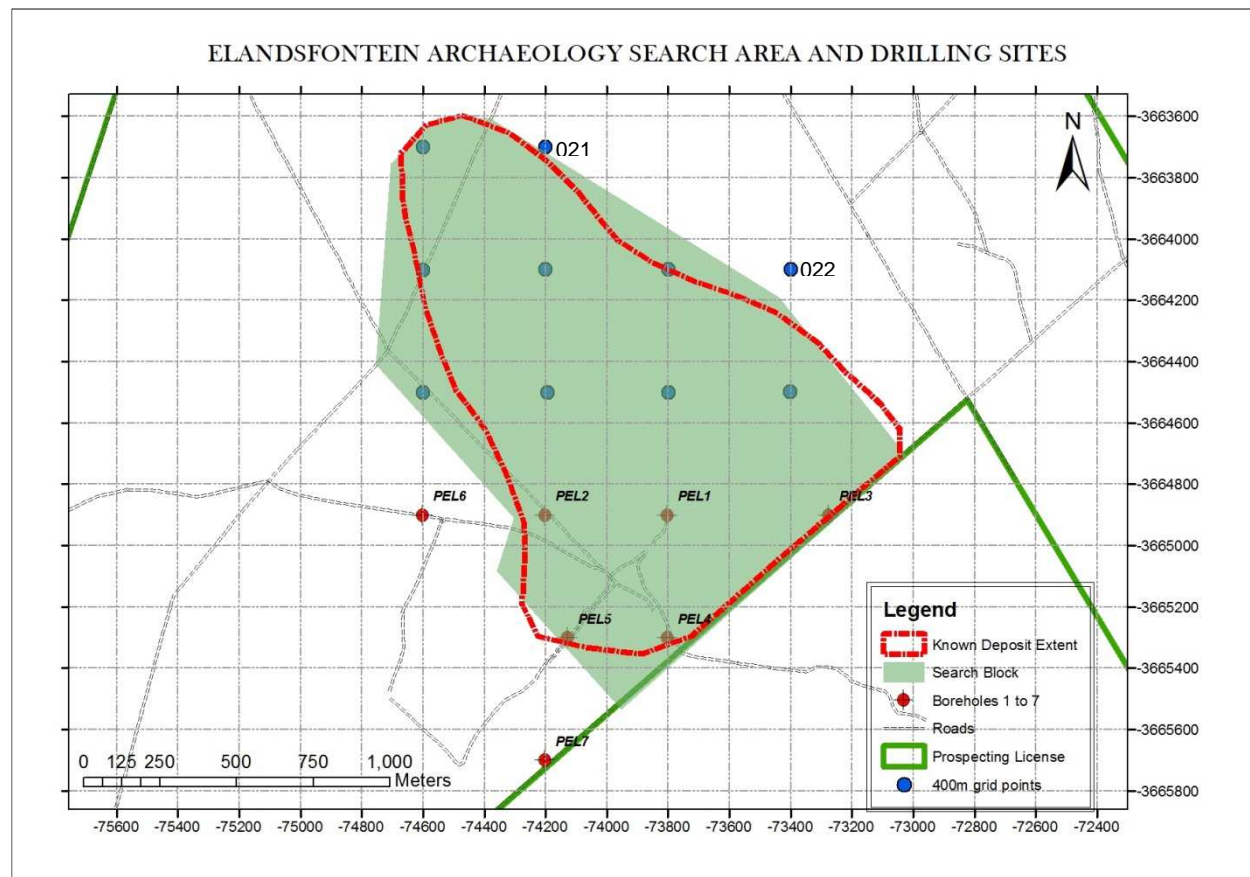


Figure 3. Elandsfontyn Farm 349/4 proposed drilling sites





Figure 4. Example of the drill and drilling method to be used on Farm 349

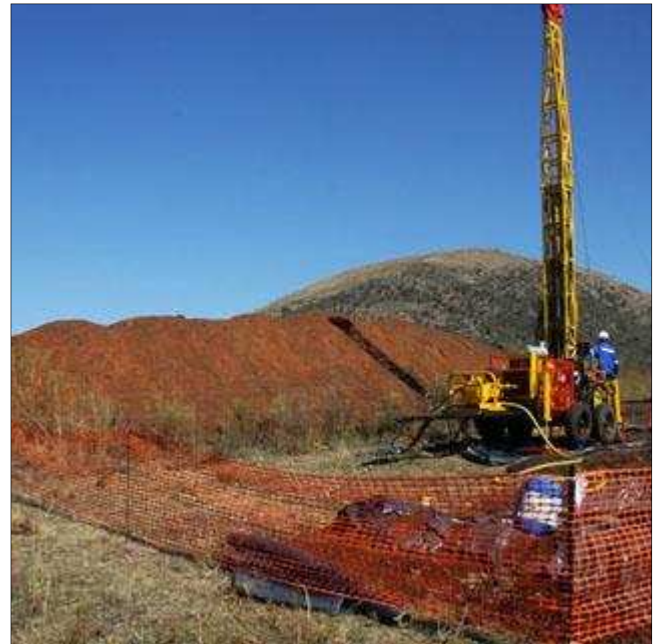


Figure 5. Example of the drill and drilling method to be used on Farm 349

## 2. The study site

Farm 349 is located approximately 95kms northwest of Cape Town, on the R27/West Coast Road. Access to the farm is via the board marked Elandsfontein Nature Reserve, about 10kms before the turnoff to Langebaan. The proposed development site is located about 10km inland from the coast and nearly 3kms west of the Elandsfontyn Stone Age fossil site.

Most of the study site is fairly flat and undulating, with some outcroppings of limestone occurring on a few low dunes. A larger dune ridge is located alongside the north eastern boundary of Portion 2 of the property, outside the proposed development site. The proposed prospecting area is covered with very dense natural vegetation (mainly Fynbos, Restio, thorny scrub & some succulent ground cover), and underlain by soft windblown sands. While there is very little surface stone covering the proposed study site, nodules of loose calcrete do occur in places. Most of the surrounding land use is Wilderness (Figures 6-9).



Figure 6. View of the study site facing south west.





Figure 7. View of the study site facing west.



Figure 8. View of the study site facing south east.



Figure 9. View of the study site facing south.



### 3. Approach to the study

With the assistance of J. Plasket, 15 of the proposed 17 drilling sites were inspected by the archaeologist on 23<sup>rd</sup> July, 2013 (refer to Figure 26 in Appendix I). Drilling site 021 was not inspected as the beacon could not be located. Drilling site 022 (refer to Figure 3) was not accessed. Figures 10-24 illustrate the receiving environment around each proposed drill site.



Figure 10. Drill site 020



Figure 13. Drill site 024



Figure 11. Drill site 022



Figure 14. Drill site 025



Figure 12. Drill site 023



Figure 15. Drill site 026





Figure 16. Drill site 027



Figure 19. Drill site 029/PEL 6



Figure 17. Drill site 028



Figure 20. Drill site 030/PEL 4



Figure 18. Drill site 028/PEL 6



Figure 21. Drill site 031/PEL7





Figure 22. Drill site 032/PEL 3



Figure 24. Drill site 034/PEL 1



Figure 23. Drill site 033/PEL 2



Figure 25. Silcrete flake. Scale is in cm

#### 4. Results of the assessment

Fifteen of the proposed 17 drilling sites were inspected for archaeological and palaeontological remains.

**Drill site 020:** No archaeological or palaeontological remains were found during an inspection of the proposed drill site.

**Drill site 022:** No archaeological or palaeontological remains were found during an inspection of the proposed drill site.

**Drill site 023:** No archaeological or palaeontological remains were found during an inspection of the proposed drill site.

**Drill site 024:** No archaeological or palaeontological remains were found during an inspection of the proposed drill site.

**Drill site 025:** No archaeological or palaeontological remains were found during an inspection of the proposed drill site.



**Drill site 026:** No archaeological or palaeontological remains were found during an inspection of the proposed drill site.

**Drill site 027:** No archaeological or palaeontological remains were found during an inspection of the proposed drill site.

**Drill site 028:** No archaeological or palaeontological remains were found during an inspection of the proposed drill site.

**Drill site 029:** No archaeological or palaeontological remains were found during an inspection of the proposed drill site.

**Drill site 030:** No archaeological or palaeontological remains were found during an inspection of the proposed drill site.

**Drill site 031:** No archaeological or palaeontological remains were found during an inspection of the proposed drill site.

**Drill site 032:** No archaeological or palaeontological remains were found during an inspection of the proposed drill site.

**Drill site 033:** No archaeological or palaeontological remains were found during an inspection of the proposed drill site.

**Drill site 034:** No archaeological or palaeontological remains were found during an inspection of the proposed drill site.

One silcrete Middle Stone Age flake was encountered while searching for Drill site 021 (refer to Figure 25).

## 5. Discussion

It is well-known that the Saldanha Bay area, which includes Langebaan, Hopefield and Langebaanweg (Langeberg Farm 168 is the site of the West Coast Fossil Park) is a region of very high archaeological and palaeontological importance, particularly with regard to Pleistocene fossil fauna (bone) and associated archaeology. Elandsfontyn Farm 349, for example, has produced Middle (MSA) and Early Stone Age (ESA) tools with associated fauna more than 200 000 years old (Goodwin 1953; Klein 1988; Braun & Archer 2010), while the 'Saldanha Man' skull from the fossil site (nearly 3 kms east of the proposed mining area), is the oldest known human in the Cape, with a date between 700 000 and 400 000 years ago (Drennan 1953, 1954; Singer & Wymer 1968). Archaeological and palaeontological research started at Elandsfontein more than 60 years ago, and has seen the production of more than 20 scientific reports dedicated to the site. Internationally, it is one of the most recognised Pleistocene archaeological sites in South Africa.

In 2010 the Archaeology Contracts Office at the University of Cape Town was commissioned to undertake a Heritage Scoping Study for the proposed prospecting of phosphate on Farm 349 (Kyla & Hart 2010). Not surprisingly, the report stressed the importance of the farm in terms of its Pleistocene and Pliocene palaeontology, and Pleistocene archaeology. The report notes that the deposits that underlie Farm 349, collectively known as the Varswater Formation (and the target of the phosphate rich sediments), are known to be highly fossiliferous.

As Kyla and Hart (2010:10) indicate, however, it is not clear how extensive the Pleistocene fossil deposits are in the area, although Orton (2007) did identify potentially fossil rich sands on Farm 349/6, about 4 kms north of the study area. Dr David Braun, who currently holds the research permit for Elandsfontyn fossil site, has noted that the area is 'one of the richest sites of its kind in Africa' (Kyla & Hart 2010:10).

Given the known heritage significance of the region and the fact that similar fossil bearing deposits underlie the farm, Kyla and Hart (2010:12) conclude that impacts associated with the prospecting phase of the operation, will be 'moderate to low'. Monitoring of prospecting operations and examination of the borehole material is also recommended.

As recently as July 2013, an archaeological survey of Farm 349/4 was undertaken by J. Plasket (2013), who logged a handful of Middle Stone Age flakes, fossil bone and coprolites. The study, however, was constrained by extremely dense vegetation cover, resulting in very poor visibility. A track path was not logged and it is therefore unclear how much of the study site was covered during the survey.

While little is known about the Holocene Later Stone Age (LSA) archaeology in the area, Kaplan (2011) did document a relatively large number of silcrete stone flakes on a limestone ridge (outside the application area) on Farm 349, alongside the Eskom servitude that runs between the Elandsfontyn fossil site, and the proposed prospecting area. Orton (2007) also identified a single LSA flake on Farm 349/6.

## 6. Recommendations

Given the known palaeontological and archaeological importance of the area, it is assumed, that proposed future mining on Farm 349/4 will penetrate or intersect potentially fossiliferous sediments in underlying deposits of the Langebaan and Varswater Formations.

However, it is concluded that, considering the very small footprint area that is envisaged during borehole drilling operations, proposed prospecting on Portion 4 and 2 of Farm 349 is not likely to impact on any significant subsurface in-situ fossil and archaeological heritage, and that prospecting should be allowed to proceed, subject to the following conditions:

1. An archaeologist must be on site during prospecting/drilling operations and all deposits must be sieved for archaeological and palaeontological remains such as stone, ostrich eggshell and fossil bone.

These conditions (11-13) are also contained in the Department of Mineral Energy approval of the Environmental Management Plan for proposed prospecting on Portions 2 and 4 of the Farm Elandsfontyn 349 (refer to Appendix II).

It is recommended that the archaeologist Ms J. Plasket (who is currently employed to curate the heritage remains from the Elandsfontyn fossil site), be appointed to undertake this task, under the supervision of Dr David Braun of the University of Cape Town who holds the excavation permit for the fossil site

2. An archaeological and palaeontological monitoring and recovery plan must be submitted to Heritage Western Cape prior to any drilling/prospecting taking place on the farm.
3. An archaeological and palaeontological monitoring report must be submitted to Heritage Western Cape within 30 days of completion of the prospecting/drilling programme.

4. A Heritage Impact Assessment (HIA) must be undertaken in the proposed mining application area. This includes the proposed mine infrastructure area.

It is noted that a HIA was recommended by ACO in their 2010 Heritage Scoping Study for proposed prospecting on the Farm 349. A HIA has also been requested by the Provincial Heritage Authority, Heritage Western Cape.

5. The HIA should take place after prospecting when a final decision on future mining is made. The HIA must form part of the Environmental Impact Assessment (EIA) process that will be carried out in the proposed mining and infrastructure area.
6. A Heritage Management Plan must also form part of the required Environmental Management Plan (EMP) for proposed any future proposed mining operations on the property. The Heritage Management Plan must also be approved by Heritage Western Cape.
7. Any future planned drilling/prospecting sites on the affected property must be inspected for archaeological and palaeontological material.



## 7. References

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## Appendix I

Track path and location sites of proposed drilling sites

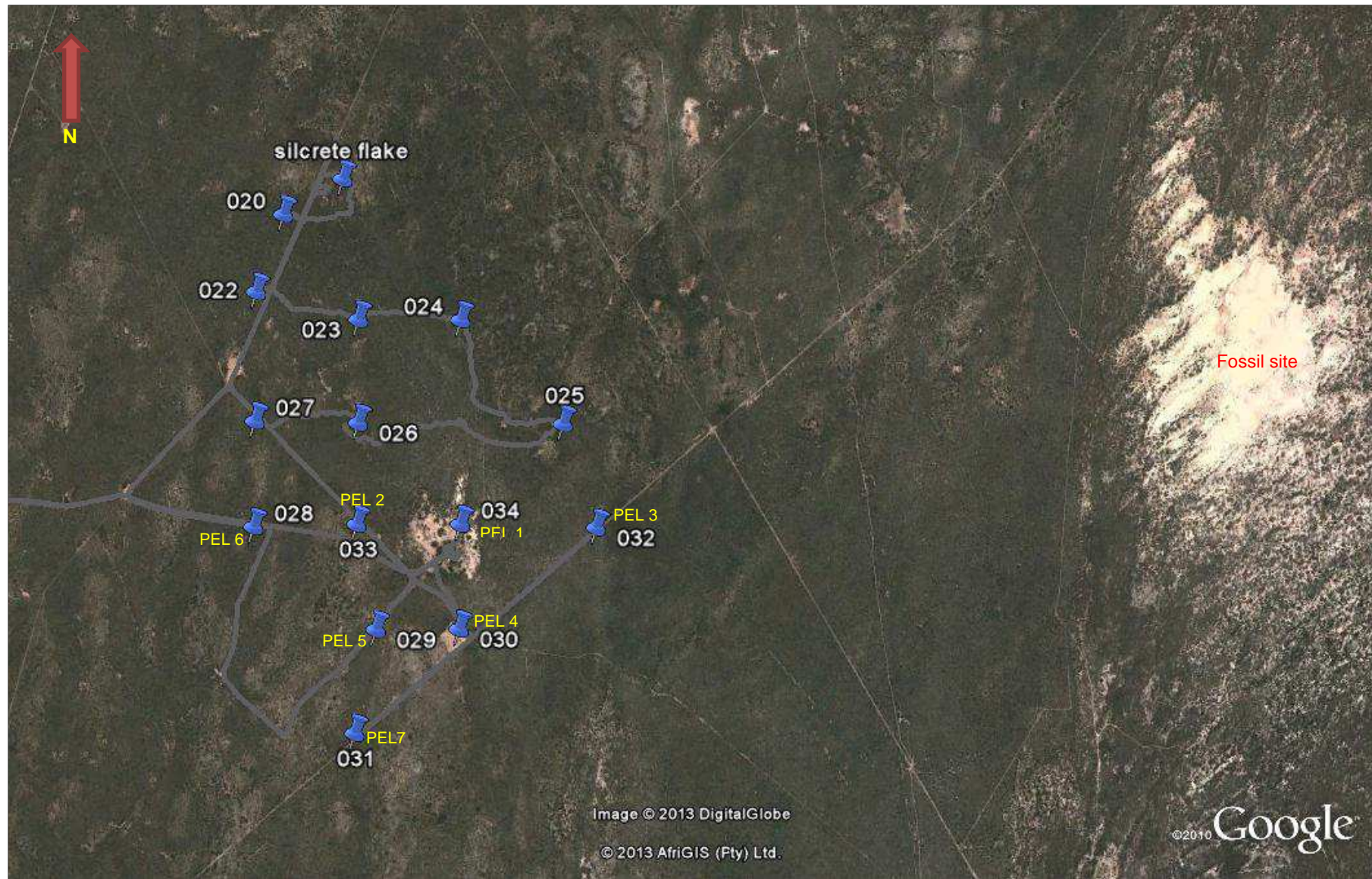


Figure 26. Track path and location of proposed drill sites



Appendix II

Letter from Department of Mineral Energy