

HERITAGE SCOPING ASSESSMENT

THE PROPOSED WESKUSFLEUR SUBSTATION

Prepared for:

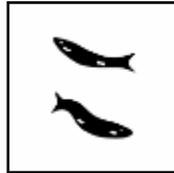
LIDWALA CONSULTING ENGINEERS

Att: Mr Marinus Boon
P.O. Box 32497
Waverley
Pretoria
0135

On behalf of:

ESKOM HOLDINGS SOC LIMITED

By



Jonathan Kaplan

Agency for Cultural Resource Management

5 Stuart Road
Rondebosch
7700

Ph/Fax: 021 685 7589

Mobile: 082 321 0172

E-mail: acrm@wcaccess.co.za

JUNE
2013

Executive summary

ACRM was commissioned to conduct a heritage scoping assessment for the proposed construction of the new Weskusfleur substation at the Koeberg Nuclear Power Station north of Cape Town on the Atlantic coast.

For the purpose of scoping, six site alternatives are being considered, including the 'No-Go' option.

Site alternatives 1-3 are located within the footprint area of the Koeberg Nuclear Power Station (KNPS) on the Farm Duynfontein. Site alternative 4, on the Farm Brakkefontein No. 32/1 is located east of the R27/West Coast Road, while site alternative 5 is located alongside the Eskom Sterrekus Substation on the Farm Groot Oliphantskop, east of the R303 (Atlantis-Mamre road).

The aim of scoping is to assess each of the proposed site alternatives for the presence of any tangible archaeological and cultural heritage remains.

A desk top study was also undertaken.

Archival research has established that Cape Farm No. 34 Duynfontein (1731) is not a farm that played any significant role in the colonial history of the Cape, while the farm Groot Oliphantskop (site alternative 5) was first granted in 1773, but may have been used as a grazing farm prior to this. Brakke Fontein No. 32/1 was first granted in 1855, but it is likely that the area, which included a number of other farms, was already inhabited and cultivated during Dutch reign in the Cape sometime between 1652 and 1759.

The archaeological and palaeontological heritage significance at Duinefontein has been highlighted in several studies that have been undertaken at KNPS, as part of the EIA process.

Five-six million year old fossil-bearing deposits were first intersected during geotechnical excavations for the nuclear power station in the 1970s. Palaeontological research undertaken since then has shown that Duinefontein is a 'highly sensitive site'.

Archaeological excavations at Duinefontein 2, in the dune fields north of the nuclear reactor established the name as a 'place of world class scientific discovery'. The site was first discovered in 1973 when fragments of fossil bone were uncovered during geotechnical excavations for the KNPS and has been excavated annually between 1998 and 2003. Duinefontein 2 produced a wealth of Pleistocene fauna (about 300 000 years old) and Middle Stone Age implements, on ancient buried land surfaces.

Later Stone Age shell middens have also been encountered in the shifting dunes in the nature reserve, although these are mostly ephemeral scatters of low archaeological significance.

The desktop study has shown that most of the significant archaeological and palaeontological heritage at Duinefontein lies buried below the recent windblown sands. This is particularly relevant to site alternatives 1 and 2, on the coast. Exposure of heritage resources may result in extensive and lengthy mitigation, possibly delaying the

construction of the proposed substation. These are potential risks that would need to be taken into account when deciding on the preferred site alternative.

At the same time construction of the new Weskusfleur substation will also provide a unique and rare opportunity to sample, record (their context), collect and rescue material, where deep excavations penetrate or intersect these fossil-bearing deposits.

Heritage scoping of the proposed site alternatives took place on 21st February, 13th April and 14th June, 2013.

The following observations were made:

- No pre-colonial archaeological heritage was encountered during scoping.
- There are no visible graves in the proposed site alternatives.
- There are no old buildings, structures or features, old equipment, public memorials or monuments in the footprint area of each of the proposed site alternatives.
- The cultural landscape is not a significant heritage indicator. Existing nuclear/industrial development at KNPS and Groot Oliphantskop have already compromised the rural agricultural landscape character of the receiving environment. Brakkefontein No. 32/1 does, however retain a rural agricultural 'sense of place'.

With regard to the proposed construction of the Eskom Weskusfleur substation, the following recommendations are made:

1. Each of the proposed alternatives is suitable for development, but Alternatives 1 and 2 are potentially the most significant from a heritage perspective.
2. A Notification of Intent to Develop (NID) must be submitted to Heritage Western Cape (HWC) for comment.
3. A Heritage Impact Assessment (HIA) of the preferred site alternative must be undertaken.
4. A Palaeontological Impact Assessment (Desk top study and fossil find procedure) must also be done.

Table of Contents

	Page
Executive summary	1
1. INTRODUCTION	4
2. HERITAGE LEGISLATION	5
3. TERMS OF REFERENCE	6
4. DESCRIPTION OF THE RECEIVING ENVIRONMENT	6
4.1 Alternative 1	6
4.2 Alternative 2	8
4.3 Alternative 3	9
4.4 Alternative 4	10
4.5 Alternative 5	10
5. ASSUMPTIONS AND POTENTIAL RISKS	11
6. HERITAGE CONTEXT	12
6.1 Cultural heritage	12
6.2 Fossil heritage	12
6.3 Archaeological heritage	13
6.3.1 Burials	13
7. RESULTS OF SCOPING	14
7.1 Alternative 1	14
7.2 Alternative 2	14
7.3 Alternative 3	14
7.4 Alternative 4	14
7.5 Alternative 5	14
8. CONCLUSIONS	15
9. RECOMMENDATIONS	15
10. REFERENCES	16

1. INTRODUCTION

ACRM was requested by Lidwala Consulting Engineers, on behalf of Eskom Holdings SOC Ltd, to conduct a heritage scoping assessment for the proposed construction of the Weskusfleur substation.

The location site for the proposed new substation is the Koeberg Nuclear Power Station (KNPS) situated about 30kms north of Cape Town on the Atlantic coast (Figure 1).

The required, maximum footprint area for the proposed substation is about 760m x 550m.

The length of the required overhead diversion lines could be about 2km, depending on the preferred site alternative.

For the purpose of scoping, six site alternatives are being considered, including the 'No-Go' option (Figure 2).

Site alternatives 1-3 are located within the footprint area of the KNPS on the property known as Cape Farm No. 34 Dуйnefontein. Site alternative 4, on the Farm Brakkefontein No. 32/1 is located east of the R27/West Coast Road, while site alternative 5 is located alongside the Eskom Sterrekus Substation on the Farm Groot Oliphantskop, directly east of the R303 (Atlantis-Mamre road).

The aim of scoping is to assess each of the proposed site alternatives for any tangible archaeological and cultural heritage remains.

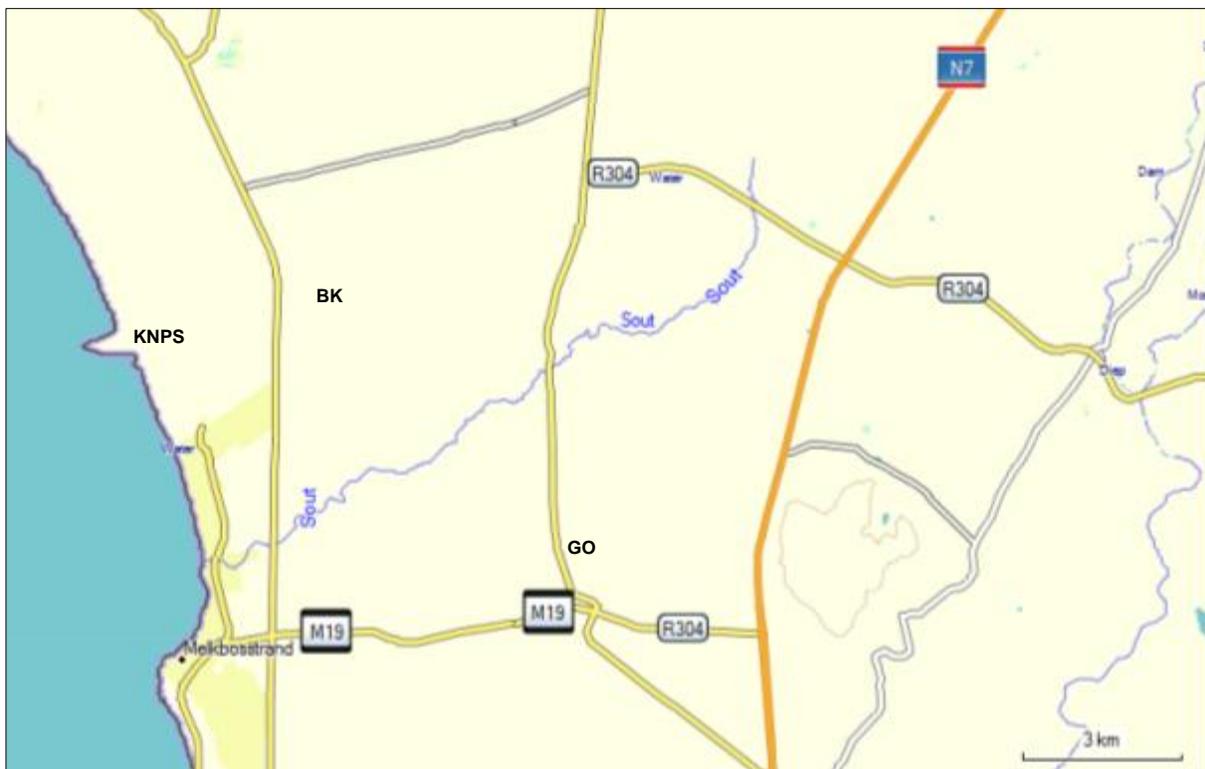


Figure 1. Locality map. KNPS is the Koeberg Nuclear Power Station. GO is Groot Oliphantskop & BK is Brakke Fontein.

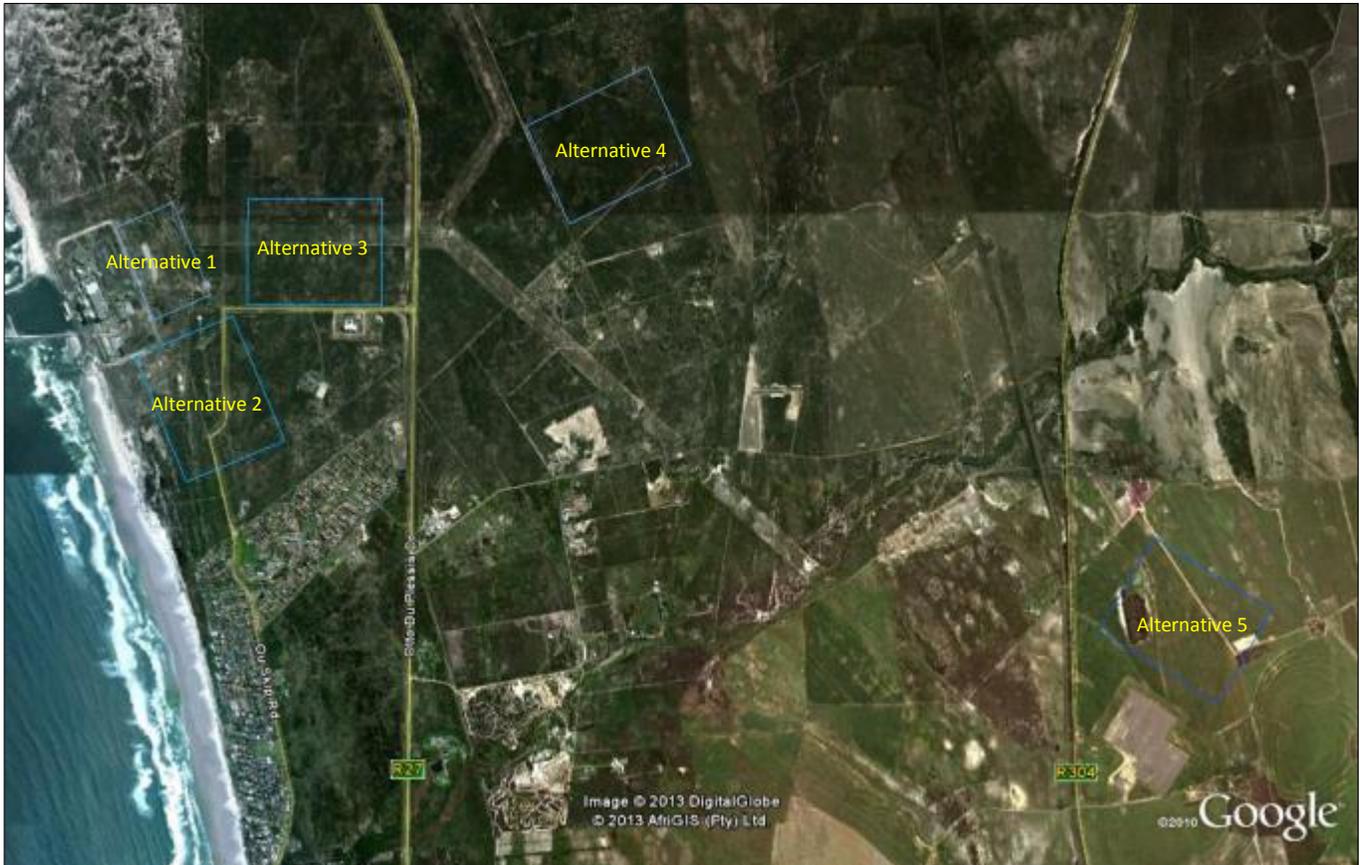


Figure 2. Google aerial photograph indicating the alternative location sites for the proposed Weskusfleur substation.

2. HERITAGE LEGISLATION

The National Heritage Resources Act (Act No. 25 of 1999) makes provision for a compulsory Heritage Impact Assessment (HIA) when an area exceeding 5000 m² is being developed. This is to determine if the area contains heritage sites and to take the necessary steps to ensure that they are not damaged or destroyed during development.

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

- Landscapes, cultural or natural (Section 3 (3))
- Buildings or structures older than 60 years (Section 34);
- Archaeological sites, palaeontological material and meteorites (Section 35);
- Burial grounds and graves (Section 36);
- Public monuments and memorials (Section 37);
- Living heritage (defined in the Act as including cultural tradition, oral history, performance, ritual, popular memory, skills and techniques, indigenous knowledge systems and the holistic approach to nature, society and social relationships) (Section 2 (d) (xxi)).

In addition, Section 38 (1) (a) of the Act specifically indicates that any person constructing a powerline, pipeline or road, or similar linear development or barrier exceeding 300m in length is required to notify the responsible heritage resources authority, who will in turn advise whether an impact assessment report is needed before development can take place.

3. TERMS OF REFERENCE

The terms of reference for the heritage scoping assessment were to:

- Determine whether there are likely to be any important heritage remains that may be impacted by the proposed development;
- Recommend further mitigation action.

4. DESCRIPTION OF THE RECEIVING ENVIRONMENT

Six site alternatives, including the `No-Go` option have been identified for the proposed Weskusfleur substation (refer to Figure 2).

4.1 Alternative 1 (Figure 3)

Two `linked` sites have been identified. Alternative 1 (132 kV yard) is located in the parking area alongside the Koeberg reactor unit (Figure 4). Alternative 1 (400 kV yard) is a levelled piece of land located in the Eskom servitude immediately north of the perimeter fence surrounding the reactor units and generator buildings (Figure 5).



Figure 3. Google Earth map illustrating the location of site Alternative 1.



Figure 4. Alternative 1 (132 Kv yard). View of the site facing south. Blouberg Hill and Table Mountain can be seen in the distance



Figure 5. Alternative 1 (400 Kv yard) with the reactor units in the background. View facing south. Blouberg Hill and Table Mountain can be seen in the distance

4.2 Alternative 2 (Figure 6)

Alternative 2 is located south of the existing Koeberg reactor unit and is the site of the (then) proposed Pebble Bed Modular Reactor PBMR (Figure 7). The site was used as a laydown or construction area when the power station was built and is severely degraded.

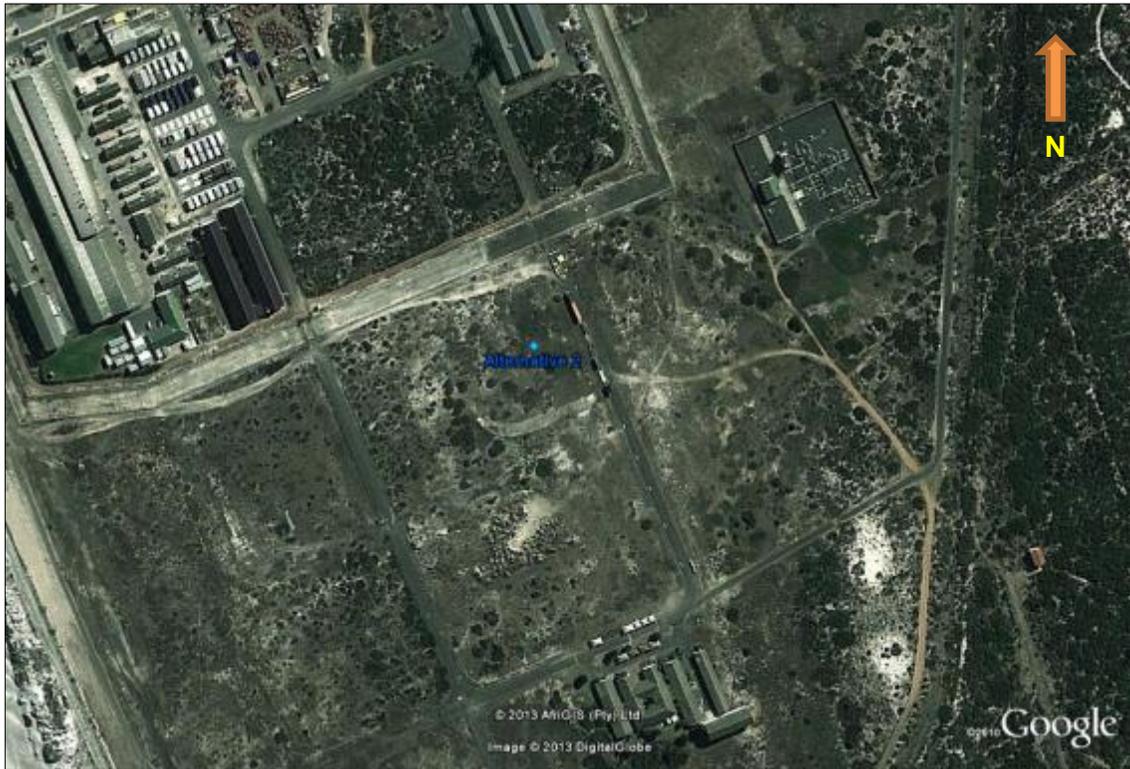


Figure 6. Google Earth map illustrating the location of site Alternative 2.



Figure 7. Alternative 2. View of the proposed site facing west.

4.3 Alternative 3 (Figure 8)

Alternative 3 includes a portion of the site that was identified for a proposed Eskom training facility. The site comprises a series of barrier dunes and smaller hummock dunes which are densely vegetated and overlain by wind-blown sands (Figure 9).



Figure 8. Google Earth map illustrating the location of site Alternative 3.



Figure 9. Alternative 3. View of the proposed site facing north.

4.4. Alternative 4 (Figure 10)

The proposed site is located about 1km east of the R27/West Coast Road within a large footprint area that is infested with invasive Port Jackson vegetation and underlain by deep windblown sands (Figure 11).

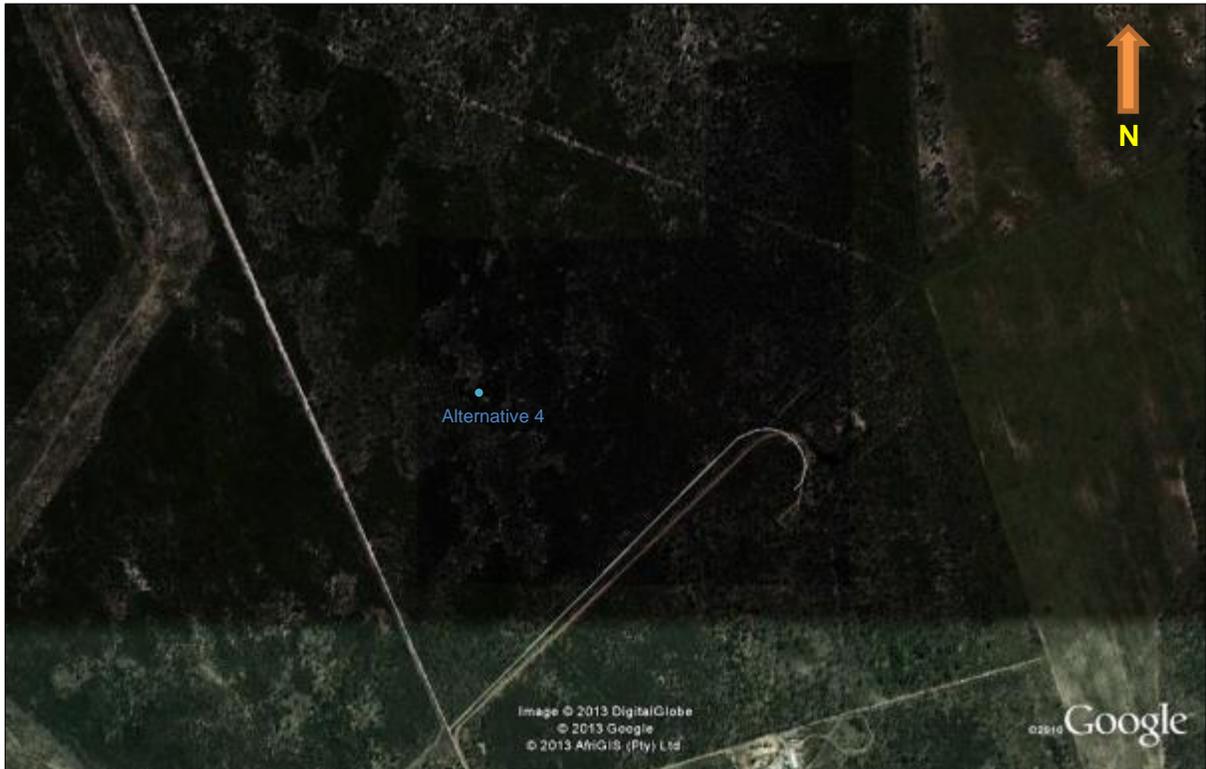


Figure 10. Google Earth map illustrating the location of site Alternative 4.



Figure 11. Alternative 4. View facing north west. Note the very dense vegetation cover.

4.5 Alternative 5 (Figure 12)

The proposed site is located east of the R303 (Atlantis-Mamre road), just north of the Eskom Sterrekus substation on the Farm Groot Oliphantskop. The receiving environment comprises old agricultural lands that are covered in Kweek grass and weeds.

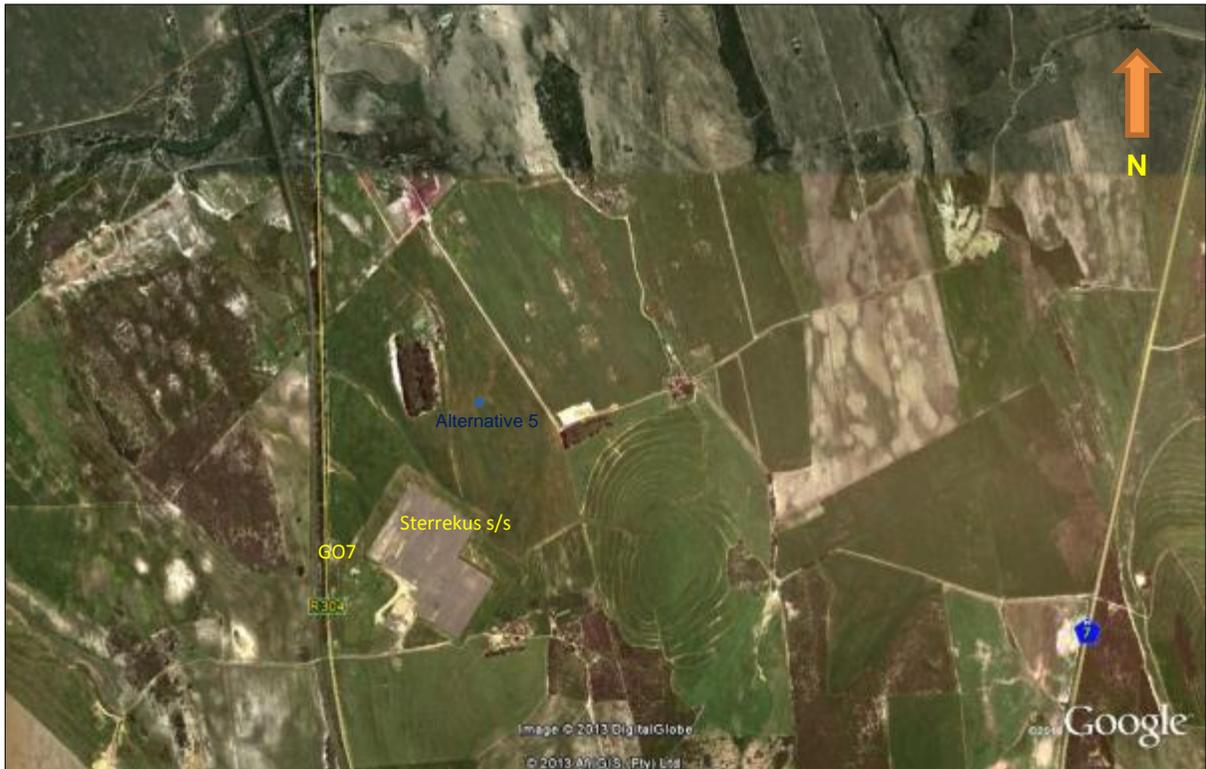


Figure 12. Google Earth map illustrating the location of site Alternative 5.

5. ASSUMPTIONS AND POTENTIAL RISKS

Given the known state of information on the archaeological and palaeontological heritage at Duinefontein/KNPS/site Alternatives 1 and 2, (Deacon 1975; Kaplan 1993; Klein 1975; Klein *et al* 1999; Hart 2008, 2010; Pether 2007), it is assumed that significant heritage resources will be impacted by the construction of the proposed Weskusfleur substation.

Unmarked pre-colonial human burials may also be uncovered or intersected during bulk earthworks and excavations. Any Pleistocene human skeletal material would be of international significance, which is possible in this geological context (Hart 2008).

Impacts on significant colonial period heritage resources are unlikely to occur (Hart 2010; Geldenhuys 2012).

6. HERITAGE CONTEXT

6.1 Cultural heritage

According to Hart (2010), Hermanus Dempers (1799) was the first owner of Duynfontein, but it is unclear who the first grantee was. Tenants were apparently awarded certain land rights in 1731, and paid rent to the Cape Government at the time. When the property was surveyed in 1834, there is no indication of houses or any built structures. The site of Dempers house is not known as is that of any of his tenants. According to Hart (2010), it is possible that ephemeral evidence of its presence may lie under the dune sands somewhere on the property. Hart (2010) notes that Duynfontein is not a farm that played any significant role in the Colonial history of the Cape.

Groot Oliphantskop (site Alternative 5) was first granted in 1773, but may have been used as a grazing farm prior to this (Orton & Hart 2004). The homestead, including outbuildings is dated to the late 18th or early 19th Century (Kaplan 2006), but the surrounding rural cultural landscape has been compromised by construction of the Eskom Sterrekus substation.

Brakke Fontein No. 32/1 (Alternative 4) was first granted in 1855, but it is likely that the area, which included a number of other farms, was already inhabited during Dutch reign in the Cape sometime between 1652 and 1759. According to Geldenhuys (2012), it appears that the farm was used as, a cattle grazing farm when it was first granted. Geldenhuys (2012) notes that the whole area was called Slagtersvled during that time as Governors from the Dutch East India Company (VOC) used to send out hunters on their behalf to hunt behind the 'Blaauwe Berg'.

6.2 Fossil heritage

Fossiliferous deposits dating to the Miocene period (about 5-6 million years ago) were first encountered during geo-technical excavations at the KNPS in the 1970s, and in the years since then, Duynfontein has been firmly established 'as a highly sensitive' (palaeontological) site (Hart 2010).

Fossiliferous marine gravels, known as the 'Duynfontein Member' of the Varswater Formation contain a diversity of fossils including teeth, bones and scales of sharks, rays and bony fish, fossil whale bone, dolphin and seal teeth, marine birds, terrestrial mammals, and reptiles. Plant pollens in thin peaty sands cap the Varswater Formation. These peaty sands (remnants of coastal vleis) are in turn overlain by a gravelly sand unit (the 'Gastropod Bed') containing gastropod casts and shark teeth. The 'Springfontyn Formation', a mix of fine and coarse sand varying in colour upwards, contains some terrestrial fossils of middle Pleistocene (about 300-400 000 years old) age. Calcareous sands and limestone (known as the Langebaan Formation) cap the 'Springfontyn Formation' and it is in these deposits that the Pleistocene fauna and associated Middle Stone Age¹ artefacts occur. Windblown sands of the Witsand Formation finally seal these deposits on the surface (Hart 2010).

¹ A term referring to the period between 20 000 and 250 000 years ago

6.3 Archaeological heritage

Melkbosstrand, south of the KNPS, is known for its rich archaeological heritage (Kaplan 1993; Rudner 1968). More than 40 Archaeological Impact Assessments (or AIAs) have been undertaken in the surrounding area as part of the EIA process. Sites ranging from Later Stone Age² (LSA) coastal shell middens, deflated sites with pottery, stone implements and ostrich eggshell, and ancient Early (ESA³) and Middle Stone Age tools have all been documented in the coastal zone, and further inland in an agricultural context. At Duinefontein, scatters of LSA tools, shellfish, bone, hearth features and cultural remains have been encountered in the dunes in the nature reserve (Klein 1975; Hart 2010), but that these types of sites are quite sparse and ephemeral.

But it is undoubtedly the archaeological excavations at Duinefontein 2, north of the KNPS that established the name as a 'place of world class scientific discovery' (Hart 2010:27). The site was first discovered in 1973 when fragments of fossil bone were uncovered during geotechnical excavations for the power station and has been excavated annually between 1998 and 2003. Duinefontein 2 produced a wealth of Pleistocene fauna (about 300 000 years old), and associated MSA implements on old buried land surfaces (Cruz-Urbe et al 2003; Klein et al 1999).

Hart (2010 and 2013 pers. comm.) argues that Duinefontein 2 was not a fortuitous discovery, and that similar deposits lie buried beneath the windblown sands of the Witsand Formation, in what he calls the Nuclear - 1 Corridor both north and south of the reactor, in which site alternatives 1 and 2 are proposed.

6.3.1 Burials

While no unmarked or buried pre-colonial human remains have been uncovered at Duinefontein/KNPS, Melkbosstrand has produced an extremely high density of burials (Morris 1992). To date more than 55 Khoisan human remains have been recovered from the coastal dunes between Milnerton and Melkbosstrand (Kaplan 2013; Orton 2010). Two burials associated with stone tools and ostrich eggshell beads were also excavated from a large sand dune on the farm Groot Oliphantskop (Kaplan 1996). Most of the unmarked human remains were routinely uncovered during excavations for water pipelines, substations, building foundations, roads and other bulk services.

² A term referring to the last 20 000 years of pre-colonial history in southern Africa

³ A term referring to period between 250 000 and 2 million years ago

7. RESULTS OF SCOPING

7.1 Alternative 1

Apart from a few small pieces of shale, broken pebbles, and isolated fragments of limpet shell, no archaeological heritage were encountered during scoping of Alternative 1. There are no old buildings, or structures of historical significance on the proposed development site.

7.2 Alternative 2

No archaeological heritage was encountered during scoping of Alternative 2. Hart (2008) did not locate any archaeological remains during an assessment of the proposed PBMR on the same site. This was supported by observations of trial excavations made by Dr G. Avery of Iziko: South African Museum. There are no old buildings, or structures of historical significance on the proposed site, which was previously used as a laydown area during construction of the KNPS.

7.3 Alternative 3

No archaeological heritage was encountered during scoping of Alternative 3. Twenty-eight test pits excavated on the site of the training facility revealed only one fossil bone (Halkett 2006). There are no old buildings, or structures of historical significance on the proposed development site.

7.4 Alternative 4

No archaeological heritage was encountered during scoping of Alternative 4, although ESA implements have been documented on a few surrounding farms (Hart *et al* 2010; Kaplan 2000, 2006, 2012a), including Brakkefontein No. 32/1 (Kaplan 2012b). The proposed footprint area is infested with Port Jackson, resulting in very low archaeological visibility. Current activity on the property includes cattle grazing and harvesting of wood. The original Brakke Fontein farmyard was located to the north of the Brakkefontein road, but was dismantled and rebuilt just south of the same road when the water spring dried up (Geldenhuys 2012:13).

The proposed 400kV powerline running over Farms 1063/1, 1063/2, 1063/3, 1063/23 and 1063/4, immediately south of Brakkefontein No. 32/1, will not impact on any buildings of historical or cultural significance. This was confirmed during a site visit undertaken by the heritage practitioner on 13 July, 2013.

7.5 Alternative 5

Heritage sites were first encountered on the historic farm Groot Oliphantskop during a study for the proposed Eskom Omega substation (Kaplan 1996), including a very small scatter of stone implements (GO7) of low archaeological significance in a bushy and sandy area alongside the R303 (Orton & Hart 2004, & refer to Figure 12). The rural agricultural cultural landscape has been highly compromised by the existing Sterrekus (Omega) substation which is located alongside the proposed alternative. The visual quality of the proposed site has also been negatively impacted by construction of the large substation.

8. CONCLUSION

Heritage scoping has indicated that the proposed construction of the Weskusfleur substation will not impact on any significant surface archaeological heritage, in site Alternatives 1-5.

The desk top study has shown, however, that most of the significant archaeological and palaeontological heritage is deeply buried and will only be exposed during the construction phase of the project. This applies particularly to Alternatives 1 and 2.

Some archaeological heritage (mainly ESA artefacts) might be exposed or uncovered in Alternatives 3, 4 and 5, but these are expected to be thinly and unevenly distributed over the proposed development sites and will be of little scientific value.

Unmarked human burials may be exposed or uncovered during bulk earthworks and excavations.

Exposure of heritage resources (in Alternatives 1 & 2) may result in extensive and lengthy mitigation, possibly delaying construction of the proposed substation by several years. These are potential risks that will need to be taken into account when deciding on the preferred site alternative.

Construction of the new Weskusfleur substation will however, also provide a unique and rare opportunity to sample, record (their context), collect and rescue material, where deep excavations penetrate or intersect these archaeological and fossil-bearing deposits

No old buildings, structures or features of historical significance were encountered during scoping, and impacts on significant colonial period heritage resources are unlikely to occur.

The cultural landscape is not a significant heritage indicator. The existing nuclear/industrial complex at KNPS and Groot Oliphantskop has already compromised the rural agricultural landscape character of the receiving environment. Brakkefontein No. 32/1 does, however, still retain a rural agricultural 'sense of place'.

9. RECOMMENDATIONS

With regard to the proposed construction of the Weskusfleur substation, the following recommendations are made:

1. Each of the proposed alternatives is suitable for development, but Alternatives 1 and 2 are potentially the most significant from a heritage perspective.
2. A Notification of Intent to Develop (NID) must be submitted to Heritage Western Cape (HWC) for comment.
3. A Heritage Impact Assessment (HIA) of the preferred site alternative must be undertaken.
4. A Palaeontological Impact Assessment (Desk top study and fossil find procedure) must also be done.

10. REFERENCES

Cruz-Uribe K., Klein, R.G., Avery, G., Avery, M, Halkett, D., Hart, T., Milo, R. G., Sampson, C. G., & Volman, T. P. 2003. Excavations of buried Late Acheleun (Mid-Quaternary) Land Surfaces at Duynfontein 2, Western Cape Province, South Africa. *Journal of Archaeological Science* 30:559-575.

Deacon, J. 1975. Report on stone artefacts from Duinefontein 2, Melkbosstrand. *South African Archaeological Bulletin* 31:21-25.

Geldenhuis, M. 2012. Heritage Impact Assessment for the proposed development of the Brakkefontein Solar Photovoltaic Power Energy Generation Facility on Portion 1 of the Farm Brakkefontein No. 32, Cape Registration Division, Western Cape. Report prepared for Withers Environmental Consultants. *Heritage Matters*, Waterfront, Cape Town.

Halkett, D. 2006. Report on the excavations of test pits at the proposed site of a training facility at the Koeberg Nuclear Power Station. Report prepared for Eskom Holdings. Archaeology Contracts Office, Department of Archaeology, University of Cape Town.

Hart, T. 2010. Environmental Impact Assessment for the proposed Nuclear Power Station ('Nuclear 1') and associated infrastructure. Heritage Impact Assessment. Report prepared for Arcus GIBB (Pty) Ltd. Archaeology Contracts Office, Department of Archaeology, University of Cape Town.

Hart, T. 2008. Heritage Impact Assessment, A Proposed Pebble bed Modular Reactor, Farm Duynfontein 34 (Koeberg) Western Cape. Report prepared for Arcus Gibb (Pty) Ltd. Archaeology Contracts Office, Department of Archaeology University of Cape Town.

Hart, T., Webley, L., Clift, H, & Schietecatte, L. 2010. Koeberg Integration Project. Heritage Impact Assessment of the proposed Acacia 2 x 400 kV loop in lines to the Omega substation, and Koeberg 2 HV Yard Western Cape. Report prepared for Savannah Environmental (Pty) Ltd. Archaeology Contracts Office, Department of Archaeology, University of Cape Town.

Kaplan, J. 2012a. Archaeological Impact Assessment the proposed Donkergat Rivier on Farm 1491 near Atlantis. Report prepared for Withers Environmental Consultants. ACRM Cape Town.

Kaplan, J. 2012b. Archaeological Impact Assessment, the proposed Brakkefontein Solar Park on Farm 32/1 near Atlantis. Report prepared for Withers Environmental Consultants. ACRM Cape Town

Kaplan, J. 2006. Archaeological and cultural impact assessment: Omega substation. Report prepared for Ninham Shand Consulting Engineers. ACRM Riebeek West

Kaplan, J. 2000. Archaeological and historical study: Sout River Catchment Management Plan. Report prepared for SRK Consulting Engineers and Scientists. ACRM Riebeek West.

Kaplan, J. 1993. The state of archaeological information in the coastal zone from the Orange River to Ponta do Ouro. Report prepared for the Departments of Environmental Affairs and Tourism. ACRM Riebeeck West.

Klein, R. G., Avery, G., Cruz-Uribe, K., Halkett, D., Hart, T., Milo, R. G. & Volman, T. P. 1999. Duynfontein 2: An Acheulean site in the Western Cape Province of South Africa. *Journal of Human Evolution* 37 (2): 153-190.

Klein, R. G. 1975. A preliminary report on the 'Middle Stone Age' open-air site of Duinefontein 2 (Melkbosstrand, South-Western Cape Province, South Africa). *South African Archaeological Bulletin* 31:12-20

Morris, A. G. 1992. A master catalogue: Holocene human skeletons from South Africa. Johannesburg: Witwatersrand University Press.

Orton, J. 2010. Heritage Impact Assessment for the proposed expansion of the N7 between the Melkbos and Atlantis junctions, Malmesbury Magisterial District, Western Cape. Report prepared for CCA Environmental. Archaeology Contracts Office University of Cape Town.

Orton, J. & Hart, T. 2004. Heritage Scoping Study of the Farm Groot Oliphantskop (Farm 81) for the proposed Omega substation, Western Cape. Report prepared for Eyethu Engineers. Archaeology Contracts Office, Department of Archaeology, University of Cape Town

Pether, J. 2007. Palaeontological Impact Assessment of the proposed PBMR site, Koeberg. Specialist report prepared for the Archaeology Contracts Office, Department of Archaeology, University of Cape Town.

Rudner, J. 1968. Strandloper pottery from South and South West Africa. *Annals of the South Africa Museum* 49:441-663.