

PRECONSTRUCTION ARCHAEOLOGICAL SURVEY OF THE MAINSTREAM SUTHERLAND 2 WIND ENERGY FACILITY, NORTHERN CAPE

Required as a condition of authorisation.

Sutherland 2 WEF SAHRIS Case IDs: 9622, 10500, 14521
Sutherland Grid & MTS SAHRIS Case IDs: 10493, 14379, 16771, 17529, 17531

Report for:

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SUMMARY

ASHA Consulting (Pty) Ltd was appointed by Nala Environmental (Pty) Ltd to conduct pre-construction field surveys of the Sutherland 2 Wind Energy Facility (WEF) and its associated infrastructure. The survey was based on the buildable area for turbines and did not cover the entirety of Tonteldoosfontein Farm 152. The powerline was largely surveyed previously and only one short section was examined during the present survey.

Many new archaeological sites were found within the WEF site. While none of these will be directly impacted, some sites are quite close to the proposed infrastructure footprints and care will be required to avoid impacts.

It is recommended that the Sutherland WEF 2 should proceed to construction but subject to the following conditions:

- Wherever project infrastructure comes within 30 m of heritage resources the infrastructure should be micro-sited to get the distance between the resource and infrastructure as close to 30 m as possible. This applies to waypoints 1176, 1184, 1194-1199 inclusive, 1301 and 1309;
- Any heritage sites located within 30 m of the final layout should be physically flagged on site as no-go areas. This applies to the waypoints listed above unless infrastructure is moved beyond 30 m;
- The ECO must regularly (suggest at least weekly) monitor the flagged sites to ensure that the no-go areas are complied with;
- No stones are to be removed from any heritage site;
- All construction work must occur within the demarcated project footprints and vehicles may not move outside of these areas;
- A Permit application must be lodged with SAHRA for any mitigation required; and
- If any archaeological material or human burials are uncovered during the course of development then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist. Such heritage is the property of the state and may require excavation and curation in an approved institution.

Glossary

Early Stone Age: Period of the Stone Age extending approximately between 2 million and 200 000 years ago.

Handaxe: A bifacially flaked, pointed stone tool type typical of the Early Stone Age Acheulian Industry. It is also referred to as a large cutting tool.

Holocene: The geological period spanning the last approximately 10-12 000 years.

Hominid: a group consisting of all modern and extinct great apes (i.e. gorillas, chimpanzees, orangutans and humans) and their ancestors.

Later Stone Age: Period of the Stone Age extending over the last approximately 20 000 years.

Middle Stone Age: Period of the Stone Age extending approximately between 200 000 and 20 000 years ago.

Pleistocene: The geological period beginning approximately 2.5 million years ago and preceding the Holocene.

Abbreviations

APHP: Association of Professional Heritage Practitioners

ASAPA: Association of Southern African Professional Archaeologists

CRM: Cultural Resources Management

DFFE: Department of Forestry, Fisheries and the Environment

EGI: Electricity Grid Infrastructure

EMPr: Environmental Management Program

ESA: Early Stone Age

GP: General Protection

GPS: global positioning system

HIA: Heritage Impact Assessment

HWC: Heritage Western Cape

LSA: Later Stone Age

MSA: Middle Stone Age

NBKB: Ngwao-Boswa Ya Kapa Bokoni

NCW: Not Conservation Worthy

NEMA: National Environmental Management Act (No. 107 of 1998)

NHRA: National Heritage Resources Act (No. 25) of 1999

REDZ: Renewable Energy Development Zone

SAHRA: South African Heritage Resources Agency

SAHRIS: South African Heritage Resources Information System

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1. INTRODUCTION

ASHA Consulting (Pty) Ltd was appointed by Nala Environmental (Pty) Ltd to conduct a pre-construction field survey of the Sutherland 2 Wind Energy Facility (WEF) and associated infrastructure proposed some 25 km south-southeast of Sutherland in Northern Cape (Figures 1 to 3). The survey was to inform the final layout (Figure 4) and Environmental management Program (EMPr) for the project. There is also an associated grid connection but, because it has already been authorised and its EMPr approved, it is only briefly considered here for the sake of completeness. An approximate centre point for this WEF project is S32° 37' 17"; E20° 45' 22", while the eastern end of the grid connection would be S32° 38' 09.9"; E20 57' 46.4".

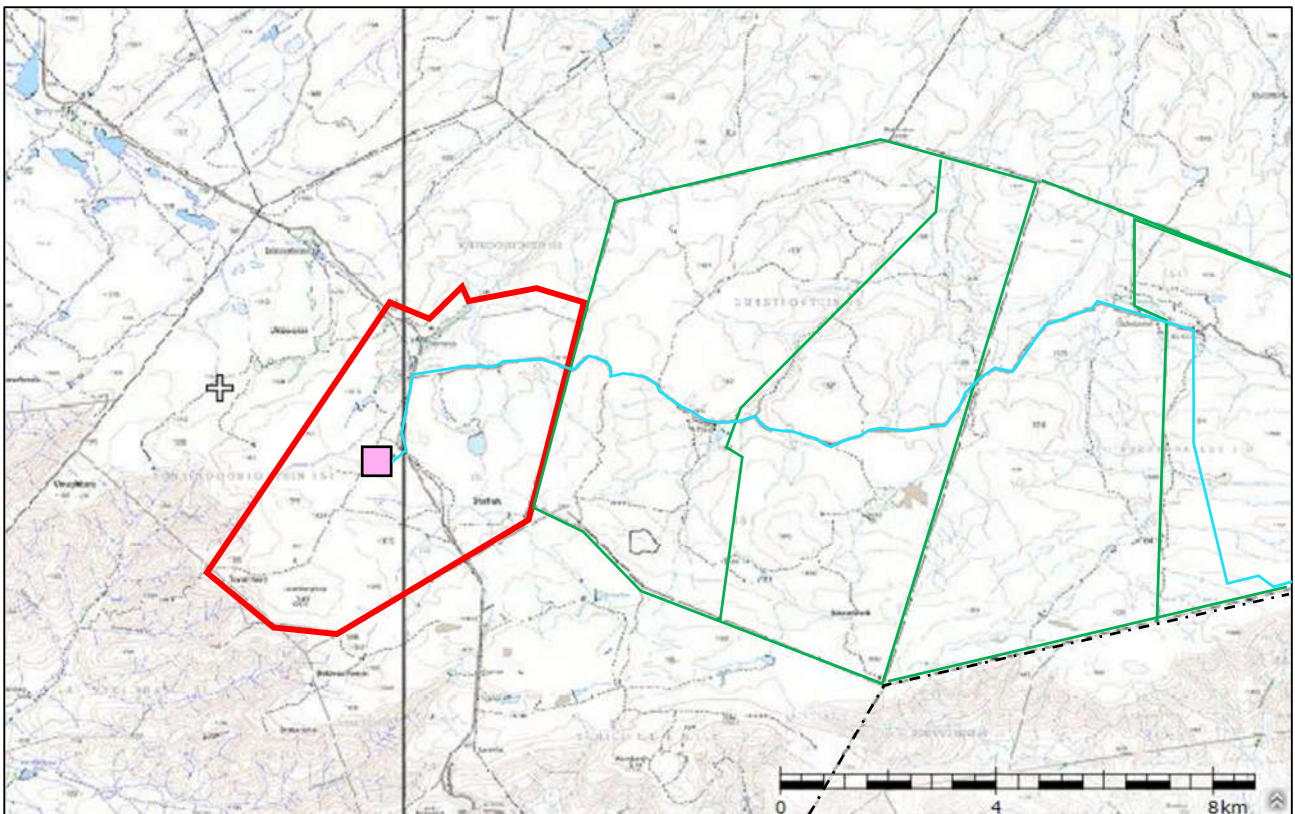


Figure 1: Extract from 1:50 000 topographic map 3220DA & 3220DB showing the location of the Sutherland 2 WEF project (red outlined farm portion) and the grid corridor (green outlined farm portions). Provincial boundary indicated by black dashed line. Source of basemap: Chief Directorate: National Geo-Spatial Information. Website: www.ngi.gov.za.

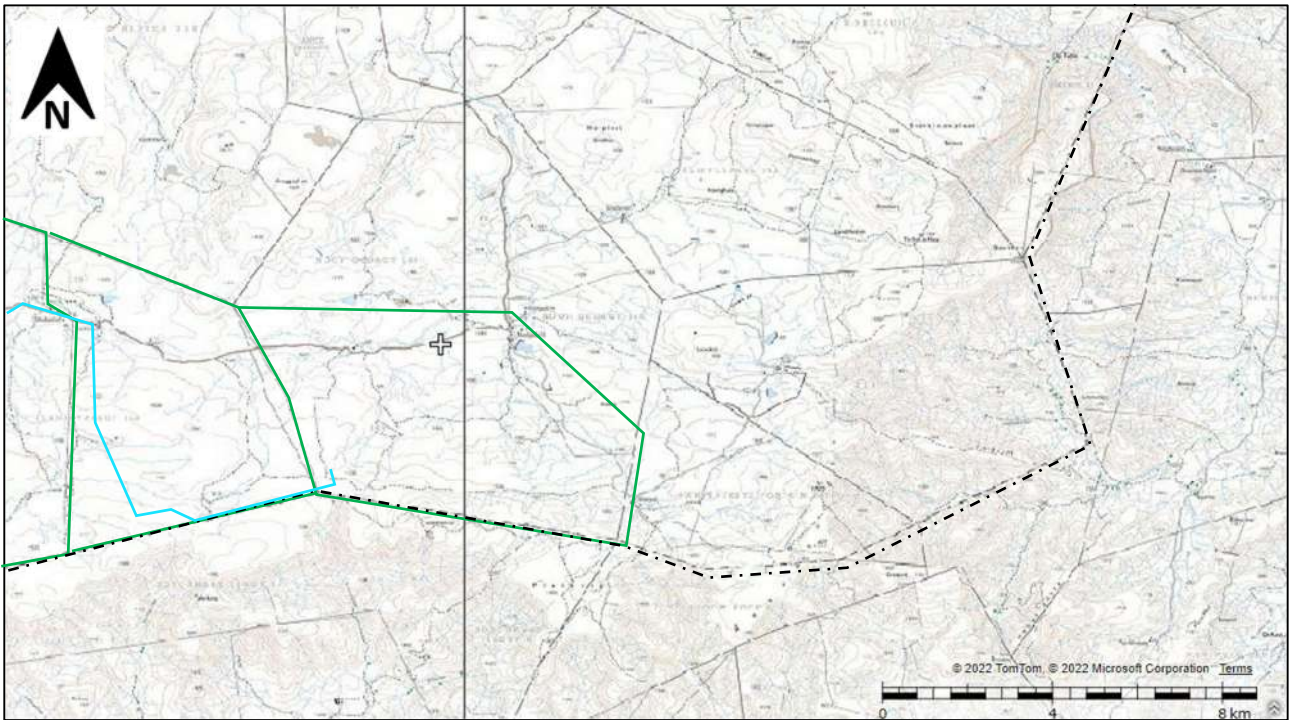


Figure 2: Extract from 1:50 000 topographic map 3220DB & 3221CA showing the central part of the grid corridor (green farm portions). Provincial boundary indicated by black dashed line. Source of basemap: Chief Directorate: National Geo-Spatial Information. Website: www.ngi.gov.za.



Figure 3: Aerial view of the study area showing the location of the project (red polygon = affected farm portion for the WEF, red shading = buildable area; pink square = Eskom substation, IPP substation, associated infrastructure and laydown area). The grid connection extends towards the east (turquoise line with farm portions outlined in orange). The black line is the provincial boundary with Western Cape.

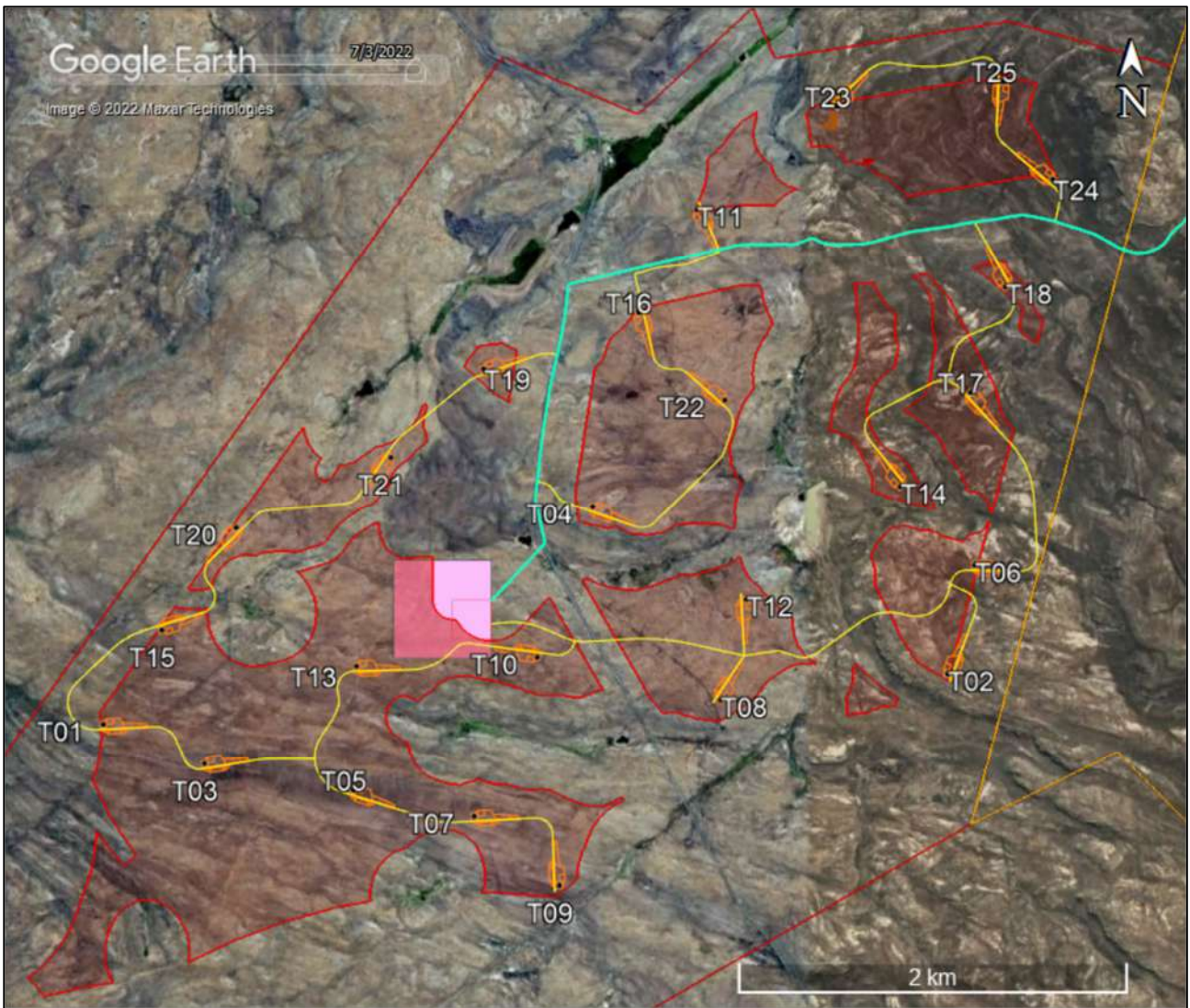


Figure 4: Aerial view showing the final WEF layout (Turbines = numbered dots with hardstands in orange, roads = yellow lines).

1.1. The proposed project

Sutherland 2 Wind Farm (Pty) Ltd received Environmental Authorisation (EA) (DFFE Ref: 12/12/20/1782/3) dated 10 November 2016 and further amendments to the EA dated 25 November 2016, 25 August 2017, 10 March 2020, 08 June 2020 and 09 July 2021, for the development of the 140MW Sutherland 2 WEF and associated infrastructure, in the Northern Cape Province. The WEF received an EA for the Independent Power Producer (IPP) portion of the on-site substation (DFFE Ref: 14/12/16/3/3/1/1814/1) on 20 October 2021 and received a separate EA for Switching Station portion of the on-site substation and 132kV over head powerline (DFFE Ref: 14/12/16/3/3/1/1814/2) on 20 October 2021. The Environmental Management Programmes (EMPRs) for the WEF, IPP portion of the on-site substation, Eskom portion of the on-site substation (including the 132kV overhead powerline) have been approved by the Department of Forestry, Fisheries and the Environment (DFFE), and will therefore be included within the Final Layout for the WEF for completeness.

The WEF will include the following:

- Up to 25 wind turbines (140MW maximum export capacity) with a hub height up to of 200m and a rotor diameter up to 200m;
- The wind turbines will be connected to one another by means of medium voltage cables.
- An internal gravel road network will be constructed to facilitate movement between turbines on site. These roads will include drainage and cabling;
- A hardstanding laydown area of a maximum of 10 000m² will be constructed; and
- A temporary site office will be constructed on site for all contractors, this would be approximately 5000m² in size.

The proposed IPP portion of the of the on-site substation and associated infrastructure will include the following:

- An IPP portion of the on-site substation;
- Laydown area;
- Operation & Maintenance Building;
- Fencing of the proposed on-site substation; and
- Battery Energy Storage Infrastructure (BESS).

The proposed Switching Station portion of the on-site substation and powerline will include the following:

- Switching Station portion of the on-site substation;
- Fencing;
- 132kV distribution line from the proposed Sutherland 2 WEF on-site substation to the Acrux third party substation (including tower/pylon infrastructure and foundations);
- Connection to the Acrux third party substation; and
- Service road below the powerline.

The property affected by the 140MW Sutherland 2 WEF and associated infrastructure is:

- Portion 1 of Tonteldoosfontein Farm 152

The properties associated with grid connection infrastructure include:

- Portion 1 of Tonteldoosfontein Farm 152;
- Portion 2 of Gunsfontein Farm 151;
- Portion 1 of Gunsfontein 151;
- Portion 1 of Beeren Valley Farm 150;
- Remaining Extent of Beeren Valley Farm 150; and
- Remaining Extent of Nooitgedacht Farm 148.

The Sutherland 2 WEF has been selected as a Preferred Bidder project via a private off-taker and construction is expected to commence in early 2023. Sutherland 2 Wind Farm (Pty) Ltd has commissioned Nala Environmental (Pty) Ltd to undertake the ground truthing and subsequent finalisation of the layouts and EMPRs in terms of the NEMA EIA Regulations, 2014 (as amended). As per the conditions of the EAs, independent specialist walkthroughs have been undertaken to inform the final layout and final EMPRs for the wind energy facility and associated infrastructure.

1.2. Terms of reference

ASHA Consulting was asked to survey the available buildable area for the WEF (it should be noted that the grid connection had been surveyed during its BA process) with a view to providing any further sensitivities so that a final project footprint could be designed in such a way as to have the absolute minimum impact on heritage resources. The final layout would then be provided and this should be presented in the report along with any mitigation and/or management measures that may still be required prior to construction and/or during construction.

1.3. Scope and purpose of the report

This report has two primary functions: (1) to identify any sensitive heritage features within the buildable area so that a project layout which takes sensitivities into account could be devised by the project developer and (2) to make final recommendations for further mitigation and/or management measures as might be necessary.

1.4. The author

Dr Jayson Orton has an MA (UCT, 2004) and a D.Phil (Oxford, UK, 2013), both in archaeology, and has been conducting Heritage Impact Assessments and archaeological specialist studies in South Africa (primarily in the Western Cape and Northern Cape provinces) since 2004 (please see curriculum vitae included as Appendix 1). He has also conducted research on aspects of the Later Stone Age in these provinces and published widely on the topic. He is an accredited heritage practitioner with the Association of Professional Heritage Practitioners (APHP; Member #43) and also holds archaeological accreditation with the Association of Southern African Professional Archaeologists (ASAPA) CRM section (Member #233) as follows:

- Principal Investigator: Stone Age, Shell Middens & Grave Relocation; and
- Field Director: Colonial Period & Rock Art.

1.5. Declaration of independence

ASHA Consulting (Pty) Ltd and its consultants have no financial or other interest in the proposed development and will derive no benefits other than fair remuneration for consulting services provided.

2. LEGISLATIVE CONTEXT

2.1. National Heritage Resources Act (NHRA) No. 25 of 1999

The NHRA protects a variety of heritage resources as follows:

- Section 34: structures older than 60 years;
- Section 35: prehistoric and historical material (including ruins) more than 100 years old as well as military remains more than 75 years old, palaeontological material and meteorites;
- Section 36: graves and human remains older than 60 years and located outside of a formal cemetery administered by a local authority; and
- Section 37: public monuments and memorials.

Following Section 2, the definitions applicable to the above protections are as follows:

- Structures: “any building, works, device or other facility made by people and which is fixed to land, and includes any fixtures, fittings and equipment associated therewith”;
- Palaeontological material: “any fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or trace”;
- Archaeological material: a) “material remains resulting from human activity which are in a state of disuse and are in or on land and which are older than 100 years, including artefacts, human and hominid remains and artificial features and structures”; b) “rock art, being any form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and which is older than 100 years, including any area within 10m of such representation”; c) “wrecks, being any vessel or aircraft, or any part thereof, which was wrecked in South Africa, whether on land, in the internal waters, the territorial waters or in the maritime culture zone of the Republic, as defined respectively in sections 3, 4 and 6 of the Maritime Zones Act, 1994 (Act No. 15 of 1994), and any cargo, debris or artefacts found or associated therewith, which is older than 60 years or which SAHRA considers to be worthy of conservation”; and d) “features, structures and artefacts associated with military history which are older than 75 years and the sites on which they are found”;
- Grave: “means a place of interment and includes the contents, headstone or other marker of such a place and any other structure on or associated with such place”; and
- Public monuments and memorials: “all monuments and memorials a) “erected on land belonging to any branch of central, provincial or local government, or on land belonging to any organisation funded by or established in terms of the legislation of such a branch of government”; or b) “which were paid for by public subscription, government funds, or a public-spirited or military organisation, and are on land belonging to any private individual.”

Section 3(3) describes the types of cultural significance that a place or object might have in order to be considered part of the national estate. These are as follows:

- a) its importance in the community, or pattern of South Africa’s history;
- b) its possession of uncommon, rare or endangered aspects of South Africa’s natural or cultural heritage;
- c) its potential to yield information that will contribute to an understanding of South Africa’s natural or cultural heritage;
- d) its importance in demonstrating the principal characteristics of a particular class of South Africa’s natural or cultural places or objects;
- e) its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
- f) its importance in demonstrating a high degree of creative or technical achievement at a particular period;
- g) its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;
- h) its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa; and
- i) sites of significance relating to the history of slavery in South Africa.

2.2. Approvals and permits

If archaeological or palaeontological mitigation is required prior to or during construction, then the appointed archaeologist or palaeontologist would need to obtain a permit from SAHRA or a Workplan Approval from HWC (depending on which province the work would be in). This would be issued in their name. This is so that the heritage authority can ensure that the appointed practitioner has proposed an appropriate methodology that will result in the mitigation being done properly.

3. METHODS

3.1. Literature survey and information sources

A survey of available literature was carried out to assess the general heritage context into which the development would be set and help understand the significance of any newly reported finds. The information sources used in this report are presented in Table 2 with relevant dates of each source referenced in the text as needed. Data were also collected via a field survey. The data quality is suitable for the purpose of informing this report.

Table 1: Information sources used in this report.

Data / Information	Source	Date	Type	Description
Maps	Chief Directorate: National Geo-Spatial Information	Various	Spatial	Historical and current 1:50 000 topographic maps of the study area and immediate surrounds
Aerial photographs	Google Earth	Various	Spatial	Recent and historical aerial photography of the study area and immediate surrounds
Cadastral data	Chief Directorate: National Geo-Spatial Information	Various	Survey diagrams	Historical and current survey diagrams, property survey and registration dates
Background data	South African Heritage Resources Information System (SAHRIS)	Various	Reports	Previous impact assessments for any developments in the vicinity of the study area
Background data	Books, journals, websites	Various	Books, journals, websites	Historical and current literature describing the study area and any relevant aspects of cultural heritage.

3.2. Field survey

The WEF buildable area was surveyed on 17th June, 29th June and 3rd July 2022, while a section of the powerline that had not been surveyed in the past was covered on 16th June 2022. The substation site was surveyed on 14th November 2016, while the remainder of the powerline was previously covered on 17th November 2016.

The WEF buildable area was covered fairly comprehensively but with the surveys not being very high density. For the powerline the whole route was covered except that the section along the road east of the WEF site which was examined largely from the vehicle. These were during both summer and winter but, in this relatively dry area, seasonality does not affect vegetation and hence ground visibility for locating archaeological materials. Other heritage resources are not affected by seasonality. During the survey the positions of finds and survey tracks were recorded on a handheld Garmin Global Positioning System (GPS) receiver set to the WGS84 datum (Figures 6 to 7). Photographs were taken at times in order to capture representative samples of both the affected heritage and the landscape setting of the project.

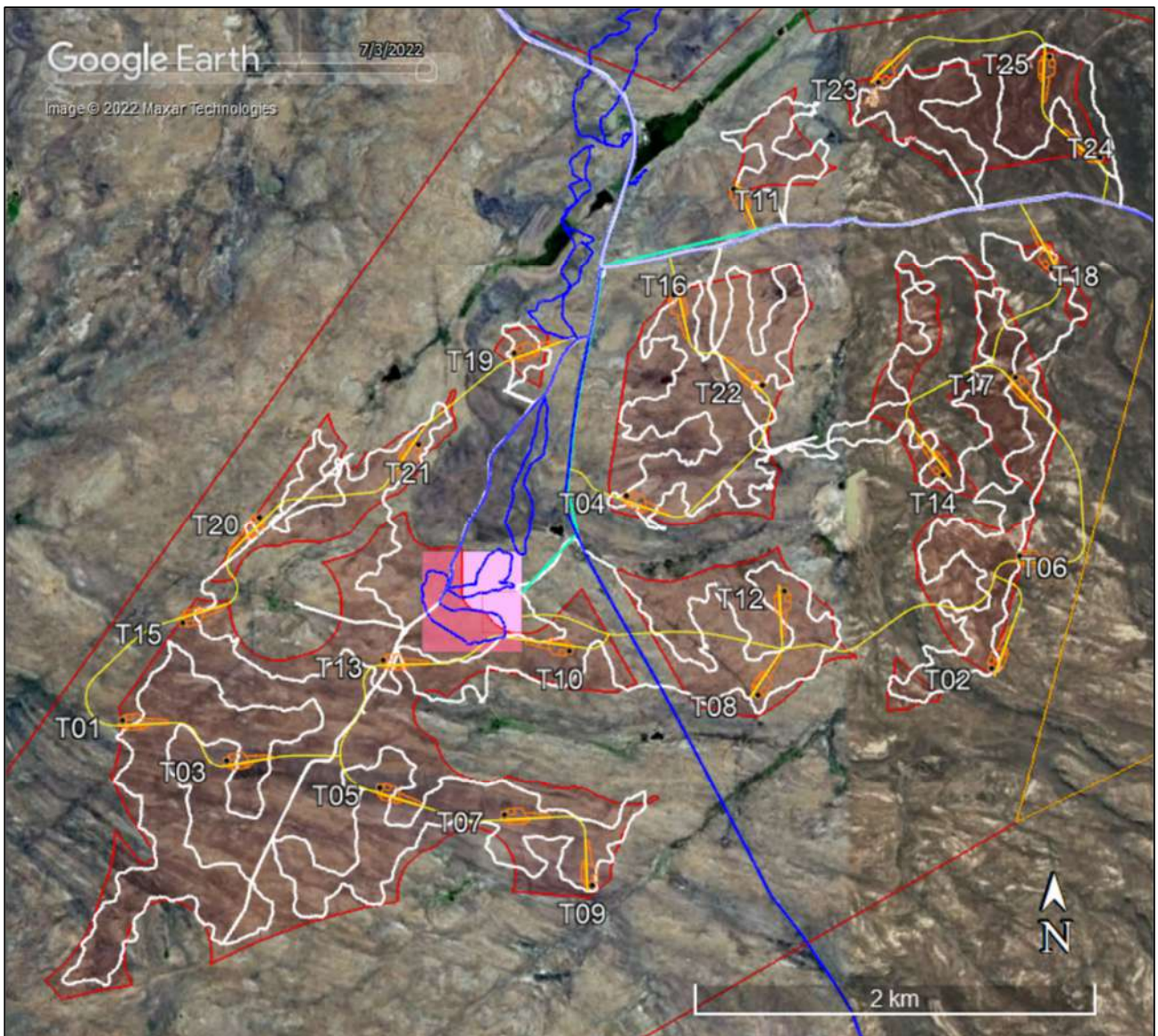


Figure 5: Aerial view of the WEF study area (key as per Figures 3 and 4) showing the survey tracks (dark blue [2016] and white [2022] lines).

3.3. Grading

S.7(1) of the NHRA provides for the grading of heritage resources into those of National (Grade I), Provincial (Grade II) and Local (Grade III) significance. Grading is intended to allow for the identification of the appropriate level of management for any given heritage resource. Grade I and II resources are intended to be managed by the national and provincial heritage resources authorities respectively, while Grade III resources would be managed by the relevant local planning authority. These bodies are responsible for grading, but anyone may make recommendations for grading.

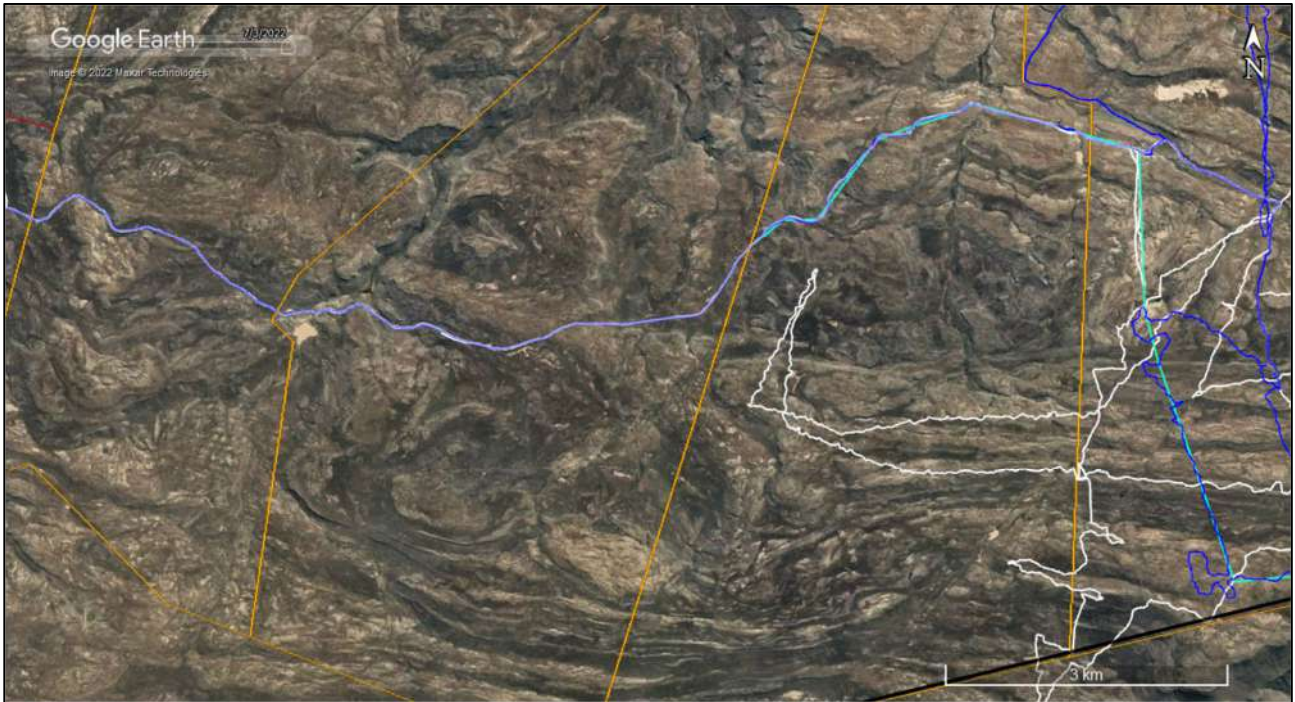


Figure 6: Aerial view of the WEF study area (key as per Figure 4 and powerline corridor in pale pink with green centre line) showing the survey tracks (dark blue [2016] and white [2022] lines). The remainder of the access road running north out of view was also covered during its impact assessment.

It is intended under S.7(2) that the various provincial authorities formulate a system for the further detailed grading of heritage resources of local significance but this is generally yet to happen. SAHRA (2007) has formulated its own system¹ for use in provinces where it has commenting authority. In this system sites of high local significance are given Grade IIIA (with the implication that the site should be preserved in its entirety) and Grade IIIB (with the implication that part of the site could be mitigated and part preserved as appropriate) while sites of lesser significance are referred to as having 'General Protection' (GP) and rated as GP A (high/medium significance, requires mitigation), GP B (medium significance, requires recording) or GP C (low significance, requires no further action).

3.4. Assumptions and limitations

The field study was carried out at the surface only and hence any completely buried archaeological sites would not be readily located. Similarly, it is not always possible to determine the depth of

¹ The system is intended for use on archaeological and palaeontological sites only.

archaeological material visible at the surface. These restrictions are assumed to not be a concern in this study area due to the generally rocky nature of the substrate with much exposed bedrock. Because the survey focused on the buildable areas (for turbines) rather than the entire farm portion, certain parts of the layout have not been surveyed in the field as they lie outside of the provided buildable area.

4. PHYSICAL ENVIRONMENTAL CONTEXT

4.1. Site context

The area is a remote, rural area in which livestock farming is the primary economic activity. The study area lies completely within the Komsberg Renewable Energy Development Zone (REDZ) and within the Central Electricity Grid Infrastructure (EGI) Corridor. The powerline route runs along the road servitude through the Komsberg Nature Reserve which lies on Portions 1 and 2 of Gunstfontein 151 immediately east of the WEF study area.

4.2. Site description

The study area is a gently undulating site with few cliffs but several areas of flat bedrock exposure. Some streams cut through the area and the vegetation is largely about knee high. Figures 7 to 13 show the nature of the area.



Figure 7: Looking southwest through the southern part of the WEF area.



Figure 8: Looking north from the southern end of the WEF area.



Figure 9: Looking northeast from the southern end of the WEF area.



Figure 10: Looking northeast through the centre of the WEF area.



Figure 11: Looking south from the north-eastern part of the WEF area.



Figure 12: Looking west from the eastern part of the WEF area.



Figure 13: Looking north from near the eastern corner of the WEF area.

5. FINDINGS

5.1. Desktop study

The Karoo region has a long history going back to the Early Stone Age (ESA) as testified to by occasional diagnostic artefacts from this period (generally handaxes). Middle Stone Age (MSA) artefacts are the most commonly encountered stone age materials in the Karoo. Later Stone Age (LSA) finds are less common but generally of higher significance because of their better contexts (Orton *et al.* 2016).

Prior to the colonial incursion into the interior of southern Africa the Bushmen and, more recently, the Khoekhoen occupied the area. Very little archaeological research has been undertaken in the area, although a number of impact assessments have been carried out, especially in connection with proposed renewable energy facilities, including those surveyed here. Most surveys found Stone Age material to be rare on the landscape, although scatters of Early (ESA), Middle (MSA) and Late Stone Age (LSA) material have been reported (Hart *et al.* 2010; Halkett & Webley 2011; Orton 2021). Occasional small rock shelters are known from the area (e.g. Evans *et al.* (1985), Hart (2005), Orton & Halkett 2011)) with one having been excavated. This one yielded a typical LSA assemblage with small scrapers, thin-walled potsherds, ostrich eggshell beads and some *Nassarius kraussianus* beads (Evans *et al.* 1985). The latter are estuarine shells that must have been obtained from the coast.

A very important aspect of the pre-colonial archaeology of the area is the many stone-built *kraals* (livestock enclosures) that have been recorded in various areas. The vast majority are in the Seacow River valley far to the east (Hart 1989; Sampson 1985, 2008), but excellent examples have also been reported from the Sutherland area. One on the southern edge of Sutherland town was a complex of 13 interlocking enclosures (Hart 2005). Another example is within the far eastern end of the Sutherland WEF study area and has about 27 enclosures with minimal associated stone artefacts and ostrich eggshell fragments (Orton 2017a, 2017b, 2017c). Stone Age *kraals* are important sites and are as yet poorly understood.

Along the dry river beds at the base of the escarpment Hart *et al.* (2010) also identified sites which they thought were large Khoekhoe encampments situated among the Kameeldoring trees in the bottom of valleys. The sites contained thin-walled, burnished pottery, stone features, stone artefacts, grinding surfaces and graves, some of which have broken grindstones on them. Also evident were discreet ash middens and animal bone. Hart *et al.* (2010) noted colonial period artefacts (19th century glass and ceramics) on some of the sites, possibly indicating continuous use of the area by Khoekhoe herders into the colonial period.

Although geometric rock art has been mapped by researchers across large swathes of South Africa, there has long been a gap in the distribution surrounding the study area (Orton 2013; Russell 2012; Smith & Ouzman 2004). Nevertheless, atypical geometric rock art has been documented in the area in recent times. With two exceptions, the imagery is all finger painted with vertical smears dominating. One site lies just south of Sutherland (Orton & Halkett 2011), others lie to the south of the escarpment edge (Halkett & Webley 2011), while another was recorded by Orton (2017a, 2017b, 2017c) along the eastern section of the powerline for the present project. One exception is a fine-line painting located below the escarpment some 11 km south of the study area. It is poorly preserved but may have an ostrich, an eland and some figures (CTS 2021). The other is a brush-painted fine line human figure located some 11 km northwest of the study area (Van der Walt 2016).

Historical archaeology abounds in the area with many ruined stone-built structures being present (e.g. CTS 2021; Hart *et al.* 2010; Hart 2015; Halkett & Webley 2011; Kaplan 2009; Orton 2017a, 2017b, 2017c, 2019; Van der Walt 2016). Because they are ruined and in a state of disuse, they would fall into the category of archaeological resources rather than built environment heritage resources. The types of structures included here are:

- Various boundary markers, cairns and beacons (e.g. Hart *et al.* 2010; Orton & Halkett 2011). They may have been built when the original farm surveys took place in the 19th century;
- Military structures occur in places, most notably on Jakkalsvalley and Gunstfontein, 25 km and 10 km northeast of the study area respectively (Orton & Halkett 2011; Van der Walt 2016). Many of these are ruined and would technically be archaeological sites; and
- Houses, outbuildings and shepherd huts and related features such as *kraals* and boundary walls occur widely, sometimes built from dressed stone but usually not.

These features often have artefactual material (broken ceramics and glass, metal items, etc) scattered about them. Occasionally a refuse midden is found alongside an old farmstead. These middens reflect the material remains of domestic life on the early frontier farms and relate to the European occupation of the Roggeveld Mountains after the 18th century expansion into the area of farmers from the Cape Colony.

Hart *et al.* (2010) and Halkett & Webley (2011) recorded numerous graveyards, generally associated with homesteads and with abandoned settlements. Graveyards were also recorded.

There are also many tracks which are likely to have their origins in the 19th century wagon routes between farms, although these are perhaps better regarded as elements of the cultural landscape.

5.2. Site visit

This section describes the archaeological heritage resources recorded in the WEF study area and along the grid connection corridor during the present survey. Table 2 provides a full list of these finds, while a selection of these from both the WEF project and the powerline corridor are illustrated below to provide the reader with a better understanding of the heritage. Locations are mapped in Appendix 2. Finds made by Halkett and Webley (2011) are not listed or described here but their report can be consulted for details. Their finds are included in the mapping and concluding discussion as necessary though.

Table 2: List of finds made during the surveys of the Sutherland 2 WEF site and the powerline corridor. Finds along the powerline route are shaded yellow.

Waypoint	Co-ordinates	Description	Significance	Grade
1165	S32 37 08.6 E20 48 44.0	Ou Plaas farm complex within the Komsberg Nature Reserve. It includes a few buildings and at least two stone-walled kraals. Two other large stone-walled features may have been small walled fields rather than kraals. Both of the main buildings are still intact but are clearly not being maintained. The main farmhouse has a pitched corrugated iron roof with gables on the north and south ends. The house faces east and has had rooms added onto both ends. A corrugated iron veranda runs along the west face but the east side of the house is not visible from the road due to the northern addition which protrudes to the east of the house. Not examined in detail but the complex is abandoned and all structures and ruins in the complex seem to be historical and stone-built.	High	IIIA Avoid
1166	S32 37 03.5 E20 49 09.8	A stone-walled ruin within the Komsberg Nature Reserve. Not examined in detail but it is evident that it is partly tumbled.	Low	GPB Avoid
1167	S32 35 57.1 E20 53 15.8	Circular, packed stone boundary marker. It is about 1 m in diameter and about 1 m high. It is in good condition.	Medium	GPA Avoid
1168	S32 35 59.7 E20 53 25.5	Square, packed stone boundary marker which also serves as a gate post. It is in good condition.	Medium	GPA Avoid
1169	S32 36 02.4 E20 53 44.2	Stone-walled ruin which, although not examined in detail, seems to have its walls intact and roof missing. There are no openings in the south and west-facing walls which are visible from the road and there is a piled stone feature to the north of the structure.	Medium	GPA Avoid
1170a	S32 36 07.7 E20 53 54.2	A small stone-walled structure that is intact. It has a north facing door but no other openings. Its corrugated iron roof is still intact and slopes downhill towards the south. Although not examined in detail, it seems to have been built with mud mortar but has had some cement applied in places at a later stage.	Medium-High	IIIB Avoid
1170b	S32 36 08.1 E20 53 51.5	A small stone-walled structure that is largely intact. It has an east-facing door but no other openings. Its corrugated iron roof is still intact and slopes downhill towards the north. It is surrounded by a very small parapet wall which has slightly crumbled at the south-eastern corner above the doorway. Although not examined in detail, it seems to have been built with mud mortar and may have had some cement applied in places at a later stage (This latter detail could not be determined from a distance).	Medium-High	IIIB Avoid
1171a	S32 36 08.0 E20 53 58.0	A small stone-walled cottage of about 4 m by 4 m with a curved corrugated-iron roof. There is a window in the west gable and a door facing to the east. Some piled stones to the south of the cottage suggest some sort of feature there but this was not checked. A small midden of modern animal bones with rare pieces of clear and green glass lies immediately adjacent to the road, about 10 m north of the cottage. There is a second small structure located 7 m southeast of the stone cottage. It is of similar size but built of red bricks and grey cement. The flat roof slopes down to the east and it has a door to the north. It is	Medium-High	IIIB Avoid
1171b	S32 36 010.0 E20 53 56.7	A stone-walled kraal measuring 33 m by 21 m and built over an area of sloping, exposed bedrock. The western end of it has had more recent walls and a corrugated iron roof added as well as a livestock loading ramp. There are fences inside and the kraal is clearly still in regular use. It was not examined in detail.	Medium-High	IIIB Avoid

1172	S32 36 12.5 E20 54 21.6	There is a long stone wall running along the edge of the farm access road at this point. It is tumbled in places. Although the wall itself only merits grade GPB, the assigned significance and grade are for the farm complex as a whole.	Medium-High	IIIB Avoid
1173	S32 36 06.1 E20 53 54.2	Stone house in good condition and well maintained. It is currently occupied. It was not examined in detail but it looks like a relatively recent construction (or renovation), but in vernacular style and possibly using dressed stones recovered from an older building. Historical aerial photography is not of sufficient resolution to assist. Considered heritage for precautionary reasons.	Medium	--- Avoid
1174	S32 36 50.9 E20 44 49.3	A point taken along a stone wall that encloses a valley. H001, H001b, H001c, H001d, D002, D002a, H001e, H001f, H001g, H001h from Halkett and Webley (2011) are all on the same wall.	Medium	GPA Avoid
1175	S32 36 51.4 E20 44 46.6	Same wall as above.	Medium	GPA Avoid
1176	S32 37 11.2 E20 44 31.4	A small circular stone-walled feature about 2 m in diameter, presumably the remnants of a shepherd's hut. Its entrance faces east and a quarter-circle wall extends out from the north side of the door. One aqua, one blue and two ink pieces of glass were seen in the area, along with two refined white earthenware fragments, one of which bears a green crown. Also recorded by Halkett & Webley as H003.	Medium	GPA Avoid
1177	S32 37 13.4 E20 44 15.6	Tumbled stone boundary beacon, looks like it was square.	Low	GPB
1178	S32 37 15.4 E20 44 12.7	Tumbled stone boundary beacon, looks like it was square.	Low	GPB
1179	S32 37 15.7 E20 44 12.2	Tumbled stone boundary beacon.	Low	GPB
1180	S32 37 21.7 E20 44 04.2	Stone boundary beacon, still standing about 1 m high with very few rocks missing.	Medium	GPA Avoid
1181	S32 37 21.2 E20 44 04.9	Stone boundary beacon present only as a small pile of stones.	Low	GPB
1182	S32 37 20.9 E20 44 05.3	Stone boundary beacon present only as a small pile of stones.	Low	GPB
1183	S32 37 20.5 E20 44 05.7	Stone boundary beacon present only as a small pile of stones.	Low	GPB
1184	S32 37 18.2 E20 44 08.8	Stone boundary beacon present only as a small pile of stones.	Low	GPB
1185	S32 37 18.1 E20 44 09.1	Stone boundary beacon present only as a small pile of stones.	Low	GPB
1186	S32 37 17.5 E20 44 09.8	A single stone standing in the ground along the line of the beacons and presumed to be one of them.	Low	GPB
1187	S32 37 17.3 E20 44 10.2	A single elongated stone lying on its side along the line of boundary beacons and presumed to be one of them.	Low	GPB

1188	S32 37 16.2 E20 44 11.6	An elongated stone lying on its side and a few other stones along the line of boundary beacons and presumed to be one of them.	Low	GPB
1189	S32 37 14.7 E20 44 13.5	A small, square stone boundary beacon with a few stones having fallen off.	Medium	GPA Avoid
1190	S32 37 12.8 E20 44 16.1	A few stones in a cluster that look like they are a collapsed small stone boundary beacon.	Low	GPB
1191	S32 37 12.2 E20 44 17.1	A small, square stone boundary beacon in a cluster of bushes.	Medium	GPA Avoid
1192	S32 37 11.9 E20 44 17.5	Tumbled stone boundary beacon that would have probably been about 1 m high.	Medium	GPA Avoid
1193	S32 37 23.1 E20 44 02.2	Square stone boundary beacon on top of a rock outcrop.	Medium	GPA Avoid
1194	S32 37 23.5 E20 44 01.6	Stone boundary beacon made from a few stones piled in a square shape.	Medium	GPA Avoid
1195	S32 37 24.5 E20 44 00.4	Tumbled stone boundary beacon with just nine stones sitting on a bedrock outcrop.	Low	GPB
1196	S32 37 24.9 E20 43 59.8	An elongated stone lying on its side and a few other stones along the line of boundary beacons and presumed to be one of them.	Low	GPB
1197	S32 37 25.1 E20 43 59.5	Stone boundary beacon present only as a small pile of stones.	Low	GPB
1198	S32 37 26.4 E20 43 57.7	Stone boundary beacon present only as a small, dispersed pile of stones.	Low	GPB
1199	S32 37 28.5 E20 43 54.8	Small cluster of five stones along the line of boundary beacons and presumed to be one of them.	Low	GPB
1200	S32 37 30.3 E20 43 52.5	Tumbled stone boundary beacon.	Low	GPB
1201	S32 37 30.7 E20 43 51.8	Tumbled stone boundary beacon. Also recorded by Halkett & Webley as H005.	Low	GPB
1202	S32 37 31.7 E20 43 50.6	A large stone boundary beacon standing about 1 m high. It is squarish in shape. Also recorded by Halkett & Webley as H004.	Medium	GPA Avoid
1203	S32 38 14.1 E20 44 59.2	A small, square ruin 1.5 to 2 m across built against a boulder which forms the western wall. An opening faces east. There is another small wall extending from the north side of the door forming a vestibule area. A small stone cairn about 0.3 m high lies a few meters to the west. It looks like it was made to store something as there is a small entrance at its base.	Medium	GPA Avoid
1204	S32 37 51.9 E20 44 41.9	A small, ruined farmstead lies on a rocky ridge with an outlook towards the south. The main house is an oval shape and built of rock slabs and mud with a door opening towards the north. It is 2.5 m by 4 m with the door in the long side. The doorway is intact and it looks like the wall above it was curved like a small gable with the east and west sides being lower than above the door. A small, deep muirkas lies just inside the door on its	Medium-High	IIIB

		eastern side. The east wall is partly tumbled. There is a curved vestibule wall on the west side of the entrance. Another low wall extends off the west side of the house for 5 m. Just to the northeast of the oval house is a two-roomed ruin. The western room is rectangular and measures about 2 m by 4 m. The eastern one is round and is about 3 m in diameter. An opening in the southeast corner of the rectangular room leads into the round room. There is a muurkas in the south wall of the round room. There is a small opening in the round room at the point where it meets the rectangular room at the latter's northeast corner. An old branch with some wire tied round it lies next to the rectangular room and must have been a roof beam for one of the structures. There are very few glass, ceramic and metal fragments and these are widely scattered. They include the blade of a spade, some clear glass, some refined white earthenware (sponge print and green transfer ware) and some light and dark green glass. A sardine tin with "PACKED IN CANADA" embossed on its base was also seen. Also recorded by Halkett & Webley as H006.		
1205	S32 37 53.9 E20 45 34.4	The slightly raised berm of the old Komsberg Pass road runs through the site. See also 1208.	Very low	GPC
1206	S32 37 53.8 E20 45 35.2	A single, tall standing stone that must have been a fence post along the old road.	Very low	GPC
1207	S32 37 43.3 E20 45 24.8	A metal fence pole and an ephemeral stone alignment that must have been along the base of the fence. This lies along the old Komsberg Pass Road.	Very low	GPC
1208	S32 37 31.1 E20 45 07.5	A pair of concrete headwalls on either end of a pipe culvert that ran under the old Komsberg Pass road. The concrete is modern.	---	---
1209	S32 36 38.8 E20 45 26.5	A point on a long <i>leiwater</i> furrow that runs for 2.75 km leading water from a small dam in the southeast of the farm into the large dam to the northwest. The furrow branches in the northwest with an option to lead water to a field upstream of the dam (for flood irrigation). The age of this feature is unknown but the south-eastern dam appears on the 1986 topographic map but not the preceding 1967 one. The 1960 aerial photography shows the north-western dam but not the south-eastern one. The <i>leiwater</i> , however, is present which means the system is older than 60 years but there was perhaps only a weir in the stream to the southeast in 1960.	Medium	GPA
1286	S32 37 12.5 E20 45 46.8	A point along the same <i>leiwater</i> as waypoint 1209. Also recorded by Halkett & Webley as D011.	Medium	GPA
1287	S32 36 58.9 E20 46 28.0	A small cairn built on a bedrock outcrop.	Very low	GPC
1288	S32 37 20.6 E20 46 22.5	An earth berm has been built to capture stream flow from one small stream and lead it into another which in turn feeds the nearby dam.	Medium	GPA
1289	S32 37 19.9 E20 46 16.4	A point along the same berm as waypoint 1288.	Medium	GPA
1290	S32 37 12.4 E20 45 37.1	A point along the same <i>leiwater</i> as waypoint 1209.	Medium	GPA
1291	S32 37 12.9 E20 45 36.6	An area below a low scarp with a mix of Stone Age and historical artefact scatter. There are stone artefacts and precolonial pottery as well as fragments of glass, ceramic, metal and bone. Halkett and Webley (2011) recorded this site as D013 and appear to have seen substantially more archaeological material during their	Medium-High	IIIB

		survey and the assigned grade is based on their description and photographs and the apparent rarity of dense LSA artefact scatters in this area. There is a high likelihood of buried artefacts here.		
1292	S32 37 13.1 E20 45 35.1	A tiny stone shelter of sorts with a flat slab roof. It looks more like a spot to store something in. There is a piece of old black plastic here.	Low	GPB
1293	S32 37 13.3 E20 45 34.9	A small stone-walled enclosure about 2 m across and with an entrance to the east. It is built on the south side of a rock outcrop. A fragment of metal and an ostrich eggshell fragment were seen here. Also recorded by Halkett & Webley as D014.	Low	GPB
1294	S32 37 17.3 E20 45 36.9	A widespread scatter of both Stone Age and historical materials but with the latter very rare. Most of the Stone Age material is pottery fragments with some being rim sherds with everted lips. Also rare flaked artefacts and a lower grindstone. The scatter extends over at least 30 m. Also recorded by Halkett & Webley as H008.	Medium	GPA
1295	S32 37 17.2 E20 45 35.9	Another point within the same scatter as waypoint 1294. Also recorded by Halkett & Webley as H009.	Medium	GPA
1296	S32 36 44.5 E20 45 24.3	A point along the same <i>leiwater</i> as waypoint 1209.	Medium	GPA
1297	S32 36 57.0 E20 45 24.6	A point along the same <i>leiwater</i> as waypoint 1209.	Medium	GPA
1301	S32 36 13.8 E20 45 57.7	This is an LSA kraal complex with nine enclosures. The walls are completely tumbled and are also discontinuous in places making it difficult to accurately determine their original location and hence the width of the enclosures. 1301: A 10-12 m diameter stone walled kraal enclosure with a single dark grey sandstone flake in it. 1302: A 15-17 m diameter stone walled kraal enclosure. 1303: An 8-9 m diameter stone walled kraal enclosure. 1304: A 6-m m diameter stone walled kraal enclosure but with the eastern half of the enclosure composed of natural rock outcrops. 1305: An 11-13 m diameter stone walled kraal enclosure. A single dark grey sandstone flake was seen inside it. 1306: A 10-12 m diameter stone walled kraal enclosure. A lower grindstone slab was present inside this enclosure. 1307: A 6-7 m diameter C-shaped stone walled kraal enclosure with its opening towards the east. 1308: A 12-14 m diameter stone walled kraal enclosure but with walling that seems very discontinuous. One potsherd and two dark grey sandstone flakes were found inside the enclosure. 1309: A 4 m diameter stone walled kraal enclosure.	Medium-High	IIIB Avoid
1302	S32 36 14.3 E20 45 57.6			
1303	S32 36 14.7 E20 45 58.0			
1304	S32 36 14.7 E20 45 56.9			
1305	S32 36 15.5 E20 45 56.1			
1306	S32 36 15.9 E20 45 57.2			
1307	S32 36 15.9 E20 45 57.8			
1308	S32 36 15.4 E20 45 57.8			
1309	S32 36 13.5 E20 45 57.1			
1310	S32 36 18.2 E20 45 53.6			

1311	S32 36 19.0 E20 45 53.7	A small, low cairn of rocks less than 1 m in diameter.	Very low	GPC
1312	S32 36 18.1 E20 45 57.2	A partial circular stone-walled enclosure. Likely an LSA kraal.	Medium	GPA Avoid
1313	S32 36 22.5 E20 46 03.0	A 2 m by 2 m square stone-walled ruin with opening facing east. There is a roughly circular vestibule on the east side with its opening towards the northeast.	Medium	GPA Avoid
1314	S32 36 22.2 E20 46 03.6	A 7 m by 11 m kraal built against a southwest-facing scarp. There is almost nothing left of the walling which is badly tumbled and hard to see.		
1315	S32 36 21.5 E20 46 03.7	This is an LSA kraal complex with four enclosures. The walls are completely tumbled making it difficult to accurately determine their original location and hence the width of the enclosures. No artefacts were seen associated with any of these features. 1315: A 8-10 m diameter stone walled kraal enclosure. 1316: A 10-12 m diameter stone walled kraal enclosure. 1317: A 5 m diameter stone walled kraal enclosure. 1318: A 7-8 m diameter stone walled kraal enclosure.	Medium-High	IIIB Avoid
1316	S32 36 21.4 E20 46 04.2			
1317	S32 36 21.4 E20 46 04.9			
1318	S32 36 21.5 E20 46 05.1			
1319	S32 36 17.1 E20 45 46.0	A small rock shelter very close to a stream and with three small patches of red paint. No imagery is discernible, although it is possible that there are finger dots in one of them.	Medium-High	IIIB Avoid

5.2.1. WEF study area

A number of stone age sites were found in the WEF study area. These are illustrated in Figures 13 to 26.



Figure 13: Quartzite flake and potsherds from the LSA and historical scatter at waypoint 1291. Scale = 15 cm.



Figure 14: Glass, ceramic, stone artefact, bone and pottery from the LSA and historical scatter at waypoint 1291. Scale = 20 cm.



Figure 15: Pot sherds from the scatter with little other than pottery at waypoint 1294. The inset shows the cross-section through the rim sherd with everted lip. Scale = 6 cm.



Figure 16: A lower grindstone found on the scatter at waypoint 1295. Scale = 20 cm.

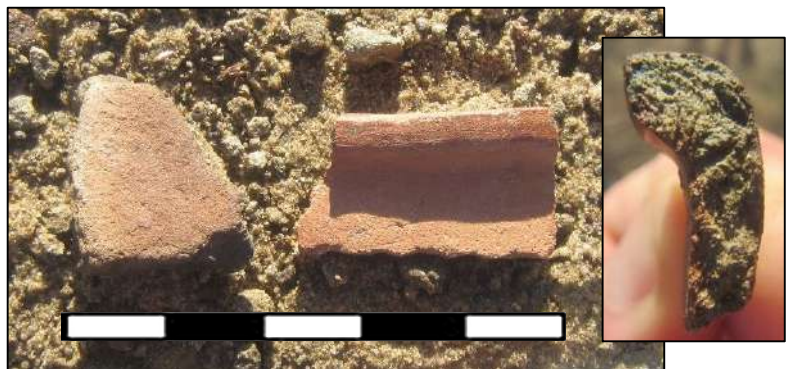


Figure 17: Pot sherds from the scatter at waypoint 1295. The inset shows the cross-section through the rim sherd with everted lip. Scale = 6 cm.



Figure 18: An example of one of the stone-walled enclosures in the LSA kraal complex at waypoints 1301 to 1309. This is at waypoint 1301.



Figure 19: An example of one of the stone-walled enclosures in the LSA kraal complex at waypoints 1301 to 1309. This is at waypoint 1307.



Figure 20: An example of one of the stone-walled enclosures in the LSA kraal complex at waypoints 1301 to 1309. This is at waypoint 1302.



Figure 21: Flake from waypoint 1305. Scale = 6 cm.



Figure 22: Potsherd and two flakes from waypoint 1308. Scale = 6 cm.



Figure 23: Lower grindstone from waypoint 1306. Scale = 30 cm.



Figure 24: An example of one of the stone-walled enclosures in the LSA kraal complex at waypoints 1315 to 1318. This is at waypoint 1315.



Figure 25: An example of one of the stone-walled enclosures in the LSA kraal complex at waypoints 1315 to 1318. This is at waypoint 1318.

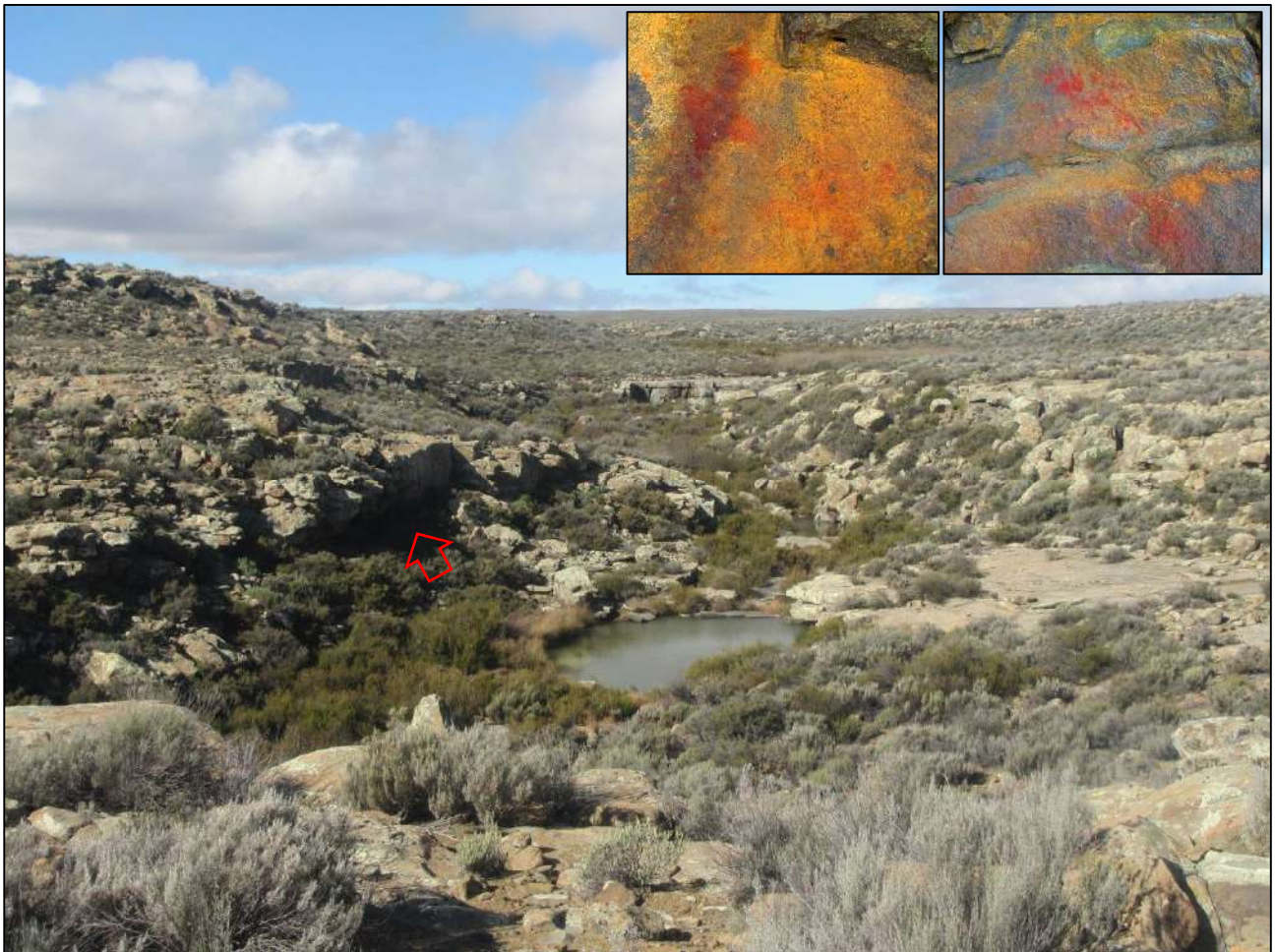


Figure 26: View towards the pool in the river and the adjacent rock shelter at waypoint 1319 (arrowed). The shelter contains faded red finger-painted imagery (insets with colour manipulation to enhance the paint).

Historical sites were also found in the WEF study area, while further sites lay along the powerline route. A selection of these sites is illustrated in Figures 27 to 54 with a historical aerial photograph illustrating the existence of the *leiwater* system in 1960 (Figure 55). The historical finds include a long line of boundary cairns that run just inside the western boundary of Theronsrus but are not parallel to the current boundary (Figures 30 to 44). They might indicate an earlier boundary. A section in between the two clusters has not been examined and there may well be further cairns in this area. A selection of them has been illustrated to show the variation.



Figure 27: A long stone wall surrounds the valley that contains the largest dam on Theronsrus. Such walls were often built around areas with arable land to keep animals out of the crops. Waypoints 1174 and 1175 fall along this wall with this view being at the former point.



Figure 28: Small stone-walled structure at waypoint 1176. It was likely a shepherd's hut.



Figure 29: Semi-circular stone kraal against a scarp at waypoint 1313 (indicated by yellow dots) with the house ruin at waypoint 1314 in the background (arrowed).



Figure 30: Cairn at waypoint 1177



Figure 31: Cairn at waypoint 1178



Figure 32: Cairn at waypoint 1179



Figure 33: Cairn at waypoint 1180



Figure 34: Cairn at waypoint 1184 with 1185 behind



Figure 35: Cairn at waypoint 1186



Figure 36: Cairn at waypoint 1187



Figure 37: Cairn at waypoint 1188



Figure 38: Cairn at waypoint 1189



Figure 39: Cairn at waypoint 1192



Figure 40: Cairn at waypoint 1193



Figure 41: Cairn at waypoint 1195



Figure 42: Cairn at waypoint 1196



Figure 43: Cairn at waypoint 1197



Figure 44: Cairn at waypoint 1202



Figure 45: The small structure at waypoint 1203. Its western wall is formed by a boulder.



Figure 46: The small structure at waypoint 1203 showing the vestibule area. In the foreground

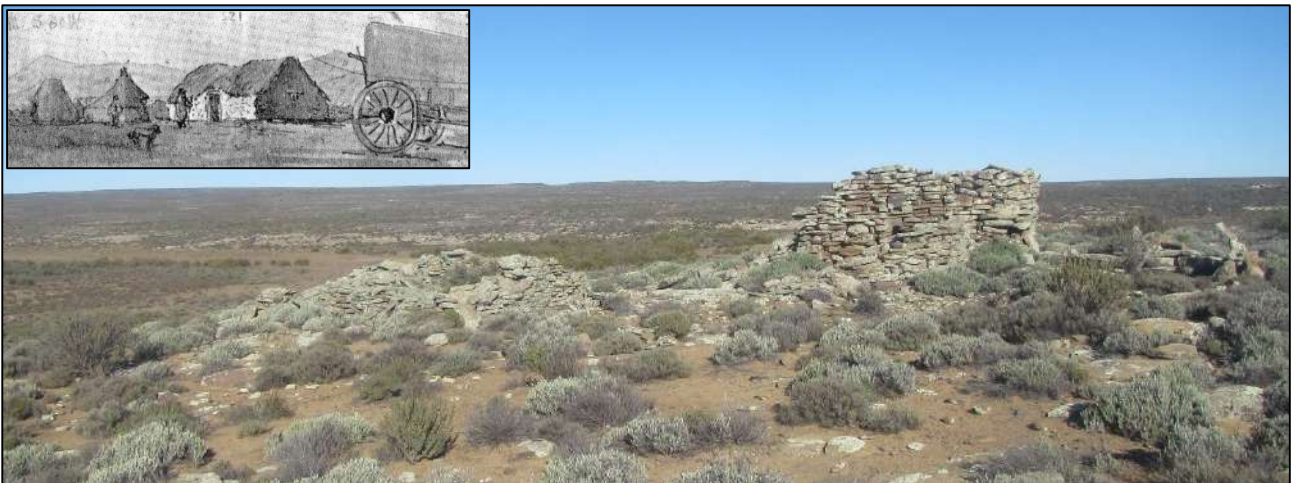


Figure 47: House ruin at waypoint 1204. It is part of a ruined early farm complex. The inset shows an 1811 drawing of a trekboer farmhouse by William Burchell with a similar doorway to that seen on this house. Source: Van Zyl (1975:103).



Figure 48: The doorway in the house at waypoint 1204 is fully preserved.



Figure 49: Artefacts seen around the house at waypoint 1204. Scale = 15 cm.



Figure 50: View of the historic leiwater furrow where it crosses the west-east gravel road through the site. This is at waypoint 1209.



Figure 51: Section of the leiwater furrow at waypoint 1286.



Figure 52: Section of the leiwater furrow (no specific waypoint)



Figure 53: Section of the leiwater furrow at waypoint 1296.



Figure 54: Section of the leiwater furrow at waypoint 1297.

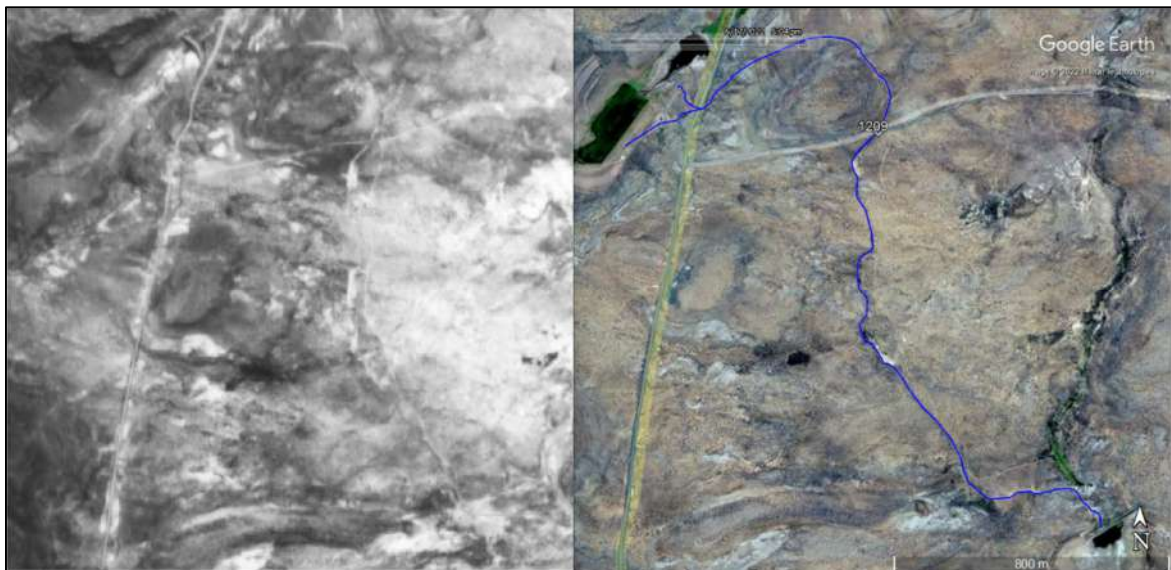


Figure 55: Comparative aerial photography from 1960 (450_012_05047) and 2014 (Google Earth) with the leiwater marked in blue on the latter image. This is the earliest available aerial photography for the study area but it shows the leiwater system to be older than 60 years.

5.2.2. Powerline

The powerline has previously been reported on (Orton 2017b) and although there are no layout updates, this section of the project is briefly discussed for completeness. The main concerns are the three farmsteads passed by the powerline route. The first is Ou Plaas on Gunstfontein 151 (Figures 56 to 60). The powerline will be placed within the road servitude which means that direct impacts will not occur here. The complex is abandoned and neglected but nonetheless retains considerable heritage significance.



Figure 56: Abandoned farmhouse in the Ou Plaas farm complex at waypoint 1165. This is the northern end of the house showing a flat-roofed addition.



Figure 57: Western side of the abandoned farmhouse in the Ou Plaas farm complex at waypoint 1165. A veranda shades the three west-facing windows.



Figure 58: View of the stone-walled kraal in the Ou Plaas farm complex at waypoint 1165. The game fences flanking the road are visible.



Figure 59: A stone-walled outbuilding in the Ou Plaas farm complex at waypoint 1165.

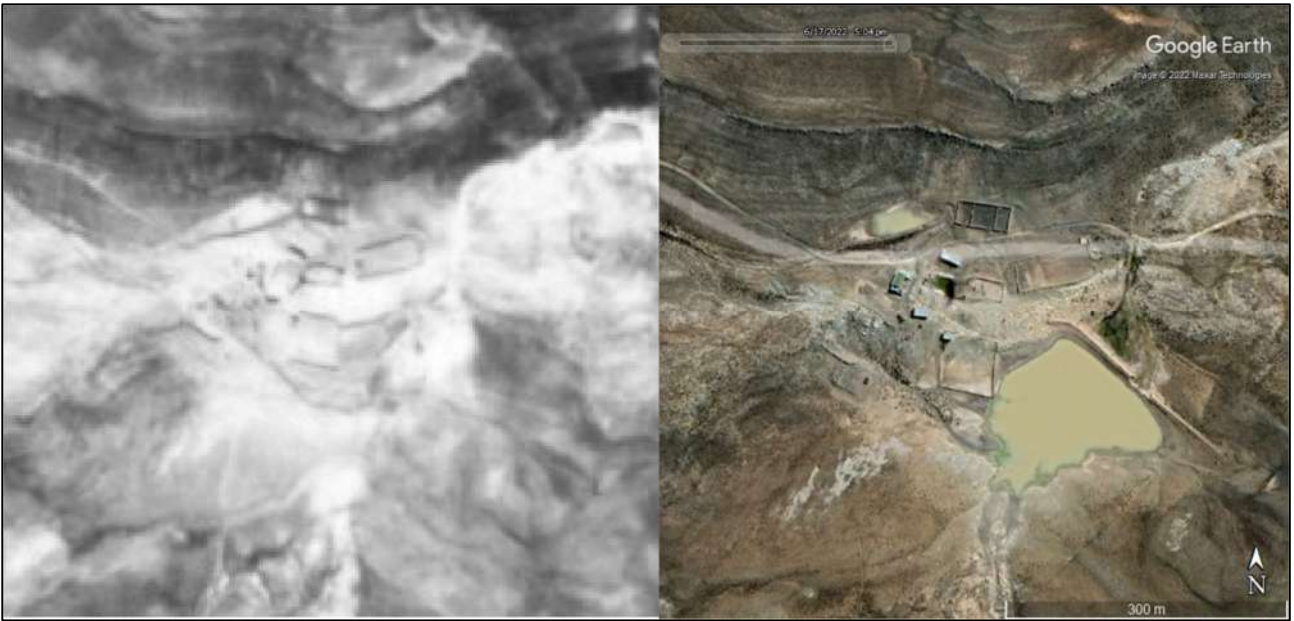


Figure 60: Comparative aerial photography from 1960 (450_012_05046) and 2014 (Google Earth) showing the Ou Plaas farmstead in the Komsberg Nature Reserve (Gunstfontein 151). The large dam post-dates 1960.

Further east is the Scholtzenhoz farm complex. It has fewer historical features than Ou Plaas (Figure 61). Just west of the farmstead are two stone-built boundary beacons that lie adjacent to the existing gravel road (Figures 62 & 63).



Figure 61: Comparative aerial photography from 1960 (450_011_04619) and 2014 (Google Earth) showing the Scholtzenhof farmstead (on Portion 1 of Beerenvally 150). Visible historical features are arrowed. They include, from northwest to southeast, a small structure (not recorded, but the ruin to its south was recorded as waypoint 1169), the house alongside the road that has been added to and renovated with a small dam alongside it (waypoint 1173), a stone kraal (waypoint 1171b) and the farm dam (not recorded). Other recorded features are too small to be visible.



Figure 62: Stone boundary beacon at waypoint 1167.



Figure 63: Stone boundary beacon at waypoint 1168.

The individual features of the Beerfontein farmstead on the Remainder of Beerenvally 150 do not show up clearly on the historical aerial photography, but it is evident that the farmstead and dam to the southeast are present (Figure 64). A number of small historical structures occur in the southern part of the complex (e.g. Figure 65) and a stone boundary wall runs immediately adjacent to the road (Figure 66).

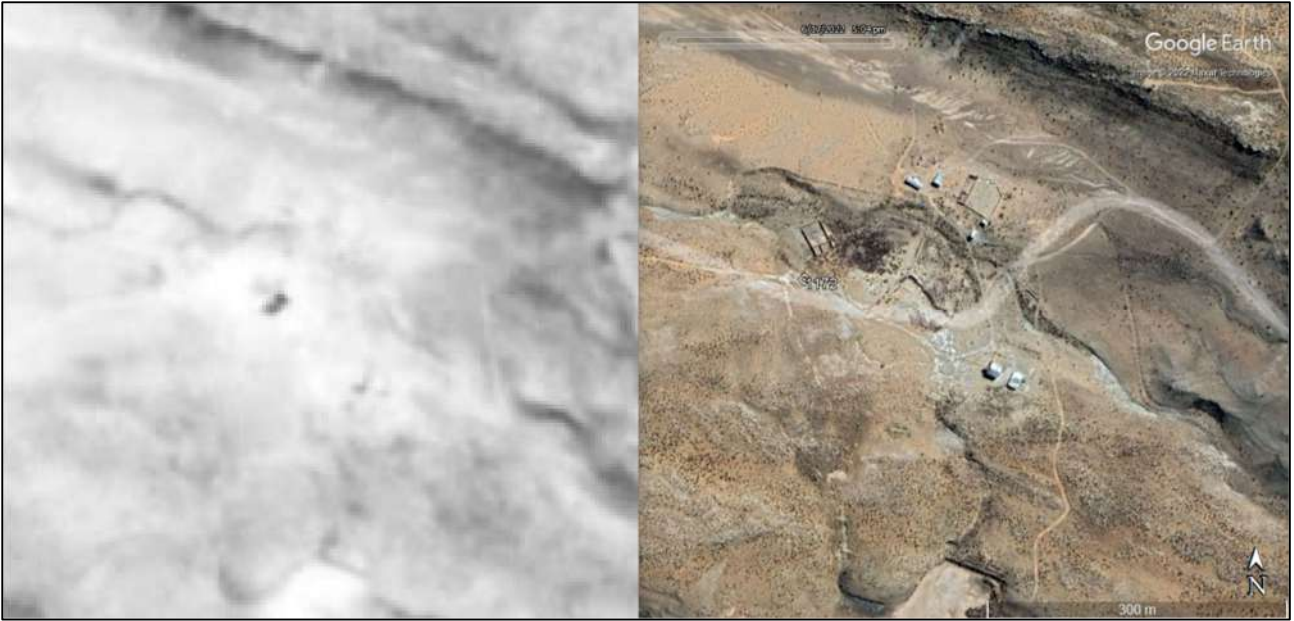


Figure 64: Comparative aerial photography from 1960 (450_011_04620) and 2014 (Google Earth) showing the Beerfontein farmstead (on the Remainder of Beerenvally 150).



Figure 65: Stone structure within the Beerfontein farmstead at waypoint 1171a.



Figure 66: Stone boundary wall in the Beerfontein farmstead area at waypoint 1172.

5.3. Statement of significance and provisional grading

In the context of heritage impact assessments, Section 38(3)(b) of the NHRA requires an assessment of the significance of all heritage resources. This is also useful here, however. In terms of Section 2(vi), “cultural significance” means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance. The reasons that a place may have cultural significance are outlined in Section 3(3) of the NHRA (see Section 2 above).

The Stone Age archaeological resources are deemed to have high cultural significance at the local level for their scientific value and can be graded up to IIIB with an artefact scatter, a rock art site and a Stone Age kraal complex all receiving this grade. The historical ruins are seen as of variably medium-high to low local significance for their architectural, historical and social values and are considered to be up to IIIB resources.

Graves are deemed to have high cultural significance at the local level for their social value. Although none were seen in the layout footprint, the possibility exists that graves could occur in the landscape and they would be allocated a grade of IIIA.

The farm complexes are of high or medium-high cultural significance for their architectural, historical and social values.

6. CONCLUSIONS

The field survey recorded many heritage resources within the WEF study area and a few along the powerline route. Most of the heritage resources described here are stone-walled sites. Due to the inadequacy of mitigating impacts to stone-walled features, avoidance is best. However, they could be recorded in detail and then destroyed if absolutely necessary. Table 3 lists all those resources that are located close to the final proposed layouts and indicates the mitigation that should be applied. Aerial views of each site are provided below with 50 m buffers.

Table 3: Summary list of heritage resources falling within or very close to the development footprints. *Note that non-archaeological features are not supposed to be graded according to the SAHRA system but an indicative grade is given here for convenience.

Way-point	Project	Report	Type of resource	Grade	Discussion	Mitigation & Management
1177-1202	WEF	This report and Halkett & Webley (2011)	Historical stone beacons	GPA	Turbine 20 has its hardstand lying within 10 m of three of the boundary beacons (Figure 67). These specific beacons are graded GPB but the overall alignment is GPA. The road to Turbine 20 passes between the beacons to the northeast and southwest of the turbine and should not impact on any of them. Further to the southwest between Turbines 15 and 01 the road goes out of the surveyed buildable area and follows the same alignment as the beacons. More beacons could occur there.	<ul style="list-style-type: none"> Archaeologist to check road layout between T15 and T01. Microsite infrastructure or conduct detailed recording of any affected features prior to destruction. Flag all features as no-go areas and monitor compliance.
1176	WEF	This report and Halkett & Webley (2011)	Historical stone-walled feature	GPA	Turbine 21 has its hardstand within 16 m of the stone-walled ruin at waypoint 1176. (Figure 68)	<ul style="list-style-type: none"> Feature to be marked as a no-go area and monitored for compliance.
n/a	WEF	This report and Halkett & Webley (2011)	Historical leiwater furrow	GPA	The WEF road between Turbines 4 and 22 crosses the historic leiwater furrow (Figure 69).	<ul style="list-style-type: none"> Install culvert to maintain functionality of furrow.
1297	WEF	This report and Halkett & Webley (2011)	Historical leiwater furrow	GPA	The WEF road between Turbines 4 and 22 crosses the historic leiwater furrow (Figure 70).	<ul style="list-style-type: none"> Install culvert to maintain functionality of furrow.
1302-1309	WEF	This report	LSA stone-walled features	IIIB	Turbine 23 has its hardstand within 25 m of the closest LSA kraal enclosure, but the other enclosures lie further away (Figure 71). The hardstand also extends out of the surveyed buildable area and lies very close to similar substrate as that in which the two kraal complexes lie (i.e. this one and the one at waypoints 1315 to 1318).	<ul style="list-style-type: none"> North-eastern edge of kraal complex to be marked as a no-go area and monitored for compliance. Archaeologist to check area adjacent to Turbine 23 for further features needing protection.
1165	powerline	This report and Orton (2017b)	Historic farm complex	IIIA*	The powerline runs along the road servitude through the Ou Plaas farm complex (Figure 72). Due to the high fences, no direct impacts are expected.	n/a
1167	powerline	This report and Orton (2017b)	Historic stone beacon	GPA	The powerline runs close to the stone beacon (Figure 73).	<ul style="list-style-type: none"> Beacon to be marked as a no-go area and monitored for compliance.

1168	powerline	This report and Orton (2017b)	Historic stone beacon	GPA	The powerline runs over the stone beacon (Figure 73).	<ul style="list-style-type: none"> • Beacon to be marked as a no-go area and monitored for compliance. • No pylon to be placed within 20 m of beacon.
1169-1171 & 1173	powerline	This report and Orton (2017b)	Historic farm complex	IIIB*	The powerline runs through the Scholtzenhof farm complex, spanning over the southern edge of the house at waypoint 1173 (Figure 74).	<ul style="list-style-type: none"> • No pylon to be placed within 20 m of house. • House to be marked as a no-go area and monitored for compliance.
1172	powerline	This report and Orton (2017b)	Historic farm complex	IIIB*	The powerline runs through the Beerfontein farm complex, making a turn towards the south immediately adjacent to a stone boundary wall (Figure 75).	<ul style="list-style-type: none"> • Corner pylon must be placed to the south of the farm access road. • Walling to be marked as a no-go area and monitored for compliance.
575	powerline	Orton (2017b)	Historical stone-walled feature	GPB	The powerline just intersects the 50 m buffer around this site. Impacts are not expected due to the distance between the site and the powerline (47 m).	n/a

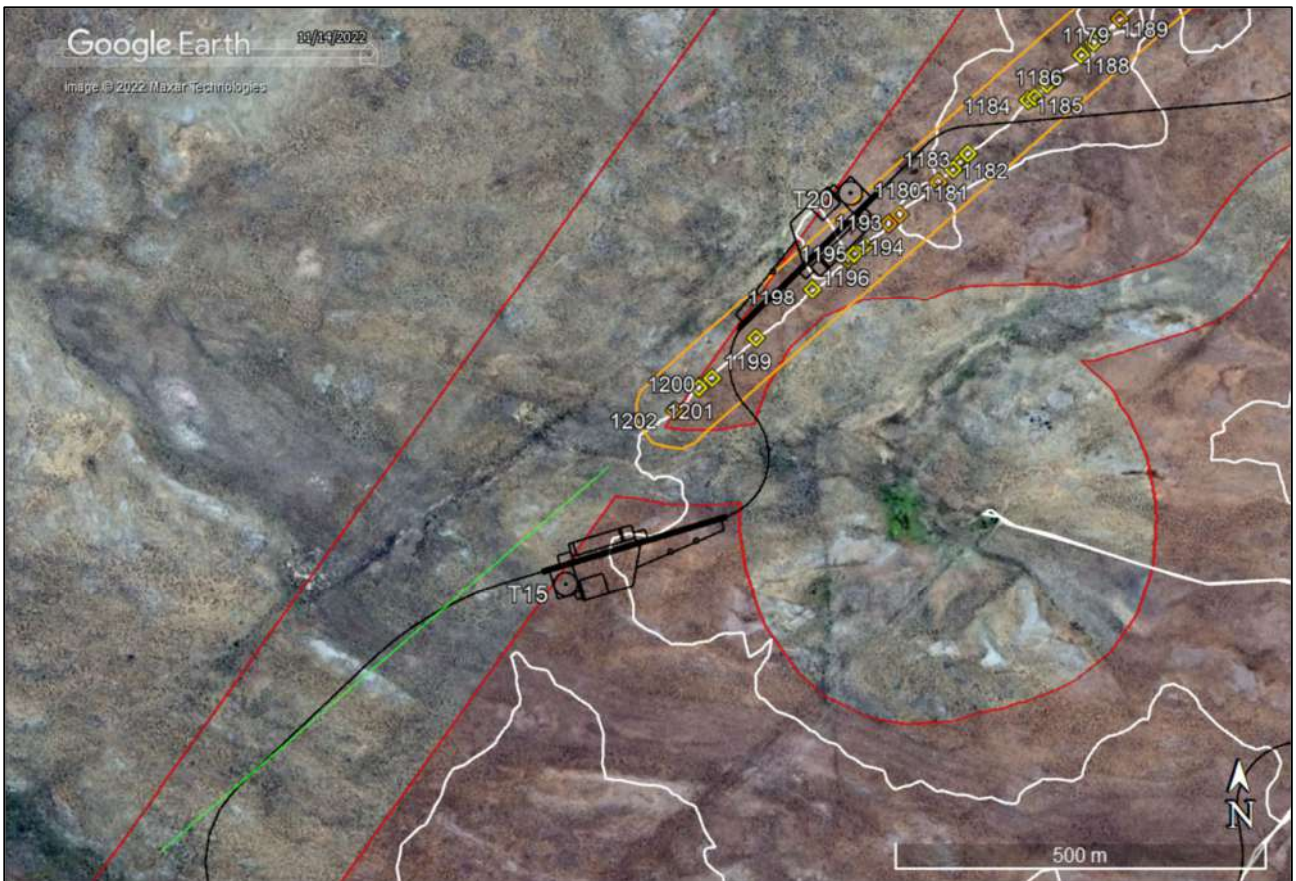


Figure 67: The vicinity of Turbines 15 and 20. The numbered waypoints indicate the mapped boundary beacons, while the green line shows the extension of their alignment. Although none were seen southwest of waypoint 1202, the survey (white lines) did not continue in that direction.



Figure 68: The vicinity of Turbine 21 and waypoint 1176.



Figure 69: The vicinity of the road between Turbines 4 and 22. The buffered archaeological sites will be safe from harm but the WEF road crosses the leiwater furrow (orange line).

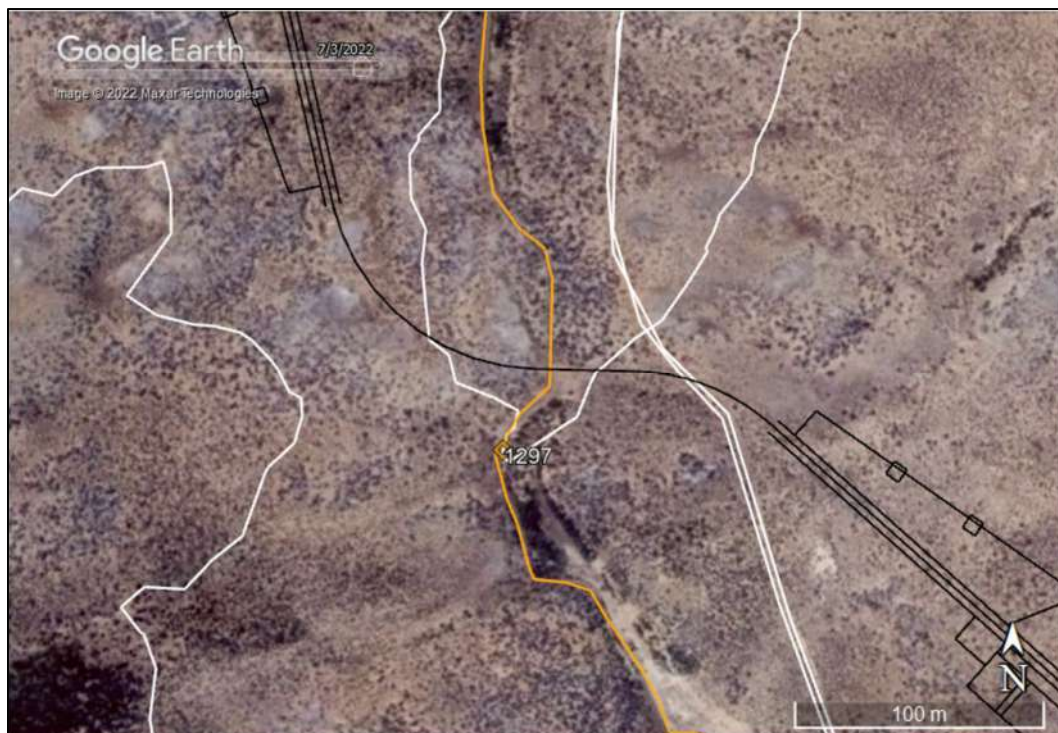


Figure 70: The vicinity of the road between Turbines 16 and 22. The WEF road crosses the leiwater furrow (orange line, waypoint 1297).

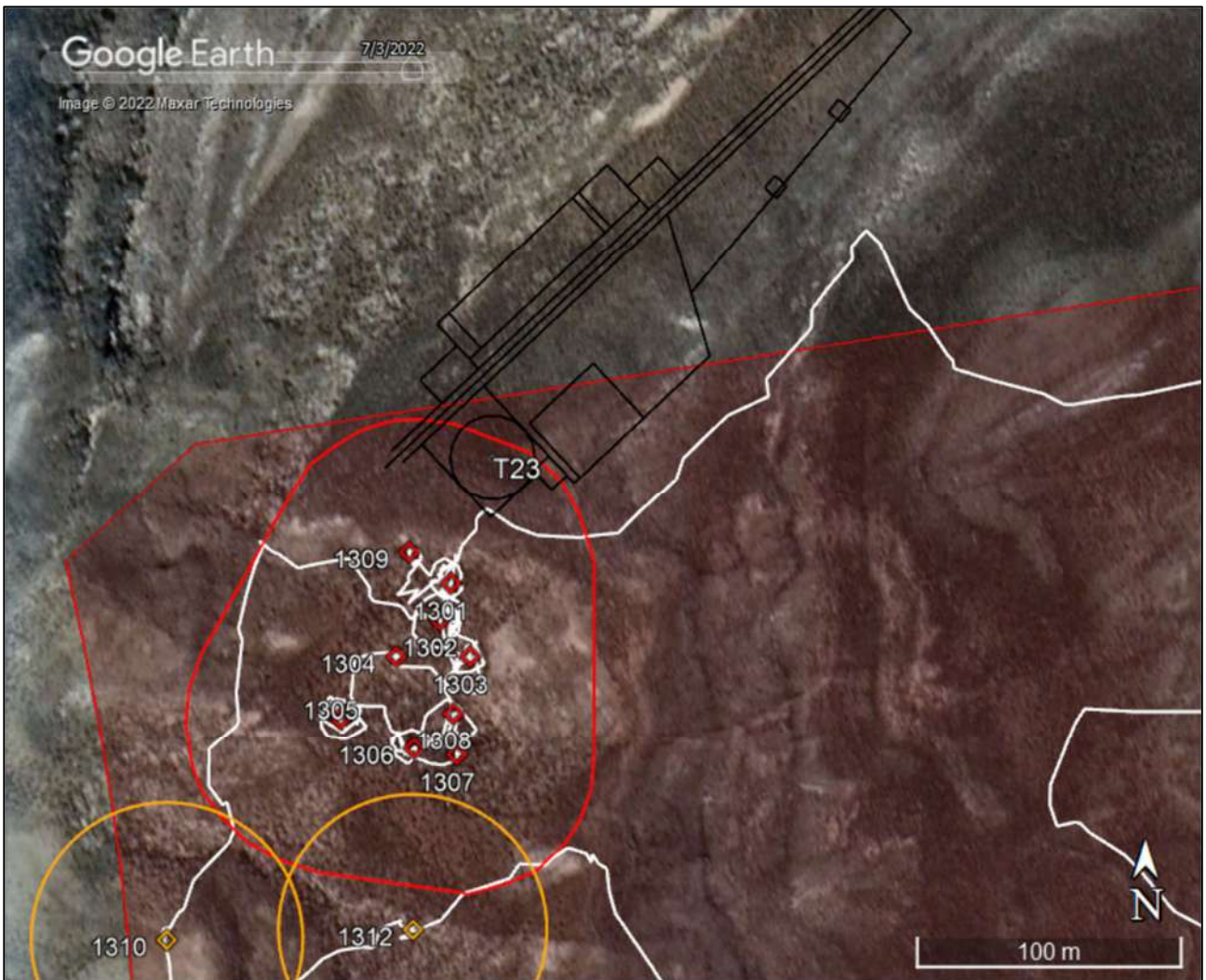


Figure 71: The vicinity of Turbine 23 and waypoints 1302 to 1309.

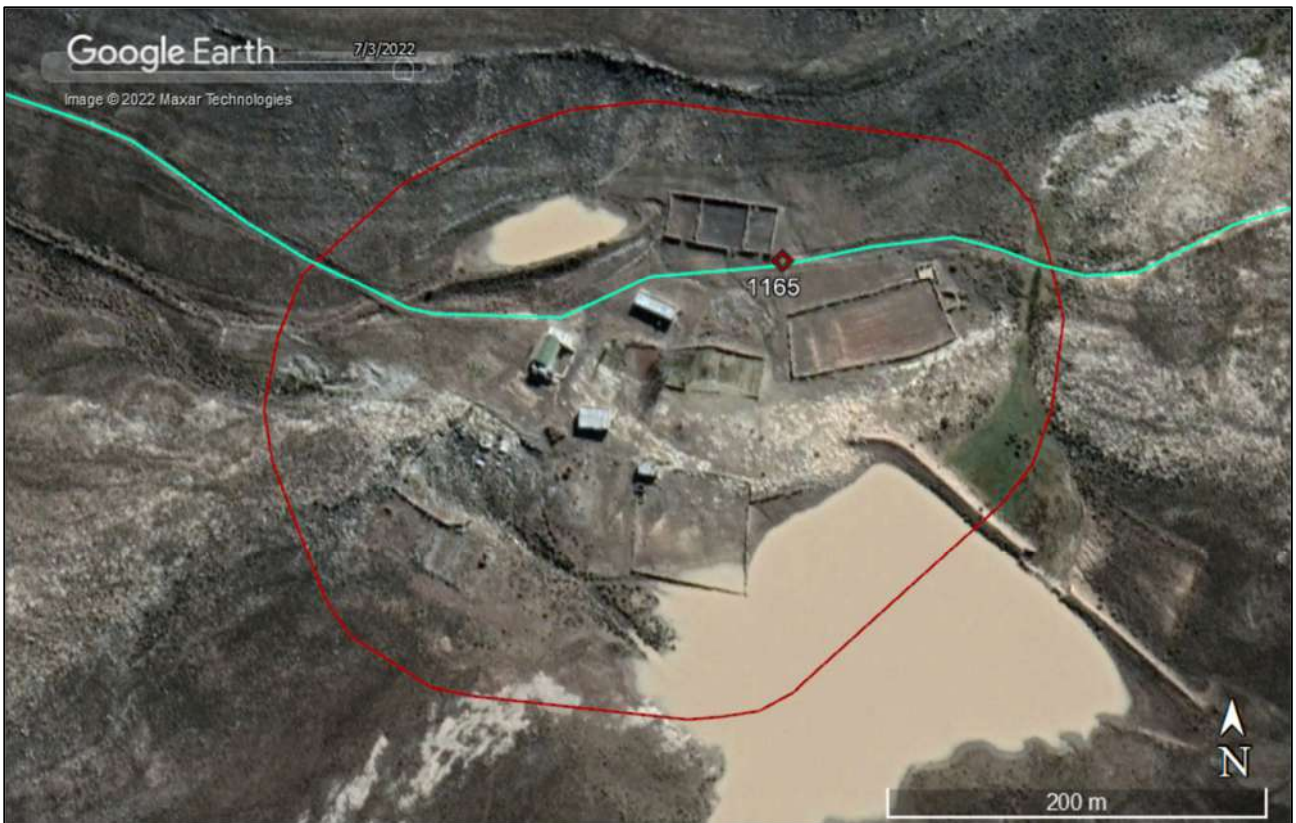


Figure 72: The powerline route (turquoise line) along the road servitude through the Ou Plaas farm complex at waypoint 1165.



Figure 73: The powerline route (turquoise line) passing waypoints 1167 and 1168.



Figure 74: The powerline route (turquoise line) along the road servitude through the Scholtzenhof farm complex at waypoints 1169-1171 and 1173.



Figure 75: The powerline route (turquoise line) through the Beerfontein farm complex at waypoint 1172.



Figure 76: The powerline route (turquoise line) past waypoint 1172.

It is clear that there are many heritage resources in close proximity to the WEF and its associated powerline. The layout as assessed here appears to avoid direct impacts to all known heritage resources, but some resources are within 10 m of the layout and care will be required to avoid impacts. Where possible, infrastructure should be moved slightly so as to increase the space between the heritage features and the project footprint. All heritage resources

7. RECOMMENDATIONS

It is recommended that the Sutherland WEF 2 should proceed to construction but subject to the following conditions:

- Wherever project infrastructure comes within 30 m of heritage resources the infrastructure should be microsited to get the distance between the resource and infrastructure as close to 30 m as possible. This applies to waypoints 1176, 1184, 1194-1199 inclusive, 1301 and 1309;
- Any heritage sites located within 30 m of the final layout should be physically flagged on site as no-go areas. This applies to the waypoints listed above unless infrastructure is moved beyond 30 m;
- The ECO must regularly (suggest at least weekly) monitor the flagged sites to ensure that the no-go areas are complied with;
- No stones are to be removed from any heritage site;
- All construction work must occur within the demarcated project footprints and vehicles may not move outside of these areas;
- A Permit application must be lodged with SAHRA for any mitigation required; and
- If any archaeological material or human burials are uncovered during the course of development then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist. Such heritage is the property of the state and may require excavation and curation in an approved institution.

8. REFERENCES

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APPENDIX 1 – Curriculum Vitae



Curriculum Vitae

Jayson David John Orton

ARCHAEOLOGIST AND HERITAGE CONSULTANT

Contact Details and personal information:

Address: 40 Brassie Street, lakeside, 7945
Telephone: (021) 788 1025
Cell Phone: 083 272 3225
Email: jayson@asha-consulting.co.za

Birth date and place: 22 June 1976, Cape Town, South Africa
Citizenship: South African
ID no: 760622 522 4085
Driver's License: Code 08
Marital Status: Married to Carol Orton
Languages spoken: English and Afrikaans

Education:

SA College High School	Matric	1994
University of Cape Town	B.A. (Archaeology, Environmental & Geographical Science) 1997	
University of Cape Town	B.A. (Honours) (Archaeology)*	1998
University of Cape Town	M.A. (Archaeology)	2004
University of Oxford	D.Phil. (Archaeology)	2013

*Frank Schweitzer memorial book prize for an outstanding student and the degree in the First Class.

Employment History:

Spatial Archaeology Research Unit, UCT	Research assistant	Jan 1996 – Dec 1998
Department of Archaeology, UCT	Field archaeologist	Jan 1998 – Dec 1998
UCT Archaeology Contracts Office	Field archaeologist	Jan 1999 – May 2004
UCT Archaeology Contracts Office	Heritage & archaeological consultant	Jun 2004 – May 2012
School of Archaeology, University of Oxford	Undergraduate Tutor	Oct 2008 – Dec 2008
ACO Associates cc	Associate, Heritage & archaeological consultant	Jan 2011 – Dec 2013
ASHA Consulting (Pty) Ltd	Director, Heritage & archaeological consultant	Jan 2014 –

Professional Accreditation:

Association of Southern African Professional Archaeologists (ASAPA) membership number: 233

CRM Section member with the following accreditation:

- Principal Investigator: Coastal shell middens (awarded 2007)
Stone Age archaeology (awarded 2007)
Grave relocation (awarded 2014)
- Field Director: Rock art (awarded 2007)
Colonial period archaeology (awarded 2007)

Association of Professional Heritage Practitioners (APHP) membership number: 43

- Accredited Professional Heritage Practitioner

➤ **Memberships and affiliations:**

South African Archaeological Society Council member	2004 – 2016
Assoc. Southern African Professional Archaeologists (ASAPA) member	2006 –
UCT Department of Archaeology Research Associate	2013 –
Heritage Western Cape APM Committee member	2013 –
UNISA Department of Archaeology and Anthropology Research Fellow	2014 –
Fish Hoek Valley Historical Association	2014 –
Kalk Bay Historical Association	2016 –
Association of Professional Heritage Practitioners member	2016 –

Fieldwork and project experience:

Extensive fieldwork and experience as both Field Director and Principle Investigator throughout the Western and Northern Cape, and also in the western parts of the Free State and Eastern Cape as follows:

Feasibility studies:

- Heritage feasibility studies examining all aspects of heritage from the desktop

Phase 1 surveys and impact assessments:

- Project types
 - Notification of Intent to Develop applications (for Heritage Western Cape)
 - Desktop-based Letter of Exemption (for the South African Heritage Resources Agency)
 - Heritage Impact Assessments (largely in the Environmental Impact Assessment or Basic Assessment context under NEMA and Section 38(8) of the NHRA, but also self-standing assessments under Section 38(1) of the NHRA)
 - Archaeological specialist studies
 - Phase 1 archaeological test excavations in historical and prehistoric sites
 - Archaeological research projects
- Development types
 - Mining and borrow pits
 - Roads (new and upgrades)
 - Residential, commercial and industrial development
 - Dams and pipe lines
 - Power lines and substations
 - Renewable energy facilities (wind energy, solar energy and hydro-electric facilities)

Phase 2 mitigation and research excavations:

- ESA open sites
 - Duinefontein, Gouda, Namaqualand
- MSA rock shelters
 - Fish Hoek, Yzerfontein, Cederberg, Namaqualand
- MSA open sites
 - Swartland, Bushmanland, Namaqualand
- LSA rock shelters
 - Cederberg, Namaqualand, Bushmanland
- LSA open sites (inland)
 - Swartland, Franschhoek, Namaqualand, Bushmanland
- LSA coastal shell middens
 - Melkbosstrand, Yzerfontein, Saldanha Bay, Paternoster, Dwarskersbos, Infanta, Knysna, Namaqualand
- LSA burials
 - Melkbosstrand, Saldanha Bay, Namaqualand, Knysna
- Historical sites
 - Franschhoek (farmstead and well), Waterfront (fort, dump and well), Noordhoek (cottage), variety of small excavations in central Cape Town and surrounding suburbs
- Historic burial grounds
 - Green Point (Prestwich Street), V&A Waterfront (Marina Residential), Paarl

Awards:

Western Cape Government Cultural Affairs Awards 2015/2016: Best Heritage Project.

APPENDIX 2 – Mapping

The finds are mapped as follows:

Grade IIIA = dark red numbered symbols and buffers

Grade IIIB = red numbered symbols and buffers

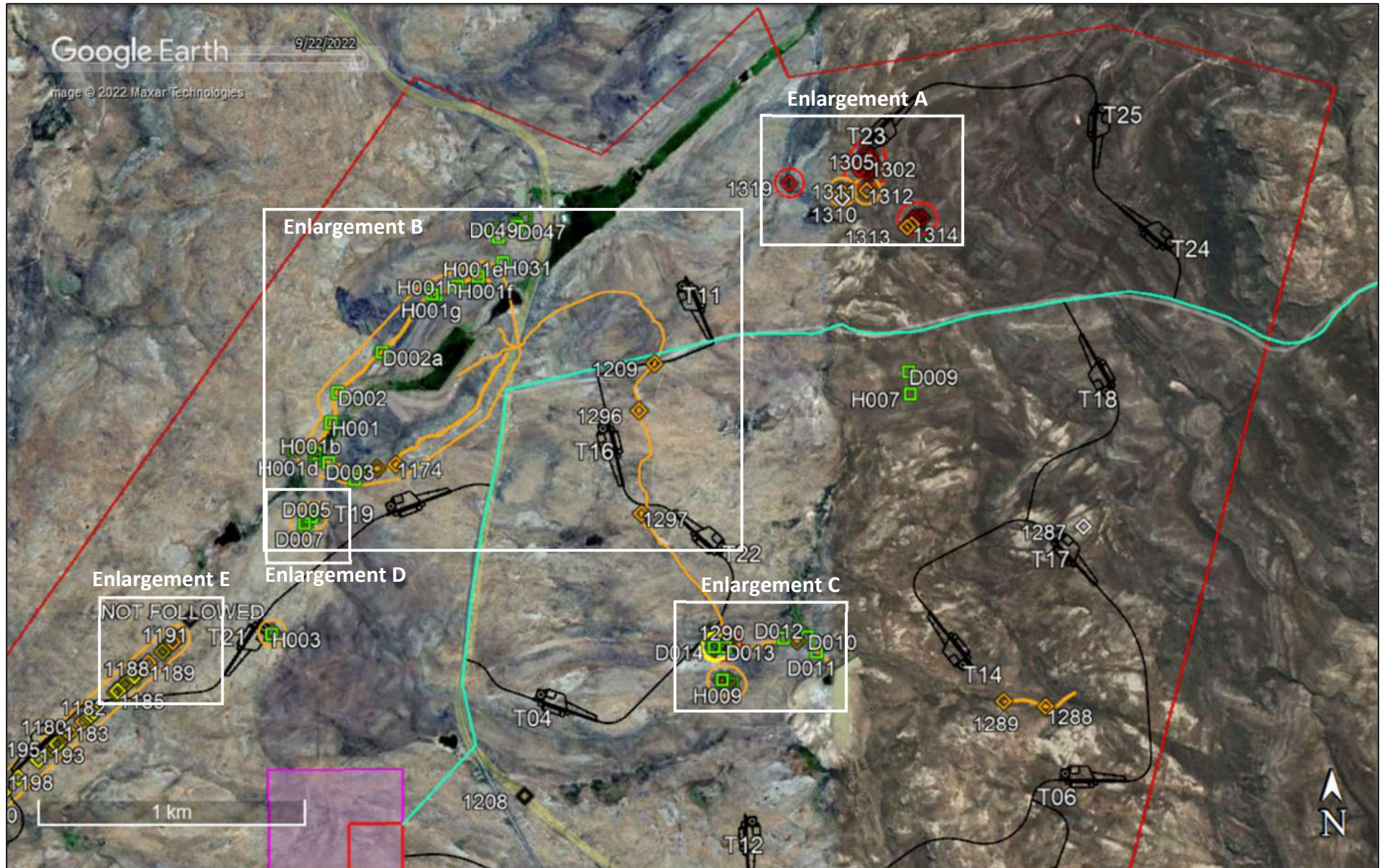
Grade GPA = orange numbered symbols and buffers

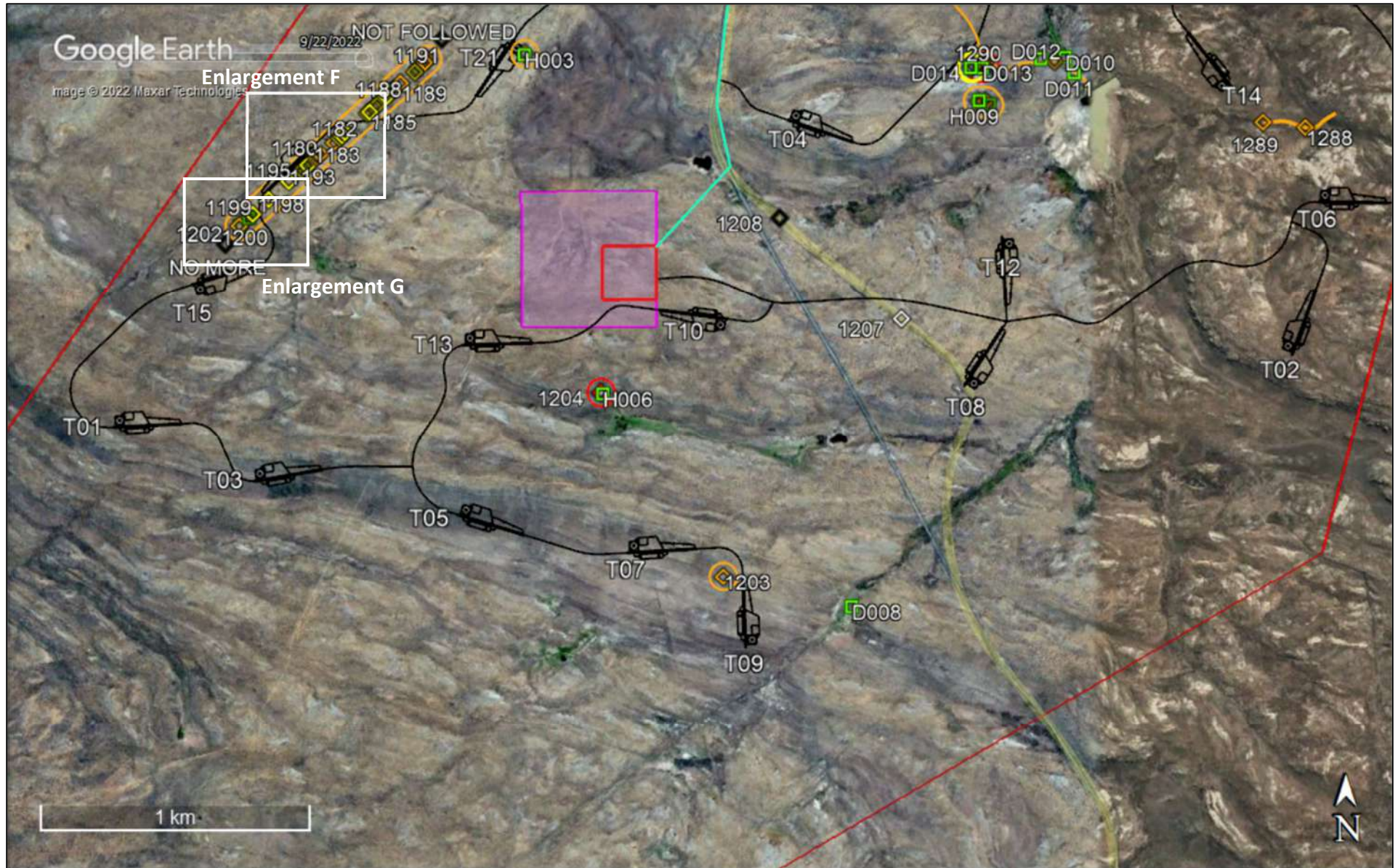
Grade GPB = yellow numbered symbols and buffers

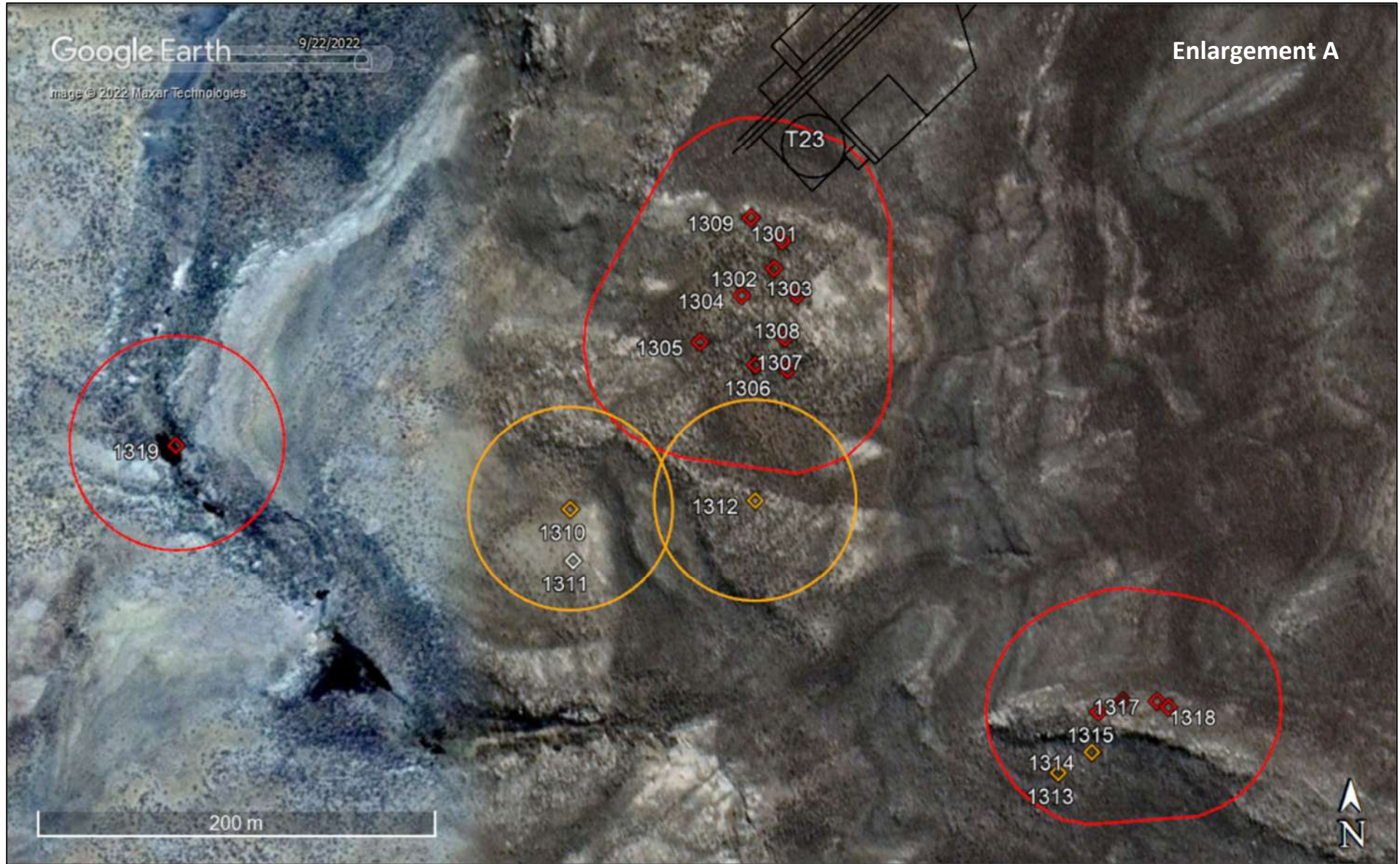
Grade GPC = white numbered symbols and buffers

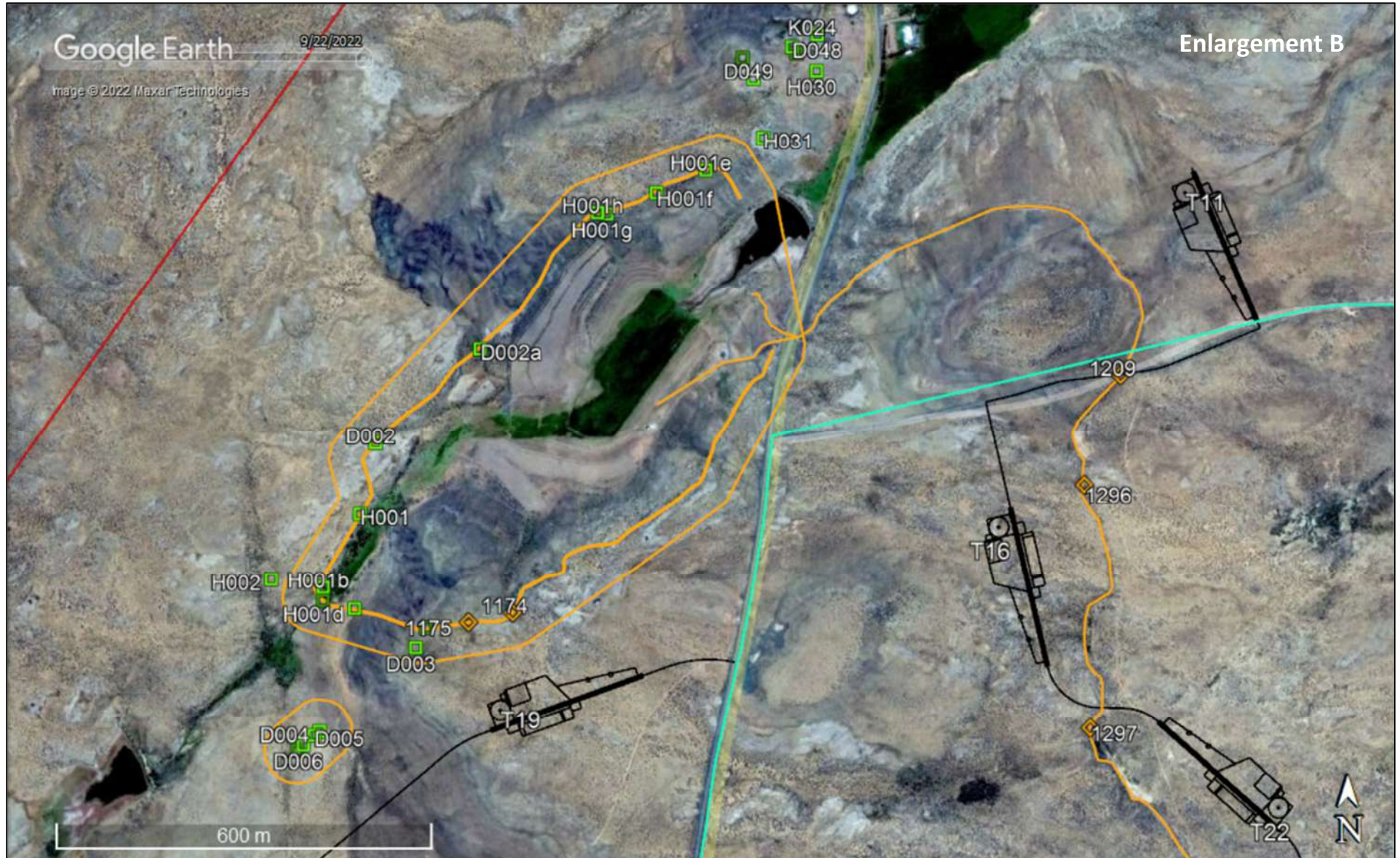
Green numbered symbols are finds from Halkett & Webley (2011). These finds were not graded at the time of their writing. However, in the mapping below appropriate grade buffers have been added. Some of the site were rerecorded but others were not and the grade is a est estimate from the descriptions Halkett and Webley provided.

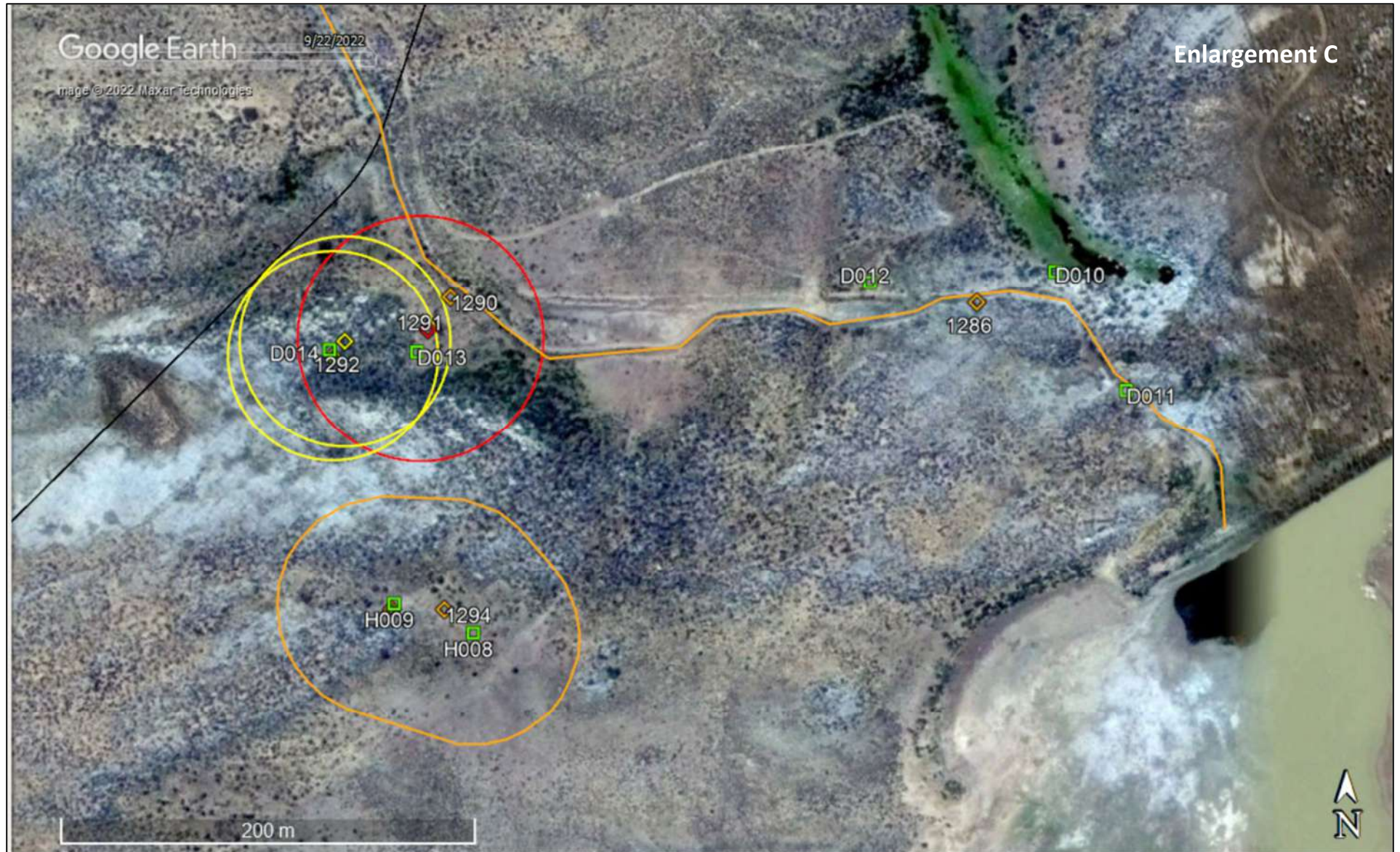
All buffers are mapped at 50 m













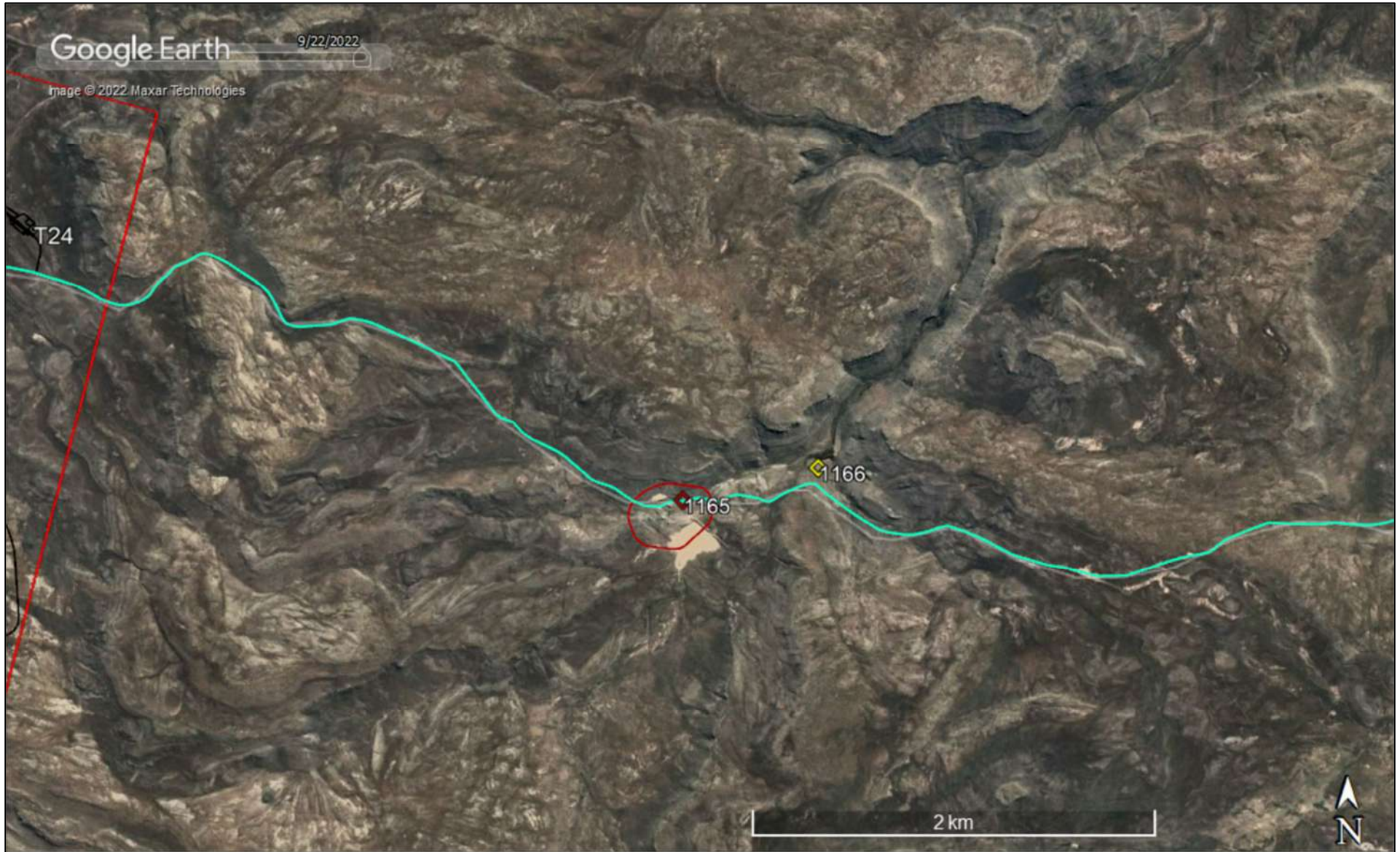


Note that “NOT FOLLOWED” indicates that further beacons may well be present in that direction but their alignment was not followed in that direction.





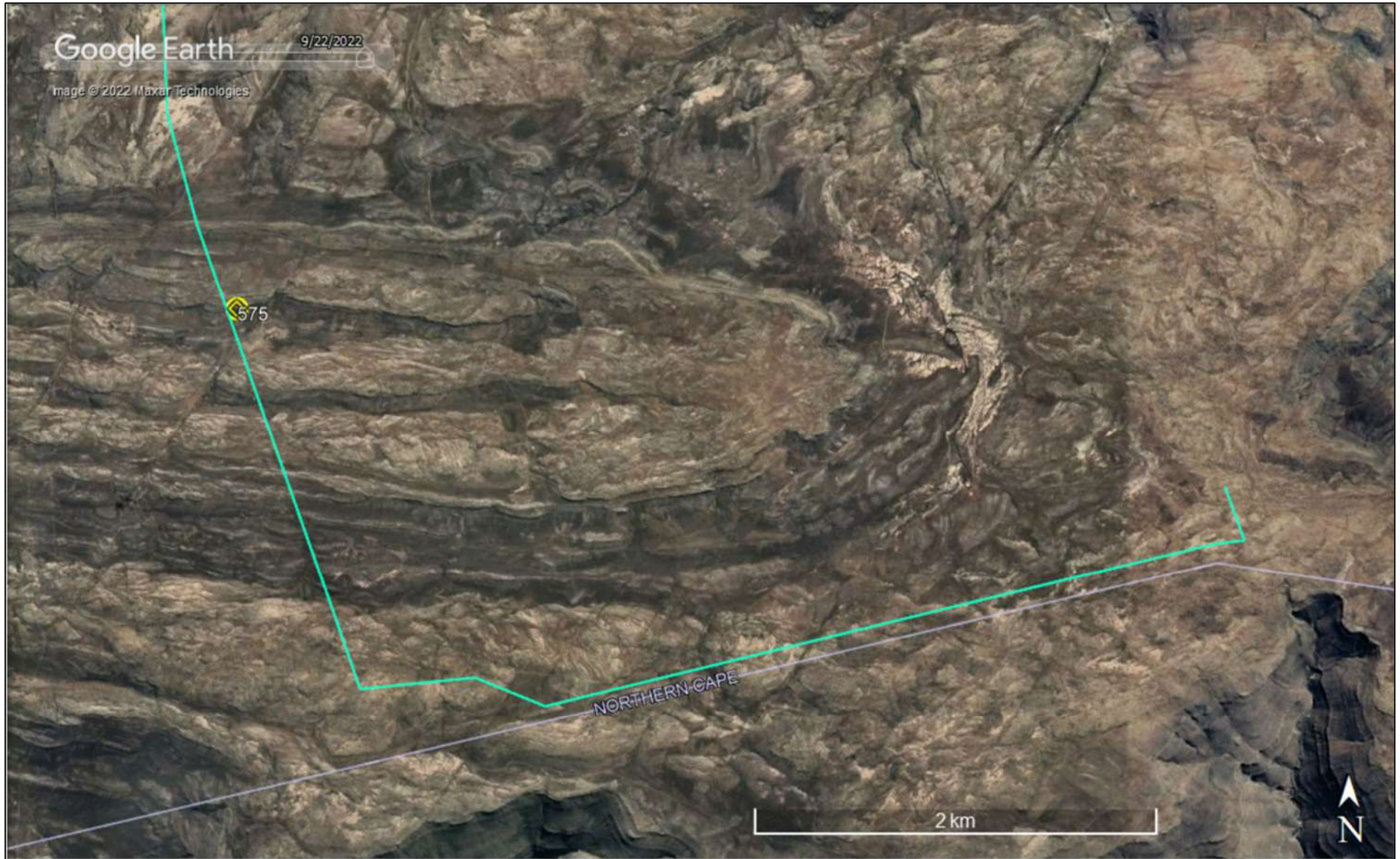
Note that “NO MORE” indicates that no further beacons were seen in that direction, but that the survey did not continue much further.



Central part of powerline



Northeast part of powerline



Southeast part of powerline

