



CTS HERITAGE

HERITAGE SCREENER

CTS Reference Number:	CTS22_080	
SAHRIS Case		
Client:	ACED	
Date:	May 2022	
Title:	Proposed development of the Castle to Hydra OHL near De Aar	

Figure 1a. Satellite map indicating the location of the proposed development in the Northern Cape Province

CTS Heritage Recommendation:	<p>RECOMMENDATION</p> <p>Based on the information available, the area proposed for development has been thoroughly assessed and we therefore know that significant archaeological, palaeontological and cultural landscape heritage resources are located within the grid corridor. No impact to these significant resources should take place as long as the recommendations included in Gribble and Euston Browne (2021) are implemented. As the area has been thoroughly surveyed, it is recommended that no further heritage assessments are required in terms of section 38(3) of the NHRA. The attached Fossil Chance Find Protocol must be implemented for the duration of construction activities and the recommendations included in Gribble and Euston-Browne (2021) must be implemented (Appendix 1.2).</p>
------------------------------	---

CTS Heritage

16 Edison Way, Century City, 7441

Tel: +27 (0)87 073 5739 Email: info@ctsheritage.com Web: www.ctsheritage.com



CTS HERITAGE

1. Proposed Development Summary

The Proponent obtained Environmental Authorisation (EA) for the construction of the proposed Castle WEF and associated infrastructure, near De Aar (DEA ref: 14/12/16/3/3/2/278) on 8 May 2015. Subsequently the EA has been amended several times¹ to account for changes to the proposed project's scope. Moreover, an EA for a proposed OHL from Castle to the Hydra MTS was obtained by the proponent (DEA ref: 14/12/16/3/3/1/1351), on 5 October 2018. During the several years ensuing these EAs the number of Renewable Energy (RE) developments and associated infrastructure such as transmission lines planned for around the town of De Aar (specifically the Hydra MTS) has increased significantly. This can mainly be attributed to two factors, the availability of RE resources and ability of RE developments to feed into the national grid at the Hydra MTS. The congestion of RE infrastructure has subsequently led to the OHL authorised (DEA ref: 14/12/16/3/3/1/1351) to evacuate electricity generated from the Castle WEF to become unfeasible. Consequently, the Proponent has identified a feasible alternative OHL route to connect the Castle WEF to the Hydra MTS. The new alternative includes in part a new OHL (Section A) and in part the upgrading of an existing OHL (Section B) as well as a small section that could potentially feed into the planned (authorised but not built) De Aar South WEF substation (Section C).

The site of the Castle WEF which the proposed OHL will connect to is located approximately 26 kilometres (km) east of De Aar and the existing Hydra MTS is approximately 7 km southeast of De Aar, in the Northern Cape Province (Figure 1). The site is bordered in the west by the N10 from where access can be gained through unsurfaced roads and jeep tracks. The entire proposed OHL is situated in the Pixley ka Seme District Municipality and the majority within Emthanjeni Local Municipality (Ward 6) although a small section of the proposed eastern section of the OHL falls within the Renosterberg Local Municipality (Ward 1). The OHL will cross over several farm portions as provided below.

The proposed development entails the construction of an OHL required to connect the Castle WEF to the national Eskom electricity grid at the Hydra MTS. The Proponent (or their successor in title) proposes to develop the grid connection infrastructure under a Self- Build agreement with Eskom. It is anticipated that construction would commence within 5 years of the date of authorisation (if granted), and the construction phase would last approximately 6-18 months. Once construction of the grid connection infrastructure is complete, it is envisaged that the infrastructure (and the associated Environmental Authorisation, if granted) will be ceded to Eskom as per Eskom's requirements. Eskom is thus expected to be the eventual owner of the infrastructure and will be responsible for the long-term operation and maintenance of the grid connection infrastructure. Alternately, pending confirmation from Eskom, part or all of the grid connection infrastructure will be owned and maintained by the Proponent instead of Eskom (i.e. Own-Build agreement).

The proposed infrastructure is expected to be permanent and will remain in place for the duration of the lifespan of the associated Castle WEF (20 years or more). Note that the construction of the proposed grid connection infrastructure is dependent on the construction timelines of the associated Castle WEF, which are not yet known. If/when the WEF are decommissioned at some point in the future, the grid connection infrastructure may also be decommissioned. The owner of the grid connection infrastructure (Eskom, or their successor in title) would be responsible for the decommissioning phase.

CTS Heritage

16 Edison Way, Century City, 7441

Tel: +27 (0)87 073 5739 Email: info@ctsheritage.com Web: www.ctsheritage.com



CTS HERITAGE

Table 1: Project Component Details

Component	Description
Overhead Powerline (OHL)	<p>132kV to 400kV single- or double-circuit Extending from the authorised Castle WEF collector substation to the Eskom Hydra MTS. OHL will be located within a servitude of up to 32m wide to be positioned within a 300m wide corridor (a 300m wide corridor assessed as part of this BA to allow micro-siting). Total Length ≈25,8km</p> <ul style="list-style-type: none"> ● Section A≈13,1km new OHL ● Section B ≈12,4km upgrading existing 132kV OHL from the De Aar South WEF to an up to 400kV maximum capacity. ● Section C ≈300m from Section A to the proposed De Aar 2 South Switching Station <p>Temporary 132kV OHL of ≈12,4km to be constructed alongside the existing De Aar South OHL to be upgraded as a temporary bypass.</p>
OHL Pylons	<p>Up to 45m in height (most structures will be up to 32m tall, only increasing to up to 45m when crossing the railway line, existing overhead transmission line and public road (all adjacent the Hydra MTS), depending on the minimum clearance specified by the road, OHL and rail authorities). Monopole (Self-supporting or stayed) and/or lattice may be used. Disturbance footprint per pylon of up to 10m by 10m (100m²)</p>
OHL footprint	<p>Length ≈25,8km Construction road / service track (jeep track) width ≈4m (or less) OHL footprint ≈10,32ha (25,8km x 4m), (consideration must be given that part of this road will use existing farm roads and/or WEF roads) Approximate number of pylons (based on average 150m average between pylons) ≈172 Pylon's disturbance footprint ≈1,72ha (172 x 100m²)</p>
Laydown Areas	<p>Temporary laydown area of ≈5000m² will be required (authorised Castle WEF Laydown areas to be utilised).</p>
Site Access	<p>The existing approved access roads to the Castle WEF substation will be used to access the proposed Section A adjacent to the authorised Castle WEF. Section A and C may require a service track (jeep track) along the OHL route for construction and maintenance purposes. Section B (upgrade section) and the bypass OHL will use existing tracks as far as possible.</p>

CTS Heritage

16 Edison Way, Century City, 7441

Tel: +27 (0)87 073 5739 Email: info@ctsheritage.com Web: www.ctsheritage.com



CTS HERITAGE

2. Application References

Name of relevant heritage authority(s)	SAHRA
Name of decision making authority(s)	DFFE

3. Property Information

Latitude / Longitude	30°39'10.26"S 24°11'0.82"E
Erf number / Farm number	Portion 13 of Farm 165 Vendussie Kuil Portion 12 of Farm 165 Vendussie Kuil Portion 3 of Farm 5 Wagt en Bittje (Hydra) Portion 1 of Farm 5 Wagt en Bittje Remainder of Farm 5 Wagt en Bittje Remainder of Farm 144 Hydra Portion 3 of Farm 3 Carolus Poort Portion 4 of Farm 3 Carolus Poort Portion 2 of Farm 3 Carolus Poort Remainder of Farm 2 Slingers Hoek Portion 2 of Farm 2 Slingers Hoek
Local Municipality	Emthanjeni
District Municipality	Pixley ka Seme
Province	Northern Cape
Current Use	Agriculture with approved PV facility
Current Zoning	Agriculture

4. Nature of the Proposed Development

Depth of excavation (m)	TBA
Height of development (m)	Max 45m
Total Area	26km x300m corridor

CTS Heritage

16 Edison Way, Century City, 7441

Tel: +27 (0)87 073 5739 Email: info@ctsheritage.com Web: www.ctsheritage.com



CTS HERITAGE

5. Category of Development

x	Triggers: Section 38(8) of the National Heritage Resources Act
	Triggers: Section 38(1) of the National Heritage Resources Act
x	1. Construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier over 300m in length.
	2. Construction of a bridge or similar structure exceeding 50m in length.
	3. Any development or activity that will change the character of a site-
x	a) exceeding 5 000m ² in extent
	b) involving three or more existing erven or subdivisions thereof
	c) involving three or more erven or divisions thereof which have been consolidated within the past five years
	4. Rezoning of a site exceeding 10 000m ²
	5. Other (state):

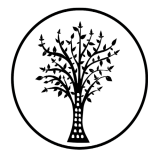
6. Additional Infrastructure Required for this Development

Additional infrastructure listed under project summary.

CTS Heritage

16 Edison Way, Century City, 7441

Tel: +27 (0)87 073 5739 Email: info@ctsheritage.com Web: www.ctsheritage.com



CTS HERITAGE

7. Mapping (please see Appendix 3 and 4 for a full description of our methodology and map legends)

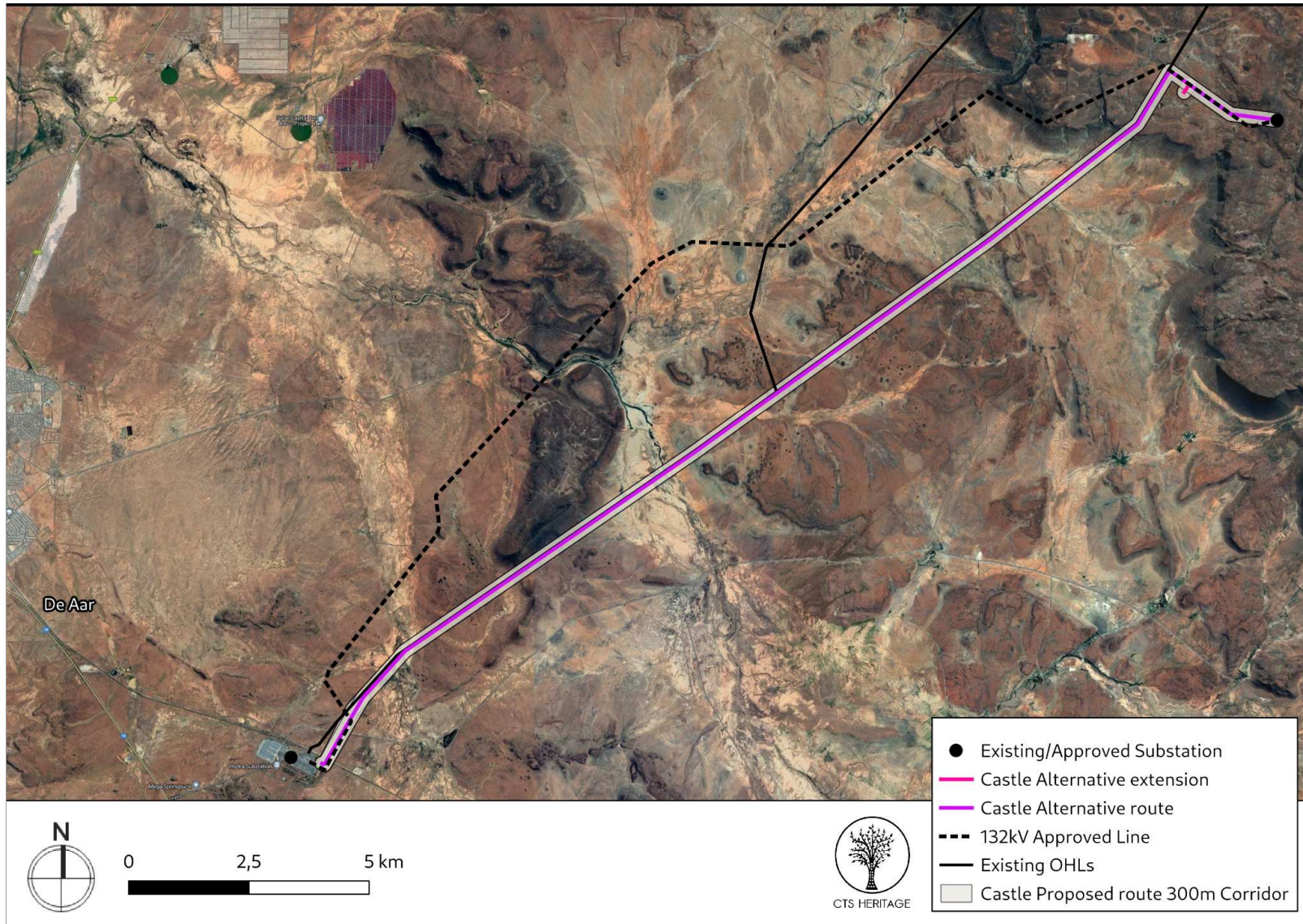
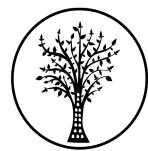


Figure 1b Overview Map. Satellite image (2019) indicating the proposed development area at closer range.

CTS Heritage

16 Edison Way, Century City, 7441

Tel: +27 (0)87 073 5739 Email: info@ctsheritage.com Web: www.ctsheritage.com



CTS HERITAGE

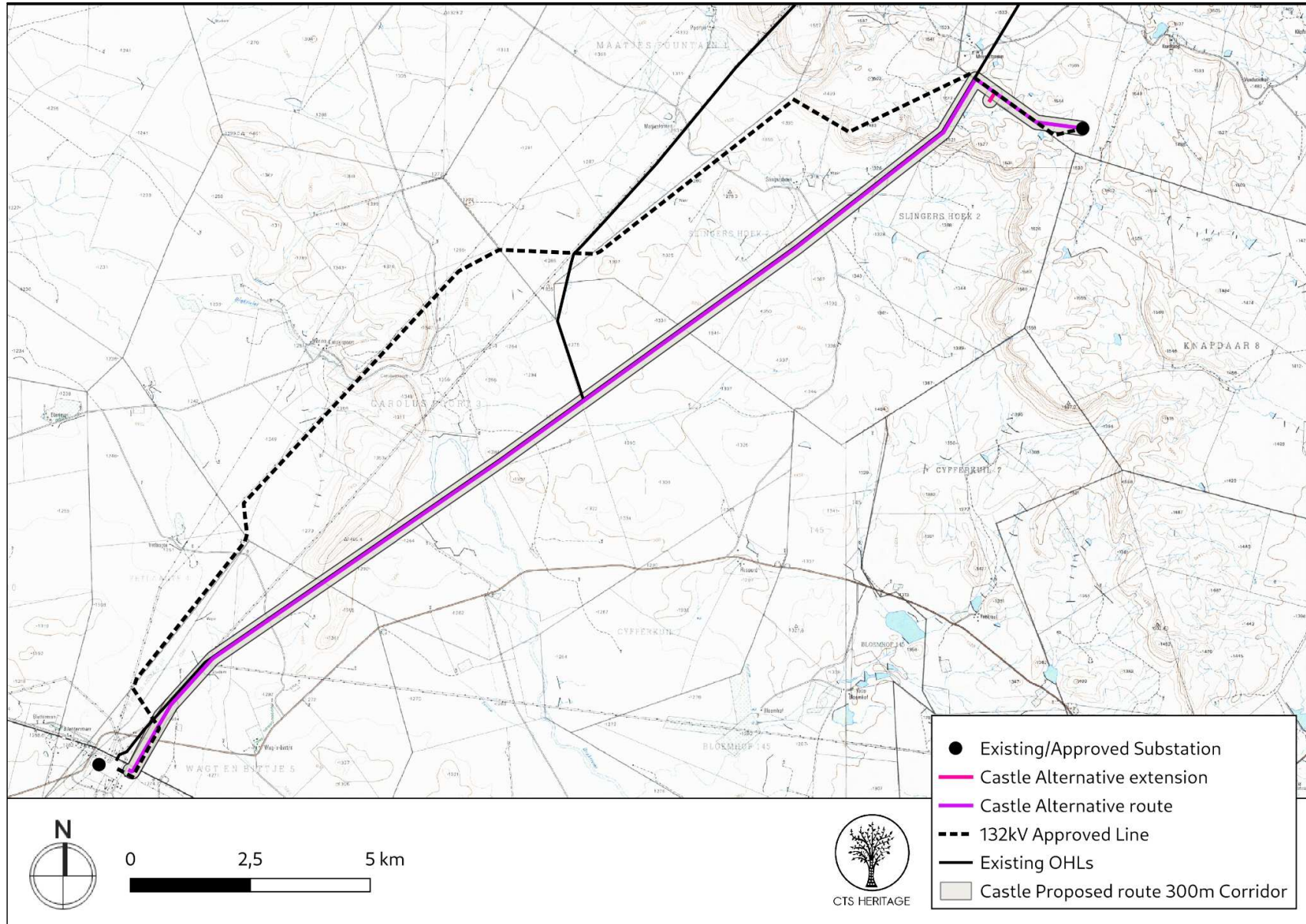


Figure 1c Overview Map. 1:50 000 Topo Map indicating the proposed development area at closer range.

CTS Heritage

16 Edison Way, Century City, 7441

Tel: +27 (0)87 073 5739 Email: info@ctsheritage.com Web: www.ctsheritage.com

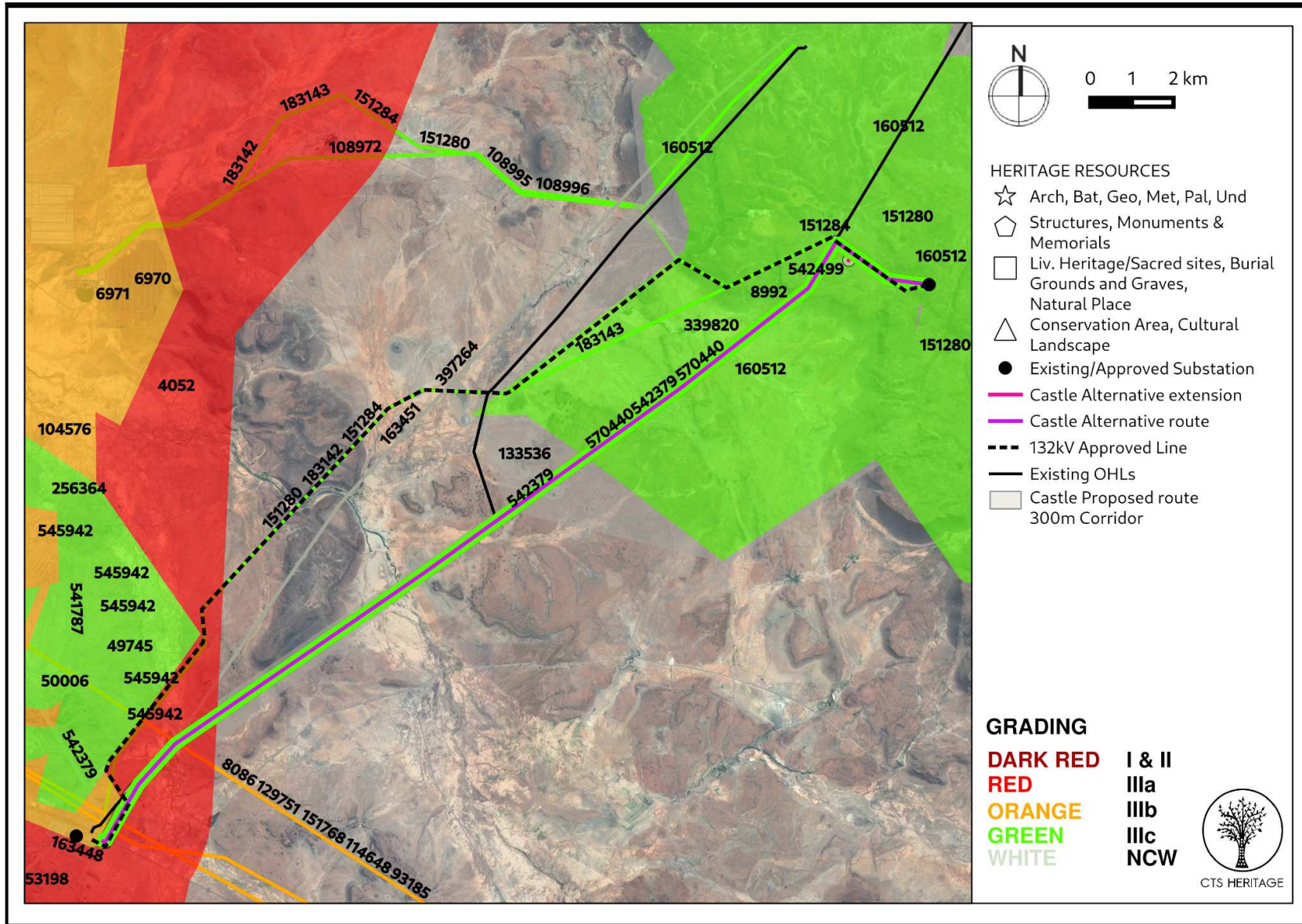


Figure 2a. Previous HIAs Map. Previous Heritage Impact Assessments surrounding the proposed development area within 10km, with SAHRIS NIDS indicated. Please see Appendix 2 for a full reference list.

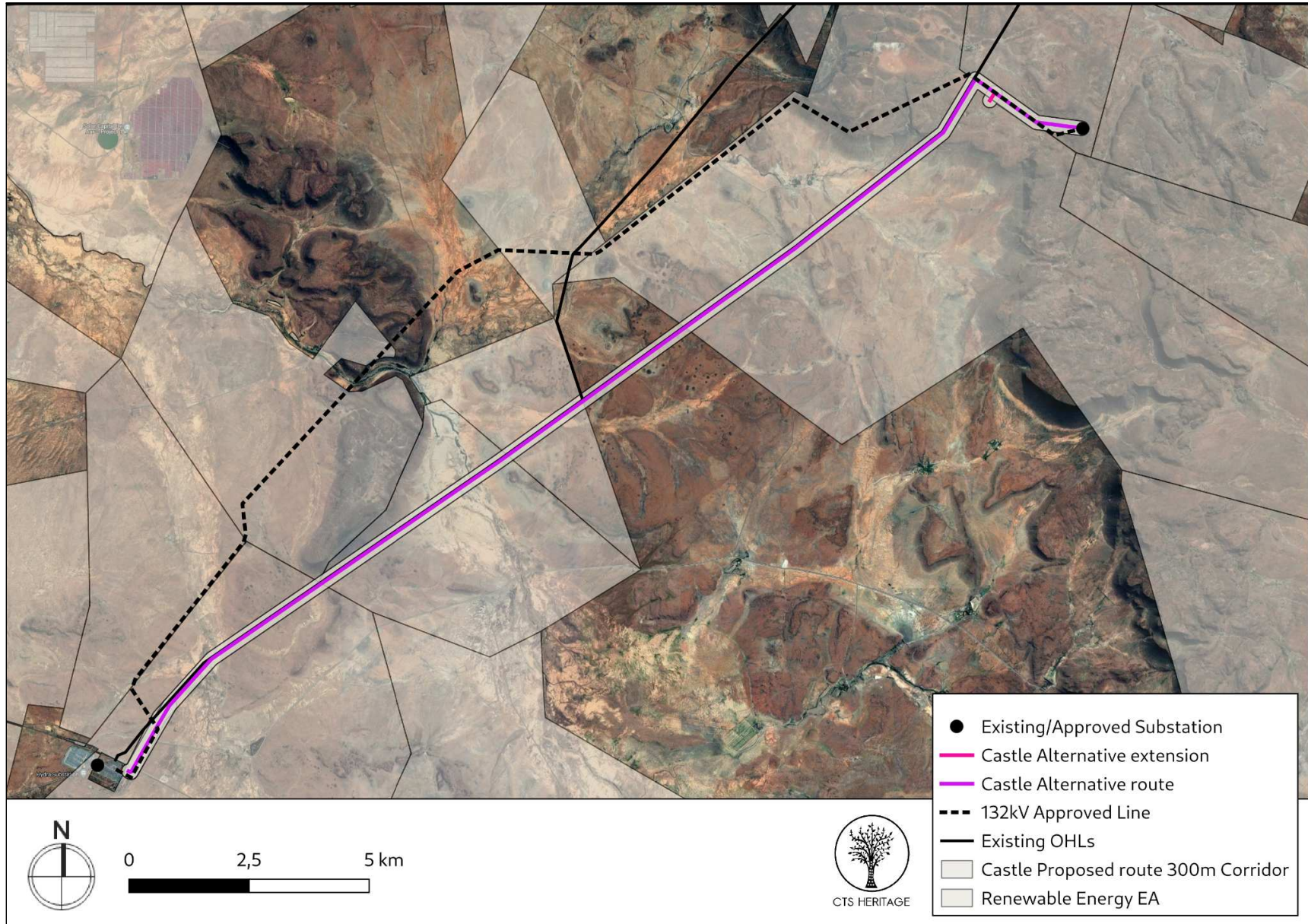


Figure 2b. Environmental Authorisations. Previous Environmental Authorisations issued for Renewable Energy Projects in the vicinity of the proposed development

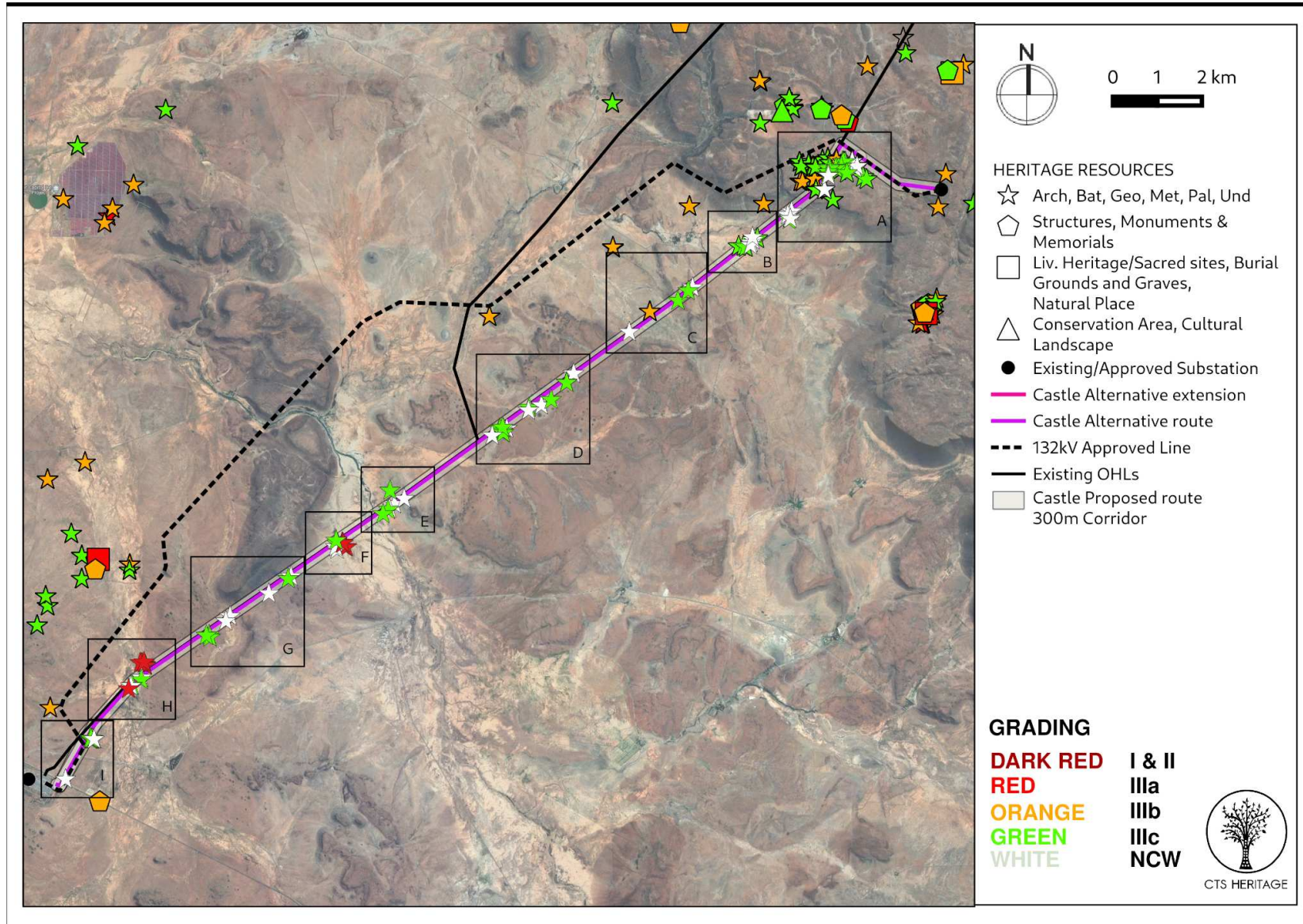


Figure 3. Heritage Resources Map. Heritage Resources previously identified in and near the study area, with SAHRIS Site IDs indicated. Please See Appendix 4 for a full description of heritage resource types.

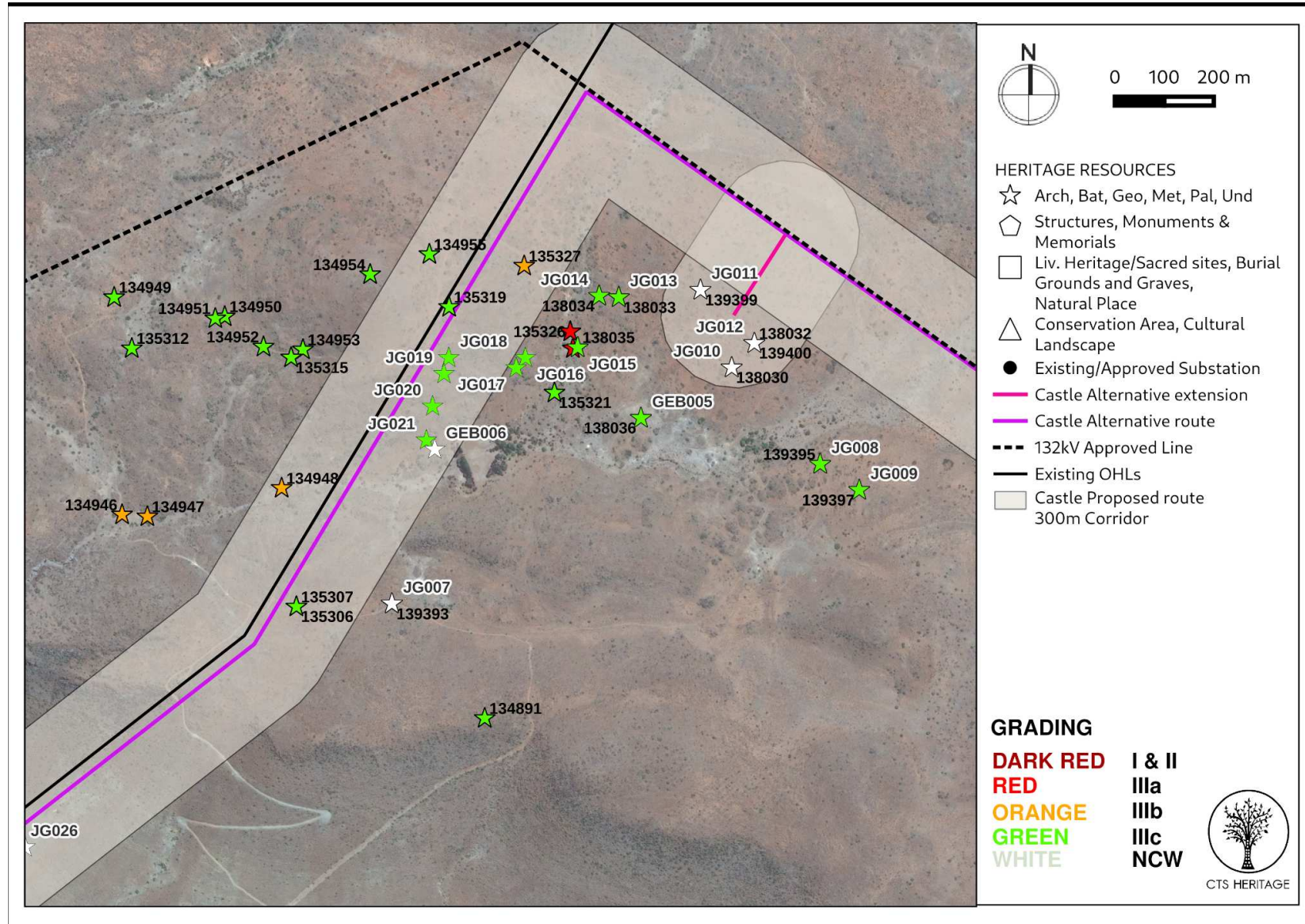


Figure 3a. Heritage Resources Map. Inset A. Site names with white buffer extracted from Gribble and Euston-Browne (2021) - Appendix 1.2

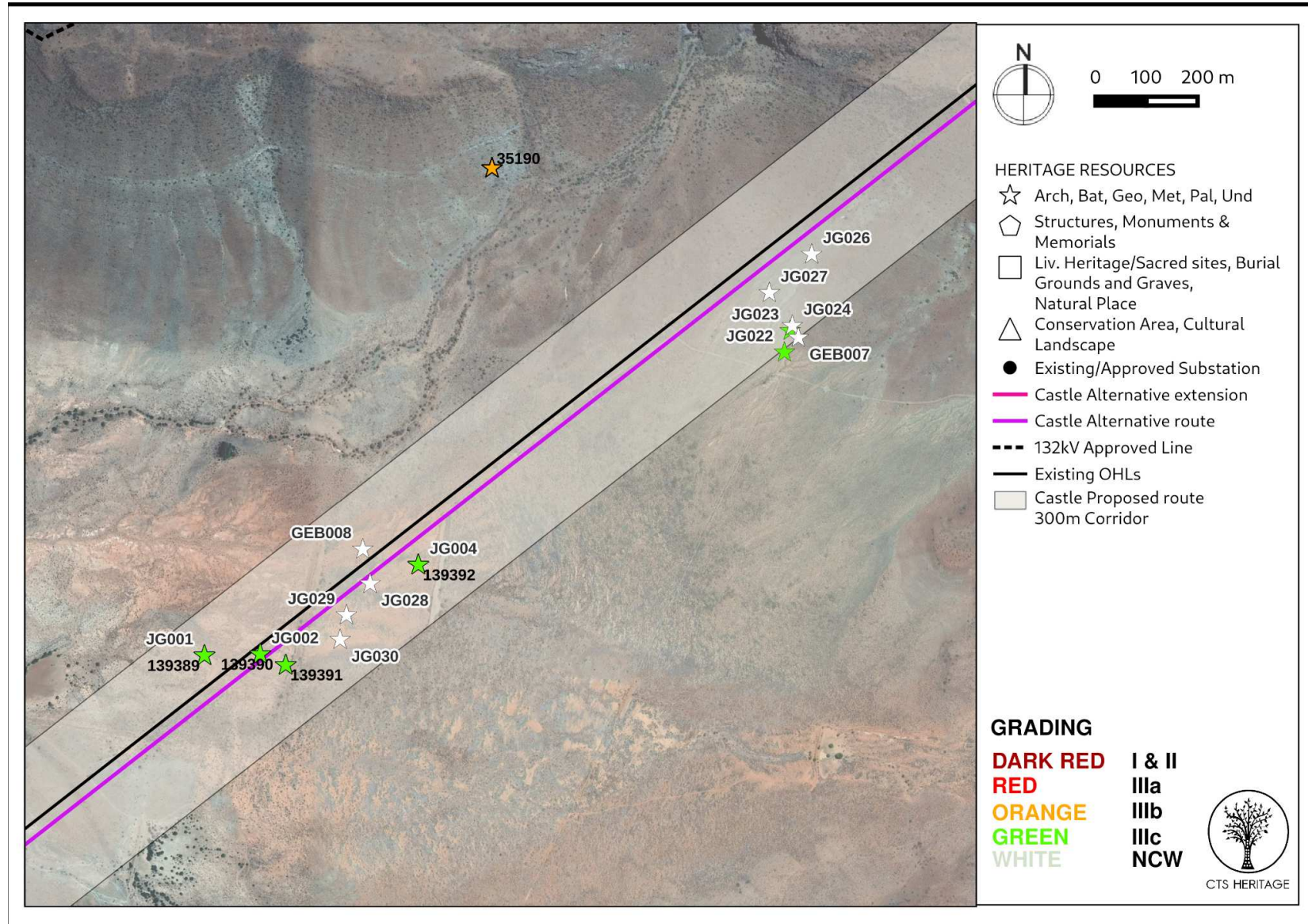


Figure 3b. Heritage Resources Map. Inset B Site names with white buffer extracted from Gribble and Euston-Browne (2021) - Appendix 1.2

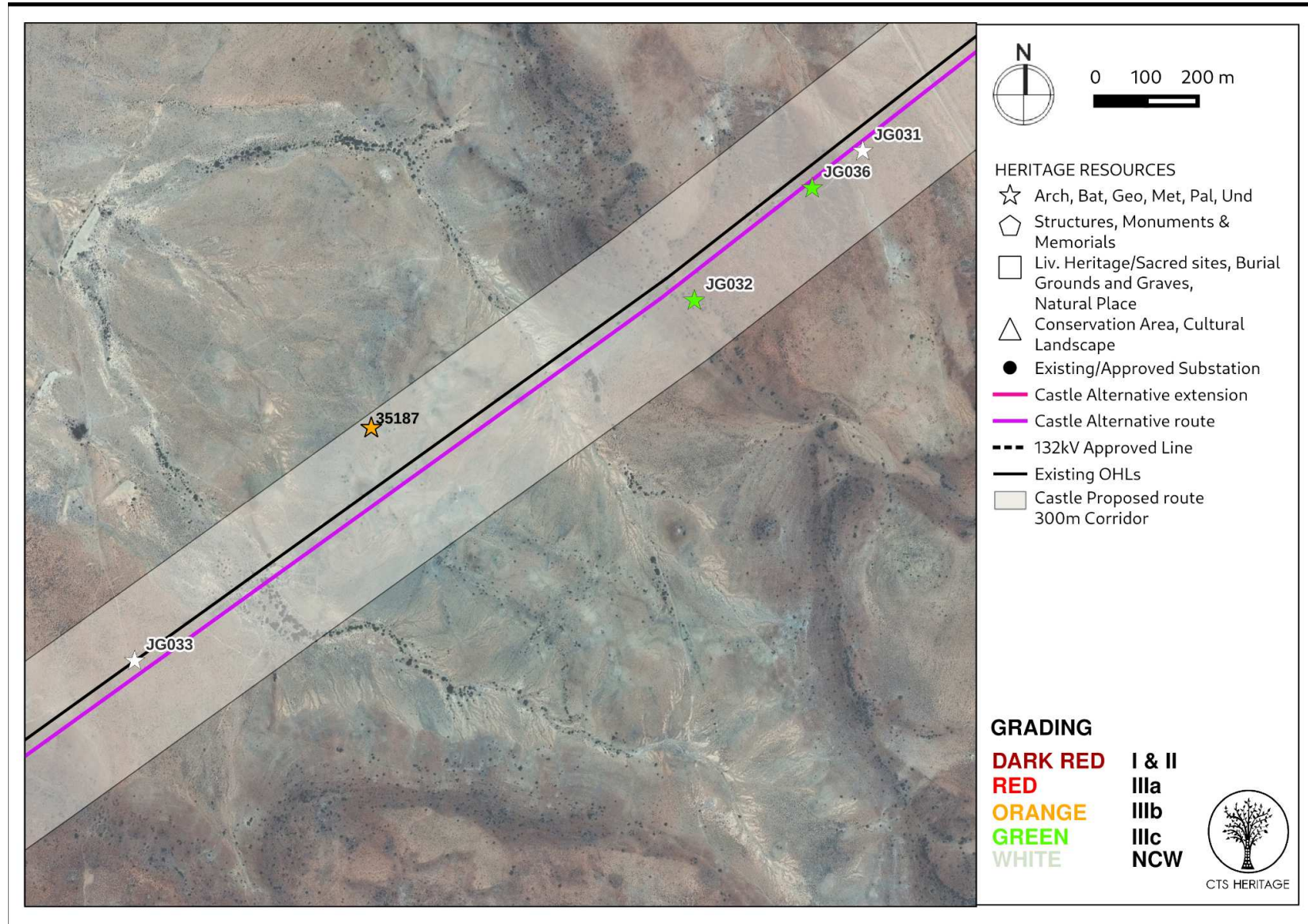


Figure 3c. Heritage Resources Map. Inset C. Site names with white buffer extracted from Gribble and Euston-Browne (2021) - Appendix 1.2

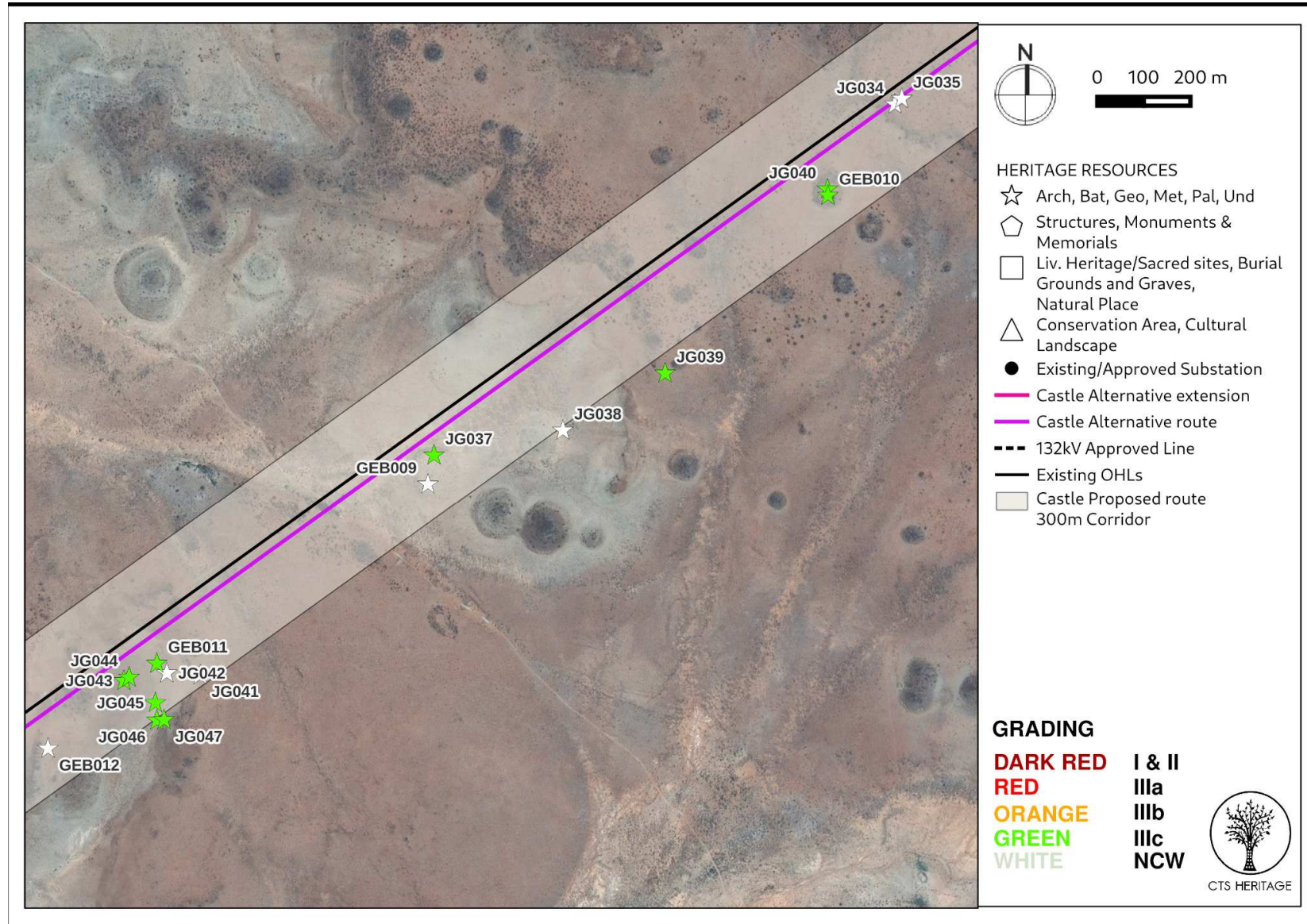


Figure 3d. Heritage Resources Map. Inset D. Site names with white buffer extracted from Gribble and Euston-Browne (2021) - Appendix 1.2

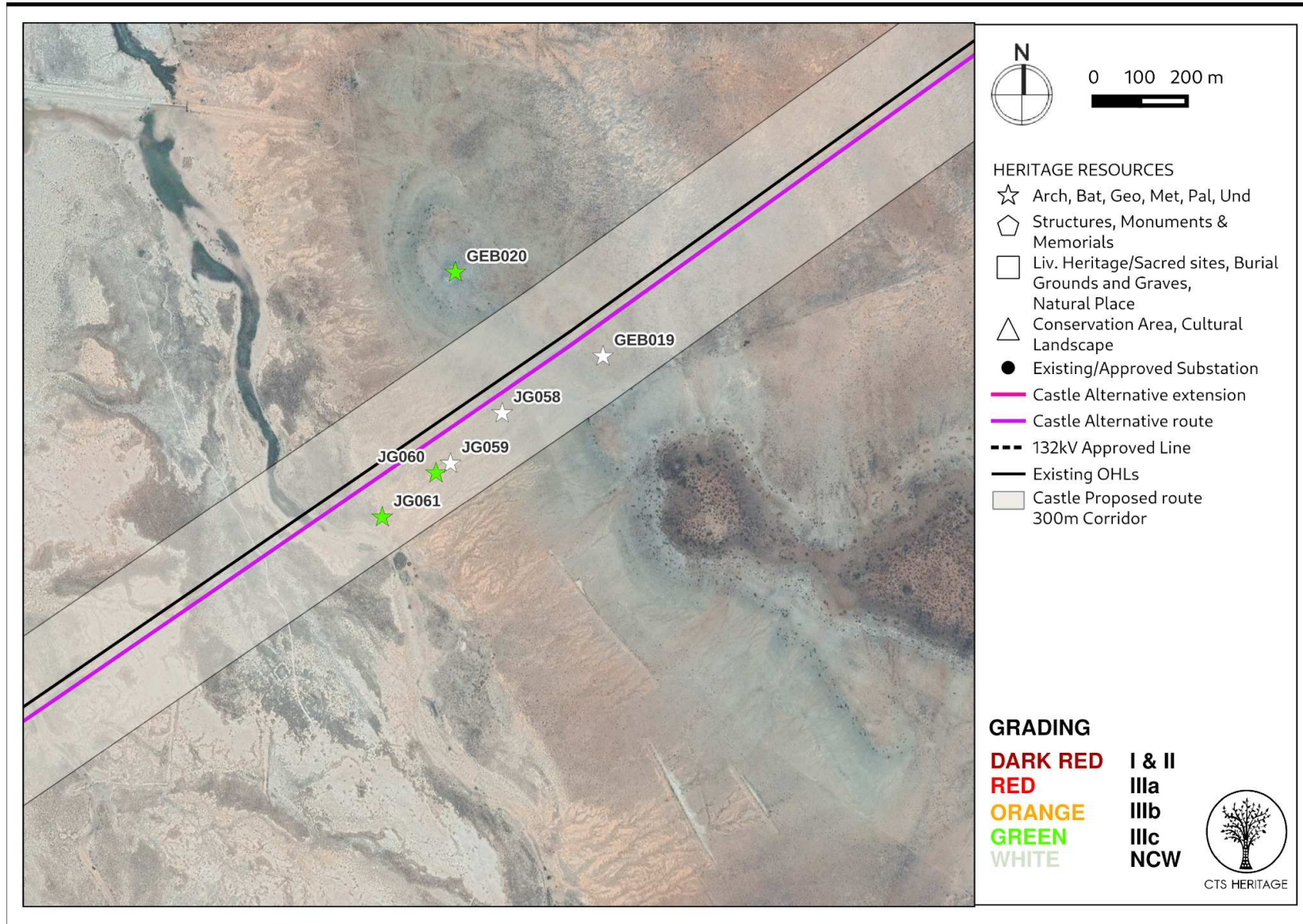


Figure 3e. Heritage Resources Map. Inset E. Site names with white buffer extracted from Gribble and Euston-Browne (2021) - Appendix 1.2

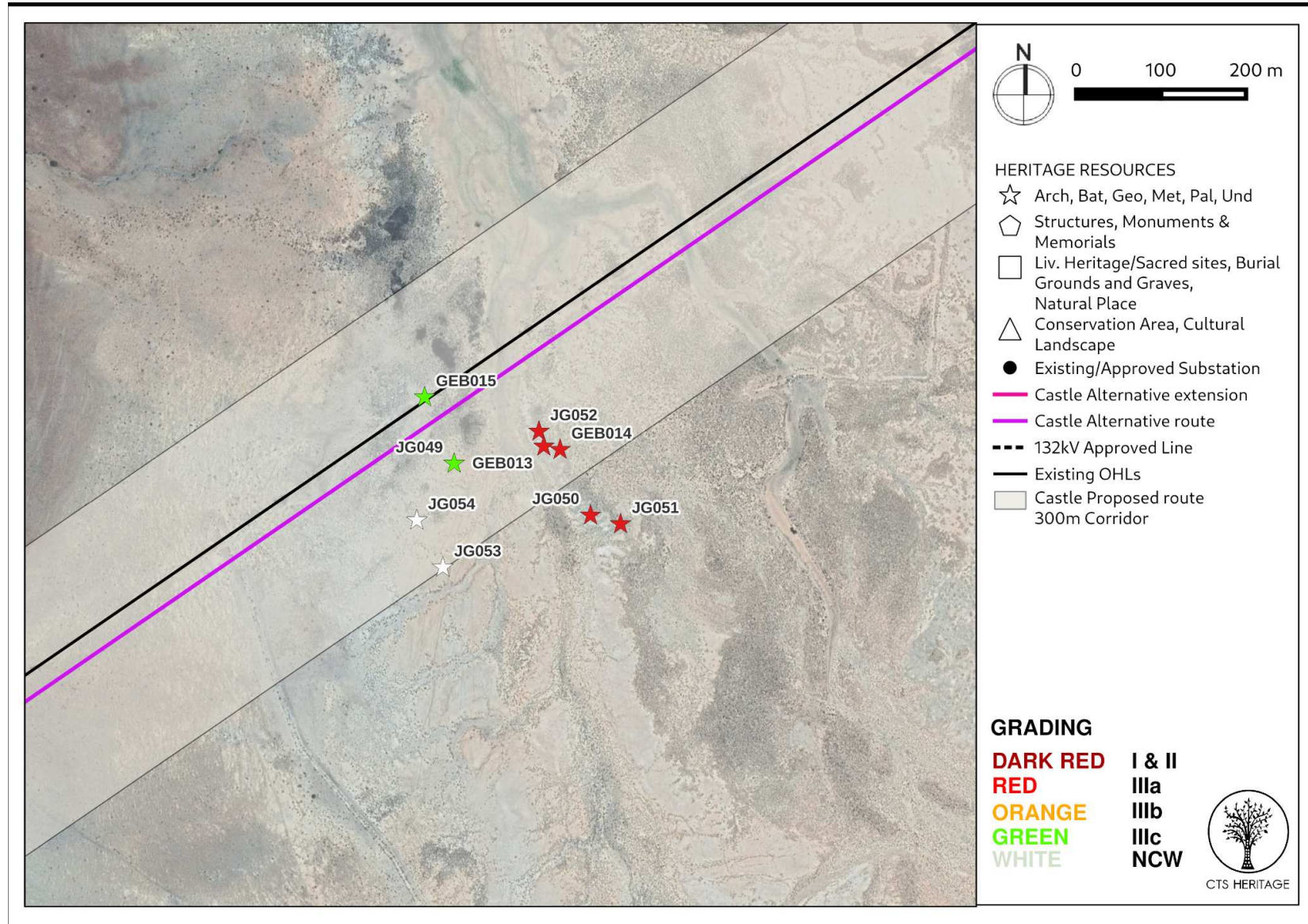


Figure 3f. Heritage Resources Map. Inset F. Site names with white buffer extracted from Gribble and Euston-Browne (2021) - Appendix 1.2

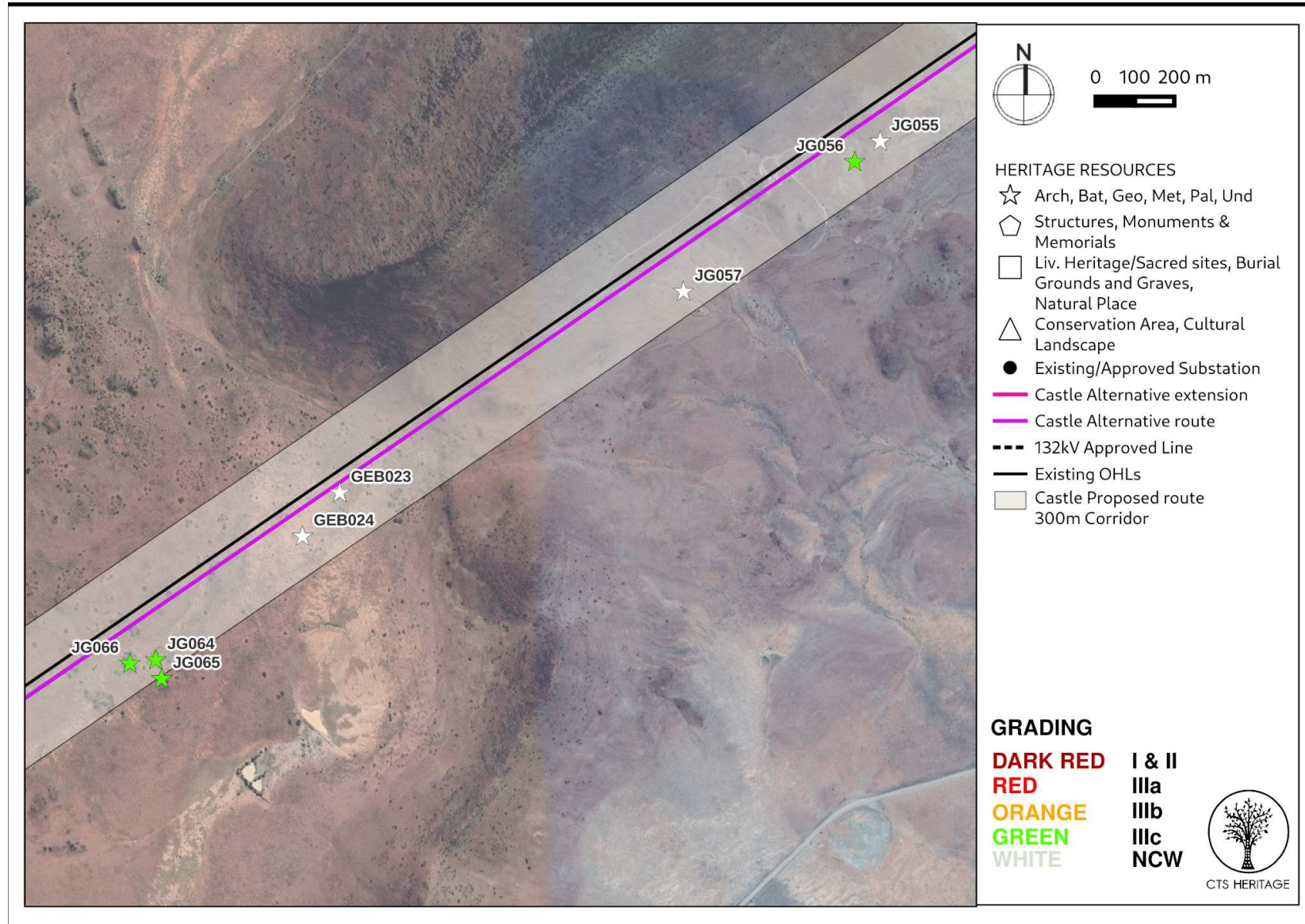


Figure 3g. Heritage Resources Map. Inset G. Site names with white buffer extracted from Gribble and Euston-Browne (2021) - Appendix 1.2

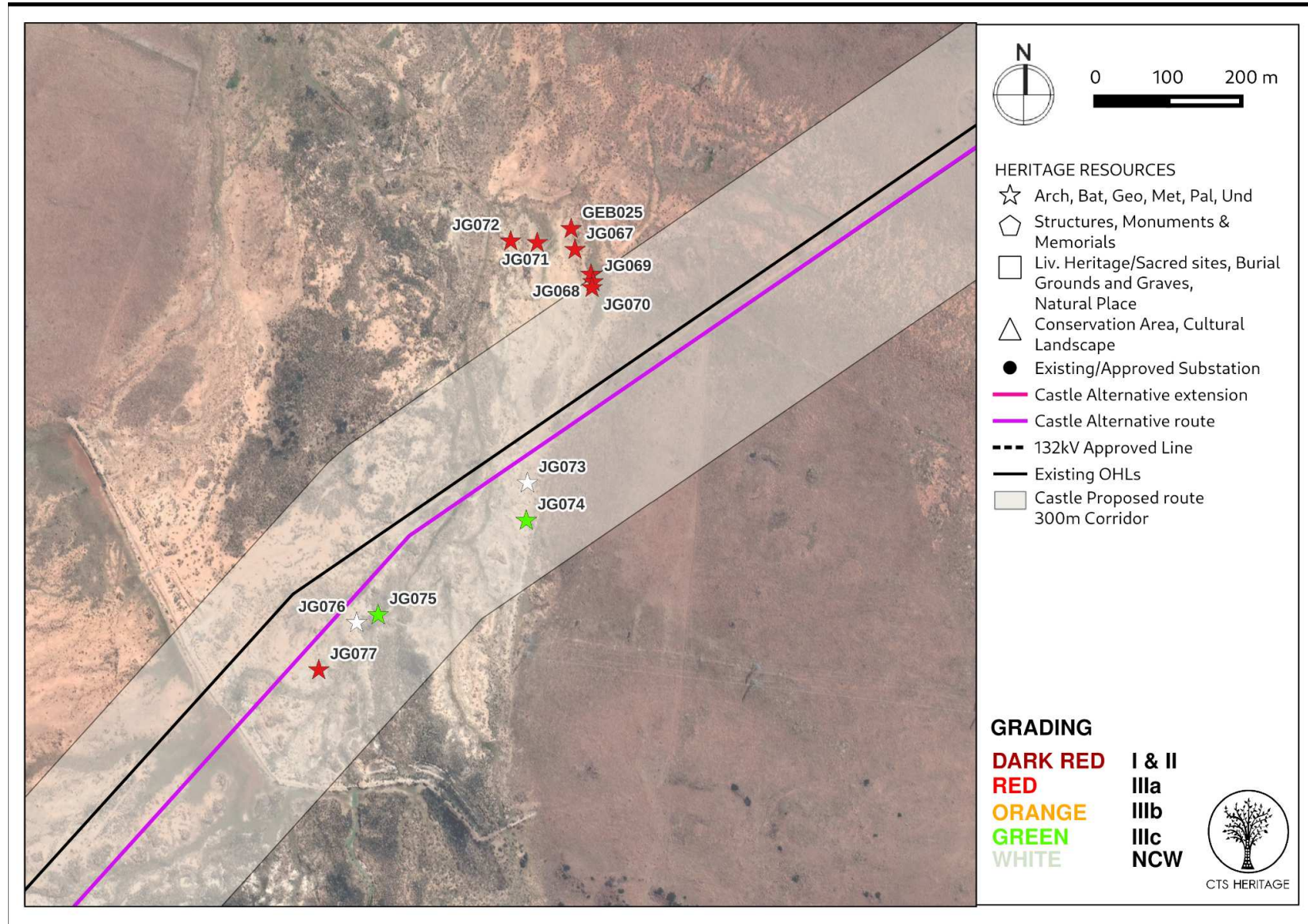


Figure 3h. Heritage Resources Map. Inset H. Site names with white buffer extracted from Gribble and Euston-Browne (2021) - Appendix 1.2

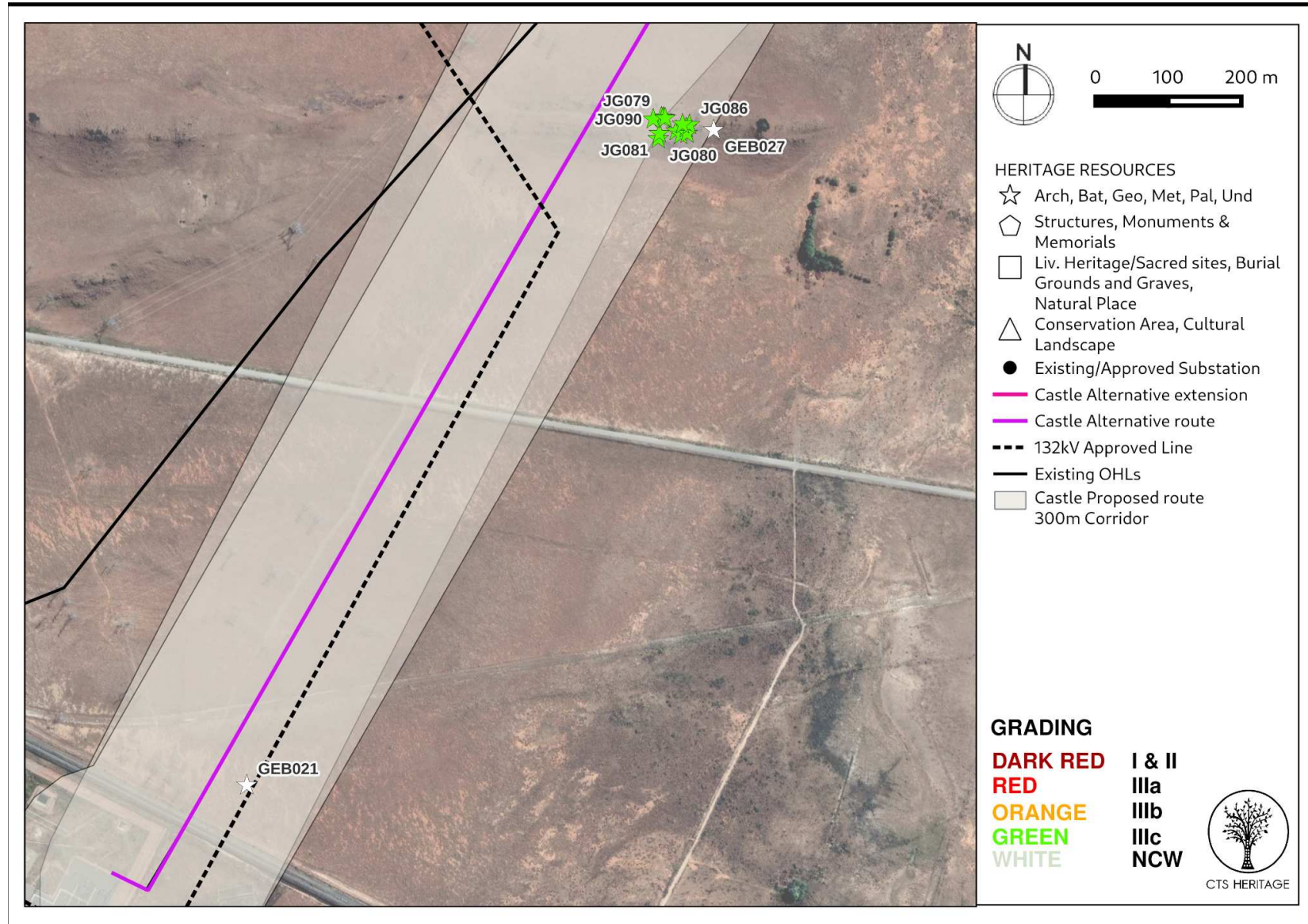
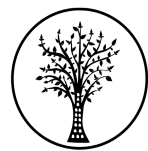


Figure 3i. Heritage Resources Map. Inset I. Site names with white buffer extracted from Gribble and Euston-Browne (2021) - Appendix 1.2



CTS HERITAGE

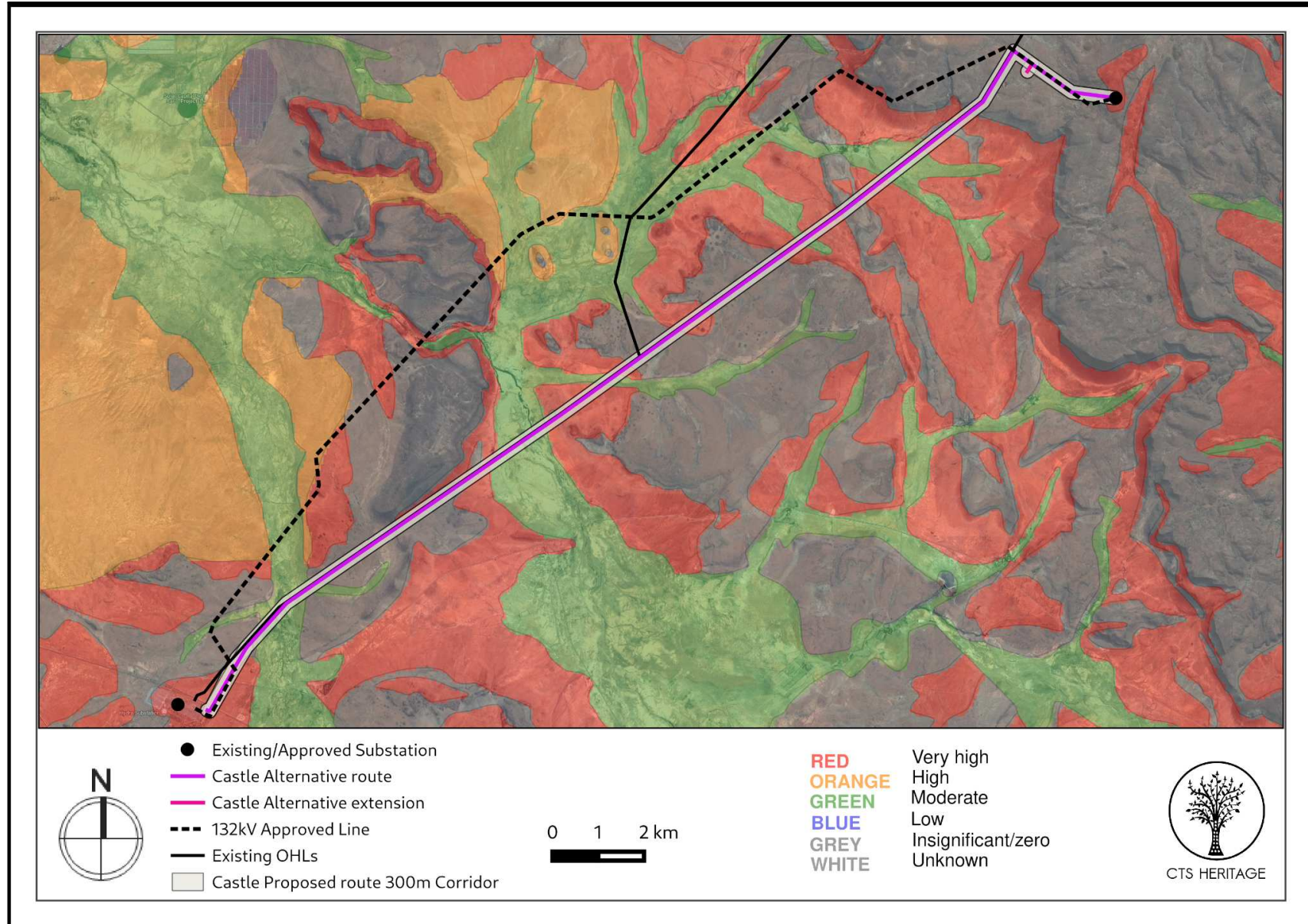


Figure 4a. Palaeosensitivity Map. Indicating very high fossil sensitivity underlying the study area. Please See Appendix 3 for a full guide to the legend.

CTS Heritage

16 Edison Way, Century City, 7441

Tel: +27 (0)87 073 5739 Email: info@ctsheritage.com Web: www.ctsheritage.com

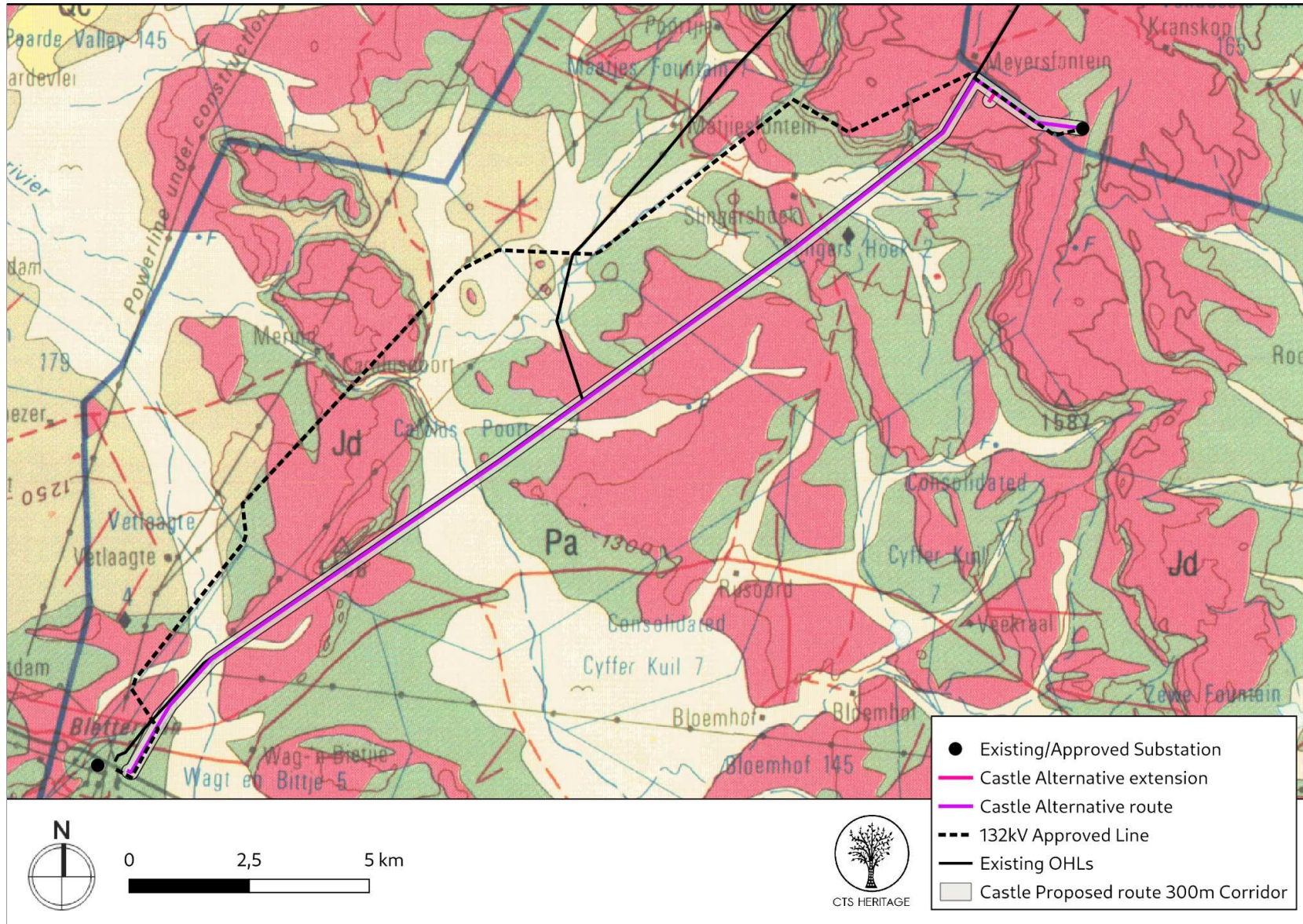


Figure 4b. Geology Map. Extracted from the Council for GeoSciences Map 3024 for Colesburg indicating that the development area is underlain by Jd: Jurassic Dolerite, Pt (lighter green); Tierberg Formation of the Ecca Group and Pa (darker green): Adelaide Subgroup of the Beaufort Group



CTS HERITAGE

8. Brief Heritage Summary

The development application under consideration in this report is an amended grid connection alignment associated with the approved Castle WEF. The area proposed for the Castle WEF was previously assessed by Van der Walt (2014) as part of the original authorisation process and has been recently surveyed again in 2021 by Gribble and Euston-Browne. The Castle WEF is also located in close proximity to an approved PV Facility, Vetlaagte PV, and a proposed PV Facility (Wag n Bietjie PV Facility), all located in close proximity to the town of De Aar. In 2021, a heritage impact assessment was completed of the proposed grid connection routes and switching station for the De Aar 2 South wind energy facility, east of De Aar by ACO Associates (Gribble and Euston-Browne, SAHRIS ID 570440). **The alignment assessed in the report by Gribble and Euston-Browne (2021) aligns with the proposed alignment assessed in this report. Furthermore, there is an existing powerline located within the grid alignment assessed.**

De Aar was originally established on the Farm "De Aar." The name means "the artery," a reference to its underground water supply. The Cape Government Railways were founded in 1872, and the route that the government chose for the line to connect the Kimberley diamond fields to Cape Town on the coast, ran directly through De Aar. Because of its central location, the government also selected the location for a junction between this first railway line, and the other Cape railway networks further east, in 1881. In 1899 two brothers who ran a trading store and hotel at the junction, Isaac and Wulf Friedlander, purchased the farm of De Aar. Following the Anglo Boer War, the Friedlander brothers surveyed the land for the establishment of a town. The municipality was created a year later in 1900.

Kruger (2012) describes the development area as "characterised by flat undulating Karoo vegetation comprised out of relatively sparse scrub and grasses, with dolerite hills in the surrounding landscape. Large portions of the land is currently devoted to livestock farming but a number of solar energy facilities are to be constructed on farms around De Aar. Shallow soils covers a combination of calcrete, shale and dolerite substrates, and large sections in the landscape are exposed to sheet erosion, specifically along low lying areas and drainage lines. Dolerite and sandstone is present, while exotic rocks occur in the gravel of the Orange River bed and terraces. These provided suitable material for stone tool production during the Earlier, Middle and Later Stone Ages. "

Archaeology

As part of the 2012 process for approval of the nearby Vetlaagte Solar Energy Facility, Kruger conducted a detailed Heritage Impact Assessment of the area proposed for development. According to Kruger (2012), "During the survey, widespread Middle Stone Age (MSA) material, including characteristic formal MSA stone tools such as points, blades and scrapers were documented in the survey area along a north-south oriented drainage on the eastern periphery of the property. The lithic remains occur in three large scatters and, almost without exception, in low lying areas along non-perennial drainage lines and wetland areas where precipitation and groundwater have exposed the stone tools, originally deposited on a decomposed calcrete rock layer approximately 30cm sub surface. Preliminary examinations of some of the lithics indicated that a number of flakes displayed faceted platforms, characteristic of the MSA."

Kruger (2012) also documented historical period remains, "specifically the old Vetlaagte homestead with restored farmhouse, outbuildings, midden and labourers quarters, as well as a dilapidated dam wall constructed in the drainage line east of the farmstead are present on the property. The date of construction of the farm house is denoted by a year count ("1930") on the front gable of the structure. The entire farmstead is situated in an area excluded from the solar farm development. A small family graveyard, associated with the farmstead at Vetlaagte, also occurs in the exclusion zone about 100m north of the farm house."

Van der Walt (SAHRIS NID 183142) conducted a field assessment of the broader area proposed for development in 2014 as part of the original authorisation process for the Castle WEF. Van der Walt (2014) found that:

CTS Heritage

16 Edison Way, Century City, 7441

Tel: +27 (0)87 073 5739 Email: info@ctsheritage.com Web: www.ctsheritage.com



CTS HERITAGE

“At the start of the survey Stone Age material was immediately noticed scattered in varying densities throughout the study area... Artefacts were observed in low densities over much of the study area where hornfel is almost exclusively used as raw material. Morris (2011) notes in most cases at documented sites in the area, the predominant component appears to be Pleistocene and early Holocene in age (the greater number of artefacts are highly patinated – a weathering/oxidation process resulting from long exposure of knapped surfaces), but there are also places with a much younger component of tools, late Holocene Later Stone Age, that are still relatively fresh-looking (little or no apparent patination – the artefacts are nearly black or grey as opposed to the more heavily patinated orange-brown of older stone tools). Some of the patinated artefacts show a high degree of weathering probably being washed in from their original context and are therefore of lower archaeological value...”

Van der Walt (2014) went on to note that “MSA and LSA artefacts are mixed at some locations and indicate that downward deflation had occurred in the study area. Nine sites were recorded consisting of six Stone Age sites (Site 1, 3, 4, 6, 7, 9) of which site 6 is an engraving site, a historical stone kraal (Site 8) and 2 historical farmstead complexes (Site 2 and 5). A further total of 3 find spots were mapped, recorded and digitally photographed.”

Van der walt (2014) concludes his report by noting that:

“The abundance of locally available raw material in the form of hornfels or indurated shale resulted in the use of the landscape over millennia by Stone Age people. Stone Age remains are mostly represented by thinly spread MSA scatters but more substantial quarries/workshops that are found scattered over the study and to a lesser extent also by LSA quarries/workshops on higher lying areas or hills. Erosion of the hills results in the gravitating of raw material and artefacts towards gently dipping plains between the dolerite hills and outcrops. Some of these deposits might be covered by the clay and sandy soils in the valleys or plains...”

Some remnants of the farms history is represented in the form of two dilapidated farm complexes.

In the assessments completed by CTS Heritage (2021) for the Castle WEF Walkdown, it was found that “The overall archaeological sensitivity of the development area with regard to the preservation of Early, Middle and Later Stone Age archaeology as well as Khoe and San heritage, early colonial settlement is regarded as very high. Despite this, the field assessment conducted for this project has demonstrated that the specific area proposed for development has low sensitivity for impacts to significant archaeological heritage. As indicated above, the results of this assessment align with the findings of other specialists such as Morris (2011) who notes that ephemeral MSA and LSA scatters are the dominant archaeological signature of the area and are therefore not archaeologically significant.”

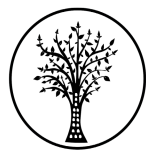
In 2021, ACO Associates (Gribble and Euston-Browne, SAHRIS ID 570440) completed an archaeological walkdown of this exact grid alignment. This assessment “identified a large number of archaeological occurrences which include Middle and Late Stone Age archaeological material, possible historic period stone structures, Khoikhoi stone kraal complexes, some rock engravings and scattered occurrences of historical period archaeological material. The volume of and apparently ubiquitous nature of the Middle Stone Age artefacts scattered across the landscape, and the fact that much of this material was found to be in secondary, or disturbed context, means that the combined overall impact of activities associated with this project on Middle Stone Age material will be relatively low. By contrast, the context of much of the Late Stone Age artefacts noted during the survey appears to be better preserved than the Middle Stone Age material, and is thus of greater archaeological significance... The possible Khoi kraals and other stone structures noted during the survey represent a little known aspect of the history and archaeology of this area and their damage or destruction would result in a loss of heritage.” The report recommends that “the archaeologist must review the positions of the individual pylons once these have been determined, to ensure that they will not impact on any recorded heritage resources. The micro-siting of pylon positions may be required, which should also be done in consultation with the archaeologist.”

All of the heritage resources identified by Gribble and Euston-Browne (2021), Kruger (2012), Van der Walt (2014) and other past heritage specialist assessments completed in the vicinity of the proposed development have been mapped relative to the proposed development in Figure 3. A number of graded archaeological sites are known to be located within the assessed 300m grid corridor. Impacts to these sites can be avoided through careful micro-siting of pylon footings and the implementation of the recommendations included in Gribble and Euston-Browne (2021). These sites are listed in Appendix 1.2 below with the recommended mitigation measures indicated.

CTS Heritage

16 Edison Way, Century City, 7441

Tel: +27 (0)87 073 5739 Email: info@ctsheritage.com Web: www.ctsheritage.com



CTS HERITAGE

Palaeontology

According to the SAHRIS Palaeosensitivity Map (Figure 4a), the area proposed for development is underlain by sediments of moderate and very high paleontological sensitivity. According to the extract from the Council for GeoSciences Map 3024 for Colesburg, the development area is underlain by Jurassic Dolerite, the Tierberg Formation of the Eccca Group and the Adelaide Subgroup of the Beaufort Group.

As part of a process undertaken for the nearby Vetlaagte PV Facility, Almond completed a field-based palaeontological assessment of the area proposed for development in this application. Almond (2012) found that “The potentially fossiliferous sediments of the Late Palaeozoic Karoo Supergroup (Eccca and Lower Beaufort Groups) that underlie the study area are almost entirely mantled in a thick layer of superficial deposits of probable Pleistocene to Recent age. These include various soils, gravels and – at least in some areas - a well-developed calcrete hardpan. The upper Eccca Group bedrocks in the northern portion of the study area contain locally abundant fossil wood (of palaeontological interest for dating and palaeoenvironmental studies), as well as low diversity non-marine trace fossil assemblages typical of the Waterford Formation, rather than the Tierberg Formation as mapped. No vertebrate fossils and only scattered woody plant impressions of the Permian Glossopteris Flora were observed within the Lower Beaufort Group rocks that are very poorly exposed in the southern portion of the Vetlaagte study area. Trace fossils, silicified wood and rare vertebrate remains (therapsids, parareptiles) of the Middle Permian Pristerognathus Assemblage Zone have recently been recorded from this succession in the De Aar region (Almond 2010b). Extensive dolerite sills and dykes of the Early Jurassic Karoo Dolerite Suite intruding the Karoo Supergroup sediments are entirely unfossiliferous, as are rare intrusive kimberlite pipe rocks of Cretaceous age. The diverse superficial deposits within the three study areas (e.g. soils, gravels, alluvium, calcrete hardpans) are of low palaeontological sensitivity as a whole . Abundant fragments of reworked fossil wood material of Eccca provenance occur widely within subsurface and surface gravels overlying the Eccca Group outcrop area.”

The observations made by Almond (2012) are mapped relative to the proposed development in Figure 3. One palaeontological site may be impacted by the proposed laydown areas - SAHRIS Site 34607. This site is described by Almond (2012) as “Thin tempestite sandstones of Waterford Formation with moderately diverse trace fossil assemblages” and he indicates that no mitigation of this site is required.

Millstead (2014, SAHRIS ID 183143) completed his palaeontology assessment for the original environmental authorisation for the Castle WEF. Millstead (2014) found that: “The reporting area is underlain by Late Permian sedimentary rocks of the Adelaide Subgroup, Jurassic dolerites of the Karoo Dolerite Suite and unconsolidated sands constituting a Cenozoic-age regolith. The rocks of the Adelaide Subgroup are known to be fossiliferous elsewhere in the Karoo Basin and contain famous and scientifically significant vertebrate faunas and plant macrofossil floras. Several fragmentary fossils were located within this unit during the site investigation and the density of their occurrence suggests that numerous other fossils may be present within the unit elsewhere in the reporting area. No fossils were located within the Cenozoic regolith, but similar deposits are known to be fossiliferous elsewhere in the Karoo and fossil materials may well be present within subsurface portions of the stratigraphic unit. The dolerites formed via intrusion of magma that crystallised deep in the earth’s crust, and accordingly, are unfossiliferous.

The potential for a negative impact on the fossil heritage of the area can be quantified in the following manner. It is probable that there will be a negative impact on the palaeontological heritage of the Adelaide Subgroup. As the Adelaide Subgroup underlies the majority of the reporting area and is likely to be affected by the construction of the project’s infrastructure, the overall probability of a negative impact is assessed as being probable. Should any undiscovered fossil materials be impacted upon, they may well be of high scientific and cultural significance.”

Millstead (2014) recommended that a Chance Fossil Finds Protocol be implemented for the duration of construction activities.

CTS Heritage

16 Edison Way, Century City, 7441

Tel: +27 (0)87 073 5739 Email: info@ctsheritage.com Web: www.ctsheritage.com



CTS HERITAGE

In Bamford's desktop assessment for this area in 2021, she notes that "Based on experience, other reports and the lack of any significant previously recorded fossils from the area, it is unlikely that any fossils would be preserved in the Tierberg Formation or Adelaide Subgroup. Nonetheless, a Fossil Chance Find Protocol should be added to the EMPr." This recommendation is also applicable to the proposed grid alignment.

Conclusion

The area proposed for the grid connection alignment has been extensively surveyed for impacts to heritage resources. We know enough about the overall heritage sensitivity of the area to be able to determine the heritage sensitivity of the area, especially due to the recent heritage impact assessment completed by ACO Associates in 2021 for the same grid alignment. A number of graded archaeological sites are known to be located within the assessed 300m grid corridor. Impacts to these sites can be avoided through the implementation of the no-go buffers and other mitigation measures recommended in Gribble and Euston-Browne (2021) (see appendix 1.2), as well as the implementation of the attached chance fossil finds procedure

RECOMMENDATION

Based on the information available, the area proposed for development has been thoroughly assessed and we therefore know that significant archaeological, palaeontological and cultural landscape heritage resources are located within the grid corridor. No impact to these significant resources should take place as long as the recommendations included in Gribble and Euston Browne (2021) are implemented. As the area has been thoroughly surveyed, it is recommended that no further heritage assessments are required in terms of section 38(3) of the NHRA. The attached Fossil Chance Find Protocol must be implemented for the duration of construction activities and the recommendations included in Gribble and Euston-Browne (2021) must be implemented (Appendix 1.2).

CTS Heritage

16 Edison Way, Century City, 7441

Tel: +27 (0)87 073 5739 Email: info@ctsheritage.com Web: www.ctsheritage.com



CTS HERITAGE

APPENDIX 1.1

List of built environment and archaeological heritage resources identified within the development area taken from SAHRIS

Site ID	Site/Observation no.	Full Site Name/Description	Site Type	Grading
35187	EMJ-5	Emthanjeni 5	Palaeontological	Grade IIIb
35190	EMJ-6	Emthanjeni 6	Palaeontological	Grade IIIb
34597	TBS003	Taaiboschfontein 003	Archaeological, Transport infrastructure	Grade IIIb
45362	CAS003	Castle WEF 003	Artefacts	Grade IIIb
45363	CAS004	Castle WEF 004	Artefacts	Grade IIIb
34474	VLG004	VETLAAGTE 4	Artefacts	Grade IIIb
135306	DWEF116	De Aar WEF	Artefacts	
135307	DWEF116	De Aar WEF	Artefacts	Grade IIIc
135312	DWEF117	De Aar WEF	Artefacts	Grade IIIc
135315	DWEF118	De Aar WEF	Artefacts	Grade IIIc
135319	DWEF119	De Aar WEF	Artefacts	Grade IIIc
135321	DWEF120	De Aar WEF	Artefacts	Grade IIIc
135325	DWEF121	De Aar WEF	Artefacts	Grade IIIa
135326	DWEF122	De Aar WEF	Artefacts	Grade IIIa
135327	DWEF123	De Aar WEF	Artefacts	Grade IIIb
138030	DA2S-001	DE AAR 2 SOUTH	Artefacts	

CTS Heritage

16 Edison Way, Century City, 7441

Tel: +27 (0)87 073 5739 Email: info@ctsheritage.com Web: www.ctsheritage.com



CTS HERITAGE

138031	DA2S-002	DE AAR 2 SOUTH	Artefacts	
138032	DA2S-003	DE AAR 2 SOUTH	Artefacts	
138033	DA2S-004	DE AAR 2 SOUTH	Rock Art	Grade IIIc
138034	DA2S-005	DE AAR 2 SOUTH	Artefacts	Grade IIIc
138035	DA2S-006	DE AAR 2 SOUTH	Artefacts	Grade IIIc
138036	DA2S-007	DE AAR 2 SOUTH	Artefacts	Grade IIIc
134946	DWEF077	De Aar WEF	Artefacts	Grade IIIb
134947	DWEF078	De Aar WEF	Artefacts	Grade IIIb
134948	DWEF079	De Aar WEF	Artefacts	Grade IIIb
134949	DWEF080	De Aar WEF	Artefacts	Grade IIIc
134950	DWEF081	De Aar WEF	Artefacts	Grade IIIc
134951	DWEF082	De Aar WEF	Artefacts	Grade IIIc
134952	DWEF083	De Aar WEF	Artefacts	Grade IIIc
134953	DWEF084	De Aar WEF	Artefacts	Grade IIIc
134954	DWEF085	De Aar WEF	Artefacts	Grade IIIc
134955	DWEF086	De Aar WEF	Artefacts	Grade IIIc

CTS Heritage

16 Edison Way, Century City, 7441

Tel: +27 (0)87 073 5739 Email: info@ctsheritage.com Web: www.ctsheritage.com



CTS HERITAGE

APPENDIX 1.2

List of built environment and archaeological heritage resources identified within the development area taken from Gribble and Euston-Browne (2021)

Waypoint	Latitude	Longitude	Description	Grade	Mitigation
JG001	-30.60648	24.253572	MSA stone scatter on and around existing Hydra line and service road. Very large and extends to east as far as berm modern farm. Tools noted on berm. See also GEB001-007 which defines the visible extent of one lithic scatter. Lithics exposed on eroded / deflated area of shallow river valley bottom. Density 20 + pieces/m2. Hornfels. Heavily patinated but with some, possibly later unpatinated pieces noted. Flakes, blades, cores and chips. Some retouch and possibly prepared platforms. Very edgeworn.	3C	
JG002	-30.606459	24.254711	MSA stone scatter on and around existing Hydra line and service road. Very large and extends to east as far as berm modern farm. Tools noted on berm. See also GEB001-007 which defines the visible extent of one lithic scatter. Lithics exposed on eroded / deflated area of shallow river valley bottom. Density 20 + pieces/m2. Hornfels. Heavily patinated but with some, possibly later unpatinated pieces noted. Flakes, blades, cores and chips. Some retouch and possibly prepared platforms. Very edgeworn.	3C	
JG003	-30.606649	24.255231	MSA stone scatter on and around existing Hydra line and service road. Very large and extends to east as far as berm modern farm. Tools noted on berm. See also GEB001-007 which defines the visible extent of one lithic scatter. Lithics exposed on eroded / deflated area of shallow river valley bottom. Density 20 + pieces/m2. Hornfels. Heavily patinated but with some, possibly later unpatinated pieces noted. Flakes, blades, cores and chips. Some retouch and possibly prepared platforms. Very edgeworn.	3C	
JG004	-30.604886	24.257939	Eroded / deflated scatter of edgeworn, patinated MSA lithics. Less dense but otherwise similar to JG001-003 / GEB001-007. One of two less patinated pieces noted one with retouch along edge - possible Lockshoek LSA sidescraper. Shaley flake - grey with light patina. Also khaki/mustard flake of what looks like mudstone.	3C	
JG006	-30.595005	24.273707	Large weathered MSA flake (HF) in roadway.	NCW	
JG007	-30.595	24.27371	Further similar MSA lithics from vicinity of JG006	NCW	
JG008	-30.592464	24.282744	Worn and patinated MSA lithics in high density across very wide area (at least 100 m in all directions). Lying on and in orange sand on and around a low dolerite koppie. Possible quarry site for hornfels lag deposit. Antbear burrow kicked up hornfels chunks from ± 20-30 cm down and flaked material. Suggests good flakeable material below sand. Evidence of	3C	

CTS Heritage

16 Edison Way, Century City, 7441

Tel: +27 (0)87 073 5739 Email: info@ctsheritage.com Web: www.ctsheritage.com



CTS HERITAGE

			material being washed together in recent rainwater runnels. Some possible LSA flakes noted and later retouch on earlier MSA flakes.		
JG009	-30.592936	24.283568	Part of same site as JG008	3C	
JG010	-30.590711	24.280878	Walked from road to BESS - litter of patinated and worn MSA everywhere. In orange sand.	NCW	
JG011	-30.589299	24.280219	Endscraper in / near BESS. Nearby lithics in eroded channels/rivulets	NCW	
JG012	-30.590268	24.281356	MSA scatter in rainwater runnel	NCW	
JG013	-30.589434	24.278496	Scatter of LSA HF lithics in sandy, sloping hollow between rocky outcrops. Some possibly on earlier MSA flakes of which there are examples present. Smithfield? - large sidescraper type flake. Also broken blade with endscraper retouch (crossmend). Site overlooks river gully. All material in orange sand. Exposed by erosion.	3C	
JG014	-30.589408	24.278082	Dense MSA slope wash on side of river gully below JG013. Very waterworn. In dolerite cobbles and scree.	3C	
JG015	-30.590345	24.277628	Further MSA lithics and later, possibly Smithfield (including endscrapers) in erosion wash and runnels.	3C	
JG016	-30.590532	24.276526	LSA, with some possible MSA, lithic scatter on dolerite outcrop. Eroded.	3C	
JG017	-30.590717	24.276331	Lithics eroding out of deposit on opposite side of outcrop to JG016. Mix of MSA with some early Holocene LSA material - large sidescraper. Single piece of flaked agate. View to BESS from dogleg.	3C	
JG018	-30.590532	24.274909	Dense MSA waterworn lithics in erosion gully. Very rolled.	3C	
JG019	-30.590824	24.274807	Same as JG018. Appears to be long, continuous scatter. Quarrying?	3C	
JG020	-30.591415	24.274568	Same as JG018/JG019.	3C	
JG021	-30.592031	24.274437	Same as JG018/JG019/JG020.	3C	
JG022	-30.601148	24.265414	MSA on slope wash. Mostly very rolled and patinated. ± 10 pieces/m2.	3C	
JG023	-30.600768	24.265531	Same as JG022.	3C	
JG024	-30.60068	24.265576	Large MSA hornfels flake with "fresh" retouch.	NCW	
JG025	-30.598577	24.266719	Approximate upper limit on slope of stone tools. Gets shaley above.	Not Graded	
JG026	-30.599426	24.265971	Stone scatter - general and of varying density down slope above and below this mark.	NCW	
JG027	-30.600102	24.265106	Rough hornfels core/flaked cobble - LSA?	NCW	
JG028	-30.605219	24.256954	Patinated (black/grey) hornfels lithics in erosion fan. Extension/part of general scatter on	NCW	

CTS Heritage

16 Edison Way, Century City, 7441

Tel: +27 (0)87 073 5739 Email: info@ctsheritage.com Web: www.ctsheritage.com



CTS HERITAGE

			either side?		
JG029	-30.60577	24.256471	Hornfels lithic scatter on eroded flat. Patinated and worn (black/grey).	NCW	
JG030	-30.606202	24.256341	Same as JG029 above.	NCW	
JG031	-30.614816	24.242742	Exposed hornfels carpet. Some worn and patinated MSA.	NCW	
JG032	-30.617445	24.239304	Boulder outcrop on ridge. Stopped to check for engraving (nothing). But ubiquitous lithics scatter. Possible mix of MSA and LSA. Hornfels (worn & patinated) but also flake on banded ironstone.	3C	
JG033	-30.623782	24.227876	Low level MSA scatter - patinated and worn hornfels.	NCW	
JG034	-30.632295	24.214686	Isolated hornfels flakes. Heavily patinated MSA. In red sand with dolerite cobbles. Adjacent to Carolus Poort 2 / Slingerhoek fence.	NCW	
JG035	-30.632187	24.214838	Small LSA agate flake.	NCW	
JG036	-30.615468	24.241709	Packed stone ruin - possibly old wolvehok.	3C	20m no-go buffer
JG037	-30.639067	24.204355	Area of patinated black dolerite boulders next to watercourse (approximately 30 x 100 m). Heavily patinated hornfels flakes and chunks noted - probably MSA. Low density visible on surface. Half circle of boulder may be portion of kraal.	3C	
JG038	-30.638589	24.207245	Isolated MSA lithics (4-5) in open area of wash.	NCW	
JG039	-30.637487	24.209534	Possible Khoi kraal. Dolerite boulders in rough circle in lee of two small rocky outcrops. Approximately 10 x 7 m across.	3C	
JG040	-30.633936	24.213173	Cleared raised area between three rocky outcrops. Possible kraal. ± 30 x 50 m. Small hand-size cobbles cover the surface, mixed with shale. Larger dolerite rocks and boulders in line around outside. 1 x LSA hornfels flake and some patinated MSA lithics (flakes and chunks) noted on surface. (Same as GEB010).	3C	40m No-Go Buffer
JG041	-30.643307	24.199117	MSA lithics eroding out of shallow slope. Very worn and heavily patinated. Mostly flakes. Hornfels.	NCW	
JG042	-30.643273	24.198368	Isolated MSA denticulated piece. Worn and heavily patinated hornfels. Upslope of JG041 on slopes of koppie.	NCW	
JG043	-30.643418	24.197404	Dense scatter of unpatinated LSA hornfels on western edge of koppie top. Lies against line of boulders on edge. 30-40 pieces/m2. Concentrated in approximately 3m2. Chips, chunks, flakes, cores, blades. Single piece with retouch noted. Some MSA present too - some red patination.	3C	
JG044	-30.643353	24.197522	(Modern) graffiti on boulder. On same koppie as JG043. North side about 10m from stone	3C	20m No-Go Buffer

CTS Heritage

16 Edison Way, Century City, 7441

Tel: +27 (0)87 073 5739 Email: info@ctsheritage.com Web: www.ctsheritage.com



CTS HERITAGE

			scatter. Two long thin parallel lines with seven "bars" scratched between them.		
JG045	-30.643845	24.19811	Hornfels lithics in bare patches on eastern slope of koppie. Some larger and worn and patinated. Most still "fresh" black. Couple of pieces, including an endscraper middle-patinated (grey) Mostly flakes and chips. Large, fresh chunky core found about 10 m SE.	3C	
JG046	-30.644182	24.198144	Heavily patinated hornfels MSA eroding down hillside. Dense. Some reuse of MSA - fresh flakes and chips.	3C	
JG047	-30.644174	24.198304	Heavily patinated hornfels MSA eroding down hillside. Dense. Some reuse of MSA - fresh flakes and chips.	3C	
JG049	-30.66664	24.159428	Barren, vegetation free areas have with lithics. Not dense - item every few metres. LSA, including duckbilled scraper. Not patinated. Hornfels	3C	
JG050	-30.667187	24.161105	Very dense LSA exposure on erosion slope. Material being exposed as bank along river channel erodes back. Suggest buried until recently. Very fresh and unpatinated hornfels. One small piece of flaked white agate. Possibly retouched piece of brown mudstone/ironstone. Formal/retouched pieces. Endscrapers (slugs?). Orangean sidescraper. Edge scraper. OES pieces noted. Possibly associated if material buried until recently? Some dolerite cobbles with flake scars. Seems to be ± 40-50 cm below modern ground level.	3A	Mapping, recording and collection by the archaeologist of exposed artefactual material prior to the commencement of any activities related to the installation of the grid connections.
JG051	-30.66728	24.161474	Eastern edge of JG050 at this location.	3A	Mapping, recording and collection by the archaeologist of exposed artefactual material prior to the commencement of any activities related to the installation of the grid connections.
JG052	-30.6663	24.160471	Same as JG050 and JG051 above. On eroding slope. OES present in quantities.	3A	Mapping, recording and collection by the archaeologist of exposed artefactual material prior to the commencement of any activities related to the

CTS Heritage

16 Edison Way, Century City, 7441

Tel: +27 (0)87 073 5739 Email: info@ctsheritage.com Web: www.ctsheritage.com



CTS HERITAGE

					installation of the grid connections.
JG053	-30.667739	24.15929	Odd collection of broken cobbles. Rough hornfels or dolerite. On pan surface. Completely isolated.	NCW	
JG054	-30.66724	24.158969	Same as JG054 above.	NCW	
JG055	-30.673205	24.148478	Isolated edge-flaked cobble. Dolerite. Large. On edge of streambed. Period unknown	NCW	
JG056	-30.673672	24.1478	Odd looking boulder field - shaped? In soil below is the same patinated/worn MSA hornfels assemblage seen elsewhere but in higher concentration here than lower down slope. Boulders are on a level platform on slope.	3C	
JG057	-30.676632	24.143262	Eroded wash on slope. Worn MSA lying in sheet wash. Wide area.	NCW	
JG058	-30.658561	24.172766	Scattered, patinated hornfels MSA lithics on slope between koppie and river. Visible where there is erosion of the surface sand - in runnels.	NCW	
JG059	-30.659533	24.171604	Random point in same sort of wash as JG058 - more extensive on this lower slope. Same general occurrence of rolled, patinated MSA stone. Extensive erosion runnels across landscape going down to river.	NCW	
JG060	-30.659719	24.17128	Smithfield(?) lithics on hornfels on eroded surface. Also patinated, earlier lithics present. \pm 10/m ² . Cores, flakes, chunks, blades. Retouch on number of pieces. Endscrapers too (ph). Appears to be visible in \pm 5m radius around waypoint - odd pieces further away. Suggest it may be more widely present under covering sand.	3C	
JG061	-30.660573	24.170073	Scatter of hornfels lithics - fairly thin (\pm 3/m ²) - on eroding sandy mound in erosion wash. Lithics actively eroding, not on sheet wash. Hornfels, unpatinated - flakes, blades. Of the 17 lithics randomly picked up in area of 5 m ² , 6 had retouch. 5 = endscraper type and 1 x side/end scraper.	3C	
JG062	-30.649812	24.053184	Open areas of low level presence of hornfels (patinated/worn) wherever soil denuded and exposed - right along line.	NCW	
JG063	-30.642762	24.048078	As above.	NCW	
JG064	-30.685039	24.129275	Possible Khoi kraal? - not hugely convincing but there seems to be packed stone along with naturally occurring boulders of dolerite outcrop (ph). Isolated flaked stone in vicinity.	3C	40m No-Go Buffer
JG065	-30.685468	24.12943	Small stone structure. Circular - (actually more oval) - opening to east. Packed cobbles/rocks from dolerite outcrop it nestles against. On S side of outcrop = 3-4 courses of stone. Walls stand 50-70 cm high. No artefacts seen associated. There is a low level presence of the patinated/worn hornfels lithics, as well as a scatter around outcrop of more	3C	

CTS Heritage

16 Edison Way, Century City, 7441

Tel: +27 (0)87 073 5739 Email: info@ctsheritage.com Web: www.ctsheritage.com



CTS HERITAGE

			freshly flaked hornfels. Internal dimensions of structure approximately 1m wide x 1.5m long. External = 2m wide x 2.5m long.		
JG066	-30.685123	24.128588	Possible kraal. Rocky outcrop with cleared centre approximately 14m x 10m. No obvious standing/packed walls, but there does seem to be a clear rocky circle.	3C	40m No-Go Buffer
JG067	-30.690737	24.114019	Stone tools on erosion slope down in wash - MSA blade with later retouch. Extension / same as GEB025 to the west.	3A	Mapping, recording and collection by the archaeologist of exposed artefactual material prior to the commencement of any activities related to the installation of the grid connections.
JG068	-30.691042	24.114248	Further exposure like JG067 and GEB025. Shale background with hornfels lithics. Calcrete like nodules present. Below ± 40-50 cm orange sand.	3A	Mapping, recording and collection by the archaeologist of exposed artefactual material prior to the commencement of any activities related to the installation of the grid connections.
JG069	-30.691134	24.114276	Same as JG068 above.	3A	Mapping, recording and collection by the archaeologist of exposed artefactual material prior to the commencement of any activities related to the installation of the grid connections.
JG070	-30.691206	24.114263	Same as JG068 and JG069 above.	3A	Mapping, recording and collection by the archaeologist of exposed artefactual material prior to the commencement of any activities related to the installation of the grid connections.

CTS Heritage

16 Edison Way, Century City, 7441

Tel: +27 (0)87 073 5739 Email: info@ctsheritage.com Web: www.ctsheritage.com



CTS HERITAGE

JG071	-30.690651	24.113478	Opposite side of wash hollow. Same eroding slope with lithics. As on other side, mainly fresh hornfels (whole range), but some older, grey patinated pieces too.	3A	Mapping, recording and collection by the archaeologist of exposed artefactual material prior to the commencement of any activities related to the installation of the grid connections.
JG072	-30.690631	24.113098	Similar exposure to JG067-071. Less dense artifactually. But mix of old and new.	3A	Mapping, recording and collection by the archaeologist of exposed artefactual material prior to the commencement of any activities related to the installation of the grid connections.
JG073	-30.693613	24.113338	Large hornfels sidescraper, isolated in eroded area (same surface as JG067-072) but in larger river eroded system.	NCW	
JG074	-30.694075	24.113321	Concentration of hornfels (probably LSA) lithics on eroded surface.	3C	
JG075	-30.695239	24.111199	Lithics in erosion gully. Grey patinated hornfels flakes.	3C	
JG076	-30.695336	24.110892	Lithics (hornfels, fresh) on calcrety eroded surface. Below bottom of orange sand.	NCW	
JG077	-30.695918	24.110349	Dense ($\pm 20/m^2$) scatter of large, fresh HF lithics. In sand. Still eroding out. Area approximately 10 x 20 m. 1 x flaked agate pebble. Some banded ironstone. Mainly large flakes and cores. No retouched pieces noted.	3A	Mapping, recording and collection by the archaeologist of exposed artefactual material prior to the commencement of any activities related to the installation of the grid connections.
JG078	-30.70594	24.101496	Hornfels scatter in neck between koppies. Fresh. Associated with piece of grass-tempered pottery. Has views to north and south. Protected in hollow. Scatter covers large part of hollow.	3C	
JG079	-30.705935	24.101464	Hornfels scatter in neck between koppies. Fresh. Associated with piece of grass-tempered pottery. Has views to north and south. Protected in hollow. Scatter covers large part of hollow.	3C	

CTS Heritage

16 Edison Way, Century City, 7441

Tel: +27 (0)87 073 5739 Email: info@ctsheritage.com Web: www.ctsheritage.com



CTS HERITAGE

JG080	-30.706201	24.101419	Hornfels scatter in neck between koppies. Fresh. Associated with piece of grass-tempered pottery. Has views to north and south. Protected in hollow. Scatter covers large part of hollow.	3C	
JG081	-30.706136	24.101435	Modern stone circle (?) with glass and burned plastic. Old spade head with broad arrow. "R Steelface".	3C	40m No-Go Buffer centred on JG088
JG082	-30.706104	24.101675	Centre stone kraal - circular with JG083 (stone bothy) in kraal.	3C	40m No-Go Buffer centred on JG088
JG083	-30.706149	24.10174	Stone bothy in kraal. Approximately 1.5 x 1.5 cm. Entrance to East.	3C	40m No-Go Buffer centred on JG088
JG084	-30.706069	24.101819	Kraal 2?	3C	40m No-Go Buffer centred on JG088
JG085	-30.706136	24.101832	Line of kraal 2 wall. Not fully enclosed/circular	3C	40m No-Go Buffer centred on JG088
JG086	-30.706028	24.101865	Line of kraal 2 wall. Not fully enclosed/circular	3C	40m No-Go Buffer centred on JG088
JG087	-30.706021	24.101766	Line of kraal 2 wall. Not fully enclosed/circular	3C	40m No-Go Buffer centred on JG088
JG088	-30.705949	24.101484	Possible kraal 3 on far side of hollow. Walls not complete.	3C	40m No-Go Buffer centred on JG088
JG089	-30.705877	24.101336			
JG090	-30.705959	24.101346	Bothy 2. Circular ± 1.8 x 1.8 m. Door to East.	3C	40m No-Go Buffer centred on JG088
GEB005	-30.591628	24.278963	Scatter of biggish worn, patinated MSA flakes in deflation hollows. Area ± 10 x 10 m	3C	
GEB006	-30.592196	24.274613	Scatter of lithics in hollow between small hills, in front of tree'd area. Worn, patinated MSA, including an endscraper, and a couple of small unpatinated LSA flakes. All lithics are hornfels. Area ± 15 x 15 m.	NCW	
GEB007	-30.60089	24.265697	Worn, patinated MSA flakes scattered all alongside the fence. Gets denser about half-way up towards the mountain.	NCW	
GEB008	-30.604612	24.256805	Just a few lithics on flat area, near pylon. Includes one side scraper.	NCW	
GEB009	-30.639628	24.204219	One patinated hornfels MSA flake amongst area of dolerite boulders. On outskirts of JG037.	NCW	
GEB010	-30.634055	24.213184	Just a handful of MSA flakes in hollow on top of hill which is surrounded by boulders. Possible kraal - the centre of hill has been cleared of boulders (Same as JG040).	3C	

CTS Heritage

16 Edison Way, Century City, 7441

Tel: +27 (0)87 073 5739 Email: info@ctsheritage.com Web: www.ctsheritage.com



CTS HERITAGE

GEB011	-30.643086	24.198144	Scatter of lithics around foot of small hill (top of hill recorded by John - JG043). Fresh, unpatinated hornfels and ? Flakes. A flake every metre or so. They appear to run all around the base of the hill.	3C	
GEB012	-30.644727	24.195703	Light scatter of patinated hornfels flakes in a slight hollow surrounded by boulder outcrops.	NCW	
GEB013	-30.666459	24.160531	Same as JG050 next to river channel. Quite a few pieces of OES, particularly in the runnels.	3A	Mapping, recording and collection by the archaeologist of exposed artefactual material prior to the commencement of any activities related to the installation of the grid connections.
GEB014	-30.666493	24.160731	On the other side of little hill to GEB013, so it is a continuation of this site.	3A	
GEB015	-30.665938	24.159066	A scatter of unpatinated hornfels flakes across an area of $\pm 20 \times 20$ m. A number of cores and some OES.	3C	
GEB016	-30.674615	24.145283	Initially thought to be a kraal, but closer inspection suggested it is probably the result of clearing for an electricity pylon.	Not Graded	
GEB017	-30.67449	24.144903	Initially thought to be a kraal, but closer inspection suggested it is probably the result of clearing for an electricity pylon.	Not Graded	
GEB018	-30.67417	24.144871	Initially thought to be a kraal, but closer inspection suggested it is probably the result of clearing for an electricity pylon.	Not Graded	
GEB019	-30.657462	24.175029	A single patinated hornfels MSA blade on plateau before going down to river valley. Area between pylon and hill with stone structure (GEB020).	NCW	
GEB020	-30.655841	24.171715	Small stone structure on the side and top of a flattened koppie, which is on escarpment above the river bed. It is round, and the highest point (opposite the entrance way) consists of about 8 courses of stone. This side appears pretty intact still. The diameter is ± 2 m. Found an upper grind stone inside the structure. On the slope about 8 m down from the structure, were a handful of very nice tools: an upper grind stone, a core and two scrapers. There were a few pieces of modern metal lying around, so maybe structure has been reused.	3C	
GEB021	-30.714167	24.095526	A handful of worn hornfels MSA flakes, on open, flat area.	NCW	
GEB022	-30.654228	24.056064	A scatter of very worn, patinated MSA flakes on the farm Lochinvaar. Wherever there's a deflated area, they are visible.	NCW	
GEB023	-30.681224	24.134149	A general scatter of worn, patinated hornfels MSA flakes.	NCW	

CTS Heritage

16 Edison Way, Century City, 7441

Tel: +27 (0)87 073 5739 Email: info@ctsheritage.com Web: www.ctsheritage.com



CTS HERITAGE

GEB024	-30.682218	24.133163	Mass of patinated hornfels, but no obvious flakes.	NCW	
GEB025	-30.690479	24.113964	Big area of lithics eroding out of a bank. Joins up with JG067(?). MSA hornfels flakes (incl a large side scraper) as well as smaller, unpatinated LSA lithics (incl side scrapers).	3A	Mapping, recording and collection by the archaeologist of exposed artefactual material prior to the commencement of any activities related to the installation of the grid connections.
GEB026	-30.705946	24.101517	Piece of grass-tempered pottery at site JG092.	3C	
GEB027	-30.706092	24.102212	Stone with striations found in shoulder between two koppies, before hill slopes down. Below sites JG082 - JG090.	NCW	

CTS Heritage

16 Edison Way, Century City, 7441

Tel: +27 (0)87 073 5739 Email: info@ctsheritage.com Web: www.ctsheritage.com



CTS HERITAGE

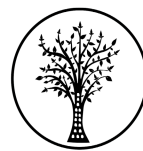
APPENDIX 2
Reference List from SAHRIS

Heritage Impact Assessments				
Nid	Report Type	Author/s	Date	Title
104574	Heritage Scoping	Wouter Fourie	10/10/2012	Heritage Scoping Report for the Proposed Wind Farm Facility for Renosterberg Wind Energy Company (RWEC) near Petrusville, Northern Cape Province
104576	Heritage Scoping	Wouter Fourie	10/10/2012	Heritage Scoping Report for the Proposed Solar PV Facility for Renosterberg Wind Energy Company (RWEC) near Petrusville, Northern Cape Province
104804	PIA Desktop	John E Almond	01/09/2012	Palaeontological specialist assessment: desktop study PROPOSED RENOSTERBERG SOLAR PV AND WIND ENERGY FACILITIES NEAR DE AAR, NORTHERN CAPE PROVINCE
133138	HIA Phase 1	Jayson Orton, Lita Webley	09/07/2013	HERITAGE IMPACT ASSESSMENT FOR MULTIPLE PROPOSED SOLAR ENERGY FACILITIES
133536	Palaeontological Specialist Reports	John E Almond	01/07/2013	PALAEONTOLOGICAL SPECIALIST STUDY
138865	HIA Phase 1	Jayson Orton	10/07/2013	HERITAGE IMPACT ASSESSMENT FOR MULTIPLE PROPOSED SOLAR ENERGY FACILITIES ON DU PLESSIS DAM 179, DE AAR, NORTHERN CAPE
138940	PIA Phase 1	John E Almond	10/07/2013	Palaeontological Specialist Study: Combined desktop and field-based assessments for the proposed Photovoltaic (Solar) Energy Facilities on Du Plessis Dam Farm near De Aar, Northern Cape
151280	Archaeological Specialist Reports	Jaco van der Walt	26/08/2013	Archeological Scoping Report for the Proposed Castle WEF near De Aar, Northern Cape Province
151284	PIA Desktop	John E Almond	31/08/2013	Palaeontological Heritage Assessment: Desktop Study
160512	Archaeological Monitoring	Lita Webley, Dave Halkett	17/03/2014	HERITAGE IMPACT ASSESSMENT: WALKDOWN OF FINAL LAYOUT OF THE LONGYUAN MULILO DE AAR 2 NORTH WIND ENERGY FACILITY, NORTHERN CAPE PROVINCE

CTS Heritage

16 Edison Way, Century City, 7441

Tel: +27 (0)87 073 5739 **Email:** info@ctsheritage.com **Web:** www.ctsheritage.com



CTS HERITAGE

163982	Palaeontological Specialist Reports		31/08/2013	Palaeontological specialist assessment: combined desktop and field study: Proposed development PV Solar Facility near De Aar, Northern CApe Province
163994	Heritage Impact Assessment Specialist Reports	Wouter Fourie	03/08/2013	Proposed PV Facility: Heritage Impact Report
177599	AIA Phase 1	Jonathan Kaplan	01/04/2010	ARCHAEOLOGICAL IMPACT ASSESSMENT PROPOSED PHOTOVOLTAIC POWER GENERATION FACILITY IN DE AAR NORTHERN CAPE
177600	Site Inspection Report	Will Archer, Jonathan Kaplan	01/05/2012	Reconnaissance and plan for further mitigation: sites impacted on by proposed photovoltaic power generation facility in De Aar Northern Cape
183142	Archaeological Specialist Reports	Jaco van der Walt	30/10/2014	Archaeological Impact Assessment Report for the Proposed Castle Wind Energy Facility, De Aar, Northern Cape
183143	Heritage Impact Assessment Specialist Reports	Barry Millstead	24/11/2014	Full Palaeontological Heritage Impact Assessment Report on a Portion of a Proposed Wind Energy Generation Facility (The Castle Project); This Being on the Eastern Extent of the Farm Knapdaar 8 near De Aar, Northern Cape Province
256363	Palaeontological Specialist Reports	John Almond	15/06/2013	Palaeontological Specialist Study: Combined Desktop and Field-based Assessments: Proposed Photovoltaic (Solar) Energy Facilities on Du Plessis Dam Farm near De Aar, Northern Cape.
256364	Heritage Impact Assessment Specialist Reports	Jayson Orton	10/07/2013	Heritage Impact Assessment for Multiple Proposed Solar Energy Facilities on Du Plessis Dam 179, De Aar, Northern Cape
256408	Palaeontological	John E Almond	16/07/2013	Palaeontological Specialist Study: Combined Desktop and Field-based Assessments - Proposed

CTS Heritage

16 Edison Way, Century City, 7441

Tel: +27 (0)87 073 5739 Email: info@ctsheritage.com Web: www.ctsheritage.com



CTS HERITAGE

	Specialist Reports			Photovoltaic (Solar) Energy Facilities on Badenhorst Dam Farm near De Aar, Northern Cape
256413	Heritage Impact Assessment Specialist Reports	Jayson Orton	09/07/2013	Heritage Impact Assessment for Multiple Proposed Solar Energy Facilities on De Aar 180/1 (Badenhorst Dam Farm), De Aar, Northern Cape
339820	Heritage Impact Assessment Specialist Reports	Lita Webley, Jayson Orton	01/12/2011	Proposed De Aar Wind Energy Facility on the North and South Plateau, Northern Cape Province
339824	Heritage Impact Assessment Specialist Reports	Lita Webley, David Halkett	01/06/2015	Addendum: Proposed Wind Energy Facility situated on the Eastern plateau (South) near De Aar, Northern Cape Province.
4052	HIA Phase 1	Albert van Jaarsveld	01/03/2006	Hydra-Perseus and Beta-Perseus 765 kV Transmission Power Lines Environmental Impact Assessment. Impact on Cultural Heritage Resources
49745	AIA Phase 1	Neels Kruger	01/03/2012	ARCHAEOLOGICAL IMPACT ASSESSMENT (AIA) OF DEMARCATED SURFACE AREAS ON THE OF THE FARM VETLAAGTE 4, DE AAR, NORTHERN CAPE PROVINCE
49843	PIA Phase 1	John E Almond	01/05/2012	PALAEONTOLOGICAL SPECIALIST STUDY: COMBINED DESKTOP AND FIELD-BASED ASSESSMENTS Proposed solar power generation facilities on the remaining extent of the farm Vetlaagte No. 4, De Aar, Northern Cape Province
50006	HIA Phase 1	Jayson Orton	20/02/2012	HERITAGE IMPACT ASSESSMENT FOR THREE SOLAR ENERGY FACILITIES AT DE AAR, WESTERN CAPE
6970	AIA Phase 1	David Morris	02/09/2011	Paarde Valley, Ilanga Lethemba PV Solar Energy Facility. Specialist input for the environmental impact assessment phase and environmental management programme for the proposed Ilanga Lethemba Solar Energy Facility, near De Aar, Northern Cape province
6971	AIA Desktop	Johnny Van	30/04/2011	Heritage Impact Scoping report for the proposed establishment of the Ilanga Lethemba PV Solar Energy

CTS Heritage

16 Edison Way, Century City, 7441

Tel: +27 (0)87 073 5739 Email: info@ctsheritage.com Web: www.ctsheritage.com



CTS HERITAGE

		Schalkwyk		Facility, near De Aar, Northern Cape Province.
8378	HIA Phase 1	Jayson Orton	29/02/2012	HIA for three solar energy facilities at the De Aar, Northern Cape (Paarde Valley, Badenhorst Dam Farm and Annex Du Plessis Dam Farm)
89361	HIA Phase 1	Neels Kruger	01/03/2012	ENNEX DEVELOPMENTS: PROPOSED ESTABLISHMENT OF A SOLAR ENERGY FACILITY NEAR DE AAR, NORTHERN CAPE PROVINCE Phase 1 Archaeological Impact Assessment Report
8992	PIA Phase 1	John E Almond	29/01/2012	Palaeontological Specialist Study: Combined Desktop and Field -based Assessments. Two wind energy facilities on the Eastern Plateau near De Aar, Northern Cape Province proposed by Mulilo Renewable Energy (Pty) Ltd
114648	PIA Desktop	John E Almond	01/09/2012	Palaeontological specialist assessment: desktop study PROPOSED 16 MTPA EXPANSION OF TRANSNET'S EXISTING MANGANESE ORE EXPORT RAILWAY LINE & ASSOCIATED INFRASTRUCTURE BETWEEN HOTAZEL AND THE PORT OF NGQURA, NORTHERN & EASTERN CAPE. Part 1: Hotazel to Kimberley, Northern Cape
129751	HIA Phase 1	Elize Becker	20/02/2013	Phase 1 Heritage Impact Assessment Hotazel to Kimberley and De Aar to Port of Ngqura
151768	PIA Phase 1	John E Almond	01/11/2013	Palaeontological specialist assessment: combined desktop and field-based study: PROPOSED 16 MTPA EXPANSION OF TRANSNET'S EXISTING MANGANESE ORE EXPORT RAILWAY LINE & ASSOCIATED INFRASTRUCTURE BETWEEN HOTAZEL AND THE PORT OF NGQURA, NORTHERN & EASTERN CAPE.
163451	Archaeological Specialist Reports	Wouter Fourie	27/03/2014	Proposed construction of a 132kV transmission line from the Longyuan Mulilo De Aar 2 North Wind Energy Facility on the Eastern Plateau (De Aar 2) near De Aar, Northern Cape
8086	AIA Phase 1	Johan Nel	14/11/2008	Final Report Heritage Resources Scoping Survey & Preliminary Assessment Transnet Freight Line EIA, Eastern Cape and Northern Cape
92575	HIA Phase 1	Elize Becker	10/10/2012	Phase 1 Heritage Impact Assessment Kimberley to De Aar
93185	HIA Phase 1	Elize Becker	01/11/2012	Phase 1 Heritage Impact Assessment Hotazel to Kimberley and De Aar to Port Ngqura

CTS Heritage

16 Edison Way, Century City, 7441

Tel: +27 (0)87 073 5739 Email: info@ctsheritage.com Web: www.ctsheritage.com



CTS HERITAGE

APPENDIX 3 - Keys/Guides

Key/Guide to Acronyms

AIA	Archaeological Impact Assessment
DARD	Department of Agriculture and Rural Development (KwaZulu-Natal)
DEA	Department of Environmental Affairs (National)
DEADP	Department of Environmental Affairs and Development Planning (Western Cape)
DEDEAT	Department of Economic Development, Environmental Affairs and Tourism (Eastern Cape)
DEDECT	Department of Economic Development, Environment, Conservation and Tourism (North West)
DEDT	Department of Economic Development and Tourism (Mpumalanga)
DEDTEA	Department of economic Development, Tourism and Environmental Affairs (Free State)
DENC	Department of Environment and Nature Conservation (Northern Cape)
DMR	Department of Mineral Resources (National)
GDARD	Gauteng Department of Agriculture and Rural Development (Gauteng)
HIA	Heritage Impact Assessment
LEDET	Department of Economic Development, Environment and Tourism (Limpopo)
MPRDA	Mineral and Petroleum Resources Development Act, no 28 of 2002
NEMA	National Environmental Management Act, no 107 of 1998
NHRA	National Heritage Resources Act, no 25 of 1999
PIA	Palaeontological Impact Assessment
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
VIA	Visual Impact Assessment

Full guide to Palaeosensitivity Map legend

	RED:	VERY HIGH - field assessment and protocol for finds is required
	ORANGE/YELLOW:	HIGH - desktop study is required and based on the outcome of the desktop study, a field assessment is likely
	GREEN:	MODERATE - desktop study is required
	BLUE/PURPLE:	LOW - no palaeontological studies are required however a protocol for chance finds is required
	GREY:	INSIGNIFICANT/ZERO - no palaeontological studies are required
	WHITE/CLEAR:	UNKNOWN - these areas will require a minimum of a desktop study.

CTS Heritage

16 Edison Way, Century City, 7441

Tel: +27 (0)87 073 5739 Email: info@ctsheritage.com Web: www.ctsheritage.com



CTS HERITAGE

APPENDIX 4 - Methodology

The Heritage Screener summarises the heritage impact assessments and studies previously undertaken within the area of the proposed development and its surroundings. Heritage resources identified in these reports are assessed by our team during the screening process.

The heritage resources will be described both in terms of **type**:

- Group 1: Archaeological, Underwater, Palaeontological and Geological sites, Meteorites, and Battlefields
- Group 2: Structures, Monuments and Memorials
- Group 3: Burial Grounds and Graves, Living Heritage, Sacred and Natural sites
- Group 4: Cultural Landscapes, Conservation Areas and Scenic routes

and **significance** (Grade I, II, IIIa, b or c, ungraded), as determined by the author of the original heritage impact assessment report or by formal grading and/or protection by the heritage authorities.

Sites identified and mapped during research projects will also be considered.

DETERMINATION OF THE EXTENT OF THE INCLUSION ZONE TO BE TAKEN INTO CONSIDERATION

The extent of the inclusion zone to be considered for the Heritage Screener will be determined by CTS based on:

- the size of the development,
- the number and outcome of previous surveys existing in the area
- the potential cumulative impact of the application.

The inclusion zone will be considered as the region within a maximum distance of 50 km from the boundary of the proposed development.

DETERMINATION OF THE PALAEOLOGICAL SENSITIVITY

The possible impact of the proposed development on palaeontological resources is gauged by:

- reviewing the fossil sensitivity maps available on the South African Heritage Resources Information System (SAHRIS)
- considering the nature of the proposed development
- when available, taking information provided by the applicant related to the geological background of the area into account

DETERMINATION OF THE COVERAGE RATING ASCRIBED TO A REPORT POLYGON

Each report assessed for the compilation of the Heritage Screener is colour-coded according to the level of coverage accomplished. The extent of the surveyed coverage is labeled in three categories, namely low, medium and high. In most instances the extent of the map corresponds to the extent of the development for which the specific report

CTS Heritage

16 Edison Way, Century City, 7441

Tel: +27 (0)87 073 5739 Email: info@ctsheritage.com Web: www.ctsheritage.com



CTS HERITAGE

was undertaken.

Low coverage will be used for:

- desktop studies where no field assessment of the area was undertaken;
- reports where the sites are listed and described but no GPS coordinates were provided.
- older reports with GPS coordinates with low accuracy ratings;
- reports where the entire property was mapped, but only a small/limited area was surveyed.
- uploads on the National Inventory which are not properly mapped.

Medium coverage will be used for

- reports for which a field survey was undertaken but the area was not extensively covered. This may apply to instances where some impediments did not allow for full coverage such as thick vegetation, etc.
- reports for which the entire property was mapped, but only a specific area was surveyed thoroughly. This is differentiated from low ratings listed above when these surveys cover up to around 50% of the property.

High coverage will be used for

- reports where the area highlighted in the map was extensively surveyed as shown by the GPS track coordinates. This category will also apply to permit reports.

RECOMMENDATION GUIDE

The Heritage Screener includes a set of recommendations to the applicant based on whether an impact on heritage resources is anticipated. One of three possible recommendations is formulated:

(1) The heritage resources in the area proposed for development are sufficiently recorded - The surveys undertaken in the area adequately captured the heritage resources. There are no known sites which require mitigation or management plans. No further heritage work is recommended for the proposed development.

This recommendation is made when:

- enough work has been undertaken in the area
- it is the professional opinion of CTS that the area has already been assessed adequately from a heritage perspective for the type of development proposed

(2) The heritage resources and the area proposed for development are only partially recorded - The surveys undertaken in the area have not adequately captured the heritage resources and/or there are sites which require mitigation or management plans. Further specific heritage work is recommended for the proposed development.

This recommendation is made in instances in which there are already some studies undertaken in the area and/or in the adjacent area for the proposed development. Further studies in a limited HIA may include:

CTS Heritage

16 Edison Way, Century City, 7441

Tel: +27 (0)87 073 5739 Email: info@ctsheritage.com Web: www.ctsheritage.com



CTS HERITAGE

- improvement on some components of the heritage assessments already undertaken, for instance with a renewed field survey and/or with a specific specialist for the type of heritage resources expected in the area
- compilation of a report for a component of a heritage impact assessment not already undertaken in the area
- undertaking mitigation measures requested in previous assessments/records of decision.

(3) The heritage resources within the area proposed for the development have not been adequately surveyed yet - Few or no surveys have been undertaken in the area proposed for development. A full Heritage Impact Assessment with a detailed field component is recommended for the proposed development.

CTS Heritage

16 Edison Way, Century City, 7441

Tel: +27 (0)87 073 5739 Email: info@ctsheritage.com Web: www.ctsheritage.com