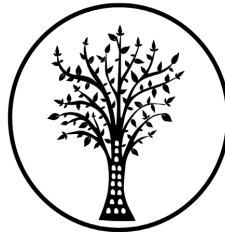


ARCHAEOLOGICAL SPECIALIST STUDY

In terms of Section 38(8) of the NHRA for a

**Proposed Development of the Wag n Bietjie infrastructure associated with the
authorised PV Facilities near De Aar**

Prepared by



CTS HERITAGE

In Association with

Savannah Environmental

November 2021



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EXECUTIVE SUMMARY



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1. INTRODUCTION

1.1 Background Information on Project

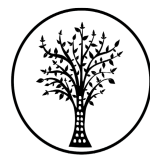
Project components and areas for assessment

- MTS
- Loop in Loop Out lines connecting the new MTS to an existing 400kV power line
- A grid connection that connects the Wag 'n Bietjie MTS and the Vetlaagte MTS

1.2 Description of Property and Affected Environment

The farm, Wag en Bietje 5 (Wag 'n Bietjie), lies 6 km east of the town of De Aar and about 2km north of the large Hydra substation. A number of renewable energy projects, particularly solar PV farms, have been proposed immediately surrounding this development and three completed solar farms lie north and northwest of Wag 'n Bietjie such as De Aar Solar and Paarde Valley. A completed 144MW wind farm lies on the plateau north east of the development and can be seen from parts of Wag 'n Bietjie. The Wag 'n Bietjie project entails various solar PV panels and infrastructure. The powerline route runs along its northwestern border before breaking across into the middle of the study area near an existing jeep track. Most of Wag 'n Bietjie is covered in vlaktes covered in grassland, especially in the north-south floodplain. The eastern half of has a number of dolerite koppies dotting the area with a larger koppie rising 200m higher above the area to the east. Large powerlines run right through the middle of the study area and down to the Hydra substation.

The farms are currently used for grazing by sheep and a few farm kraals, dams and windmills were observed. The vegetation is typical of the Karoo and the grassland was dense enough over much of the site to hamper visibility of archaeological material lying on the surface. A few (currently dry) farm dams were evident that appear to be in a state of disuse within the floodplain.



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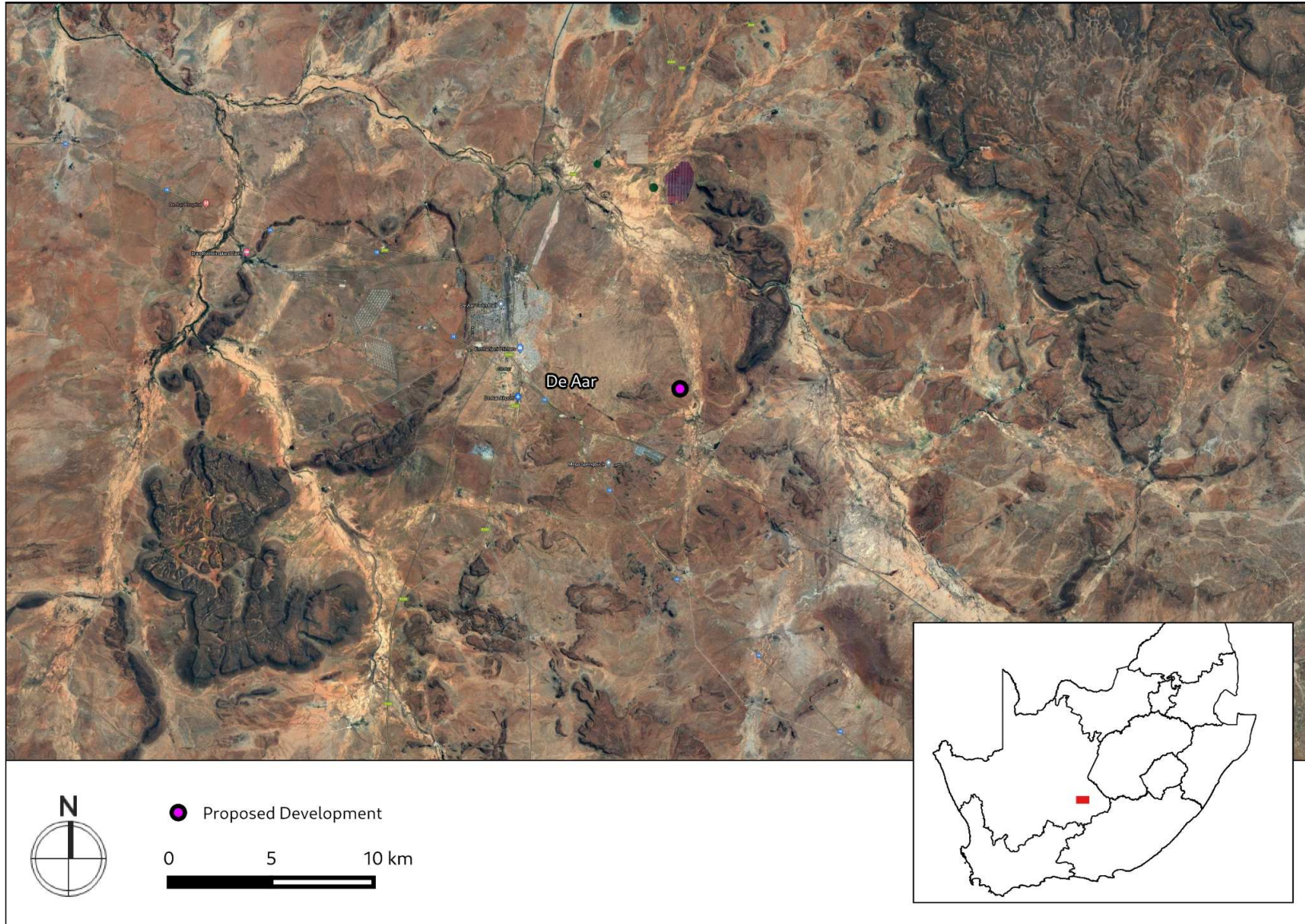
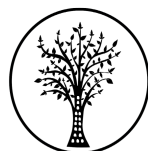


Figure 1.1: Close up satellite image indicating proposed location of study area



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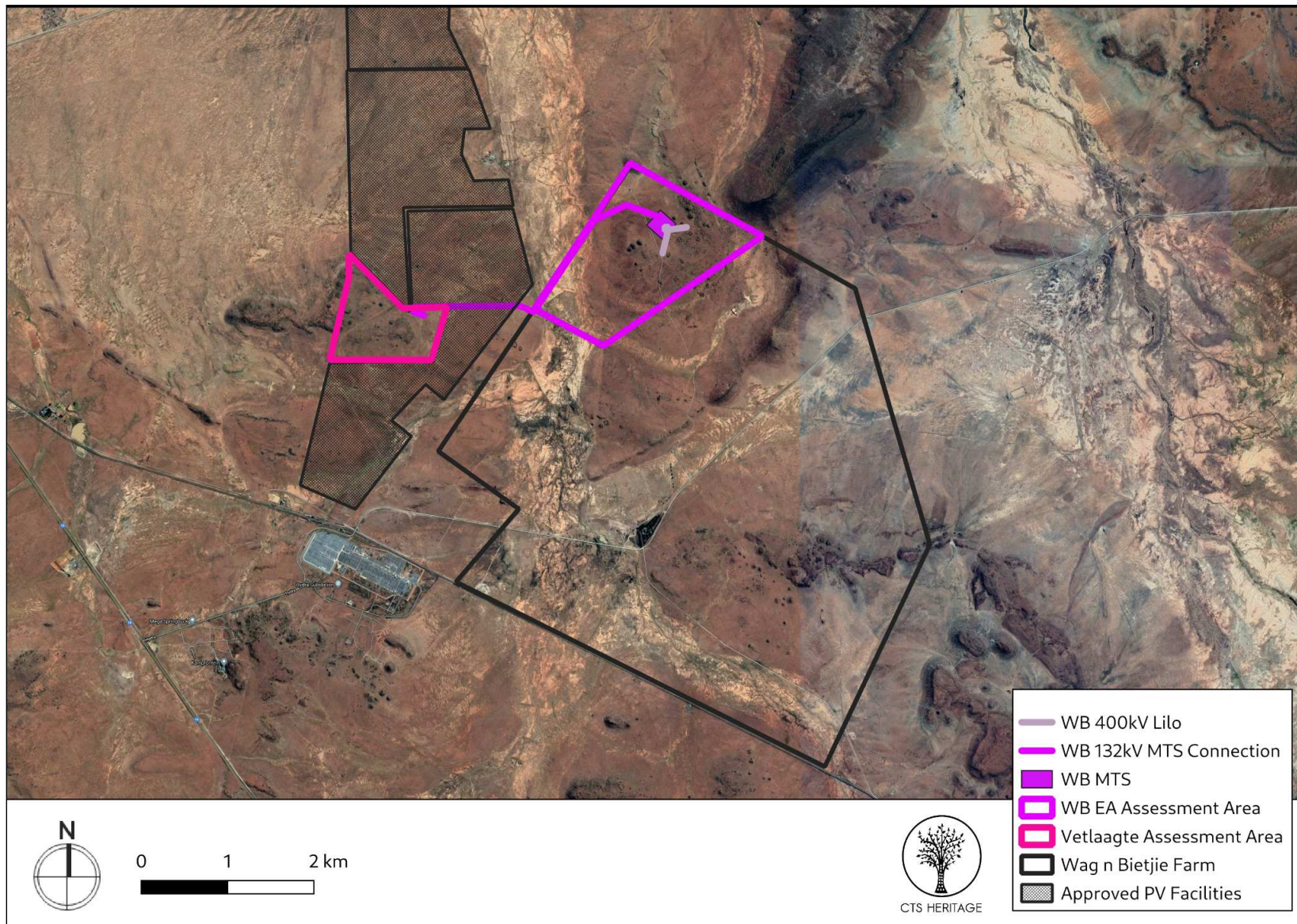


Figure 1.2: Study Area



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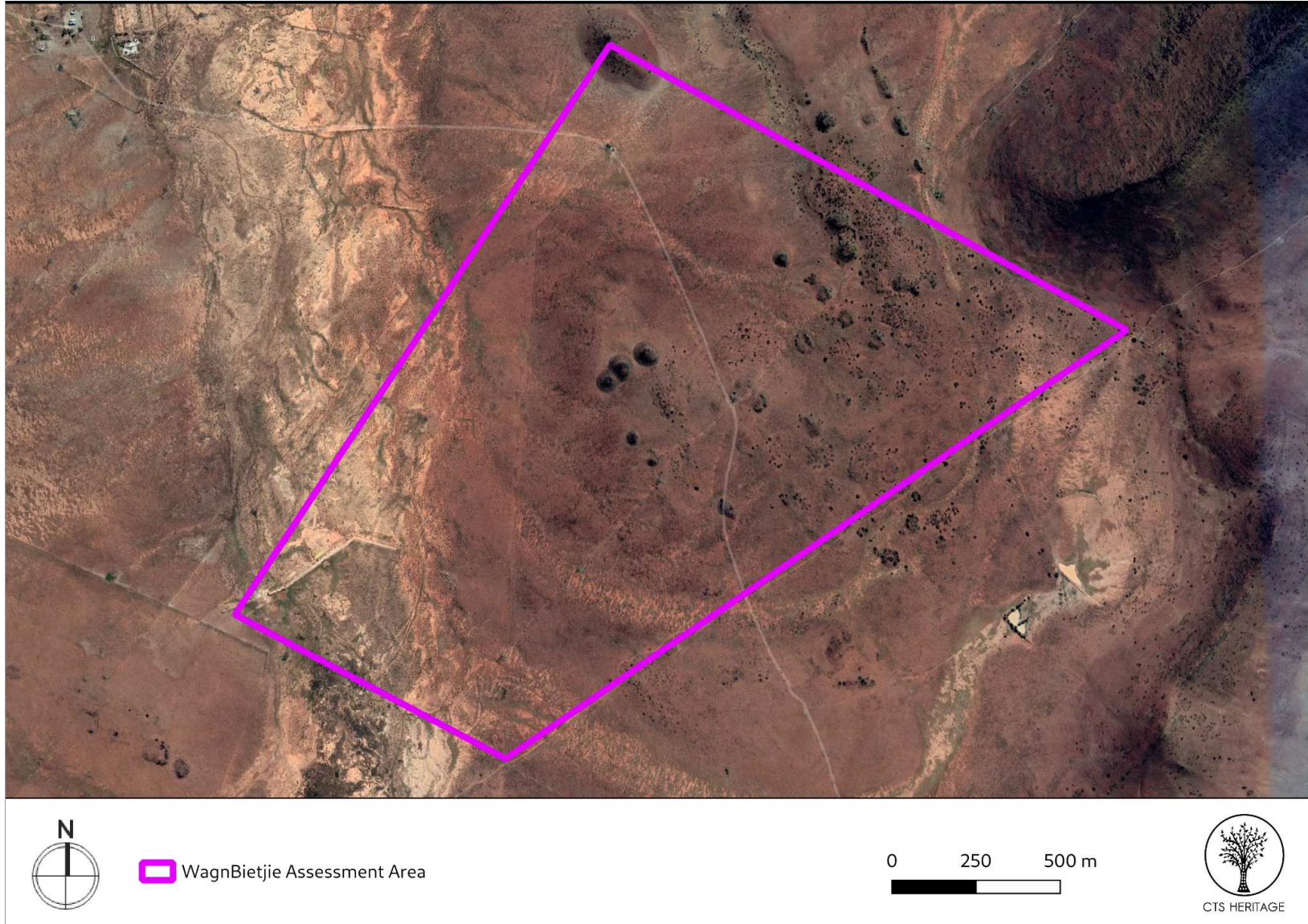


Figure 1.3: Study Area



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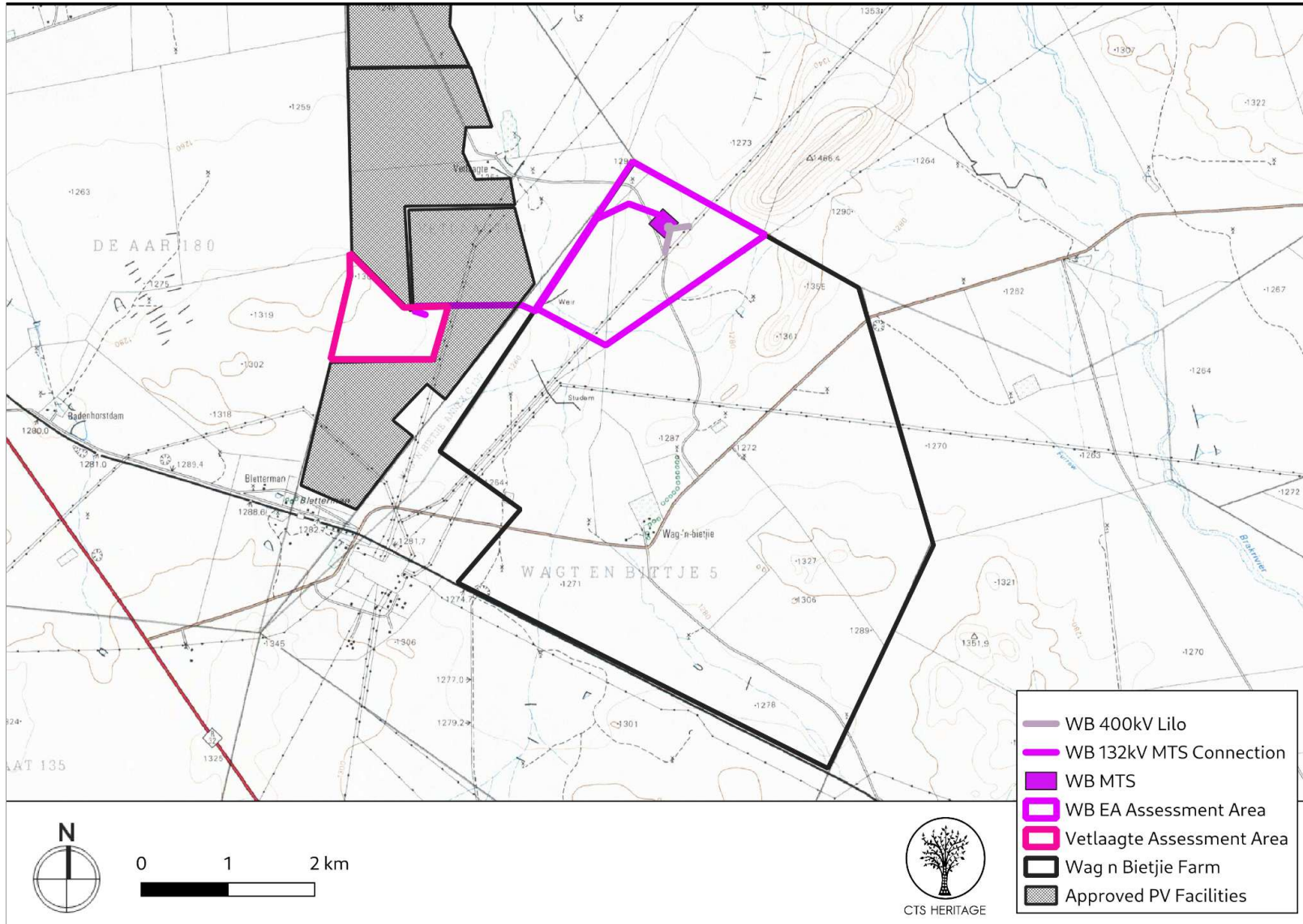


Figure 1.4: Study Area reflected on the 1:50 000 Topo Map



2. METHODOLOGY

2.1 Purpose of Archaeological Study

The purpose of this archaeological study is to satisfy the requirements of section 38(8), and therefore section 38(3) of the National Heritage Resources Act (Act 25 of 1999) in terms of impacts to archaeological resources.

2.2 Summary of steps followed

- An archaeologist conducted a survey of the site and its environs on 9 November 2021 to determine what archaeological resources are likely to be impacted by the proposed development.
- The study area was assessed on foot in transects, photographs of the context and finds were taken, and tracks were recorded using a GPS.
- The identified resources were assessed to evaluate their heritage significance in terms of the grading system outlined in section 3 of the NHRA (Act 25 of 1999).
- Alternatives and mitigation options were discussed with the Environmental Assessment Practitioner.

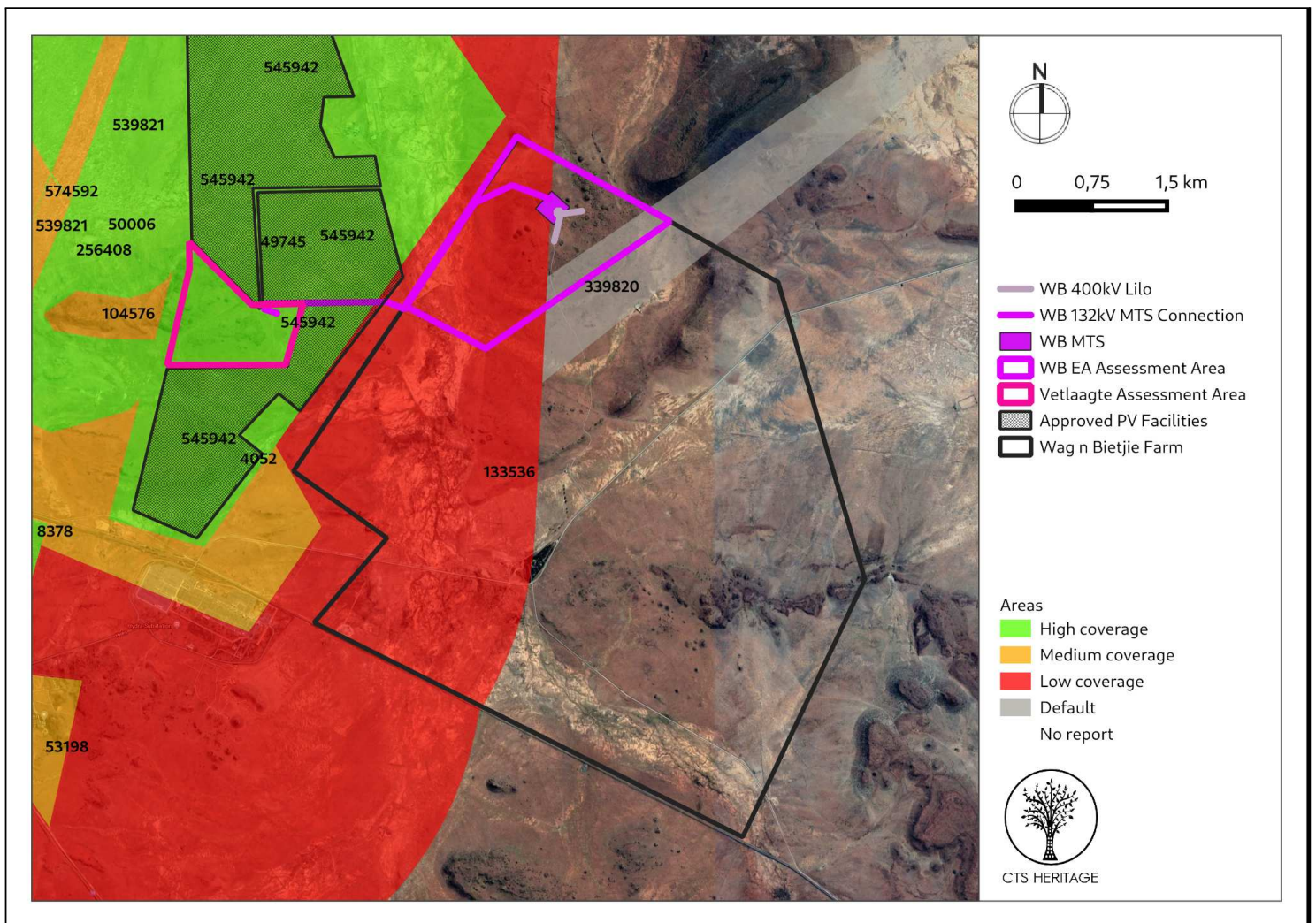


Figure 2: Close up satellite image indicating proposed location of the study area in relation to heritage studies previously conducted



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2.3 Constraints & Limitations

The grassland areas could be quite densely covered in places spread throughout the site which certainly contributed to obscuring the archaeological material on the surface. However, enough patches of exposed and open ground were encountered throughout the study area and scatters of artefacts were easily recorded in these spots along with Stone Age material associated with occupation areas nearer to the dolerite outcrops. There were therefore no major limitations or constraints to the survey carried out and we are confident that the assessment provided an accurate report on the archaeological sensitivity of the area.

3. HISTORY AND EVOLUTION OF THE SITE AND CONTEXT

This application is for the proposed development of supplementary infrastructure associated with the Wag 'n Bietjie Solar Energy Facility located West of De Aar in the Northern cape. 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.

The area proposed for development is located immediately adjacent to the approved Vetlaagte Solar Energy Facility (SAHRIS Case ID 192). The studies completed for the Vetlaagte Solar Energy Facility are referred to below in order to provide heritage context to the proposed development area. The heritage impact assessment (Kruger, 2012 SAHRIS ID 49745) and palaeontology assessment (Almond, 2012 SAHRIS ID 49843) are referred to extensively below.

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 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



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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.”

All of the heritage resources identified by Kruger (2012) have been mapped relative to the proposed development in Figure 3. No impact to any known heritage resources are anticipated. None of the infrastructure proposed as part of this development application are located near the archaeologically sensitive drainage located along the eastern periphery of the property. The sites listed in the table below are located within the development footprint however direct impact is only anticipated to Site Vetlaagte 03 (SAHRIS ID 34471) as it is located within the proposed 132kV alignment. As per Kruger (2012), it is recommended that the site be properly recorded prior to construction.



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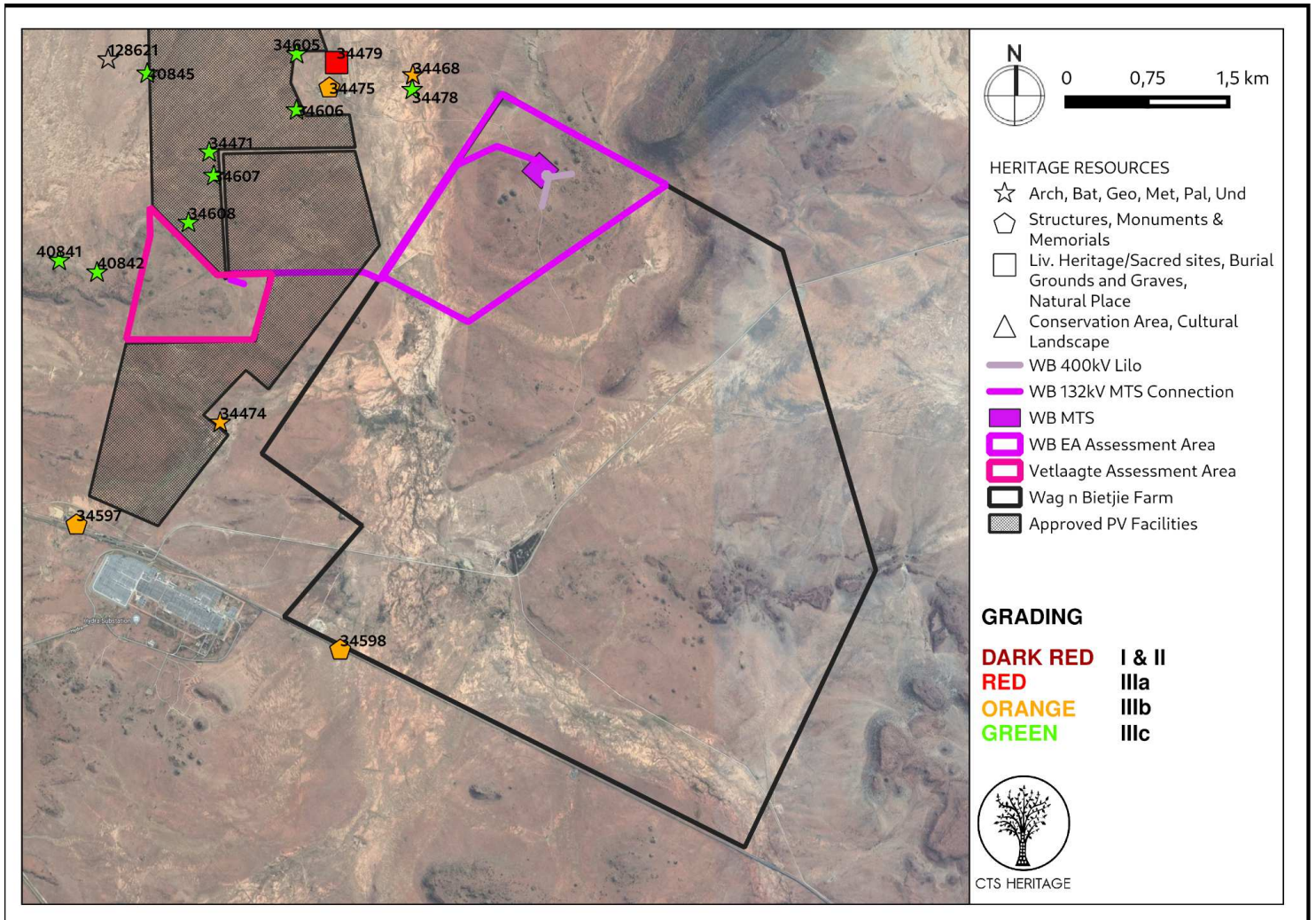


Figure 3. Heritage Resources Map. Heritage Resources previously identified in and near the study area, with SAHRIS Site IDs indicated



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4. IDENTIFICATION OF HERITAGE RESOURCES

4.1 Field Assessment

Over 25 archaeological observations were made on Wag 'n Bietjie. Hornfels dominated the assemblages with smaller components of CCS and siltstones. While the vast majority of the scatters were made during the Middle Stone Age, there was also a relatively clear Later Stone Age presence in the study area. Many examples of blade forms were found which is typical of the Still Bay period (>70 000 years BP) and the neighbouring Vetlaagte farm was also surveyed whilst conducting an HIA for a similar solar PV facility there. Relatively dense Later Stone Age sites were found on the far eastern end of Wag 'n Bietjie and these date within the last 2000 years due to the presence of pottery in these sites. The increasing density of material as one moved eastwards was probably due to the shortening distance from the Brakrivier which runs around Caroluspoort (4km northeast of Wag 'n Bietjie). This is the closest source of reliable water in the area.

Two sites warranted protection with an interesting scatter of Still Bay tools on top of a dolerite outcrop with excellent views of the surrounding area. It is highly unlikely this area will be developed and it is recommended that infrastructure is not placed on this outcrop. Another site was found warranting a IIIB rating with pottery, bone and an extensive stone tool assemblage in amongst the dolerite outcrops on the eastern end of the property. Again, this site has been demarcated as sensitive and the project team has been advised to avoid this area when finalising the layouts. A minimum buffer of 100m is recommended from this site (Wag n Bietjie 014). The rest of the observationsn are typical of the area and are ubiquitously distributed in low densities of less than 5 artefacts per observation. Kruger's previous survey on ground overlapping with this study area found similar material but we feel the gradings attributed to these (IIIC) are better downgraded to NCW now that we have greater coverage contextualising these finds and that they are widespread. Much of the archaeological material will be well conserved within a series of areas that can't be developed for the solar PV arrays while the flat, grassy vlaktes that are idea for the solar PV are also the areas with the lowest archaeological sensitivity.



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Figure 4.1: Contextual Images



Figure 4.2: Contextual Images with existing electrical infrastructure



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Figure 4.3: Contextual Images



Figure 4.4: Contextual Images



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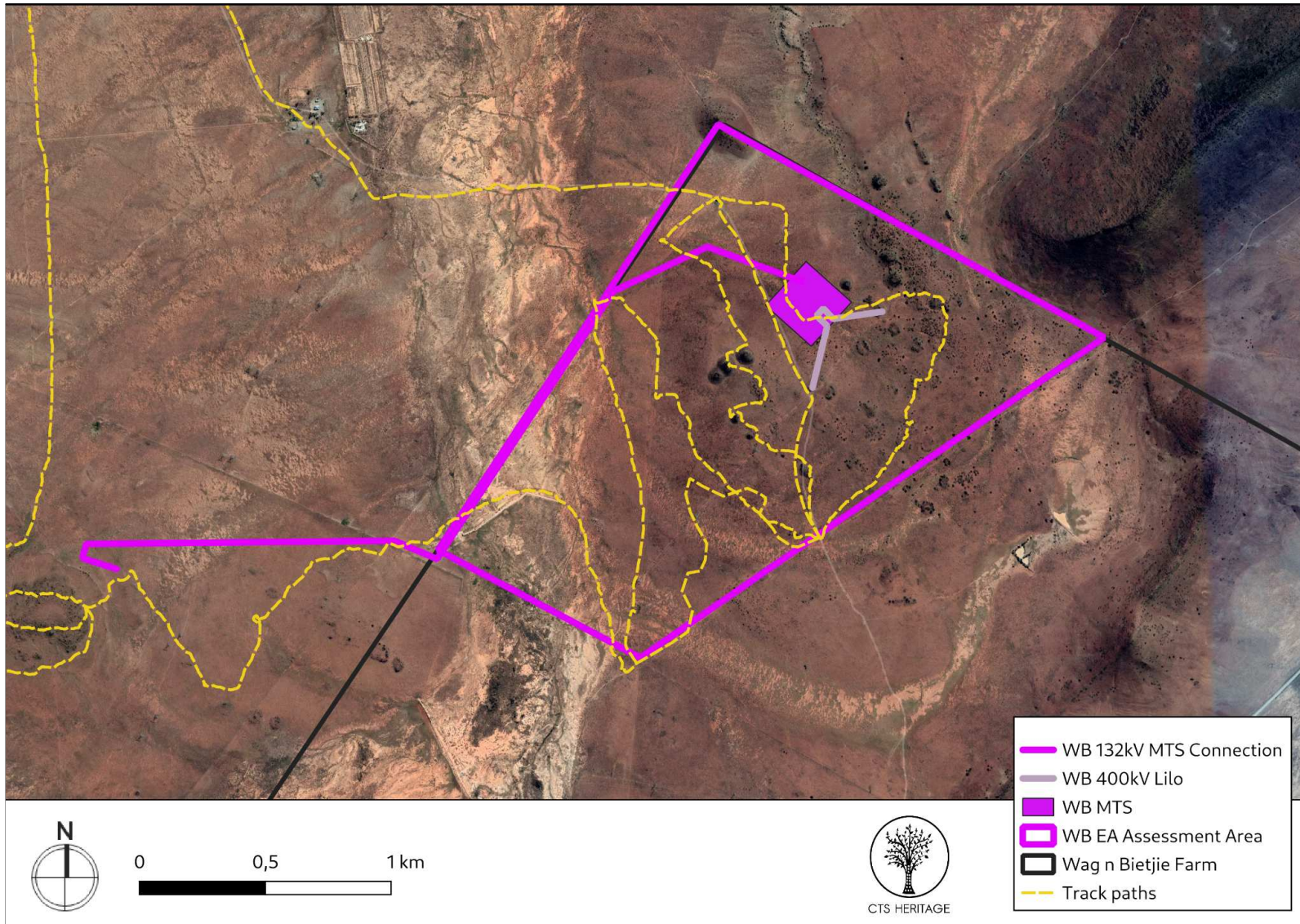


Figure 5.1: Overall track paths of foot survey



4.2 Archaeological Resources identified

Table 2: Observations noted during the field assessment

Site No.	Site Name	Description	Density m ²	Period	Co-ordinates		Grading	Mitigation
001	Wag n Bietjie 001	Heavily patinated hornfels flake, edge retouched, next to dolerite outcrop	0-5	MSA	-30.68461	24.12304	NCW	NA
002	Wag n Bietjie 002	Hornfels blade flake no cortex, hinge terminations on dorsal	0-5	MSA	-30.68347	24.12082	NCW	NA
003	Wag n Bietjie 003	Hornfels flake with small secondary flake scar	0-5	MSA	-30.68271	24.1198	NCW	NA
004	Wag n Bietjie 004	Still bay point, blades, hornfels, burnt bone, on top of dolerite outcrop with good views	5-10	MSA	-30.68097	24.11972	IIIC	30m no-go buffer
005	Wag n Bietjie 005	Couple of patinated hornfels flakes, one scraper	0-5	MSA	-30.67919	24.11971	NCW	NA
006	Wag n Bietjie 006	Single long hornfels blade flake retouched near windmill	0-5	MSA	-30.67512	24.1188	NCW	NA
007	Wag n Bietjie 007	Two unworked hornfels flakes	0-5	MSA	-30.6751	24.12113	NCW	NA
008	Wag n Bietjie 008	Hornfels flake, unworked, heavily patinated	0-5	MSA	-30.67872	24.12576	NCW	NA
009	Wag n Bietjie 009	Hornfels core	0-5	MSA	-30.67845	24.12653	NCW	NA
010	Wag n Bietjie 010	Heavily patinated hornfels flakes in a small clearing	0-5	MSA	-30.67832	24.12772	NCW	NA
011	Wag n Bietjie 011	Three hornfels flakes, one with edge retouch	0-5	MSA	-30.67847	24.12838	NCW	NA
012	Wag n Bietjie 012	Thumbnail scraper, msa hornfels blade and flakes	10-30	MSA, LSA	-30.67917	24.12871	NCW	NA
013	Wag n Bietjie 013	Hornfels point, edge retouched	0-5	MSA	-30.68179	24.12737	NCW	NA
014	Wag n Bietjie 014	LSA and MSA site with mainly LSA hornfels flakes and pottery	30+	MSA, LSA	-30.68296	24.12708	IIIB	100m no go buffer
015	Wag n Bietjie 015	Msa hornfels, still fresh looking, flakes and blades, LSA too	10-30	MSA, LSA	-30.68397	24.12654	NCW	NA
016	Wag n Bietjie 016	heavily patinated hornfels blade retouched	0-5	MSA	-30.68002	24.11668	NCW	NA
017	Wag n Bietjie 017	Unworked siltstone and hornfels flakes	0-5	MSA	-30.67955	24.11629	NCW	NA
018	Wag n Bietjie 018	Hornfels flakes in sandy pan/depression, prominent bulb of percussion	0-5	MSA	-30.67856	24.11406	NCW	NA
019	Wag n Bietjie 019	Hornfels chunks in edge of pan	0-5	LSA	-30.68099	24.11445	NCW	NA
020	Wag n Bietjie 020	Large hornfels point, and flake	0-5	MSA	-30.6824	24.11505	NCW	NA
021	Wag n Bietjie 021	Long hornfels blade near windmill	0-5	MSA	-30.68971	24.11579	NCW	NA
022	Wag n Bietjie 022	Broken hornfels blade, sides retouched	0-5	MSA	-30.69121	24.11485	NCW	NA
023	Wag n Bietjie 023	Hornfels flake worth lateral retouch	0-5	MSA	-30.68977	24.11459	NCW	NA
024	Wag n Bietjie 024	Hornfels chunks, flakes, points	10-30	MSA, LSA	-30.68687	24.11367	NCW	NA
025	Wag n Bietjie 025	hornfels bladelet with hinge terminations on dorsal, hornfels core with less than 10% cortex left	0-5	MSA	-30.68546	24.11078	NCW	NA
026	Wag n Bietjie 026	Next to old dam wall. Hornfels points and flakes, siltstone flake worth adze wear, possibly scraping	0-5	MSA	-30.68727	24.10714	NCW	NA



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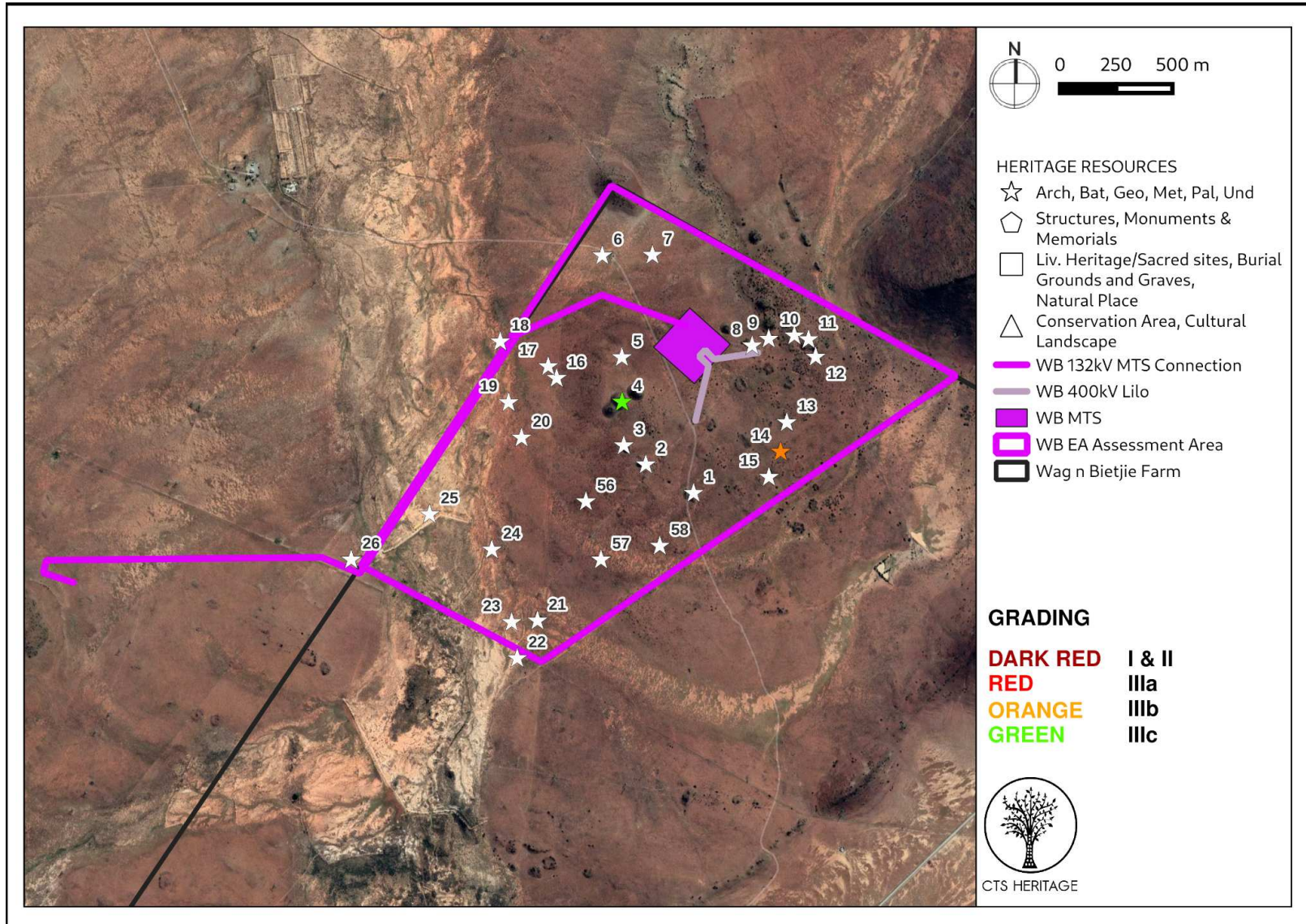
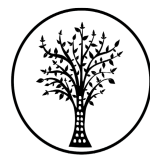


Figure 6.1: Map of field observations relative to the proposed development



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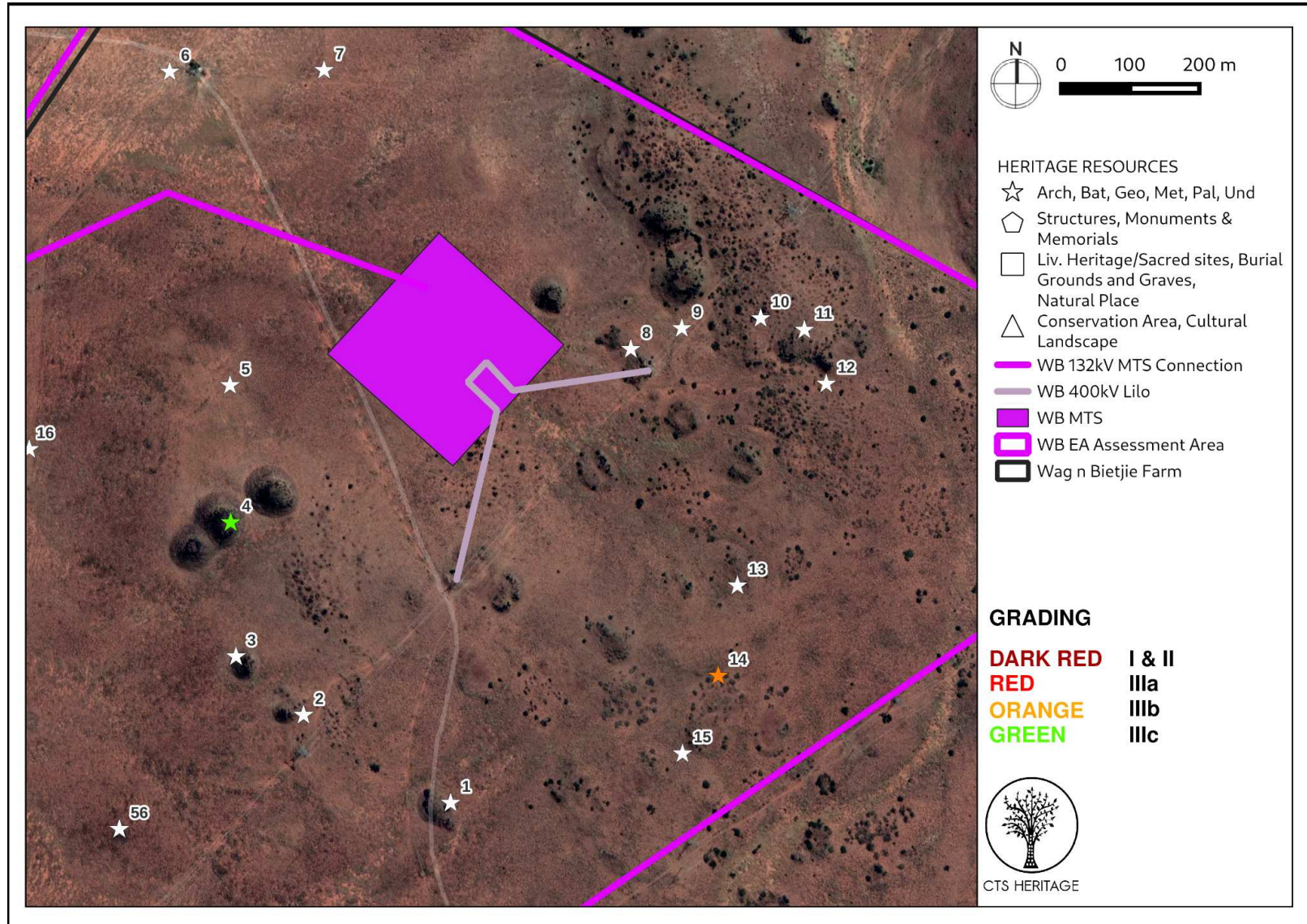


Figure 6.2: Map of field observations relative to the proposed development



4.3 Selected photographic record

(a full photographic record is available upon request)



Figure 7.1: Observation 001



Figure 7.2: Observation 004



Figure 7.3: Observation 004



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Figure 7.4: Observation 010 and 011



Figure 7.5: Observation 014



Figure 7.6: Observation 014

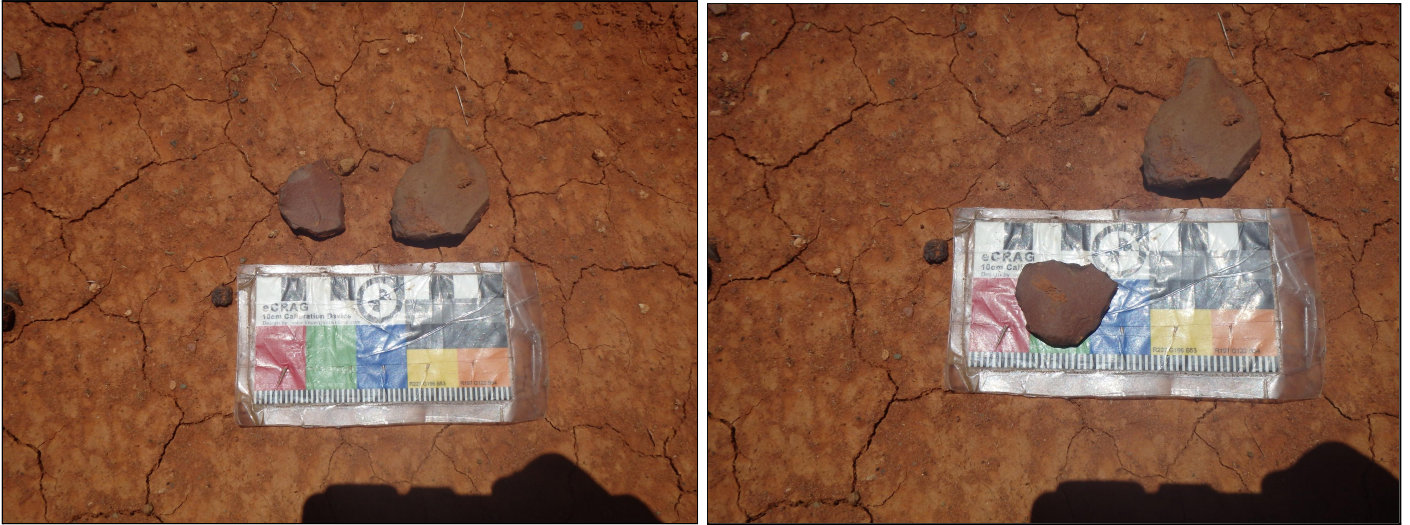


Figure 7.7: Observation 018

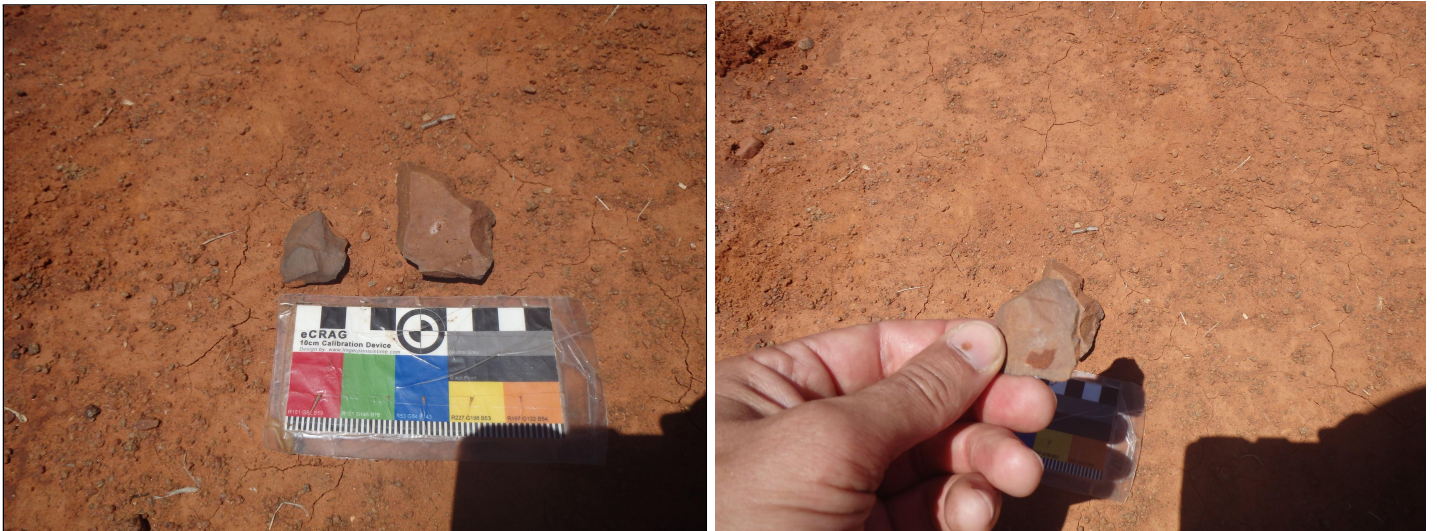


Figure 7.8: Observation 020

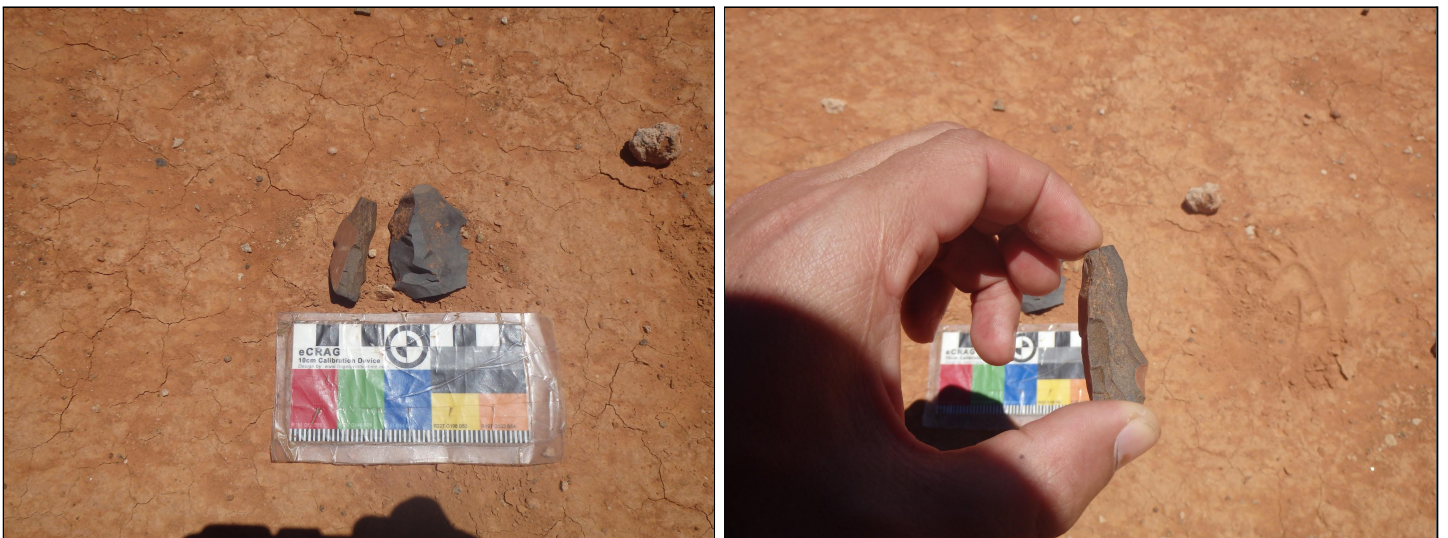


Figure 7.9: Observation 025



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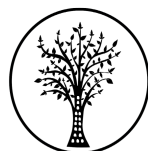
5. ASSESSMENT OF THE IMPACT OF THE DEVELOPMENT

5.1 Assessment of impact to Archaeological Resources

The results of the archaeological field assessment conducted largely aligns with the findings of previous archaeological assessments completed in the vicinity of the proposed development. The archaeological resources identified within the development area are dominated by Later and Middle Stone Age flakes, which corresponds with similar findings of others (Kruger, 2012). The majority of the archaeological resources identified within the area proposed for the development in this field assessment have been determined to be not conservation-worthy. As such, these resources have been sufficiently recorded and there is no objection to the proposed development in these locations from an archaeological perspective.

Two archaeological sites of significance were identified in the field assessment, Site 004, graded IIIC and 014, graded IIIB. In order to ensure that the sites are not negatively impacted by the proposed development, it is recommended that a no-go development buffer of 30m is implemented around Site 004 and a no-go development buffer of 100m is implemented around Site 014. These sites and their respective buffers should be indicated on site development maps during the construction phase of the project. Furthermore, during the operational phase of the projects, relevant staff of the facility should be made aware of these sites and proper training provided regarding appropriate behaviour at archaeological sites.

Other than LSA and MSA artefacts that have been described above, the archaeological field assessment completed in November 2021 identified no structures or other kinds of heritage resources located within the areas proposed for development.



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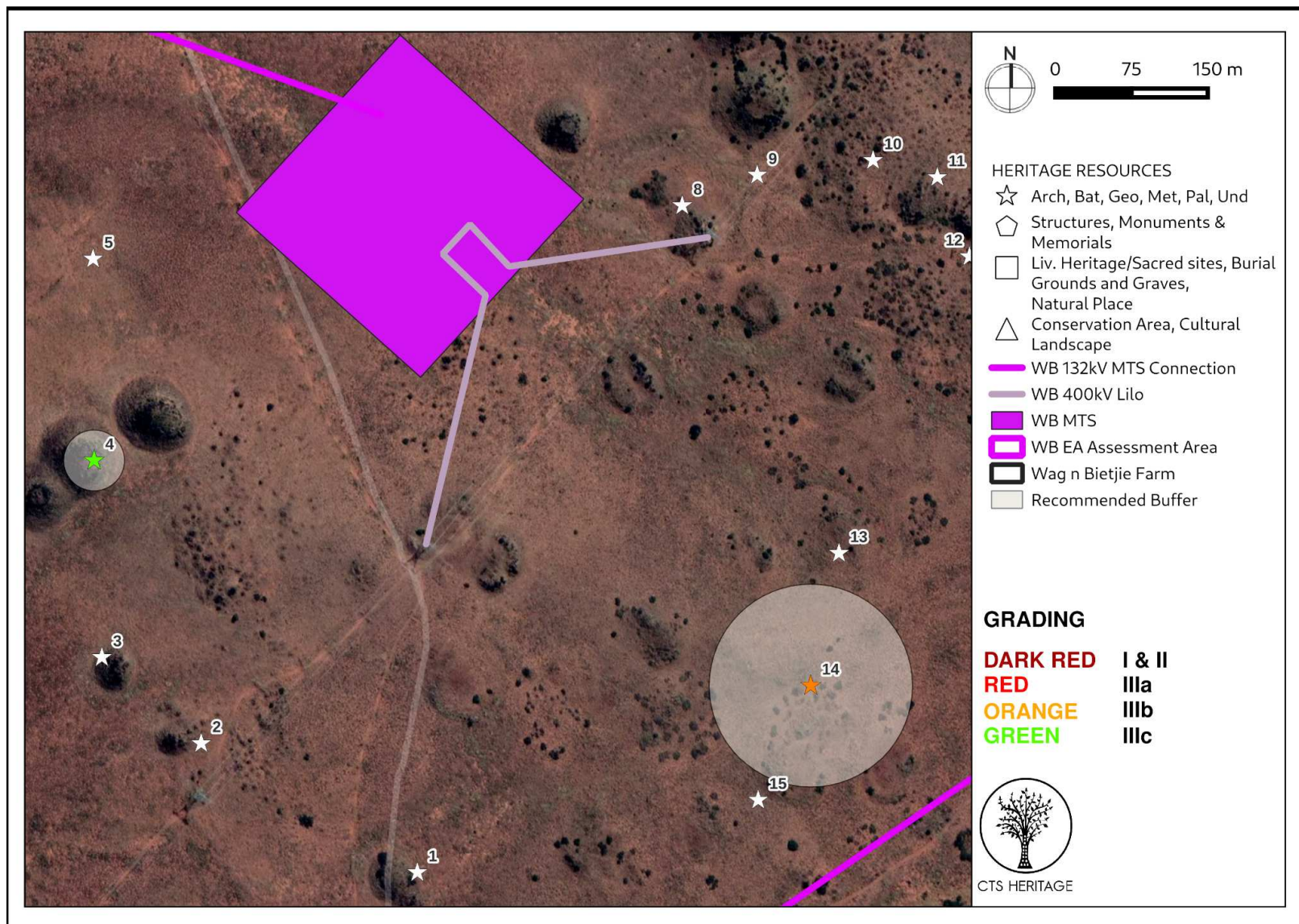


Figure 8: Recommended Buffers



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6. CONCLUSION AND RECOMMENDATIONS

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.

Recommendations

There is no objection to the proposed development in terms of impacts to archaeological heritage on condition that:

- A no-go development buffer of 30m is implemented around Site 004 and a no-go development buffer of 100m is implemented around Site 014. These sites and their respective buffers should be indicated on site development maps during the construction phase of the project. Furthermore, during the operational phase of the projects, relevant staff of the facility should be made aware of these sites and proper training provided regarding appropriate behaviour at archaeological sites.
- Should any buried archaeological resources or human remains or burials be uncovered during the course of development activities, work must cease in the vicinity of these finds. The South African Heritage Resources Agency (SAHRA) must be contacted immediately in order to determine an appropriate way forward.



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7. REFERENCES

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
133536	Palaeontological Specialist Reports	John E Almond	01/07/2013	PALAEONTOLOGICAL SPECIALIST STUDY
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	HIA	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
256408	Palaeontological Specialist Reports	John E Almond	16/07/2013	Palaeontological Specialist Study: Combined Desktop and Field-based Assessments - Proposed 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	Lita	01/12/2011	Proposed De Aar Wind Energy Facility on the North and South Plateau,



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	Impact Assessment Specialist Reports	Webley, Jayson Orton		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
53198	HIA Phase 1	Elize Becker	20/04/2012	Phase 2 Heritage Impact Assessment De Aar Solar One Photovoltaic Power Project Heritage Impact Assessment Phase 2
53200	Heritage Scoping	Elize Becker	18/01/2012	HERITAGE IMPACT ASSESSMENT SCOPING REPORT Prepared for De Aar Solar One Photovoltaic Power Plant, Northern Cape
58989	PIA Desktop	James Brink	10/08/2012	A Palaeontological Desktop Study of the Area to be Affected by the Proposed Photovoltaic Power Project on Portion 3 of Farm Hartebeestplaats 135
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