HERITAGE IMPACT ASSESSMENT

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

Proposed Development of the Notsi PV 1 project as part of the Notsi Solar Projects near Dealesville, Free State Province

Prepared by CTS Heritage

CTS HERITAGE

Jenna Lavin

For

EnviroNamics

March 2023

CTS HERITAGE

EXECUTIVE SUMMARY

1. Site Name:

Notsi PV1 Facility

2. Location:

Approximately 13 km Southwest of Dealesville on Farm Ebenhaezer 1623.

3. Locality Plan:

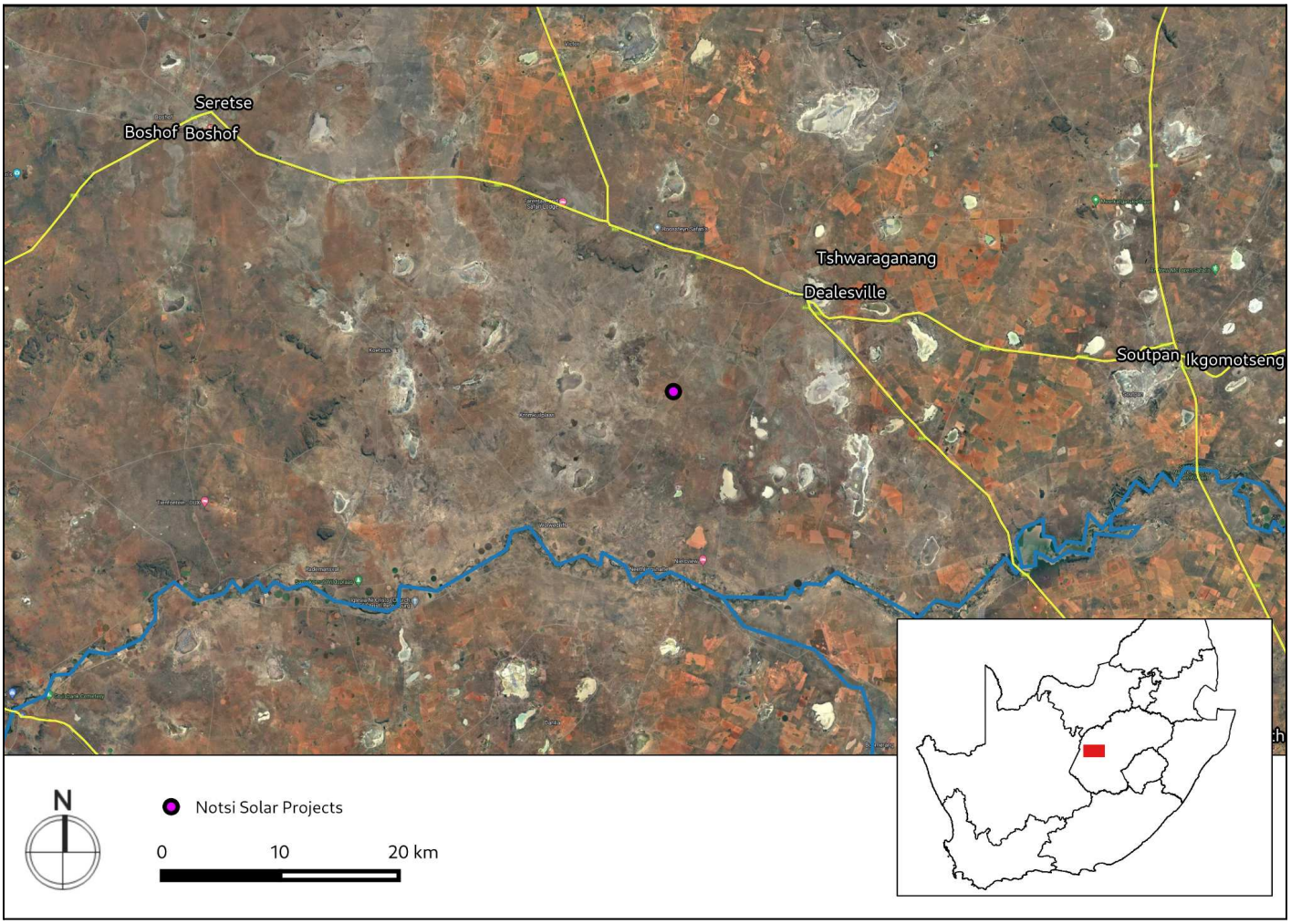

Figure A: Location of the proposed development area

4. Description of Proposed Development:

Notsi PV(Pty) Ltd are interested in developing a cluster of 100 MW solar PV facilities and associated infrastructure of an area located on Farm 1623 Ebenhaezer, located approximately 13 km southwest of the centre of Dealesville in the Free State Province. Each project will include a solar PV facility with standard infrastructure of a PV facility

including PV arrays; cabling; inverters; on-site substation and grid connection; battery storage; auxiliary buildings; access and internal roads; temporary laydown areas; and fencing. This assessment is for the proposed Notsi PV 1 facility.

5. Heritage Resources Identified:

No heritage resources were identified within the area proposed for the Notsi PV 1 development.

6. Anticipated Impacts on Heritage Resources:

The field assessment for the proposed development identified that most of the area under assessment has been previously disturbed through extensive agricultural activity. Stone Age archaeological heritage resources were identified within the broader area proposed for development, however these were largely in disturbed contexts. One very significant *in situ* archaeological site (DV2) was identified adjacent to the pan site located in the west of the development area however no significant heritage resources were identified as being impacted by the proposed Notsi PV 1 facility.

Other significant heritage resources identified within the development area are associated with the colonial history of the area. The burial grounds identified within the development area have very high levels of local value due to their substantial social cultural significance. It is important that the burial grounds identified, and their context, are not impacted by the proposed development.

The palaeontological field assessment identified no visible evidence of fossiliferous outcrops in the development footprint and thus an overall **LOW** palaeontological significance is allocated to the development footprint. It is therefore considered that the proposed development will not lead to detrimental impacts on the palaeontological reserves of the area and construction of the development may be authorised in its whole extent. If Palaeontological Heritage is uncovered during surface clearing and excavations the Chance find Protocol attached should be implemented immediately.

Overall, however, the heritage sensitivity of the area proposed for development is low except for the sites identified. There is no objection to the proposed development here on condition that the recommendations outlined below are implemented.

7. Recommendations:

Based on the outcomes of this report, it is not anticipated that the proposed development of the Notsi PV 1 facility and its associated grid connection infrastructure will negatively impact on significant heritage resources on condition that:

- The recommended no-development buffer areas listed in Table 4 are adhered to.
- The Chance Fossil Finds Procedure must be implemented for the duration of construction activities within the sensitive Tierberg Formation.
- Although all possible care has been taken to identify sites of cultural importance during the investigation of the study area, it is always possible that hidden or subsurface sites could be overlooked during the assessment. If any evidence of archaeological sites or remains (e.g., remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils, burials or other categories of heritage resources are found during the proposed development, work must cease in the vicinity of the find and SAHRA must be alerted immediately to determine an appropriate way forward.

8. Author/s and Date:

Jenna Lavin

March 2023

Details of Specialist who prepared the HIA

Jenna Lavin, an archaeologist with an MSc in Archaeology and Palaeoenvironments, and currently completing an MPhil in Conservation Management, heads up the heritage division of the organisation, and has a wealth of experience in the heritage management sector. Jenna's previous position as the Assistant Director for Policy, Research and Planning at Heritage Western Cape has provided her with an in-depth understanding of national and international heritage legislation. Her 8 years of experience at various heritage authorities in South Africa means that she has dealt extensively with permitting, policy formulation, compliance and heritage management at national and provincial level and has also been heavily involved in rolling out training on SAHRIS to the Provincial Heritage Resources Authorities and local authorities.

Jenna is a member of the Association of Professional Heritage Practitioners (APHP) and is also an active member of the International Committee on Monuments and Sites (ICOMOS) as well as the International Committee on Archaeological Heritage Management (ICAHM). In addition, Jenna has been a member of the Association of Southern African Professional Archaeologists (ASAPA) since 2009. Recently, Jenna has been responsible for conducting training in how to write Wikipedia articles for the Africa Centre's WikiAfrica project.

Since 2016, Jenna has drafted over 250 Screening and Heritage Impact Assessments throughout South Africa.

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APPENDICES

1. INTRODUCTION

1.1 Background Information on Project

Notsi PV (Pty) Ltd are interested in a cluster of 100 MW solar PV facilities and associated infrastructure on an area located on Farm 1623 Ebenhaezer, located approximately 13 km southwest of the centre of Dealesville in the Free State Province. Each project will include a solar PV facility with standard infrastructure of a PV facility including PV arrays; cabling; inverters; on-site substation and grid connection; battery storage; auxiliary buildings; access and internal roads; temporary laydown areas; and fencing. This assessment is for the proposed Notsi PV 1 facility.

The term photovoltaic describes a solid-state electronic cell that produces direct current electrical energy from the radiant energy of the sun through a process known as the Photovoltaic Effect. This refers to light energy placing electrons into a higher state of energy to create electricity. Each PV cell is made of silicon (i.e., semiconductors), which is positively and negatively charged on either side, with electrical conductors attached to both sides to form a circuit. This circuit captures the released electrons in the form of an electric current (direct current). The key components of the proposed project are described below:

- PV Panel Array - The proposed facility will require numerous linked rows of PV (single axis) modules placed behind a protective glass sheet to form a panel. Multiple panels will be required to form the solar PV arrays which will comprise the PV facility with associated support infrastructure (concrete footings, below ground electrical cables) to produce up to 100MW electricity.
- Battery Energy Storage System (BESS) – The battery energy storage system will make use of solid state or flow battery technology and will have a capacity of up to 400MWh. Both lithium-ion and Redox-flow technology are being considered for the project, depending on which is most feasible at the time of implementation. The extent of the system will be up to 3ha. The containers may be single stacked only to reduce the footprint. The containers will include cells, battery charge controllers, inverters, transformers, HVAC, fire, safety and control systems.
- Inverters - Sections of the PV array will be wired to inverters. The inverter is a pulse width mode inverter that converts direct current (DC) electricity to alternating current (AC) electricity at grid frequency.
- Supporting Infrastructure – The following auxiliary buildings with basic services, including water, and electricity will be required:
    - o Temporary Laydown Areas; (~ 20000 m^2) and construction site camp/site office;
    - o Site Administration Office (~500m^2);
    - o Switch gear and relay room (~400m^2);
    - o Staff lockers and changing room (~200m^2);
    - o Security control (~60m^2);

o Operations & Maintenance (O& M) building (~ 500 m 2); and

o Warehouse.

- Roads – Access will be obtained via the S322 secondary road and various gravel farm roads within the area and affected property. An internal site road network will also be required to provide access to the solar field and associated infrastructure. Access roads will be up to 8m wide (6m wide road surface, with 1m drainage either side).
- Fencing - For health, safety and security reasons, the facilities will require perimeter fencing and internal security fencing. The fencing will be up to 2.4m in height.

Table 1: Technical Details

Component	Description / dimensions
Height of PV panels	Up to 4.5 meters
Area of PV Array	TBC - detail will only be available once the layouts for the respective facilities have been designed following consideration of the environmental sensitivities of the sites as part of the final facility layout design.
Number of inverters required	To be determined as part of the final facility layout design.
Area occupied by inverter / transformer stations / substations	On-site Facility Substation: Up to 4ha Eskom Portion of the Substation: up to 5ha BESS: 3 ha
Capacity of the on-site substation	33kV / 132kV
Area occupied by both permanent and construction laydown areas	Up to 4 hectares
Area occupied by buildings	Up to 3ha: ● Administration Office (~500m²); ● Switch gear and relay room (~400m²); ● Staff lockers and changing room (~200m²); ● Security control (~60m²);
Width of internal roads	Between 6 and 8 meters
Height of fencing	Approximately 2.4 meters

1.2 Description of Property and Affected Environment

The proposed Notsi PV 1 Project is located about 13 km south west of the centre of Dealesville in the Free State. Dealesville is the agricultural service centre for the surrounding agricultural communities. This town is the third largest town in the municipality. Dealesville includes Dealesville town and Tswaraganang (informal settlement). The R64 passes through Dealesville and connects Kimberley and Bloemfontein. The R64 is the only tarred road in the area while farm roads connect the surrounding agricultural communities to the town.

The Dealesville area is known for its electrical infrastructure with the Beta Substation located south-west of the town and the Perseus Substation north-west of Dealesville. These substations are connected through power lines and large pylons that dominate the landscape. The Kentani Cluster is located north and east of the Notsi PV Project (this study) and is located less than 10 km from one of the two substations (Holland, 2015).

The Dealesville area has a flat topography with elevations between 1200 m and 1320 m above mean sea level (AMSL). Scattered Karoo koppies are present in the Dealesville area. Holland (2015) describes the topography as flat and influenced by the Modder River south of the proposed development. A large number of endorheic pans is also present in the immediate surrounding landscape (Holland, 2015). Two vegetation types, namely the Western Free State Clay Grassland and Vaal-Vet Sandy Grassland are present in the Notsi development area. The footprint of the proposed Notsi Solar Projects, and associated infrastructure, is located across several private agricultural camps approximately 15 km southwest of the town of Dealesville, in the grassland biome of the summer rainfall region of the Free State Province, South Africa.

This is a region well-known archaeologically for its abundant paleo-river terraces, springs and seasonal lake pan sites. Water was the common attractor for hominins and fauna to these landscape features and, when eroded through natural or anthropogenic processes, they often yield material remains pertaining to human-environment interactions throughout the Pleistocene, with frequently abundant stone artefacts and fossils. The area surrounding the footprint in question is no exception and has abundant pans and erosional dongas. Importantly though, only one seasonal pan was identified that encroaches on the footprint itself, which marginally abuts the north-western margin of the potentially affected area. During wetter phases of the Pleistocene, pans tended to support large herbivore communities which were also exploited by foragers attracted to the same water sources. The potentially affected area is ~12 km north of the Modder River – which has reasonably abundant fossiliferous and artefact rich paleo-terraces at certain points - and ~30km west of the world-renowned later Pleistocene fossil and artefact bearing locality of Florisbad.

Where retained and unaffected by agriculture, the natural vegetation within the footprint comprises grassland and shrubland typical of the Free State Grassland Biome, interspersed with marginally denser indigenous foliage along modern seasonal wetland margins in the eastern portions of the area, that also have substantial standing water. Indigenous wildlife is generally sparse due to the area's current use for cattle and other stock farming, but game is more abundant in the areas that retain more extensive coverage of indigenous vegetation. Smaller antelope (such as Duiker and Steenbok), abundant indigenous fowl including francolin, spurfowl and guineafowl, as well as some traces of burrowing rodents (molerats, hares and meerkats) were documented in the project footprint.

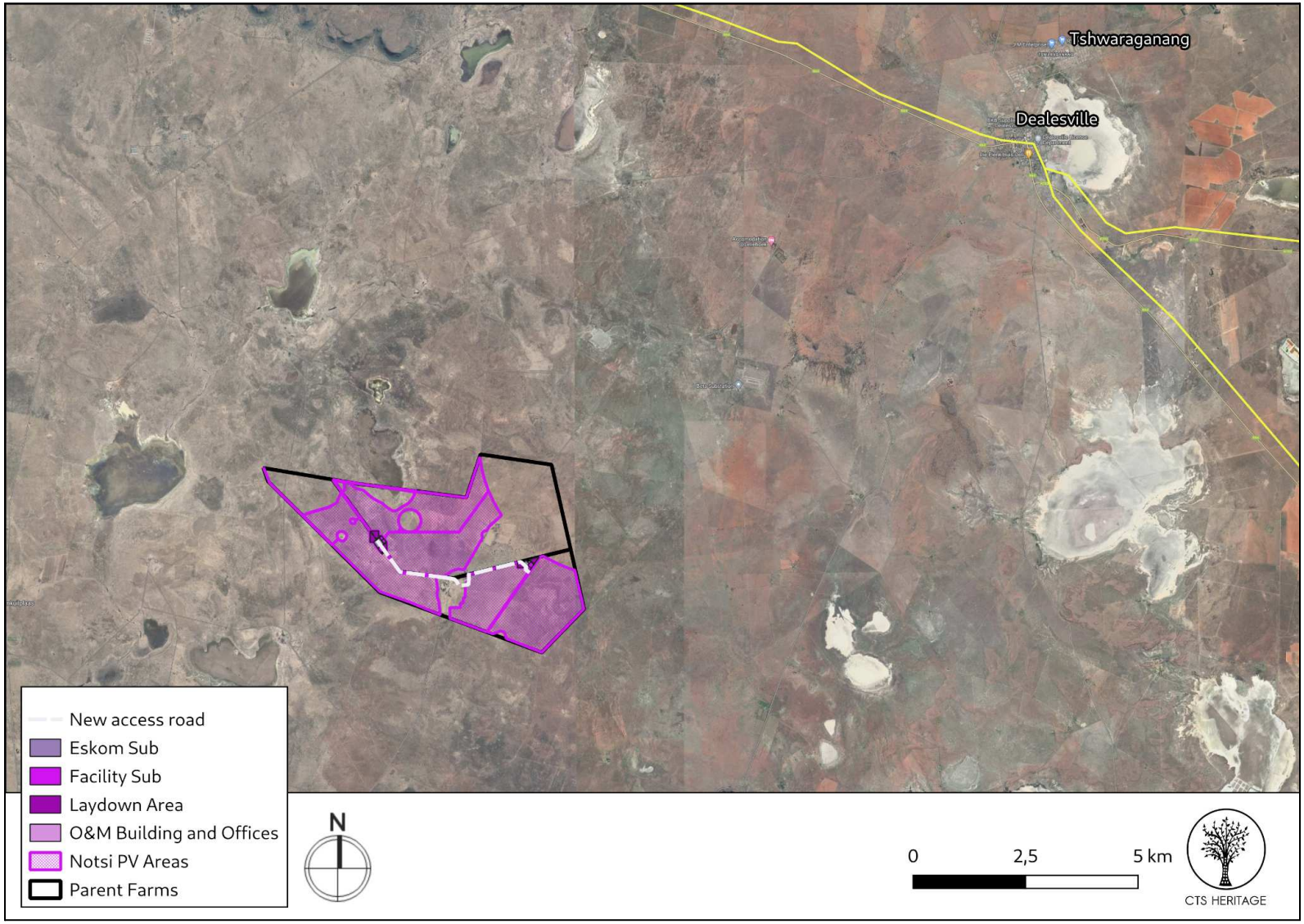

Figure 1.1: Proposed development relative to Dealesville

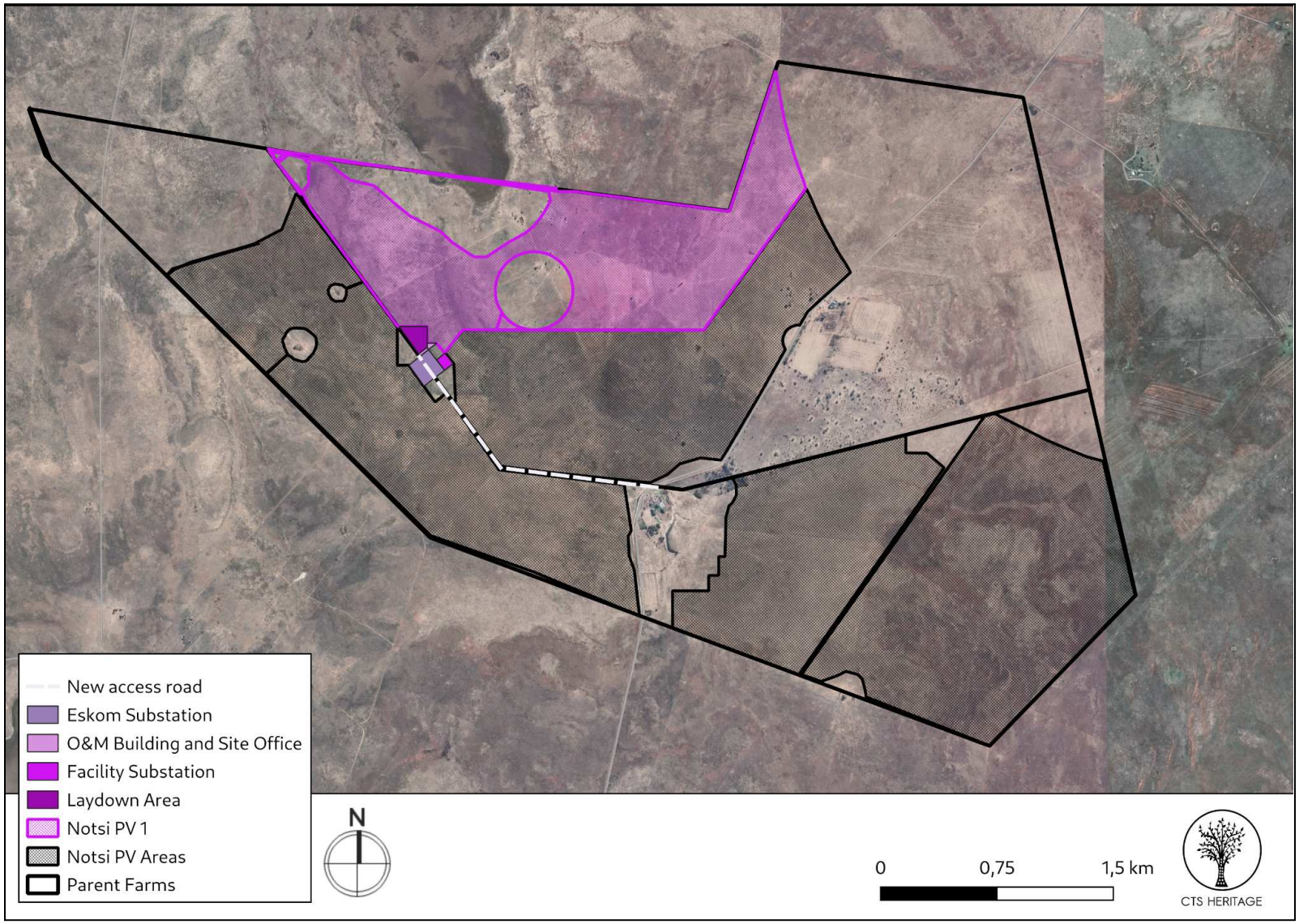

Figure 1.2: The proposed development layout of Notsi PV 1 Facility

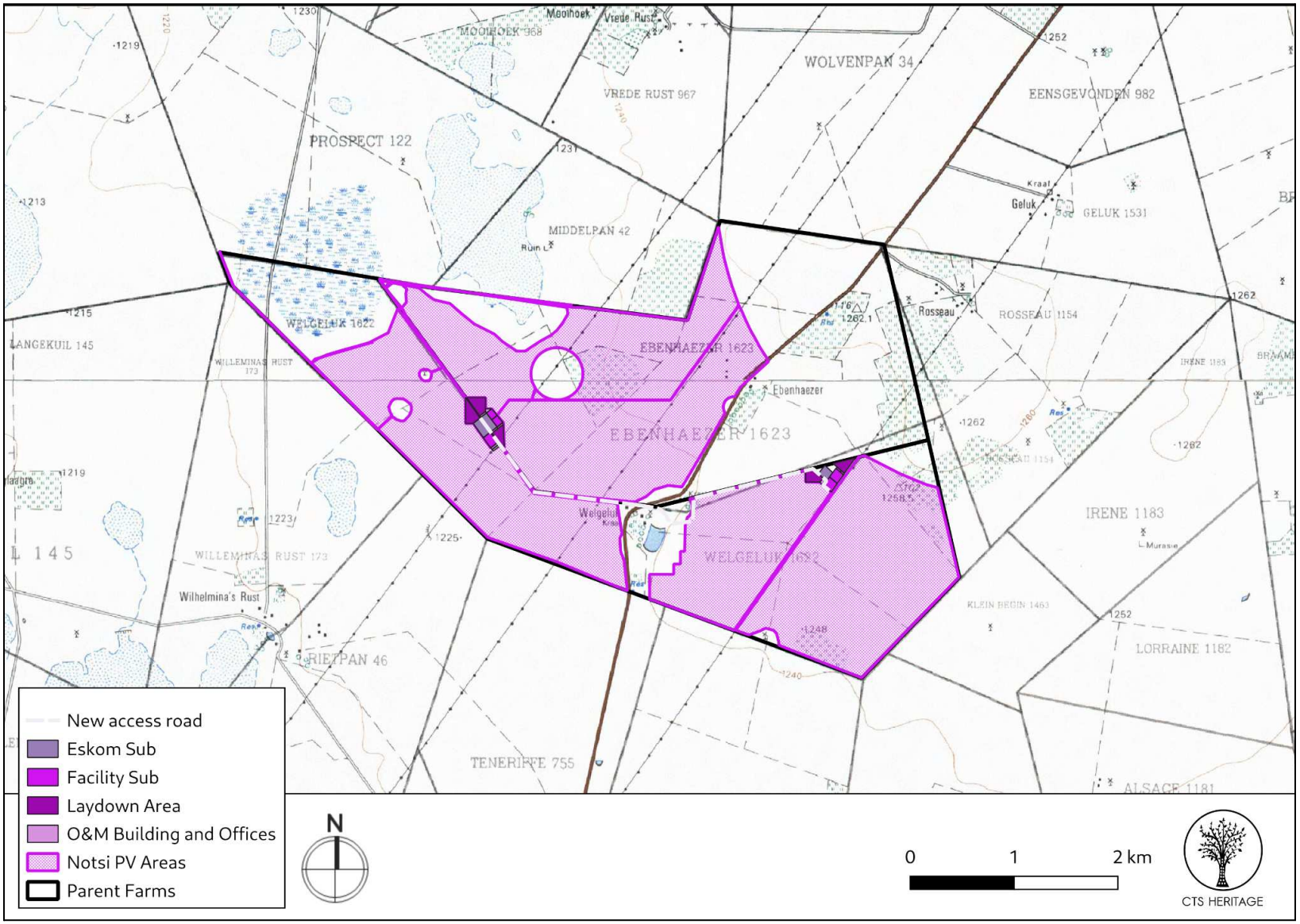

Figure 1.3: The proposed development layout on an extract of the 1:50 000 Topo Map

2. METHODOLOGY

2.1 Purpose of HIA

The purpose of this Heritage Impact Assessment (HIA) is to satisfy the requirements of section 38(8), and therefore section 38(3) of the National Heritage Resources Act (Act 25 of 1999).

2.2 Summary of steps followed

- A Desktop Study was conducted of relevant reports previously written (please see the reference list for the age and nature of the reports used)
- An archaeologist conducted a survey of the site and its environs on 12 to 14 August 2022 to determine what archaeological resources are likely to be impacted by the proposed development (Appendix 1).
- A palaeontologist conducted a field assessment of palaeontological resources likely to be disturbed by the proposed development in September 2022 (Appendix 2)
- The identified resources were assessed to evaluate their heritage significance and impacts to these resources were assessed.
- Alternatives and mitigation options were discussed with the Environmental Assessment Practitioner

2.3 Assumptions and uncertainties

- The *significance* of the sites and artefacts is determined by means of their historical, social, aesthetic, technological and scientific value in relation to their uniqueness, condition of preservation and research potential. It must be kept in mind that the various aspects are not mutually exclusive, and that the evaluation of any site is done with reference to any number of these.

- It should be noted that archaeological and palaeontological deposits often occur below ground level. Should artefacts or skeletal material be revealed at the site during construction, such activities should be halted, and it would be required that the heritage consultants are notified for an investigation and evaluation of the find(s) to take place.

However, despite this, sufficient time and expertise was allocated to provide an accurate assessment of the heritage sensitivity of the area.

2.4 Constraints & Limitations

(1) Dense grasses and occasional shrubs cover portions of the project area. This coverage inhibited the visibility of surface archaeology, although this is not regarded as a major problem in relation to the Stone

Age archaeological remains, which in most cases look to have generally limited scientific importance due to the disturbed and deflated contexts they occur in.

(2) A portion of the footprint area was challenging to comprehensively assess at ground surface level (due to modern vegetation cover). This should be regarded as a constraint to the documentation of potential graves as it has been established that there are graves in the area.

(3) Previous vegetation clearing activities by farmers may have affected evidence of surface archaeology including the possible above-surface presence of structures relating to graves around the areas that have modern dwelling structures (i.e., the removal of surface stone structures).

(4) Upper sediments are disturbed in the portions of the potentially affected area that have historically been used as enclosures for animals, inhibiting visibility.

(5) Access was not possible in areas wherein people are actively living in dwelling structures today; however, any archaeology occurring in these areas apart from graves would probably be *ex situ* and of limited scientific importance.

Despite these constraints, a comprehensive assessment of the likely impacts to significant archaeological heritage resources was achieved.

2.5 Environamics Impact Assessment Methodology

The environmental assessment aims to identify the various possible environmental impacts that could results from the proposed activity. Different impacts need to be evaluated in terms of its significance and in doing so highlight the most critical issues to be addressed.

Significance is determined through a synthesis of impact characteristics which include context and intensity of an impact. Context refers to the geographical scale i.e., site, local, national or global whereas intensity is defined by the severity of the impact e.g., the magnitude of deviation from background conditions, the size of the area affected, the duration of the impact and the overall probability of occurrence. Significance is calculated as shown in the Table below.

Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The total number of points scored for each impact indicates the level of significance of the impact.

Impact Rating System

Impact assessment must take account of the nature, scale and duration of impacts on the environment whether such impacts are positive or negative. Each impact is also assessed according to the project phases:

- planning
- construction
- operation
- decommissioning

Where necessary, the proposal for mitigation or optimisation of an impact should be detailed. A brief discussion of the impact and the rationale behind the assessment of its significance should also be included. The rating system is applied to the potential impacts on the receiving environment and includes an objective evaluation of the mitigation of the impact. In assessing the significance of each impact the following criteria is used:

Table 2: The rating system

NATURE		
Include a brief description of the impact of environmental parameters being assessed in the context of the project. This criterion includes a brief written statement of the environmental aspect being impacted upon by a particular action or activity.		
GEOGRAPHICAL EXTENT		
This is defined as the area over which the impact will be experienced.		
1	Site	The impact will only affect the site.
2	Local/district	Will affect the local area or district.
3	Province/region	Will affect the entire province or region.
4	International and National	Will affect the entire country.
PROBABILITY		
This describes the chance of occurrence of an impact.		
1	Unlikely	The chance of the impact occurring is extremely low (Less than a 25% chance of occurrence).
2	Possible	The impact may occur (Between a 25% to 50% chance of occurrence).
3	Probable	The impact will likely occur (Between a 50% to 75% chance of occurrence).
4	Definite	Impact will certainly occur (Greater than a 75% chance of occurrence).
DURATION		

This describes the duration of the impacts. Duration indicates the lifetime of the impact as a result of the proposed activity.		
1	Short term	The impact will either disappear with mitigation or will be mitigated through natural processes in a span shorter than the construction phase (0 – 1 years), or the impact will last for the period of a relatively short construction period and a limited recovery time after construction, thereafter it will be entirely negated (0 – 2 years).
2	Medium term	The impact will continue or last for some time after the construction phase but will be mitigated by direct human action or by natural processes thereafter (2 – 10 years).
3	Long term	The impact and its effects will continue or last for the entire operational life of the development, but will be mitigated by direct human action or by natural processes thereafter (10 – 30 years).
4	Permanent	The only class of impact that will be non-transitory. Mitigation either by man or natural process will not occur in such a way or such a time span that the impact can be considered indefinite.
INTENSITY/ MAGNITUDE		
Describes the severity of an impact.		
1	Low	Impact affects the quality, use and integrity of the system/component in a way that is barely perceptible.
2	Medium	Impact alters the quality, use and integrity of the system/component but system/component still continues to function in a moderately modified way and maintains general integrity (some impact on integrity).
3	High	Impact affects the continued viability of the system/ component and the quality, use, integrity and functionality of the system or component is severely impaired and may temporarily cease. High costs of rehabilitation and remediation.
4	Very high	Impact affects the continued viability of the system/component and the quality, use, integrity and functionality of the system or component permanently ceases and is irreversibly impaired. Rehabilitation and remediation often impossible. If possible rehabilitation and remediation often unfeasible due to extremely high costs of rehabilitation and remediation.
REVERSIBILITY		
This describes the degree to which an impact can be successfully reversed upon completion of the proposed activity.		
1	Completely reversible	The impact is reversible with implementation of minor mitigation measures.
2	Partly reversible	The impact is partly reversible but more intense mitigation measures are required.
3	Barely reversible	The impact is unlikely to be reversed even with intense mitigation measures.
4	Irreversible	The impact is irreversible and no mitigation measures exist.

IRREPLACEABLE LOSS OF RESOURCES		
This describes the degree to which resources will be irreplaceably lost as a result of a proposed activity.		
1	No loss of resource	The impact will not result in the loss of any resources.
2	Marginal loss of resource	The impact will result in marginal loss of resources.
3	Significant loss of resources	The impact will result in significant loss of resources.
4	Complete loss of resources	The impact is result in a complete loss of all resources.
CUMULATIVE EFFECT		
This describes the cumulative effect of the impacts. A cumulative impact is an effect which in itself may not be significant but may become significant if added to other existing or potential impacts emanating from other similar or diverse activities as a result of the project activity in question.		
1	Negligible cumulative impact	The impact would result in negligible to no cumulative effects.
2	Low cumulative impact	The impact would result in insignificant cumulative effects.
3	Medium cumulative impact	The impact would result in minor cumulative effects.
4	High cumulative impact	The impact would result in significant cumulative effects
SIGNIFICANCE		
Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The calculation of the significance of an impact uses the following formula: (Extent + probability + reversibility + irreplaceability + duration + cumulative effect) x magnitude/intensity. The summation of the different criteria will produce a non-weighted value. By multiplying this value with the magnitude/intensity, the resultant value acquires a weighted characteristic which can be measured and assigned a significance rating.		
Points	Impact significance rating	Description
6 to 28	Negative low impact	The anticipated impact will have negligible negative effects and will require little to no mitigation.
6 to 28	Positive low impact	The anticipated impact will have minor positive effects.
29 to 50	Negative medium impact	The anticipated impact will have moderate negative effects and will require moderate mitigation measures.
29 to 50	Positive medium impact	The anticipated impact will have moderate positive effects.
51 to 73	Negative high impact	The anticipated impact will have significant effects and will require significant mitigation measures to achieve an acceptable level of impact.
51 to 73	Positive high impact	The anticipated impact will have significant positive effects.

74 to 96	Negative very high impact	The anticipated impact will have highly significant effects and are unlikely to be able to be mitigated adequately. These impacts could be considered "fatal flaws".
74 to 96	Positive very high impact	The anticipated impact will have highly significant positive effects.

3. HISTORY AND EVOLUTION OF THE SITE AND CONTEXT

3.1 Desktop Assessment

Background:

CTS Heritage has been requested to draft a heritage screening and sensitivity analysis for the proposed Notsi Solar Projects located approximately 15km southwest of Dealesville in the Free State Province Unfortunately, as no direct archaeological or palaeontological survey information is available for the development area, all indications of sensitivity have to be inferred from the results of archaeological and palaeontological assessments completed in the vicinity and known archaeological and palaeontological sites in the area. We have also used information from satellite imagery as well as the 1:50 000 topo map to identify areas that may have heritage sensitivity. Orton (2015 SAHRIS ID 321231) completed a comprehensive Heritage Impact Assessment located immediately north of the study area and his results provide excellent insight into the heritage sensitivities of this study area (Figure 2.1). All of the findings of Orton (2015) have been mapped along with all other known heritage resources in close proximity to the study area in Figure 2.2 and are listed in Appendix 3). His assessment is referred to extensively below.

Archaeology

Scattered throughout the Karoo is evidence of historic and prehistoric occupation in the form of Early, Middle and Later Stone Age lithics and other material remains. The descendants of the historic and prehistoric occupants of the region are found in the indigenous Khoe and San, as well as modern inhabitants of the area. According to Orton (2015 SAHRIS ID 321231), “The general vicinity of Dealesville is very flat with extensive tracts of open grassland and numerous large pans. However, close to and southwest of the town there are a number of rocky koppies. The soil is orange, coloured by the dolerite that breaks the surface in many areas. Calcrete is also common just beneath the surface with exposures visible at times where the cover sands have eroded away. The landscape is quite strongly characterised by electrical infrastructure…”

Orton (2015) also notes that “There are some important fossil sites in the greater region and thus the chance of finding material of significance does exist. Florisbad is a very well-known fossil locality lying some 35 km to the east of the present study area. Here an early human cranium was recovered in 1932 (Dreyer 1935; Rightmire 1978) while mid-Pleistocene fauna and Middle Stone Age stone artefacts have also been recovered (Brink 1987; Dreyer 1938). Because of its importance in terms of both palaeontology and archaeology, Florisbad has been declared a Provincial Heritage Site (SAHRIS n.d.). Erfkroon is another important fossil site that lies along the Modder River some 5 km southwest of the southern end of the present study area. The fossils occur over a large area and are revealed in erosion gullies. Stone artefacts from the earlier part of the Middle Stone Age (MSA) and from the Later Stone Age (LSA) have also been found associated with the bones in places (Churchill et al. 2000).”

Tomose (2013) notes that the earliest evidence of Iron Age communities in the Free State is documented in the south-eastern region of the Free State where they came into contact with the San people. Most of the existing evidence about the Iron Age communities in the Free State dates to the 16th and 18th when they moved across the Vaal River coming into contact with the San hunter-gather people (Klatzow 1994). Numerous stone wall structures and pottery dating to this period have been recorded and lie on the frontier zone where the San people come into contact with agro-pastoralist (Thorp 1996). Stonewalls are one major characteristic of the Iron Age people. However, they are not the only characteristic features of the Iron Age. Huffman (1982) described cattle dug, both vitrified and unverified, as one of the Iron Age traits. He also included pits and burials, with some located inside the cattle kraals (ibid)." According to Orton (2015), "Stone-walled settlements dating to the Iron Age have been widely documented in parts of the Free State and adjacent Northern Cape (Maggs 1976a, 1976b) but the Iron Age appears to be absent from the immediate study area and its surrounds. Later Stone Age stone-built dwellings occur along the Riet River to the west (Humphreys 1972, 2009). With the exception of the rich MSA deposits of Florisbad (Kuman et al. 1999) and the MSA and LSA stone artefact assemblages from Erfkroon (Churchill et al. 2000), archaeological resources appear to be quite rare in this flat, open and well-grassed landscape." Webley (2010) surveyed an area to the east of the present study area and reported a complete absence of any archaeological material of any sort. She further noted that stone suitable for the manufacture of flaked tools was not present and that the quantity of other rock available on the surface was insufficient to allow for the construction of stone dwellings. This can be explained by the preference to settle close to water sources that is prevalent across much of the relatively dry interior of southern Africa.

Findings of nearby assessments

In Orton's assessment conducted immediately north of the study area, he identified a number of artefact scatters related to the MSA, while even more widespread were individual MSA artefacts (2015). Orton (2015) notes that these were all found in areas where the surface had become denuded and often eroded and this suggests that these artefacts are generally beneath the surface sands and could in fact be far more common than is expected. The context is essentially secondary, with the artefact accumulations having been the result of erosion, deflation and reburial; they could thus be referred to as background scatter. Orton (2015) also notes that the majority of these artefacts were identified close to the rockier part of the landscape. Orton (2015) also identified artefact scatters pertaining to the LSA however these were less common on the landscape. They tended far more strongly to be associated with features on the landscape such as springs, pans and hills. Orton (2015) also noted scatters of historical artefacts that were generally associated with sites that included some structural remains. In his assessment, Orton (2015) also identified a number of ruined dry stone-walled structures. Most of which are historical in nature.

Orton (2015) notes that based on his desktop assessment, “Rock engravings occur widely in the interior of South Africa where suitable rock exists. Many sites are located in the Free State with the National Museum, Bloemfontein (2014), listing numerous examples that may be visited by the public.” In his field assessment, Orton (2015) identified a number of rock engravings in the rockier parts of the landscape. These relate to both the naturalistic and geometric rock art traditions said to have been made by the Bushmen and Khoekhoen respectively (Orton, 2015). Often this kind of rock art is associated with dolerite ridge exposures.

By the end of the 17th Century, the Trekboer movement had begun to cross this landscape with land claimed by Dutch farmers. One such farm was purchased for the establishment of Bloemfontein. Though historically a !Orana settlement, and then a Boer settlement, Bloemfontein was officially founded in 1846 as a British army fort within the broader area which was occupied by various groups of peoples including the !Orana (so-called "Korana" of the IHõall'aes, IHũdill'aes, Einill'aes and others), Cape Colony Trek Boers, Griqua (at that time known as *Baasters*), and Barolong. Dealesville was established on the Farm Klipfontein and was proclaimed a township in 1899 and achieved municipal status in 1914. Structures relating to the early trekboer settlement of this area may still be present on the landscape and these may have heritage significance. Orton (2015) also notes that “The second Anglo-Boer War (1899-1902) played a significant role in South African History, particularly in the interior of the country. Many battles were fought between the British and Boer forces… Graves, graveyards and memorials across the central interior of South Africa serve as reminders of the war.”

Orton (2015) notes that the vicinity of Dealesville does not have a well-developed cultural landscape. Farmsteads are widely scattered and are not linked by any features such as tree lines. Tree lines, in fact, are very rare in the area. It is therefore not likely that the study area contributes to a significant cultural landscape.

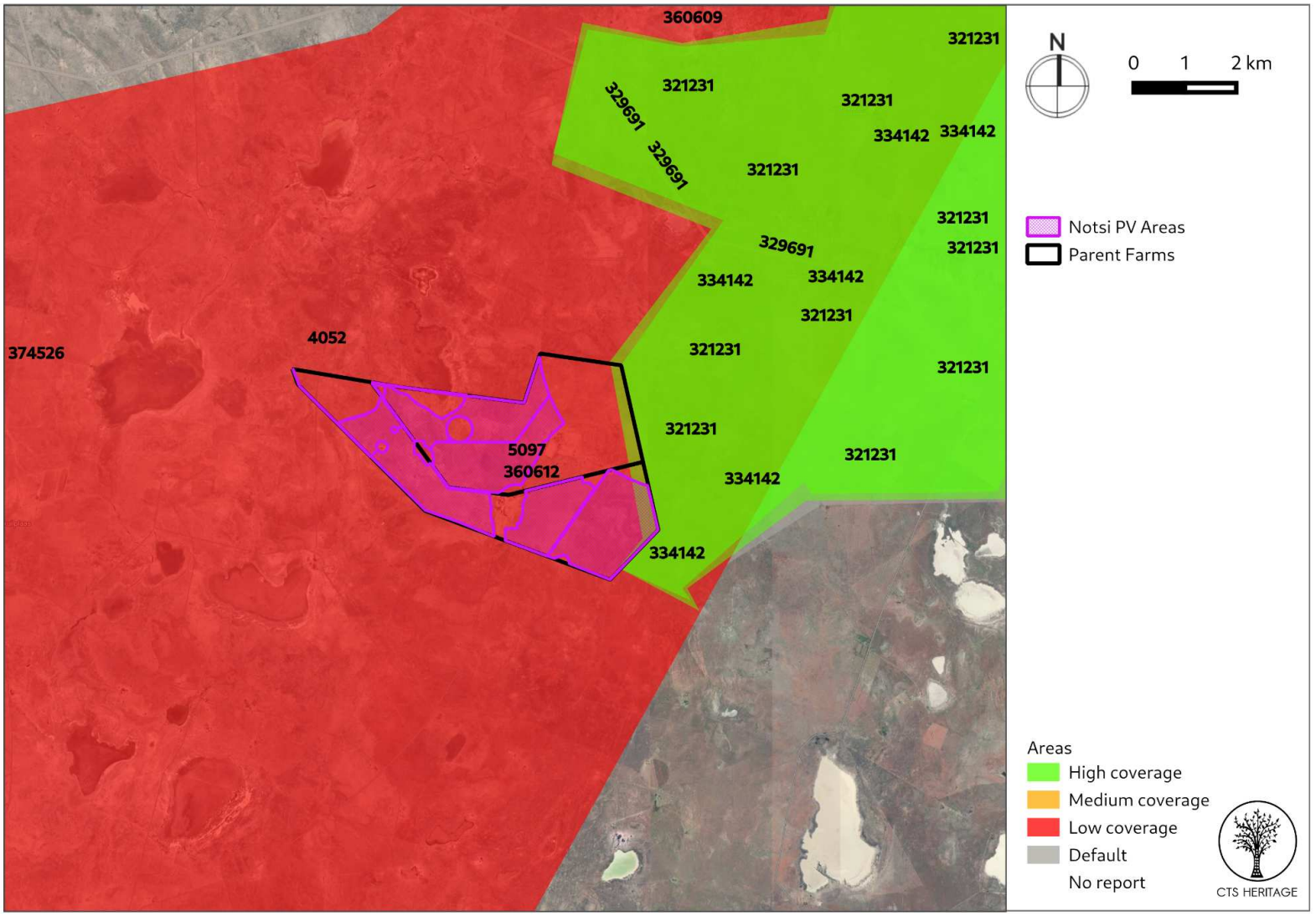

Figure 2.1: Spatialisation of heritage assessments conducted in proximity to the proposed development

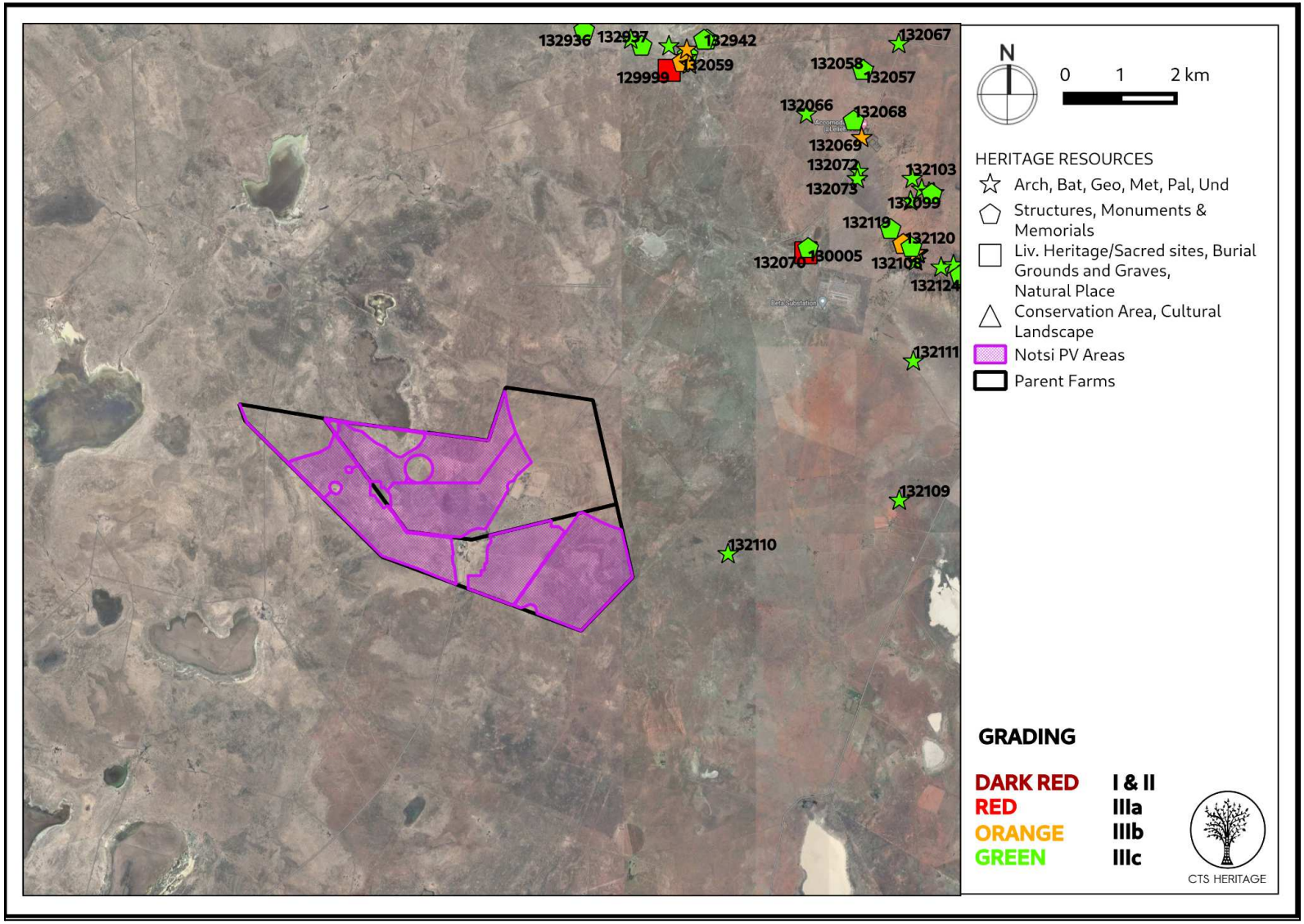

Figure 2.2. Heritage Resources Map. Heritage Resources previously identified in and near the study area, with SAHRIS Site IDs indicated. Please See Appendix 4 for full description of heritage resource types.

Palaeontology

According to the SAHRIS Palaeosensitvity Map (Figure 3.1), the study area is underlain by sediments of zero, moderate and high palaeontological sensitivity. However, this map requires updating as it does not reflect the actual palaeontological sensitivity of the geology as per the PalaeoTechnic Report completed for the Free State Province by Groenwald (2014, SAHRIS NID 163080). According to the extract from the CGS Map for Kimberley 2824, the sediments underlying the study area include Jurassic Dolerite which has no palaeontological sensitivity, Quaternary Sands of the Gordonia Formation and sediments of the Tierberg Formation of the Ecca Group. The palaeontological sensitivity of the Quaternary Sands sediments derives from the likelihood of findings archaeological deposits preserved in these sediments and as such, is dealt with in the paragraphs above.

According to Groenewald (2014), in the Tierberg Formation, "Ecca Sea traces are among the most diverse and best preserved non-marine ichnofaunas from Gondwana. There have been doubtful stromatolites also recorded." Fossil heritage from the Tierberg Formation includes "Disarticulated microvertebrate remains (e.g., fish teeth, scales), sponge spicules, spare vascular plants (leaves, petrified wood), moderate diversity trace fossil assemblages (plus variety of additional taxa such as large ribbed pellet burrows, arthropod scratch burrows, Siphonichnus etc)."

According to the assessment completed by Rossouw (2015, SAHRIS NID 334142), the area immediately to the north of this study area is characterised as lying "within the outcrop belt of the Middle Permian Tierberg Formation (Ecca Group) which is a generally poorly fossiliferous shale. It is thus only of moderate palaeontological sensitivity. The main fossils expected in the Tierberg Formation are trace fossils, fragmentary fish remains, and, in the upper parts of the formation, plant remains that include petrified wood and leaves. The diversity of the assemblages is generally low. Dolerite dykes and sills occur throughout the area and are not palaeontologically significant (Rossouw 2014). Quaternary alluvial deposits along major river courses and deposits related to springs and pan dunes are of high palaeontological sensitivity. Fossils found in these deposits include collections of mammalian teeth and bones, coprolites, freshwater molluscs and plant microfossils, as well as isolated specimens and even fossilised hyena burrows. Particularly notable are the banks of the Modder River. Fossil hyena lairs can also be found away from present river valleys and might be associated with pan dunes and spring deposits. In contrast, sediments related to ephemeral water courses or deposits accumulated through sheet wash have low sensitivity."

An updated and more realistic palaeontological sensitivity map (Figure 3.3) has been developed which indicates that the majority of the study area is underlain by sediments of low palaeontological sensitivity (Gordonia Formation and Quaternary Sands) shaded in blue. The primary sensitivity of these deposits is archaeological in nature due to their recent age.

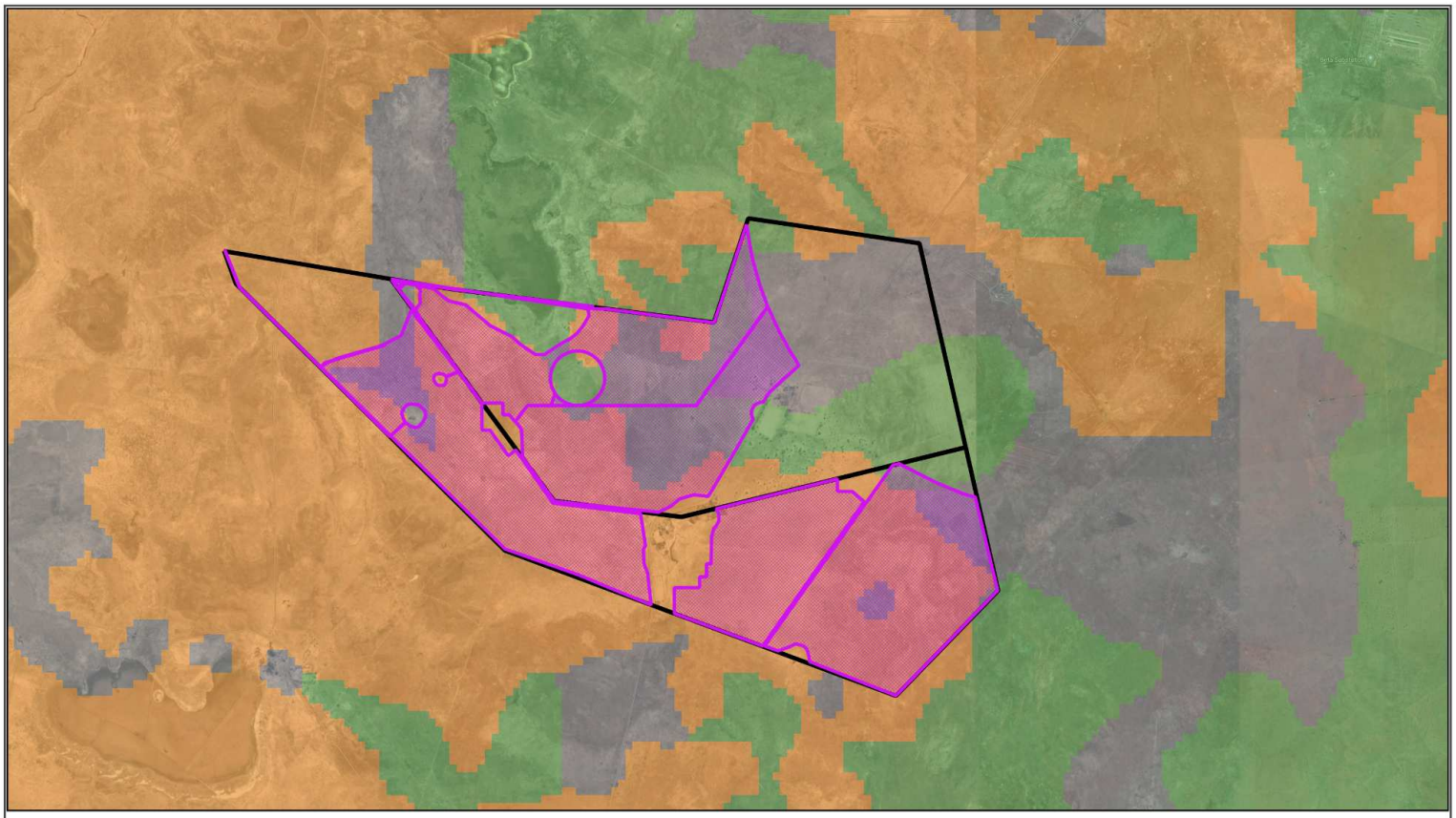

Figure 3.1: Palaeontological sensitivity of the proposed development area

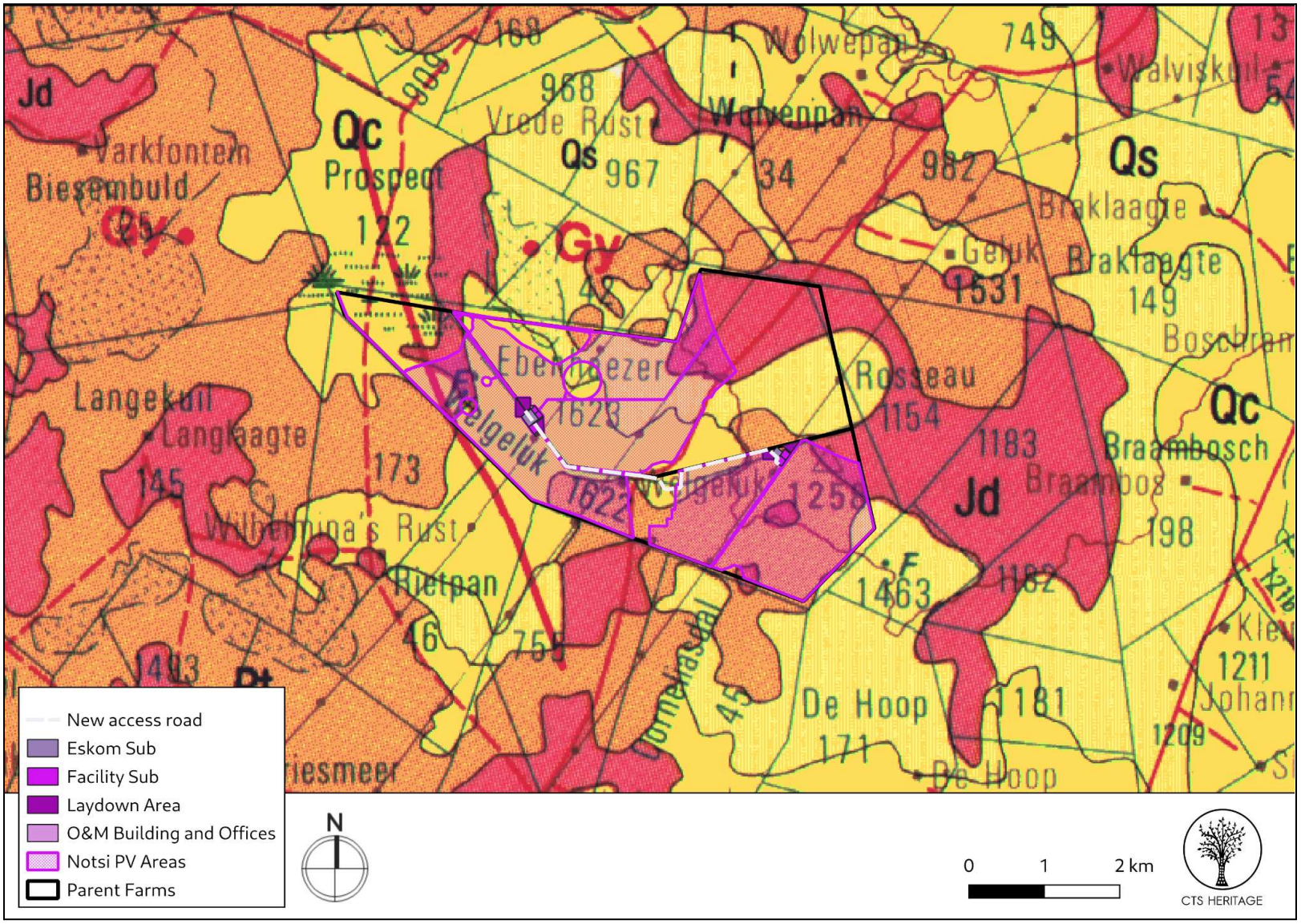

Figure 3.2: Geology Map. Indicating the underlying geology across the study area through overlaying the geology maps from the CGS series 2824 Kimberley (Jd: Jurassic Dolerite, Qs and Qc: Quaternary Sands (Gordonia Formation) and Pt: Tierberg Formation of the Ecca Group sediments)

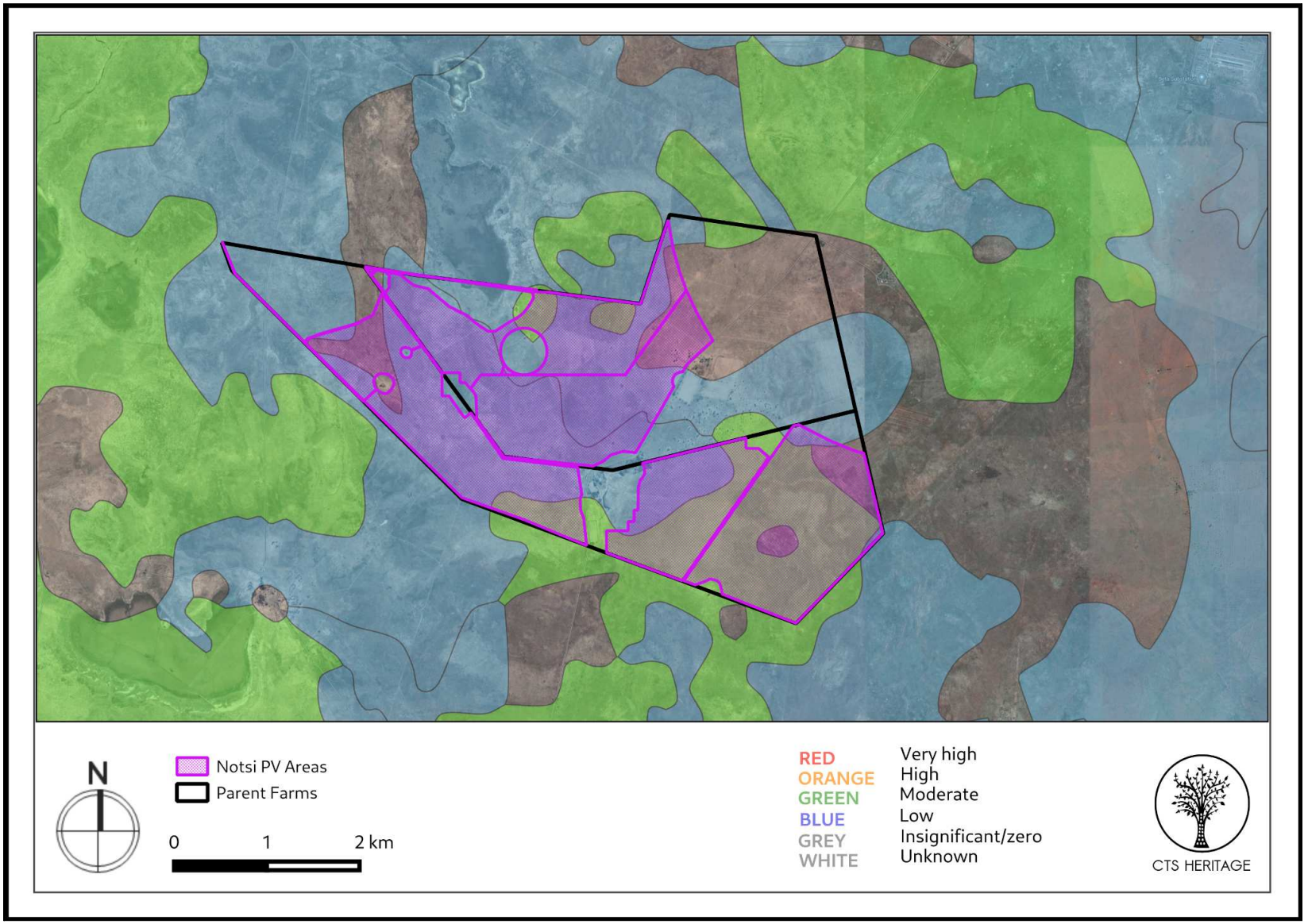

Figure 3.3. Updated Palaeosensitivity Map. Indicating Zero, Low and Moderate palaeontological sensitivity underlying the study area

Summary

Areas that may have heritage sensitivity are therefore included in the table below. These sensitivities have been ground-truthed as part of the field assessments which have been completed as part of this HIA process. The findings of the field assessments are summarised below in Section 4:

Table 3: Desktop Site Sensitivities

Key	Feature	Potential Sensitivity	Recommended Mitigation
Stars	Kraals and stone-walled ruins	Archaeology	Field assessment by an archaeologist required to determine cultural significance. Impact must be avoided.
Orange	Tierberg Formation deposits	Palaeontology	Field assessment by a palaeontologist required to identify fossil exposures that must be avoided or excavated.
Black Pentagon	Structures	Historic	Field assessment by an archaeologist required to determine cultural significance. Impact must be avoided.
Green	Hills	Archaeology	Field assessment by an archaeologist required to determine presence of archaeology and its cultural significance.
Blue	Pans and Springs	Archaeology	Field assessment by an archaeologist required to determine presence of archaeology and its cultural significance. Impact must be avoided
Black	Dolerite	Archaeology	Field assessment by an archaeologist required to determine the presence of rock art and its cultural significance. Impact must be avoided
Clear	Unknown	Unknown	Field assessment by an archaeologist required to determine presence of archaeology and its cultural significance.

We have used available information from the 1:50 000 Topo Maps for the area and GoogleEarth Satellite Imagery to map some of these sensitive archaeological areas in Figure 4 however, this map is not exhaustive and has subsequently been GROUND-TRUTHED by an archaeologist and palaeontologist. The heritage, archaeology and palaeontology sensitivity maps have been combined in Figure 4.

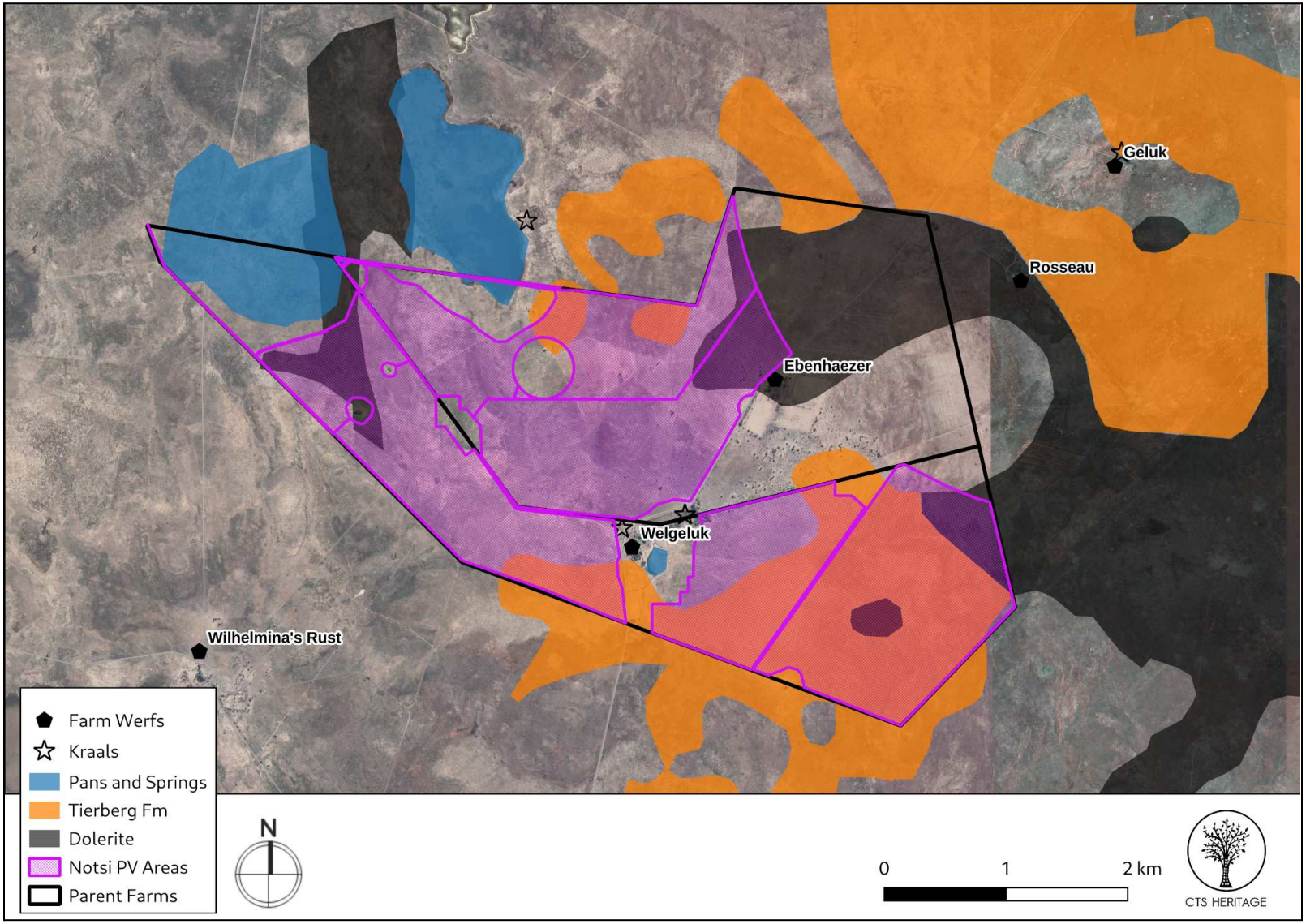

Figure 4. Combined Heritage Sensitivity Map.

4. IDENTIFICATION OF HERITAGE RESOURCES

4.1 Summary of findings of Specialist Reports

Archaeology (Appendix 1)

The survey was conducted on foot and by vehicle and sought to assess the presence and significance of archaeological occurrences within the project area. Field assessment documented a number of stone artefacts in both primary (in situ) and secondary contexts in an eroded pan, as well as isolated finds in deflated open landscape settings. These sites suggest the area may have been traversed by Stone Age groups potentially through periods in both the Middle Stone Age (MSA – ~300ka:~40ka) and the Later Stone Age (LSA: ~40ka: ~2ka). The presence of artefact-quality raw-materials in the project area as well as relatively abundant standing water (including sedimentary evidence for standing water in the past) were likely the resources that attracted groups there and resulted in them leaving behavioural traces in the form of stone artefacts in the Pleistocene.

The archaeological remains present in the affected area are generally sparse but, in terms of *in situ* remains, were densest in the north-western portion, relating to the abovementioned seasonal pan margin in this area, in addition to the relatively minimal impact of modern agricultural activities. In the north-western portion, donga formation was relatively intensive in some places around the pan which is potentially underpinned by a combination of historical overgrazing, climatic factors, and potentially also tectonic elements that are thought to drive Pleistocene pan formation in some parts of the Free State. Erosional processes associated with pan formation have exposed Pleistocene sediments and related archaeology in one locality (DV2). The graves identified are listed in the relevant tables (see below). Buffer zones around each grave, or set of graves, are recommended.

Palaeontology (Appendix 2)

The study area is underlain by Quaternary deposits, Jurassic dolerite, as well as the Tierberg Formation of the Ecca Group (Karoo Supergroup). According to the PalaeoMap on the South African Heritage Resources Information System (SAHRIS) database, the Palaeontological Sensitivity of the Quaternary calcrete is High, while that of Quaternary aeolian sands are Moderate, that of Jurassic dolerite is Zero and the Tierberg Formation has a Moderate Palaeontological Sensitivity (Almond and Pether, 2009; Almond *et al.*, 2013). Recent Shape files produced by the Council of Geosciences, Pretoria) indicates that the study area is underlain by calcretes, surface limestones and Hardpan superficial sediments, the Kalahari Group, Karoo Dolerite as well as the Tierberg Formation of the Ecca Group. Topographical as well as Google Earth images indicate that the relief of the proposed project is low, and outcrops in the area are rare.

A site-specific field survey of the development footprint was conducted on foot in September 2022. No visible evidence of fossiliferous outcrops was found in the development footprint and thus an overall **LOW** palaeontological significance is allocated to the development footprint.

4.2 Heritage Resources identified

Table 4: Observations noted during the field assessment

Site No.	Facility	Description	Density/m²	Period	Co-ordinates		Grading	Mitigation
DV1	**1**	**Stone Age palimpsest of probable Later and Middle Stone Age artefacts.**	**~3-6/m²**	**LSA/MSA**	**-28.741873 959079300**	**25.610159989446400**	**IIIC**	**20m Buffer**
DV2	**1**	**Contextualised Middle Stone Age site in probable dateable context.**	**Sub-surface and surface context off ~6/m²**	**MSA**	**-28.7458230089396 00**	**25.623247995972600**	**IIIA**	**100m Buffer**
DV3	2	Historical graves of several adults (~5-6 identifiable individuals although several eroded surface structures)	~5-6 identifiable individuals although several eroded surface structures	Recent historical	-28.752805 972471800	25.644082 976505100	IIIA	100m Buffer
DV4	5	Stone Age palimpsest of probable Later and Middle Stone Age artefacts.	~3-6/m²	LSA/MSA	-28.756456 039845900	25.663071004673800	IIIC	20m Buffer
DV5	4	Historical grave of at least 1 adult individual.	1 clear adult grave with potential for additional structures.	Recent historical	-28.761470 010504100	25.638956 017792200	IIIA	100m Buffer
DV6	2 and 4	Sandstone ruin, no roof and only walls remaining. No evidence of associated burials	NA	Recent historical	-28.760048 020631000	25.639273021370100	IIIC	20m Buffer
DV7	NA	Ruined Victorian farm house. No evidence of associated burials	NA	Recent historical	-28.734387 997537800	25.676143001765000	IIIC	20m Buffer
DV8	NA	Stone Age palimpsest of probable Later and Middle Stone Age artefacts.	~3-6/m²	LSA/MSA	-28.733059 968799300	25.677087977528500	IIIC	20m Buffer

4.3 Mapping and spatialisation of heritage resources

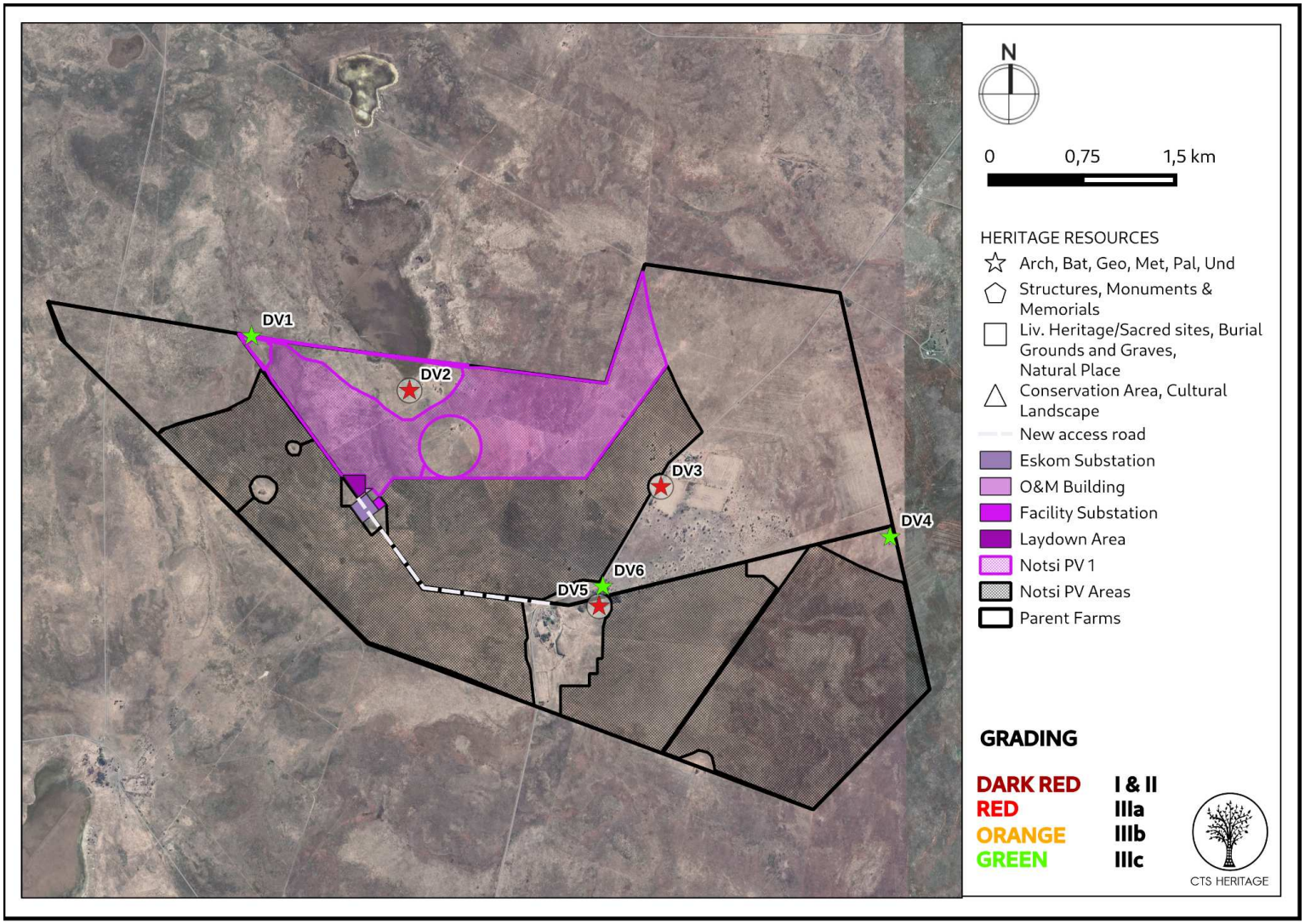

Figure 6.1: Map of known heritage resources relative to the proposed development area

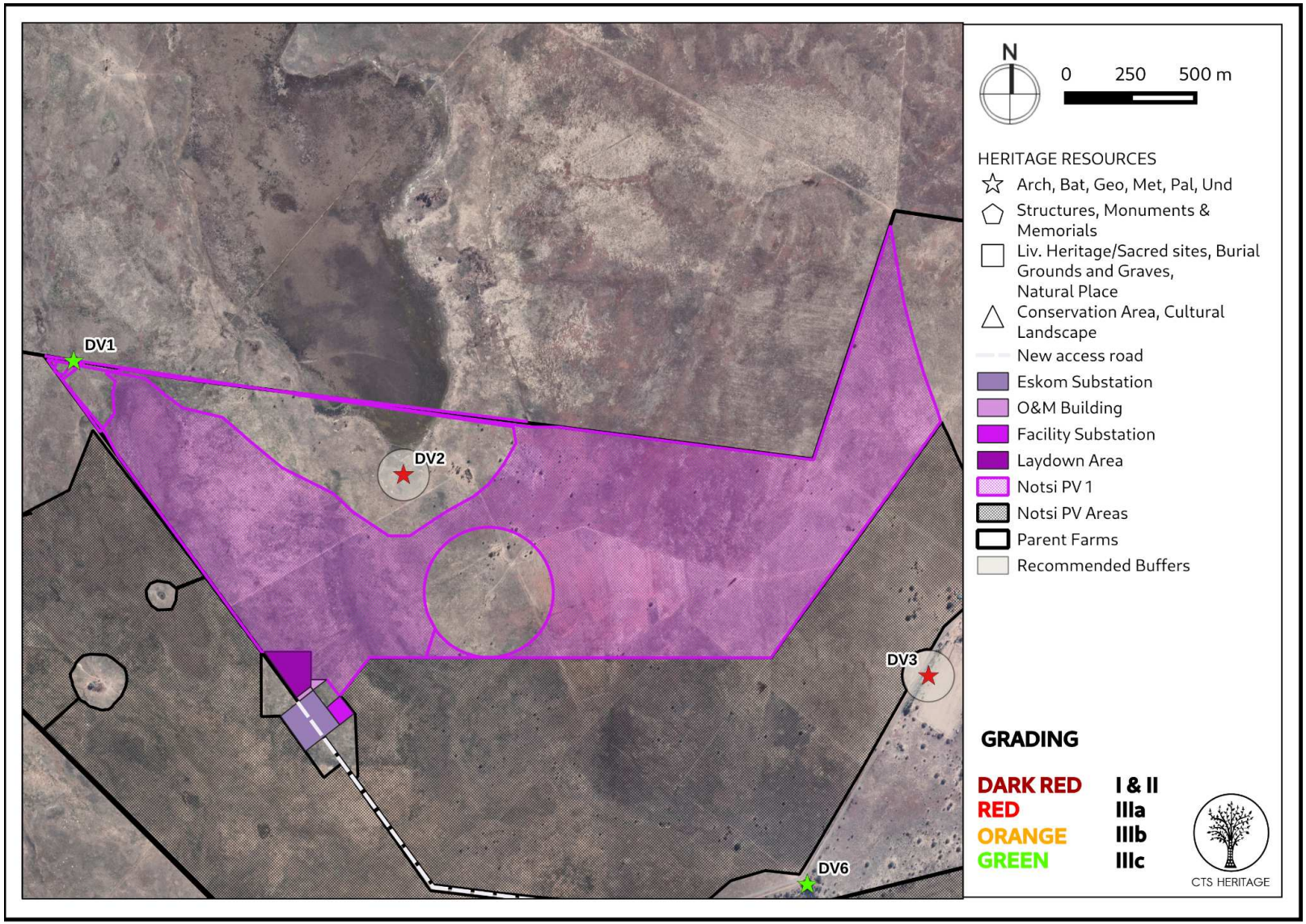

Figure 6.2: Map of known heritage resources relative to the proposed development area

5. ASSESSMENT OF THE IMPACT OF THE DEVELOPMENT

5.1 Assessment of impact to Heritage Resources

Due to the nature of heritage resources, impacts to archaeological and palaeontological heritage resources are unlikely to occur during the PLANNING, OPERATIONAL and DECOMMISSIONING phases of the project. Potential impacts to the cultural landscape throughout the OPERATIONAL phase are discussed in the section below that deals with Cumulative Impacts. The impacts discussed here pertain to the CONSTRUCTION phase of the project.

Archaeology

Field assessment of the footprint of the proposed Notsi Solar Projects documented several stone artefact scatters in secondary contexts and one site in a close to primary context that needs to be avoided (DV2). The stone artefacts at DV4, DV1 and DV8 are *ex-situ* and occur in a disturbed deflated context, whereas the MSA occupation of the Pleistocene pan margin at DV2 needs to be avoided.

DV1 and DV2 are identified within the area proposed for the Notsi PV 1 development, however the layout provided respects the recommended buffer areas and no direct impact is anticipated.

Concerning the Stone Age archaeology within the footprint of the proposed Notsi Solar Projects, there are no objections to the authorization of the proposed development, provided that the buffering described above is adhered to. Further, that if any evidence of human remains are exposed during excavation that development activities cease in the area of the identified remains.

Table 5: Assessment of impacts to archaeological heritage resources

NATURE		
Destruction of significant archaeological heritage during the construction phase of development.		
GEOGRAPHICAL EXTENT		
This is defined as the area over which the impact will be experienced.		
1	Site	The impact will only affect the site.
PROBABILITY		
This describes the chance of occurrence of an impact.		
1	Unlikely	The chance of the impact occurring is extremely low (Less than a 25% chance of occurrence).
DURATION		
This describes the duration of the impacts. Duration indicates the lifetime of the impact as a result of the proposed activity.		

4	Permanent	The only class of impact that will be non-transitory. Mitigation either by man or natural process will not occur in such a way or such a time span that the impact can be considered indefinite.
INTENSITY/ MAGNITUDE		
Describes the severity of an impact.		
1	Low	Impact affects the quality, use and integrity of the system/component in a way that is barely perceptible.
REVERSIBILITY		
This describes the degree to which an impact can be successfully reversed upon completion of the proposed activity.		
4	Irreversible	The impact is irreversible and no mitigation measures exist.
IRREPLACEABLE LOSS OF RESOURCES		
This describes the degree to which resources will be irreplaceably lost as a result of a proposed activity.		
4	Complete loss of resources	The impact results in a complete loss of all resources.
CUMULATIVE EFFECT		
This describes the cumulative effect of the impacts. A cumulative impact is an effect which in itself may not be significant but may become significant if added to other existing or potential impacts emanating from other similar or diverse activities as a result of the project activity in question.		
3	Medium cumulative impact	The impact would result in minor cumulative effects.
SIGNIFICANCE		
Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The calculation of the significance of an impact uses the following formula: (Extent + probability + reversibility + irreplaceability + duration + cumulative effect) x magnitude/intensity. The summation of the different criteria will produce a non-weighted value. By multiplying this value with the magnitude/intensity, the resultant value acquires a weighted characteristic which can be measured and assigned a significance rating.		
Points	Impact significance rating	Description
6 to 28	Negative low impact	The anticipated impact will have negligible negative effects and will require little to no mitigation.

Palaeontology

A site-specific field survey of the development footprint was conducted on foot in September 2022. No visible evidence of fossiliferous outcrops was found in the development footprint and thus an overall **LOW** palaeontological significance is allocated to the development footprint. It is therefore considered that the proposed development will not lead to detrimental impacts on the palaeontological reserves of the area and construction of the development may be authorised in its whole extent.

If Palaeontological Heritage is uncovered during surface clearing and excavations the Chance find Protocol attached should be implemented immediately.

Table 6: Assessment of impacts to palaeontological heritage resources

NATURE		
Destruction of significant palaeontological heritage during the construction phase of development.		
GEOGRAPHICAL EXTENT		
This is defined as the area over which the impact will be experienced.		
1	Site	The impact will only affect the site.
PROBABILITY		
This describes the chance of occurrence of an impact.		
1	Unlikely	The chance of the impact occurring is extremely low (Less than a 25% chance of occurrence).
DURATION		
This describes the duration of the impacts. Duration indicates the lifetime of the impact as a result of the proposed activity.		
4	Permanent	The only class of impact that will be non-transitory. Mitigation either by man or natural process will not occur in such a way or such a time span that the impact can be considered indefinite.
INTENSITY/ MAGNITUDE		
Describes the severity of an impact.		
1	Low	Impact affects the quality, use and integrity of the system/component in a way that is barely perceptible.
REVERSIBILITY		
This describes the degree to which an impact can be successfully reversed upon completion of the proposed activity.		
4	Irreversible	The impact is irreversible and no mitigation measures exist.
IRREPLACEABLE LOSS OF RESOURCES		

This describes the degree to which resources will be irreplaceably lost as a result of a proposed activity.		
4	Complete loss of resources	The impact results in a complete loss of all resources.
CUMULATIVE EFFECT		
This describes the cumulative effect of the impacts. A cumulative impact is an effect which in itself may not be significant but may become significant if added to other existing or potential impacts emanating from other similar or diverse activities as a result of the project activity in question.		
3	Medium cumulative impact	The impact would result in minor cumulative effects.
SIGNIFICANCE		
Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The calculation of the significance of an impact uses the following formula: (Extent + probability + reversibility + irreplaceability + duration + cumulative effect) x magnitude/intensity. The summation of the different criteria will produce a non-weighted value. By multiplying this value with the magnitude/intensity, the resultant value acquires a weighted characteristic which can be measured and assigned a significance rating.		
Points	Impact significance rating	Description
6 to 28	Negative low impact	The anticipated impact will have negligible negative effects and will require little to no mitigation.

5.2 Sustainable Social and Economic Benefit

According to the information provided, the development will introduce employment opportunities during the construction phase (temporary employment) and a limited number of permanent employment opportunities during the operation phase. The proposed project could assist the local economy in creating entrepreneurial growth and opportunities, especially if local business is involved in the provision of general material, goods and services during the construction and operational phases. This positive impact is likely to be compounded by the cumulative impact associated with the development of several other solar facilities within the surrounding area, and because of the project's location within an area which is characterised by high levels of solar irradiation and which is therefore well suited to the development of commercial solar energy facilities.

The proposed development also represents an investment in infrastructure for the generation of non-polluting, Renewable Energy, which, when compared to energy generated because of burning polluting fossil fuels, represents a positive social benefit for society. It should be noted that the perceived benefits associated with the project, which include RE generation and local economic and social development, outweigh the perceived impacts associated with the project.

Based on the available information, the anticipated socio-economic benefits to be derived from the development outweigh the impacts to heritage resources identified in this report.

5.3 Proposed development alternatives

The Department of Environmental Affairs and Tourism (DEAT) 2006 guidelines on 'assessment of alternatives and impacts' proposes the consideration of four types of alternatives namely, the no-go, location, activity, and design alternatives. It is however, important to note that the regulation and guidelines specifically state that only 'feasible' and 'reasonable' alternatives should be explored. It also recognizes that the consideration of alternatives is an iterative process of feedback between the developer and EAP, which in some instances culminates in a single preferred project proposal. An initial site assessment was conducted by the developer and the farm portions were found favourable due to its proximity to grid connections, solar radiation, site access and relative flat terrain. These factors were then taken into consideration and avoided as far as possible, where required. The following alternatives were considered in relation to the proposed activity:

No-go alternative

This alternative considers the option of 'do nothing' and maintaining the status quo. The site is currently zoned for agricultural land uses. Should the proposed activity not proceed, the site will remain unchanged and will continue to be used for these purposes. The potential opportunity costs in terms of adding solar energy generation to the current land use, would be lost if the status quo persists, and therefore all positive socio-economic opportunities and associated growth will also be lost. No or neutral impact to heritage resources is anticipated in the absence of the proposed development.

Location alternatives

The location identified for the development is based on various aspects considered by the Applicant from a technical, economic, and environmental perspective. This includes the solar radiation values of the area, proximity to the national grid, available grid connection capacity in the national grid, readily available access to the development, landowner support, terrain characteristics and the absence of potentially sensitive environmental features and areas. The properties proposed are considered suitable for the development by the Applicant and therefore the area has been demarcated and indicated as being preferred. No other properties have been identified for the development in the Dealesville area.

Design and layout alternatives

Design alternatives will be considered throughout the planning and design phase and specialist studies are expected to inform the final layout of the proposed development.

Technical and technology alternatives have also been considered however these are unlikely to impact on heritage resources.

5.4 Cumulative Impacts

The area proposed for development is presently dominated by agricultural activities and as such, the pattern of settlement within this landscape reflects this. A series of farm werfs runs down the centre of the development area. None of these farms were identified as having significant heritage value. However, the proposed development of this PV facility and the adjacent PV facilities is likely to negatively impact on the broader context of these farm werfs. The area proposed for development is located more than 8km from the nearest significant road (the R64). Furthermore, there are a number of approved renewable energy facility developments located between this proposed facility and the nearest significant town of Dealesville.

At this stage, there is the potential for the cumulative impact of proposed renewable energy facilities to negatively impact the cultural landscape due to a change in the landscape character from natural wilderness to semi-industrial. This project is located within a Renewable Energy Development Zone[1] (REDZ) area, and it is noted that it is preferable to have renewable energy facility development clustered in an area such as a REDZ.

The number of proposed renewable energy developments located in the vicinity of this project is likely to impact the character of the broader area – changing it from predominantly agricultural and rural to predominantly industrial, at least in the immediate context of this development. However, this is to be expected within a REDZ area.

[1] Kimberley Solar REDZ5

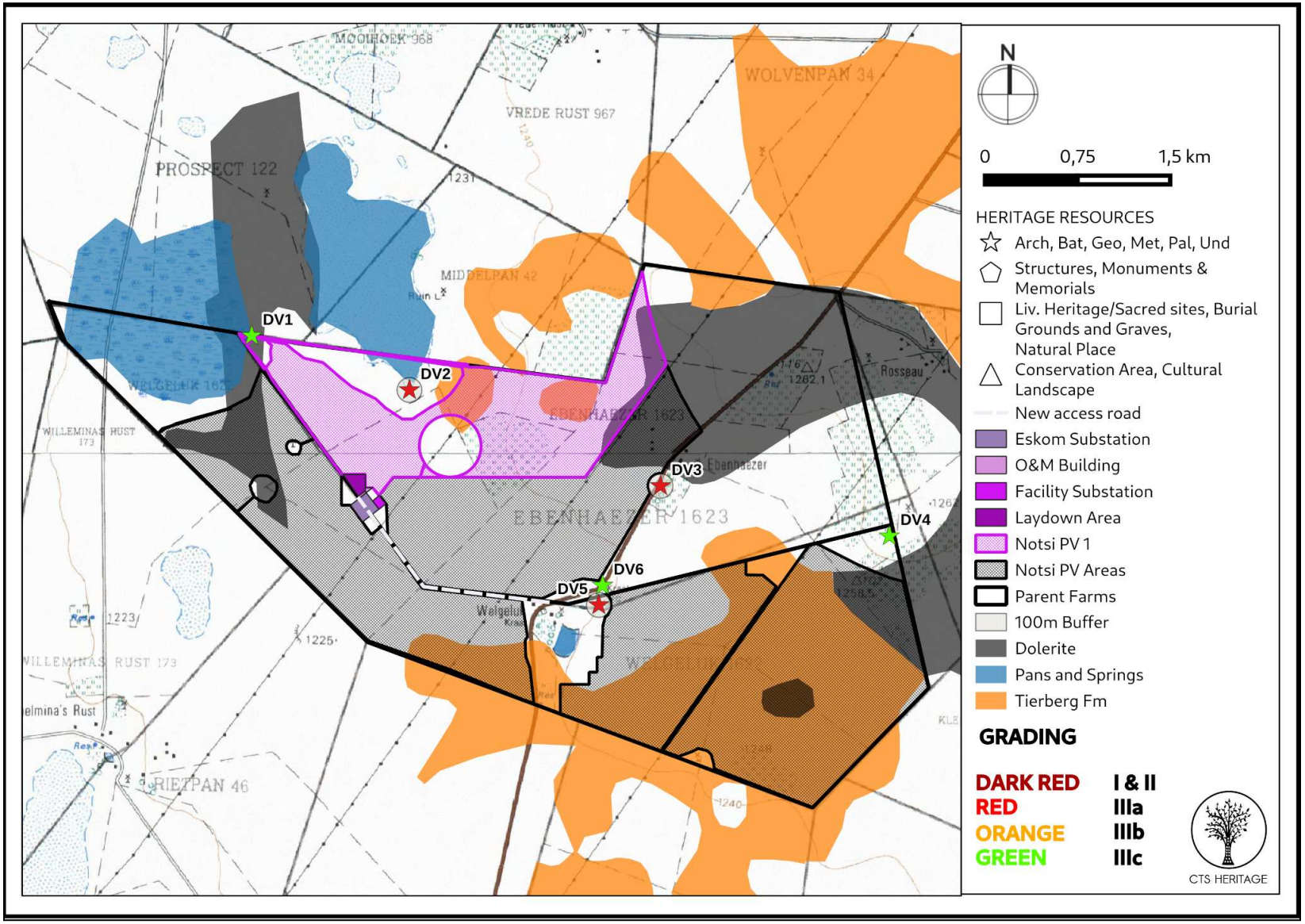

Figure 8.2: Combined site sensitivity map

6. RESULTS OF PUBLIC CONSULTATION

As this application is made in terms of NEMA, the public consultation on the HIA will take place with the broader public consultation process required for the Environmental Impact Assessment process and will be managed by the lead environmental consultants on the project.

7. CONCLUSION

The field assessment for the proposed development identified that most of the area under assessment has been previously disturbed through extensive agricultural activity. Stone Age archaeological heritage resources were identified within the broader area proposed for development, however these were largely in disturbed contexts. One very significant *in situ* archaeological site (DV2) was identified adjacent to the pan site located in the west of the development area however no significant heritage resources were identified as being impacted by the proposed Notsi PV 1 facility.

Other significant heritage resources identified within the development area are associated with the colonial history of the area. The burial grounds identified within the development area have very high levels of local value due to their substantial social cultural significance. It is important that the burial grounds identified, and their context, are not impacted by the proposed development.

The palaeontological field assessment identified no visible evidence of fossiliferous outcrops in the development footprint and thus an overall LOW palaeontological significance is allocated to the development footprint. It is therefore considered that the proposed development will not lead to detrimental impacts on the palaeontological reserves of the area and construction of the development may be authorised in its whole extent. If Palaeontological Heritage is uncovered during surface clearing and excavations, the Chance find Protocol attached should be implemented immediately.

Overall, however, the heritage sensitivity of the area proposed for development is low except for the sites identified. These are avoided by the development area. There is no objection to the proposed development, on condition that the recommendations outlined below are implemented.

8. RECOMMENDATIONS

Based on the outcomes of this report, it is not anticipated that the proposed development of the Notsi PV 1 facility and its associated grid connection infrastructure will negatively impact on significant heritage resources on condition that:

- The recommended no-development buffer areas listed in Table 4 are adhered to.
- The HWC Chance Fossil Finds Procedure must be implemented for the duration of construction activities within the sensitive Tierberg Formation.
- Although all possible care has been taken to identify sites of cultural importance during the investigation of the study area, it is always possible that hidden or subsurface sites could be overlooked during the assessment. If any evidence of archaeological sites or remains (e.g., remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils, burials or other categories of heritage resources are found during the proposed development, work must cease in the vicinity of the find and SAHRA must be alerted immediately to determine an appropriate way forward.

9. REFERENCES

Heritage Impact Assessments				
Nid	**Report Type**	**Author/s**	**Date**	**Title**
321231	Heritage Impact Assessment	Jayson Orton	05/05/2015	Heritage impact assessment for eleven Solar PV Facilities and Supporting Electrical Infrastructure near Dealesville in the Free State Province Proposed by Mainstream Renewable Power Developments (Pty) Ltd.
334142	PIA Desktop	Lloyd Rossouw	03/02/2015	Palaeontological Desktop Assessment for 12 new Solar Photovoltaic facilities near Dealesville, Free State Province
360358	HIA Phase 1	Jayson Orton	01/02/2016	HERITAGE IMPACT ASSESSMENT: Scoping and Environmental Impact Assessment for the proposed development of the Marconi PV 100 MW Photovoltaic Facility near Dealesville, Free State
360609	HIA Phase 1	Jayson Orton	01/02/2016	HERITAGE IMPACT ASSESSMENT: Scoping and Environmental Impact Assessment for the proposed development of the Maxwell PV 100 MW Photovoltaic Facility near Dealesville, Free State
360610	HIA Phase 1	Jayson Orton	01/02/2016	HERITAGE IMPACT ASSESSMENT: Scoping and Environmental Impact Assessment for the proposed development of the Faraday PV 100 MW Photovoltaic Facility near Dealesville, Free State
360611	HIA Phase 1	Jayson Orton	01/02/2016	HERITAGE IMPACT ASSESSMENT: Scoping and Environmental Impact Assessment for the proposed development of the Watt PV 100 MW Photovoltaic Facility near Dealesville, Free State
360612	Heritage Impact Assessment	Lloyd Rossouw	31/01/2016	Palaeontological Desktop Assessment of 5 new Solar Photovoltaic facilities to be established over nine farms near Dealesville, Free State Province.
360615	HIA Phase 1	Jayson Orton	01/02/2016	HERITAGE IMPACT ASSESSMENT: Scoping and Environmental Impact Assessment for the proposed development of the Edison PV 100 MW Photovoltaic Facility near Dealesville, Free State
374522	HIA Phase 1	David Morris	07/07/2016	FS 30/5/1/1/2/10298 PR Doorndam - HIA
374526	HIA Phase 1		04/07/2016	FS 30/5/1/1/2/10307 PR Eerste Aanleg - HIA
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
5097	AIA Phase 1	Johnny Van Schalkwyk	07/03/2003	Mercury-Perseus 400 kV Transmission Line, Cultural Heritage Resources
114445	HIA	Nkosinathi	07/07/2013	A Phase 1 Heritage impact assessment study for the proposed

		Tomose		photovoltaic (PV) solar energy facilities (in Sannaspos), near Bloemfontein, Free State Province: DEA Ref No: 14/12/16/3/3/2/360 (Phase 1); DEA Ref No: 14/12/16/3/3/1/615 (Phase 2)

APPENDICES

APPENDIX 1: Archaeological Assessment (2022)

APPENDIX 2: Palaeontological Assessment (2022)

APPENDIX 3: Heritage Screening Assessments