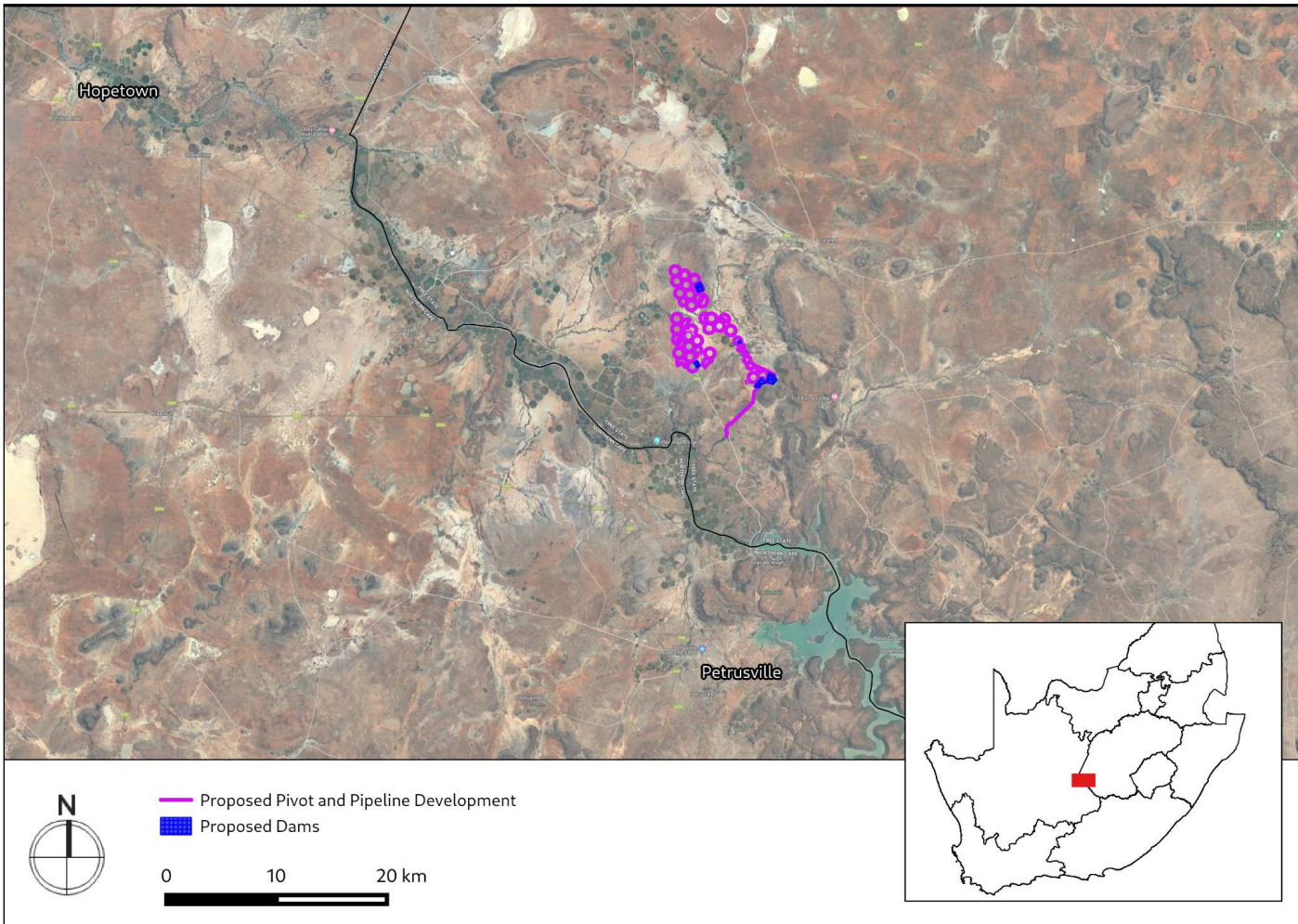




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## HERITAGE SCREENER

CTS Reference Number:	CTS22_028	
SAHRIS Reference:		
Client:	Savannah Environmental (Pty) Ltd	
Date:	March 2022	
Title:	Agricultural and Pivot Expansion near Luckhoff, Free State Province	
<b>RECOMMENDATION</b> It is likely that the proposed development will impact significant archaeological and palaeontological heritage and as such, it is recommended that a heritage impact assessment be completed that assesses these impacts as per section 38(3) of the NHRA.		

**Figure 1a.** Satellite map indicating the location of the proposed development in the Free State Province

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## 1. Proposed Development Summary

JN Venter Beleggings Trust is proposing the development of an expansion of a centre pivot irrigation farm on a site located Southwest of Luckhoff and Koffiesfontein in the Free State Province. The proposed area of development is accessible via the R48. This expansion will be developed on farms Weltevreden 755, Lemoen-spruit 667 and Diepdraai 754. The total area on all three portions is 4800 ha, however only 2690 ha is proposed for development. The study area falls within the Letsemeng Local Municipality within the Xhariep District Municipality. The agricultural development will entail the following at a minimum:

- Development of centre pivot areas (cultivation and irrigation)
- Construction of an abstraction pipeline from the existing irrigation canal
- Two water storage dams each with a proposed alternative
- A new pump stations
- A 9ha solar PV with alternatives and an 5MW overhead power line
- A Battery Energy Storage System

The current proposed water pipeline crossing will be approximately 68m downstream and north west of an existing road bridge crossing.

It is proposed that ~2690ha will be transformed across the property for the establishment of the agricultural development

The proposed development will require the following infrastructure:

Infrastructure	Purpose
<b>315 mm PVC pipeline</b>	Water for the pivots will be sourced from the Oranje Riet Water User Association's canal pumped 6km underground through 2 x 1.4m fibreglass pipes, which will be extended by further 500 m to reach the pivots
<b>Centre Pivot Irrigation System</b>	The underground PVC pipeline will provide water to a centre pivot irrigation system. A centre pivot irrigation system is a moveable pipe structure which usually spans the length of a field and rotates around a pivot in the centre of the field. As the irrigation system rotates around its central pivot, it supplies water to crops through sprinklers along its length.
<b>Two Water Storage Systems</b>	Two main storage dams are proposed for utilization on the agricultural development. This dam system will feed the planned additional expansion



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<b>Pump station</b>	A new pumpstation will facilitate the required water from the Oranje Riet canal to the proposed storage dams
<b>Solar PV area and overhead power line</b>	Solar PV is proposed as the main energy source for the pump and pipeline system which will irrigate the entire development area as well as the dams
<b>BESS</b>	A battery system will be used to collect any additional power generated by the PV facility for use as and when required.

## 2. Application References

<b>Name of relevant heritage authority(s)</b>	SAHRA
<b>Name of decision making authority(s)</b>	TBA

## 3. Property Information

<b>Latitude / Longitude</b>	29°49'14.77"S 24°40'32.96"E
<b>Erf number / Farm number</b>	Weltevreden 755, Lemoen-spruit 667 and Diepdraai 754
<b>Local Municipality</b>	Letsemeng
<b>District Municipality</b>	Xhariep
<b>Province</b>	Free State Province
<b>Current Use</b>	Agriculture
<b>Current Zoning</b>	Agriculture

## 4. Nature of the Proposed Development

<b>Total Length of pipeline</b>	TBA
<b>Depth of excavation (m)</b>	NA

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Height of development (m)

NA

## 5. Category of Development

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

## 6. Additional Infrastructure Required for this Development

TBA

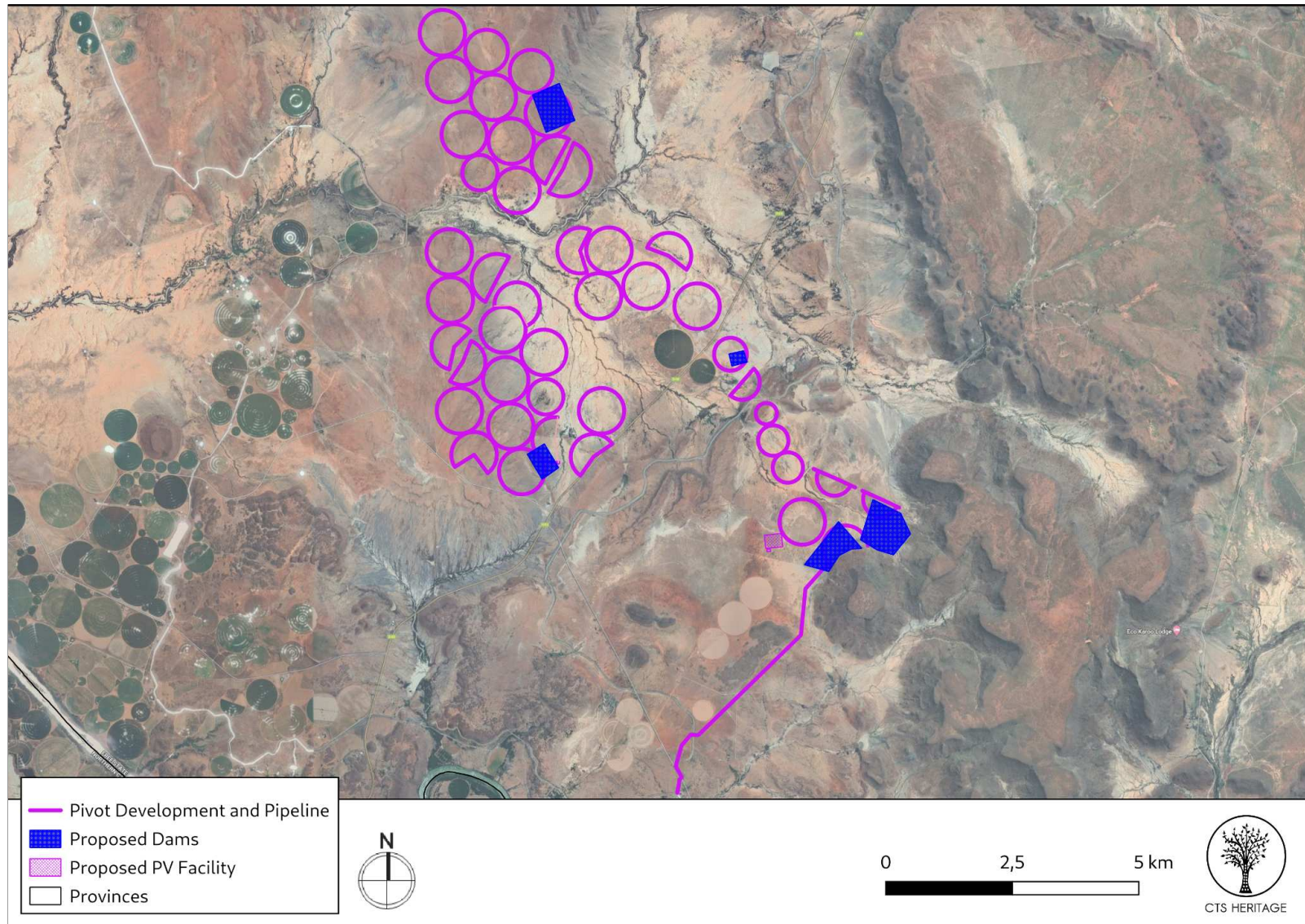
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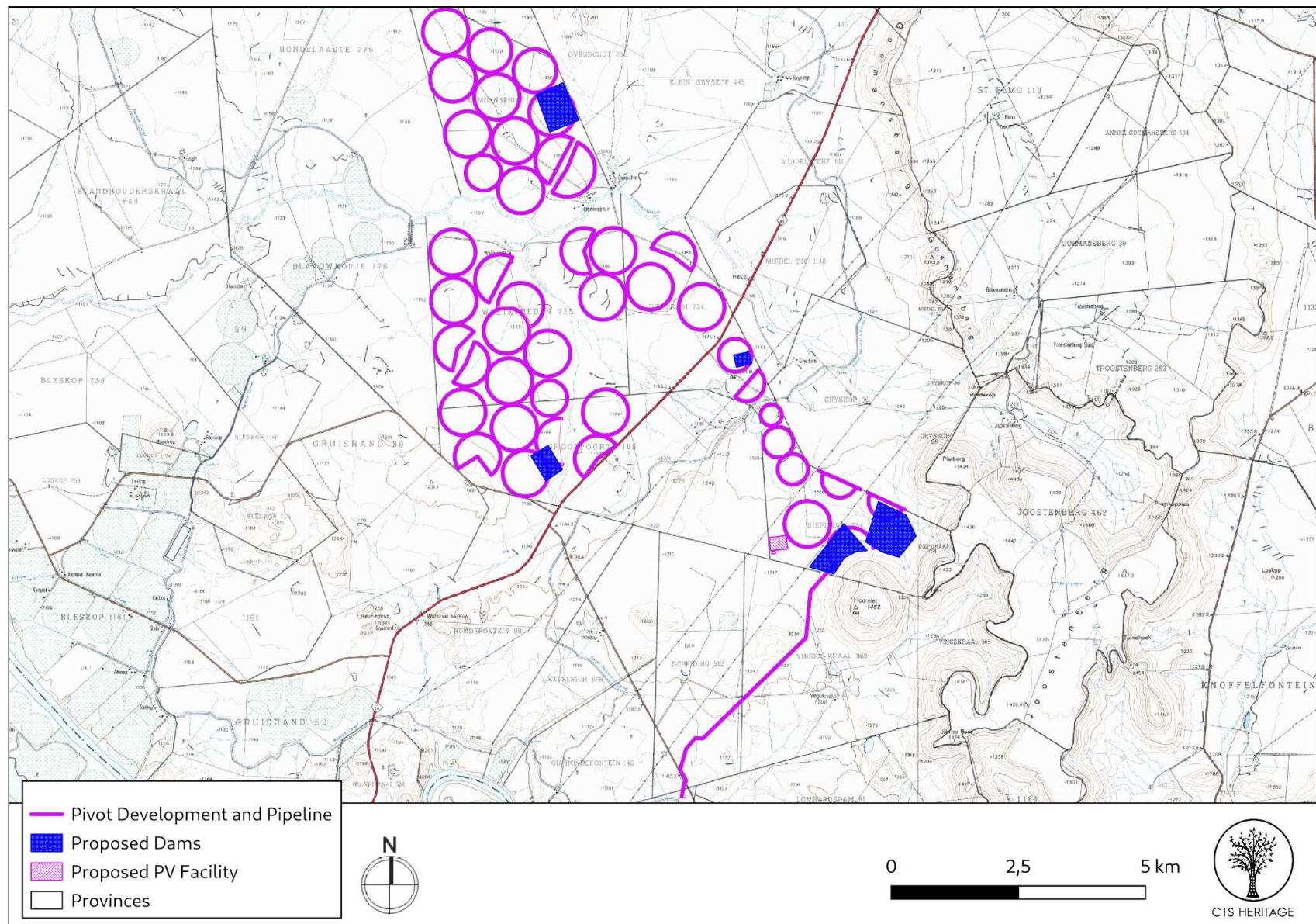


## 7. Mapping (please see Appendix 3 and 4 for a full description of our methodology and map legends)

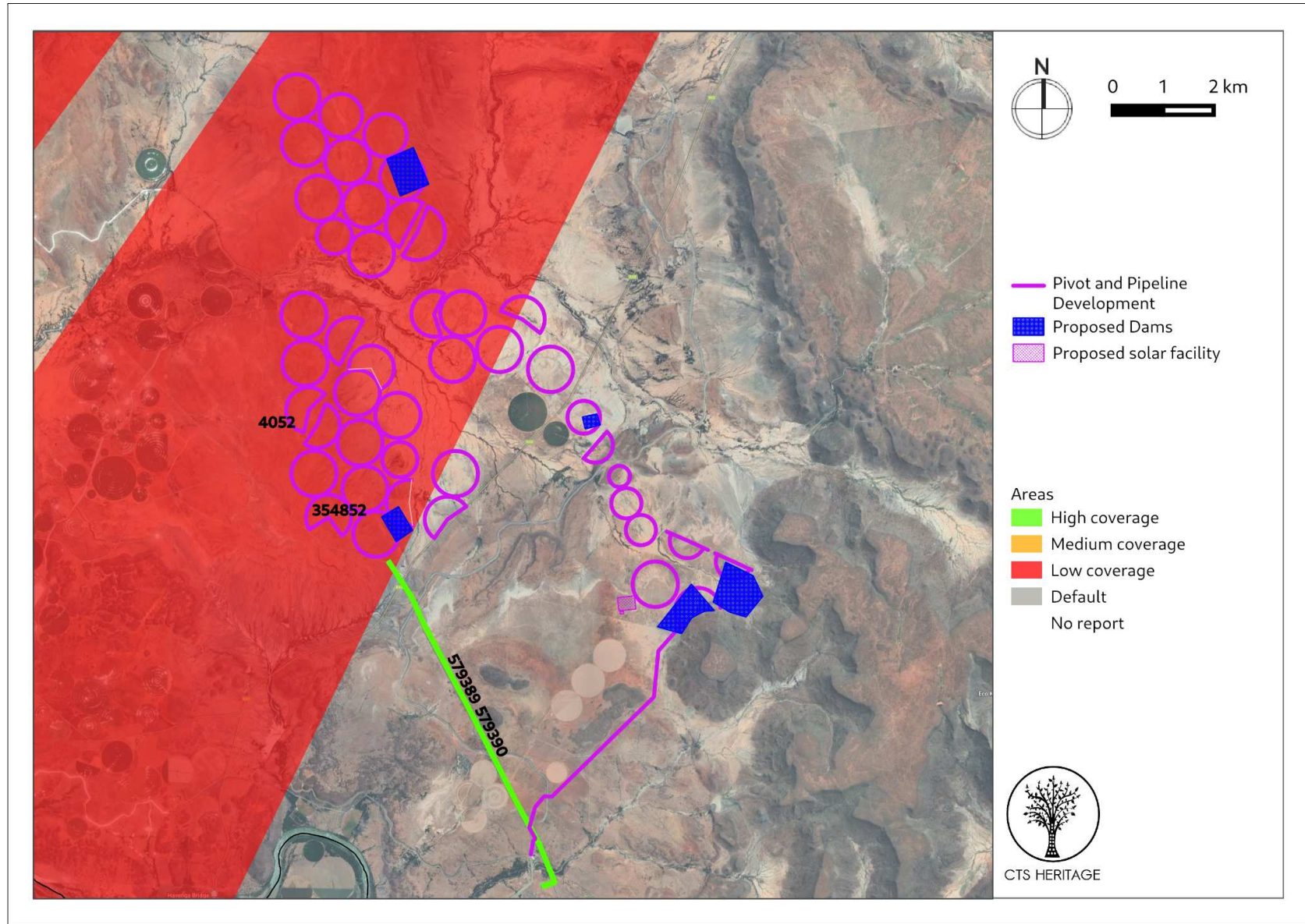


**Figure 1b. Overview Map.** Satellite image (2020) indicating the proposed development area



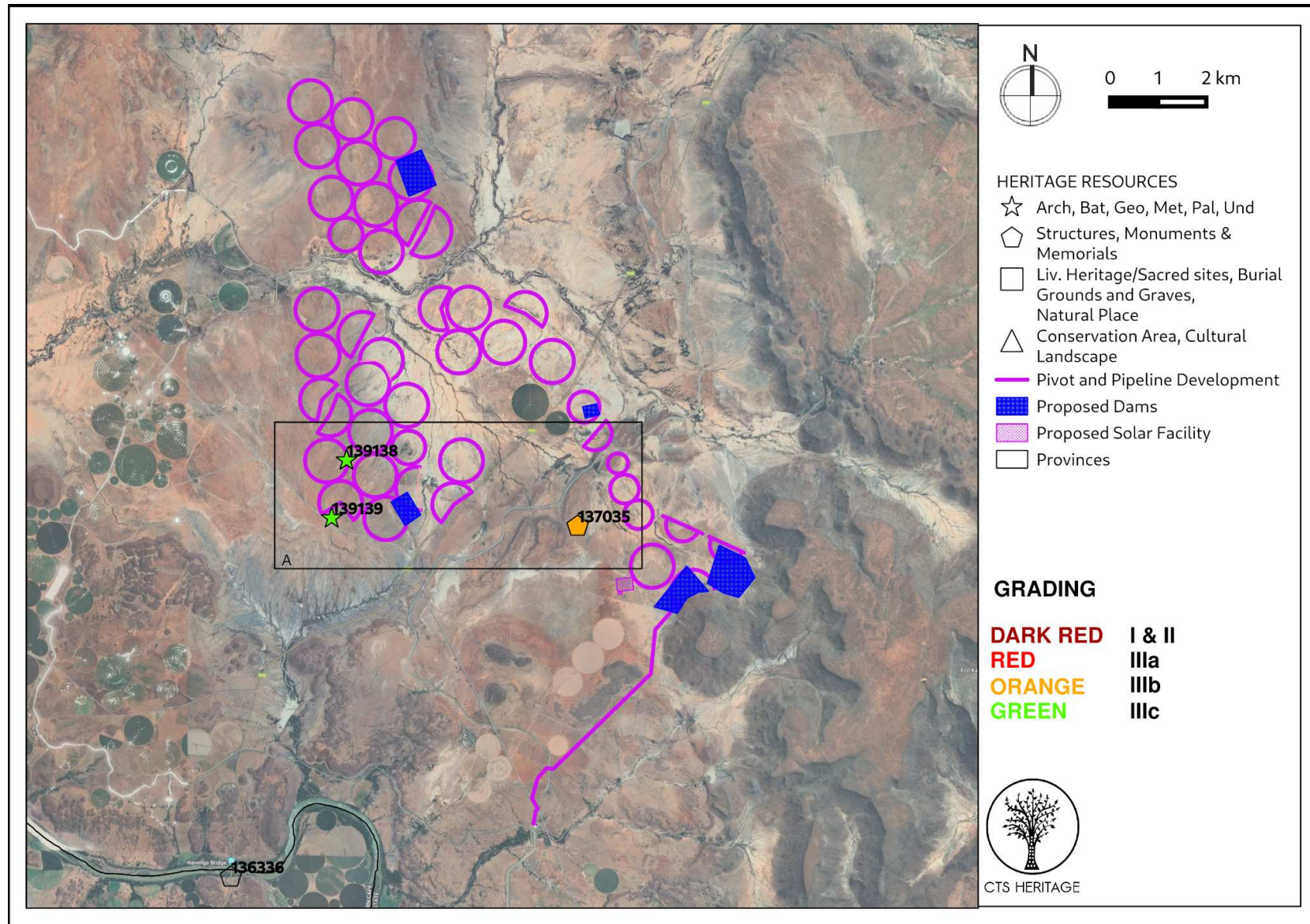






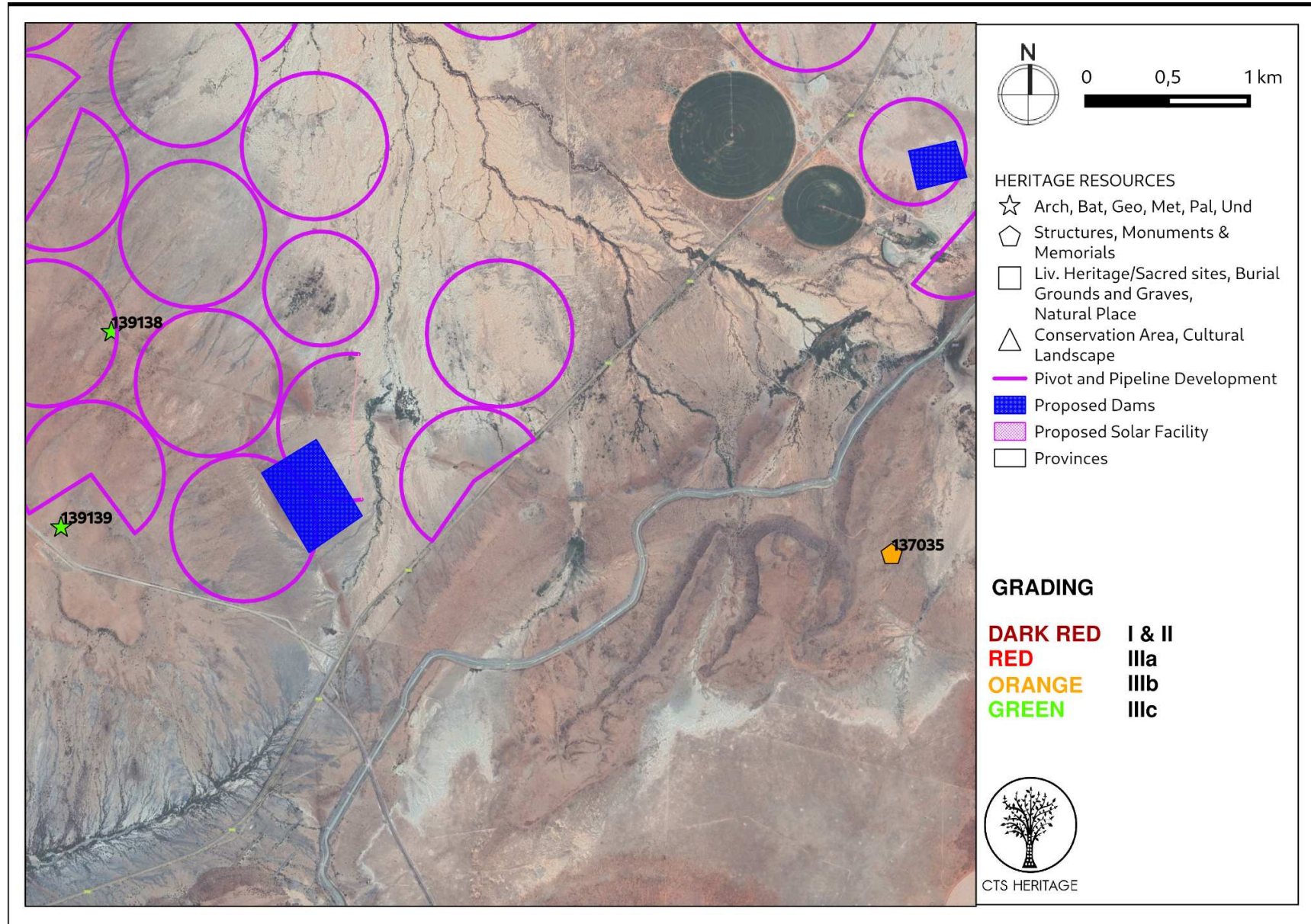
**Figure 2. Previous HIAs Map.** Previous Heritage Impact Assessments covering the proposed development area with SAHRIS NIDS indicated. Please see Appendix 2 for a full reference list.





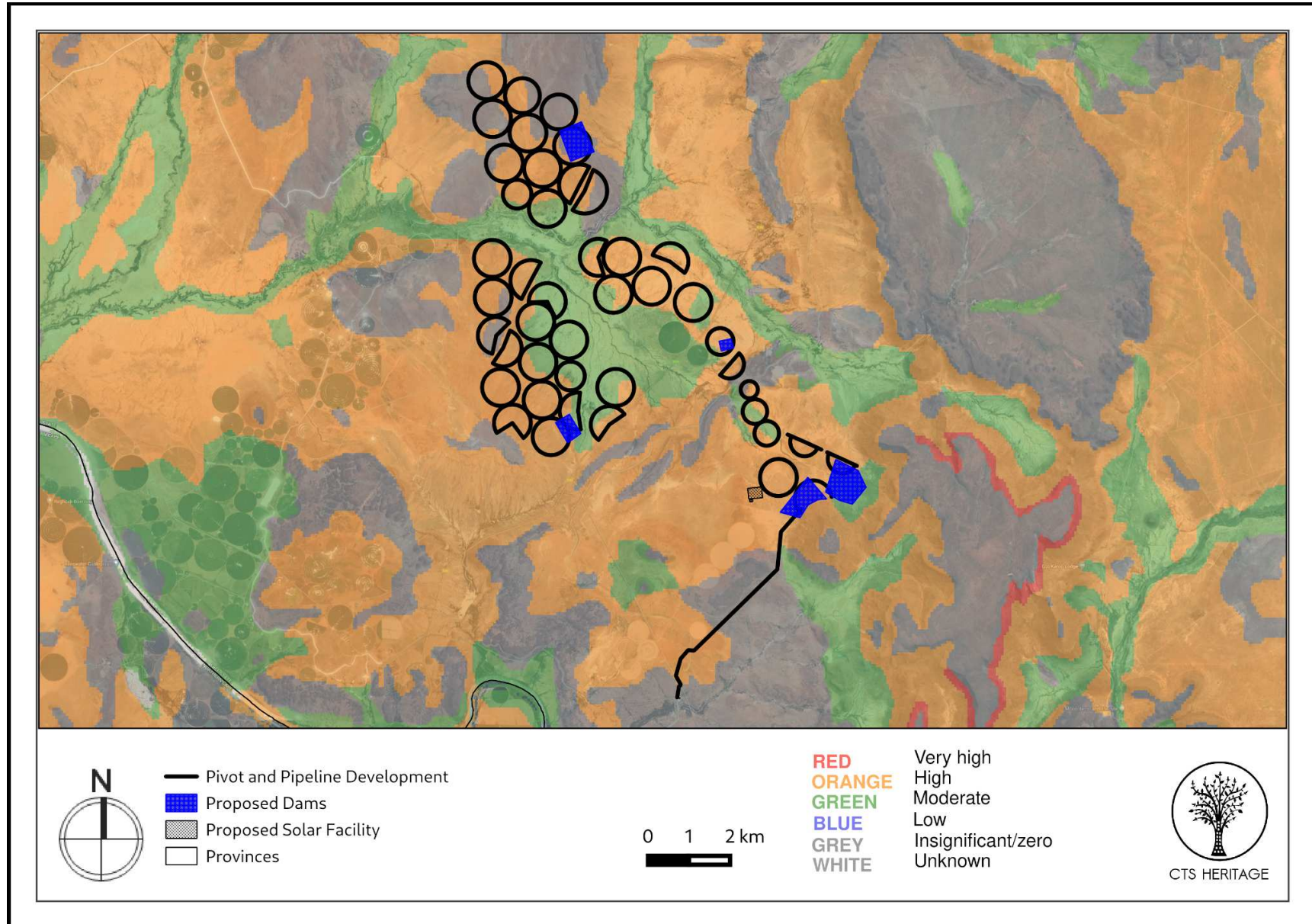
**Figure 3. Heritage Resources Map.** Heritage Resources previously identified within the study area, with SAHRIS Site IDs indicated in the insets below. Please See Appendix 4 for full description of heritage resource types.





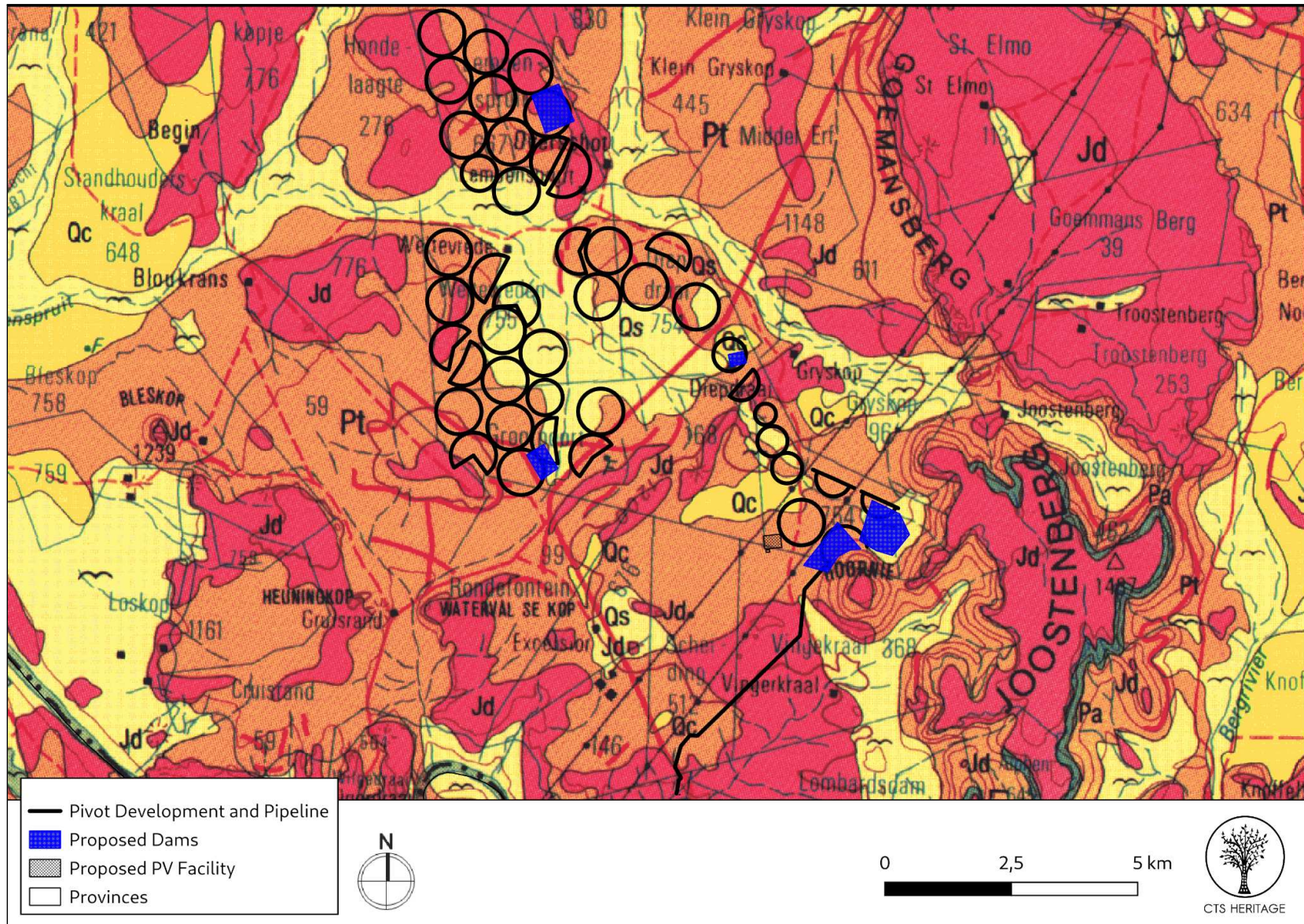
**Figure 3a. Heritage Resources Map** showing heritage resources near the proposed extension power line project.





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





**Figure 4b. Geology Map.** Extract from the CGS 2924 Koffiefontein Map indicating that the development area is underlain by sediments Qc and Qs - Quaternary Sands, Pt - Tierberg Formation of the Ecca Group and Jd - Jurassic Dolerite

## 8. Heritage Assessment

### Background

This application is for the proposed development of agricultural pivots, a dam and pipeline located inbetween Luckhoff and Vanderkloof Dam in the Free State. The area proposed for the development has been extensively transformed through agricultural activities. The nearest town to the proposed development is the town of Vanderkloof which has been established on the banks of the dam. The Vanderkloof dam was constructed in 1977. Neither the town nor the dam are anticipated to be negatively impacted by the proposed development, furthermore, the proposed development is largely agricultural in nature and as such, will contribute to the existing cultural landscape of the area.

### Archaeology and the Built Environment

Very few Heritage Impact Assessments have been completed in the area according to the South African Heritage Resources Information System (SAHRIS, Figure 2) and very few heritage resources are known from the vicinity of the development (Figure 3). According to Morris (2008), “The Northern Cape has a wealth of archaeological sites (Beaumont & Morris 1990; Morris & Beaumont 2004), with locales along and adjacent to the major river systems being of particular significance. Stone Age material found in the broader region spans the Earlier, Middle and Later Stone Ages through Pleistocene and Holocene times. Late Holocene material with pottery is known to occur on the river banks, while rock engravings are richly distributed in the region (Wilman 1933; Fock & Fock 1989; Morris 1988). A particularly notable rock engraving is known from the farm Kraai Bosch, while others occur on the hills near Petrusville.”

In his assessment, Morris (2008) identified low significance Middle and Later Stone Age scatters of archaeological material. These finds correspond with the findings of Tusenius (2016) who noted that “Most of the archaeological remains recorded in the study area consist of a background scatter of weathered and patinated, typologically mixed Middle Stone Age (MSA)/ Later Stone Age (LSA) artefacts, with the former being more common. These artefacts occur dispersed within the surface gravels, rather than as discrete concentrations, and are in a secondary context in areas affected by sheet erosion. The fact that there appears to be no stratigraphic context and no organic remains are preserved would suggest that most of the proposed Kloofsig 1 development area is of low archaeological heritage sensitivity.” Three archaeological observations have been noted within the area proposed for pivot development - these are listed in Appendix 1. Two of these observations consist of very low density MSA archaeological scatters and the third reflects a corrugated iron shed.

Based on the known archaeological sensitivity of the broader area as noted in these assessments, as well as known heritage resources located within the development area, it is likely that significant archaeological heritage will be impacted by the proposed development and as such, a field assessment is recommended.

### Palaeontology

According to the SAHRIS Palaeosensitivity Map, the area proposed for development is underlain by sediments of low, moderate and high palaeontological sensitivity. According to the extract from the Council for GeoScience Map 2924 for Koffiefontein, the area is underlain by Jurassic Dolerite (zero paleontological sensitivity) and Quaternary Sands (moderate and high sensitivity). According to the Desktop Palaeontological Assessment completed by Bamford (2021) for a grid connection project located in the immediate vicinity of this development, the proposed development is positioned within “a mix of potentially fossiliferous (trace fossils) Tierberg Formation (Ecca Group, Karoo Supergroup), Jurassic dolerite and on the Quaternary aeolian sands and calcretes that are non-fossiliferous unless there are traps for fossils such as paleo-pans or palaeo-springs. No such feature is visible on the satellite imagery. Nonetheless, a Fossil Chance Find Protocol should be added to the EMP. Based on this information it is recommended that no palaeontological site visit is required unless fossils are found when excavations for pole foundations commence.” This recommendation is also applicable to this proposed development. It is further recommended that this be confirmed in an updated desktop palaeontological assessment.





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#### **RECOMMENDATION**

**It is likely that the proposed development will impact significant archaeological and palaeontological heritage and as such, it is recommended that a heritage impact assessment be completed that assesses these impacts as per section 38(3) of the NHRA.**

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## 9. Scoping Assessment Impact Table

### Impact

- Impact to archaeological resources
- Impact to palaeontological resources
- Impact to Cultural Landscape
- Cumulative Impact

### Desktop Sensitivity Analysis of the Site

- Impact to significant archaeological resources such as Stone Age artefact scatters, burial grounds and graves, historical artefacts, historical structures and rock art engravings through destruction during the development phase and disturbance during the operational phase is unlikely.
- Impacts to palaeontological resources are possible.
- Due to the nature of the development and its context, cumulative impact and negative impact to the cultural landscape is unlikely

Issue	Nature of Impact	Extent of Impact	No-Go Areas
Impact to significant heritage resources through destruction during the development phase.	Destruction of significant heritage resources	Local scale with broader impacts to scientific knowledge	None known at present

### Gaps in knowledge & recommendations for further study

- It is likely that the proposed development will impact significant archaeological and palaeontological heritage and as such, it is recommended that a heritage impact assessment be completed that assesses these impacts as per section 38(3) of the NHRA.

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## APPENDIX 1

### List of heritage resources within the development area

Site ID	Site no	Full Site Name	Description	Site Type	Grading
139138	GTP-001	Grootpoort	Two localised areas, associated with small outcrops, where thin scatters of MSA tools and flakes were identified. The density of the material is approximately 1 artefact/flake per 10m <sup>2</sup> . The material used for the tools are hardened shale and lideanite	Artefacts	Grade IIIc
139139	GTP-002	Grootpoort	Two localised areas, associated with small outcrops, where thin scatters of MSA tools and flakes were identified. The density of the material is approximately 1 artefact/flake per 10m <sup>2</sup> . The material used for the tools are hardened shale and lideanite.	Artefacts	Grade IIIc
137035	ZTF-011	Zoutpansfontein	This shed has been refurbished with a new corrugated iron roof. It was the processing and dispatch centre of grapes produced at what was then the largest wine-fields in South Africa and in the southern hemisphere. Operations ceased in the 1990s	Building	Grade IIIb

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## APPENDIX 2

### Reference List with relevant AIAs and PIAs

Heritage Impact Assessments				
Nid	Report Type	Author/s	Date	Title
354852	Heritage Impact Assessment Specialist Reports	Johnny Van Schalkwyk		Cultural Heritage Impact Assessment for the proposed Grootpoort Photovoltaic Solar Energy development Facility near Luckhoff, Letsemeng Local Municipality, Free State Province.
364728	PIA Desktop	John E. Almond	01/06/2016	PALAEONTOLOGICAL IMPACT ASSESSMENT: DESKTOP STUDY PROPOSED GROOTPOORT PHOTOVOLTAIC SOLAR ENERGY FACILITY NEAR LUCKHOFF, FREE STATE 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
579389	Letter of Exemption	CTS Heritage	02/08/2021	Desktop Heritage Screening Assessment: Proposed development of the Grootpoort OHL near Luckhoff in the Free State
579390	PIA Desktop	Marion Bamford	29/07/2021	Desktop Palaeontology Assessment: Proposed development of the Grootpoort OHL near Luckhoff in the Free State

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## APPENDIX 3 - Keys/Guides

### Key/Guide to Acronyms

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

### Full guide to Palaeosensitivity Map legend

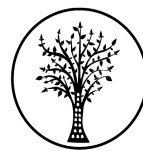
<b>RED:</b>	VERY HIGH - field assessment and protocol for finds is required
<b>ORANGE/YELLOW:</b>	HIGH - desktop study is required and based on the outcome of the desktop study, a field assessment is likely
<b>GREEN:</b>	MODERATE - desktop study is required
<b>BLUE/PURPLE:</b>	LOW - no palaeontological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

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## APPENDIX 4 - Methodology

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

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

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

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

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

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

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

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

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

### DETERMINATION OF THE PALAEONTOLOGICAL SENSITIVITY

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

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

### DETERMINATION OF THE COVERAGE RATING ASCRIBED TO A REPORT POLYGON

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

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**Low coverage** will be used for:

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

**Medium coverage** will be used for

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

**High coverage** will be used for

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

## RECOMMENDATION GUIDE

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

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

This recommendation is made when:

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

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

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

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



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- undertaking mitigation measures requested in previous assessments/records of decision.

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

**Note:**

The responsibility for generating a response detailing the requirements for the development lies with the heritage authority. However, since the methodology utilised for the compilation of the Heritage Screeners is thorough and consistent, contradictory outcomes to the recommendations made by CTS should rarely occur. Should a discrepancy arise, CTS will immediately take up the matter with the heritage authority to clarify the dispute.

## **APPENDIX 5 -Summary of Specialist Expertise**

**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 on the Executive Committee 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 50 Heritage Impact Assessments throughout South Africa.

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