

Phase 1 Archaeological & Cultural Heritage Impact Assessment –
**Panorama Farm Centre Pivot Irrigation Development,
near Cradock, Inxuba Yethemba Local Municipality, Eastern Cape**

- 3 November 2017 -

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Specialist Declaration of Interest

I, Karen van Ryneveld (Company – ArchaeoMaps; Qualification – MSc Archaeology), declare that:

- o I act as independent specialist in this application;
- o I do not have any financial or personal interest in the application, its' proponent or subsidiaries, aside from fair remuneration for specialist services rendered;
- o I am suitably qualified, accredited and experienced to act as independent specialist in this application;
- o That work conducted have been done in an objective manner – and that any circumstances that may have compromised objectivity have been reported on transparently;
- o That all material information collected for purposes of this application, that may reasonably influence the decision of the competent authority, are transparently disclosed in the report; and
- o That work conducted have been done in accordance with relevant heritage legislation, regulations and policy guidelines, and with cognisance to environmental legislation, regulations and policies, including the principle of Integrated Environmental Management (IEM).



Signature –

- 3 November 2017 -

**Panorama Farm Centre Pivot Irrigation Development,
near Cradock, Inxuba Yethemba Local Municipality, Eastern Cape**

Executive Summary

Project Description –

The *Panorama Farm Centre Pivot Irrigation Development* (S32°00'22.1"; E25°29'45.1"), near Cradock, Inxuba Yethemba Local Municipality, Eastern Cape, will entail the immediate installation of 4 centre pivots covering an area of 114.41ha, with an additional centre pivot to be developed in future (Brakland pivot), covering an area of 23.91ha, situated on the properties Portion 4 of the Farm Doorn Rivier No 122, Portion 14 of the Farm Doorn Rivier No 123, Farm No 70, Remainder of Farm No 69 and Farm Goedehoop No 126, Division of Cradock, Eastern Cape. The proposed development thus basically entails a change from flood irrigation to centre pivot irrigation on existing irrigation lands, including development of associated infrastructure.

The Phase 1 Archaeological & Cultural Heritage Impact Assessment –

Project Name & Locality: *Panorama Farm Centre Pivot Irrigation Development*, near Cradock, Inxuba Yethemba Local Municipality, Eastern Cape [1:50,000 Map Ref – 3125CD, 3125DC, 3225AB and 3225BA].

Summary of Findings:

Four (4) archaeological and cultural heritage resources were identified during the field assessment, namely Sites PNR-S1 to PNR-S4. Sites PNR-S1 and PNR-S2 will not be impacted by development. Destruction of Site PNR-S3, archaeological structures older than 100 years should proceed without the developer having to apply for an EC PHRA permit. In the event of impact on the Site PNR-S4 grave relocation of the grave should proceed under an EC PHRA-APM Unit permit, including associated consultative processes.

- The proposed development poses no 'fatal flaws' with reference to archaeological and cultural heritage resources.
- From an archaeological and cultural heritage point of view consideration of a 'No-Go' option is irrelevant.
- The development will have no cumulative impact on archaeological or cultural heritage resources or the associated cultural landscape.
- [In the event of any incidental archaeological and cultural heritage resources, as defined and protected by the NHRA 1999, being identified during the course of development the process described in 'Appendix B: Heritage Protocol for Incidental Finds during the Construction Phase' should be followed. The developer is advised to ensure a sufficient heritage contingency budget to address incidental finds during the course of development.]

Heritage Compliance Summary – Panorama Farm Centre Pivot Irrigation Development, near Cradock, Inxuba Yethemba Local Municipality, EC				
Map Code	Site	Co-ordinates	Site Significance	Recommendations
Panorama Farm Centre Pivot Irrigation Development (S32°00'22.1"; E25°29'45.1")				
Site PNR-S1	Colonial Period – Structure Ruins	S31°59'51.8"; E25°29'53.5"	High Significance Provincial Grade II (Automatic protection)	Site conservation [No additional conservation measures recommended for purposes of development]
Site PNR-S2	Colonial Period – Barn	S31°59'52.1"; E25°29'55.7"	High Significance Provincial Grade II (Automatic protection)	Site conservation [Formal conservation measures in place]
Site PNR-S3	Colonial Period – Workers Residences	S31°59'54.9"; E25°30'01.1"	Low Significance Generally Protected IV-C	Site destruction [Archaeological site older than 100 years – The developer does not need to apply for a site destruction permit]
Site PNR-S4	Colonial Period – Grave	S32°00'22.7"; E25°29'53.4"	High / Medium Significance Generally Protected IV-A	Site conservation / relocation [In event of impact site relocation under an EC PHRA permit; NHRA 1999, Section 38 and NHRA Regulations 2000]

Recommendations –

With reference to archaeological and cultural heritage compliance, as per the requirements of the NHRA 1999, it is recommended that the proposed *Panorama Farm Centre Pivot Irrigation Development*, near Cradock, Inxuba Yethemba Local Municipality, Eastern Cape, proceed provided the developer comply with the above tabled heritage compliance requirements.

The EC PHRA-APM Unit HIA Comment will state legal requirements for development to proceed, or reasons why, from a heritage perspective, development may not be further considered.

CONTENTS

1 – Project Description & Terms of Reference	1
2 – The Phase 1 Archaeological & Cultural Heritage Impact Assessment	4
2.1) Archaeological & Cultural Heritage Legislative Compliance	4
2.2) Methodology & Gap Analysis	4
2.1 – Pre-feasibility Assessment	6
2.1.1) Pre-feasibility Summary	6
2.1.2) The SAHRA 2009 MPD & SAHRIS	6
2.1.3) SAHRA Provincial Heritage Site Database – Eastern Cape	7
2.1.4) General Discussion	7
2.2 – Field Assessment	9
2.2.1) Site PNR-S1: Colonial Period – Structure Ruins: S31°59'51.8"; E25°29'53.5"	9
2.2.2) Site PNR-S2: Colonial Period – Barn: S31°59'52.1"; E25°29'55.7"	9
2.2.3) Site PNR-S3: Colonial Period – Workers Residences: S31°59'54.9"; E25°30'01.1"	9
2.2.4) Site PNR-S4: Colonial Period – Grave: S32°00'22.7"; E25°29'53.4"	10
3 – Environmental Impact Assessment Rating	16
4 – Recommendations	18
5 – Acronyms & Abbreviations	20
6 – References	21

Appendix A:

Schematic Outline of the Pre-colonial and Colonial Periods in South Africa

Appendix B:

Heritage Protocol for Incidental Finds during the Construction Phase

Appendix C:

Resumé: Karen van Ryneveld

List of Maps

Map 1: General locality of the Panorama Farm, near Cradock, Inxuba Yethemba Local Municipality, Eastern Cape (Base Map – MapStudio, 2008).....	2
Map 2: General locality of the Panorama Farm, near Cradock, Inxuba Yethemba Local Municipality, Eastern Cape [1: 50,000 Map Ref – 3125CD, 3125DC, 3225AB and 3225BA].....	2
Map 3: Proposed Panorama Farm Centre Pivot Irrigation Development, near Cradock, Inxuba Yethemba Local Municipality, Eastern Cape.....	3
Map 4: Spatial distribution of geo-referenced PHSs in the SAHRA – Eastern Cape database in relation to the Panorama Farm Centre Pivot Irrigation Development study site (https://en.wikipedia.org/wiki/List_of_heritage_sites_in_Eastern_Cape)	7
Map 6: Phase 1 AIA findings for the Panorama Farm Centre Pivot Irrigation Development, near Cradock, Inxuba Yethemba Local Municipality, Eastern Cape, study site.....	12

List of Plates

Plate 1: Commemorative certificate of Private John Adams (https://www.cwgc.org/find-war-dead/casualty/2724337/adams,_john).....	10
Plate 2: General view of Site PNR-S1.....	13
Plate 3: General view of Site PNR-S2.....	13
Plate 4: General view of Site PNR-S3 [1].....	13
Plate 5: general view of Site PNR-S3 [2].....	13
Plate 6: General view of Site PNR-S4 [1].....	14
Plate 7: General view of Site PNR-S4 [2].....	14
Plate 8: View of the anthropogenic sterile test pit, +/- 1.2m in depth.....	14
Plate 9: View from the bridge across the flood irrigation system.....	14
Plate 10: General view of the study site [1].....	15
Plate 11: General view of the study site [2].....	15
Plate 12: General view of the study site [3].....	15
Plate 13: General view of the study site [4].....	15

List of Tables

Table 1: Extract from the NHRA 1999, Section 38.....	4
Table 2: SAHRA archaeological and cultural heritage site significance assessment ratings and associated mitigation recommendations5	
Table 3: Archaeological and basic cultural heritage probability assessment.....	6
Table 4: Environmental Impact Assessment Rating: Sites PNR-S1 and PNR-S2.....	17
Table 5: Environmental Impact Assessment Rating: Site PNR-S3.....	17
Table 6: Environmental Impact Assessment Rating: Site PNR-S4.....	17
Table 7: Heritage compliance summary.....	18

1 – Project Description & Terms of Reference

The *Panorama Farm Centre Pivot Irrigation Development* (general development co-ordinate S32°00'22.1"; E25°29'45.1"), near Cradock, Inxuba Yethemba Local Municipality, Eastern Cape, will entail the immediate installation of four (4) centre pivots covering an area of 114.41ha, with an additional centre pivot to be developed in future (Brakland pivot), covering an area of 23.91ha, situated on the properties:

- o Portion 4 of the Farm Doorn Rivier No 122, Division of Cradock (30,1927ha);
- o Portion 14 of the Farm Doorn Rivier No 123, Division of Cradock (57,1661ha);
- o Farm No 70, Inxuba Yethemba Local Municipality, Division of Cradock (251,9789ha);
- o Remainder of Farm No 69, Inxuba Yethemba Local Municipality, Division of Cradock (108,8127ha); and
- o Farm Goedehoop No 126, Inxuba Yethemba Local Municipality, Division of Cradock (27,1007ha).

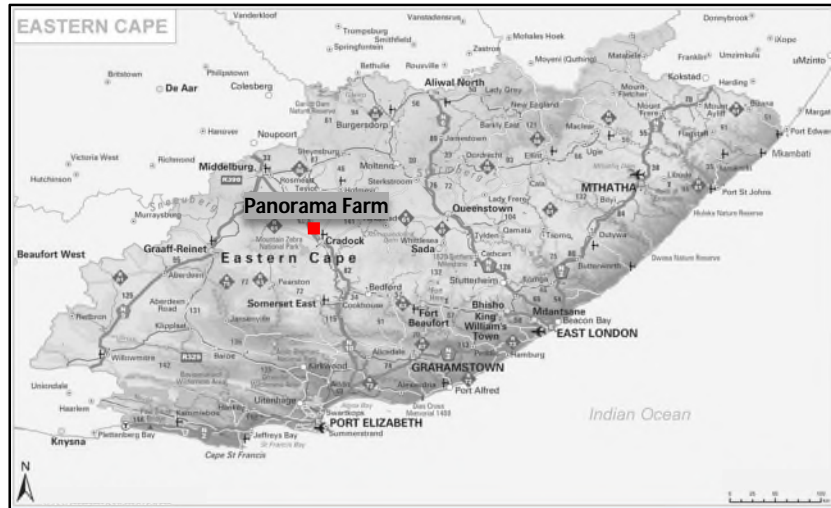
The Panorama farm is currently owned by Mr. D.J. Mulder (Title Deeds: T 29410/94 and T 037648/2002), who has sold the farm to Burnside Farms Trading Trust. Burnside Farms Trading Trust will take possession of the farms immediately under a one (1) year lease agreement with transfer of ownership to be effected in October 2018. In terms of the sales agreement Burnside Farms Trading Trust may implement the development with immediate effect.

Current land use of the Panorama farm comprises flood irrigation with scheduled water rights under the Great Fish River Water User's association and a section of natural vegetation. The proposed development thus basically entails a change from flood irrigation to centre pivot irrigation on existing irrigation lands, including the development of associated infrastructure.

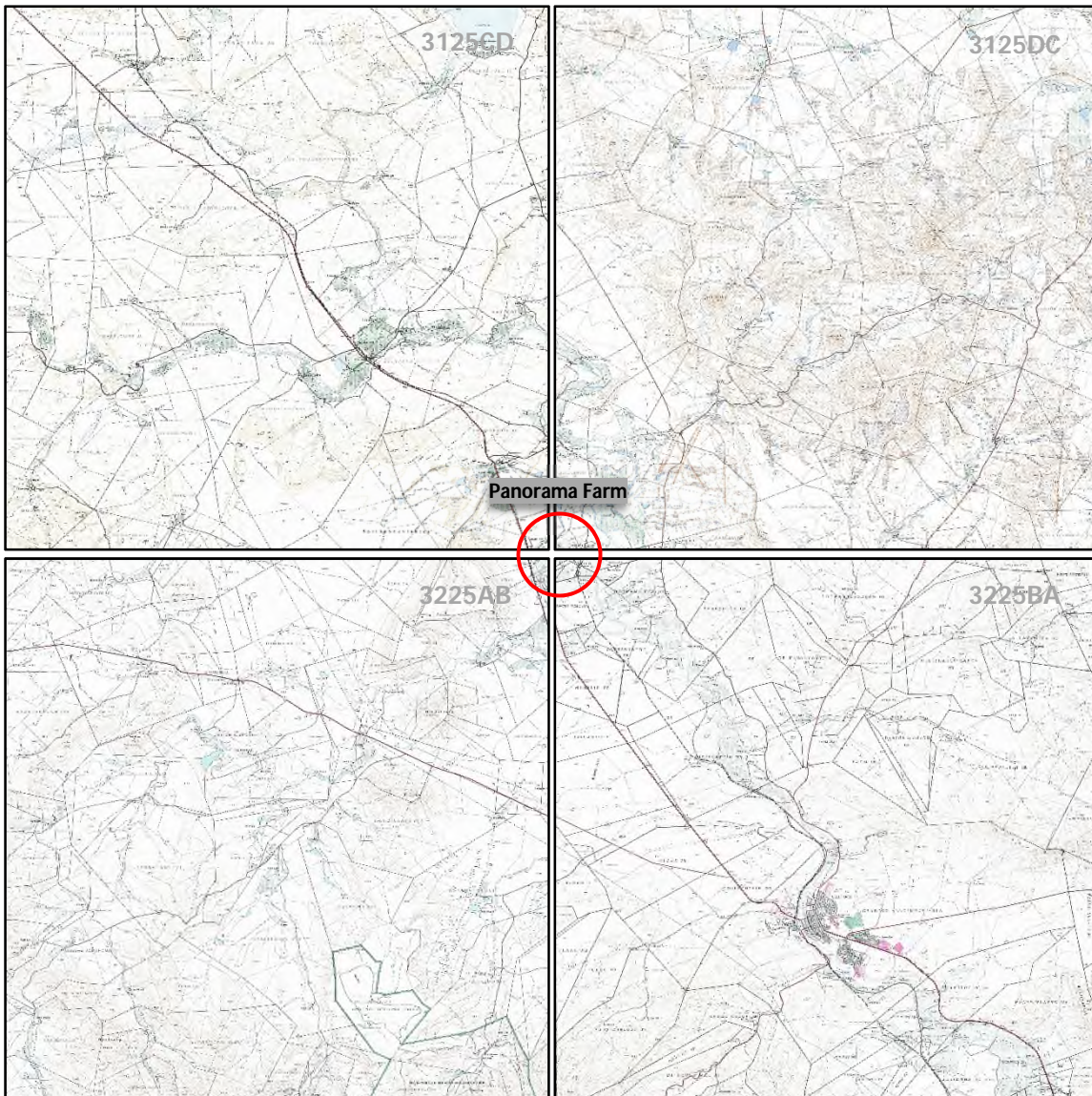
The immediate installation of the proposed four (4) centre pivots do not trigger an environmental process in terms of the National Environmental Management Act, No 107 of 1998 (NEMA 1998) and the NEMA Regulations 2017. Future development of the Brakland pivot will however require an environmental process. The proposed development triggers a Heritage Impact Assessment (HIA) in terms of the National Heritage Resources Act, No 25 of 1999.

ArchaeoMaps have been appointed through Isi-Xwiba Consulting, on behalf of Mr. D.J. Mulder and Burnside farms Trading Trust to compile the Phase 1 Archaeological & Cultural Heritage Impact Assessment (AIA) for the development, as specialist component to the application's Heritage Impact Assessment (HIA). The Phase 1 AIA addresses both immediate heritage requirements and future environmental process requirements (Brakland pivot). Terms of Reference (ToR) for the Phase 1 AIA are summarized as:

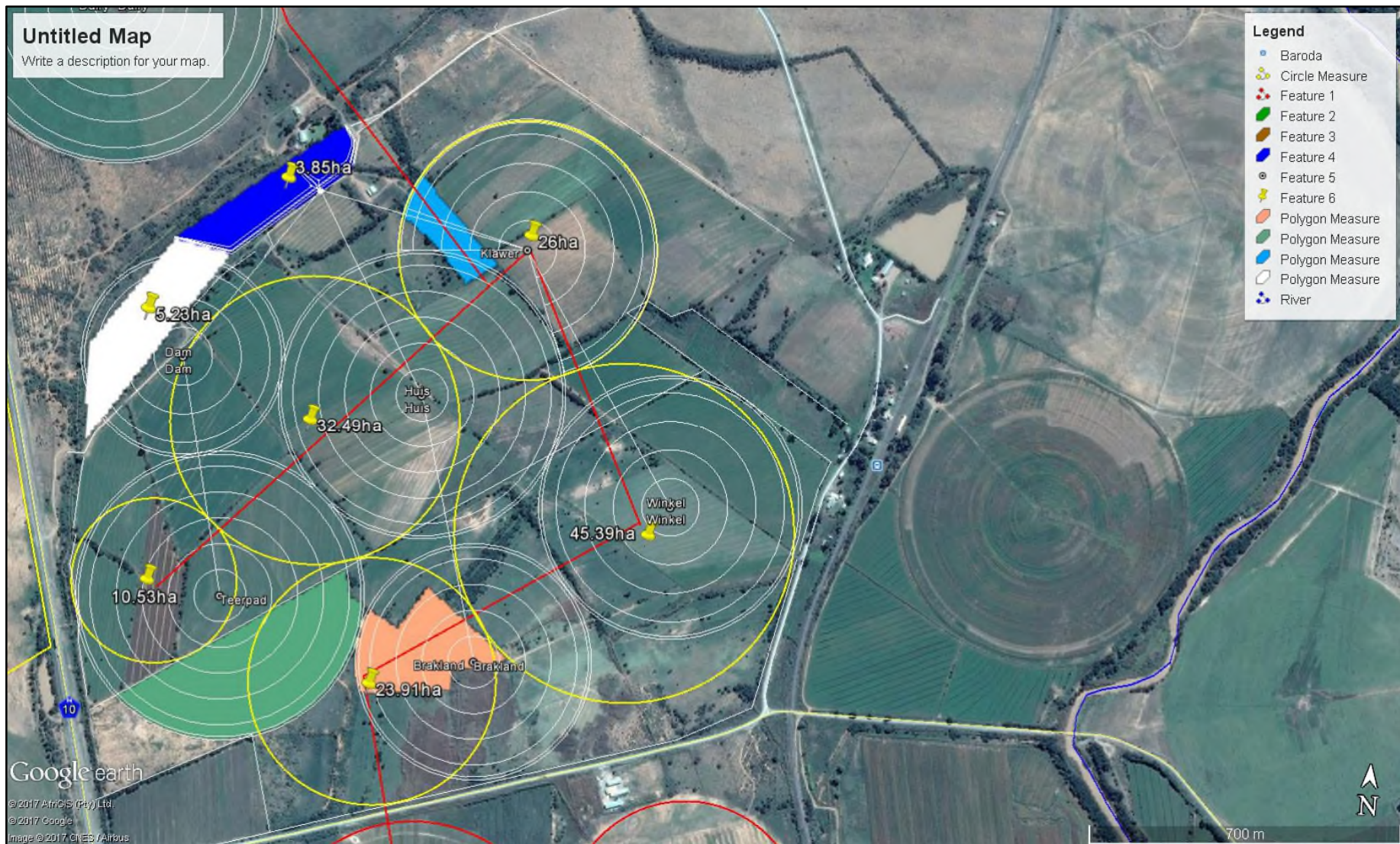
- o Describe the existing area to be directly affected by the proposal in terms of its archaeological and cultural heritage characteristics as formally protected by the National Heritage Resources Act, No 25 of 1999 (NHRA 1999) and the general sensitivity of these components to change;
- o Describe the likely scope, scale and significance of impacts (positive and negative) on the archaeological and cultural heritage resources of the area associated with the 1) construction and 2) operation or use phases of the proposal;
- o Make recommendations on the scope of any mitigation measures that may be applied during the 1) construction and 2) operation or use phases to reduce / avoid the significance of identified related impacts. Mitigation measures could be design recommendations as well as operational controls, monitoring programmes, Phase 2 mitigation, management procedures and the like;
- o Broadly describe the implication of a 'No-Go' option;
- o Broadly comment on the cumulative impact (positive or negative) on archaeological or cultural heritage resources associated with the 1) construction and 2) operation or use phases of the proposal; and
- o Confirm if there are any outright 'fatal flaws' to the proposal at its current location from an archaeological and cultural heritage perspective.



Map 1: General locality of the Panorama Farm, near Cradock, Inxuba Yethemba Local Municipality, Eastern Cape (Base Map – MapStudio, 2008)



Map 2: General locality of the Panorama Farm, near Cradock, Inxuba Yethemba Local Municipality, Eastern Cape [1: 50,000 Map Ref – 3125CD, 3125DC, 3225AB and 3225BA]



Map 3: Proposed Panorama Farm Centre Pivot Irrigation Development, near Cradock, Inxuba Yethemba Local Municipality, Eastern Cape

2 – The Phase 1 Archaeological & Cultural Heritage Impact Assessment

2.1) Archaeological & Cultural Heritage Legislative Compliance

The Phase 1 Archaeological & Cultural Heritage Impact Assessment (AIA) for the *Panorama Farm Centre Pivot Irrigation Development*, near Cradock, Inxuba Yethemba Local Municipality, Eastern Cape, was requested to meet the Eastern Cape Provincial Heritage Resources Authority's (EC PHRA) requirements with reference to archaeological and basic cultural heritage resources in terms of the National Heritage Resources Act, No 25 of 1999 (NHRA 1999), with specific reference to Section 38(1)(c)(i). This report is submitted in (partial) fulfilment of the NHRA 1999, Section 38(3) requirements, for purposes of a NHRA 1999, Section 38(4) / Section 38(8) Heritage Impact Assessment (HIA) Comment by the EC PHRA.

NHRA 1999, Section 38	
1)	Subject to the provisions of subsections 7), 8) and 9), any person who intends to undertake a development categorized as –
a)	The construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
b)	The construction of a bridge or similar structure exceeding 50m in length;
c)	Any development or other activity which will change the character of a site –
i.	Exceeding 5,000m² in extent; or
ii.	Involving three or more existing erven or subdivisions thereof; or
iii.	Involving three or more erven or subdivisions thereof which have been consolidated within the past five years; or
iv.	The costs which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;
d)	The rezoning of a site exceeding 10,000m ² in extent;
e)	Any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority,
	Must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

Table 1: Extract from the NHRA 1999, Section 38

The Phase 1 AIA aimed to locate, identify and assess the significance of archaeological and cultural heritage resources, inclusive of archaeological deposits / sites (Stone Age, Iron Age and Colonial Period), rock art and shipwreck sites, built structures older than 60 years, sites of military history older than 75 years, certain categories of burial grounds and graves, graves of victims of conflict, basic living heritage and cultural landscapes and viewsapes as defined and protected by the NHRA 1999, Section 2, 34, 35 and 36, that may be affected by the development.

This report comprises a Phase 1 AIA, including a basic pre-feasibility study and field assessment only. The report was prepared in accordance with the 'Minimum Standards' specifications for Phase 1 AIA reports, as stipulated by SAHRA (2007).

Additional relevant legislation pertaining to the Phase 1 AIA is listed as:

- National Environmental Management Act, No 107 of 1998 (NEMA 1998) and associated Regulations (2017).

2.2) Methodology & Gap Analysis

The Phase 1 AIA includes a basic pre-feasibility study and field assessment:

- The pre-feasibility assessment is based on the Appendix A schematic outline of South Africa's Pre-colonial and Colonial past, associated with introductory archaeological as well as general and scientific literature available and relevant to the study site. Databases consulted include the SAHRA 2009 Mapping Project Database (MPD), the South African Heritage Resources Information System (SAHRIS) and SAHRA database(s) on declared Provincial Heritage Sites (PHS) pertaining to the study site. The study excludes consultation of museum and university databases.
- The field assessment was done over a 1 day period (2017-09-28) with fieldwork conducted by the author. The assessment was done by vehicle and foot and limited to a Phase 1 surface survey. GPS co-ordinates were taken

with Garmin Montana 680 (Datum: WGS84) Photographic documentation was done with a Canon EOS 1300D camera. A combination of Garmap (Base Camp) and Google Earth software was used in the display of spatial information.

The Phase 1 AIA was done according to the system and 'Minimum Standards' prescribed for the 3-tiered Phase 1-3 Heritage Impact Assessment (HI A) process (SAHRA 2007):

- Phase 1 HIA – A Phase 1 HIA is compulsory for development types as stipulated in the NHRA 1999, Section 38(1) and Section 38(8), including any other development type or study site as required by the South African Heritage Resources Agency (SAHRA) or relevant Provincial Heritage Resources Authority (PHRA). A Phase 1 HIA comprises at minimum of an archaeological (AIA) and palaeontological (PIA) study, but aims to address all heritage types protected by the NHRA 1999 and to alert developers to additional heritage specialist study requirements, if and where relevant to a development. Phase 1 HIA studies focusses on pre-feasibility and desktop studies, routinely coined with field assessments in order to locate, describe and assign heritage site significance ratings to identified resources that may be impacted by development. The aim of a Phase 1 AIA is to make site specific and general development recommendations regarding identified heritage resources for development planning and implementation purposes and may include recommendations for conservation, heritage site declaration, monitoring, Phase 2 mitigation (excavation), or destruction.
- Phase 2 HIA – Phase 2 HIAs are as a norm required where heritage resources of such significance have been identified during the Phase 1 HIA that mitigation (excavation) thereof is necessary for development purposes. Aside from large scale Phase 2 mitigation (routinely to precede development impact), lower keyed Phase 2 requirements may well include sampling, testing and monitoring during the construction or implementation phase of a development. Phase 2 HIA work is as a norm done under a compulsory heritage permit.
- Phase 3 HIA – As an extension to Phase 2 HIA work or cases where recommendations for heritage declaration formed part of a development's heritage compliance requirements, heritage resources of such scientific or heritage tourism significance, that their long-term conservation and continued research would be necessary within a development framework is proposed as a Phase 3 HIA.

Archaeological and cultural heritage site significance assessment and associated mitigation recommendations are done according to the combined NHRA 1999, Section 7(1) and SAHRA (2007) system.

SAHRA Archaeological & Cultural Heritage Site Significance System			
Site Significance	Field Rating	Grade	Recommended Mitigation
High Significance	National Significance	Grade I	Heritage site conservation / Heritage site development
High Significance	Provincial Significance	Grade II	Heritage site conservation / Heritage site development
High Significance	Local Significance	Grade III-A	Heritage site conservation or extensive mitigation prior to development / destruction
High Significance	Local Significance	Grade III-B	Heritage site conservation or extensive mitigation prior to development / destruction
High / Medium Significance	Generally Protected A	Grade IV-A	Heritage site conservation or mitigation prior to development / destruction
Medium Significance	Generally Protected B	Grade IV-B	Heritage site conservation or mitigation / test excavation / systematic sampling / monitoring prior to or during development / destruction
Low Significance	Generally Protected C	Grade IV-C	On-site sampling, monitoring or no heritage mitigation required prior to or during development / destruction

Table 2: SAHRA archaeological and cultural heritage site significance assessment ratings and associated mitigation recommendations

2.1.1) Pre-feasibility Summary

Based on the Appendix A schematic outline of the Pre-colonial and Colonial Periods in South Africa and background literature and database information, the probability of archaeological and cultural heritage resources affected by, or situated in proximity to the *Panorama Farm Centre Pivot Irrigation Development*, near Cradock, Inxuba Yethemba Local Municipality, Eastern Cape, can briefly be described as:

Archaeological and Basic Cultural Heritage Probability Assessment – Panorama Centre Pivot Irrigation Development, near Cradock, Inxuba Yethemba Local Municipality, EC			
Primary Type / Period	Sub-period	Sub-period type site	Probability
EARLY HOMININ / HOMINID	-	-	None
	Graves / human remains: High scientific significance		
STONE AGE	Earlier Stone Age (ESA)		Low
	Middle Stone Age (MSA)		Medium-High
	Later Stone Age (LSA)		Medium
		Rock Art	Medium-High
		Shel Middens	None
	Graves / human remains: ESA & MSA - High scientific significance; LSA – High scientific & social significance		
IRON AGE	Early Iron Age (EIA)		None
	Middle Iron Age (MIA)		None
	Later Iron Age (LIA)		Low-Medium
	Graves / human remains: EIA – High scientific significance; MIA & LIA – High scientific & social significance		
COLONIAL PERIOD	Colonial Period		High
		LSA – Colonial Period Contact	Low
		LIA – Colonial Period Contact	Low
		Industrial Revolution	Low
		Apartheid & Struggle	Low
	Graves / human remains: Medium-high scientific & high social significance		

Table 3: Archaeological and basic cultural heritage probability assessment

2.1.2) The SAHRA 2009 MPD & SAHRIS

Four (4) archaeological Cultural Resources Management (CRM) reports are recorded in the SAHRA 2009 Mapping Project Database (MPD) and situated within an approximate 20km radius from the proposed *Panorama Farm Centre Pivot Irrigation Development* study site, referenced as:

- o Binneman, J. 2007. (Albany Museum). *A Phase 1 Archaeological Impact Assessment for the Proposed New Entrance Gate with Associated Infrastructure and Construction and Upgrade of Roads in the Mountain Zebra National Park, Cradock District.*
- o Nel, J. 2008. (Archaic Heritage Project Management). *Final report – Heritage Resources Scoping Survey and Preliminary Assessment: Transnet Freight Line EIA, Eastern Cape and Northern Cape.*
- o Philip, L., Koortzen, C. & Henderson, Z.L. 2008. (NMB). *Assessment of Area of Proposed Construction, Operation and Maintenance of the Cypress Grave to Tafelberg Road (Chris Hani Magisterial District, Inxuba Yethemba Municipality, Eastern Cape) in terms of Archaeological and other Heritage Sites.*
- o Van Ryneveld, K. 2007. (NMB). *Phase 1 Archaeological Impact Assessment – Cradock Weir Residential Development, Portion of Erf 1, Cradock, Eastern Cape, South Africa.*

Post compilation of the SAHRA 2009 MPD at least eight (8) SAHRIS cases have been recorded, with study sites situated within the rough 20km radius from the *Panorama Farm Centre Pivot Irrigation Development* study site. SAHRIS CaseID 2597 (prospecting on various farms in the Cradock area) and SAHRIS CaseID 1355 (Ngqura prospecting) have been recorded 'For Noting' only. SAHRIS CaseID 10881 and SAHRIS CaseID 749 both refer to destruction / alteration permit applications for structures older than 60 years (NHRA 1999, Section 34 applications). SAHRIS CaseID 263, the Rodicon Wind Energy facility application is associated with an archaeological CRM report, but with the report not downloadable from the SAHRIS website. The remainder of the SAHRIS cases are associated with archaeological CRM reports, with relevant reports listed as:

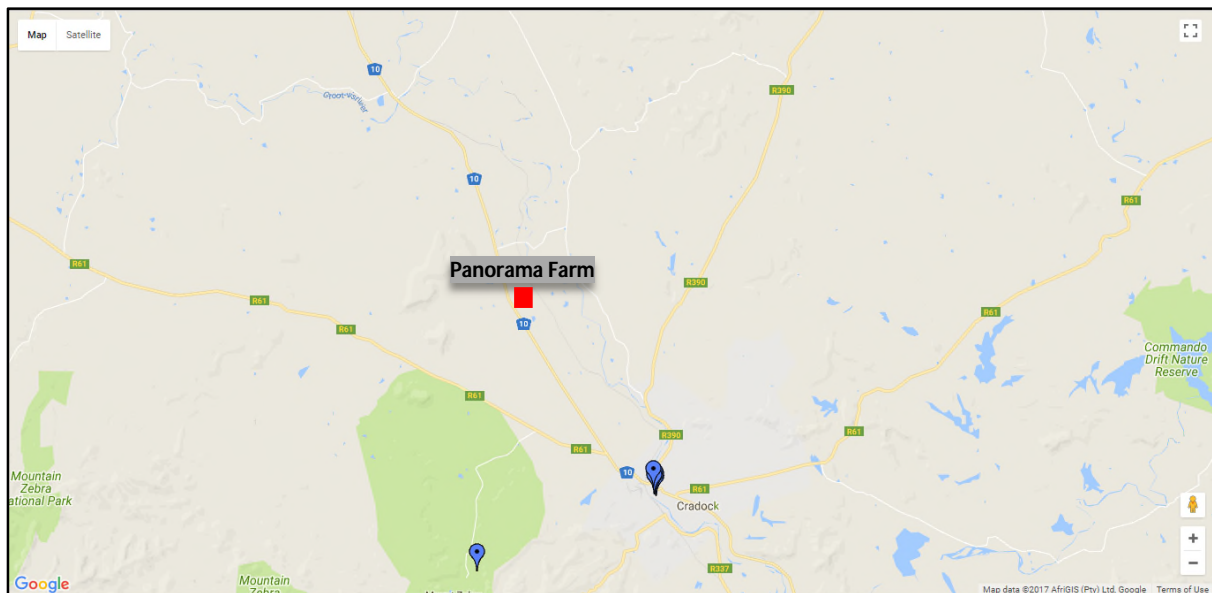
- o Booth, C. 2012. (Albany Museum). *A Phase 1 Archaeological Impact Assessment for the Proposed 75MW Dobbin Photovoltaic Solar Farm on the Farm Het Fontein 1/66, near Cradock, Inxuba Yethemba District Municipality, Eastern Cape Province.* [SAHRIS CaseID 139].

- Morris, D. 2013. (McGregor Museum). *Archaeology Specialist Input on the Site of the Proposed Platfontein Photovoltaic Construction Site North of De Aar, Northern Cape*. [SAHRIS CaseID 1944].
- Van Ryneveld, K. 2012. (ArchaeoMaps). *A Phase 1 Archaeological Impact Assessment – Upgrade of the N10-4 Cradock [km1.6] to Knustford [km29], Eastern Cape, South Africa*. [SAHRIS CaseID 221].

2.1.3) SAHRA Provincial Heritage Site Database – Eastern Cape

Six (6) geo-referenced declared Provincial Heritage Sites (PHS) are recorded in the SAHRA – Eastern Cape database (https://en.wikipedia.org/wiki/List_of_heritage_sites_in_Eastern_Cape) and situated within the approximate 20km radius from the proposed *Panorama Farm Centre Pivot Irrigation Development*, with none of these situated within 5km from the study site. Mentioned geo-referenced PHS are referenced as:

- SAHRA Identifier 9/2/024/0010 - Doornhoek Homestead, Mountain Zebra National Park, Cradock District
- SAHRA Identifier 9/2/024/0003 - Old Congregational Church, 1 High Street, Cradock
- SAHRA Identifier 9/2/024/0012 - Dutch Reformed Church, Stockenstrroom Street, Cradock
- SAHRA Identifier 9/2/024/0013 - 38 Bree Street, Cradock
- SAHRA Identifier 9/2/024/0014 - 38 Stockenstrroom Street, Cradock
- SAHRA Identifier 9/2/024/0015 - Olive Schreiner House, 9 Cross Street, Cradock



Map 4: Spatial distribution of geo-referenced PHSs in the SAHRA – Eastern Cape database in relation to the *Panorama Farm Centre Pivot Irrigation Development* study site (https://en.wikipedia.org/wiki/List_of_heritage_sites_in_Eastern_Cape)

2.1.4) General Discussion

Earlier (ESA), Middle (MSA) and Later Stone Age (LSA) sites and occurrences were reported on by Nel (2008) situated along the approximate 1,200km Transnet Freight Line development corridor. However, closer to the Panorama study site it seems MSA sites and occurrences dominate. Binneman (2007) reported on a possible Smithfield Industrial Complex identified at the Mountain Zebra National Park, which may span the MSA to LSA period, or either of the periods depending on the particular aspect of the Smithfield Industrial Complex (Smithfield A, B or C). Morris (2013) reported on high densities of MSA lithic artefacts at the Platfontein site, while Van Ryneveld (2007) commented on a portion of the known Cain's MSA site possibly impacted by the Cradock Weir Residential development, as well as scattered MSA artefacts found across the study site. One [1] confirmed MSA site was also reported on from Cradock to Knustford road assessment, as well as an ex-situ MSA / LSA occurrence (Van Ryneveld 2012). Further scatters of MSA artefacts occurred at the Dobbin Solar Farm site (Booth 2012). A confirmed LSA lithic site was reported on from the Dobbin Solar Farm site (Booth 2012), with LSA lithic scatters also present at the Platfontein site (Morris 2013). The report by Philip *et al.* (2008) on the Cypress Grove to Tafelberg Road confirmed the presence of a general Stone Age across the greater terrain.

LSA sites need further attention with specific reference to the presence of Rock Art sites. Booth (2012) commented on rock engravings from the Dobbin Solar Farm site, comprising mainly of collections of scratches and faint figurative art,

with similar findings confirmed by Morris (2013) from the Platfontein study site. At the Mountain Zebra National Park Binneman (2007) recorded rock paintings from a sandstone overhang, with imagery including both human and domestic animal figurines as well as finger paintings, possibly indicative of both fairly late hunter-gatherer (San) and herder (Khoen) LSA occupation of the area.

Reports of Iron Age sites across the greater terrain remain scarce. Situated outside the known Earlier (EIA) and Middle Iron Age (MIA) areas of occupation, Later Iron Age (LIA) reports include stone walled features, workers accommodation and grave and cemetery sites (Nel 2008). Closer to the Panorama study site one [1] LIA cemetery site was reported on from the Cradock Weir Residential Development site (Van Ryneveld 2007).

Colonial Period records are fairly ample, including primarily Colonial Period farmstead sites and associated cemeteries (Nel 2008). Early Colonial Period industrial development were commented on by Morris (2013) and including the construction of the railway line to Kimberley, completed in 1885, with the railway line development corridor associated with a number of blockhouses relating to the Anglo-Boer War. Colonial Period stone walling were also discovered at the Dobbin Solar Farm study site together with associated midden type artefactual remains including metal, bottle glass and porcelain (Booth 2012). Five (5) Colonial Period farmsteads, a Colonial Period farm gate and two (2) stone walled sites were reported on from the Cradock to Knustford road study site (Van Ryneveld 2012), as well as Colonial Period farmstead ruins from the Cradock Weir Residential Development site (Van Ryneveld 2007).

Colonial Period Dutch farmers started to settle in the Cradock area from the late 18th Century, with the official proclamation of Cradock having had appeared in the Cape Town Gazette of 21 January 1814, established on the farm Driefontein (https://en.wikipedia.org/wiki/Cradock,_Eastern_Cape). Establishment of Cradock also serves as evidence of farms in the greater Cradock area having had been established prior to 1814. Although original registration documents of farms affected by the *Panorama Farm Centre Pivot Irrigation Development* could not be obtained from Chief Surveyor General (CSG) records, evidence exist of substantial subdivision of affected farms dating to the periods 1891, 1911, 1928 and 1938 (www.csg.dla.gov.za). Fair inference can thus be made that early structures on the farms may well date to the general period of farm registration in the area, followed by subsequent subdivision of farms, giving a rough estimated date for early structures as dating to approximate 100 years ago.

Four (4) archaeological and cultural heritage resources, as defined and protected by the NHRA 1999, were identified during the field assessment of the *Panorama Farm Centre Pivot Irrigation Development*, near Cradock, Inxuba Yethemba Local Municipality, Eastern Cape, namely Sites PNR-S1 to PNR-S4. All identified sites comprise Colonial Period heritage resources. Further contemporary structures (pre-dating 60 years of age) are present at the study site. These structures, not formally protected by the NHRA 1999, were not recorded for purposes of a heritage assessment: Impact on these sites are not subject to heritage compliance requirements.

Of the identified heritage sites two (2) will be conserved, namely Sites PNR-S1 and PNR-S2. The Site PNR-S3 archaeological structures are recommended for destruction, while Site PNR-S4, a Colonial Period grave site, is recommended for relocation on the property in the event of development impact on the site.

Surface visibility across the site proved to be good to fair, negatively affected in places by thick vegetation. Agricultural fields provided for a sub-surface preliminary inspection of up to approximately 20-30cm in depth, while a test pit, situated at S32°00'27.1"; E25°29'45.7", of more or less 1.2m in depth yielded no sub-surface archaeological members or lenses.

2.2.1) Site PNR-S1: Colonial Period – Structure Ruins: S31°59'51.8"; E25°29'53.5"

The Site PNR-S1 locality represents Colonial Period structure ruins of inferred vernacular origin and dating to 60-100 years of age. No formal conservation measures are in place. The Colonial Period structure ruins receives formal SAHRA / EC PHRA protection, but will not be impacted by development. The site will by implication be conserved.

- **Site Significance and Recommendations:** The Site PNR-S1 vernacular structure ruins date to between 60-100 years of age and receives automatic SAHRA / EC PHRA protection as a site of *High Significance* with a *Provincial Grade II Field Rating*. The site is no longer in use and no formal conservation measures are in place. Proximity from development does not warrant additional temporary conservation measures during the construction phase.

2.2.2) Site PNR-S2: Colonial Period – Barn: S31°59'52.1"; E25°29'55.7"

Site PNR-S2 comprise a Colonial Period barn (farming infrastructure). The vernacular structure is reasonably inferred to be between 60-100 years of age, having been constructed in the years following registration of farms in the general Cradock area. The site is at present still in use and formally conserved (permanent fence with access gate), with formal conservation measures complying with SAHRA / EC PHRA Minimum Site Conservation Standards. The site will not be impacted by development.

- **Site Significance and Recommendations:** The Site PNR-S2 vernacular structure reasonably dates to between 60-100 years of age, thus most probably receiving automatic SAHRA / EC PHRA protection as a site of *High Significance* with a *Provincial Grade II Field Rating*. The site is still in use, with current formal conservation measures being in place and with these complying with SAHRA / EC PHRA Minimum Heritage Site Conservation Standards. The site will not be impacted by development. No additional heritage conservation measures for purposes of development is recommended.

2.2.3) Site PNR-S3: Colonial Period – Workers Residences: S31°59'54.9"; E25°30'01.1"

Site PNR-S3 constitutes a row of five (5) Colonial Period workers residences. Residences are reasonably inferred to be more than 100 years old, dating to soon after the time of registration of farms in the area. Site PNR-S3 is by implication formally protected by the NHRA 1999, both as structure(s) older than 60 years of age and as an archaeological site / manmade structure(s) older than 100 years. Workers residences are still in use, but required to be demolished for

purposes of development. Workers residences are of no architectural, stylistic, aesthetic, scientific or technological significance.

- **Site Significance and Recommendations:** Site PNR-S3 receives automatic SAHRA / EC PHRA protection as a site of *High Significance* with a *Provincial Grade II Field Rating* (NHRA 1999, Section 34). However, from an archaeological perspective [NHRA 1999, Section 2(ii)(a), and Section 35] the site is ascribed a SAHRA / EC PHRA *Low Significance* with a *Generally Protected IV-C Field Rating*. With specific reference to the NHRA 1999, Section 2(ii)(a) it is argued that the site's classification as an archaeological site takes precedence over its description as a NHRA 1999, Section 34 site.

Site PNR-S3 is required to be demolished under the development proposal. It is recommended that the site be destroyed as a *Low Significance, Generally Protected IV-C* archaeological without the developer having to apply for a SAHRA / EC PHRA Section 34 permit.

2.2.4) Site PNR-S4: Colonial Period – Grave: S32°00'22.7"; E25°29'53.4"

Site PNR-S4 is defined as a grave older than 60 years, situated outside a formal cemetery and is formally protected by the NHRA 1999. The site is formally conserved with permanent fence immediately surrounding the grave. The commonwealth grave site hosts the inscription 'M. Z3789 Manskap; John Adams; I.M.C.; 26 Mei 1947; Veilig in Jesus Hoede'. The commonwealth commemorative certificate contains limited additional information on the deceased, including 'Private; Adams, John; Service Number M/23789; Died 26/05/1947; Indian and Malay Corps; Son of Dick and Lydia Adams of Cradock; Husband of Dora Adams of Cradock' (https://www.cwgc.org/find-war-dead/casualty/2724337/adams,_john). The grave site may be impacted by development.

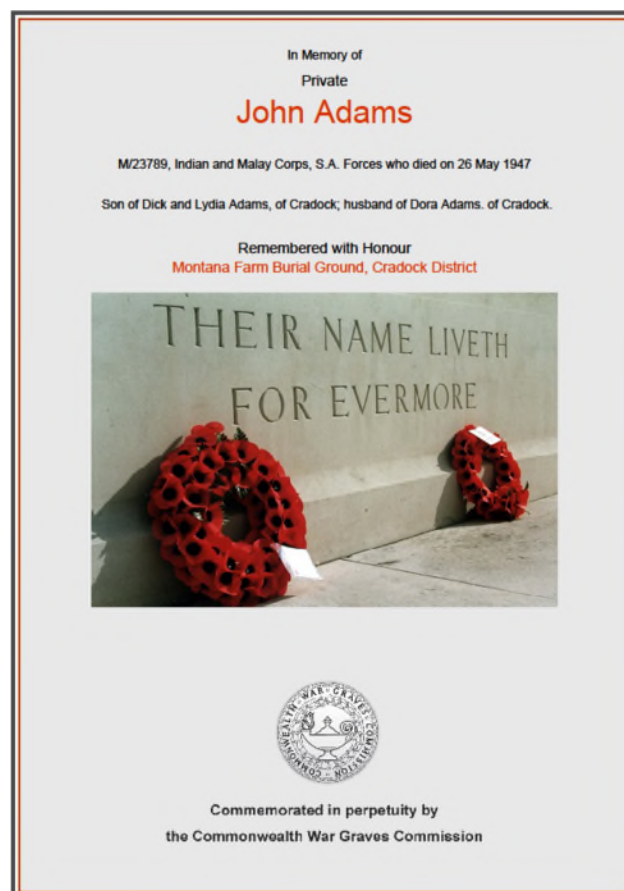


Plate 1: Commemorative certificate of Private John Adams (https://www.cwgc.org/find-war-dead/casualty/2724337/adams,_john)

- **Site Significance and Recommendations:** Site PNR-S4, a commonwealth grave site, is ascribed a SAHRA / EC PHRA *High / Medium Significance* and a *Generally Protected IV-A Field Rating*. The grave site may be impacted by the proposed Panorama development. Two (2) heritage management development options, namely in-situ conservation of the site or relocation of the grave in terms of the NHRA 1999, Section 36 may be considered by the developer.
 1. ***In-situ Conservation:*** In-situ conservation of the grave site is recommended where it would be possible to ensure a minimum 5m heritage conservation buffer zone between the grave and the pivot development. In-situ conservation of the grave site may require alteration (decrease in pivot size) in the proposed development layout.
 2. ***Relocation of the Grave:*** Should it not be possible to ensure in-situ conservation of the grave, the grave should be relocated in terms of the NHRA 1999, Section 36 and in accordance with the relevant EC PHRA permit process (NHRA 1999, Section 38 and Regulations 2000), including a public participation process, exhumation and reinternment. In the event of relocation of the grave it is recommended that the grave be relocated to a suitable locale on the Panorama Farm, preferably to one of the intermediate areas between the proposed pivots, thereby ensuring a tranquil and scenic setting for the final resting place of the deceased and with the final resting place being as close as possible to the original burial site, whilst asserting no possible future development impact on the grave. Alternatively, grave relocation to a municipal cemetery may be considered.



Map 5: Phase 1 AIA findings for the *Panorama Farm Centre Pivot Irrigation Development*, near Cradock, Inxuba Yethemba Local Municipality, Eastern Cape, study site



Plate 2: General view of Site PNR-S1



Plate 4: General view of Site PNR-S3 [1]



Plate 3: General view of Site PNR-S2



Plate 5: general view of Site PNR-S3 [2]



Plate 6: General view of Site PNR-S4 [1]



Plate 8: View of the anthropogenic sterile test pit, +/- 1.2m in depth



Plate 7: General view of Site PNR-S4 [2]



Plate 9: View from the bridge across the flood irrigation system



Plate 10: General view of the study site [1]



Plate 12: General view of the study site [3]



Plate 11: General view of the study site [2]



Plate 13: General view of the study site [4]

3 – Environmental Impact Assessment Rating

Identified archaeological and cultural heritage resources are ascribed an Environmental Impact Assessment (EIA) rating, based on the outline presented below to provide a significance rating of development impact on resources, both during the 1) construction and 2) operation and use phases of development (in accordance with NEMA 1998, Regulations 2014):

Overall Nature:	1) Negative (negative impact on affected biophysical or human environment), or 2) Positive (benefit to the affected biophysical or human environment).
Type:	1) Direct (caused by the action and occur at the same time and place), 2) Indirect or secondary (caused by the action and are later in time or further removed in distance but reasonably foreseeable), or 3) Cumulative (impact which results from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions; can result from individually minor, but collectively significant actions taking place over a period of time).
Spatial Extent:	1) Site (immediate area of activity, incorporating a 5m zone from the edge of the affected area), 2) Local (area up to and/or within 10km from the 'site' as defined above), 3) Regional (entire community, basin or landscape), or 4) National (South Africa).
Duration:	1) Short-term (impact would last for the duration of activities; quickly reversible), 2) Medium-term (impact would affect project activity; reversible over time), 3) Long-term (impact would continue beyond project activity), or 4) Permanent (impact would continue beyond decommissioning).
Severity:	1) Low , 2) Medium , or 3) High , being +) Positive , or -) Negative (based on separately described categories examining whether the impact is destructive or benign, whether it destroys the impacted environment, alters its functionality or slightly alters the environment itself).
Reversibility:	1) Completely reversible (completely reversible impact with implementation of correct mitigation measures), 2) Partly reversible (partly reversible impact with implementation of correct mitigation measures), or 3) Irreversible (impact cannot be reversed, regardless of mitigation or rehabilitation measures).
Irreplaceable loss:	1) Resource will not be lost (resource will not be lost provided mitigation measures are implemented), 2) Resource will be partly lost (partial loss or destruction of the resource will occur even though management and mitigation measures are implemented), or 3) Resource cannot be replaced (resource is irreplaceable no matter which management or mitigation measures are implemented).
Probability:	1) Unlikely (<40% probability), 2) Possible (40% probability), 3) Probable (>70% probability), or 4) Definite (>90% probability).
Mitigation potential:	1) High or completely mitigatable (relatively easy and cost effective to manage. Specialist expertise and equipment generally not required. Nature of impact easily understood and may be mitigated through implementation of a management plan or 'good housekeeping', including regular monitoring and reporting regimes. Significance of the impact after mitigation is likely to be low or negligible), 2) Moderate or partially mitigatable (management requires higher level of expertise and resources to maintain impacts with acceptable levels. Mitigation can be tied up in the design of the project. Significance of the impacts after mitigation is likely to be low to moderate. It may not be possible to mitigate the impact entirely, with residual impacts resulting), or 3) Low or un-mitigatable (will not be possible to mitigate the impact entirely, regardless of expertise and resources. Potential to manage the impacts may be beyond the scope of the project. Management of the impact is not likely to result in a measurable change in the level of significance).
Impact significance:	1) Negligible , 2) Low (largely of HIGH mitigation potential, after consideration of other criteria), 3) Moderate (largely of MODERATE or partial mitigation potential, after consideration of other criteria), or 4) Substantial (largely of LOW mitigation potential, after consideration of other criteria).

Environmental Impact Assessment Rating: Panorama Centre Pivot Irrigation Development, near Cradock, Inxuba Yethemba Local Municipality, EC												
Potential Impacts	Overall nature	Type	Spatial extent	Duration	Severity	Reversibility	Irreplaceable loss	Probability	MITIGATION POTENTIAL	IMPACT SIGNIFICANCE		MITIGATION MEASURES
										Without mitigation	With mitigation	
SITES: PNR-S1 and PNR-S2												
Construction phase	(+)	Direct	Site	Permanent	Low (+)	N/A	Resource will not be lost	Definite	N/A	N/A	N/A	N/A
Operational phase	(+)	Direct	Site	Permanent	Low (+)	N/A	Resource will not be lost	Definite	N/A	N/A	N/A	N/A
Mitigation details: Sites that will be conserved by virtue of proximity from the development where existing formal conservation measures are in place or where no conservation measures are required for development purposes												

Table 4: Environmental Impact Assessment Rating: Sites PNR-S1 and PNR-S2

Environmental Impact Assessment Rating: Panorama Centre Pivot Irrigation Development, near Cradock, Inxuba Yethemba Local Municipality, EC												
Potential Impacts	Overall nature	Type	Spatial extent	Duration	Severity	Reversibility	Irreplaceable loss	Probability	MITIGATION POTENTIAL	IMPACT SIGNIFICANCE		MITIGATION MEASURES
										Without mitigation	With mitigation	
SITES: PNR-S3												
Construction phase	(-)	Direct	Site	Short-term	Medium (-)	Irreversible	Resource will be lost	Definite	Low / unmitigatable	N/A	Low	Destruction without develop having to apply for an EC PHRA site destruction permit
Operational phase	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Mitigation details: Site destruction without the developer having to apply for an EC PHRA site destruction permit												

Table 5: Environmental Impact Assessment Rating: Site PNR-S3

Environmental Impact Assessment Rating: Panorama Centre Pivot Irrigation Development, near Cradock, Inxuba Yethemba Local Municipality, EC												
Potential Impacts	Overall nature	Type	Spatial extent	Duration	Severity	Reversibility	Irreplaceable loss	Probability	MITIGATION POTENTIAL	IMPACT SIGNIFICANCE		MITIGATION MEASURES
										Without mitigation	With mitigation	
SITES: PNR-S4												
Construction phase	(+)	Direct	Site	Permanent	High (+)	Completely reversible	Resource will be lost	Possible / Probable	High / Completely mitigatable	Substantial	Negligible	Conservation or site relocation under an EC PHRA permit
Operational phase	(+)	Direct	Site	Permanent	High (+)	N/A	Resource will not be lost	Definite	N/A	Negligible	Negligible	Site Conservation (in-situ or relocated)
Mitigation details: Site conservation or relocation of grave under an EC PHRA permit												

Table 6: Environmental Impact Assessment Rating: Site PNR-S4

With reference to archaeological and cultural heritage compliance, as per the requirements of the NHRA 1999, it is recommended that the proposed **Panorama Farm Centre Pivot Irrigation Development, near Cradock, Inxuba Yethemba Local Municipality, Eastern Cape, proceed provided the developer comply with the below tabled heritage compliance requirements.**

Four (4) archaeological and cultural heritage resources were identified during the field assessment, namely Sites PNR-S1 to PNR-S4. Sites PNR-S1 and PNR-S2 will not be impacted by development. Destruction of Site PNR-S3, archaeological structures older than 100 years should proceed without the developer having to apply for an EC PHRA permit. In the event of impact on the Site PNR-S4 grave relocation of the grave should proceed under an EC PHRA-APM Unit permit, including associated consultative processes.

- The proposed development poses no 'fatal flaws' with reference to archaeological and cultural heritage resources.
- From an archaeological and cultural heritage point of view consideration of a 'No-Go' option is irrelevant.
- The development will have no cumulative impact on archaeological or cultural heritage resources or the associated cultural landscape.
- [In the event of any incidental archaeological and cultural heritage resources, as defined and protected by the NHRA 1999¹, being identified during the course of development the process described in 'Appendix B: Heritage Protocol for Incidental Finds during the Construction Phase' should be followed. The developer is advised to ensure a sufficient heritage contingency budget to address incidental finds during the course of development.]

Heritage Compliance Summary – Panorama Farm Centre Pivot Irrigation Development, near Cradock, Inxuba Yethemba Local Municipality, EC				
Map Code	Site	Co-ordinates	Site Significance	Recommendations
Panorama Farm Centre Pivot Irrigation Development (S32°00'22.1"; E25°29'45.1")				
Site PNR-S1	Colonial Period – Structure Ruins	S31°59'51.8"; E25°29'53.5"	High Significance Provincial Grade II (Automatic protection)	Site conservation [No additional conservation measures recommended for purposes of development]
Site PNR-S2	Colonial Period – Barn	S31°59'52.1"; E25°29'55.7"	High Significance Provincial Grade II (Automatic protection)	Site conservation [Formal conservation measures in place]
Site PNR-S3	Colonial Period – Workers Residences	S31°59'54.9"; E25°30'01.1"	Low Significance Generally Protected IV-C	Site destruction [Archaeological site older than 100 years – The developer does not need to apply for a site destruction permit]
Site PNR-S4	Colonial Period – Grave	S32°00'22.7"; E25°29'53.4"	High / Medium Significance Generally Protected IV-A	Site conservation / relocation [In event of impact site relocation under an EC PHRA permit; NHRA 1999, Section 38 and NHRA Regulations 2000]

Table 7: Heritage compliance summary

The EC PHRA-APM Unit HIA Comment will state legal requirements for development to proceed, or reasons why, from a heritage perspective, development may not be further considered.

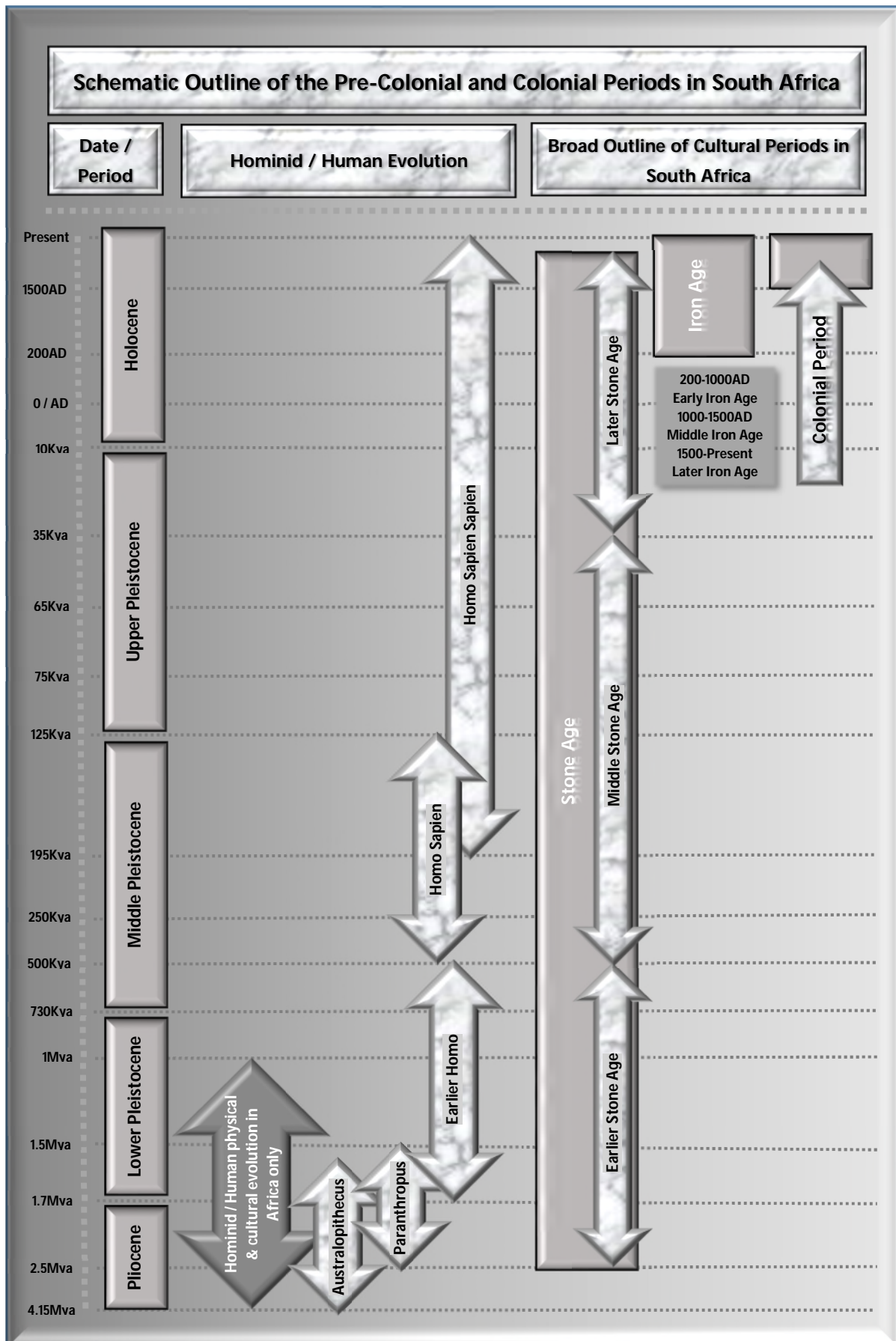
¹ Simplified Guide to the Identification of Archaeological Sites:

- ❖ **Stone Age** – Knapped stone display flakes and flake scars that appear unnatural and may result in similar type 'shaped' stones often concentrated in clusters or forming a distinct layer in the geological stratigraphy. ESA shapes may represent 'pear' or oval shaped stones, often in the region of 10cm or larger. Typical MSA types include blade-like or rough triangular shaped artefacts, often associated with randomly shaped lithics or flakes that display use- or edge-wear around the rim of the artefact. LSA types are similar to MSA types, but generally smaller (≤3cm in size), often informally shaped, and are frequently found in association with bone, pieces of charcoal, ceramic shards and food remains.
 - **Rock Art** – Includes both painted and engraved images.
 - **Shell Middens** – Include compact shell lenses that may be quite extensive in size or small ephemeral scatters of shell food remains, often associated with LSA artefact remains, but may also be of MSA and Iron Age cultural association.
- ❖ **Iron Age** – Iron Age sites are often characterized by stone features, i.e. the remains of former livestock enclosures or typical household remains; huts are identified by either mound or depression hollows. Typical artefacts include ceramic remains, farming equipment, beads and trade goods, metal artefacts (including jewellery) etc. Remains of the 'Struggle' – events, histories and landmarks associated therewith are often, based on cultural association, classed as part of the Iron Age heritage of South Africa.
- ❖ **Colonial Period** – Built environment remains, either urban or rural, are of a Western cultural affiliation with typical artefacts representing early Western culture, including typical household remains, trade and manufactured goods, such as old bottle, porcelain and metal artefacts. War memorial remains, including the vast array of associated graves and the history of the Industrial Revolution form important parts of South Africa's Colonial Period heritage.
- ❖ **Grave and Cemetery Sites** – Marked grave and cemetery sites are routinely associated with the Iron Age and Colonial Period. Unmarked grave sites associated with the Stone Age, Iron Age and Colonial Period may be uncovered during the course of development.

Notes: Should any registered Interested & Affected Party (I&AP) wish to be consulted in terms of Section 38(3)(e) of the NHRA 1999 (socio-cultural consultation / SAHRA SIA) it is recommended that the developer / EAP ensures that the consultation be prioritized within the timeframe of the environmental assessment process.

AD	: Anno Domini (the year 0)
AIA	: Archaeological Impact Assessment
AMAFA	: Amafa aKwaZulu-Natali (Natal PHRA)
ASAPA	: Association of Southern African Professional Archaeologists
BAR	: Basic Assessment Report
BC	: Before the Birth of Christ (the year 0)
BCE	: Before the Common Era (the year 0)
BID	: Background Information Document
BP	: Before the Present (the year 0)
cm	: Centimetre
CMP	: Conservation Management Plan
CRM	: Cultural Resources Management
DAC	: Department of Arts and Culture
DEAT	: Department of Environmental Affairs and Tourism
DME	: Department of Minerals and Energy
EAP	: Environmental Assessment Practitioner
ECO	: Environmental Control Officer
ELO	: Environmental Liaison Officer
EC PHRA	: Eastern Cape Provincial Heritage Resources Authority
EIA ₁	: Environmental Impact Assessment
EIA ₂	: Early Iron Age
EMPr	: Environmental Management Plan / Programme Report
ESA	: Earlier Stone Age
ha	: Hectare
HIA	: Heritage Impact Assessment
HWC	: Heritage Western Cape
ICOMOS	: International Council on Monuments and Sites
IEM	: Integrated Environmental Management
km	: kilometre
Kya	: Thousands of years ago
LIA	: Later Iron Age
LSA	: Later Stone Age
m	: metre
m ²	: Square meter
MIA	: Middle Iron Age
Mm	: millimetre
MPRDA 2002	: Mineral and Petroleum Resources Development Act, No 28 of 2002
MSA	: Middle Stone Age
Mya	: Millions of years ago
NEMA 1998	: National Environmental Management Act, No 107 of 1998
NHRA 1999	: National Heritage Resources Act, No 25 of 1999
PIA	: Palaeontological Impact Assessment
PHRA	: Provincial Heritage Resources Authority
PSSA	: Palaeontological Society of South Africa
PPP	: Public Participation Process
SAHRA	: South African Heritage Resources Agency
SAHRIS	: South African Heritage Resources Information System
SIA	: Social Impact Assessment

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Heritage Impact Assessment (HIA) – Panorama Farm Centre Pivot Irrigation Development, near Cradock, Inxuba Yethemba Local Municipality, Eastern Cape

Heritage Protocol for Incidental Finds during the Construction Phase

Should any palaeontological, archaeological or cultural heritage resources, including human remains / graves, as defined and protected by the NHRA 1999, be identified during the construction phase of development (including as a norm during vegetation clearing, surface scraping, trenching and excavation phases), it is recommended that the process described below be followed.

➤ **On-site Reporting Process:**

1. The identifier should immediately notify his / her supervisor of the find.
2. The identifier's supervisor should immediately (and within 24 hours after reporting by the identifier) report the incident to the on-site SHE / SHEQ officer.
3. The on-site SHE / SHEQ officer should immediately (and within 24 hours after reporting by the relevant supervisor) report the incident to the appointed ECO / ELO officer. [Should the find relate to human remains the SHE / SHEQ officer should immediately notify the nearest SAPS station informing them of the find].
4. The ECO / ELO officer should ensure that the find is within 72 hours after the SHE / SHEQ officers report reported on SAHRIS and that a relevant heritage specialist is contacted to make arrangements for a heritage site inspection. [Should the find relate to human remains the ECO / ELO officer should ensure that the archaeological site inspection coincides with a SAPS site inspection, to verify if the find is of forensic, authentic (informal / older than 60 years), or archaeological (older than 100 years) origin].
5. The appointed heritage specialist should compile a 'heritage site inspection' report based on the site specific findings. The site inspection report should make recommendations for the destruction, conservation or mitigation of the find and prescribe a recommended way forward for development. The 'heritage site inspection' report should be submitted to the ECO / ELO, who should ensure submission thereof on SAHRIS.
6. SAHRA / the relevant PHRA will state legal requirements for development to proceed in the SAHRA / PHRA Comment on the 'heritage site inspection' report.
7. The developer should proceed with implementation of the SAHRA / PHRA Comment requirements. SAHRA / PHRA Comment requirements may well stipulate permit specifications for development to proceed.
 - Should permit specifications stipulate further Phase 2 archaeological investigation (including grave mitigation) a suitably accredited heritage specialist should be appointed to conduct the work according to the applicable SAHRA / PHRA process. The heritage specialist should apply for the permit. Upon issue of the SAHRA / PHRA permit the Phase 2 heritage mitigation program may commence.
 - Should permit specifications stipulate destruction of the find under a SAHRA / PHRA permit the developer should immediately proceed with the permit application. Upon the issue of the SAHRA / PHRA permit the developer may legally proceed with destruction of the palaeontological, archaeological or cultural heritage resource.
 - Upon completion of the Phase 2 heritage mitigation program the heritage specialist will submit a Phase 2 report to the ECO / ELO, who should in turn ensure submission thereof on SAHRIS. Report recommendations may include that the remainder of a heritage site be destroyed under a SAHRA / PHRA permit.
 - Should the find relate to human remains of forensic origin the matter will be directly addressed by the SAPS: A SAHRA / PHRA permit will not be applicable.

NOTE: Note that SAHRA / PHRA permit and process requirements relating to the mitigation of human remains requires suitable advertising of the find, a consultation, mitigation and re-interment / deposition process.

➤ **Duties of the Supervisor:**

1. The supervisor should immediately upon reporting by the identifier ensure that all work in the vicinity of the find is ceased.
2. The supervisor should ensure that the location of the find is immediately secured (and within 12 hours of reporting by the identifier), by means of a temporary conservation fence (construction netting) allowing for a 5-10m heritage conservation buffer zone around the find. The temporary conserved area should be sign-posted as a 'No Entry – Heritage Site' zone.
3. Where development has impacted on the resource, no attempt should be made to remove artefacts / objects / remains further from their context, and artefacts / objects / remains that have been removed should be collected and placed within the conservation area or kept for safekeeping with the SHE / SHEQ officer. It is imperative that where development has impacted on palaeontological, archaeological and cultural heritage resources the context of the find be preserved as good as possible for interpretive and sample testing purposes.
4. The supervisor should record the name, company and capacity of the identifier and compile a brief report describing the events surrounding the find. The report should be submitted to the SHE / SHEQ officer at the time of the incident report.

➤ **Duties of the SHE / SHEQ Officer:**

1. The SHE / SHEQ officer should ensure that the location of the find is recorded with a GPS. A photographic record of the find (including implementation of temporary conservation measures) should be compiled. Where relevant a scale bar or object that can indicate scale should be inserted in photographs for interpretive purposes.
2. The SHE / SHEQ officer should ensure that the supervisors report, GPS co-ordinate and photographic record of the find be submitted to the ECO / ELO officer. [Should the find relate to human remains the SHE / SHEQ officer should ensure that the mentioned reporting be made available to the SAPS at the time of the incident report].
3. Any retrieved artefacts / objects / remains should, in consultation with the ECO / ELO officer, be deposited in a safe place (preferably on-site) for safekeeping.

➤ **Duties of the ECO / ELO officer:**

1. The ECO / ELO officer should ensure that the incident is reported on SAHRIS. (The ECO / ELO officer should ensure that he / she is registered on the relevant SAHRIS case with SAHRIS authorship to the case at the time of appointment to enable heritage reporting).
2. The ECO / ELO officer should ensure that the incident report is forwarded to the heritage specialist for interpretive purposes at his / her soonest opportunity and prior to the heritage site inspection.
3. The ECO / ELO officer should facilitate appointment of the heritage specialist by the developer / construction consultant for the heritage site inspection.
4. The ECO / ELO officer should facilitate access by the heritage specialist to any retrieved artefacts / objects / remains that have been kept in safekeeping.
5. The ECO / ELO officer should facilitate coordination of the heritage site inspection and the SAPS site inspection in the event of a human remains incident report.
6. The ECO / ELO officer should facilitate heritage reporting and heritage compliance requirements by SAHRA / the relevant PHRA, between the developer / construction consultant, the heritage specialist, the SHE / SHEQ officer (where relevant) and the SAPS (where relevant).

➤ **Duties of the Developer / Construction Consultant:**

The developer / construction consultant should ensure that an adequate heritage contingency budget is accommodated within the project budget to facilitate and streamline the heritage compliance process in the event of identification of incidental palaeontological, archaeological and cultural heritage resources during the course of development, including as a norm during vegetation clearing, surface scraping, trenching and excavation phases, when resources not visible at the time of the surface assessment may well be exposed.

Resumé
Karen van Ryneveld
2017

Name: Karen van Ryneveld

Contact Details: 1) Mobile – 084 871 1064
2) E-mail – karen@archaeomaps.co.za
3) Website – www.archaeomaps.co.za
4) Postal address – Postnet Suite 239, Private Bag X3, Beacon Bay, 5205

Company: ArchaeoMaps cc

Occupation: Archaeologist

Qualification: MSc Archaeology (WITS University – 2003)

Accreditation: 1) Association of Southern African Professional Archaeologists (ASAPA) accredited Cultural Resources Management CRM practitioner [member nr – 163]
 o 2010 – ASAPA CRM Section: Principle Investigator – Stone Age
 o 2005 – ASAPA CRM Section: Field Director – Iron Age & Colonial Period
 2) SAHRA, AMAFA, EC PHRA and HWC listed ASAPA accredited CRM archaeologist

Tertiary Education

2015 – Present **University of Fort Hare (UFH), East London** (MPhil Environmental Studies)

2010 **University of South Africa (UNISA), Pretoria** (Project Management 501)

2006 – 2007 **Nelson Mandela Metropolitan University (NMMU), Port Elizabeth** (Undergraduate Certificate in Geographical Information Systems – GIS)

2001 – 2003 **University of the Witwatersrand (WITS), Johannesburg** (MSc Archaeology)

1999 – 2000 **University of Pretoria (UP), Pretoria** (BA Hons. Archaeology)

1991 – 1993 **University of Pretoria (UP), Pretoria** (BA Archaeology & History of Art)

Courses

2016/01 SPA (Safety Passport Alliance) – Petrol Retail [SA Safety Management Training Services – SMST]

Employment – Professional Archaeology

2007/04 – Present ArchaeoMaps [Self-employed] (Archaeologist – CRM)

2006/06 – 2007/03 National Museum, Bloemfontein (Archaeologist – CRM, Dept. of Archaeology)

2005/04 – 2006/05 McGregor Museum, Kimberley (Archaeologist – CRM / Research, Dept. of Archaeology)

2004/04 – 2005/01 Amafa aKwaZulu-Natali (HoD: Archaeology, Palaeontology & Meteorites Unit – APM Unit)

2002/09 – 2004/03 McGregor Museum, Kimberley (Archaeologist – CRM / Research, Dept. of Archaeology)

Employment – Freelance: Ground Penetrating Radar

2015/10 – Present Terra Scan assistant (BCM area, EC) – GPR & underground utilities focussing on petrol retail (oil & gas) industry

Archaeology – Summary

Karen has been involved in CRM archaeology since 2003 and has been the author (including selected co-authored reports) of approximately 500 Phase 1 AIA studies. Phase 1 AIA work is centred in South Africa, focussing on the Northern and Eastern Cape provinces and the Free State. She has also conducted Phase 1 work in Botswana (2006 / 2007). In 2007 she started ArchaeoMaps, an independent archaeological and heritage consultancy. In 2010 she was awarded ASAPA CRM Principle Investigator (PI) status based on large scale Phase 2 Stone Age mitigation work (De Beers Consolidated Mines – Rooipoort, Northern Cape, 2008 / 2009) and has also been involved in a number of other Phase 2 projects including Stone Age, Shell Middens, Grave / Cemetery projects and Iron Age sites.

In addition to CRM archaeology she has been involved in research, including the international collaborations at Maloney's Kloof and Grootkloof, Ghaap Plateau, Northern Cape (2005 / 2006). Archaeological compliance experience includes her position as Head of the Archaeology, palaeontology and Meteorites (APM) Unit at AMAFA aKwaZulu-Natali (2004).

Company Profile

Company Name : ArchaeoMaps cc

Registration Number : 2005/180719/23

VAT Number : Not VAT Registered

Accountant : AZIMA Financial Services

Members / Shareholders : Karen van Ryneveld (100%)

BBBEE Status : Exempted Micro Enterprise (EME)