

**Upgrading of the Main Road MR450 (R335) from Motherwell to Addo,
Nelson Mandela Bay Municipality and Sundays River Valley Local Municipality, Eastern Cape**

- 23 August 2016 -

Report to:

Sello Mkhanya (Eastern Cape Provincial Heritage Resources Authority – EC PHRA, APM Unit)
E-mail: smkhanya@ecphra.org.za; Tel: 043 745 0888; Postal Address: N/A

Cherize Mattheus (Terratest)
E-mail: mattheusc@terratest.co.za; Tel: 041 390 8730; Postal Address: P.O. Box 27308, Greenacres, Port Elizabeth, 6057



Prepared by:

Karen van Ryneveld (ArchaeoMaps)
E-mail: karen@archaeomaps.co.za; Tel: 084 871 1064; Postal Address: Postnet Suite 239, Private Bag X3, Beacon Bay, 5205

Specialist Declaration of Interest

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

- I am suitably qualified and accredited to act as independent specialist in this application;
- I do not have any financial or personal interest in the application, its' proponent or subsidiaries, aside from fair remuneration for specialist services rendered; and
- That work conducted have been done in an objective manner – and that any circumstances that may have compromised objectivity have been reported on transparently.



Signature –

- 23 August 2016 -

Upgrading of the Main Road MR450 (R335) from Motherwell to Addo, Nelson Mandela Bay Municipality and Sundays River Valley Local Municipality, Eastern Cape

Executive Summary

Project Description –

Terratest have been appointed as independent EAP by the consulting engineer, Gibb, on behalf of the project proponent, the DRPW, to apply for EA, including a BAR and EMP(s) to the Eastern Cape DEDEAT and the Eastern Cape DMR for the proposed *Upgrading of the Main Road MR450 (R335) from Motherwell to Addo*, NMBM and SRVLM, Eastern Cape. The proposed development comprises 2 components:

o Upgrade of the MR450 (R335) from Motherwell to Addo –

The MR450 (R335) road upgrade proposal comprise an approximate 30km road upgrade from Motherwell [km5.75] (S33°47'45.0"; E25°36'31.7") to Addo [km38.2] (S33°34'51.9"; E25°40'29.7"). The current road width is 6m, with a single lane of traffic in each direction. Road width will be increased to 12m, aiming to widen each lane by 3m to create a shoulder with a yellow line; a single lane of traffic will be maintained, but the current speed limit of 80km/h will be increased to 120km/h. The MR450 (R335) crosses 2 rivers, including the Sundays and Coega Rivers. The proposed upgrading works will include stormwater drainage upgrades, widenings / replacements of bridges and culverts and all associated road furniture.

o Utilization of borrow pits and quarries –

Construction material for the proposed road upgrade will be sourced from 3 previously authorized borrow pits and quarries, listed as:

- o PPC Quarry - S33°38'30.0"; E25°34'18.4";
- o BP-01 (Sandstone) - S33°37'13.2"; E25°34'59.3"; and
- o BP-02 (Calcrete) - S33°34'30.4"; E25°37'08.6".

The Phase 1 Archaeological & Cultural Heritage Impact Assessment –

Project Name & Locality: *Upgrading of the Main Road MR450 (R335) from Motherwell to Addo*, NMBM and SRVLM, Eastern Cape [1:50,000 Map Ref – 3325DA & 3325DC].

Summary of Findings:

- Eleven (11) archaeological and cultural heritage resources (Sites MR450-S1 to MR450-S11), as defined and protected by the NHRA 1999, and one (1) culturally sensitive site (Site MR450-S12), not formally protected by the NHRA 1999, were identified. Of the identified resources Site MR450-S1, the Colonial Period bridge across the Sundays River and Site MR450-S7, the Colonial Period bridge across the Coega River will be directly impacted by development. In both cases EC PHRA – BE Unit alteration / demolition permits would be requisite to development.
- The development proposal poses no 'fatal flaws' with reference to archaeological and cultural heritage resources or to the cultural landscape within which the development is set. No alternative study sites or realignment of portions of the line route is recommended.
- [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.]

Heritage Compliance Summary – Upgrading of the Main Road MR450 (R335) from Motherwell to Addo, NMBM & SRVLM, Eastern Cape			
Map Code	Site	Co-ordinates	Recommendations
MR450 (R335) Motherwell to Addo Line Route			
Site MR450-S1	Colonial Period: Sundays River Bridge	S33°34'53.7"; E25°40'26.3"	Bridge alteration to be done under EC PHRA – BE Unit Permit – NHRA 1999, Section 34 [Previous EC PHRA – BE Unit Permit have expired (2008-2009)]
Site MR450-S2	Colonial Period: Farmstead	S33°35'09.8"; E25°39'46.6"	N/A (Permanent heritage conservation measures in place)
Site MR450-S3	Colonial Period: Farmstead (with Cemetery)	S33°35'19.8"; E25°39'36.5"	N/A (Permanent heritage conservation measures in place)
Site MR450-S4	Colonial Period: Homestead	S33°43'54.9"; E25°35'28.9"	N/A (Recorded for heritage database purposes only)
Site MR450-S5	Colonial Period: Outbuildings	S33°44'01.4"; E25°35'23.8"	N/A (Recorded for heritage database purposes only)
Site MR450-S6	Colonial Period: Homestead (Clarence Lodge – 1881)	S33°44'03.9"; E25°35'24.2"	N/A (Recorded for heritage database purposes only)
Site MR450-S7	Colonial Period: Coega River Bridge	S33°44'43.8"; E25°35'37.7"	Bridge destruction to be done under EC PHRA – BE Unit Permit – NHRA 1999, Section 34
Site MR450-S8	Colonial Period: Homestead	S33°44'48.7"; E25°35'37.6"	N/A (Permanent heritage conservation measures in place)
Site MR450-S9	Colonial Period: Homestead	S33°45'00.2"; E25°35'41.6"	N/A (Permanent heritage conservation measures in place)
Site MR450-S10	Colonial Period: Homestead	S33°45'13.0"; E25°35'46.4"	N/A (Permanent heritage conservation measures in place)
Site MR450-S11	Colonial Period: Silo	S33°46'28.1"; E25°35'32.9"	N/A (Recorded for heritage database purposes only)
Site MR450-S12	Contemporary Period: Municipal Managed Motherwell Cemetery	S33°47'13.3"; E25°35'43.7"	Cognisance to cultural / religious sensitivity during the course of construction

Borrow Pits and Quarries			
PPC Quarry	PPC quarry	S33°38'30.0"; E25°34'18.4"	Destruction of Stone Age occurrence without developer having to apply for EC PHRA – APM Unit Permit
-	Low density MSA occurrence	-	
BP-01	Borrow Pit 1	S33°37'13.2"; E25°34'59.3"	Destruction of Stone Age occurrence without developer having to apply for EC PHRA – APM Unit Permit
-	Low density MSA occurrence	-	
BP-02	Borrow Pit 2	S33°34'30.4"; E25°37'08.6"	Assessment upon landowner approval of site use
-	Not assessed	-	

Recommendations –

With reference to archaeological and cultural heritage compliance, as per the requirements of the NHRA 1999, it is recommended that the proposed *Upgrading of the Main Road MR450 (R335) from Motherwell to Addo*, Nelson Mandela Bay Municipality and Sundays River Valley Local Municipality, Eastern Cape, proceed as applied for provided the developer comply with the abovementioned 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.

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Resumé: Karen van Ryneveld

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1 – Project Description & Terms of Reference

Terratest (Pty) Ltd (Terratest) have been appointed as independent Environmental Assessment Practitioner (EAP) by the consulting engineer, GIBB (Pty) Ltd (Gibb), on behalf of the project proponent, the Department of Roads and Public Works (DRPW), to apply for Environmental Authorization (EA), including a Basic Assessment Report (BAR) and Environmental Management Plan(s) (EMPr) to the Eastern Cape Department of Economic Development, Environmental Affairs and Tourism (DEDEAT) and the Eastern Cape Department of Mineral Resources (DMR) for the proposed *Upgrading of the Main Road MR450 (R335) from Motherwell to Addo*, Nelson Mandela Bay Municipality (NMBM) and Sundays River Valley Local Municipality (SRVLM), Eastern Cape. The proposed development comprises 2 components (Terratest 2016):

- **Upgrade of the MR450 (R335) from Motherwell to Addo –**

The MR450 (R335) road upgrade proposal comprise an approximate 30km road upgrade from Motherwell [km5.75] (S33°47'45.0"; E25°36'31.7") to Addo [km38.2] (S33°34'51.9"; E25°40'29.7"). The current road width is 6m, with a single lane of traffic in each direction. Road width will be increased to 12m, aiming to widen each lane by 3m to create a shoulder with a yellow line; a single lane of traffic will be maintained, but the current speed limit of 80km/h will be increased to 120km/h. The MR450 (R335) crosses two (2) rivers, including the Sundays and Coega Rivers. The proposed upgrading works will include stormwater drainage upgrades, widenings / replacements of bridges and culverts and all associated road furniture.

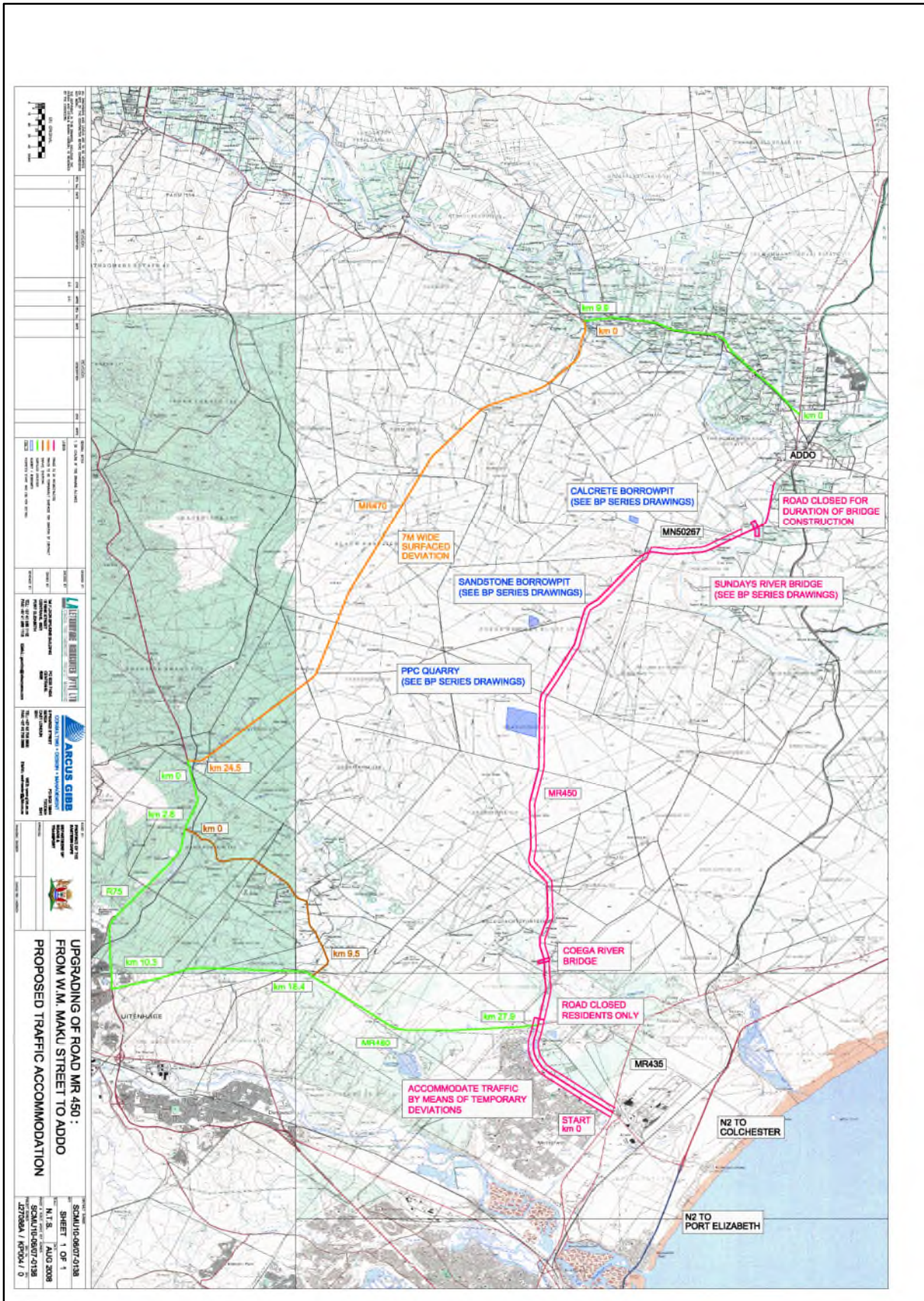
- **Utilization of borrow pits and quarries –**

Construction material for the proposed road upgrade will be sourced from three (3) previously authorized borrow pits and quarries, listed as:

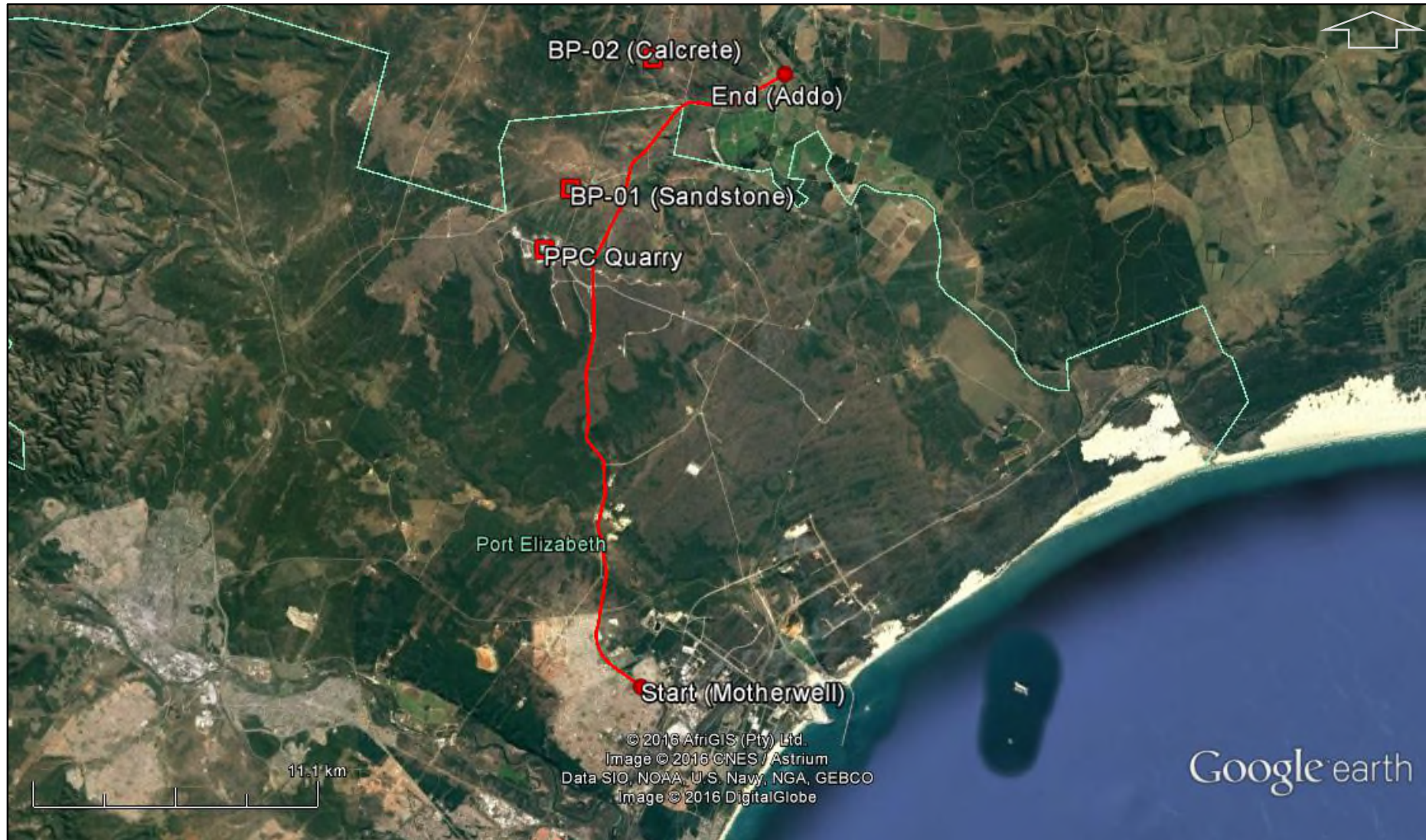
- PPC Quarry - S33°38'30.0"; E25°34'18.4";
- BP-01 (Sandstone) - S33°37'13.2"; E25°34'59.3"; and
- BP-02 (Calcrete) - S33°34'30.4"; E25°37'08.6".

ArchaeoMaps have been appointed by Terratest 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), and with findings and recommendations thereof to be included in the BAR and EMPr(s). Terms of Reference (ToR) for the Phase 1 AIA are summarized as:

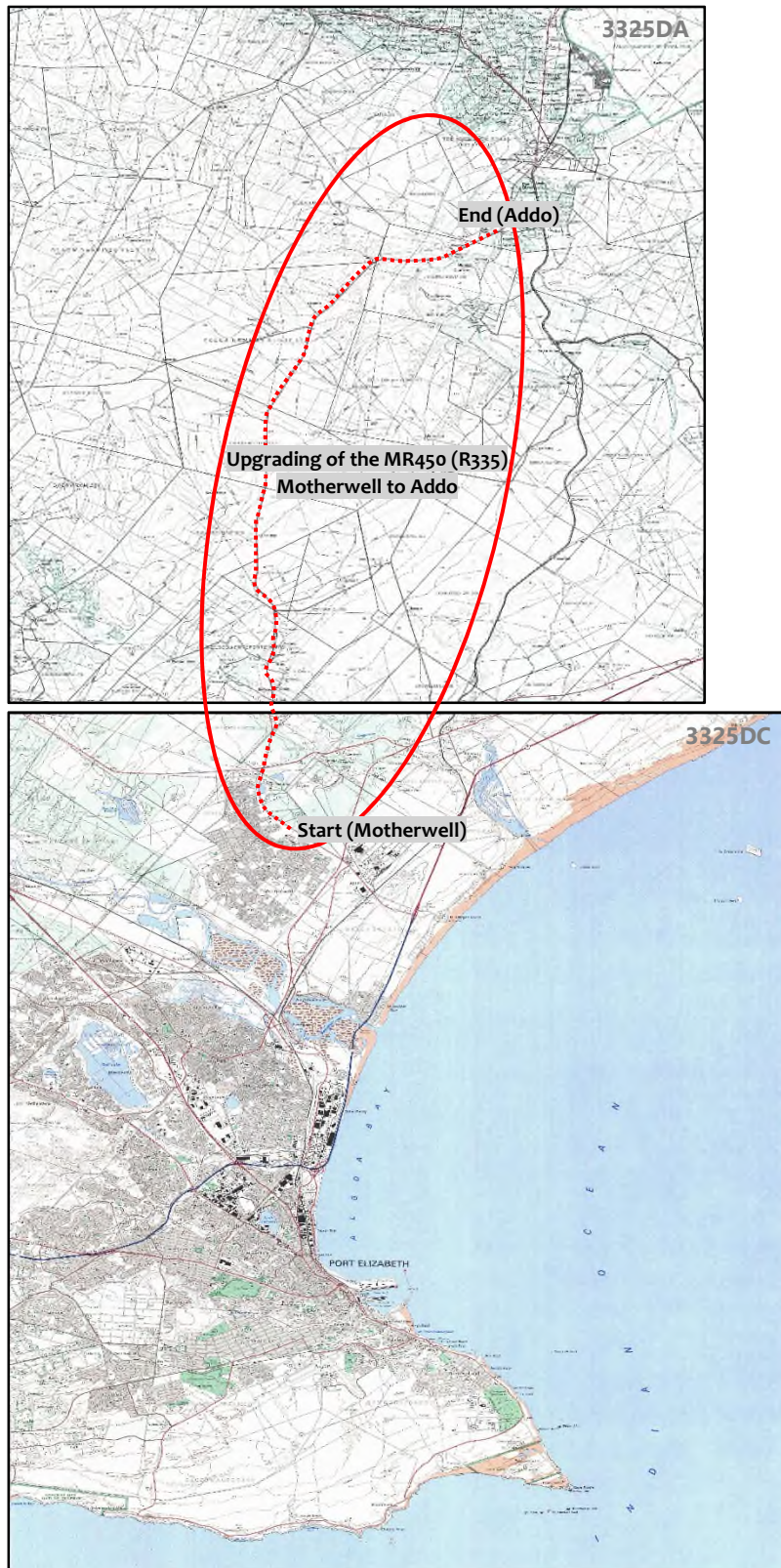
- Describe the existing area to be directly affected by the proposal in terms of its archaeological and cultural heritage characteristics as formally protected by the National Heritage Resources Act, No 25 of 1999 (NHRA 1999) and the general sensitivity of these components to change;
- Describe the likely 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;
- 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;
- Broadly describe the implication of a 'No-Go' option;
- 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
- Confirm if there are any outright 'fatal flaws' to the proposal at its current location from an archaeological and cultural heritage perspective.



Map 1: Proposed Upgrading of the Main Road MR450 (R335) from Motherwell to Addo study site, NMBM and SRVLM, Eastern Cape (courtesy Terratest)



Map 2: Proposed Upgrading of the Main Road MR450 (R335) from Motherwell to Addo study site, NMBM and SRVLM, Eastern Cape



Map 3: Proposed Upgrading of the Main Road MR450 (R335) from Motherwell to Addo study site, NMBM and SRVLM, Eastern Cape [1:50,000 Map Ref – 3325DA & 3325DC]

2 – The Phase 1 Archaeological & Cultural Heritage Impact Assessment

2.1.1) Archaeological & Cultural Heritage Legislative Compliance

The Phase 1 Archaeological & Cultural Heritage Impact Assessment (AIA) for the proposed *Upgrading of the Main Road MR450 (R335) from Motherwell to Addo*, NMBM and SRVLM, 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)(a), Section 38(1)(b) and 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 5,000m ² 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 views as defined and protected by the NHRA 1999, Section 2, 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:

- o National Environmental Management Act, No 107 of 1998 (NEMA 1998) and associated Regulations (2014); and
- o Mineral and Petroleum Resources Development Act, No 28 of 2002 (MPRDA 2002).

2.1.2) Methodology & Gap Analysis

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

- o 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.
- o The field assessment was done over a one (2) day period [2016-08-15 to 08-16] 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 650 (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 (HIA) 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 has 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 sapling, 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

2.2.1) 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 situated on, or in proximity to the proposed *Upgrading of the Main Road MR450 (R335) from Motherwell to Addo*, NMBM and SRVLM, Eastern Cape, can briefly be described as:

Archaeological and Basic Cultural Heritage Probability Assessment – Upgrading of the MR450 (R335) from Motherwell to Addo, NMBM and SRVLM, Eastern Cape			
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)		Medium-High
	Middle Stone Age (MSA)		High
	Later Stone Age (LSA)		Medium-High
		Rock Art	None-Low
		Shel Middens	None-Low
	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)		None-Low
	Graves / human remains: EIA – High scientific significance; MIA & LIA – High scientific & social significance		
COLONIAL PERIOD	Colonial Period		High
		LSA – Colonial Period Contact	None
		LIA – Colonial Period Contact	None
		Industrial Revolution	Medium-High
		Apartheid & Struggle	Low
	Graves / human remains: Medium-high scientific & high social significance		

Table 3: Archaeological and basic cultural heritage probability assessment

2.2.2) The SAHRA 2009 MPD & SAHRIS

Thirteen (13) archaeological Cultural Resources Management (CRM) reports are recorded in the SAHRA 2009 Mapping Project Database (MPD) with applicable study sites situated within an approximate 10km radius from the proposed *Upgrading of the Main Road MR450 (R335) from Motherwell to Addo* study site, referenced as:

- o Binneman, J. 2000. (Albany Museum). *Eskom Poseidon (Cookhouse) – Grass-Ridge (Port Elizabeth). Proposed Powerline: First Phase Desktop Data Survey of Cultural Heritage Resources.*
- o Kaplan, J.M. 2007. (ACRM). *Draft Feasibility Report for the proposed Regional General and Hazardous Waste Disposal Facility (Addo, Eastern Cape): Heritage Assessment.*
- o Kaplan, J.M. 2008. (ACRM). *Proposed Exxaro Alloystream Manganese Project in the Coega Industrial Development Zone: Heritage Impact Assessment.*
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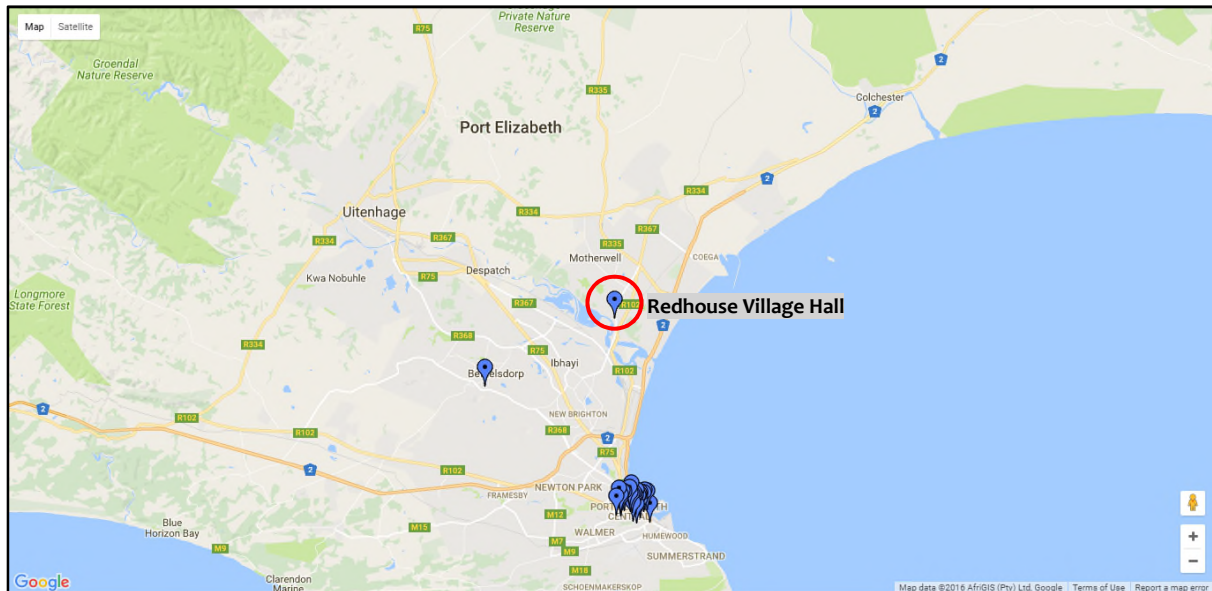
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[The SAHRIS Cases and Reports Map database, containing data related to project reports post 2009 / 2012, was not available for purposes of this pre-feasibility study].

2.2.3) SAHRA Provincial Heritage Site Database – Port Elizabeth

One (1) geo-referenced declared Provincial Heritage Site (PHS) is recorded in the SAHRA – Port Elizabeth database (https://en.wikipedia.org/wiki/List_of_heritage_sites_in_Eastern_Cape) and situated within an approximate 5km radius from the *Upgrading of the Main Road MR450 (R335) from Motherwell to Addo* study site, with the majority of sites clustered in the Port Elizabeth Central Business District (CBD). The declared PHS, situated approximately 5km from the proposed study site, is listed as:

- SAHRA Identifier 9/2/073/0052 - Redhouse Village Hall, 31 Paterson Street, Redhouse, Port Elizabeth



Map 4: Spatial distribution of geo-referenced PHSs in the SAHRA – Port Elizabeth database in relation to the *Upgrading of the Main Road MR450 (R335) from Motherwell to Addo* study site (https://en.wikipedia.org/wiki/List_of_heritage_sites_in_Port_Elizabeth)

2.2.4) General Discussion

The greater study site area is particularly noteworthy with reference to its Stone Age past: Earlier (ESA), Middle (MSA) and Later Stone Age (LSA) records are ample: Nel (2008) reported on scatters of ESA, MSA and LSA artefacts and including LSA rock art discovered along the approximate 1,200km line route, with similar finds, excluding rock art, reported on by Van Schalkwyk & Wahl (2007), identified along the Gamma-Grassridge power lines, just north of the *Upgrading of the Main Road MR450 (R335) from Motherwell to Addo* study site. Kaplan (2007, 2008), focussing in the Coega IDZ area again commented on ESA, MSA and LSA occurrences, with a seeming focus on the MSA, but including LSA shell midden sites discovered to as far as 2km inland from the shoreline. From the Addo Elephant National Park Webley (2003, 2007b) reported on primarily MSA and LSA Stone Age occurrences, but including infrequent ESA samples, as stipulated by Webley (2003) with occurrences also occurring on the banks of the Sundays and Bushmans Rivers. The Amanzi Springs ESA Acheulean site, excavated in the 1960s, remains one of the most significant ESA sites in the area, containing a 3-4m deep deposit of stratified archaeological deposit including lithic artefacts associated with organic remains (Binneman 2000, Webley 2008b).

Iron Age remains are scars across the greater terrain, mainly comprising farmworkers residences and associated graves (Van Schalkwyk & Wahl 2007).

The Colonial Period past of the area is rich, with records comprising a number of farmsteads, in cases associated with family cemeteries, early industrial development and large scale early infrastructural development, to name a few (Kaplan 2007, 2008; Nel 2008; Van Scalkwyk & Wahl 2007; Webley 2008b).

* * *

Records indicate that the Iqua, Damasqua, and GONUQUA Khoekhoen originally lived in the greater Addo area, many of which were wiped out by a smallpox epidemic in the 1700s, coined with tribal wars of southern moving Xhosa tribes, the Gqunukhwebe of Chief Cungwa and the Dange of Chief Habana. In the late 1800s Colonial Period farmers started to move into the area. The Addo Elephant National Park was originally proclaimed in 1931 (a mere 2,000ha), with the aim to protect the then eleven (11) remaining Addo elephant (<https://www.sanparks.org/parks/addo/tourism/history.pnp>). The name 'Addo' is of Khoekhoen origin, meaning 'euphorbia ravine' (https://en.wikipedia.org/wiki/Addo,_Eastern_Cape).

Port Elizabeth was officially founded in 1820, mainly to house British Settlers, thereby strengthening the border region between the Cape Colony and the Xhosa (https://en.wikipedia.org/wiki/Port_Elizabeth). Following the Frontier Wars, a rising number of Blacks, mainly Xhosa, moved to Port Elizabeth to seek employment and 'locations' began to be established on the outskirts of town. Significant early Black suburbs or 'locations' of Port Elizabeth include: Bethelsdorp (1803), the Fingo and Hottentot Location (1830s), LMS Outstation (1834), Dassieskraal (c. 1850), Korsten (1853), Stranger's Location (1855), Gubbs Location (1860), Cooper's Kloof Location (1877) and Reservoir Location (1883) (<https://www.sahistory.org.za/article/community-histories-port-elizabeth>). Motherwell is a recent 'location', established only in 1984, originally to accommodate informal Black settlers relocated to the area from Zwide and Veeplaas (https://en.wikipedia.org/wiki/Motherwell,_Eastern_Cape).

Eleven (11) archaeological and cultural heritage resources (Sites MR450-S1 to MR450-S11), as defined and protected by the NHRA 1999, and one (1) culturally sensitive site (Site MR450-S12), not formally protected by the NHRA 1999, were identified during the field assessment of the *Upgrading of the Main Road MR450 (R335) from Motherwell to Addo* study site.

Of the identified resources Site MR450-S1, the Colonial Period bridge across the Sundays River and Site MR450-S7, the Colonial Period bridge across the Coega River will be directly impacted by development. In both cases EC PHRA – BE Unit alteration / demolition permits would be requisite to development. The bulk of the identified resources (Sites MR450-S2 to MR450-S6, and MR450-S8 to MR450-S11) comprise Colonial Period farmstead / homestead sites, situated in proximity to the study site only. These sites will not be directly impacted by development; they will be conserved – and reported on here to further describe the immediate receiving cultural environment of the proposed development. Site MR450-S12, the Motherwell cemetery does not constitute a NHRA 1999 protected site. The site, a municipal managed cemetery, falls outside the mandate of the NHRA 1999, and was recorded for purposes of its cultural sensitivity only. The Motherwell cemetery will not be impacted by the proposed development.

Low density Stone Age occurrences were present at the PPC quarry study site, with slightly higher, yet still very low incidences of lithic artefacts recorded at the BP-01 borrow pit site. Recorded low density Stone Age occurrences do not warrant further monitoring or mitigation prior to, or during the course of use of the licenced PPC and BP-01 sites. The Site BP-02 borrow pit study site was not assessed: The site is situated on a game farm, with tourist activities including amongst others hunting. It is unlikely, due to logistics of access, cost of game stock and safety (both human and animal) that the borrow pit will be utilized to source construction material. However, should approval be reached with the landowner, assessment of the site should be prioritized prior to utilization.

2.2.1) Heritage Sites Identified along the MR450 (R335), Motherwell to Addo Line Route [Description and Photographic Documentation: North to South]

2.2.1.1) Site MR450-S1 – Colonial Period: Sundays River Bridge – S33°34'53.7"; E25°40'26.3"

Site MR450-S1 comprises the Colonial Period bridge across the Sundays River. The bridge was constructed in 1942; currently 74 years of age and by implication formally protected by the NHRA 1999.

Proposed works at the bridge is described by Terratest (2016) as: *'The Sundays River bridge is located in the rural environment on the Farm Addo Drift East 122. The proposed widening of the existing bridge, for the purpose of accommodating the new road cross-section, will involve the demolition of the existing balustrades and sidewalks on top of the spandrel walls, and the construction of a new deck slab on the existing fill between the spandrel walls. It is anticipated that the existing substructure will not have to be modified. The new bridge will therefore have a road width of 9.8m. The F-shaped concrete parapet will be placed along the outer edges of the bridge. The resulting bridge width is thus 10.75m. The length of the bridge will still be 118.6m, with its three arch spans of 31.39m each. The bridge surface area is therefore equal to some 1,235m². Guardrails will be placed on the approach embankments. The existing embankment protection on the upstream and downstream sides of the approach embankments will be modified with gabion mattresses and boxes to suit the new formation width'*.

Previous alteration of the Sundays River bridge, associated with a road upgrade proposal have been approved. However, the project as then proposed was not implemented. Associated with the then proposal was a formal, permitted approval by the EC PHRA – BE Unit for alteration to the Sundays River bridge. However, the permit has expired (01 September 2008 – 01 September 2009) and the project proponent would need to reapply for a permit. With reference to basic project management and the streamlining of environmental, including heritage requirements within the development framework it is recommended that the permit application be made, and considered by the EC PHRA – BE Unit, for the tenure of construction as per the EA.

- **Site Significance and Recommendation:** Site MR450-S1, the Sundays River bridge comprise a structure older than 60 years of age and is formally protected by the NHRA 1999. The site receives automatic SAHRA / EC PHRA protection as a site of *High Significance* with a *Provincial Grade II Field Rating*. Development will directly impact

on the bridge. Development will need to be done under an EC PHRA – BE Unit NHRA 1999, Section 34 site alteration permit. It is recommended that the permit application be made, and considered by the EC PHRA – BE Unit, for the tenure of construction as per the EA, in the event of a positive EA being issued for the proposed development.




	EASTERN CAPE PROVINCIAL HERITAGE RESOURCES AUTHORITY	<small>SOUTH AFRICA</small>	<small>40 King Street, Southernwood, East London, Republic of South Africa PO Box 759, East London, 5200, Republic of South Africa Telephone: 043 722 1934, Intl: +27 43 722 1934 Fax: 043 722 1749, Intl: +27 43 722 1749 E-mail: info@ecphra.org.za Website: www.ecphra.org.za</small>	
Ref: 14/08/108		01 September 2008		
Permit Permit no: 00/14/08/1/08 Issued in terms of the National Heritage Resources Act (Act No. 25 of 1999)				
APPROVAL IS HEREBY GIVEN:				
TO: National Department of Public Works Private Bag x 0022 BISHO 5608				
FOR: ALTERATIONS TO AN EXISTING BRIDGE				
AT: Sundays River Bridge (MR 450, Between Motherwell & Addo)				
IN ACCORDANCE WITH: Submitted drawings.				
<u>THE FOLLOWING CONDITIONS APPLY:</u> Building constructor may not deviate from the approved drawings.				
PLEASE NOTE:				
<ul style="list-style-type: none"> ▪ The issuing of this permit does not exonerate the applicant from obtaining local authority approval or any other required approval for the proposed work. ▪ This permit is not transferable. ▪ This permit is valid until 01 September 2009. 				
Signed:				
				
<small>Chairperson Permit Committee Provincial Heritage Resources Authority of the Eastern Cape</small>				

Figure 1: EC PHRA – BE Unit Permit for alteration to the Sundays River Bridge (01 September 2008 – 01 September 2009)

2.2.1.2) Site MR450-S2 – Colonial Period: Farmstead – S33°35'09.8"; E25°39'46.6"

The Site MR450-S2 Colonial Period farmstead, including the main residence and outbuildings comprise a structure(s) pre-dating 60 years of age; the site is formally protected by the NHRA 1999. The site is still in use, reasonably well conserved and will not be impacted by development. The site, situated approximately 45m from the proposed development corridor is at present permanently fenced with an access gate, with these conservation measures complying with SAHRA / EC PHRA minimum standards for heritage site conservation.

- **Site Significance and Recommendation:** Site MR450-S2 comprise a structure(s) pre-dating 60 years of age; the site is formally protected by the NHRA 1999 and receives automatic SAHRA / EC PHRA protection as a site of *High Significance* with a *Provincial Grade II Field Rating*. Development will not impact on the site. Formal

conservation measures, complying with SAHRA / EC PHRA minimum standards for heritage site conservation are already in place. It is recommended that development in the vicinity of Site MR450-S2 proceeds as applied for without the developer having to comply with additional heritage compliance requirements.

2.2.1.3) Site MR450-S3 – Colonial Period: Farmstead (with Cemetery) – S33°35'19.8"; E25°39'36.5"

Site MR450-S3 comprises a Colonial Period farmstead, including the main residence and outbuildings, situated at general co-ordinate S33°35'22.2"; E25°39'32.8", more or less 80m from the proposed development corridor. The farmstead, with buildings pre-dating 60 years of age, is formally protected by the NHRA 1999. The farmstead, still in use, is at present formally fenced with an access gate, with these measures complying with SAHRA / EC PHRA minimum standards for heritage site conservation. Within the boundaries of the said farmstead conservation fence an independently fenced cemetery site is present, situated at co-ordinate S33°35'19.8"; E25°39'36.5" (site co-ordinate), approximately 85m north-east of the farmstead. The informal cemetery is protected by the NHRA 1999, with current conservation measures, including a permanent fence with access gate, complying with SAHRA / EC PHRA minimum standards for heritage site conservation. Development will not directly impact on Site MR450-S3.

- **Site Significance and Recommendation:** Site MR450-S3 comprises a Colonial Period farmstead with a cemetery. The farmstead, including the main residence with outbuildings, with these pre-dating 60 years of age, receives automatic SAHRA / EC PHRA protection as a site of *High Significance* with a *Provincial Grade II Field Rating*. The cemetery is ascribed a SAHRA / EC PHRA *High / Medium Significance* with a *Generally Protected Grade IV-A Field Rating*. Site MR450-S3 is situated approximately 80m from the proposed development corridor and will not be impacted. Current conservation measures, including a permanent fence with access gate, with additional fencing around the cemetery, comply with SAHRA / EC PHRA minimum standards for heritage site conservation. It is recommended that development in the vicinity of Site MR450-S3 proceeds as applied for without the developer having to comply with additional heritage compliance requirements.

2.2.1.4) Site MR450-S4 – Colonial Period: Homestead – S33°43'54.9"; E25°35'28.9"

Site MR450-S4 is situated approximately 250m from the development corridor: Development will by implication not impact on the site – the site will be conserved. The site was recorded for heritage database purposes only. The site comprises a Colonial Period homestead, pre-dating 60 years of age and formally protected by the NHRA 1999. The site is at present formally fenced with an access gate, with these measures complying with SAHRA / EC PHRA minimum standards for heritage site conservation.

- **Site Significance and Recommendation:** Site MR450-S4 comprises a Colonial Period homestead, pre-dating 60 years of age and formally protected by the NHRA 1999. The site receives automatic SAHRA / EC PHRA protection as a site of *High Significance* with a *Provincial Grade II Field Rating*. The site is situated approximately 250m from the proposed development corridor and was recorded for heritage database purposes only. Further heritage compliance requirements for purposes of development does not pertain.

2.2.1.5) Site MR450-S5 – Colonial Period: Outbuildings – S33°44'01.4"; E25°35'23.8"

The Site MR450-S5 locality refers to the collective location of at least three (3) Colonial Period outbuildings, inferred to be older than 60 years of age and most probably related to either Site MR450-S4 or MR450-S6. Outbuildings are no longer in use and in a dilapidated state, with only ruined wall remains still partially standing. No conservation measures are in place. The Site MR450-S5 outbuildings are situated in excess of 300m from the proposed development corridor and will not be impacted by development. The site is recorded for heritage database purposes only.

- **Site Significance and Recommendation:** The Site MR450-S5 Colonial Period outbuildings comprise structures pre-dating 60 years of age and are formally protected by the NHRA 1999. These structures receive automatic SAHRA / EC PHRA protection as sites of *High Significance* with *Provincial Grade II Field Ratings*. Structures are situated in excess of 300m from the proposed development corridor and will not be impacted by development. No formal conservation measures are in place. Based on proximity from the development corridor no additional conservation measures on behalf of the developer would apply for purposes of construction. The site is recorded for heritage database purposes only.

2.2.1.6) Site MR450-S6 – Colonial Period: Homestead (Clarence Lodge) – S33°44'03.9"; E25°35'24.2"

The Site MR450-S6 locality designates the location of the Colonial Period 'Clarence Lodge' homestead, constructed in 1881: The homestead thus being 138 years old, most probably the oldest Colonial Period resource in the vicinity of the *Upgrading of the Main Road MR450 (R335) from Motherwell to Addo* study site. The site is formally protected as an archaeological site, older than 100 years, under the NHRA 1999. The site is at present still in use, though in a poor state of conservation. Formal conservation measures, including a permanent fence with access gate comply with SAHRA / EC PHRA minimum standards for heritage site conservation. Site MR450-S6 is situated more than 280m from the proposed development corridor: The site will not be impacted by development; the site will be conserved, and is recorded for heritage database purposes.

- **Site Significance and Recommendation:** Site MR450-S6 comprises a Colonial Period homestead, pre-dating 100 years of age. The site receives formal protection as an archaeological site under the NHRA 1999. Site MR450-S6 is ascribed a SAHRA / EC PHRA *High / Medium Significance* and a *Generally Protected IV-A Field Rating*. Current conservation measures, including a permanent fence with access gate comply with SAHRA / EC PHRA minimum standards for heritage site conservation. The site is situated more than 280m from the proposed development corridor and is recorded for heritage database purposes. The developer need not comply with any additional heritage compliance requirements pertaining to Site MR450-S6 for purposes of development.

2.2.1.7) Site MR450-S7 – Colonial Period: Coega River Bridge – S33°44'43.8"; E25°35'37.7"

Site MR450-S7 comprises the Colonial Period bridge across the Coega River. The bridge was constructed in 1956, having just come of its NHRA 1999, Section 34, 60-year-old formal heritage protection status.

Proposed works at the bridge is described by Terratest (2016) as: *'The Coega River bridge, located in the rural environment on the Farm Welbedachtsfontein 300, will be demolished and reconstructed on a new horizontal and vertical alignment close to the existing bridge. The new bridge will have a road width of 9.8m. The F-shaped concrete parapet will be placed along the outer edges of the bridge. The resulting bridge width will be 10.75m whereas the length of the bridge will be 30.8m with 3 arch spans of 9.4, 11.6 and 9.4m, crossing the river at right angles. The bridge surface area is therefore equal to some 320m². Guardrails will be placed on the approach embankments. The upstream and downstream sides of the approach embankments will be protected by gabion mattresses and boxes.'*

Proposed works will require demolition of the Site MR450-S7 Coega River bridge to be done under an EC PHRA – BE Unit permit. With reference to basic project management and the streamlining of environmental, including heritage requirements within the development framework it is recommended that the permit application be made, and considered by the EC PHRA – BE Unit, for the tenure of construction as per the EA.

- **Site Significance and Recommendation:** Site MR450-S7, the Coega River bridge, have just come of its 60-year-old heritage protection status in terms of the NHRA 1999. The site receives automatic SAHRA / EC PHRA protection as a site of *High Significance* with a *Provincial Grade II Field Rating*. Development will directly impact on the bridge, requiring demolition thereof to meet development requirements in terms of the project proposal. Development will need to be done under an EC PHRA – BE Unit NHRA 1999, Section 34 site demolition permit. It is recommended that the permit application be made, and considered by the EC PHRA – BE Unit, for the tenure of construction as per the EA, in the event of a positive EA being issued for the proposed development.

2.2.1.8) Site MR450-S8 – Colonial Period: Homestead – S33°44'48.7"; E25°35'37.6"

Site MR450-S8 constitutes a Colonial Period homestead site, older than 60 years of age and formally protected by the NHRA 1999. The site is still in use and fairly well conserved. The site, situated a mere approximate 15m from the proposed development corridor is formally conserved, with conservation measures including a permanent fence with access gate, thus complying with SAHRA / EC PHRA minimum standards for heritage site conservation. Although development will encroach on the conservation fence, it will not impact thereon: Development will be restricted to the existing road reserve.

- **Site Significance and Recommendation:** Site MR450-S8, a Colonial Period homestead pre-dating 60 years of age is formally protected by the NHRA 1999. The site receives automatic SAHRA / EC PHRA protection as a site of *High Significance* with a *Provincial Grade II Field Rating*. The site is situated approximately 15m from the proposed development corridor, but with formal conservation measures, including a permanent fence and access gate, complying with SAHRA / EC PHRA minimum standards for heritage site conservation already in place, versus the logistics of realignment for purposes of development, it is recommended that development proceeds as applied for, without the developer having to comply with additional heritage compliance requirements, despite proximity to the conservation fence. Development will be restricted to the existing road reserve.

2.2.1.9) Site MR450-S9 – Colonial Period: Homestead – S33°45′00.2″; E25°35′41.6″

Site MR450-S9 comprise a Colonial Period homestead, pre-dating 60 years of age, and is formally protected by the NHRA 1999. The site is still in use and well conserved, but with evident alterations to the original structure. The site is situated approximately 75m from the proposed development corridor and will not be impacted by development. The site is at present permanently fenced with an access gate, with these conservation measures complying with SAHRA / EC PHRA minimum standards for heritage site conservation.

- **Site Significance and Recommendation:** Site MR450-S9 comprise a structure pre-dating 60 years of age; the site is formally protected by the NHRA 1999 and receives automatic SAHRA / EC PHRA protection as a site of *High Significance* with a *Provincial Grade II Field Rating*. Development will not impact on the site. Formal conservation measures, complying with SAHRA / EC PHRA minimum standards for heritage site conservation are already in place. It is recommended that development in the vicinity of Site MR450-S9 proceeds as applied for without the developer having to comply with additional heritage compliance requirements.

2.2.1.10) Site MR450-S10 – Colonial Period: Homestead – S33°45′13.0″; E25°35′46.4″

Site MR450-S10 constitutes a Colonial Period homestead with structures older than 60 years of age; thus formally protected by the NHRA 1999. The site, still in use and reasonably conserved, is situated approximately 100m from the development corridor. Current conservation measures include a permanent fence with access gate, with these complying with SAHRA / EC PHRA minimum standards for heritage site conservation.

- **Site Significance and Recommendation:** The Site MR450-S10 homestead comprise a structure pre-dating 60 years of age. The site is formally protected by the NHRA 1999, receiving automatic SAHRA / EC PHRA protection as a site of *High Significance* with a *Provincial Grade II Field Rating*. Development will not impact on the site. Formal conservation measures, complying with SAHRA / EC PHRA minimum standards for heritage site conservation are already in place. It is recommended that development in the vicinity of Site MR450-S10 proceeds as applied for without the developer having to comply with additional heritage compliance requirements.

2.2.1.11) Site MR450-S11 – Colonial Period: Silo – S33°46′28.1″; E25°35′32.9″

Site MR450-S11 is situated approximately 140m from the development corridor: Development will by implication not impact on the site – the site will be conserved. The site was recorded for heritage database purposes only. The site comprises a Colonial Period silo, situated in the Motherwell suburb. The silo, no longer in use and in a dilapidated state of conservation, is older than 60 years of age and formally protected by the NHRA 1999. No formal conservation measures are in place.

- **Site Significance and Recommendation:** Site MR450-S11 comprises a structure pre-dating 60 years of age and formally protected by the NHRA 1999. The site receives automatic SAHRA / EC PHRA protection as a site of *High Significance* with a *Provincial Grade II Field Rating*. The site is situated approximately 140m from the proposed development corridor and was recorded for heritage database purposes only. Further heritage compliance requirements for purposes of development does not pertain.

2.2.1.12) Site MR450-S12 – Contemporary Period: Motherwell Cemetery – S33°47'13.3"; E25°35'43.7"

Site MR450-S12 designates the locality of the Contemporary Period Motherwell cemetery. The cemetery comprises a municipal managed cemetery, with management thereof falling outside the mandate of the NHRA 1999. The cemetery does however designate a culturally sensitive site, as described in the NHRA 1999. The cemetery is formally fenced. The proposed development alignment runs alongside the cemetery fence for approximately 1.2km, within the road reserve, an existing development corridor.

- **Site Significance and Recommendation:** Site MR450-S12 comprise a municipal cemetery, with management thereof falling outside the mandate of the NHRA 1999: A SAHRA / EC PHRA site significance assignation is thus irrelevant. The proposed development alignment runs alongside the formal cemetery fence for approximately 1.2km, within the road reserve, an existing development corridor. The cemetery comprises a culturally sensitive site: The developer is reminded to proceed with construction in the vicinity of Site MR450-S12 with cognisance to cultural and religious sensitivity.

2.2.2) Borrow Pits and Quarries

2.2.2.1) PPC Quarry – Low Density Stone Age Occurrence – S33°38'30.0"; E25°34'18.4"

The PPC quarry comprises a large, in excess of 400ha formal, licenced mining area. The mining area was revisited for purposes of an informal assessment pertaining to the use of construction material from the quarry for the *Upgrading of the Main Road MR450 (R335) from Motherwell to Addo* project. Infrequent lithic artefacts were found scattered across the surface of the less impacted mining area, often identified in disturbed, ex-situ calcrete granule contexts. Artefact densities were however too low to attempt an artefact ratio (artefacts: m²) description, and estimated at ≤1: 200. Low artefact densities do not allow a further description or period assignation thereof, aside from the fact that based on artefact size, lithics are most probably ascribable to the Middle Stone Age (MSA), but may well include other temporal periods. The primary source of raw material seems to be local quartzitic material. Low artefact densities do not warrant further recording or mitigation of the low density Stone Age occurrences present at the PPC quarry.

- **Site Significance and Recommendation:** The identified low density Stone Age occurrence at the PPC quarry is ascribed a SAHRA / EC PHRA *Low Significance* and a *Generally Protected IV-C Field Rating*. Extremely low densities of artefacts coined with an essential disturbed context does not warrant further recording or mitigation. It is reasonably inferred that similar findings were made for purposes of the licencing of the PPC quarry. Use of material sourced from the PPC quarry for purposes of the development will not impact on any significant heritage resource, as defined and protected by the NHRA 1999.

2.2.2.2) Borrow Pit 1 (BP-01) – Low Density Stone Age Occurrence – S33°37'13.2"; E25°34'59.3"

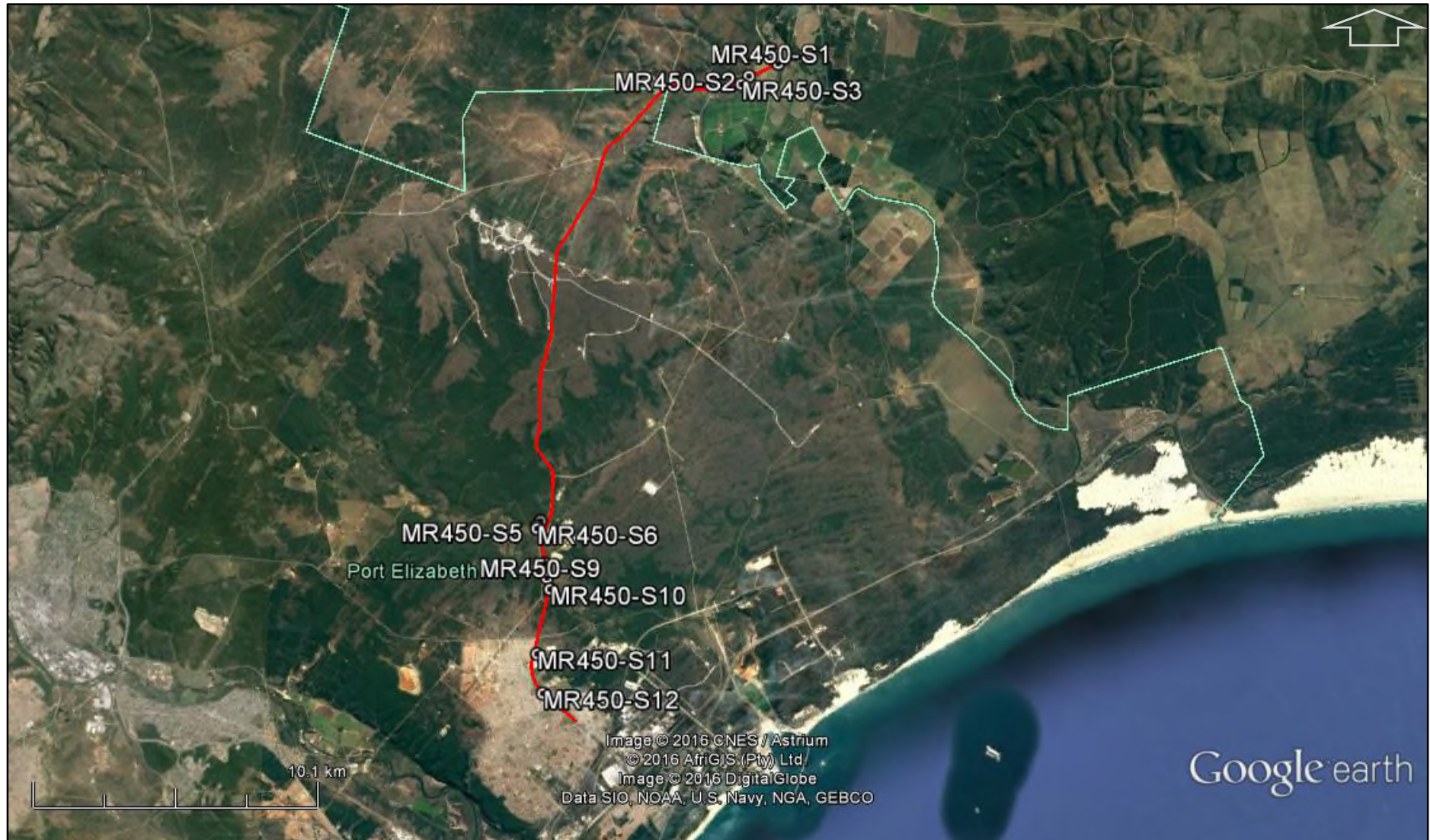
Proposed Borrow Pit 1 (BP-01) comprise an approximate 1.5ha licenced study site. The borrow pit was revisited for purposes of an informal assessment prior to continued use. A low density of Stone Age artefacts was identified on the surface of the site and within shallow subsurface scrapings, down to an estimated depth of approximately 20-40cm bgl (below ground level). Artefacts can typologically be ascribed to the Middle Stone Age (MSA), with a focus on flake types, rather than blades. Technology seem to be quite rudimentary resulting in a crude, amorphous typology. Based on artefact size a later MSA can reasonably be inferred. Artefact densities were very low, with recorded artefact ratios (artefacts: m²) of ≤1: 4. Low artefact densities coined with the crude, amorphous MSA typology is characteristic of the greater terrain and does not warrant further recording or mitigation.

- **Site Significance and Recommendation:** The identified low density Stone Age occurrence at the Borrow Pit 1 (BP-01) study site is characteristic of the greater terrain and is ascribed a SAHRA / EC PHRA *Low Significance* and a *Generally Protected IV-C Field Rating*. Low artefact ratios coined with crude, amorphous typology does not warrant further recording or mitigation. It is recommended that the identified low density Stone Age occurrence at the BP0-01 study site be destroyed for purposes of development without the developer having to apply for an EC PHRA – APM Unit site destruction permit.

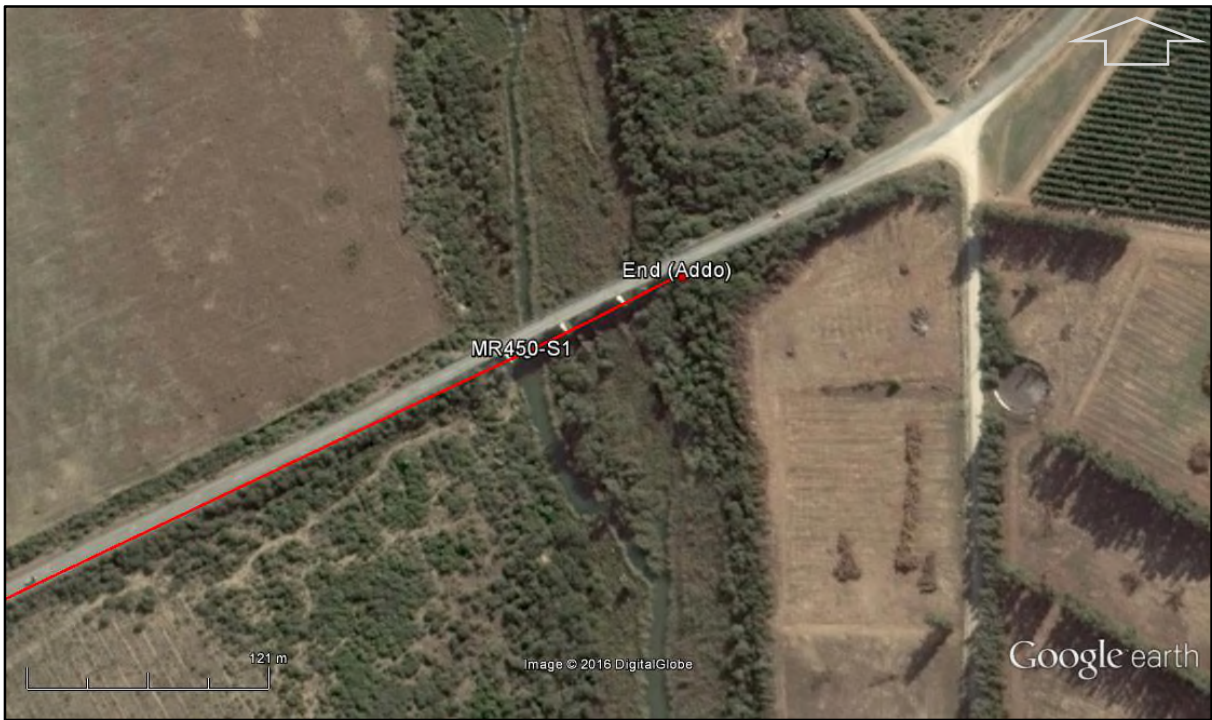
2.2.2.3) Borrow Pit 2 (BP-02) — S33°34'30.4"; E25°37'08.6"

The Borrow Pit 2 (BP-02) study site was not assessed: The site is situated on a game farm, with tourist activities including amongst others hunting. It is unlikely, due to logistics of access, cost of game stock and safety (both human and animal) that the borrow pit will be utilized to source construction material.

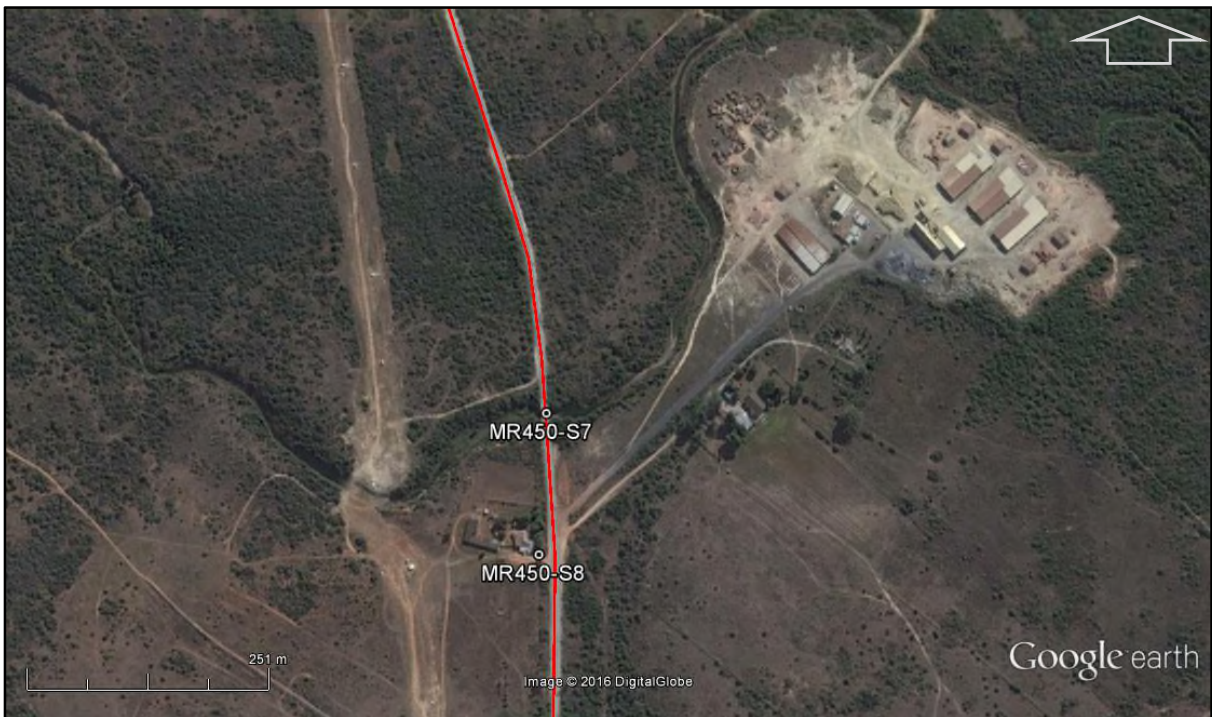
- **Site Significance and Recommendation:** Should approval be reached with the landowner assessment of the site should be prioritized prior to utilization.



Map 5: Spatial distribution of identified heritage resources in relation to the *Upgrading of the Main Road MR450 (R335) from Motherwell to Addo* line route



Map 6: Close-up of the locality of Site MR450-S1, the Sundays River bridge



Map 7: Close-up of the locality of Site MR450-S7, the Coega River bridge



Map 8: General locality of the PPC quarry



Map 9: General locality of BP-01



Map 10: General locality of BP-02



Plate 1: General view of the MR450 line route from its northern end, Addo



Plate 3: Site MR450-S1, the Sundays River bridge [2]



Plate 2: Site MR450-S1, the Sundays River bridge [1]



Plate 4: Site MR450-S1, the Sundays River bridge [3]



Plate 5: Site MR450-S1, the Sundays River bridge [4]



Plate 7: View of Site MR450-S2



Plate 6: General view of the MR450 line route [1]



Plate 8: General view of Site MR450-S3



Plate 9: Site MR450-S3 – View of the cemetery



Plate 11: General view of the MR450 line route [2]



Plate 10: Site MR450-S3 – View of the farmstead



Plate 12: General view of the MR450 line route [3]



Plate 13: General view of the MR450 line route [4]



Plate 15: View of Site MR450-S4



Plate 14: General view of the MR450 line route [5]



Plate 16: View of the Site MR450-S5 structures, with Site MR450-S6 in the left background



Plate 17: View of Site MR450-S6



Plate 19: General view of the MR450 line route [6]



Plate 18: Site MR450-S6 – Close-up of the 'Clarance Lodge – 1881' plaque



Plate 20: Site MR450-S7, the Coega River bridge [1]



Plate 21: Site MR450-S7, the Coega River bridge [2]



Plate 23: View of Site MR450-S8



Plate 22: Site MR450-S7, the Coega River bridge [3]



Plate 24: General view of the MR450 line route [7]



Plate 25: General view of Site MR450-S9



Plate 27: General view of the MR450 line route [7]



Plate 26: General view of Site MR450-S10



Plate 28: View of Site MR450-S11



Plate 29: General view of the MR450 line route [7]



Plate 31: General view of Site MR450-S12, the municipal Motherwell cemetery [2]



Plate 30: General view of Site MR450-S12, the municipal Motherwell cemetery [1]



Plate 32: View of the southern-most starting point of the MR450 line route in Motherwell



Plate 33: General view of the PPC Quarry study site [1]



Plate 35: General view of the PPC Quarry study site [3]

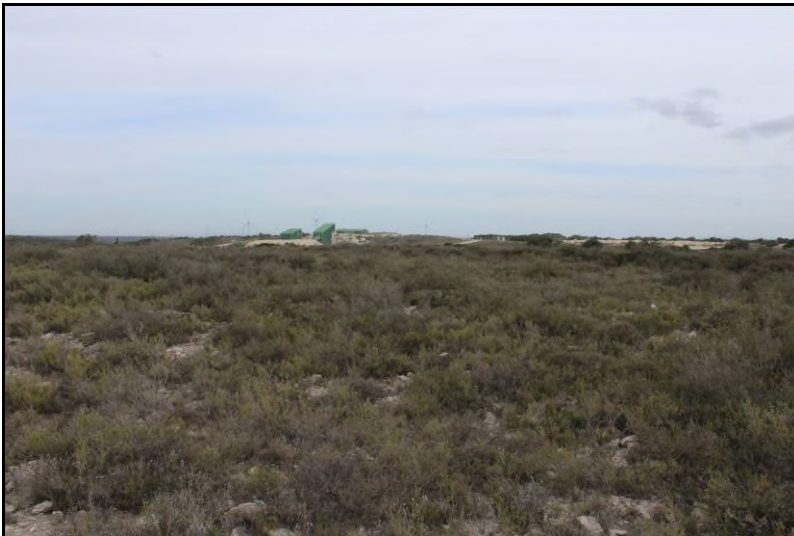


Plate 34: General view of the PPC Quarry study site [2]



Plate 36: General view of the PPC Quarry study site [4]



Plate 37: General view of the BP-01 borrow pit study site [1]



Plate 39: General view of the BP-01 borrow pit study site [3]



Plate 38: General view of the BP-01 borrow pit study site [2]



Plate 40: General view of the BP-01 borrow pit 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: Upgrading of the MR450 (R335) from Motherwell to Addo, NMBM and SRVLM, Eastern Cape												
Potential Impacts	Overall nature	Type	Spatial extent	Duration	Severity	Reversibility	Irreplaceable loss	Probability	MITIGATION POTENTIAL	IMPACT SIGNIFICANCE		MITIGATION MEASURES
										Without mitigation	With mitigation	
SITES: MR450-S2, MR450-S3, MR450-S4, MR450-S5, MR450-S6, MR450-S8, MR450-S9, MR450-S10, MR450-S11, MR450-S12												
Construction phase	2	3	2	4	3(+)	N/A	N/A	N/A	N/A	N/A	N/A	Conservation
Operational phase	2	3	2	4	3(+)	N/A	N/A	N/A	N/A	N/A	N/A	Conservation
Mitigation details: Heritage site conservation by virtue of proximity from the development corridor or with permanent heritage conservation measures already in place												
SITES: MR450-S1, MR450-S7												
Construction phase	1	1	1	1	2(-)	3	2/3	3/4	2/3	4	2/3	Heritage site alteration and destruction
Operational phase	2	2	1	2	1(-)	1	2/3	3/4	2/3	4	2/3	N/A
Mitigation details: Recommendation for alteration and alteration to heritage resources to be done under EC PHRA – BE Unit Permits, in accordance with the NHRA (1999), Section 34, Regulations (2000) and SAHRA Guidelines (2007)												

Table 4: Environmental Impact Assessment Rating

With reference to archaeological and cultural heritage compliance, as per the requirements of the NHRA 1999, it is recommended that the proposed *Upgrading of the Main Road MR450 (R335) from Motherwell to Addo*, Nelson Mandela Bay Municipality and Sundays River Valley Local Municipality, Eastern Cape, proceed as applied for provided the developer comply with the below listed heritage compliance requirements.

- Eleven (11) archaeological and cultural heritage resources (Sites MR450-S1 to MR450-S11), as defined and protected by the NHRA 1999, and one (1) culturally sensitive site (Site MR450-S12), not formally protected by the NHRA 1999, were identified. Of the identified resources Site MR450-S1, the Colonial Period bridge across the Sundays River and Site MR450-S7, the Colonial Period bridge across the Coega River will be directly impacted by development. In both cases EC PHRA – BE Unit alteration / demolition permits would be requisite to development.
- The development proposal poses no ‘fatal flaws’ with reference to archaeological and cultural heritage resources or to the cultural landscape within which the development is set. No alternative study sites or realignment of portions of the line route is recommended.
- [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.]

Heritage Compliance Summary – Upgrading of the Main Road MR450 (R335) from Motherwell to Addo, NMBM & SRVLM, Eastern Cape			
Map Code	Site	Co-ordinates	Recommendations
MR450 (R335) Motherwell to Addo Line Route			
Site MR450-S1	Colonial Period: Sundays River Bridge	S33°34'53.7"; E25°40'26.3"	Bridge alteration to be done under EC PHRA – BE Unit Permit – NHRA 1999, Section 34 [Previous EC PHRA – BE Unit Permit have expired (2008-2009)]
Site MR450-S2	Colonial Period: Farmstead	S33°35'09.8"; E25°39'46.6"	N/A (Permanent heritage conservation measures in place)
Site MR450-S3	Colonial Period: Farmstead (with Cemetery)	S33°35'19.8"; E25°39'36.5"	N/A (Permanent heritage conservation measures in place)
Site MR450-S4	Colonial Period: Homestead	S33°43'54.9"; E25°35'28.9"	N/A (Recorded for heritage database purposes only)
Site MR450-S5	Colonial Period: Outbuildings	S33°44'01.4"; E25°35'23.8"	N/A (Recorded for heritage database purposes only)
Site MR450-S6	Colonial Period: Homestead (Clarence Lodge – 1881)	S33°44'03.9"; E25°35'24.2"	N/A (Recorded for heritage database purposes only)
Site MR450-S7	Colonial Period: Coega River Bridge	S33°44'43.8"; E25°35'37.7"	Bridge destruction to be done under EC PHRA – BE Unit Permit – NHRA 1999, Section 34
Site MR450-S8	Colonial Period: Homestead	S33°44'48.7"; E25°35'37.6"	N/A (Permanent heritage conservation measures in place)
Site MR450-S9	Colonial Period: Homestead	S33°45'00.2"; E25°35'41.6"	N/A (Permanent heritage conservation measures in place)
Site MR450-S10	Colonial Period: Homestead	S33°45'13.0"; E25°35'46.4"	N/A (Permanent heritage conservation measures in place)
Site MR450-S11	Colonial Period: Silo	S33°46'28.1"; E25°35'32.9"	N/A (Recorded for heritage database purposes only)
Site MR450-S12	Contemporary Period: Municipal Managed Motherwell Cemetery	S33°47'13.3"; E25°35'43.7"	Cognisance to cultural / religious sensitivity during the course of construction
Borrow Pits and Quarries			
PPC Quarry	PPC quarry	S33°38'30.0"; E25°34'18.4"	Destruction of Stone Age occurrence without developer having to apply for EC PHRA – APM Unit Permit
-	Low density MSA occurrence	-	
BP-01	Borrow Pit 1	S33°37'13.2"; E25°34'59.3"	Destruction of Stone Age occurrence without developer having to apply for EC PHRA – APM Unit Permit
-	Low density MSA occurrence	-	
BP-02	Borrow Pit 2	S33°34'30.4"; E25°37'08.6"	Assessment upon landowner approval of site use
-	Not assessed	-	

Table 5: 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.

Notes:

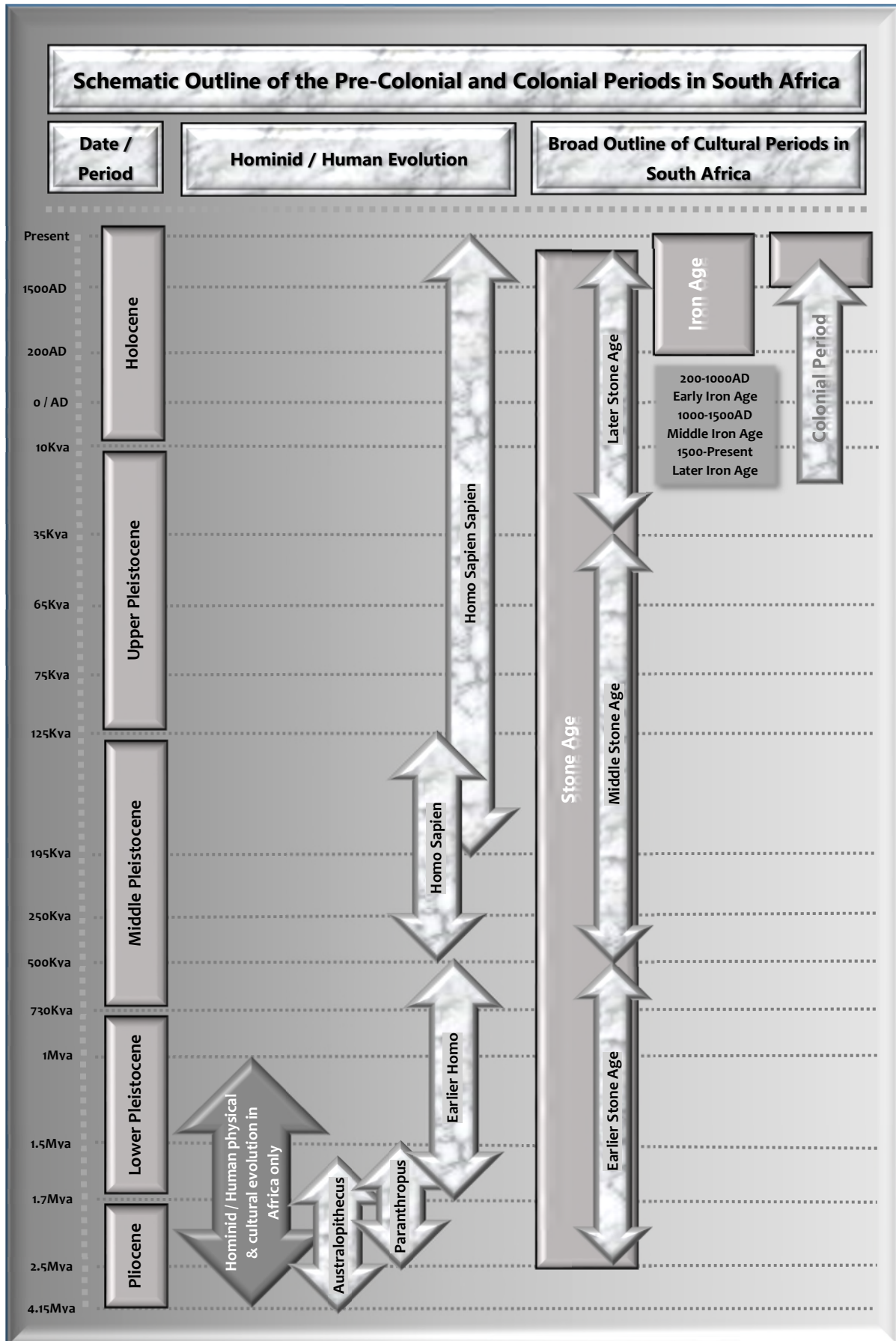
Should any registered Interested & Affected Party (I&AP) wish to be consulted in terms of Section 38(3)(e) of the NHRA 1999 (socio-cultural consultation / SAHRA SIA) it is recommended that the developer / EAP ensures that the consultation be prioritized within the timeframe of the environmental assessment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

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 (≤ 3 cm 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.

AD	: Anno Domini (the year o)
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 o)
BCE	: Before the Common Era (the year o)
BID	: Background Information Document
BP	: Before the Present (the year o)
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) – Upgrading of the Main Road MR450 (R335) from Motherwell to Addo, Nelson Mandela Bay Municipality and Sundays River Valley 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
2016

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]
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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
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Archaeology – Summary

Karen has been involved in CRM archaeology since 2003 and has been the author (including selected co-authored reports) of approximately 450 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)