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# **HERITAGE IMPACT ASSESSMENT REPORT : AMENDED ROUTE ALIGNMENT OF KOMATI WATER SCHEME AUGMENTATION PROJECT CONNECTING DUVHA AND MATLA POWER STATIONS WITH RIETFONTein PUMPING PLANT, EMALAHLENI, MPUMALANGA**



**PREPARED FOR:**

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**DATE OF SUBMISSION: 23 February 2010**

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## EXECUTIVE SUMMARY

This report contains a comparative heritage impact assessment investigation in accordance with the provisions of Sections 38(1) and 38(3) of the *National Heritage Resources Act (25/1999)*. It includes archaeological issues insofar that a number of graves were identified, as well as a few sites (foundations) where homesteads used to exist. No other archaeological remains were identified.

The broader project, known as the Komati Water Scheme Augmentation Project (KWSAP) entails the construction of a 64-km, water pipeline system between the Rietfontein Weir Pump Station south of the town of Ga-Nala (Kriel) and the Duvha Power Station, with an off-take to the Matla Power Station. The original scheme for this pipeline included alternative routes or corridor variations, a *corridor* being 300 meters wide. *These alternatives have emerged as the preferred routes and hence this scheme has been amended accordingly.*

The pipeline between the Rietfontein Weir Pump Station and the off-take point to the Matla Power Station (7.1 km) will be 1 100 mm in diameter. The pipeline between this off-take point and the Duvha Power Station (50 km) will be 1 100 mm in diameter while the pipeline from the off-take point to Matla Power Station (7.2 km) will be 600 mm in diameter. The difference in diameter sizes is due to the different required supply capacities.

It was observed that a direct pipeline between the Rietfontein Weir itself and the Matla Power Station already exists.

The affected area partially consists of working (operating) farms located in a typical Eastern Highveld environment. These farms display heritage features that normally occur in this type of environment, comprising grazing and ploughing areas, farmsteads (some with buildings older than 60 years), workers' homesteads and the remains thereof, roads, tracks, planted eucalyptus and other exotic trees (as windbreaks and a source of wood), dams, furrows, foundations and cemeteries. These features do not possess any particular physical or intangible heritage significance and are common for the Eastern Highveld environment.

The affected area partially consists of redundant and operating collieries, interspersed with a few small villages associated with these mines. Other features include the town of Ga-Nala (Kriel) and well-developed road and rail infrastructure. The proposed pipeline crosses several rivers en route including the perennial Steenkoolspruit, and one of its tributaries near the town of Ga-Nala (Kriel), as well as the perennial Dwars, and Olifants Rivers. There are numerous dams and pans in the vicinity of the pipeline.

The pipeline route has been partially assessed through previous HIA reports prepared by Cultmatrix for the Middelburg Mine and its waste water treatment plant and connecting pipelines. Strategic Environmental Focus commissioned Dr JA van Schalkwyk in 2007 to submit an archaeological impact survey report for the entire pipeline route. BKS appointed Cultmatrix in 2009 to prepare and heritage report for the original pipeline scheme taking into consideration the alternatives.

The intended development comprises the construction of a pipeline with buried and above-ground sections and this provided the following "triggers" for an HIA:

- Linear development longer than 300m
- Farmsteads and other buildings older than 60 years in the vicinity
- Burial sites in the vicinity
- Historic mining sites in the vicinity

The general aim of any HIA is to ensure that the needs of socio-economic development are balanced by the needs to preserve significant heritage resources.

The purpose of this report is to identify and assess features of heritage significance, identify possible impacts and propose management measures to mitigate negative impacts. This information must enable the relevant heritage authority to approve the proposed development as required in terms of Section 38 of the NHRA.

This report complies as follows with the provisions of Section 38 (3) of the *National Heritage Resources Act (Act 25 of 1999)*:

- (a) Identification and mapping of heritage resources**
- (b) Cultural significance**
- (c) Predicted impacts**
- (f) Mitigation before construction**

See Table 1 (below).

For ease of reference the amended route has been divided into various sections (see Figures 1-4 for maps):

- A-B: Rietfontein Pump Station to a point where another section of the amended route joins
- B-B1: Amended route section between B and a point on Road R 547
- B-C: Between B and the point of crossing with Road R 547
- C-D: Between C and the Matla Power Station pond
- E-D: Between the junction of the Matla road and the power station pond
- B1-A1-E: Along Road R 547
- E-F: Along Road R 547 between E and a point on Road R 547 where the amended route section starts/ends (close to the old Kriel post office)
- F-G: Amended and authorised routes (different alignments) between points of junction with Road R 544 north and west of Kriel
- G-H: Amended and authorised routes (same alignment) along Road R 544 to Springbok Village
- H-I: Amended and authorised routes (same alignment) along Road R 544 and a portion of Road R 575 to Duvha Power Station
- I-K: Amended route from R 575 to Duvha Power Station
- I-J-K: Authorised route along R 575 and the Duvha access road to the power station

Direct impacts of the pipelines imply demolition of buildings and structures and the relocation of graves that need to make way.

Heritage features that are on the periphery or just outside the pipeline boundaries may not be affected directly but may be exposed to indirect impacts in the longer term through damage from construction work, ongoing neglect, inappropriate uses and similar activities. They must be protected and monitored and, should it be necessary, such heritage features should then rather be recorded and demolished (in the case of buildings and structures) or relocated (in the case of graves).

- FR = Farm Ruin
- FH = Farm Homestead
- MS = Mine Site
- FD = Farmstead
- GY = Graveyard
- S = Shop

Bolded section legend indicates that the heritage resource may be directly affected and hence may involve risks/issues.

**TABLE 1: Identification of heritage features, impacts and mitigation measures**

S 3(2) NHRA heritage resource	(a) Identification		(b) Significance	(c) Impact	(f) Mitigation	Section	
	Site	GPS				Authorised	Amended
Buildings, structures, places and equipment of cultural significance	MS 1	26° 8'35.62"S 29°20'13.31"E	<b>Low</b>	Low	Old mine shaft on Vaalkranz adjacent to R544 – no mitigation	G-H	G-H
	FR 1	26°11'2.46"S 29°19'33.64"E	<b>Low</b>	Low	Homestead ruin on Welstand close to R544 – outside route - no mitigation	G-H	G-H
	FD 1	26°11'38.85"S 29°19'17.36"E	<b>Low</b>	Low	Merlindale farmstead close to R544 (parts older than 60 years) – no mitigation	F-G	-

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S 3(2) NHRA heritage resource	(a) Identification		(b) Significance	(c) Impact	(f) Mitigation	Section	
	Site	GPS				Authorised	Amended
					(outside route)		
	FD 2	26°17'32.62"S 29° 9'13.25"E	Low	Low	Bakenlaagte farmstead (parts older than 60 years) – avoid if possible	E-D	-
	FD 3	26°20'49.86"S 29°12'32.40"E	Low	Low	Rietfontein farmstead (parts older than 60 years) – no mitigation (outside route)	A-A1	
	FH 1	26°11'17.47"S 29°19'5.88"E	Low	Low	Rietkuil homestead – no mitigation – outside route	-	F-G
	FH 2	26°11'43.99"S 29°19'3.12"E	Low	Low	Rietkuil homestead – avoid if possible - could be outside route	F-G	-
	FH 3	26°11'45.42"S 29°19'1.42"E	Low	Low	Rietkuil homestead – avoid if possible - could be outside route	F-G	-
	FH 4	26°12'46.80"S 29°16'41.58"E	Low	Low	Rietkuil homestead – avoid if possible, could be outside route	F-G	-
	FH 5	26°16'5.17"S 29°13'26.12"E	Low	Low	Onverwacht homesteads – no mitigation – outside route	-	F-G
	PO	26°16'26.54"S 29°13'26.69"E	Low	Low	Old Kriel post office (older than 60 years) – avoid and preserve	F-G	-
	S 1	26° 3'1.30"S 29°19'37.86"E	Low	Low	Kayo Bazaar (older than 60 years) - avoid	G-H	G-H
	S 2	26° 6'6.99"S 29°19'32.94"E	Low	Low	Van Dyksdrift shops (younger than 60 years) – no mitigation	G-H	G-H
Areas to which oral traditions are attached or which are associated with intangible heritage	Bakenlaagte farm	-	Low	Low	Battle of Bakenlaagte area (Anglo-Boer War) – no remains and not directly affected by pipeline – no mitigation required	-	C-D
Historical settlements and townscapes	None	-	-	-	-		
Landscapes and natural features of cultural significance	None	-	-	-	-		
Geological sites of scientific or cultural importance	None	-	-	-	-		
Archaeological sites	Chance finds	-	Unknown	Unknown	Monitor during site preparation work	All	All
Graves and burial sites	GY 1	25°58'15.74"S 29°19'50.30"E	Medium	Low-Medium	Two graves near Matla – avoid and preserve	-	I-K



S 3(2) NHRA heritage resource	(a) Identification		(b) Significance	(c) Impact	(f) Mitigation	Section	
	Site	GPS				Authorised	Amended
					otherwise relocate		
	GY 2	26°12'27.30"S 29°16'40.50"E	Medium	Low-Medium	One grave near former Rietkuil farmstead – relocate if impossible to avoid and preserve	-	F-G
	GY 3	26°12'49.23"S 29°16'42.08"E	Medium	Low-medium	Graves at homestead FH 4 – avoid if possible, otherwise relocate	F-G	
	GY 4	26°20'51.90"S 29°12'31.00"E	Medium	Low	Cemetery at Rietfontein farmstead – outside route	-	A-A1
	GY 5	26°17'43.30"S 29° 7'38.60"E	Medium	Low-Medium	Graves at Matla storage pond – avoid and protect if possible, otherwise relocate	-	C-D
Features associated with labour history	None	-	-	-	-		
Movable objects	None	-	-	-	-		

**(d) Social and economic benefits**

Where the development may directly affect graveyards but bypass them, such graveyards should be properly documented and protected, implying a benefit to heritage conservation. The development will have no direct benefits related to the conservation of other heritage resources since it is possible that these either may not be affected or may be destroyed.

The Komati Water Scheme Augmentation Project is intended to augment the Komati Water Scheme with water of sufficient quality to ultimately supply the Duvha Power Station. Included as part of the Augmentation Project is the infrastructure required to support the new proposed coal-fired power station in the Bronkhorstspuit area (Project Bravo).

Due to the imminent re-commissioning of the Komati Power Station, and the resultant increased demand on the Komati Water Scheme, the supply of water to the Duvha Power Station will experience increasing pressure. Therefore, Eskom has had to resort to alternative water sources to supply the Duvha Power Station. Hence, the instigation of the Komati Water Scheme Augmentation Project, and the planned construction of the proposed new pipeline from the Rietfontein Weir Pump Station.

**(e) Public consultation**

Since this HIA is part of an Amendment Application Process, no specific HIA-related public consultation was required. Final reports that will be submitted to SAHRA must include the public participation report associated with the Amendment Application Process.

**(g) Mitigation during construction**

Except for monitoring of chance finds during site preparation and construction work, no mitigation measures apply.

**Findings**

The anticipated impact on any heritage resources will be low, with the possible exception of the graves, where the anticipated impact could be medium. In the unlikely event that foundations, old rubbish dumps and similar chance finds are discovered, the anticipated impact will be moderate, depending what the nature and significance of such chance finds will be. The pipeline sections will traverse large areas that

have been transformed by grazing, mining, pastures and road-making; hence, very few significant heritage resources have remained and therefore the impact will be very low.

The below table lists the number of risks (and consequent mitigations) associated with each section in terms of authorised and amended routes:

**TABLE 2: Risks and mitigations regarding authorised and amended routes**

SECTION	NUMBER OF RISKS		COMMENTS
	AUTHORISED ROUTE	AMENDED ROUTE	
A-B	-	-	Supported
B-B1	-	-	Supported
B-C	-	-	Supported
C-D	-	Yes: 1 (GY 5)	Supported (graves can remain in situ)
E-D	Yes: 1 (Bakenlaagte farmstead)	-	Not supported: Damage to and destruction of parts of farmstead
B1-A1-E	-	-	Supported (runs along road)
E-F	-	-	Supported (runs along road)
F-G	Yes: 5 (PO, FH 4, FH 2 and 3, GY 3)	-	Not supported (may affect too many heritage resources)
F-G	-	Yes: 1 (GY 2)	Supported (grave can be relocated)
G-H	Yes: 2 (S1 and S 2)	Yes: 2 (S1 and S 2)	Supported (runs along road and buildings will not be affected)
H-I	-	-	Supported (runs along roads, no heritage)
I-K	-	Yes: 1 (GY 1)	Supported (graves can be relocated)
I-J-K	-	-	Supported (runs along road)

Based on the above findings, Cultmatrix states that there are no compelling reasons to delay or prevent the proposed amendment, provided that the recommended mitigation measures are applied. Except for three burial sites (which can be preserved or relocated), no heritage resources will be severely affected. There are no heritage resources of significance that should be preserved or memorialised in case of demolition.

Based on additional fieldwork since the 2009 BKS report, the amended route is supported since it will directly affect less heritage features (5 in total) than the authorised route (8 in total).

Both the authorised (I-J-K) and amended (I-K) northern sections of the project are supported. Preference is given to the authorised section since this runs along existing roads, but other factors (e.g. longer distance) may negate this option.

### Recommendations

1. Should any human remains be disturbed, exposed or uncovered during excavations for the proposed project (unlikely), these should immediately be reported to an accredited archaeologist. Burial remains should not be disturbed or removed until inspected by an archaeologist.
2. Site preparation activities must be monitored for the occurrence of any other archaeological material (Stone Age tools, Iron Age artefacts, historic waste disposal sites etc) and similar hidden/buried chance finds and an archaeologist should be asked to inspect the area when this has reached an advanced stage in order to verify the presence or absence of any such material.
3. Grave sites should be cleared of vegetation in order to establish the exact number of graves that may need to be preserved or moved.

4. If possible, graves in close proximity of the pipeline should be left in situ and sites should be cleared, documented and fenced off, together with an interpretive sign that explains their significance. Should this not be feasible, they may be relocated subject to the granting of a permit by SAHRA.
5. The above recommendations must be included in the Environment Management Plan for the proposed project.



**RC DE JONG**  
Public Officer

**Date: 23 February 2010**

## 1. REPORT CONTEXT

### 1.1 General notes

1. The structure of this report is based on:
  - SOUTH AFRICAN HERITAGE RESOURCES AGENCY, Heritage Impact Assessment: Notification of intent to develop (form)
  - DEPARTMENT OF ENVIRONMENTAL AFFAIRS AND DEVELOPMENT PLANNING, PROVINCIAL GOVERNMENT OF THE WESTERN CAPE, 2005, Guideline for involving heritage specialists in EIA processes (document)
  - DEPARTMENT OF ENVIRONMENT AFFAIRS AND TOURISM, Integrated Environmental Management Guidelines
  - SOUTH AFRICAN HERITAGE RESOURCES AGENCY, 2006, *Minimum standards: Archaeological and palaeontological components of impact assessment reports* (unpublished).
  - WORLD BANK, *Environmental Assessment Sourcebook Update No 8, September 1994: Cultural Heritage in Environmental Assessment*.
  - Best-practice HIA reports submitted by Cultmatrix and other heritage consultants
2. This report is informed by the *National Heritage Resources Act (25/1999)* (NHRA) and is consistent with the various ICOMOS charters for places of cultural significance.
3. Recommendations contained in this application do not exempt the applicant from complying with any national, provincial and municipal legislation or other regulatory requirements, including any protection or management or general provision in terms of the NHRA.
4. Rights and responsibilities that arise from this report are those of the applicant and not that of Cultmatrix cc. Cultmatrix cc assumes no responsibility for compliance with conditions that may be required by SAHRA in terms of this report.
5. Cultmatrix assumes no responsibility whatsoever for any loss or damages that may be suffered as a direct or indirect result of information contained in this application. Any claim that may however arise is limited to the amount paid to Cultmatrix for services rendered to compile this report.

### 1.2 Purpose of the report

The purpose of this report is to identify and assess features of heritage significance, identify possible impacts and propose management measures to mitigate negative impacts. This information must enable the relevant heritage authority to approve the proposed development as required in terms of Section 38 of the NHRA.

The below table lists and describes the three general categories of heritage impact assessment studies and reports, which SAHRA offices are involved (i.e. to which SAHRA offices reports should be submitted) and which type of response is required from these offices.

**TABLE 3: Applicable category of heritage impact assessment study and report**

Type of study and report	Aim	SAHRA office involved	Requested SAHRA response
Screening: Not this report	The aim of the screening investigation is to provide an informed heritage-related opinion about the proposed development by an appropriate heritage specialist. The objectives of this investigation are to screen potential heritage issues through a site inspection, to develop a broad understanding of heritage policy-related context, to review any existing data on the history and heritage significance of the site, to check if the site has any formal heritage status, to discuss the proposed development with heritage contacts and to scan the development proposals. The result of this investigation is a brief statement indicating potential heritage impacts/issues and the need for further investigation.	-	-
		-	-
		-	-

Type of study and report	Aim	SAHRA office involved	Requested SAHRA response
Scoping (basic assessment): Not this report	The aim of the scoping investigation is to analyse heritage issues and how to manage them within the context of the proposed development. The objectives are to assess heritage significance (involving site inspections and basic desktop and archival research); to identify the need for further detailed inputs by heritage specialists, to consult with local heritage groups and experts, to review the general compatibility of the development proposals with heritage policy and to assess the acceptability of the proposed development from a heritage perspective. The result of this investigation is a heritage scoping report indicating the presence/absence of heritage resources and how to manage them in the context of the proposed development.	-	-
		-	-
		-	-
Full HIA: This report	The aim of the full HIA investigation is to analyse and recommend heritage management mitigation measures and monitoring programmes. The objectives are to analyse heritage issues, to research the chronology of the site and its role in the broader context, to undertake a comprehensive assessment of heritage significance, to analyse the nature and scale of the proposed development, to consult with local heritage groups and experts as part of the broader EIA stakeholder engagement process, to establish the compatibility of the proposed development with heritage and other statutory frameworks and to assess alternatives in order to promote heritage conservation issues.	SAHRA Nelspruit (final report to include public participation process report)	Approval of development
		SAHRA Palaeontology, Archaeology and Meteorites Unit	Comments
		SAHRA Burial Grounds and Graves Unit	Comments

### 1.3 Terms of reference

- To survey the amended pipeline routes
- To identify and map heritage resources that may be affected directly and indirectly (based on the assumption that the construction HIA work will use a corridor at least 50 m in diameter)
- To assess the cultural significance of these heritage resources
- To assess the impact of the development on these heritage resources
- To assess the benefits of conserving these heritage resources in relationship to the socio-economic benefits of the development
- To provide the public with an opportunity to comment on the heritage aspects of the proposed development
- To consider alternatives if heritage resources will be affected in a negative manner
- To determine methods to mitigate negative impacts before, during and after construction activities
- To compare sections of the authorised route with sections of the amended route in terms of heritage impact risks

### 1.4 History of the report

This report is the third HIA report. It is preceded by:

- An archaeological impact survey report, prepared by Dr JA van Schalkwyk (National Cultural History Museum) for SEF (2007) for the same area.
- A draft HIA report for the original proposed and alternative routes, prepared by Cultmatrix for BKS (2009)
- A draft HIA report for the proposed amended route, prepared by Cultmatrix for ILISO (2010)
- A revised draft HIA report for the proposed amended route, prepared by Cultmatrix for ILISO (2010)

### 1.4 Legal context of the report

ACT	COMPONENT	IMPLICATION	RELEVANCE	COMPLIANCE
NHRA	S 34	Impacts on buildings and structures older than 60 years	Possibly section E-D (FD 2) and section G-H (S 1)	Demolition authorisation
	S 35	Impacts on archaeological and palaeontological heritage resources	Chance finds	Monitor during construction work, identify and sample

ACT	COMPONENT	IMPLICATION	RELEVANCE	COMPLIANCE
				middens
	S 36	Impacts on graves	Five burial grounds in total	Avoid if possible, otherwise relocate
	S 37	Impacts on public monuments	None present	-
	S 38	Developments requiring an HIA	Development is listed activity	Full HIA
NEMA	EIA Regulations	Activities requiring an EIA	Development is subject to an EIA	HIA is part of EIA
Other	-	-	-	-

### 1.5 Planning context of the report

It is assumed that the proposed development complies with the local IDP and other strategic planning documents.

### 1.6 Development criteria in terms of Section 38 of the NHRA

1.6	Development criteria in terms of Section 38(1)	Yes/No details
1.6.1	Construction of road, wall, power line, pipeline, canal or other linear form of development or barrier exceeding 300m in length	Yes
1.6.2	Construction of bridge or similar structure exceeding 50m in length	Possible
1.6.3	Development exceeding 5000 sq m	No
1.6.4	Development involving three or more existing erven or subdivisions	No
1.6.5	Development involving three or more erven or divisions that have been consolidated within past five years	No
1.6.6	Rezoning of site exceeding 10 000 sq m	No
1.6.7	Any other development category, public open space, squares, parks, recreation grounds	No

### 1.7 Property details

1.7	Property details	
1.7.1	Name and location of property	Area between Duvha and Matla power stations
1.7.2	Erf or farm numbers	Various farms
1.7.3	Magisterial districts	Middelburg, Kriel
1.7.4	Closest town	Kriel (Ga-Nala)
1.7.5	Local authority	Steve Tshwete and Emalahleni
1.7.5	Current use	Agriculture, mining, transportation
1.7.5	Current zoning	Agricultural, mining
1.7.5	Predominant land use of surrounding properties	Vacant, roads, farming, mining, residential
1.7.9	Total extent of properties	Not available

### 1.8 Property ownership

1.8	Property owners	
1.8.1	Farms	Various
1.8.2	Name and contract address	
1.8.3	Telephone number	
1.8.4	Fax number	
1.8.5	E-mail	

### 1.9 Developer

1.9	Developer	
1.9.1	Name and contact address	Department of Water Affairs
1.9.2	Telephone number	-
1.9.3	Fax	-
1.9.4	E-mail	-

**1.10 Environmental practitioner**

<b>1.10</b>	<b>Environmental Specialist</b>	
1.10.1	Name and contact address	Terry Baker, ILISO Consulting, PO Box 68735, Highveld Park 0169
1.10.2	Telephone number	(012) 685-0900
1.10.3	Fax	(012) 665-1886
1.10.4	E-mail	<a href="mailto:terry@iliso.com">terry@iliso.com</a>

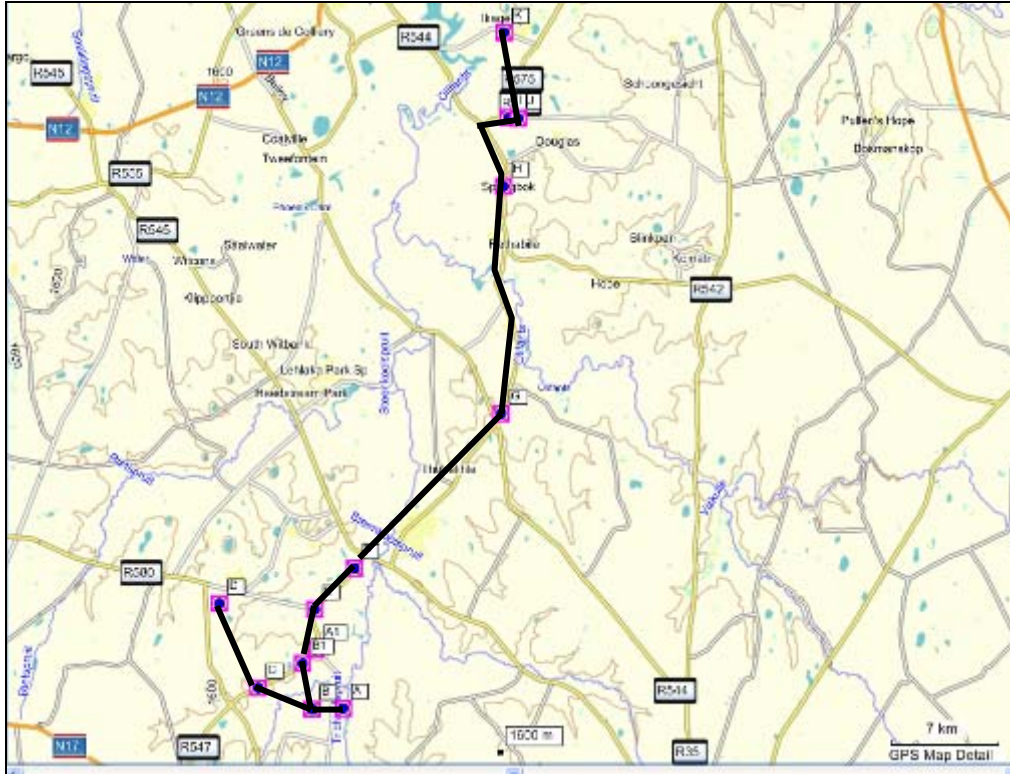
**1.11 Heritage assessment practitioner**

<b>1.11</b>	<b>Specialist (1)</b>	
1.11.1	Name and contact address	Dr RC de Jong (Principal Member: Cultmatrix cc), PO Box 12013, Queenswood 0121, Pretoria
1.11.2	Qualifications and field of expertise	PhD (Cultural History) UP (1990), Post-Graduate Museology Diploma UP (1979), generalist heritage management specialist with experience in museums and heritage since 1983
1.11.3	Relevant experience in study area	HIAs for Middelburg Mine, Middelburg Mine water treatment scheme, Vandyksdrift South mining development, Survey of heritage resources in Nkangala DM
1.11.4	Telephone number	(082) 577-4741
1.11.5	Fax number	(086) 612-7383
1.11.6	E-mail	<a href="mailto:cultmat@iafrica.com">cultmat@iafrica.com</a>

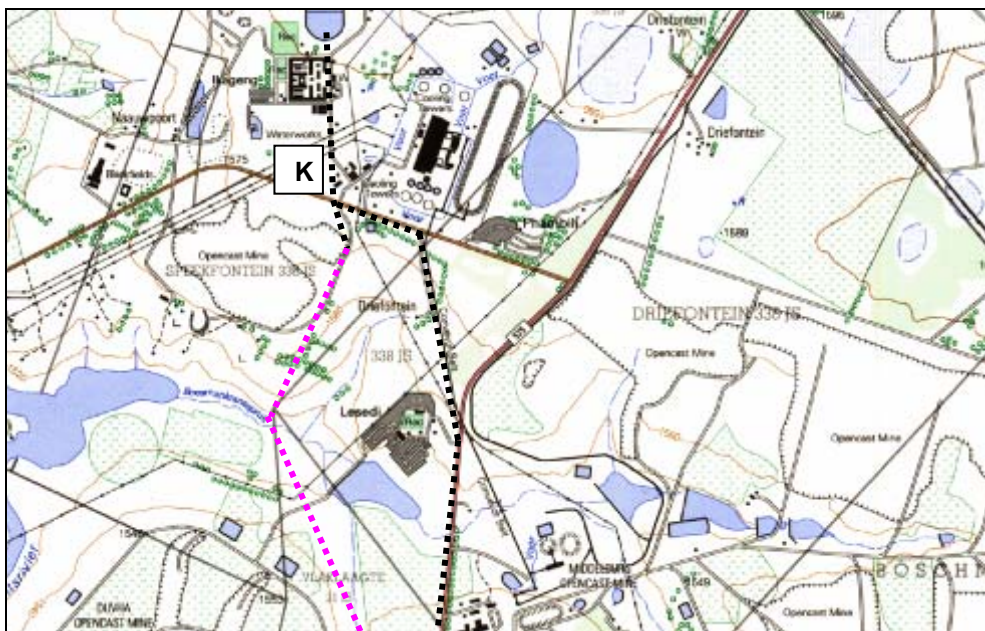
## 2. DEVELOPMENT CONTEXT

### 2.1 Development site/area location and boundaries

The study area comprises the region between the Duvha and Matla power stations, located south of Middelburg and Emalaheni in Mpumalanga.

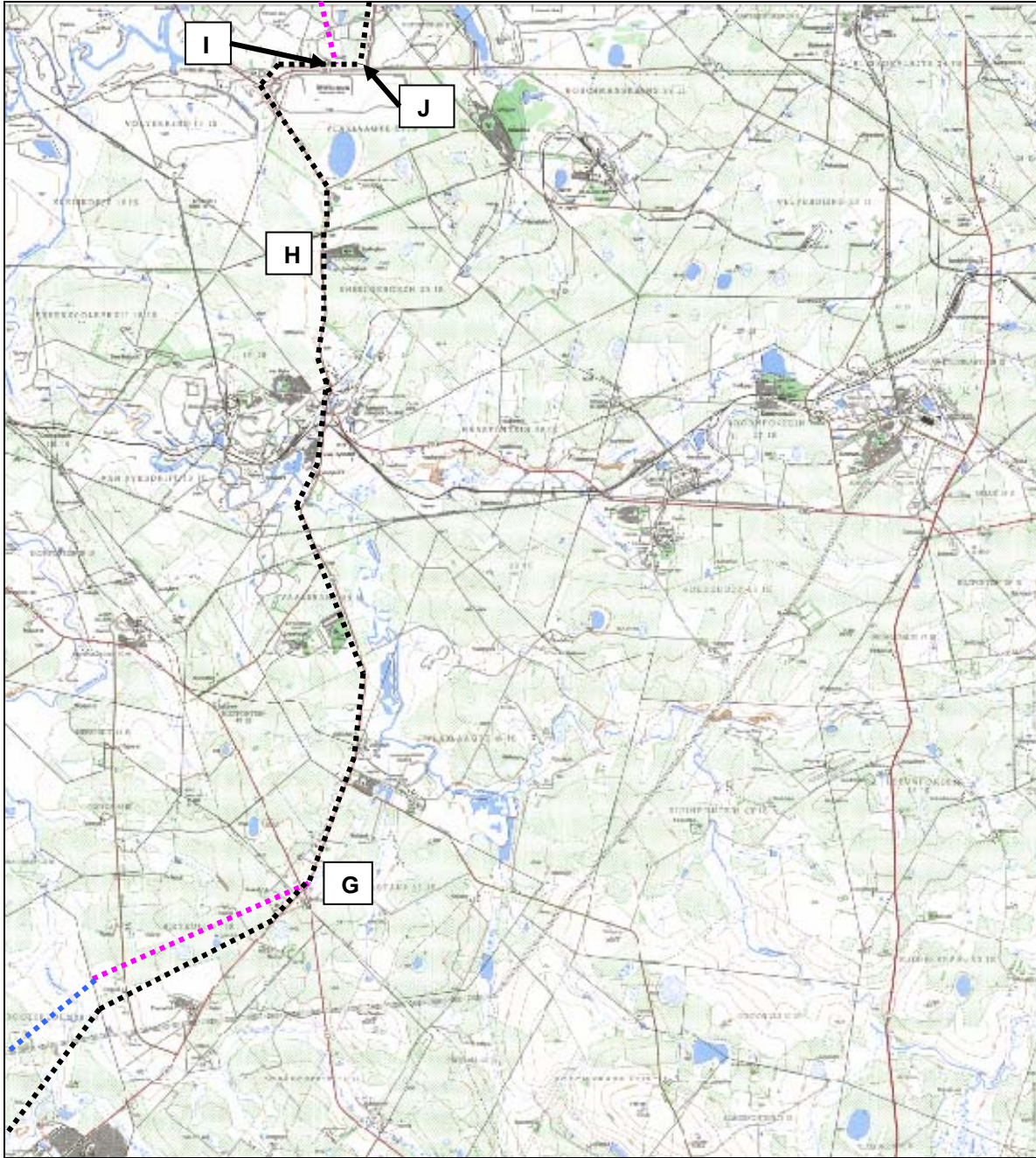


**FIGURE 1: Location of the pipeline routes with sections (schematic representation) consisting of a 100 m wide corridor between Rietfontein (A) and Matla (D) and Rietfontein and Duvha (K)**



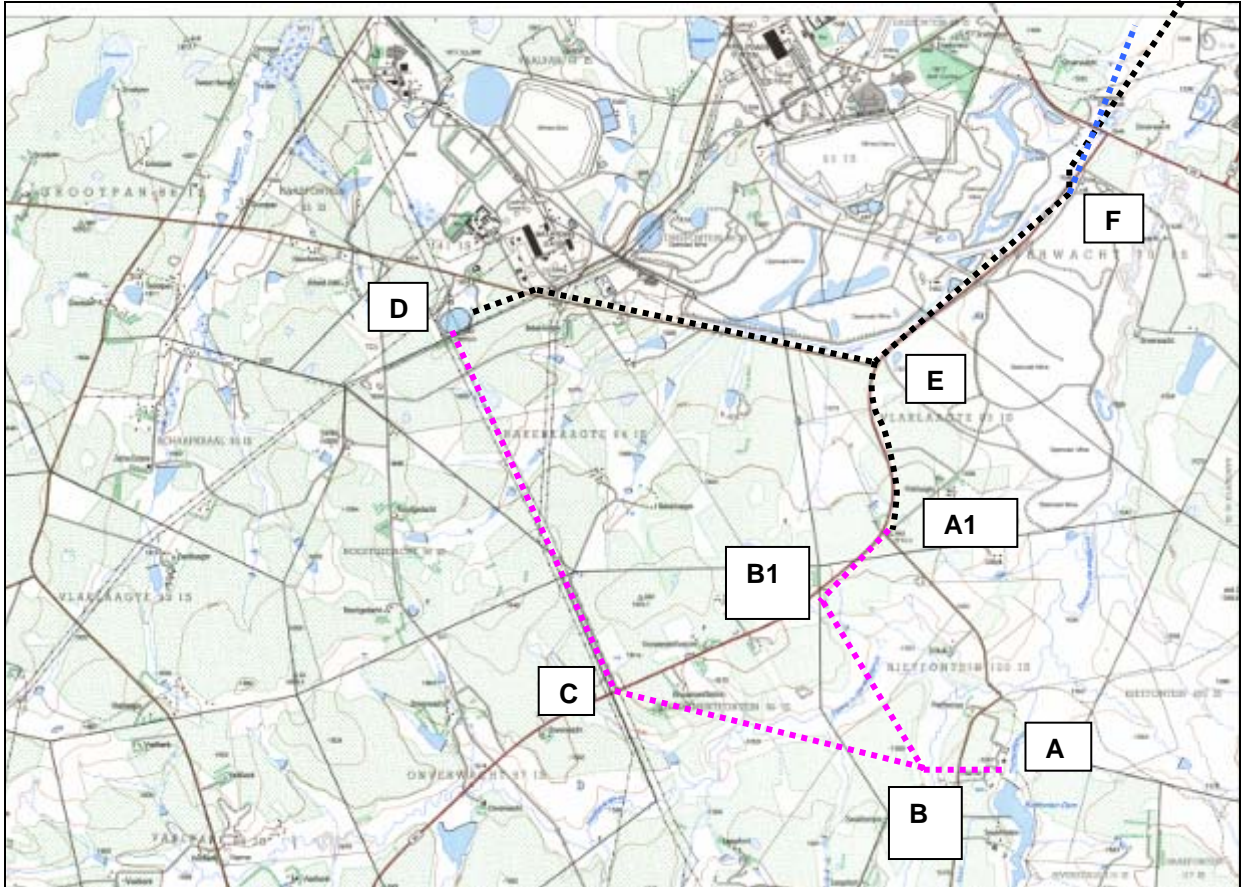
**FIGURE 2: Portion of 2529 CD Middelburg (1996) indicating the original northern route section (black) and preferred amendment (blue, both ending at point K)**





**FIGURE 3: Portion of 2629 AB Van Dyksdrif (1996) indicating the original central route sections (black) and preferred amendment (blue)**





**FIGURE 4: Portion of 2629 AC Evander (1995) indicating the original southern route sections (black) and preferred amendment (blue)**

**2.2 Description of distinguishing regional features**

**2.2.1 Environmental features**

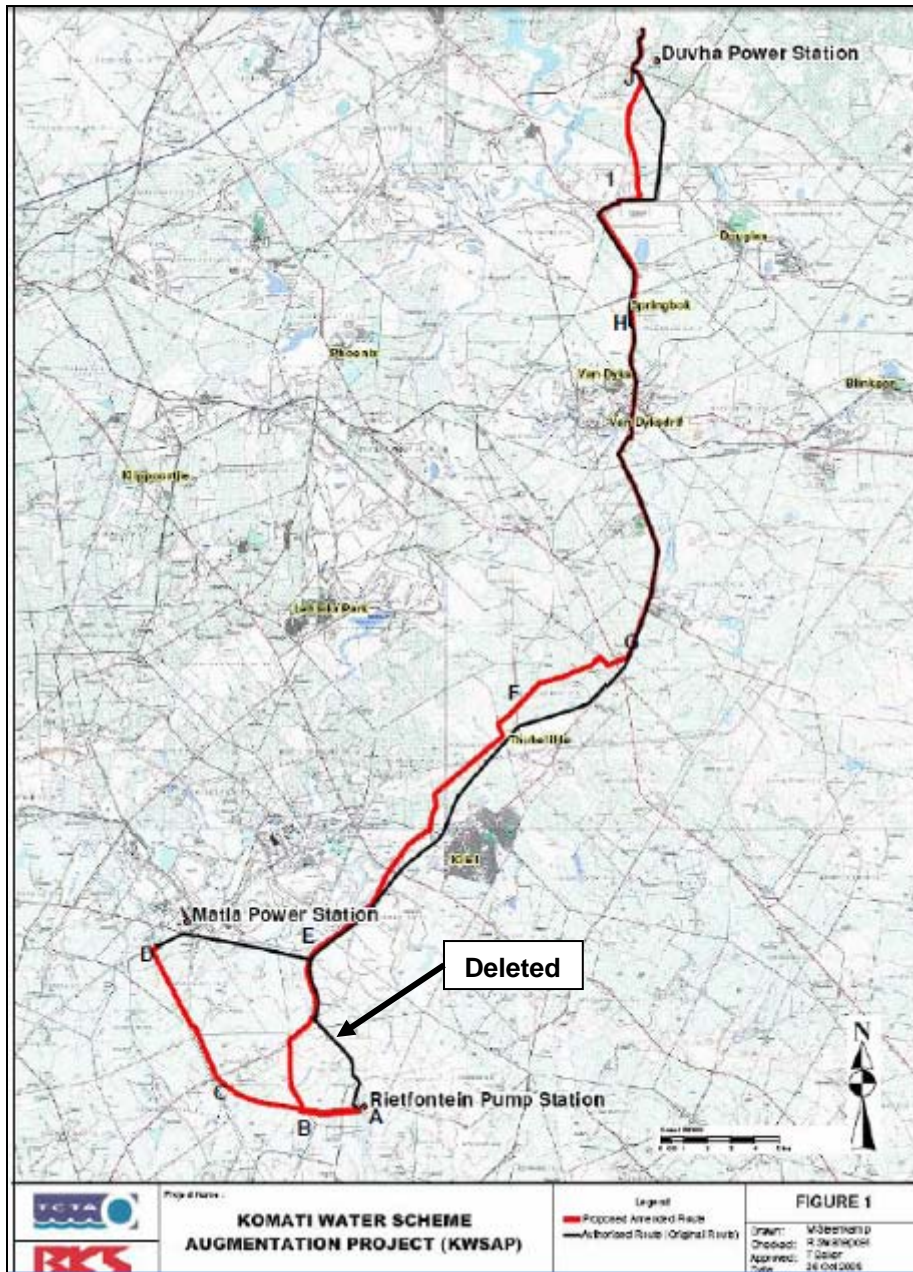
**TABLE 4: Environmental features**

COMPONENT	DESCRIPTION
Acocks veld type	Bankenveld
Geological and mining	Collieries
Geology	Mainly Arenite
Hydrology	Olifants River, Steenkool Spruit and tributaries, dams and pans
Land cover	Mines and quarries, commercial cultivated land, degraded grassland
Land use	Farming, transport, power generation, mining, commercial, residential
Vegetation	Moist Sandy Highveld Grassland
Slope	0-9%
Terrain morphology	Slightly to moderately undulating plains
Wetlands	Pans and rivers

**2.2.2 Heritage features**

**TABLE 5: Heritage features**

<b>S 3(2) NHRA heritage resource</b>	<b>DESCRIPTION</b>
Buildings, structures, places and equipment of cultural significance	Farmsteads and homesteads, some with buildings older than 60 years; ruins of farm structures (older than 60 years), collieries, shops, dwellings etc.
Areas to which oral traditions are attached or which are associated with intangible heritage	Study area
Historical settlements and townscapes	Mining villages, Ga-Nala (Kriel)
Landscapes and natural features of cultural significance	None
Geological sites of scientific or cultural importance	None
Archaeological and palaeontological sites	Area is known for trace fossils; Middle and late Stone Age artefacts scattered along rivers (out of context)
Graves and burial grounds	Yes
Areas of significance related to labour history	Homesteads and farm workers' graves
Movable objects	None



**FIGURE 5: Map of original and amended pipeline routes showing sections used in this report – this report has changed some of the numbered references and added a few more**

**2.2.3 Site description**

The affected area partially consists of working (operating) farms located in a typical Eastern Highveld environment. These farms display heritage features that normally occur in this type of environment, comprising grazing and ploughing areas, farmsteads (some with buildings older than 60 years), workers’ homesteads and the remains thereof, roads, tracks, planted eucalyptus and other exotic trees (as windbreaks and a source of wood), dams, furrows, foundations and cemeteries. These features do not possess any particular physical or intangible heritage significance and are common for the Eastern Highveld environment.

The affected area partially consists of redundant and operating collieries, interspersed with a few small villages associated with these mines. Other features include the town of Ga-Nala (Kriel) and well-developed road and rail infrastructure. The proposed pipeline crosses several rivers en route including the perennial Steenkoolspruit, and one of its tributaries near the town of Ga-Nala (Kriel), as well as the perennial Dwars, and Olifants Rivers. There are numerous dams and pans in the vicinity of the pipeline.

### 2.2.4 Surrounding environment

AREA	DESCRIPTION
East	Farm land, collieries, villages
North	Farm land, Duvha, collieries
West	Farm land, collieries
South	Farm land, Matla, Kriel, collieries

### 2.3 Development description

2.3	Development description	
2.3.1	Nature of proposed development	Construction of a 64-km, water pipeline, 100 m wide corridor, between the Rietfontein Weir Pump Station south of the town of Ga-Nala (Kriel) and the Duvha Power Station, with an off-take to the Matla Power Station.
2.3.2	Predicted impacts on heritage value of site and contents	Preservation or relocation of graves
2.3.3	Structures older than 60 years affected by proposed development	Possible
2.3.4	Rezoning or change of land use	No
2.3.5	Construction work	Yes
2.3.6	Total floor area of proposed development	-
2.3.7	Extent of land coverage of development	-
2.3.8	Earth moving and excavation	Yes
2.3.9	Number of storeys	-
2.3.10	Maximum height above ground level	-
2.3.11	Monetary value development	Not available
2.3.12	Time frames	Not available

#### Section A-B

The proposed amended pipeline originates at the Rietfontein Weir Pump Station and will connect with another proposed pipeline along the R 547. This section consists of grazing land and ploughed fields intersected by a small stream.

No heritage resources were identified in this section.

#### Section A-A1

The proposed authorized pipeline will run along an existing farm road and then run across ploughed fields to Rietfontein Pump Station. Farmstead FD 3 and graveyard GY 4 are in the vicinity but will not be affected.

#### Section B-C

The pipeline will run alongside an existing DWAF pipeline to Matla up to the R 547. This section consists of ploughed fields.

No heritage resources were identified in this section.

#### Section B-B1

The proposed amended pipeline will run across ploughed fields and grazing land. There are no heritage resources in this section.

### **Section C-D**

The pipeline will run alongside an existing DWAF pipeline to Matla from the R 547. This section consists of ploughed fields.

A small cemetery (GY 5) exists at the Matla storage pond.

### **Section D-E**

The proposed authorised pipeline will run along the Matla access road and may affect the Bakenlaagte farmstead (FD 2).

### **Section B1-A1-E**

The proposed authorised and amended pipelines follow the same road along Road R 547 and will affect no heritage resources.

### **Section E-F-G**

The proposed amended part of the pipeline will run along (western side) of the existing R 547 road to a point south of Kriel, where it will run north and west of the R 547 around Thubelihle, joining the R 544 north of the latter. This area consists of mining activities, with several areas having already been undermined. In addition, there are several dams and water sources nearby, with the pipeline having to cross the Steenkoolspruit. The pipeline will bypass a cluster of homesteads (FH 5) and another homestead (FH 1) but may directly affect a single grave (GY 2).

The proposed authorised pipeline route runs more to the south closer to Kriel and Tubelihle and may affect the old Kriel post office (PO), homesteads FH 2, 3 and 4 and a cemetery (GY 3).

### **Section G-H-I**

The majority of the areas surrounding the proposed route (both authorized and amended) in this section consist of agricultural land, with two residential areas along the western edge of the R544. The pipeline will be located in the western road servitude of the R 544 and will join the R 575 north of Van Dyksdrift. The Transvaal Navigation Colliery, and sewage disposal works are located in the Vlaklaagte area.

The pipeline may affect an old mine shaft (MS 1) and will probably bypass an old ruin (FR 1). It will bypass two shops (S1 and S 2), of which S 1 (Kayo Bazaar) is older than 60 years.

### **Section I-K**

The proposed amended section of the pipeline leaves the R 575 south of Duvha and runs across mining areas and old farm land to the Duvha Power Station. It may affect a small graveyard (GY 1).

### **Section I-J-K**

The proposed authorised section of the pipeline continues along the R 575 and then follows the Duvha access road to point K. No heritage resources were identified along this route.



### 3. HERITAGE IMPACT CONTEXT

#### 3.1 Cultural landscape evidence

**TABLE 6: Cultural landscape classification**

HERITAGE LANDSCAPE CONTEXT	ELEMENTS	EVIDENCE
A. PALAEOONTOLOGICAL LANDSCAPE CONTEXT	Fossil remains. Such resources are typically found in specific geographical areas, e.g. the Karoo and are embedded in ancient rock and limestone/calcrete formations.	None
B. ARCHAEOLOGICAL LANDSCAPE CONTEXT	Archaeological remains dating to the following periods: <ul style="list-style-type: none"> <li>• Early Stone Age</li> <li>• Middle Stone Age</li> <li>• Late Stone Age</li> <li>• Early Iron Age</li> <li>• Late Iron Age</li> <li>• Historical</li> </ul>	None
C. HISTORICAL BUILT URBAN LANDSCAPE CONTEXT	<ul style="list-style-type: none"> <li>• Historical townscapes/streetscapes</li> <li>• Historical structures; i.e. older than 60 years</li> <li>• Formal public spaces</li> <li>• Formally declared urban conservation areas</li> <li>• Places associated with social identity/displacement</li> </ul>	None
<b>D. HISTORICAL FARMLAND CONTEXT</b>	<p><b>These possess distinctive patterns of settlement and historical features such as:</b></p> <ul style="list-style-type: none"> <li>• <b>Historical farm werfs</b></li> <li>• <b>Historical farm workers villages/settlements</b></li> <li>• <b>Irrigation furrows</b></li> <li>• <b>Tree alignments and groupings</b></li> <li>• <b>Historical routes and pathways</b></li> <li>• <b>Distinctive types of planting</b></li> <li>• <b>Distinctive architecture of cultivation e.g. planting blocks, trellising, terracing, ornamental planting.</b></li> </ul>	<b>Grazing and pasture areas</b>
E. HISTORICAL RURAL TOWN CONTEXT	<ul style="list-style-type: none"> <li>• Historical mission settlements</li> <li>• Historical townscapes</li> </ul>	None
F. PRISTINE/NATURAL LANDSCAPE CONTEXT	<ul style="list-style-type: none"> <li>• Historical patterns of access to a natural amenity</li> <li>• Formally proclaimed nature reserves</li> <li>• Evidence of pre-colonial occupation</li> <li>• Scenic resources, e.g. view corridors, viewing sites, visual edges, visual linkages</li> <li>• Historical structures/settlements older than 60 years</li> <li>• Pre-colonial or historical burial sites</li> <li>• Geological sites of cultural significance.</li> </ul>	None
G. RELIC LANDSCAPE CONTEXT	<ul style="list-style-type: none"> <li>• Past farming settlements</li> <li>• Past industrial sites</li> <li>• Places of isolation related to attitudes to medical treatment</li> <li>• Battle sites</li> <li>• Sites of displacement,</li> </ul>	None
H. BURIAL GROUND & GRAVE SITE CONTEXT	<ul style="list-style-type: none"> <li>• Pre-colonial burials (marked or unmarked, known or unknown)</li> <li>• Historical graves (marked or unmarked, known or unknown)</li> <li>• Human remains (older than 100 years)</li> <li>• Associated burial goods (older than 100 years)</li> <li>• Burial architecture (older than 60 years)</li> </ul>	None

I. ASSOCIATED LANDSCAPE CONTEXT	<ul style="list-style-type: none"> <li>Sites associated with living heritage e.g. initiation sites, harvesting of natural resources for traditional medicinal purposes</li> <li>Sites associated with displacement &amp; contestation</li> <li>Sites of political conflict/struggle</li> <li>Sites associated with an historic event/person</li> <li>Sites associated with public memory</li> </ul>	None
J. HISTORICAL FARM WERF CONTEXT	<ul style="list-style-type: none"> <li>Setting of werf and its context</li> <li>Composition of structures</li> <li>Historical/architectural value of individual structures</li> <li>Tree alignments</li> <li>Views to and from</li> <li>Axial relationships</li> <li>System of enclosure, e.g. werf walls</li> <li>Systems of water reticulation and irrigation, e.g. furrows</li> <li>Sites associated with slavery and farm labour</li> <li>Colonial period archaeology</li> </ul>	None
K. HISTORICAL INSTITUTIONAL LANDSCAPE CONTEXT	<ul style="list-style-type: none"> <li>Historical prisons</li> <li>Hospital sites</li> <li>Historical school/reformatory sites</li> <li>Military bases</li> </ul>	None
L. SCENIC/VISUAL	<ul style="list-style-type: none"> <li>Scenic routes</li> </ul>	None
K. AMENITY LANDSCAPE CONTEXT	<ul style="list-style-type: none"> <li>View sheds</li> <li>View points</li> <li>Views to and from</li> <li>Gateway conditions</li> <li>Distinctive representative landscape conditions</li> <li>Scenic corridors</li> </ul>	

### 3.2 Heritage context classification

**TABLE 7: Classification of heritage context**

CATEGORY	DESCRIPTION	EVIDENCE
A	Of high intrinsic, associational and contextual heritage value within a national, provincial and local context, i.e. formally declared or potential Grade 1, 2 or 3A heritage resources	No
B	Of moderate to high intrinsic, associational and contextual value within a local context, i.e. potential Grade 3B heritage resources	No
C	Of medium to low intrinsic, associational or contextual heritage value within a national, provincial and local context, i.e. potential Grade 3C heritage resources	No
D	<b>Of little or no intrinsic, associational or contextual heritage value due to disturbed, degraded conditions or extent of irreversible damage</b>	<b>Yes</b>

### 3.3 Development type

**TABLE 8: Classification of development type**

CATEGORY	DESCRIPTION	EVIDENCE
A: Minimal intensity development	<ul style="list-style-type: none"> <li>No rezoning involved; within existing use rights</li> <li>No subdivision involved</li> <li>Upgrading of existing infrastructure within existing envelopes</li> <li>Minor internal changes to existing structures</li> <li>New building footprints limited to less than 1000m<sup>2</sup></li> </ul>	No
B: Low-intensity development	<ul style="list-style-type: none"> <li>Spot rezoning with no change to overall zoning of a site</li> <li>Linear development less than 100m</li> <li>Building footprints between 1000m<sup>2</sup>-2000m<sup>2</sup></li> </ul>	No



CATEGORY	DESCRIPTION	EVIDENCE
	<ul style="list-style-type: none"> <li>Minor changes to external envelop of existing structures (less than 25%)</li> <li>Minor changes in relation to bulk and height of immediately adjacent structures (less than 25%).</li> </ul>	
C: Moderate intensity development	<ul style="list-style-type: none"> <li>Rezoning of a site between 5000m<sup>2</sup>-10 000m<sup>2</sup></li> <li>Linear development between 100m and 300m</li> <li>Building footprints between 2000m<sup>2</sup> and 5000m<sup>2</sup></li> <li>Substantial changes to external envelop of existing structures (more than 50%)</li> <li>Substantial increase in bulk and height in relation to immediately adjacent buildings (more than 50%)</li> </ul>	No
<b>D: High intensity development</b>	<ul style="list-style-type: none"> <li><b>Rezoning of a site in excess of 10 000m<sup>2</sup></b></li> <li><b>Linear development in excess of 300m</b></li> <li><b>Any development changing the character of a site exceeding 5000m<sup>2</sup> or involving the subdivision of a site into three or more erven</b></li> <li><b>Substantial increase in bulk and height in relation to immediately adjacent buildings (more than 100%)</b></li> </ul>	<b>Pipeline</b>

### 3.4 Expected impact significance

**TABLE 9: Expected impact significance on heritage features**

HERITAGE CONTEXT	TYPE OF DEVELOPMENT			
	CATEGORY A	CATEGORY B	CATEGORY C	CATEGORY D
A: High heritage value	Moderate heritage impact expected	High heritage impact expected	Very high heritage impact expected	Very high heritage impact expected
B: Medium to high heritage value	Minimal heritage impact expected	Moderate heritage impact expected	High heritage impact expected	Very high heritage impact expected
C: Medium to low heritage value	Little or no heritage impact expected	Minimal heritage impact expected	Moderate heritage impact expected	High heritage impact expected
D: Low heritage value	Little or no heritage impact expected	Little or no heritage impact expected	Minimal heritage value expected	<b>Moderate heritage impact expected</b>



**FIGURE 6: Section of amended pipeline route near Duvha Power Station (I-K) where the pipeline will run alongside this track**



**FIGURE 7: Section of Road R 575 south of Duvha where the pipeline (authorised and amended routes I-H) will run next to the road**



**FIGURE 8: Section of Road R 544 between Duvha and Van Dyksdrif (G-H) where the pipeline will run next to the road**



**FIGURE 9:** Landscape between Thubelihle Township near Kriel and the Matla Power Station (arrow), to be traversed by the amended route (F-G) of the pipeline



**FIGURE 10:** Section of Road R 547 south of Ga-Nala (Kriel) where the pipeline (E-F) will run next to the road



**FIGURE 11: Air vent of the existing DWAF pipeline between Matla (arrow) and the Rietfontein Pumping Station, amended route section A-B-C-D**



**FIGURE 12: Rietfontein Pumping Station**

## 4. HERITAGE IMPACT ASSESSMENT

### 4.1 Approach

#### 4.1.1 Definitions and assumptions

The following aspects have a direct bearing on the investigation and the resulting report:

- *Cultural (heritage) resources* are all non-physical and physical human-made occurrences, as well as natural occurrences that are associated with human activity. These include all sites, structures and artefacts of importance, either individually or in groups, in the history, architecture and archaeology of human (cultural) development.
- The *cultural significance* of sites and artefacts is determined by means of their historical, social, aesthetic, technological and scientific value in relation to their uniqueness, condition of preservation and research potential. It must be kept in mind that the various aspects are not mutually exclusive, and that the evaluation of any site is done with reference to any number of these.
- The *value* is related to concepts such as *worth, merit, attraction or appeal*, concepts that are associated with the (current) usefulness and condition of a place or an object. Hence, in the development area, there are instances where elements of the place have a high level of significance but a lower level of value.
- It must be kept in mind that significance and value are not mutually exclusive, and that the evaluation of any feature is based on a combination or balance between the two.
- Isolated occurrences: findings of artefacts or other remains located apart from archaeological sites. Although these are noted and samples are collected, it is not used in impact assessment and therefore do not feature in the report.
- Traditional cultural use: resources which are culturally important to people.
- All archaeological remains, artificial features and structures older than 100 years and historic structures older than 60 years are protected by the relevant legislation, in this case the National Heritage Resources Act (NHRA) (Act No. 25 of 1999). No archaeological artefact, assemblage or settlement (site) and no historical building or structure older than 60 years may be altered, moved or destroyed without the necessary authorisation from the South African Heritage Resources Agency (SAHRA) or a provincial heritage resources authority. Full cognisance is taken of this Act in making recommendations in this report.
- The guidelines as provided by the NHRA (Act No. 25 of 1999) in Section 3, with special reference to subsection 3, and the Australian ICOMOS Charter (also known as the Burra Charter) are used when determining the cultural significance or other special value of archaeological or historical sites.
- It should be kept in mind that archaeological deposits usually occur below ground level. Should artefacts or skeletal material be revealed at the site during construction, such activities should be halted, and it would be required that the heritage consultants would be required to be notified in order for an investigation and evaluation of the find(s) to take place (*cf.* NHRA (Act No. 25 of 1999), Section 36 (6)).

#### 4.1.2 Limiting/Restricting factors

The investigation has been influenced by the following factors related to the overall HIA:

- Unpredictability of buried archaeological remains (absence of evidence does not mean evidence of absence)

**4.1.3 Field work**

This was done through foot and vehicle investigations of the study area in November 2009 and again in January and February 2010.

**4.1.4 Desktop study**

- Published literature
- Aerial images (historical and contemporary)
- Cadastral diagrams
- Archival records
- Maps (historical and contemporary)
- Title deeds
- Existing HIA reports (see list of references)

**4.1.5 Verbal information**

- Farm workers
- Farmers
- Project team members

**4.2 General issues of site and context**

<b>4.2.1 Context</b>		
	<i>(check box of all relevant categories)</i>	<i>Brief description/explanation</i>
	Urban environmental context	<ul style="list-style-type: none"> <li>• Roads</li> <li>• Vacant land</li> <li>• Former grazing land</li> <li>• Former pasture land</li> <li>• Farmland with modern buildings</li> <li>• Mining areas</li> </ul>
x	Rural environmental context	
	Natural environmental context	
<b>Formal protection (NHRA)</b>		
	Is the property part of a protected area (S. 28)?	No
	Is the property part of a heritage area (S. 31)?	No
<b>Other</b>		
	Is the property near to or visible from any protected heritage sites?	No
	Is the property part of a conservation area or special area in terms of the Zoning Scheme?	No
	Does the site form part of a historical settlement or townscape?	No
x	Does the site form part of a rural cultural landscape?	Yes: Former farm land
	Does the site form part of a natural landscape of cultural significance?	No
	Is the site within or adjacent to a scenic route?	No
	Is the property within or adjacent to any other area which has special environmental or heritage protection?	No
	Does the general context or any adjoining properties have cultural significance?	No

<b>4.2.2 Property features and characteristics</b>		
	<i>(check box if YES)</i>	<i>Brief description</i>
x	Have there been any previous development impacts on the property	Yes: Roads, tracks, old pastures, grazing land, buildings, water reservoirs, tree lanes, collieries, villages, etc
	Are there any significant landscape features on the property?	No
	Are there any sites or features of geological significance on the property?	No
	Does the property have any rocky outcrops on it?	No
x	Does the property have any fresh water sources (springs, streams, rivers) on or alongside it?	Yes
	Does the property have any sea frontage?	No
	Does the property form part of a coastal dune system?	No
	Are there any marine shell heaps or scatters on the property?	No
	Is the property or part thereof on land reclaimed from the sea?	No

<b>4.2.3 Heritage resources on the property</b>		
	<i>(check box if present on the property)</i>	<i>Name / List / Brief description</i>
<b>Formal protections (NHRA)</b>		
	National heritage site (S. 27)	No
	Provincial heritage site (S. 27)	No
	Provisional protection (s.29)	No
	Place listed in heritage register (S. 30)	No
<b>General protections (NHRA)</b>		
x	structures older than 60 years (S. 34)	Yes
	archaeological site or material (S. 35)	No
x	palaeontological site or material (S. 35)	Possible
x	graves or burial grounds (S. 36)	Yes
	public monuments or memorials (S. 37)	No
<b>Other</b>		
	Any heritage resource identified in a heritage survey (state author and date of survey and survey grading/s)	No
	Any other heritage resources (describe)	No

<b>4.2.4 Property history and associations</b>		
	<i>(check box if YES)</i>	<i>Brief description/explanation</i>
x	Provide a brief history of the property (e.g. when granted, previous owners and uses).	See Appendix 1
	Is the property associated with any important persons or groups?	No
x	Is the property associated with any important events, activities or public memory?	Yes: Battle of Bakenlaagte 30 October 1901

<b>4.2.4 Property history and associations</b>		
	Does the property have any direct association with the history of slavery?	No
	Is the property associated with or used for living heritage?	No
	Are there any oral traditions attached to the property?	No

### 4.3 Summarised identification and significance assessment of heritage resources

See Appendix 3 for significance assessment criteria

**TABLE 10: Identification and significance assessment of heritage features**

S 3(2) NHRA heritage resource category	ELEMENTS	INDICATORS OF HERITAGE SIGNIFICANCE										CUMULATIVE SIGNIFICANCE RATING (TOTAL 30) 1-9 = Low = 1 10-19 = Medium = 2 20-30 = High = 3
		HISTORICAL	RARE	SCIENTIFIC	TYPICAL	AESTHETIC	TECHNOLOGICAL	PERSON COMMUNITY	LANDMARK	MATERIAL CONDITION	SUSTAINABILITY	
Buildings, structures, places and equipment of cultural significance	All sites	1	0	0	1	0	0	3	0	2	1	8 = Low = 1 (average for all)
Areas to which oral traditions are attached or which are associated with intangible heritage	Bakenlaagte farm (part of battlefield)	3	1	0	2	0	0	2	1	1	3	13 = Medium = 2
Historical settlements and townscapes	None	-	-	-	-	-	-	-	-	-	-	-
Landscapes and natural features of cultural significance												
Geological sites of scientific or cultural importance	None	-	-	-	-	-	-	-	-	-	-	-
Archaeological and palaeontological sites	None	-	-	-	-	-	-	-	-	-	-	-
Graves and burial grounds	All grave sites	3	0	0	3	1	0	3	0	1	2	13 = Medium = 2
Areas of significance related to labour history	None	-	-	-	-	-	-	-	-	-	-	-
Movable objects	None	-	-	-	-	-	-	-	-	-	-	-





**FIGURE 13: Graveyard 1 near Duvha (Photo M Moolman) located on the amended section I-K**



**FIGURE 14: Google Earth image showing the location of Graveyard 1 in relationship to the amended (preferred) section indicated in yellow**



**FIGURE 15: Google Earth image showing the location of S 1 (Kayo Bazaar) in relationship to the amended and also authorised section G-H indicated in yellow**



**FIGURE 16: Kayo Bazaar (S 1). This building is probably older than 60 years but will not be affected.**





**FIGURE 17: Google Earth image showing the location of S 2 (Van Dyksdrift shops) in relationship to the amended and also authorised section G-H indicated in yellow**



**FIGURE 18: Modern shop and utility buildings, Van Dyksdrift, which will not be affected**



**FIGURE 19: Google Earth image showing the location of the old mine shaft (MS 1) in relationship to the amended and authorised section G-H indicated in yellow**

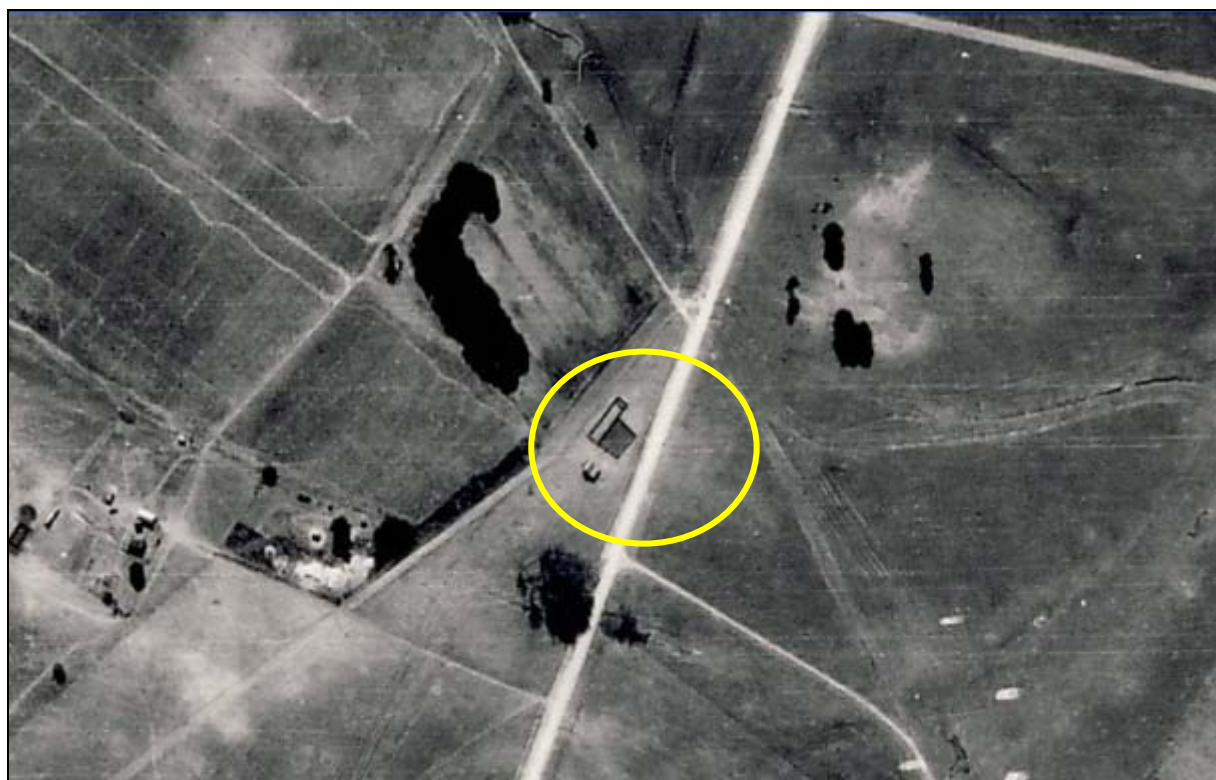


**FIGURE 20: Google Earth image showing the location of the ruin (FR 1) and a homestead (FH 1) in relationship to the amended section F-G indicated in yellow**





**FIGURE 21: Farm Ruin 1 close to the R 544**



**FIGURE 22: Portion of 1954 aerial image showing that Farm Ruin 1 used to be a shed with an enclosure**



**FIGURE 23: Google Earth image showing the location of homesteads FH 2 and FH 3 as well as farmstead FD 1 in relationship to the authorised section F-G (light blue)**

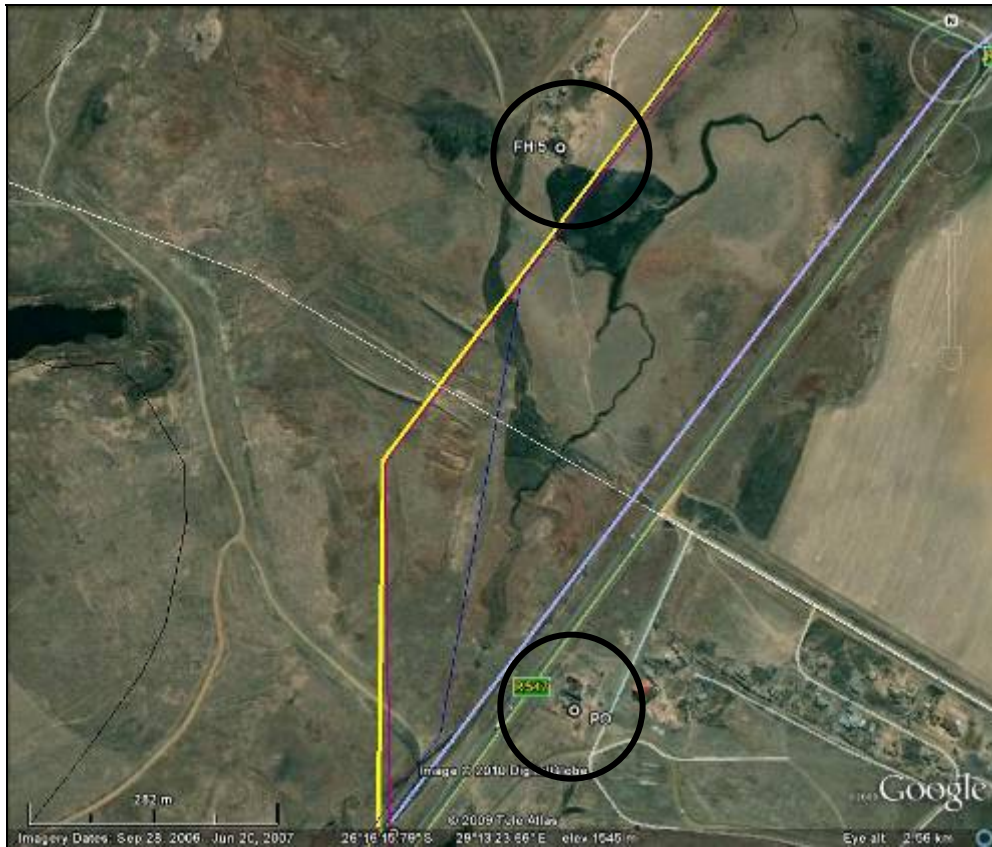


**FIGURE 24: Google Earth image showing the location of homestead FH 4 and graveyards GY 2 and 3 in relationship to the authorised section F-G (light blue) and the amended section (yellow)**





**FIGURE 25: Graveyard 2 (single grave) near former farmstead located on amended section F-G**



**FIGURE 26: Google Earth image showing the location of a homestead (FH 5) in relationship to the amended section F-G indicated in yellow, and the location of the old post office (PO) in relationship to the authorised section F-G (light blue)**



**FIGURE 27: FH 5 (foreground) and the old Kriel post office (PO) in the background (arrow)**



**FIGURE 28: Google Earth image showing the location of Graveyard 5 in relationship to the amended section C-D indicated in yellow and of the Bakenlaagte farmstead FD 2 in relationship to the authorised section D-E (light blue)**





**FIGURE 29: Graveyard 5 near Matla Power Station, consisting of about 14 graves**



**FIGURE 30: Bakenlaagte farmstead FD 2**

**4.4 Summarised impact assessment affecting heritage resources**

- See Appendix 4 for an explanation of the rating system

**TABLE 11: Summarised heritage impact assessment**

ITEM	AFFECTED HERITAGE RESOURCES	IMPACT TYPE	ISSUES	SEVERITY RATING (intensity factor x duration factor = value = rating)				PROBABILITY RATING	IMPACT SIGNIFICANCE RATING (severity rating x probability rating)	RISK CONS.	RISK RATING
				INTENSITY	DURATION	VALUES	RATING				
1	Buildings, structures, places and equipment of cultural significance: Homesteads and old mine shaft	Pos.	None	1	2	2	2	2	4	Low	1
		Neg.	Possible demolition	1	2	2	2	2	4	Low	1
2	Areas to which oral traditions are attached or which are associated with intangible heritage	Pos.	None	1	2	2	2	2	4	Low	1
		Neg.	None	1	2	2	2	2	4	Low	1
3	Historical settlements and townscapes	Pos.	-	-	-	-	-	-	-	-	-
		Neg.	-	-	-	-	-	-	-	-	-
4	Landscapes and natural features of cultural significance	Pos.	-	-	-	-	-	-	-	-	-
		Neg.	-	-	-	-	-	-	-	-	-
5	Geological sites of scientific or cultural importance	Pos.	-	-	-	-	-	-	-	-	-
		Neg.	-	-	-	-	-	-	-	-	-
6	Archaeological and palaeontological sites	Pos.	Chance finds	1	2	2	2	2	4	Low	1
		Neg.	Chance finds	1	2	2	2	2	4	Low	1
7	Graves and burial grounds	Pos.	Relocation	4	3	12	4	3	12	Low-Medium	2
		Neg.	Relocation	4	3	12	4	3	12	Low-Medium	2
8	Areas of significance related to labour history	Pos.	-	-	-	-	-	-	-	-	-
		Neg.	-	-	-	-	-	-	-	-	-
9	Movable objects	Pos.	-	-	-	-	-	-	-	-	-
		Neg.	-	-	-	-	-	-	-	-	-

#### 4.5 Summarised recommended impact management interventions

**TABLE 12: Summarised recommended impact management interventions**

S 3(2) NHRA heritage resource	Site no	Site name	Impact significance Cultural significance rating x impact risk rating			Impact management	Motivation
			Cult. Sign.	Impact risk	Impact Sign.		
Buildings, structures, places and equipment of cultural significance	Homesteads	-	1	2 = Low pos.	+ 2 = Low	-	-
				2 = Low neg.	+ 2 = Low	Avoid, otherwise demolition permits for structures older than 60 years	NHRA Section 34
Areas to which oral traditions are attached or which are associated with intangible heritage	-	Study area	1	1 = Low pos.	+ 1 = Low	-	-
				1 = Low neg.	- 1 = Low	-	Difficult to mitigate – battle field itself outside pipeline route
Historical settlements and townscapes	-	-	-	Pos.	-	-	-
				Neg.	-	-	-
Landscapes and natural features of cultural significance	-	Whole site	1	Pos.	-	-	-
				Neg.	-	-	-
Geological sites of scientific or cultural importance	-	-	-	Pos.	-	-	-
				Neg.	-	-	-
Archaeological and palaeontological sites	-	Chance finds	1	1 = Low pos.	+ 1 = Low	Sample	Opportunity to gather new info – NHRA Section 35
				1 = Low neg.	- 1 = Low	Sample and destroy	NHRA Section 35
Graves and burial grounds	GY sites	-	2	2 = Medium pos.	+ 4 = Medium	-	-
				2 = Medium neg.	- 4 = Medium	Avoid and protect otherwise relocate	NHRA Section 36
Areas of significance related to labour history	-	-	-	Pos.	-	-	-
				Neg.	-	-	-
Movable objects	-	-	-	Pos.	-	-	-
				Neg.	-	-	-

#### 4.6 Social and economic benefits

Where the development may directly affect graveyards but bypass them, such graveyards should be properly documented and protected, implying a benefit to heritage conservation. The development will have no direct benefits related to the conservation of other heritage resources since it is possible that these either may not be affected or may be destroyed.

The Komati Water Scheme Augmentation Project is intended to augment the Komati Water Scheme with water of sufficient quality to ultimately supply the Duvha Power Station. Included as part of the Augmentation Project is the infrastructure required to support the new proposed coal-fired power station in the Bronkhorstspuit area (Project Bravo).

Due to the imminent re-commissioning of the Komati Power Station, and the resultant increased demand on the Komati Water Scheme, the supply of water to the Duvha Power Station will experience increasing pressure. Therefore, Eskom has had to resort to alternative water sources to supply the Duvha Power Station.

**4.7 Consultation with affected communities**

Since this HIA is part of an Amendment Application Process, no specific HIA-related public consultation was required. Final reports that will be submitted to SAHRA must include the public participation report associated with the Amendment Application Process.

Farm workers, shop owners and farmers were consulted during fieldwork.

**4.8 Identification of other risk sources**

The following project actions will very likely impact negatively on any potential palaeontological and archaeological sites and remains.

The actions are likely to occur during the Construction Phase of the proposed project:

- Bulk earthworks and excavations may expose or uncover objects and artefacts and unmarked human burials.

**4.9 Key mitigation and enhancement measures before and during construction**

- Monitor for chance finds (e.g. burial sites, old waste disposal sites, ruins, foundations etc)
- Demarcate and fence graves (if to be preserved)
- Relocate graves (if preservation is not feasible) – cost ca R7000 per grave. Thus must be done by an accredited archaeologist through a Section 36 SAHRA permit application.

**4.10 Consideration of alternatives**

The amended route sections were originally considered as alternatives to a preferred route and it has proven that these amended sections are to be preferred; hence, alternatives have already been considered as part of the HIA process.

**4.11 Summarised findings and recommendations**

The anticipated impact on any heritage resources will be low, with the possible exception of the graves, where the anticipated impact could be medium. In the unlikely event that foundations, old rubbish dumps and similar chance finds are discovered, the anticipated impact will be moderate, depending what the nature and significance of such chance finds will be. The pipeline sections will traverse large areas that have been transformed by grazing, mining, pastures and road-making; hence, very few significant heritage resources have remained and therefore the impact will be very low.

The below table lists the number of risks (and consequent mitigations) associated with each section in terms of authorised and amended routes:

**TABLE 13: Risks and mitigations regarding authorised and amended routes**

SECTION	NUMBER OF RISKS		COMMENTS
	AUTHORISED ROUTE	AMENDED ROUTE	
A-B	No	Yes: None	Supported
B-B1	-	Yes: None	Supported
B-C	-	Yes: None	Supported
C-D	-	Yes: 1 (GY 6)	Supported (graves can be relocated)
E-D	Yes: 1 (Bakenlaagte farmstead)	-	Not supported: Damage to and destruction of parts of farmstead
B1-A1-E	Yes: None	Yes: None	Supported (runs along road)
E-F	Yes: None	Yes: None	Supported (runs along road)

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SECTION	NUMBER OF RISKS		COMMENTS
	AUTHORISED ROUTE	AMENDED ROUTE	
F-G	Yes: 5 (PO, FH 4, GY 7, FH 2 and 3)	-	Not supported (may affect too many heritage resources)
F-G	-	Yes: 1 (GY 2)	Supported (grave can be relocated)
G-H	Yes: 2 (GY 4 and 5)	Yes: 2 (GY 4 and 5)	Supported (runs along road and graves can be relocated)
H-I	Yes: None	Yes: None	Supported (runs along roads, no heritage)
I-K	-	Yes: 1 (GY 1)	Supported (graves can be relocated)
I-J-K	Yes: None	-	Supported (runs along road)

Based on the above findings, Cultmatrix states that there are no compelling reasons to delay or prevent the proposed amendment, provided that the recommended mitigation measures are applied. Except for three burial sites (which can be preserved or relocated), no heritage resources will be severely affected. There are no heritage resources of significance that should be preserved or memorialised in case of demolition.

Based on additional fieldwork since the 2009 BKS report, the amended route is supported since it will directly affect less heritage features (5 in total) than the authorised route (8 in total).

Both the authorised (I-J-K) and amended (I-K) northern sections of the project are supported. Preference is given to the authorised section since this runs along existing roads, but other factors (e.g. longer distance) may negate this option.

### Recommendations

1. Should any human remains be disturbed, exposed or uncovered during excavations for the proposed project (unlikely), these should immediately be reported to an accredited archaeologist. Burial remains should not be disturbed or removed until inspected by an archaeologist.
2. Site preparation activities must be monitored for the occurrence of any other archaeological material (Stone Age tools, Iron Age artefacts, historic waste disposal sites etc) and similar hidden/buried chance finds and an archaeologist should be asked to inspect the area when this has reached an advanced stage in order to verify the presence or absence of any such material.
3. Grave sites should be cleared of vegetation in order to establish the exact number of graves that may need to be preserved or moved.
4. If possible, graves in close proximity of the pipeline should be left in situ and sites should be cleared, documented and fenced off, together with an interpretive sign that explains their significance. Should this not be feasible, they may be relocated subject to the granting of a permit by SAHRA.
5. The above recommendations must be included in the Environment Management Plan for the proposed project.

## APPENDIX 1: SOCIO-CULTURAL HISTORY OF DEVELOPMENT SITE

### Early Stone Age

*In South Africa the ESA dates from about 2 million to 250 000 years ago, from the early to middle Pleistocene. Over this time, the archaeological evidence shows, as our early ancestors advanced physically, mentally and socially they invented stone and bone tools and learned to control fire and exploit natural resources effectively. The earliest tools clearly manufactured by our ancestors and their relatives (early hominids) date to 2,5 million years ago, from the site of Gona in Ethiopia. These tools showed that early hominids were able to select a suitable raw material and flake it for a specific purpose. As many of the bones found in association with early tools bear cut marks, scientists have inferred that early hominids were chipping flakes off cobbles in order to create a sharp edge with which to cut meat from animal carcasses. It would seem that these early stone tools helped early hominids to access a high-protein food source in sufficient quantity to develop their brains – the brain being metabolically the most expensive organ in the body.*

*This earliest stone tool industry is called the Oldowan, after Olduvai Gorge in Tanzania where the tools and their importance to hominid development were first recognised by Mary Leakey in the 1960s.*

*To date Oldowan tools have only been found in Africa. This early technology is fairly consistent across Africa, in that the tools are mainly simple flakes struck from cobbles, a technology that appears to have been sufficient to meet the needs of early hominids as it persisted for a long time. At sites like Olduvai Gorge and Koobi Fora in Kenya, Oldowan tools remained unchanged until about 1,5 million years ago. Oldowan technology thus represents a long period of successful adaptation, which lasted for almost a million years. In South Africa the Oldowan Industry dates from about 2 million years ago. There is still some debate about which hominid made the Oldowan tools as there were at least two hominids in South Africa at that time which were capable of doing so. The first was an early form of Homo, and the second was Paranthropus robustus, which went extinct approximately one million years ago. Because the technology did not disappear when Paranthropus went extinct, it is often assumed that Homo was the toolmaker.*

*About 1,7 million years ago more specialised tools appeared, developing first in Africa then spreading to Asia and Europe through the movement of hominids out of Africa. These core tools, which are known as Acheulean tools after the French site, Saint Acheul, where they were first discovered in the 1800s, were intentionally designed to have sharper and straighter edges and studies suggest they were used to carry out a range of activities including butchering animals, chopping wood, digging up roots and cracking bone. Interestingly, even though the tools were named after a French site, they only appeared in Europe about 500 000 years ago.*

*The hominid species Homo ergaster has been credited with the manufacture of the Acheulean tools in South Africa. Compared with earlier hominids, Homo ergaster was physically almost like us; it had a larger brain, and was relatively modern in face, body proportion and height. In fact, it had a body very much like our own. Homo ergaster ranged over vast areas of territory, and occupied a variety of habitats, including drier, more open grassland settings. Most importantly, Homo ergaster became more dependent on tools; it became a habitual tool user.*

*Oldowan and Acheulean tools are widely distributed across South Africa, where they are most commonly found in association with water sources such as lakes and rivers. Unfortunately, because of this there are very few sites where the tools are found in a primary context, that is, exactly where the user left them. Most of the tools have either been washed into caves or eroded out of riverbanks and washed down rivers.*

(Source: Peter Delius (ed), 2006, *Mpumalanga – Reclaiming the Past, Defining the Future*)

There are only a few places in Mpumalanga where Early Stone Age tools have been found and the area is not known as a site.

### Middle Stone Age

*By 250 000 the large hand axes and cleavers of the Earlier Stone Age had begun to diminish in numbers, and our ancestors started to employ a different technique in order to produce a greater variety of tools of diverse shapes and sizes. This change in technology marks the beginning of the Middle Stone Age*

*(MSA). MSA tools are generally smaller, and, unlike ESA tools, which were produced by removing flakes, MSA tools were the flakes. These flakes were of a predetermined size and shape and were produced by preparing the core and striking the flake off. Long, parallel-sided blades, as well as triangular flakes, were commonly produced. The hafting of stone tools onto bone or wood to produce spears, knives or axes also became popular during the MSA, which reflected a shift from scavenging to spear hunting. During the MSA early humans still settled along or near water sources, but also took shelter in caves. Importantly, the MSA marks the transition from a more archaic Homo to anatomically modern humans, Homo sapiens. With this physical development the first signs of art, decoration and symbolism began to emerge.*

*Although the MSA has not been extensively studied in Mpumalanga, evidence for this period has been excavated from Bushman Rock Shelter, a well-known site situated on the farm Klipfonteinhoek in the Ohrigstad District.*

(Source: Peter Delius (ed), 2006, *Mpumalanga – Reclaiming the Past, Defining the Future*)

Middle Stone Age sites may occur along rivers and streams but none have been identified and their occurrence is difficult to predict.

### **Late Stone Age**

*The Later Stone Age (LSA), which occurred from about 20 000 years ago, is signalled by a series of technological innovations and social transformations within these early hunter-gatherer societies. The hunting apparatus now included two important innovations, the bow and the link-shaft arrow. Link-shaft arrows were constructed with a poisoned bone tip, a link and shaft that fell away on impact, leaving the poison tip imbedded in the animal. Other innovations included bored stones, used as digging-stick weights to aid in uprooting tubers and roots; small stone tools, often less than 25 mm in length, used for cutting meat and scraping hides; polished bone tools such as needles; twine made from plant fibre or leather; tortoiseshell bowls; fishing equipment, including hooks and sinkers; bone tools with decoration; high frequencies of ostrich eggshell beads and an increase in ornaments and artwork.*

*There appears to be a gap in the Mpumalanga LSA record between 9 000 BP and 5 000 BP. This may have to do with the general dearth of Stone Age research in the province, but it also encompasses a period of rapid warming and major climate fluctuation, which may have forced people to seek out more protected and viable environments in this area.*

*We pick up the Mpumalanga Stone Age record again in the mid-Holocene at the farm Honingklip (HKLP) near Badplaas in the Carolina District. Here two LSA sites were found on opposite sides of a bend in the Nhlazatshe River, about 1km west of its confluence with the Teespruit. The HKLP sites are in the foothills of the Drakensberg, where the climate is warmer than the Highveld but cooler than the Lowveld.*

(Source: Peter Delius (ed), 2006, *Mpumalanga – Reclaiming the Past, Defining the Future*)

Late Stone Age sites occur along rivers and streams but none have been identified and their occurrence is difficult to predict.

### **Early Iron Age occupation**

*The expansion of early farmers, who, among other things, cultivated crops, raised livestock, mined ore and smelted metals, occurred in this area between AD 400 and AD 1100. Dates from Early Iron Age sites indicated that by the beginning of the 5th century AD Bantu-speaking farmers had migrated down the eastern lowlands and settled in the Mpumalanga Lowveld. Subsequently, farmers continued to move into and between the Lowveld and Highveld of Mpumalanga until the 12th century. These Early Iron Age sites tend to be found in similar locations. Sites were found within 100m of water, either on a riverbank or at the confluence of streams. The close proximity to streams meant that the sites were often located on alluvial fans. The nutrient rich alluvial soils would have been favoured for agriculture. The availability of floodplains and naturally wetter soils would have been important for the practice of dryland farming. This may have been particularly so during the Early Iron Age when climate reconstruction for the interior of South Africa suggests decreased rainfall between AD 900 and AD 1100 and again after AD 1450.*

*Burned dagha and plaster with pole impressions found at these early Lowveld sites indicated that early farmers lived in fairly permanent agricultural villages. Grindstones and an imprint of millet or domestic Pennisetum in a piece of pottery from an AD 400 site on the northern border of Mpumalanga provided the*



*first evidence of the cultivation of millet in South Africa. Remains of iron tools indicated that metalworking was also practised. Iron was an important commodity, and ores in the form of haematite and magnetite were either picked up off the surface or mined from shafts dug into the ground. Large cattle byres with pits were also significant features of EIA Highveld sites dating from AD 600.*

(Source: Peter Delius (ed), 2006, *Mpumalanga – Reclaiming the Past, Defining the Future*)

Farming activities have transformed the study area and there are no traces of Early Iron Age settlements. The environment also is not known for its Early Iron Age.

### **Late Iron Age occupation**

*While there is some evidence that the EIA continued into the 15th century in the Lowveld, on the escarpment it had ended by AD1100. The Highveld, particularly around Lydenburg, Badfontein, Sekhukhuneland, Roosenekal, and Steelpoort, became active again from the 15th century onwards. This later phase, termed the Late Iron Age (LIA), was accompanied by extensive stonewalled settlements.*

*Trade no doubt played an important role in the economy of these early societies. Goods were traded both locally and further afield. Control of resources such as metal provided a solid economic base that was fairly impervious to changes in the environment. Traditional sources of wealth were easily bolstered as metals were used in place of cattle to encourage key marriage alliances, and at the same time used to purchase livestock and other trade items from outside the country.*

*Local trade consisted of metal, salt, thatch, poles, cattle and grain. Salt was produced from alkaline springs. This valuable commodity could be obtained by paying a tithe to the chief on whose land the salt was located. However, there were examples of mass production where salt was 'balled' for transport and sold for huge profit in salt scarce areas. By the 1700s, with growing trade wealth, economically driven centres of control began to emerge and, following the establishment of Portuguese trade posts, the Mpumalanga landscape became an important thoroughfare for both local and foreign traders.*

(Source: Peter Delius (ed), 2006, *Mpumalanga – Reclaiming the Past, Defining the Future*)

Typical late Iron Age features such as stone-walled settlements, potsherds, hut floors, middens and iron artefacts were not found in the study area due to disturbance by farming and mining activities. Scattered artefacts may be found along the river courses.

### **Pre-colonial settlement**

*Mpumalanga was populated by multiple and ethnically diverse but interrelated communities. It was inhabited by the San (Hunter-Gatherer, Basarwa or Bathwa) groupings prior to the settlement of various Late Iron Age (LIA) farming communities, the ancestors of modern Sotho-Tswana and Nguni societies. The north-western and southern portions of the region came to be broadly occupied by the Kgatla (Bakgatla), Rolong (Barolong), Ntwane (Bantwane), Koni (Bakone), Kopa (Bakopa) and Southern Ndebele mixed farming communities.*

*Despite their general association with LSA and their assumed disappearance, it is clear that San groups continued to interact with farmers in the Eastern Transvaal, as was the case elsewhere, and the evidence of a range of forms of coexistence warns us against drawing rigid distinctions between the two cultures. Material assemblages from excavated sites, San rock paintings and engravings and cultural and linguistic evidence point to some forms of peaceful contacts between these diverse communities.*

*According to other recorded oral traditions ancestors of Bakone groupings occupied parts of the low country (Phalaborwa and Bokgaga near Leydsdorp) at an uncertain date. The main body of the Bakone appears to have been under the Matlala ruling lineage at the time of their fragmentation into a multiplicity of groups and subsequent chiefdoms around the 15th to 16th centuries. While some groups remained in the low country others ventured further west and southwards and Koni groups came to settle in the areas later called Ohrigstad, Lydenburg and Middelburg.*

*Either before or at the start of the 17th century an early Nguni-speaking community entered the orbit of the Sotho-Tswana communities in the Transvaal and in particular the north-eastern Highveld. The Sotho-Tswana people commonly called this early Nguni offshoot Matebele, denoting Pursuers. According to P.*

*Lekgoathi these Nguni groups accepted the appellation Matebele but pronounced it as Amandebele. Anthropologists and historians later rendered both Sotho-Tswana and Nguni terms as Ndebele.*

*In due course relations between other royal contenders degenerated into open confrontation. The Manala (Mabena) and Mhwaduba sections remained independently in and around Pretoria areas while the Ndzundza and Mthombeni groups moved north-eastward into the environs of the Steelpoort (Tubatse) River valley and the slopes of Bothasberg in Middelburg.*

*There is evidence that Mzilikazi's Ndebele invaded the south-eastern and central Transvaal areas. Accounts of the Southern Ndebele, the Koni, the Kgatla, the Rolong and the Ntwane attest to Mzilikazi's sporadic plunder and their own counter raids of Mzilikazi's frequent raids. The Koni, Kopa and some Eastern Sotho fortified settlements in the Middelburg, Nelspruit (Waterval Boven, Sudwala Caves) and Lydenburg areas were attacked by intruding armies.*

(Source: Peter Delius (ed), 2006, *Mpumalanga – Reclaiming the Past, Defining the Future*)

### **Colonial settlement**

*In 1845 the establishment of a Boer settlement at Ohrigstad marked the beginning of a new phase in the history of the Eastern Transvaal. The first Trekkers to settle in the area were the followers of A H Potgieter, who moved from Mooi River in the south-western Transvaal. Trekkers from Natal led by J J Burger joined them. Tensions between the two groups soon surfaced and the difficulties facing the community were compounded by malaria, which decimated the population, and stock disease, which ravaged their herds. In 1848, partly to escape this disease and conflict-ridden community, Potgieter and his followers moved north and founded the town of Schoemansdal. Most of those who remained behind moved to higher-lying lands to the south. The town of Lydenburg became the new centre of the community and white settlers slowly established themselves in the wider region. The Trekkers' political fractiousness did not, however, diminish. In 1856 the Lydenburg community seceded from the Zuid Afrikaansche Republiek (ZAR) – a development that was symptomatic of the fragility of the wider state. Political instability and racial exclusivity – blacks were infamously denied any equality in church or state – however, co-existed with strong traditions of popular democracy. It was not until 1864 that political unity was achieved among the main Trekker communities in the Transvaal and even thereafter the state remained both rudimentary and cash strapped.*

*Once the Trekkers had established what they saw as their right to the land they set about distributing it among themselves. The land was demarcated into large farms and title deeds were issued. The initial policy was that all burghers (citizens) were entitled to two farms of 3 000 morgen each (about 6 330 acres or 2 564 hectares) from the state. White newcomers to the Transvaal were quickly granted citizenship and the land that went with it. Farms, which were not distributed, remained government property and the ZAR, which battled to raise revenue, increasingly fell back on its principal asset – land.*

*This profligate distribution of land could not be sustained. From 1860 land grants to burghers were reduced to one 3 000 morgen farm each. After 1866 newcomers no longer received any grant of land and from 1871 this prohibition applied even to the sons of burghers.*

*The most consistent supply of labour for those farmers able to enforce their claim to ownership of the land came from African families living on their property. The practice that developed in the area was that five families of a group were expected to render unpaid labour service to the landowner but were then spared from further demands on their labour or their produce by officials or neighbouring farmers. Elements of a patriarchal pact underpinned these arrangements as male elders within African communities used their authority over both women and youths to meet the farmers' appetite for workers. Over the subsequent decades the amount of labour that could be extracted from resident workers would be a source of recurring strife. Communities settled on land owned by absentee landlords were often able to secure their tenure through payments of rent in cash or kind, to the considerable irritation of their white neighbours, who believed they should be forced to work for them.*

(Source: Peter Delius (ed), 2006, *Mpumalanga – Reclaiming the Past, Defining the Future*)

The farms were divided and subdivided many times over. Each subdivided portion often had a separate farmstead where the owner lived. Black tenant farmers and sharecroppers were allowed to live on the land in return for providing farm labour to the white farmers. They lived in homesteads away from the main farmstead. The graves are probably associated with this community.

Fought on the farms Nooitgedacht and Bakenlaagte, the Battle of Bakenlaagte (30 October 1901) was one of the most striking victories gained by Gen Louis Botha in the Anglo-Boer War. In the second half of October 1901 a British column under Lt-Col GE Benson proceeded from Bethal to Middelburg. No other British forces were in the neighbourhood. Botha quickly called up several Boer commandos from the Highveld districts and attacked Benson on the farms Nooitgedacht and Bakenlaagte. A heroic and unusual cavalry charge by the burghers during a heavy thunderstorm and their rifle fire decimated the British forces. Benson himself was mortally wounded and many of the British capitulated. This was the last important battle fought on the Highveld.



**FIGURE 31: Boer cavalry charge at the Battle of Bakenlaagte**

## APPENDIX 2: INFORMATION SOURCES USED IN THIS REPORT

### Databases

Environmental Potential Atlas, Department of Environmental Affairs and Tourism.  
Heritage Sites Database, Pretoria

### Literature

BERGH, JS (ed), 1999, *Geskiedenisatlas van Suid-Afrika. Die vier noordelike provinsies*. Pretoria: JL van Schaik.

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*Living with the land. A manual for documenting cultural landscapes in the Northwest Territories*. Yellowknife (Canada), 2007.

MAGGS, T.M.O'C. 1976. Iron Age communities of the southern Highveld. Pietermaritzburg: Occasional Publications of the Natal Museum, No.2.

MASON, R, *Prehistory of the Transvaal*.

*National Heritage Resources Act (Act 25 of 1999)*

*Standard Encyclopedia of Southern Africa*.

STRATEGIC ENVIRONMENTAL FOCUS, 2008, *Environmental Impact Assessment Report: The Komati Water Scheme Augmentation Project Mpumalanga*. Unpublished report submitted to DEAT.

VAN SCHALKWYK, JA, 2007, *Heritage Impact Survey Report for the Komati Water Scheme Augmentation Project, Mpumalanga Province*. Unpublished report submitted to SEF.

### Maps

2529 CD Middelburg (1959, 1996)

2629 AB Van Dyksdrif (1996)

2629 AC Evander (1995)

Cadastral diagrams of the farm (Chief Surveyor-General)

Maps provided by client

**Aerial photos**

Job 340/1954 strips 1-6  
Google Earth  
Images provided by client

**Verbal information**

Farmers and farm workers  
Mr Yunus Hashim, Ideal Supermarket, Van Dyksdrift  
Project team members

## APPENDIX 3: GLOSSARY OF TERMS

### Cultural significance (Burra Charter)

Aesthetic, historic, scientific, social or spiritual importance, meaning or noteworthiness for past, present or future generations

Cultural significance is embodied in the place itself (intrinsic significance), its fabric, setting, use, associations, meanings, records, related places and related objects.

Cultural significance is assessed in terms of the following criteria, some of which are embodied in the NHRA:

- Historic value: Material or intangible evidence resulting from changing social, political and environmental circumstances or conditions
- Rarity: Unique or unusual features also possess rarity value, apart from their age. Section 34 of the NHRA provided general protection for all structures older than 60 years. This does not imply that recently erected structures cannot possess rarity, or for that matter cultural value.
- Scientific value: Indicates research potential (the capacity to yield more knowledge)
- Typical: Indicates that the feature is a good example of a certain class or type of heritage resource
- Aesthetic: Other than artistic or architectural expression, aesthetic value can also be evident in craftsmanship, technique, visual cohesion (harmony), visual evidence of permanence and stability, setting etc.
- Technological: Indicates value in terms of a technological achievement
- Personal/Community: Indicates value in terms of association with a certain person, community, organisation or cultural group
- Landmark: A sense of place or belonging involves the physical and visual relationship between a feature and its environment.
- Condition (material integrity): Indicates substantial evidence of authentic fabric with minor degree of lost or obliterated fabric; also refers to a structure's restoration potential
- Sustainability: The potential for lasting economic viability (use) and the perpetuation of the original use or part thereof.

### Heritage resources/features (NHRA)

Any place or object of cultural significance, including:

- (a) places, buildings, structures and equipment of cultural significance;
- (b) places to which oral traditions are attached or which are associated with living heritage;
- (c) historical settlements and townscapes;
- (d) landscapes and natural features of cultural significance;
- (e) geological sites of scientific or cultural importance;
- (f) archaeological and palaeontological sites;
- (g) graves and burial grounds, including—
  - (i) ancestral graves;
  - (ii) royal graves and graves of traditional leaders;
  - (iii) graves of victims of conflict;
  - (iv) graves of individuals designated by the Minister by notice in the *Gazette*;
  - (v) historical graves and cemeteries; and
  - (vi) other human remains, which are not covered in terms of the Human Tissue Act, 1983 Act No. 65 of 1983);
- (h) sites of significance relating to the history of slavery in South Africa;
- (i) movable objects, including—
  - (i) objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens;
  - (ii) objects to which oral traditions are attached or which are associated with living heritage;
  - (iii) ethnographic art and objects;
  - (iv) military objects;

(v) objects of decorative or fine art;  
 (vi) objects of scientific or technological interest; and  
 (vii) books, records, documents, photographic positives and negatives, graphic, film or video material or sound recordings, excluding those that are public records as defined in section 1(xiv) of the National Archives of South Africa Act, 1996 (Act No. 43 of 1996).

Heritage significance (NHRA)

(a) its importance in the community, or pattern of South Africa's history;  
 (b) its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;  
 (c) its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;  
 (d) its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;  
 (e) its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;  
 (f) its importance in demonstrating a high degree of creative or technical achievement at a particular period;  
 (g) its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;  
 (h) its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa; and  
 (i) sites of significance relating to the history of slavery in South Africa.

### **Historic period**

Since the arrival of the white settlers - c. AD 1840 in this part of the country

### **Impact**

A description of the effect of an aspect of the development on a specified component of the biophysical, social or economic environment within a defined time and space

### **Impact assessment**

Issues that cannot be resolved during screening (Level 1) and scoping (Level 2) and thus require further investigation

### **Intangible heritage**

Defined in terms of the UNESCO Convention for the Safeguarding of the Intangible Cultural Heritage (2003) as:

- Oral traditions and expressions, including language as a vehicle of the intangible cultural heritage;
- Performing arts;
- Social practices, rituals and festive events;
- Knowledge and practices concerning nature and the universe;
- Traditional craftsmanship.

The "intangible cultural heritage" means the practices, representations, expressions, knowledge, skills – as well as the instruments, objects, artefacts and cultural spaces associated therewith – that communities, groups and, in some cases, individuals recognize as part of their cultural heritage. This intangible cultural heritage, transmitted from generation to generation, is constantly recreated by communities and groups in response to their environment, their interaction with nature and their history, and provides them with a sense of identity and continuity, thus promoting respect for cultural diversity and human creativity.

Visual and social impact assessments as part of an HIA are directly associated with intangible cultural heritage.



**Iron Age**

Early Iron Age (EIA)	AD 200 - AD 1000
Late Iron Age (LIA)	AD 1000 - AD 1830

**Issue**

A question that asks what the impact of the proposed development will be on some element of the environment

**Maintenance**

Keeping something in good health or repair

**Management actions**

Actions that enhance benefits associated with a proposed development or avoid, mitigate, restore, rehabilitate or compensate for the negative impacts

**Preservation**

Conservation activities that consolidate and maintain the existing form, material and integrity of a cultural resource

**Reconstruction**

Re-erecting a structure on its original site using original components

**Rehabilitation**

Re-using an original building or structure for its historic purpose or placing it in a new use that requires minimal change to the building or structure characteristics and its site and environment.

**Restoration**

Returning the existing fabric of a place to a known earlier state by removing additions or by reassembling existing components

**SAHRA** - South African Heritage Resources Agency

**Stone Age**

Early Stone Age (ESA)	2 000 000 - 150 000 Before Present
Middle Stone Age (MSA)	150 000 - 30 000 BP
Late Stone Age (LSA)	30 000 - until c. AD 200

**Value**

Worth, conservation utility, desirability to conserve etc in terms of physical condition, level of significance (importance), economy (feasibility), possible new uses and associations/comparisons with similar features elsewhere

## APPENDIX 4: STANDARDIZED SET OF CONVENTIONS USED TO ASSESS THE IMPACT OF PROJECTS ON INDIVIDUAL HERITAGE FEATURES

### Category of heritage significance of feature

One or more of the categories (a) to (i) in terms of Section 3(3) of the NHRA

From a heritage perspective there should be a distinction between significance embedded in the physical fabric, or in associations with events or persons, or in the experience of the place.

### Conservation value of heritage feature (individual)

Worth, conservation utility, and desirability to conserve: low, medium, high

### Duration of the impact

- Short term  
1-5 years  
Factor 2
- Medium term  
5-10 years  
Factor 3
- Long term  
Risk will only cease after the operational life of the activity, either because of natural processes or by human intervention  
Factor 4
- Permanent (irreversible)  
Mitigation, either by natural process or by human intervention, will not occur in such a way that the risk can be considered transient  
Factor 5

### Impact significance rating

This is calculated by multiplying the **severity rating** with the **probability rating**.

The impact significance factor should influence the development project as described below.

LEVEL	RATING	POSITIVE RISK CONSEQUENCE	NEGATIVE RISK CONSEQUENCE
Low	4-6	No influence on proposed development	No influence on proposed development
Medium	7-12	Proposed development should be approved	Proposed development should be mitigated or mitigation measures should be formulated before it can be approved
High	13-18	Points towards a decision to approve the development and with enhancement in final design	Points towards a decision to terminate development proposal or to formulate and perform mitigation to reduce significance level to at least low
Very high	19-25 and above	The development should be approved	If mitigation cannot be effectively implemented the development proposal should be terminated

### Intensity of impact

- Low  
Functions and processes of natural or human origin are not affected and only minor risks may occur  
Factor 1
- Medium  
Natural or heritage environment is affected but functions and processes of natural or human origin can continue through often in an altered manner

Factor 2

- High

Natural or heritage environment is affected to the extent that functions and processes of natural or human origin will temporarily or permanently cease  
Factor 4

**Nature of the impact**

Impact of the activity (development) on a heritage resource with indications about its positive and/or negative effects. The statement of significance informs it. The nature of the impact may be historical, aesthetic, social, linguistic, architectural, intrinsic, associational, contextual (visual or non-visual) or a combination of the above.

**Probability of the impact**

Probability describes the likelihood of the risk actually occurring and is rated as follows:

- Improbable Low possibility of risk to occur either because of design or historic experience  
Rating 2
- Probable Prominent possibility that risk will occur  
Rating 3
- Highly probable Most likely that risk will occur  
Rating 4
- Definite Risk will occur regardless of any prevention measures  
Rating 5

**Recommended management action**

For each impact, the recommended practically attainable mitigation actions that would result in a measurable reduction of the impact must be identified. This is expressed according to the following:

1. Avoidance: Preserve feature at all costs and restore/rehabilitate/enhance it together with interpretation
2. Mitigation: Preserve feature if possible, otherwise salvage excavation and/or documentation/recording before demolition/alteration, followed by preserving its memory in design and scale of development
3. None: No further action required

**Severity rating**

The severity rating is calculated from the multiplying the **intensity factor** with the **duration factor**, e.g. 2 x 3 = 6 (factor).

RATING	FACTOR
Low severity: rating = 2	Calculated values 2 to 4
Medium severity: rating = 3	Calculated values 5 to 8
High severity: rating = 4	Calculated values 9 to 12
Very high severity: rating = 5	Calculated values 13 to 16 and more
Severity factors below 3 indicate no risk	