

# HERITAGE IMPACT ASSESSMENT

(REQUIRED UNDER SECTION 38(8) OF THE NHRA (No. 25 OF 1999))

FOR THE PROPOSED PIPELINE (SE2) BETWEEN SPITSKOP PUMP STATION AND  
MOTOTOLO MINE, STEELPOORT, LIMPOPO PROVINCE

**Type of development:**

Water Infrastructure

**Client:**

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**APPROVAL PAGE**

<b>Project Name</b>	Proposed pipeline (SE2) between Spitskop Pump Station and Mototolo Mine, located near Steelpoort, Limpopo Province
<b>Report Title</b>	Heritage Impact Assessment for the proposed pipeline (SE2) between Spitskop Pump Station and Mototolo Mine, located near Steelpoort, Limpopo Province
<b>Authority Reference Number</b>	TBC
<b>Report Status</b>	Final Report
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<b>Responsibility</b>	<b>Name</b>	<b>Qualifications and Certifications</b>	<b>Date</b>
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## Amendments on Document

Date	Report Reference Number	Description of Amendment
20 September 2021	2164	Technical revision

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## REPORT OUTLINE

Appendix 6 of the GNR 326 EIA Regulations published on 7 April 2017 provides the requirements for specialist reports undertaken as part of the environmental authorisation process. In line with this, Table 1 provides an overview of Appendix 6 together with information on how these requirements have been met.

**Table 1. Specialist Report Requirements.**

Requirement from Appendix 6 of GN 326 EIA Regulation 2017	Chapter
(a) Details of - (i) the specialist who prepared the report; and (ii) the expertise of that specialist to compile a specialist report including a curriculum vitae	Section a Section 12
(b) Declaration that the specialist is independent in a form as may be specified by the competent authority	<i>Declaration of Independence</i>
(c) Indication of the scope of, and the purpose for which, the report was prepared	Section 1
(cA) an indication of the quality and age of base data used for the specialist report	Section 3.4 and 7.1.
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	9
(d) Duration, Date and season of the site investigation and the relevance of the season to the outcome of the assessment	Section 3.4
(e) Description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used	Section 3
(f) details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of site plan identifying site alternatives;	Section 8 and 9
(g) Identification of any areas to be avoided, including buffers	Section 8 and 9
(h) Map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers	Section 8
(I) Description of any assumptions made and any uncertainties or gaps in knowledge	Section 3.7
(j) a description of the findings and potential implications of such findings on the impact of the proposed activity including identified alternatives on the environment or activities;	Section 1.3
(k) Mitigation measures for inclusion in the EMPr	Section 10.1
(l) Conditions for inclusion in the environmental authorisation	Section 10. 1.
(m) Monitoring requirements for inclusion in the EMPr or environmental authorisation	Section 10. 5.
(n) Reasoned opinion - (i) as to whether the proposed activity, activities or portions thereof should be authorised; (iA) regarding the acceptability of the proposed activity or activities; and (ii) if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan	Section 10.3
(o) Description of any consultation process that was undertaken during the course of preparing the specialist report	Section 6
(p) A summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	Refer to BAR report
(q) Any other information requested by the competent authority	N.A

## Executive Summary

Alta van Dyk Environmental Consultants was appointed as the Environmental Assessment Practitioner (EAP) by Lebalelo Water User Association (LWUA) to undertake the required Environmental Authorisation Process for the proposed pipeline (SE2) between Spitskop Pump Station and Mototolo Mine, located near Steelpoort, Limpopo Province. Beyond Heritage was appointed to conduct a Heritage Impact Assessment (HIA) for the project and the study area was assessed on desktop level and by a non-intrusive pedestrian field survey. Key findings of the assessment include:


- In anticipation of other mining activities in the greater study area, numerous heritage surveys were conducted (e.g., Huffman & Schoeman 2001, 2002 a and b; van Schalkwyk 2005; Roodt 2003a, 2003b, 2003c, 2005, 2008a, 2008b; Van der Walt & Fourie 2006; Van der Walt & Celliers 2009; Van der Walt 2009; 2016 and Pistorius 2007, 2010, 2011). These studies provide a good understanding of the archaeology of the area and use of the wider landscape.
- The area of interest (Aoi) is impacted on by extensive mining developments, road infrastructure and installation of an existing water pipeline within the servitude that the SE2 alignment will follow;
- These activities would have impacted on surface indicators of heritage sites if any ever existed in these areas, however three burial sites (Site numbers LWUA 1, LWUA 2, LWUA 3) and a possible Iron Age site (Site Number LWUA 4) marked by ephemeral stone packed terrace walls have been recorded in proximity of the proposed alignment.
- The project area is of insignificant paleontological sensitivity and no further action is required for this aspect.
- The study area is located within active mining areas and includes a river crossing which prevented access to some areas.

The project is in line with surrounding land use and the impact to heritage resources can be mitigated to an acceptable level. The project can commence provided that the recommendations in this report are adhered to, based on the South African Heritage Resource Authority (SAHRA) 's approval.

## Recommendations:

- The recorded burial sites LWUA 1, LWUA 2, LWUA 3 are all located more than 30 meters from the proposed pipeline and will not be directly impacted on. It is recommended that these sites are indicated on development plans and avoided with a 30 m buffer zone. Care must be taken to ensure that access to these sites is not restricted for family members during the construction phase;
- The area around the possible ephemeral terrace walls (LWUA 4) must be monitored during construction;
- Implementation of a chance find procedure for the project.

**Declaration of Independence**

<b>Specialist Name</b>	Jaco van der Walt
<b>Declaration of Independence</b>	<p>I declare, as a specialist appointed in terms of the National Environmental Management Act (Act No 108 of 1998) and the associated 2014 Environmental Impact Assessment (EIA) Regulations, that I:</p> <ul style="list-style-type: none"> <li>• I act as the independent specialist in this application;</li> <li>• I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;</li> <li>• I declare that there are no circumstances that may compromise my objectivity in performing such work;</li> <li>• I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;</li> <li>• I will comply with the Act, Regulations and all other applicable legislation;</li> <li>• I have no, and will not engage in, conflicting interests in the undertaking of the activity;</li> <li>• I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;</li> <li>• All the particulars furnished by me in this form are true and correct; and</li> <li>• I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.</li> </ul>
<b>Signature</b>	
<b>Date</b>	13/08/2021

**a) Expertise of the specialist**

Jaco van der Walt has been practising as a CRM archaeologist for 15 years. He obtained an MA degree in Archaeology from the University of the Witwatersrand focussing on the Iron Age in 2012 and is a PhD candidate at the University of Johannesburg focussing on Stone Age Archaeology with specific interest in the Middle Stone Age (MSA) and Later Stone Age (LSA). Jaco is an accredited member of ASAPA (#159) and have conducted more than 500 impact assessments in Limpopo, Mpumalanga, North West, Free State, Gauteng, KZN as well as he Northern and Eastern Cape Provinces in South Africa.

Jaco has worked on various international projects in Zimbabwe, Botswana, Mozambique, Lesotho, DRC Zambia, Guinea and Tanzania. Through this, he has a sound understanding of the IFC Performance Standard requirements, with specific reference to Performance Standard 8 – Cultural Heritage.

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**ABBREVIATIONS**

ASAPA: Association of South African Professional Archaeologists
BGG Burial Ground and Graves
BIA: Basic Impact Assessment
CFPs: Chance Find Procedures
CMP: Conservation Management Plan
CRR: Comments and Response Report
CRM: Cultural Resource Management
DEA: Department of Environmental Affairs
EA: Environmental Authorisation
EAP: Environmental Assessment Practitioner
ECO: Environmental Control Officer
EIA: Environmental Impact Assessment*
EIA: Early Iron Age*
EIA Practitioner: Environmental Impact Assessment Practitioner
EMPr: Environmental Management Programme
ESA: Early Stone Age
ESIA: Environmental and Social Impact Assessment
GIS Geographical Information System
GPS: Global Positioning System
GRP Grave Relocation Plan
HIA: Heritage Impact Assessment
LIA: Late Iron Age
LSA: Late Stone Age
MEC: Member of the Executive Council
MIA: Middle Iron Age
MPRDA: Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)
MSA: Middle Stone Age
NEMA National Environmental Management Act, 1998 (Act No. 107 of 1998)
NHRA National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NID Notification of Intent to Develop
NoK Next-of-Kin
PRHA: Provincial Heritage Resource Agency
SADC: Southern African Development Community
SAHRA: South African Heritage Resources Agency

*\*Although EIA refers to both Environmental Impact Assessment and the Early Iron Age both are internationally accepted abbreviations and must be read and interpreted in the context it is used.*

**GLOSSARY**

Archaeological site (remains of human activity over 100 years old)

Early Stone Age (~ 2.6 million to 250 000 years ago)

Middle Stone Age (~ 250 000 to 40-25 000 years ago)

Later Stone Age (~ 40-25 000, to recently, 100 years ago)

The Iron Age (~ AD 400 to 1840)

Historic (~ AD 1840 to 1950)

Historic building (over 60 years old)

## 1 Introduction and Terms of Reference:

Beyond Heritage was appointed to conduct a HIA for the proposed pipeline (SE2) between Spitskop Pump Station and Mototolo Mine, located near Steelpoort, Limpopo Province (Figure 1.1 to 1.4). The report forms part of the Basic Assessment (BA) and Environmental Management Programme Report (EMPr) for the development.

The aim of the study is to survey the proposed development footprint to identify cultural heritage sites, document, and assess their importance within local, provincial and national context. It serves to assess the impact of the proposed project on non-renewable heritage resources, and to submit appropriate recommendations with regard to the responsible cultural resources management measures that might be required to assist the developer in managing the discovered heritage resources in a responsible manner. It is also conducted to protect, preserve and develop such resources within the framework provided by the National Heritage Resources Act of 1999 (Act No 25 of 1999). The report outlines the approach and methodology utilized before and during the survey, which includes Phase 1, review of relevant literature; Phase 2, the physical surveying of the area on foot and by vehicle; Phase 3, reporting the outcome of the study.

During the survey, burial sites as well as possible Iron Age ephemeral walling were recorded. General site conditions and features on sites were recorded by means of photographs, GPS locations and site descriptions. Possible impacts were identified and mitigation measures are proposed in the following report. SAHRA as a commenting authority under section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) require all environmental documents, compiled in support of an Environmental Authorisation application as defined by NEMA EIA Regulations section 40 (1) and (2), to be submitted to SAHRA for commenting. Upon submission to SAHRA the project will be automatically given a case number as reference. As such the EIA report and its appendices must be submitted to the case as well as the EMPr, once it's completed by the Environmental Assessment Practitioner (EAP).

### 1.1 Terms of Reference

#### Field study

Conduct a field study to: (a) locate, identify, record, photograph and describe sites of archaeological, historical or cultural interest; b) record GPS points of sites/areas identified as significant areas; c) determine the levels of significance of the various types of heritage resources affected by the proposed development.

#### Reporting

Report on the identification of anticipated and cumulative impacts the operational units of the proposed project activity may have on the identified heritage resources for all 3 phases of the project; i.e., construction, operation and decommissioning phases. Consider alternatives, should any significant sites be impacted adversely by the proposed project. Ensure that all studies and results comply with the relevant legislation, SAHRA minimum standards and the code of ethics and guidelines of ASAPA.

To assist the developer in managing the discovered heritage resources in a responsible manner, and to protect, preserve, and develop them within the framework provided by the National Heritage Resources Act of 1999 (Act No 25 of 1999).

## 1.2 Project Description

LWUA is proposing a new raw water pipeline between the Spitskop Pump Station and Mototolo Mine, located near Steelpoort in the Limpopo Province. This project is also referred to as the Southern Extension 2 (SE2) pipeline. Project components and the location is outlined under Table 2 and 3.

**Table 2: Project Description**

<b>Project area</b>	<p><b><u>Pipeline:</u></b>  Dwarsrivier 372 KT portions RE, Portion 1, 6 and 7  Thorncliffe 374 KT portions 1, 3 and 7  Helena 6 JT portion RE  Spitskop 333 KT portion 20  Kennedy's Vale 361 KT portion 12 and 30  Tweefontein 360 KT portions 1, 2, 3, 4, 6, 7, 9 and 10  Steelpoort Ext 11 erven 1216, 1218 and 1221  Steelpoort Ext 10</p> <p><b><u>Reservoir:</u></b>  Dwarsrivier 372 KT portion 7</p>
<b>Magisterial District</b>	Fetakgomo Tubatse Local Municipality Sekhukhune District Municipality
<b>Central co-ordinate of the development</b>	Start point 24°48'36.54"S & 30° 7'18.70"E End point 25° 0'32.67"S & 30° 6'45.19"E
<b>Topographic Map Number</b>	2430 CC

**Table 3: Infrastructure and project activities**

<b>Type of development</b>	Bulk Water Infrastructure
<b>Size of development</b>	Approximately 20 km
<b>Project Components</b>	<p>The LWUA was established to supply raw water to mines along the Eastern Limb of the Bushveld Igneous Complex. The main aim of the LWUA is to supply raw water to a number of existing and planned new mines in the area, and as a spin-off, to provide additional capacity in the water supply scheme to meet the requirements of the rural population in the area. Only raw water is provided by LWUA.</p> <p>The following is proposed for the new SE2 Pipeline Project:</p> <ul style="list-style-type: none"> <li>• New pump station at existing Spitskop Pump Station (within fenced area of existing Spitskop Pump Station);</li> <li>• Solar panels (75 x 75m) to be constructed within fenced area of existing Spitskop Pump Station. This is for a 0,5MW solar panel generation plant;</li> </ul>

	<ul style="list-style-type: none"> <li>• New 500mm pipeline 15km in length next to the existing pipeline (within the current pipeline servitude) to a new reservoir near the existing Dwarsrivier Pump Station;</li> <li>• A new reservoir to be constructed near the existing Dwarsrivier Pump Station (10Mℓ);</li> <li>• New pump station at the existing Dwarsrivier Pump Station adjacent to the existing pump station fenced off area;</li> <li>• New 300 or 350mm pipeline 9km in length next to the existing pipeline in the pipeline reserve from the new Dwarsrivier Pump Station to Mototolo Mine; and</li> <li>• Valve chambers along pipeline route.</li> </ul> <p>The proposed SE2 pipeline will provide raw water to the following entities:</p> <ul style="list-style-type: none"> <li>• Lion Smelter (Glencore South Africa)</li> <li>• Dwarsrivier Mine (Assore)</li> <li>• Two Rivers Mine (African Rainbow Minerals)</li> <li>• Mototolo Mine (Anglo American Platinum)</li> <li>• Steelpoort Industrial Park (Freedom Property Fund) (potentially)</li> </ul>
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### 1.3 Alternatives

No alternatives were provided to be assessed although the extent of the area assessed allows for siting of the development to minimise impacts to heritage resources. The pipeline will be within the existing SE1 pipeline servitude

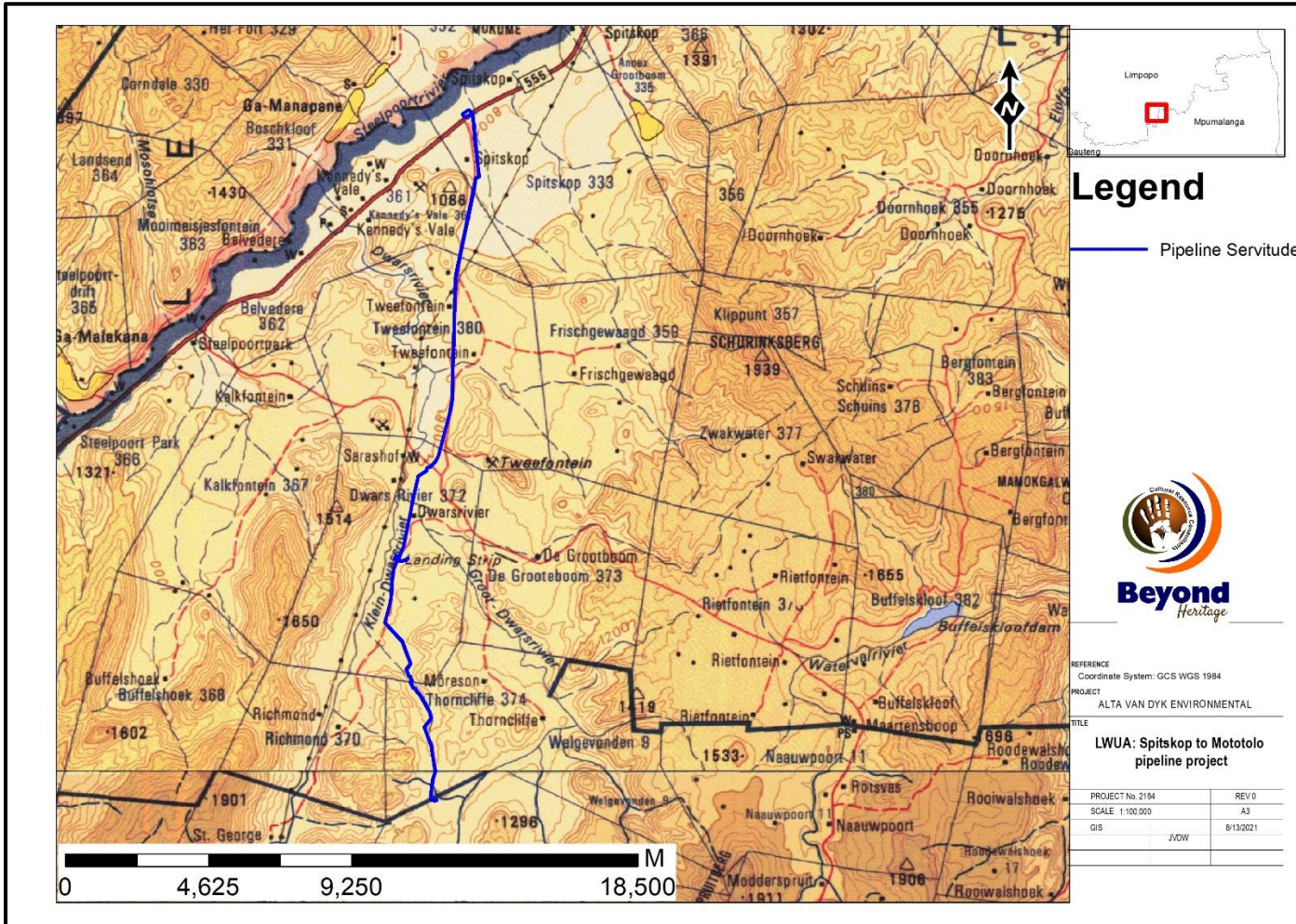


Figure 1.1. Regional setting (1: 250 000 topographical map) of the project.



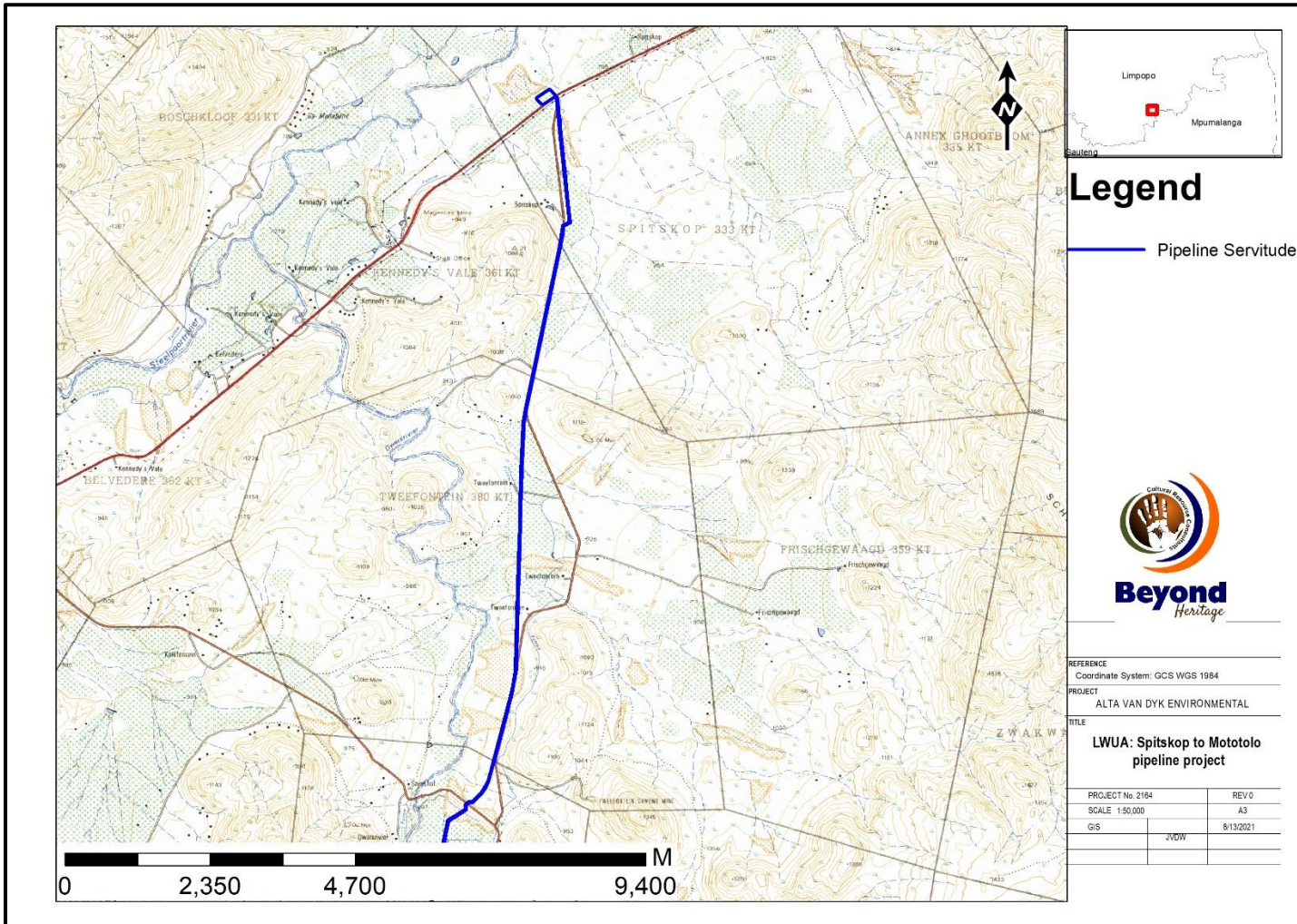


Figure 1.2. Local Setting of the project (Northern section).

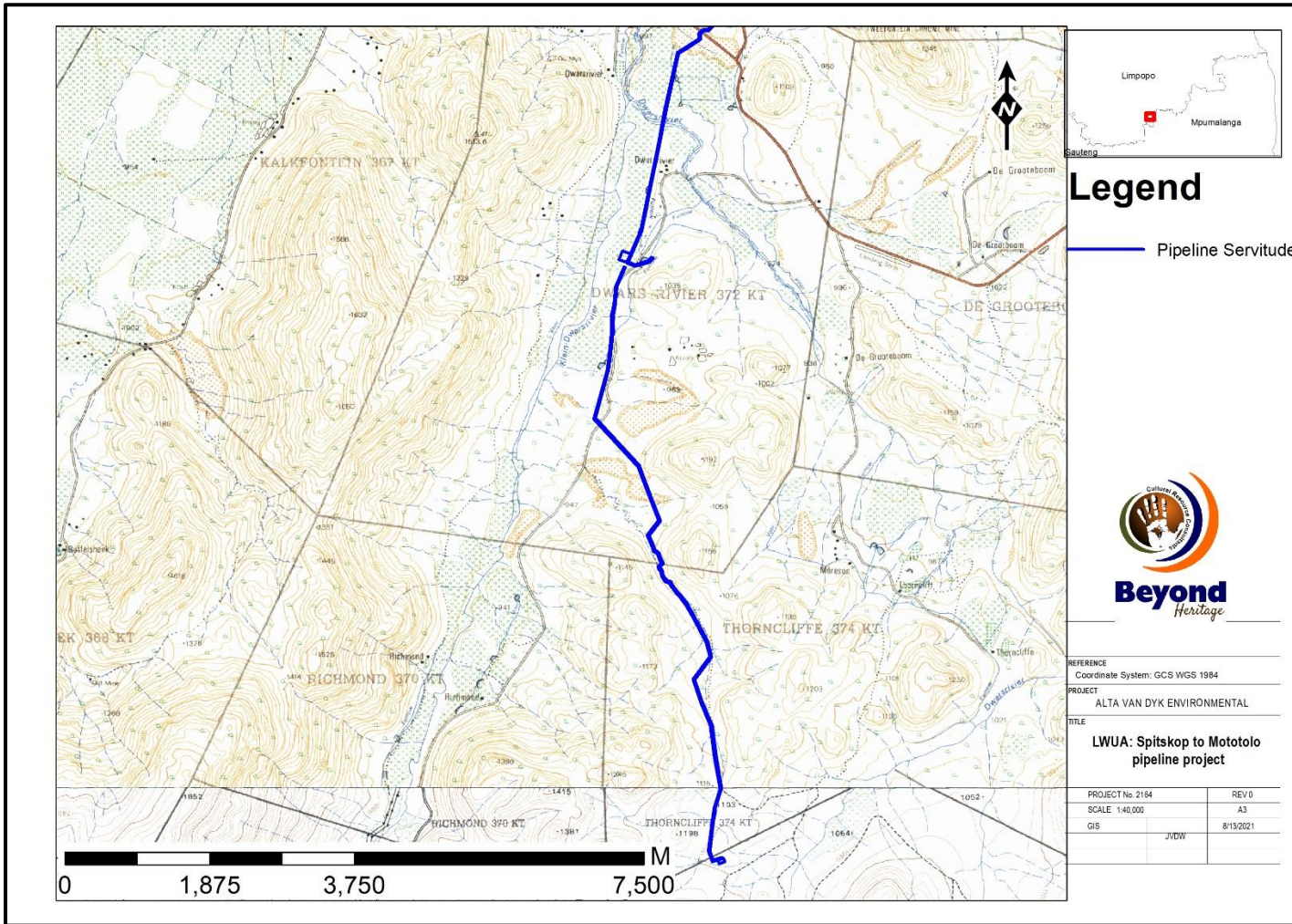


Figure 1.3. Local Setting of the project (Southern section).

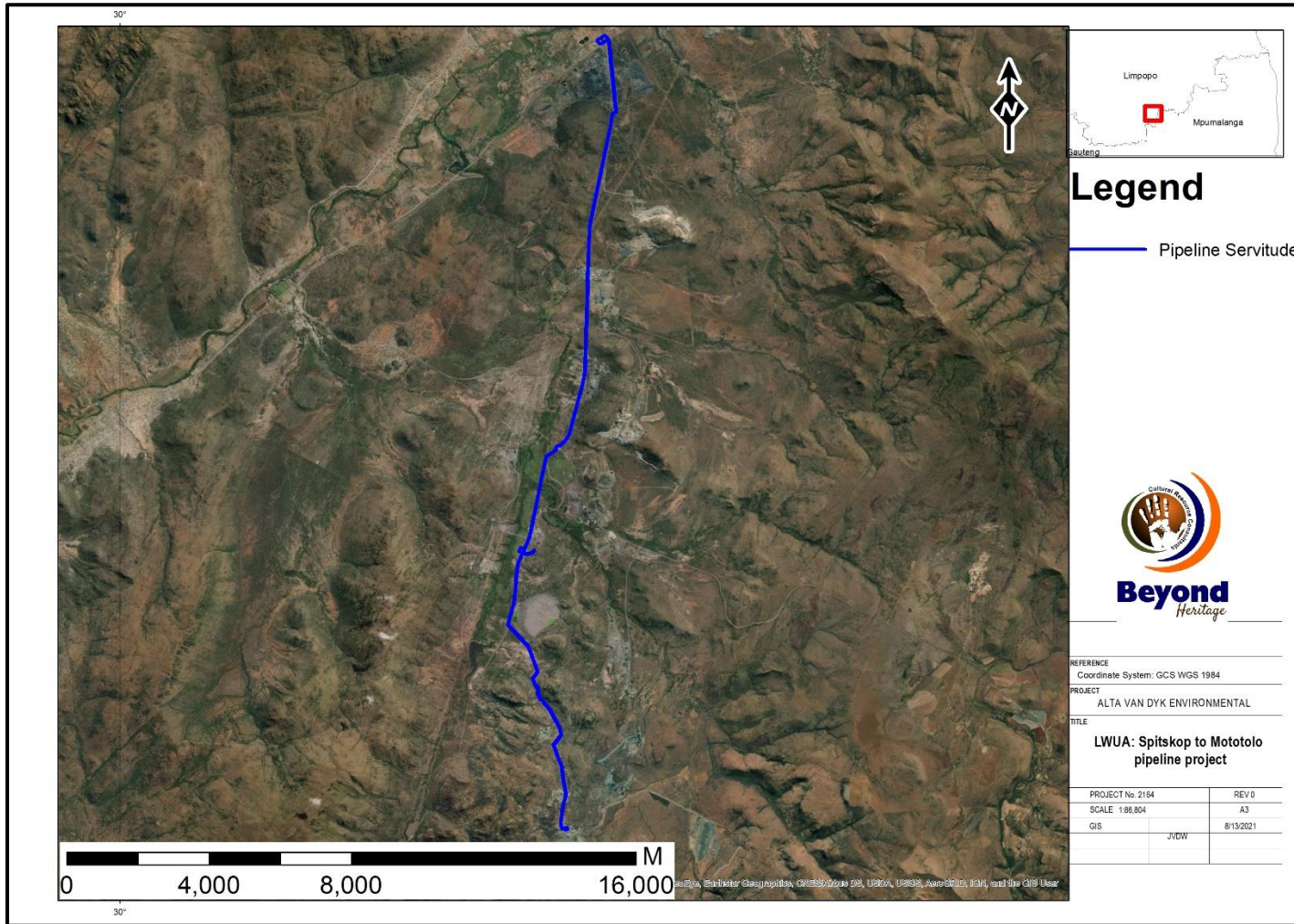


Figure 1.4. Aerial image of the development footprint.

## 2 Legislative Requirements

The HIA, as a specialist sub-section of the EIA, is required under the following legislation:

- National Heritage Resources Act (NHRA), Act No. 25 of 1999)
- National Environmental Management Act (NEMA), Act No. 107 of 1998 - Section 23(2)(b)
- Mineral and Petroleum Resources Development Act (MPRDA), Act No. 28 of 2002 - Section 39(3)(b)(iii)

A Phase 1 HIA is a pre-requisite for development in South Africa as prescribed by SAHRA and stipulated by legislation. The overall purpose of heritage specialist input is to:

- Identify any heritage resources, which may be affected;
- Assess the nature and degree of significance of such resources;
- Establish heritage informants/constraints to guide the development process through establishing thresholds of impact significance;
- Assess the negative and positive impact of the development on these resources; and
- Make recommendations for the appropriate heritage management of these impacts.

The HIA should be submitted, as part of the impact assessment report or EMPr, to the PHRA if established in the province or to SAHRA. SAHRA will ultimately be responsible for the evaluation of Phase 1 HIA reports upon which review comments will be issued. 'Best practice' requires Phase 1 HIA reports and additional development information, as per the impact assessment report and/or EMPr, to be submitted in duplicate to SAHRA after completion of the study. SAHRA accepts Phase 1 HIA reports authored by professional archaeologists, accredited with ASAPA or with a proven ability to do archaeological work.

Minimum accreditation requirements include an Honours degree in archaeology or related discipline and 3 years post-university CRM experience (field supervisor level). Minimum standards for reports, site documentation and descriptions are set by ASAPA in collaboration with SAHRA. ASAPA is based in South Africa, representing professional archaeology in the SADC region. ASAPA is primarily involved in the overseeing of ethical practice and standards regarding the archaeological profession. Membership is based on proposal and secondment by other professional members.

Phase 1 HIA's are primarily concerned with the location and identification of heritage sites situated within a proposed development area. Identified sites should be assessed according to their significance. Relevant conservation or Phase 2 mitigation recommendations should be made. Recommendations are subject to evaluation by SAHRA.

Conservation or Phase 2 mitigation recommendations, as approved by SAHRA, are to be used as guidelines in the developer's decision-making process.

Phase 2 archaeological projects are primarily based on salvage/mitigation excavations preceding development destruction or impact on a site. Phase 2 excavations can only be conducted with a permit, issued by SAHRA to the appointed archaeologist. Permit conditions are prescribed by SAHRA and includes (as minimum requirements) reporting back strategies to SAHRA and deposition of excavated material at an accredited repository.

In the event of a site conservation option being preferred by the developer, a site management plan, prepared by a professional archaeologist and approved by SAHRA, will suffice as minimum requirement.

After mitigation of a site, a destruction permit must be applied for with SAHRA by the applicant before development may proceed.

Human remains older than 60 years are protected by the National Heritage Resources Act, with reference to Section 36. Graves older than 60 years, but younger than 100 years fall under Section 36 of Act 25 of 1999 (National Heritage Resources Act), as well as the Human Tissues Act (Act 65 of 1983) and are the jurisdiction of SAHRA. The procedure for Consultation Regarding Burial Grounds and Graves (Section 36[5]) of Act 25 of 1999 is applicable to graves older than 60 years that are situated outside a formal cemetery administrated by a local authority. Graves in this age category, located inside a formal cemetery administrated by a local authority, require the same authorisation as set out for graves younger than 60 years, in addition to SAHRA authorisation. If the grave is not situated inside a formal cemetery, but is to be relocated to one, permission from the local authority is required and all regulations, laws and by-laws, set by the cemetery authority, must be adhered to.

Human remains that are less than 60 years old are protected under Section 2(1) of the Removal of Graves and Dead Bodies Ordinance (Ordinance No. 7 of 1925), as well as the Human Tissues Act (Act 65 of 1983) and are the jurisdiction of the National Department of Health and the relevant Provincial Department of Health and must be submitted for final approval to the office of the relevant Provincial Premier. This function is usually delegated to the Provincial MEC for Local Government and Planning; or in some cases, the MEC for Housing and Welfare. Authorisation for exhumation and reinternment must also be obtained from the relevant local or regional council where the grave is situated, as well as the relevant local or regional council to where the grave is being relocated. All local and regional provisions, laws and by-laws must also be adhered to. To handle and transport human remains, the institution conducting the relocation should be authorised under Section 24 of Act 65 of 1983 (Human Tissues Act).

### **3 METHODOLOGY**

#### **3.1 Literature Review**

A brief survey of available literature was conducted to extract data and information on the area in question to provide general heritage context into which the development would be set. This literature search included published material, unpublished commercial reports and online material, including reports sourced from the South African Heritage Resources Information System (SAHRIS).

#### **3.2 Genealogical Society and Google Earth Monuments**

Google Earth and 1:50 000 maps of the area were utilised to identify possible places where sites of heritage significance might be located; these locations were marked and visited during the fieldwork phase. The database of the Genealogical Society was consulted to collect data on any known graves in the area.

#### **3.3 Public Consultation and Stakeholder Engagement:**

Stakeholder engagement is a key component of any EA process, it involves stakeholders interested in, or affected by the proposed development. Stakeholders are provided with an opportunity to raise issues of concern (for the purposes of this report only heritage related issues will be included). The aim of the public consultation process was to capture and address any issues raised by community members and other stakeholders during key stakeholder and public meetings. The process involved:

- Placement of advertisements and site notices
- Stakeholder notification (through the dissemination of information and meeting invitations);
- Stakeholder meetings undertaken with I&APs;
- Authority Consultation
- The compilation of Basic Assessment Report (BAR).

### 3.4 Site Investigation

The aim of the site visit was to:

- survey the proposed project area to locate, identify, record, photograph and describe sites of archaeological, historical or cultural interest;
- record GPS points of sites/areas identified as significant areas;
- determine the levels of significance of the various types of heritage resources recorded in the project area.

**Table 4: Site Investigation Details**

	<b>Site Investigation</b>
Date	4 and 5 August 2021
Season	Winter – It was not possible to walk the entire line due to access limitations within active mining areas and a river crossing. The project area was however sufficiently covered to understand the heritage character of the area (Figure 3-1 and 3.2).

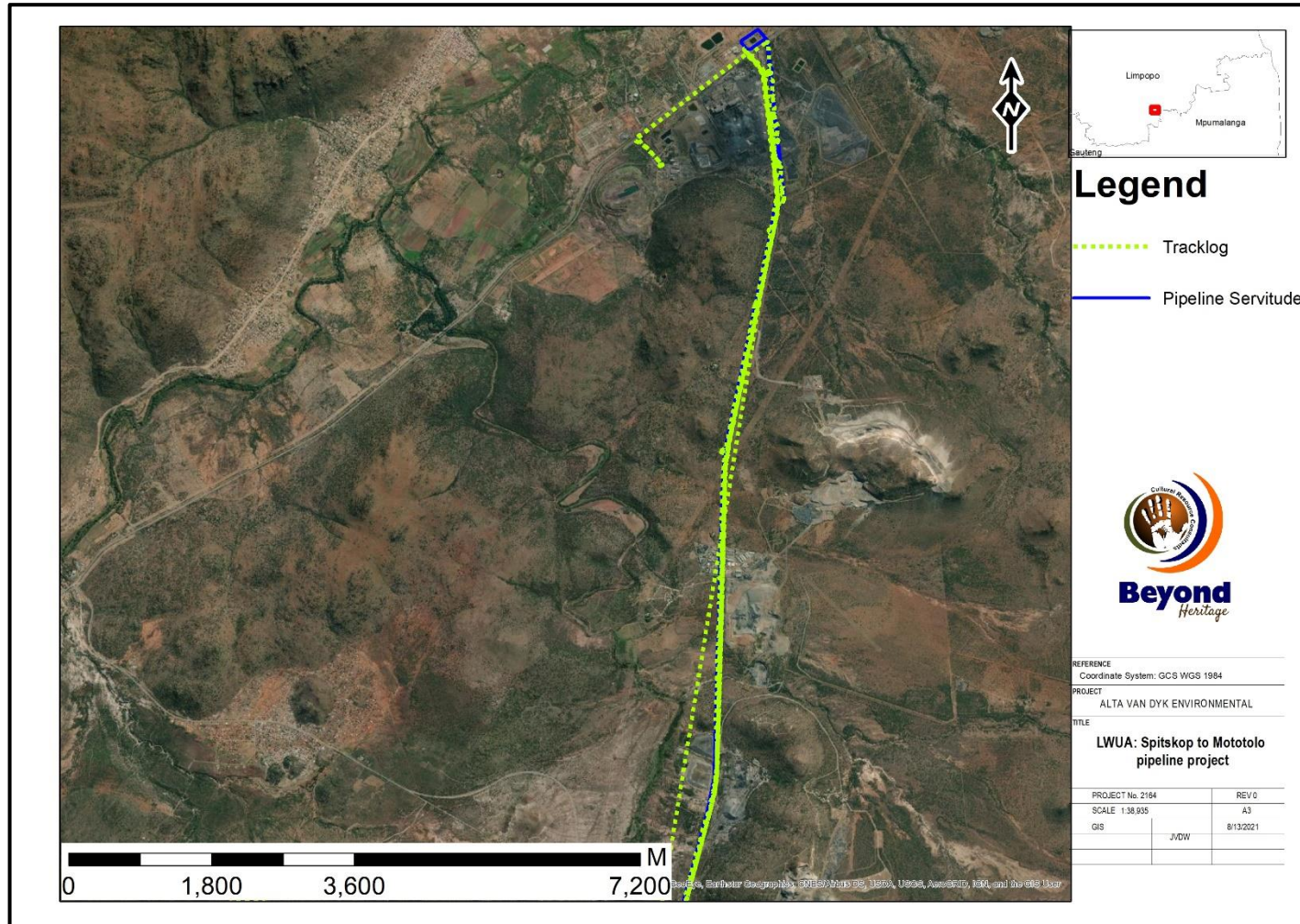


Figure 3.1: Tracklog of the survey in green (Northern section).

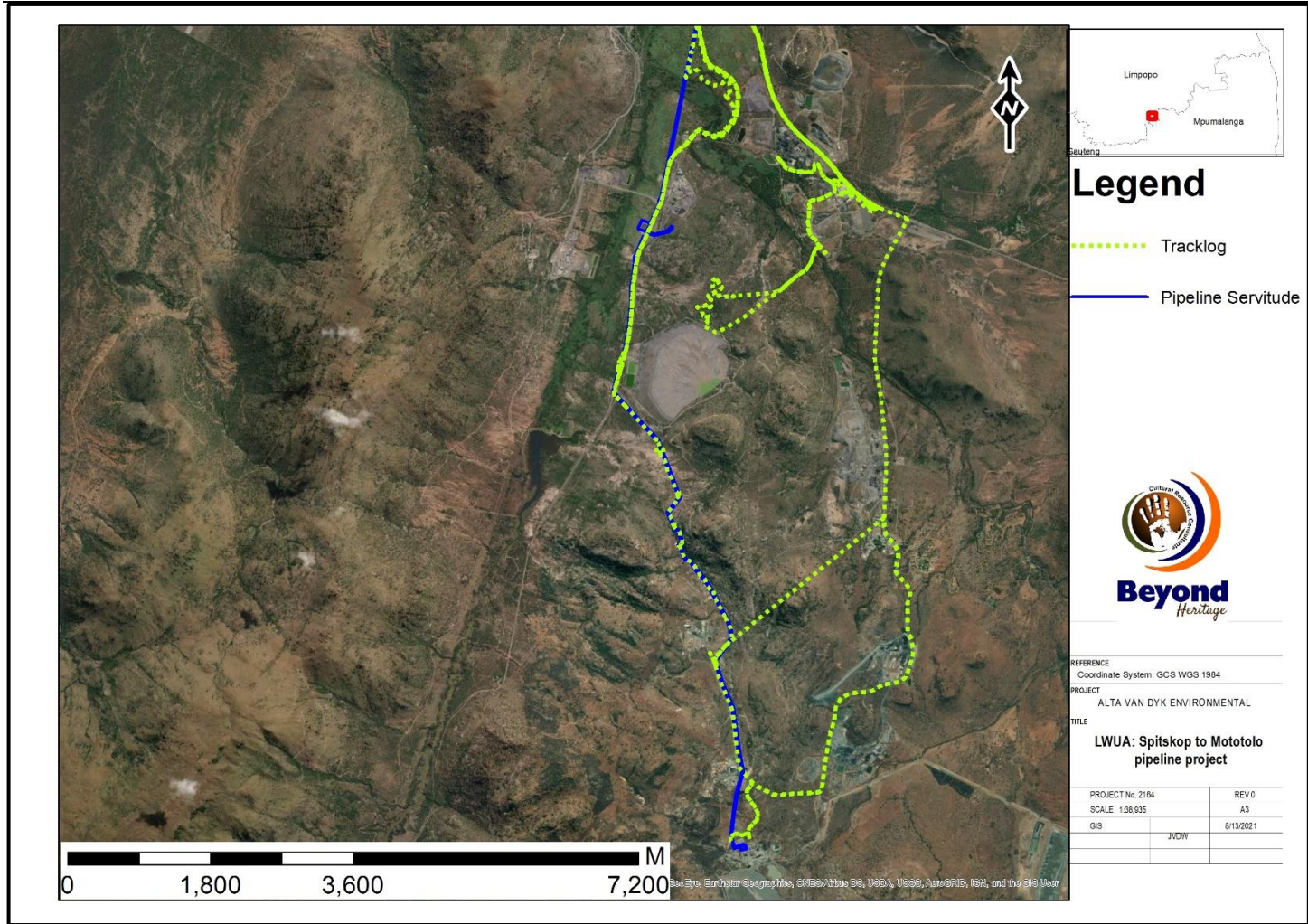


Figure 3.2 . Tracklog of the survey in green (Southern section).



### 3.5 Site Significance and Field Rating

Section 3 of the NHRA distinguishes nine criteria for places and objects to qualify as ‘part of the national estate’ if they have cultural significance or other special value. These criteria are:

- Its importance in/to the community, or pattern of South Africa’s history;
- Its possession of uncommon, rare or endangered aspects of South Africa’s natural or cultural heritage;
- Its potential to yield information that will contribute to an understanding of South Africa’s natural or cultural heritage;
- Its importance in demonstrating the principal characteristics of a particular class of South Africa’s natural or cultural places or objects;
- Its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
- Its importance in demonstrating a high degree of creative or technical achievement at a particular period;
- Its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;
- Its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa;
- Sites of significance relating to the history of slavery in South Africa.

The presence and distribution of heritage resources define a ‘heritage landscape’. In this landscape, every site is relevant. In addition, because heritage resources are non-renewable, heritage surveys need to investigate an entire project area, or a representative sample, depending on the nature of the project. In the case of the proposed project the local extent of its impact necessitates a representative sample and only the footprint of the areas demarcated for development were surveyed. In all initial investigations, however, the specialists are responsible only for the identification of resources visible on the surface. This section describes the evaluation criteria used for determining the significance of archaeological and heritage sites. The following criteria were used to establish site significance with cognisance of Section 3 of the NHRA:

- The unique nature of a site;
- The integrity of the archaeological/cultural heritage deposits;
- The wider historic, archaeological and geographic context of the site;
- The location of the site in relation to other similar sites or features;
- The depth of the archaeological deposit (when it can be determined/is known);
- The preservation condition of the sites; and
- Potential to answer present research questions.

In addition to this criteria field ratings prescribed by SAHRA (2006), and acknowledged by ASAPA for the SADC region, were used for the purpose of this report. The recommendations for each site should be read in conjunction with section 10 of this report.

Table 5. Heritage significance and field ratings

<b>FIELD RATING</b>	<b>GRADE</b>	<b>SIGNIFICANCE</b>	<b>RECOMMENDED MITIGATION</b>
National Significance (NS)	Grade 1	-	Conservation; national site nomination
Provincial Significance (PS)	Grade 2	-	Conservation; provincial site nomination
Local Significance (LS)	Grade 3A	High significance	Conservation; mitigation not advised
Local Significance (LS)	Grade 3B	High significance	Mitigation (part of site should be retained)
Generally Protected A (GP. A)	-	High/medium significance	Mitigation before destruction
Generally Protected B (GP. B)	-	Medium significance	Recording before destruction
Generally Protected C (GP.C)	-	Low significance	Destruction

### 3.6 Impact Assessment Methodology

The following impact assessment methodology was provided by the AVDE:

The significance of the identified impacts will be determined using an accepted methodology from the Department of Environmental Affairs and Tourism Guideline document on EIA Regulations, April 1998 as provided by the EAP. As with all impact methodologies, the impact is defined in a semi-quantitative way and will be assessed according to methodology prescribed in the following section.

#### Scale utilised for the evaluation of the Environmental Risk Ratings

<b>Evaluation Component</b>	<b>Rating</b>	<b>Scale</b>	<b>Description / criteria</b>
<b>MAGNITUDE of negative impact</b> (at the indicated spatial scale)	<b>10</b>	<b>Very high</b>	Bio-physical and/or social functions and/or processes might be <i>severely</i> altered.
	<b>8</b>	<b>High</b>	Bio-physical and/or social functions and/or processes might be <i>considerably</i> altered.
	<b>6</b>	<b>Medium</b>	Bio-physical and/or social functions and/or processes might be <i>notably</i> altered.
	<b>4</b>	<b>Low</b>	Bio-physical and/or social functions and/or processes might be <i>slightly</i> altered.
	<b>2</b>	<b>Very low</b>	Bio-physical and/or social functions and/or processes might be <i>negligibly</i> altered.
	<b>0</b>	<b>Zero</b>	Bio-physical and/or social functions and/or processes will remain <i>unaltered</i> .
<b>MAGNITUDE of POSITIVE IMPACT</b> (at the indicated spatial scale)	<b>10</b>	<b>Very high</b>	Positive: Bio-physical and/or social functions and/or processes might be <i>substantially</i> enhanced.
	<b>8</b>	<b>High</b>	<b>Positive:</b> Bio-physical and/or social functions and/or processes might be <i>considerably</i> enhanced.
	<b>6</b>	<b>Medium</b>	<b>Positive:</b> Bio-physical and/or social functions and/or processes might be <i>notably</i> enhanced.
	<b>4</b>	<b>Low</b>	<b>Positive:</b> Bio-physical and/or social functions and/or processes might be <i>slightly</i> enhanced.

	2	<b>Very low</b>	<b>Positive:</b> Bio-physical and/or social functions and/or processes might be <i>negligibly</i> enhanced.
	0	<b>Zero</b>	<b>Positive:</b> Bio-physical and/or social functions and/or processes will remain <i>unaltered</i> .
<b>DURATION</b>	5	<b>Permanent</b>	<b>Impact in perpetuity. –</b>
	4	<b>Long term</b>	Impact ceases after operational phase/life of the activity > 60 years.
	3	<b>Medium term</b>	Impact might occur during the operational phase/life of the activity – 60 years.
	2	<b>Short term</b>	Impact might occur during the construction phase - < 3 years.
	1	<b>Immediate</b>	<b>Instant impact.</b>
<b>EXTENT</b> (or spatial scale/influence of impact)	5	<b>International</b>	<b>Beyond the National boundaries.</b>
	4	<b>National</b>	Beyond provincial boundaries, but within National boundaries.
	3	<b>Regional</b>	Beyond 5 km of the Impact Area and within the provincial boundaries.
	2	<b>Local</b>	Within a 5 km radius of the Impact Area .
	1	<b>Site-specific</b>	<b>On site or within 100 meters of the site boundaries.</b>
	0	<b>None</b>	<b>Zero extent.</b>
<b>IRREPLACEABLE</b> loss of resources	5	<b>Definite</b>	<b>Definite</b> loss of irreplaceable resources.
	4	<b>High potential</b>	<b>High potential</b> for loss of irreplaceable resources.
	3	<b>Moderate potential</b>	<b>Moderate potential</b> for loss of irreplaceable resources.
	2	<b>Low potential</b>	<b>Low potential</b> for loss of irreplaceable resources.
	1	<b>Very low potential</b>	<b>Very low potential</b> for loss of irreplaceable resources.
	0	<b>None</b>	<b>Zero potential.</b>
<b>REVERSIBILITY</b> of impact	5	<b>Irreversible</b>	Impact <b>cannot</b> be reversed.
	4	<b>Low irreversibility</b>	<b>Low potential</b> that impact might be reversed.
	3	<b>Moderate reversibility</b>	<b>Moderate potential</b> that impact might be reversed.
	2	<b>High reversibility</b>	<b>High potential</b> that impact might be reversed.
	1	<b>Reversible</b>	Impact <b>will be</b> reversible.
	0	<b>No impact</b>	No impact.
<b>PROBABILITY</b> (of occurrence)	5	<b>Definite</b>	>95% chance of the potential impact occurring.
	4	<b>High probability</b>	75% - 95% chance of the potential impact occurring.
	3	<b>Medium probability</b>	25% - 75% chance of the potential impact occurring
	2	<b>Low probability</b>	5% - 25% chance of the potential impact occurring.
	1	<b>Improbable</b>	<5% chance of the potential impact occurring.
	0	<b>No probability</b>	<b>Zero probability.</b>
<b>Evaluation Component</b>	<b>Rating scale and description / criteria</b>		
<b>CUMULATIVE impacts</b>	<p><b>High:</b> The activity is one of several similar past, present or future activities in the same geographical area, and might contribute to a very significant combined impact on the natural, cultural, and/or socio-economic resources of local, regional or national concern.</p> <p><b>Medium:</b> The activity is one of a few similar past, present or future activities in the same geographical area, and might have a combined impact of moderate significance on the natural, cultural, and/or socio-economic resources of local, regional or national concern.</p> <p><b>Low:</b> The activity is localised and might have a negligible cumulative impact.</p> <p><b>None:</b> No cumulative impact on the environment.</p>		

Once the Environmental Risk Ratings have been evaluated for each potential environmental impact, the Significance Score of each potential environmental impact is calculated by using the following formula:

- **SS (Significance Score) = (magnitude + duration + extent + irreplaceable + reversibility) x probability.**

The maximum Significance Score value is 150.

The Significance Score is then used to rate the Environmental Significance of each potential environmental impact as per Table 8.2 below. The Environmental Significance rating process is completed for all identified potential environmental impacts both before and after implementation of the recommended mitigation measures.

#### Scale used for the evaluation of the Environmental Significance Ratings

Significance Score	Environmental Significance	Description / criteria
125 – 150	Very high (VH)	An impact of very high significance will mean that the project cannot proceed, and that impacts are irreversible, regardless of available mitigation options.
100 – 124	High (H)	An impact of high significance which could influence a decision about whether or not to proceed with the proposed project, regardless of available mitigation options.
75 – 99	Medium-high (MH)	If left unmanaged, an impact of medium-high significance could influence a decision about whether or not to proceed with a proposed project. Mitigation options should be relooked at.
40 – 74	Medium (M)	If left unmanaged, an impact of moderate significance could influence a decision about whether or not to proceed with a proposed project.
<40	Low (L)	An impact of low is likely to contribute to positive decisions about whether or not to proceed with the project. It will have little real effect and is unlikely to have an influence on project design or alternative motivation.
+	Positive impact (+)	A positive impact is likely to result in a positive consequence/effect, and is likely to contribute to positive decisions about whether or not to proceed with the project.

### 3.7 Limitations and Constraints of the study

The authors acknowledge that the brief literature review is not exhaustive on the literature of the area. Due to the nature of heritage resources and pedestrian surveys, the possibility exists that some features or artefacts may not have been discovered/recorded and the possible occurrence of graves and other cultural material cannot be excluded. Similarly, the depth of cultural deposits and the extent of heritage sites cannot be accurately determined due its subsurface nature. This report only deals with the footprint area of the proposed development and consisted of non-intrusive surface surveys. During the survey, it was not possible to walk the entire line due to access limitations within active mining areas and a river crossing. This study did not assess the impact on medicinal plants and intangible heritage as it is assumed that these components would have been highlighted through the public consultation process if relevant. It is possible that new information could come to light in future, which might change the results of this Impact Assessment.

## 4 Description of Socio-Economic Environment

The following information was obtained for the municipality from StatsSa.gov.za: The population size is 93 795. Of the population, 99,4% are black African, with the other population groups making up the remaining 0,6%. Of those persons aged 20 years and above, 10,7% have some primary education, 3% have completed primary education, 33,3% have some secondary education and 22% have completed matric. Of the mentioned age group, 6,6% have some form of higher education, and almost one in four (24,3%) had no form of schooling. The municipality has a weak economic base and high poverty levels. There is one shopping centre in the municipality and a few mining activities happening in the region.

Only a third of households (33,1%) have access to piped water on a community stand less than 200 m from their dwelling, followed by 30,2% who have access to piped water in the yard. Only 5,5% of households have access to piped water inside the dwelling, and 11,5% have no access to piped water.

## 5 Results of Public Consultation and Stakeholder Engagement:

### 5.1 Stakeholder Identification

Adjacent landowners and the public at large were informed of the proposed activity as part of the BA process. Site notices and advertisements notifying interested and affected parties were placed at strategic points and in local newspapers as part of the process.

## 6 Literature / Background Study:

### 6.1 Literature Review (SAHRIS)

Google Earth and 1:50 000 maps of the area were utilised to identify possible places where archaeological and historical sites might be located.

In anticipation of other mining activities in the greater study area, archaeologists have completed numerous heritage surveys including Huffman & Schoeman 2001, 2002 a and b; van Schalkwyk 2005; Roodt 2003a, 2003b, 2003c, 2005, 2008a, 2008b; Van der Walt & Fourie 2006; Van der Walt & Celliers 2009; Van der Walt 2009; 2016 and Pistorius 2007, 2010, 2011 for various Environmental Impact Assessment Reports (EIAs) and Environmental Management Programmes (EMPs). These studies provide a good understanding of the archaeology of the area and use of the wider landscape. Since 2001, heritage surveys have recorded more than 240 sites in the greater study area, ranging from the Middle Stone Age (MSA) to the recent households of farm labourers. The following Cultural Resource Management (CRM) studies (Table 6) were conducted in the immediate area and were consulted for this report:

**Table 6. Heritage Reports conducted close to the study area.**

Author	Year	Project	Findings
Huffman, T. N. and Schoeman, A.	2002	Archaeological Assessment of The Der Brochen Project, Mpumalanga	25 sites or occurrences, ranging from the Middle Stone Age to the Iron Age and Historic Pedi.
Roodt, F.	2003	Phase 1 Heritage Impact Assessment Der Brochen Tailings Dams Farms: Helena and St. George Mpumalanga Province	39 sites were recorded ranging from the Iron age to burial sites.
Van der Walt, J. and Fourie, W.	2007	Mining development for Mareesburg 8JT Mpumalanga, Archaeological Impact Assessment	3 Iron Age sites
Matoho, E.	2012	Preliminary Report of The Investigation of The Late Iron Age Stone Wall Enclosure Site Identified On The Farm Schaapkraal 42jt, Mpumalanga Province	Iron Age features and burial sites.
Du Piesanie, J and Higgitt, N.	2012	Heritage Impact Assessment for the Everest North Mining 2530 AA, Vygenhoek 10JT, Mpumalanga.	50 Sites recorded ranging from Stone Age, Iron Age and burial sites as well as historical features.
Coetzee, T.	2018	Phase 1 Archaeological Impact Assessment for Environmental Assurance (Pty) Ltd for the Construction of the Mareesburg Haul Road near Boschfontein, Mpumalanga	Seven historical sites consisting of angular stone walling, as well as buildings constructed from bricks and cement; 10 LIA / Farmer sites consisting of linear stone walling and stone-walled enclosures; six stone cairns that might be grave sites; two formal graveyards and two modern sites.

### 6.1.1 Genealogical Society and Google Earth Monuments

No known grave sites are indicated in the study area.

### 6.2. Background to the general area

South Africa has a long and complex Stone Age sequence of more than 2 million years. The broad sequence includes the Later Stone Age, the Middle Stone Age and the Earlier Stone Age. Each of these phases contains sub-phases or industrial complexes, and within these we can expect regional variation regarding characteristics and time ranges. For (CRM) purposes it is often only expected/ possible to identify the presence of the three main phases.

Yet sometimes the recognition of cultural groups, affinities or trends in technology and/or subsistence practices, as represented by the sub-phases or industrial complexes, is achievable (Lombard 2012). The three main phases can be divided as follows:

- Earlier Stone Age: associated with early Homo groups such as Homo habilis and Homo erectus. 400 000-> 2 million years ago.
- Middle Stone Age: associated with Homo sapiens and archaic modern humans. 30-300 thousand years ago.
- Later Stone Age: associated with Khoi and San societies and their immediate predecessors. Recently to ~30 thousand years ago

Very few Early Stone Age sites are on record for Mpumalanga and no *in situ* sites dating to this period are expected for the study area. An example in Mpumalanga is Maleoskop on the farm Rietkloof where ESA tools have been found. This is one of only a handful of such sites in Mpumalanga.

Middle Stone Age isolated artefacts are known to occur in the general area. Finds typically include radial cores, triangular points and flakes. These artefacts are usually scattered too sparsely to be of any significance (Van der Walt 2016). Evidence of this period has been excavated at Bushman Rock Shelter, a well-known site on the farm Klipfonteinhoek in the Ohrigstad district located about 70 km from the project area. This cave was excavated twice in the 1960s by Louw and later by Eloff. The MSA layers show that the cave was repeatedly visited over a long period. Lower layers have been dated to over 40 000 BP (Before Present) while the top layers date to approximately 27 000 BP (Esterhuizen & Smith in Delius, 2007; Bergh, 1998). At Bushman Rock Shelter the MSA is also represented and starts at around 12 000 BP but only lasted for some 3 000 years.

The LSA is of importance in geological terms as it marks the transition from the Pleistocene to the Holocene which was accompanied by a gradual shift from cooler to warmer temperatures. This change had its greatest influence on the higher lying areas of South Africa. Both Bushman Rock Shelter and another site, Heuningneskrans, have revealed a greater use in plant foods and fruit during this period (Esterhuizen & Smith in Delius, 2007; Bergh, 1998).

Faunal evidence suggests that LSA hunter-gatherers trapped and hunted zebra, warthog and bovids of various sizes. They also diversified their protein diet by gathering tortoises and land snails (*Achatina*) in large quantities.

Ostrich eggshell beads were found in most of the levels at these two sites. It appears that there is a gap of approximately 4 000 years in the Mpumalanga LSA record between 9 000 BP and 5 000 BP. This may be a result of generally little Stone Age research being conducted in the province. It is, however, also a period known for rapid warming and major climate fluctuation which may have led people to seek out protected environments in this area. The Mpumalanga Stone Age sequence is visible again during the mid-Holocene at the farm Honingklip near Badplaas in the Carolina district (Esterhuizen & Smith in Delius, 2007; Bergh, 1998).

The LSA period is also associated with rock engravings and rock paintings. Approximately 400 rock art sites are distributed throughout Mpumalanga and can be divided into San rock art, herder or Khoe Khoe (Khoi Khoi) paintings (thin scattering from the Limpopo Valley) through the Lydenburg district into the Nelspruit area) and localised late white farmer paintings. Farmer paintings can be divided into Sotho-Tswana finger paintings and Nguni engravings (Only 20 engravings occur at Boomplaats, north-west of Lydenburg). Farmer paintings are more localised than San or herder paintings and were mainly used by the painters for instructional purposes (Smith & Zubieta 2007).

A rock engraving which date from the more recent past were recorded against the eastern slope of the Groot Dwars River Valley (Huffman & Schoeman 2001, 2002[a], 2002[b] & 2002[c]) and it is possible that more engravings may exist in this valley.

## 6.2 The Iron Age

The Iron Age represents the spread of Bantu speaking people and includes both the pre-Historic and Historic periods. It can be divided into three distinct periods:

- The Early Iron Age: Most of the first millennium AD.
- The Middle Iron Age: 10th to 13th centuries AD
- The Late Iron Age: 14th century to colonial period.

The Iron Age is characterised by the ability of these early people to manipulate and work Iron ore into implements that assisted them in creating a favourable environment to make a better living. Most of the decorated pottery found in the study area belongs to the stylistic facies known as *Eiland*. This style dates to between 1550 AD and 1750 AD and was made by Sotho-Tswana people (Huffman 2007: 186-189). These Middle Iron Age Sites do not have any stone walling associated with them and is found close to cultivatable soil. Some stylistic *Marateng* pottery were also recorded presumably in association with Late

Iron Age stone walled settlements. *Marateng* pottery dates to between 1650 AD and 1840 AD (Huffman 2007: 207). Also refer to Section 6.7 for a discussion on the Iron Age Cultural Landscape.

### 6.3 Historical Information

European occupation began in 1845 when trekkers established Ohrigstad and then Lydenburg a few years later. Originally, the trekkers were interested in ivory, but they also needed land and labour for agriculture. Tensions with African communities over these needs rose to such a point that the Trekkers attacked the Pedi capital in 1852. They failed, however, to destroy Pedi authority. Somewhat later, they negotiated a peace with Sekwati and traded cattle for land. Boers then started to establish farms in the region. GS Maree, for example, settled on Mareesburg in 1871. Tensions over land and labour increased again until the ZAR attacked the Pedi capital in 1876, this battle also failed to break Pedi resistance.

This brief historical outline helps to date some other sites in the study area. A number of settlements located around high meadows in the Dwarsrivier valley probably date from 1860 to 1880, when tensions were high but before major European occupation of local farms.

### 6.4 Anglo-Boer War Sites

The Anglo-Boer War was the greatest conflict that had taken place in South Africa up to date. No sites relating to the war are known to occur in the study area.

### 6.5 Cultural Landscape

The cultural landscape of the region is characterised by a rural area that is extensively disturbed by mining activities and in the past by agricultural activities. From the archaeological database of the general area archaeological settlements show different land use patterns. Many agriculturally orientated societies (making Eiland, Leolo and Marateng pottery) built their villages in the valleys near cultivatable alluvium. Others (probably Ndebele) built terraced settlements on basal slopes of the valley edge, while farm labourers usually lived in the valleys as well. During the 19th Century, farmers lived around the edge of high meadows as a measure of protection. A few Middle Iron Age Eiland sites were also cited in this plateau environment.

### 6.6 Graves and Burial Sites

No known graves are indicated on databases consulted but graves and cemeteries are widely distributed across the landscape and can be expected anywhere.

## 7 Description of the Physical Environment

The project area is located within an existing servitude next to an existing pipeline. The proposed line starts approximately 5 km west from Steelpoort, from where it runs in a southerly direction to Mototolo Mine. It traverses several mine properties. General site conditions consist of moderate grass cover (burned along some sections) and areas altered by mining and road infrastructure. General site conditions are illustrated in Figure 7.1 to 7.4





Figure 7.1. Existing Spitskop Pumpstation.



Figure 7.2. General site conditions in the servitude.



Figure 7.3. Existing pipeline in the servitude.



Figure 7.4. General site conditions in the servitude.

### 8 Findings of the Survey

It is important to note that only the development footprint was surveyed over 2 days. Previous disturbances relating to existing mining operations and pipeline are evident along the route and would have destroyed surface evidence of heritage sites within the existing servitude. However, three burial sites (LWUA 1 – LWUA 3) and possible ephemeral Iron Age stone packed terrace site (LWUA 4) were recorded. These sites are all located outside of the pipeline servitude and will not be directly impacted on. The spatial data for the sites are presented in Table 7 and illustrated in Figure 8.1. Burial sites and cemeteries are of high social significance and the recorded sites consists of formal graves with headstones as well as a palisaded cemetery (Figure 8.1 – 8.4). At the Iron Age site, the ephemeral stone packed features have already been disturbed by the existing pipelines and little remains of the site (Figure 8.5 and 8.6).

**Table 7. Heritage resources recorded during the survey.**

LABEL	LONGITUDE	LATITUDE	DESCRIPTION	HERITAGE SIGNIFICANCE
LWUA 1	30° 07' 19.4124" E	24° 50' 23.1360" S	2 X graves	High Social Significance GP A
LWUA 2	30° 07' 05.5812" E	24° 51' 23.1085" S	Cemetery	High Social Significance GP A
LWUA 3	30° 06' 48.6935" E	24° 54' 32.6772" S	Cemetery	High Social Significance GP A
LWUA 4	30° 06' 33.3215" E	24° 58' 49.4003" S	Possible ephemeral stone packed terraces	Low Significance GP C

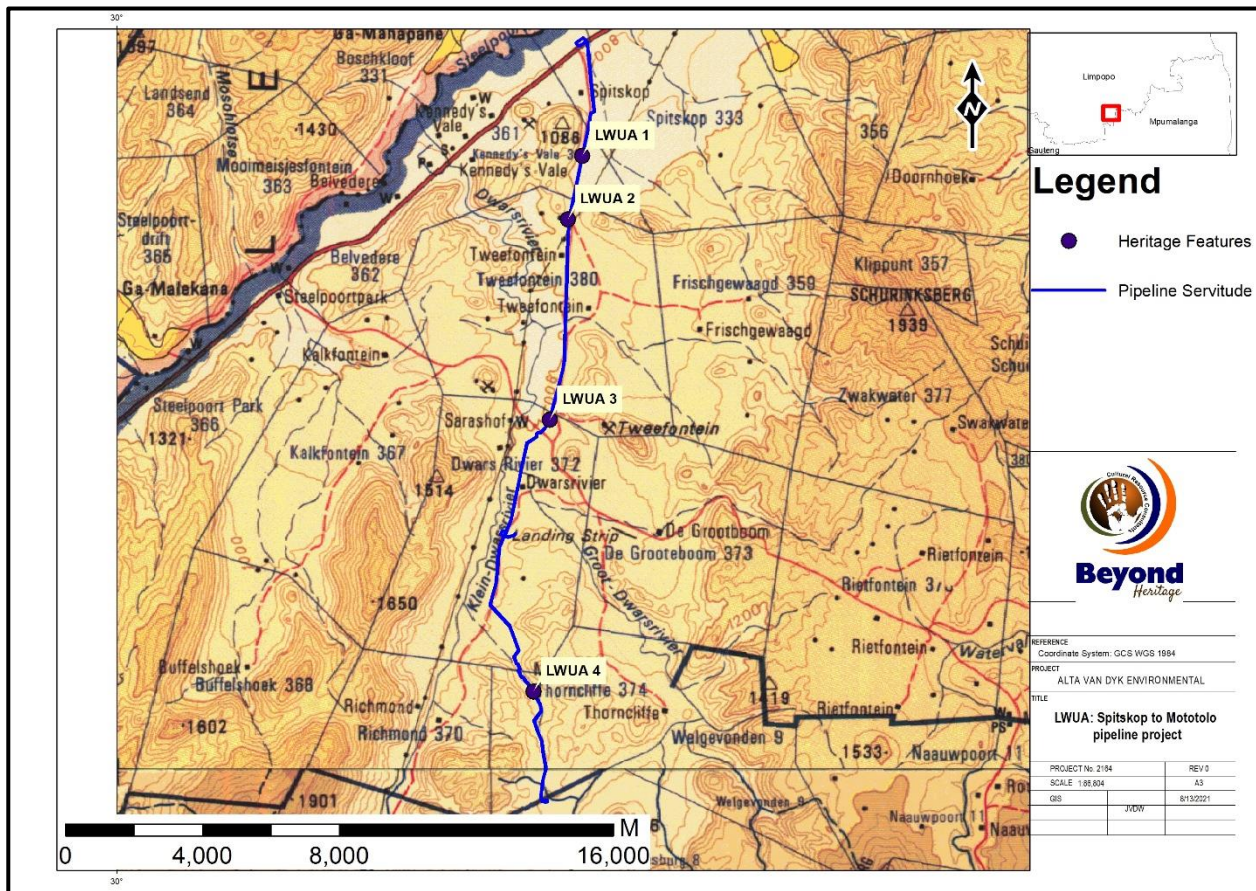


Figure 8.1. Distribution of recorded heritage features.



Figure 8.2. Graves at LWUA 1.



Figure 8.3. Graves at LWUA 1.



Figure 8.4. General site conditions at LWUA 2.



Figure 8.5. General site conditions at LWUA 2.



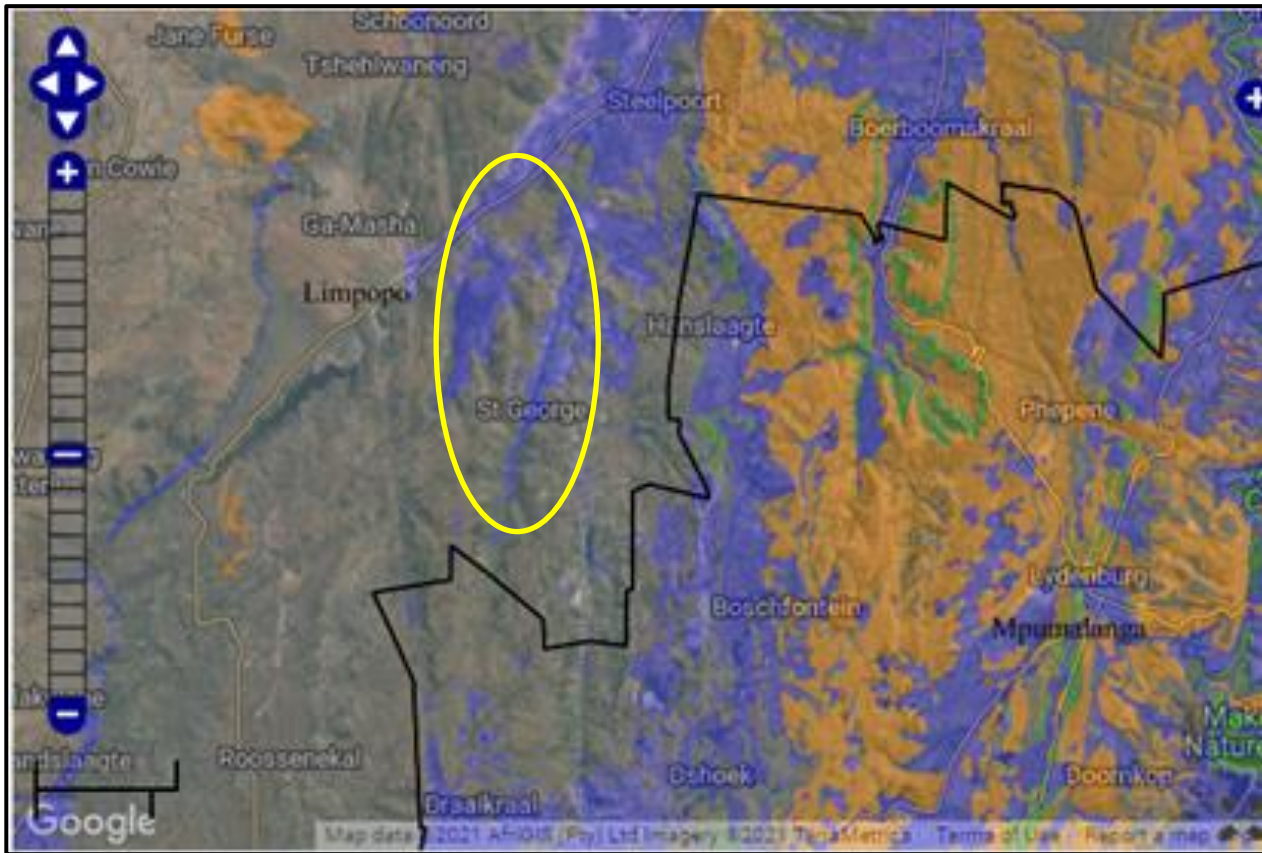
Figure 8.6. General site conditions at LWUA 4.



Figure 8.7. General site conditions at LWUA 4.

### 8.1 Paleontological Heritage

According to the SAHRA Paleontological map the paleontological sensitivity of the study area is low, and no further studies are required (Figure 8.7).



Colour	Sensitivity	Required Action
RED	VERY HIGH	Field assessment and protocol for finds is required
ORANGE/YELLOW	HIGH	Desktop study is required and based on the outcome of the desktop study; a field assessment is likely
GREEN	MODERATE	Desktop study is required
BLUE	LOW	No palaeontological studies are required however a protocol for finds is required
GREY	INSIGNIFICANT/ZERO	No palaeontological studies are required
WHITE/CLEAR	UNKNOWN	These areas will require a minimum of a desktop study. As more information comes to light, SAHRA will continue to populate the map

Figure 8.8. Paleontological sensitivity of the study area as indicated on the SAHRA Palaeontological sensitivity map.

## **9 Potential Impact**

Based on the current alignment the pipeline will not have a direct impact on LWUA 1, LWUA 2 and LWUA 3, These sites are all located further than 30 meters away from the pipeline servitude (Figure 9.1 to 9.3). Graves and cemeteries are of high social significance but as these features will be avoided and preserved no impact is expected (Table 8). The project can have a possible indirect impact on LWUA 4 (Figure 9.4), this area is impacted on by the existing pipeline and it is not certain that this is indeed an archaeological site with surface features being destroyed by the existing pipeline. Any additional impacts to subsurface heritage resources can be successfully mitigated by implementing a chance find procedure and this should be implemented during all phases of the project, and the expected impact is low (Table 9).

### **9.1.1 Pre-Construction phase**

It is assumed that the pre-construction phase involves the removal of topsoil and vegetation as well as the establishment of infrastructure. These activities can have a negative and irreversible impact on heritage features if any occur. Impacts include destruction or partial destruction of non-renewable heritage resources.

### **9.1.2 Construction Phase**

During this phase, the impacts and effects are similar in nature but more extensive than the pre-construction phase. Potential impacts include destruction or partial destruction of non-renewable heritage resources.

### **9.1.3 Operation Phase**

No impacts are expected after construction of the pipeline during the operational phase.

### **9.1.4 Cumulative impacts**

Cumulative impacts occur from the combination of effects of various impacts on heritage resources. The importance of identifying and assessing cumulative impacts is that the whole is greater than the sum of its parts. In the case of this project the pipeline will not directly impact on significant heritage resources and with the implementation of the mitigation measures as proposed in this report the cumulative impact of the project on heritage resources is low.

9.1.5 Impact Assessment for the Project

Table 8. Impact assessment of the proposed project on graves and cemeteries.

POTENTIAL ENVIRONMENTAL IMPACT	ACTIVITY	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION								Cumulative	Status	RECOMMENDED MEASURES/ REMARKS	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION							
		M	D	S	I	R	P	TOTAL	SP				M	D	S	I	R	P	TOTAL	SP
<b>Cultural Heritage Impact Assessment</b>																				
Graves and Cemeteries	Construction of the pipeline.	4	5	3	5	5	1	22	L	Low	Negative	<ul style="list-style-type: none"> <li>All recorded graves and burial sites should be indicated on development plans and avoided.</li> <li>Ensuring access to the sites during construction.</li> <li>Implementation of a chance find procedure for the project.</li> </ul>	4	5	3	0	0	1	12	L

Table 9. Impact of the project on archaeological resources.

POTENTIAL ENVIRONMENTAL IMPACT	ACTIVITY	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION								Cumulative	Status	RECOMMENDED MEASURES/ REMARKS	MITIGATION	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION							
		M	D	S	I	R	P	TOTAL	SP					M	D	S	I	R	P	TOTAL	SP
<b>Cultural Heritage Impact Assessment</b>																					
Ephemeral walling at LWUA 04.	Construction of the pipeline.	4	5	1	5	5	2	40	L	Low	Negative	<ul style="list-style-type: none"> <li>Monitoring during construction as outlined in Section 10.5.</li> <li>Implementation of a chance find procedure for the project.</li> </ul>		4	5	3	0	0	1	12	L

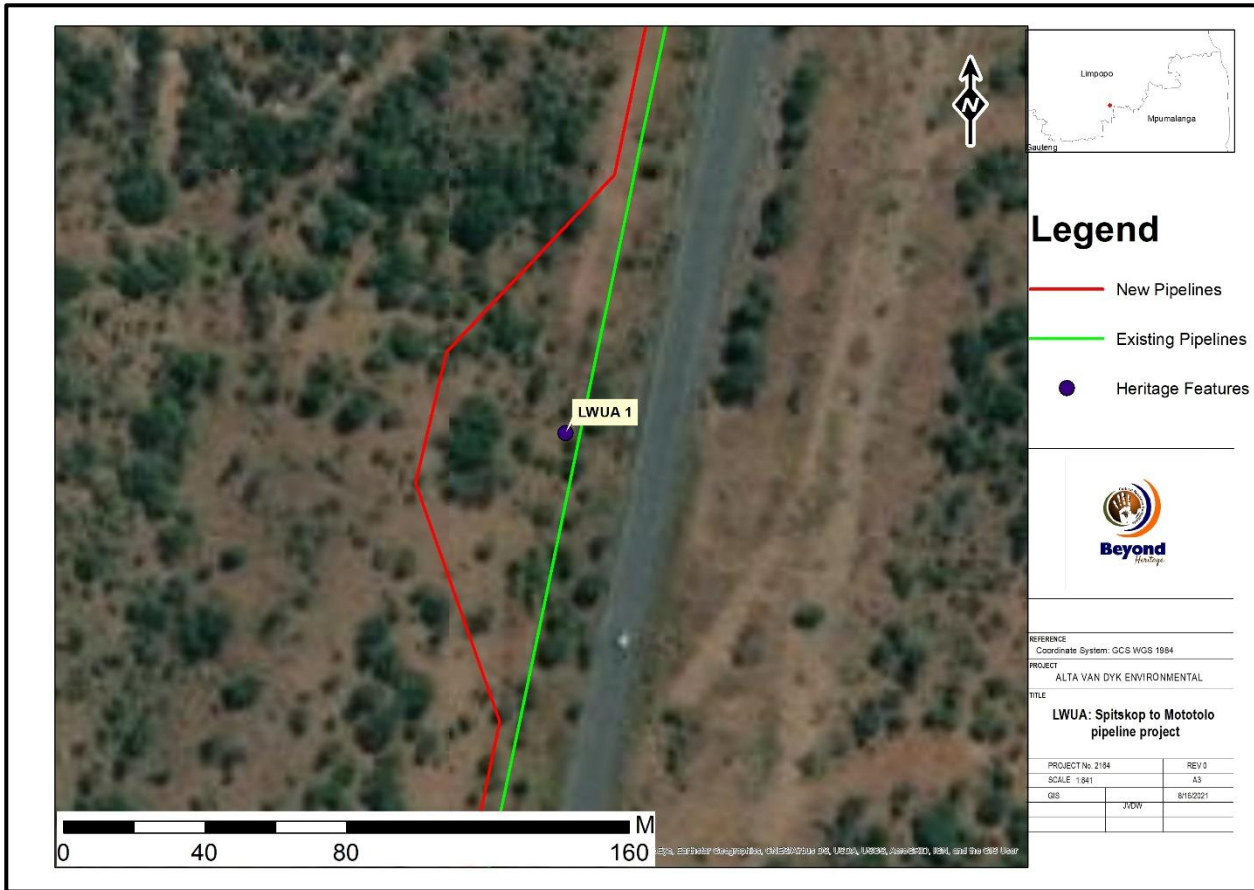


Figure 9.1. Site LWUA 1 in relation to the proposed pipeline.



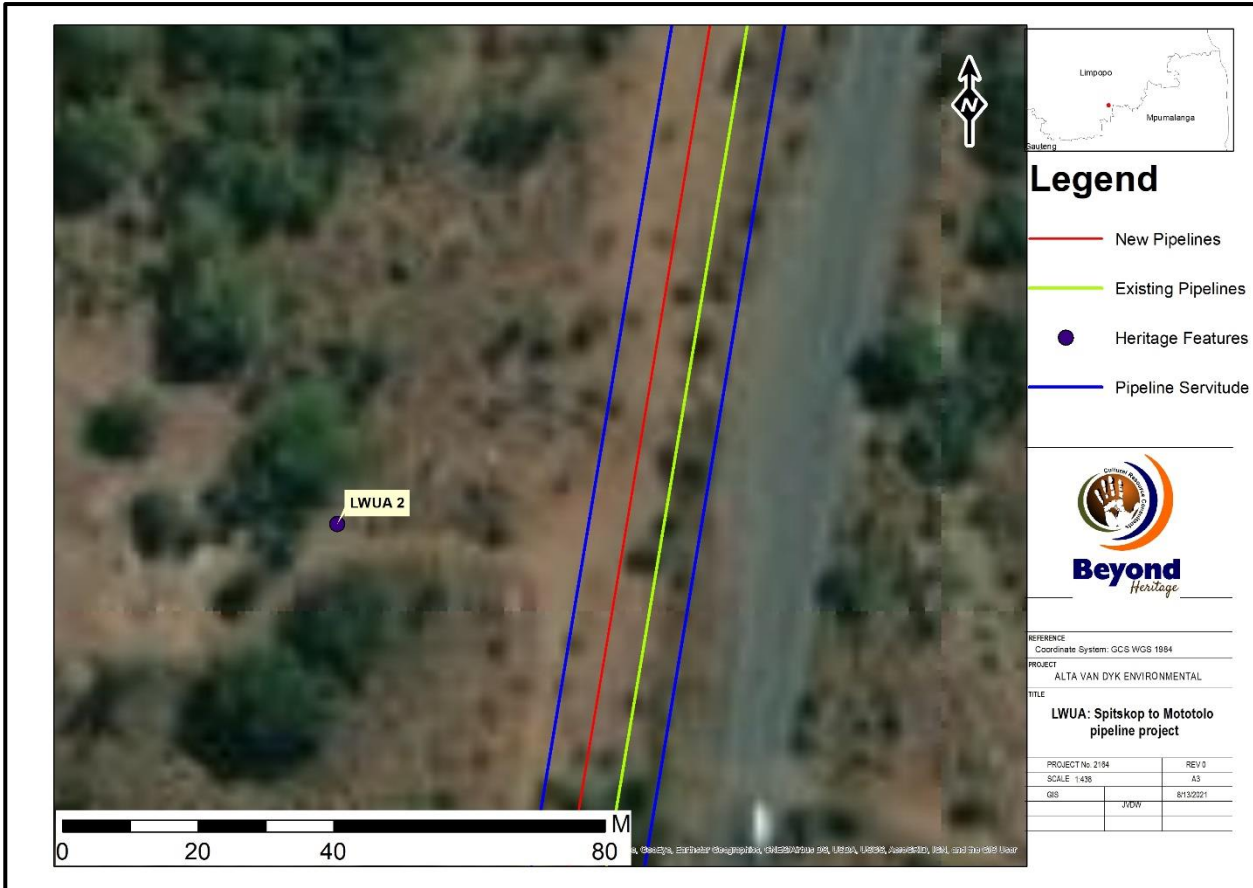


Figure 9.2. Site LWUA 2 in relation to the proposed pipeline.

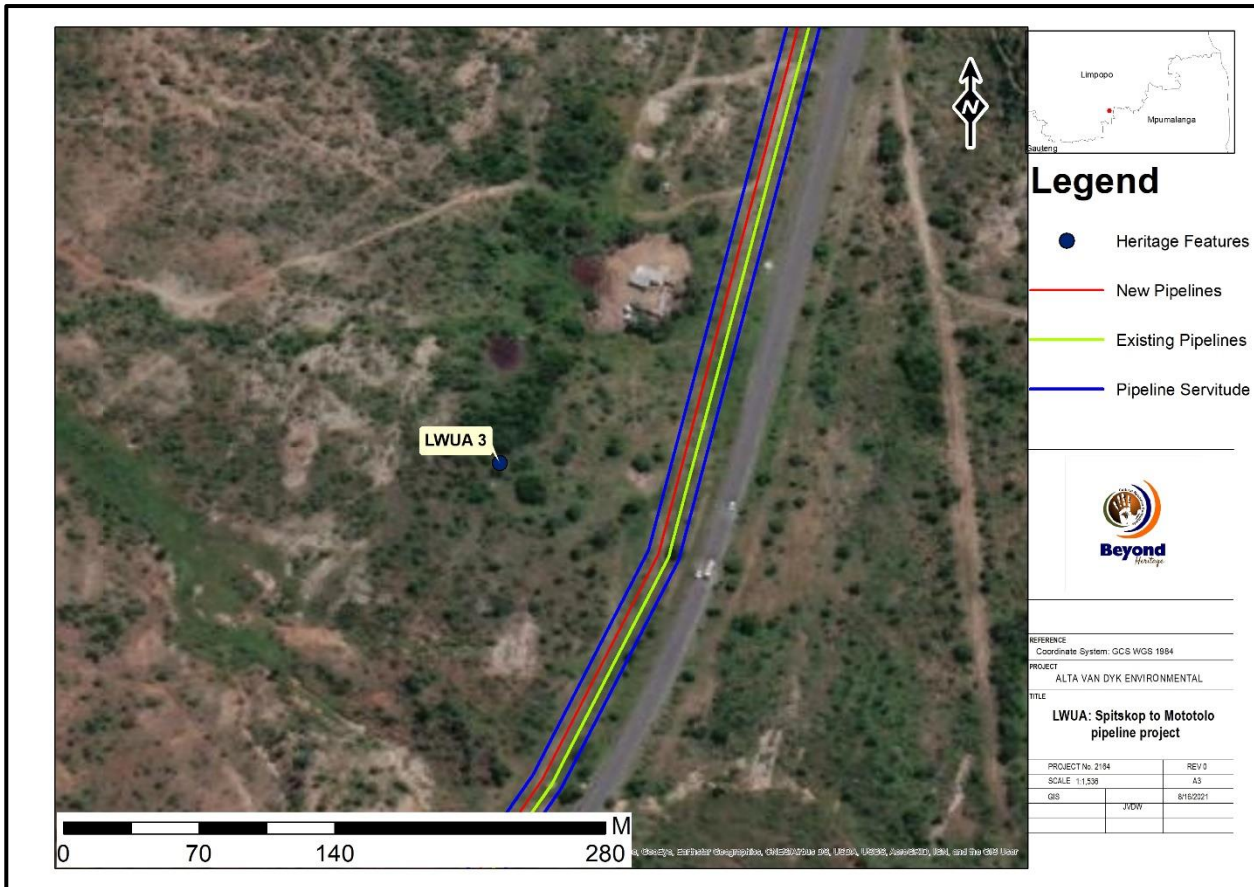


Figure 9.3. Site LWUA 3 in relation to the proposed pipeline.

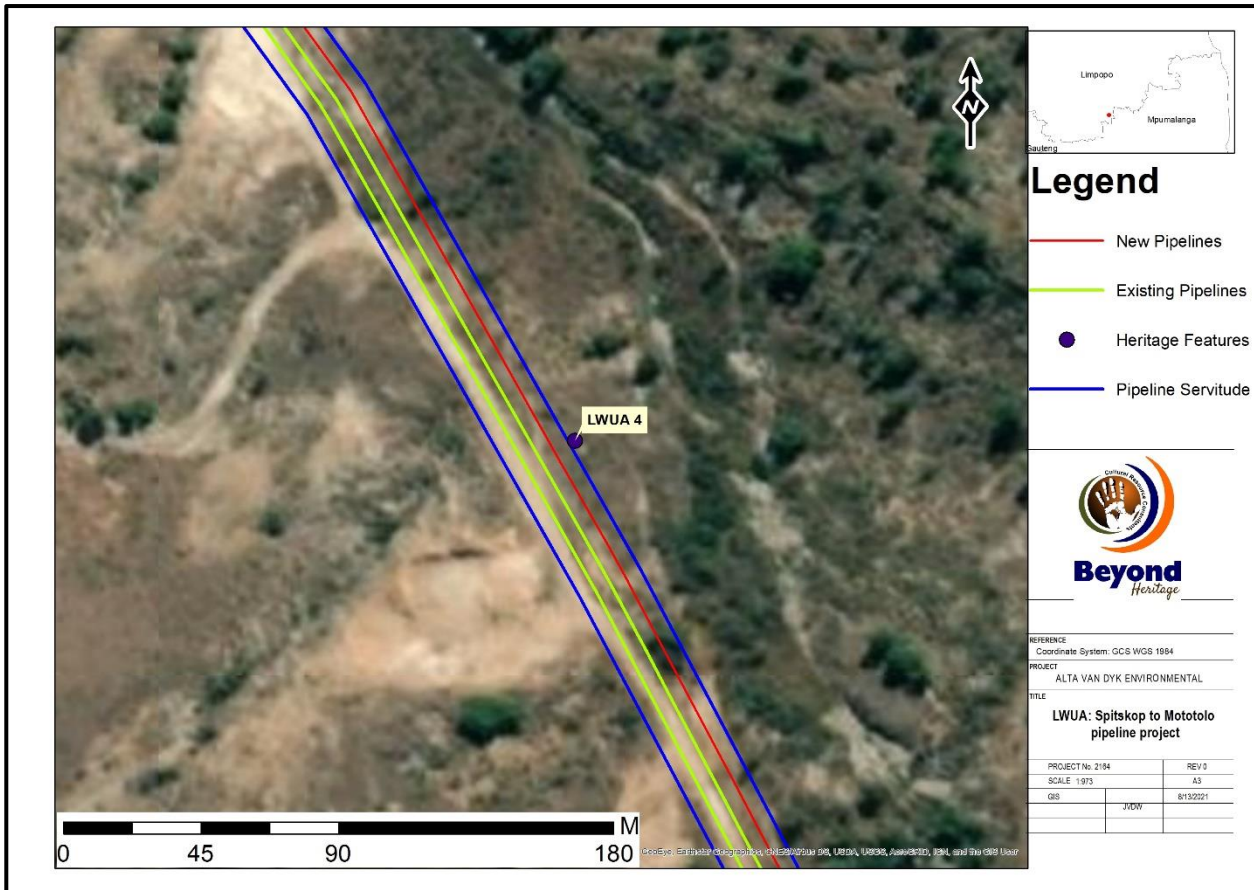


Figure 9.4. Site LWUA 4 in relation to the proposed pipeline.

## 10 Conclusion and recommendations

Previous disturbances relating to existing mining operations and pipeline are evident along the route and would have destroyed surface evidence of heritage sites within the existing servitude. However, three burial sites (LWUA 1 – LWUA 3) and possible ephemeral Iron Age stone packed terrace site LWUA 4 were recorded. The burial sites are all located further than 30 meters away from the pipeline servitude (Figure 9.1 to 9.3). Graves and cemeteries are of high social significance but as these features will be avoided and preserved no direct impact is expected. Site LWUA 4 is impacted on by the existing pipeline and pipeline servitude and it is not certain that this is indeed an archaeological site with surface features being destroyed by the existing pipeline. Although unlikely any impacts to subsurface heritage resources in this area can be successfully mitigated by implementing a chance find procedure.

The impact of the proposed project on heritage resources can be mitigated to an acceptable level and it is recommended that the proposed project can commence on the condition that the following recommendations are implemented as part of the EMP, based on approval from SAHRA:

### Recommendations:

- It is recommended that all recorded burial sites should be indicated on development plans and avoided by the development (with a 30 m buffer). If this is not possible the graves can be relocated adhering to all legal requirements;
- The recorded Iron Age feature should be monitored during construction;
- Implementation of a chance find procedure for the project as outlined below.

### 10.1 Chance Find Procedures

The possibility of the occurrence of subsurface finds cannot be excluded. Therefore, if during construction any possible finds such as stone tool scatters, artefacts or bone and fossil remains are made, the operations must be stopped, and a qualified archaeologist must be contacted for an assessment of the find and therefore chance find procedures should be put in place as part of the EMP. A short summary of chance find procedures is discussed below.

This procedure applies to the developer's permanent employees, its subsidiaries, contractors and subcontractors, and service providers. The aim of this procedure is to establish monitoring and reporting procedures to ensure compliance with this policy and its associated procedures. Construction crews must be properly inducted to ensure they are fully aware of the procedures regarding chance finds as discussed below.

- If during the pre-construction phase, construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance or heritage site, this person must cease work at the site of the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager.
- It is the responsibility of the senior on-site Manager to make an initial assessment of the extent of the find and confirm the extent of the work stoppage in that area.
- The senior on-site Manager will inform the ECO of the chance find and its immediate impact on operations. The ECO will then contact a professional archaeologist for an assessment of the finds who will notify the SAHRA.

## **10.2 Reasoned Opinion**

The overall impact of the project is considered to be low and residual impacts can be managed to an acceptable level through implementation of the recommendations made in this report. The socio-economic benefits also outweigh the possible impacts of the development if the correct mitigation measures are implemented for the project.

## **10.4 Potential risk**

Potential risks to the proposed project are the occurrence of intangible features and unrecorded cultural resources (of which graves are the highest risk) or subsurface archaeological deposit. This can cause delays during construction, additional costs involved in mitigation.

### 10.5 Monitoring Requirements

Ideally, site monitoring should be conducted by an experienced archaeologist or heritage specialist. Day to day monitoring can be conducted by the Environmental Control Officers (ECO). The ECO or other responsible persons should be trained along the following lines:

- *Induction training:* Responsible staff identified by the developer should attend a short course on heritage management and identification of heritage resources.
- *Site monitoring and watching brief:* As most heritage resources occur below surface, all earth-moving activities need to be routinely monitored in case of accidental discoveries. The greatest potential impacts are the initial soil removal and subsequent earthworks during construction. The ECO should monitor all such activities daily. If any heritage resources are found, the chance finds procedure must be followed as outlined above.

Table 10. Monitoring requirements for the project

Heritage Monitoring					
Aspect	Area	Responsible for monitoring and measuring	Frequency	Proactive or reactive measurement	Method
Clearing activities and construction	Entire project area	ECO	Weekly (Preconstruction and construction phase)	Proactively	<ul style="list-style-type: none"> <li>• If risks are manifested (accidental discovery of heritage resources) the chance find procedure should be implemented:               <ol style="list-style-type: none"> <li>1. Cease all works immediately;</li> <li>2. Report incident to the Sustainability Manager;</li> <li>3. Contact an archaeologist/ palaeontologist to inspect the site;</li> <li>4. Report incident to the competent authority; and</li> <li>5. Employ reasonable mitigation measures in accordance with the requirements of the relevant authorities.</li> </ol> </li> <li>• Only recommence operations once impacts have been mitigated.</li> </ul>

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Heritage Monitoring					
Aspect	Area	Responsible for monitoring and measuring	Frequency	Proactive or reactive measurement	Method
Ephemeral Walling	LWUA 4	EAP/ Applicant	Weekly (Preconstruction and construction phase)	Proactively	<ul style="list-style-type: none"> <li>• Measure levels of subsidence and compare with recorded baseline conditions;</li> <li>• Status quo will be recorded through photographs; and</li> <li>• Results will be reported in the progress reporting.</li> </ul>

## 10.6 Management Measures for inclusion in the EMPr

Table 11. Heritage Management Plan for EMPr implementation

Area	Mitigation measures	Phase	Timeframe	Responsible party for implementation	Target	Performance indicators (Monitoring tool)
<b>General project area</b>	Implement chance find procedures in case possible heritage finds are uncovered	Pre-Construction and construction	Throughout the project	Applicant EAP	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 35, 36 and 38 of NHRA	ECO Checklist/Report
<b>LWU 1,2,3</b>	All recorded graves and burial sites should be indicated on development plans and avoided. Ensure access to the sites during construction.	Pre-Construction and construction	Pre-Construction and construction	Applicant EAP	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 36 and 38 of NHRA	EO Checklist/Report
<b>LWUA 4</b>	Monitor Site during construction	Pre-Construction and construction	Pre-Construction and construction	Applicant EAP	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 35 and 38 of NHRA	EO Checklist/Report



### **10.7 Knowledge Gaps**

Due to the subsurface nature of heritage resources, the possibility of discovery of heritage resources during the construction phase cannot be excluded, in addition it was not possible to walk the entire line due to access limitations within active mining areas and a river crossing and although unlikely heritage sites could occur in these areas. The limitations are successfully mitigated with the implementation of a chance find procedure.

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