



PGS HERITAGE

THE PROPOSED TETRA4 CLUSTER 2 GAS PRODUCTION PROJECT, BETWEEN WELKOM, VIRGINIA AND THEUNISSEN, FREE STATE PROVINCE

Heritage Impact Assessment

Issue Date: 29 June 2022

Revision No.: 0.2

Project No.: 580HIA



+ 27 (0) 12 332 5305



+27 (0) 86 675 8077



contact@pgsheritage.co.za



PO Box 32542, Totiusdal, 0134

Head Office:
906 Bergarend Streets
Waverley, Pretoria,
South Africa

Offices in South Africa, Kingdom of Lesotho and Mozambique

Directors: HS Steyn, PD Birkholtz, W Fourie

Declaration of Independence

I, Nikki Mann, declare that –

1. General declaration:
2. I act as the independent heritage practitioner in this application
3. 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
4. I declare that there are no circumstances that may compromise my objectivity in performing such work;
5. I have expertise in conducting heritage impact assessments, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
6. I will comply with the Act, Regulations and all other applicable legislation;
7. I will take into account, to the extent possible, the matters listed in section 38 of the NHRA when preparing the application and any report relating to the application;
8. I have no, and will not engage in, conflicting interests in the undertaking of the activity;
9. 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;
10. I will ensure that information containing all relevant facts in respect of the application is distributed or made available to interested and affected parties and the public and that participation by interested and affected parties is facilitated in such a manner that all interested and affected parties will be provided with a reasonable opportunity to participate and to provide comments on documents that are produced to support the application;
11. I will provide the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not
12. All the particulars furnished by me in this form are true and correct;
13. I will perform all other obligations as expected from a heritage practitioner in terms of the Act and the constitutions of my affiliated professional bodies; and
14. I realise that a false declaration is an offence in terms of regulation 71 of the Regulations and is punishable in terms of section 24F of the NEMA.

Disclosure of Vested Interest

15. I do not have and will not have any vested interest (either business, financial, personal or other) in the proposed activity proceeding other than remuneration for work performed in terms of the Regulations;

HERITAGE CONSULTANT:

PGS Heritage (Pty) Ltd

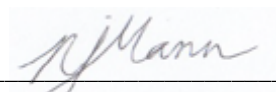
CONTACT PERSON:

Nikki Mann - Archaeologist

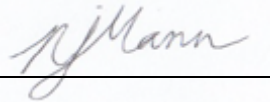

Tel: +27 (0) 12 332 5305

Email: nikki@pgsheritage.co.za

SIGNATURE:



Report Title	THE PROPOSED TETRA4 CLUSTER 2 GAS PRODUCTION PROJECT, BETWEEN WELKOM, VIRGINIA AND THEUNISSEN, FREE STATE PROVINCE
--------------	---------------------------------------------------------------------------------------------------------------------------

Control	Name	Signature	Designation
Author	Nikki Mann		Archaeologist – PGS Heritage
Reviewed	Wouter Fourie		Senior Heritage Specialist/ Project Manager – PGS Heritage
Reviewed			EIMS

DETAILS OF CLIENT:

CLIENT: Environmental Impact Management Services (Pty) Ltd (EIMS)

CONTACT PERSON:

EXECUTIVE SUMMARY

PGS Heritage (Pty) Ltd (PGS) was appointed by Environmental Impact Management Services Consulting (Pty) Ltd (EIMS) to undertake a Heritage Impact Assessment (HIA), which forms part of the environmental process for the proposed Tetra4 Cluster 2 Gas Production Project, located within the Matjhabeng and Masilonyana Local Municipalities, between Welkom, Virginia and Theunissen, Free State Province.

This HIA aims to evaluate the possible impacts on heritage resources present within the proposed development footprint of the Tetra4 Cluster 2 Gas Production Project. Immediate and direct impacts on archaeological and palaeontological resources were addressed through the HIA.

Site Name and Location

The proposed Tetra4 Cluster 2 Gas Production Project is located within Matjhabeng and Masilonyana Local Municipalities, between Welkom, Virginia and Theunissen, Free State Province.

Coordinates for Study Area	Northernmost point: S -28.07716 E 26.66416	Easternmost point: S -28.23105 E 26.80612
	Southernmost point: S -28.23972 E 26.69567	Westernmost point: S -28.16878 E 26.63364

General Desktop Study

An archival and historical desktop study was undertaken to provide a historic framework for the project area and surrounding landscape. This was augmented by a study of available historical and archival maps and an assessment of previous archaeological and heritage studies completed for the area. The desktop study revealed that the surroundings of the study area are characterised by a long and significant history, whereas previous archaeological and heritage studies from this area have revealed several archaeological and heritage sites from the surroundings.

Several archaeological and heritage surveys have been undertaken within the region. In 2016 and 2017, fieldwork was conducted by Polke Birkholtz (2017a, 2017b), an archaeologist of PGS. **Thirty-five** (35) of the **heritage finds** identified during this fieldwork, fall within the current study area. These were classified as either cemeteries, historic structures believed to be older than 100 years, historic structures believed to be older than 60 years, historical buildings of low significance, historic to recent sites with possible stillborn baby graves and possible grave sites.

There were ten (10) graves and burial grounds (**TET 1, TET 7-8, TET 11, TET 15, TET 19, TET 22, SSL/BET/72, SITE 2, SITE 19**), eleven (11) structures (**TET 2-3, TET 9, TET 27, SSL/BET/25-26, SSL/BET/36, SITE 1A, SITE 1B, SITE 20-21**), fourteen (14) historic to recent sites with possible graves (**TET 4-6, TET 13-14, TET 25a, TET 25b, TET 26, SSL/BET/37-39, SSL/BET/53, SSL/BET/60, SSL/BET/66**).

Palaeontology

Elize Butler of Banzai Environmental (Pty) Ltd was commissioned to undertake a two-day Palaeontological Impact Assessment. Her report and findings are attached in full in Appendix B.

Butler found that the study area is “by Quaternary sediments as well as Permian aged sandstone and shale of the Adelaide Subgroup (Beaufort Group, Karoo Supergroup). According to the PalaeoMap of the South African Heritage Resources Information System (SAHRIS) the Palaeontological Sensitivity of Quaternary sediments in this area is Moderate, while that of the Adelaide Subgroup (Beaufort Group, Karoo Supergroup) is Very High.”

Fieldwork

The fieldwork component of the study was aimed at identifying tangible remains of archaeological, historical and heritage significance.

The fieldwork was undertaken by way of intensive walkthroughs of the proposed development footprint areas. It is important to note that although as intensive a fieldwork coverage as possible was undertaken, sections of the study area are in areas which are more densely overgrown and/or disturbed (crops: maize, sunflowers, soya beans; ploughed areas) or have restricted access, which limited visibility in those areas of the study area. Therefore, the walkthroughs were focused on those areas that are not disturbed, as the potential for identifying archaeological and heritage sites in the more undisturbed components of the study area are much higher. As a result, only limited fieldwork was undertaken in those components of the study area that are entirely disturbed.

The fieldwork was undertaken by three archaeologists from PGS (Nikki Mann, Michelle Sachse, Nicholas Fletcher) on 14-24 February 2022. Throughout the fieldwork, hand-held GPS devices were used to record tracklogs showing the routes followed by the fieldwork team.

Recent fieldwork undertaken resulted in the identification of a total of **forty-one (41) heritage sites** (four of which were previously recorded; see footnotes below).

These sites comprised the following:

- Seven (7) sites containing burial grounds and graves. See sites **T0003, T0009, T0010, T0012¹, T0013, T0024, T0029**.
- Nine (9) sites historic to recent sites with possible graves. See sites **T0007, T0008, T0011, T0015, T0023, T0026, T0027, T0028, T0035²**.
- Twenty-five (25) structures. See sites **T0001, T0002, T0004, T0005, T0006³, T0014, T0016, T0017, T0018, T0019, T0020, T0021, T0022, T0025, T0030, T0031, T0032⁴, T0033, T0034, T0036, T0037, T0038, T0039, T0040, T0041**.

Impact Assessment

Burial grounds and graves

A total of fourteen (14) burial grounds and graves (**TET 1, TET 7-8, TET 11, TET 15¹, TET 19, TET 22, SSL/BET/72, SITE 2, SITE 19** and **T0003, T0009, T0024, T0029**) were identified within the proposed development areas. Burial grounds and graves have high heritage significance and are given a IIIA significance rating in accordance with the system described in Section 4 of this document.

Burial grounds and graves are protected under Section 36 of the NHRA 25 of 1999. Thus, the sites are provisionally rated as having a high heritage significance with a heritage rating of IIIA. All graves have high levels of emotional, religious and in some cases historical significance. It is also important to understand that the identified graves could have significant heritage value to the relevant families.

The pre-mitigation impact significance is rated as **MEDIUM**, but with the implementation of the required mitigation measures the post-mitigation impact will be **LOW**. The overall Environmental significance will be Low negative.

Historic to recent sites with possible graves

A total of fourteen (14) possible grave sites (**TET 4-6, TET 13², TET 14, TET 25a, TET 25b, TET 26, SSL/BET/37-39, SSL/BET/53, SSL/BET/60, SSL/BET/66**) were identified within the proposed development area. Burial grounds and graves have high heritage significance and are given a IIIA significance rating in accordance with the system described in Section 4 of this document.

¹ Note that site T0012 identified during the field assessment is the same site as TET15 identified in the 2016/2017 heritage assessment.

² Note that site T0035 identified during the field assessment is the same site as TET13 identified in the 2016/2017 heritage assessment.

³ Note that site T0006 identified during the field assessment is the same site as SITE 1B identified in the 2016/2017 heritage assessment.

⁴ Note that site T0032 identified during the field assessment is the same site as TET3 identified in the 2016/2017 heritage assessment.

The pre-mitigation impact significance is rated as **MEDIUM**, but with the implementation of the required mitigation measures the post-mitigation impact will be **LOW**. The overall Environmental significance will be Low negative.

Structures

A total of thirty-one (31) structures (**TET 2, TET3⁴, TET 9, TET 27, SSL/BET/25-26, SSL/BET/36, SITE 1A, SITE 1B³, SITE 20-21** and **T0001, T0002, T0004, T0005, T0017, T0018, T0019, T0020, T0021, T0025, T0030, T0031, T0033, T0034, T0036, T0037, T0038, T0039, T0040, T0041**) were identified within the proposed development area.

Twenty-one (21) of the heritage sites (**TET27, SSL/BET/25, SSL/BET/26, SSL/BET/36, T0001, T0002, T0004, T0005, T0017, T0018, T0019, T0020, T0025, T0030, T0031, T0033, T0034, T0036, T0037, T0038, T0039**) are assessed to have a low heritage significance are not included in the impact assessment. The reason for this is that sites of low significance will not require mitigation.

Structures older than 60 years fall under the protection of Section 34(1) of the National Heritage Resources Act 25 of 1999. Additionally, in terms of Section 35(4) of the National Heritage Resources Act (25 of 1999), man-made features and artefacts older than 100 years are defined as being archaeological. In the same section, the act also states that such archaeological sites and objects may not be disturbed, altered, modified or destroyed without a suitable permit from the South African Heritage Resources Agency (SAHRA).

The pre-mitigation impact significance is rated as **MEDIUM**, but with the implementation of the required mitigation measures the post-mitigation impact will be **LOW**. The overall Environmental significance will be Low negative.

Palaeontology

No visible evidence of fossiliferous outcrops was found in the development footprint and thus an overall medium palaeontological significance is allocated to the development footprint. It is therefore considered that the proposed development will not lead to detrimental impacts on the palaeontological reserves of the area and construction of the development may be authorised in its whole extent.

Mitigation measures

The following mitigation measures are listed in the table below.

Area and site no.	Mitigation Measures
General project area	▪ Implement a chance find procedures in case where possible heritage finds are uncovered.

Area and site no.	Mitigation Measures
Burial Grounds and Graves (TET 1, TET 7-8, TET 11, TET 15¹, TET 19, TET 22, SSL/BET/72, SITE 2, SITE 19 and T0003, T0009, T0024, T0029) that were located within the proposed development area and were rated as high local heritage significance and had a heritage grading of IIIA.	<ul style="list-style-type: none"> ▪ The graves should be demarcated with a 50-meterbuffer and should be avoided and left in situ. ▪ A Grave Management Plan should be developed for the graves which also need to be approved by SAHRA BGG. ▪ If the site is going to be impacted and the graves need to be removed a grave relocation process as per the Heritage Management Plan for the site is recommended as a mitigation and management measure. This will involve the necessary social consultation and public participation process before grave relocation permits can be applied for with the SAHRA BGG under the NHRA and National Health Act regulations.
Burial Grounds and Graves (T0010, T0013) that were located outside of the proposed development area.	<ul style="list-style-type: none"> ▪ No mitigation required.
Historic to recent sites with possible grave sites (TET 4-6, TET 13², TET 14, TET 25a, TET 25b, TET 26, SSL/BET/37-39, SSL/BET/53, SSL/BET/60, SSL/BET/66) that were located within the proposed development area and were rated as high local heritage significance and had a heritage grading of IIIA.	<ul style="list-style-type: none"> ▪ Apply for the test excavation and/or GPR permit to determine if the site contains graves. ▪ If human remains are discovered a grave relocation process is recommended as a mitigation and management measure. This will involve the necessary social consultation and public participation process before grave relocation permits can be applied for with the SAHRA BGG under the NHRA and National Health Act regulations. ▪ When graves are discovered/uncovered the site should be demarcated with a 50-meterno-go-buffer-zone and the grave should be avoided. ▪ If, during test excavations, it is determined that the site does not contain graves, no further mitigation will be required.
Historic to recent sites with possible grave sites (T0015, T0023, T0026, T0027, T0028) that were located outside of the proposed development area and were rated as high local heritage significance and had a heritage grading of IIIA.	<ul style="list-style-type: none"> ▪ No mitigation required.
Structures (TET2, TET3⁴, TET9, SITE 1A, SITE 1B³, SITE 20,	<ul style="list-style-type: none"> ▪ It is recommended that a no-go-buffer-zone of at least 30m is kept to the closest infrastructure.

Area and site no.	Mitigation Measures
<p>SITE 21, T0021, T0040, T0041) that were located within the proposed development area and were rated as medium local heritage significance and had a heritage grading of IIIB.</p>	<ul style="list-style-type: none"> ▪ If development occurs within 30m of the site, the structure will need to be satisfactorily studied and recorded before impact occurs. ▪ Recording of the site i.e. (a) map indicating the position and footprint of the structure (b) photographic recording of the structure (c) measured drawings of the floor plans of the structure. ▪ Submission of permit application to SAHRA to allow for the disturbance to the site. A Phase 2 Heritage Report must accompany the permit.
<p>Structures (T0014) that were located outside of the proposed development area and were rated as medium local heritage significance and had a heritage grading of IIIB.</p>	<ul style="list-style-type: none"> ▪ No mitigation is required.
<p>Structures (TET27, SSL/BET/25, SSL/BET/26, SSL/BET/36, T0017, T0018, T0019, T0020, T0025, T0037, T0038) that were located within the proposed development area and were rated as low local heritage significance and had a heritage grading of IIIC.</p>	<ul style="list-style-type: none"> ▪ No mitigation is required. The documentation of the site in the HIA report is sufficient and the site can be destroyed without a permit but with the approval of this report.
<p>Structures (T0016, T0022) that were located outside of the proposed development area and were rated as low local heritage significance and had a heritage grading of IIIC.</p>	<ul style="list-style-type: none"> ▪ No mitigation is required.
<p>Structures (T0001, T0002, T0004, T0005, T0030, T0031, T0033, T0034, T0036, T0039) that were located within the proposed development area and were rated to have no research potential or other cultural significance and had a heritage</p>	<ul style="list-style-type: none"> ▪ No mitigation is required.

Area and site no.	Mitigation Measures
grading of not conservation worthy (NCW).	
Palaeontology	<ul style="list-style-type: none"> • The ECO for this project must be informed that the Adelaide Subgroup (Beaufort Group, Karoo Supergroup) has a Very High Palaeontological Sensitivity. • If Palaeontological Heritage is uncovered during surface clearing and excavations the Chance find Protocol attached should be implemented immediately. Fossil discoveries ought to be protected and the ECO/site manager must report to South African Heritage Resources Agency (SAHRA) (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za) so that mitigation (recording and collection) can be carried out. • Before any fossil material can be collected from the development site the specialist involved would need to apply for a collection permit from SAHRA. Fossil material must be housed in an official collection (museum or university), while all reports and fieldwork should meet the minimum standards for palaeontological impact studies proposed by SAHRA (2012). • These recommendations should be incorporated into the Environmental Management Plan for the Tetra4 Development.

General

It is the considered opinion of the authors of this report that the overall impact of the proposed Tetra4 Cluster 2 Gas Production Project on heritage resources will be Low. Provided that the general recommendations and mitigation measures outlined in this report are implemented, the impact would be acceptably Low or could be totally mitigated to the degree that the project could be approved from a heritage perspective. The management and mitigation measures as described in section 8 of this report have been developed to minimise the project impact on heritage resources.

TABLE OF CONTENTS

EXECUTIVE SUMMARY

1	INTRODUCTION	28
1.1	SCOPE OF THE STUDY	28
1.2	SPECIALIST QUALIFICATIONS	28
1.3	ASSUMPTIONS AND LIMITATIONS	29
1.4	IDENTIFICATION OF POLICIES, LEGISLATION, STANDARDS & GUIDELINES	29
1.4.1	STATUTORY FRAMEWORK: THE NATIONAL HERITAGE RESOURCES (ACT 25 OF 1999)	30
1.4.2	NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT NO. 107 OF 1998)	33
1.4.3	NOTICE 648 OF THE GOVERNMENT GAZETTE 45421	34
1.4.4	NEMA – APPENDIX 6 REQUIREMENTS	36
1.4.5	MPRDA 2002 (ACT NO. 28 OF 2002)	39
2	SITE LOCATION AND DESCRIPTION	41
2.1	LOCALITY AND SITE DESCRIPTION	41
2.2	TECHNICAL PROJECT DESCRIPTION	44
2.2.1	PROPOSED CLUSTER 2 PROJECT	44
3	CURRENT STATUS QUO	51
3.1	SITE DESCRIPTION	51
3.2	SITE VEGETATION	54
4	ASSESSMENT METHODOLOGY	55
4.1.1	SITE SIGNIFICANCE	56
4.2	ARCHAEOLOGICAL SPECIFIC METHODOLOGY	58
5	HISTORICAL AND ARCHAEOLOGICAL OVERVIEW OF THE STUDY AREA	59
5.1	OVERVIEW OF THE STUDY AREA AND SURROUNDING LANDSCAPE	59
5.2	HERITAGE SENSITIVITY AS REVEALED IN THE HISTORICAL AND ARCHAEOLOGICAL OVERVIEW	79
5.3	EXAMINATION OF ARCHIVAL AND HISTORICAL MAPS	80
5.3.1	FIRST EDITION OF THE 2826BA BLAAUWDRIFT AND 2826BB VIRGINIA TOPOGRAPHICAL MAP DATED TO 1945	81
5.3.2	SECOND EDITION OF THE 2826BA AND 2826BB TOPOGRAPHICAL MAP DATED TO 1954	88
5.3.3	THIRD EDITION OF THE 2826BB TOPOGRAPHICAL MAP DATED TO 1975	93
5.3.4	FOURTH EDITION OF THE 2826BA TOPOGRAPHICAL MAP DATED TO 1997	96
5.4	PREVIOUS ARCHAEOLOGICAL AND HERITAGE RESEARCH FROM WITHIN THE STUDY AREA AND SURROUNDINGS	100

5.4.1	<i>PREVIOUS ARCHAEOLOGICAL AND HERITAGE STUDIES FROM WITHIN THE STUDY AREA</i>	102
5.5	FINDINGS OF THE HISTORICAL DESKTOP STUDY	103
5.5.1	<i>HERITAGE SCREENING</i>	103
5.5.2	<i>HERITAGE SENSITIVITY</i>	103
6	FIELDWORK AND FINDINGS	106
6.1	HERITAGE SITES PREVIOUSLY IDENTIFIED WITHIN THE STUDY AREA	106
6.2	HERITAGE SITES IDENTIFIED DURING THE CURRENT FIELD ASSESSMENT	162
6.3	SENSITIVITY ASSESSMENT OUTCOME	278
7	PALEONTOLOGY	290
8	IMPACT ASSESSMENT	291
8.1	DETERMINATION OF ENVIRONMENTAL RISK	291
8.2	IMPACT PRIORITISATION	293
8.3	HERITAGE IMPACTS	295
8.3.1	<i>GENERAL OBSERVATIONS</i>	295
8.3.2	<i>BURIAL GROUNDS AND GRAVES</i>	295
8.3.3	<i>HISTORIC TO RECENT SITES WITH POSSIBLE GRAVES</i>	296
8.3.4	<i>STRUCTURES</i>	296
9	MANAGEMENT RECOMMENDATIONS AND GUIDELINES	300
9.1	CONSTRUCTION PHASE	300
9.2	CHANCE FIND PROCEDURE	300
9.3	POSSIBLE FINDS DURING CONSTRUCTION PHASES	301
9.4	TIMEFRAMES	301
9.5	HERITAGE MANAGEMENT PLAN FOR EMPR IMPLEMENTATION	302
10	CONCLUSIONS	307
10.1	GENERAL DESKTOP STUDY	307
10.2	PALAEONTOLOGY	308
10.3	FIELDWORK	308
10.4	IMPACT ASSESSMENT	309
10.4.1	<i>BURIAL GROUNDS AND GRAVES</i>	309
10.4.2	<i>HISTORIC TO RECENT SITES WITH POSSIBLE GRAVES</i>	309
10.4.3	<i>STRUCTURES</i>	310
10.4.4	<i>PALAEONTOLOGY</i>	310
10.5	MITIGATION MEASURES	310
10.6	GENERAL	314
11	REFERENCES	315
11.1	PUBLISHED REFERENCES	315

11.2 HISTORIC TOPOGRAPHIC MAPS	318
11.3 INTERNET	318
11.4 GOOGLE EARTH	319

List of Tables

<i>Table 1 - List of abbreviations used in this report</i>	xxvi
<i>Table 2 - Reporting requirements for GN 648 of 2019</i>	34
<i>Table 3 - Reporting requirements as per NEMA Appendix 6 for specialist reports</i>	38
<i>Table 4 - Rating system for archaeological resources</i>	56
<i>Table 5 - Rating system for built environment resources</i>	57
<i>Table 6 – Archaeological and Historical Overview of the Study Area and Surrounding Landscape</i>	59
<i>Table 7 - Tangible heritage site in the study area</i>	104
<i>Table 8 - Landform type to heritage find matrix</i>	104
<i>Table 9: Sites previously identified in the study area</i>	112
<i>Table 10 - Sites identified during the heritage survey</i>	174
<i>Table 11 - Criteria for Determining Impact Consequence</i>	291
<i>Table 12 - Probability Scoring</i>	292
<i>Table 13 - Determination of Environmental Risk</i>	292
<i>Table 14 - Significance Classes</i>	293
<i>Table 15 - Criteria for Determining Prioritisation</i>	293
<i>Table 16 - Determination of Prioritisation Factor</i>	294
<i>Table 17 - Final Environmental Significance Rating</i>	294
<i>Table 18 - Impact rating for heritage resources</i>	298
<i>Table 19 - Impact rating for palaeontological resources</i>	299
<i>Table 20 - Lead times for permitting and mobilisation</i>	301
<i>Table 21: Heritage Management Plan for EMPr implementation</i>	302

List of Figures

<i>Figure 1 - Human and Cultural Timeline in Africa (Morris, 2008).</i>	xxvii
<i>Figure 2 - Environmental screening tool's depiction of the archaeological and heritage sensitivity of the study area and surroundings.</i>	35
<i>Figure 3 - Environmental screening tool's depiction of the palaeontological sensitivity of the study area and surroundings.</i>	36
<i>Figure 4 - Locality map depicting the regional context of the study area.</i>	43
<i>Figure 5 - Project history and mineral tenure</i>	44
<i>Figure 6 – Cluster 2 study area and proposed infrastructure footprint buffer zones.</i>	45
<i>Figure 7 - View of an existing pigging station constructed as part of Cluster 1.</i>	48
<i>Figure 8 - Example of Compressor Station just recently constructed as part of Cluster 1.</i>	49
<i>Figure 9 – Typical dense vegetation observed during the field assessment.</i>	52

Figure 10 – View of a wetland observed within the study area.....	52
Figure 11 – View of overgrown farm track.	52
Figure 12 – General view of soya bean crops.	52
Figure 13 – View of sunflower fields.	53
Figure 14 – Typical ploughed land.....	53
Figure 15 – View of muddy farm roads.	53
Figure 16 – View of flooded road after rainfall.	53
Figure 17 – Photograph of the archaeological field survey as published in De Ruiter et. al. (2011).	60
Figure 18 - This plan depicts the settlement layout of a typical Type Z site, and was recorded at site OXF 1 (Maggs, 1976:233).....	61
Figure 19 – Artist’s impression of a bilobial dwelling at site OXF 1. These bilobial dwellings represent a characteristic element of Type Z settlements (Maggs, 1976:241).	62
Figure 20 – Corbelled stone huts associated with a Type V settlement (Huffman, 2007:39).....	63
Figure 21 – Layout of a Type V Settlement (Huffman, 2007:38).	63
Figure 22 - King Mzilikazi of the Matabele. This illustration was made by Captain Cornwallis Harris in c. 1838 (www.sahistory.org.za).....	64
Figure 23 – Depiction of an ox wagon crossing a river during the Great Trek (Reader’s Digest, 1994:116).	65
Figure 24 – Lord Frederick Sleight Roberts (left) and General Louis Botha (right). These two officers commanded the opposing forces at the Battle of Zand River (Changuion, 2001:77 & 117)	68
Figure 25 – Lord Roberts’s infantry crossing the Zand River at the conclusion of the Battle of Zand River. This photograph was in all likelihood taken during the afternoon of 10 May 1900, after all the significant drifts across the river had been cleared by the cavalry and other units. The crossing and surrounding landscape are monitored by an observation balloon (see top right). It is not possible to identify the exact drift where this crossing took place, although the remnants of a bridge foundation structure can be seen in the river bed (Raath, 2007:351).	70
Figure 26 - Two of the British officers at the Battle of the Zand River who were closely associated with the events within the study area, namely the occupation of the Du Preez Leger Drift on 9 May 1900 as well as the crossing of the drift on the morning of 10 May 1900. General John French (left) (Changuion, 2001:77) and Colonel Thomas William Porter (www.nzetc.victoria.ac.nz).	71
Figure 27 – Sir Thomas Major Cullinan was one of the founding directors of the Driekopjes Diamond Mining Company, which acquired an interest in the farm Welgegund in 1894. In the historic photograph on the left he is shown shortly after the discovery of the Cullinan diamond (which is held by F. Wells) at the Premier Diamond Mining Company, of which he was the chairman. The photograph on the right depicts Cullinan in 1929 (Helme, 1974: 75 & 146).	72
Figure 28 – Archibald Megson standing in the prospecting trench on the farm Aandenk (Felstar Publications, 1968).....	73
Figure 29 –The hardships experienced by General C.R. de Wet during the rebellion can be seen on these photographs. The one on the left shows De Wet shortly after the South African War (Van Schoor,	

2007) with the image on the right depicting the general in the Bloemfontein prison after his capture late in 1914 (Raath & Langner, 2014:119).....	74
Figure 30 - The first gold prospecting borehole in the Free State was sunk on the farm Aandenk between October 1933 and February 1935. The arrows indicate the positions of Allan Roberts and his wife (Felstar Publications, 1968:11).	75
Figure 31 –The famous geologist Dr. Hans Merensky, who had his role to play in the discovery of the Free State goldfields (Machens, 2009).	76
Figure 32 –The first mine shaft ever sunk along the Free State goldfields, namely the No. 3 Incline Shaft at the St. Helena Gold Mine (Felstar Publishers, 1968:151).	77
Figure 33 –This photograph of Welkom was taken during the 1960s, roughly ten years after its establishment (Felstar Publications, 1968:171).	78
Figure 34 - Section of First Edition of the 2826BA Topographical Map, showing several heritage features. These comprise structures (purple polygon), ruins (yellow polygon) and historical Black Homesteads (red polygons) located within the immediate vicinity of the proposed development.	82
Figure 35– Second section of First Edition of the 2826BA Topographical Map, showing several heritage features. These comprise structures (purple polygon), graves (blue polygon) and historical Black Homesteads (red polygons) located within the immediate vicinity of the proposed development.	83
Figure 36 – Third section of First Edition of the 2826BA Topographical Map, showing several heritage features. These comprise structures (purple polygon) and historical Black Homesteads (red polygons) located within the immediate vicinity of the proposed development.	84
Figure 37 – Fourth section of First Edition of the 2826BA Topographical Map, showing several heritage features. These comprise structures (purple polygon) and historical Black Homesteads (red polygons) located within the immediate vicinity of the proposed development.	85
Figure 38 - Section of First Edition of the 2826BB Topographical Map, showing several heritage features. These comprise structures (purple polygon), ruin (yellow polygon), historical Black Homesteads (red polygons) and graves (blue polygon) located within the vicinity of the proposed development.....	86
Figure 39– Second section of First Edition of the 2826BB Topographical Map, showing several heritage features. These comprise structures (purple polygon), historical Black Homesteads (red polygons) and graves (blue polygon) located within the vicinity of the proposed development.	87
Figure 40 - Section of Second Edition of the 2826BA Topographical Map, showing several heritage features. These comprise structures (purple polygon), historical Black Homesteads (red polygons) and graves (blue polygon) located within the vicinity of the proposed development.	89
Figure 41 – Second section of Second Edition of the 2826BA Topographical Map, showing several heritage features. These comprise structures (purple polygon) and historical Black Homesteads (red polygons) located within the vicinity of the proposed development.	90
Figure 42 - Section of Second Edition of the 2826BB Topographical Map, showing several heritage features. These comprise structures (bright green polygon), historical Black Homesteads (dark green polygons) and graves (red polygon) located within the vicinity of the proposed development.....	91

Figure 43 – Second section of Second Edition of the 2826BB Topographical Map, showing several heritage features. These comprise structures (bright green polygon) and historical Black Homesteads (dark green polygons) located within the vicinity of the proposed development.	92
Figure 44 - Section of Third Edition of the 2826BB Topographical Map, showing several heritage features. These comprise structures (purple polygon) and ruins (yellow polygon) located within the vicinity of the proposed development.	94
Figure 45 – Second section of Third Edition of the 2826BB Topographical Map, showing several heritage features. These comprise structures (orange polygon), ruins (dark green polygon) and graves (red polygon) located within the vicinity of the proposed development.	95
Figure 46 – A section of Fourth Edition of the 2826BA Topographical Map, showing several heritage features. These comprise graves (pink polygon) located within the vicinity of the proposed development.	97
Figure 47 – Second section of Fourth Edition of the 2826BA Topographical Map, showing several heritage features. These comprise graves (blue polygon) located within the vicinity of the proposed development.	98
Figure 48 – Third section of Fourth Edition of the 2826BA Topographical Map, showing several heritage features. These comprise graves (blue polygon) located within the vicinity of the proposed development.	99
Figure 49 - Heritage Sensitivity Map indicating possible sensitive areas within and adjacent to the proposed development areas.	105
Figure 50 – Map depicting the distribution of the previously identified sites in the region.	107
Figure 51 – Closer view of the previously identified sites recorded within the buffer zones in the northern section of the current study area.	108
Figure 52 – Closer view of the previously identified sites recorded within the buffer zones in the central section of the current study area.	109
Figure 53 – Closer view of the previously identified sites recorded within the buffer zones near one of the proposed compressor stations.	110
Figure 54 - Closer view of the previously identified sites recorded within the buffer zones in the Southern section of the current study area.	111
Figure 55 - General view of the cemetery at TET 1.	113
Figure 56 – Close up view of the headstone on the grave of John Adamson and his wife Emma Young Adamson (Scale is in 10cm increments).	113
Figure 57 – One of the stone packed graves from TET 1 (Scale is in 10cm increments).	113
Figure 58 – View of a section of TET 2. The cemetery at TET 1 can be seen at the trees in the back (Scale is in 10cm increments).	114
Figure 59 – General view of a section of the site (Scale is in 10cm increments).	115
Figure 60 – This view along the southern wall of the structure depicts the disturbance which had taken place at the site. Although the original foundation of the wall is located on left, the dispersed stones from the actual stone wall itself can be seen on the right (Scale is in 10cm increments).	115
Figure 61 – General view of TET 4 (Scale is in 10cm increments).	117

Figure 62 - One of the poorly preserved structures from TET 4 (Scale is in 10cm increments).	117
Figure 63 – One of the stone concentrations identified at TET 5 (Scale is in 10cm increments).	118
Figure 64 – The lithics and hammerstone identified at TET 5 (Scale is in 1cm increments).	118
Figure 65 – General view of the rectangular stone concentration identified at TET 6 (Scale is in 10cm increments).	119
Figure 66 - General view of the cemetery at TET 7. The positions of three of the four headstones identified at the site which can be seen on this image are marked with red arrows (Scale is in 10cm increments).	121
Figure 67 - One of the broken headstones at the cemetery at TET 7 (Scale is in 10cm increments).	121
Figure 68 – Another view of one of the broken headstones from the cemetery at TET 7 (Scale is in 10cm increments).	121
Figure 69 - General view of the cemetery at TET 8.	123
Figure 70 – Closer view of one of the graves at TET 8 (Scale is in 10cm increments).	123
Figure 71 - Close up view of the granite headstone.	124
Figure 72 – Closer view of one of the graves at TET 8. This grave dressing consists of a soil heap with small upright stones marking the head and foot of the grave (Scale is in 10cm increments).	124
Figure 73 – General view of TET 9, with the older drift visible on the right and the modern concrete bridge dominating the landscape on the left.	126
Figure 74 – View along the older drift with the more modern concrete bridge on the left.	126
Figure 75 - General view of the cemetery at TET 11. The boundary fence between the farms Kalkoenkrans (left of the fence) and Palmietkuil (right of the fence) can clearly be seen.	128
Figure 76 – General view of some of what is believed to be some of the older graves from the cemetery comprising stone concentrations with unmarked upright stones as headstones (Scale is in 10cm increments).	128
Figure 77 – Granite headstone from one of the graves with a brick-lined dressing and granite headstone (Scale is in 10cm increments).	129
Figure 78– View of the remnants of what appears to have been a livestock camp. Apart from the upright corner post visible in the front, the positions of the corner posts are marked with red arrows (Scale is in 10cm increments).	131
Figure 79 - General view of the remains of the structure (Scale is in 10cm increments).	132
Figure 80 – Another view of the remains of the structure (Scale is in 10cm increments).	132
Figure 81 – General view of TET 14 (Scale is in 10cm increments).	133
Figure 82 – Cultural material in the form of glass and metal fragments were found across the surface of TET 14 (Scale is in 10cm increments).	133
Figure 83 - General view of the cemetery at TET 15.	134
Figure 84 - Closer view of one of the graves at TET15.	134
Figure 85 – One of the graves from the cemetery at TET 19 (Scale is in 10cm increments).	135
Figure 86 - Another view of one of the graves from the cemetery at TET19.	135
Figure 87 – General view of TET 22.	136

Figure 88 – Closer view of the cross at TET 22.....	136
Figure 89 – General view of a section of the area where cultural material was identified.....	137
Figure 90 – Cultural material in the form of glass and metal fragments is found across the surface of the site. Scale is in 1cm and 5cm increments.....	137
Figure 91 – General view of the structure at TET 26.....	138
Figure 92 – General view of a section of the building.....	140
Figure 93 – View of a section of the interior of the building.....	140
Figure 94 – General view of remains of the farmhouse at SSL/BET/25.....	141
Figure 95 – Example of the linoleum flooring within the old farmhouse at SSL/BET/25 (Scale is in 10cm increments).....	141
Figure 96 - The foundation remains of the outbuilding at site SSL/BET/25.....	142
Figure 97 - Fragments of earthenware piping (Scale is in 10cm increments).	142
Figure 98 – General view of the reservoir identified at SSL/BET/26 (Scale is at 10cm increments)..	143
Figure 99 - Closer view of one of the bricks with which the reservoir was built.....	143
Figure 100 – Front view of the building at SSL/BET/36. The concrete lintels are visible.	144
Figure 101 – Rear view of the same building. The steel doorframes can be seen.....	144
Figure 102 – Remains of an old brick reservoir at SSL/BET/36.....	145
Figure 103 – Remains of an old corrugated reservoir.	145
Figure 104 – Upright stone fence post at SSL/BET/37 (Scale is in increments of 10cm).	146
Figure 105 - Visible remains of stone foundation of the 8x3m structure (Scale is in increments of 10cm).	146
Figure 106 – General view of SSL/BET/38, showing the Eskom pylon (Scale is in increments of 10cm).	147
Figure 107 - Visible remains of structure foundation (Scale is in increments of 10cm).....	147
Figure 108–General view of the remains of the stone and mud wall at SSL/BET/39.....	148
Figure 109–General view of the structure observed at SSL/BET/53 (Scale is in 10cm increments).	150
Figure 110 - Three of the glass fragments observed in proximity to Site 050a (Scale is in 1cm increments).....	150
Figure 111 - General view of the structure at Site 050b (Scale is in 10cm increments).....	151
Figure 112 - The midden identified at Site 051c (Scale is in 10cm increments).....	151
Figure 113– Section of the 1945 topographical map showing a hut at SSL/BET/60.....	152
Figure 114– Section of the 1945 topographical map showing a hut at SSL/BET/66.....	153
Figure 115 – General views of grave observed at SSL/BET/72.	154
Figure 116 – General views of SITE 1A.....	155
Figure 117 – Section of the 1945 topographical map showing a structure at SITE 1A.	155
Figure 118–General views of SITE 1B.....	156
Figure 119– Section of the 1945 topographical map showing a structure at SITE 1B.	157
Figure 120– View of headstones observed at SITE 2.	158
Figure 121–General view of the two fenced off graves observed at SITE 19.	159
Figure 122–General views of SITE 20.	160

Figure 123 – General view of SITE 21.....	161
Figure 124 - Historical photographs of the farmhouse at SITE 21.	161
Figure 125 - Survey Tracklogs.....	164
Figure 126 - Heritage Resources identified during the fieldwork. See insets below.....	165
Figure 127 – Heritage Resources identified during the fieldwork. Inset A.	166
Figure 128 - Heritage Resources identified during the fieldwork. Inset B.	167
Figure 129 - Heritage Resources identified during the fieldwork. Inset C.	168
Figure 130 - Heritage Resources identified during the fieldwork. Inset D.	169
Figure 131 - Heritage Resources identified during the fieldwork. Inset E.....	170
Figure 132 - Heritage Resources identified during the fieldwork. Inset F.	171
Figure 133 - Heritage Resources identified during the fieldwork. Inset G.	172
Figure 134 - Heritage Resources identifies during previous and current field assessments.....	173
Figure 135 – General views of the two structures at T0001.	175
Figure 136 – General views of T0003.....	177
Figure 137 – General views of T0002.....	178
Figure 138 – General views of T0004.....	179
Figure 139 – General views of T0005.....	180
Figure 140 – Satellite image illustrating that T0006 was previously recorded as SITE 1B.	181
Figure 141 – General views of T0006 in an overgrown environment.	182
Figure 142 - General views of T0007.....	184
Figure 143 - Sample of building materials observed at T0007.	184
Figure 144 - 2826BB topographical sheet surveyed in 1945 depicts two structures at T0007.	185
Figure 145 - General view of T0008.	187
Figure 146 - Rubble observed at T0008.	188
Figure 147 - Sample of refuse observed at T0008.	188
Figure 148 - View of a water trough at T0008.....	189
Figure 149 - 2826BB topographical sheet surveyed in 1945 depicts two huts at T0008.	189
Figure 150 - 2826BB topographical sheet surveyed in 1954 depicts a structure and windpump at T0008.	190
Figure 151 - 2826BB topographical sheet surveyed in 1975 depicts several structures at T0008. ...	190
Figure 152 - Views of the grave at T0009.....	191
Figure 153 - Closer view of the grave at T0009.....	192
Figure 154 - 2826BB topographical sheet surveyed in 1945 depicts a grave at T0009.	192
Figure 155 - General view of T0010.	194
Figure 156 – View of grave with metal marker at T0010.	195
Figure 157 - Rectangular brick-line dressing with granite headstone at T0010.	195
Figure 158 – View of overgrown stone packed grave dressing at T0010.....	196
Figure 159 - View of overgrown stone packed grave dressing with unmarked stone as headstone at T0010.	196
Figure 160 – Engraved stone headstone at T0010.	196

Figure 161 – Overgrown grave with granite headstone at T0010.....	197
Figure 162 - View of stone headstone at T0010.....	197
Figure 163 - 2826BB topographical sheet surveyed in 1945 depicts several huts at T0010.	197
Figure 164 - General view of T0011.	199
Figure 165 - View of rubble at T0011.....	199
Figure 166 - Closer view of rubble at T0011.....	199
Figure 167 - 2826BB topographical sheet surveyed in 1945 depicts a structure and avenue of trees at T0011.	200
Figure 168 – Satellite image illustrating that T0012 was previously recorded as TET 15.	202
Figure 169 – General views of the overgrown and waterlogged graves at T0012.	202
Figure 170 - General view of the graves at T0013.	204
Figure 171 - View of an overgrown stone packed grave at T0013.	204
Figure 172 – Views of the two granite headstones observed at T0013.....	205
Figure 173 - 2826BB topographical sheet surveyed in 1975 depicts a grave at T0013.	206
Figure 174 - General views of the ruin at T0014.	208
Figure 175 - Horse shoe identified at T0014.....	209
Figure 176 - 2826BB topographical sheet surveyed in 1945 depicts a grave at T0014.	209
Figure 177 - 2826BB topographical sheet surveyed in 1954 depicts a grave at T0014.	209
Figure 178 - General view of T0015.	210
Figure 179 - General views of the stone kraals at T0016.	211
Figure 180 - General views of T0017.....	213
Figure 181 - 2826BB topographical sheet surveyed in 1975 depicts a grave at T0017.	213
Figure 182 - General views of T0018 and T0019.	214
Figure 183 - 2826BB topographical sheet surveyed in 1997 depicts two structures in the vicinity of T0018 and T0019.	215
Figure 184 - General views of T0020.....	216
Figure 185 - General views of the historical farmstead ruin at T0021.	218
Figure 186 - Views of the different building materials and methods observed at T0021.....	219
Figure 187 - View of the remnants of walling at T0021.	220
Figure 188 - Views of foundations observed at T0021.	220
Figure 189 - View of the stone fountain at T0021.....	221
Figure 190 - View of anti-erosion walling at T0021.....	221
Figure 191 - 2826BA topographical sheet surveyed in 1945 depicts two structures in the vicinity of T0021.	221
Figure 192 - 2826BA topographical sheet surveyed in 1954 depicts several structures and an anti-erosion wall in the vicinity of T0021.	221
Figure 193 - General view of the ruins at T0022.	223
Figure 194 - Closer view of the construction materials used at T0021.....	224
Figure 195 - 2826BA topographical sheet surveyed in 1997 depicts several structures in the vicinity of T0021.	225

Figure 196 - General view of T0023.	226
Figure 197 - View of stone and brick rubble observed at T0023.	226
Figure 198 - Section of the 1945 topographical map showing two huts in the vicinity of T0023.	227
Figure 199 - Section of the 1954 topographical map showing three huts in the vicinity of T0023.	227
Figure 200 - Views of the signage and access gate to T0024.	229
Figure 201 – One of the formal graves observed at T0024.	230
Figure 202 – View of a cement headstone at T0024.	230
Figure 203 – One of the stone packed grave dressings at T0024.	231
Figure 204 – View of a metal grave marker at T0024.	231
Figure 205 - Section of the 1945 topographical map showing a churchyard in the proximity of T0024.	231
Figure 206 - General views of the ruin at T0025.	233
Figure 207 - General view of the overgrown stone wall reservoir at T0025.	233
Figure 208 - Section of the 1997 topographical map showing a reservoir at T0025.	233
Figure 209 - General view of T0026.	235
Figure 210 - View of the line of stones observed at T0026.	235
Figure 211 - Section of the 1945 topographical map showing a single hut at T0026.	236
Figure 212 - Section of the 1954 topographical map showing several huts in the proximity of T0026.	236
Figure 213 - General view of T0027.	238
Figure 214 - Sample of ceramic fragments observed at T0027.	239
Figure 215 - Section of the 1945 topographical map showing a single hut at T0027.	239
Figure 216 - Section of the 1954 topographical map showing several huts in the proximity of T0027.	239
Figure 217 - Views of stone lines at T0028.	241
Figure 218 - Fragments of metal and glass observed at T0028.	242
Figure 219 - Section of the 1945 topographical map showing a single hut at T0028.	242
Figure 220 - Section of the 1954 topographical map showing a single hut in proximity to T0028.	242
Figure 221 - General view of T0029.	244
Figure 222 - Views of the grave observed at T0029.	245
Figure 223 - Section of the 1997 topographical map showing a grave in proximity to T0029.	245
Figure 224 - Views of the T0030.	247
Figure 225 - Section of the 1945 topographical map showing a kraal within the vicinity of T0030.	247
Figure 226 - Views of the stones at T0031.	249
Figure 227 - Section of the 1997 topographical map showing a farm track within the vicinity of T0031.	249
Figure 228 – Satellite image illustrating that T0032 was previously recorded as TET 3.	251
Figure 229 - Views of the overgrown site at T0032.	251
Figure 230 - General view of T0033.	253
Figure 231 - Section of the 1954 topographical map showing a terrace at T0033.	253

Figure 232 – View of the dam at T0034.....	254
Figure 233 – View of the stones at T0034.	254
Figure 234 – Satellite image illustrating that T0035 was previously recorded as TET 13.	254
Figure 235 - Views of T0036.....	256
Figure 236 - View of the structure at T0037.....	257
Figure 237 – Additional view of the structure at T0037.	258
Figure 238 – Closer view of the building materials and techniques observed at T0037.	259
Figure 239 - Section of the 1945 topographical map showing a structure at T0037.	260
Figure 240 - Views of the ruin at T0038.....	262
Figure 241 – Additional views of the ruin at T0038.....	263
Figure 242 - Section of the 1945 topographical map showing a structure within the vicinity of T0038.	264
Figure 243 - Section of the 1954 topographical map showing a structure within the vicinity of T0038.	264
Figure 244 - Views of T0039.....	265
Figure 245 - Section of the 1975 topographical map showing a structure at T0039.	266
Figure 246 - Views of T0040.....	268
Figure 247 - Closer view of the stone kraal walling at T0040.	269
Figure 248 - Closer view of the building materials used at T0040.....	270
Figure 249 - Section of the 1945 topographical map showing a kraal at T0040.	271
Figure 250 - General view of T0041.	273
Figure 251 - Views of the two-roomed structure at T0041.....	274
Figure 252 - View of an additional structure at T0041.	274
Figure 253 - Views of the possible stable at T0041.....	275
Figure 254 - Views of the towers at T0041.	276
Figure 255 - Section of the 1954 topographical map showing several structures at T0041.....	277
Figure 256 - Map showing heritage sensitivity rating of identified heritage resources. See insets below.	279
Figure 257 - Heritage sensitivity rating of identified heritage resources. Inset A.....	280
Figure 258 - Heritage sensitivity rating of identified heritage resources. Inset B.....	281
Figure 259 - Heritage sensitivity rating of identified heritage resources. Inset C.	282
Figure 260 - Heritage sensitivity rating of identified heritage resources. Inset D.	283
Figure 261 - Heritage sensitivity rating of identified heritage resources. Inset E.....	284
Figure 262 - Heritage sensitivity rating of identified heritage resources. Inset F.....	285
Figure 263 - Heritage sensitivity rating of identified heritage resources. Inset G.	286
Figure 264 - Heritage sensitivity rating of identified heritage resources. Inset H.	287
Figure 265 - Heritage sensitivity rating of identified heritage resources. Inset I.	288
Figure 266 - Heritage sensitivity rating of identified heritage resources. Inset J.	289

List of Appendices

- A Specialist CVs
- B Palaeontological Impact Assessment

TERMINOLOGY AND ABBREVIATIONS

Archaeological resources

This includes:

- material remains resulting from human activity which are in a state of disuse and are in or on land and which are older than 100 years including artefacts, human and hominid remains and artificial features and structures;
- rock art, being any form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency, and which is older than 100 years, including any area within 10m of such representation;
- wrecks, being any vessel or aircraft, or any part thereof, which was wrecked in South Africa, whether on land, in the internal waters, the territorial waters or in the maritime culture zone of the republic as defined in the Maritimes Zones Act, and any cargo, debris or artefacts found or associated therewith, which is older than 60 years or which SAHRA considers to be worthy of conservation; and
- features, structures and artefacts associated with military history which are older than 75 years and the site on which they are found.

Cultural significance

This means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance

Development

This means any physical intervention, excavation, or action, other than those caused by natural forces, which may in the opinion of the heritage authority in any way result in a change to the nature, appearance or physical nature of a place or influence its stability and future well-being, including:

- construction, alteration, demolition, removal or change in use of a place or a structure at a place;
- carrying out any works on or over or under a place;
- subdivision or consolidation of land comprising a place, including the structures or airspace of a place;
- constructing or putting up for display signs or boards;
- any change to the natural or existing condition or topography of land; and
- any removal or destruction of trees, or removal of vegetation or topsoil.

Early Stone Age

The archaeology of the Stone Age between 700 000 and 3 300 000 years ago.

Fossil

Mineralised bones of animals, shellfish, plants and marine animals. A trace fossil is the track or footprint of a fossil animal that is preserved in stone or consolidated sediment.

Heritage

That which is inherited and forms part of the National Estate (historical places, objects, fossils as defined by the National Heritage Resources Act 25 of 1999).

Heritage resources

This means any place or object of cultural significance and can include (but is not limited to) the following list as outlined under Section 3 of the National Heritage Resources Act (NHRA):

- places, buildings, structures, and equipment of cultural significance;
- places to which oral traditions are attached or which are associated with living heritage;
- historical settlements and townscapes;
- landscapes and natural features of cultural significance;
- geological sites of scientific or cultural importance;
- archaeological and palaeontological sites;
- graves and burial grounds, and
- sites of significance relating to the history of slavery in South Africa;

Holocene

The most recent geological time which commenced 10 000 years ago.

Late Stone Age

The archaeology of the last 30 000 years associated with fully modern people.

Late Iron Age (Early Farming Communities)

The archaeology of the last 1000 years up to the 1800's, associated with iron-working and farming activities such as herding and agriculture.

Middle Iron Age

The archaeology of the period between 900-1300AD, associated with the development of the Zimbabwe culture, defined by class distinction and sacred leadership.

Middle Stone Age

The archaeology of the Stone Age between 30 000-300 000 years ago, associated with early modern humans.

Palaeontology

Any fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or trace.

Site

Site in this context refers to a place where a heritage resource is located and not a proclaimed heritage site as contemplated under s27 of the NHRA.

Table 1 - List of abbreviations used in this report

Abbreviations	Description
AIA	Archaeological Impact Assessment
ASAPA	Association of South African Professional Archaeologists
CRM	Cultural Resource Management
DEA	Department of Environmental Affairs
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EIMS	Environmental Impact Management Services (Pty) Ltd
EMPr	Environmental Management Programme
ESA	Earlier Stone Age
FSHRA	Free State Heritage Resources Authority
GPS	Global Positioning System
HIA	Heritage Impact Assessment
I&AP	Interested & Affected Party
LCTs	Large Cutting Tools
LSA	Late Stone Age
LIA	Late Iron Age
LOM	Life of Mine
MPRDA	Mineral and Petroleum Resources Development Act 28 of 2002
MSA	Middle Stone Age
MIA	Middle Iron Age
NEMA	National Environmental Management Act, 1998 (Act No 107 of 1998)
NHRA	National Heritage Resources Act, 1999 (Act No 25 of 1999)
PGS	PGS Heritage (Pty) Ltd
PHRA	Provincial Heritage Resources Authority
PIA	Palaeontological Impact Assessment
PSSA	Palaeontological Society of South Africa
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System

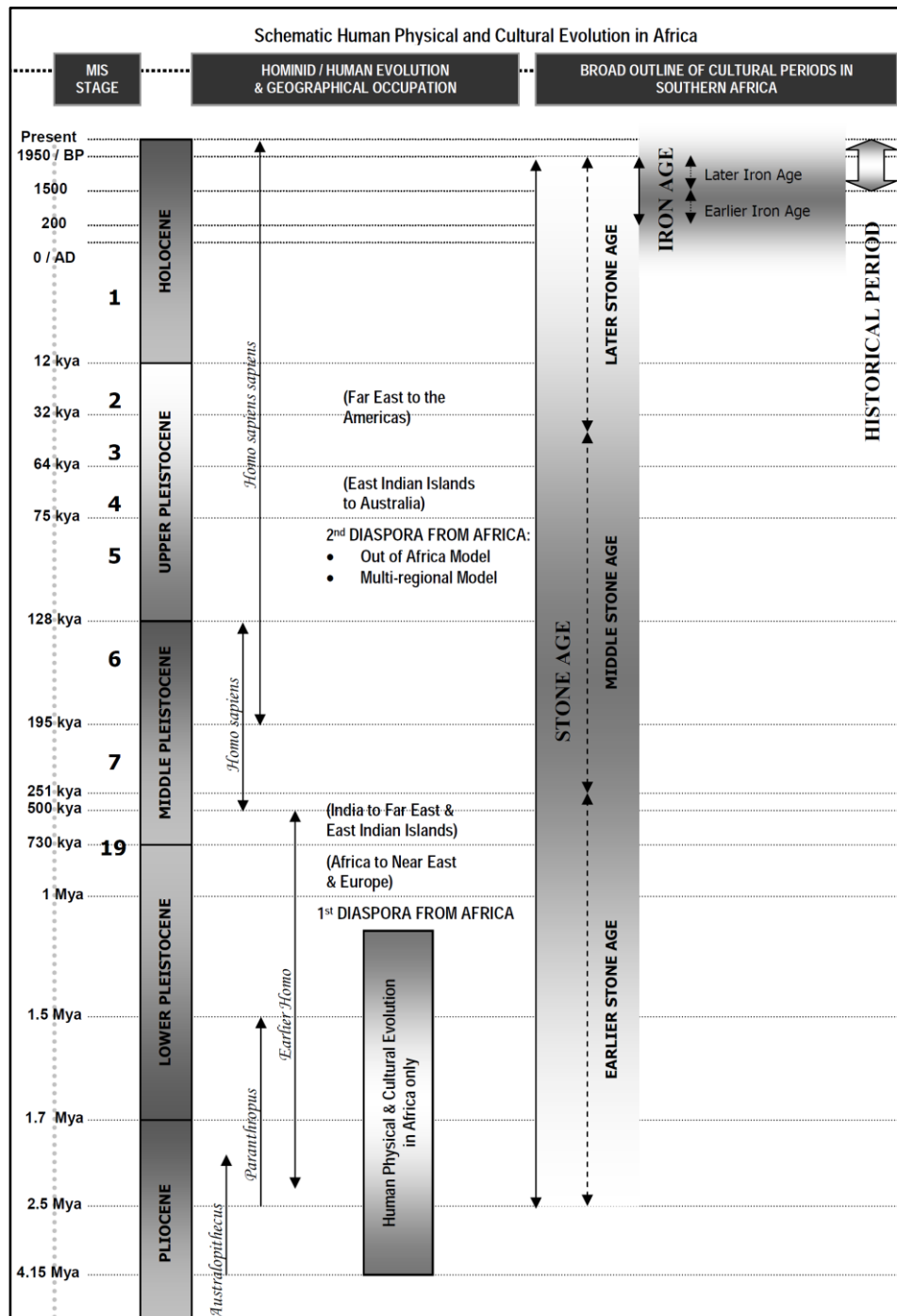


Figure 1 - Human and Cultural Timeline in Africa (Morris, 2008).

1 INTRODUCTION

PGS Heritage (Pty) Ltd (PGS) was appointed by Environmental Impact Management Services Consulting (Pty) Ltd (EIMS) to undertake a Heritage Impact Assessment (HIA), which forms part of the environmental process for the proposed Tetra4 Cluster 2 project. The project proposes to extend natural gas production operations within an existing Production Right (PASA Reference: 12/4/1/07/2/2), within the Matjhabeng and Masilonyana Local Municipalities, located between Welkom, Virginia and Theunissen. The study area is approximately 25 000ha in extent in the Free State Province.

Apart from the overall study area, which was assessed by the desktop study, a development footprint was provided by EIMS to assess as part of this HIA.

1.1 SCOPE OF THE STUDY

The aim of the study is to identify possible heritage sites and finds that may occur in the proposed development area. The HIA aims to inform the EIA in the development of a comprehensive EMP to assist the project applicant in responsibly managing the identified heritage resources to protect, preserve, and develop them within the framework provided by the National Heritage Resources Act (Act 25 of 1999) (NHRA).

1.2 SPECIALIST QUALIFICATIONS

This HIA was compiled by PGS.

The staff at PGS has a combined experience of nearly 90 years in the heritage consulting industry. PGS and its staff have extensive experience in managing HIA processes. And will only undertake heritage assessment work where they have the relevant expertise and experience to undertake that work competently.

The following individuals were involved with this study:

- Wouter Fourie, the Project Coordinator, is registered with the ASAPA as a Professional Archaeologist and is accredited as a Principal Investigator; he is further an Accredited Professional Heritage Practitioner with the Association of Professional Heritage Practitioners (APHP).
- Nikki Mann, the author of this report, is registered as a Professional Archaeologist with the Association of Southern African Professional Archaeologists (ASAPA). She has 4 years of

experience in the heritage assessment field and holds a Master's degree (MSc) in Archaeology from the University of Cape Town.

- Michelle Sachse, the co-author of this report, is registered with the Association of Southern African Professional Archaeologists (ASAPA) as a Professional Archaeologist. She holds a MA in Archaeology and a BA (Hons) in Archaeology
- Nicholas Fletcher is a field archaeologist. He holds a BA (Hons) in Archaeology.

1.3 ASSUMPTIONS AND LIMITATIONS

The following assumptions and limitations regarding this study and report exist:

- Not detracting in any way from the comprehensiveness of the fieldwork undertaken, it is important to realise that the heritage resources located during the fieldwork do not necessarily represent all the possible heritage resources present within the area. Various factors account for this, including the subterranean nature of some archaeological sites, as well as the dense vegetation cover and disturbance found in some areas (crops: maize, sunflowers, soya bean; ploughed land).
- There was also restricted access to certain farm properties (BLAAUWDRIFT No.188 (Portion 3), BRUINTJE HOOGTE No.367 (Portion 2, 3), BRYAN No.561 (Portion 10, 21, 28, 29, 30, 31, 38), GLEN ROSS No.734 (Portion 4, 5, 6, 7, 18, 20), JONKERS RUST No.72, KALKOENKRANS No.225 (Portion 3), MOND VAN DOORN RIVIER No.38 (Portion 2), MOOIFONTEIN No.639, PALMIETJUIL No.548 (Portion 1), STILLE WONING no.703, VLAKPAN No.358) due to farm owners not giving permission to access their properties, flooded roads and dangerous game life on the properties.
- As such, should any heritage features and/or objects not included in the present inventory be located or observed, a heritage specialist must immediately be contacted. Such observed or located heritage features and/or objects may not be disturbed or removed in any way until such time that the heritage specialist has been able to make an assessment as to the significance of the site (or material) in question. This applies to graves and cemeteries as well. In the event that any graves or burial places are located during the development, the procedures and requirements pertaining to graves and burials will apply as set out below.
- The study area boundaries and development footprints depicted in this report were provided by the client. As a result, these were the areas assessed during the fieldwork. Should any additional development footprints located outside of these study area boundaries be required, such additional areas will have to be assessed in the field by an experienced archaeologist/heritage specialist long before construction starts.

1.4 IDENTIFICATION OF POLICIES, LEGISLATION, STANDARDS & GUIDELINES

The identification, evaluation and assessment of any cultural heritage site, artefact or find in the South

African context is required and governed by the following legislation:

1.4.1 STATUTORY FRAMEWORK: THE NATIONAL HERITAGE RESOURCES (ACT 25 OF 1999)

The NHRA is utilised as the basis for the identification, evaluation and management of heritage resources, and in the case of Cultural Resource Management (CRM), those resources specifically impacted by the development as stipulated in Section 38 of NHRA.

The National Heritage Resources Act (Act No 25 of 1999, Art 3) outlines the following types and ranges of heritage resources that qualify as part of the National Estate, namely:

- 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;
 - (iv) (v) historical graves and cemeteries; and
 - (v) (vi) other human remains which are not covered by in terms of the Human Tissues Act, 1983 (Act No 65 of 1983);
- h) sites of significance relating to the history of slavery in South Africa;
- i) movable objects, including -
- j) objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens;
 - (i) objects to which oral traditions are attached or which are associated with living heritage;
 - (ii) ethnographic art and objects;
 - (iii) military objects;
 - (iv) objects of decorative or fine art;
 - (v) objects of scientific or technological interest; and
 - (vi) books, records, documents, photographs, positives and negatives, graphic, film or video material
 - (vii) 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).

The NHRA (Act No 25 of 1999) also 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:

3) Without limiting the generality of subsections (1) and (2), a place or object is to be considered part of the national estate if it has cultural significance or other special value because of—

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

1.4.1.1 SECTION 34 – STRUCTURES

According to Section 34 of the NHRA, no person may alter, damage or destroy any structure that is older than 60 years, and which forms part of the built environment of the sites, without the necessary permits from the relevant provincial heritage authority.

1.4.1.2 SECTION 35 – ARCHAEOLOGY, PALAEOLOGY AND METEORITES

According to Section 35 (Archaeology, Palaeontology and Meteorites) and Section 38 (Heritage Resources Management) of the NHRA, PIAs and AIAs are required by law in the case of developments in areas underlain by potentially fossiliferous (fossil-bearing) rocks, especially where substantial bedrock excavations are envisaged, and where human settlement is known to have occurred during prehistory and the historic period.

1.4.1.3 SECTION 36 – BURIAL GROUNDS & GRAVES

A Section 36 permit application is made to the SAHRA or the competent provincial heritage authority which protects burial grounds and graves that are older than 60 years and must conserve and generally care for burial grounds and graves protected in terms of this section, and it may make such arrangements for their conservation as it sees fit. SAHRA must also identify and record the graves of victims of conflict and any other graves which it deems to be of cultural significance and may erect memorials associated with these graves and must maintain such memorials. A permit is required under the following conditions:

Permit applications for burial grounds and graves older than 60 years should be submitted to the South African Heritage Resources Agency:

- destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of the conflict, or any burial ground or part thereof which contains such graves.
- destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or
- bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) any excavation equipment, or any equipment which assists in the detection or recovery of metals.
- SAHRA or a provincial heritage resources authority may not issue a permit for the destruction or damage of any burial ground or grave referred to in subsection (3)(a) unless it is satisfied that the applicant has made satisfactory arrangements for the exhumation and re-interment of the contents of such graves, at the cost of the applicant.

1.4.1.4 SECTION 38 - HIA AS A SPECIALIST STUDY WITHIN THE EIA IN TERMS OF SECTION 38(8)

A NHRA Section 38 (Heritage Impact Assessments) application is required when the proposed development triggers one or more of the following activities:

- a) the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
- b) the construction of a bridge or similar structure exceeding 50 m in length;
- c) any development or other activity which will change the character of a site,
 - i. exceeding 5 000 m² in extent; or
 - ii. involving three or more existing erven or subdivisions thereof; or
 - iii. involving three or more erven or divisions thereof which have been consolidated within the past five years; or

- iv. the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;
- d) the re-zoning of a site exceeding 10 000 m² in extent; or
- e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority

In this instance, the heritage assessment for the property is to be undertaken as a component of the EIA for the project. Provision is made for this in terms of Section 38(8) of the NHRA, which states that:

- An HIA report is required to identify, and assess archaeological resources as defined by the NHR Act, assess the impact of the proposal on the said archaeological resources, review alternatives and recommend mitigation (see methodology above).

Section 38 (3) Impact Assessments are required, in terms of the statutory framework, to conform to basic requirements as laid out in Section 38(3) of the NHRA. These are:

- The identification and mapping of heritage resources in the area affected;
- The assessment of the significance of such resources;
- The assessment of the impact of the development on the heritage resources;
- An evaluation of the impact on the heritage resources relative to sustainable socio/economic benefits;
- Consideration of alternatives if heritage resources are adversely impacted by the proposed development;
- Consideration of alternatives; and
- Plans for mitigation.

1.4.2 NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT NO. 107 OF 1998)

The cultural environment in South Africa is managed through Section 24 of the National Environmental Management Act (NEMA), No. 107 of 1998. The NEMA creates the legal framework by which cultural heritage can be managed.

Furthermore, under Section 2(4)(a) of the NEMA:

2 (4) (a) Sustainable development requires the consideration of all relevant factors including the following:

(iii) the disturbance of landscapes and sites that constitute the nation's cultural heritage must be avoided, or where it cannot be altogether avoided, is minimised and remedied.

1.4.3 NOTICE 648 OF THE GOVERNMENT GAZETTE 45421

Although minimum standards for archaeological (2007) and palaeontological (2012) assessments were published by SAHRA (2016), Government Notice (GN) 648 of 2019 requires sensitivity verification for a site selected on the national web-based environmental screening tool for which no specific assessment protocol related to any theme has been identified. The requirements for this GN are listed in **Table 2** and the applicable section in this report noted.

Table 2 - Reporting requirements for GN 648 of 2019

GN 648	Relevant section in report	Where not applicable
2.2 (a) a desktop analysis, using satellite imagery	Section 5	-
2.2 (b) a preliminary on-site inspection to identify if there are any discrepancies with the current use of land and environmental status quo versus the environmental sensitivity as identified on the national web-based environmental screening tool, such as new developments, infrastructure, indigenous/pristine vegetation, etc.	Section 3	-
2.3(a) confirms or disputes the current use of the land and environmental sensitivity as identified by the national web-based environmental screening tool	Section 1 and 5	-
2.3(b) contains a motivation and evidence (e.g. photographs) of either the verified or different use of the land and environmental sensitivity	Section 3 provides a description of the current use and confirms the status in the screening report	-

An assessment of the Environmental Screening tool provides the following sensitivity rating for archaeological and heritage resources that fall within the proposed area as Low (**Figure 2**), while palaeontological resources are rated as Medium to Very High (**Figure 3**). Based on the fieldwork findings the screening tool for the archaeological and cultural heritage layer mapped the known historical sites in the central portion of the study area as well as those within the towns adjacent to the study area. However, parts of the study area contain numerous archaeological sites not listed on the database of the screening tool.

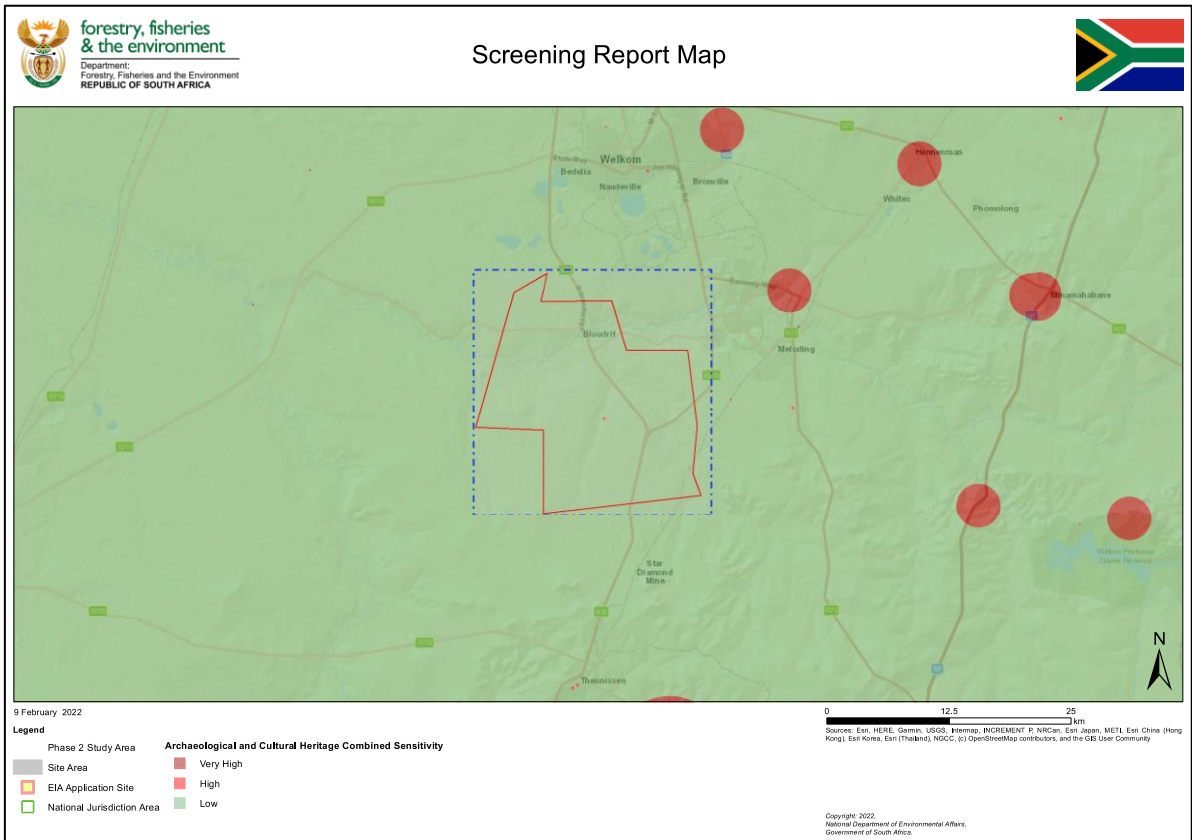


Figure 2 - Environmental screening tool's depiction of the archaeological and heritage sensitivity of the study area and surroundings.

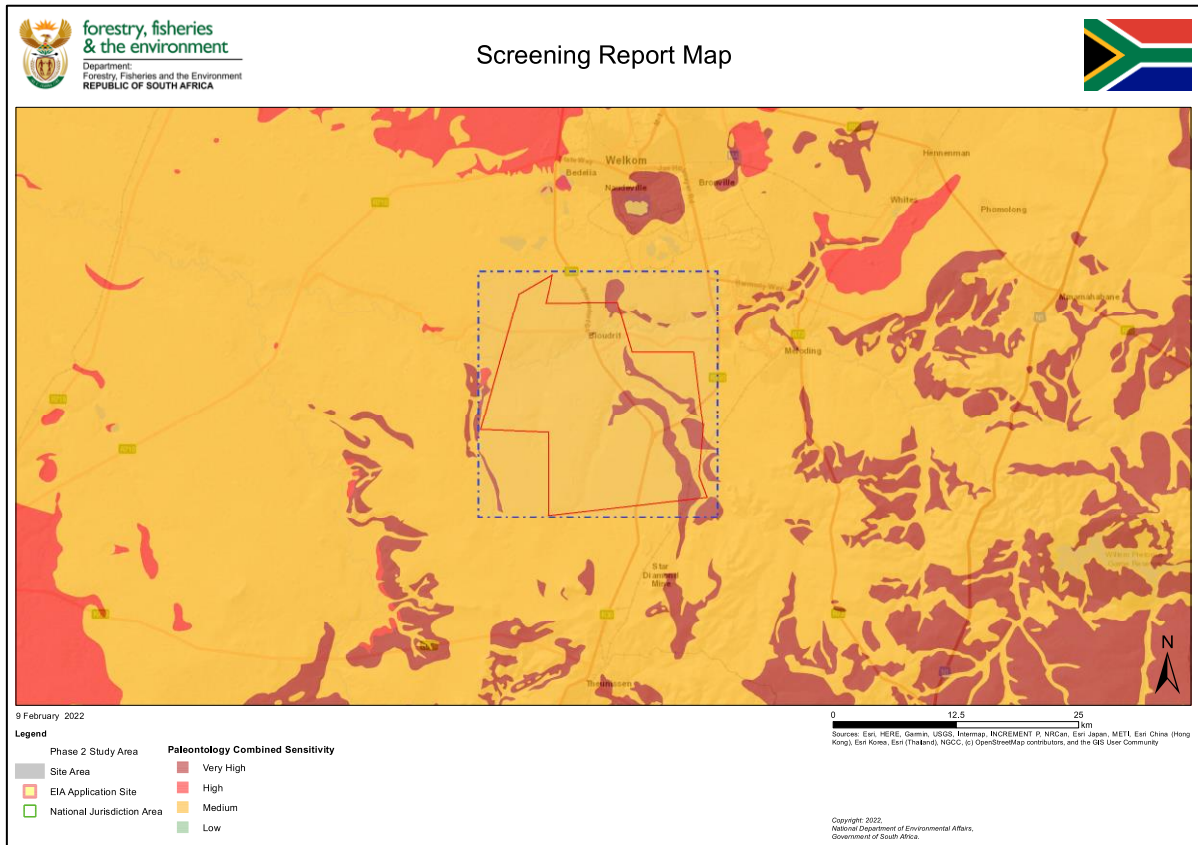


Figure 3 - Environmental screening tool's depiction of the palaeontological sensitivity of the study area and surroundings.

1.4.4 NEMA – APPENDIX 6 REQUIREMENTS

The HIA report has been compiled considering the National Environmental Management Act (Act No. 107 of 1998) (NEMA) and Environmental Impact Assessment (EIA) Regulations (2014, and as amended in 2017) (

Table 3).

The table below sets out the relevant sections as listed in Appendix 6 of the EIA Regulations (2017), which describes the requirements for specialist reports. For ease of reference, the table provides cross-references to the report sections where these requirements have been addressed. It is important to note that where something is not applicable to this HIA, this has been indicated in the table below.

Table 3 - Reporting requirements as per NEMA Appendix 6 for specialist reports

Requirements of Appendix 6 – GN R326 EIA Regulations of 7 April 2017	Relevant section in report	Comment where not applicable
1.(1) (a) (i) Details of the specialist who prepared the report	Page ii of Report – Contact details and company	-
(ii) The expertise of that person to compile a specialist report including a curriculum vita	Section 1.2 – refer to Appendix A	-
(b) A declaration that the person is independent in a form as may be specified by the competent authority	Page ii of the report	-
(c) An indication of the scope of, and the purpose for which, the report was prepared	Section 1.1	-
(cA) An indication of the quality and age of base data used for the specialist report	Section 4	-
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	Section 5 and 6	-
(d) The duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment	Section 3, 4	-
(e) a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used	Section 4	-
(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 a site plan identifying site alternatives;	Sections 3, 5	-
(g) An identification of any areas to be avoided, including buffers	Section 8	-
(h) A 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 6	-
(i) A description of any assumptions made and any uncertainties or gaps in knowledge;	Section 1.3	-
(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	Executive Summary, Sections 6, 7, 8	-
(k) Any mitigation measures for inclusion in the EMPr	Executive Summary, Sections 8	-
(l) Any conditions for inclusion in the environmental authorisation	Executive Summary, Sections 8, 9	-
(m) Any monitoring requirements for inclusion in the EMPr or environmental authorisation	Executive Summary, Sections 8, 9	-
(n)(i) A reasoned opinion as to whether the proposed activity, activities or portions thereof should be authorised and	Executive Summary; Section 10	-

Requirements of Appendix 6 – GN R326 EIA Regulations of 7 April 2017	Relevant section in report	Comment where not applicable
(n)(iA) A reasoned opinion regarding the acceptability of the proposed activity or activities; and		-
(n)(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 EMP, and where applicable, the closure plan	Executive summary, Sections 8 and 9	-
(o) A description of any consultation process that was undertaken during the course of carrying out the study		Not applicable. A public consultation process was handled as part of the environmental process.
(p) A summary and copies if any comments that were received during any consultation process		Not applicable. To date no comments regarding heritage resources that require input from a specialist have been raised.
(q) Any other information requested by the competent authority.		Not applicable.
(2) Where a government notice by the Minister provides for any protocol or minimum information requirement to be applied to a specialist report, the requirements as indicated in such notice will apply.	NEMA Appendix 6 and GN648 SAHRA guidelines on HIAs, PIAs and AIAs	

1.4.5 MPRDA 2002 (ACT NO. 28 OF 2002)

As per the NEMA no 107 of 1998, and the NEMA EIA Regulations, any activity requiring a prospecting right, mining right, mining permit, production right or exploration right, triggers the Mineral and Petroleum Resources Development Act, 28 of 2002 (MPRDA). The MPRDA Act 28 of 2002 intends to make provision for sustainable development of South Africa's mineral and petroleum resources.

Under Section 5(4) no person may prospect for or remove, mine, conduct technical co-operation operations, reconnaissance operations, explore for and produce any mineral or petroleum or commence with any work incidental thereto on any area without

- (a) an approved environmental management programme or approved environmental management plan, as the case may be.

Furthermore, Chapter 8 of the MPRDA, as amended in 2015, states that the principles of the NEMA No. 107 of 1998 apply to all mining-related activities. It also serves as guidelines for the interpretation, administration and implementation of all the needed environmental requirements and authorizations of the MPRDA. In conjunction with the NEMA, the MPRDA makes provision that mining companies need

to comply with other South African legislation regulating the impacts of mining-related projects on the natural and cultural environment, including the National Environmental Management Protected Areas Act (No. 57 of 2003) and the NHRA No. 25 of 1999.

Section 86 for EIA of the Regulations for Petroleum Exploration and Production (2015) of the MPRDA states that:

- (1) The exploration and production activities related to petroleum are subject to the requirements of the NEMA and any relevant specific environmental management Act;
- (2) Before exploration and production activities related to petroleum may commence, the holder must be in possession of an Environmental Authorisation (EA) issued in terms of the EIA Regulations, 2014.
- (3) When submitting an application in terms of the EIA Regulations an applicant must comply with the minimum information requirement, guidance document or decision support tool as identified by the competent authority.
- (4) The designated agency, the Council of Geosciences and the Council for Scientific Research must be identified as interested and affected parties for the purposes of the public participation to be undertaken as part of the EIA process.

2 SITE LOCATION AND DESCRIPTION

2.1 LOCALITY AND SITE DESCRIPTION

Coordinates for Study Area	Northernmost point: S -28.07716 E 26.66416	Easternmost point: S -28.23105 E 26.80612	
	Southernmost point: S -28.23972 E 26.69567	Westernmost point: S -28.16878 E 26.63364	
Location	The proposed development area is located west and east of the R30. It is located approximately 10km south of Welkom, approximately 3.6km west of Virginia and approximately 16km north of Theunissen. The Sand River flows west-east through the study area (Figure 4).		
Property	The proposed application area comprises portions of the following farms:		
	ADAMSONS VLEY No. 655	JORDAANS RUST No. 59	
	ANNEX GLEN ROSS No. 562	KAALPAN No. 65	
	ANNEX GRUSDE No. 474	KALKOENKRANS No. 225	
	BLAAUWDRIFT No. 188	KOVNO No. 235	
	BLAAUWDRIFT No. 188	LEEUWAARDEN No. 171	
	BOSCHLUI SPRUIT No. 278	LEEUWBULT No. 52	
	BRAKSPRUIT No. 121	MIDDELPLAAS No. 583	
	BRUINTJES HOOGTE No. 367	MOND VAN DOORNRIVIER No. 38	
	BRYAN No. 561	MOOIFONTEIN No. 639	
	CABRIERE No. 215	MOOIVLAKTE No. 199	
	DANKBAARHEID No. 16	NORTIER No. 361	
	DE KLERKS KRAAL No. 231	PALMIETKUIL No. 328	
	DIGITO No. 642	PAULINA No. 470	
	DOORN RIVER No. 330	RONDEHOEK No. 200	
	DOORNDIEL No. 236	STILLE WONING No. 703	
	ENKELDOORN No. 360	TERRA BLANDA No. 155	
	GLEN ROSS No. 734	VLAKPAN No. 358	
	GRUSDE No. 229	WALKERSVLEI 133/0	
	HAKKIES No. 695	WELTEVREDE No. 638	
	HAKKIES No. 742	WELTEVREDEN No. 443	
	HARMONIE No. 579	WOLVEPAN No. 85	
	JONKERS RUST No. 72		
	Topographical Map	2826BA Blaauwdrift and 2826BB Virginia	

Extent	Tetra4 has a production right for natural gas over a large area ~300 000ha.
---------------	-----------------------------------------------------------------------------

The following infrastructure is encountered in the areas surveyed:

- Provincial roads (R30)
- Farmsteads
- Schools
- Mining infrastructure
- Power lines
- Local roads (tar and informal)
- Existing pipelines

Tetra4 Cluster 2 Gas Production Project

PGS Heritage (Pty) Ltd
Heritage Management Unit



Locality Map

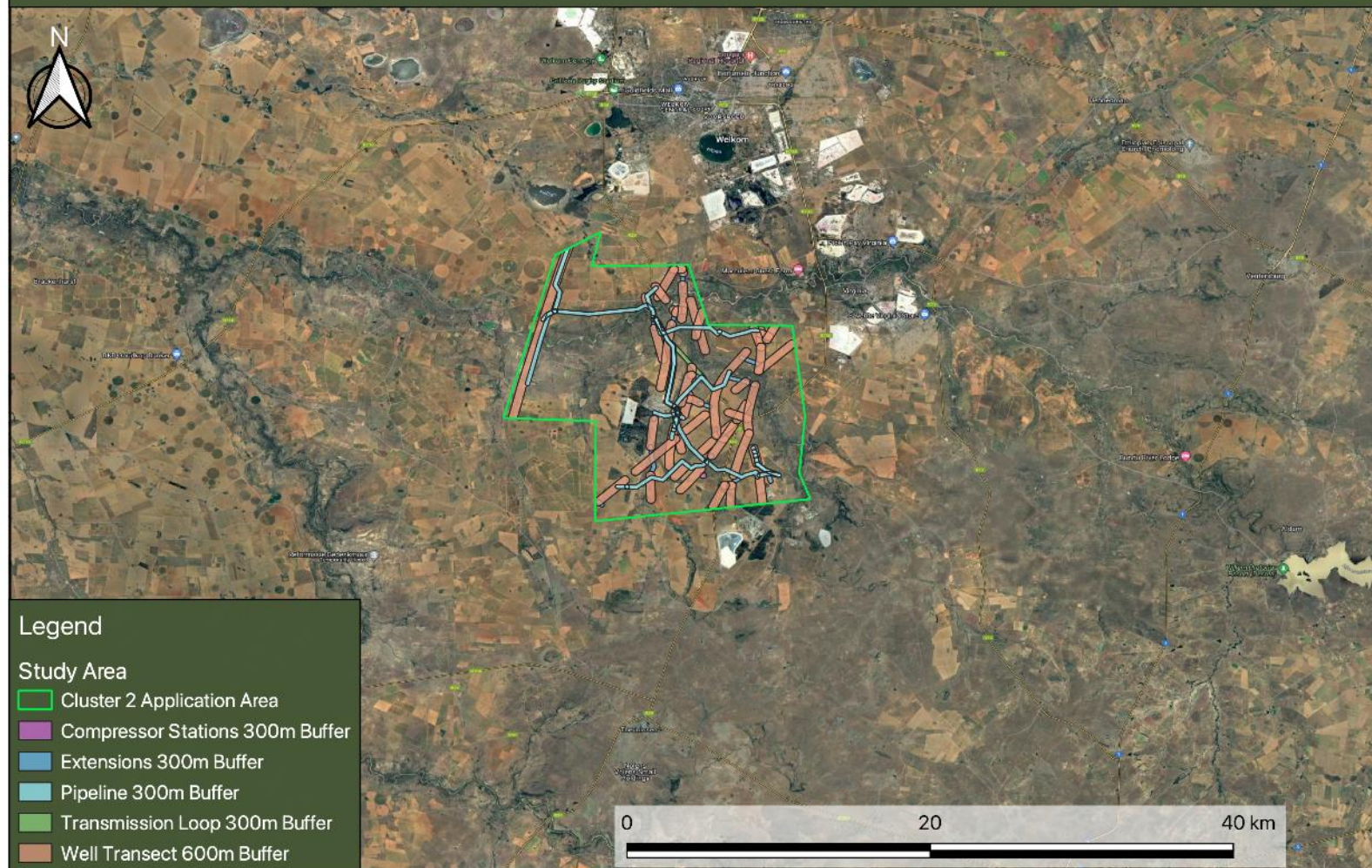


Figure 4 - Locality map depicting the regional context of the study area.

2.2 TECHNICAL PROJECT DESCRIPTION

The following project description for the project has been supplied by EIMS.

2.2.1 PROPOSED CLUSTER 2 PROJECT

Tetra4 now wishes to expand the natural gas operations, to be located within the approved production right area and around the Cluster 1 project (**Figure 5**). This planned expansion to the existing approved production activities will involve up to 300 new production wells, gas transmission pipelines and associated infrastructure, 3 compressor stations and an additional new combined Liquid Natural Gas (LNG) and Liquid Helium (LHe) plant (“LNG/LHe Plant”) and associated infrastructure, as well as powerlines as part of the Cluster 2 expansion of the Project in order to meet the future production requirements. The Cluster 2 study area and infrastructure buffer zones are presented in **Figure 6**.

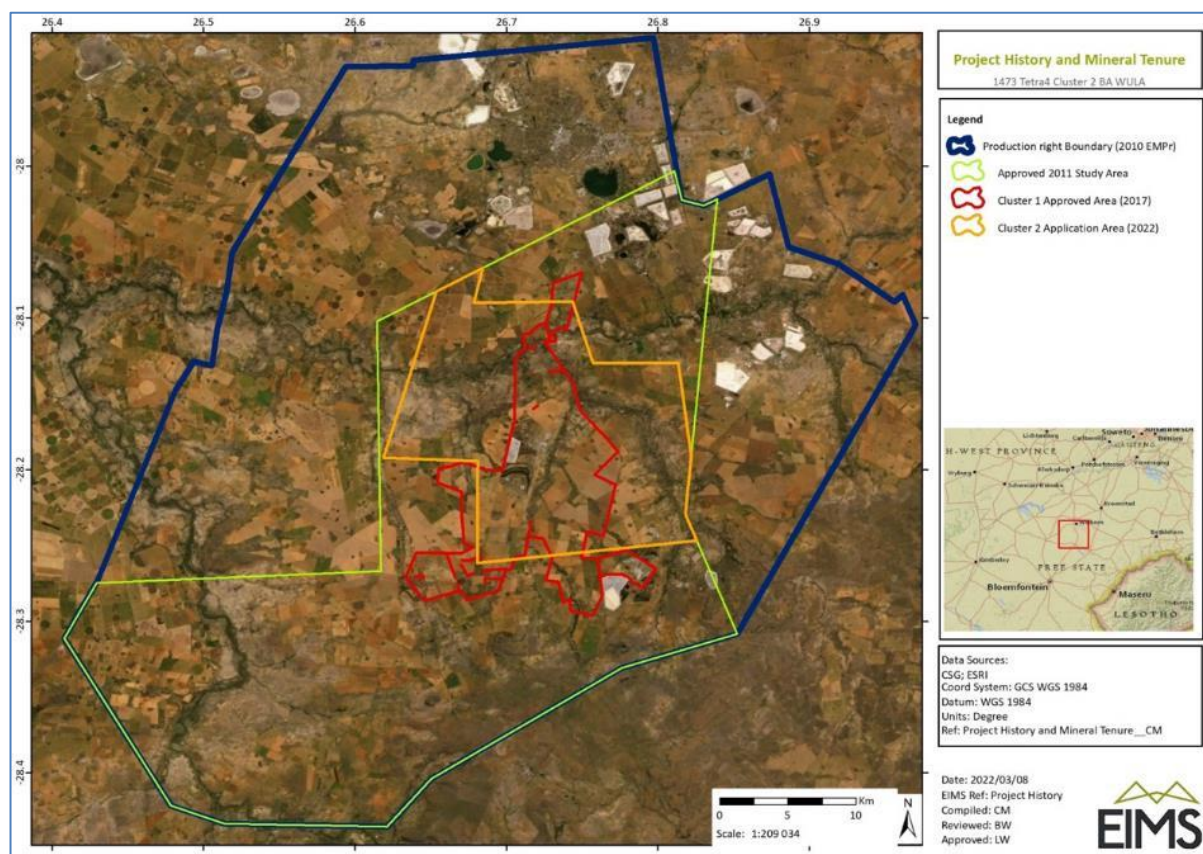


Figure 5 - Project history and mineral tenure.

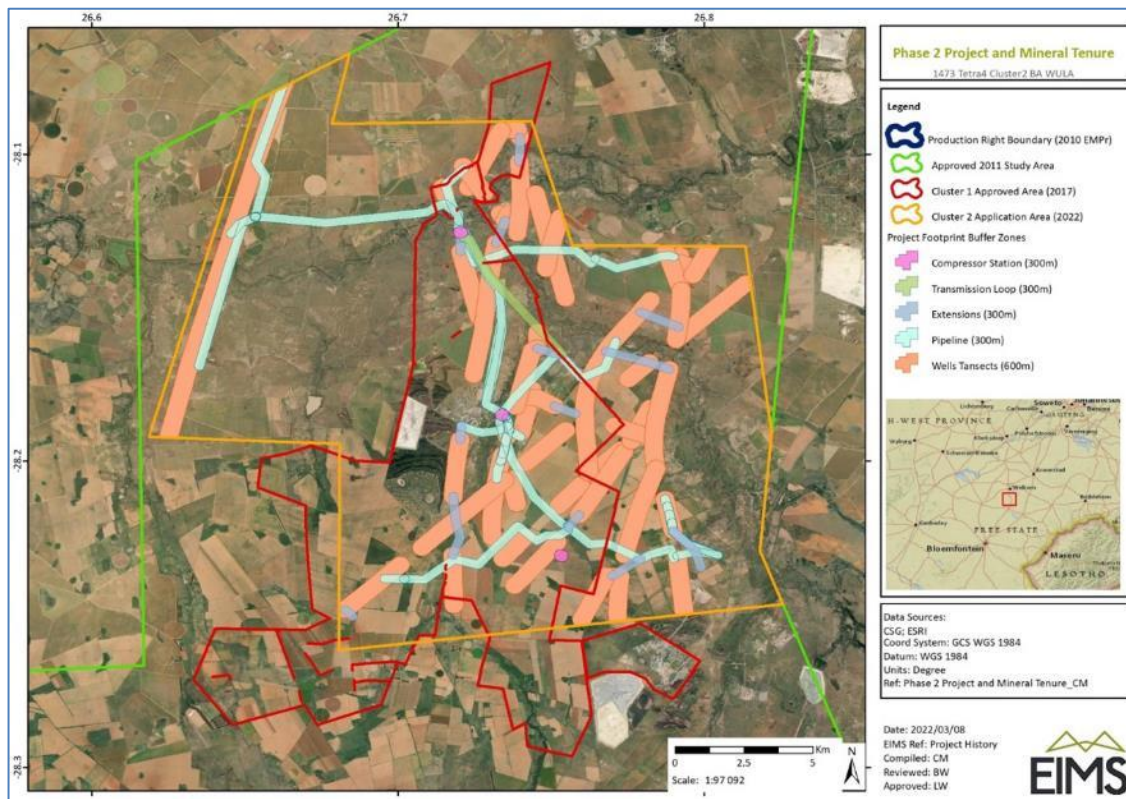


Figure 6 – Cluster 2 study area and proposed infrastructure footprint buffer zones.

2.2.1.1 THE GAS RESOURCE

The Tetra4 Production Right is located within the Sand River Play or Virginia Gas Field. Despite not being clearly defined, the field is composed predominantly of Karoo, Ventersdorp and Witwatersrand Supergroup lithologies complete with younger dolerite intrusions. Major fault systems associated with closely spaced zones of fractures and joints provide for preferential pathways for a combination of abiogenic and biogenic gas to reach the surface.

As such, the resulting gas at the surface is a direct emission from the major fault or from minor secondary faults linked to a major fault. In this regard, it is thought that the primary source of gas originates from the Witwatersrand Supergroup or shallower Karoo. As an unconventional resource, the gas is presumed to be a mix of both abiogenic from the mantle and biogenic hydrocarbons originating from ancient fissure waters, coal beds of the Eccu Group of the Karoo Supergroup as well as ancient algal mats within the shallow marine/lacustrine Witwatersrand Supergroup deposits. Once the gas target areas are intersected, the feed gas will flow passively out of the wells at a low pressure of ~0.4 barg⁵ (gauge pressure) and with a temperature in the range between 10 ° and 30 °C. The feed gas will be compressed upstream of the helium process units by 3 inline compressor stations which will be located at strategic points along the gas pipeline routes. A gas pre-treatment will remove condensate

⁵ Barg: a unit of gauge pressure, i.e. pressure in bars above ambient or atmospheric pressure.

as well as traces of sulphur, mercury and C3+ gas components (e.g. propanes, butanes, pentanes) which could cause possible damage to the downstream process equipment.

2.2.1.2 GAS PRODUCTION METHOD

Gas production encompasses the exploration for gas resources with specific focus on existing geological fractures followed by the extraction of gas through production wells. From the production wells, a gas gathering network of pipes, booster stations, metering stations, pigging stations and compressor stations transports the gas to the LNG/LHe Plant where gas processing, storage and distribution is undertaken.

Gas production is accomplished by extracting gas occurring in fractures, fissures and faults within the Ventersdorp and Witwatersrand supergroups located at depths of between approximately 380 to 880 meters (m). Construction of the gas gathering pipelines for Cluster 1 is well underway and the LNG/LHe processing facility is currently in the construction phase. Once Cluster 1 is complete, Tetra4 will begin producing up to 50 tons of LNG and 375 kg of LHe per day.

Cluster 2 of the project aims to expand upon Cluster 1 production by increasing natural gas production. This is achieved through the expansion of the existing gas sources, gas gathering and the production capacities. The project consists of two components namely, gas gathering and the LNG/LHe processing plant. The targeted total feed gas flow from Cluster 2 production wells is estimated at 44 million-standard cubic feet per day (MMSCFD) by 2026. From experience in Cluster 1 the helium composition will be between approximately 2% and 4% to the LNG/LHe process plant and the ability to recover at least 95% methane and helium from the gas wells before supplying to the plant.

The gas is to be collected from a group of wells located in the well transects and transported to a single feed point whereafter it is piped to the processing plant (LNG/LHe plant). Each group of gas wells will feed into a common booster station. From the booster stations the gas will be fed into a dual gathering pipeline (trunkline) towards a compressor station. The compressor stations' outlets will then be combined through a trunkline into the single tie-in feed point within the proximity of the Plant.

The Cluster 2 project entails a total of ~ 300 production wells with a 0.17 MMSCFD flowrate per well to get a total of 44.37 MMSCFD. The wells will be located within the identified zones with the number of wells informed by the total gas requirements and expected well gas capacity. The current plan is to drill vertical or incline wells ~300m apart along the fault lines and withing the identified and assessed well transect areas.

The Cluster 2 gas field will have 3 x ~15MMSCFD zones each with one compressor station. Approximately 10 production wells will be grouped and will be routed to a common booster station and thereafter feed to a compressor station. Power to the booster stations will be provided from nearby existing Eskom power sources or alternatively a gas engine.

The gas gathering network will comprise primarily of HDP pipelines buried at least 1.5m below plough level in order to ensure minimal disruption to existing agricultural activities. Sensitive environmental

features, land-uses and infrastructure will be avoided as far as practically possible. However, it is practically impossible to avoid all sensitive features (including tar road crossings and river crossings). In the case where the pipeline will cross dirt roads an open cut trench technique will be used. To ensure integrity of tar roads is not compromised, horizontal directional drilling (HDD) will be used to lay the pipe underneath the road. Similarly, horizontal directional drilling (HDD) will be used for river crossings to lay the pipeline approximately 6m underneath the riverbeds.

2.2.1.3 EXPLORATION DRILLING

Exploration wells will be drilled and, if successful, converted into production wells. As the exact location of exploration well drilling cannot be identified at this stage, this study has followed the approach of assessing well corridors (600m wide or 300m on either side of known target fault lines). Exploration drilling entails the use of a truck, trailer or skid mounted percussion or diamond drill rig to drill to varying depths (~380m to ~880m) along known fault lines in order to strike the gas reserve.

Percussion and diamond drills typically require temporary clearance of an area of 30 m x 30 m in order to set up the rig and begin drilling activities. All exploration boreholes to be drilled and cased in accordance with applicable international standards and best practice guidelines⁶, and will be sealed with a combination of casing and grouting to ensure vertical isolation of the gas from both the surrounding geology and hydrological regime. In addition to the drill rig, lined sumps will be required to store and recirculate water for the drilling process. A maximum of 6000 litres per day is required for drilling purposes and will be sourced from the municipality.

In the event that an exploration borehole proves unsuccessful it will be sealed and cased (in accordance with the EMPr) and the area rehabilitated. In the event that an exploration borehole proves successful it will be converted into a production well (as described below) and added to the network of gas producing wells for Cluster 2. The drilling of exploration boreholes is a temporary and short-lived activity and the equipment to be used during drilling activities includes a truck/trailer or skid mounted diamond drill rig, excavator, dozer, grader water cart, light motor vehicle for transport of personnel and chemical toilets.

2.2.1.4 WELL SITE CONNECTION

All wells that are drilled and used for production purposes are strengthened with a combination of casing and grouting to average depths of 300 m to prevent any interplay between deep and shallow aquifers. The casing and grouting ensure that the gas is isolated from surrounding geology and promotes the preferential flow of gas from the formation through the well and up to the surface. As the gas is naturally lighter than air, it rises naturally to the surface and no well stimulation is required. The combination of

⁶ Internationally accepted best practice should be applied and reference should be made to the relevant British Oil and Gas and/or the API guidelines and standards.

casing and grouting also serves to ensure that gas is isolated and prevented from interacting with the geohydrological regime.

Due to low gas pressures in the wells, groups of ~10 wells will be included as an inlet to a booster station to provide vacuum suction. The booster stations will be connected via pipelines to centralised infield reciprocating gas compressor stations. Pipelines will be a combination of high-pressure steel as well as low-pressure high-density polyethylene (HDPE) and is installed at a minimum depth of 1.5m below the plough line. The pipeline will be installed using a back-actor and TLB. Where piping (e.g. for the compressors and driers) will be brought to surface, a 110 mm steel piping of approximately 10 m – 30 m will be utilised instead.

Production wells will be placed within a secured precast well chamber with manhole for access. Minimal mechanical infrastructure will be placed within the precast well chamber other than the wellhead, connecting pipeline, an isolation valve and sample point. The surface infrastructure for the manhole would be 1,4m x 1,1m and the manhole surface height will be 0,25m.

2.2.1.5 GAS INLINE STATIONS

In order to transport gas via pipelines from the wellheads to the Plant, various inline infrastructure is required to monitor, measure and control gas flow through the pipelines and this includes booster stations, pigging stations and compressor stations.

Localised inline gas booster stations will be installed for each cluster of 7-10 wells which will feed pressurised gas via pipelines from the production wells to the compressor stations. The booster stations will occupy an area of 10 m x 14m and a total of 28 booster stations may be constructed.

Inline pigging stations (**Figure 7**) are installed to allow for regular cleaning and inspection of the pipelines. The pigging stations allow for insertion of probes or cleaning pigs (plugs) at regular intervals in order to perform regular maintenance.



Figure 7 - View of an existing pigging station constructed as part of Cluster 1.

Raw gas received at the compressor stations will be filtered to remove dust and moisture through the use of a combination of water filter and an activated carbon filter that absorbs dust and unwanted organic compounds. Once filtered, the gas from the compressors will be dried to 7 pounds per MMSCF

adjacent to the compressor stations, and then piped for final processing to the LNG/LHe Plant. The footprint for a compressor station including the gas drier station will be approximately 60 m x 60 m (Figure 8).



Figure 8 - Example of Compressor Station just recently constructed as part of Cluster 1.

2.2.1.6 COMBINED HELIUM AND LIQUID NATURAL GAS PLANT

Feed gas from the centralised reciprocating infield compressor stations will be discharged into the combined LNG/LHe Plant. The LNG/LHe facility is a modularized facility to convert the Feed Gas into LNG, LHe and to provide fuel gas for future power generation. The power generation will be a separate project and is not included in this application process.

The Cluster 2 LNG/LHe Plant will be constructed directly adjacent to the Cluster 1 plant which is currently under construction on the remaining extent of the farm Mond Van Doornrivier 38. The LNG and LHe products will be loaded to trucks for distribution to users.

The LNG/LHe plant comprises of the following process units:

- Gas Treatment and Boosting System;
- Helium Separation Unit;
- Gas Liquefaction System;
- LHe Storage (~2x100m³);
- LNG Storage (~11x300m³); and
- LHe and LNG loading bays.

The area occupied by the proposed Cluster 2 LNG/LHe plant in the operational phase is approximately 9ha while additional areas are required during the construction phase for various contractor laydown areas, offices, parking, etc.

The plant will include a small sewage treatment works as well as stormwater infrastructure to divert potentially dirty water into an evaporation pond of approximately 1005 m³. Treated effluent from the sewage treatment plant will also be directed to the evaporation pond from where water will be pumped into a reverse osmosis plant and then stored in the fire water and service water tanks for reuse. The fire water and service water tanks are linked and therefore, recirculating to service water tank is taken off for use in the system. The fire water tank is maintained at a minimum level to ensure fire water availability. No discharge of polluted water will take place and all waste products from the sewage treatment works (sludge) and the reverse osmosis plant will be collected by a registered waste contractor for offsite disposal at a suitably licenced facility.

2.2.1.7 SURFACE INFRASTRUCTURE

The proposed Cluster 2 project expansion requires various surface infrastructure as listed below:

- Access roads;
- Pipelines and powerlines;
- Coalescer filter or knockout drum at each booster station;
- Pipe markers (approximately every 100 m of the pipeline, where feasible);
- Wellheads;
- Booster pumps (where required);
- Inline booster compressors or infield reciprocating compressors;
- Gas driers;
- Fencing and security (limited to gas producing wells, compressor stations and LNG/LHe Plant infrastructure);
- Combined helium and LNG plant;
- LNG/LHe storage and dispensing units;
- Chemical storage;
- Temporary hazardous waste storage (including but not limited to waste water recirculation at drill sites and waste containing hydrocarbons such as used oil and filters, diesel, lubricants, grease, etc.);
- Temporary general waste storage;
- Contractors' laydown areas around the LNG/LHe Plant area; and
- Permanent offices, storage areas and workshops.

In broad summary, infrastructure required for the Cluster 2 gas field development is broadly split between:

- a) Gas Gathering Network: infrastructure required for gas extraction and transport at well sites (including compressor stations); and
- b) Gas Processing: infrastructure required for gas processing and transport of final product.

3 CURRENT STATUS QUO

3.1 SITE DESCRIPTION

A site visit was conducted by three archaeologists from PGS on 14th-24th February 2022. The proposed development area is located within Matjhabeng and Masilonyana Local Municipalities, located between Welkom, Virginia and Theunissen, in the Free State Province.

Significant components of the study area are characterized by extensive farming activities in the form of extensive agricultural fields. For the most part maize production is undertaken within this area, although other crops such as sunflowers and soya beans are also grown. In the northern section of the study area, there is mining of sediment along the Sand River. Whilst the central and south-eastern components of the study area are associated with mines and mining activities of the Beatrix Mine of Sibanye Gold. The likelihood of finding in-situ heritage resources within these particular regions of the study area is lessened due to these facts. Therefore, the walkthroughs were focused on those areas that are not disturbed, as the potential for identifying archaeological and heritage sites in the more undisturbed components of the study area are much higher. As a result, only limited fieldwork was undertaken in those components of the study area that are entirely disturbed. There was also restricted access to certain farm properties (BLAAUWDRIFT No.188 (Portion 3), BRUINTJE HOOGTE No.367 (Portion 2, 3), BRYAN No.561 (Portion 10, 21, 28, 29, 30, 31, 38), GLEN ROSS No.734 (Portion 4, 5, 6, 7, 18, 20), JONKERS RUST No.72, KALKOENKRANS No.225 (Portion 3), MOND VAN DOORNRIVIER No.38 (Portion 2), MOOIFONTEIN No.639, PALMIETJUIL No.548 (Portion 1), STILLE WONING no.703, VLAKPAN No.358) due to flooded roads, game life on the properties or farm owners not giving permission to access their properties.

In terms of the topography, the study area comprises relatively level portions of land. Ephemeral streams and the Sand River cut across some of the components within the application area. Several man-made dams and reservoirs are also located within this area. In terms of the geology, the study area comprises: Karoo Dolerite Suite (Dolerite and minor ultrabasic rocks), Balfour Formation (Greenish- to bluish-grey and greyish-red mudstone, siltstone and subordinate sandstone) and alluvium.

The study area is serviced by the R30 road, provincial gravel roads and farm roads. Existing infrastructure includes mine infrastructure, electricity transmission lines, telephone lines, fences, schools, and other buildings and structures. In terms of buildings and structures, several farmsteads are located within the study area. These farmsteads can be expected to comprise farmhouses of varying ages as well as farm worker accommodation, sheds, barns, silos, livestock enclosures etc. Photographs of the general study area are provided below.



Figure 9 – Typical dense vegetation observed during the field assessment.



Figure 10 – View of a wetland observed within the study area.



Figure 11 – View of overgrown farm track.



Figure 12 – General view of soya bean crops.



Figure 13 – View of sunflower fields.



Figure 14 – Typical ploughed land.



Figure 15 – View of muddy farm roads.



Figure 16 – View of flooded road after rainfall.

3.2 SITE VEGETATION

Significant sections of the undisturbed components of the study area comprise open grassland, interposed by scattered pockets of trees. Planted vegetation, which includes exotic trees (*Eucalyptus*) and plants, are found in proximity to farmsteads and human occupation areas. Lanes of such planted exotic trees were also strategically planted as wind-breaks and are found all over the study area. There is also secondary grassland which is associated with areas of cultivation/grazing.

In terms of region's vegetation, the study area is characterised by two vegetation types: The Vaal-Vet Sandy Grassland and the Highveld Alluvial Vegetation (Mucina and Rutherford, 2006).

"The Vaal-Vet Sandy Grassland is characterised by Aeolian and colluvial sand overlying sandstone, mudstone and shale of the Karoo Supergroup (mostly the Ecca Group). An important feature of the vegetation type is the dominance of *Themeda triandra*. In areas where heavy grazing and/or erratic rainfall occurs low cover of *T. triandra* associated with an increase in *Elionurus muticus*, *Cymbopogon pospischii* and *Aristida congesta* is evident."

Highveld Alluvial Vegetation "occurs within a flat topography supporting riparian thickets, which are mostly dominated by *Vachellia karroo*, accompanied by seasonally flooded grassland and distributed herb lands that are often dominated by alien plants. It is characterised by deep sand to clayey (but mostly coarse sand) alluvial soils developed over Quaternary alluvial (fluvatile) sediments."

4 ASSESSMENT METHODOLOGY

The section below outlines the assessment methodologies utilised in the study. This report was compiled by PGS for the proposed Tetra4 Cluster 2 Production Project. The applicable maps, tables and figures, are included as stipulated in the NHRA (no 25 of 1999) and the NEMA (no 107 of 1998). The HIA process consisted of three steps:

Step I – Desktop Study: A detailed archaeological and historical overview of the study area and surroundings was undertaken. This work was augmented by an assessment of reports and data contained on the South African Heritage Resources Information System (SAHRIS). Additionally, an assessment was made of the available historic topographic maps. All these desktop study components were undertaken to support the fieldwork.

Step II – Field Survey: The fieldwork component of the study was aimed at identifying tangible remains of archaeological, historical and heritage significance. The fieldwork was undertaken by way of intensive walkthroughs of the proposed development footprint areas.

The fieldwork was undertaken by three archaeologists (Nikki Mann, Michelle Sachse, Nicholas Fletcher) on 14-24 February 2022. Throughout the fieldwork, hand-held GPS devices were used to record the track logs showing the routes followed by the fieldwork team.

Step III – Report: The final step involved the recording and documentation of relevant archaeological resources, the assessment of resources in terms of the HIA criteria and report writing, as well as mapping and constructive recommendations.

The significance of heritage sites was based on four main criteria:

- Site integrity (i.e. primary vs. secondary context),
- Amount of deposit, range of features (e.g., stonewalling, stone tools and enclosures),
- Density of scatter (dispersed scatter)
 - Low-<10/50m²
 - Medium - 10-50/50m²
 - High - >50/50m²
- Uniqueness; and
- Potential to answer present research questions.

Management actions and recommended mitigation, which will result in a reduction in the impact on the sites, will be expressed as follows:

A - No further action necessary;

B - Mapping of the site and controlled sampling required;

C - No-go or relocate development activity position;

D - Preserve site, or extensive data collection and mapping of the site; and

E - Preserve site.

Impacts on these sites by the development will be evaluated as follows:

4.1.1 SITE SIGNIFICANCE

Site significance classification standards use is based on the heritage classification of s3 in the NHRA and developed for implementation keeping in mind the grading system approved by SAHRA for archaeological impact assessments. The update classification and rating system as developed by Heritage Western Cape (2016) is implemented in this report

Site significance classification standards prescribed by the Heritage Western Cape Guideline (2016), were used for the purpose of this report (**Table 4** and **Table 5**).

Table 4 - Rating system for archaeological resources

Grading	Description of Resource	Examples of Possible Management Strategies	Heritage Significance
I	Heritage resources with qualities so exceptional that they are of special national significance. Current examples: Wonderwerk Cav), Cradle of Humankind	May be declared as a National Heritage Site managed by SAHRA. Specific mitigation and scientific investigation can be permitted in certain circumstances with sufficient motivation.	Highest Significance
II	Heritage resources with special qualities which make them significant, but do not fulfil the criteria for Grade I status. Current examples: Blombos, Paternoster Midden.	May be declared as a Provincial Heritage Site managed by Free State Heritage Resources Authority (FSHRA). Specific mitigation and scientific investigation can be permitted in certain circumstances with sufficient motivation.	Exceptionally High Significance
III	Heritage resources that contribute to the environmental quality or cultural significance of a larger area and fulfils one of the criteria set out in section 3(3) of the Act but that does not fulfil the criteria for Grade II status. Grade III sites may be formally protected by placement on the Heritage Register.		
IIIA	Such a resource must be an excellent example of its kind or must be sufficiently rare. Current examples: Varschedrift; Peers Cave; Brobartia Road Midden at Bettys Bay	Resource must be retained. Specific mitigation and scientific investigation can be permitted in certain circumstances with sufficient motivation.	High Significance
IIIB	Such a resource might have similar significances to those of a Grade III A resource, but to a lesser degree.	Resource must be retained where possible where not possible it must be fully investigated and/or mitigated.	Medium Significance
IIIC	Such a resource is of contributing significance.	Resource must be satisfactorily studied before impact. If the recording already done (such as in an HIA or permit application) is not sufficient, further recording or even mitigation may be required.	Low Significance
NCW	A resource that, after appropriate investigation, has been determined	No further actions under the NHRA are required. This must be	No research potential or

Grading	Description of Resource	Examples of Possible Management Strategies	Heritage Significance
	to not have enough heritage significance to be retained as part of the National Estate.	motivated by the applicant or the consultant and approved by the authority.	other cultural significance

Table 5 - Rating system for built environment resources

Grading	Description of Resource	Examples of Possible Management Strategies	Heritage Significance
I	Heritage resources with qualities so exceptional that they are of special national significance. Current examples: Robben Island	May be declared as a National Heritage Site managed by SAHRA.	Highest Significance
II	Heritage resources with special qualities which make them significant in the context of a province or region, but do not fulfil the criteria for Grade I status. Current examples: 8 Ventershoek Street, Colesberg	May be declared as a Provincial Heritage Site managed by FSHRA.	Exceptionally High Significance
II	Such a resource contributes to the environmental quality or cultural significance of a larger area and fulfils one of the criteria set out in section 3(3) of the Act but that does not fulfil the criteria for Grade II status. Grade III sites may be formally protected by placement on the Heritage Register.		
IIIA	Such a resource must be an excellent example of its kind or must be sufficiently rare. These are heritage resources which are significant in the context of an area.	This grading is applied to buildings and sites that have sufficient intrinsic significance to be regarded as local heritage resources; and are significant enough to warrant that any alteration, both internal and external, is regulated. Such buildings and sites may be representative, being excellent examples of their kind, or may be rare. In either case, they should receive maximum protection at local level.	High Significance
IIIB	Such a resource might have similar significances to those of a Grade III A resource, but to a lesser degree. These are heritage resources which are significant in the context of a townscape, neighbourhood, settlement or community.	Like Grade IIIA buildings and sites, such buildings and sites may be representative, being excellent examples of their kind, or may be rare, but less so than Grade IIIA examples. They would receive less stringent protection than Grade IIIA buildings and sites at local level.	Medium Significance
IIIC	Such a resource is of contributing significance to the environs. These are heritage resources which are significant in the context of a streetscape or direct neighbourhood.	This grading is applied to buildings and/or sites whose significance is contextual, i.e., in large part due to its contribution to the character or significance of the environs. These buildings and sites should, as a consequence,	Low Significance

Grading	Description of Resource	Examples of Possible Management Strategies	Heritage Significance
		only be regulated if the significance of the environs is sufficient to warrant protective measures, regardless of whether the site falls within a Conservation or Heritage Area. Internal alterations should not necessarily be regulated.	
NCW	A resource that, after appropriate investigation, has been determined to not have enough heritage significance to be retained as part of the National Estate.	No further actions under the NHRA are required. This must be motivated by the applicant and approved by the authority. Section 34 can even be lifted by HWC for structures in this category if they are older than 60 years.	No research potential or other cultural significance

4.2 ARCHAEOLOGICAL SPECIFIC METHODOLOGY

Additional to the preceding methodological description the archaeological methodology included fulfilling the requirements of the NHRA (section 35 and 36) that protects the following features in the landscape:

- Material remains resulting from human activity which are in a state of disuse and are in or on land and which are older than 100 years, including artefacts, human and hominid remains and artificial features and structures;
- Rock art, being any form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and which is older than 100 years, including any area within 10m of such representation;
- Graves and burial grounds, including ancestral graves, royal graves, graves of traditional leaders, graves of victims of conflict, historical graves and cemeteries, and other human remains not covered by the Human Tissue Act (1983) (Act No 65 of 1983).

5 HISTORICAL AND ARCHAEOLOGICAL OVERVIEW OF THE STUDY AREA

5.1 OVERVIEW OF THE STUDY AREA AND SURROUNDING LANDSCAPE


The high-level archival research focused on available information sources that were used to compile a general background history of the study area and surrounds.

The Free State has a rich archaeological and historical history going back millions of years and includes significant aspects such as Later Stone Age rock art, Battlefields and Iron Age stonewalled enclosures. The general surroundings of the study area became a melting pot of contact and conflict as it represents one of many frontiers where San hunter- gatherers, Nguni and Sotho-Tswana agro-pastoralists, Dutch Voortrekkers and British Colonists all came together. The ravages of war also swept across these plains, and in particular the South African War (1899-1902) as well as the Boer Rebellion (1914-1915).

It must be noted that such an overview, which is based on available literature and archival research, would necessarily reflect a bias toward a traditional white history of the region as this would have been the focus of publications and archival documents during the last 150 years.

Table 6 – Archaeological and Historical Overview of the Study Area and Surrounding Landscape

DATE	DESCRIPTION
The Study Area during the Stone Age	
Very little is known about the Stone Age archaeology of the study area and its immediate surroundings. In the wider surroundings, probably the most significant Stone Age is at Florisbad, located roughly 78 km south-west of the present study area. Closer to the study area, a number of Middle and Later Stone Age material in associated with mammal fossil remains have been identified in erosion gullies along the Sand, Doring and Vet Rivers between Virginia and Theunissen (De Ruiter <i>et. al.</i> 2011). See also Rossouw (n.d.).	
2.5 million to 250 000 years ago	The Earlier Stone Age (ESA) is the first and oldest phase identified in South Africa's archaeological history and comprises two technological phases. The earliest of these is known as Oldowan and is associated with crude flakes and hammer stones. It dates to approximately 2 million years ago. The second technological phase is the Acheulian and comprises more refined and better made stone artefacts such as the cleaver and bifacial hand axe. The Acheulian dates back to approximately 1.5 million years ago. No information regarding ESA sites from the study area and surroundings was found.
>250 000 to 40 000 years ago	The Middle Stone Age (MSA) is associated with flakes, points and blades manufactured by means of the prepared core technique. This phase is furthermore associated with modern humans and complex cognition (Wadley, 2013). During research fieldwork by the National Museum in Bloemfontein, ten sites were recorded where Middle Stone Age and/or Later Stone Age lithics were identified in association with mammal fossil remains from erosion gullies along the Sand, Vet and Doring Rivers (De Ruiter <i>et. al.</i> 2011). While almost all of these sites are located within a distance of 20 km of the present study area, one site is located immediately adjacent to the study area. This site is named Kalkoenkrans 225 and is located no more than 500 m north-east of the study area.

DATE	DESCRIPTION
	<p>During the fieldwork undertaken during the Heritage Scoping, a Middle Stone Age site was identified within the study area on the northern bank of the Sand River (see Site 33 (Birkholtz, 2017a)).</p>
	
<p><i>Figure 17 – Photograph of the archaeological field survey as published in De Ruiter et. al. (2011).</i></p>	
<p>40 000 years ago to c. 1800s</p>	<p>The Later Stone Age (LSA) is the third archaeological phase identified and is characterised by an abundance of very small stone tools known as microliths as well many rock art sites across the country. This period is associated with hunter-gatherers (San) as well as early pastoralists (Khoekhoe) and lasted up until - and in many cases a considerable number of years after – the arrival of Iron Age and European communities.</p> <p>Apart from the occurrence of Later Stone Age lithics along the Sand, Vet and Doring Rivers (see above), no other Later Stone Age sites are known from the surroundings of the study area. Similarly, no known rock art sites are known from the study area or its wider surroundings.</p>
<p>The Study Area during the Iron Age</p>	
<p>The arrival of early farming communities during the first millennium, heralded in the start of the Iron Age for South Africa. The Iron Age is that period in South Africa's archaeological history associated with pre-colonial farming communities associated with agricultural and pastoralist farming activities, metal working, cultural customs such as lobola as well as the tangible representation of the significance of cattle imprinted on their settlement layouts (known as the Central Cattle Pattern) (Huffman, 2007).</p> <p>According to the distribution map for Iron Age settlements on the Southern Highveld as published in Maggs (1976), the study area is located to the west of the known distribution of such Late Iron Age sites. It is therefore unlikely for any Late Iron Age sites to be located within the study area or its immediate surroundings. This surmise is largely supported by the distribution maps as published by Huffman (2007), albeit these latter distribution maps (which are based on known archaeological information) indicate that the study area is located very close to the periphery of two Iron Age facies. For the sake of completeness, these two Iron Age facies, known as Thabeng and Makgwareng, will be presented here.</p>	

DATE	DESCRIPTION
AD 1700 – AD 1840	<p>The Thabeng facies of the Moloko Branch of the Urewe Tradition is one of the facies identified within the study area. The decoration on the ceramics associated with this facies is characterised by incised triangles, coloured chevrons and arcades. The Tlhaping at Dithakong, Rolong at Platberg and the Kubung from the Free State form a Southwestern Sotho-Tswana cluster that is associated with this Thabeng facies pottery and Type Z settlement layouts (Huffman, 2007).</p> <p>The Type Z settlements are one of the Late Iron Age stonewalled settlement types identified by Tim Maggs during his extensive archaeological research project on the Iron Age of the southern Highveld, which includes the present study area (Maggs, 1976). These sites are characterised by large primary enclosures enclosed by a ‘discontinuous ring’ of characteristic bilobial dwellings. Each of these bilobial dwellings comprises a hut at its front with a semi-circular courtyard at the back. With the area in front of the hut enclosed by a low stone wall and the courtyard at the back similarly enclosed by a smaller enclosure, the layout plan of these huts comprise two lobes, one larger than the other. The huts are defined by a ring of upright stones and are usually paved with flat stones. Unlike Type V settlements (see below), corbelled hut are rarely associated with these Type Z settlements, and appear to be the result of contact with the Type V settlements located to the east.</p> <p>While a number of Type Z sites are located within the study area, one of the more prominent ones is OXF1, located roughly 34.7 km east-by-northeast of the present study area and a short distance north-west of the town of Ventersburg. This site was excavated by Tim Maggs during the 1970s as part of his overall research project alluded to above (Maggs, 1976).</p> <p>In his conclusions on the history of his entire study area, Maggs (1976:317) states that “...the conclusion seems inescapable that the Kubung were the builders of Type Z. This conclusion could be put forward on the typological evidence alone, for the Kubung are the only known off-shoot of the Rolong to have settled in our area, and the Type Z industry was clearly the work of a group related to the Rolong.”</p>

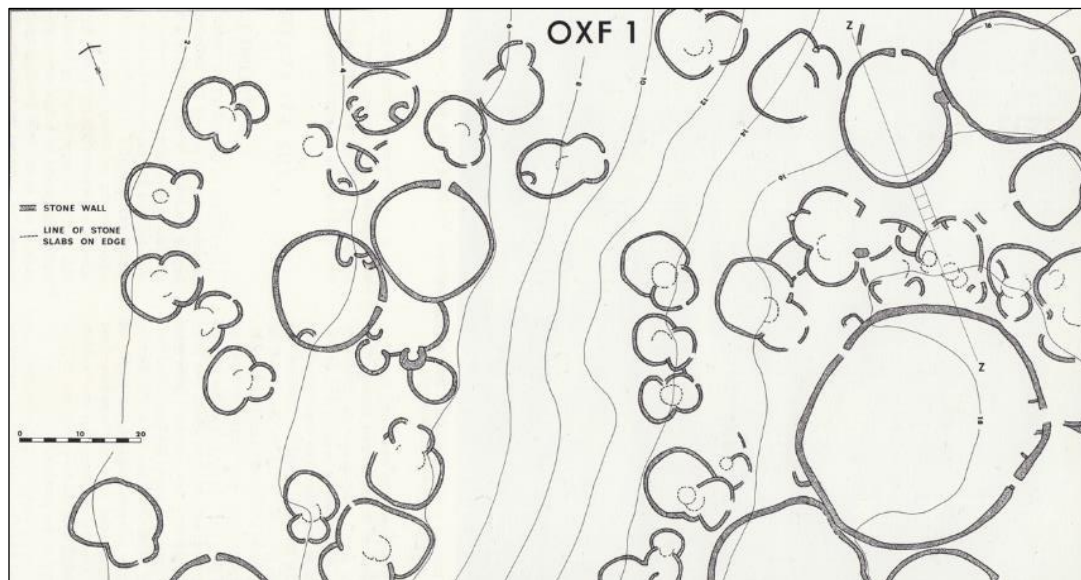
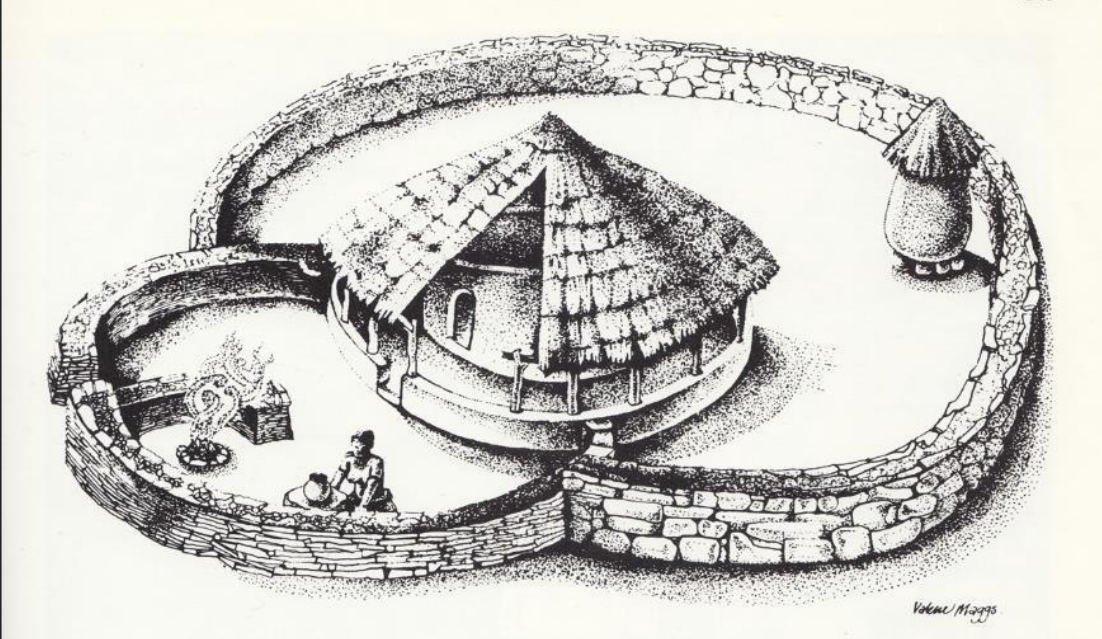

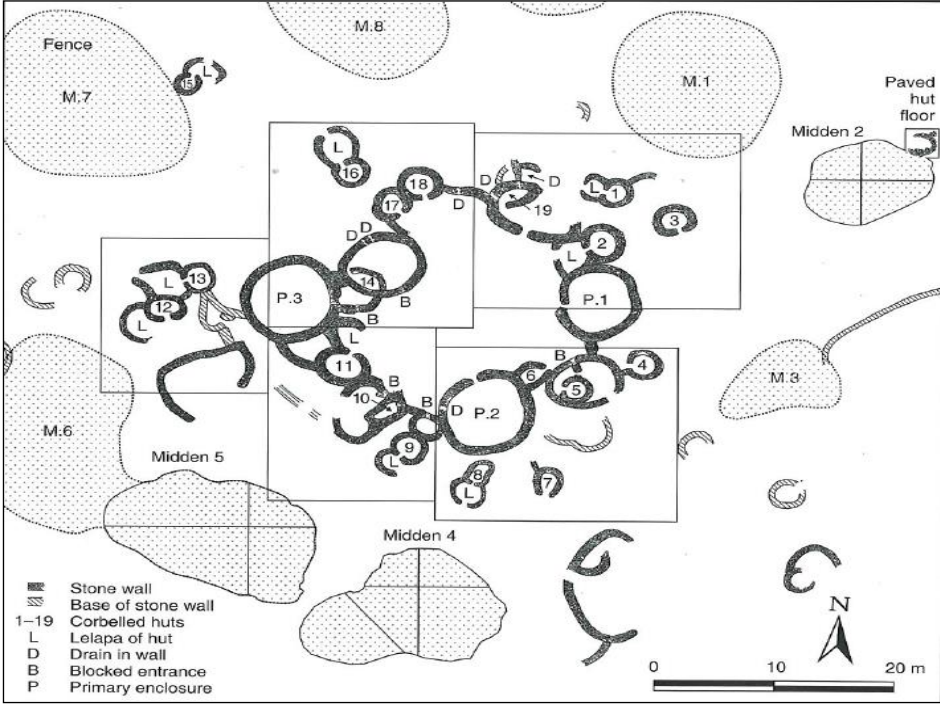


Figure 18 - This plan depicts the settlement layout of a typical Type Z site, and was recorded at site OXF 1 (Maggs, 1976:233).

DATE	DESCRIPTION
	 <p data-bbox="252 913 1326 987"><i>Figure 19 – Artist's impression of a bilobial dwelling at site OXF 1. These bilobial dwellings represent a characteristic element of Type Z settlements (Maggs, 1976:241).</i></p>
<p data-bbox="204 1391 336 1451">AD 1700 – AD 1820</p>	<p data-bbox="359 1037 1374 1160">The Makgwareng facies of the Blackburn Branch of the Urewe Ceramic Tradition represents the next known Iron Age period within the surroundings of the study area. The decoration on the ceramics from this facies is characterised by finely stamped triangles, rim notching and appliqué (Huffman, 2007).</p> <p data-bbox="359 1160 1374 1525">This facies developed from Ntsuanatsatsi south of the Vaal River and can be associated with the Type V stone walling settlement type (Huffman, 2007), the name of which is derived from Vegkop (Maggs, 1976). Van Riet Lowe (1927) was one of the first to record these structures. Dreyer (1990) also conducted excavations on Type V Late Iron Age stonewalled settlements located a short distance south-west of Winburg. The Type V settlements comprise a core of cattle enclosures surrounded by beehive huts. Corbelled stone huts are associated with this walling type, and can be seen as characteristic. They are low stone huts located at the edge of the cattle enclosures and were where the boys herding the cattle often lived (Huffman 2007). As suggested by Huffman (2007), the corbelled huts were in fact beehive huts made of stone rather than grass and reeds. Furthermore, the presence of beehive huts at these sites necessarily indicates a Nguni association or origin with these settlements.</p> <p data-bbox="359 1525 1374 1805">Based in information presently available, the best known site of this type found within the surroundings of the study area, comprises a so-called “Early Sotho Settlement, Waterval, Sandrivierhoogte” that was originally declared a National Monument and which is now registered as a Provincial Heritage Site. The site is located 27.3 km east of the present study area. The site was proclaimed a national monument by virtue of a notice in the Government Gazette on 17 December 1982. In the declaration, the site is described as a ‘Leghoya Village’ comprising corbelled huts and stonewalls. The site has since been declared a Provincial Heritage Site in terms of the National Heritage Resources Act (www.sahra.org.za).</p>

DATE	DESCRIPTION
	 <p data-bbox="253 813 1324 842"><i>Figure 20 – Corbelled stone huts associated with a Type V settlement (Huffman, 2007:39).</i></p>  <p data-bbox="413 1608 1163 1637"><i>Figure 21 – Layout of a Type V Settlement (Huffman, 2007:38).</i></p>
1820s	<p data-bbox="357 1695 1375 1874">Across the Southern Highveld, this period was characterised by warfare and unrest. Known as the Mfecane, these years of upheaval originated primarily in the migration of three Nguni groups from present day Kwazulu-Natal into the present day Free State as a result of the conquests of the Zulu under King Shaka. The three Nguni groups were the Hlubi of Mpangazitha, the Ngwane of Matiwane and the Khumalo Ndebele (Matabele) of Mzilikazi.</p> <p data-bbox="357 1879 1375 2022">In c. 1821, the Hlubi migrated across the Drakensberg Mountains in a westerly direction (Maggs, 1976) and attacked the Tlokwa of MaNthatisi along the banks of the Wilge River. This river has its source near Harrismith and flows into the Vaal River where the Vaal Dam is located today. While it is not exactly certain where MaNthatisi's settlements would have been located (in all likelihood further south), the Tlokwa fled</p>

DATE	DESCRIPTION
	<p>westward as a result of the Hlubi attack and in turn attacked other groups in its path. This started a period of unrest and warfare, which rippled across the Highveld on both sides of the Vaal River (Legassick, 2010) (Lye and Murray, 1980).</p> <p>The Ngwane followed closely on the Hlubi and further augmented the unrest and warfare along the southern Highveld (Legassick, 2010).</p> <p>Although the effects of the migrations of the Hlubi and Ngwane would certainly have had a profound impact on the northern Free State, this was also the case in terms of the Khumalo Ndebele who would have played a significant role in the surroundings of the study area during this time.</p> <p>The Khumalo Ndebele (also known as the Matabele) were also forced to leave Kwazulu-Natal and between 1823 and 1827 settled along the central Vaal River (Bergh, 1999). Mzilikazi attacked a number of Sotho-Tswana groups and settlements and incorporated them into his kingdom. As a result, his activities would have had a definite impact on the northern Free State at the time.</p>

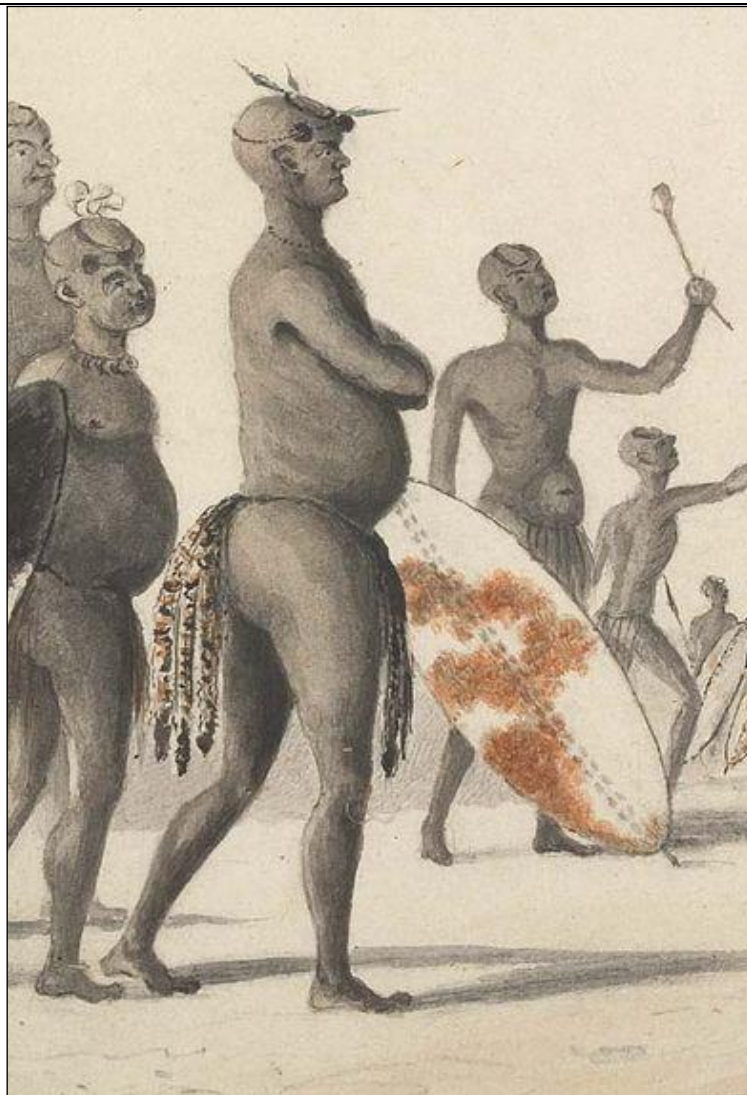




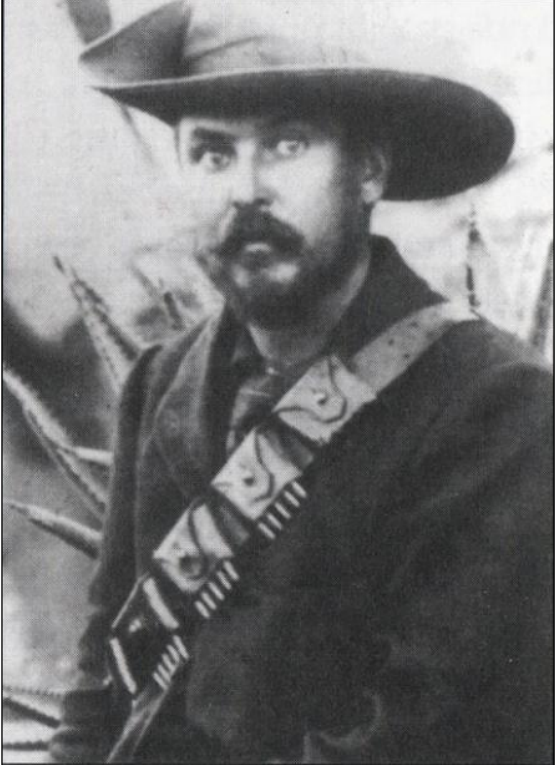
Figure 22 - King Mzilikazi of the Matabele. This illustration was made by Captain Cornwallis Harris in c. 1838 (www.sahistory.org.za).

The Early Colonial Period

DATE	DESCRIPTION
	<p>The early Colonial Period within the study area and surroundings was characterised by the arrival of newcomers to the Transoraniga. The first arrivals were the Griqua followed by white Trekboers, who for the most part practiced a nomadic pastoralist way of life and were small in number. During the 1830s a mass migration of roughly 2 540 Afrikaner families (comprising approximately 12 000 individuals) from the frontier zone of the Cape Colony to the interior of Southern Africa took place. The people who took part in this Great Trek were later to be known as Voortrekkers (Visagie, 2011).</p>
1804	<p>The Griqua were of European and Khoikhoi descent, and although they had been present on the Orange River for some time, they only established themselves permanently north of the river in 1804 when they settled near present-day Danielskuil (Reader's Digest, 1994).</p>
Early 1800s	<p>During the early 1800s, frequent droughts forced white farmers from the Cape Colony to move with their livestock across the Orange River to look for better grazing. Initially, these Trekboers first obtained permission from the Cape authorities before departing across the frontier, however with time, increasing numbers of Trekboers moved across this river into the Transorangia (as it became known) without any prior permission (Schoeman, 1980).</p>
Early 1836	<p>The first Voortrekker party of some 70 wagons crossed over the Orange River during early 1836. More groups followed and in terms of the surroundings of the study area, established themselves along the Vet River (Schoeman, 1980). Meintjies (1973) mentions that a Voortrekker party under Hendrik Potgieter arrived along the Vet River during this time. The grazing around the Vet River was not enough for all the livestock and animals of the Voortrekkers, so they split into smaller groups with one group establishing itself in May 1836 at Blaauwdrift, on the Zand River. This farm is located within the study area. Apart from this historic event, the closest known tangible evidence for the Voortrekkers to the study area was a fort which they built on the northern bank of the Zand River on the farm Du Preez Leger. The farm Du Preez Leger is located 1.7 km east of the present study area.</p>
1837 - 1843	<p>In 1841 the town of Winburg was established on the banks of the Vet river. After the annexation of Natal by the British in 1843 and the subsequent dissolution of the Voortrekker Republic of Natalia, Winburg became the capital of the Voortrekkers in what is today known as the Free State (Erasmus, 2004). Winburg is located 34 km south-east of the study area. On 10 October 1968, an extensive Voortrekker Monument was opened near Winburg (www.artefacts.co.za).</p>
	 <p><i>Figure 23 – Depiction of an ox wagon crossing a river during the Great Trek (Reader's Digest, 1994:116).</i></p>
The Mid to Late Nineteenth Century	

DATE	DESCRIPTION
3 February 1848	<p>The Orange River Sovereignty was proclaimed over the Transorangia by Great Britain and had its capital at the newly established town of Bloemfontein (www.wikipedia.org). The sovereignty came about after one-sided agreements that favoured the British Government had been reached between Great Britain on the one hand and King Moshe of the Basotho and Adam Kok III of the Griqua on the other.</p> <p>Those Voortrekkers present in the Transorangia were completely by-passed by these agreements, which led to serious dismay and disappointment amongst them. In terms of the surroundings of the study area, the response of the Voortrekkers was to force the British magistrate at Winburg, one Thomas Biddulph, out of town and proclaim the Republic of Winburg (Reader's Digest, 1994).</p>
16 January 1852	<p>On 16 January 1852 the Sand River Convention was signed between the British Government and the Transvaal Boers. The British Government was represented by British Assistant Commissioners W.S. Hogge and C.M. Owen, whereas the Transvaal Boers were under the leadership of the Voortrekker hero of Blood/Ncome River, General Andries Pretorius.</p> <p>This convention formally recognised the existence and independence of the Boer Republic north of the Vaal River by the British Government. As a result, this agreement allowed for the creation of a Boer Republic, namely the <i>Zuid-Afrikaansche Republiek</i> (South African Republic) (Oberholster, 1972). The <i>Zuid-Afrikaansche Republiek</i> remained in existence until the end of the South African War in 1902.</p> <p>The site where the signing of the convention took place, was declared a monument and for many years was marked by a stone cairn and plaque (Oberholster, 1972). The present condition of the monument is not known.</p> <p>The site is located near the bridge where the N1 highway passes over the Sand River, and is located approximately 29 km east of the present study area.</p>
23 February 1854	<p>The Orange River Convention was signed by representatives of Great Britain and the Boers, and resulted in the proclamation of the Boer Republic of the Orange Free State. The convention was signed at Bloemfontein (www.wikipedia.org).</p> <p>As with the proclamation of the Sovereignty, the Orange River Convention was again one-sided and did not obtain the blessing or inputs of all the major role-players in the Free State. While the Voortrekkers were excluded in 1848, the signing of the Orange River Convention in 1854 did the same to the Basotho and Griqua.</p> <p>For the next 48 years, the study area fell within the boundaries of the Boer Republic of the Orange Free State.</p> <p>Incidentally, the Orange River Convention is sometimes referred to as the Bloemfontein Convention.</p>
1872	<p>The town of Ventersburg was laid out on the farm Kromfontein in 1872. Kromfontein had originally belonged to one of the early Voortrekker leaders, namely Field-Cornet P.A. Venter. After his death in 1857, his son B.G. Venter allowed church services to be held in his father's homestead. The second Gereformeerde (Dopper) church north of the Orange River was also established at Kromfontein in 1859.</p> <p>The use of the farm for church services led to the establishment of a town. The new town was named after Field-Cornet P.A. Venter, and formal proclamation for Ventersburg took place in 1876 (Erasmus, 2004).</p> <p>Ventersburg is located 37.23 km east of the present study boundaries.</p>
1890	<p>Erasmus (2004) states that two American engineers were responsible for the original survey of sections of the proposed railway line between Bloemfontein and Johannesburg. On the farm Merriespruit they chiselled the name 'Virginia' on a boulder, presumably in honour of the American State of Virginia. When the railway line was built a few years later, the nearby railway siding was named Virginia and some years later, in 1954, the town of Virginia was also established.</p> <p>The Virginia railway siding is located 13.5 km east of the present study area. The exact position of the chiselled boulder, if it still exists today, is not presently known.</p>

DATE	DESCRIPTION
Early 1890s	The railway line between Bloemfontein and Johannesburg was built during the early 1890s, and eventually reached Johannesburg during September 1891 and Pretoria in January 1892 (Schoeman, 1980). In terms of the study area, this railway line passed to its east and in this area was built from Smaldeel (present day Theunissen) to Theron, Welgelegen and Virginia.
9 November 1892 – 1899	<p>The Driekopjes Diamond Mining Company was registered. One of the founding directors of the company was the man who would become synonymous with South African diamond mining and diamonds, Sir Thomas Major Cullinan.</p> <p>The “Driekopjes” in the name of the company referred to a farm of that name north-west of Kroonstad, where diamond mining was taking place. In June 1894 the Driekopjes Diamond Mining Company also acquired an interest in the farm Welgegund from the Van Rensburg Diamond Mining Syndicate. The farm Welgegund was located within the study area, and is presently known as the farm Driekoppies 422. No information could be found on this syndicate. However, the fact that the Driekopjes Company acquired an interest from the Van Rensburg syndicate, suggests that diamond prospecting and possibly mining activities had taken place within the study area before this transfer took place.</p> <p>A large number of diamonds were subsequently recovered from Welgegund. However all mining activities came to a halt with the South African War (1899 – 1902) (Helme, 1974).</p>
Mid 1890s	<p>During the mid 1890s two men arrived on the farm Aandenk to undertake prospecting work. Alexander Edward King Donaldson was a prospector and his associate Herbert Hinds an engineer. They excavated an 18-meter-deep shaft and took samples from their excavations for further testing and analysis. On their return journey to England, both men died when their ship, the Drummond Castle, wrecked at Ushant off France, and with it the samples they had brought from the Free State (www.sahra.org.za) (Felstar Publishers, 1968).</p> <p>The activities of these two men laid the foundation for the discovery and development of the Free State Goldfields. The farm Aandenk is located immediately south of Allanridge today, some 35 km north by north-west of the present study area.</p>
1899	The town of Odendaalsrust was officially established in 1899 when the Dutch Reformed Church chose the farm Kalkkuil for its new parish. The town was proclaimed a municipality in 1912. At the time, it only had about 40 houses, three shops and a hotel (Mayhew, 1982).
The South African War (1899 – 1902)	
<p>The South African War was fought between the Boer Republics of the Transvaal and Free State on the one side and Great Britain on the other, but is referred to as the South African War as the victims and participants of the war were not excluded to Britain or Boer alone.</p> <p>As will be discussed in more detail below, the march of Lord Roberts from Bloemfontein to Pretoria in May and June 1900 was especially significant in terms of the study area. In particular, the so-called Battle of Zand River (7 – 10 May 1900) was fought very close to the study area, with at least the movement of troops during the battle taking place across the study area.</p>	
13 March 1900 – 6 May 1900	<p>Bloemfontein, the capital of the Boer Republic of the Orange Free, was occupied by the British Army under Lord Roberts on 13 March 1900. The Boer Republic of the Orange Free State was renamed the Orange River Colony.</p> <p>With the Republican forces of the Transvaal and Free State retreating northwards from Bloemfontein, Lord Roberts's eyes drifted further north, where the greatest prize of the war lay waiting, Pretoria. Lord Roberts and his staff strongly believed that once the capital of the <i>Zuid-Afrikaansche Republiek</i> fell, the war would be over.</p> <p>However, the success of the British Army required all focus on the immediate front, as the land between Bloemfontein and Pretoria was bisected by a myriad of rivers, dongas</p>

DATE	DESCRIPTION
	<p>and hills, all strategically significant obstacles from where the Boer forces could implement a solid defence. The Boer forces standing between Lord Roberts and Transvaal capital were estimated by British Intelligence to comprise two main groups namely a force of between 5 000 to 6 000 burghers with 18 guns under General Louis Botha and a similarly large force in the surroundings of Kroonstad (Maurice & Grant, 1906).</p> <p>After departing from Bloemfontein, Lord Roberts's force was involved in a couple of successful actions on their way to Pretoria, including Brandfort (3 May 1900) and Vet River (4 - 6 May 1900). With the successful conclusion of the battle of Vet River, Lord Roberts and almost his entire army crossed over the river successfully, and by the evening of 6 May 1900 bivouacked at the small railway siding known as Smaldeel. The town of Theunissen is located here today and is roughly 12 km south of the present study area (Maurice & Grant, 1906).</p> <p>A short distance to the north lay the next, and far more daunting, obstacle on Lord Roberts's march to Pretoria, the Zand (or Sand) River. It was here, at this river, that General Louis Botha, the commanders-in chief of the Transvaal republican forces, was determined to halt Lord Roberts's march on Pretoria.</p>
	 <p><i>Figure 24 – Lord Frederick Sleigh Roberts (left) and General Louis Botha (right). These two officers commanded the opposing forces at the Battle of Zand River (Changuion, 2001:77 & 117)</i></p>
7 – 10 May 1900	<p>On 7 May 1900 a reconnaissance of the Zand River by General Edward Hutton indicated that the northern bank of the river was held by a force of roughly 6 000 Boers supported by two heavy and eight light pieces of artillery. These estimates provided by General Hutton allowed Lord Roberts to draw up a battle plan (Maurice & Grant, 1906).</p> <p>On the 9th of May 1900, Lord Roberts moved his army forward and established his headquarters at the Welgelegen Station, roughly 6 km east of the study area. The movement of the British Army under Lord Roberts from a position a short distance south of the study area at</p>

DATE	DESCRIPTION
	<p>Smaldeel to a position a short distance east of it, suggests that the main component of Lord Roberts's force followed the railway line and in this way skirted around the study area. However, in view of the closeness of this railway line to the present study area, sections of his force would almost certainly have crossed over the study area as well.</p> <p>Lord Roberts's battle plan focussed on securing significant drifts that provides safe crossing of his infantry over the Zand River, and especially so Junction Drift (23.5 km east of the study area), Merriespruit (16.6 km east of the study area), Du Preez Leger Drift (located within the study area where the bridge on the road between Theunissen and Welkom crosses the river) and De Klerks Kraal Drift (940 m west of the present study area). For the purposes of this discussion, the events associated with the latter two of these drifts will be discussed in more detail below.</p> <p>On the morning of 9 May 1900, Lieutenant-Colonel Thomas William Porter with the 1s Cavalry Brigade departed from Smaldeel to reconnoitre the two drifts at Du Preez Leger and De Klerks Kraal. They were assisted in this task by Major-General J.B.B. Dickson with the 4th Cavalry Brigade. Meanwhile, at 11 am, Major-General John French with his advance guard reached Kalkoenkrans, a section of which farm is located within the present study area. At Kalkoenkrans, French received word from the reconnaissance units on the river that the Du Preez Leger Drift was not held by the enemy. Seizing the opportunity to outflank the Boer positions, French immediately ordered a squadron of the Scots Greys forward to take possession of the drift, and ordered the remainder of the 1st Cavalry Brigade to follow and assist in this task. The 4th Cavalry Brigade was left at Kalkoenkrans in support. By 15h30 that afternoon the Du Preez Leger Drift was occupied by the British force, with the De Klerks Kraal Drift was taken shortly thereafter. Incidentally, the other significant drifts on the river had also been taken with similar ease.</p> <p>On the morning of 10 May 1900, Lord Roberts's army advanced on the river. On its left flank (and the side closest to the study area) General French with the 1st Cavalry Brigade, the 4th Cavalry Brigade as well as Hutton's Mounted Infantry, crossed over the Du Preez Leger Drift from where they moved in a north-eastern direction.</p> <p>On the left centre of the front, the 3rd Cavalry Brigade and Henry's Mounted Infantry crossed over the drift at the railway line in proximity to present-day Virginia, some 16.6 km to the east of the study area. The northern bank was occupied by 8 am that same morning.</p> <p>The crossing of the drifts further to the east was achieved with more difficulty, but the northern banks were also occupied a mere half an hour after the crossing over the Merriespruit Drift near the railway line.</p> <p>This meant that Lord Roberts's front comprising cavalry and mounted infantry units had successfully crossed over the Zand River early on the morning of 10 May 1900, without meeting any significant resistance. However, the fortunes of war were about to change for Lord Roberts.</p> <p>A patrol sent out by General French ran into a large Boer force of between 2 000 and 3 000 burghers moving down onto the centre of Lord Roberts's front at the Virginia Station. French ordered an attack by one squadron each from the 6th Inniskilling Dragoons, Scots Greys and Australian Horse and two troops from the 6th Dragoon Guards (Carabiniers). Their attack was focussed on the centre of the advancing Boer force on a ridge located on the farm Vredes Verdrag. This farm is situated some 21.3 km north-east of the present study area and as a result this part of the battle will not be discussed in any detail. Suffice to say that the battle raged for some time and the outcome was not at all clear until 14h00 that afternoon when the Boers abandoned the field of battle, allowing the British to occupy the ridge and proceed forward (Maurice & Grant, 1906).</p>

DATE	DESCRIPTION
	Further battles and actions took place to the east, near Junction Drift. However, by the afternoon of 10 May 1900, all the drifts had been successfully cleared and occupied to allow for the crossing of the Zand River by Lord Roberts's infantry (Maurice & Grant, 1906).

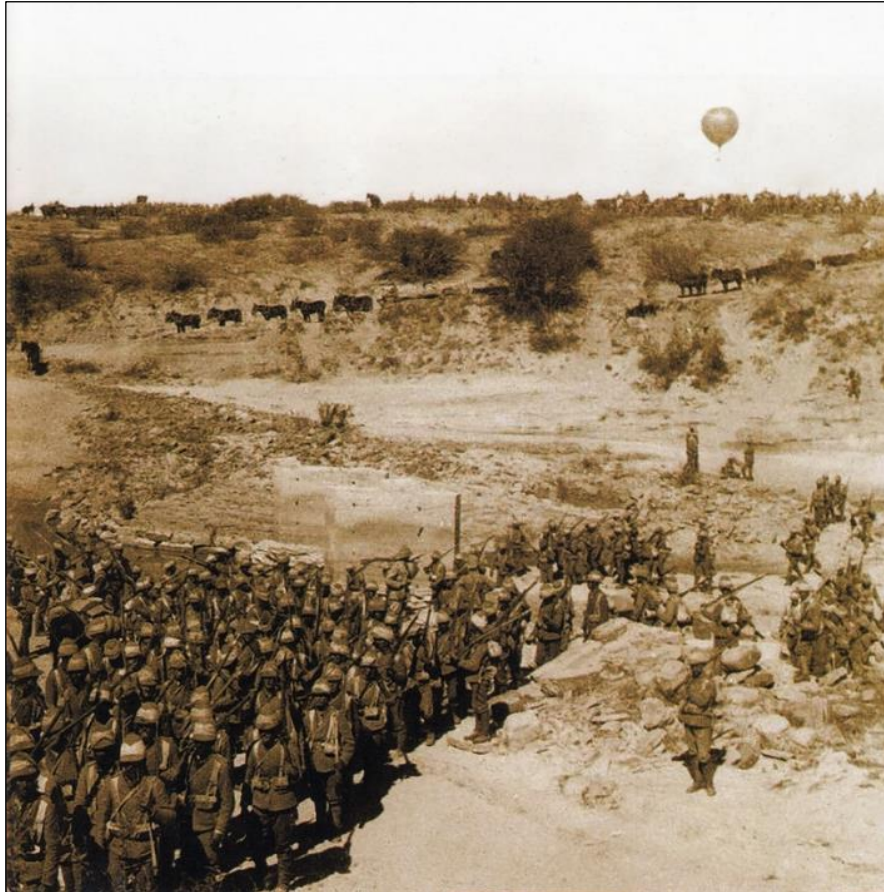

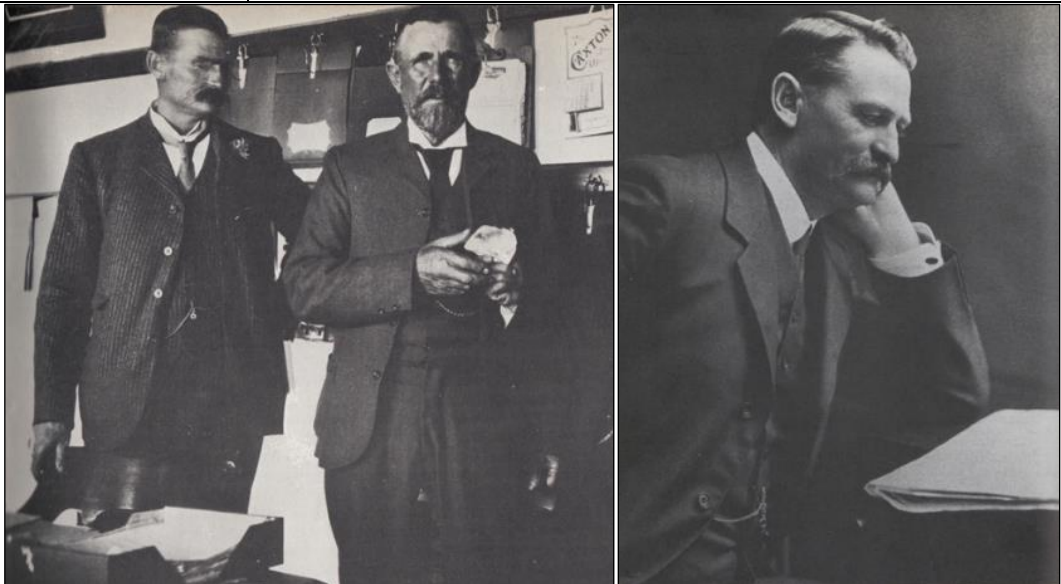

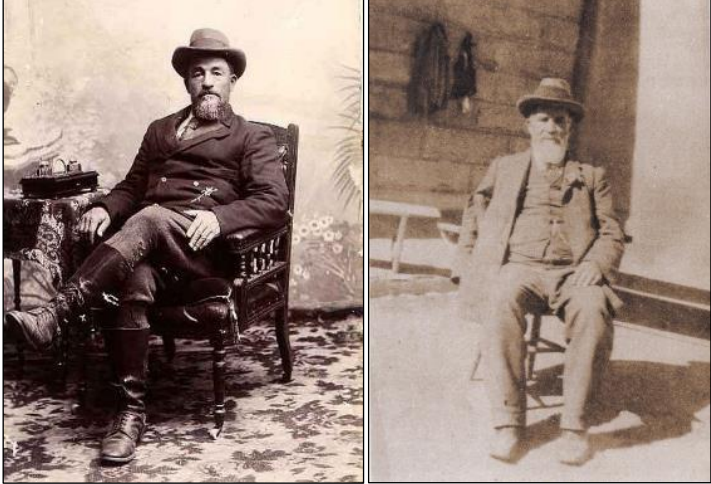


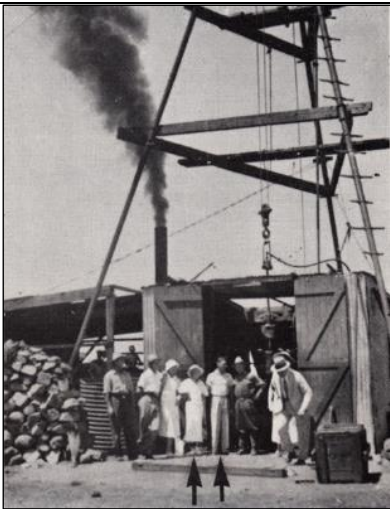
Figure 25 – Lord Roberts's infantry crossing the Zand River at the conclusion of the Battle of Zand River. This photograph was in all likelihood taken during the afternoon of 10 May 1900, after all the significant drifts across the river had been cleared by the cavalry and other units. The crossing and surrounding landscape are monitored by an observation balloon (see top right). It is not possible to identify the exact drift where this crossing took place, although the remnants of a bridge foundation structure can be seen in the river bed (Raath, 2007:351).


DATE	DESCRIPTION
	
	<p><i>Figure 26 - Two of the British officers at the Battle of the Zand River who were closely associated with the events within the study area, namely the occupation of the Du Preez Leger Drift on 9 May 1900 as well as the crossing of the drift on the morning of 10 May 1900. General John French (left) (Changuion, 2001:77) and Colonel Thomas William Porter (www.nzetc.victoria.ac.nz).</i></p>
	<p>After the fall of Pretoria on 5 June 1900 and the subsequent battles of Diamond Hill (11-12 June 1900) and Bergendal (21-27 August 1900), the Boer generals decided that the only way to proceed with the war would be the implementation of a completely different strategy, a strategy based on mobility by using smaller commandos to attack and harass the British on all fronts in what was to become known as guerrilla warfare. This style of warfare had significant successes, and extended the war for nearly another two years. However, these successes also came with significant losses as the war increasingly dragged the civilian population of the Boer Republics into the carnage of war.</p> <p>No skirmishes or battles associated with the guerrilla war are known from within the study area or its immediate surroundings. This said, the study area and surroundings, as with almost the entire South Africa, experienced the effects of guerrilla warfare.</p> <p>In retaliation to the new form of warfare, the British High Command devised a strategy of building extensive blockhouse lines across the country as a way of hindering the mobility of the Boer commandoes. By December 1900, points along the railway line north of Bloemfontein had been fortified with hastily constructed trenches shaded by roofs and defended by razor wire. The closest of these defensive works to the present study area was at Virginia, 13.5 km to the east. Shortly thereafter, a number of key positions along the railway line north of Bloemfontein were significantly strengthened with the construction of multi-storey blockhouses. At Virginia, for example, a double storey stone blockhouse as well as one corrugated iron blockhouse were built (Hattingh & Wessels, 1997).</p> <p>Lord Kitchener, in particular, also implemented a strategy that was to become known as scorched earth whereby the Boer farms were burnt to the ground and the civilian population (both white and black) remaining on these farms forced into concentration camps. No details regarding the destruction of farms from within the study area are presently known. However, the destruction of farms during the guerrilla phase of the war would certainly have taken place within the study area as well.</p> <p>While no concentration camps existed within the study area, a surprising large number of such camps were located in the surroundings of the study area. Black concentration camps were located at Smaldeel, Virginia, Welgelegen and Winburg (Warwick, 1983). Of these,</p>


DATE	DESCRIPTION
	<p>Welgelegen is the closest at a distance of 6 km east of the present study area. The closest white concentration camp to the study area was at Winburg, roughly 34 km south-east of the study area (www.angloboerwar.com).</p> <p>Untold hardship ensued in these concentration camps, and many women and children died as a result of exposure, inadequate nutrition and poor medical facilities. These camps resulted in the deaths of 27 926 white and 14 154 black people (www.sahistory.org.za).</p>
The Early Twentieth Century (1902 – 1913)	
<p>October 1902 – November 1904</p>	<p>In October 1902, some months after the end of the South African War, the name of the Driekopjes Diamond Mining Company was changed to the New Driekopjes Diamond Mining Company, which still had Thomas Major Cullinan as one of its directors.</p> <p>Although work at the Driekopjes Mine north-west of Kroonstad resumed on a small scale during 1903 (in all likelihood work at Welgegund also continued), all work at the mine was permanently halted by November 1904. This was due to disappointing yields and as a result the company was liquidated shortly thereafter (Helme, 1974).</p>
<div data-bbox="256 891 1321 1473">  </div> <p><i>Figure 27 – Sir Thomas Major Cullinan was one of the founding directors of the Driekopjes Diamond Mining Company, which acquired an interest in the farm Welgegund in 1894. In the historic photograph on the left he is shown shortly after the discovery of the Cullinan diamond (which is held by F. Wells) at the Premier Diamond Mining Company, of which he was the chairman. The photograph on the right depicts Cullinan in 1929 (Helme, 1974: 75 & 146).</i></p>	
<p>1904</p>	<p>After the South African War, renewed efforts were made to carry out gold prospecting work in the area.</p> <p>In 1904, a prospector named Archibald Megson arrived on the farm Aandenk, and the farmer showed him the trench where Alexander Edward King Donaldson and Herbert Hinds had looked for gold. It had been more than a decade since these two pioneers had prospected the same farm.</p> <p>Megson opened up the old trench and continued with the excavations. At a depth of 30 meters, he found indications of gold and took a number of samples.</p>


DATE	DESCRIPTION
	<p>Megson returned to Johannesburg with his samples and attempted to gain the interest of various mining houses and investors on the rand. However, with the rapid development and expansion of the Witwatersrand gold mining industry attracting all of the attention, no one seemed interested in possible gold discoveries so far away from Johannesburg (www.sahra.org.za).</p>
	 <p><i>Figure 28 – Archibald Megson standing in the prospecting trench on the farm Aandenk (Felstar Publications, 1968).</i></p>
August 1907	<p>In August 1907, the town of Theunissen was proclaimed. This proclamation followed on a petition by farmers living in proximity to Smaldeel Siding. The town was named in honour of Commandant Helgaardt Theunissen, who led the petition and had also been the leader of the local commando during the South African War. The town of Theunissen became a municipality in 1912 (Erasmus, 2004). Theunissen is located 2.5 km from the study area.</p>
1910	<p>At the time, the Driekoppies Diamond Mine at Welgegund comprised 50 claims (Johnson, 1910). Although no detailed information on these syndicates and companies could be obtained, it would appear that by this time the farm was prospected and mined by at least the Magnus Diamond Syndicate Limited as well as the Triumph Diamond Mining Company Limited. Based on this information, it would appear that the Magnus and Triumph entities in all likelihood took over at Welgegund after the liquidation of the New Driekopjes Mining Company in 1904.</p>
25 November 1911	<p>The Drie Koppie Diamond Mine Limited was formed on 25 November 1911 by W.G. Griffiths to acquire from the Magnus Diamond Syndicate Limited and the Triumph Diamond Mining Company Limited the farm Welgegund in the Winburg District (The Mining Manual and Mining Year Book, 1914). The later history of the diamond mine and mining activities at Welgegund could not be revealed by way of the desktop study. However, based on the remains of the mine property observed during the field, it would appear that a diamond mine was operated here into the relatively recent past.</p>
The Boer Rebellion (1914 – 1918)	
<p>At the end of the South African War (1899 – 1902), the Transvaal and Orange Free State republics lost their independence to the British Empire. In 1910, the Union of South Africa was established consisting of the Cape Colony, Natal, the Transvaal Colony and the Orange River Colony. General Louis Botha was appointed the Union's first prime minister and believed that South Africa's future would be best served as part of the British Commonwealth. In 1914, the South African government under General Louis Botha decided to assist Great Britain in its war with Germany. A number of</p>	

DATE	DESCRIPTION
<p>Boer leaders were not happy about this turn of events, and when General Koos de la Rey was killed at a roadblock in Johannesburg, emotions reached a boiling point and rebellion broke out across the former Boer republics. This rebellion saw more than 11 000 Boer men under the leadership of some of the former Boer War generals such as De Wet, Maritz, Kemp and Beyers rebelling against the South African government and its armed forces under the leadership of former Boer War generals Louis Botha and Jan Smuts.</p>	
<p>16 November 1914</p>	<p>In terms of the study area, the most notable event relating to the Boer Rebellion was the battle that occurred between the commando of General De Wet and the Government forces under the command of Colonel Enslin at the Virginia railway station on 16 November 1914. This battle followed on the defeat of De Wet's rebels at Mushroom Valley, south-east of Winburg, at the hands of General Louis Botha. De Wet and 2 000 rebels managed to escape from Mushroom Valley and followed the railway line north-eastwards towards the Virginia Station on the Zand River. De Wet wanted to cross over the railway line, and as a result, a fight ensued with Colonel Enslin's forces stationed at Virginia Station. General De Wet suffered a number of casualties and 50 of his men were also taken prisoner. After the battle, De Wet and his men followed the Zand River in a western direction and crossed over the river into the Transvaal Colony in proximity to Hoopstad (Union of South Africa, 1916). The Virginia Station is located 13.5 km east of the study area, and as a result the battle would have taken place outside the study area boundaries. However, the movement of De Wet and his commando after the battle would have taken them through the present study area.</p>
<div data-bbox="432 1055 1145 1536">  </div> <p><i>Figure 29 –The hardships experienced by General C.R. de Wet during the rebellion can be seen on these photographs. The one on the left shows De Wet shortly after the South African War (Van Schoor, 2007) with the image on the right depicting the general in the Bloemfontein prison after his capture late in 1914 (Raath & Langner, 2014:119).</i></p>	
<p>The Remainder of the Twentieth Century (1915 – Present Day)</p>	
<p>1929 - 1933</p>	<p>Nearly 25 years after finding the first indications of gold on the farm Aandenk, Archibald Megson finally managed to raise the interests of possible investors in Johannesburg. In 1929, during a chance encounter with Joseph Freedman, Megson found a more welcoming response. Freedman introduced the prospector to Johannesburg attorney, Emmanuel Jacobson, and his friend Allan Roberts, a dental technician. Despite being interested in what the prospector had to say, it took almost</p>

DATE	DESCRIPTION
	<p>four years before Jacobson, Roberts and Megson travelled to the Free State (Shorten, 1970).</p> <p>Allan Roberts, who was an amateur prospector, was able to trace a conglomerate outcrop all along the farm Aandenk, and incorrectly identified it as part of the Upper Witwatersrand series. The two friends returned to Johannesburg and formed a syndicate comprising themselves, F.L. Marx, Dr. E.B. Woolf, Samuel Potter and Joseph Freedman. Freedman represented the interests of the old prospector Archibald Megson in the syndicate (Shorten, 1970).</p> <p>The syndicate acquired prospecting options on 31 farms in the area and the company Wit. Extensions Limited was established by the syndicate. On 23 October 1933, drilling commenced at a point roughly 80 m from Megson's trench on the same farm Aandenk. However, by February 1935 the drilling work had to be halted due to a lack of funds without any evidence for gold-bearing reefs identified. Many years later, it was estimated that if the two friends had only managed to deepen the hole by another 400 feet, they would have become very rich men and the discoverers of the Free State goldfields. Sadly, this was not to be their fate. Allan Roberts died in such poverty in 1939 and his friends had to pay for his funeral whereas Emmanuel Jacobson had to sell all his assets to survive (Shorten, 1970). Today, the town of Allanridge (named after Allan Roberts) and a monument to the west of the road between Welkom and Bothaville are all that is left of the dreams and expectations of these two mining pioneers.</p>
	 <p><i>Figure 30 - The first gold prospecting borehole in the Free State was sunk on the farm Aandenk between October 1933 and February 1935. The arrows indicate the positions of Allan Roberts and his wife (Felstar Publications, 1968:11).</i></p>
1935	<p>After the failure of Wit. Extensions Limited, an agreement was reached with the Anglo-French Exploration Company to continue prospecting work at Aandenk. However, instead of continuing deeper on the same borehole, the Anglo-French Exploration Company decided to rather deflect the borehole and no results were achieved. It was later estimated that if either one of these companies had deepened the borehole by only another 400 feet, payable gold would have been discovered (Shorten, 1970).</p> <p>The agreement between Wit. Extensions Limited and Anglo-French Exploration Company came to an end and the famous geologist Dr. Hans Merensky acquired an interest in Wit. Extensions Limited. He subsequently carried out extensive prospecting work including the drilling</p>

DATE	DESCRIPTION
	<p>of further boreholes. However, even these more extensive attempts by Merensky to find the Free State goldfields also failed (Shorten, 1970). Machens (2009) indicates that when news broke that the famous discoverer of inter alia South Africa's platinum reserves owned options in a company working on the Free State goldfields, the interest from investors and mining companies to this part of the Free State was further awakened.</p>
	 <p><i>Figure 31 – The famous geologist Dr. Hans Merensky, who had his role to play in the discovery of the Free State goldfields (Machens, 2009).</i></p>
1 February 1937 – April 1939	<p>After failing to discover any payable gold, Merensky sold his shares in Wit. Extensions to the Anglo American Corporation, who on 1 February 1937 established the West Rand Investment Trust. The trust also carried out an extensive drilling operation. The activities and interest of the Anglo American Corporation in this part of the Free State attracted the interest of other mining houses and investment companies, and prospecting options were taken out on a large number of farms from this area (Shorten, 1970).</p>
	<p>Despite all this interest, the first payable gold in the Free state was only identified in March 1939 during drilling operations by the African and European Investment Company on the farm Uitsig at a depth of 2 701 feet (Felstar Publishers, 1968). One month later, during April 1939, another discovery of payable gold was made on the farm St. Helena at a depth of 1 143 feet (Shorten, 1970).</p> <p>The discoveries of payable gold at Uitsig and St. Helena created significant excitement amongst mining companies and investors, and increasing numbers of prospecting options and eventually mines were acquired and developed. The Free State gold rush had begun.</p> <p>The farm Uitsig is located 10.3 km north by north-east of the present study area with the farm St. Helena roughly 2.9 km to the north.</p>
1941	<p>The first gold mining lease in the Free State was granted by the government of the Union of South Africa for the farm St. Helena in 1941, and the St. Helena Gold Mining Company was established to mine and develop the property (Felstar Publishers, 1968). A number of other gold mining companies were also established in a relatively short spate of time, including the Welkom Gold Mining Company, President Steyn Gold Mining Company and the President Brand Gold Mining Company.</p>

DATE	DESCRIPTION
	 <p data-bbox="209 645 1369 723"><i>Figure 32 –The first mine shaft ever sunk along the Free State goldfields, namely the No. 3 Incline Shaft at the St. Helena Gold Mine (Felstar Publishers, 1968:151).</i></p>
16 April 1946	<p data-bbox="517 775 1374 1021">The borehole of the Blinkpoort Gold Syndicate Limited on the boundary of the farms Geduld and Friedenheim, reached payable gold in 1946. On 16 April 1946 it was announced that the gold-bearing material retrieved at a depth of 3 922 feet from this borehole assayed at an impressive 1 252 dwts per ton which was unique in the history of gold prospecting and mining in South Africa, with averages usually in the region of 250 dwts per ton. This discovery led to further interest in the Free State goldfields (Felstar Publishers, 1968).</p>
11 July 1946 – 15 April 1947	<p data-bbox="517 1052 1374 1294">On 11 July 1946 an application was made by the land company of Sir Ernest Oppenheimer's Anglo American Corporation, namely the South African Township and Mining and Finance Corporation, for the establishment of a new town called Welkom. After some legal and procedural processes and debate between the township applicants and its opponents (including the Odendaalsrus Town Council), the application for the establishment of the town of Welkom was approved on 15 April 1947 (Felstar Publishers, 1968).</p> <p data-bbox="517 1294 1374 1420">William Backhouse designed the town as a garden city with a commercial centre built around a town square and traffic circles rather than stop streets or traffic lights. More than a million trees were also planted (Erasmus 2014).</p>

DATE	DESCRIPTION
	 <p><i>Figure 33 –This photograph of Welkom was taken during the 1960s, roughly ten years after its establishment (Felstar Publications, 1968:171).</i></p>
1953	<p>After gold was discovered in the area, Odendaalsrus became a prominent town in the Free State. A railway line was built from Allanridge to Odendaalsrus in 1953 and served the two Freddie's mines (Nienaber et al. 1982).</p>
1954	<p>Three of the six mines surrounding Welkom had reached production stage by 1954. These were the Welkom, Western Holdings and St. Helena Mines.</p> <p>During the same year, the town of Virginia was laid out on the banks of the Zand River. As indicated elsewhere, the name of this town was derived from the nearby railway station, which in turn was named this after two American engineers working on the line in 1890 had carved the name "Virginia" on a boulder from a nearby hill (Erasmus 2014).</p> <p>Virginia is located 13.5 km east of the present study area.</p>
1981 - 1987	<p>Beisa Shaft (now the Beatrix West Section) was commissioned in 1981 to exploit uranium. The sinking of Beatrix 1 and 2 Shafts (now the Beatrix South Section) were also started at the time (www.sibanyegold.co.za).</p> <p>In 1984, the Beisa Uranium Mine was closed due to the low price of uranium at the time. In 1985 the Beatrix 1 and 2 Shafts were commissioned and exploration work commenced in proximity to the Beisa Mine on the farm Kalkoenkrans (www.sibanyegold.co.za).</p> <p>The sinking of two sub-vertical shafts and a ventilation shaft commenced at the Beisa Mine in 1987. During the same year this mine was renamed the Oryx Mine (www.sibanyegold.co.za).</p> <p>The Beisa (Oryx) Mine is located within the study area on the farm Palmietkuil.</p>

5.2 HERITAGE SENSITIVITY AS REVEALED IN THE HISTORICAL AND ARCHAEOLOGICAL OVERVIEW

It is clear that the historical and archaeological overview revealed various aspects relating to the surroundings of the study area. While this assists with reconstructing the historical landscape, it does however provide some indication of the relatively limited historical significance of the study area as a whole. The following historical events and sites can be directly associated with the study area:

- During archaeological research undertaken by the National Museum in Bloemfontein, a total of 10 Middle Stone Age and Later Stone Age sites were identified in association with mammal fossil bones in drainage gullies along the Vet, Doring and Sand Rivers. It is important to note that this research was not focussed on identifying Stone Age sites without the associated presence of mammal fossil bones. The chances for finding more Stone Age sites along these rivers are therefore high. The prevalence of such sites along the banks of rivers was supported during the fieldwork when a previously unrecorded Middle Stone Age site was identified within the boundaries of the study area on the northern bank of the Sand River (see Site 33).
- The historical and archaeological review has revealed that the study area is located outside of the known distribution of Late Iron Age stonewalled settlements as published by Maggs (1976). This observation is largely supported by the distribution maps of known Iron Age sites as published by Huffman (2007). This said, it is always still possible for Iron Age sites to be located within the study area, and especially sites associated with the Thabeng and Makgwareng facies.
- In May 1836, a Voortrekker party under the leadership of Hendrik Potgieter arrived in the wider surroundings of the study area. Due to limited grazing the party decided to splinter into smaller groups. One of these groups established themselves at the present-day farm Blaauwdrift, located within the study area (Meintjies, 1976).
- Diamond prospecting and mining activities had been undertaken on the farm Welgegund since at least the early 1890s. These early activities appear to have been undertaken by the Van Rensburg Diamond Mining Syndicate. In June 1894 an interest in the farm Welgegund was acquired by the Driekopjes Diamond Mining Company, a founding director of which was the famous diamond magnate Sir Thomas Major Cullinan. While mining activities were undertaken in earnest during the remainder of the decade, the outbreak of the South African War in 1899 brought all work to a halt. After the war, mining activities continued at Welgegund. With time other mining companies also acquired claims on the farm, including the Magnus Diamond Mining Company, Triumph Diamond Mining Company, Welgegund Diamond Mining Company as well as the Drie Koppies Diamond Mining Company. This latter company appears to have still existed by 1931. The farm Welgegund was located within the study area, and is presently known as the farm Driekoppies 422.
- The South African War (1899-1902) had a significant impact across the country, and also within the study area. During the Battle of Zand River (7 – 10 May 1900), the most significant drifts across the river were earmarked for attention by Lord Robers in his attack, including the Du Preez Leger Drift as well as De Klerks Kraal Drift. While the latter drift is located outside of the study area, the

available land deed information has revealed that the farms Blaauwdrift and Adamson's Vley located within the present study area, were subdivided from the farm Du Preez Leger after the war. It is evident that at the time of the battle, the drift located within the study area on the farm Blaauwdrift, was in fact located on the farm Du Preez Leger. This means that the actions and events associated with this drift during the battle, would have taken place within the study area.

- During the Boer Rebellion (1914 -1915) a battle took place between the commando of General De Wet and government forces under Colonel Enslin at the Virginia railway station on 16 November 1914. While this battle was located some distance east of the study area, it is important to note that after the battle De Wet and his commando followed the Zand River in a westerly direction towards Hoopstad, and as a result crossed through the study area.
- In March and April 1939 and 16 April 1946 significant discoveries of payable gold were made during prospecting drilling operations on the farms Uitsig, St. Helena and Geduld. These discoveries led to the rapid development of the Free State goldfields which significantly changed the entire landscape, including the present study area.
- In 1981 the Beisa Shaft was commissioned. This shaft is located within in the study area, and is where the Beatrix 4 Shaft is still located today.

5.3 EXAMINATION OF ARCHIVAL AND HISTORICAL MAPS

The examination of historical data and cartographic resources represents a critical tool for locating and identifying heritage resources and in determining the historical and cultural context of the study area. Relevant topographic maps and satellite imagery were studied to identify structures, possible burial grounds or archaeological sites present in the footprint area.

Historical topographic maps (1:50 000) for various years (1945, 1954, 1975, 1997, 2007) were available for utilisation in the background study. These maps were assessed to observe the development of the area, as well as the location of possible historical structures and burial grounds. The study area was overlain on the map sheets to identify structures or graves situated within or immediately adjacent to the study area that could possibly be older than 60 years and thus protected under Section 34 and 36 of the NHRA.

5.3.1 FIRST EDITION OF THE 2826BA BLAAUWDRIFT AND 2826BB VIRGINIA TOPOGRAPHICAL MAP DATED TO 1945

The 2826BA Blaauwdrift map sheet was surveyed in 1945 by 45 Survey Company U.D.F and drawn by the Trigonometrical Survey Office, 1945. The 2826BB Virginia map sheet was surveyed in 1945 and drawn by the Trigonometrical Survey Office, 1945.

As the study area extends over a significant portion of land, the discussion that follows will be done on a section-by-section basis. These map sheets show several structures (incl. farmsteads and kraals), ruins, homesteads and graves within the vicinity of the study area. If these heritage sites still exist today, they would be at least 77 years old. Overlays of the study area components over this map sheet are provided in the section below.

First Edition of the 2826BA Topographical Sheet:

Tetra4 Cluster 2 Gas Production Project

First Edition Map Analysis

PGS Heritage (Pty) Ltd
Heritage Management Unit

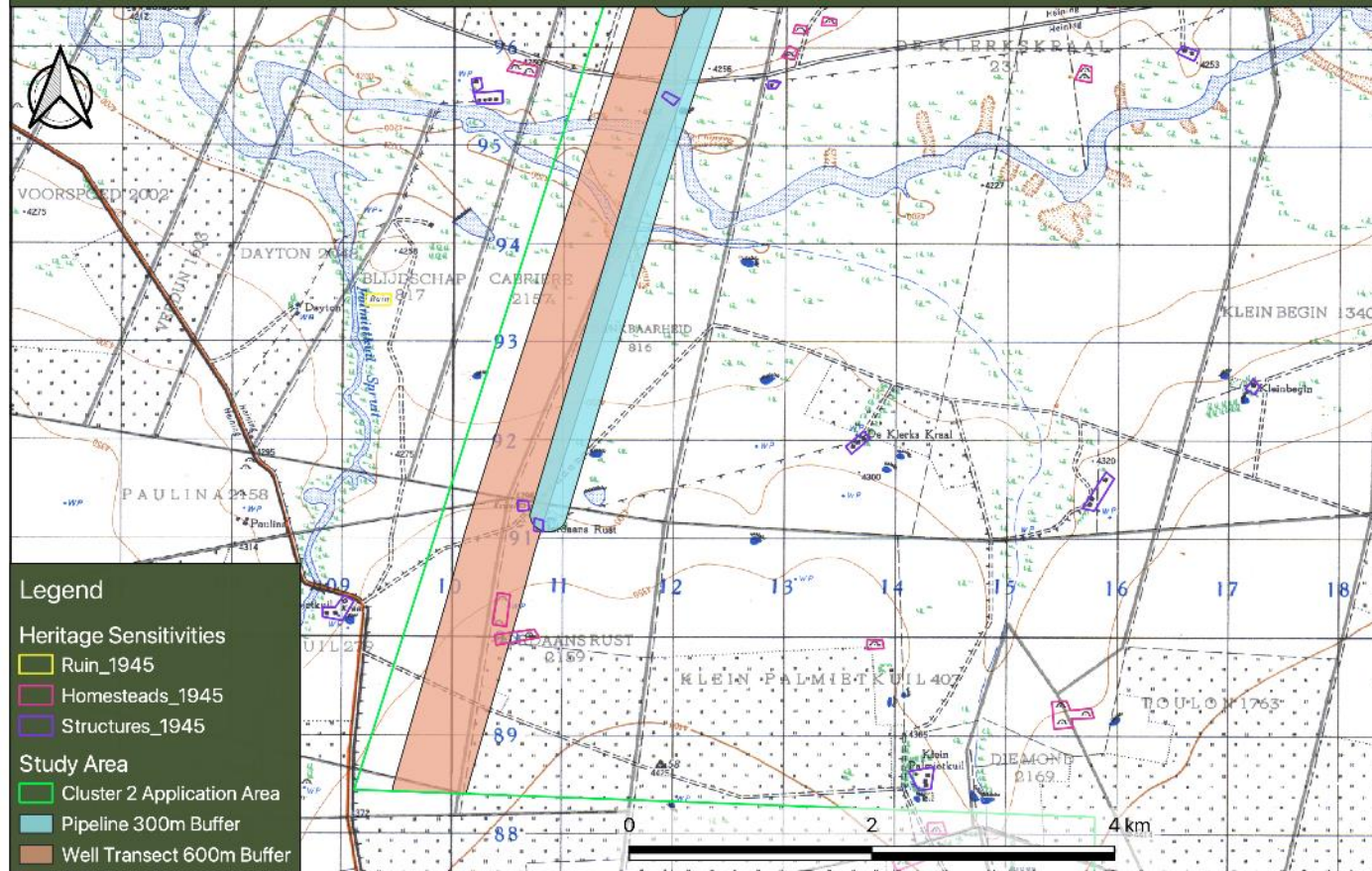


Figure 34 - Section of First Edition of the 2826BA Topographical Map, showing several heritage features. These comprise structures (purple polygon), ruins (yellow polygon) and historical Black Homesteads (red polygons) located within the immediate vicinity of the proposed development.

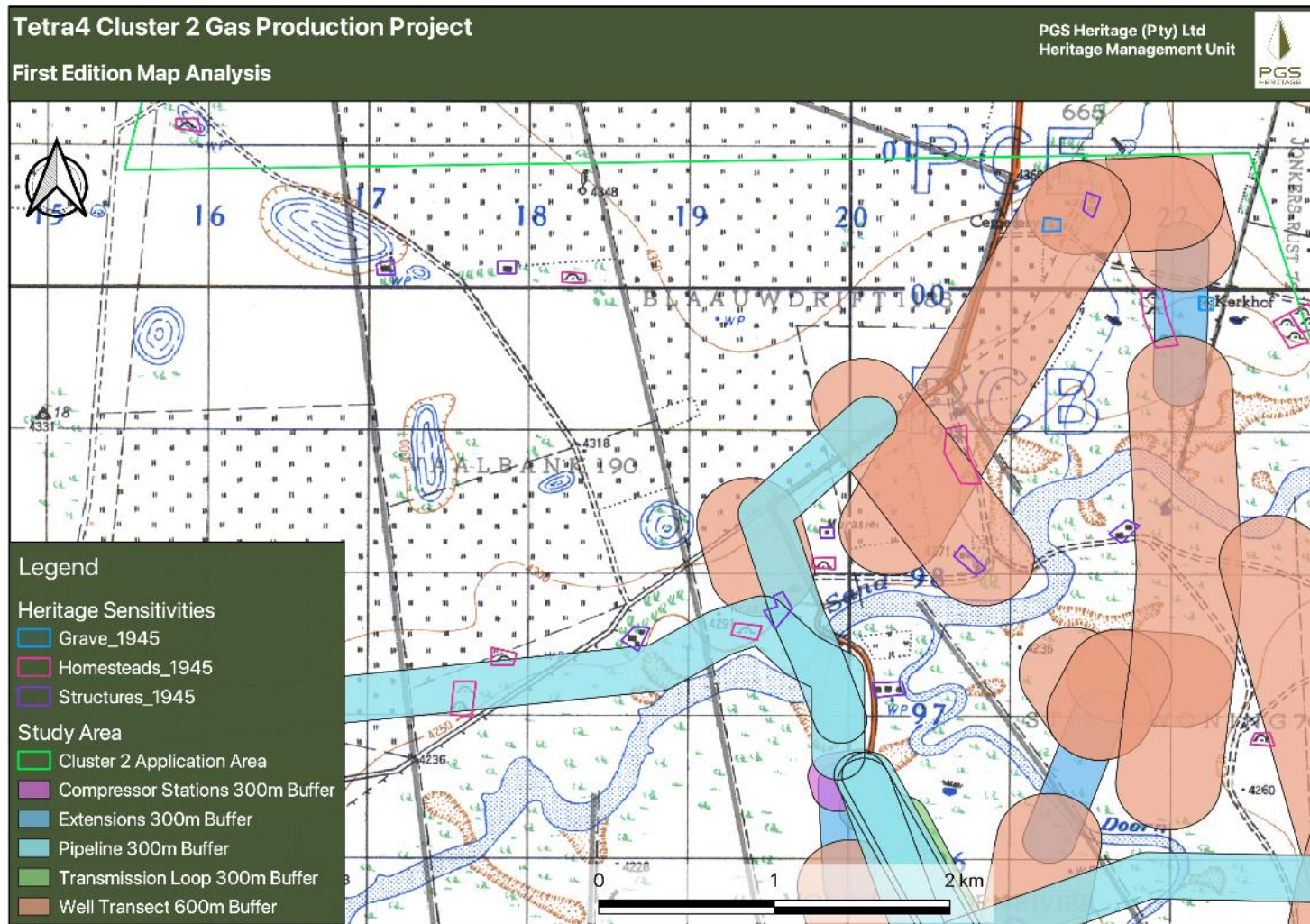


Figure 35 – Second section of First Edition of the 2826BA Topographical Map, showing several heritage features. These comprise structures (purple polygon), graves (blue polygon) and historical Black Homesteads (red polygons) located within the immediate vicinity of the proposed development.

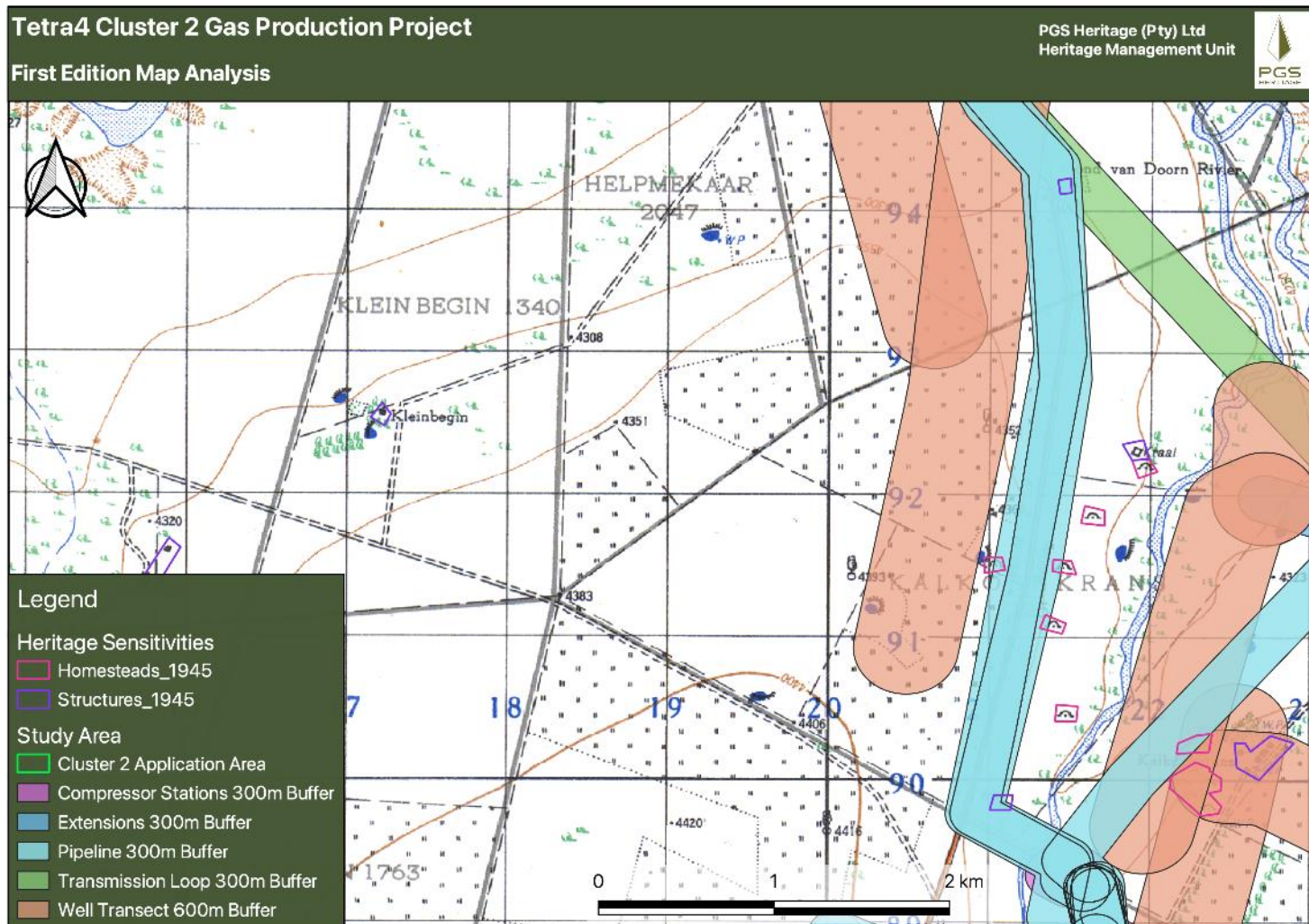


Figure 36 – Third section of First Edition of the 2826BA Topographical Map, showing several heritage features. These comprise structures (purple polygon) and historical Black Homesteads (red polygons) located within the immediate vicinity of the proposed development.

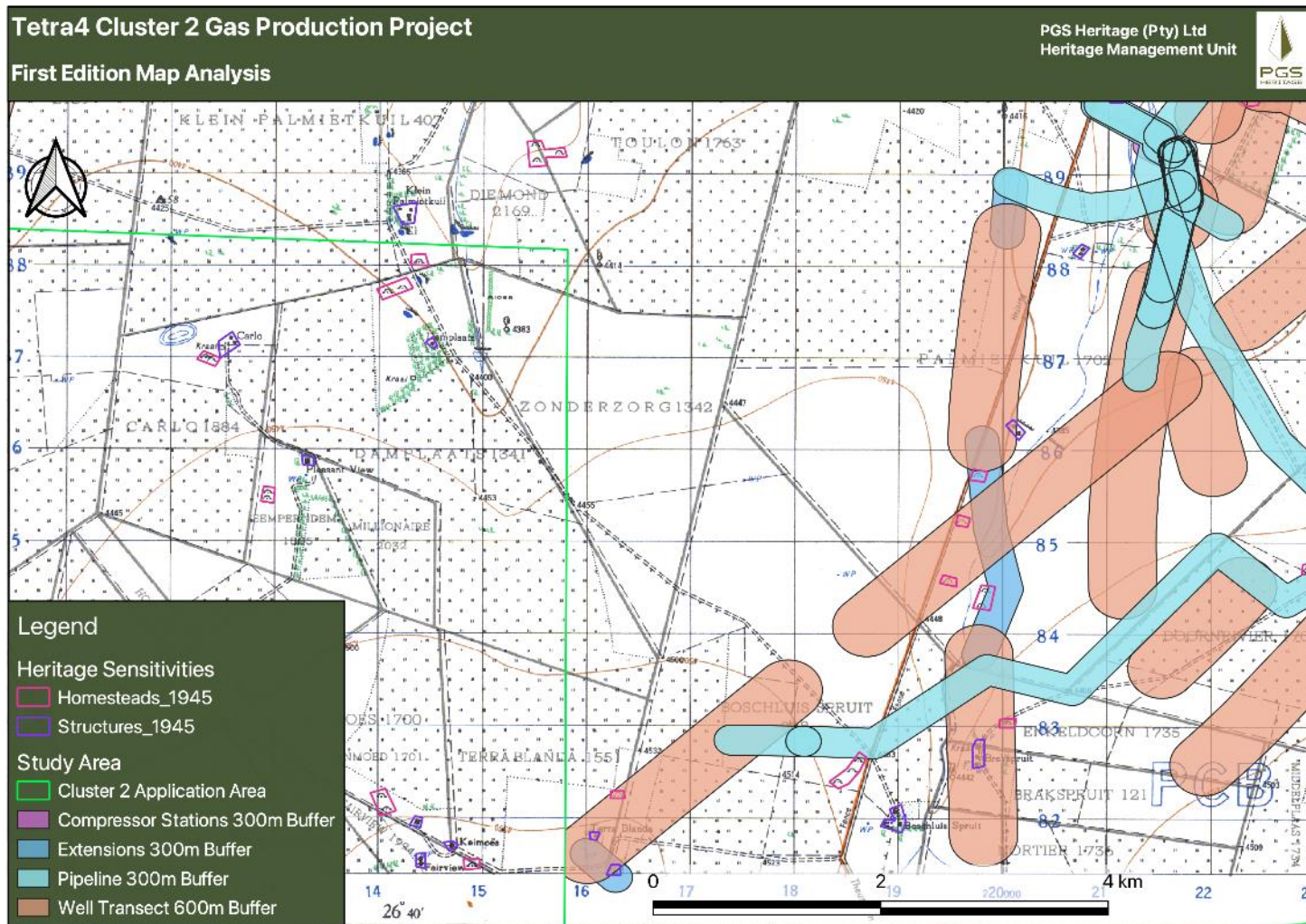


Figure 37 – Fourth section of First Edition of the 2826BA Topographical Map, showing several heritage features. These comprise structures (purple polygon) and historical Black Homesteads (red polygons) located within the immediate vicinity of the proposed development.

First Edition of the 2826BB Topographical Sheet:

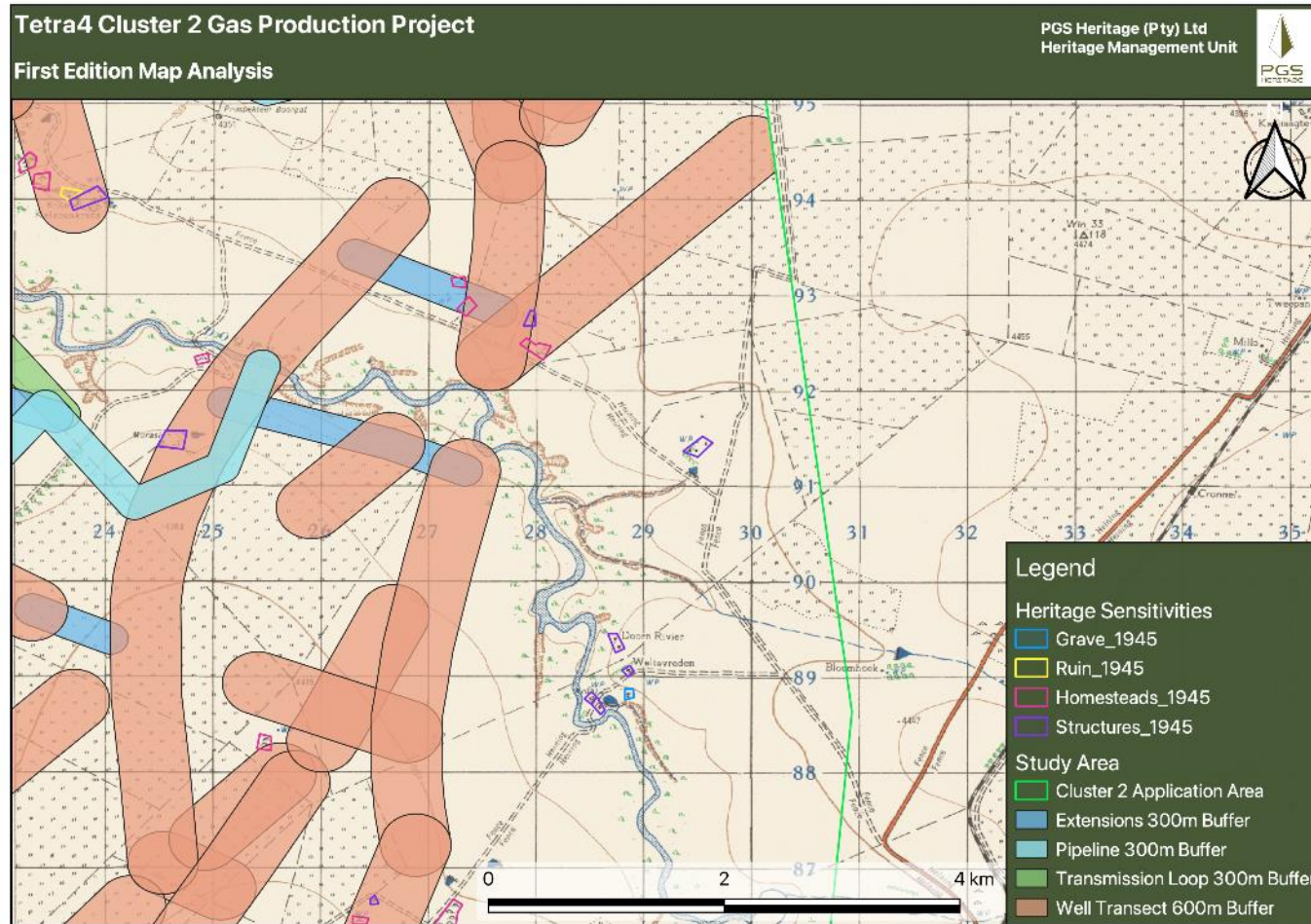


Figure 38 - Section of First Edition of the 2826BB Topographical Map, showing several heritage features. These comprise structures (purple polygon), ruin (yellow polygon), historical Black Homesteads (red polygons) and graves (blue polygon) located within the vicinity of the proposed development.

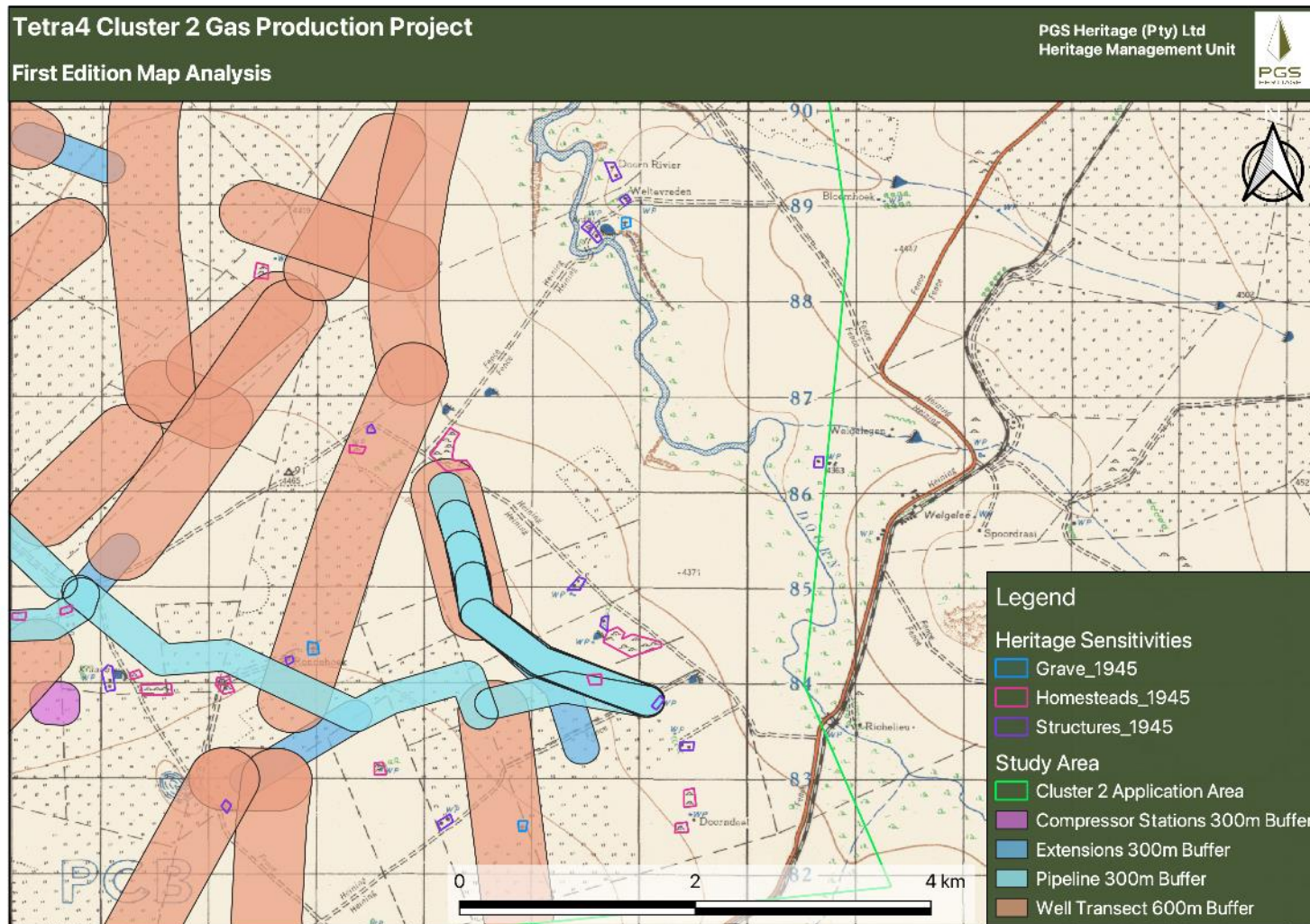


Figure 39 – Second section of First Edition of the 2826BB Topographical Map, showing several heritage features. These comprise structures (purple polygon), historical Black Homesteads (red polygons) and graves (blue polygon) located within the vicinity of the proposed development.

5.3.2 SECOND EDITION OF THE 2826BA AND 2826BB TOPOGRAPHICAL MAP DATED TO 1954

The 2826BA Bloudrif map sheet was based on aerial photography carried out in 1952, was surveyed in 1954 and drawn in 1957 by the Trigonometrical Survey Office. The 2826BB Virginia map sheet was based on aerial photography carried out in 1952, was surveyed in 1954 and drawn in 1957 by the Trigonometrical Survey Office.

As the study area extends over a significant portion of land, the discussion that follows will be done on a section-by-section basis. These map sheets show several structures (incl. farmsteads and kraals), homesteads and graves within the vicinity of the study area. If these heritage sites still exist today, they would be at least 68 years old. Overlays of the study area components over this map sheet are provided in the section below.

Second Edition of the 2826BA Topographical Sheet:

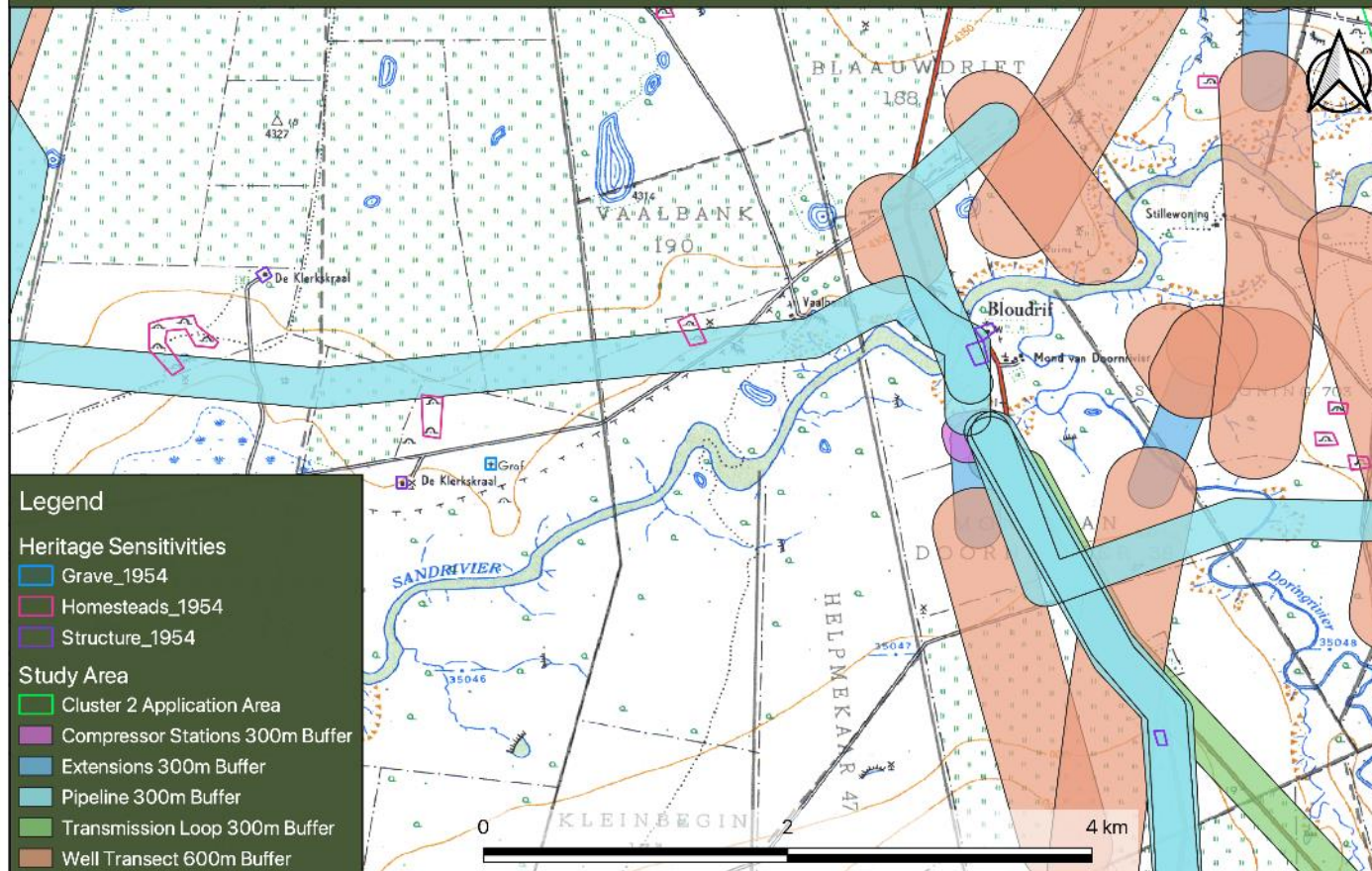


Figure 40 - Section of Second Edition of the 2826BA Topographical Map, showing several heritage features. These comprise structures (purple polygon), historical Black Homesteads (red polygons) and graves (blue polygon) located within the vicinity of the proposed development.

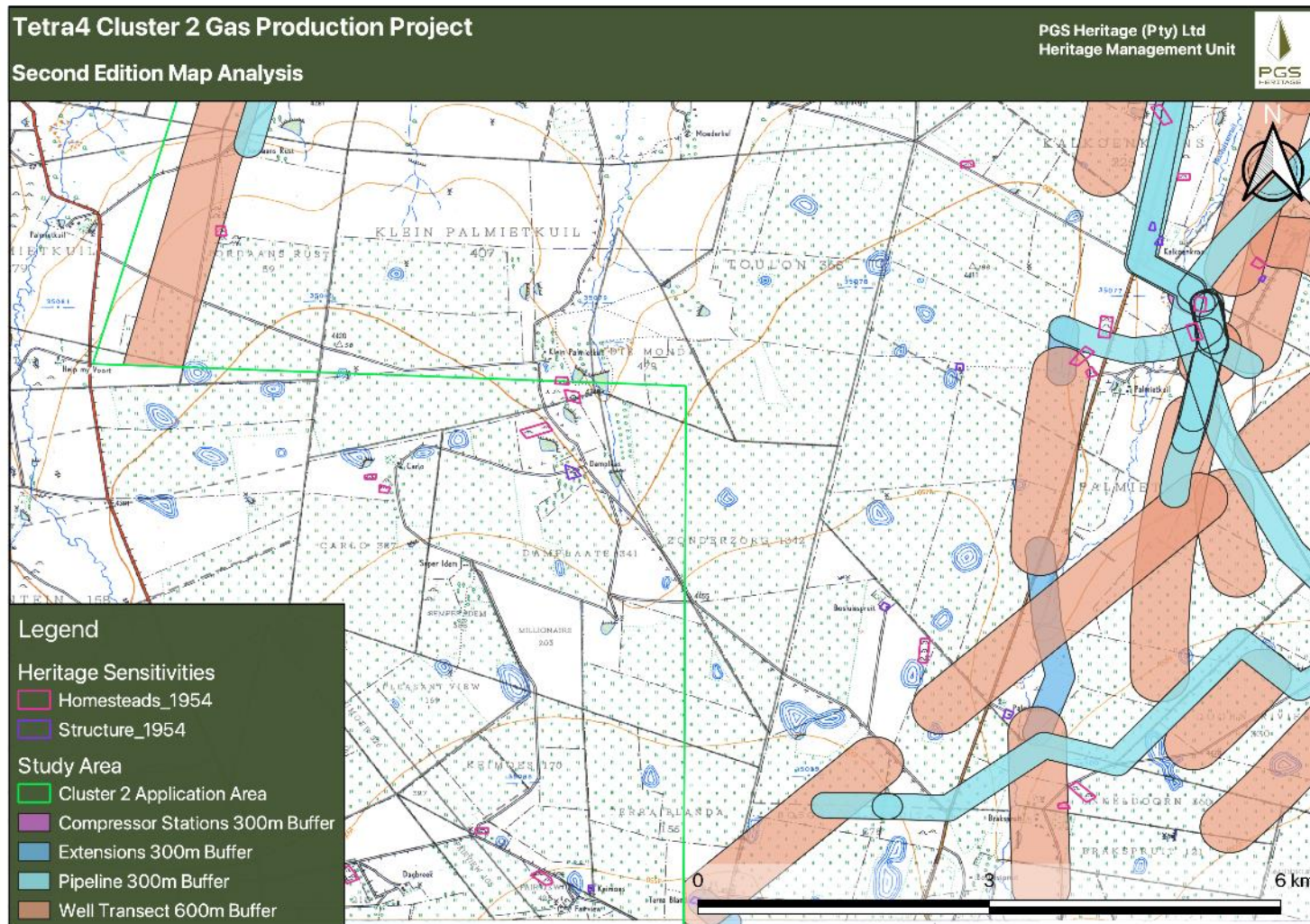


Figure 41 – Second section of Second Edition of the 2826BA Topographical Map, showing several heritage features. These comprise structures (purple polygon) and historical Black Homesteads (red polygons) located within the vicinity of the proposed development.

Second Edition of the 2826BB Topographical Sheet:

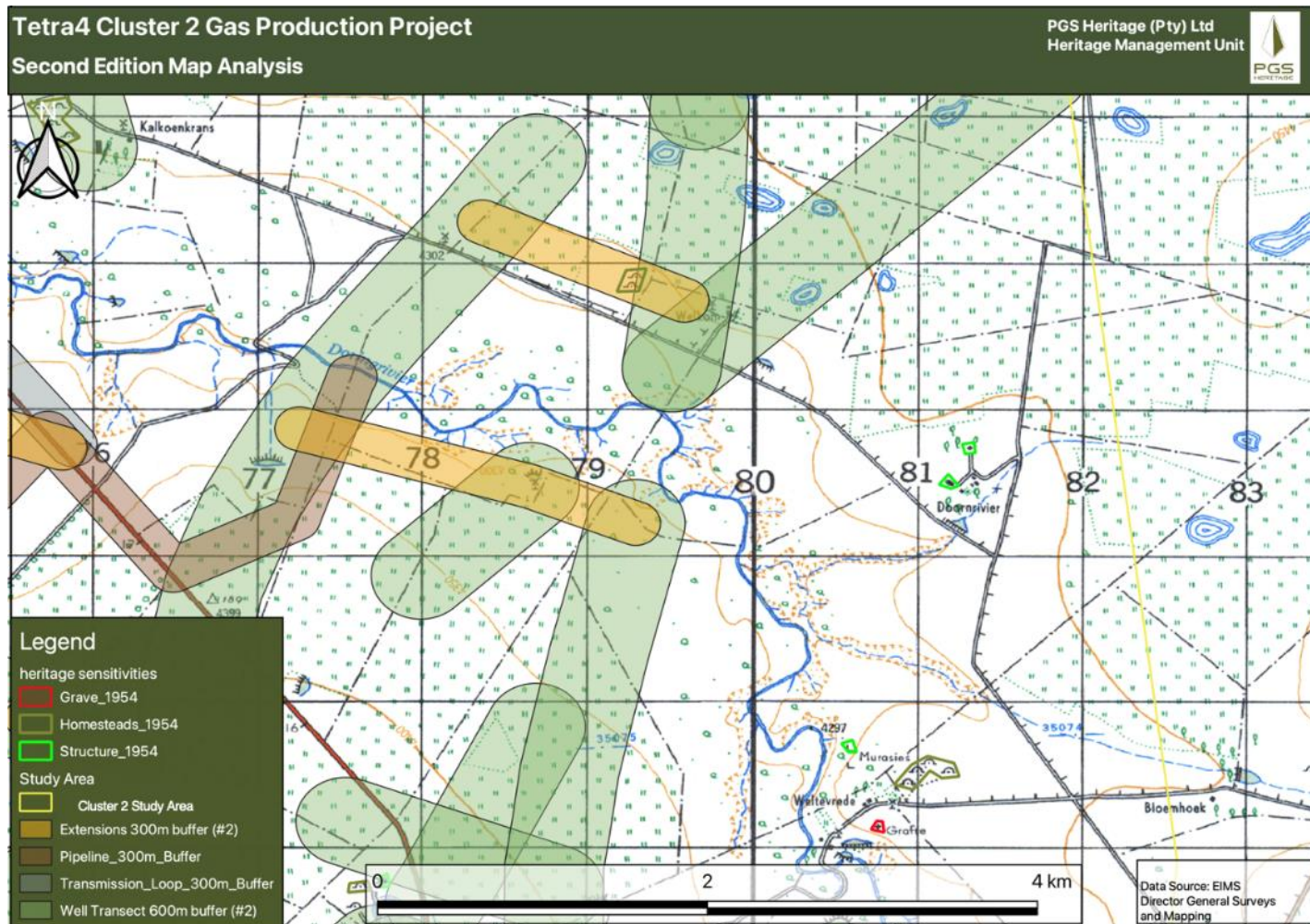


Figure 42 - Section of Second Edition of the 2826BB Topographical Map, showing several heritage features. These comprise structures (bright green polygon), historical Black Homesteads (dark green polygons) and graves (red polygon) located within the vicinity of the proposed development.

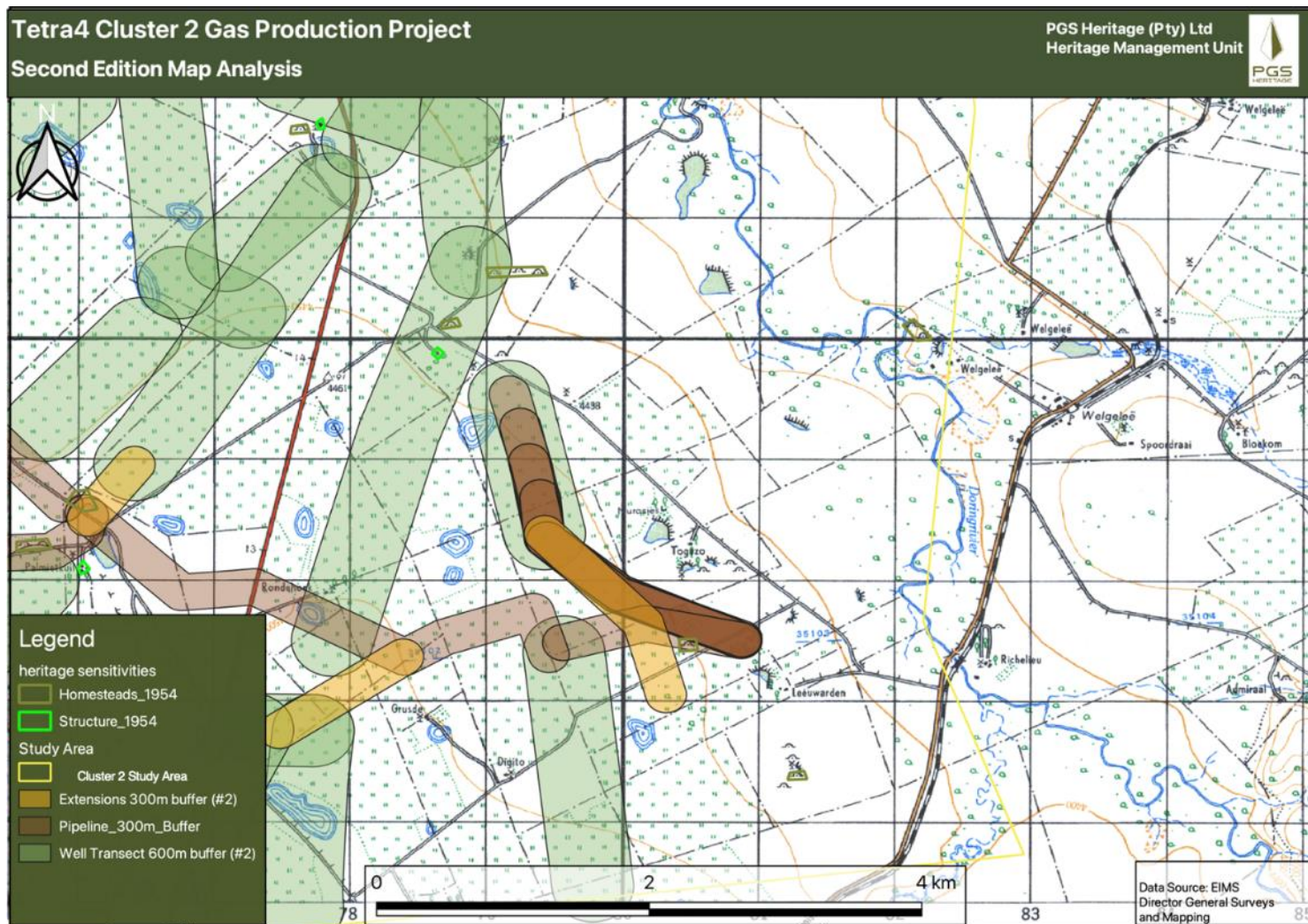


Figure 43 – Second section of Second Edition of the 2826BB Topographical Map, showing several heritage features. These comprise structures (bright green polygon) and historical Black Homesteads (dark green polygons) located within the vicinity of the proposed development.

5.3.3 THIRD EDITION OF THE 2826BB TOPOGRAPHICAL MAP DATED TO 1975

The 2826BB Virginia map sheet was remapped in 1975 by the Director – General of Surveys.

As the study area extends over a significant portion of land, the discussion that follows will be done on a section-by-section basis. This map sheet shows several structures (incl. farmsteads and kraals), graves and ruins within the vicinity of the study area. If these heritage sites still exist today, they would be at least 47 years old. Overlays of the study area components over this map sheet are provided in the section below.

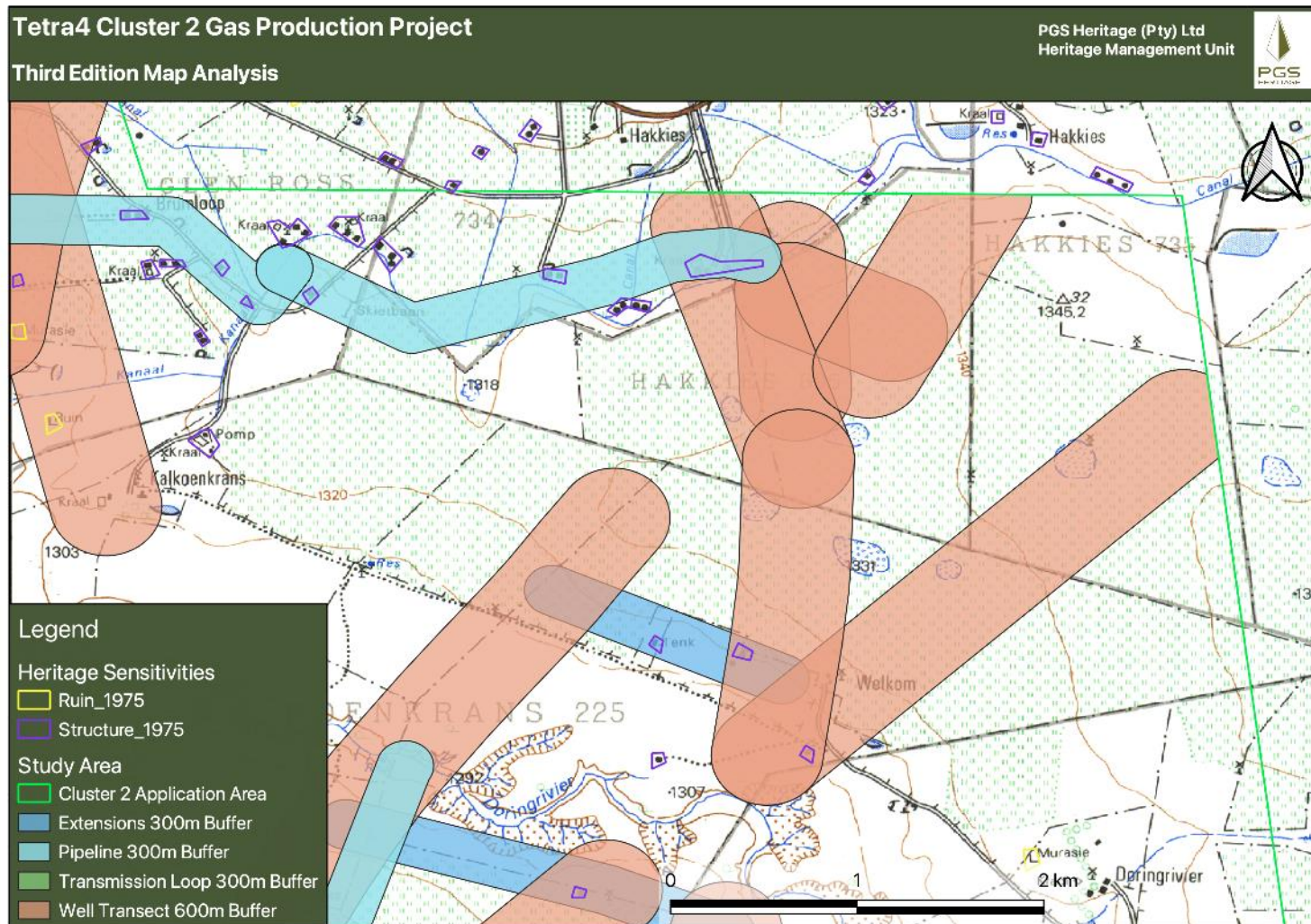


Figure 44 - Section of Third Edition of the 2826BB Topographical Map, showing several heritage features. These comprise structures (purple polygon) and ruins (yellow polygon) located within the vicinity of the proposed development.

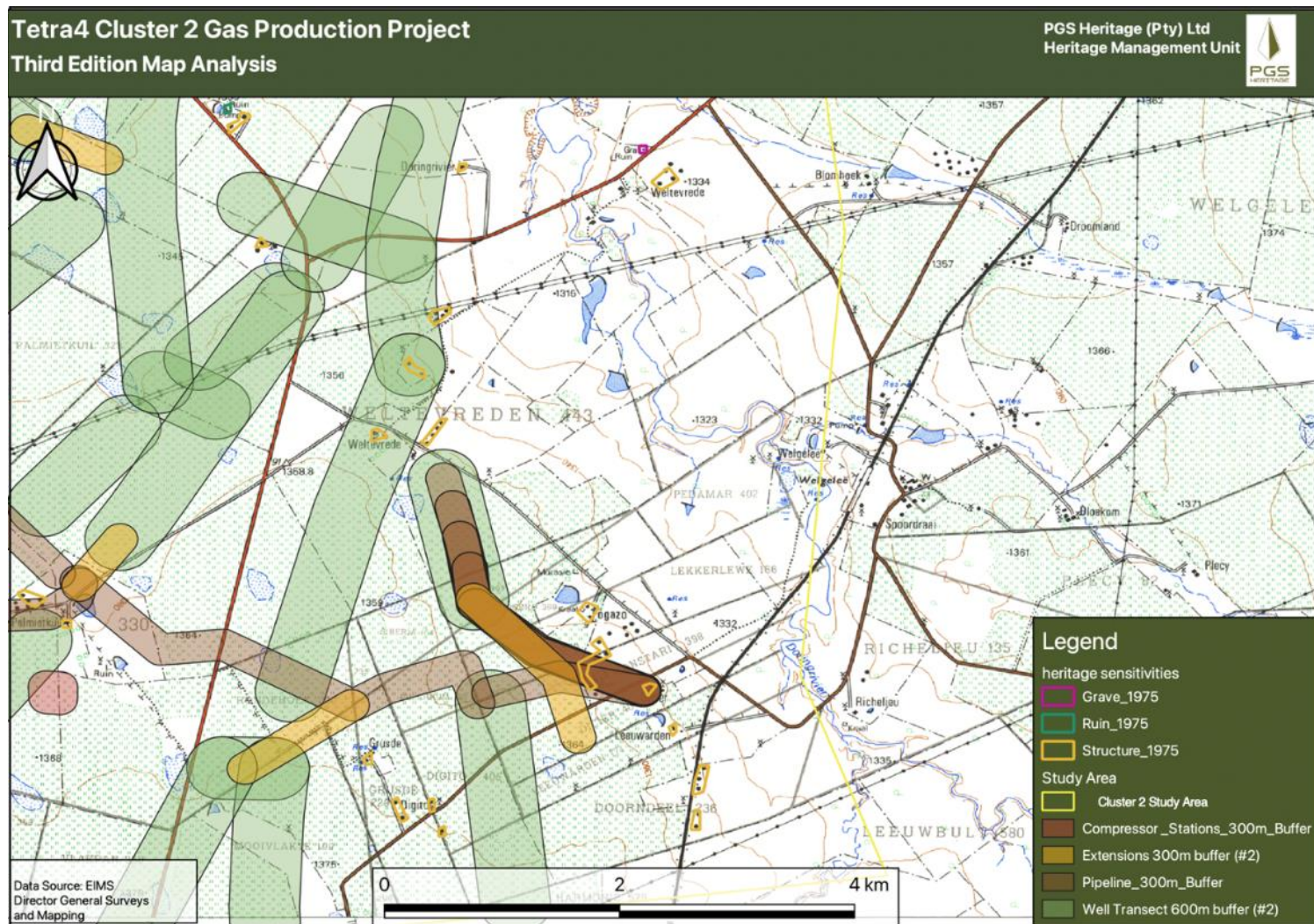


Figure 45 – Second section of Third Edition of the 2826BB Topographical Map, showing several heritage features. These comprise structures (orange polygon), ruins (dark green polygon) and graves (red polygon) located within the vicinity of the proposed development.

5.3.4 FOURTH EDITION OF THE 2826BA TOPOGRAPHICAL MAP DATED TO 1997

The 2826BA Bloudrif map sheet was remapped and published by the Chief Directorate: Surveys and Mapping, copyright 2001.

As the study area extends over a significant portion of land, the discussion that follows will be done on a section-by-section basis. This map sheet shows several graves within the vicinity of the study area. If these heritage sites still exist today, they would be at least 25 years old. Overlays of the study area components over this map sheet are provided in the section below.

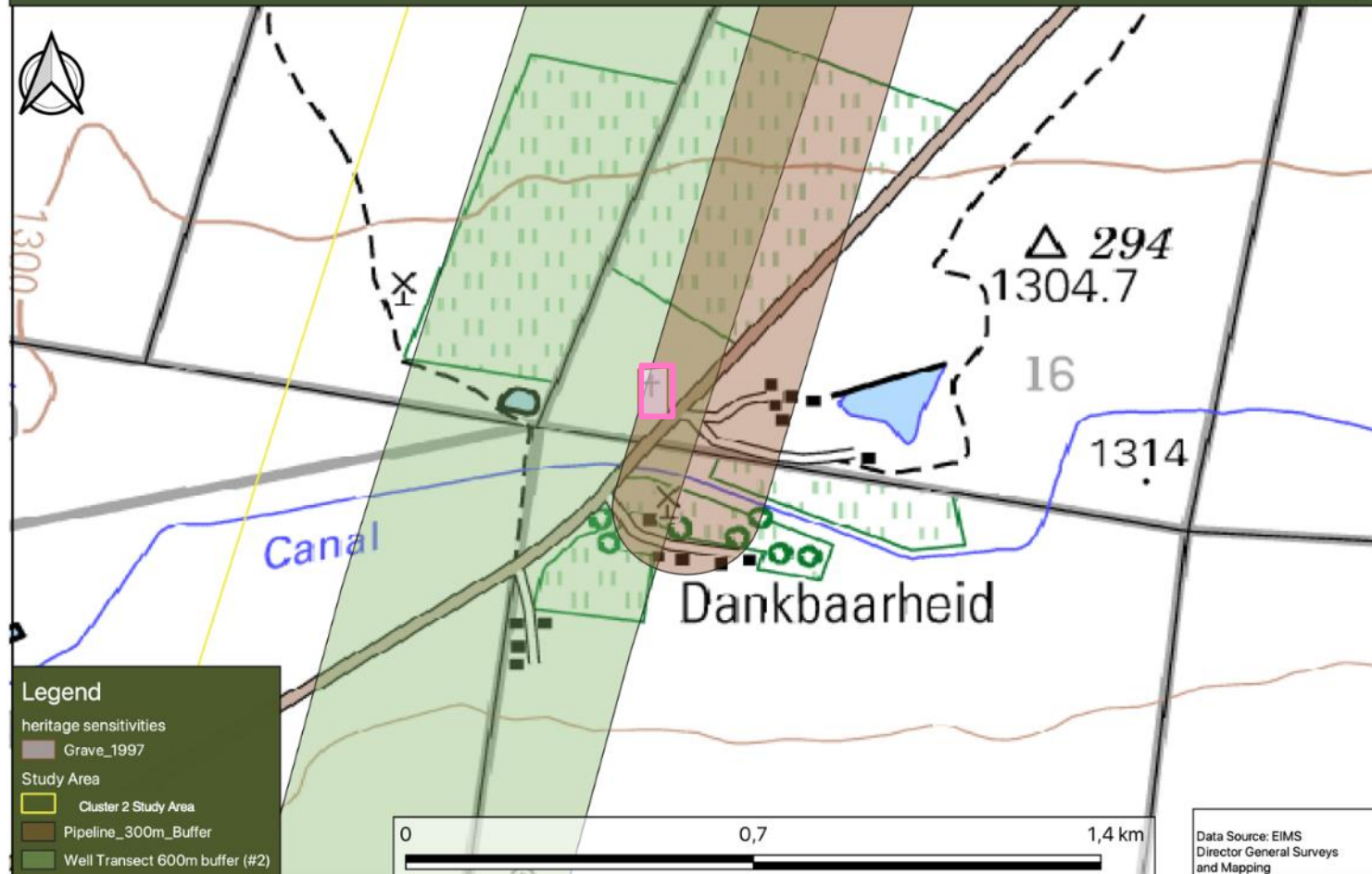


Figure 46 – A section of Fourth Edition of the 2826BA Topographical Map, showing several heritage features. These comprise graves (pink polygon) located within the vicinity of the proposed development.

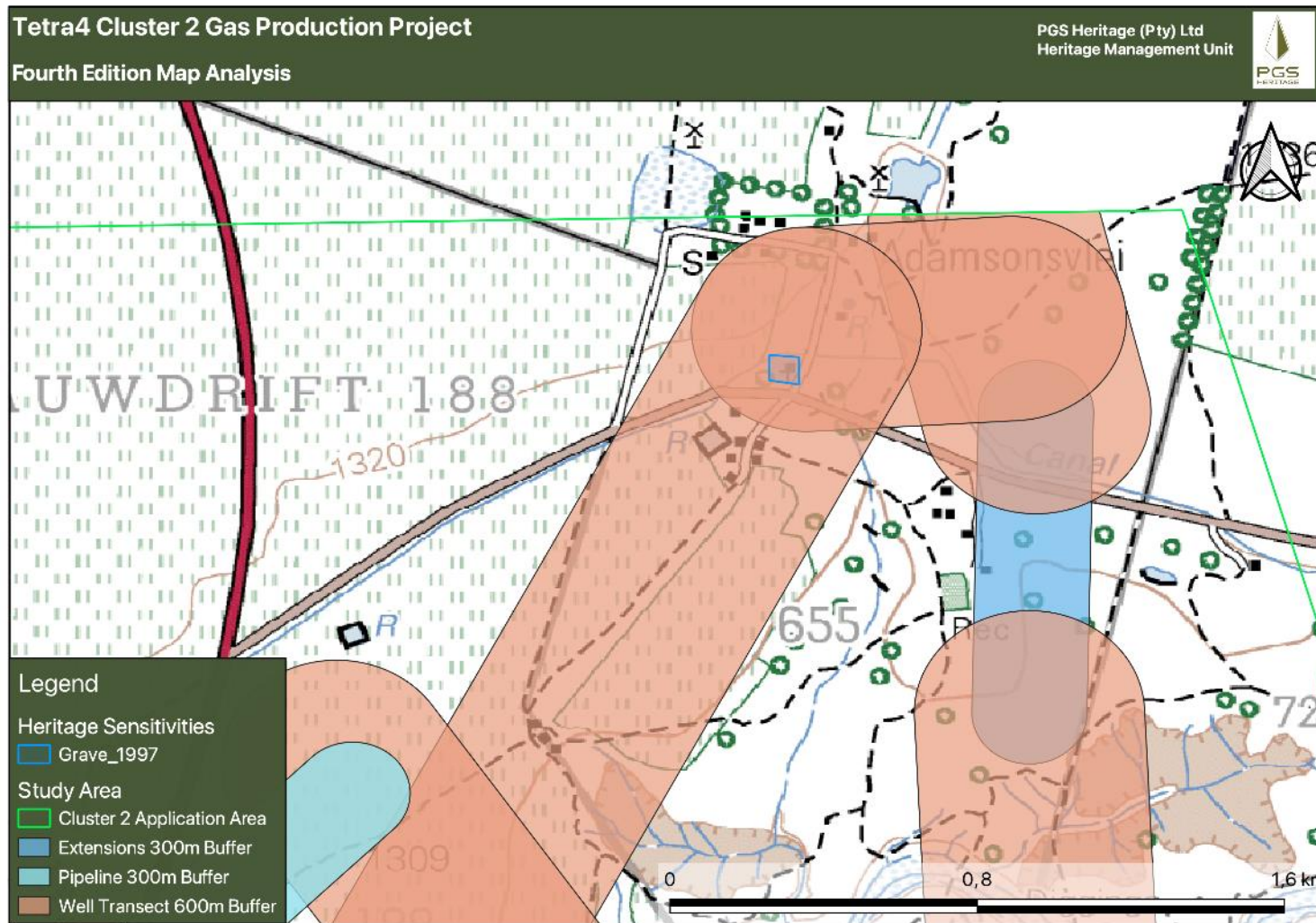


Figure 47 – Second section of Fourth Edition of the 2826BA Topographical Map, showing several heritage features. These comprise graves (blue polygon) located within the vicinity of the proposed development.

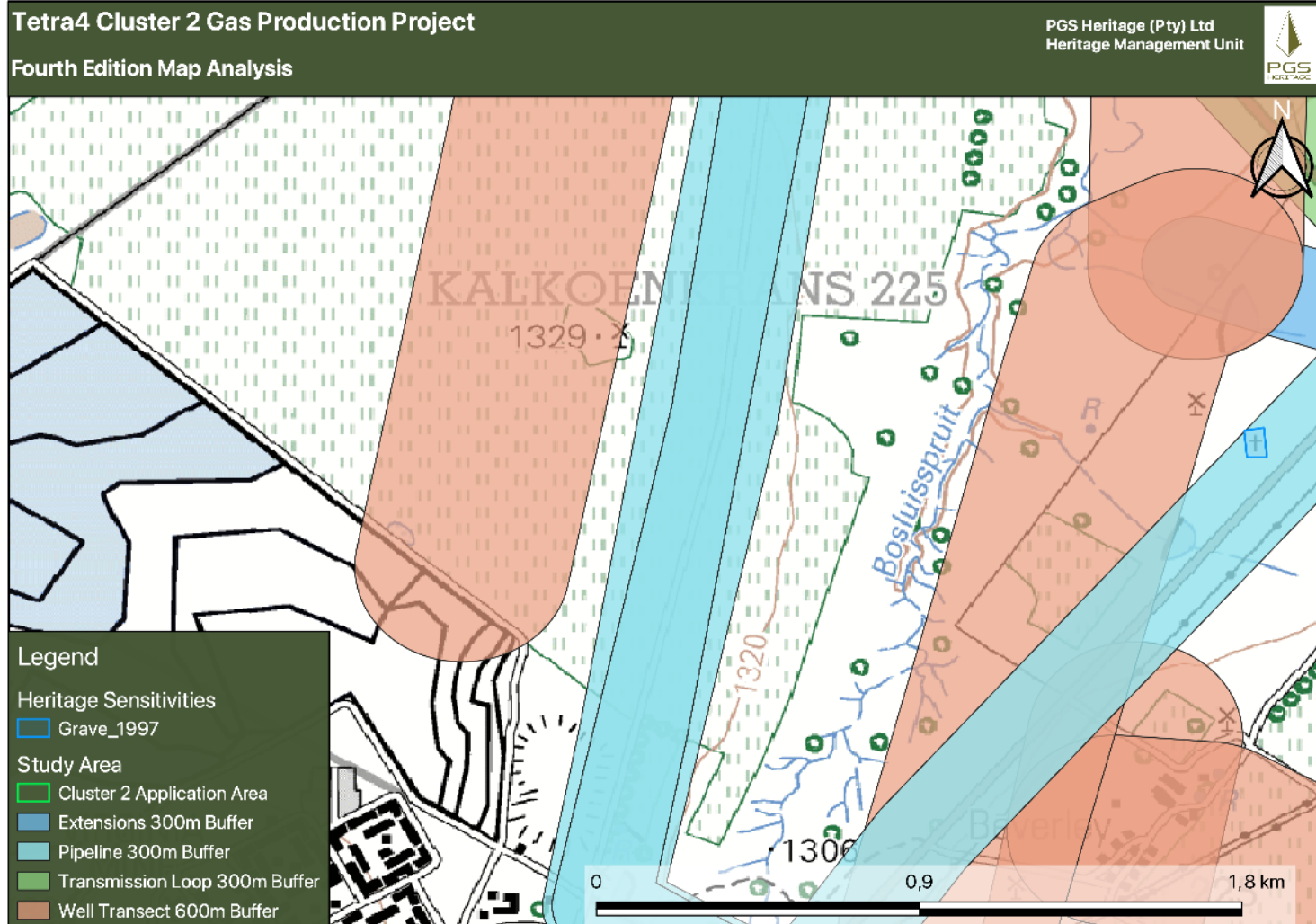


Figure 48 – Third section of Fourth Edition of the 2826BA Topographical Map, showing several heritage features. These comprise graves (blue polygon) located within the vicinity of the proposed development.

5.4 PREVIOUS ARCHAEOLOGICAL AND HERITAGE RESEARCH FROM WITHIN THE STUDY AREA AND SURROUNDINGS

A search of the South African Heritage Resources Information System (SAHRIS) database revealed that several previous archaeological and heritage impact assessments had been undertaken within the surroundings of the study area. In each case, the results of each study are shown in bold. These previous studies are listed below in ascending chronological order:

- Dreyer, C. 2004a. First Phase Heritage/Archaeological Assessment of the Proposed Powerline Route at Phakisa Mine, Welkom, Free State. **The survey was conducted approximately 20km north of the current study area. No archaeological, cultural, or historical material was identified during the survey.**
- Dreyer, C. 2004b. Archaeological and Historical Investigation of the Graves at the Proposed Housing Developments near Thabong, Welkom, Free State. **The survey was conducted approximately 22km north-east of the current study area. One grave and several other stones protruding from the ground suggested that it was an old graveyard.**
- Dreyer, C. 2005. Archaeological and Historical Investigation of the Proposed New Filling Station at Virginia, Free State. **The survey was conducted approximately 11.5km north-east of the current study area. No archaeological, cultural, or historical material was identified during the survey.**
- Dreyer, C. 2007. First Phase Archaeological and Cultural Heritage Assessment of the Proposed New MTN Cell Phone Mast at Pumlani Cemetery, Thabong, Welkom, Free State. **The survey was conducted approximately 22km north-east of the current study area. No archaeological, cultural or historical material was identified during the survey.**
- Coetzee, F. 2008. Cultural Heritage Survey of the Proposed Phakisa Housing Development, Welkom, Free State. **The survey was conducted approximately 16km north-north-east of the current study area. No Stone Age or Iron Age settlements, structures, features, or artefacts were recorded during the survey. One site that consisted of a mine shaft and various associated buildings and structures that probably older than 60 years were identified. No impact on the site was envisaged.**
- Dreyer, C. 2008. First Phase Archaeological and Heritage Investigation of the proposed Oppenheimer Park Golf Estate, Welkom, Free State. **The survey was conducted approximately**

11km north-east of the current study area. No archaeological, cultural, or historical material was identified during the survey due to the surface disturbance.

- Dreyer, C. 2011. First Phase Archaeological and Heritage Investigation of the proposed Chicken Egg Production Developments at Mooidoorns 319, Welkom, Free State. **The survey was conducted approximately 26km north-north-east of the current study area. No archaeological, cultural, or historical material was identified during the survey due to the surface disturbance (ploughed fields).**
- Van Ryneveld, K. 2013. Phase 1 Archaeological Impact Assessment for the Lebone Solar Farm, Onvewag RE/728 and Vaalkranz 2/220, Welkom, Free State, South Africa. Prepared for Enviroworks. **The survey was conducted approximately 19km north-east of the current study area. The report identified five sites: colonial period farming infrastructure, farmstead, cultural landscape, structure remains and railway bridge.**
- van Schalkwyk, J. 2014. Cultural Heritage Impact Assessment Report for the Proposed SANRAL Thabong Interchange Development, Welkom Region, Free State Province. **The survey was conducted approximately 16km north-north-east of the current study area. No archaeological, cultural, or historical material was identified during the survey.**
- Fourie, W. 2021. Heritage Impact Assessment for The Proposed Harmony FSS6 Reclamation Pipeline, Welkom, Free State Province. **The survey was conducted approximately 11km north-east of the current study area. No archaeological, cultural, or historical material was identified during the survey.**
- Kruger, N. 2021a. Archaeological Impact Assessment (AIA) On Portions Of The Farms Bloemhoek 509, Welgelegen 382, Mooi Uitzig 352, Florida 633, Le Roux 717 And Detente 744 For The Proposed Virginia Solar Park Power Lines Ba Project, Lejweleputswa District Municipality, Free State Province. **The survey was conducted approximately 12km north-east of the current study area. The study noted the remains of a later Historical Period settlement (possibly a farmworkers compound of houses). The site was poorly preserved and of medium to low significance.**
- Kruger, N. 2021b. Archaeological Impact Assessment (AIA) On Portions Of The Farm Blomskraal 216 For The Proposed Virginia 1, 2 & 3 Solar Parks Eia Project, Lejweleputswa District Municipality, Free State Province. **The survey was conducted approximately 20km east of the current study area. The study noted the remains of a large Iron Age occupation, several Historical Period settlements, and farmsteads, and three burial sites.**

5.4.1 PREVIOUS ARCHAEOLOGICAL AND HERITAGE STUDIES FROM WITHIN THE STUDY AREA

A previous archaeological and heritage surveys was undertaken within the immediate vicinity of the study area.

- Van der Walt, J. 2013a. Archaeological Scoping Report for the Proposed Oryx Solar Energy Facility. Prepared for Savannah Environmental (Pty) Ltd.

The study was conducted on Portion 2 of the farm Kalkoenkrans 225. This farm portion is located on the eastern end of the present study area.

- Van der Walt, J. 2013b. Archaeological Impact Assessment for the Proposed Oryx Solar Energy Facility. Prepared for Savannah Environmental (Pty) Ltd.

The survey was conducted on Portion 2 of the farm Kalkoenkrans 225. This farm portion is located on the eastern end of the present study area. **The report identified three sites: informal cemetery and two derelict structures younger than 60 years and of little architectural value.**

- Birkholtz, P.D. 2017a. Heritage Impact Assessment for the Proposed Tetra4 Cluster 1 Gas Production Project. Prepared for EIMS.

Fieldwork was undertaken during both the Heritage Scoping and HIA Phases. During the Heritage Scoping Phase, the fieldwork focused on the Cluster 1 study area. The fieldwork undertaken during the HIA Phase focused on the assessing the proposed development footprints for the pipeline and surface infrastructure and their alternatives.

In March 2016, a field survey was conducted for the Heritage Scoping Phase. The fieldwork resulted in the identification of 45 sites (Site 1 to Site 45) and of these, 36 were confirmed heritage sites. In December 2016, a field survey was conducted as part of the HIA. A total of 18 heritage sites were identified (TET1 – TET18). A second fieldwork component was undertaken in February 2017. A total of 9 heritage sites were identified (TET19 – TET27).

These identified sites comprise the following: cemeteries, Stone Age sites, historic structures believed to be older than 100 years, historic structures believed to be older than 60 years, historical buildings of low significance, historic to recent sites with possible stillborn baby graves, possible grave sites and a site comprising a single lower grinder.

- Birkholtz, P.D. 2017b. Heritage Audit Report for the Beatrix Mining Areas of Sibanye Gold, Between Welkom and Theunissen, Lejweleputswa District, Orange Free State Province. Prepared for Sibanye Gold (Pty Ltd).

The purpose of the Heritage Audit was to compile a database of known heritage resources within a particular area as the foundation block for the management of such identified resources. The fieldwork was undertaken during June, July and August 2017.

A total of 66 heritage sites were identified within the total study area (Site 001 to Site 066). These identified heritage sites comprise 9 graves or burial grounds, 30 historical structures believed to be older than 60 years, of which 11 are believed to be older than 100 years, and 12 archaeological (Stone Age) sites. Sites where possible unmarked (infant) graves could occur were also identified (15). These sites include the remains of black homesteads. In terms of black African tradition, stillborn babies were often buried in unmarked graves underneath or adjacent to the homesteads of their parents.

5.5 FINDINGS OF THE HISTORICAL DESKTOP STUDY

This archival and historical desktop study has revealed important aspects about the history of the area. The findings of the historical desktop study can be compiled as follows and have been combined to produce a heritage sensitivity map for the project based on the desktop assessment (refer **Figure 49**).

5.5.1 HERITAGE SCREENING

A heritage screening report was compiled by the Department of Environmental Affairs National Web-based Environmental Screening Tool as required by Regulation 16(1)(v) of the Environmental Impact Assessment Regulations 2014, as amended. According to the heritage screening report, the project area has a Low Heritage Sensitivity (**Figure 2**). The field work that was conducted in the study area demonstrates that there were numerous archaeological and historical sites of heritage significance that warrant conservation. Therefore, in the case of this study area, the DFFE screening tool sensitivity map is not supported based on the findings of this fieldwork.

5.5.2 HERITAGE SENSITIVITY

Analysis of maps and satellite imagery enabled the identification of possible heritage sensitive areas. By superimposition and analysis, it was possible to rate these structures according to age and thus their

level of protection under NHRA. **Table 7** lists the possible tangible heritage sites identified in the vicinity of the study area and the relevant legislative protection.

Table 7 - Tangible heritage site in the study area.

Name	Description	Legislative protection
Archaeology	Older than 100 years	NHRA Sections 3 and 35
Structures	Possibly older than 60 years	NHRA Sections 3 and 34
Burial grounds	Graves	NHRA Sections 3 and 36 and MP Graves Act

Additionally, evaluation of satellite imagery has indicated the following areas that may be sensitive from a heritage perspective. The analysis of the studies conducted in the area assisted in the development of the following landform type to heritage find matrix (**Table 8**).

Table 8 - Landform type to heritage find matrix

LANDFORM TYPE	HERITAGE TYPE
Crest and foot hill	LSA and MSA scatters, LIA settlements
Crest of small hills	Small LSA sites – scatters of stone artefacts, ostrich eggshell, pottery and beads
Water holes/pans/rivers	MSA and LSA sites, LIA settlements
Farmsteads	Historical archaeological material
Ridges and drainage lines	LSA sites, LIA settlements

The heritage sensitivity map (**Figure 49**) was used during the fieldwork to assist in identifying and assessing any heritage resources in the landscape.

Tetra4 Cluster 2 Gas Production Project

Heritage Sensitivity Map

PGS Heritage (Pty) Ltd
Heritage Management Unit



Figure 49 - Heritage Sensitivity Map indicating possible sensitive areas within and adjacent to the proposed development areas.

6 FIELDWORK AND FINDINGS

6.1 HERITAGE SITES PREVIOUSLY IDENTIFIED WITHIN THE STUDY AREA

Several archaeological and heritage studies were previously conducted within the region of the current study area (Birkholtz, 2017a, 2017b; **Figure 50**).

Thirty-five (35) heritage sites were identified within the footprint areas of the current proposed Tetra4 Cluster 2 Gas Production Project study area (**Figure 51 to Figure 54**). There were 10 graves and burial grounds (**TET 1, TET 7-8, TET 11, TET 15, TET 19, TET 22, SSL/BET/72, SITE 2, SITE 19**), 11 structures (**TET 2-3, TET 9, TET 27, SSL/BET/25-26, SSL/BET/36, SITE 1A, SITE 1B, SITE 20-21**), 14 historic to recent sites with possible graves (**TET 4-6, TET 13-14, TET 25a, 25b, TET 26, SSL/BET/37-39, SSL/BET/53, SSL/BET/60, SSL/BET/66**).

The 35 heritage sites will be discussed individually below (Birkholtz, 2017a, 2017b).

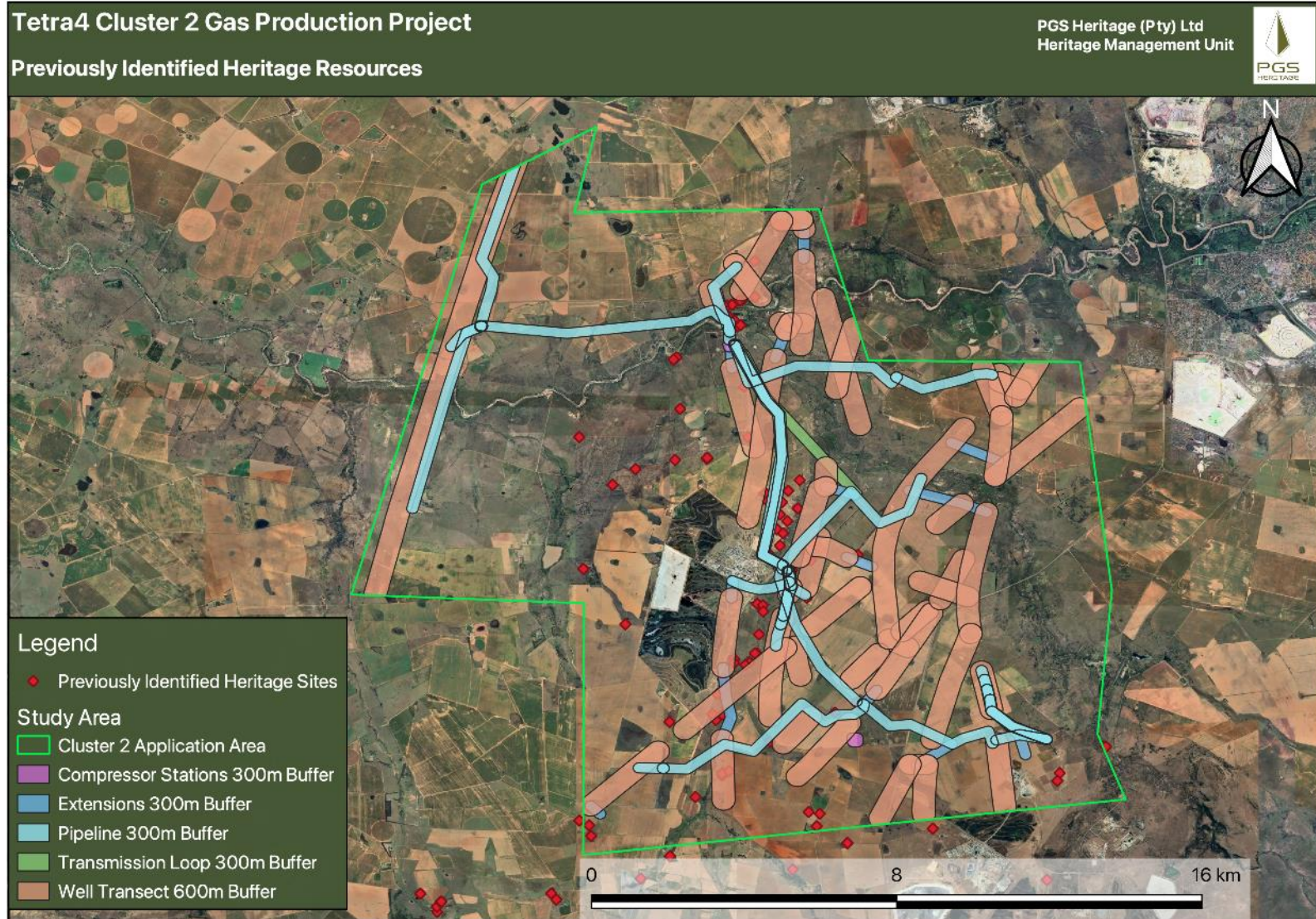


Figure 50 – Map depicting the distribution of the previously identified sites in the region.

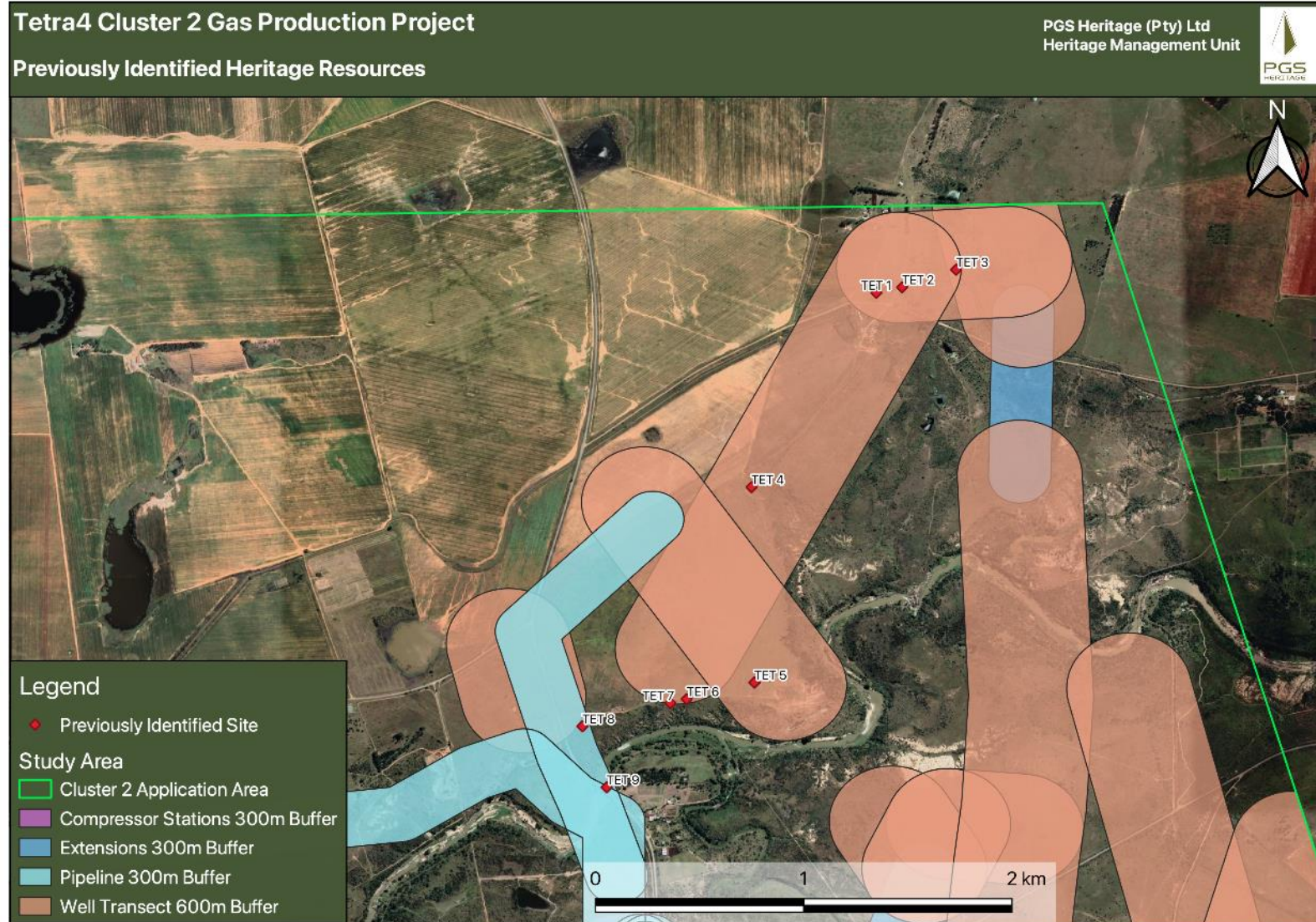


Figure 51 – Closer view of the previously identified sites recorded within the buffer zones in the northern section of the current study area.

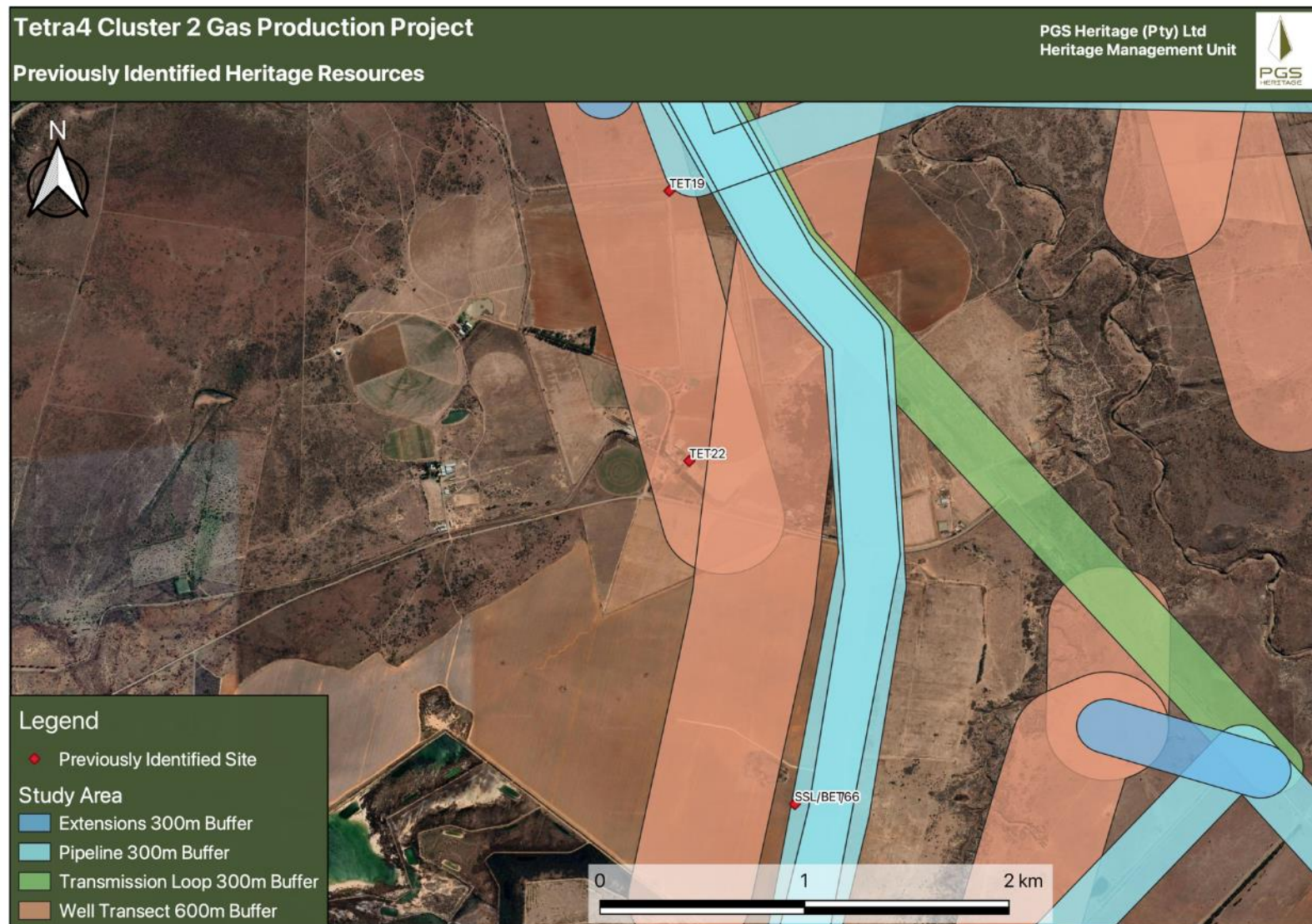


Figure 52 – Closer view of the previously identified sites recorded within the buffer zones in the central section of the current study area.

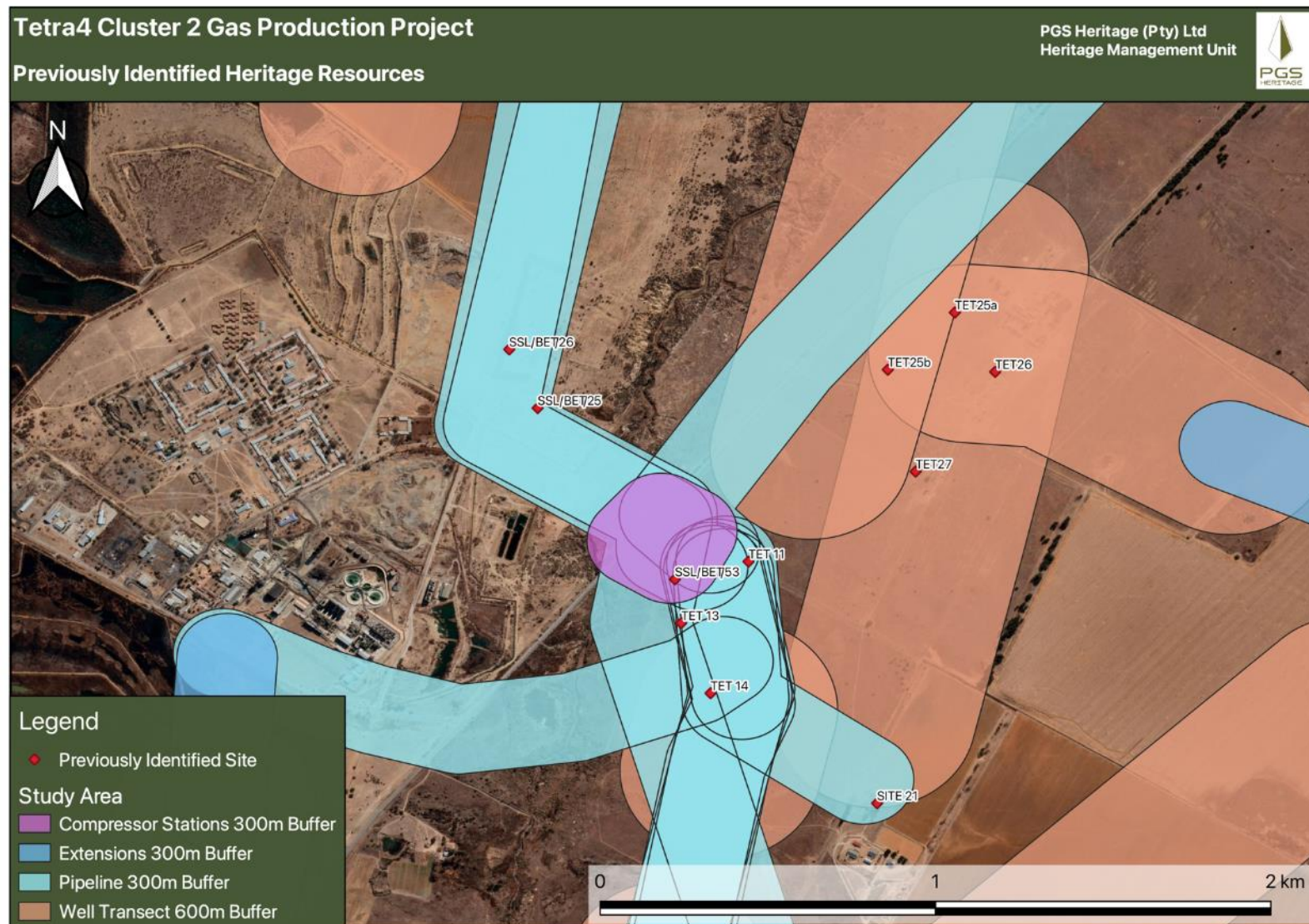


Figure 53 – Closer view of the previously identified sites recorded within the buffer zones near one of the proposed compressor stations.

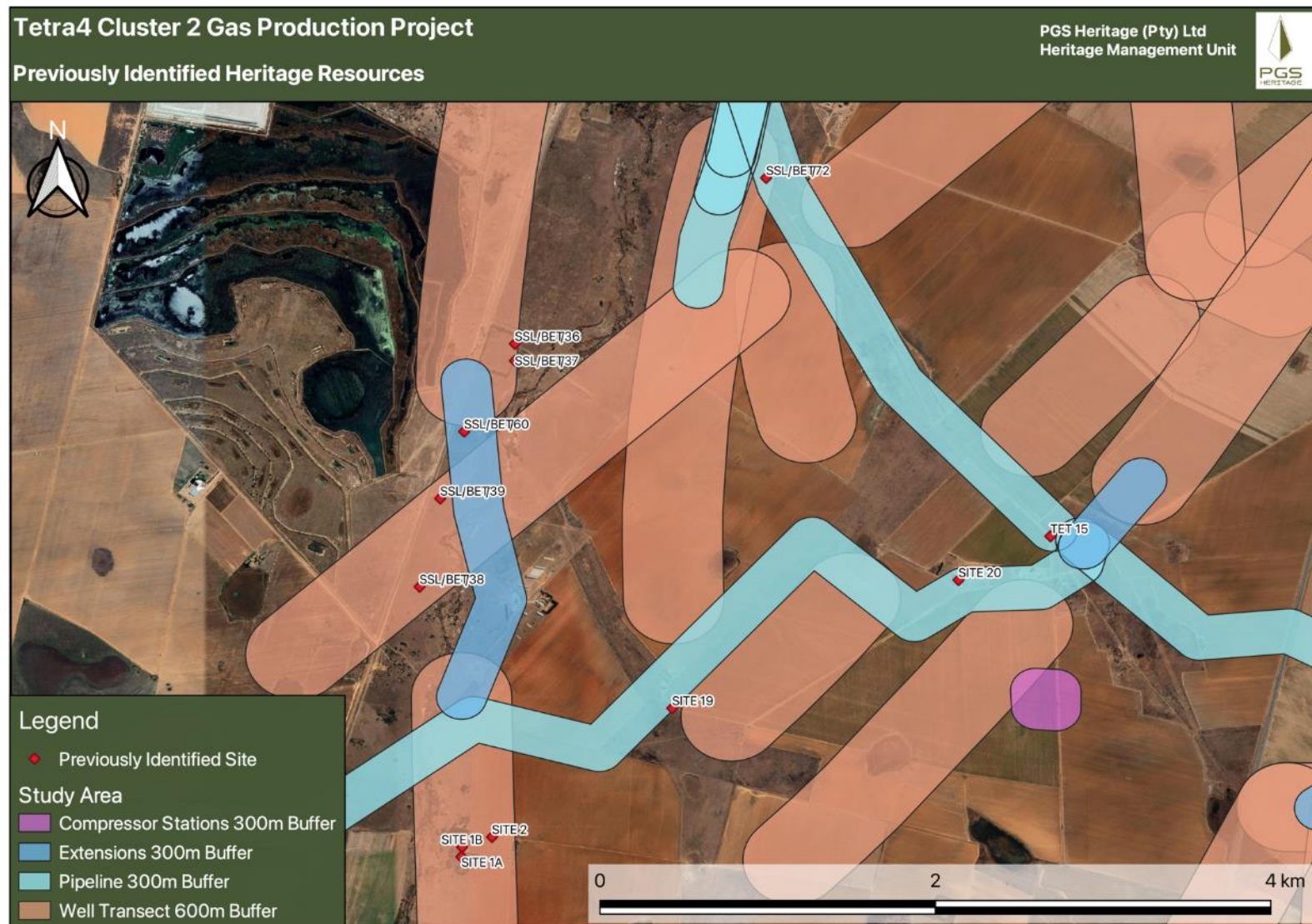





Figure 54 - Closer view of the previously identified sites recorded within the buffer zones in the Southern section of the current study area.



Table 9: Sites previously identified in the study area



Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
TET 1	-28.09339°S	26.73264°E	<p>The site comprised an informal cemetery comprising 37 graves was identified in a clump of trees on the farm Adamsonsvlei 655. All the graves from the cemetery are orientated along the east-west axis. The following dressing types were identified:</p> <ul style="list-style-type: none"> ▪ Upright formal marked headstone at the head of the grave (n = 1) ▪ Upright unmarked stone at the head of the grave (n = 2) ▪ Stone packed grave dressing some with upright unmarked stone as headstone (n = 33) ▪ Rectangular dressing comprising vertically packed stones (n = 1) <p>Only the one grave comprising a single upright formal headstone contained details of the particular deceased (Figure 56). The inscription from this headstone revealed that two individuals were buried here. It reads as follows:</p> <p style="text-align: center;"> <i>"IN SACRED MEMORY</i> <i>OF</i> <i>JOHN ADAMSON</i> <i>DIED 27 FEBRUARY 1913</i> <i>AND</i> <i>EMMA YOUNG ADAMSON</i> <i>DIED ... 1903"</i> </p> <p>The inscription on this grave makes it clear that this cemetery can be associated with Adamson family who gave the farm Adamsonsvlei 655 its name. At least sections of the cemetery are at least 100 years old.</p> <p>Extent: Approximately 70m x 40m.</p> <p>As TET 1 is located within a well transect buffer zone, it is possible that the site may be impacted upon by the proposed development.</p>	High Significance	IIIA


Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
TET 2	-28.09312°S	26.73390°E	<p>The site comprises a stone packed terrace wall located approximately 130m from the historic cemetery where John Adamson lies buried. Apart from its function of a terrace wall, the structure may also have formed part of the livestock enclosures on the farm. It seems likely that the wall forms part of the meagre tangible remains associated with John Adamson that still exists today as well as the early history of the farm Adamsonsvlei.</p> <p>Although the exact age of the structure is not presently known, it is certainly older than 60 years and more than likely older than 100 years as well.</p> <p>As TET 2 is located within a well transect buffer zone, it is possible that the site may be impacted upon by the proposed development.</p>	Medium Significance	IIIB
 <p><i>Figure 58 – View of a section of TET 2. The cemetery at TET 1 can be seen at the trees in the back (Scale is in 10cm increments).</i></p>					
TET 3	-28.09226°S	26.73654°E	<p>The site comprises an extensive rectangular stone walled-enclosure which is sub-divided into two main sections. The rectangular shape of the stone-walled enclosure indicates that it dates from the Historic Period rather than the Late Iron Age. It seems more than likely that this rectangular structure was the main cattle enclosure for the original farmstead of John Adamson.</p>	Medium Significance	IIIB

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			<p>The walls of the structure are in a poor state of preservation. Although the foundations and lower wall sections are still <i>in situ</i>, the remainder of these stone walls appear to have been deliberately damaged. Although this is not certain, it is possible that these upper wall sections were bulldozed at an unknown point in time. The presence of vegetation growth on disturbed wall sections indicates that this mechanical disturbance is not a recent event. Although the exact age of the structure is not presently known, it is certainly older than 60 years and more than likely older than 100 years as well.</p> <p>Extent: Approximately 60m x 60m.</p> <p>As TET 3 is located within a well transect buffer zone, it is possible that the site may be impacted upon by the proposed development.</p>		
					
<p>Figure 59 – General view of a section of the site (Scale is in 10cm increments).</p>			<p>Figure 60 – This view along the southern wall of the structure depicts the disturbance which had taken place at the site. Although the original foundation of the wall is located on left, the dispersed stones from the actual stone wall itself can be seen on the right (Scale is in 10cm increments).</p>		




Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
TET 4	-28.10289°S	26.72654°E	<p>The site comprises the poorly preserved remains of farm worker accommodation on both sides of the fence between the farms Adamsonsvlei and Blaauwdrift. The remains of structures and associated rubbish heaps were observed. The site has been abandoned for a number of years and as a result was found to be quite overgrown by vegetation.</p> <p>The exact age of the site is not known. However, based on the artefacts observed at the various middens from the site, it is not very old. These middens revealed a significant number of recent and modern items, including plastics. It is therefore quite clear that the site is not older than 60 years. Although the structures and cultural material located at this site is of little heritage significance, the possibility does exist for unmarked stillborn graves to be located at this site. Until such time that the presence of graves at the site has been tested, the site must be viewed as containing stillborn graves.</p> <p>As TET 4 is in a well transect buffer zone, it is possible that the site may be impacted upon by the proposed development.</p>	Medium-High Significance	IIIA

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
TET 4			 <p>Figure 61 – General view of TET 4 (Scale is in 10cm increments).</p>		
			 <p>Figure 62 - One of the poorly preserved structures from TET 4 (Scale is in 10cm increments).</p>		
TET 5	-28.11244°S	26.72668°E	<p>The site comprises three irregularly shaped stone concentrations associated with a low-density scatter of cultural material of different ages. The stone concentrations can presently be viewed as possible graves only. The cultural material observed in proximity to the stone concentrations include Later Stone Age lithics as well as a hammerstone, undecorated potsherds that may be associated with either the Late Iron Age or Historic Period as well as glass artefacts from the Historic Period. The site is located within an agricultural field. As a result, the context of the artefacts observed here is not known.</p> <p>Extent: Approximately 30m x 30m.</p> <p>Although the structures and cultural material located at this site is of little heritage significance, the possibility does exist for unmarked stillborn graves to be located at this site. Until such time that the presence of graves at the site has been tested, the three stone concentrations must be viewed as containing graves.</p>	Medium-High Significance	IIIA



Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			As TET 5 is in a well transect buffer zone, it is possible that the site may be impacted upon by the proposed development.		
			 <p>Figure 63 – One of the stone concentrations identified at TET 5 (Scale is in 10cm increments).</p>	 <p>Figure 64 – The lithics and hammerstone identified at TET 5 (Scale is in 1cm increments).</p>	
TET 6	-28.11325°S	26.72337°E	<p>The site comprises a rectangular stone concentration that is orientated along the east-west axis. The rectangular structure is approximately 1.6m long and 1m wide. Despite the absence of a formal headstone and grave goods, the structure does have the appearance of a grave.</p> <p>Two irregularly shaped stone concentrations were observed 5m and 8m respectively west of the rectangular stone concentration described first. These stone concentrations may also be graves.</p> <p>Extent: Approximately 20m x 20m.</p>	Medium-High Significance	IIIA

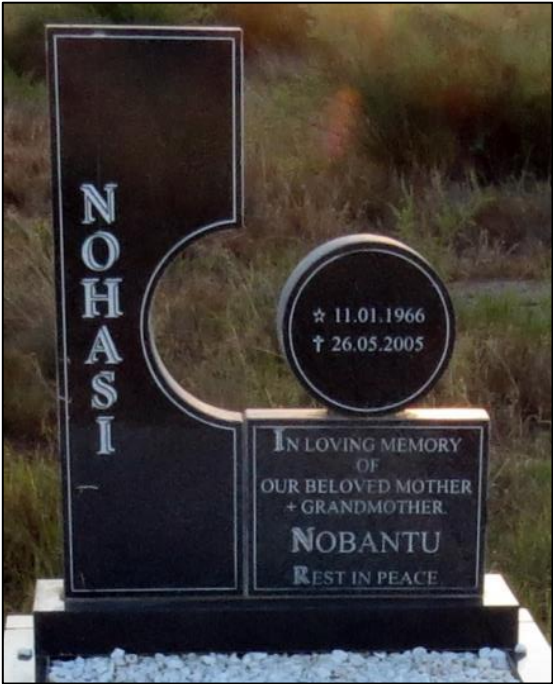

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			<p>The cultural material identified at the site is of low significance. Until such time that the presence of graves at the site has been tested, the stone concentrations must be viewed as containing graves.</p> <p>As TET 6 is in a well transect buffer zone, it is possible that the site may be impacted upon by the proposed development.</p>		
 <p><i>Figure 65 – General view of the rectangular stone concentration identified at TET 6 (Scale is in 10cm increments).</i></p>					
TET 7	-28.11344°S	26.72257°E	<p>The site comprises a loose pile of stones and headstones. One of these headstones is firmly placed in the ground in an upright position, with the remainder of the headstones that could be observed at the site scattered around. All the headstones from the site were found to be broken.</p> <p>It is not presently known whether the site represents the original position of a cemetery comprising roughly four graves, or whether disturbed graves from another site had been dumped here. This said, the fact that at least one of the</p>	High Significance	IIIA

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			<p>headstone fragments was found to be still firmly placed in the ground, suggest that this site represents the original location of the cemetery.</p> <p>The following headstones could be identified:</p> <ul style="list-style-type: none"> ▪ Loose broken cement headstone on which the name ELISA can still be read. This stone was lying flat and was partially covered by soil; ▪ Loose upper section of a broken gothic-shaped cement headstone containing the name DICK SWAR(?). The headstone does contain a date of death, but this was illegible; ▪ Base of broken cement headstone that was still firmly placed in the ground in an upright position. Only the date of death section could be read from the headstone, namely DIED 8 – 9 – 35; and ▪ Two broken cement headstone fragments found lying next to each other. The following sections could be read from the two headstone fragments: LYDIA...THLAHO 1923...HLOKAHALA...10 SEPTEMBER 1933 ROBALE KA KHOTSO. In terms of this headstone, the only component of the name that could be deciphered is LYDIA. The remaining words have reference to aspects such as Born (Date of Birth), Died (Date of Death) and Rest in Peace. From this it is clear that a 10 year old girl named Lydia was buried here. <p>It is clear from the dates appearing on two of the headstones, namely 1933 and 1935, that these graves appear to date from the 1930s and are as a result certainly older than 60 years.</p> <p>Extent: Approximately 10m x 10m.</p> <p>As TET 7 is located within a well transect buffer zone, it is possible that the site may be impacted upon by the proposed development.</p>		



Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			 <p>Figure 66 - General view of the cemetery at TET 7. The positions of three of the four headstones identified at the site which can be seen on this image are marked with red arrows (Scale is in 10cm increments).</p>		
			 <p>Figure 67 - One of the broken headstones at the cemetery at TET 7 (Scale is in 10cm increments).</p>		
			 <p>Figure 68 – Another view of one of the broken headstones from the cemetery at TET 7 (Scale is in 10cm increments).</p>		

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
TET 8	-28.11458°S	26.71827°E	<p>An informal cemetery comprising eight graves is located here. One grave has a granite headstone with a granite-lined dressing, six of the graves have soil heaps with small upright stones at the head and foot whereas the remaining grave has a stone packed dressing. The inscription on the granite grave dressing reads as follows:</p> <p style="text-align: center;"> <i>"NOHASI 11.01.1966 26.05.2005 IN LOVING MEMORY OF OUR BELOVED MOTHER + GRANDMOTHER NOBANTU REST IN PEACE"</i> </p> <p>The cemetery may be associated with the small settlement located 140m to the west. Extent: Approximately 25m x 25m.</p> <p>As TET 8 is located within a pipeline buffer zone, it is possible that the site may be impacted upon by the proposed development.</p>	High Significance	IIIA



Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			 <p>Figure 69 - General view of the cemetery at TET 8.</p>		
			 <p>Figure 70 – Closer view of one of the graves at TET 8 (Scale is in 10cm increments).</p>		

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			 <p>Figure 71 - Close up view of the granite headstone.</p>	 <p>Figure 72 – Closer view of one of the graves at TET 8. This grave dressing consists of a soil heap with small upright stones marking the head and foot of the grave (Scale is in 10cm increments).</p>	
TET 9	-28.11755°S	26.71946°E	<p>The site comprises the concrete drift and adjacent bridge over the Sand River at Blaauwdrift. According to information obtained during the desktop study, this drift was also known as the Du Preez Leger Drift. The drift pre-dates the bridge and was embedded by two rocks. The drift is depicted on the First Edition of the 2826BA Topographical Sheet that was surveyed in 1945, whereas the concrete bridge is depicted for the first time on the Second Edition of the 2826BA Topographical Sheet that was surveyed in 1954. As a result, both structures are older than 60 years.</p> <p>As revealed during the archival and historical desktop study, the following historic events associated with the Battle of Zand River can be associated with the Du Preez Leger Drift:</p>	Medium Significance	IIIB

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			<ul style="list-style-type: none"> On the morning of 9 May 1900, Lieutenant-Colonel Thomas William Porter with the 1s Cavalry Brigade departed from Smaldeel to reconnoitre the two drifts at Du Preez Leger and De Klerks Kraal. They were assisted in this task by Major-General J.B.B. Dickson with the 4th Cavalry Brigade; At 11 am, Major-General John French with his advance guard reached Kalkoenkrans, a section of which farm is located within the present study area. Here he received word from the reconnaissance units on the river that the Du Preez Leger Drift was not held by the enemy. Seizing the opportunity to outflank the Boer positions, French immediately ordered a squadron of the Scots Greys forward to take possession of the drift, and ordered the remainder of the 1st Cavalry Brigade to follow and assist in this task; and By 15h30 that afternoon the Du Preez Leger Drift was occupied by the British force. <p>The site possesses moderate levels of historic and architectural significance. Although events associated with the Battle of Zand River appears to have taken place at the drift where the site is located, the drift was not held by the Boer forces and as a result no shots were actually fired here.</p> <p>Extent: Approximately 100m x 50m.</p> <p>As TET 9 is in a pipeline buffer zone, it is possible that the site may be impacted upon by the proposed development.</p>		

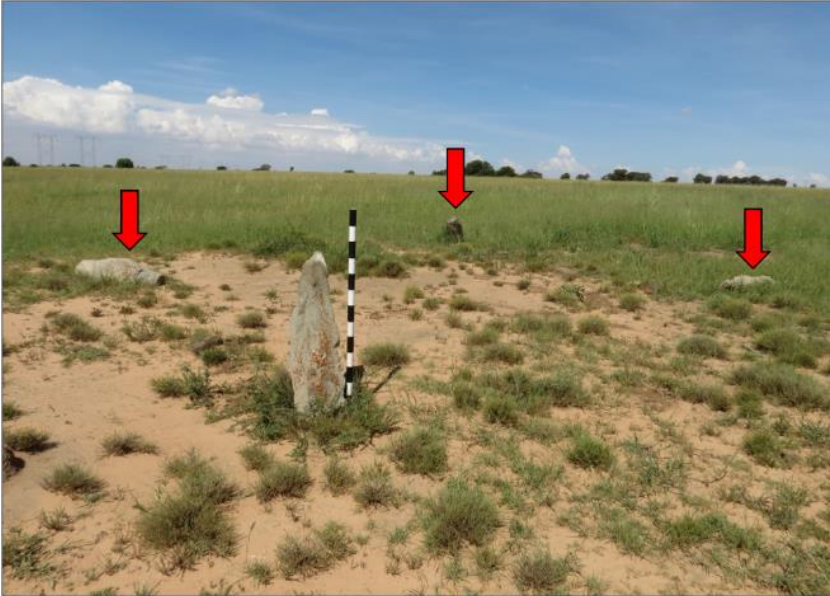
Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
					
	<p><i>Figure 73 – General view of TET 9, with the older drift visible on the right and the modern concrete bridge dominating the landscape on the left.</i></p>		<p><i>Figure 74 – View along the older drift with the more modern concrete bridge on the left.</i></p>		
TET 11	-28.18559°S	26.73656°E	<p>An extensive cemetery comprising 112 graves of black people is located here. The cemetery is located on the boundary fence between the farms Palmietkuil 328 and Kalkoenkrans 225, and is situated in its entirety within the latter farm's property. The cemetery was included in a previous heritage report undertaken by Van der Walt (2013).</p> <p>The cemetery had been fenced and is located 26m from Eskom power line pylons. The cemetery is not maintained and a number of headstones were seen in a fallen-down state.</p> <p>Eight different grave dressing types could be identified at the cemetery. For the most part, these grave dressing were orientated along the east-west axis. The following grave dressings were identified at the cemetery:</p> <ul style="list-style-type: none"> ▪ Upright stones at the head and foot of the grave (n = 57) ▪ Stone packed grave dressing with upright unmarked stone as headstone (n = 39) ▪ Stone packed grave dressing with metal marker as headstone (n = 1) ▪ Rectangular brick-line dressing with granite headstone (n = 6) ▪ Rectangular brick-lined dressing with cement headstone (n = 2) 	High Significance	IIIA



Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			<ul style="list-style-type: none"> Rectangular granite-lined dressing with granite headstone (n = 1) Metal marker without any other dressing components (n = 4) Cement headstone without any other dressing components (n = 2) <p>The oldest date that could be identified on any of the graves from the cemetery, is 1956. Of course, this does not mean that 1956 can be considered the <i>terminus post quem</i> for the site. A large number of graves from the site do not possess any inscriptions or details of the deceased. It is therefore quite likely for the cemetery to be considerably older than the 1950s.</p> <p>The extensive size of the cemetery suggests that it was associated with a reasonably large community. Approximately 340m south-east of the cemetery the remains of an old farm school is located. It seems more than likely that the school and cemetery were associated with the same reasonably large farm worker community residing on the farm Kalkoenkrans.</p> <p>Extent: Approximately 60m x 60m. As TET 11 is located within a pipeline buffer zone, adjacent to a proposed compressor station, it is possible that the site may be impacted upon by the proposed development.</p>		



Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			 <p>Figure 75 - General view of the cemetery at TET 11. The boundary fence between the farms Kalkoenkrans (left of the fence) and Palmietkuil (right of the fence) can clearly be seen.</p>	 <p>Figure 76 – General view of some of what is believed to be some of the older graves from the cemetery comprising stone concentrations with unmarked upright stones as headstones (Scale is in 10cm increments).</p>	



Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
					
<p><i>Figure 77 – Granite headstone from one of the graves with a brick-lined dressing and granite headstone (Scale is in 10cm increments).</i></p>					
TET 13	-28.18746°S	26.73452°E	<p>The site comprises the poorly preserved remains of farm worker accommodation on the farm Palmietkuil 328. All that remains of the farm worker accommodation is a rectangular stone foundation (5m x 3m) and four stone corner posts of a small camp (5m x 5m). Cultural material in the form of glass, metal and imported ceramic fragments were identified in association with the rectangular foundation structure.</p>	Medium-High Significance	IIIA



Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			<p>As indicated above, the four stone posts appear to be all that remains of a small camp, possibly for the keeping of livestock. Only one of the stone posts are still in an upright position, with another one leaning over and the remaining two posts lying flat on the ground.</p> <p>The exact age of the site is not known. However, the only time that huts are depicted in proximity to this site on the available topographical map sheets, is on the Second Edition of the 2826BA sheet that was surveyed in 1954.</p> <p>The site may be just older than 60 years with some remnants of its stone structures remaining. The cultural material identified here is not older than 100 years and as a result not protected by the available heritage legislation. However, the risk does exist for stillborn babies to have been buried here. Until the presence of such possible graves at the site has been proven or disproven, a worst case scenario will be adopted within which it is assumed that such stillborn baby graves are indeed located here.</p> <p>Extent: Approximately 70m x 50m.</p> <p>As TET 13 is in a pipeline buffer zone, it is possible that the site may be impacted upon by the proposed development.</p>		



Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
					
<p><i>Figure 78– View of the remnants of what appears to have been a livestock camp. Apart from the upright corner post visible in the front, the positions of the corner posts are marked with red arrows (Scale is in 10cm increments).</i></p>					



Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
					
	<p>Figure 79 - General view of the remains of the structure (Scale is in 10cm increments).</p>			<p>Figure 80 – Another view of the remains of the structure (Scale is in 10cm increments).</p>	
TET 14	-28.18959°S	26.73541°E	<p>The site comprises the poorly preserved remains of farm worker accommodation on the farm Palmietkuil 328. All that remains of the farm worker accommodation are scatters of cultural material such as glass and metal fragments. The extent of the site is approximately 120m x 70m. The exact age of the site is not known. However, the only time that huts are depicted in proximity to this site on the available topographical map sheets, is on the Second Edition of the 2826BA sheet that was surveyed in 1954.</p> <p>Although the site may be just older than 60 years, none of the structures have remained preserved. Furthermore, the cultural material identified here is not older than 100 years and as a result not protected by the available heritage legislation. However, the risk does exist for stillborn babies to have been buried here. Until the presence of such possible graves at the site has been proven or disproven, a worst case scenario will be adopted within which it is assumed that such stillborn baby graves are indeed located here.</p> <p>As TET 14 is in a pipeline buffer zone, it is possible that the site may be impacted upon by the proposed development.</p>	Medium-High Significance	IIIA


Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
TET 14			 <p>Figure 81 – General view of TET 14 (Scale is in 10cm increments).</p>		
			 <p>Figure 82 – Cultural material in the form of glass and metal fragments were found across the surface of TET 14 (Scale is in 10cm increments).</p>		
TET 15	-28.22097°S	26.75365°E	<p>An informal cemetery comprising two black graves is located immediately adjacent to a farm road. The cemetery is enclosed by a fence.</p> <p>The two graves are located adjacent to each other and their dressings are both orientated along the east-west axis. One of the graves has a granite headstone with a granite lined dressing. The second grave is stone packed with a metal plaque. From the information found on the granite headstone, it is evident that the graves from this cemetery include the deceased of the Mokati family. This grave dates to 1978. The site may have been a small farmworker cemetery.</p> <p>Extent: Approximately 5m x 5m.</p> <p>As TET 15 is located within a pipeline buffer zone, it is possible that the site may be impacted upon by the proposed development.</p>	High Significance	IIIA

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			 <p>Figure 83 - General view of the cemetery at TET 15.</p>		
			 <p>Figure 84 - Closer view of one of the graves at TET15.</p>		
TET 19	-28.13652°S	26.72375°E	<p>An informal cemetery comprising approximately 26 black graves is located here. The cemetery is situated along a boundary fence. All the grave dressings from this cemetery are orientated along the East-West axis. Six of the grave dressings are stone concentrations, with unmarked upright stones on their western ends. Two of the grave dressings have cement brick linings, one has a clay baked lining with a cement headstone and one grave dressing has a brick lining with a granite headstone. The only surface markings on the remainder of the graves are small upright stones or concrete fragments. From information found on the headstones, it is evident that the graves from this cemetery include the deceased of the Nhlapo and Nondela families. The site appears to have been a farmworker cemetery.</p> <p>Extent: Approximately 40m x 20m.</p>	High Significance	IIIA



Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			As TET 19 is located within a well transect buffer zone, it is possible that the site may be impacted upon by the proposed development.		
 <p>Figure 85 – One of the graves from the cemetery at TET 19 (Scale is in 10cm increments).</p>			 <p>Figure 86 - Another view of one of the graves from the cemetery at TET19.</p>		
TET 22	-28.14997°S	26.72474°E	<p>The site comprises the burial place for the ashes of Mr. Lourens Lourens snr. The burial site is located in the garden of the deceased's son, Mr. Lourens Lourens (jnr.). The place where the ashes were buried is marked with a cross.</p> <p>Extent: Approximately 5m x 5m.</p> <p>As TET 22 is located within a well transect buffer zone, it is possible that the site may be impacted upon by the proposed development.</p>	High Significance	IIIA



Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating	
TET 25a and 25b	-28.17803°S/ -28.17977°S	26.74283°E/ 26.74080°E			Medium-High Significance	IIIA
			<p>The site comprises the poorly preserved remains of farm worker accommodation on the farm Kalkoenkrans 225. All that remains of the farm worker accommodation are scatters of cultural material such as glass and metal fragments that were identified between the two waypoints shown above. This cultural material was observed over a corridor roughly 400m. While the exact age of the site is not known, a number of huts are depicted in this area on both the First and Second Editions of the 2826BA topographical sheets surveyed in 1945 and 1954 respectively.</p> <p>Although the site may be just older than 60 years, none of the structures have remained preserved. Furthermore, the cultural material identified here is not older than 100 years and as a result not protected by the available heritage legislation. However, the risk does exist for stillborn babies to have been buried here. Until the presence of such possible graves at the site has been proven</p>			



Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			<p>or disproven, a worst case scenario will be adopted within which it is assumed that such stillborn baby graves are indeed located here.</p> <p>As TET 25a and 25b are in a well transect buffer zone, it is possible that the site may be impacted upon by the proposed development.</p>		
 <p>Figure 89 – General view of a section of the area where cultural material was identified.</p>			 <p>Figure 90 – Cultural material in the form of glass and metal fragments is found across the surface of the site. Scale is in 1cm and 5cm increments.</p>		
TET 26	-28.17983°S	26.74406°E	<p>The site comprises the poorly preserved remains of farm worker accommodation on the farm Kalkoenkrans 225. All that remains of the farm worker accommodation at the site is a poorly preserved structure of mud and baked red clay bricks. Only three of the walls of this structure still remains preserved, with no roof present.</p> <p>The poorly preserved structure is located within a cluster of modern farm worker accommodation units. The exact age of the structure is not known. However, huts are depicted in proximity to this structure on both the First and Second Editions of the 2826BA topographical sheets that were surveyed in</p>	Medium-High Significance	IIIA



Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			<p>1945 and 1954 respectively. It seems likely therefore for the site to be potentially older than 60 years.</p> <p>While the structure itself is too poorly preserved to have any heritage significance, the risk does exist for stillborn babies to have been buried here. Until the presence of such possible graves at the site has been proven or disproven, a worst case scenario will be adopted within which it is assumed that such stillborn baby graves are indeed located here.</p> <p>Extent: Approximately 20m x 20m.</p> <p>As TET 26 is in a well transect buffer zone, it is possible that the site may be impacted upon by the proposed development.</p>		
					
			<p><i>Figure 91 – General view of the structure at TET 26.</i></p>		



Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
TET 27	-28.18286°S	26.74164°E	<p>A poorly preserved east-facing farm dwelling is located here. The building originally had a hipped roof construction, and it was built out of cement bricks. Most of the roof and all the window and door frames missing and sections of the walling are also disintegrating.</p> <p>A brick reservoir is associated with the building.</p> <p>Although the exact age of the structure is not presently known, a building is depicted for the first time here on the Second Edition of the 2826BA that was surveyed in 1954. This building is not depicted on the First Edition of the same topographical sheet that was surveyed in 1945. As a result, it would appear that the building is between 77 and 68 years old.</p> <p>Extent: Approximately 60m x 60m.</p> <p>As TET 27 is in a well transect buffer zone, it is possible that the site may be impacted upon by the proposed development.</p>	Low Significance	IIIC



Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
					
<p><i>Figure 92 – General view of a section of the building.</i></p>			<p><i>Figure 93 – View of a section of the interior of the building.</i></p>		
SSL/BET/25	-28.18093°S	26.730159°E	<p>The site comprises a concrete and brick foundation of an old farmhouse and an outbuilding. It was located on the farm Kalkoenkrans 225 (Portion 1). The remains of the walling on the farmhouse indicates that a brick-laying technique known as header bond was used in the construction of the building. This brick-laying technique results in 11-inch thick internal walls and is typical of the period before the 1940s. The remains of linoleum flooring and earthenware piping also indicate that the structure was probably built in the 1930s. A possible midden was also identified in the area.</p> <p>Although the structure is not depicted on the 1940 topographical map, it is, in all likelihood, between 60 and 100 years old. As most of the structures have been demolished, the site is of low heritage significance.</p>	Low Significance	IIIC



Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			<p>Extent: Farmhouse: approximately 20 square meters; an outbuilding: approximately 10 square meters.</p> <p>As SSL/BET/25 is in a pipeline buffer zone, it is possible that the site may be impacted upon by the proposed development.</p>		
 <p>Figure 94 – General view of remains of the farmhouse at SSL/BET/25.</p>			 <p>Figure 95 – Example of the linoleum flooring within the old farmhouse at SSL/BET/25 (Scale is in 10cm increments).</p>		



Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
 <p>Figure 96 - The foundation remains of the outbuilding at site SSL/BET/25.</p>			 <p>Figure 97 - Fragments of earthenware piping (Scale is in 10cm increments).</p>		
SSL/BET/26	-28.179151°S	26.729295°E	<p>The site consists of an old reservoir with an associated furrow located between several trees. It most likely supplied water to the farmhouse identified at site 023. The brick used in its construction was a baked red brick of imperial dimensions with large holes to facilitate the pouring of cement. This brick design was used before the 1940s.</p> <p>Extent: Approximately 5m x 5m</p> <p>As SSL/BET/26 is in a pipeline buffer zone, it is possible that the site may be impacted upon by the proposed development.</p>	Low Significance	IIIC


Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating	
			<div></div> <p>Figure 98 – General view of the reservoir identified at SSL/BET/26 (Scale is at 10cm increments).</p>	<div></div> <p>Figure 99 - Closer view of one of the bricks with which the reservoir was built.</p>		
SSL/BET/36	-28.209272°S	26.721111°E	<p>The site consists of the remains of a southwest facing, small building (8x8m) which is surrounded by an extensive Blue gum tree wind-break (6000m²). The building has baked clay brick walls with concrete lintels, a concrete foundation and steel door frames. It may be the remains of farmworker accommodation. It is depicted as two buildings on an early topographic map sheet surveyed during the 1940s.</p> <p>In addition to this main structure, the site contains the remains of several other structures:</p> <ul style="list-style-type: none">▪ A brick reservoir with a diameter of approximately 10m.▪ An old, corrugated reservoir situated north-west of the brick reservoir, which had been used as a relatively recent midden containing a large amount of beer bottles and cans dating to the 1960s/1970s.▪ Two boreholes and a windmill situated north-east of the brick dam. <p>Extent: Approximately 300m x 200m.</p> <p>As SSL/BET/36 is in a well transect buffer zone, it is possible that the site may be impacted upon by the proposed development.</p>	Low Significance	IIIC	

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			 <p>10/07/2017 12:07</p> <p>Figure 100 – Front view of the building at SSL/BET/36. The concrete lintels are visible.</p>		
			 <p>10/07/2017 12:08</p> <p>Figure 101 – Rear view of the same building. The steel doorframes can be seen.</p>		



Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			 <p>Figure 102 – Remains of an old brick reservoir at SSL/BET/36.</p>	 <p>Figure 103 – Remains of an old corrugated reservoir.</p>	
SSL/BET/37	-28.210306°S	26.721111°E	<p>This site is located just outside a Blue gum wind break and is, in all likelihood, the remains of labourers' accommodation associated with Site SSL/BET/36. An upright stone fence post as well as two rectangular stone foundations (6x3m and 8x3m) were identified here. It must be noted that in terms of black African tradition, stillborn babies were often buried in unmarked graves underneath or adjacent to the homesteads of their parents. Until the presence of such possible graves at the site has been proven or disproven, a worst-case scenario will be adopted within which it is assumed that such stillborn baby graves are indeed located here.</p> <p>Extent: Approximately 70 m x20 m.</p> <p>As SSL/BET/37 is in a well transect buffer zone, it is possible that the site may be impacted upon by the proposed development.</p>	Medium-High Significance	IIIA



Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
SSL/BET/38	-28.224040°S	26.715320°E	 <p>Figure 104 – Upright stone fence post at SSL/BET/37 (Scale is in increments of 10cm).</p>	Medium-High Significance	IIIA
			 <p>Figure 105 - Visible remains of stone foundation of the 8x3m structure (Scale is in increments of 10cm).</p>		
			<p>The site was depicted as a hut on an early topographic map sheet surveyed in the 1940s. The remains identified in the field consist of a 3x12m dressed, packed-stone foundation. Although the exact age of the structure is not known, it is certainly older than 60 years. A nearby electricity pylon may have disturbed sections of the site. It must be noted that in terms of black African tradition, stillborn babies were often buried in unmarked graves underneath or adjacent to the homesteads of their parents. Until the presence of such possible graves at the site has been proven or disproven, a worst-case scenario will be adopted within which it is assumed that such stillborn baby graves are indeed located here.</p> <p>Extent: Approximately 10 m x 5 m.</p>		


Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			As SSL/BET/38 is in a well transect buffer zone, it is possible that the site may be impacted upon by the proposed development.		
 <p>Figure 106 – General view of SSL/BET/38, showing the Eskom pylon (Scale is in increments of 10cm).</p>			 <p>Figure 107 - Visible remains of structure foundation (Scale is in increments of 10cm).</p>		
SSL/BET/39	-28.218674°S	26.716572°E	<p>The site was depicted as a single hut on an early topographic map sheet surveyed during the 1940s. The remains of the site identified in the field consist of a stone and mud wall which is approximately 40cm long. Although the exact age of the structure is not known, it is certainly older than 60 years. It must be noted that in terms of black African tradition, stillborn babies were often buried in unmarked graves underneath or adjacent to the homesteads of their parents. Until the presence of such possible graves at the site has been proven or disproven, a worst-case scenario will be adopted within which it is assumed that such stillborn baby graves are indeed located here.</p>	Medium-High Significance	IIIA

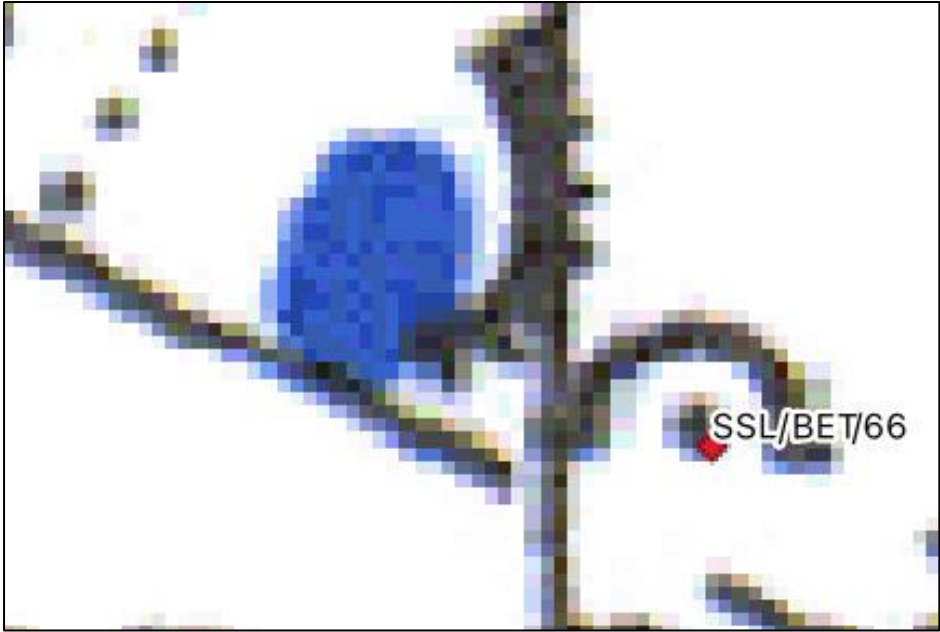
Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			<p>Extent: Approximately 5 m x 4m.</p> <p>As SSL/BET/39 is in a well transect buffer zone, it is possible that the site may be impacted upon by the proposed development.</p>		
			 <p><i>Figure 108—General view of the remains of the stone and mud wall at SSL/BET/39.</i></p>		
SSL/BET/53	-28.18613°S	26.73433°E	<p>The site comprises the poorly preserved remains of farm worker accommodation on the farm Palmietkuil 328. All that remains of the farm worker accommodation at this site are two rectangular stone foundations (050a & 050b) associated with cultural material in the form of glass and metal fragments. A concentration of cultural material in the form of a midden (050c) is also located nearby.</p> <p>The three components of the site can be described as follows:</p>	Medium-High Significance	IIIA



Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			<p>050a) comprises the remnants of a rectangular stone foundation that is located close to an Eskom pylon. As indicated above, glass and metal fragments were found associated with this structure;</p> <p>051b) comprises a rectangular stone foundation (5m x 4m) with glass and metal fragments found associated with the structure. Two of these glass fragments are from the same clear container and have embossed letters on them. One of these glass fragments contains the embossed word section "...EUR..." and the second fragment the word section "...ON..." It is not presently possible to identify the particular bottle or brand; and</p> <p>051c) represents a midden located roughly 5m from the previous structure. The fragments observed on the surface of the site include the lid of a Consol glass jar, a writing slate fragment as well as the shoulder, neck and rim of a small brown medicine bottle.</p> <p>The exact age of the site is not known. However, the only time that huts are depicted in proximity to this site on the available topographical map sheets, is on the Second Edition of the 2826BA sheet that was surveyed in 1954. It seems likely therefore for the site to be potentially just older than 60 years. Furthermore, the presence of a Consol glass item provides a <i>terminus post quem</i> for this section of the midden in that Consolidated Glass Works was started in May 1946 (www.consol.co.za).</p> <p>The cultural material identified here is not older than 100 years and as a result not protected by the available heritage legislation. It must be noted that in terms of black African tradition, stillborn babies were often buried in unmarked graves underneath or adjacent to the homesteads of their parents. Until the presence of such possible graves at the site has been proven or disproven, a worst-case scenario will be adopted within which it is assumed that such stillborn baby graves are indeed located here.</p> <p>Extent: Approximately 70 m x 70m.</p> <p>As SSL/BET/53 is in a compressor station buffer zone, it is possible that the site may be impacted upon by the proposed development.</p>		



Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
 <p>Figure 109—General view of the structure observed at SSL/BET/53 (Scale is in 10cm increments).</p>			 <p>Figure 110 - Three of the glass fragments observed in proximity to Site 050a (Scale is in 1cm increments).</p>		



Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
					
					
SSL/BET/60	-28.214607°S	26.718030°E	<p>The site was depicted as a single hut on an early topographic map sheet surveyed during the 1940s. No structural remains of the site were identified in the field. However, it must be noted that in terms of black African tradition, stillborn babies were often buried in unmarked graves underneath or adjacent to the homesteads of their parents. Until the presence of such possible graves at the site has been proven or disproven, a worst-case scenario will be adopted within which it is assumed that such stillborn baby graves are indeed located here.</p> <p>As such, this must be considered as a sensitive area and must be given a buffer.</p> <p>As SSL/BET/60 is in an extension buffer zone, it is possible that the site may be impacted upon by the proposed development.</p>	Medium-High Significance	IIIA


Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
 <p>Figure 113– Section of the 1945 topographical map showing a hut at SSL/BET/60.</p>					
SSL/BET/66	-28.1670611°S	26.730000°E	<p>The site was depicted as a single hut on an early topographic map sheet surveyed during the 1940s. However, the site was not visited during the fieldwork survey. Due to the risk of unmarked stillborn graves, it is included in the inventory. It is clear from satellite imagery that there will be no surface remains as the site lies in an agricultural field and has been heavily ploughed. However, it must be noted that in terms of black African tradition, stillborn babies were often buried in unmarked graves underneath or adjacent to the homesteads of their parents. Until the presence of such possible graves at the site has been proven or disproven, a worst-case scenario will be adopted within which it is assumed that such stillborn baby graves are indeed located here.</p> <p>As such, this must be considered as a sensitive area and must be given a buffer.</p> <p>As SSL/BET/66 is in a pipeline buffer zone, it is possible that the site may be impacted upon by the proposed development.</p>	Medium-High Significance	IIIA


Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
 <p>Figure 114– Section of the 1945 topographical map showing a hut at SSL/BET/66.</p>					
SSL/BET/72	-28.19919°S	26.73638°E	<p>The site comprises one grave, with a metal marker, with no inscription. According to local tradition, a number of graves are buried at this location. While only one grave dressing could be observed, the position of the site on a farm boundary fence supports oral history. The site may have been a small farmworker cemetery.</p> <p>As SSL/BET/72 is in a well transect buffer zone, it is possible that the site may be impacted upon by the proposed development.</p>	High Significance	IIIA


Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
<div style="display: flex; justify-content: space-around;">   </div> <p style="text-align: center;"><i>Figure 115 – General views of grave observed at SSL/BET/72.</i></p>					
SITE 1A	-28.24045°S	26.71786°E	<p>The site comprises an old farmhouse with at least two identifiable construction phases; the core comprises a multi-roomed structure built with clay sundried bricks and mortar which is built in an English bond style. Largely enclosing the core is a kiln baked brick veranda on the northern and eastern sides as well as other additions. Associated structures include a water tank foundation, brick and cement reservoir and brick meat-processing room. The site was depicted as a single structure on an early topographic map sheet surveyed during the 1940s. As no additional information was available, the site is provisionally rated as IIIB with medium heritage significance.</p> <p>As SITE 1A is in a well transect buffer zone, it is possible that the site may be impacted upon by the proposed development.</p>	Medium Significance	IIIB

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
					
<p><i>Figure 116 – General views of SITE 1A.</i></p>					
					
<p><i>Figure 117 – Section of the 1945 topographical map showing a structure at SITE 1A.</i></p>					



Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
SITE 1B	-28.23986°S	26.71790°E	<p>The site comprises an old wagon shed is located here. Its southern aspect is dressed sandstone and is joined to the stone built eastern façade with coining. The structure is divided via three internal walls of mud bricks and stone with room added to the northern side of the structure. All corners of the structure are joined with coined sandstone blocks. The site was depicted as a single structure on an early topographic map sheet surveyed during the 1940s.</p> <p>The wagon shed is certainly older than 60 years and in all likelihood is older than 100 years as well. Considering its age, the structure is in a moderate state of preservation. As no additional information was available, the site is provisionally rated as IIIB with medium heritage significance.</p> <p>Extent: Approximately 11 m x20 m.</p> <p>As SITE 1B is in a well transect buffer zone, it is possible that the site may be impacted upon by the proposed development.</p>	Medium Significance	IIIB
<div style="display: flex; justify-content: space-around; align-items: center;">   </div> <p style="text-align: center;">Figure 118–General views of SITE 1B.</p>					

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
 <p><i>Figure 119– Section of the 1945 topographical map showing a structure at SITE 1B.</i></p>					
SITE 2	-28.23925°S	26.71972°E	<p>The site comprises the Jordaan and Pienaar cemetery comprising at least four graves, three of which have headstones. While the area around the graves is reasonably well kept, the headstones and grave dressings are damaged. The position of this cemetery so close to the buildings and structures identified at Site 1, suggests that the two sites are associated with one another.</p> <p>As SITE 2 is in a well transect buffer zone, it is possible that the site may be impacted upon by the proposed development.</p>	High Significance	IIIA

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			 <p><i>Figure 120– View of headstones observed at SITE 2.</i></p>		
SITE 19	-28.23142°S	26.73067°E	<p>The site comprises five graves, of which two are fenced soil heaps, with one upright stone. The other three graves are outside the fenced area, with soil heaps. Two of these latter graves have stones and one has a metal marker. No information could be obtained from the headstones or dressings. However, it seems likely that the site is a small farmworker cemetery.</p> <p>As SITE 19 is in a pipeline buffer zone, it is possible that the site may be impacted upon by the proposed development.</p>	High Significance	IIIA

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
					
			<p><i>Figure 121—General view of the two fenced off graves observed at SITE 19.</i></p>		
SITE 20	-28.22363°S	26.74807°E	<p>The site comprises the original farm house of the farm, which has now been repurposed as a shed. It has a hipped roof with metal tie rods on the eastern aspect. The original window sills have been bricked up and a double door added to the one facade. It is evident that the building is currently being used as a shed.</p> <p>The farmhouse is older than 60 years but has been extensively modified over the years and is currently used as a shed.</p> <p>Extent: Approximately 13 m x 12m.</p> <p>As SITE 20 is in a pipeline buffer zone, it is possible that the site may be impacted upon by the proposed development.</p>	Low-Medium Significance	IIIB

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
					
Figure 122–General views of SITE 20.					
SITE 21	-28.19293°S	26.74047°E	<p>The site comprises a farmhouse. According to the landowner, Mr. Oosthuizen, this farmhouse was built in 1955. The house has since then been extensively modified by the three generations that have resided here. Mr. Oosthuizen kindly provided old photographs of the original house. A comparison between these historic photographs and the contemporary view of the dwelling today, clearly shows the significant modifications which have taken place here.</p> <p>The farmhouse is older than 60 years, but has been extensively modified.</p> <p>As SITE 21 is in a pipeline and well transect buffer zone, it is possible that the site may be impacted upon by the proposed development.</p>	Low-Medium Significance	IIIB

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			 <p>Figure 123 – General view of SITE 21.</p>	 <p>Figure 124 - Historical photographs of the farmhouse at SITE 21.</p>	

6.2 HERITAGE SITES IDENTIFIED DURING THE CURRENT FIELD ASSESSMENT

The fieldwork component of the study was aimed at identifying tangible remains of archaeological, historical and heritage significance. The fieldwork was conducted by three archaeologists from PGS (Nikki Mann, Michelle Sachse and Nicholas Fletcher) on 14-24 February 2022. The fieldwork comprised a controlled exclusive survey of the proposed development footprint areas. The fieldwork team recorded track logs with their hand-held GPS devices. These track logs are depicted in yellow in **Figure 256** and show the areas assessed by the archaeologists during the fieldwork.

For the most part, the archaeological visibility of the area was not ideal for surveying due to the dense grass cover and disturbance found in some areas (crops: maize, sunflowers, soya beans; ploughed land). Therefore, the walkthroughs were focused on those areas that are not disturbed, as the potential for identifying archaeological and heritage sites in the more undisturbed components of the study area are much higher. As a result, only limited fieldwork was undertaken in those components of the study area that are entirely disturbed. Furthermore, none of the currently occupied farmhouses are expected to be impacted upon by the proposed development and as such were not documented in this report to respect the owner's privacy.

There was also restricted access to certain farm properties (BLAAUWDRIFT No.188 (Portion 3), BRUINTJE HOOGTE No.367 (Portion 2, 3), BRYAN No.561 (Portion 10, 21, 28, 29, 30, 31, 38), GLEN ROSS No.734 (Portion 4, 5, 6, 7, 18, 20), JONKERS RUST No.72, KALKOENKRANS No.225 (Portion 3), MOND VAN DOORNRIEVER No.38 (Portion 2), MOOIFONTEIN No.639, PALMIETJUIL No.548 (Portion 1), STILLE WONING no.703, VLAKPAN No.358) due to flooded roads, game life on the properties or farm owners not giving permission to access their properties.

The fieldwork identified heritage finds that were then classified as either structures, ruins or graves and burial grounds. The fieldwork completed for the HIA component has confirmed the presence of 7 burial ground sites (**T0003, T0009, T0010, T0012⁷, T0013, T0024, T0029**), 9 historic to recent sites with possible graves (**T0007, T0008, T0011, T0015, T0023, T0026, T0027, T0028, T0035⁸**) and 25 structures (**T0001, T0002, T0004, T0005, T0006⁹, T0014, T0016, T0017, T0018, T0019, T0020, T0021, T0022, T0025, T0030, T0031, T0032¹⁰, T0033, T0034, T0036, T0037, T0038, T0039, T0040, T0041**)

⁷ Note that the site T0012 identified during the field assessment is the same site as TET15 identified in the 2016/2017 heritage assessment.

⁸ Note that the site T0035 identified during the field assessment is the same site as TET13 identified in the 2016/2017 heritage assessment

⁹ Note that site T0006 identified during the field assessment is the same site as SITE 1B identified in the 2016/2017 heritage assessment.

¹⁰ Note that site T0032 identified during the field assessment is the same sites as TET3 identified in the 2016/2017 heritage assessment.

that may be affected by the proposed development. The position and distribution of the sites are illustrated in **Figure 126** to **Figure 133**.

The most recently identified sites were also combined with the previously identified sites (Birkholtz, 2017a, 2017b). See **Figure 134**.

Only additional photos or comments will be provided for the previously recorded sites as their descriptions are provided in **Section 6.1** (see SITE 1B, TET 15, TET 3, TET 13).

Tetra4 Cluster 2 Gas Production Project

Survey Tracklogs

PGS Heritage (Pty) Ltd
Heritage Management Unit

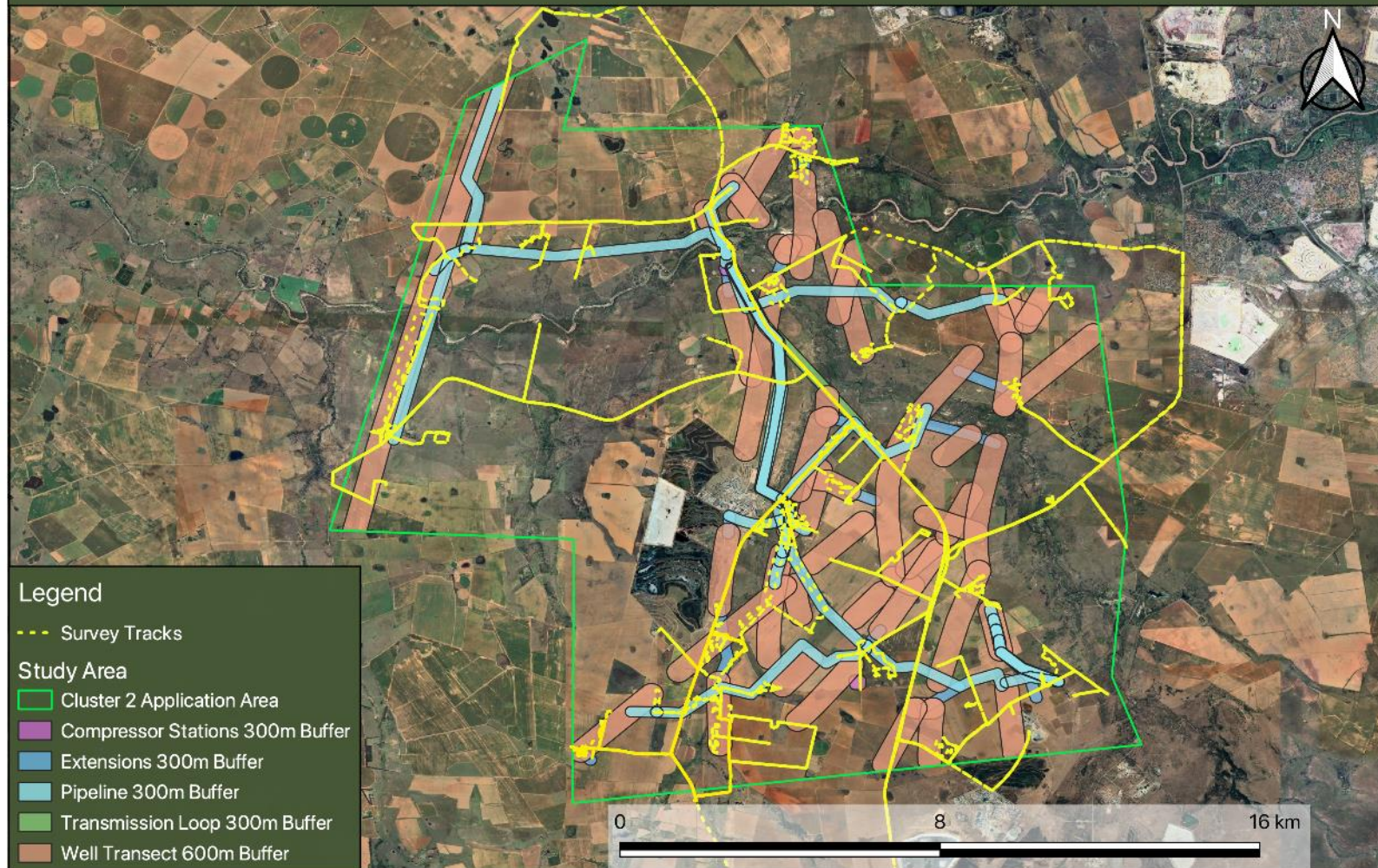


Figure 125 - Survey Tracklogs.

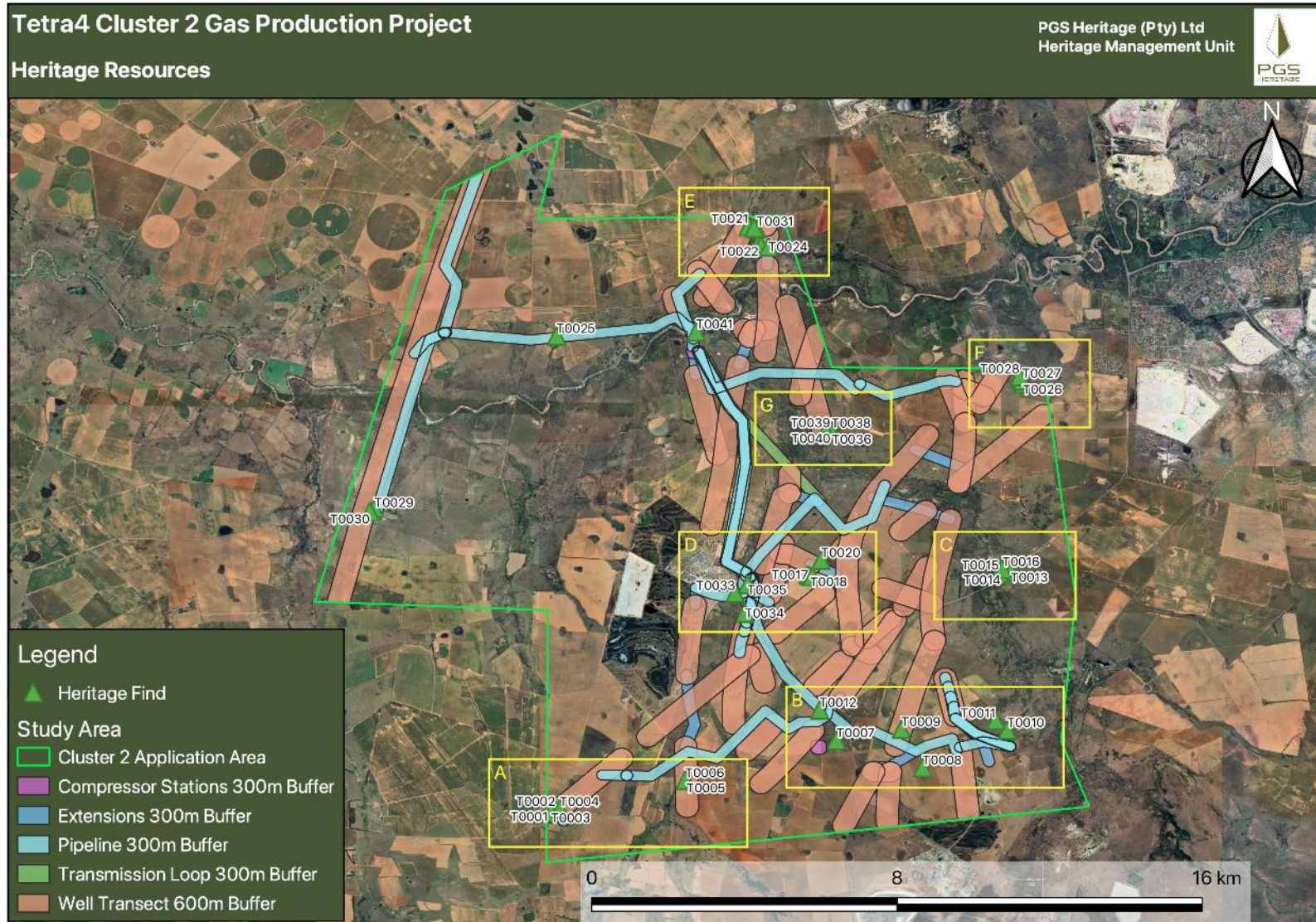


Figure 126 - Heritage Resources identified during the fieldwork. See insets below.

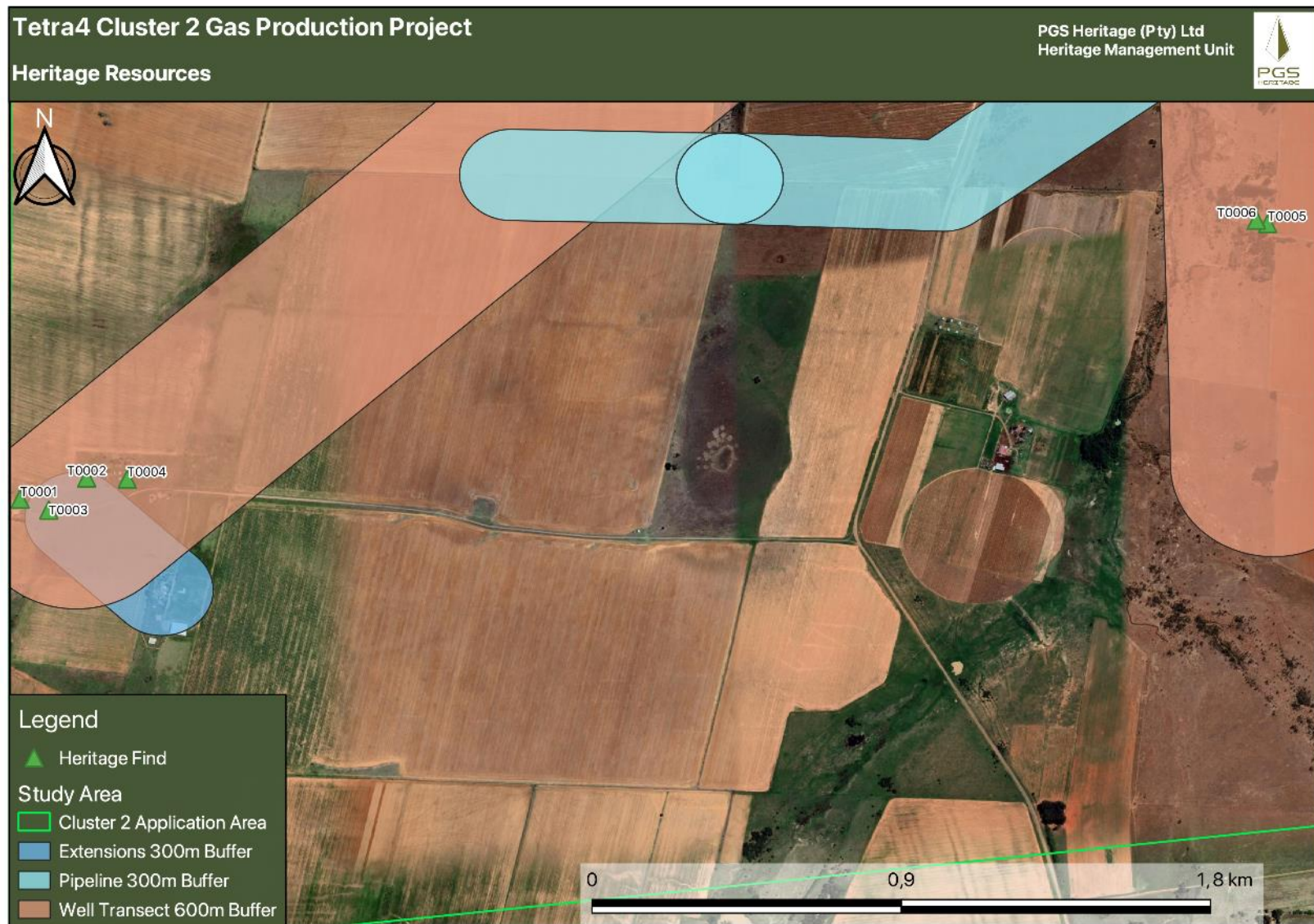


Figure 127 – Heritage Resources identified during the fieldwork. Inset A.

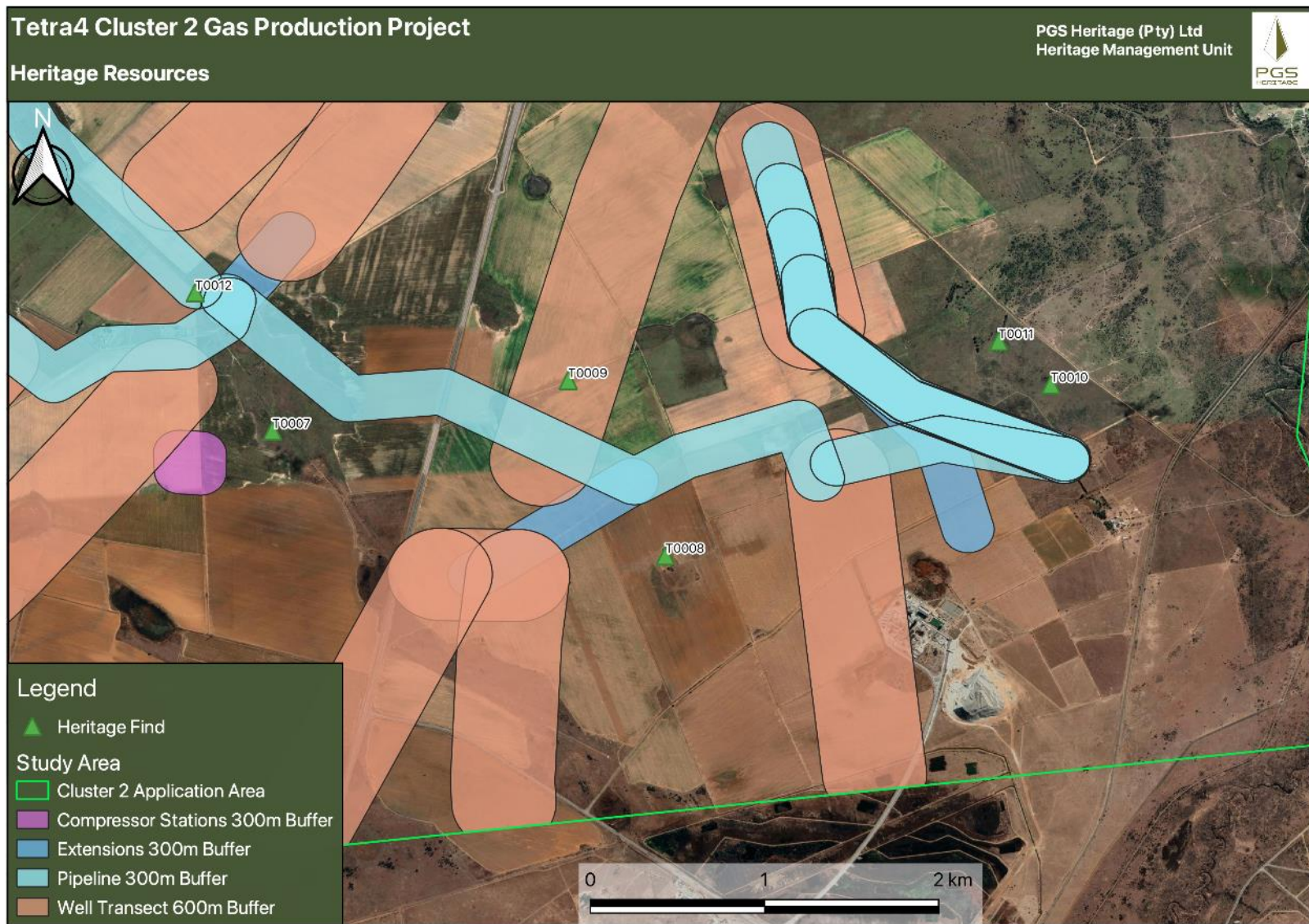


Figure 128 - Heritage Resources identified during the fieldwork. Inset B.

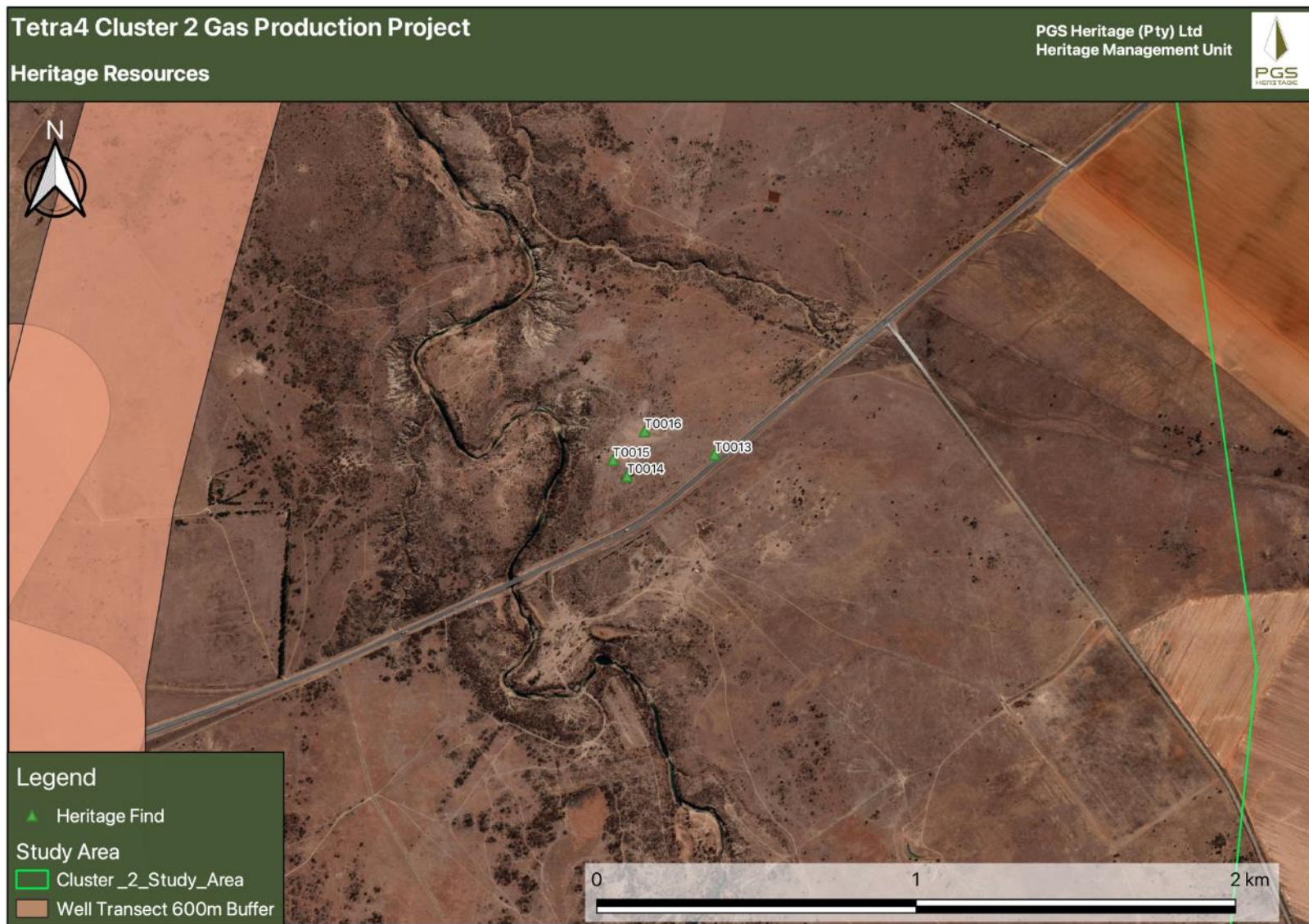


Figure 129 - Heritage Resources identified during the fieldwork. Inset C.

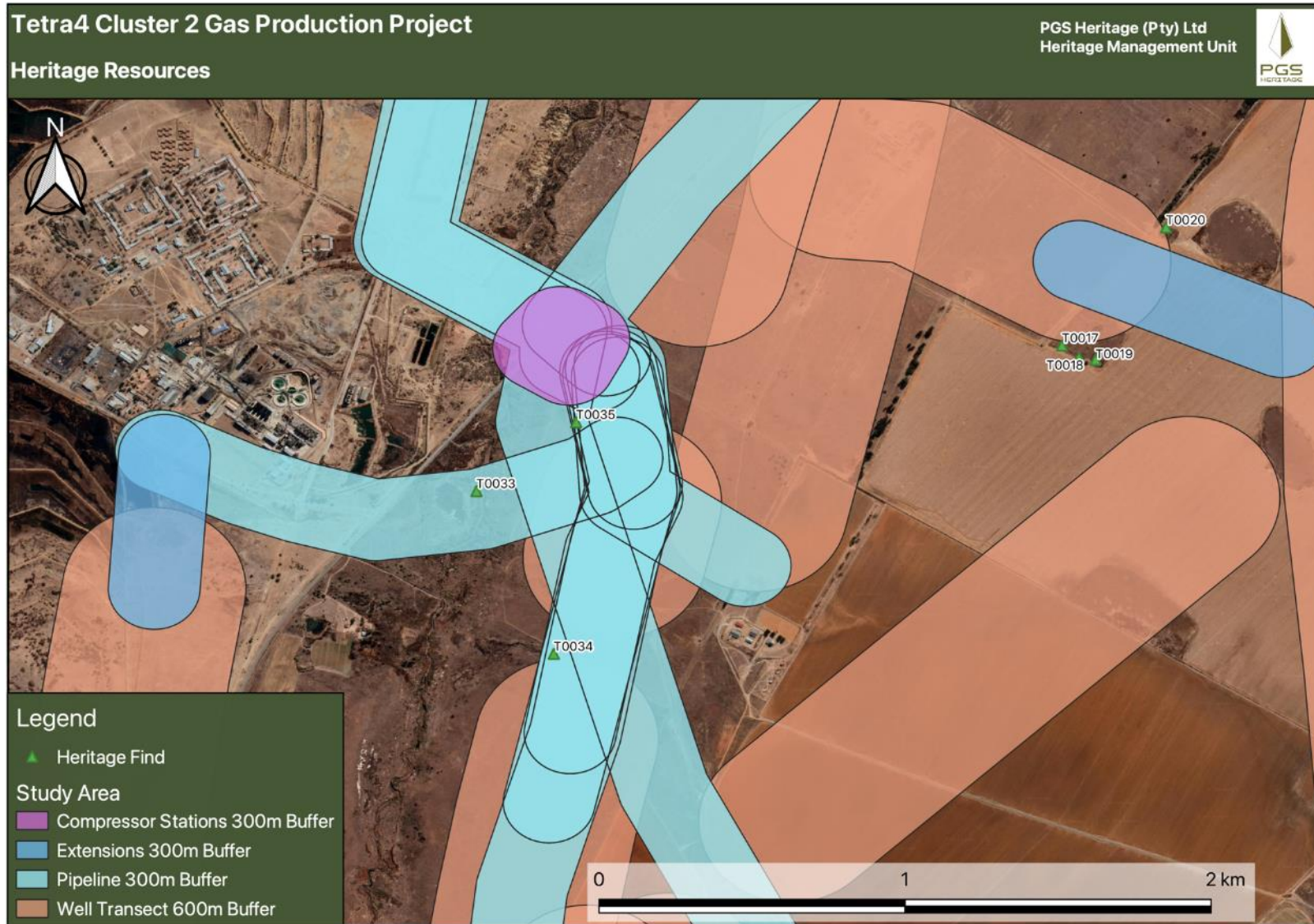


Figure 130 - Heritage Resources identified during the fieldwork. Inset D.

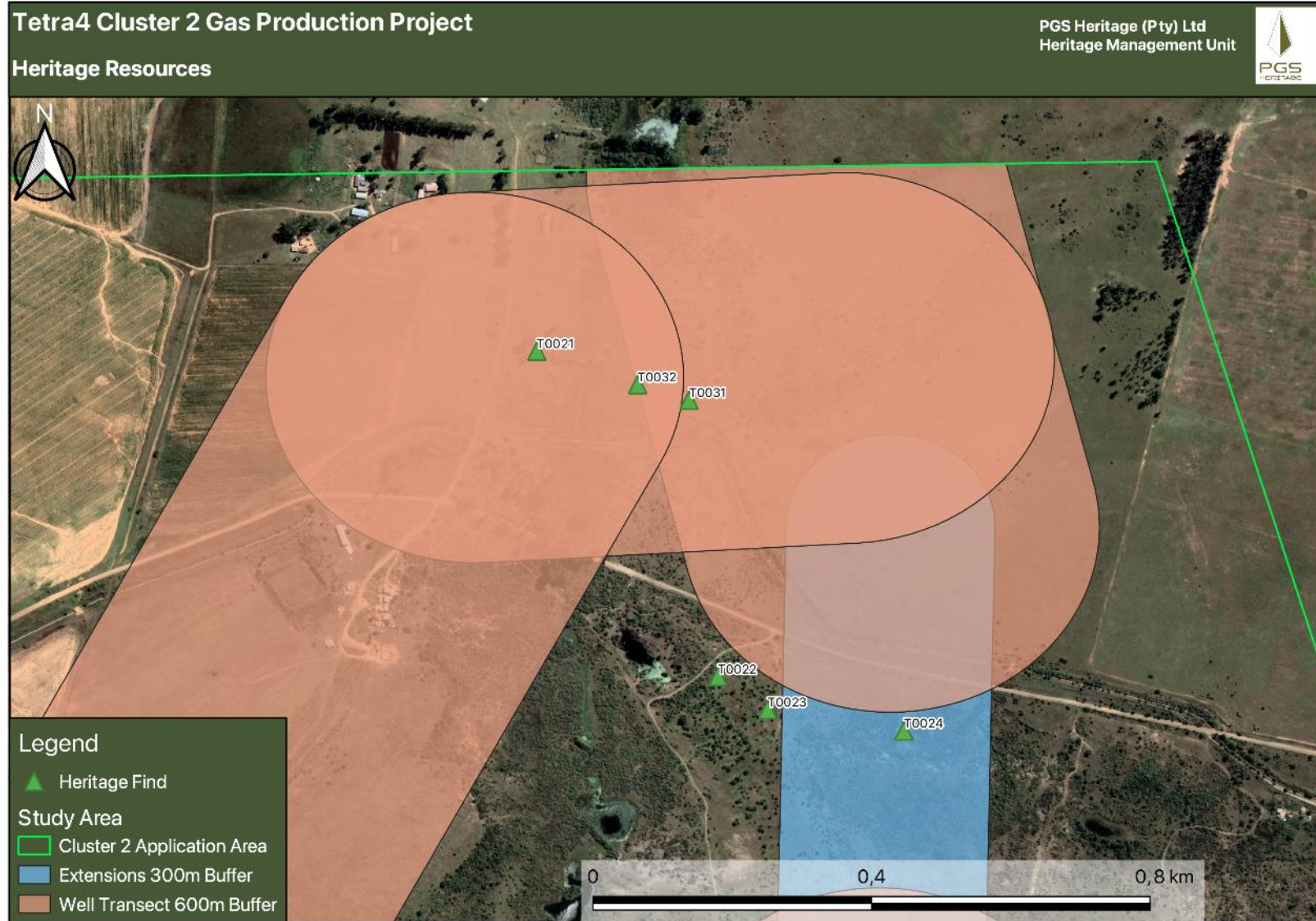


Figure 131 - Heritage Resources identified during the fieldwork. Inset E.

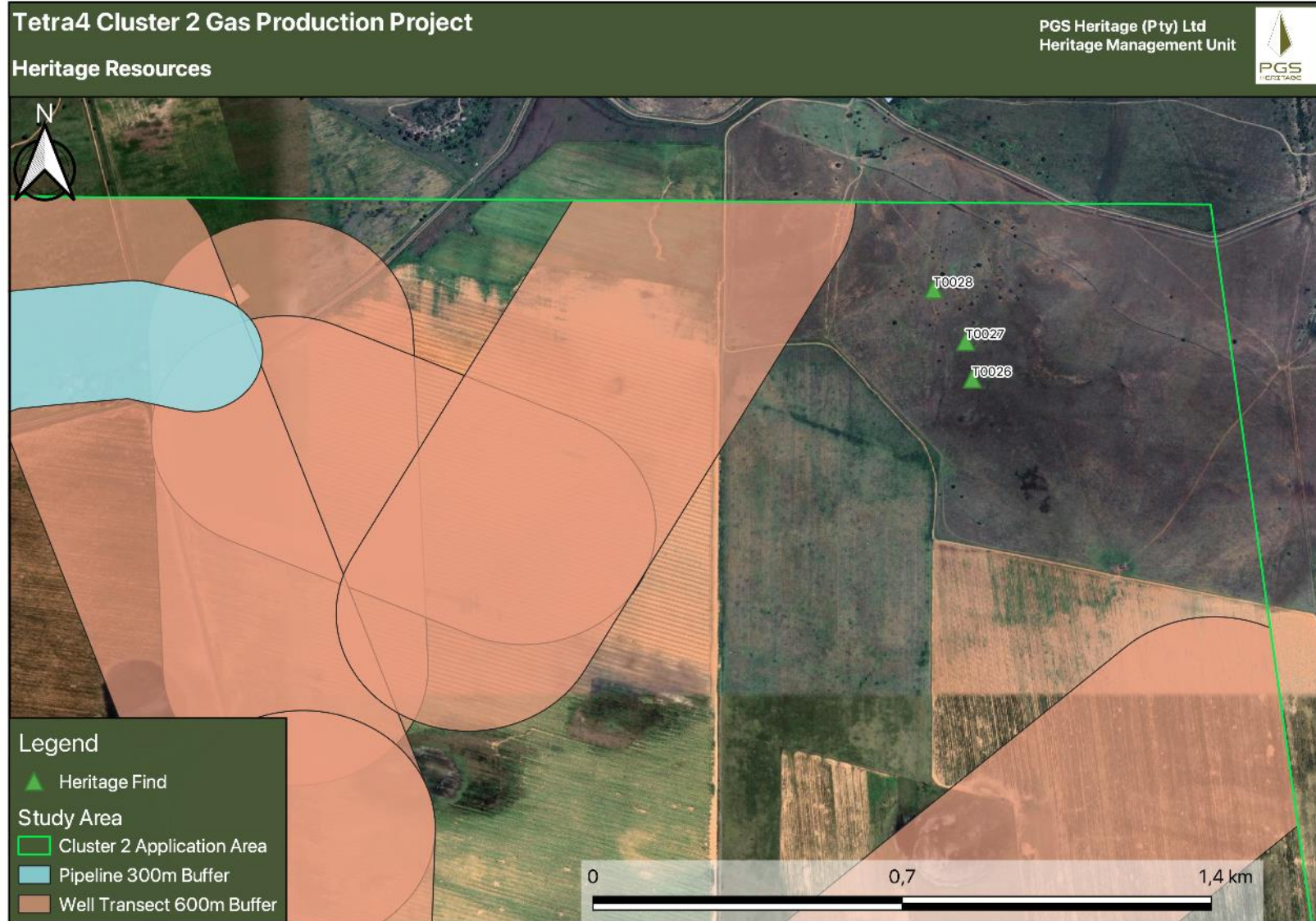


Figure 132 - Heritage Resources identified during the fieldwork. Inset F.

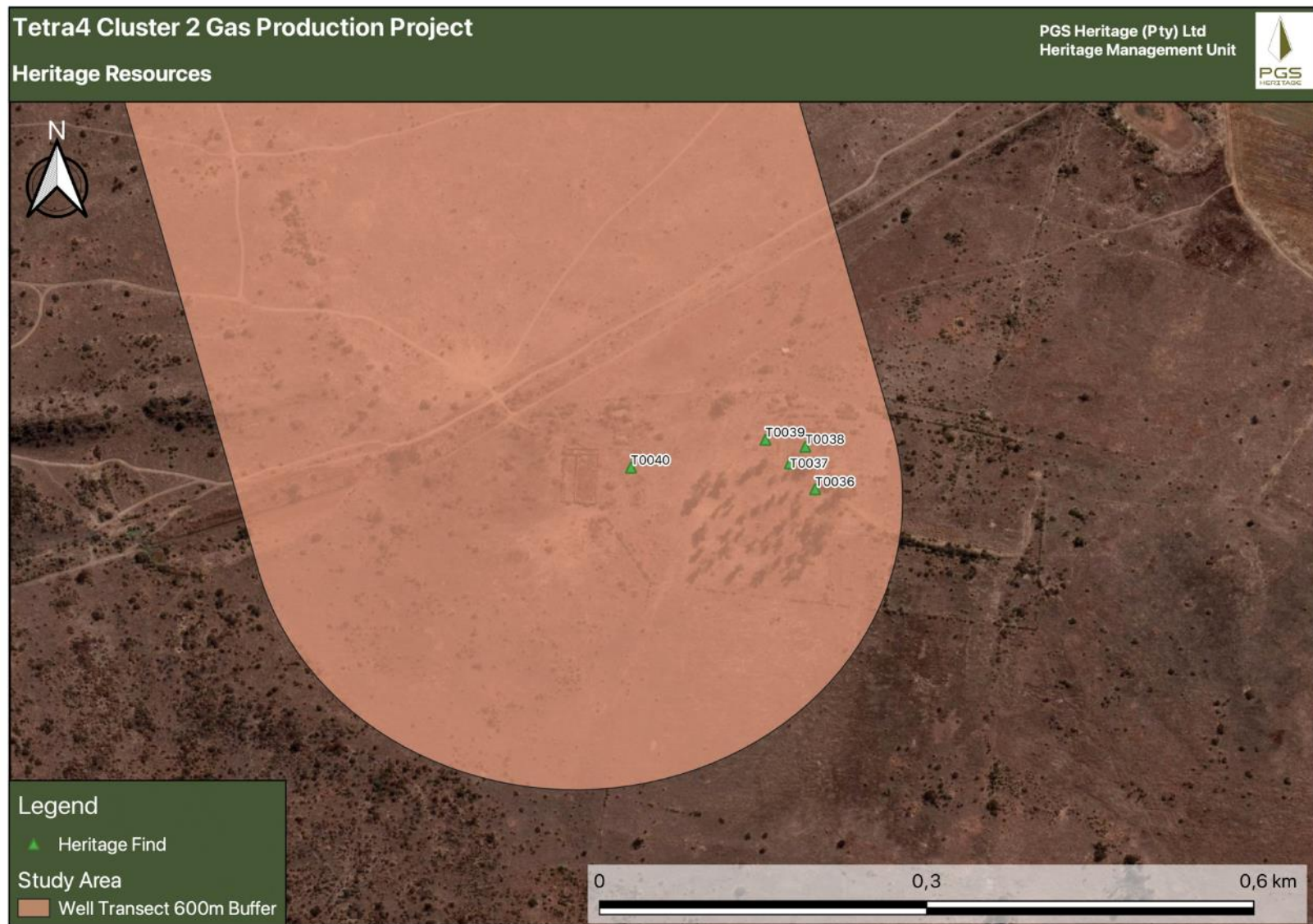


Figure 133 - Heritage Resources identified during the fieldwork. Inset G.

Tetra4 Cluster 2 Gas Production Project

Combined Heritage Resources

PGS Heritage (Pty) Ltd
Heritage Management Unit



Figure 134 - Heritage Resources identifies during previous and current field assessments.

Table 10 - Sites identified during the heritage survey

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
T0001	-.28.247976°S	26.681095°E	<p>The site comprises a fenced-off maize storage facility. It is located on the farm Terra Blanda No.155 in the south-western portion of the proposed development area. Two structures are located adjacent to existing maize fields. The structures had brick walls and one of the structures had a corrugated iron roof. The other structure's roof was missing. The construction materials and technique are consistent with modern building methods. No other cultural material was identified around the site.</p> <p>Extent: Approximately 95m x 150m fenced property. The structures were approx. 10m x 15m and 15 x 20m.</p> <p>The site was not depicted at this locality on the 2826BA topographical sheet dating to 1945 or 1954. Two structures were depicted at this locality on the 2826BA topographical sheet dating to 1997. The site is therefore younger than 60 years and is of no heritage significance. The site is rated as NCW.</p> <p>T0001 is located within a well transect buffer. It is possible that the proposed development will impact on the site.</p>	No research potential or other cultural significance	NCW



Figure 135 – General views of the two structures at T0001.

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
T0003	-.28.248300°S	26.681945°E	<p>A single grave site was found at T0003. It is located within a fenced-off property (T0001) on the farm Terra Blanda No.155. The grave site which may mark the burial place of ashes is marked by an engraved granite block with palisade fencing around it. The inscription on the granite grave dressing reads as follows:</p> <p style="text-align: center;"> “DANIE MEINTJES ★ 05.02.1974 † 12.06.2015 GELIEFDE BROER EN VRIEND TOT ONS WEER SIEN” </p> <p>T0003 is located within an extension buffer. It is possible that the proposed development will impact on the site.</p>	High Significance	IIIA





Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			 		







Figure 136 – General views of T0003.

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
T0002	-28.247349°S	26.683071°E	<p>The site comprises an animal pen and loading ramp. It is located adjacent to maize fields on the farm Terra Blanda No.155.</p> <p>The site is rated as NCW as it has no research potential or is of other cultural significance.</p> <p>T0002 is located within an extension buffer. It is possible that the proposed development will impact on the site.</p>	No research potential or other cultural significance	NCW
 <p><i>Figure 137 – General views of T0002.</i></p>					
T0004	-28.247385°S	26.684274°E	<p>The site comprises five brick labourer dwellings. It is located within an overgrown fenced-off property located adjacent to maize fields on the farm Terra Blanda No.155. The construction materials and technique are consistent with modern building methods. No other cultural material was identified around the site.</p> <p>The site was not depicted at this locality on the 2826BA topographical sheet dating to 1945 or 1954. The site is therefore younger than 60 years. As. No</p>	No research potential or other cultural significance	NCW



Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			<p>additional information was available, the site is provisionally rated as NCW as it has no research potential or is of other cultural significance.</p> <p>T0004 is located within a well transect buffer. It is possible that the proposed development will impact on the site.</p>		
 <p style="text-align: center;"><i>Figure 138 – General views of T0004.</i></p>					
T0005	-28.239803°S	26.718104°E	<p>The site comprises a brick and corrugated iron structure. It is located adjacent to maize fields on the farm Brakspruit No.121 in the south-western portion of the proposed development area. The structure has concrete brick walls and the roof is missing. The construction materials and technique are consistent with modern building methods. No other cultural material was identified around the site.</p> <p>Extent: Approximately 15m x 20m.</p> <p>The site is rated as NCW as it has no research potential or is of other cultural significance.</p> <p>T0005 is located within a well transect buffer. It is possible that the proposed development will impact on the site.</p>	No research potential or other cultural significance	NCW


Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
<div data-bbox="264 268 1131 922" data-label="Image"> </div> <div data-bbox="1137 268 1998 922" data-label="Image"> </div> <p style="text-align: center;"><i>Figure 139 – General views of T0005.</i></p>					
T0006	-.28.239696°S	26.717768°E	Please note that T006 was already recorded in the 2017 assessments as SITE 1B. As such it was described in Table 9.	Medium Significance	IIIB

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			 <p>A satellite image of a landscape. A green triangle is labeled 'T0006' and a red dot is labeled 'SITE 1B'. The terrain appears to be a mix of dark, possibly vegetated areas and lighter, possibly cleared or bare ground.</p>		
<p>Figure 140 – Satellite image illustrating that T0006 was previously recorded as SITE 1B.</p>					

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
					
					
					
					
					
					
Figure 141 – General views of T0006 in an overgrown environment.					

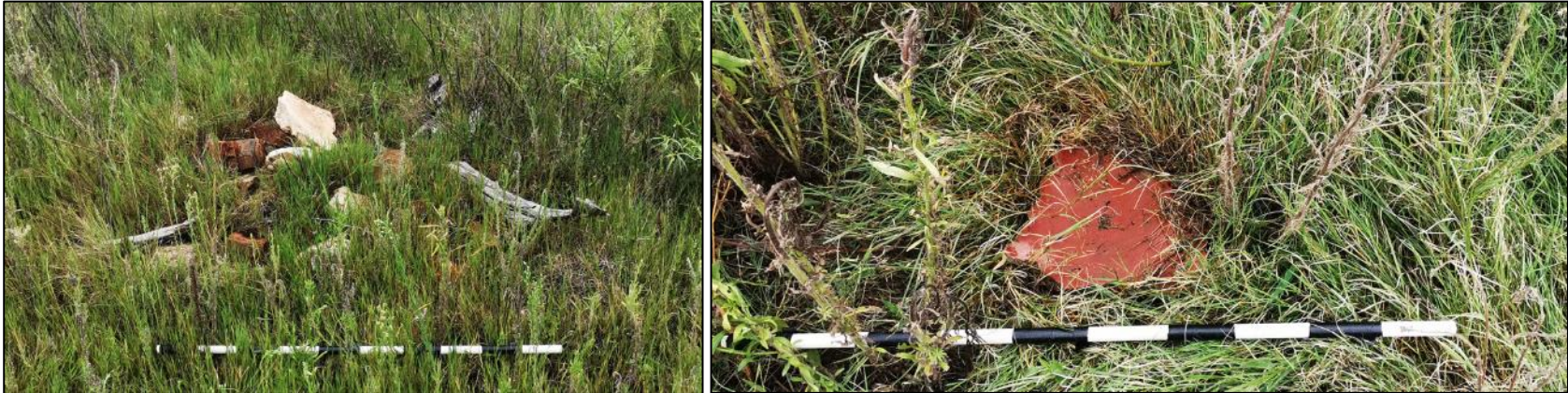

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
T0007	-.28.229026°S	26.758204°E	<p>The site comprises the poorly preserved remains of a structure on the farm Doorn River 330 (Portion 2). It is located in an overgrown partially waterlogged area and all that remains of the structure at the site are a few baked red clay bricks and stone blocks.</p> <p>The exact age of the structure is not known. However, two structures are depicted in proximity to this structure on both the First and Second Editions of the 2826BB topographical sheets that were surveyed in 1945 and 1954 respectively. It seems likely therefore for the site to be potentially older than 60 years.</p> <p>While the structure itself is too poorly preserved to have any heritage significance, the risk does exist for stillborn babies to have been buried here. Until the presence of such possible graves at the site has been proven or disproven, a worst case scenario will be adopted within which it is assumed that such stillborn baby graves are indeed located here.</p> <p>Extent: Approximately 20m x 20m.</p> <p>As T0007 is located outside the proposed development area, no mitigation is required, as no impact is expected.</p>	Medium-High Significance	IIIA

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			 <p>Figure 142 - General views of T0007.</p>		
			 <p>Figure 143 - Sample of building materials observed at T0007.</p>		

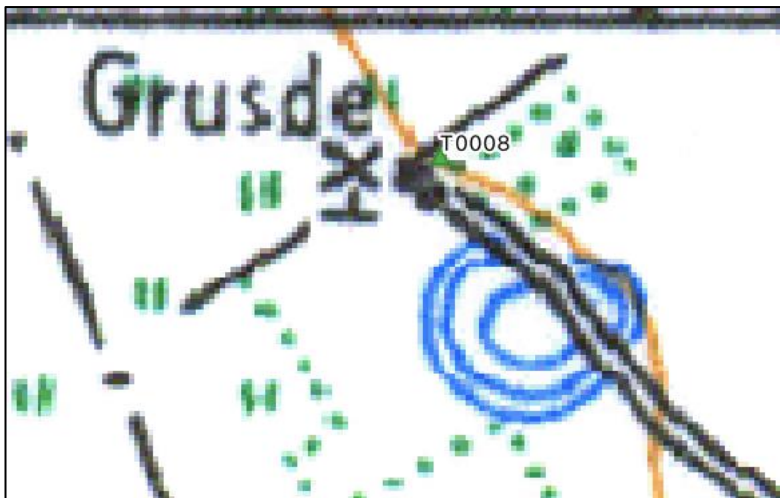
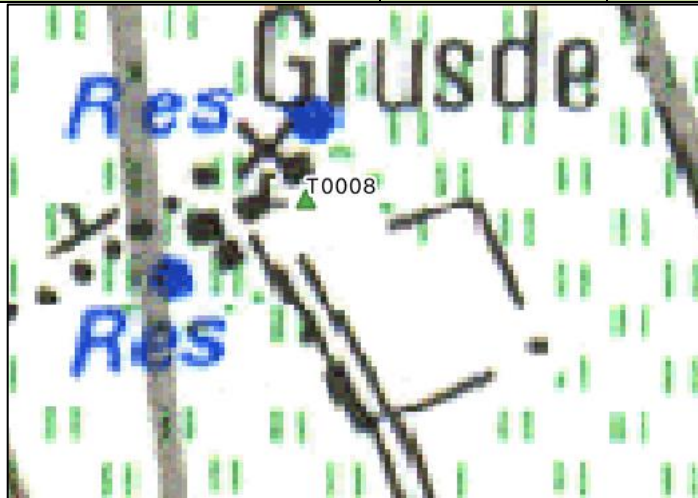
Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
 <p>Figure 144 - 2826BB topographical sheet surveyed in 1945 depicts two structures at T0007.</p>					

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
T0008	-28.236338°S	26.781216°E	<p>The site comprises the poorly preserved remains of several structures (historical farmstead), on the farm Grusde 229. It is located in an overgrown area adjacent to cultivated fields. All that remains of the structure at the site are baked red clay bricks, stone blocks and chunks of foundation (rubble). There is also refuse scattered around the site.</p> <p>The exact age of the structure is not known. However, two huts are depicted in proximity to this structure on the First Edition of the 2826BB topographical sheet that was surveyed in 1945. A structure and a wind pump were depicted at this location on the Second Edition of the 2826BB topographical sheet that was surveyed in 1954. Several structures and a wind pump were depicted at this location on the Third Edition of the 2826BB topographical sheet that was surveyed in 1975. It seems likely therefore for the site to be potentially older than 60 years.</p> <p>While the structure itself is too poorly preserved to have any heritage significance, the risk does exist for stillborn babies to have been buried here. Until the presence of such possible graves at the site has been proven or disproven, a worst case scenario will be adopted within which it is assumed that such stillborn baby graves are indeed located here.</p> <p>Extent: Approximately 80m x 80m.</p> <p>As T0008 is located outside the proposed development area, no mitigation is required, as no impact is expected.</p>	Medium-High Significance	IIIA

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
 <p><i>Figure 145 - General view of T0008.</i></p>					

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			 <p><i>Figure 146 - Rubble observed at T0008.</i></p>  <p><i>Figure 147 - Sample of refuse observed at T0008.</i></p>		

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			 <p>Figure 148 - View of a water trough at T0008.</p>		
			 <p>Figure 149 - 2826BB topographical sheet surveyed in 1945 depicts two huts at T0008.</p>		

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			 <p>Figure 150 - 2826BB topographical sheet surveyed in 1954 depicts a structure and windpump at T0008.</p>		
			 <p>Figure 151 - 2826BB topographical sheet surveyed in 1975 depicts several structures at T0008.</p>		
T0009	-28.226073°S	26.775525°E	<p>The site comprises a single grave located adjacent to a farm track, within maize field, on the farm Rondehoek N.200. The grave is not maintained and the ground has been partially eroded away. The grave is marked by an engraved sandstone headstone. The inscription on the granite grave dressing is weathered by the grave dates to 1937.</p> <p>A grave is depicted at this location on the First Edition of the 2826BB topographical sheet that was surveyed in 1945.</p> <p>T0009 is located within a well transect buffer zone. It is possible that the site may be impacted upon by the proposed development.</p>	High Significance	IIIA


Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
					
Figure 152 - Views of the grave at T0009.					

[illegible]




Figure 153 - Closer view of the grave at T0009.




Figure 154 - 2826BB topographical sheet surveyed in 1945 depicts a grave at T0009.

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
T0010	-28.226324°S	26.803788°E	<p>The site comprises an extensive burial ground with both formal and informal graves. It is located approximately 170m west of a farm track on the farm Digito No. 642. The area is very overgrown but it is estimated that at least fifty graves are located at this site. The burial ground is not maintained and a number of headstones were dislodged. There were several types of grave dressing types identified at the burial ground. For the most part, these grave dressings were orientated along the east-west axis. The following grave dressings were identified at the cemetery:</p> <ul style="list-style-type: none"> ▪ Upright stones at the head and foot of the grave ▪ Stone packed grave dressing with unmarked stone as headstone ▪ Stone packed grave dressing with marked stone headstone ▪ Metal marker without any other dressing components ▪ Stone packed grave dressing with granite headstone ▪ Rectangular brick-line dressing with granite headstone <p>Several huts are depicted in proximity to this burial ground on the First Edition of the 2826BB topographical sheet that was surveyed in 1945. The extensive size of the cemetery suggests that it was associated with a reasonably large community.</p> <p>As T0010 is located outside the proposed development area, no impact is expected.</p>	High Significance	IIIA




Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			 <p><i>Figure 155 - General view of T0010.</i></p>		

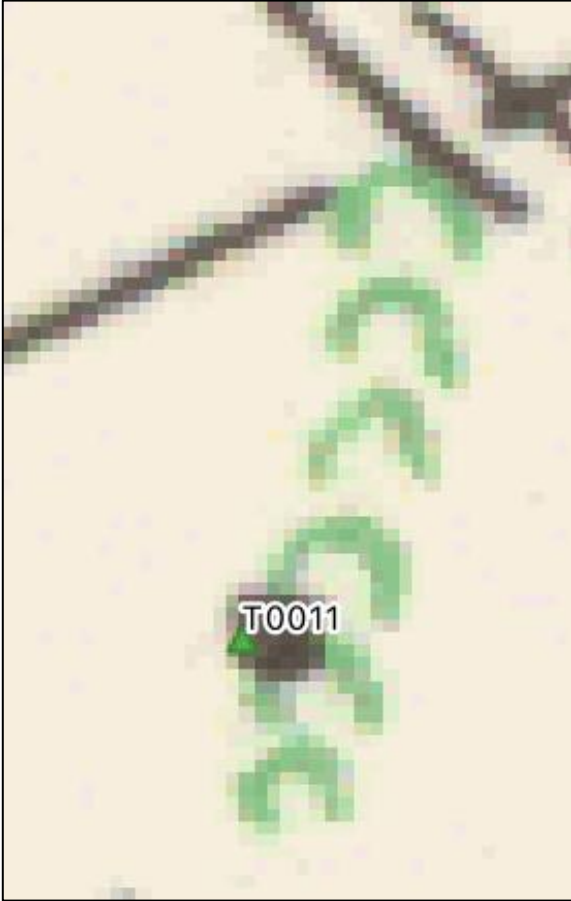
Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			 <p>Figure 156 – View of grave with metal marker at T0010.</p>		
			 <p>Figure 157 - Rectangular brick-line dressing with granite headstone at T0010.</p>		

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			 <p>Figure 158 – View of overgrown stone packed grave dressing at T0010.</p>		
			 <p>Figure 159 - View of overgrown stone packed grave dressing with unmarked stone as headstone at T0010.</p>		
			 <p>Figure 160 – Engraved stone headstone at T0010.</p>		

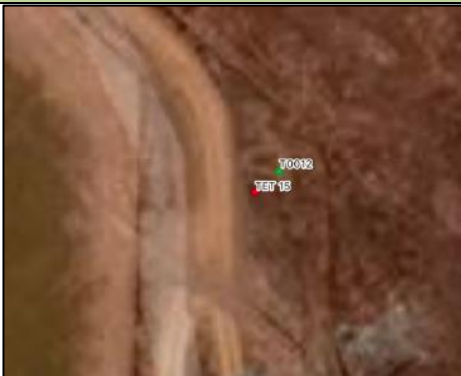

Site number	Lat	Lon	Description		Heritage Significance	Heritage Rating
			 <p>Figure 161 – Overgrown grave with granite headstone at T0010.</p>	 <p>Figure 162 - View of stone headstone at T0010.</p>		
			 <p>Figure 163 - 2826BB topographical sheet surveyed in 1945 depicts several huts at T0010.</p>			

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
T0011	-28.223779°S	26.800728°E	<p>The site comprises the remains of historical structure adjacent to an avenue of trees. It is located in an overgrown area approximately 210m south of a farm track on the farm Digito No. 642.</p> <p>All that remains of the structure at the site are baked red clay bricks, stone and cement blocks (rubble).</p> <p>The exact age of the structure is not known. However, a structure is depicted at this location on the First Edition of the 2826BB topographical sheet that was surveyed in 1945. It seems likely therefore for the site to be potentially older than 60 years.</p> <p>While the structure itself is too poorly preserved to have any heritage significance, the risk does exist for stillborn babies to have been buried here. Until the presence of such possible graves at the site has been proven or disproven, a worst case scenario will be adopted within which it is assumed that such stillborn baby graves are indeed located here.</p> <p>Extent: Approximately 80m x 80m.</p> <p>As T0011 is located outside the proposed development area, no mitigation is required, as no impact is expected.</p>	Medium-High Significance	IIIA


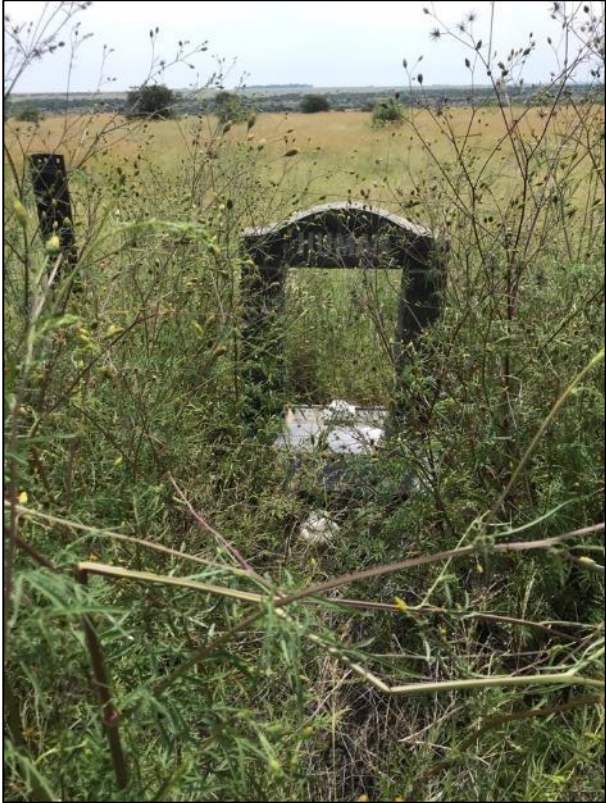
Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			 <p><i>Figure 164 - General view of T0011.</i></p>		
			 <p><i>Figure 165 - View of rubble at T0011.</i></p>	 <p><i>Figure 166 - Closer view of rubble at T0011.</i></p>	

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
					
<p><i>Figure 167 - 2826BB topographical sheet surveyed in 1945 depicts a structure and avenue of trees at T0011.</i></p>					

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
T0012	-28.220937°S	26.753686°E	<p>Please note that T012 was already recorded in the 2017 assessments as TET 15. As such it was described in Table 9.</p> <p>At the time of the field assessment the two graves were overgrown and waterlogged.</p>	High Significance	IIIA

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			 <p>Figure 168 – Satellite image illustrating that T0012 was previously recorded as TET 15.</p>		
			 <p>Figure 169 – General views of the overgrown and waterlogged graves at T0012.</p>		

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
T0013	-28.184090°S	26.804759°E	<p>The site comprises a fenced-off burial ground with five graves (two formal, three informal). It is located adjacent to a tar road (R730) on the farm Doorn River No.330 (Portion 5). Graves of the Human family were found here.</p> <p>The area is very overgrown and is not maintained. There were several types of grave dressing types identified at the burial ground. For the most part, these grave dressings were orientated along the east-west axis. The following grave dressings were identified at the cemetery:</p> <ul style="list-style-type: none"> ▪ Stone packed grave dressing with unmarked stone as headstone ▪ Rectangular brick-line dressing with granite headstone <p>The inscription on the one granite grave dressing reads as follows:</p> <p style="text-align: center;"> "IN MEMORIAM HIER RUS ONS DIERBARE EGGNOTE EN MOEDER SUSANNA ELIZABETH HUMAN (GEE. MARAIS) GEB. 9 JULIE 1872 - OVERL. 22 NOV 1928 STILLE RUST PLAATS VAN GOD'S DOGTER..." </p> <p>A grave is depicted in proximity to this burial ground on the Third Edition of the 2826BB topographical sheet that was surveyed in 1975.</p> <p>As T0013 is located outside the proposed development area, no impact is expected.</p>	High Significance	IIIA

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			<div>   </div> <p>Figure 172 – Views of the two granite headstones observed at T0013.</p>		






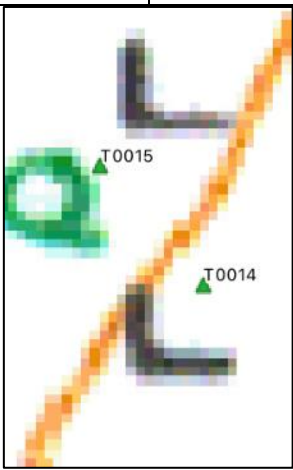

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
					


Figure 173 - 2826BB topographical sheet surveyed in 1975 depicts a grave at T0013.

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
T0014	-28.184780°S	26.801970°E	<p>The site comprises the remains of a historical structure. adjacent to a tar road (R730) on the farm Doorn River No.330 (Portion 5). It is likely that the graves at T0013 are associated with T0014. The materials used in the construction indicate a mix of local stone and modern plastered brick, which suggests modification and additions through time. There is also refuse (incl. a horse shoe) scattered around the site.</p> <p>Extent: Approximately 9m x 12m.</p> <p>Two structures were depicted at this locality on the 2826BB topographical sheet dating to 1945 and 1954. It seems likely therefore for the site to be potentially older than 60 years. As no additional information was available, the site is provisionally rated as IIIB with medium heritage significance.</p> <p>T0014 is located outside of the proposed development areas. It is unlikely that the proposed development will impact on the site.</p>	Medium Significance	IIIB
					



Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
					
Figure 174 - General views of the ruin at T0014.					


Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			 <p>Figure 175 - Horse shoe identified at T0014.</p>		
			 <p>Figure 176 - 2826BB topographical sheet surveyed in 1945 depicts a grave at T0014.</p>		
			 <p>Figure 177 - 2826BB topographical sheet surveyed in 1954 depicts a grave at T0014.</p>		

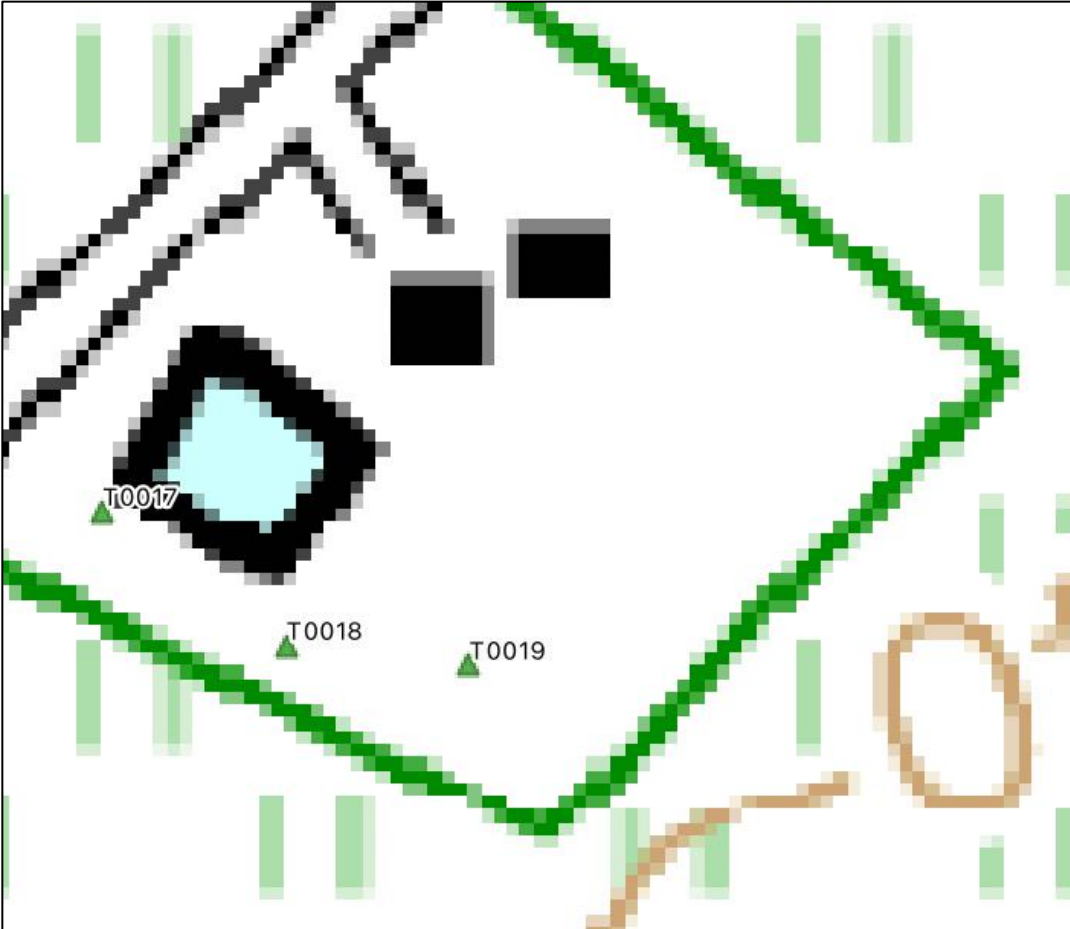
Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
T0015	-28.184260°S	26.801520°E	<p>The site is a possible grave situated adjacent to T0014. The only indication that it is possibly a grave is the stones at the head and foot.</p> <p>T0015 is located outside of the proposed development areas. It is unlikely that the proposed development will impact on the site.</p>	High Significance	IIIA
 <p><i>Figure 178 - General view of T0015.</i></p>					
T0016	-28.183344°S	26.802529°E	<p>The site comprises a stone kraal which is divided into a large and smaller enclosure. It is likely that the graves (T0013) and ruin (T0014) are associated with this site. No other cultural material was identified around the site.</p> <p>Extent: approximately 15m x 42m and 8m x 15m</p>	Low Significance	IIIC


Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			<p>As no additional information was available, the site is provisionally rated as IIIC with low heritage significance.</p> <p>T0016 is located outside of the proposed development areas. It is unlikely that the proposed development will impact on the site.</p>		
 <p>Figure 179 - General views of the stone kraals at T0016.</p>					


Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
T0017	-28.184868°S	26.750606°E	<p>The site comprises a historical reservoir which is located adjacent to ploughed fields in a very overgrown area. It is situated on the farm Kalkoenkrans No. 225 (Portion 2).</p> <p>Extent: approximately 50m x 58m</p> <p>A reservoir was depicted at this locality on the 2826BB topographical sheet dating to 1975. As no additional information was available, the site is provisionally rated as IIIC with low heritage significance.</p> <p>T0017 is located within a well transect buffer. It is possible that the proposed development will impact on the site.</p>	Low Significance	IIIC

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
					
<p><i>Figure 180 - General views of T0017.</i></p>					
					
<p><i>Figure 181 - 2826BB topographical sheet surveyed in 1975 depicts a grave at T0017.</i></p>					


Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
T0018 and T0019	-28.185277°S/ -28.185337°S	26.751167°E/ 26.751725°E	<p>The site comprises numerous concrete foundations of structures which are located in a very overgrown area. It is situated on the farm Kalkoenkrans No. 225 (Portion 2). A possible midden was also identified in the area.</p> <p>Several structures were depicted at this locality on the 2826BB topographical sheet dating to 1997. As no additional information was available, and all the structures have been demolished, the site is provisionally rated as IIIC with low heritage significance.</p> <p>The site is located within a well transect buffer. It is possible that the proposed development will impact on the site.</p>	Low significance	IIIC
 <p>Figure 182 - General views of T0018 and T0019.</p>					



Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
					
<p>Figure 183 - 2826BB topographical sheet surveyed in 1997 depicts two structures in the vicinity of T0018 and T0019.</p>					





Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
T0020	-28.180938°S	26.7544069°E	<p>The site comprises the remains of a core yard which are located in a very overgrown area. It is situated on the farm Kalkoenkrans No. 225 (Portion 2). A possible midden was also identified in the area.</p> <p>As no additional information was available, the site is provisionally rated as IIIC with low heritage significance.</p> <p>The site is located within a well transect buffer. It is possible that the proposed development will impact on the site.</p>	Low significance	IIIC
 <p><i>Figure 184 - General views of T0020.</i></p>					
T0021	-28.091772°S	26.734648°E	<p>The site comprises the remains of a historical farm complex. adjacent to a farm track, approximately 300m south-east of the existing farm house on the farm Adamsonsvlei 655. It is likely that the sites at is also associated with TET 1, TET 2 and TET 3. The materials used in the construction indicate a mix of local stone, baked red clay bricks and concrete, which suggests modification and additions through time. There is also the remains of a stone fountain and an anti-erosional wall.</p> <p>Extent: Approximately 40m x 50m.</p> <p>Two structures were depicted at this locality on the 2826BA topographical sheet dating to 1945 and multiple structures were depicted at this locality on</p>	Medium Significance	IIIB

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			<p>the 2826BA topographical sheet dating to 1954. It seems likely therefore for the site to be potentially older than 60 years. As no additional information was available, the site is provisionally rated as IIIB with medium heritage significance.</p> <p>T0021 is located within a well transect buffer. It is possible that the proposed development will impact on the site.</p>		
					


Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
					
<p><i>Figure 185 - General views of the historical farmstead ruin at T0021.</i></p>					
			 		



Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
					
<p><i>Figure 186 - Views of the different building materials and methods observed at T0021.</i></p>					

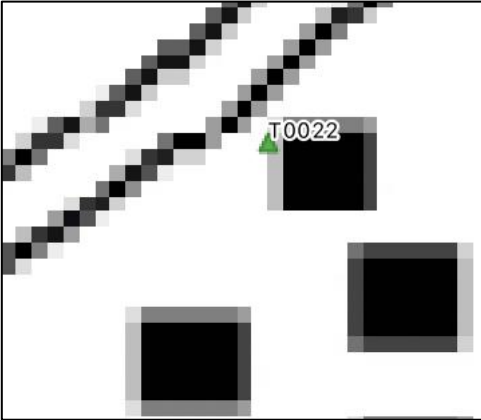
Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			 <p><i>Figure 187 - View of the remnants of walling at T0021.</i></p>		
			 <p><i>Figure 188 - Views of foundations observed at T0021.</i></p>		



Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			 <p><i>Figure 189 - View of the stone fountain at T0021.</i></p>		
			 <p><i>Figure 190 - View of anti-erosion walling at T0021.</i></p>		
			 <p><i>Figure 191 - 2826BA topographical sheet surveyed in 1945 depicts two structures in the vicinity of T0021.</i></p>		
			 <p><i>Figure 192 - 2826BA topographical sheet surveyed in 1954 depicts several structures and an anti-erosion wall in the vicinity of T0021.</i></p>		


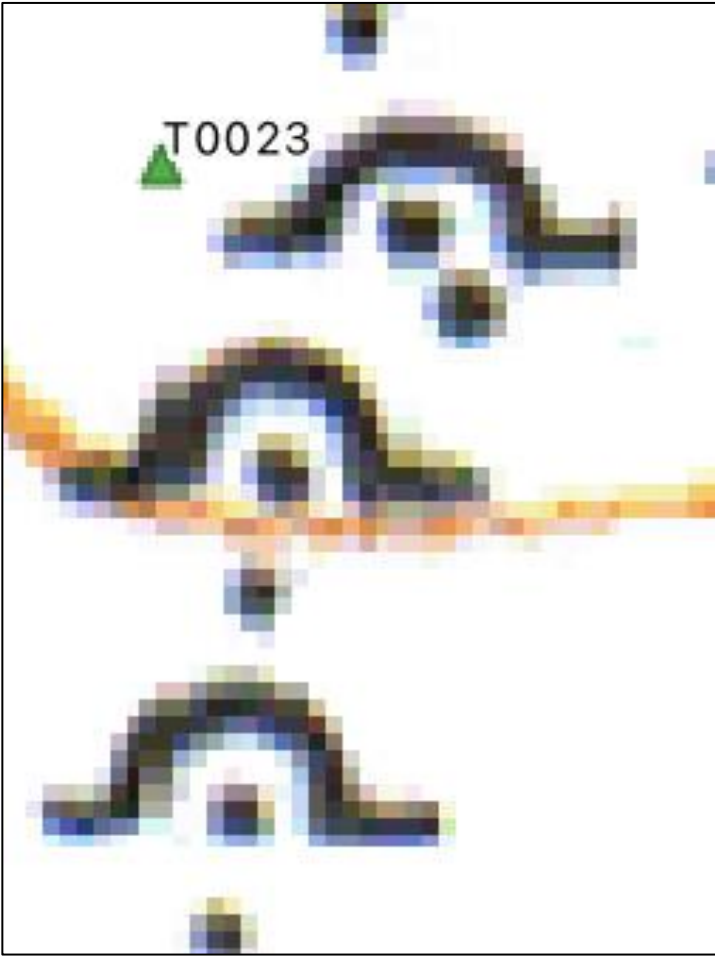
Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
T0022	-28.096527°S	26.737295°E	<p>The site comprises two ruins located adjacent to a farm track on the farm Adamsonsvlei 655. The structures were made out of clay sundried bricks, stone and wood. No other cultural material was identified around the site.</p> <p>Several structures were depicted at this locality on the 2826BA topographical sheet dating to 1997. As no additional information was available, the site is provisionally rated as IIIC with low heritage significance.</p> <p>T0022 is located approx. 50m outside of a proposed well transect buffer . It is unlikely that the proposed development will impact on the site.</p>	Low Significance	IIIC

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
 <p><i>Figure 193 - General view of the ruins at T0022.</i></p>					


Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			 		
<p><i>Figure 194 - Closer view of the construction materials used at T0021.</i></p>					



Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			 <p><i>Figure 195 - 2826BA topographical sheet surveyed in 1997 depicts several structures in the vicinity of T0021.</i></p>		
T0023	-28.097008°S	26.738023°E	<p>The site was depicted as a several huts, on the farm Adamsonsvlei No. 655, on an early topographic map sheet surveyed during the 1940s and 1950s. The remains of the site identified in the field consist of a stone and brick rubble.</p> <p>Although the exact age of the structure is not known, it is certainly older than 60 years. The Primrose bricks observed at the site may date back to the 1930s-40s. The bricks were made by hand, sun-dried and kiln-baked.</p> <p>Several huts were depicted at this locality on the 2826BA topographical sheet dating to 1945 and 1954. It must be noted that in terms of black African tradition, stillborn babies were often buried in unmarked graves underneath or adjacent to the homesteads of their parents. Until the presence of such possible graves at the site has been proven or disproven, a worst-case scenario will be adopted within which it is assumed that such stillborn baby graves are indeed located here.</p> <p>As T0023 is approx. 20m adjacent to a well transect buffer zone, it is possible that the site may be impacted upon by the proposed development.</p>	Medium-High Significance	IIIA




Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			 <p>Figure 196 - General view of T0023.</p>		
			 <p>Figure 197 - View of stone and brick rubble observed at T0023.</p>		

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			 <p>Figure 198 - Section of the 1945 topographical map showing two huts in the vicinity of T0023.</p>		
			 <p>Figure 199 - Section of the 1954 topographical map showing three huts in the vicinity of T0023.</p>		


Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
T0024	-28.097317°S	26.740014°E	<p>An extensive cemetery comprising at least 100 formal and informal graves is located on the farm Adamsonsvlei No. 655. The cemetery is very overgrown and not maintained, and as such the exact number of graves could not be determined. It is evident that the cemetery is still being used as more recent grave sites were observed. A number of headstones were seen in a fallen-down state and some grave sites were being eroded out.</p> <p>Several different grave dressing types could be identified at the cemetery. For the most part, these grave dressing were orientated along the east-west axis. The following grave dressings were identified at the cemetery:</p> <ul style="list-style-type: none"> ▪ Upright stones at the head and foot of the grave ▪ Stone packed grave dressing with upright unmarked stone as headstone ▪ Stone packed grave dressing with metal marker as headstone ▪ Rectangular brick-line dressing with granite headstone ▪ Rectangular brick-lined dressing with cement headstone ▪ Rectangular granite-lined dressing with granite headstone ▪ Metal marker without any other dressing components ▪ Cement headstone without any other dressing components <p>A churchyard was depicted at this locality on the 2826BA topographical sheet dating to 1945. The extensive size of the cemetery suggests that it was associated with a reasonably large community and that several generations of families have been buried at this site.</p> <p>Extent: Approximately 55m x 75m.</p> <p>As T0024 is located within an extension buffer zone, it is possible that the site may be impacted upon by the proposed development.</p>	High Significance	IIIA

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
					
<p><i>Figure 200 - Views of the signage and access gate to T0024.</i></p>					



Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			 <p>Figure 201 – One of the formal graves observed at T0024.</p>		
			 <p>Figure 202 – View of a cement headstone at T0024.</p>		



Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			 <p>Figure 203 – One of the stone packed grave dressings at T0024.</p>	 <p>Figure 204 – View of a metal grave marker at T0024.</p>	
			 <p>Figure 205 - Section of the 1945 topographical map showing a churchyard in the proximity of T0024.</p>		

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
T0025	-28.121075°S	26.683404°E	<p>The site comprises a ruin and stone wall reservoir. It is located adjacent to a farm track on the Farm De Klerks Kraal No.231 (portion 7). The structure was made out of bricks and cement. No other cultural material was identified around the site.</p> <p>No structure was depicted on any of the topographical maps but a reservoir was depicted adjacent to this locality on the 2826BA topographical sheet dating to 1997. As no additional information was available, the site is provisionally rated as IIIC with low heritage significance.</p> <p>As T0025 is located within a pipeline buffer zone, it is possible that the site may be impacted upon by the proposed development.</p>	Low Significance	IIIC


Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			<div></div>		
<p>Figure 206 - General views of the ruin at T0025.</p>					
			<div></div>		
<p>Figure 207 - General view of the overgrown stone wall reservoir at T0025.</p>			<p>Figure 208 - Section of the 1997 topographical map showing a reservoir at T0025.</p>		

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
T0026	-28.133914°S	26.807963°E	<p>The site comprises the remains of homestead in a very overgrown field on the Farm Hakkies No. 742. The site was depicted as a single hut on the 2826BB topographic map sheet surveyed during the 1940s. Several huts were depicted on the topographical map sheet surveyed during the 1950s. The remains of the site identified in the field consist of a line of stones. Although the exact age of the structure is not known, it is certainly older than 60 years.</p> <p>It must be noted that in terms of black African tradition, stillborn babies were often buried in unmarked graves underneath or adjacent to the homesteads of their parents. Until the presence of such possible graves at the site has been proven or disproven, a worst-case scenario will be adopted within which it is assumed that such stillborn baby graves are indeed located here.</p> <p>As T0026 is not located within the proposed development area, it is unlikely that the site may be impacted upon.</p>	Medium-High Significance	IIIA

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			 <p><i>Figure 209 - General view of T0026.</i></p>		
			 <p><i>Figure 210 - View of the line of stones observed at T0026.</i></p>		

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
T0026			 <p>Figure 211 - Section of the 1945 topographical map showing a single hut at T0026.</p>		
			 <p>Figure 212 - Section of the 1954 topographical map showing several huts in the proximity of T0026.</p>		
T0027	-28.133049°S	26.807810°E	<p>The site comprises the remains of homestead in a very overgrown field on the Farm Hakkies No. 742. The site was depicted as a single hut on the 2826BB topographic map sheet surveyed during the 1940s. Several huts were depicted on the topographical map sheet surveyed during the 1950s. The remains of the site identified in the field consist of a few lines of stones and fragments of ceramics, glass and metal. Although the exact age of the structure is not known, it is certainly older than 60 years.</p> <p>It must be noted that in terms of black African tradition, stillborn babies were often buried in unmarked graves underneath or adjacent to the homesteads of their parents. Until the presence of such possible graves at the site has been proven or disproven, a worst-case scenario will be adopted within which it is assumed that such stillborn baby graves are indeed located here.</p>	Medium-High Significance	IIIA

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			As T0027 is not located within the proposed development area, it is unlikely that the site may be impacted upon.		

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
					
<p><i>Figure 213 - General view of T0027.</i></p>					

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			  		

Figure 214 - Sample of ceramic fragments observed at T0027.

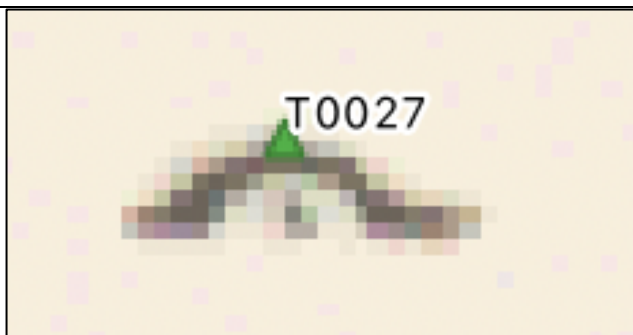


Figure 215 - Section of the 1945 topographical map showing a single hut at T0027.

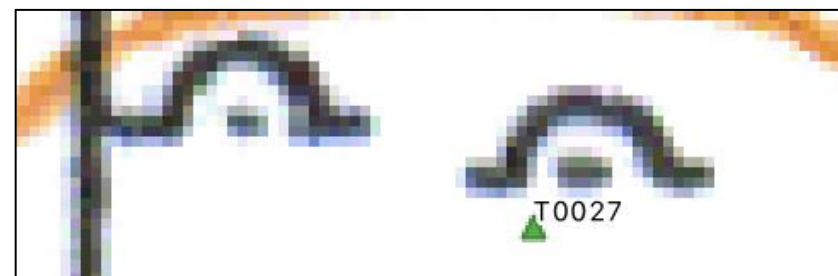



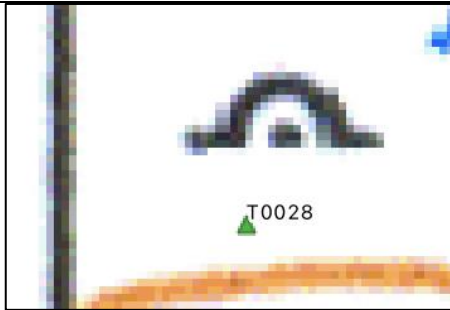



Figure 216 - Section of the 1954 topographical map showing several huts in the proximity of T0027.

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
T0028	-28.131855°S	26.807071°E	<p>The site comprises the remains of homestead in a very overgrown field on the Farm Hakkies No. 742. The site was depicted as a single hut on the 2826BB topographic map sheet surveyed during the 1940s. Several huts were depicted on the topographical map sheet surveyed during the 1950s. The remains of the site identified in the field consist of lines of stones and fragments of ceramics, glass and metal. Although the exact age of the structure is not known, it is certainly older than 60 years.</p> <p>It must be noted that in terms of black African tradition, stillborn babies were often buried in unmarked graves underneath or adjacent to the homesteads of their parents. Until the presence of such possible graves at the site has been proven or disproven, a worst-case scenario will be adopted within which it is assumed that such stillborn baby graves are indeed located here.</p> <p>As T0028 is not located within the proposed development area, it is unlikely that the site may be impacted upon.</p>	Medium-High Significance	IIIA

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			 <p>Figure 217 - Views of stone lines at T0028.</p>		

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
					
<p>Figure 218 - Fragments of metal and glass observed at T0028.</p>					
					
<p>Figure 219 - Section of the 1945 topographical map showing a single hut at T0028.</p>					
<p>Figure 220 - Section of the 1954 topographical map showing a single hut in proximity to T0028.</p>					

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
T0029	-28.167103°S	26.634733°E	<p>The site comprises a grave on the farm Dankbaarheid No. 16. The area is very overgrown and the fenced off grave is not maintained. It is possible that additional unmarked graves are located within the vicinity of the site. The inscription on the granite grave dressing reads as follows:</p> <p style="text-align: center;"> “BOTHMA HIER RUS ONS VADER JACOBUS JOHANNES CEB. 20.3.1875 – OORL.16.1.1910 GOD IS LIEFDE” </p> <p>A single grave is depicted at this locality on the 2826BA topographical sheet dating to 1997.</p> <p>T0029 is located within a pipeline and well transect buffer. It is therefore possible that the site will be impacted upon by the proposed development.</p>	High Significance	IIIA

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			 <p><i>Figure 221 - General view of T0029.</i></p>		


Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
					
					

Figure 222 - Views of the grave observed at T0029.

Figure 223 - Section of the 1997 topographical map showing a grave in proximity to T0029.

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
T0030	-28.168002°S	26.633488°E	<p>The site comprises the remains of stone walling on the Farm Jordaans Rust No.59</p> <p>The site possibly represents the remnants of a kraal that was depicted at this locality on the 2826BA topographical sheet dating to 1945. The kraal was associated with the main farmstead but the construction of a farm road in the area destroyed the site.</p> <p>T0030 is located within a well transect buffer, but due to its current state the possible impact of the proposed development will be negligible.</p>	No research potential or other cultural significance	NCW

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
<div data-bbox="271 268 1993 834" data-label="Image"> </div> <div data-bbox="927 860 1330 898" data-label="Caption"> <p>Figure 224 - Views of the T0030.</p> </div>					
<div data-bbox="517 911 1740 1305" data-label="Image"> </div> <div data-bbox="562 1331 1697 1369" data-label="Caption"> <p>Figure 225 - Section of the 1945 topographical map showing a kraal within the vicinity of T0030.</p> </div>					

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
T0031	-28.092487°S	26.736873°E	<p>The site comprises a small concentration of stones. It is located within an overgrown field on the Farm Adamsonsvlei 655. No other cultural material was identified around the site.</p> <p>A structure was not depicted at this locality on any of the 2826BA topographical sheets. However on the topographical sheet dating to 1997, a farm track is depicted at this locality. It is possible that the stones may associated with the farm track. As no additional information is available, the site is provisionally rated as NCW.</p> <p>As T0031 is in a well transect buffer zone, it is possible that the site may be impacted upon by the proposed development.</p>	No research potential or other cultural significance	NCW

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
					

Figure 226 - Views of the stones at T0031.

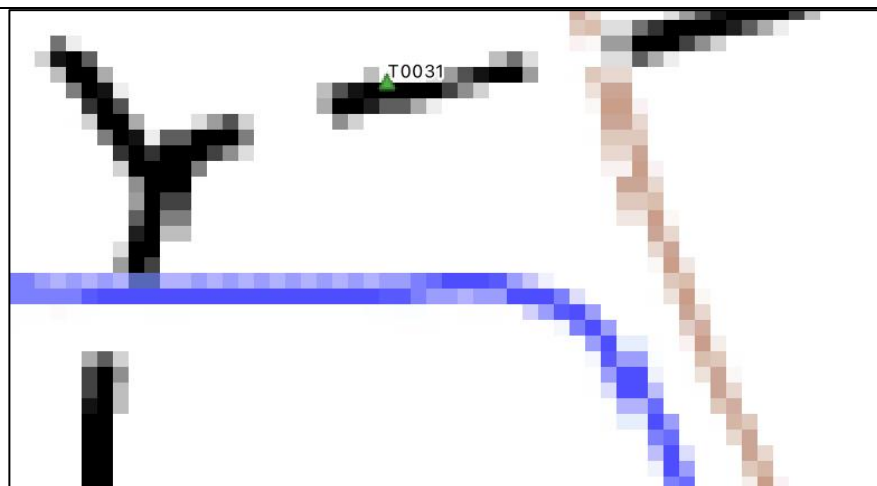
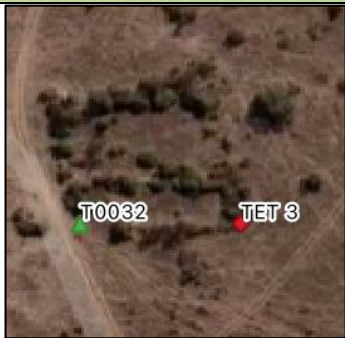


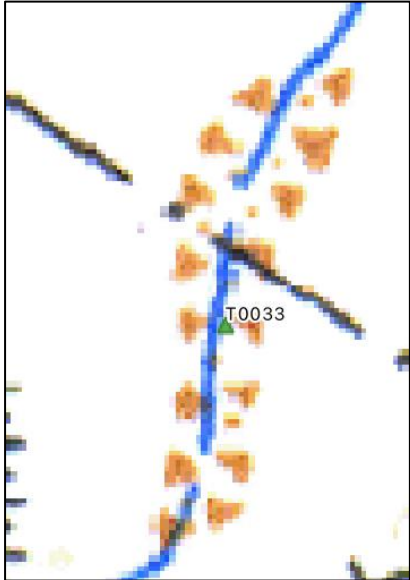





Figure 227 - Section of the 1997 topographical map showing a farm track within the vicinity of T0031.

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
T0032	-28.092260°S	26.736122°E	Previously recorded as TET 3 in the 2017 assessments. As such it was described in Table 9 .	Medium Significance	IIIB

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
					
<p><i>Figure 228 – Satellite image illustrating that T0032 was previously recorded as TET 3</i></p>					
					
<p><i>Figure 229 - Views of the overgrown site at T0032.</i></p>					

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
T0033	-28.189717°S	26.731113°E	<p>The site comprises a 25m long packed low stone walling located adjacent to an ephemeral stream on the farm Palmiet No.328 (Portion 6). The area is very overgrown and no other cultural material was identified around the site.</p> <p>A terrace is depicted at this locality on the 2826BA topographical sheet dating to 1954. As no additional information was available, the site is provisionally rated as NCW.</p> <p>As T0033 is located within a pipeline buffer zone, it is possible that the site may be impacted upon by the proposed development.</p>	No research potential or other cultural significance	NCW

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			 <p>Figure 230 - General view of T0033.</p>	 <p>Figure 231 - Section of the 1954 topographical map showing a terrace at T0033.</p>	
T0034	-28.195137°S	26.733686°E	<p>The site comprises the remains of a concentration of stones and a dam. It is located adjacent to a farm track on the farm Palmiet No.328 (RE/328).</p> <p>No structures are depicted at this locality on any of the 2826BA topographical sheets. It is likely that the stones were related to the construction of the dam. As no additional information was available, the site is provisionally rated as NCW.</p> <p>As T0034 is located within a pipeline buffer zone, it is possible that the site may be impacted upon by the proposed development.</p>	No research potential or other cultural significance	NCW

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
 <p><i>Figure 232 – View of the dam at T0034.</i></p>			 <p><i>Figure 233 – View of the stones at T0034.</i></p>		
T0035	-28.187420°S	26.734432°E	<p>The site was previously recorded as TET13.</p> <p>As T0035 is located within a pipeline buffer zone, it is possible that the site may be impacted upon by the proposed development.</p>	Medium-High Significance	IIIA
 <p><i>Figure 234 – Satellite image illustrating that T0035 was previously recorded as TET 13.</i></p>					

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
T0036	-28.146731°S	26.756982°E	<p>The site comprises an outhouse. It is located on the farm Kalkoenkrans No.225 (RE/225). The structure is constructed from bricks and cement.</p> <p>As no additional information was available, the site is provisionally rated as NCW.</p> <p>As T0036 is located within a well transect buffer zone, it is possible that the site may be impacted upon by the proposed development.</p>	No research potential or other cultural significance	NCW



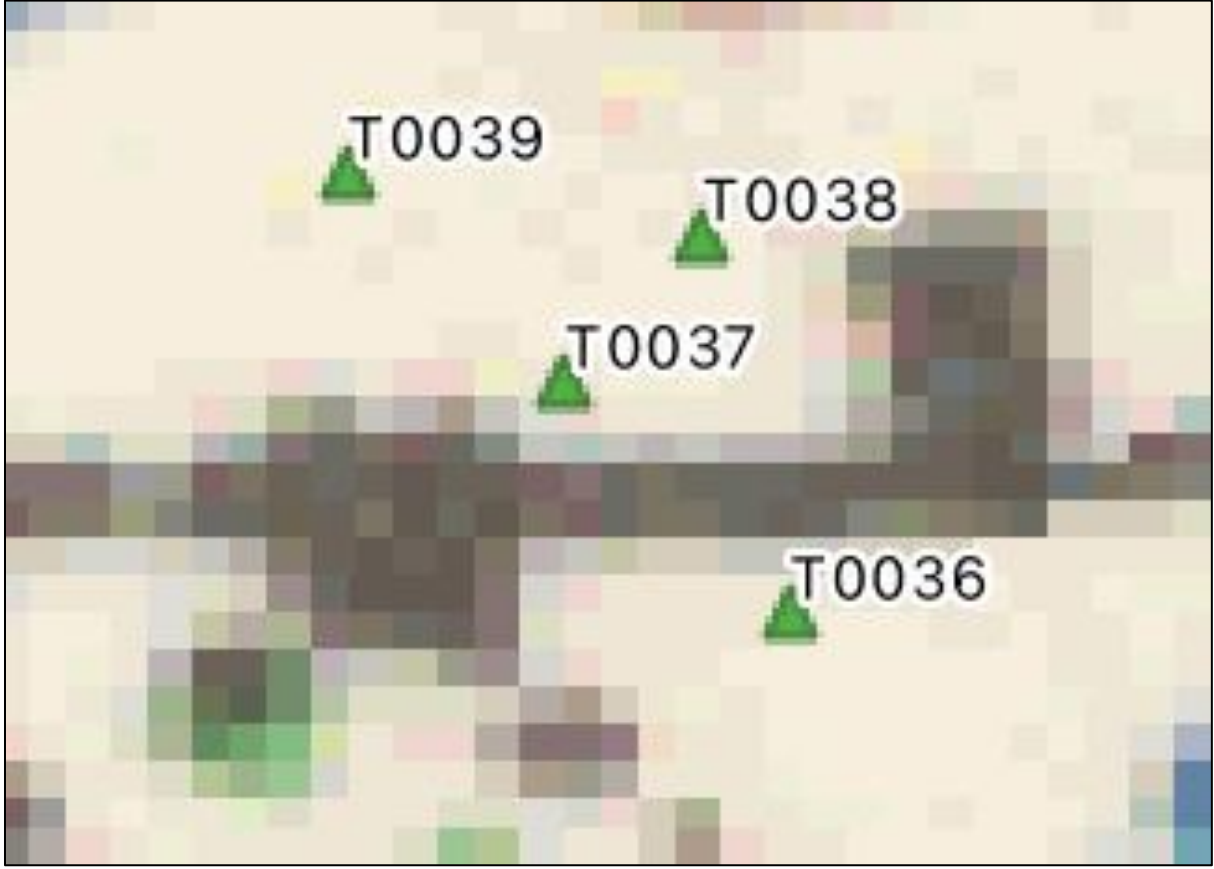
Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
					
<i>Figure 235 - Views of T0036.</i>					
T0037	-28.146489°S	26.756746°E	<p>The site comprises a two roomed ruin. It is located on the farm Kalkoenkrans No.225 (RE/225). There are the remains of walling. The materials used in the construction indicate a mix of sun-baked and cemented modern brick which suggests modification and additions through time.</p> <p>A structure is depicted within the vicinity of this locality on the 2826BB topographical sheet dating to 1945. The site is therefore older than 60 years. As no additional information was available, the site is provisionally rated as IIIC with low heritage significance.</p> <p>As T0037 is located within a well transect buffer zone, it is possible that the site may be impacted upon by the proposed development.</p>	Low Significance	IIIC



Figure 236 - View of the structure at T0037.

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
					
<p><i>Figure 237 – Additional view of the structure at T0037.</i></p>					

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
					
<p><i>Figure 238 – Closer view of the building materials and techniques observed at T0037.</i></p>					

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
 <p><i>Figure 239 - Section of the 1945 topographical map showing a structure at T0037.</i></p>					

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
T0038	-28.146335°S	26.756890°E	<p>The site comprises a large ruin. It is located on the farm Kalkoenkrans No.225 (RE/225). There are the remains of walling. The materials used in the construction indicate a mix of sun-baked and cemented modern brick which suggests modification and additions through time.</p> <p>A structure is depicted within the vicinity of this locality on the 2826BB topographical sheet dating to 1945 and 1954. The site is therefore older than 60 years. As no additional information was available, the site is provisionally rated as IIIC with low heritage significance.</p> <p>As T0038 is located within a well transect buffer zone, it is possible that the site may be impacted upon by the proposed development.</p>	Low Significance	IIIC



Figure 240 - Views of the ruin at T0038.

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating




Figure 241 – Additional views of the ruin at T0038.

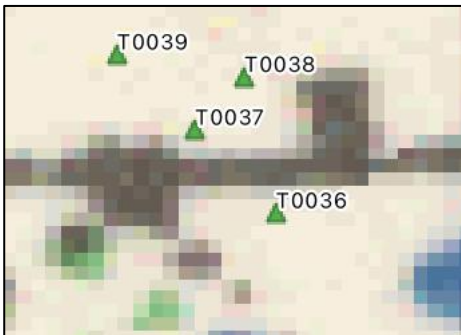
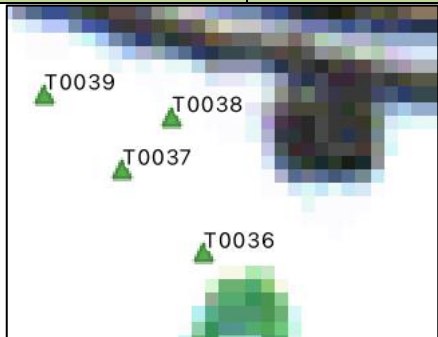
Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			 <p>Figure 242 - Section of the 1945 topographical map showing a structure within the vicinity of T0038.</p>	 <p>Figure 243 - Section of the 1954 topographical map showing a structure within the vicinity of T0038.</p>	
T0039	-28.146270°S	26.756518°E	<p>The site comprises a ruin and rubble debris. It is located on the farm Kalkoenkrans No.225 (RE/225). It is likely associated with T0037 and T0038.</p> <p>A structure is depicted within the vicinity of this site on the 2826BB topographical sheet dating to 1975. The site is therefore younger than 60 years. As no additional information was available, the site is provisionally rated as NCW.</p> <p>As T0039 is located within a well transect buffer zone, it is possible that the site may be impacted upon by the proposed development.</p>	No research potential or other cultural significance	NCW



Figure 244 - Views of T0039.

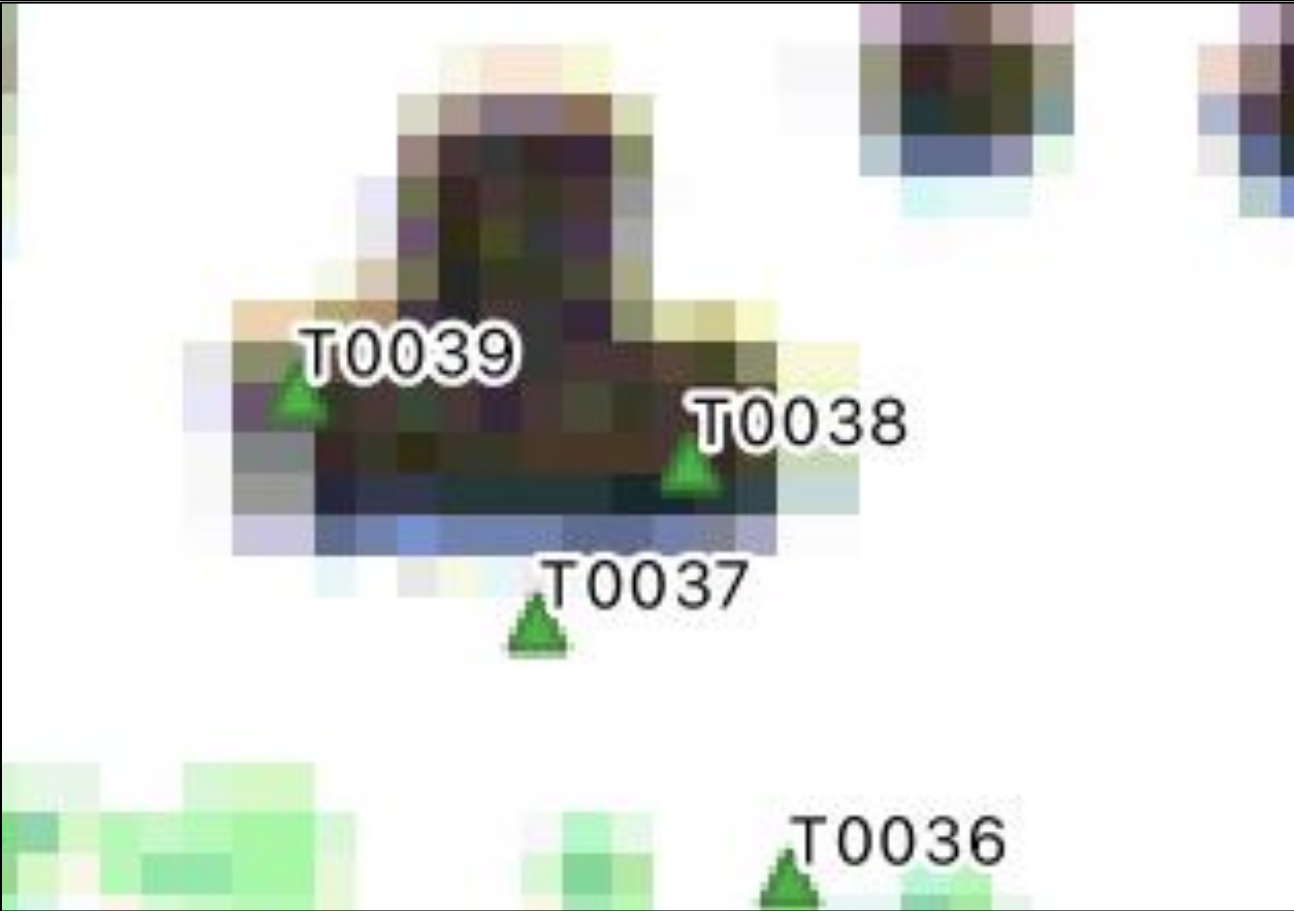

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
					


Figure 245 - Section of the 1975 topographical map showing a structure at T0039.

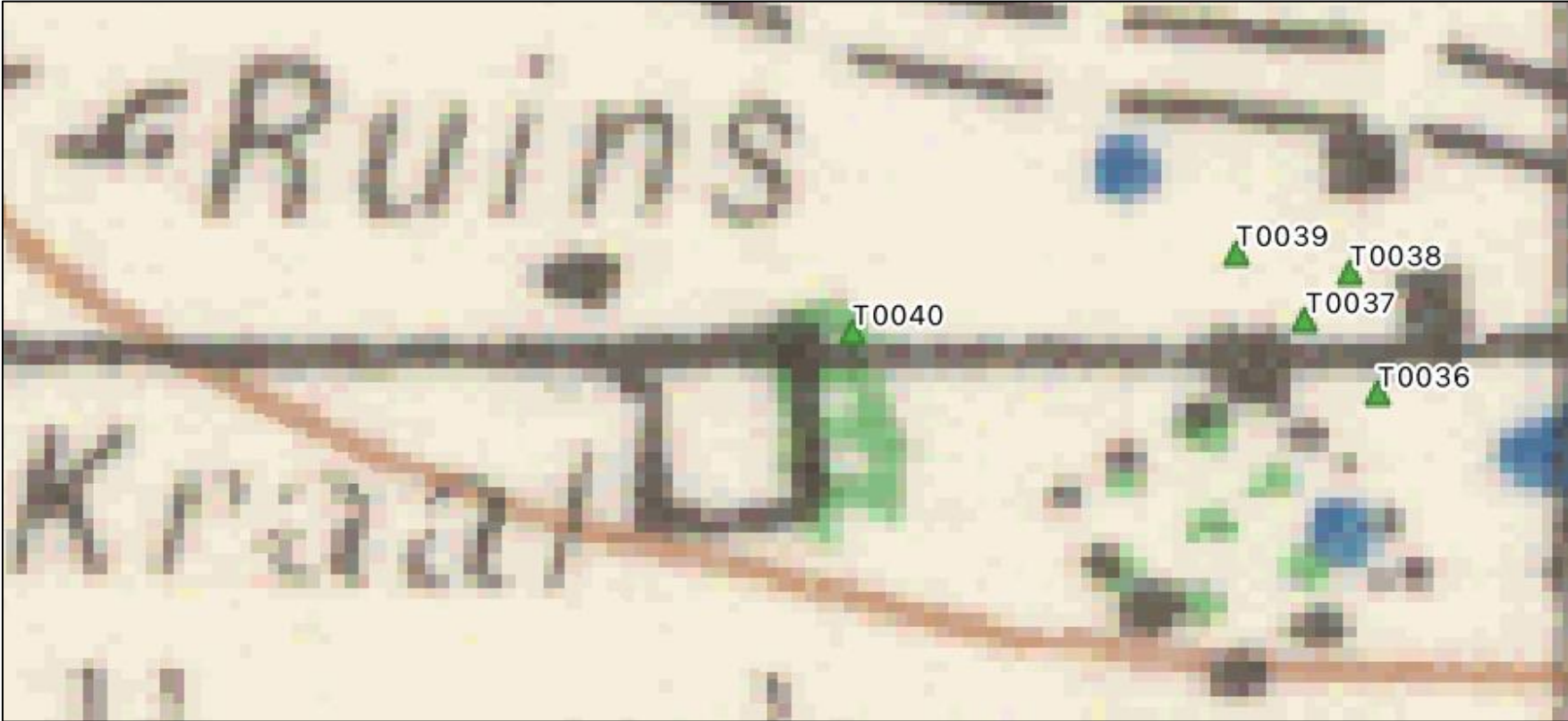
Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
T0040	-28.146529°S	26.755262°E	<p>The site comprises a complex of stone kraals. It is located on the farm Kalkoenkrans No.225 (RE/225).</p> <p>A kraal is depicted within the vicinity of this site on the 2826BB topographical sheet dating to 1945. The site is therefore older than 60 years. As no additional information was available, the site is provisionally rated as IIIB.</p> <p>Extent: Approx. 30m x 60m</p> <p>As T0040 is located within a well transect buffer zone, it is possible that the site may be impacted upon by the proposed development.</p>	Medium Significance	IIIB

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating


Figure 246 - Views of T0040.

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			 <p><i>Figure 247 - Closer view of the stone kraal walling at T0040.</i></p>		

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
					
<p><i>Figure 248 - Closer view of the building materials used at T0040.</i></p>					

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
 <p>Figure 249 - Section of the 1945 topographical map showing a kraal at T0040.</p>					
T0041	-28.119933°S	26.720693°E	The site comprises a complex of structures on the farm Mond Van Doornrivier No.38. It is located within a very overgrown and neglected area, next to the R30 adjacent to a farm track. There is a two-roomed structure, a smaller structure, one possible animal stable, two towers and a reservoir.	Medium Significance	IIIB

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			<p>Several structures are depicted at this locality on the 2826BA topographical sheet dating to 1954. The site is therefore older than 60 years. As no additional information was available, the site is provisionally rated as IIB.</p> <p>As T0041 is located within a pipeline buffer zone, it is possible that the site may be impacted upon by the proposed development.</p>		

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
					
Figure 250 - General view of T0041.					




Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
					
					


Figure 251 - Views of the two-roomed structure at T0041.

Figure 252 - View of an additional structure at T0041.



Figure 253 - Views of the possible stable at T0041.

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
					
<p>Figure 254 - Views of the towers at T0041.</p>					

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
					
<p><i>Figure 255 - Section of the 1954 topographical map showing several structures at T0041.</i></p>					

6.3 SENSITIVITY ASSESSMENT OUTCOME

Thirty-five (35) heritage sites which were previously identified for a 2016/2017 assessment, fall within the footprint areas of the current proposed Tetra4 Cluster 2 Gas Production Project. There were 10 graves and burial grounds (**TET 1, TET 7-8, TET 11, TET 15, TET 19, TET 22, SSL/BET/72, SITE 2, SITE 19**), 11 structures (**TET 2-3, TET 9, TET 27, SSL/BET/25-26, SSL/BET/36, SITE 1A, SITE 1B, SITE 20-21**), 14 historic to recent sites with possible graves (**TET 4-6, TET 13-14, TET 25a, TET 25b, TET 26, SSL/BET/37-39, SSL/BET/53, SSL/BET/60, SSL/BET/66**).

During the current field assessment, a further **thirty-seven (37) heritage sites** were recorded. There were six (6) sites containing burial grounds and graves (**T0003, T0009, T0010, T0013, T0024, T0029**), eight (8) sites historic to recent sites with possible graves (**T0007, T0008, T0011, T0015, T0023, T0026, T0027, T0028**) and twenty-three (23) structures (**T0001, T0002, T0004, T0005, T0014, T0016, T0017, T0018, T0019, T0020, T0021, T0022, T0025, T0030, T0031, T0033, T0034, T0036, T0037, T0038, T0039, T0040, T0041**).

Thirty-seven (37) sites were rated as having high heritage significance (IIIA): **TET 1, TET 7-8, TET 11, TET 15, TET 19, TET 22, SSL/BET/72, SITE 2, SITE 19, TET 4-6, TET 13-14, TET 25a, TET 25b, TET 26, SSL/BET/37-39, SSL/BET/53, SSL/BET/60, SSL/BET/66, T0003, T0009, T0010, T0013, T0024, T0029, T0007, T0008, T0011, T0015, T0023, T0026, T0027, T0028**.

Twelve (12) sites were rated as having medium heritage significance (IIIB): **TET 2, TET 3, TET 9, SITE 1A, SITE 1B, SITE 20, SITE 21, T0014, T0015, T0021, T0040, T0041**

Thirteen (13) sites were rated as having low heritage significance (IIIC): **TET 27, SSL/BET/25, SSL/BET/26, SSL/BET/36, T0016, T0017, T0018, T0019, T0020, T0022, T0025, T0037, T0038**

Ten (10) sites were rated as having no research potential or other cultural significance (NCW): **T0001, T0002, T0004, T0005, T0030, T0031, T0033, T0034, T0036, T0039**

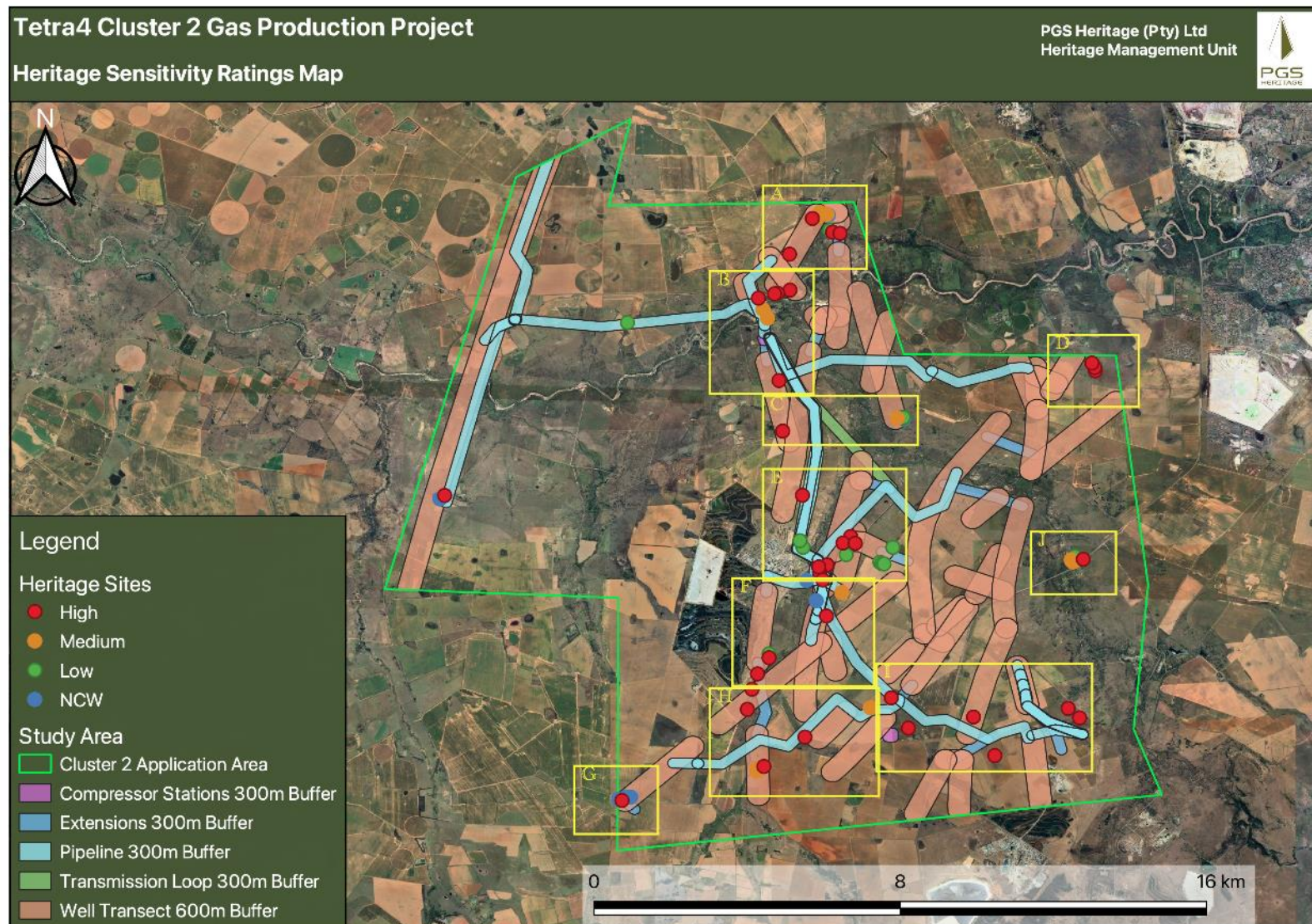


Figure 256 - Map showing heritage sensitivity rating of identified heritage resources. See insets below.

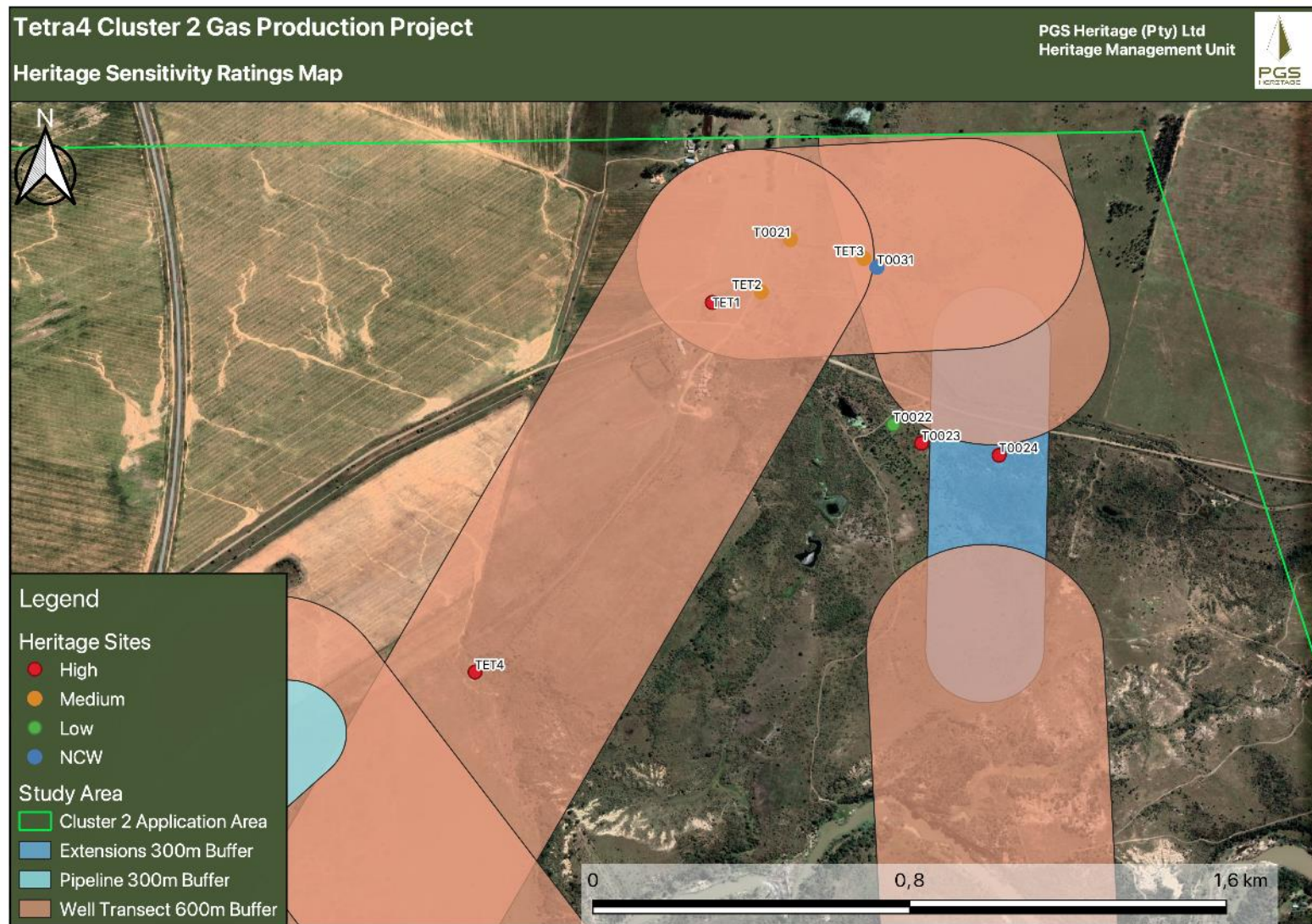


Figure 257 - Heritage sensitivity rating of identified heritage resources. Inset A.

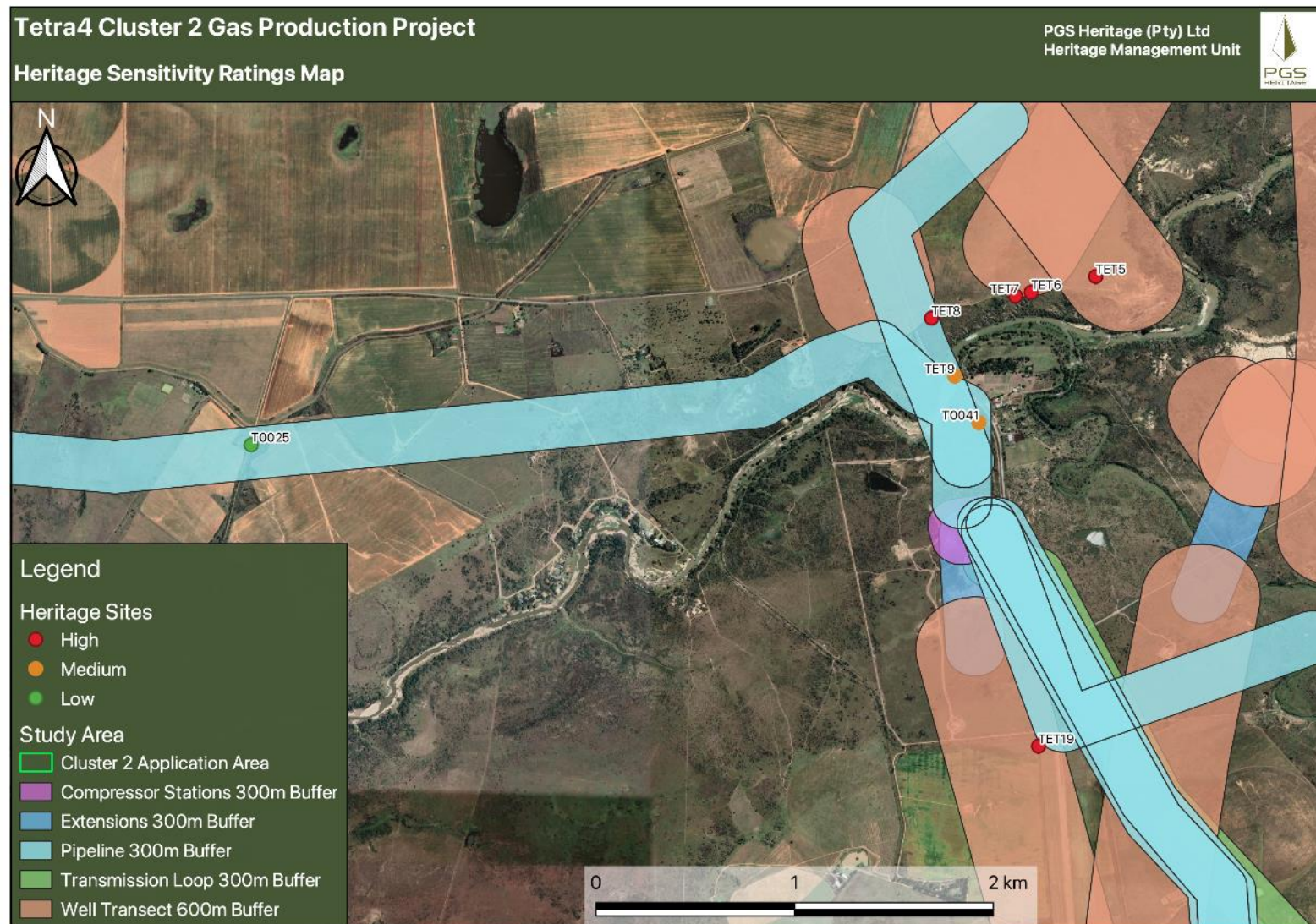


Figure 258 - Heritage sensitivity rating of identified heritage resources. Inset B.

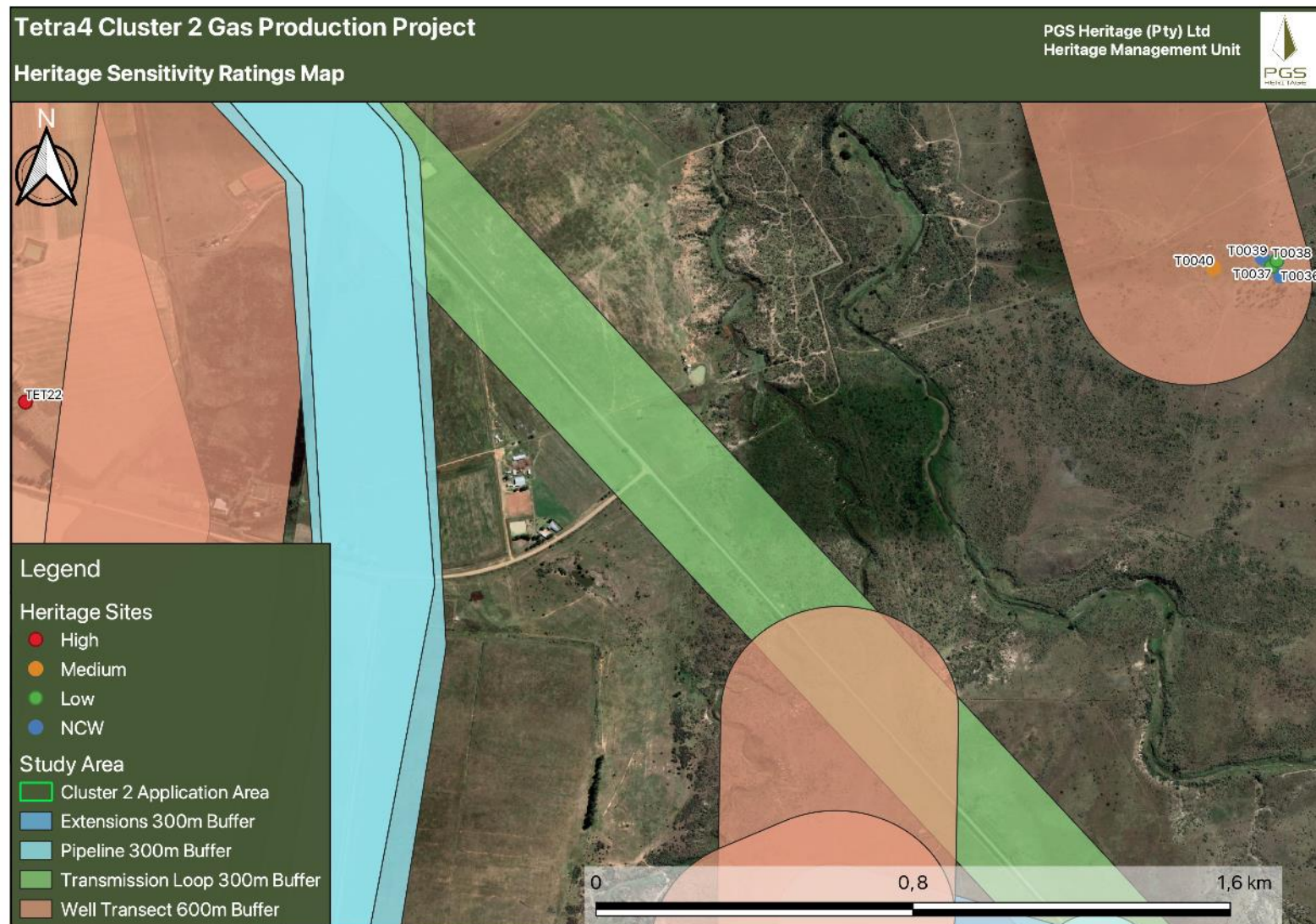


Figure 259 - Heritage sensitivity rating of identified heritage resources. Inset C.

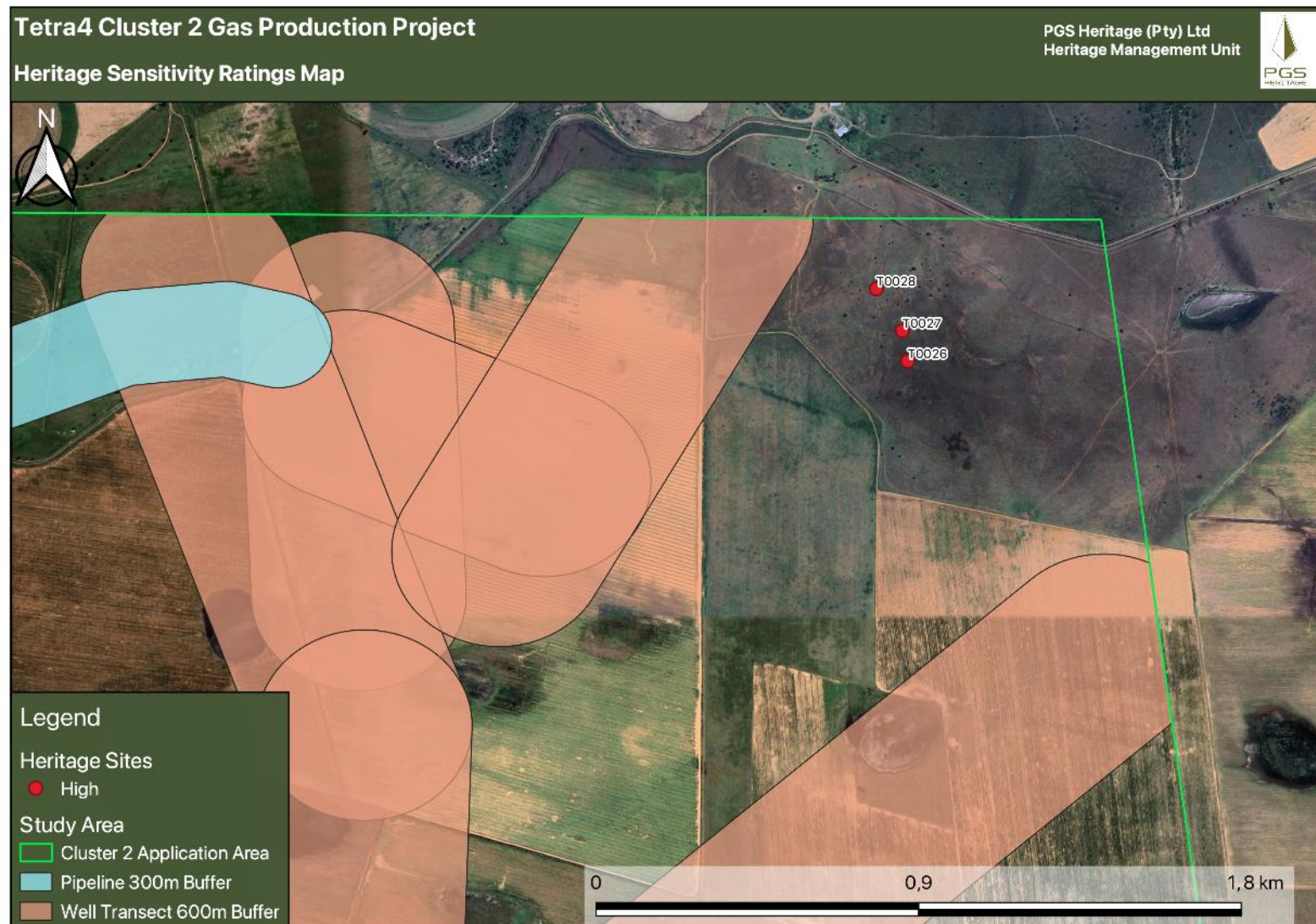


Figure 260 - Heritage sensitivity rating of identified heritage resources. Inset D.

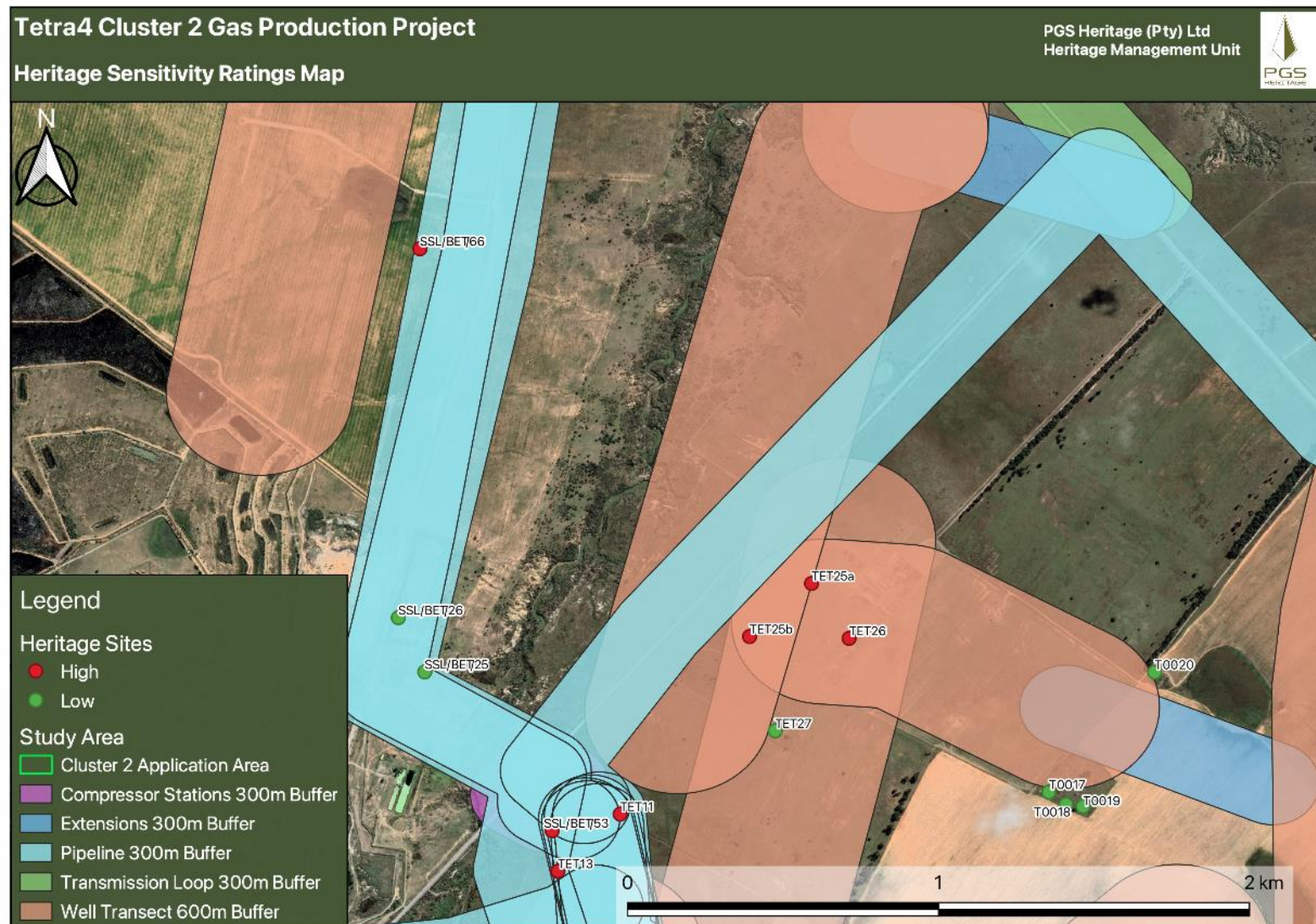


Figure 261 - Heritage sensitivity rating of identified heritage resources. Inset E.

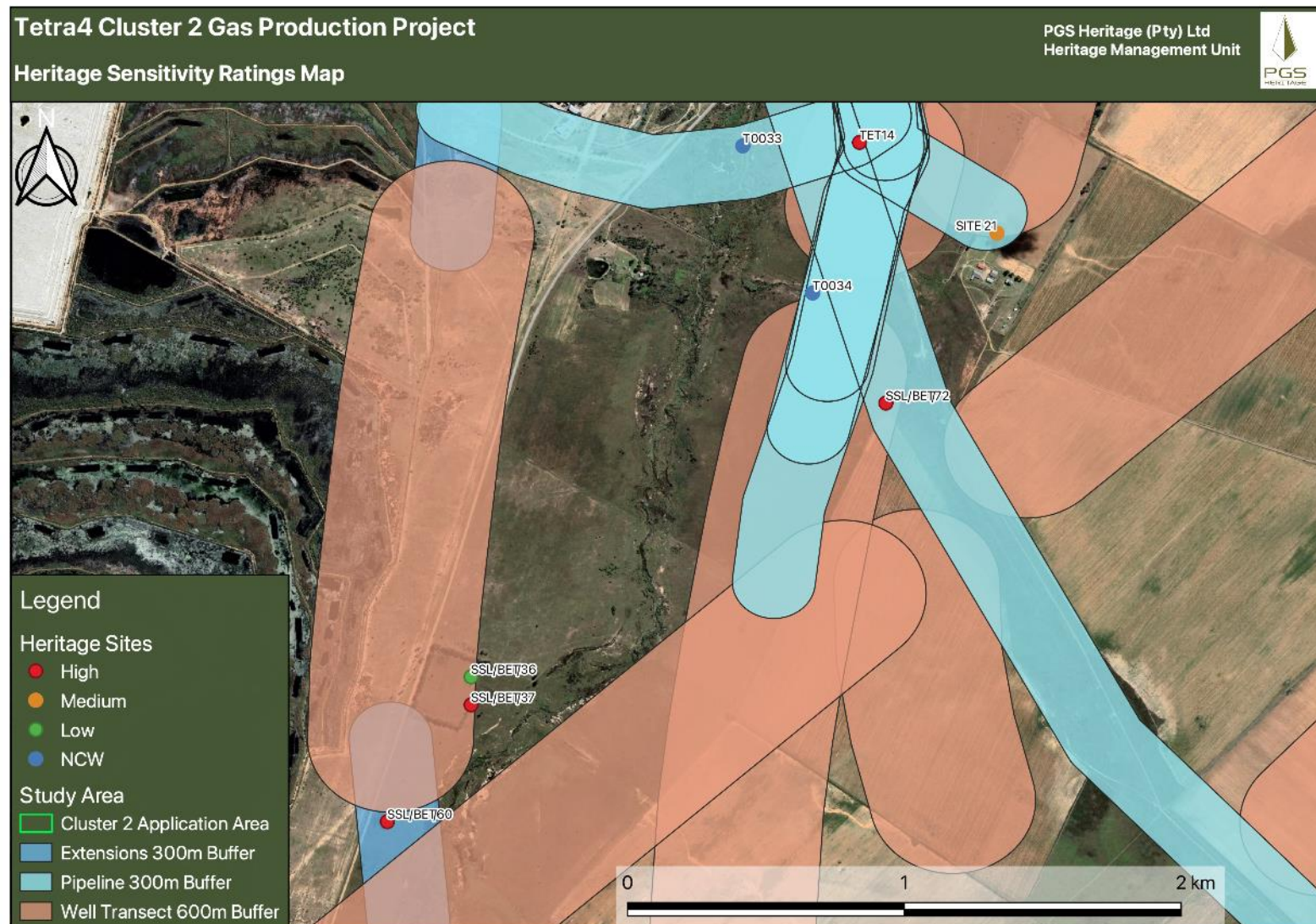


Figure 262 - Heritage sensitivity rating of identified heritage resources. Inset F.

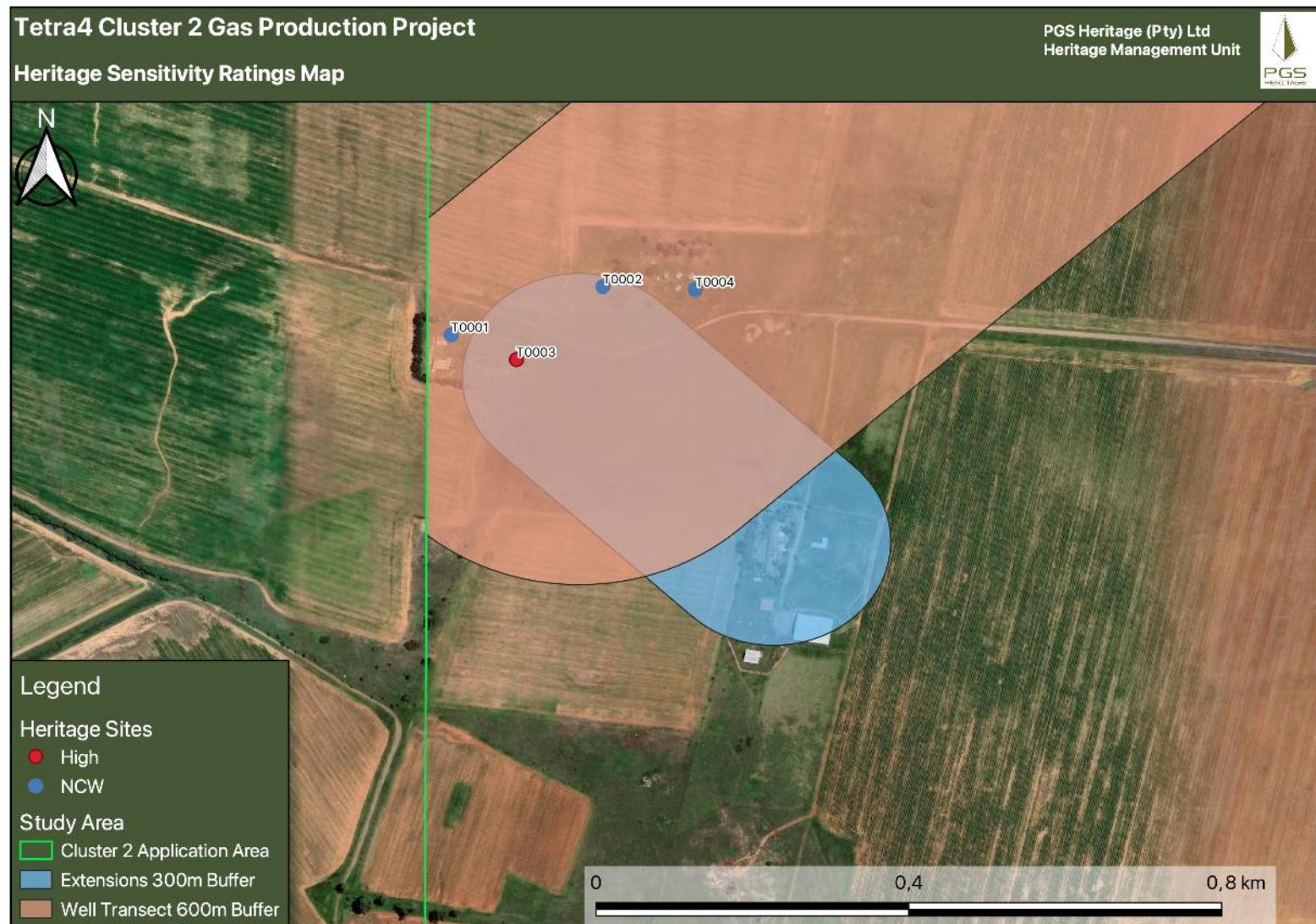


Figure 263 - Heritage sensitivity rating of identified heritage resources. Inset G.

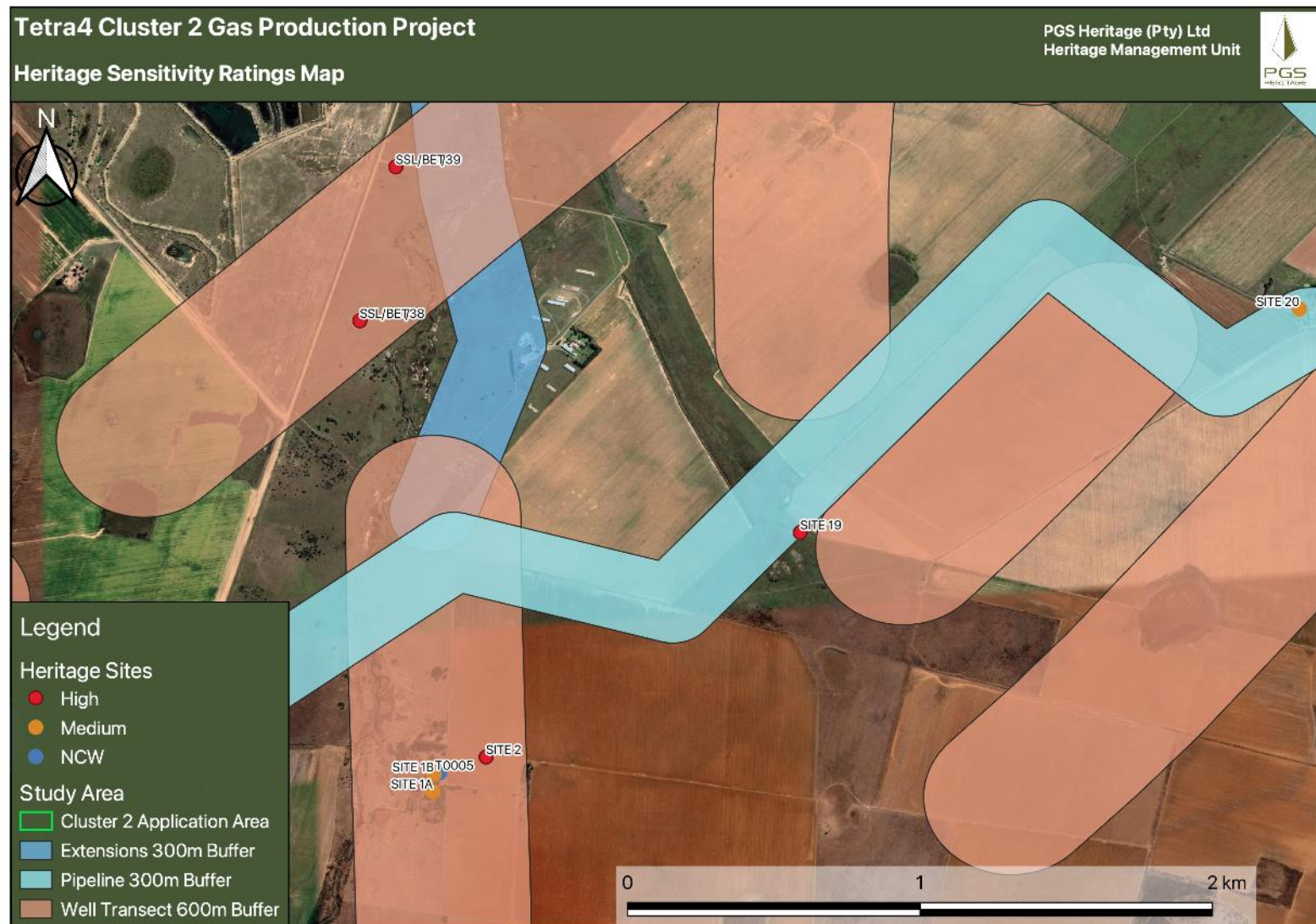


Figure 264 - Heritage sensitivity rating of identified heritage resources. Inset H.

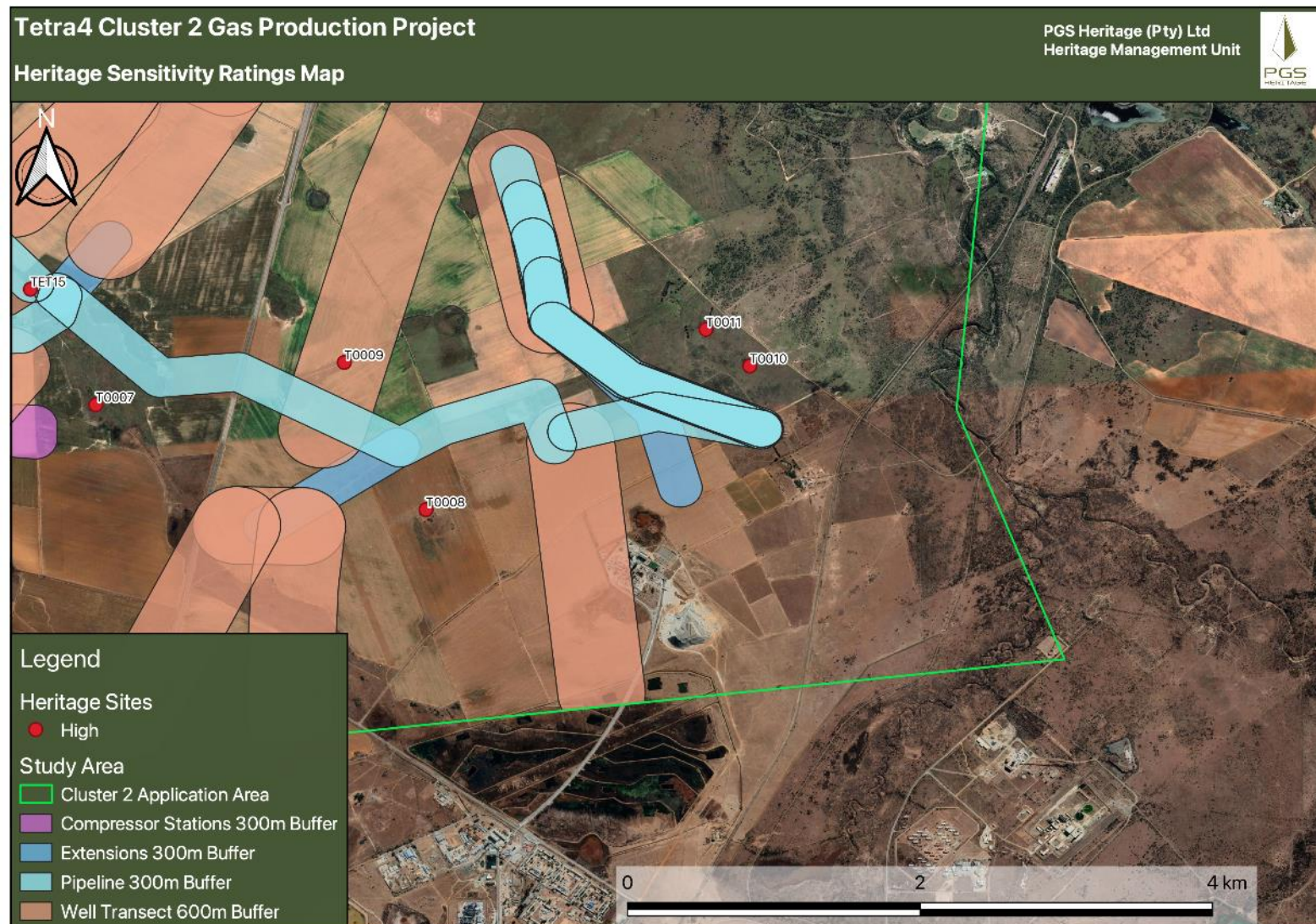


Figure 265 - Heritage sensitivity rating of identified heritage resources. Inset I.



Figure 266 - Heritage sensitivity rating of identified heritage resources. Inset J.

7 PALEONTOLOGY

The Palaeontological study completed by Elize Butler (February 2022) indicates the proposed Tetra4 development is underlain by Quaternary sediments as well as Permian aged sandstone and shale of the Adelaide Subgroup (Beaufort Group, Karoo Supergroup). According to the PalaeoMap of the South African Heritage Resources Information System (SAHRIS) the Palaeontological Sensitivity of Quaternary sediments in this area is Moderate, while that of the Adelaide Subgroup (Beaufort Group, Karoo Supergroup) is Very High.

A 2-day site-specific field survey of the development footprint was conducted on foot and by a motor vehicle on 26 to 27 February 2021. No visible evidence of fossiliferous outcrops was found in the development footprint and thus an overall medium palaeontological significance is allocated to the development footprint. It is therefore considered that the proposed development will not lead to detrimental impacts on the palaeontological reserves of the area and construction of the development may be authorised in its whole extent.

8 IMPACT ASSESSMENT

The following section provides an analysis of the proposed development on heritage resources within the study area.

The impact significance rating methodology, as provided by EIMS, is guided by the requirements of the NEMA EIA Regulations 2014 (as amended). The broad approach to the significance rating methodology is to determine the environmental risk (ER) by considering the consequence (C) of each impact (comprising Nature, Extent, Duration, Magnitude, and Reversibility) and relate this to the probability/likelihood (P) of the impact occurring. This determines the environmental risk. In addition, other factors, including cumulative impacts and potential for irreplaceable loss of resources, are used to determine a prioritisation factor (PF) which is applied to the ER to determine the overall significance (S). possible, mitigation measures will be recommended for the impacts identified.

8.1 DETERMINATION OF ENVIRONMENTAL RISK

The significance (S) of an impact is determined by applying a prioritisation factor (PF) to the environmental risk (ER). The environmental risk is dependent on the consequence (C) of the particular impact and the probability (P) of the impact occurring. The consequence is determined through the consideration of the Nature (N), Extent (E), Duration (D), Magnitude (M), and reversibility (R) applicable to the specific impact.

For the purpose of this methodology, the consequence of the impact is represented by:

$$C = \frac{(E+D+M+R) \times N}{4}$$

Each individual aspect in the determination of the consequence is represented by a rating scale as defined in **Table 11** below.

Table 11 - Criteria for Determining Impact Consequence

Aspect	Score	Definition
Nature	- 1	Likely to result in a negative/ detrimental impact
	+1	Likely to result in a positive/ beneficial impact
Extent	1	Activity (i.e. limited to the area applicable to the specific activity)
	2	Site (i.e. within the development property boundary),
	3	Local (i.e. the area within 5 km of the site),
	4	Regional (i.e. extends between 5 and 50 km from the site)
	5	Provincial / National (i.e. extends beyond 50 km from the site)
Duration	1	Immediate (<1 year)
	2	Short term (1-5 years),
	3	Medium term (6-15 years),

Aspect	Score	Definition
	4	Long term (the impact will cease after the operational life span of the project),
	5	Permanent (no mitigation measure of natural process will reduce the impact after construction).
Magnitude/ Intensity	1	Minor (where the impact affects the environment in such a way that natural, cultural and social functions and processes are not affected),
	2	Low (where the impact affects the environment in such a way that natural, cultural and social functions and processes are slightly affected),
	3	Moderate (where the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way),
	4	High (where natural, cultural or social functions or processes are altered to the extent that it will temporarily cease), or
	5	Very high / don't know (where natural, cultural or social functions or processes are altered to the extent that it will permanently cease).
Reversibility	1	Impact is reversible without any time and cost.
	2	Impact is reversible without incurring significant time and cost.
	3	Impact is reversible only by incurring significant time and cost.
	4	Impact is reversible only by incurring prohibitively high time and cost.
	5	Irreversible Impact

Once the C has been determined, the ER is determined in accordance with the standard risk assessment relationship by multiplying the C and the P. Probability is rated/ scored as per Table 12.

Table 12 - Probability Scoring

Probability	1	Improbable (the possibility of the impact materialising is very low as a result of design, historic experience, or implementation of adequate corrective actions; <25%),
	2	Low probability (there is a possibility that the impact will occur; >25% and <50%),
	3	Medium probability (the impact may occur; >50% and <75%),
	4	High probability (it is most likely that the impact will occur- > 75% probability), or
	5	Definite (the impact will occur)

The result is a qualitative representation of relative ER associated with the impact. ER is therefore calculated as follows:

$$ER = C \times P$$

Table 13 - Determination of Environmental Risk

Consequence	5	5	10	15	20	25
	4	4	8	12	16	20
	3	3	6	9	12	15
	2	2	4	6	8	10
	1	1	2	3	4	5
	0	1	2	3	4	5
	Probability					

The outcome of the environmental risk assessment will result in a range of scores, ranging from 1 through to 25. These ER scores are then grouped into respective classes as described in **Table 14**.

Table 14 - Significance Classes

Environmental Risk Score	
Value	Description
< 9	Low (i.e. where this impact is unlikely to be a significant environmental risk).
≥9 - <17	Medium (i.e. where the impact could have a significant environmental risk),
≥17	High (i.e. where the impact will have a significant environmental risk).

The impact ER will be determined for each impact without relevant management and mitigation measures (pre-mitigation), as well as post-implementation of relevant management and mitigation measures (post-mitigation). This allows for a prediction in the degree to which the impact can be managed/mitigated.

8.2 IMPACT PRIORITISATION

Further to the assessment criteria presented in the section above, it is necessary to assess each potentially significant impact in terms of:

1. Cumulative impacts; and
2. The degree to which the impact may cause irreplaceable loss of resources.

To ensure that these factors are considered, an impact prioritisation factor (PF) will be applied to each impact ER (post-mitigation). This prioritisation factor does not aim to detract from the risk ratings but rather to focus the attention of the decision-making authority on the higher priority/significance issues and impacts. The PF will be applied to the ER score based on the assumption that relevant suggested management/mitigation impacts are implemented.

Table 15 - Criteria for Determining Prioritisation

Cumulative Impact (CI)	Low (1)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change.
	Medium (2)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is probable that the impact will result in spatial and temporal cumulative change.
	High (3)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is highly probable/ definite that the impact will result in spatial and temporal cumulative change.
	Low (1)	Where the impact is unlikely to result in irreplaceable loss of resources.

Irreplaceable Loss of Resources (LR)	Medium (2)	Where the impact may result in the irreplaceable loss (cannot be replaced or substituted) of resources but the value (services and/or functions) of these resources is limited.
	High (3)	Where the impact may result in the irreplaceable loss of resources of high value (services and/or functions).

The value for the final impact priority is represented as a single consolidated priority, determined as the sum of each individual criteria represented in Table 16. The impact priority is therefore determined as follows:

$$\text{Priority} = \text{CI} + \text{LR}$$

The result is a priority score which ranges from 3 to 9 and a consequent PF ranging from 1 to 2 (Refer to **Table 16**).

Table 16 - Determination of Prioritisation Factor

Priority	Ranking	Prioritisation Factor
2	Low	1
3	Medium	1.125
4	Medium	1.25
5	Medium	1.375
6	High	1.5

In order to determine the final impact significance, the PF is multiplied by the ER of the post-mitigation scoring. The ultimate aim of the PF is an attempt to increase the post-mitigation environmental risk rating by a full ranking class if all the priority attributes are high (i.e. if an impact comes out with a medium environmental risk after the conventional impact rating, but there is significant cumulative impact potential and significant potential for irreplaceable loss of resources, then the net result would be too upscale the impact to a high significance).

Table 17 - Final Environmental Significance Rating

Environmental Significance Rating	
Value	Description
< -17	High negative (i.e. where the impact must have an influence on the decision process to develop in the area).
≥ -17 ≤ -9	Medium negative (i.e. where the impact could influence the decision to develop in the area).
> -9, <0	Low negative (i.e. where this impact would not have a direct influence on the decision to develop in the area).
0	No impact
<0, <9	Low positive (i.e. where this impact would not have a direct influence on the decision to develop in the area).

Environmental Significance Rating	
Value	Description
$\geq 19 \leq 17$	Medium positive (i.e. where the impact could influence the decision to develop in the area).
≥ 217	High positive (i.e. where the impact must have an influence on the decision process to develop in the area).

The significance ratings and additional considerations applied to each impact will be used to provide a quantitative comparative assessment of the alternatives being considered. In addition, professional expertise and opinion of the specialists and the environmental consultants will be applied to provide a qualitative comparison of the alternatives under consideration. This process will identify the best alternative for the proposed project.

8.3 HERITAGE IMPACTS

8.3.1 GENERAL OBSERVATIONS

- Thirty-five (35) of the previously identified sites are located within the proposed development buffer areas.
- Heritage sites assessed to have a low heritage significance are not included in these impact assessment calculations. The reason for this is that sites of low significance will not require mitigation. These sites are **TET27, SSL/BET/25, SSL/BET/26, SSL/BET/36, T0001, T0002, T0004, T0005, T0017, T0018, T0019, T0020, T0025, T0030, T0031, T0033, T0034, T0036, T0037, T0038, T0039.**

8.3.2 BURIAL GROUNDS AND GRAVES

A total of fourteen (14) burial grounds and graves (**TET 1, TET 7-8, TET 11, TET 15¹, TET 19, TET 22, SSL/BET/72, SITE 2, SITE 19** and **T0003, T0009, T0024, T0029**) were identified within the proposed development areas. Burial grounds and graves have high heritage significance and are given a IIIA significance rating in accordance with the system described in Section 4 of this document.

The pre-mitigation impact significance is rated as **MEDIUM**, but with the implementation of the required mitigation measures the post-mitigation impact will be **LOW**. The overall Environmental significance will be Low negative.

8.3.2.1 MITIGATION MEASURES

- The sites should be demarcated with a 50-meterno-go-buffer-zone and the graves should be avoided.

- A Grave Management Plan should be developed for the graves which also needs to be approved by SAHRA BGG.
- If the site is going to be impacted upon, then a grave relocation process is recommended as a mitigation and management measure. This will involve the necessary social consultation and public participation process before grave relocation permits can be applied for with the SAHRA BGG under the NHRA and National Health Act regulations.

8.3.3 HISTORIC TO RECENT SITES WITH POSSIBLE GRAVES

A total of fourteen (14) possible grave sites (**TET 4-6, TET 13², TET 14, TET 25a, TET 25b, TET 26, SSL/BET/37-39, SSL/BET/53, SSL/BET/60, SSL/BET/66**) were identified within the proposed development area. Burial grounds and graves have high heritage significance and are given a IIIA significance rating in accordance with the system described in Section 4 of this document.

The pre-mitigation impact significance is rated as **MEDIUM**, but with the implementation of the required mitigation measures the post-mitigation impact will be **LOW**. The overall Environmental significance will be Low negative.

8.3.3.1 MITIGATION MEASURES

- Mitigation measures would include applying for the test excavation and/or GPR permit to determine if the site contains graves.
- If human remains are discovered a grave relocation process is recommended as a mitigation and management measure. This will involve the necessary social consultation and public participation process before grave relocation permits can be applied for with the SAHRA BGG under the NHRA and National Health Act regulations.
- When graves are discovered/uncovered the site should be demarcated with a 50-meter no-go-buffer-zone and the grave should be avoided.
- If, during test excavations, it is determined that the site does not contain graves, no further mitigation will be required.

8.3.4 STRUCTURES

A total of ten (10) structures (**TET 2, TET3⁴, TET 9, SITE 1A, SITE 1B³, SITE 20-21 and T0021, T0040, T0041**) that have medium heritage significance (IIIB significance rating) were identified within the proposed development area.

The pre-mitigation impact significance is rated as **MEDIUM**, but with the implementation of the required mitigation measures the post-mitigation impact will be **LOW**. The overall Environmental significance will be Low negative.

8.3.4.1 MITIGATION MEASURES

- It is recommended that a no-go-buffer-zone of at least **30m** is kept to the closest infrastructure.
- If development occurs within 30m of the site, the structure will need to be satisfactorily studied and recorded before impact occurs.
- Recording of the site i.e. (a) map indicating the position and footprint of the structure (b) photographic recording of the structure (c) measured drawings of the floor plans of the structure.
- Submission of permit application to SAHRA to allow for the disturbance to the site. A Phase 2 Heritage Report must accompany the permit.

Table 18 illustrates the impact rating for heritage resources and **Table 19** illustrates the impact rating for palaeontological resources. The possibility of chance finds of unidentified heritage resources, can be mitigated through the proposed management measures contained in the next section of this report.

Table 18 - Impact rating for heritage resources

IMPACT DESCRIPTION			Pre-Mitigation							Post Mitigation								Priority Factor Criteria			
Identifier	Impact	Nature	Extent	Duration		Magnitude	Reversibilit	Probability	Pre-mitigation ER	Nature	Extent	Duration	Magnitude	Reversibilit	Probability	Post-mitigation ER	Confid ence	Cumulative Impact	Irreplaceabl e loss	Priority Factor	Final score
10.1.1	Impact on unidentified heritage resources	-1	1	5		1	5	1	-3	-1	1	4	2	4	2	-5.5	Mediu m	2	3	1.375	-7.56
10.1.2	Impact on burial grounds and graves	-1	2	4		5	5	4	-16	-1	1	4	2	5	2	-6	Mediu m	2	3	1.375	-8.25
10.1.3	Impact on historic to recent sites with possible graves	-1	2	4		4	5	3	-11.25	-1	1	4	2	5	2	-6	Mediu m	1	3	1.25	-7.5
10.1.4	Impact on structures of medium heritage significance	-1	1	5		3	5	3	-10.5	-1	1	3	3	3	2	-5	Mediu m	2	2	1.25	-6.25

Table 19 - Impact rating for palaeontological resources

IMPACT DESCRIPTION			Pre-Mitigation							Post Mitigation								Priority Factor Criteria			
Identifier	Impact	Nature	Extent	Duration		Magnitude	Reversibility	Probability	Pre-mitigation ER	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Post-mitigation ER	Confidence	Cumulative Impact	Irreplaceable loss	Priority Factor	Final score
10.1.1	Impact on palaeontology	-1	4	5		4	5	4	-18	-1	4	5	2	5	2	-8	Medium	2	3	1.375	-11

9 MANAGEMENT RECOMMENDATIONS AND GUIDELINES

9.1 CONSTRUCTION PHASE

The project will encompass a range of activities during the Construction Phase, including disturbance to the soil surface and small-scale infrastructure development associated with the project.

It is always possible that cultural material may be exposed during construction and may be recoverable, keeping in mind delays can be costly during construction and as such must be minimised. Development surrounding mining and construction results in significant disturbance; however, any excavation work offers a window into the past, and it thus may be possible to rescue some of the data and materials. It is also possible that substantial alterations will be implemented during this phase of the project, and these must be catered for. Temporary infrastructure developments, such as construction camps and laydown areas, are often changed or added to the project as required. In general, these are low impact developments as they are superficial, resulting in little alteration of the land surface, but still need to be catered for.

During the Construction Phase, it is important to recognize any significant material being unearthed, making the correct judgment on which actions should be taken. It is recommended that the following chance find procedure should be implemented.

9.2 CHANCE FIND PROCEDURE

- A heritage practitioner / archaeologist should be appointed to develop a heritage induction program and conduct training for the ECO as well as team leaders in the identification of heritage resources and artefacts.
- An appropriately qualified heritage practitioner / archaeologist must be identified to be called upon if any possible heritage resources or artefacts are identified.
- Should an archaeological site or cultural material be discovered during construction (or operation), the area should be demarcated, and construction activities halted.
- The qualified heritage practitioner / archaeologist will then need to come out to the site and evaluate the extent and importance of the heritage resources and make the necessary recommendations for mitigating the find and the impact on the heritage resource.
- The contractor therefore should have some sort of contingency plan so that operations could move elsewhere temporarily while the materials and data are recovered.
- Construction can commence as soon as the site has been cleared and signed off by the heritage practitioner / archaeologist.

9.3 POSSIBLE FINDS DURING CONSTRUCTION PHASES

The study area occurs within a greater historical and archaeological context as identified during the desktop and fieldwork phase. Soil clearance may uncover the following:

- Unmarked graves.
- High density concentrations of stone artefacts

9.4 TIMEFRAMES

It must be kept in mind that mitigation and monitoring of heritage resources discovered during construction activity will require permitting for collection or excavation of heritage resources and lead times must be worked into the construction time frames. The table below gives guidelines for lead times on permitting.

Table 20 - Lead times for permitting and mobilisation

Action	Responsibility	Timeframe
Preparation for field monitoring and finalisation of contracts	The contractor and service provider	1 month
Application for permits to do necessary mitigation work	Service provider – Archaeologist and SAHRA	3 months
Documentation, excavation and archaeological report on the relevant site	Service provider – Archaeologist	3 months
Handling of chance finds – Graves/Human Remains	Service provider – Archaeologist and SAHRA	2 weeks
Relocation of burial grounds or graves in the way of construction	Service provider – Archaeologist, SAHRA, local government and provincial government.	6 months

9.5 HERITAGE MANAGEMENT PLAN FOR EMPR IMPLEMENTATION

Table 21: Heritage Management Plan for EMPr implementation

Area and site no.	Mitigation measures	Phase	Timeframe	The responsible party for implementation	Monitoring Party (frequency)	Target	Performance indicators (monitoring tool)
General project area	Implement a chance find procedures in case where possible heritage finds (incl. unmarked graves) are uncovered.	Planning, Construction	Prior to construction and ongoing.	Applicant ECO Heritage Specialist	ECO (monthly / as or when required)	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 34-36 and 38 of NHRA	ECO Monthly Checklist/Report
Grave and burial ground sites (TET 1, TET 7-8, TET 11, TET 15¹, TET 19, TET 22, SSL/BET/72, SITE 2, SITE 19 and T0003, T0009, T0024, T0029) that were located within the proposed development area and were rated as high local heritage significance and had a heritage grading of IIIA.	<ul style="list-style-type: none"> The graves should be demarcated with a 50-meterbuffer and should be avoided and left in situ. A Grave Management Plan should be developed for the graves which also need to be approved by SAHRA BGG. If the site is going to be impacted and the graves need to be removed a grave relocation process as per the Heritage Management Plan for the site is recommended as a mitigation and management measure. This will involve the necessary social consultation and public participation process before grave relocation permits can be applied for with the SAHRA BGG under the NHRA and National Health Act regulations. 	Planning, Construction	Prior to construction and ongoing.	Applicant ECO Heritage Specialist	ECO (monthly / as or when required)	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 34-36 and 38 of NHRA	ECO Monthly Checklist/Report
Burial Grounds and Graves (T0010, T0013) that were located	<ul style="list-style-type: none"> No mitigation required. 	Planning, Construction	Prior to construction and ongoing.	Applicant ECO	ECO (monthly / as or when required)	Ensure compliance with relevant legislation and recommendations	ECO Monthly Checklist/Report

Area and site no.	Mitigation measures	Phase	Timeframe	The responsible party for implementation	Monitoring Party (frequency)	Target	Performance indicators (monitoring tool)
outside of the proposed development area.						from SAHRA under Section 34-36 and 38 of NHRA	
Historic to recent sites with possible grave sites (TET 4-6, TET 13 ² , TET 14, TET 25a, TET 25b, TET 26, SSL/BET/37-39, SSL/BET/53, SSL/BET/60, SSL/BET/66) that were located within the proposed development area and were rated as high local heritage significance and had a heritage grading of IIIA.	<ul style="list-style-type: none"> Mitigation measures would include applying for the test excavation and/or GPR permit to determine if the site contains graves. If human remains are discovered a grave relocation process is recommended as a mitigation and management measure. This will involve the necessary social consultation and public participation process before grave relocation permits can be applied for with the SAHRA BGG under the NHRA and National Health Act regulations. When graves are discovered/uncovered the site should be demarcated with a 50-meter no-go-buffer-zone and the grave should be avoided. If, during test excavations, it is determined that the site does not contain graves, no further mitigation will be required. 	Planning, Construction	Prior to construction and ongoing.	Applicant ECO Heritage Specialist	ECO (monthly / as or when required)	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 34-36 and 38 of NHRA	ECO Monthly Checklist/Report
Historic to recent sites with possible grave sites (T0015, T0023, T0026, T0027, T0028) that were located outside of the proposed	<ul style="list-style-type: none"> No mitigation required. 	Planning, Construction	Prior to construction and ongoing.	Applicant ECO	ECO (monthly / as or when required)	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 34-36 and 38 of NHRA	ECO Monthly Checklist/Report

Area and site no.	Mitigation measures	Phase	Timeframe	The responsible party for implementation	Monitoring Party (frequency)	Target	Performance indicators (monitoring tool)
development area and were rated as high local heritage significance and had a heritage grading of IIIA.							
Structures (TET2 , TET3 ⁴ , TET9 , SITE 1A , SITE 1B ³ , SITE 20 , SITE 21 , T0021 , T0040 , T0041) that were located within the proposed development area and were rated as medium local heritage significance and had a heritage grading of IIIB.	<ul style="list-style-type: none"> It is recommended that a no-go-buffer-zone of at least 30m is kept to the closest infrastructure. If development occurs within 30m of the site, the structure will need to be satisfactorily studied and recorded before impact occurs. Recording of the site i.e. (a) map indicating the position and footprint of the structure (b) photographic recording of the structure (c) measured drawings of the floor plans of the structure. Submission of permit application to SAHRA to allow for the disturbance to the site. A Phase 2 Heritage Report must accompany the permit. 	Construction	Prior to construction and ongoing.	Applicant ECO Heritage Specialist	ECO (monthly / as or when required)	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 34-36 and 38 of NHRA	ECO Monthly Checklist/Report
Structures (T0014) that were located outside of the proposed development area and were rated as medium local heritage significance and had a heritage grading of IIIB.	<ul style="list-style-type: none"> No mitigation is required. 	Construction	Prior to construction and ongoing.	Applicant ECO	ECO (monthly / as or when required)	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 34-36 and 38 of NHRA	ECO Monthly Checklist/Report

Area and site no.	Mitigation measures	Phase	Timeframe	The responsible party for implementation	Monitoring Party (frequency)	Target	Performance indicators (monitoring tool)
Structures (TET27, SSL/BET/25, SSL/BET/26, SSL/BET/36, T0017, T0018, T0019, T0020, T0025, T0037, T0038) that were located within the proposed development area and were rated as low local heritage significance and had a heritage grading of IIIC.	<ul style="list-style-type: none"> No mitigation is required. The documentation of the site in the HIA report is sufficient and the site can be destroyed without a permit but with the approval of this report. 	Construction	Prior to construction and ongoing.	Applicant ECO	ECO (monthly / as or when required)	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 34-36 and 38 of NHRA	ECO Monthly Checklist/Report
Structures (T0016, T0022) that were located outside of the proposed development area and were rated as low local heritage significance and had a heritage grading of IIIC.	<ul style="list-style-type: none"> No mitigation required. 	Construction	Prior to construction and ongoing.	Applicant ECO	ECO (monthly / as or when required)	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 34-36 and 38 of NHRA	ECO Monthly Checklist/Report
Structures (T0001, T0002, T0004, T0005, T0030, T0031, T0033, T0034, T0036, T0039) that were located within the proposed development area	<ul style="list-style-type: none"> No mitigation required. 	Construction	Prior to construction and ongoing.	Applicant ECO	ECO (monthly / as or when required)	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 34-36 and 38 of NHRA	ECO Monthly Checklist/Report

Area and site no.	Mitigation measures	Phase	Timeframe	The responsible party for implementation	Monitoring Party (frequency)	Target	Performance indicators (monitoring tool)
and were rated to have no research potential or other cultural significance and had a heritage grading of not conservation worthy (NCW).							
Palaeontological finds	<ul style="list-style-type: none"> The ECO for this project must be informed that the Adelaide Subgroup (Beaufort Group, Karoo Supergroup) has a Very High Palaeontological Sensitivity. If fossil remains are discovered during any phase of construction, either on the surface or exposed by fresh excavations the Chance Find Protocol must be implemented by the ECO in charge of these developments. 	Construction	During construction	Applicant ECO Palaeontologist	Monthly	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 35 of NHRA	Final report to be used by the developer to apply for a destruction permit under s35 of the NHRA.

10 CONCLUSIONS

PGS Heritage (Pty) Ltd (PGS) was appointed by Environmental Impact Management Services Consulting (Pty) Ltd (EIMS) to undertake a Heritage Impact Assessment (HIA), which forms part of the environmental process for the proposed Tetra4 Cluster 2 Gas Production Project, located within the Matjhabeng and Masilonyana Local Municipalities, between Welkom, Virginia and Theunissen, Free State Province.

This HIA aims to evaluate the possible impacts on heritage resources present within the proposed development footprint of the Tetra4 Cluster 2 Gas Production Project. Immediate and direct impacts on archaeological and palaeontological resources were addressed through the HIA.

The HIA has shown that the study area has a multitude of heritage resources situated within the proposed development boundaries.

10.1 GENERAL DESKTOP STUDY

An archival and historical desktop study was undertaken to provide a historic framework for the project area and surrounding landscape. This was augmented by a study of available historical and archival maps and an assessment of previous archaeological and heritage studies completed for the area. The desktop study revealed that the surroundings of the study area are characterised by a long and significant history, whereas previous archaeological and heritage studies from this area have revealed several archaeological and heritage sites from the surroundings.

Several archaeological and heritage surveys have been undertaken within the region. In 2016 and 2017, fieldwork was conducted by Polke Birkholtz (2017a, 2017b), an archaeologist of PGS. **Thirty-five** (35) of the **heritage finds** identified during this fieldwork, fall within the current study area. These were classified as either cemeteries, historic structures believed to be older than 100 years, historic structures believed to be older than 60 years, historical buildings of low significance, historic to recent sites with possible stillborn baby graves and possible grave sites.

There were ten (10) graves and burial grounds (**TET 1, TET 7-8, TET 11, TET 15, TET 19, TET 22, SSL/BET/72, SITE 2, SITE 19**), eleven (11) structures (**TET 2-3, TET 9, TET 27, SSL/BET/25-26, SSL/BET/36, SITE 1A, SITE 1B, SITE 20-21**), fourteen (14) historic to recent sites with possible graves (**TET 4-6, TET 13-14, TET 25a, TET 25b, TET 26, SSL/BET/37-39, SSL/BET/53, SSL/BET/60, SSL/BET/66**).

10.2 PALAEOLOGY

Elize Butler of Banzai Environmental (Pty) Ltd was commissioned to undertake a two-day Palaeontological Impact Assessment. Her report and findings are attached in full in Appendix B.

Butler found that the study area is “by Quaternary sediments as well as Permian aged sandstone and shale of the Adelaide Subgroup (Beaufort Group, Karoo Supergroup). According to the PalaeoMap of the South African Heritage Resources Information System (SAHRIS) the Palaeontological Sensitivity of Quaternary sediments in this area is Moderate, while that of the Adelaide Subgroup (Beaufort Group, Karoo Supergroup) is Very High.”

10.3 FIELDWORK

The fieldwork component of the study was aimed at identifying tangible remains of archaeological, historical and heritage significance. The fieldwork was undertaken by way of intensive walkthroughs of the proposed development footprint areas. The fieldwork was conducted by three archaeologists from PGS (Nikki Mann, Michelle Sachse and Nicholas Fletcher) on 12 November 2021. It is important to note that although as intensive a fieldwork coverage as possible was undertaken, sections of the study area are in areas which are more densely overgrown and/or disturbed (crops: maize, sunflowers, soya beans; ploughed areas) or have restricted access, which limited visibility in those areas of the study area. Therefore, the walkthroughs were focused on those areas that are not disturbed, as the potential for identifying archaeological and heritage sites in the more undisturbed components of the study area are much higher. As a result, only limited fieldwork was undertaken in those components of the study area that are entirely disturbed.

Recent fieldwork undertaken resulted in the identification of a total of **forty-one (41) heritage sites** (four of which were previously recorded; see footnotes below).

These sites comprised the following:

- Seven (7) sites containing burial grounds and graves. See sites **T0003, T0009, T0010, T0012¹¹, T0013, T0024, T0029**.
- Nine (9) sites historic to recent sites with possible graves. See sites **T0007, T0008, T0011, T0015, T0023, T0026, T0027, T0028, T0035¹²**.

¹¹ Note that site T0012 identified during the field assessment is the same site as TET15 identified in the 2016/2017 heritage assessment.

¹² Note that site T0035 identified during the field assessment is the same site as TET13 identified in the 2016/2017 heritage assessment.

- Twenty-five (25) structures. See sites **T0001, T0002, T0004, T0005, T0006¹³, T0014, T0016, T0017, T0018, T0019, T0020, T0021, T0022, T0025, T0030, T0031, T0032¹⁴, T0033, T0034, T0036, T0037, T0038, T0039, T0040, T0041.**

10.4 IMPACT ASSESSMENT

10.4.1 BURIAL GROUNDS AND GRAVES

A total of fourteen (14) burial grounds and graves (**TET 1, TET 7-8, TET 11, TET 15¹, TET 19, TET 22, SSL/BET/72, SITE 2, SITE 19** and **T0003, T0009, T0024, T0029**) were identified within the proposed development areas. Burial grounds and graves have high heritage significance and are given a IIIA significance rating in accordance with the system described in Section 4 of this document.

Burial grounds and graves are protected under Section 36 of the NHRA 25 of 1999. Thus, the sites are provisionally rated as having a high heritage significance with a heritage rating of IIIA. All graves have high levels of emotional, religious and in some cases historical significance. It is also important to understand that the identified graves could have significant heritage value to the relevant families.

The pre-mitigation impact significance is rated as **MEDIUM**, but with the implementation of the required mitigation measures the post-mitigation impact will be **LOW**. The overall Environmental significance will be Low negative.

10.4.2 HISTORIC TO RECENT SITES WITH POSSIBLE GRAVES

A total of fourteen (14) possible grave sites (**TET 4-6, TET 13², TET 14, TET 25a, TET 25b, TET 26, SSL/BET/37-39, SSL/BET/53, SSL/BET/60, SSL/BET/66**) were identified within the proposed development area. Burial grounds and graves have high heritage significance and are given a IIIA significance rating in accordance with the system described in Section 4 of this document.

The pre-mitigation impact significance is rated as **MEDIUM**, but with the implementation of the required mitigation measures the post-mitigation impact will be **LOW**. The overall Environmental significance will be Low negative.

¹³ Note that site T0006 identified during the field assessment is the same site as SITE 1B identified in the 2016/2017 heritage assessment.

¹⁴ Note that site T0032 identified during the field assessment is the same site as TET3 identified in the 2016/2017 heritage assessment.

10.4.3 STRUCTURES

A total of thirty-one (31) structures (**TET 2, TET3⁴, TET 9, TET 27, SSL/BET/25-26, SSL/BET/36, SITE 1A, SITE 1B³, SITE 20-21** and **T0001, T0002, T0004, T0005, T0017, T0018, T0019, T0020, T0021, T0025, T0030, T0031, T0033, T0034, T0036, T0037, T0038, T0039, T0040, T0041**) were identified within the proposed development area.

Twenty-one (21) of the heritage sites (**TET27, SSL/BET/25, SSL/BET/26, SSL/BET/36, T0001, T0002, T0004, T0005, T0017, T0018, T0019, T0020, T0025, T0030, T0031, T0033, T0034, T0036, T0037, T0038, T0039**) are assessed to have a low heritage significance are not included in the impact assessment. The reason for this is that sites of low significance will not require mitigation.

Structures older than 60 years fall under the protection of Section 34(1) of the National Heritage Resources Act 25 of 1999. Additionally, in terms of Section 35(4) of the National Heritage Resources Act (25 of 1999), man-made features and artefacts older than 100 years are defined as being archaeological. In the same section, the act also states that such archaeological sites and objects may not be disturbed, altered, modified or destroyed without a suitable permit from the South African Heritage Resources Agency (SAHRA).

The pre-mitigation impact significance is rated as **MEDIUM**, but with the implementation of the required mitigation measures the post-mitigation impact will be **LOW**. The overall Environmental significance will be Low negative.

10.4.4 PALAEOLOGY

No visible evidence of fossiliferous outcrops was found in the development footprint and thus an overall medium palaeontological significance is allocated to the development footprint. It is therefore considered that the proposed development will not lead to detrimental impacts on the palaeontological reserves of the area and construction of the development may be authorised in its whole extent.

10.5 MITIGATION MEASURES

The following mitigation measures are listed in the table below.

Area and site no.	Mitigation Measures
General project area	<ul style="list-style-type: none"> Implement a chance find procedures in case where possible heritage finds are uncovered.
Burial Grounds and Graves (TET 1, TET 7-8, TET 11, TET 15¹, TET 19, TET 22, SSL/BET/72, SITE 2, SITE 19 and T0003, T0009, T0024, T0029) that were located within the proposed development area and were rated as high local heritage significance and had a heritage grading of IIIA.	<ul style="list-style-type: none"> The graves should be demarcated with a 50-meterbuffer and should be avoided and left in situ. A Grave Management Plan should be developed for the graves which also need to be approved by SAHRA BGG. If the site is going to be impacted and the graves need to be removed a grave relocation process as per the Heritage Management Plan for the site is recommended as a mitigation and management measure. This will involve the necessary social consultation and public participation process before grave relocation permits can be applied for with the SAHRA BGG under the NHRA and National Health Act regulations.
Burial Grounds and Graves (T0010, T0013) that were located outside of the proposed development area.	<ul style="list-style-type: none"> No mitigation required.
Historic to recent sites with possible grave sites (TET 4-6, TET 13², TET 14, TET 25a, TET 25b, TET 26, SSL/BET/37-39, SSL/BET/53, SSL/BET/60, SSL/BET/66) that were located within the proposed development area and were rated as high local heritage significance and had a heritage grading of IIIA.	<ul style="list-style-type: none"> Apply for the test excavation and/or GPR permit to determine if the site contains graves. If human remains are discovered a grave relocation process is recommended as a mitigation and management measure. This will involve the necessary social consultation and public participation process before grave relocation permits can be applied for with the SAHRA BGG under the NHRA and National Health Act regulations. When graves are discovered/uncovered the site should be demarcated with a 50-meterno-go-buffer-zone and the grave should be avoided. If, during test excavations, it is determined that the site does not contain graves, no further mitigation will be required.
Historic to recent sites with possible grave sites (T0015, T0023, T0026,	<ul style="list-style-type: none"> No mitigation required.

Area and site no.	Mitigation Measures
<p>T0027, T0028) that were located outside of the proposed development area and were rated as high local heritage significance and had a heritage grading of IIIA.</p>	
<p>Structures (TET2, TET3⁴, TET9, SITE 1A, SITE 1B³, SITE 20, SITE 21, T0021, T0040, T0041) that were located within the proposed development area and were rated as medium local heritage significance and had a heritage grading of IIIB.</p>	<ul style="list-style-type: none"> ▪ It is recommended that a no-go-buffer-zone of at least 30m is kept to the closest infrastructure. ▪ If development occurs within 30m of the site, the structure will need to be satisfactorily studied and recorded before impact occurs. ▪ Recording of the site i.e. (a) map indicating the position and footprint of the structure (b) photographic recording of the structure (c) measured drawings of the floor plans of the structure. ▪ Submission of permit application to SAHRA to allow for the disturbance to the site. A Phase 2 Heritage Report must accompany the permit.
<p>Structures (T0014) that were located outside of the proposed development area and were rated as medium local heritage significance and had a heritage grading of IIIB.</p>	<ul style="list-style-type: none"> ▪ No mitigation is required.
<p>Structures (TET27, SSL/BET/25, SSL/BET/26, SSL/BET/36, T0017, T0018, T0019, T0020, T0025, T0037, T0038) that were located within the proposed development area and were rated as low local heritage significance and</p>	<ul style="list-style-type: none"> ▪ No mitigation is required. The documentation of the site in the HIA report is sufficient and the site can be destroyed without a permit but with the approval of this report.

Area and site no.	Mitigation Measures
had a heritage grading of IIIC.	
Structures (T0016, T0022) that were located outside of the proposed development area and were rated as low local heritage significance and had a heritage grading of IIIC.	<ul style="list-style-type: none"> ▪ No mitigation is required.
Structures (T0001, T0002, T0004, T0005, T0030, T0031, T0033, T0034, T0036, T0039) that were located within the proposed development area and were rated to have no research potential or other cultural significance and had a heritage grading of not conservation worthy (NCW).	<ul style="list-style-type: none"> ▪ No mitigation is required.
Palaeontology	<ul style="list-style-type: none"> • The ECO for this project must be informed that the Adelaide Subgroup (Beaufort Group, Karoo Supergroup) has a Very High Palaeontological Sensitivity. • If Palaeontological Heritage is uncovered during surface clearing and excavations the Chance find Protocol attached should be implemented immediately. Fossil discoveries ought to be protected and the ECO/site manager must report to South African Heritage Resources Agency (SAHRA) (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za) so that mitigation (recording and collection) can be carried out.

Area and site no.	Mitigation Measures
	<ul style="list-style-type: none"> • Before any fossil material can be collected from the development site the specialist involved would need to apply for a collection permit from SAHRA. Fossil material must be housed in an official collection (museum or university), while all reports and fieldwork should meet the minimum standards for palaeontological impact studies proposed by SAHRA (2012). • These recommendations should be incorporated into the Environmental Management Plan for the Tetra4 Development.

10.6 GENERAL

It is the considered opinion of the authors of this report that the overall impact of the proposed Tetra4 Cluster 2 Gas Production Project on heritage resources will be **Low**. Provided that the general recommendations and mitigation measures outlined in this report are implemented, the impact would be acceptably Low or could be totally mitigated to the degree that the project could be approved from a heritage perspective. The management and mitigation measures as described in **Section 8** of this report have been developed to minimise the project impact on heritage resources.

11 REFERENCES

11.1 PUBLISHED REFERENCES

- Bergh, J.S. 1999. Geskiedenisatlas van Suid-Afrika: die Vier Noordelike Provinsies. Van Schaik, Pretoria.
- Birkholtz, P.D. 2017a. Heritage Impact Assessment for the Proposed Tetra4 Cluster 1 Gas Production Project. Prepared for EIMS.
- Birkholtz, P.D. 2017b. Heritage Audit Report for the Beatrix Mining Areas of Sibanye Gold, Between Welkom and Theunissen, Lejweleputswa District, Orange Free State Province. Prepared for Sibanye Gold (Pty Ltd).
- Changuion, L. Silence of the Guns: The History of the Long Toms of the Anglo-Boer War. Protea Book House, Pretoria.
- Coetzee, F. 2008. Cultural Heritage Survey of the Proposed Phakisa Housing Development, Welkom, Free State.
- De Bruin, J. C. 1960. Hennenman ('n Gedenkboek). Hennenman: Volksskool.
- De Kock, M. G. W. 1985. Gister is Verby! 1910-1985: Verhaal van die Ned. Geref. Gemeente Theunissen. P.p 11 – 24.
- De Ruiter, D.J., Churchill, S.E., Brophy, J.K. and Berger, L.R. 2011. Regional Survey of Middle Stone Age Fossil Vertebrate Deposits in the Virginia-Theunissen area of the Free State, South Africa in Navorsing van die Nasionale Museum, vol. 27, part 1.
- Deacon, H.J. & J. Deacon. 1999. Human Beginnings in South Africa: Uncovering the Secrets of the Stone Age. David Philip Publishers. Cape Town.
- Dreyer, J.J.B. 1990. The Iron Age Prehistory of the Winburg Area, Orange Free State. Unpublished MA Dissertation, University of the Witwatersrand.
- Dreyer, C. 2004a. First Phase Heritage/Archaeological Assessment of the Proposed Powerline Route at Phakisa Mine, Welkom, Free State.
- Dreyer, C. 2004b. Archaeological and Historical Investigation of the Graves at the Proposed Housing Developments near Thabong, Welkom, Free State.
- Dreyer, C. 2005. Archaeological and Historical Investigation of the Proposed New Filling Station at Virginia, Free State.

- Dreyer, C. 2007. First Phase Archaeological and Cultural Heritage Assessment of the Proposed New MTN Cell Phone Mast at Pumlani Cemetery, Thabong, Welkom, Free State.
- Dreyer, C. 2008. First Phase Archaeological and Heritage Investigation of the proposed Oppenheimer Park Golf Estate, Welkom, Free State.
- Dreyer, C. 2011. First Phase Archaeological and Heritage Investigation of the proposed Chicken Egg Production Developments at Mooidoorns 319, Welkom, Free State.
- Duncan, P. 1915. Report of the Select Committee on Rebellion (SC1 '15) Cape Town, House of Assembly.
- Erasmus, B.J. 2004. On Route in South Africa. Jonathan Ball Publishers, Johannesburg.
- Felstar Publishers. 1968. Welkom: Capital of the Orange Free State Goldfields. Felstar Publishers (Pty) Ltd, Johannesburg.
- Fourie, W. 2008b. Archaeological Impact Assessments within South African Legislation in South African Archaeological Bulletin, 63(187): 77 – 85.
- Fourie, W. 2021. Heritage Impact Assessment for The Proposed Harmony FSS6 Reclamation Pipeline, Welkom, Free State Province.
- Helme, N. 1974. Thomas Major Cullinan: A Biography. McGraw-Hill Book Company, Johannesburg.
- Huffman, T.N. 2007. Handbook to the Iron Age: The archaeology of Pre-Colonial Farming Societies in Southern Africa. University of KwaZulu-Natal Press, Scottsville.
- Johnson, J.P. 1910. Geological and Archaeological Notes on Orangia. Longmans, Green & Company, London.
- Kuman K & R. J. Clarke. 1986. Florisbad-New Investigations at a Middle Stone Age Hominid Site in South Africa. *Geoarchaeology: An International Journal*, Vol. 1, No. 2, 103-125 (1986). John Wiley & Sons, Inc.
- Kruger, N. 2021a. Archaeological Impact Assessment (AIA) On Portions Of The Farms Bloemhoek 509, Welgelegen 382, Mooi Uitzig 352, Florida 633, Le Roux 717 And Detente 744 For The Proposed Virginia Solar Park Power Lines Ba Project, Lejweleputswa District Municipality, Free State Province.
- Kruger, N. 2021b. Archaeological Impact Assessment (AIA) On Portions Of The Farm Blomskraal 216 For The Proposed Virginia 1, 2 & 3 Solar Parks Eia Project, Lejweleputswa District Municipality, Free State Province.

- Langner, D. & A. Raath. 2014. Die Afrikanerrebellie: 1914-1915. Die Erwe van Ons Vaad're Nr. 6. Kraal Uitgewers, Pretoria.
- Legassick, M. 2010. The politics of a South African frontier: the Griqua, the Sotho-Tswana and the missionaries, 1780 – 1840. Basler Afrika Bibliographien, Basel.
- Lye, W.F. & C. Murray. 1980. Transformations on the Highveld: The Tswana and Southern Sotho. David Phillip, Cape Town.
- Machens, E.W. 2009. Platinum, Gold and Diamonds: The adventure of Hans Merensky's discoveries. Protea Boekhuis, Pretoria. Maggs, T.M. 1976. Iron Age Communities of the Southern Highveld. (Occasional Publication 2). Pietmaritzburg: Natal Museum.
- Mason, R.J. 1969. The Oppermansdrif Dam Archaeological Project: Vaal Basin in The South African Archaeological Bulletin, Vol. 24, No. 95/96, pp. 182-192.
- Maurice, J.F. & M.H. Grant. 1906. History of the War in South Africa. Hurst and Blackett, London.
- Mayhew, V. 1982. Reader's Digest: Illustrated Guide to Southern Africa. The Reader's Digest Association.
- Meintjies, J. 1973. The Voortrekkers. Cassell, London.
- Morris, D. 2008. Archaeological and Heritage Phase 1, Impact Assessment for proposed upgrading of Sishen Mine Diesel Depot Storage Capacity at Kathu, Northern Cape. Kimberley: McGregor Museum.
- Mucina, L. & Rutherford, M.C. (eds) (2006). The vegetation of South Africa, Lesotho and Swaziland. Strelitzia 19. South African National Biodiversity Institute, Pretoria.
- Nienaber, P. J. & Le Roux, C. J. P. 1982. Vrystaat-Fokus. Pretoria: Sigma Press (Pty) Ltd.
- Oberholster, J.J. 1972. The Historical Monuments of South Africa. The Rembrandt van Rijn Foundation for Culture, Cape Town.
- Pakenham, T. 1979. The Boer War. Bergvlei: Jonathan Ball Publishers.
- Raath, A.W.G. 2007. De La Rey: Die Stryd vir Vryheid. Kraal Uitgewers, Pretoria.
- Rossouw, L. n.d. Phase 1 Heritage Impact Assessment of a proposed new rehabilitation facility at Odendaalsrust, Free State Province. Prepared for EKO Environmental Consultants.
- Schoeman, K. Bloemfontein: die ontstaan van 'n stad 1846 – 1946. Human & Rousseau, Cape T own.

- Shorten, J.R., 1970: The Johannesburg Saga. John R. Shorten (Pty) Ltd, Johannesburg.
- The Mining Manual and Yearbook, 1914.
- The Reader's Digest. 1994. Illustrated History of South Africa: The Real Story. The Reader's Digest Association Limited, Cape Town.
- Union of South Africa, 1916. Report of the Judicial Commission of Enquiry into the Causes of and Circumstances relating to the recent Rebellion in South Africa, December 1916.
- Unpublished References
- Van der Walt, J. 2013a. Archaeological Scoping Report for the Proposed Oryx Solar Energy Facility. Prepared for Savannah Environmental (Pty) Ltd.
- Van der Walt, J. 2013b. Archaeological Impact Assessment for the Proposed Oryx Solar Energy Facility. Prepared for Savannah Environmental (Pty) Ltd.
- Van Ryneveld, K. 2013. Phase 1 Archaeological Impact Assessment for the Lebone Solar Farm, Onvewag RE/728 and Vaalkranz 2/220, Welkom, Free State, South Africa. Prepared for Enviroworks.
- van Schalkwyk, J. 2014. Cultural Heritage Impact Assessment Report for the Proposed SANRAL Thabong Interchange Development, Welkom Region, Free State Province.
- Van Schoor, M.C.E. 2007. Christiaan Rudolph de Wet: Krygsman en Volksman. Protea Boekhuis, Pretoria.
- Visagie, J.C. 2011. Voortrekkerstamouers: 1835 – 1845. Protea Boekhuis, Pretoria.
- Wadley, L. 2013. Recognizing complex cognition through innovative technology in Stone Age and Palaeolithic sites in Cambridge Archaeological Journal, 23: 163-183.
- Warwick, P. 1983. Black People and the South African War: 1899 – 1902. Ravan, Johannesburg.

11.2 HISTORIC TOPOGRAPHIC MAPS

All historic topographic maps used in this report were obtained from the Directorate: National Geo-spatial Information of the Department of Rural Development and Land Reform in Cape Town.

11.3 INTERNET

www.angloboerwar.com
www.nzetc.victoria.ac.za
www.sahistory.org.za

www.sahra.org.za

www.sanbi.org

www.wikipedia.org

11.4 GOOGLE EARTH

All the aerial depictions and overlays used in this report are from Google Earth.

WOUTER FOURIE

Professional Heritage Specialist and Professional Archaeologist and Director PGS Heritage

Summary of Experience

Specialised expertise in Archaeological Mitigation and excavations, Cultural Resource Management and Heritage Impact Assessment Management, Archaeology, Anthropology, Applicable survey methods, Fieldwork and project management, Geographic Information Systems, including *inter alia* -

Involvement in various grave relocation projects (some of which relocated up to 1000 graves) and grave “rescue” excavations in the various provinces of South Africa

Involvement with various Heritage Impact Assessments, within South Africa, including -

- Archaeological Walkdowns for various projects
- Phase 2 Heritage Impact Assessments and EMPs for various projects
- Heritage Impact Assessments for various projects
- Iron Age Mitigation Work for various projects, including archaeological excavations and monitoring
- Involvement with various Heritage Impact Assessments, outside South Africa, including -
- Archaeological Studies in Democratic Republic of Congo
- Heritage Impact Assessments in Mozambique, Botswana and DRC
- Grave Relocation project in DRC

Key Qualifications

BA [Hons] (Cum laude) - Archaeology and Geography - 1997

BA - Archaeology, Geography and Anthropology - 1996

Professional Archaeologist - Association of Southern African Professional Archaeologists (ASAPA) - Professional Member

Accredited Professional Heritage Specialist – Association of Professional Heritage Practitioners (APHP)

CRM Accreditation (ASAPA) -

- Principal Investigator - Grave Relocations
- Field Director – Iron Age
- Field Supervisor – Colonial Period and Stone Age
- Accredited with Amafa KZN

Key Work Experience

2003- current - Director – Professional Grave Solutions (Pty) Ltd

2007 – 2008 - Project Manager – Matakoma-ARM, Heritage Contracts Unit, University of the Witwatersrand

2005-2007 - Director – Matakoma Heritage Consultants (Pty) Ltd

2000-2004 - CEO– Matakoma Consultants

1998-2000 - Environmental Coordinator – Randfontein Estates Limited. Randfontein, Gauteng

1997-1998 - Environmental Officer – Department of Minerals and Energy. Johannesburg, Gauteng

Worked on various heritage projects in the SADC region including, Botswana, Mozambique, Malawi, Mauritius, Zimbabwe and the Democratic Republic of the Congo

CURRICULUM VITAE FOR NIKKI MANN
Professional Archaeologist for PGS Heritage

Name: Nikki Mann
Profession: Archaeologist
Date of birth: 1992-10-13
Parent Firm: PGS Heritage (Pty) Ltd
Position at Firm: Archaeologist
Years with firm: 2
Years of experience: 7
Nationality: South African
HDI Status: White

EDUCATION:

Name of University or Institution : University of Cape Town
Degree obtained : BSc
Major subjects : Archaeology, Environmental and
Geographical Sciences
Year : 2013

Name of University or Institution : University of Cape Town
Degree obtained : BSc [Hons]
Major subjects : Archaeology
Year : 2014

Name of University or Institution : University of Cape Town
Certificate obtained : MSc – Archaeology (phytolith analysis)
Year : 2017

Professional Qualifications:

Professional Archaeologist - Association of Southern African Professional Archaeologists -
Professional Member – No 472

Languages:

English
French

KEY QUALIFICATIONS

- 3 years of work in the heritage consulting field;
- 7 years working experience in archaeological excavations;
- Proven experience in report writing and report deliverables;

HERITAGE IMPACT ASSESSMENTS

South African

Harmony Kareerand Pipelines Project. Between Klerkdorp and Potchefstroom, North West Province.

EIMS. **Position:** Heritage Specialist

Black Mountain PV. Northern Cape. Uvuna. **Position:** Heritage Specialist

Proposed amendment of existing mining activities for Kolomela Mine. South-west of Postmasburg, Northern Cape. EXM. **Position:** Heritage Specialist.

Proposed amendment of existing mining activities for Kudumane Mine. Hotazel, Northern Cape. SRK. **Position:** Heritage Specialist.

10MW Chelsea Solar PV. Gqeberha, Eastern Cape. SLR. **Position:** Heritage Specialist.

Koup 1 and Koup 2 WEF. Beaufort West, Western Cape. SiVEST. **Position:** Heritage Specialist.

Victoria West Pipelines. Victoria West, Northern Cape. iXEng. – **Position:** Heritage Specialist.

East Orchards Poultry Farm Project. Delmas, Mpumalanga. EcoSphere. – **Position:** Heritage Specialist.

Gunstfontein WEF and OHL. Sutherland, Northern Cape. Savannah– **Position:** Heritage Specialist.

Overhead power line for Oya PV Facility. Sutherland, Northern Cape. SiVEST– **Position:** Heritage Specialist.

Infrastructure for Kudusberg WEF. Sutherland, Northern Cape. SiVEST– **Position:** Heritage Specialist.

Proposed SKA fibre optic cable, between Beaufort West and Carnarvon, Northern and Western Cape. **Position:** Heritage Specialist.

Proposed SANSA Space Operations. Matjiesfontein, Western Cape. **Position:** Heritage Specialist

Pienaarspoort WEF 1 and 2. North-west of Matjiesfontein, Western Cape. Savannah- **Position:** Heritage Specialist.

Swellendam WEF. Swellendam, Western Cape. – **Position:** Heritage Specialist.

Matjiesfontein Road Extension Project. Matjiesfontein, Western Cape. **Position:** Heritage Specialist.

MITIGATION WORK

2020 – Coega Zone 10, Coega IDZ, Eastern Cape Province. Colonial Period Phase 2 Mitigation Archaeological Excavation. **Archaeologist.**

2019 – 2020 - **Lesotho Highland Development Authority – Polihali Dam Project - Heritage Management Plan development and Implementation.** Mokhotlong, Kingdom of Lesotho. **Archaeologist.**

2018- Proposed development of boreholes and associated pipelines for the Langebaan Aquifer within the Hopefield Private Nature Reserve, Hopefield, Western Cape. **Archaeologist.**

POSITIONS HELD

2021 – current: Archaeologist - PGS (Pty) Ltd

2019 – 2020: Archaeologist - PGS (Pty) Ltd Lesotho

2018 – 2020: Contract Archaeologist – CTS Heritage

REFERENCES

Wouter Fourie

PGS Heritage

Tel: +27 12 332 5305

Email:

wouter@pgsheritage.co.za

Dr David Braun

George Washington

University

Email:

drbraun76@gmail.com

Nicholas Wiltshire

CTS Heritage

Tel: +27 (0)87 073 5739

Email:

nic.wiltshire@ctsheritage.com