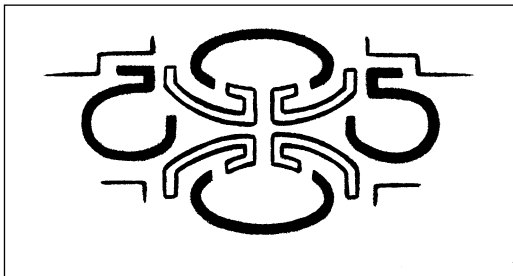


**Cultural Heritage Impact Assessment:
Phase 1 Investigation for the Proposed Underground Water Treatment Facility and Pipeline near Cowles Dam in Springs, New Kleinfontein Goldmine (Pty) Ltd (Modder East Operations), Ekurhuleni Metropolitan Municipality, Gauteng**



For

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Date:	August 2018
Updated & Revised	September 2018
Version:	2 (Final Report)

Executive Summary

This report contains a comprehensive heritage impact assessment investigation in accordance with the provisions of Sections 38(1) and 38(3) of the *National Heritage Resources Act* (Act No. 25 of 1999) (NHRA) and focuses on the survey results from a cultural heritage survey as requested by Prime Resources Environmental Consultants (Pty) Ltd who has been appointed to conduct the environmental authorisation and WULA processes. New Kleinfontein Goldmine (Pty) Ltd (NKGM) (also referred to as Modder East Operations) is an existing mine located on the East Rand of Gauteng, near the town of Modder East/Eastvale. The remaining life of mine is approximately 7 years. NKGM is applying to install of an underground water treatment facility, to treat up to 20 megalitres of underground water per day, using Cold Lime Softening (CLS) treatment. Treated water will be pumped to surface and discharged via a pipeline to a wetland downstream of Cowles Dam. The proposed pipeline is approximately 5 km north of Springs, Ekurhuleni Metropolitan Municipality, Gauteng. The EIA process for Environmental Authorisation for the proposed prospecting application is conducted in terms of the National Environmental Management Act (Act No. 107 of 1998) (NEMA).

The remains of one historical farmhouse complex (Site 1) were recorded during the survey. The site is probably associated with a late 19th through to an early 20th century occupation phase of the farm. The structure has been stripped of its fittings (roofs, doors and windows) and has partially collapsed. As a result of the general bad state of preservation the structure has a low significance value.

Site No	Site Type	Field Rating of Significance	Direct Impacts	Significance of Impact before Mitigation	Significance of Impact after Mitigation	Proposed Mitigation
1	Historical farmhouse complex	Generally Protected C: Low Significance	None	6 (Low)	6 (Low)	<ul style="list-style-type: none"> Maintain a 50 metres buffer zone

No archaeological (both Stone Age and Iron Age) artefacts, assemblages, features, structures or settlements were recorded during the survey of the project footprint.

It is therefore recommended, from a cultural heritage perspective that the proposed construction of a water pipeline and associated infrastructure may proceed. No Phase 2 investigation will be required.

Also, please note:

Archaeological deposits usually occur below ground level. Should archaeological artefacts or skeletal material be revealed in the area during development activities, such activities should be halted, and a university or museum notified in order for an investigation and evaluation of the find(s) to take place (*cf.* NHRA (Act No. 25 of 1999), Section 36 (6)).

Definitions and abbreviations

Midden:	Refuse that accumulates in a concentrated heap.
Stone Age:	An archaeological term used to define a period of stone tool use and manufacture
Iron Age:	An archaeological term used to define a period associated with domesticated livestock and grains, metal working and ceramic manufacture
LIA:	Late Iron Age sites are usually demarcated by stone-walled enclosures
NHRA:	National Heritage Resources Act (Act No. 25 of 1999)
SAHRA:	South African Heritage Resources Agency
SAHRIS:	South African Heritage Resources Information System
PHRA-G:	Provincial Heritage Resources Authority - Gauteng
GDARD:	Gauteng Department of Agriculture and Rural Development
HIA:	Heritage Impact Assessment
DMR:	Department of Mineral Resources
DENC:	Department of Environment and Nature Conservation: Northern Cape
I&APs:	Interested and Affected Parties

I, Francois Coetzee, hereby confirm my independence as a cultural heritage specialist and declare that I do not have any interest, be it business, financial, personal or other, in any proposed activity, application or appeal in respect of the listed environmental processes, other than fair remuneration for work performed on this project.



Francois P Coetzee
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1. Introduction and Terms of Reference

New Kleinfontein Goldmine (NKGM) (also referred to as Modder East Operations) is planning the construction of a pipeline for the discharge of treated water to a wetland associated with the Cowles Dam in Springs, Ekurhuleni Metropolitan Municipality, Gauteng. Prime Resources (Pty) Ltd has been appointed to conduct the environmental authorisation and WULA processes associated with the pipeline. The proposed pipeline is approximately 5 km north of Springs. A Cultural Heritage Impact Assessment (HIA) was requested by Prime Resources Environmental Consultants (Pty) Ltd on behalf of the client to evaluate the potential impact of the proposed water pipeline on cultural heritage resources in the footprint of the development.

2. Objectives

The general objective of the cultural heritage survey is to record and document cultural heritage remains consisting of both tangible and intangible archaeological and historical artefacts, structures (including graves), settlements and oral traditions of cultural significance.

As such the terms of reference of this survey are as follows:

- Identify and provide a detailed description of all artefacts, assemblages, settlements and structures of an archaeological or historical nature (cultural heritage sites) located on the study area,
- Estimate the level of significance/importance of these remains in terms of their archaeological, historical, scientific, social, religious, aesthetic and tourism value,
- Assess any impact on the archaeological and historical remains within the area emanating from the development activities, and
- Propose recommendations to mitigate heritage resources where complete or partial conservation may not be possible and thereby limit or prevent any further impact.

3. Description of Physical Environment of Study Area

The heritage survey focussed on an area situated approximately 5 kilometres north of Springs (CBD).

Farm Name(s) and Portions	The following portions and farms: <ul style="list-style-type: none"> • Cloverfield 75 IR <ul style="list-style-type: none"> ○ Remaining extent ○ Portion 3 • Geduld 123 IR <ul style="list-style-type: none"> ○ Portions 104 & 107
Size of Survey Area	Pipeline: 1.4 km in length
Magisterial District	Ekurhuleni Metropolitan Municipality
1:50 000 Map Sheet	2628AB
1:250 000 Map Sheet	2628
Central Coordinates of the Development	28.462250°E 26.200760°S

Table 1: Physical Environment

The northern parts of the survey area falls within the Grassland Biome, particularly the Mesic Highveld Grassland Bioregion and more specifically the Soweto Highveld Grassland (Gm 8).

This veld type occurs in Mpumalanga, Gauteng (and to a very small extent also in neighbouring Free State and North-West) Provinces. It occurs in a broad band roughly delimited by the N17 road between Ermelo and Johannesburg in the north, Perdekop in the southeast and the Vaal River (border with the Free State) in the south. It extends further westwards along the southern edge of the Johannesburg Dome (including part of Soweto) as far as the vicinity of Randfontein. In southern Gauteng it includes the surrounds of Vanderbijlpark and Vereeniging as well as Sasolburg in the northern Free State. Soweto Highveld Grassland is dominated by *Themeda triandra* (Red Grass) accompanied by grasses such as *Elionorus muticus* (Wire Grass), *Eragrostis racemosa* (Narrow Heart Love Grass), *Heteropogon contortus* (Spear Grass) and *Tristachya leucothrix* (Hairy Trident Grass) (Mucina & Rutherford 2006).

The survey footprint is characterised as an open and flat area dominated by red clay soils covered mostly in grasses and sporadic tree clusters. Infrastructure include railway lines, access roads, dirt roads, fences, old agricultural and grazing lands, various power lines, surrounding mines and informal settlements. Also note that the 1939 topographic map indicates that there was a canal running almost parallel with the proposed water pipeline.

The survey footprint is also surrounded by several long-term industrial, mining and residential developments, such as:

- East Geduld Mines (with associated diggings, slimes dams, sewage disposal works, hospital and residential area);
- Enstra Sappi Mill and associated infrastructure;
- Cowles Dam (with dam wall and other canal infrastructure);
- Welgedacht Sewage Works;
- Geduld Proprietary Mines (with diggings and slimes dam);
- Modderfontein East Gold Mine; and
- Bakerton, Welgedacht, Eastvale, Petersfield and Dersley residential areas

Springs normally receives about 586 mm of rain per year, with most rainfall occurring during summer. The region receives the lowest rainfall (0 mm) in June and the highest (111 mm) in January. Average annual rainfall is 715 mm to 735 mm. The monthly distribution of average daily maximum temperatures indicate that the average midday temperatures for Springs range from 16.9°C in June to 26°C in January. The region is the coldest during July when the mercury drops to 0°C on average during the night (SAExplorer 2018).

Current Zoning	Mining Cattle grazing (pastoralism)
Economic activities	Farming Mining
Soil and basic geology	The region is dominated by five main geological formations. In the north-west at Tembisa and to the west of Clayville, areas of granite-gneiss are found. Dolomite dominates the northern area between Clayville in the west and Bapsfontein in the east and all along the eastern boundary of the study area towards Putfontein, Strubenvale as far south as Kwa-Thema and Dunnotar. Another extensive area of dolomite is found in the south-west of Ekurhuleni in the Katorus area. Quartsite dominates the north-south central area from the west of Clayville in the north through Kaalfontein, to the east of OR Tambo Airport and in a broad band from west to east from Germiston to Springs. It also occurs north of Bapsfontein. Surface shale is found in the west,

	south of Bapsfontein and in the east, south of OR Tambo International Airport towards Germiston. Amphibolite occur in the area around Edenvale east of Kempton Park and OR Tambo International Airport. A small area of surface dolomite occurs in the extreme south between Duduza and Vosloorus (Environmental Management Framework for Ekurhuleni 2007).
Prior activities	Livestock farming and agriculture
Socio Economic Environment	The structure of the City of Ekurhuleni's economy is dominated by four sectors: manufacturing, finance and business services, community services and general government and to a lesser extent the trade and hospitality sector. Over the past 15 years, major structural shifts have occurred in the structure of the economy principally involving the decline of the dominance of the manufacturing sector which dropped from 30.3% in 2000 to 22.7% in 2015 and a comparable increase of the contribution of the finance and business services sector which increased its share from 14.8% in 2011 to 21.3% in 2015. The continuing decline of the manufacturing sector is a big challenge for the municipality and for that reason the revitalization of the manufacturing sector is a key strategic focus area for the municipality. With a GDP of R 301 billion in 2015 (up from R 128 billion in 2005), Ekurhuleni contributed 21.43% to the Gauteng Province GDP of R 1.41 trillion in 2015 increasing in the share of the Gauteng from 22.18% in 2005. The City of Ekurhuleni contributes 7.51% to the GDP of South Africa which had a total GDP of R 4.01 trillion in 2015 (as measured in nominal or current prices). It's contribution to the national economy remain constant in importance from 2005 when it contributed 7.5% to South Africa, but it is lower than the peak of 7.8% in 2005 (City Of Ekurhuleni IDP 2017).
Evaluation of Impact	An evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits NHRA (Act No. 25 of 1999, Section 38(3d)): Positive

Table 2: Socio-economic environment

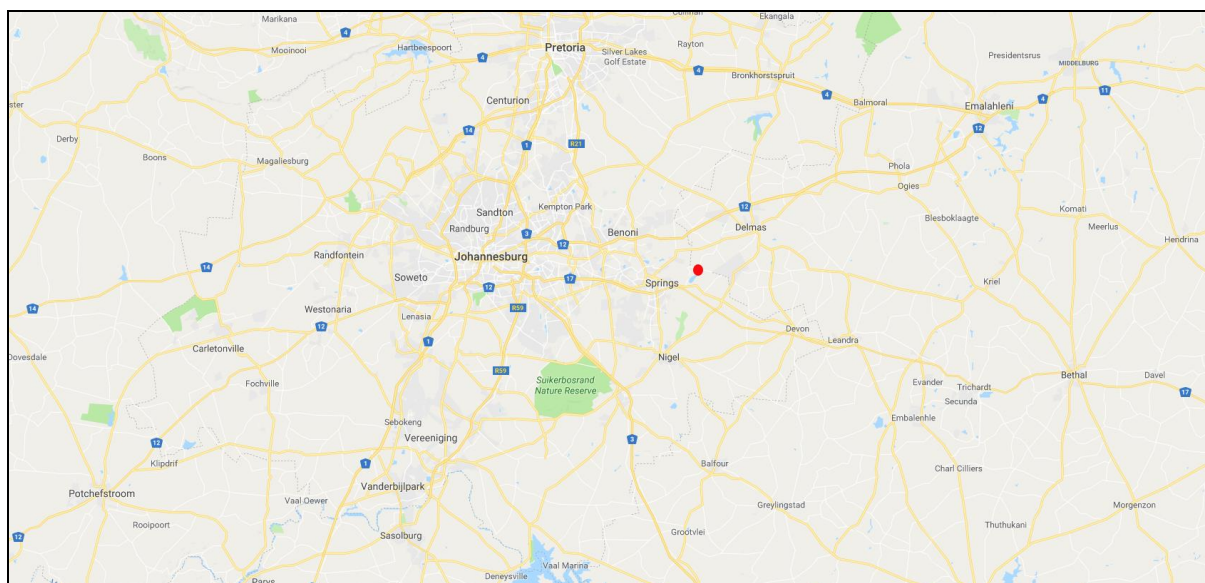


Figure 1: Regional map of the survey area situated north of Springs (indicated by the red area)

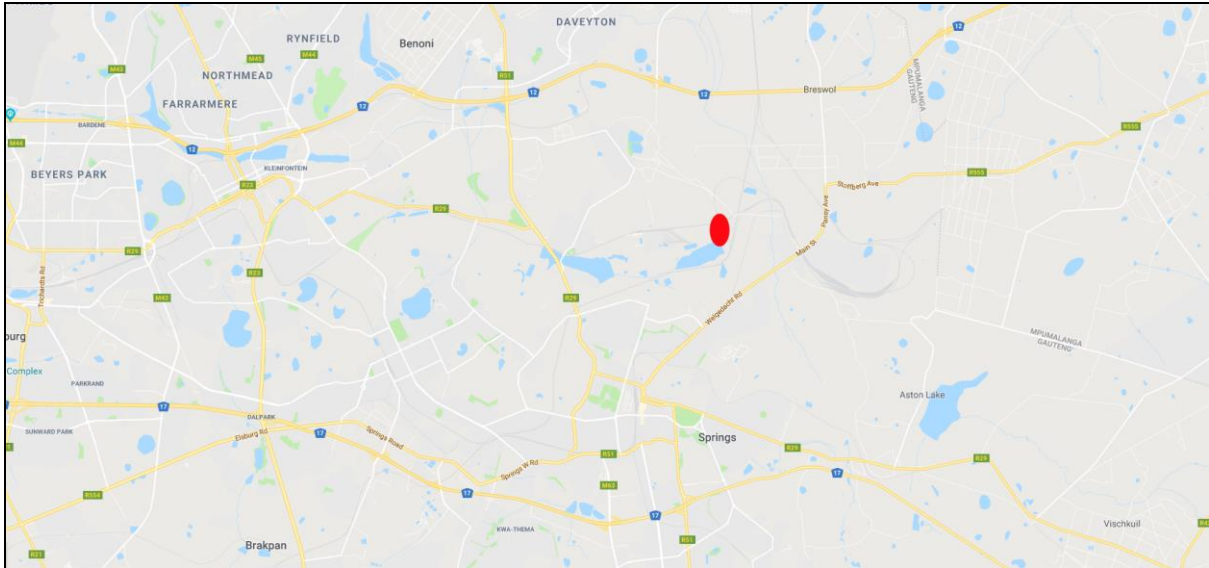


Figure 2: Local context of the survey footprint located north of Springs (indicated by the red area)

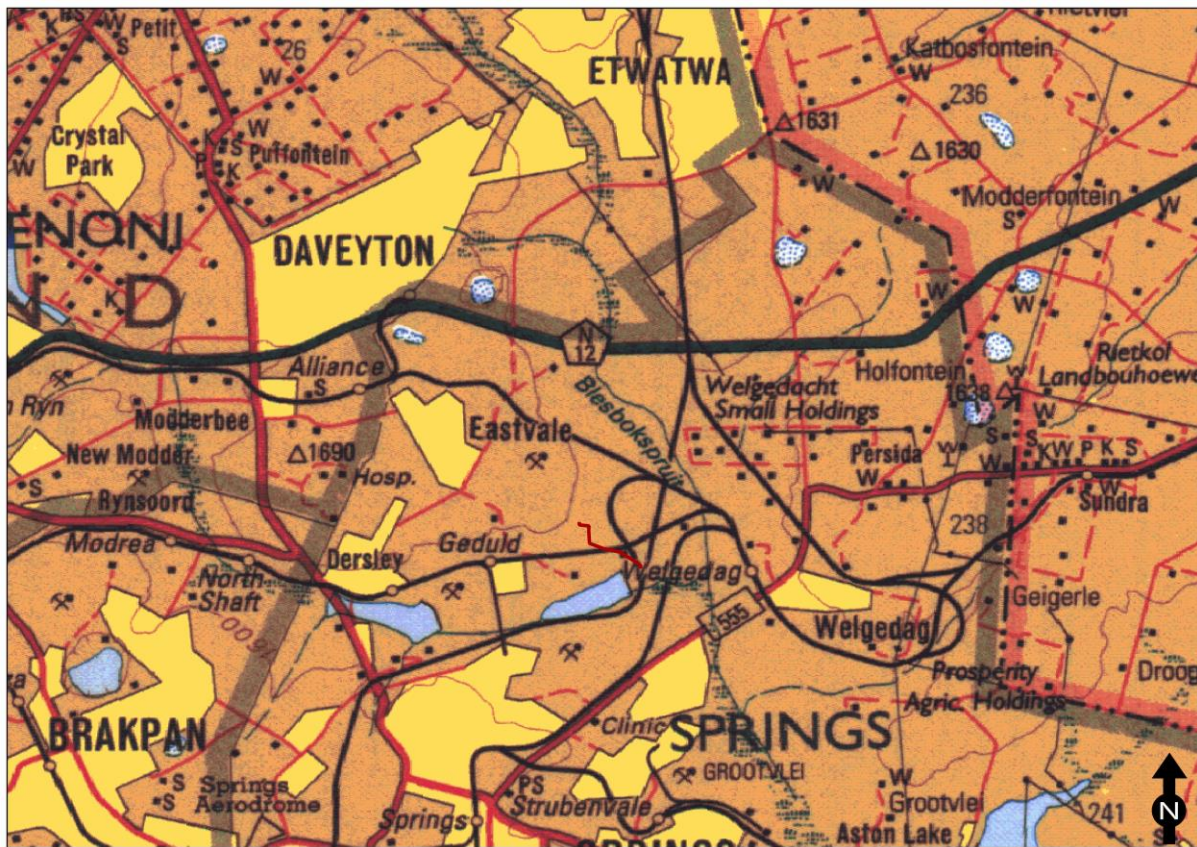


Figure 3: Local context of the survey footprint (1:250 000 Topographical Map 2628)

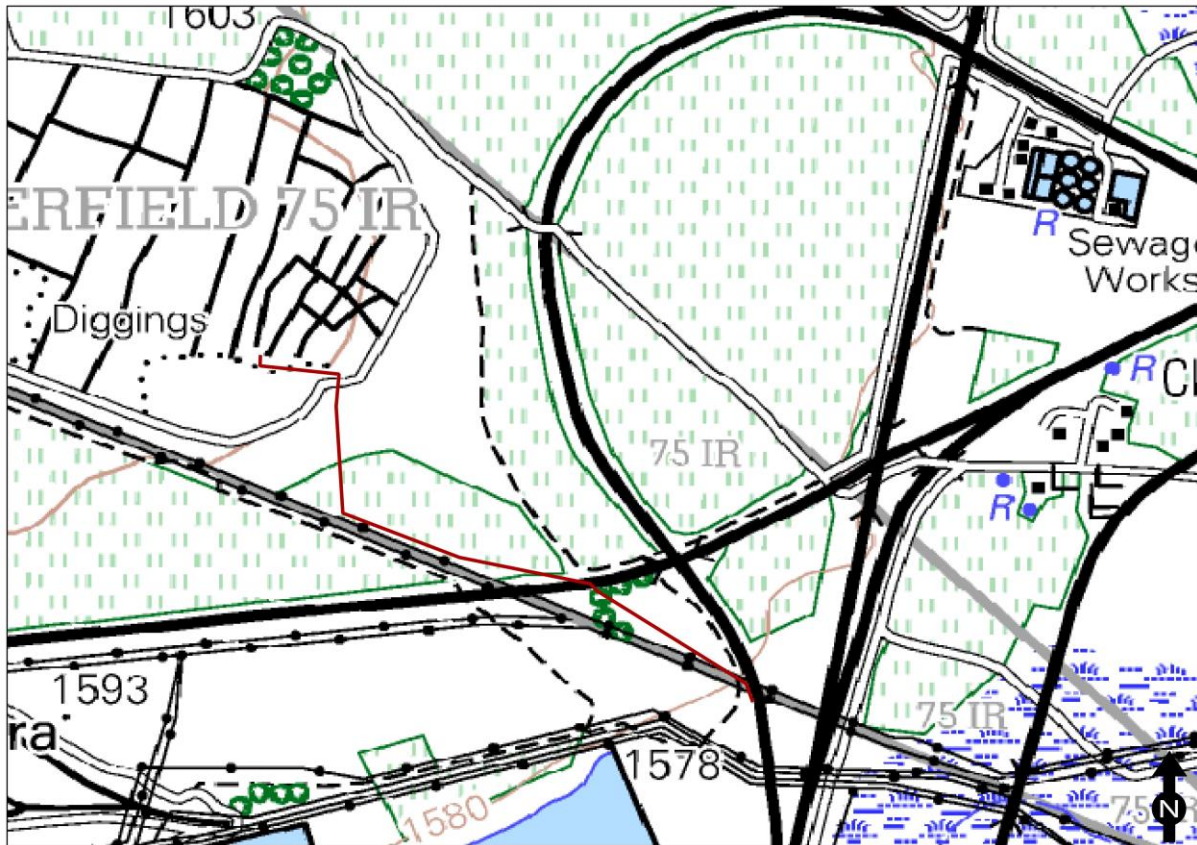


Figure 4: The survey area as indicated on the 1:50 000 topographic map 2628AB (2002)

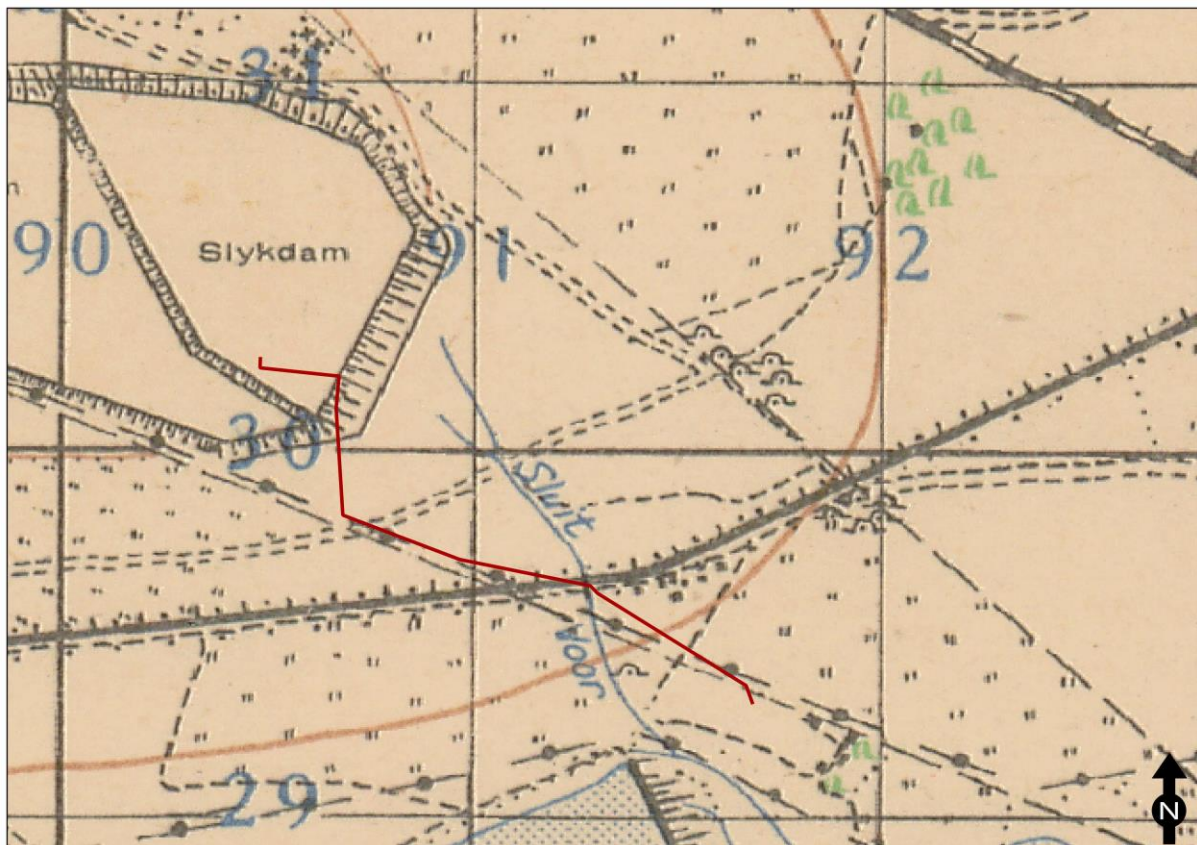


Figure 5: The survey area as indicated on the 1:50 000 topographic map 2628AB (1939)



Figure 6: Survey area within general context (Google Earth Pro 2018)



Figure 7: Survey area within local context (Google Earth Pro 2018)



Figure 8: General view of the grass plains (with infrastructure) indicative of the survey footprint



Figure 9: General view of existing infrastructure (power lines)



Figure 10: General view of the northern section of the survey footprint (connecting with existing mine)



Figure 11: General view of the middle section of the survey footprint (railway lines)



Figure 12: General view of the middle and southern section of the proposed water pipeline

4. Proposed Project Description

NKGM is applying to install of an underground water treatment facility, to treat up to 20 megalitres of underground water per day, using Cold Lime Softening (CLS) treatment. Treated water will be pumped to surface and discharged via a pipeline to a wetland downstream of Cowles Dam. The pipeline will be approximately 1.4 km in length.

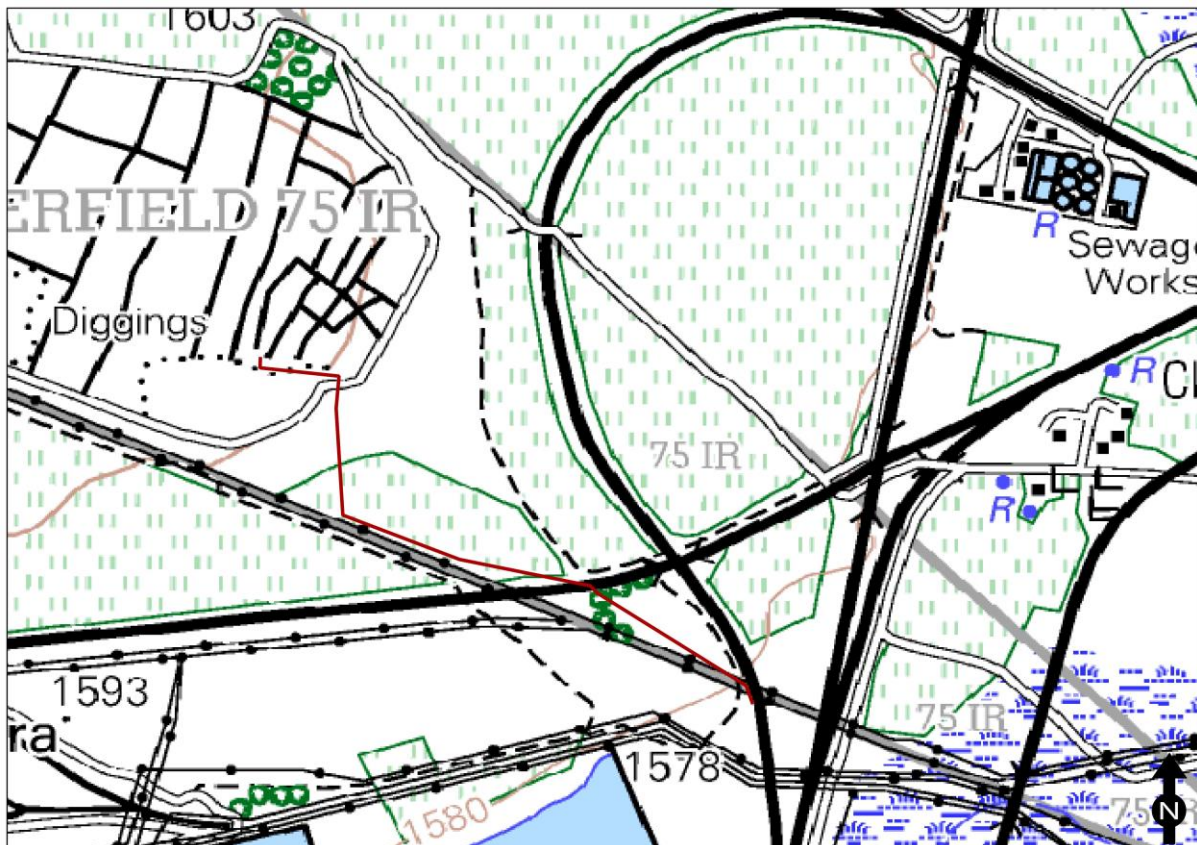


Figure 13: Proposed layout of the water pipeline

5. Legal Framework

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE APPLIED
The Constitution of the Republic of South Africa (Act No. 108 of 1996)	
The National Environmental Management Act (Act No. 107 of 1998)	Section 24(1) Section 28(1)
The National Water Act (Act No. 36 of 1998)	Section 21 (a)(b)
Air Quality Act (Act No. 39 of 2004)	Section 21
National Forests Act, Act of 84 of 1998	-
The National Heritage Resources Act (Act No. 25 of 1999)	Section 38, 34, 35, 36
Conservation of Agricultural Resources Act (Act No. 85 of 1983)	
Mineral and Petroleum Resources Development Act (Act No. 28 of 2002)	
The National Water Act (Act No. 36 of 1998);	
Mine Health and Safety Act (Act No. 29 of 1996) (MHSA)	
Biodiversity Act (Act 10 of 2004)	
Environmental Management Framework for Ekurhuleni 2007	
City Of Ekurhuleni Integrated Development Plan 2017/18 to 2020/212	

Table 3: Legal framework

Notice No.	Activity No.	Applies to:
GNR983	10(ii)	Construction of a pipeline longer than 1 km
	12(ii)	Construction of pipeline and erosion protection features within 32 m of a watercourse
	16	Treatment of water for potable use - more than 100 m ³ / day
	30	Activity identified in terms of the National Environmental Management: Biodiversity Act, 2004 (NEMBA)
GNR984	6	Development of facilities requiring a Water Use Licence
	25	Treatment of water underground - more than 15 000 m ³ / day
GNR985	12	Clearance of more than 300 m ² of indigenous vegetation, within a Critical Biodiversity Area (CBA) or Ecological Support Area (ESA)
	14	Construction of pipeline and erosion protection features within 32 m of a watercourse in sites listed as CBAs or ESAs

Table 4: Listed activities

- Section 38 of the NHRA (Act No. 25 of 1999) stipulates that the following activities trigger a heritage survey:

Development criteria in terms of Section 38(1a-e) of the NHRA (Act No. 25 of 1999)	Yes/No
Construction of road, wall, powerline, pipeline, canal or other linear form of development or barrier exceeding 300m in length	Yes
Construction of bridge or similar structure exceeding 50m in length	No
Development exceeding 5000 m ² in extent	Yes
Development involving three or more existing erven or subdivisions	No
Development involving three or more erven or divisions that have been consolidated within past five years	No
Rezoning of site exceeding 10 000 m ²	No
Any other development category, public open space, squares, parks, recreation grounds	No

Table 5: Activities that trigger Section 38 of the NHRA

- Field rating system as recommended by SAHRA:

Field Rating	Grade	Significance	Recommended Mitigation
National Significance	Grade I	High significance	Conservation by SAHRA, national site nomination, mention any relevant international ranking. No alteration whatsoever without permit from SAHRA.

Provincial Significance	Grade II	High significance	Conservation by provincial heritage authority, provincial site nomination. No alteration whatsoever without permit from provincial heritage authority.
Local Significance	Grade III-A	High significance	Conservation by local authority, no alteration whatsoever without permit from provincial heritage authority. Mitigation as part of development process not advised.
Local Significance	Grade III-B	High significance	Conservation by local authority, no external alteration without permit from provincial heritage authority. Could be mitigated and (part) retained as heritage register site.
Generally Protected A	Grade IV-A	High/medium significance	Conservation by local authority. Site should be mitigated before destruction. Destruction permit required from provincial heritage authority.
Generally Protected B	Grade IV-B	Medium significance	Conservation by local authority. Site should be recorded before destruction. Destruction permit required from provincial heritage authority.
Generally Protected C	Grade IV-C	Low significance	Conservation by local authority. Site has been sufficiently recorded in the Phase 1 HIA. It requires no further recording before destruction. Destruction permit required from provincial heritage authority.

Table 6: Field rating system to determine site significance

- Heritage resources have lasting value in their own right and provide evidence of the origins of South African society and they are valuable, finite, non-renewable and irreplaceable.
- All archaeological remains, features, structures and artefacts older than 100 years and historic structures older than 60 years are protected by the relevant legislation, in this case the **National Heritage Resources Act (NHRA) (Act No. 25 of 1999, Section 34 & 35)**. The Act makes an archaeological impact assessment as part of an EIA and EMPR mandatory (see **Section 38**). No archaeological artefact, assemblage or settlement (site) may be moved or destroyed without the necessary approval from the **South African Heritage Resources Agency (SAHRA)**. Full cognisance is taken of this Act in making recommendations in this report.
- Cognisance will also be taken of the Mineral and Petroleum Resources Development Act (Act No 28 of 2002) and the National Environmental Management Act (Act No 107 of 1998) when making any recommendations.
- Human remains older than 60 years are protected by the NHRA, with reference to Section 36. Human remains that are less than 60 years old are protected by the Regulations Relating to the Management of Human Remains (GNR 363 of 22 May 2013) made in terms of the National Health Act No. 61 of 2003 as well as local Ordinances and regulations.
- With reference to the evaluation of sites, the certainty of prediction is definite, unless stated otherwise.
- The guidelines as provided by the NHRA (Act No. 25 of 1999) in Section 3, with special reference to subsection 3, and the Australian ICOMOS (International Council on Monuments and Sites) Charter (also known as the Burra Charter) are used when determining the cultural significance or other special value of archaeological or historical sites.

- A copy of this report will be submitted on SAHRIS as stipulated by the National Heritage Resources Act (NHRA) (Act No. 25 of 1999), Section 38 (especially subsection 4) and the relevant Provincial Heritage Resources Authority (PHRA).
- Note that the final decision for the approval of permits, or the removal or destruction of sites, structures and artefacts identified in this report, rests with the SAHRA (or relevant PHRA).

6. Study Approach/Methodology

Geographical information (KML shapefiles) on the proposed prospecting activities was supplied by Prime Resources Environmental Consultants (Pty) Ltd. The most up-to-date Google Earth images and topographic maps were used to indicate the survey area. Topographic maps were sources from the Surveyor General. Please note that all maps are orientated with north facing upwards (unless stated otherwise).

The strategy during this survey was to survey most of the footprint that form part of the application. However, certain areas were restricted by active mining and some areas were surveyed by detailed pedestrian (foot) survey techniques. Also note that the northern section of the proposed pipeline is completely disturbed on the surface.

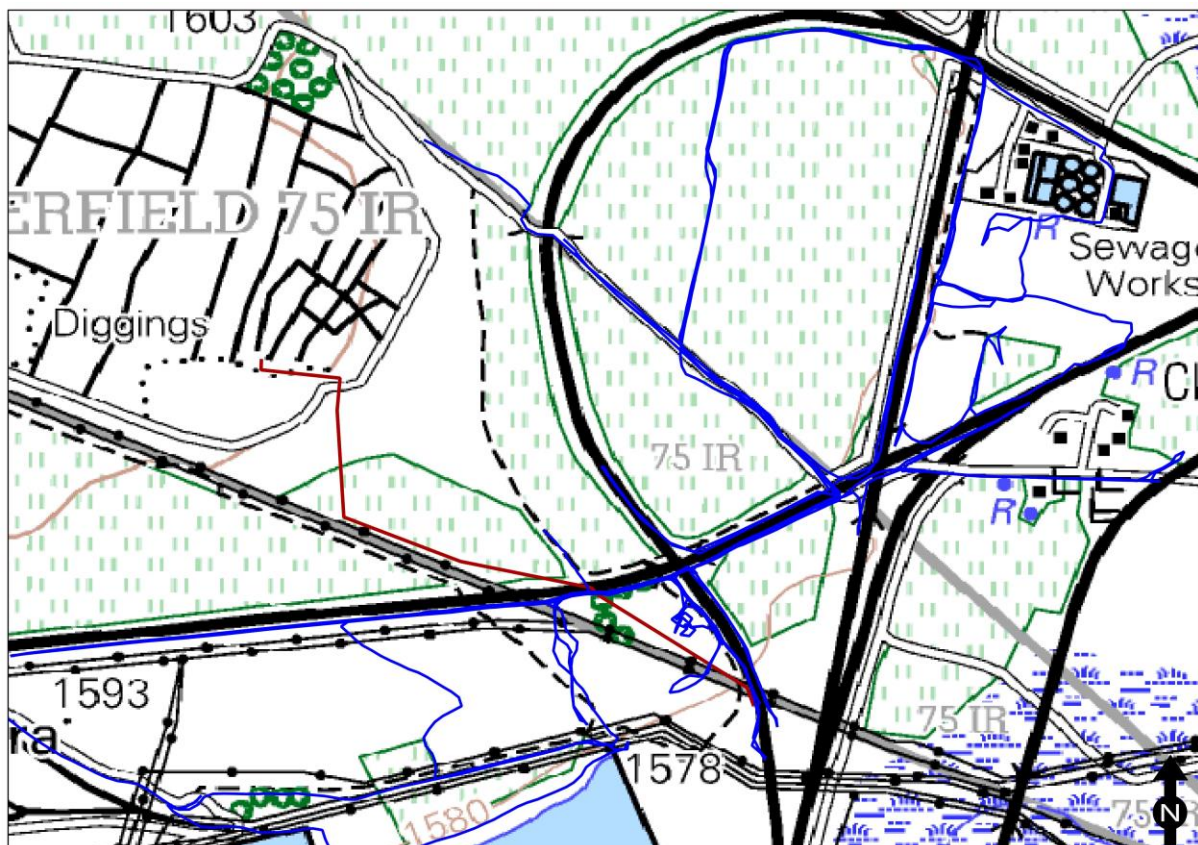


Figure 14: Recorded survey tracks for the project

6.1 Review of existing information/data

Additional information on the cultural heritage of the area was sourced from the following records:

- National Mapping Project by SAHRA (which lists heritage impact assessment reports submitted for South Africa);
- Environmental Potential Atlas (ENPAT);
- Online SAHRIS database;
- National Automated Archival Information retrieval System (NAAIRS);
- Maps and information documents supplied by the client; and
- Several heritage surveys have been conducted in the vicinity of the survey area (published and unpublished material on the area) (Coetzee 2014, Van Schalkwyk 2004).

Several heritage surveys and research projects have been completed outside the project footprint during the last few years. However note that remains of a historical house (Site 1), was recorded inside the current survey footprint (Coetzee 2014).

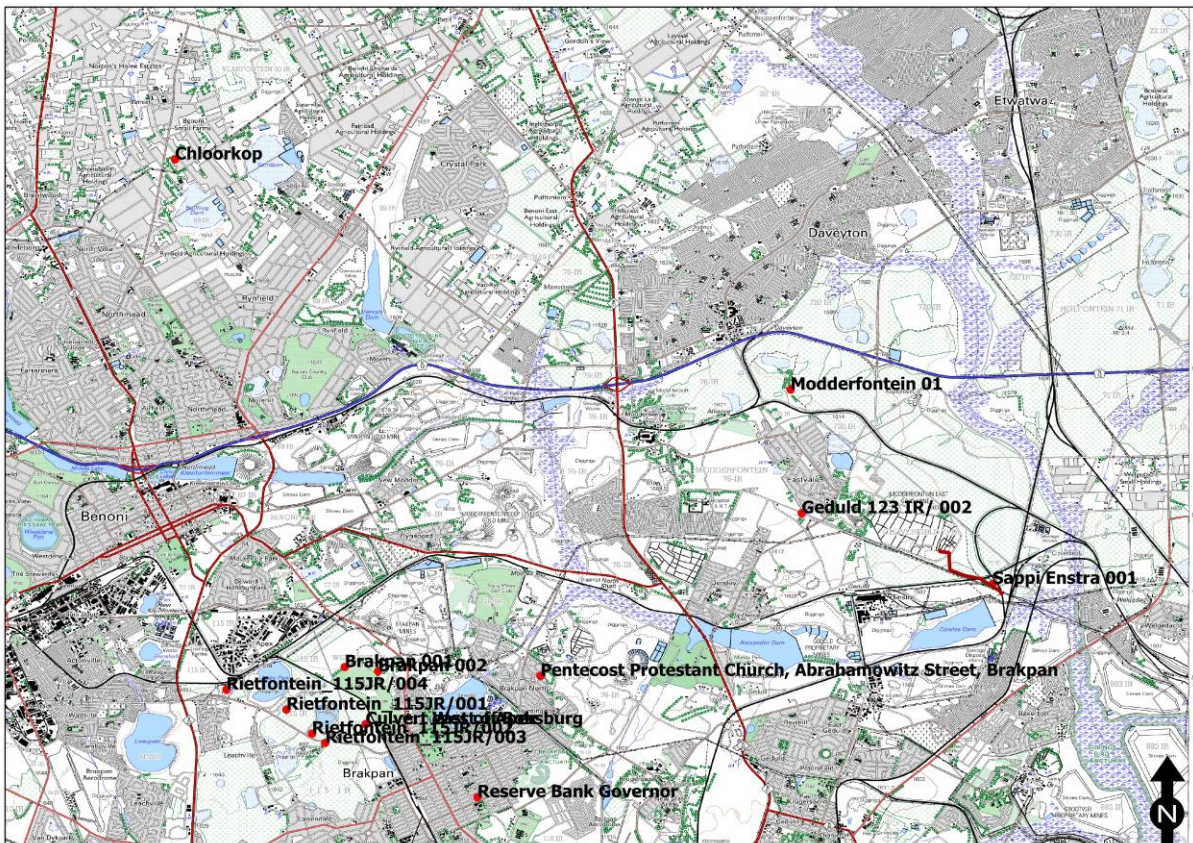


Figure 15: Recorded sites near the survey footprint as recorded on SAHRIS (as at August 2018)

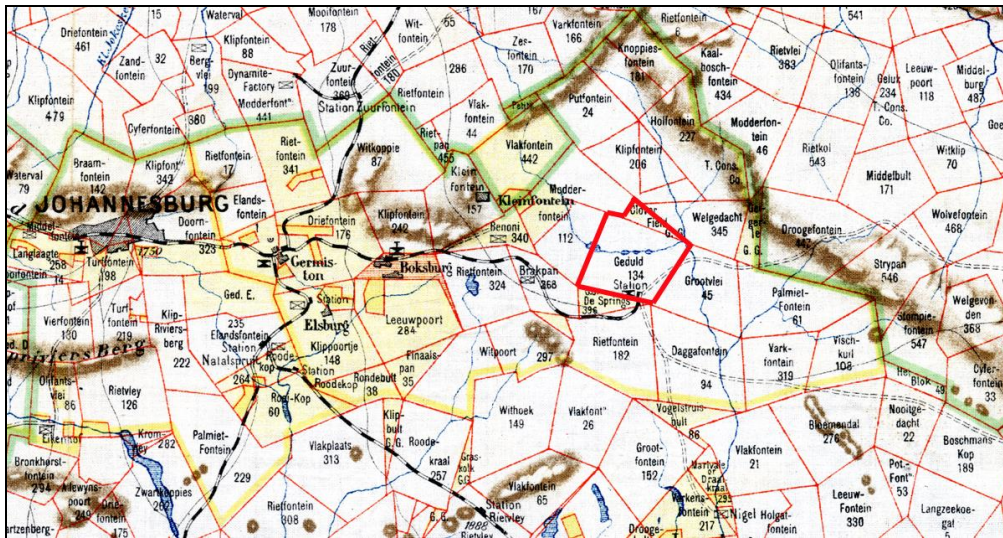


Figure 16: Jeppe’s Map dating to 1899 indicates the location of the farms north of Springs Station

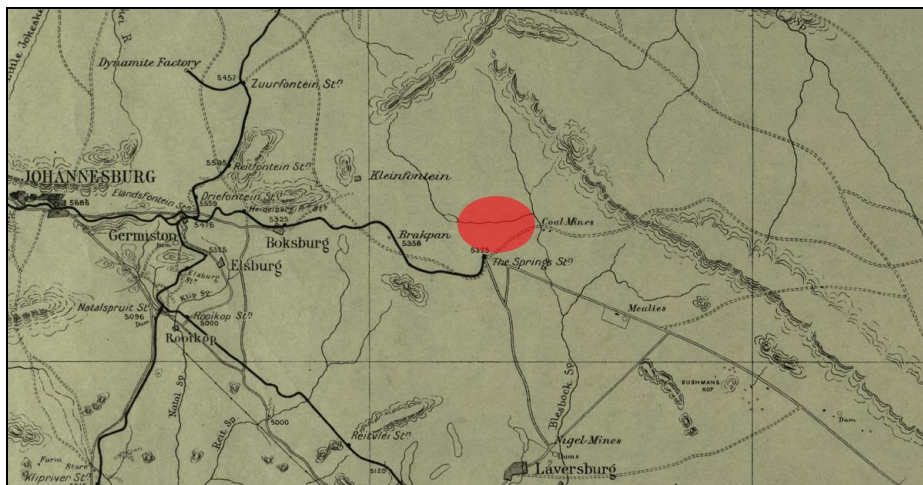


Figure 17: War Office Map indicating the location of the survey area north of Springs Station in 1899

The Surveyor General’s database shows the farms Geduld 123 IR and Cloverfield 75 IR were first surveyed in 1899, 1916 (1893). Coupled with the initial late 19th gold and coal mining in the area it is clear the region has over a century of mining and industrial history (see Addendum 2). Also note that the Sappi Enstra Mill as established in 1936. (also see Addendum 3).

6.2 Palaeontological sensitivity

Amphibolite occur in the area around Edenvale east of Kempton Park and OR Tambo International Airport. A small area of surface dolomite occurs in the extreme south between Duduza and Vosloorus



Figure 18: Palaeontological sensitivity zones as indicated for the survey footprint (SAHRIS 2018)

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

The palaeontological sensitivity map was extracted from the SAHRIS database and clearly shows red (Very high) sensitivity for the relevant farms. As a result a full palaeontological assessment and protocols will be required for the survey footprint.

6.3 Site visits

The field survey was conducted on 22 August 2018.

6.4 Social interaction and current inhabitants

A mining representative was present during the field survey and was consulted during the survey to locate known heritage sites in the region.

6.5 Public Consultation and Stakeholder Engagement

Standard process will be followed to identify and register I&APs affected by the project. Public participation meetings will be scheduled in due course.

6.6 Assumptions, restrictions, gaps and limitations

No severe physical restrictions were encountered as the survey area was fairly accessible.

6.7 Methodology for assessment of potential impacts

All impacts identified during the EIA stage of the study will be classified in terms of their significance. Issues were assessed in terms of the following criteria:

- The **nature**, a description of what causes the effect, what will be affected and how it will be affected;
- The **physical extent**, wherein it is indicated whether:
 - 1 - the impact will be limited to the site;
 - 2 - the impact will be limited to the local area;
 - 3 - the impact will be limited to the region;
 - 4 - the impact will be national; or
 - 5 - the impact will be international.
- The **duration**, wherein it is indicated whether the lifetime of the impact will be:
 - 1 - of a very short duration (0–1 years);
 - 2 - of a short duration (2-5 years);
 - 3 - of a medium-term (5–15 years);
 - 4 - of a long term (> 15 years); or
 - 5 - permanent.
- The **magnitude** of impact, quantified on a scale from 0-10, where a score is assigned:
 - 0 - small and will have no effect;
 - 2 - minor and will not result in an impact;
 - 4 - low and will cause a slight impact;
 - 6 - moderate and will result in processes continuing but in a modified way;
 - 8 - high, (processes are altered to the extent that they temporarily cease); or
 - 10 - very high and results in complete destruction of patterns and permanent cessation of processes;
- The **probability** of occurrence, which describes the likelihood of the impact actually occurring and is estimated on a scale where:
 - 1 - very improbable (probably will not happen);
 - 2 - improbable (some possibility, but low likelihood);
 - 3 - probable (distinct possibility);
 - 4 - highly probable (most likely); or
 - 5 - definite (impact will occur regardless of any prevention measures);
- The **significance**, which is determined through a synthesis of the characteristics described above (refer formula below) and can be assessed as low, medium or high;
- The **status**, which is described as either positive, negative or neutral;
 - The degree to which the impact can be reversed;
 - The degree to which the impact may cause irreplaceable loss of resources; and
 - The degree to which the impact can be mitigated.

The significance is determined by combining the criteria in the following formula:

$S = (E+D+M) \times P$; where:

S = Significance weighting

E = Extent

D = Duration
M = Magnitude
P = Probability

Points	Significance Weighting	Discussion
< 30 points	Low	Where this impact would not have a direct influence on the decision to develop in the area.
31-60 point	Medium	Where the impact could influence the decision to develop in the area unless it is effectively mitigated.
> 60 points	High	Where the impact must have an influence on the decision process to develop in the area.

7. The Cultural Heritage Sites

7.1. Isolated occurrences

Isolated occurrences are artefacts or small features recorded on the surface with no contextual information. No other associated material culture (in the form of structures or deposits) was noted that might provide any further context. This can be the result of various impacts and environmental factors such as erosion and modern developments. By contrast archaeological sites are often complex sites with evidence of archaeological deposit and various interrelated features such as complex deposits, stone walls and middens. However, these isolated occurrences are seen as remains of erstwhile complex or larger sites and they therefore provide a broad indication of possible types of sites or structures that might be expected to occur or have occurred in the survey footprint.

Throughout the survey footprint no isolated finds were recorded.

7.2 Heritage sites

The remains of one historical farmhouse complex (Site 1) were recorded during the survey. The site is probably associated with a late 19th through to an early 20th century occupation phase of the farm. The structure has been stripped of its fittings (roofs, doors and windows) and has partially collapsed. As a result of the general bad state of preservation the structure has a low significance value.

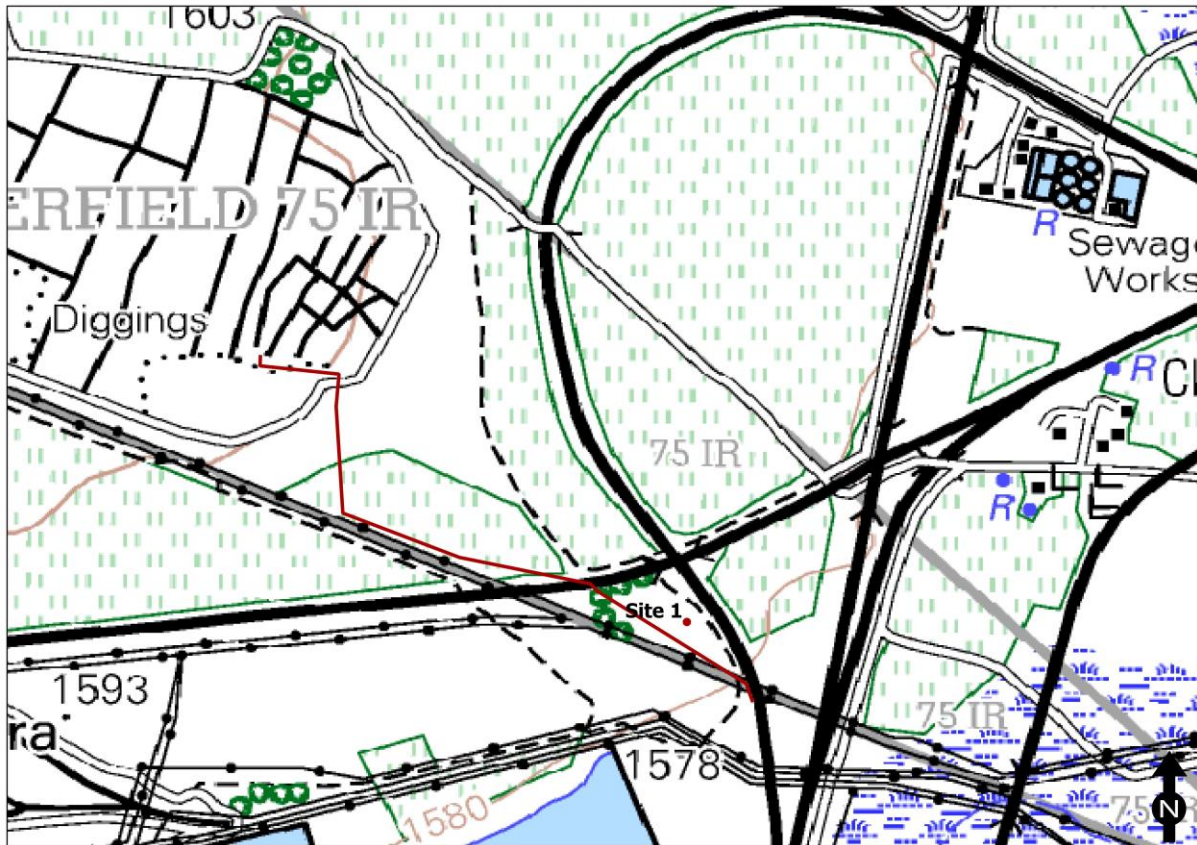


Figure 19: Location of the historic farmhouse complexes

8. Locations and Evaluation of Sites

Site No	Coordinates	Site Type	Field Rating of Significance	Impact	Proposed Mitigation
1	26.202038°S 28.464862°E	Historical farmhouse complex	Generally Protected C Low significance	None	<ul style="list-style-type: none"> Maintain a 50 metres buffer zone

Table 7: Location and evaluation of sites

9. Management Measures

Heritage sites are fixed features in the environment, occurring within specific spatial confines. Any impact upon them is permanent and non-reversible. Those resources that cannot be avoided and that are directly impacted by the proposed development can be excavated/recorded and a management plan can be developed for future action. Those sites that are not impacted on can be written into the management plan, whence they can be avoided or cared for in the future.

9.1 Objectives

- Protection of archaeological, historical and any other site or land considered being of cultural value within the project boundary against vandalism, destruction and theft.
- The preservation and appropriate management of new discoveries in accordance with the NHRA, should these be discovered during construction activities

The following shall apply:

- Known sites should be clearly marked in order that they can be avoided during construction activities.
- The contractors and workers should be notified that archaeological sites might be exposed during the construction activities.
- Should any heritage artefacts be exposed during excavation, work on the area where the artefacts were discovered, shall cease immediately and the Environmental Control Officer shall be notified as soon as possible;
- All discoveries shall be reported immediately to a heritage practitioner so that an investigation and evaluation of the finds can be made. Acting upon advice from these specialists, the Environmental Control Officer will advise the necessary actions to be taken;
- Under no circumstances shall any artefacts be removed, destroyed or interfered with by anyone on the site; and
- Contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the NHRA (Act No. 25 of 1999), Section 51. (1).

9.2 Control

In order to achieve this, the following should be in place:

- A person or entity, e.g. the Environmental Control Officer, should be tasked to take responsibility for the heritage sites and should be held accountable for any damage.
- Known sites should be located and isolated, e.g. by fencing them off. All construction workers should be informed that these are no-go areas, unless accompanied by the individual or persons representing the Environmental Control Officer as identified above.
- In areas where the vegetation is threatening the heritage sites, e.g. growing trees pushing walls over, it should be removed, but only after permission for the methods proposed has been granted by SAHRA. A heritage official should be part of the team executing these measures.

10. Recommendations and Conclusions

The remains of one historical farmhouse complex (Site 1) were recorded during the survey. The site is probably associated with a late 19th through to an early 20th century occupation phase of the farm. The structure has been stripped of its fittings (roofs, doors and windows) and has partially collapsed. As a result of the general bad state of preservation the structure has a low significance value.

No archaeological (both Stone Age and Iron Age) artefacts, assemblages, features, structures or settlements were recorded during the survey of the project footprint. It is well known that Late Iron Age stone-walled settlements do not usually occur in open low-lying grasslands.

Nature: The remains of a historical farm house (Sites 1)		
	Without mitigation	With mitigation
Pre-construction & Construction Phase		
<i>Probability</i>	Very Improbable (1)	Very Improbable (1)
<i>Duration</i>	Very short term (1)	Very short term (1)
<i>Extent</i>	Limited to the site (1)	Limited to the site (1)
<i>Magnitude</i>	Small (0)	Small (0)

Significance of Impact	2 (Low)	2 (Low)
<i>Status (positive or negative)</i>	Neutral	Neutral
Operational Phase		
<i>Probability</i>	Very Improbable (1)	Very Improbable (1)
<i>Duration</i>	Permanent (5)	Permanent (5)
<i>Extent</i>	Limited to the site (1)	Limited to the site (1)
<i>Magnitude</i>	Small (0)	Small (0)
Significance of Impact	6 (Low)	6 (Low)
<i>Status (positive or negative)</i>	Neutral	Neutral
Reversibility	Low	Low
<i>Irreplaceable loss of resources?</i>	None	None
<i>Cumulative impacts and indirect impacts</i>	Construction activities result in extensive heavy vehicle traffic, extraction of deposits, movements of heavy machinery which culminate in vibrations and dust.	
<i>Can impacts be mitigated?</i>	Not required	

It is therefore recommended, from a cultural heritage perspective that the proposed construction of a water pipeline and associated infrastructure may proceed. No Phase 2 investigation will be required.

Also, please note:

Archaeological deposits usually occur below ground level. Should archaeological artefacts or skeletal material be revealed in the area during development activities, such activities should be halted, and a university or museum notified in order for an investigation and evaluation of the find(s) to take place (*cf. NHRA (Act No. 25 of 1999)*, Section 36 (6)).

11. References

Coetzee, F.P. 2014. Cultural Heritage Assessment for the Proposed Construction of a Treated Waste Water Pipeline from Welgedacht Waste Water Treatment Works (WWTW) to the Sappi Enstra Mill, Springs, Ekurhuleni Metropolitan Municipality, Gauteng

Huffman, T. N. 2007. *Handbook to the Iron Age: the Archaeology of Pre-Colonial Farming Societies in Southern Africa*. University of KZN Press: Pietermaritzburg.

Jeppe, F. 1899. Jeppe's Map of the Transvaal. London: Edward Stanford.

Lombard, M., Wadley, L., Deacon, J., Wurz, S., Parsons, I., Mohapi, M., Swart, J. & Mitchell, P. 2012. South African and Lesotho Stone Age Sequence Update (I). *The South African Archaeological Bulletin*. Vol 67 (195): 123-144.

Mucina, L. & Rutherford, M.C. 2010. The Vegetation of South Africa, Lesotho and Swaziland. *Strelitzia 19*. Pretoria: South African National Biodiversity Institute.

National Heritage Resources Act. Act No. 25 of 1999. Government Printer: Pretoria.

Ordnance Survey Office (Intelligence Division). 1899. Transvaal and Orange Free State: Kimberley. War Office No. 1367. Southampton: War Office.

Office of the President. 27 November 1998. National Environmental Management Act (Act No. 107 of 1998). Government Gazette Vol 401 (19519). Pretoria: Government Printer.

SAHRA, 2005. Minimum Standards for the Archaeological and the Palaeontological Components of Impact Assessment Reports, Draft version 1.4.

South African Heritage Resources Agency (SAHRA). Report Mapping Project. Version 1.0, 2009.

Van Schalkwyk, J.A. 2004. Heritage Impact Assessment: Payneville Ext 1, Springs District, Gauteng

Other Sources

Google Earth Pro 2018 (Images: 2018)

<http://samilitaryhistory.org/vol041dp.html> (Accessed: August 2018)

National Archives (NAAIRS) (Accessed: August 2018)

SAHRIS Database. <http://www.sahra.org.za/sahris> (Accessed August 2018)

www.saexplorer.co.za (Accessed August 2018)

<https://www.cwgc.org> [Commonwealth War Grace Commission] (Accessed August 2018)

Addendum 1: Archaeological and Historical Sequence

The table provides a general overview of the chronological sequence of the archaeological periods in South Africa.

PERIOD	APPROXIMATE DATES
Earlier Stone Age	more than 2 million years ago to >200 000 years ago
Middle Stone Age	<300 000 years ago to >20 000 years ago
Later Stone Age (Includes hunter-gatherer rock art)	<40 000 years ago up to historical times in certain areas
Early Iron Age	c. AD 200 - c. AD 900
Middle Iron Age	c. AD 900 – c. AD 1300
Late Iron Age (Stonewalled sites)	c. AD 1300 - c. AD 1840 (c. AD 1640 - c. AD 1840)

< = less than; > = greater than

Archaeological Context

Stone Age Sequence

Concentrations of Early Stone Age (ESA) sites are usually present on the flood-plains of perennial rivers and may date to over 2 million years ago. These ESA open sites may contain scatters of stone tools and manufacturing debris and secondly, large concentrated deposits ranging from pebble tool choppers to core tools such as handaxes and cleavers. The earliest hominins who made these stone tools, probably not always actively hunted, instead relying on the opportunistic scavenging of meat from carnivore kill sites.

Middle Stone Age (MSA) sites also occur on flood plains, but are also associated with caves and rock shelters (overhangs). Sites usually consist of large concentrations of knapped stone flakes such as scrapers, points and blades and associated manufacturing debris. Tools may have been hafted but organic materials, such as those used in hafting, seldom preserve. Limited drive-hunting activities are also associated with this period.

Sites dating to the Later Stone Age (LSA) are better preserved in rock shelters, although open sites with scatters of mainly stone tools can occur. Well-protected deposits in shelters allow for stable conditions that result in the preservation of organic materials such as wood, bone, hearths, ostrich eggshell beads and even bedding material. By using San (Bushman) ethnographic data a better understanding of this period is possible. South African rock art is also associated with the LSA.

The following chronological sequence was recently established by prominent Stone Age archaeologists (Lombard et al 2012):

Later Stone Age

- Age Range: recent to 20-40 thousand years ago
 - General characteristics: expect variability between assemblages, a wide range of formal tools, particularly scrapers (microlithic and macrolithic), backed artefacts, evidence of hafted stone and bone tools, borers, bored stones, upper and lower grindstones, grooved stones, ostrich eggshell (OES) beads and other ornaments, undecorated/decorated OES fragments, flasks/flask fragments, bone tools (sometimes with decoration), fishing equipment, rock art, and ceramics in the final phase.
- **Ceramic or Final Later Stone Age**
 - Generally < 2 thousand years ago
 - MIS 1
 - Contemporaneous with, and broadly similar to, final Later Stone Age, but includes ceramics
 - Economy may be associated with hunter-gatherers or herders

Technological characteristics

- Stone tool assemblages are often microlithic
- In some areas they are dominated by long end scrapers and few backed microliths; in others formal tools are absent or rare
- Grindstones are common, ground stone artefacts, stone bowls and boat-shaped grinding grooves may occur
- Includes grit- or grass-tempered pottery
- Ceramics can be coarse, or well-fired and thin-walled; some times with lugs, spouts and conical bases; sometimes with decoration; sometimes shaped as bowls
- Ochre is common
- Ostrich eggshell (OES) is common
- Metal objects, glass beads and glass artefacts also occur

- **Final Later Stone Age**
 - 100 – 4000 years ago
 - MIS 1
 - Hunter-gatherer economy

Technological characteristics

- Much variability can be expected
- Variants include macrolithic (similar to Smithfield [Sampson 1974]) and/or microlithic (similar to Wilton) assemblages
- Assemblages are mostly informal (Smithfield)
- Often characterised by large untrimmed flakes (Smithfield)
- Sometimes microlithic with scrapers, blades and bladelets, backed tools and adzes (Wilton-like)
- Worked bone is common
- OES is common
- Ochre is common
- Iron objects are rare
- Ceramics are absent

- **Wilton**
 - 4000 – 8000 years ago
 - MIS 1
 - At some sites continues into the final Later Stone Age as regional variants (e.g. Wilton Large Rock Shelter and Cave James)

Technological characteristics

- Fully developed microlithic tradition with numerous formal tools
 - Highly standardised backed microliths and small convex scrapers (for definition of standardisation see Eerkens & Bettinger 2001)
 - OES is common
 - Ochre is common
 - Bone, shell and wooden artefacts occur
- **Oakhurst**
 - 7000 – 12 000 years ago
 - MIS 1
 - Includes Albany, Lockshoek and Kuruman as regional variants

Technological characteristics

- Flake based industry
 - Characterised by round, end, and D-shaped scrapers and adzes
 - Wide range of polished bone tools
 - Few or no microliths
- **Robberg**
 - 12 000 to 18 000 years ago
 - MIS 2

Technological characteristics

- Characterised by systematic bladelet (<26mm) production and the occurrence of outils ecailles or scaled pieces
 - Significant numbers of unretouched bladelets and bladelet cores
 - Few formal tools
 - Some sites have significant macrolithic elements
- **Early Late Stone Age**
 - 18 000 – 40 000 years ago
 - MIS 2-3
 - Informal designation
 - Also known as transitional MSA-LSA
 - Overlapping in time with final Middle Stone Age

Technological Characteristics

- Characterised by unstandardised, often microlithic, pieces and includes the bipolar technique
- Described at some sites, but not always clear whether assemblages represent a real archaeological phase or a mixture of LSA/MSA artefacts

Middle Stone Age

- Age Range: 20 000 – 30 000 years ago
- General characteristics: Levallois or prepared core techniques (for definitions see Van Peer 1992; Boeda 1995; Pleurdeau 2005) occur in which triangular flakes with convergent dorsal scars, often with faceted striking platforms, are produced. Discoidal systems (for definition see Inizan et al. 1999) and intentional blade production from volumetric cores (for definition see Pleurdeau 2005) also occur; formal tools may include unifacially and bifacially retouched points, backed artefacts, scrapers, and denticulates (for definition see Bisson 2000); evidence of hafted tools; occasionally includes marine shell beads, bone points, engraved ochre nodules, engraved OES fragments, engraved bone fragments, and grindstones.
- In the sequence below we highlight differences or characteristics that may be used to refine interpretations depending on context.
- **Final Middle Stone Age**
 - 20 000 – 40 000 years ago
 - MIS 3
 - Informal designation partly based on the Sibudu sequence

Technological characteristics

- Characterised by high regional variability that may include, e.g. bifacial tools, bifacially retouched points, hollow-based points
- Triangular flake and blade industries (similar to Strathalan and Melikane)
- Small bifacial and unifacial points (similar to Sibudu and Rose Cottage Cave)
- Sibudu point characteristics: short, stout, lighter in mass compared to points from the Sibudu technocomplex, but heavier than those from the Still Bay
- Can be microlithic
- Can include bipolar technology
- Could include backed geometric shapes such as segments, as well as side scrapers

Sibudu

- 45 000 – 58 000 years ago
- MIS 3
- Previously published as informal late Middle Stone Age and post-Howieson's Poort at Sibudu
- Formerly known post-Howieson's Poort, MSA 3 generally, and MSA III at Klasies River

Technological characteristics

- Most points are produced using Levallois technique
- Most formal retouch aimed at producing unifacial points
- Sibudu unifacial point (type fossil) characteristics: faceted platform; shape is somewhat elongated with a mean length of 43.9 mm, a mean breadth of 26.8 mm and mean thickness of 8.8 mm (L/B ratio 1.7); their mean mass is 11.8 g (Mohapi, 2012)
- Some plain butts
- Rare bifacially retouched points
- Some side scrapers are present

- Backed pieces are rare

- **Howieson's Poort**

- 58 000 – 66 000 years ago
- MIS 3-4

- **Technological characteristics**

- Characterised by blade technology
- Includes small (<4 cm) backed tools, e.g. segments, scrapers, trapezes and backed blades
- Some denticulate blades
- Pointed forms are rare or absent

- **Still Bay**

- 70 000 – 77 000 years ago
- MIS 4-5a

- **Technological characteristics**

- Characterised by thin (<10 mm), bifacially worked foliate or lanceolate points
- Semi-circular or wide-angled pointed butts
- Could include blades and finely serrated points (Lombard et al. 2010)

- **Pre-Still Bay**

- 72 000 – 96 000 years ago
- MIS 4-5

- **Technological characteristics**

- Characteristics currently being determined / studied

- **Mossel Bay**

- 77 000 to —105 000 years ago
- MIS 5a-4
- Also known as MSA II at Klasies River or MSA 2b generally

- **Technological characteristics**

- Characterised by recurrent unipolar Levallois point and blade reduction
- Products have straight profiles; percussion bulbs are prominent and often splintered or ring-cracked
- Formal retouch is infrequent and restricted to sharpening the tip or shaping the butt

- **Klasies River**

- 105 000 to —130 000 years ago
- MIS 5d-5e
- Also referred to as MSA I at Klasies River or MSA 2a generally

- **Technological characteristics**

- Recurrent blade and convergent flake production
- End products are elongated and relatively thin, often with curved profiles
- Platforms are often small with diffused bulbs
- Low frequencies of retouch

- Denticulate pieces
- **Early Middle Stone Age**
 - Suggested age MIS 6 to MIS 8 (130 000 to —300 000 years ago)
 - Informal designation

Technological characteristics

- This phase needs future clarification regarding the designation of cultural material and sequencing
- Includes discoidal and Levallois flake technologies, blades from volumetric cores and a generalised toolkit
- **Earlier Stone Age**
 - Age range: >200 000 to 2 000 000 years ago
 - General characteristics: early stages include simple flakes struck from cobbles, core and pebble tools; later stages include intentionally shaped handaxes, cleavers and picks; final or transitional stages have tools that are smaller than the preceding stages and include large blades.
 - In the sequence below we highlight differences or characteristics that may be used to refine interpretations depending on context.
- **ESA-MSA transition**
- 200 to —600 thousand years ago
- MIS 7-15

Technological characteristics

- Described at some sites as Fauresmith or Sangoan
- Relationships, descriptions, issues of mixing and ages yet to be clarified
- Fauresmith assemblages have large blades, points, Levallois technology, and the remaining ESA components have small bifaces
- The Sangoan contains small bifaces (<100 mm), picks, heavy and light-duty denticulated and notched scrapers
- The Sangoan is less well described than the Fauresmith

- **Acheulean**

- 300 thousand to —1.5 million years ago
- MIS 8-50

Technological characteristics

- Bifacially worked handaxes and cleavers, large flakes > 10 cm
- Some flakes with deliberate retouch, sometimes classified as scrapers
- Gives impression of being deliberately shaped, but could indicate result of knapping strategy
- Sometimes shows core preparation
- Generally found in disturbed open-air locations
- **Oldowan**
 - 1.5 to >2 million years ago
 - MIS 50-75

Technological characteristics

- Cobble, core or flake tools with little retouch and no flaking to predetermined patterns
- Hammerstones, manuports, cores
- Polished bone fragments/tools

Iron Age Sequence

In the northern regions of South Africa at least three settlement phases have been distinguished for early prehistoric agropastoralist settlements during the **Early Iron Age** (EIA). Diagnostic pottery assemblages can be used to infer group identities and to trace movements across the landscape. The first phase of the Early Iron Age, known as **Happy Rest** (named after the site where the ceramics were first identified), is representative of the Western Stream of migrations, and dates to AD 400 - AD 600. The second phase of **Diamant** is dated to AD 600 - AD 900 and was first recognized at the eponymous site of Diamant in the western Waterberg. The third phase, characterised by herringbone-decorated pottery of the **Eiland** tradition, is regarded as the final expression of the Early Iron Age (EIA) and occurs over large parts of the North West Province, Northern Province, Gauteng and Mpumalanga. This phase has been dated to about AD 900 - AD 1200. These sites are usually located on low-lying spurs close to water.

The Late Iron Age (LIA) settlements are characterised by stone-walled enclosures situated on defensive hilltops c. AD 1640 - AD 1830). This occupation phase has been linked to the arrival of ancestral Northern Sotho, Tswana and Ndebele (Nguni-speakers) in the northern regions of South Africa with associated sites dating between the sixteenth and seventeenth centuries AD. The terminal LIA is represented by late 18th/early 19th century settlements with multichrome Moloko pottery commonly attributed to the Sotho-Tswana. These settlements can in many instances be correlated with oral traditions on population movements during which African farming communities sought refuge in mountainous regions during the processes of disruption in the northern interior of South Africa, resulting from the so-called difaqane (or mfecane).

Ethno-historical Context

Springs

Springs was originally founded as a coal and gold mining town in 1904, but its history can be traced back to the second half of the 19th century.

From about 1840 farmers moved into the area and declared farms for themselves, especially after the Zuid-Afrikaansche Republiek (ZAR) (later Transvaal) became an independent republic with the signing of the Sand River Convention in 1852. The original odd piece (685 ha) of land on the Witwatersrand, was given the name 'The Springs' by the land surveyor James Brooks, probably because of all the springs (and abundant surface water) in the area.

On 16 September 1884 the official map of 'The Springs' was registered in Pretoria, the then ZAR capital. Initially, the land's value was equal to R200. But the discovery of coal and gold and its subsequent mining increased the value considerably.

The original farm on which the city of Springs was later to be built was surveyed in 1883. Coal was discovered in the area in 1887 and three years later the ZAR's first railway was built to carry coal from the East Rand coalfields to the gold mines of the Witwatersrand.

Gradually, especially after coal was discovered further east in South Africa in Witbank, the Springs collieries were closed. In the meanwhile, however, gold had also been discovered in the area. A village was laid out in 1904 and in 1908 the first gold mining began. Springs was granted municipal status in 1912. By the late 1930s, there were eight gold mines near Springs, making it the largest single gold-producing area in the world.

The coal discovered in 'The Springs' was of a good quality and in 1888 the first contract was signed to mine coal. Initially mining was on a small scale, but rose when the Great Eastern mine was established. There were a number of corrugated iron houses around the mine and, although there were a few small hotels and general dealers, it was not a town yet. The settlement grew and in 1902 a health committee was appointed to look after the building and location of structures and also the hygiene in the growing township. In 1904 the Grootvlei Proprietary Mines were registered and shafts were sunk. This followed the discovery in 1899 of gold on the farm Geduld and the further discovery of the main reef in 1902.

In April 1904 'The Springs' was proclaimed a town, called Springs, the health committee replaced by a town council, and it flourished as a mining town. In 1962, Springs produced 10% of the country's gold and 9% of its uranium. However, by the end of the 1960s the last mine in town, the Daggafontein Mine was exhausted. The town did not die, but instead developed into an industrial centre.

Springs is currently one of the industrial centers of the Witwatersrand and also the Eastern Gateway of Gauteng towards Mpumalanga and Northern KwaZulu Natal. Mining has been replaced by manufacturing and engineering industries of economic importance; products of the region include processed metals, chemicals, paper and foodstuffs.

Sappi Enstra Mill celebrated its 76th year of existence in 2012 having been established in 1936, producing its first paper in 1938 from Paper Machine 1. Enstra produces office paper, security paper and packaging paper products of superior quality for use in different industries. Currently the mill is a business unit of Sappi Paper and Paper Packaging; a division of Sappi Limited.

The City of Ekurhuleni, was established in the year 2000 from the amalgamation of two existing regional entities, namely Kyalami Metropolitan and the Eastern Gauteng Services Council. Unlike the other metropolitan regions formed after the 2000 local government elections which were formed around large cities, Ekurhuleni agglomerated a set of relatively small and fragmented nine towns: Alberton, Benoni, Boksburg, Brakpan, Edenvale, Germiston and Kempton Park, Nigel and Springs.

Addendum 2: Description of the Recorded Sites

A system for grading the significance of heritage sites was established by the NHRA (Act No. 25 of 1999) and further developed by the South African Heritage Resources Agency (SAHRA 2007) and has been approved by ASAPA for use in southern Africa and was utilised during this assessment.

Site 1

A. GENERAL SITE DESCRIPTION			
Site type	Historical farmhouse complex		
Site Period	Late 19 th to early 20 th century		
Physical description	<p>The site comprises the remains of a rectangular stone-built house. The foundation is roughly 10 x 5 metres and the house probably had two rooms. Dressed stone was used in the construction and stone lintels with wooden door and window frames. The roof has been removed with the resultant internal walling collapse. Most of the fittings have also been removed from the house frame. No substantial midden was recorded near the site. The remains of a more recent square brick-walled structure that was probably a secondary dwelling is situated approximately 30 metres away. This structure was completely demolished.</p> <p>Please take note that structure is probably older than 60 years and is therefore protected by the NHRA (Act No. 25 of 1999).</p>		
Integrity of deposits or structures	The structures are unstable and in the process of collapse.		
Site extent	Main structure each: 10 m x 5 m (sections of the walls are 1.5 m in height)		
B. SITE EVALUATION			
B1. HERITAGE VALUE		Yes	No
Historic Value			
It has importance to the community or pattern of South Africa's history or precolonial history.			X
It has strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa.			X
It has significance relating to the history of slavery in South Africa.			X
Aesthetic Value			
It has importance in exhibiting particular aesthetic characteristics valued by a particular community or cultural group.			X
Scientific Value			
It has potential to yield information that will contribute to an understanding of South Africa's natural and cultural heritage.			X
It has importance in demonstrating a high degree of creative or technical achievement at a particular period.		X	
It has importance to the wider understanding of the temporal change of cultural landscapes, settlement patterns and human occupation.		X	
Social Value			
It has strong or special association with a particular community or cultural group for social, cultural or spiritual reasons (sense of place).			X
Tourism Value			
It has significance through its contribution towards the promotion of a local sociocultural identity and can be developed as tourist destination.			X
Rarity Value			
It possesses unique, uncommon, rare or endangered aspects of South Africa's natural or cultural heritage.			X
Representative Value			
It is importance in demonstrating the principle characteristics of a particular class of South Africa's natural or cultural places or objects.		X	
B2. REGIONAL CONTEXT			


Other similar sites in the regional landscape.			X
C. SPHERE OF SIGNIFICANCE	High	Medium	Low
International			X
National			X
Provincial			X
Local			X
Specific community			X
D. FIELD REGISTER RATING			
National/Grade 1 [should be registered, retained]			
Provincial/Grade 2 [should be registered, retained]			
Local/Grade 3A [should be registered, mitigation not advised]			
Local/Grade 3B [High significance; mitigation, partly retained]			
Generally Protected A [High/Medium significance, mitigation]			
Generally protected B [Medium significance, to be recorded]			
Generally Protected C [Low significance, no further action]			X
E. GENERAL STATEMENT OF SITE SIGNIFICANCE			
Low			X
Medium			
High			
F. RATING OF POTENTIAL IMPACT OF DEVELOPMENT			
None			X
Peripheral			
Destruction			
Uncertain			
G. RECOMMENDED MITIGATION			
<ul style="list-style-type: none"> Maintain a buffer zone of 50 metres 			
H. APPLICABLE LEGISLATION AND LEGAL REQUIREMENTS			
<ul style="list-style-type: none"> National Heritage Resources Act (Act No. 25 of 1999, Sections 34) 			
I. PHOTOGRAPHS			
			
<p>Figure 20: Frontal view of the layout and dressed sandstone used in the construction of the house</p>			



Figure 21: Frontal view of one of the farm houses



Figure 22: Aerial view of the layout of the farm house

Addendum 3: Surveyor General Farm Diagram

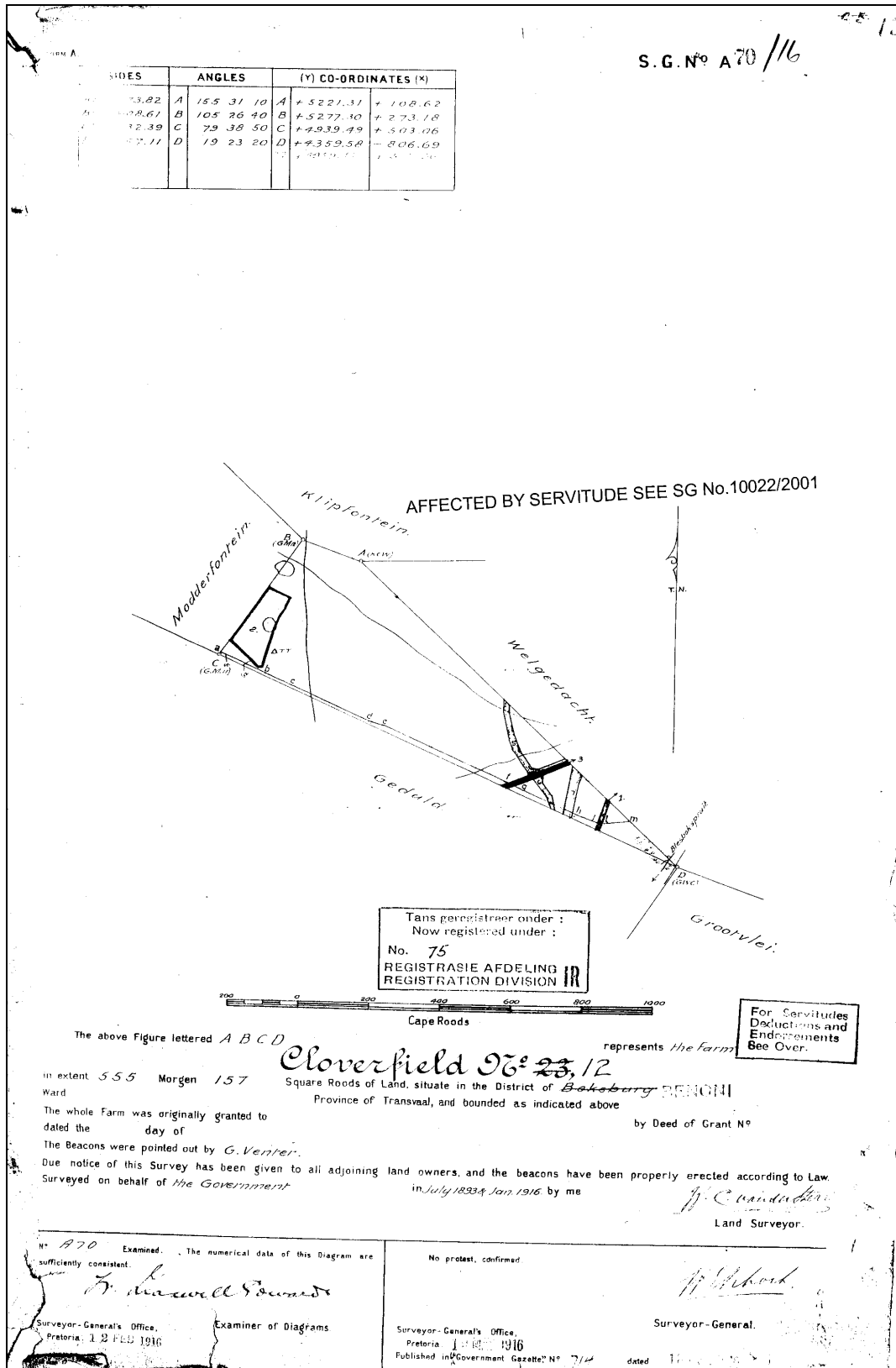


Figure 23: Surveyor General's sketch of the farm Cloverfield 75 IR was first surveyed in 1916

Addendum 4: Relocation of Graves

Marked graves younger than 60 years do not fall under the protection of the NHRA (Act No. 25 of 1999) with the result that exhumation, relocation and reburial can be conducted by an undertaker. This will include logistical aspects such as social consultation, purchasing of plots in cemeteries, procurement of coffins, etc. Other legislative measures which may be pertinent include the Removal of Graves and Dead Bodies Ordinance (Ordinance No. 7 of 1925), Regulations Relating to the Management of Human Remains (GNR 363 of 22 May 2013) made in terms of the National Health Act No. 61 of 2003, Ordinance on Exhumations (Ordinance No. 12 of 1980) as well as any local and regional provisions, laws and by-laws that may be in place.

Marked graves older than 60 years are protected by the NHRA (Act No. 25 of 1999) and as a result an archaeologist must be in attendance to assist with the exhumation and documentation of the graves. Note that unmarked graves are by default regarded as older than 60 years and therefore also falls under the NHRA (Act No. 25 of 1999, Section 36).

The relocation of graves entails the following procedure:

- Notices of intent to relocate the graves must be put up at the burial site for a period of 60 days. This should contain contact information where communities and family members can register as interested and affected parties. All information pertaining to the identification of the graves must be documented for the application of a SAHRA permit. All notices must be in at least 3 languages, of which English is one. This is a requirement by law.
- These notices of intention must also be placed in at least two local newspapers and have the same information as above.
- Local radio stations can also be used to try contact family members. This is not required by law, but can be helpful.
- During this time (60 days) a suitable cemetery must be identified near to the development or otherwise one specified by the family of the deceased.
- An open day for family members should be arranged after the period of 60 days so that they can gather to discuss the way forward, and to sort out any problems. The developer needs to take the families requirements into account.
- Once the 60 days have passed and all the information from the family members have been received, a permit can be requested from SAHRA. This is a requirement by law.
- Once the permit has been issued, the graves may be exhumed and relocated.
- All headstones must be relocated with the graves as well as any remains and any additional objects found in the grave.

Information needed for the SAHRA permit application

- The permit application must be done by an archaeologist.
- A map of the area where the graves have been located.
- A survey report of the area prepared by an archaeologist.
- All the information on the families that have identified graves.
- A letter of permission from the landowner granting permission to the developer to exhume and relocate the graves.

- A letter (or proof of purchase of the plots) from the new cemetery confirming that the graves will be reburied there.
- Details of the farm name and number, magisterial district and GPS coordinates of the gravesite.

Graves are generally be classified into four categories. These are:

- Graves younger than 60 years;
- Graves older than 60 years, but younger than 100 years;
- Graves older than 100 years; and
- Graves of victims of conflict or of individuals of royal descent.