ARCHAEOLOGICAL SCOPING REPORT

FOR THE PROPOSED CLAYVILLE THERMAL PLANT, GAUTENG PROVINCE

Client:
Savannah Environmental (Pty) Ltd

Client information:
Thalita Botha
Tel: 011 656 3237

E – Mail: thalita@savannahsa.com

HCAC - Heritage Consultants

Private Bag X 1049
Suite 34
Modimolle
0510

Tel: 082 373 8491
Fax: 086 691 6461
E-Mail: jaco.heritage@gmail.com

Report Author:

Mr. J. van der Walt

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EXECUTIVE SUMMARY

Site name and location: The proposed Clayville Thermal Plant will be located on Erf 457, Erf 459 and Portion 12 of Erf 508 in the Clayville industrial area, Olifantsfontein, Gauteng Province.

1: 50 000 Topographic Map: 2528 CC.

EIA Consultant: Savannah Environmental (Pty) Ltd.

Developer: Bellmall Energy Project 325 (Pty) Ltd

Heritage Consultant: Heritage Contracts and Archaeological Consulting CC (HCAC).
Contact person: Jaco van der Walt, Tel: +27 82 373 8491, Email: jaco.heritage@gmail.com.

Date of Report: 31 August 2017.

Findings of the Assessment:

The scope of work comprises a heritage scoping report for the Clayville Thermal Plant. This report was conducted based on a desktop study of available data regarding cultural heritage resources of the area.

This brief background study indicates that the general area under investigation has a wealth of heritage sites and a cultural layering dating to the following periods:

- Late Stone Age scatters;
- Numerous grave sites and cemeteries.

None of these sites are located within or close to the project area but provides an indication of sites that can be expected in the study area. Several buildings occur on site and if these are older than 60 years they are protected by legislation and a permit will be required from the Provincial Heritage Resources Authority Gauteng (PHRAG) to alter or demolish them.

The site has previously been disturbed and it is expected that identified impacts on heritage resources in this area can be mitigated. The study area is of very high paleontological sensitivity and according to the SAHRIS palaeontological sensitivity map must be subjected to a field based palaeontological impact assessment.

From an archaeological point of view the proposed project is considered to be viable and no fatal flaws are expected. This will be confirmed through a Heritage Impact Assessment to be undertaken in the EIA Phase.

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ABBREVIATIONS

AIA: Archaeological Impact Assessment
ASAPA: Association of South African Professional Archaeologists
BIA: Basic Impact Assessment
CRM: Cultural Resource Management
EAP: Environmental Assessment Practitioner
ECO: Environmental Control Officer
EIA: Environmental Impact Assessment*
EIA: Early Iron Age*
EMP: Environmental Management Plan
ESA: Early Stone Age
GPS: Global Positioning System
HIA: Heritage Impact Assessment
LIA: Late Iron Age
LSA: Late Stone Age
MEC: Member of the Executive Council
MIA: Middle Iron Age
MPRDA: Mineral and Petroleum Resources Development Act
MSA: Middle Stone Age
NEMA: National Environmental Management Act
PRHA: Provincial Heritage Resource Agency
SADC: Southern African Development Community
SAHRA: South African Heritage Resources Agency
SAHRIS: South African Heritage Resources Information System

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

GLOSSARY

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

Early Stone Age (2 million to 300 000 years ago)

Middle Stone Age (300 000 to 30 000 years ago)

Late Stone Age (30 000 years ago until recent)

Historic (approximately AD 1840 to 1950)

Historic building (over 60 years old)

Lithics: Stone Age artefacts

1. INTRODUCTION

HCAC was contracted by Savannah Environmental (Pty) Ltd to conduct a heritage scoping study for the proposed Clayville Thermal Plant. The Project is located on Erf 457, Erf 459 and Portion 12 of Erf 508 in the Clayville industrial area in Olifantsfontein (Figure 1). The heritage scoping report forms part of the Environmental Impact Assessment (EIA) process for the project and will be followed by a Heritage Impact Assessment report as part of the EIA phase.

The aim of the scoping report is to conduct a desktop study to identify possible heritage resources within the project site. The study furthermore aims to assess the impact of the proposed project on non - renewable heritage resources and to submit appropriate recommendations with regards to the responsible cultural resources management measures that might be required to assist the developer in managing the discovered heritage resources in a responsible manner, in order to protect, preserve and develop them within the framework provided by Heritage legislation.

This report outlines the approach and methodology utilised for the scoping phase of the project. The report includes information collected from various sources and consultations. Possible impacts are identified and mitigation measures are proposed in the following report. It is important to note that no field work was conducted as part of the scoping phase but will be conducted as part of the EIA phase.

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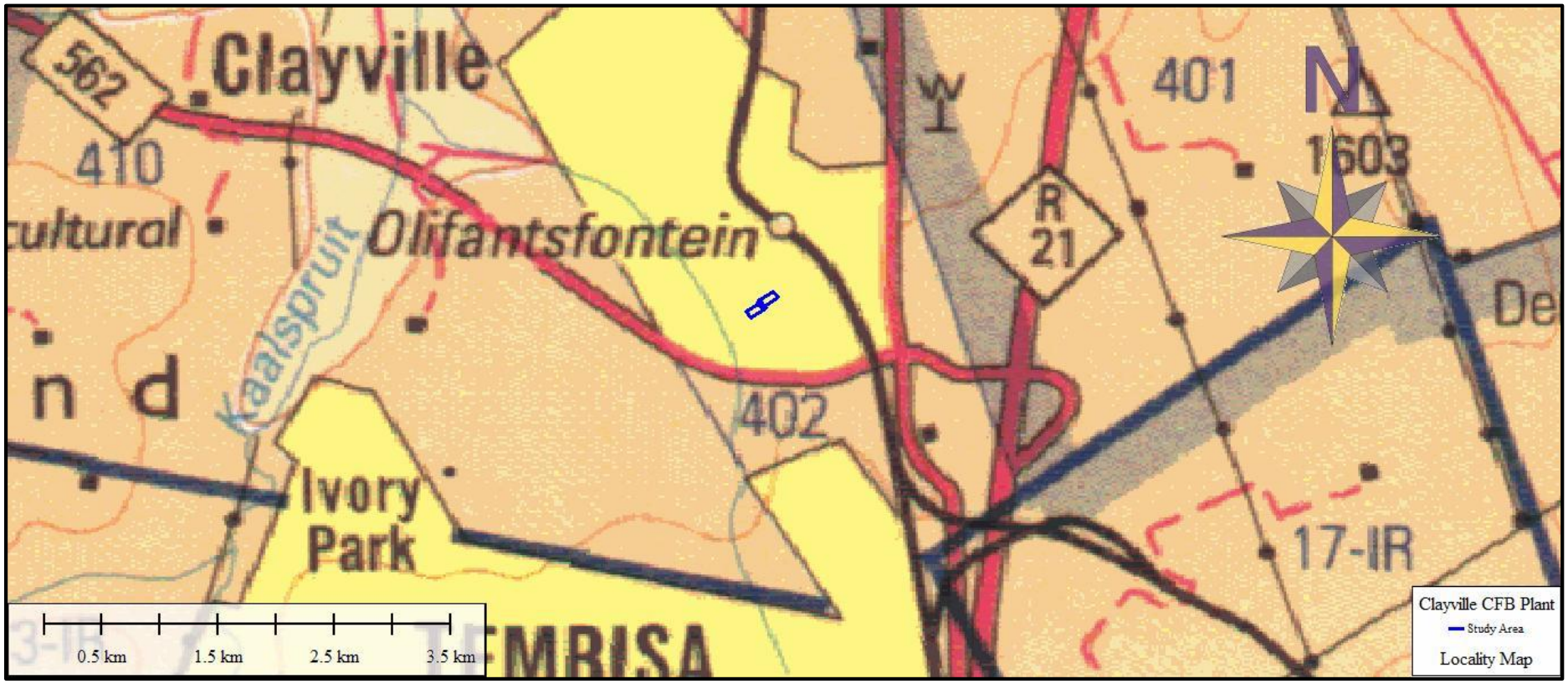

Figure 1. Regional Locality map of the site under investigation indicated in blue.

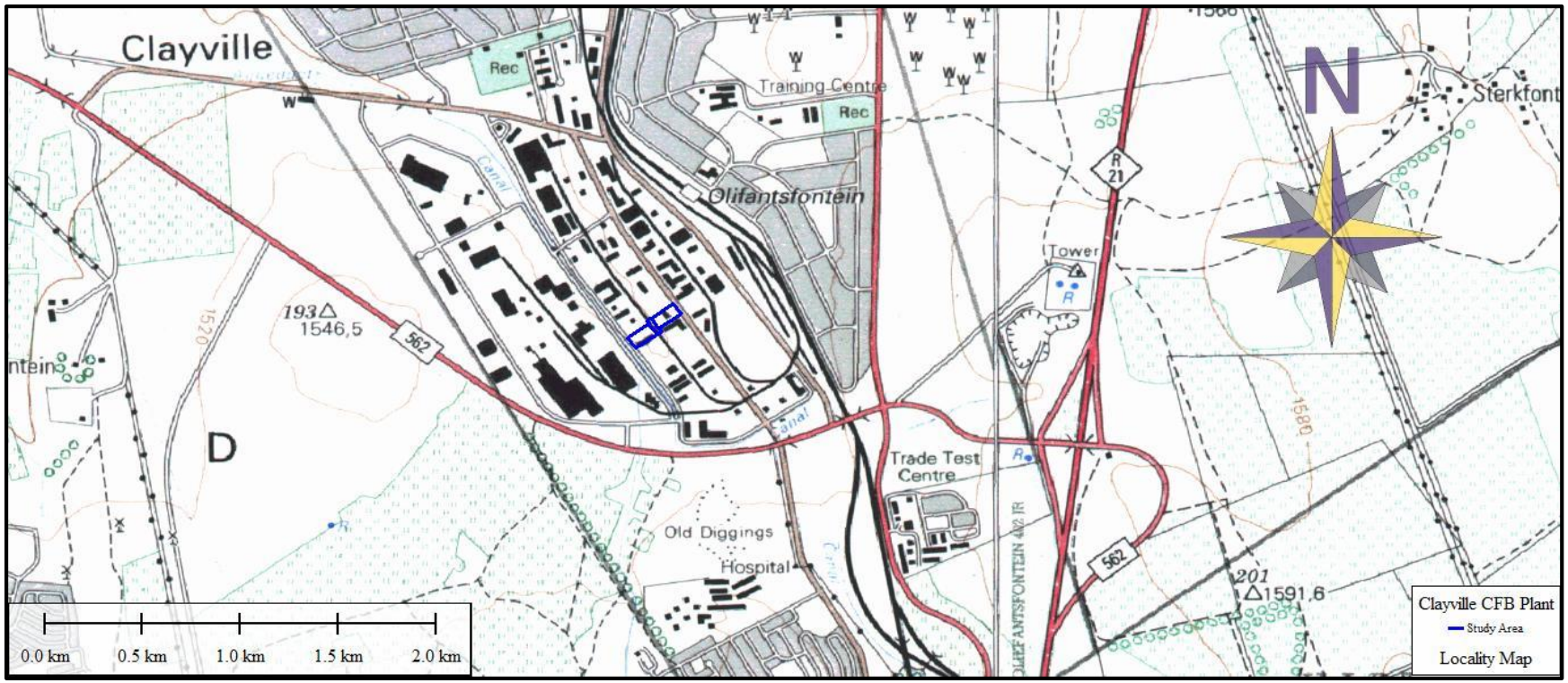

Figure 2. 1:50 000 Topographical map indicating the site in blue.

1.1 Terms of Reference

The main aim of this scoping report is to determine if any known heritage resources occur within the project site. The objectives of the scoping report were to:

- Conduct a desktop study:
  - Review available literature, previous heritage studies and other relevant information sources to obtain a thorough understanding of the archaeological and cultural heritage conditions of the area;
  - Identify known and recorded archaeological and cultural sites; and
  - Determine whether the area is renowned for any cultural and heritage resources, such as Stone Age sites, Iron Age sites, informal graveyards or historical homesteads.
- Compile a specialist Heritage Scoping Report in line with the requirements of the EIA Regulations, 2014, as amended on 07 April 2017.

The reporting of the scoping component is based on the results and findings of a desktop study, wherein potential issues associated with the proposed project will be identified, and those issues requiring further investigation through the Impact Assessment Phase highlighted. Reporting will aim to identify the anticipated impacts, as well as cumulative impacts, of the operational units of the proposed project activity on the identified heritage resources for all 3 development stages of the project, i.e. construction, operation and decommissioning. Reporting will also consider alternatives should any significant sites be impacted on by the proposed project. This is done to assist the developer in managing the discovered heritage resources in a responsible manner, in order to protect, preserve and develop them within the framework provided by Heritage Legislation.

During the EIA phase, the following terms apply:

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

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

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

1.2 Nature of the development

The proposed Clayville Thermal Plant will be located on Erf 457, Portion 12 of Erf 508 and Erf 459 in the Clayville industrial area in Olifantsfontein. The thermal plant will utilising an advanced circulating fluidised bed (CFB) boiler developed by Valmet (Finland). It combines high-efficiency combustion of various solid fuels with low emissions, even when burning fuels with completely different calorific values at the same time. The feedstock for the CFB boiler will be a combination of waste from Astral Foods

and other production facilities in the area, where a maximum of 30% of Refuse Derived Fuel (RDF), and a maximum of 90% coal fines, i.e. waste coal from coal mines will be blended as feedstock into the CFB Boiler. The Thermal Plant will have a capacity of up to 240 tons of steam per hour, or a thermal equivalent of 60 MWe.

The steam from the central boiler will be supplied directly to industrial off-takers via a steam pipe, with a return pipe for condensed steam. Each off-taker will have their own condenser on site. Condensed Steam in the form of heated water will be returned to the central plant, which then is recycled into steam in a continuous process.

Circulating Fluidised Bed (CFB) combustion provides operators with greater flexibility in burning a range of coal and other fuels without compromising efficiency and at the same time reducing emissions.

At the bottom of the boiler furnace is a bed of inert material, typically sand. The feedstock is spread on the bed. Air supply from under the bed is at high pressure which lifts the bed material and the feedstock and keeps it in suspension. This ensures that the gas and solids mix together turbulently for better heat transfer and chemical reactions. Combustion takes place in this suspended condition at a temperature of 760◦C to 927˚C to prevent the formation of nitrogen oxide (NO).

During combustion flue gas containing sulphur dioxide (SO_2) and particulates are released. Sulphur-absorbing chemical such as limestone or dolomite are typically mixed with the coal in the fluidisation phase. These absorb up to 95% of the SO_2. Fine particles of partly burned coal, ash and bed material are carried along with the flue gases to the upper areas of the furnace and then into a cyclone. In the cyclone, the heavier particles separate from the gas and fall into the hopper. This is returned to the furnace for recirculation, leading to the technology name of Circulating Fluidised Bed combustion. The hot gases from the cyclone pass to the heat transfer surfaces and go out of the boiler. Steam will be provided to off-takers to use in various processes.

The Clayville Thermal Plant will use a combination of coal fines and Refuse Derived Fuel (RDF). RDF is produced from combustible components of municipal solid waste (MSW). The waste is sorted, shredded, dried and blended with the coal fines before being fed into the furnace.

1.3 The receiving environment

The project is located in the Olifantsfontein area in Gauteng (Figure 1). The site is located at 25° 58' 11.9310" S, 28° 14' 02.3816" E. The site measures less than two hectares ha and is bordered by Industry Road and Spanner Road. The general area is characterised by a densely developed area and several buildings occur on site.

2. APPROACH AND METHODOLOGY

The assessment is to be undertaken in two phases, a desktop study as part of the Scoping phase and an Archaeological Impact Assessment as part of the EIA phase. This report concerns the scoping phase. The aim of the scoping phase is to cover available data regarding archaeological and cultural heritage to compile a background history of the study area in order to identify possible heritage issues or fatal flaws that could possibly be associated with the project and should be avoided during development.

This was accomplished by means of the following phases (the results are represented in section 4 of this report):

2.1 Literature review
A review was conducted utilising data for information gathering from a range of sources on the archaeology and history of the area. The aim of this is to extract data and information on the area in question, looking at archaeological sites, historical sites and graves of the area. Data is of good quality and the SAHRIS database were accessed in 2017.

2.2 Information collection
The South African Heritage Resources Information System (SAHRIS) was consulted to further collect data from CRM practitioners who undertook work in the area to provide the most comprehensive account of the history of the area where possible, data obtained from CRM reports is of good quality and SAHRIS was accessed in Aug 2017. In addition, the archaeological database housed at the University of the Witwatersrand was consulted.

2.3 Public consultation
No public consultation was conducted during this phase by the author.

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

2.5 Genealogical Society of South Africa
The database of the genealogical society was consulted to collect data on any known graves in the area.

2.6. Restrictions
This study did not assess the impact on intangible resources or the palaeontological component of the project. Based on available data and resources as outlined in the report additional information that becomes available at a later stage might change the outcome of assessment.

3. LEGISLATION

For this project, the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA) is of importance and the following sites and features are protected:

a. Archaeological artefacts, structures and sites older than 100 years;
b. Ethnographic art objects (e.g. prehistoric rock art) and ethnography;
c. Objects of decorative and visual arts;
d. Military objects, structures and sites older than 75 years;
e. Historical objects, structures and sites older than 60 years;
f. Proclaimed heritage sites;
g. Grave yards and graves older than 60 years;
h. Meteorites and fossils; and
i. Objects, structures and sites or scientific or technological value.

The national estate includes the following:

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 features of cultural significance;
e. Geological sites of scientific or cultural importance;
f. Archaeological and palaeontological importance;
g. Graves and burial grounds;
h. Sites of significance relating to the history of slavery; and
i. Movable objects (e.g. archaeological, palaeontological, meteorites, geological specimens, military, ethnographic, books etc.).

Section 34 (1) of the Act deals with structures that are older than 60 years. Section 35(4) of this Act deals with archaeology, palaeontology and meteorites. Section 36(3) of the Act, deals with human remains older than 60 years. Unidentified/unknown graves are also handled as older than 60 years until proven otherwise.

3.1 Heritage Site Significance and Mitigation Measures

The presence and distribution of heritage resources define a Heritage Landscape. In this landscape, every site is relevant. In addition, because heritage resources are non-renewable, heritage surveys need to investigate an entire project area. In all initial investigations, however, the specialists are responsible only for the identification of resources visible on the surface.

This section describes the evaluation criteria used for determining the significance of archaeological and heritage sites. National and Provincial Monuments are recognised for conservation purposes. The following interrelated criteria were used to establish site significance:

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

The criteria above will be used to place identified sites within the South African Heritage Resources Agency's (SAHRA's) (2006) system of grading of places and objects that form part of the national estate. This system is approved by the Association of South African Professional Archaeologists (ASAPA) for the Southern African Development Community (SADC) region. The recommendations for each site should be read in conjunction with Section 10 of this report.

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

4. REGIONAL OVERVIEW

4.1 General Information

4.1.1. Database search

Five previously recorded sites are on record for the 2528 CC topographic map at the Wits database. These recorded sites are mostly classified as Later Stone Age Sites. None of these are in close proximity to the current area of investigation.

The following CRM reports consulted for this study:

Author	Year	Project	Findings
Van der Walt, J	2017	Heritage Impact Assessment for the Clayville Bulk Services and Mix Use development	No heritage resources were identified
Pelser, A.J.	2016	A Report on A Phase 1 HIA For Proposed Sand Mine Development on Olifantsfontein 410JR, Near Tembisa, Gauteng	No heritage resources were identified.
Van Schalkwyk, J.A.	2006	Heritage Impact Assessment: Clayville	A Large Cemetery was identified.

From the Wits database and previous CRM studies, the following resources have been identified in the larger area:

- Later Stone Age scatters have been identified;
- Numerous Grave sites and cemeteries have also been recorded.

4.1 2. Public consultation

No public consultation was conducted by the heritage consultant during the scoping phase.

4.1.3. Google Earth and mapping survey

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

4.1.4. Genealogical Society of South Africa

No grave sites are on record for the study area.

5. ARCHAEOLOGICAL AND HISTORICAL INFORMATION AVAILABLE ON THE STUDY AREA

5.1 Stone Age

South Africa has a long and complex Stone Age sequence of more than 2 million years. The broad sequence includes the Later Stone Age, the Middle Stone Age and the Earlier Stone Age. Each of these phases contain sub-phases or industrial complexes, and within these we can expect regional variation regarding characteristics and time ranges. Excavations by Mason (1997) at the Boulders shopping centre (approximately 12 km to the south west of the current study area) was aimed at interpreting the cultural layering of the Midrand area and provides a good platform for understanding the cultural use of the wider landscape. He identified 7 occupational layers in his excavations that can be broadly divided into Stone Age, Iron Age and historical occupations.

The Stone Age can be divided in three main phases as follows;

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

Remains dating to all three of these phases were identified by Mason at the Boulders shopping Centre site, MSA and LSA material was also recorded at Glennferness cave on the farm Witkoppen located 30 km to the west. The Iron Age of the region consists of Tswana speaking people who settled in the area from the early 16th century. J. S. Bergh's historical atlas of the four northern provinces of South Africa is a very useful source for the writing of local and regional history. The study area is located about 34 km north east of the Melville Koppies, which is a Middle Stone-Age site. (Bergh 1999: 4) This area was also important to Iron Age communities, since these people had smelted and worked iron ore at the Melville Koppies site since the year 1060, by approximation. (Bergh 1999: 7, 87)

There is evidence of the use of the larger area by Stone Age communities for example along the Kliprivier where ESA and MSA tools were recorded. The greater study area is located in the vicinity of the Linksfield and Primrose Middle Stone Age terrains (Bergh 1999: 4-8). For the Later Stone Age, some petroglyphs occur to the south at Redan as well as along the Vaal River (Bergh 1999).

5.2. The Iron Age

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

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

The Iron Age is characterised by the ability of these early people to manipulate and work Iron ore into implements that assisted them in creating a favourable environment to make a better living.

Regarding the Iron Age, the Smelting Site at Melville Koppies requires further mention. The site was excavated by Professor Mason from the Department of Archaeology of the University of Witwatersrand (WITS) in the 1980's. Extensive stone walled sites are also recorded further south at Klipriviers Berg Nature Reserve belonging to the Late Iron Age period. A large body of research is available on this area. These sites (Taylor's Type N, Mason's Class 2 & 5) are now collectively referred to as Klipriviersberg (Huffman 2007). These settlements are complex in that aggregated settlements are common, the outer wall sometimes includes scallops to mark back courtyards, there are more small stock kraals, and straight walls separate households in the residential zone. These sites date to the 18th and 19th centuries and was built by people in the Fokeng cluster.

In this area, the Klipriviersberg walling would have ended at approximately AD 1823, when Mzilikazi entered the area (Rasmussen 1978). This settlement type may have lasted longer in other areas because of the positive interaction between Fokeng and Mzilikazi.

The Difaqane (Sotho), or Mfekane ("the crushing" in Nguni) was a time of bloody upheavals in Natal and on the Highveld, which occurred around the early 1820's until the late 1830's (Bergh 1999: 10). It came about in response to heightened competition for land and trade, and caused population groups like gun-carrying Griquas and Shaka's Zulus to attack other tribes. (Bergh 1999: 14; 116-119) It seems that, in 1827, Mzilikazi's Ndebele started moving through the area where Johannesburg is located today. This group went on raids to various other areas in order to expand their area of influence (Bergh 1999: 11). In this area, the Klipriviersberg walling would have ended at about AD 1823, when Mzilikazi entered the area (Rasmussen 1978). This settlement type may have lasted longer in other areas because of the positive interaction between Fokeng and Mzilikazi.

5.3. **Historical Information**

During the time of the Difaqane, a northwards migration of white settlers from the Cape was also taking place. Some travellers, missionaries and adventurers had gone on expeditions to the northern areas in South Africa, some already as early as the 1720's. It was however only by the late 1820's that a mass-movement of Dutch speaking people in the Cape Colony started advancing into the northern areas. This was due to feelings of mounting dissatisfaction caused by economical and other circumstances in the Cape. This movement later became known as the Great Trek.

This migration resulted in a massive increase in the extent of that proportion of modern South Africa dominated by people of European descent (Ross 2002: 39). By 1939 to 1940, farm boundaries were drawn up in an area that includes the present-day Johannesburg and Krugersdorp (Bergh 1999: 15).

The first settlers moved in the Midrand area in the 1820s, this included hunters, traders, missionaries and other travellers. Voortrekker farmers such as Frederik Andries Strydom and Johannes Elardus Erasmus established the farms Olifantsfontein and Randjesfontein respectively around the 1840's and this indicated permanent occupation of the area by white settlers. These early white settlers and their descendants were often buried on their farms and formal and informal graves and graveyards can be expected anywhere on the landscape (Van Schalkwyk 1998).

The Anglo-Boer War (1899-1902) also impacted the Midrand area. The area was a key focus of the British war effort for a short period of time when the British forces under Lord Roberts advanced through Midrand from Johannesburg while travelling to Pretoria. Pretoria was occupied on 5 June 1900.

Some British military units were stationed close to the study area this includes the Eskom Academy of Learning (approximately 8km southwest) as well as Bibury Grange (17 km to the west). No major battles took place in Midrand. Conflict in the area was defined by the Boer attempts to sabotage the railway line as well as attacks on troop trains. A notable incident was the successful Boer demolition of the railway culvert near the Pinedene Station (Van Schalkwyk 1998).

5.4. Anglo-Boer War

During the Anglo-Boer War (1899-1902) there was a skirmish between Boer and British forces near Olifantsfontein, while there was also a Black Concentration Camp built by the British near Olifantsfontein station/railway (Bergh 1999: 51; 55).

5.5. Cultural Landscape

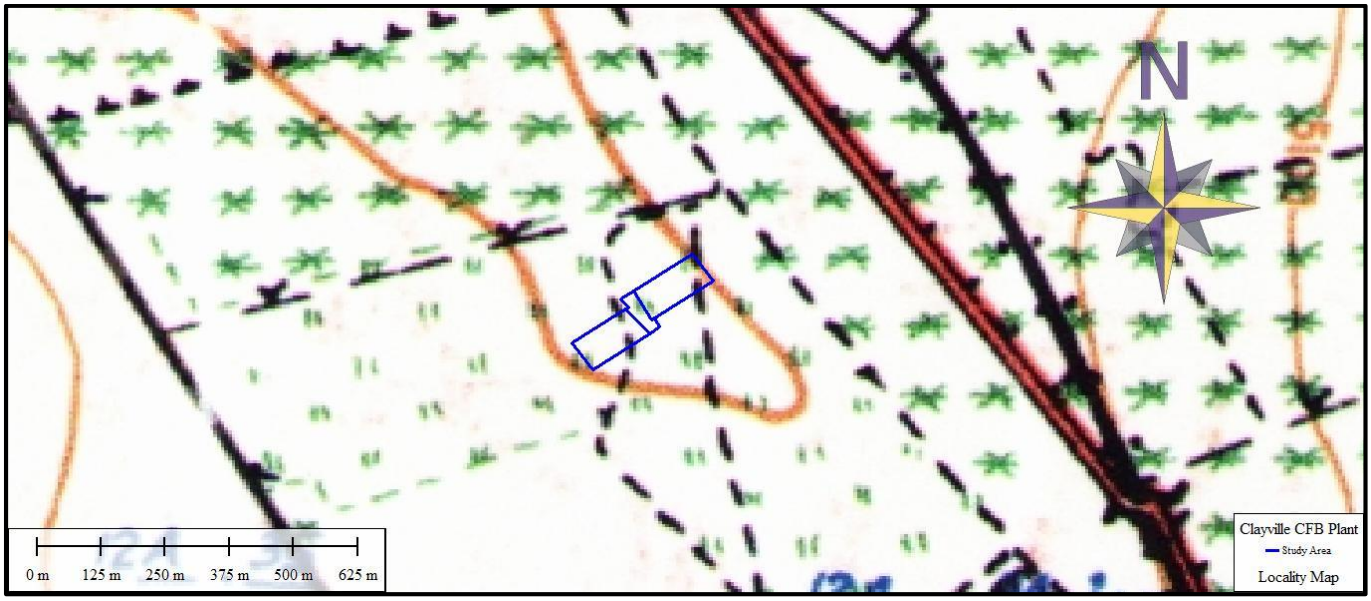

Figure 3. 1943 Topographical map of the site under investigation. The approximate study area is indicated with a blue border. Two farm roads run through the property. No other developments are visible. (Topographical Map 1943)

5.6. Built Environment

Several structures occur in the development footprint, the age of these structures are unknown although they have not been in existence by 1943 (Figure 3) and therefore not older than a 100 years. If they are older than 60 years they are protected by Section 34 of the NHRA.

5.7. Graves and Burial Sites

Graves and cemeteries are widely distributed across the landscape and can be expected anywhere. Some grave sites are known from the Genealogical society's database but these are located outside of the development footprint.

5.8. Known Battles in relation to the study area

No battles took place in the study area.

6. PROBABILITY OF OCCURRENCE OF SITES

Based on the above information, it is possible to determine the probability of finding archaeological and cultural heritage sites within the study area to a certain degree. For the purposes of this section of the report the following terms are used – low, medium and high probability. Low probability indicates that no known occurrences of sites have been found previously in the general study area. Medium probability indicates some known occurrences in the general study area are documented and can therefore be expected in the study area. A high probability indicates that occurrences have been documented close to or in the study area and that the environment of the study area has a high degree of probability for the occurrence of sites.

» Archaeological and Cultural Heritage Landscape

NOTE: *Archaeology is the study of human material and remains (by definition) and is not restricted in any formal way as being below the ground surface*.

Archaeological remains dating to the following periods can be expected within the study areas:

» Stone Age finds
ESA: *Low Probability*
MSA*: Low Probability*
LSA: Medium Probability
LSA –Herder: Low Probability

» Iron Age finds
EIA: *Low to Medium Probability*
MIA*: Low Probability*
LIA: Low to Medium Probability

» Historical finds
Historical period: *Low-Medium Probability*
Historical dumps: *Low-Medium Probability*
Structural remains: *Low-Medium Probability*

» Living Heritage
For example, rainmaking sites: *Low Probability*

» Burial/Cemeteries
Burials over 100 years: *Low Probability*
Burials younger than 60 years*: Medium Probability*

Subsurface excavations including ground levelling, landscaping, and foundation preparation can expose any number of these resources.

7. ASSUMPTIONS AND LIMITATIONS

The study area was not subjected to a field survey at this stage in the environmental process, this will be done during the EIA phase. It is assumed that information obtained for the wider area is applicable to the study area. Additional information could become available in future that could change the results of this report. It is assumed that the EAP will upload all relevant documents to the SAHRIS.

8. FINDINGS

8.1. Archaeology

8.1.1 Archaeological finds

Based on research conducted in the area LSA scatters can be expected in the larger study area. Due to the development of the study area that would have impacted on surface indicators of heritage sites no significant sites or finds are expected. Impacts to heritage resources will occur primarily during the construction phase and no impacts are expected during the operation and decommissioning phase.

8.1.2 Nature of Impact

The construction phase of the project could directly impact on surface and subsurface archaeological sites.

8.1.3 Extent of impact

The project could have a low impact on a local scale.

8.2. Historical period

8.2.1 Historical finds:

Historical finds include middens, structural remains and cultural landscape. Several buildings of an unknown age occur in the study area. Due to the large scale, industrial development of the study area and surrounds it is assumed that the current structures are younger than 60 years and not protected by the NHRA. Impacts to heritage resources will occur primarily during the construction phase and no impacts are expected during the operation and decommissioning phase.

8.2.2 Nature of Impact

Due to the large scale, industrial development of the study area and surrounds no impacts of any magnitude are expected as the proposed development is in line with the surrounding land use.

8.2.3 Extent of impact

The construction of the project could have a low impact on a local scale.

8.3. Burials and Cemeteries

8.3.1 Burials and Cemeteries

Former studies in the surrounding areas recorded informal graves. Therefore, graves, informal cemeteries and unmarked graves can be expected anywhere on the landscape.

8.3.2 Nature of Impact

The construction of the proposed project could directly impact on marked and unmarked graves.

8.3.3 Extent of impact

The project could have a low to medium impact on a local scale.

Impact on Heritage resources

The construction of the proposed project could directly impact on graves, archaeological sites and historical sites. Indirect impacts and residual impacts relating to the cultural landscape and sense of place and the depletion of the archaeological record of the wider region are also associated with the development of the thermal plant.

Issue	Nature of Impact	Extent of Impact	No-Go Areas
Disturbance and destruction of archaeological sites, historical sites and graves.	Construction activities could cause irreversible damage or destroy heritage resources and depletion of the archaeological record of the area.	Low to Medium on a local scale.	TBC after field work

Description of expected significance of impact

Significance of sites, mitigation and significance of possible impact can only be determined after the field work has been conducted, but based on previous work in the area Stone Age find spots and graves can be expected.

Gaps in knowledge & recommendations for further study

The study area has not been subjected to a heritage resource survey and it is assumed that information obtained for the wider region is applicable to the study area. To address these gaps, it is recommended that a field study should be conducted to confirm the presence of heritage resources after which mitigation measures will be recommended (if needed).

9. POTENTIAL SIGNIFICANCE OF HERITAGE RESOURCES

Based on the current information obtained for the area at a desktop level it is anticipated that any sites that occur within the proposed development area will have a Generally Protected B (GP.B) or lower field rating and all sites should be mitigatable. No red flags have been identified.

10. CONCLUSIONS AND RECOMMENDATIONS

This brief background study indicates that the general area under investigation has a wealth of heritage sites and a cultural layering dating to the following periods:

- Late Stone Age scatters;
- Numerous grave sites and cemeteries.

Every site is relevant to the Heritage Landscape, but it is anticipated that few sites in the study area could have conservation value. It is recommended that impacts to heritage sites should be mitigated by micro adjustments to the layout to preserve the sites *in situ* as far as possible. If this is not possible, the following conclusions are applicable to the heritage sites:

» Archaeological sites

No sites are on record for the study area, but this will have to verified during a field based study. If any sites of significance are found these sites could be mitigated either in the form of conservation of the sites within the development or by a Phase 2 study where the sites will be recorded and sampled before the client can apply for a destruction permit for these sites prior to development.

» Historical finds and Cultural landscape

Some buildings do occur on site of an unknown age. A field visit and archival study is required to confirm the age and condition of these features and should be done during the Impact Assessment phase.

» Burials and cemeteries

Formal and informal cemeteries as well as pre-colonial graves occur widely across Southern Africa. It is generally recommended that these sites are preserved *in situ* and within a development. These sites can however be relocated if conservation is not possible, but this option must be seen as a last resort and is not advisable. The presence of any grave sites must be confirmed during the field survey and the public consultation process.

» General

From a heritage viewpoint, the proposed project is considered to be viable. This will however be confirmed through the Heritage Impact Assessment to be undertaken in the EIA Phase.

11. PLAN OF STUDY

The development triggers the NHRA in the following areas and therefore a Phase 1 Archaeological Impact Assessment (AIA) is recommended:

Action Trigger	**Yes/No**	**Description**
Construction of a road, wall, power line, pipeline, canal or other linear form of development or barrier exceeding 300 m in length.	Yes	Internal access roads
Construction of a bridge or similar structure exceeding 50 m in length.	No	
Development exceeding 5000 m²	Yes	Footprint of impact area exceeds 5000m²
Development involving more than 3 erven or sub divisions	No	
Development involving more than 3 erven or sub divisions that have been consolidated in the past 5 years	No	
Re-zoning of site exceeding 10 000 m²	Yes	Unknown
Any other development category, public open space, squares, parks or recreational grounds	No	

With cognisance of the recorded archaeological sites in the wider area and in order to comply with the National Heritage Resources Act (Act 25 of 1999) it is recommended that a Phase 1 AIA must be undertaken. During this study sites of archaeological, historical or places of cultural interest must be located, identified, recorded, photographed and described. During this study, the levels of significance of recorded heritage resources must be determined and mitigation proposed should any significant sites be impacted upon, ensuring that all the requirements of the SAHRA are met.

11.1 Reasoned Opinion

If the above recommendations are adhered to, HCAC is of the opinion that the impact of the development on heritage resources can be mitigated. This will be confirmed through the Heritage Impact Assessment to be undertaken in the EIA Phase.

If during the pre-construction phase or during construction, any archaeological finds are made (e.g. graves, stone tools, and skeletal material), the operations must be stopped, and the archaeologist must be contacted for an assessment of the finds. Due to the subsurface nature of archaeological material and graves the possibility of the occurrence of unmarked or informal graves and subsurface finds cannot be excluded.

12. LIST OF PREPARERS

Jaco van der Walt (Archaeologist and project manager).

13. STATEMENT OF COMPETENCY

The author of the report is a member of the Association of Southern African Professional Archaeologists and is also accredited in the following fields of the Cultural Resource Management (CRM) Section, member number 159: Iron Age Archaeology, Colonial Period Archaeology, Stone Age Archaeology and Grave Relocation. Jaco is also an accredited CRM Archaeologist with SAHRA and AMAFA.

Jaco has been involved in research and contract work in South Africa, Botswana, Mozambique, Zimbabwe, Tanzania and the DRC and conducted well over 300 AIAs since he started his career in CRM in 2000. This involved several mining operations, Eskom transmission and distribution projects and infrastructure developments. The results of several of these projects were presented at international and local conferences.

14. STATEMENT OF INDEPENDENCE

I, Jaco van der Walt as duly authorised representative of Heritage Contracts and Archaeological Consulting CC, hereby confirm my independence as a specialist and declare that neither I nor the Heritage Contracts and Archaeological Consulting CC have any interest, be it business, financial, personal or other, in any proposed activity, application or appeal in respect of which the client was appointed as Environmental Assessment practitioner, other than fair remuneration for work performed on this project.

SIGNATURE: _____

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