

A Phase 1 Heritage Impact Assessment for the proposed Reclaiming of clinker (ash from old power stations) in Witbank, eMalahleni Local Municipality in Mpumalanga Province.

MSEI

MBVISENI SUSTAINABLE ENVIRONMENTAL MANAGEMENT INITIATIVE [MSEI]

May 22, 2017

Authored by: Trust Mlilo and Foreman Bandama Ph.D. (UCT) Professional Archaeologist and Heritage Management Specialist (ASAPA member)

DOCUMENT SYNOPSIS (EXECUTIVE SUMMARY)

Item	Description
Proposed development and location	The proposed reclaiming of clinker (ash from old power stations) in Witbank, eMalahleni Local Municipality in Mpumalanga Province
Purpose of the study	Phase 1 Archaeological Impact Assessment to determine the presence of cultural heritage sites and the impact of the proposed project on these resources within the area demarcated for the proposed landfill site development.
1:50 000 Topographic Map	2529CC Witbank
Coordinates	South 25 53 ' 40.819; East 29 12 ' 56.428'
Municipalities	eMalahleni Local Municipality.
Predominant land use of surrounding area	Agriculture, industrial, residential, powerlines, Ash dumb, road and transport
Developer	Clinker Supplies (Pty) Ltd
Heritage Consultant	Mbviseni Sustainable Environmental Management Initiative (MSEI) 135 Pitzer Road, Glen Austin 1685
Date of Report	Final report 22 May 2017
Contact person	Trust Mlilo Email: trust.mlilo@gmail.com , Tel: +27 11 1565, Cell: +27 71 685 9247

This document serves to inform and guide the developer (Clinker Supplies) and its contractors about the possible impacts that the development (the proposed reclaiming of clinker and road construction) may have on heritage resources (if any) located in the study area. In the same light, the document must also inform South African heritage authorities about the presence, absence and significance of heritage resources located in the study area. As required by South African heritage legislation, developments such as this require pre-development assessment by a competent heritage practitioner in order to identify record and if necessary salvage the irreplaceable heritage resources that may be impacted upon by the development. In compliance with these laws Clinker Supplies (Pty) Ltd appointed Mbviseni Sustainable Environmental Initiative (MSEI) to conduct a Phase 1 Heritage Impact Assessment (HIA) of the proposed Witbank Ash Dump site, proposed access road to site, proposed weigh bridge, plant and stock piling area located on the highly industrialized zone in the Witbank area of Mpumalanga. Desktop studies, drive-throughs and fieldwalking were conducted in order to identify heritage landmarks on and around the proposed development area. The study area is not on pristine ground, having seen significant transformations owing to industrial developments, powerlines, railway lines, ash dumping and agriculture. Although the area is known for historical and LIA occurrences, no archaeological resources were identifiable on the surface, even though this may be due to the tall grass that inhibits ground surface visibility. In terms of the built environment of the area, isolated structures of unknown age (but possibly not older than 60 years) occur in the surrounding areas. Should the development encroach into these areas, a professional heritage practitioner should be appointed to study them before they are destroyed because if they are older than 60 years, then they would be protected under the NHRA and a demolition permit will be required for these structures. However, in terms of the archaeology of the area under study, no mitigation will be required prior to construction. Nonetheless, sub-surface archaeological material and unmarked graves may still exist and when encountered during construction, work must be stopped forthwith and the finds must be reported to the South African Heritage Resource Agency (SAHRA) or the heritage practitioner. This report must also be submitted to the SAHRA or the relevant PHRA for review.

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Authorship: This A/HIA Report has been prepared by Mr Trust Mlilo (Professional Archaeologist). The report is for the review of the Heritage Resources Agency (PHRA).

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Agencies to the extent that this is required for the purposes of the Archaeological and Heritage Management purposes in accordance with the National Heritage Resources Act, Act 25 of 1999

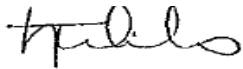
Geographic Co-ordinate Information: Geographic co-ordinates in this report were obtained using a hand-held Garmin Global Positioning System device. The manufacturer states that these devices are accurate to within +/- 5 m.

Maps: Maps included in this report use data extracted from the NTS Map and Google Earth Pro.

Disclaimer: The Author is not responsible for omissions and inconsistencies that may result from information not available at the time this report was prepared.

The Archaeological and Heritage Impact Assessment Study was carried out within the context of tangible and intangible cultural heritage resources as defined by the SAHRA Regulations and Guidelines as to the authorisation proposed development being proposed by Clinker Supplies (Pty) Ltd.

Signed by

A handwritten signature in black ink, appearing to be 'H. P. ...', written in a cursive style.

May 2016

Acknowledgements

The authors acknowledge Clinker Supplies (Pty) Ltd for their assistance with project information, and the associated project BID as well as responding to technical queries related to the project.

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1. Abbreviations

AIA	Archaeological Impact Assessment
ASAPA	Association of South African Professional Archaeologists
EIA	Environmental Impact Assessment
EIA	Early Iron Age (<i>EIA refers to both Environmental Impact Assessment and the Early Iron Age but in both cases the acronym is internationally accepted. This means that it must be read and interpreted within the context in which it is used.</i>)
EIAR	Environmental Impact Assessment Report
ESA	Early Stone Age
GPS	Global Positioning System
HIA	Heritage Impact Assessment
ICOMOS	International Council of Monuments and Sites
LIA	Late Iron Age
LFC	Late Farming Community
LSA	Late Stone Age
MIA	Middle Iron Age
MSA	Middle Stone Age
MSEI	Mbviseni Sustainable Environmental Initiative
NEMA	National Environmental Management Act 107 of 1998
NHRA	National Heritage Resources Act 25 of 1999
PHRA	Provincial Heritage Resource Agency
SAHRA	South African Heritage Resources Agency

ToR

Terms of Reference

2. Key concepts and terms

2.1 Periodization

Periodization Archaeologists divide the different cultural epochs according to the dominant material finds for the different time periods. This periodization is usually region-specific, such that the same label can have different dates for different areas. This makes it important to clarify and declare the periodization of the area one is studying. These periods are nothing a little more than convenient time brackets because their terminal and commencement are not absolute and there are several instances of overlap. In the present study, relevant archaeological periods are given below;

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

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

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

Early Iron Age (~ AD 200 to 1000)

Late Iron Age (~ AD1100-1840)

Historic (~ AD 1840 to 1950, but a Historic building is classified as over 60 years old)

2.2 Definitions

Definitions Just like periodization, it is also critical to define key terms employed in this study. Most of these terms derive from South African heritage legislation and its ancillary laws, as well as international regulations and norms of best-practice. The following aspects have a direct bearing on the investigation and the resulting report:

Cultural (heritage) resources are all non-physical and physical human-made occurrences, and natural features that are associated with human activity. These can be singular or in groups and include significant sites, structures, features, ecofacts and artefacts of importance associated with the history, architecture or archaeology of human development.

Cultural significance is determined by means of aesthetic, historic, scientific, social or spiritual values for past, present or future generations.

Value is related to concepts such as worth, merit, attraction or appeal, concepts that are associated with the (current) usefulness and condition of a place or an object. Although significance and value are not mutually exclusive, in some cases the place may have a high level of significance but a lower level of value. Often, the evaluation of any feature is based on a combination or balance between the two.

Isolated finds are occurrences of artefacts or other remains that are not in-situ or are located apart from archaeological sites. Although these are noted and recorded, but do not usually constitute the core of an impact assessment, unless if they have intrinsic cultural significance and value.

In-situ refers to material culture and surrounding deposits in their original location and context, for example an archaeological site that has not been disturbed by farming.

Archaeological site/materials are remains or traces of human activity that are in a state of disuse and are in, or on, land and which are older than 100 years, including artefacts, human and hominid remains, and artificial features and structures. According to the National Heritage Resources Act (NHRA) (Act No. 25 of 1999), no archaeological artefact, assemblage or settlement (site) and no historical building or structure older than 60 years may be altered, moved or destroyed without the necessary authorisation from the South African Heritage Resources Agency (SAHRA) or a provincial heritage resources authority.

Historic material are remains resulting from human activities, which are younger than 100 years, but no longer in use, including artefacts, human remains and artificial features and structures.

Chance finds means archaeological artefacts, features, structures or historical remains accidentally found during development.

A grave is a place of interment (variably referred to as burial) and includes the contents, headstone or other marker of such a place, and any other structure on or associated with such place. A grave may occur in isolation or in association with others where upon it is referred to as being situated in a cemetery (contemporary) or burial ground (historic).

A site is a distinct spatial cluster of artefacts, structures, organic and environmental remains, as residues of past human activity.

Heritage Impact Assessment (HIA) refers to the process of identifying, predicting and assessing the potential positive and negative cultural, social, economic and biophysical impacts of any proposed project

which requires authorisation of permission by law and which may significantly affect the cultural and natural heritage resources. Accordingly, an HIA must include recommendations for appropriate mitigation measures for minimising or circumventing negative impacts, measures enhancing the positive aspects of the proposal and heritage management and monitoring measures.

Impact is the positive or negative effects on human well-being and / or on the environment.

Mitigation is the implementation of practical measures to reduce and circumvent adverse impacts or enhance beneficial impacts of an action.

Mining heritage sites refer to old, abandoned mining activities, underground or on the surface, which may date from the prehistorical, historical or the relatively recent past.

Study area or '**project area**' refers to the area where the developer wants to focus its development activities (refer to plan).

Phase I studies refer to surveys using various sources of data and limited field walking in order to establish the presence of all possible types of heritage resources in any given area.

2.3 Assumptions and disclaimer

The investigation has been influenced by the unpredictability of buried archaeological remains (absence of evidence does not mean evidence of absence) and the difficulty in establishing intangible heritage values. It should be remembered that archaeological deposits (including graves and traces of mining heritage) usually occur below the ground level. Should artefacts or skeletal material be revealed at the site during construction, such activities should be halted immediately, and a competent heritage practitioner, SAHRA or PHRA must be notified in order for an investigation and evaluation of the find(s) to take place (see NHRA (Act No. 25 of 1999), Section 36 (6)). Recommendations contained in this document do not exempt the developer from complying with any national, provincial and municipal legislation or other regulatory requirements, including any protection or management or general provision in terms of the NHRA. MSEI assumes no responsibility for compliance with conditions that may be required by SAHRA in terms of this report.

3. Terms of Reference (ToR)

The author was requested by Afrimat on behalf of Clinker Supplies (Pty) Ltd to conduct an AIA/HIA study addressing the following issues:

- Archaeological and heritage potential of the proposed Witbank ash dump reclamation including any known data on affected areas;
- Provide details on methods of study; potential and recommendations to guide the PHRA provincial authority to make an informed decision with regards to authorization of the proposed development.

3.1 Introduction

MSEI was requested by Afrimat to carry out a scoping and Phase 1 AIA/ HIA of the proposed reclamation of ash site in Witbank for Clinker Supplies. The study area is located in Witbank, about 2 kilometres south of Witbank's CBD and also immediately to the south of the N4 highway within eMalahleni Local Municipality in Mpumalanga Province. The Witbank Ash Dump site is approximately 15 hectares and situated on Portion 307 of the Farm Witbank, which is a highly industrialized area (Figure 1). The site is zoned as S.A.R (Eskom services), therefore the site can be developed in any way Clinker Supplies intends to, as long as it is in line with Eskom business. However, as prescribed by SAHRA and stipulated by legislation, a HIA is a pre-requisite for this kind of development. The overall purpose of this heritage report is to identify, assess any heritage resources that may be located in the study area and evaluate the positive and negative impacts of the proposed development on these resources in order to make recommendations for their appropriate management. To achieve this, we conducted background research of published literature, maps and databases (desktop studies) which was then followed by ground-truthing by means of drive-through surveys and field walking. Desktop studies had shown that Iron Age and historical sites were a possibility in the study area but no such sites were recorded during ground-truthing. While heritage resources may have been located in the study area, subsequent developments such as industrial work and dumping have either obliterated these materials or reduced them to isolated finds that can only be identifiable as chance finds during construction. If the recommendations of this report are adopted, there is no archaeological reason why construction cannot proceed, taking full cognizance of clear procedures to follow in the event of chance findings.

4. Project Location

The study area is located in Witbank, about 2 kilometres south of Witbank's CBD and also immediately to the south of the N4 highway within eMalahleni Local Municipality in Mpumalanga Province. The Witbank Ash Dump site is approximately 15 hectares and situated on Portion 307 of the Farm Witbank, which is a highly industrialized area (Figure 1). The site is zoned as S.A.R (Eskom services).

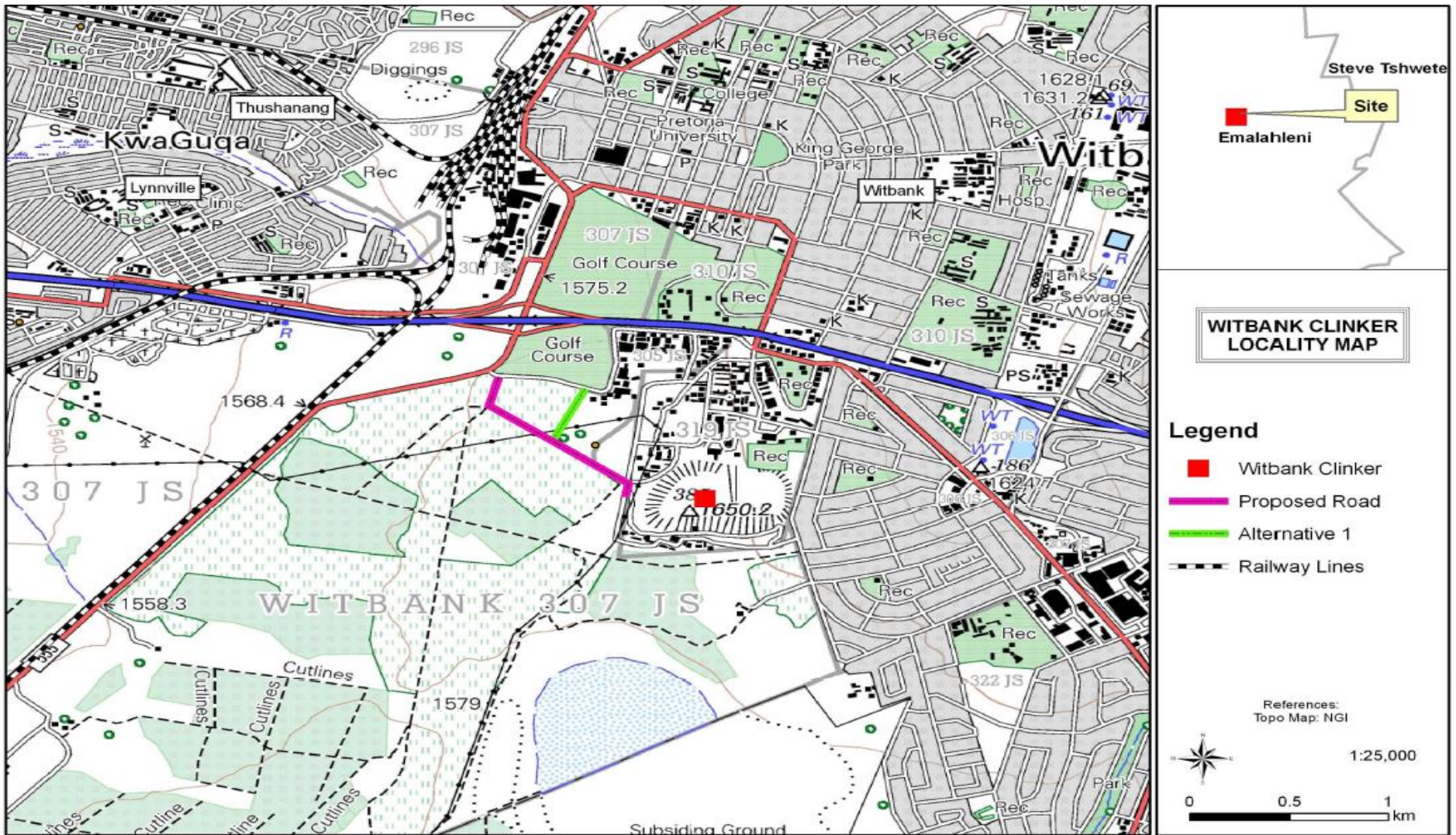


Figure 1: Location of the proposed project area (Clinker Supplies 2016)

4.1 Project descriptions

Clinker Supplies intends to develop a new access road, plant and weigh bridge site and site offices at a site (Witbank Ash Dump Site) approximately 15 hectares in extent within the old Eskom Power Station which consists of ash disposal site and a reclaiming facility for all other ash material. The project will consist of two parts:

- The reclamation of clinker from Eskom's ash dump at Witbank by Clinker Supplies (Pty) Ltd
- The manufacture of clinker bricks on the same site by SA Block (Pty) Ltd

Clinker Supplies intends to erect a reclamation plant at Eskom's old power station ash dump at Witbank. The operation will be closely similar to the reclamation plants operated by Clinker Supplies at Eskom's dumps in Gauteng. The clinker will be reclaimed, layer by layer, from the top of the dump by excavator. Thereafter the clinker will be transported down the dump to the processing plant. Here it will be crushed, screened, graded and stockpiled before being sold as aggregate to Concrete Product Manufacturers, such as brick factories etc. A weighing system, comprising of one or more weighbridges will be installed at the site entrance to weigh the aggregate being sold. The aggregate will be sold to third party off-site CPM's as well as to SA Block, Clinker Supplies' sister company, namely SA Block (Pty) Ltd, who intend to commence brick manufacture operations on site at Witbank. It is anticipated that the dump will be fully reclaimed in 10 years – 15 years' time, this would however be dependent on ruling market conditions and annual consumption of the aggregate. On conclusion, all of the clinker ash will be cleared with no residue remaining, and the property can then be re-zoned for commercial purposes.

Since the proposed site is more than 5 hectares and entails the development and upgrading of a property greater than 0.5 hectares, the National Heritage Resources Act, 1999 (Act No. 25 of 1999) demands that an AIA/HIA of the development site be undertaken in terms of Section 38 (3) of the Act. Various other legislations also mandate that development such as this should be preceded by an AIA as shown below.



Figure 2: Location showing the project area (Clinker Supplies 2016).



Figure 3: Showing aerial view of project area (Clinker Supplies 2016)



Figure 4: Showing aerial view of project area and proposed recovery methodology (Source: Clinker Supplies, 2016).



Figure 5: Showing aerial view of the project area (Clinker Supplies 2016)

5. Legislative context

Two main pieces of legislations are relevant to the present study and there are presented here. Under the National Heritage Resources Act (Act 25 of 1999) (NHRA) and the National Environmental Management Act (NEMA), an AIA or HIA is required as a specialist sub-section of the EIA.

Heritage management and conservation in South Africa is governed by the NHRA and falls under the overall jurisdiction of the SAHRA and its PHRAs. There are different sections of the NHRA that are relevant to this study. The present proposed development is a listed activity in terms of Section 38 of the NHRA which stipulates that the following development categories require an HIA to be conducted by an independent heritage management consultant:

- Construction of a road, wall, power line, pipeline, canal or other linear form of development or barrier exceeding 300m in length
- Construction of bridge or similar structure exceeding 50m in length
- Development or other activity that will change the character of a site -
 - ❖ Exceeding 5000 sq m
 - ❖ Involving three or more existing erven or subdivisions
 - ❖ Involving three or more erven or divisions that have been consolidated within past five years
 - ❖ Rezoning of site exceeding 10 000 sq m
 - ❖ The costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority
- Any other development category, public open space, squares, parks, recreation grounds

Thus any person undertaking any development in the above categories, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development. Section 38 (2) (a) of the same act also requires the submission of a heritage impact assessment report for authorization purposes to the responsible heritage resources agencies (SAHRA/PHRAs). Because, the proposed landfill site development will change the character of a site exceeding 5000 sq m, then an HIA is required according to this section of act.

Related to Section 38 of the NHRA are Sections 34, 35, 36 and 37. Section 34 stipulates that no person may alter damage, destroy, relocate etc any building or structure older than 60 years, without a permit issued by SAHRA or a provincial heritage resources authority. This section may not apply to present study since none were identified. Section 35 (4) of the NHRA stipulates that no person may, without a permit issued by SAHRA, destroy, damage,

excavate, alter or remove from its original position, or collect, any archaeological material or object. This section may apply to any significant archaeological sites that may be discovered before or during construction. This means that any chance find must be reported to the heritage practitioner or SAHRA, who will assist in investigating the extent and significance of the finds and inform about further actions. Such actions may entail the removal of material after documenting the find site or mapping of larger sections before destruction. Section 36 (3) of the NHRA also stipulates that no person may, without a permit issued by the South African Heritage Resources Agency (SAHRA), destroy, damage, alter, exhume or remove from its original position or otherwise disturb any grave or burial ground older than 60 years, which is situated outside a formal cemetery administered by a local authority. This section may apply in case of the discovery of chance burials, which is unlikely. The procedure for reporting chance finds also applies to the unlikely discovery of burials or graves by the developer or his contractors. Section 37 of the NHRA deals with public monuments and memorials but this may not apply to this study because no protected monument will be physically affected by the proposed project.

In addition, the new EIA Regulations (21 April 2006) promulgated in terms of NEMA (Act 107 of 1998) determine that any environmental reports will include cultural (heritage) issues. The new regulations in terms of Chapter 5 of the NEMA provide for an assessment of development impacts on the cultural (heritage) and social environment and for Specialist Studies in this regard. The end purpose of such a report is to alert the developer (Clinker Supplies in this case), the environmental consultant (MCA), SAHRA and interested and affected parties about existing heritage resources that may be affected by the proposed development, and to recommend mitigatory measures aimed at reducing the risks of any adverse impacts on these heritage resources.

Table 1: Evaluation of the proposed development as guided by the criteria in NHRA and NEMA

ACT	Stipulation for developments	Requirement details
NHRA Section 38	Construction of road, wall, power line, pipeline, canal or other linear form of development or barrier exceeding 300m in length	No
	Construction of bridge or similar structure exceeding 50m in length	No
	Development exceeding 5000 sq m	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 sq m	Not available
	Any other development category, public open space, squares, parks, recreation grounds	No
NHRA Section 34	Impacts on buildings and structures older than 60 years	Subject to identification during Phase 1
NHRA Section 35	Impacts on archaeological and palaeontological heritage resources	Subject to identification during Phase 1
NHRA Section 36	Impacts on graves	Subject to identification during Phase 1
NHRA Section 37	Impacts on public monuments	Subject to identification during Phase 1
Chapter 5 (21/04/2006) NEMA	HIA is required as part of an EIA	Yes

6. Methodology

This document falls under the screening and basic assessment phase of the HIA and therefore aims at providing an informed heritage-related opinion about the proposed development. This is usually achieved through a combination of a review of any existing literature and a basic site inspection. As part of the desktop study, published literature and cartographic data, as well as archival data on heritage legislation, the history and archaeology of the area were studied. The desktop study was followed by field surveys. The field assessment was conducted according to generally accepted HIA practices and aimed at locating all possible objects, sites and features of cultural significance on the development footprint. Initially a drive-through was undertaken around the proposed development as a way of acquiring the archaeological impression of the general area. This was then followed by a walk down survey in the study area, with a hand held Global Positioning System (GPS) for recording the location/position of each possible site. Detailed photographic recording was also undertaken where relevant. The findings were then analysed in view of the proposed development in order to suggest further action. The result of this investigation is a report indicating the presence/absence of heritage resources and how to manage them in the context of the proposed development.

6.2 Consultation

The EIA Public Participation process will be conducted by an independent specialist in collaboration with the EAP and specialists. The EIA Public Participation Process will invite and address comments from affected communities and any registered heritage bodies on any matter related to the proposed project including heritage concerns that

may arise as a result of the project. The issues raised by the public with respect to the proposed development will also be included in the Final EIR.

7. The fieldwork survey

The fieldwork survey was undertaken in May 2016. The main focus of the survey involved a pedestrian survey which was conducted across the Project Area. The pedestrian survey focussed on parts of the project area where it seemed as if disturbances may have occurred in the past, for example bald spots in the grass veld; stands of grass which are taller than the surrounding grass veld; the presence of exotic trees; evidence for building rubble, and ecological indicators such as invader weeds.

The literature survey suggests that prior to the 20th century modern residential and on-going industrial developments; the general area where the proposed development is located would have been a rewarding region to locate heritage resources related to Stone Age and particularly Iron Age and historical sites (Bergh 1999: 4). However, the situation today is completely different. The study area now lies on a clearly modified landscape that has previously been cleared of vegetation but is now dominated by a continuous sweep of tall grass and shrubs that limit ground visibility. Several industrial and illegal dumping are also on-going on and around the development footprint (Figure 2A-L).

The following photographs illuminate the nature and character of the Project Area.



Plate 1: Photo **A**. showing Witbank ash dump site.



Plate 2: Photo **B**. showing the terminal points of the proposed haul road within the Witbank Ash dump site.



Plate 3: Photo **C**. showing some powerlines running on the edge of the Witbank ash dump site.



Plate 4: Photo **D** showing Eskom Residential and office area on the north eastern side of the Witbank Ash dumping site.



Plate 5: Photo **E**. showing some of the historical buildings which will be utilized for the proposed projects.



Plate 6: Photo **F** showing some of the functional historical buildings which will be utilized for the proposed development



Plate 7: Photo **G**, showing historical buildings within the proposed development site, the buildings are currently utilized by Eskom.



Plate 8: Photo H, showing historical buildings within the proposed development site. Note that according to the developer, the existing buildings will be utilized for various functions.



Plate 9: Photo I, showing the southern edge of the Witbank Ash dump site, note one historical building on the edge of the site.



Plate 10: Photo **J**, showing the proposed road servitude. Note the thick vegetation cover along the proposed road servitude.



Plate 11: Photo **K**, showing starting point of proposed haul road.



Plate 12: Photo **L** showing proposed haul road servitude cutting across agriculture fields.



Plate 13: Photo **M** showing agriculture fields along proposed road servitude.



Plate 14: Photo **N** showing existing farm track on the edge of agriculture field.



Plate 15: Photo **O** showing proposed road servitude along existing farm track.



Plate 16: Photo **P** showing overgrown concentration of alien vegetation along the proposed road servitude



Plate 17: Photo **Q** showing some of the tracks and 400kv powerlines cutting across the proposed project area.



Plate 18: Photo **R** showing farm tracks on the edge of agriculture field along alternative 1 haul road servitude



Plate 19: Photo **S** showing agriculture field along proposed alternative 1 haul road servitude.



Plate 20: Photo T showing 33kv powerline and agriculture field along alternative 1 haul road servitude.



Plate 21: Photo U showing shooting range on the south eastern edge of the proposed haul road alternative 1 servitude.



Plate 22: Photo **V** showing starting point for alternative 1 haul road servitude. Note high voltage powerlines, industrial structures and golf course in the vicinity of the proposed development.



Plate 23: Photo **W**. Showing powerlines cutting across the proposed road development

2.4 Archaeological Context

In order to place the project area (eMalahleni) in archaeological and historical context, primary and secondary sources were consulted. Ethnographical and linguistic studies by early researchers such as Theal and Van Warmelo provide insights on the cultural groups who lived in and around the project area since ca 1600. Historic and academic sources by Küsel and Bergh, Makhura, Delius, and Webb were also consulted. There are no museums in the eMalahleni and Middelburg towns which could be consulted, and no historical information was available at the municipalities or information centres (Van Wyk Rowe 2012). Very little contemporary research has been done on prehistoric African settlements in the study area, and according to Bergh, there are no recorded sites that date from the Stone Age, (including Rock paintings or engravings), Early or Later Iron Age. The topographical map 2529CC Witbank, shows that the project area is highly disturbed with cultivated land, plantations and mining.

2.5 Stone Age Archaeology

Stone Age sites are marked by stone artefacts that are found scattered on the surface of the earth or as parts of deposits in caves and rock shelters. The Stone Age is divided into the Early Stone Age (covers the period from 2.5 million years ago to 250 000 years ago), the Middle Stone Age (refers to the period from 250 000 years ago to 22 000 years ago) and the Late Stone Age (the period from 22 000 years ago to 200 years ago). The Later Stone Age is also associated with rock paintings and engravings which were done by the San, Khoi Khoi and in more recent times by Iron Age farmers. Heritage surveys up to now have recorded few outstanding Stone Age sites, rock paintings and engravings in the Eastern Highveld - primarily as a result of limited extensive archaeological surveys. Stone tools have been recorded around some of the pans which occur on the Eastern Highveld.

In the larger geographical area there is material manifestation of Stone Age people but generally, Highveld area did not attract much of habitation in these early times due to lack of rock-shelters and domination of exposed environments. Thus, it is mostly in the vicinity of large watercourses and lower parts of mountains that some ESA (~ 2.6 million to 250 000 years ago) materials (crude chopper and other unifacial tools of the Oldowan industry and the characteristic Acheulian hand axes and cleavers) and MSA (~ 250 000 to 40-25 000 years ago) materials are generally found. The MSA is a flake-technological stage characterized by faceted platforms, produced from prepared cores, as distinct from the core tool-based ESA technology. More technological and behavioural changes than those witnessed in the MSA, occurred during the LSA (~ 40-25 000, to recently, 100 years ago), which is also associated with Homo Sapiens (Barham and Mitchell 2008). For the first time we get evidence of people's activities derived from material other than stone tools (ostrich eggshell beads, ground bone arrowheads, small bored stones and wood fragments) (Deacon and Deacon 1999). The LSA people are also credited with the production of rock art (engravings and paintings), which is an expression of their complex social and spiritual beliefs (Parkington et al. 2008). However, it is important to note that no Stone Age materials were recorded during the field walking, perhaps

due to the presence of tall grass. Nonetheless, it is possible to encounter isolated finds of these objects in the study area, even though these would most likely be out of context due to the modern disturbances.

2.6 Iron Age Archaeology

The Iron Age of the Mpumalanga region dates back to the 5th Century AD when the Early Iron Age (EIA) proto-Bantu-speaking farming communities began arriving in this region which was then occupied by hunter-gatherers. These EIA communities are archaeologically referred to as the Mzonjani Facies of the Urewe EIA Tradition (Huffman, 2007: 127-9). They occupied the foot-hills and valley lands along the general Indian Ocean coastland introducing settled life, domesticated livestock, crop production and the use of iron (also see Maggs 1984a; 1984b; Huffman 2007). Alongside the Urewe Tradition was the Kalundu Tradition whose EIA archaeological sites have been recorded along the Mpumalanga areas. From AD 650 to 750 the EIA sites in there region are classified as the Msuluzi facies which was replaced by the Ndongondwane and Ntsekane facies from AD 750 to 950 and AD 950 to 1050 respectively (Huffman, 2007).

By 1050 AD proto-Nguni Bantu-speaking groups associated with the Late Iron Age (LIA) called the Blackburn sub-branch of the Urewe Tradition had arrived in the eastern regions of South Africa, including modern day Mpumalanga, migrating from the central African region of the Lakes Tanganyika and Victoria (Huffman 2007: 154-5). According to archaeological data available, the Blackburn facies ranged from AD 1050 to 1500 (ibid. p.155). The Mpumalanga and the Natal inland regions saw the development of the LIA Moor Park facies between AD 1350 and 1750. This archaeological facies is interpreted as representing inland migration by LIA Nguni speaking groups (Huffman 2007). Moor Park is associated with settlements marked by stonewalling. The period from AD 1300 to 1750 saw multiple Nguni dispersal from the coastland into the hinterland and eventually across the Drakensberg Escapement into central and eastern South Africa (ibid).

No Iron Age sites are indicated in a historical atlas around the town of Witbank, but this may only indicate a lack of research. The closest known Iron Age occurrences to the surveyed area are Late Iron Age sites that have been identified to the west of Bronkhorstspuit and in the vicinity of Bethal (Bergh 1999: 7-8). The good grazing and access water in the area would have provided a good environment for Iron Age people although building material seem to be reasonably scarce. One would therefore expect that Iron Age people may have utilized the area. This is the same reason why white settlers moved into this environment later on.

2.7 Historical Background

The Late Iron Age Nguni communities engaged in the Indian Ocean Trade exporting ivory and importing consumables such as cloth and glass beads. The exporting point was Delagoa. This brought the Nguni speaking community in touch with the Indo-Asian and first Europeans (Portuguese). It was the arrival of the Dutch and the English traders that opened up Delagoa Bay to more trade did the Nguni engaged in extensive trade with the

international traders (Huffman 2007). From the late 1700s, trade in supply of meat to passing ship had increased substantially to an extent that by 1800 meat trade is estimated to have surpassed ivory trade. At the same time population was booming following the increased food production that came with the introduction of maize that became the staple food. Naturally, there were signs that population groups had to compete for resources especially along the east coastal regions. The KwaZulu Natal coastal region has a special place in the history of the region and country at large. This relates to the most referenced Mfecane (wandering hordes) period of tremendous insecurity and military stress which eventually affected the entire Southern Africa including the modern day Mpumalanga area. Around the 1830s, the region also witnessed the massive movements associated with the Mfecane. The causes and consequences of the Mfecane are well documented elsewhere (e.g. Hamilton 1995; Cobbing 1988). In this context, new African kingdoms emerged such as the Zulu Kingdom under Shaka in the second quarter of the 1800s AD. Military pressure from Zululand spilled onto the Highveld by at least 1821. Various marauding groups of displaced Sotho-Tswana moved across the plateau in the 1820s. Mzilikazi raided the plateau extensively between 1825 and 1837. For example, at the beginning of the 19th century, the Phuthing, a South Sotho group, stayed to the east of eMalahleni. During the Difaquane they fled to the south from the Ndebele of Mzilikazi who established several settlement complexes in Eastern Bankveld between Pretoria and Witbank (Bergh 1999: 10-11; 109).

At the same time the Boers trekked into this area in the 1830s. And throughout this time settled communities of Tswana people also attacked each other. As a result of this troubled period, Sotho-Tswana people concentrated into large towns for defensive purposes. Their settlements were built of stone because of the lack of trees in the project area. These stone-walled villages were almost always located near cultivatable soil and a source of water. Such sites are known to occur near Kriel (e.g. Pelsler, et al 2006) and to the south (Taylor 179). However stonewalled sites associated with Sotho Tswana clans have not been reported in the Witbank area as yet.

White farmers only settled in the Witbank area after 1850 (Bergh 1999: 16). One may therefore expect to find farm buildings, structures and objects from this period in time in the area. Many graveyards from this period have indeed been identified in surrounding areas during past surveys.

2.8 Mining History

The project is located within the historical town of Witbank. Witbank came into being as the railway line between Pretoria and Lourenço Marques which was built in 1894 passed close to where Witbank is located today. Witbank was established in 1903 on a farm known as Swartbos which belonged to Jacob Taljaard (Pistorius 2006, 2008). eMalahleni, formerly known as Witbank is situated on the highveld of Mpumalanga, South Africa. The name Witbank is Afrikaans for "White Ridge" and is named after a white sandstone outcrop where wagon transport drivers rested. Witbank Colliery was established by Sameul Stanford and the Neumann group as Zeraatsfontein (Leraatsfontein) and the name Witbank was derived from a white quartz outcrop, which according to Thomas Bains, loomed like a

wagon tent in the distance”. Samuel Stanford erected the first wood and iron building consisting of a shop and hotel at the new town laid by Witbank Colliery in 1903 and became a municipality in 1914. In 2006 the town was renamed eMalahleni, the Nguni word for “the place of coal”. eMalahleni is in the coal mining area with 22 collieries in an area no more that 40km in any direction (Pistorius 2008). There are also a number of power stations as well as a steel mill, Highveld Steel and Vanadium Corporation nearby, which all require coal (Van Warmelo, *Preliminary survey of the Bantu Tribes of South Africa*, 87-108). Witbank was established in 1890 and early attempts to exploit the coal deposits failed until the railway from Pretoria reached the area in 1894 (Pistorius 2008). The establishment of the NZASM railway line in the 1880s, linking Pretoria with Lourenço Marques and the world at large, brought much infra-structural and administrative development to the area. This railway line also became the scene of many battles during the Anglo-Boer *Heritage Impact Assessment Vlakfontein Mine War* and after the battle of Bakenlaagte (30 October 1901) the Clewer station served as hospital for the wounded British soldiers. A concentration camp was established near the Balmoral station, northwest of the study area (Cloete 2000). In line with the ‘scorched earth’ policy, most farmsteads were destroyed by the British during the latter part of the hostilities. Coal mining occurred only sporadically in the area. However, with the discovery of the Witwatersrand gold fields, the need for a source of cheap energy became important, and coal mining developed on a large scale in various regions. By 1899, at least four collieries were operating in the Middelburg-Witbank district, supplying the gold mining industry (Praagh 1906). Construction of Witbank Power Station was completed in in 1927. The power station covered 10 000ha which covered Witbank no.141 and Jorbertstrus no.554. The power station was built by Victoria Falls and Transvaal Power co. Ltd (VFP) on behalf of Electricity Supply Commission (Eskom).VFP obtained the licence in 1925 under the Electricity Act of 1910 and extended the licence under the Electricity Act of 1922 which created the Electricity Control Board. The power station ceased operations in 1970. With the construction of the Wilge, Komati, Hendrina, Arnot, and Grootvlei the Witbank Power Station was used less. The last time it was mentioned in annual report was in 1963 and in 1970 all operations stopped. The buildings and structures at Witbank Power Station were still used as the headquarters for Eastern Transvaal operation. Today the buildings are still used by Eskom and its contractors (www.eskom.co.za/sites/heritage/pages/witbank.aspx). The following figures bellow show the Witbank Power Station during its operational years (see figure 6 to 9).

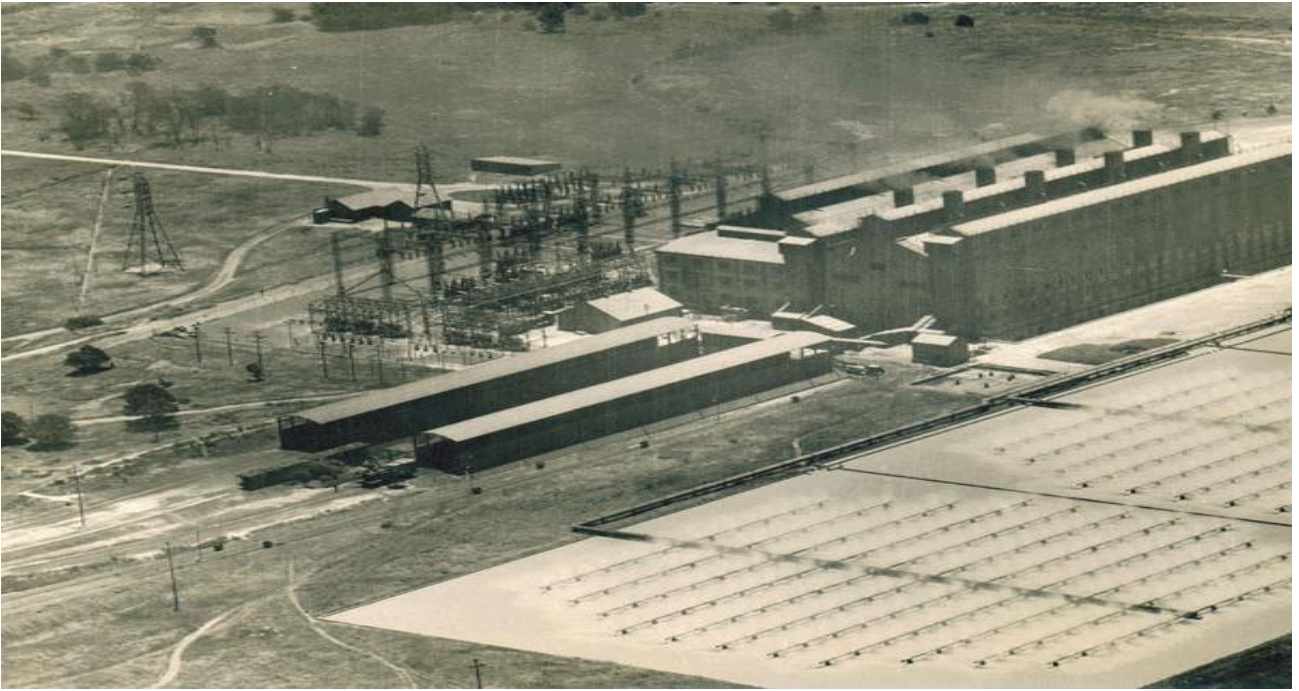


Figure 6: Showing historical aerial view of Witbank Power Station in the 1920s (www.eskom.co.za 2016).



Figure 7: Showing Witbank Power Station from 1926 to 1970 (www.eskom.co.za 2016).



Figure 8: Showing historical staff quarters for the Witbank Power Station (www.eskom.co.za 2016). Note that these staff quarters are still used by Eskom



Figure 9: Showing proposed site office (Clinker Supplies 2016).

2.9 Intangible Heritage

As defined in terms of the UNESCO Convention for the Safeguarding of the Intangible Cultural Heritage (2003) intangible heritage includes oral traditions, knowledge and practices concerning nature, traditional craftsmanship and rituals and festive events, as well as the instruments, objects, artefacts and cultural spaces associated with group(s) of people. Thus intangible heritage is better defined and understood by the particular group of people that

uphold it. In the present study area, very little intangible heritage remains because no historically known groups occupied the study area and most of the original settler descendants moved away from the area.

8. SAHRIS Data Base and Impact Assessment Reports in the project area

Several archaeological and heritage studies were conducted within eMalahleni (Witbank) and its vicinity since 2002 and these presents the nature and heritage character of the area. The HIA conducted in the area also provide some predictive evidence regarding the types and ranges of heritage resources to be expected in the proposed project area: (see reference list for HIA reports). The studies include mining, water pipeline and powerline projects completed by Pistorius (2002, 2003, 2004, 2005, 2006a, 2006b, 2007, 2008, 2009, 2010, 2011, 2013, 2014). No sites were recorded, but the reports mention that structures older than 60 years occur in the area, Pelser and Van Vollenhoven (2010, 2011, 2014, 2015) for mining and infrastructure development survey also recorded no sites. Van Schalkwyk did extensive work in the project area mostly for mining and infrastructure developments for example Van Schalkwyk, (2002, 2004, 2006, 2006, and 2010). Other than burial sites and buildings older than 60 years the studies did not record any significant archaeological sites in the Witbank area. The following table presents projects conducted in the Witbank area and its vicinity from 2002.

Table 2: Geographical co-ordinates

Name of Project	Author	Date
A survey of cultural resources in the proposed Klipspruit mining area,	Van Schalkwyk, J.A	2002a
A survey of cultural resources for the Zondagsfontein mining development, Witbank district, Mpumalanga	Van Schalkwyk, J.A	2002b
Heritage impact assessment for the Smithfield mining development, Witbank	Van Schalkwyk, J.A	2004a
Heritage impact assessment for the Weltevreden, New Largo Underground and New Largo Pit 4 mining developments, Witbank	Van Schalkwyk, J.A	2004b
Heritage impact assessment for the proposed new power station, Witbank Area	Van Schalkwyk, J.A	2006a
New Largo mining development, Witbank area,	Van Schalkwyk, J.A	200b
Landau Colliery Project Specific EMP		2006A
new power line on the farm Rietvallei 397JS	Pistorius, J.C.C.	2002
proposed 22kV Duvha Colliery power line deviation near Middelburg	Pistorius, J.C.C.	2003
EMP Amendment for Douglas Colliery in the Mpumalanga	Pistorius, J.C.C.	2004
Optimum Colliery on the farm Schoonoord 164IS in the Mpumalanga	Pistorius, J.C.C.	2004
Goedgevonden expansion project on the farms Goedgevonden 10IS, Zaaewater 11IS and	Pistorius, J.C.C.	2004

Kleinzuikerboschkraal 8IS in the eastern Transvaal highveld in the Mpumalanga		
An investigation of a historical sandstone farmstead and outbuildings on the banks of the Olifants River on the farm Kleynkopje 15IS within the boundaries of Douglas Collier	Pistorius, J.C.C.	2005
dual underground and open cast mine on the farm Middelkraal 50IS in the Mpumalanga Province	Pistorius, J.C.C.	2005
new Steelcoal Open Cast Mine in the Mpumalanga Province	Pistorius, J.C.C.	2005
new Brakfontein Open cast and underground mine on the farm Brakfontein 264IR in the Mpumalanga	Pistorius, J.C.C.	2005
Greenside Colliery Project		2006B
Petroline Liquid Fuel Storage Depot Kendal: Mpumalanga	Roodt, F.	2008
Landau colliery mining	Pelser, AJ and AC van Vollenhoven	2010
expansion of opencast coal mining operations, Landau colliery	Pelser, AJ and AC van Vollenhoven	2011
Proposed Trans Alloys development	AC van Vollenhoven	2014
Proposed Chicken Houses	AC van Vollenhoven	2015
new Emalahleni Water Reclamation Project	Pistorius, J.C.C.	2006
new Emalahleni Water Reclamation Project	Pistorius, J.C.C.	2006
deviation of a tributary of the Riet River in the Matla Colliery mining area on the Eastern Highveld in the Mpumalanga	Pistorius, J.C.C.	2007
New Calcine waste disposal facility at Vanchem	Pistorius, J.C.C.	2008
Landau Expansion Project Near Emalahleni	Pistorius, J.C.C.	2010
new Schoongezicht Coal Mine near Emalahleni (Witbank)	Pistorius, J.C.C.	2011
Landau Colliery Life Extension Project near Emalahleni (Witbank)	Pistorius, J.C.C.	2013
Landau Colliery navigation section	Pistorius, J.C.C.	2014
Landau colliery mining operations, near Witbank	Pistorius, J.C.C.	2011
Portion 22 of the farm Naauwpoort 477JS in Emalahleni	Pistorius, J.C.C.	2006
Proposed Doornpoort to Rockdale 132kv powerline	Van Wyk Rowe	2012

In addition, the Project Area was also studied by means of maps on which it appears (Witbank) 2529CC, 1: 50 000 topographical map; 2528 Pretoria, 1: 250 000 map.

Table 3: Geographical co-ordinates

Site	Coordinates	Brief Description	Comment relating to proposed development and Mitigation Measures
Alt 1 End	29°12'36.859"E 25°53'18.443"S	Open space	No heritage significant
Alt 1 Middle	29°12'34.293"E 25°53'23.816"S	Open field.	No heritage significant
Proposed End	29°12'43.275"E 25°53'40.578"S	Open field	No heritage significant
Proposed Middle and Alt 1 Start	29°12'31.405"E 25°53'29.35"S	Open filed	No heritage significance
Proposed Start	29°12'22.583"E 25°53'16.438"S	Open field	No heritage significance
Witbank Ash Dump site(Figure 3,4,5 &6 Photos E, F,G,H,I,.)	29°12'56.428"E 25°53'40.819"S	Ash dump	No heritage significance
Historical buildings A (Figure 3, 4, 5 &6 Photos E, F, G, H, I,.)	29°12'47.25"E 25°53'49.04"S	A cluster of buildings older than 60 years. The buildings are still in use and will be utilized for the proposed development	Low to medium significance must be preserved in situ. Any alteration must be approved by Mpumalanga Provincial Heritage Resources Agency
Historical buildings B (Figure 3, 4, 5 &6. Photos E, F,G,H,I,))	29°12'49.91"E 25°53'50.66"S	A cluster of buildings older than 60 years. The buildings are still in use and will be utilized for the proposed development	Low to medium significance must be preserved in situ. Any alteration must be approved by Mpumalanga Provincial Heritage Resources Agency
Historical buildings C (Figure 3,4,5 &6)	29°12'52.54"E 25°53'49.65"S	A cluster of buildings older than 60 years. The buildings are still in use and will be utilized for the proposed development	Low to medium significance must be preserved preserve in situ. Any alteration must be approved by Mpumalanga Provincial Heritage Resources Agency
Historical buildings D (Figure 3,4,5 &6 Photos E, F,G,H,I,))	29°12'55.73"E 25°53'50.46"S	A cluster of buildings older than 60 years. The buildings are still in use and will be utilized for the proposed development	Low to medium significance must be preserved in situ. Any alteration must be approved by Mpumalanga Provincial Heritage Resources Agency
Historical buildings E (Figures 3, 4, 5 &6. Photos E, F, G, H, I,.)	29°12'54.77"E 25°53'47.54"S	A cluster of buildings older than 60 years. The buildings are still in use and will be utilized for the proposed development	Low to medium significance must be preserved in situ. Any alteration must be approved by Mpumalanga Provincial Heritage Resources Agency

Site	Coordinates	Brief Description	Comment relating to proposed development and Mitigation Measures
Historical buildings F (Figure 3, 4, 5 & 6. Photos E, F,G,H,I)	29°12'45.01"E 25°53'49.10"S	A cluster of buildings older than 60 years. The buildings are still in use and will be utilized for the proposed development	Low to medium significance must be preserved in situ. Any alteration must be approved by Mpumalanga Provincial Heritage Resources Agency

9. THE ASH DUMP SITE

9.1 Archaeological and Heritage Site

The ash dump site did not yield any verifiable archaeological sites or material. The affected landscape is heavily degraded from previous and current land use such as ash dumping, industrial infrastructure and from residential property developments. This limited the chances of encountering significant *in situ* archaeological sites to be preserved *in situ*. The proposed ash dump reclamation covers more than 5ha. The proposed development is located within a heavily disturbed landscape. The project area is characterised by residential, industrial infrastructures, commercial agricultural fields, grazing land; railway lines, bulk water pipelines, powerlines, roads and other associated infrastructures across the entire project area. As such the proposed ash reclaiming and associated activities will be an additional development on the project area (Figure 2, also see Plates 1 to 20). It is the considered opinion of the author that the chances of recovering significant archaeological materials were seriously compromised and limited due to infrastructural developments and other destructive land use patterns such as deep ploughing, mining, bulk water pipeline, road works and residential areas that already exist on the project area.

Based on the field study results and field observations, the author concluded that the receiving environment for the proposed development is low to medium potential to yield previously unidentified archaeological sites during subsurface excavations and construction work associated with the proposed development. This observation is supported by the fact that no Iron Age sites are indicated in a historical atlas around the town of Witbank; however, this may be an indication of a lack of research. The closest known Iron Age occurrences to the surveyed area are Late Iron Age sites that have been identified to the west of Bronkhorstspuit, Middleburg town and townlands (Archaetnos) and in the vicinity of Bethal (Bergh 1999: 7-8). Literature review also revealed that no Stone Age sites are shown on a map contained in a historical atlas of this area (Bergh 1999: 4). The closest known Stone Age occurrence to the surveyed area is that of rock art close to the Olifants River to the south of Witbank (Bergh 1999: 5). This however should rather be seen as a lack of research in the area and not as an indication that such features does not occur.

9.2 Burial grounds and graves

The field survey did not record any burial site in the vicinity of the ash dump site. It should however be noted that burial grounds and gravesites are accorded the highest social significance threshold (see Appendix 3). They have both historical and social significance and are considered sacred. Wherever they exist or not, they may not be tempered with or interfered with during any proposed development. It is important to note that the possibility of encountering human remains during subsurface earth moving works anywhere on the landscape is ever present. Although the possibility of encountering previously unidentified burial sites is low at the dump site, should such sites be identified during subsurface construction work, they are still protected by applicable legislations and they should be protected.

9.3 Historical Monuments

There are several buildings and structures older than 60 years, which are on record in the project area (see Plate 2-9 and figure 3). The recorded historical buildings are still used by Eskom within the project area. Clinker Supplies, the developer indicated that they intend to preserve the structures *in situ* and use them for their various functions.

9.4 PROPOSED HAUL ROAD SERVITUDE

Archaeological and Heritage Site

A large section of the proposed haul road route mostly cuts across agriculture field and heavily disturbed area to the west of the Witbank ash dump site. The proposed haul road route did not yield any confirmable archaeological sites or material. Similarly the affected landscaped is heavily degraded from previous and current agricultural land use, mining and from infrastructure developments. Given the situation, the chances of encountering significant in situ archaeological sites are limited. The proposed road servitude traverses an approximate length of 0.909km from T-off to the terminal position at the ash dump site. There are residential, mining infrastructures, commercial agricultural fields, grazing land; railway lines bulk water pipelines and powerlines, roads and other associated infrastructures across the entire project area. As such the proposed road construction will be an additional development on the project area (Figure 1 and Plate 10- 19). It is assumed that the chances of recovering significant archaeological materials were seriously compromised and limited due to infrastructural developments and other destructive land use patterns such as deep ploughing, road works and residential areas that already exist on the project area. The study concluded that the proposed haul road route would cause minimum damage to archaeological remains.

9.5 Burial Sites

No burial sites were recorded along the proposed haul road route.

9.6 Historical Monuments

There are no sites along the proposed road servitude that are on the National Heritage List. However it should be noted that there are several historical building in the general Witbank area. The proposed road servitude will not impact on any historical sites because most of them are located in Witbank town.

9.7 THE PROPOSED HAUL ROAD ALTERNATIVE 1

Archaeological and Heritage Site

A large section of the alternative route 1 also cut across agriculture field and heavily disturbed area adjacent to the ash dump site. The proposed haul road alternative 1 route did not yield any verifiable archaeological sites or material. Similarly the affected landscaped is heavily degraded from previous and current agricultural land use, mining and from infrastructure developments. Given the situation, the chances of encountering significant in situ archaeological sites are limited. The proposed road servitude traverses an approximate length of 1,063km from T-off to the terminal position at the ash dump site. The proposed haul road alternative 1 route runs through heavily disturbed landscape. Similarly there are residential, mining infrastructures, commercial agricultural fields, grazing land; railway lines bulk water pipelines and powerlines, roads and other associated infrastructures across the entire project area. As such the proposed road construction will be an additional development on the project area (Figure

2, also see Plates 19-24). It is assumed that the chances of recovering significant archaeological materials were seriously compromised and limited due to infrastructural developments and other destructive land use patterns such as deep ploughing, road works and residential areas that already exist on the project area. The study concluded that the proposed haul road alternative 1 route would also cause minimum damage to archaeological remains.

9.8 Burial Sites

No burial sites were recorded along the proposed haul road alternative 1 route.

9.9 Historical Monuments

No historical buildings were recorded along the proposed road servitude. The Alternative 1 road servitude will not impact on any historical monuments and structures in Witbank town.

9.1.1.Cumulative Impacts

Although the project area is heavily degraded by agriculture, mining and other infrastructure developments, the proposed development will contribute to the cumulative impacts of the existing developments. The following table presents summary of findings and comparison for the two haul road alternative.

Table 4: Summary of findings

Heritage resource	Status/Findings
Buildings, structures, places and equipment of cultural significance	None exists with the development footprint
Areas to which oral traditions are attached or which are associated with intangible heritage	None exists
Historical settlements and townscapes	None survives in the proposed area
Landscapes and natural features of cultural significance	None
Archaeological and palaeontological sites	None
Graves and burial grounds	None exists or are identifiable on the basis of a surface survey
Movable objects	None
Overall comment	The surveyed area has no identifiable heritage resources on the surface but sub-surface chance finds are still possible.

Table 5: Summary of finding

	Archaeological sites	Burial sites	Structures of historical significance	Historic Monuments	Paleontological	Landscapes and natural features of cultural significance
Alternative						
Proposed	0	0	0	0	0	0
Alternative 1	0	0	0	0	0	0

10. Assessment Criteria

The Guidelines to the SAHRA Guidelines and the Burra Charter define the following criterion for the assessment of cultural significance:

Aesthetic Value

Aesthetic value includes aspects of sensory perception for which criteria can and should be stated. Such criteria may include consideration of the form, scale, colour, texture and material of the fabric; sense of place, the smells and sounds associated with the place and its use.

Historic Value

Historic value encompasses the history of aesthetics, science and society, and therefore to a large extent underlies all of the terms set out in this section. A place may have historic value because it has influenced, or has been influenced by, an historic figure, event, phase or activity. It may also have historic value as the site of an important event. For any given place the significance will be greater where evidence of the association or event survives in situ, or where the settings are substantially intact, than where it has been changed or evidence does not survive. However, some events or associations may be so important that the place retains significance regardless of subsequent treatment.

Scientific value

The scientific or research value of a place will depend upon the importance of the data involved, on its rarity, quality or representativeness, and on the degree to which the place may contribute further substantial information. Scientific value is also enshrined in natural resources that have significant social value. For example, pockets of forests and bushvelds have high ethnobotany value.

Social Value

Social value embraces the qualities for which a place has become a focus of spiritual, religious, political, local, national or other cultural sentiment to a majority or minority group. Social value also extend to natural resources such as bushes, trees and herbs that are collected and harvested from nature for herbal and medicinal purposes.

11. Recommendations

1. The developer must adhere to Section 34 of the NHRA which stipulates that no person may **alter damage, destroy, relocate any building or structure older than 60 years, without a permit issued by SAHRA or a provincial heritage resources authority. As such** the recorded buildings older than 60 years must be preserved *in situ* and should not be altered without approval from Mpumalanga Provincial Heritage Resources Agency.
2. Based on the results of the study, there is no alternative haul road route that has a bigger advantage over the other. However the proposed haul road is preferred because of its shorter length.
3. From a heritage perspective supported by the findings of this study, the proposed ash reclamation and associated developments are feasible. However, the proposed development should be approved to proceed as planned under observation that the development dimensions do not extend beyond the proposed sites. The foot print impact of the proposed development and associated infrastructure should be kept to minimal to limit the possibility of encountering chance finds.
4. Should any unmarked burials are exposed during construction affected families must be trekked and consulted, relevant rescue/ relocation permits must be obtained from SAHRA before any grave relocation can take place. Furthermore a professional archaeologist must be retained to oversee the relocation process in accordance with the National Heritage Resources Act 25 of 1999.
5. Should chance archaeological materials or human burials remains be exposed during subsurface construction work on any section of the proposed development laydown sites, work should cease on the affected area and the discovery must be reported to the heritage authorities immediately so that an investigation and evaluation of the finds can be made. The overriding objective, where remedial action is warranted, is to minimize disruption in construction scheduling while recovering archaeological and any affected cultural heritage data as stipulated by the PHRA and NHRA regulations.
6. Subject to the recommendations herein made and the implementation of the mitigation measures and adoption of the project EMP, other than buildings older than 60 years, there are no other significant cultural heritage resources barriers to the proposed development. The Heritage authority may approve the proposed development to proceed as planned with special commendations to implement the recommendations here in made

12. Chance finds procedures

It has already been highlighted that sub-surface materials may still be lying hidden from surface surveys. Therefore, absence (during surface survey) is not evidence of absence all together. The following monitoring and reporting procedures must be followed in the event of a chance find, in order to ensure compliance with heritage laws and policies for best-practice. This procedure applies to the developer's permanent employees, its subsidiaries, contractors and subcontractors, and service providers. Accordingly, all construction crews must be properly inducted to ensure they are fully aware of the procedures regarding chance finds.

- ❖ If during the construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance, work must cease at the site of the find and this person must report this find to their immediate supervisor, and through their supervisor to the senior on-site manager.
- ❖ The senior site Manager must then make an initial assessment of the extent of the find, and confirm the extent of the work stoppage in that area before informing MSEI.
- ❖ Witbank Clinker Supplies will then contact a professional archaeologist for an assessment of the finds who will in turn inform SAHRA/PHRA.

13. Conclusion

MSEI was appointed by Witbank Clinker Supplies to carry out HIA for the proposed ash reclamation and associated developments, as required by heritage legislation. The proposed development lies on disturbed ground that is within a highly industrialized zone. In spite of the rich history and archaeology of the general area prior to several industrial and residential developments after the mid-20th century, field surveys on and around the proposed area did not yield any archaeological material. The potential for chance finds, still remains and the developer and his contractors are advised to be diligent and observant during construction of the land site. The procedure for reporting chance finds has clearly been laid out and if this report is adopted by SAHRA, then there are no archaeological reasons why construction cannot proceed.

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15. APPENDIX 1: HERITAGE MANAGEMENT PLAN INPUT INTO THE WITBANK ASH DUMP RECLAMATION PROJECT EMP

Objective								
<ul style="list-style-type: none"> Protection of archaeological sites and land considered to be of cultural value; Protection of known physical cultural property sites against vandalism, destruction and theft; and The preservation and appropriate management of new archaeological finds should these be discovered during construction. 								
No.	Activity	Mitigation Measures	Duration	Frequency	Responsibility	Accountable	Contacted	Informed
Pre-Construction Phase								
1	Planning	Ensure all known sites of cultural, archaeological, and historical significance are demarcated on the site layout plan, and marked as no-go areas.	Throughout Project	Weekly Inspection	Contractor [C] CECO	SM	ECO	EA EM PM
Construction Phase								
1	Emergency Response	Should any archaeological or physical cultural property heritage resources be exposed during excavation for the purpose of construction, construction in the vicinity of the finding must be stopped until heritage authority has cleared the development to continue.	N/A	Throughout	C CECO	SM	ECO	EA EM PM
		Should any archaeological, cultural property heritage resources be exposed during excavation or be found on development site, a registered heritage specialist or PHRA official must be called to site for inspection.		Throughout	C CECO	SM	ECO	EA EM PM
		Under no circumstances may any archaeological, historical or any physical cultural property heritage material be destroyed or removed from site;		Throughout	C CECO	SM	ECO	EA EM PM
		Should remains and/or artefacts be discovered on the development site during earthworks, all work will cease in the area affected and the Contractor will immediately inform the Construction Manager who in turn will inform PHRA.		When necessary	C CECO	SM	ECO	EA EM PM
		Should any remains be found on site that is potentially human remains, the PHRA-G and South African Police Service should be contacted.		When necessary	C CECO	SM	ECO	EA EM PM
Rehabilitation Phase								
		Same as construction phase.						
Operational Phase								
		Same as construction phase.						

16. Appendix 2: heritage mitigation measure table

SITE REF	HERITAGE ASPECT	POTENTIAL IMPACT	MITIGATION MEASURES	RESPONSIBLE PARTY	PENALTY	METHOD STATEMENT REQUIRED
Chance Archaeological and Burial Sites	General area where the proposed project is situated is a historic landscape, which may yield archaeological, cultural property, remains. There are possibilities of encountering unknown archaeological sites during subsurface construction work which may disturb previously unidentified chance finds.	<p>Possible damage to previously unidentified archaeological and burial sites during construction phase.</p> <ul style="list-style-type: none"> • Unanticipated impacts on archaeological sites where project actions inadvertently uncovered significant archaeological sites. • Loss of historic cultural landscape; • Destruction of burial sites and associated graves • Loss of aesthetic value due to construction work • Loss of sense of place <p>Loss of intangible heritage value due to change in land use</p>	<p>In situations where unpredicted impacts occur construction activities must be stopped and the heritage authority should be notified immediately.</p> <p>Where remedial action is warranted, minimize disruption in construction scheduling while recovering archaeological data. Where necessary, implement emergency measures to mitigate.</p> <ul style="list-style-type: none"> • Where burial sites are accidentally disturbed during construction, the affected area should be demarcated as no-go zone by use of fencing during construction, and access thereto by the construction team must be denied. • Accidentally discovered burials in development context should be salvaged and rescued to safe sites as may be directed by relevant heritage authority. The heritage officer responsible should secure relevant heritage and health authorities permits for possible relocation of affected graves accidentally encountered during construction work. 	<ul style="list-style-type: none"> • Contractor / • Project Manager • Archaeologist • Project EO 	<p>Fine and or imprisonment under the PHRA-G Act & NHRA</p>	<p>Monitoring measures should be issued as instruction within the project EMP.</p> <p>PM/EO/Archaeologists Monitor construction work on sites where such development projects commences within the farm.</p>

16 APPENDIX 3: LEGAL PRINCIPLES OF HERITAGE RESOURCES MANAGEMENT IN SOUTH AFRICA

Extracts relevant to this report from the National Heritage Resources Act No. 25 of 1999, (Sections 5, 36 and 47):

General principles for heritage resources management

5. (1) All authorities, bodies and persons performing functions and exercising powers in terms of this Act for the management of heritage resources must recognise the following principles:

(a) Heritage resources have lasting value in their own right and provide evidence of the origins of South African society and as they are valuable, finite, non-renewable and irreplaceable they must be carefully managed to ensure their survival;

(b) every generation has a moral responsibility to act as trustee of the national heritage for succeeding generations and the State has an obligation to manage heritage resources in the interests of all South Africans;

(c) heritage resources have the capacity to promote reconciliation, understanding and respect, and contribute to the development of a unifying South African identity; and

(d) heritage resources management must guard against the use of heritage for sectarian purposes or political gain.

(2) To ensure that heritage resources are effectively managed—

(a) the skills and capacities of persons and communities involved in heritage resources management must be developed; and

(b) provision must be made for the ongoing education and training of existing and new heritage resources management workers.

(3) Laws, procedures and administrative practices must—

(a) be clear and generally available to those affected thereby;

(b) in addition to serving as regulatory measures, also provide guidance and information to those affected thereby; and

(c) give further content to the fundamental rights set out in the Constitution.

(4) Heritage resources form an important part of the history and beliefs of communities and must be managed in a way that acknowledges the right of affected communities to be consulted and to participate in their management.

(5) Heritage resources contribute significantly to research, education and tourism and they must be developed and presented for these purposes in a way that ensures dignity and respect for cultural values.

(6) Policy, administrative practice and legislation must promote the integration of heritage resources conservation in urban and rural planning and social and economic development.

(7) The identification, assessment and management of the heritage resources of South Africa must—

(a) take account of all relevant cultural values and indigenous knowledge systems;

(b) take account of material or cultural heritage value and involve the least possible alteration or loss of it;

(c) promote the use and enjoyment of and access to heritage resources, in a way consistent with their cultural significance and conservation needs;

- (d) contribute to social and economic development;
- (e) safeguard the options of present and future generations; and
- (f) be fully researched, documented and recorded.

Burial grounds and graves

36. (1) Where it is not the responsibility of any other authority, SAHRA must conserve and generally care for burial grounds and graves protected in terms of this section, and it may make such arrangements for their conservation as it sees fit.

(2) SAHRA must identify and record the graves of victims of conflict and any other graves which it deems to be of cultural significance and may erect memorials associated with the grave referred to in subsection (1), and must maintain such memorials.

(3) (a) No person may, without a permit issued by SAHRA or a provincial heritage resources authority—

(a) destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves;

(b) destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or

(c) bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) any excavation equipment, or any equipment which assists in the detection or recovery of metals.

(4) SAHRA or a provincial heritage resources authority may not issue a permit for the destruction or damage of any burial ground or grave referred to in subsection (3)(a) unless it is satisfied that the applicant has made satisfactory arrangements for the exhumation and re-interment of the contents of such graves, at the cost of the applicant and in accordance with any regulations made by the responsible heritage resources authority.

(5) SAHRA or a provincial heritage resources authority may not issue a permit for any activity under subsection (3)(b) unless it is satisfied that the applicant has, in accordance with regulations made by the responsible heritage resources authority—

(a) made a concerted effort to contact and consult communities and individuals who by tradition have an interest in such grave or burial ground; and

(b) reached agreements with such communities and individuals regarding the future of such grave or burial ground.

(6) Subject to the provision of any other law, any person who in the course of development or any other activity discovers the location of a grave, the existence of which was previously unknown, must immediately cease such activity and report the discovery to the responsible heritage resources authority which must, in co-operation with the South African Police Service and in accordance with regulations of the responsible heritage resources authority—

(a) carry out an investigation for the purpose of obtaining information on whether or not such grave is protected in

terms of this Act or is of significance to any community; and

(b) if such grave is protected or is of significance, assist any person who or community which is a direct descendant to make arrangements for the exhumation and re-interment of the contents of such grave or, in the absence of such person or community, make any such arrangements as it deems fit.

(7) (a) SAHRA must, over a period of five years from the commencement of this Act, submit to the Minister for his or her approval lists of graves and burial grounds of persons connected with the liberation struggle and who died in exile or as a result of the action of State security forces or agents provocateur and which, after a process of public consultation, it believes should be included among those protected under this section.

(b) The Minister must publish such lists as he or she approves in the Gazette.

(8) Subject to section 56(2), SAHRA has the power, with respect to the graves of victims of conflict outside the Republic, to perform any function of a provincial heritage resources authority in terms of this section.

(9) SAHRA must assist other State Departments in identifying graves in a foreign country of victims of conflict connected with the liberation struggle and, following negotiations with the next of kin, or relevant authorities, it may re-inter the remains of that person in a prominent place in the capital of the Republic.

General policy

47. (1) SAHRA and a provincial heritage resources authority—

(a) must, within three years after the commencement of this Act, adopt statements of general policy for the management of all heritage resources owned or controlled by it or vested in it; and

(b) may from time to time amend such statements so that they are adapted to changing circumstances or in accordance with increased knowledge; and

(c) must review any such statement within 10 years after its adoption.

(2) Each heritage resources authority must adopt for any place which is protected in terms of this Act and is owned or controlled by it or vested in it, a plan for the management of such place in accordance with the best environmental, heritage conservation, scientific and educational principles that can reasonably be applied taking into account the location, size and nature of the place and the resources of the authority concerned, and may from time to time review any such plan.

(3) A conservation management plan may at the discretion of the heritage resources authority concerned and for a period not exceeding 10 years, be operated either solely by the heritage resources authority or in conjunction with an environmental or tourism authority or under contractual arrangements, on such terms and conditions as the heritage resources authority may determine.

(4) Regulations by the heritage resources authority concerned must provide for a process whereby, prior to the adoption or amendment of any statement of general policy or any conservation management plan, the public and interested organisations are notified of the availability of a draft statement or plan for inspection, and comment is invited and considered by the heritage resources authority concerned.

(5) A heritage resources authority may not act in any manner inconsistent with any statement of general policy or conservation management plan.

(6) All current statements of general policy and conservation management plans adopted by a heritage resources authority must be available for public inspection on request.

