

Heritage Impact Assessment

APPLICATION FOR MINING PERMITS FOR THE ARUP TRANSNET NMPP ALLIANCE BORROW-PITS, GAUTENG

Prepared For

EIMS Environmental Impact Services

By



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TRANSNET BORROW PITS - AIA

KNOWLEDGEMENT OF RECEIPT

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Executive summary

Site name and location: Mining permits for the ARUP Transnet NMPP Alliance Borrow Pits.

Provincial district: Gauteng. One Borrow Pit is located close to the town of Bronkhorstspuit and two more borrow pits is located close to Vosloorus.

Developer: Transnet

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Date of field work: 22 May – 23 May 2008

Date of Report: 02 June 2008

Findings of the Assessment: No sites of heritage significance were found at the proposed locations of the borrow pits. A search on the archaeological Wits data base also yielded no known sites around the study areas. From a Heritage point of view there is no reason why the mining for fill material can not commence at these locations.

How ever, low ground visibility is present on portions of the study area due to exceptional high vegetation growth and the possibility of the occurrence of unmarked graves and subsurface finds can not be excluded. If during construction any possible finds are made, the operations must be stopped and a qualified archaeologist be contacted for an assessment of the find.

Disclaimer: *Although all possible care is taken to identify all sites of cultural importance during the investigation of study areas, it is always possible that hidden or sub-surface sites could be overlooked during the study. Wits Heritage Contracts Unit and its personnel will not be held liable for such oversights or for costs incurred as a result of such oversights.*

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- The results of the project;
- The technology described in any report
- Recommendations delivered to the Client.

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.1. INTRODUCTION

Wits Heritage Contracts Unit was contracted by EIMS to conduct an Archaeological Impact Assessment for the proposed mining of fill material for the proposed Transnet pipeline. Four borrow pit locations have been identified (refer locality map). One borrow pit is located in the Bronkhorstspuit area, Gauteng **BP_KDL_WAO_01**. The remaining three borrow pits **BP_JMP_ALR_01**, **BP_JMP_ALR_02** and **BP_JMP_ALR_03** is located in the Vosloorus/Heidelberg area, Gauteng. The report forms part of the EIA for the proposed project.

The aim of the study is to identify all heritage sites, document, and assess their importance within Local, Provincial and national context. To assess the impact of the proposed project on non renewable heritage resources and to submit appropriate recommendations with regard to the responsible cultural resources management measures that might be required to assist the developer in managing the discovered heritage resources in a responsible manner, in order to protect, preserve, and develop them within the framework provided by the National Heritage Resources Act of 1999 (Act 25 of 1999).

The report outlines the approach and methodology utilized before and during the survey, which includes in Phase 1: Information collection from various sources and consultations; Phase 2: Physical surveying of the area on foot and by vehicle; and Phase 3: Reporting the outcome of the study.

During the survey, no cultural heritage sites of significance were identified. General site conditions and features on sites were recorded by means of photos, GPS location, and description. Possible impacts were identified and mitigation measures are proposed in the following report.

This report must also be submitted to SAHRA provincial office for peer review.

1.2 TERMS OF REFERENCE

Conduct brief desktop study to:

Review available literature, previous heritage studies and other relevant information sources. Gather data and compile a background history of the area. Identify all 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.

Conduct a field study to:

Consult with locals to gather information on oral history, local history, possible informal graves, cemeteries, and other areas of cultural significance. Systematically survey the proposed project area to locate, identify record, photograph and describe sites of archaeological, historical or cultural interest; and record GPS points of significant areas identified. Determine the levels of significance of the various types of heritage resources recorded in the project area;

Reporting

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 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 requirements of the local South African Heritage Resources Agency (SAHRA) are met; and ensure that all studies and results are sufficient to comply with ALL the relevant requirements of the Equator Principles, World Bank Standards and IFC Principles and Performance Standards and National legislation. 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 the National Heritage Resources Act of 1999 (Act 25 of 1999).

1.3 Nature of the development

Arup Transnet NMPP Alliance wishes to apply for a mining permit to undertake the necessary mining for fill material. Fill material will be utilized during the anticipated construction of the NMPP pipeline. The borrow-pit footprint consists of an area less than 1.5 hectares.

1.4 Description of study area

Refer to main EIA report for geographical, environmental and demographic issues. The proposed locations of the borrow pits varies between existing borrow pits that will be extended or areas impacted on by agricultural activities.

2. APPROACH AND METHODOLOGY

The aim of the study is to extensively cover all data available to compile a background history of the study area; this was accomplished by means of the following phases.

2.1 PHYSICAL SURVEYING

Due to the nature of cultural remains, the majority that occurs below surface, a physical walk through of the study area was conducted. Wits Heritage Contract Unit was appointed to conduct a survey of the proposed locations of four borrow pits. The impact area of approximately 1ha on each borrow pit was surveyed over a period of two days, by means of vehicle and extensive surveys on foot.

Aerial photographs and 1:50 000 maps of the area were consulted and literature of the area were studied before undertaking the survey. The purpose of this was to identify topographical areas of possible historic and pre-historic activity. All sites discovered both

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inside and bordering the proposed development area was plotted on 1:50 000 maps and their GPS co-ordinates noted. 35mm photographs on digital film were taken at all the sites.

2.2 Consultation

Due to the locations of the proposed borrow pits no locals reside in close proximity to these areas. During the field work phase of the project no inhabitants was noted in the study area and there fore no consultation was conducted.

3. Abbreviations and definitions

3.1 Abbreviations

<i>ASAPA</i> : Association of South African Professional Archaeologists	<i>BPEO</i> : Best Practicable Environmental Option
<i>CRM</i> : Cultural Resource Management	<i>DEA&DP</i> : Department of Environmental Affairs and Development Planning
<i>DEAT</i> : Department of Environmental Affairs and Tourism	<i>DWAF</i> : Department of Water Affairs and Forestry
<i>EIA practitioner</i> : Environmental Impact Assessment Practitioner	<i>EIA</i> : Environmental Impact Assessment
<i>EIA</i> : Early Iron Age	<i>ESA</i> : Early Stone Age
<i>GPS</i> : Global Positioning System	<i>HIA</i> : Heritage Impact Assessment
<i>I&AP</i> : Interested & Affected Party	<i>IDP</i> : Integrated Development Plan
<i>LSA</i> : Late Stone Age	<i>LIA</i> : Late Iron Age
<i>MSA</i> : Middle Stone Age	<i>MIA</i> : Middle Iron Age
<i>NEMA</i> : National Environmental Management Act	<i>NHR Act</i> : National Heritage Resources Act
<i>PHRA</i> : Provincial Heritage Resources Agency	<i>PSSA</i> : Palaeontological Society of South Africa
<i>ROD</i> : Record of Decision	<i>SACLAP</i> : South African Council for the Landscape Architect Profession
<i>SAHRA</i> : South African Heritage Resources Agency	<i>SAIA</i> : South African Institute of Architects
<i>SAPI</i> : South African Planning Institute	<i>SDF</i> : Spatial Development Framework

3.2 Definitions

Archaeological resources:

This includes material remains resulting from human activity which are in a state of disuse and are in or on land and which are older than 100 years including artefacts, human and hominid remains and artificial features and structures;

Rock art:

Being any form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and which is older than 100 years, including any area within 10m of such representation;

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Wrecks:

Being any vessel or aircraft, or any part thereof which was wrecked in South Africa, whether on land, in the internal waters, the territorial waters or in the maritime culture zone of the republic as defined in the Maritimes Zones Act, and any cargo, debris or artefacts found or associated therewith, which is older than 60 years or which SAHRA considers to be worthy of conservation;

Military:

Features, structures and artifacts associated with military history which are older than 75 years and the site on which they are found.

Cultural significance:

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

Development:

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

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

Heritage resources:

This means any place or object of cultural significance

Stakeholders:

A subgroup of the public whose interests may be positively or negatively affected by a proposal or activity and/or who are concerned with a proposal or activity and its consequences. The term includes the proponent, authorities and all interested and affected parties. (Fransen 2004).

4. ARCHAEOLOGICAL LEGISLATION AND BEST PRACTICE

Phase 1 Archaeological Impact Assessments or Heritage Impact Assessments are a pre-requisite for development in South Africa as prescribed by SAHRA and stipulated by legislation. The overall purpose of a heritage specialist input is to:

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

The AIA or HIA, as a specialist sub-section of the Environmental Impact Assessment [EIA] is required under the National Heritage Resources Act NHRA of 1999 (Act 25 of 1999), Section 38(1), Section 38(8) the National Environmental Management Act (NEMA) and the Mineral and Petroleum Resources Development Act (MPRDA).

The AIA should be submitted, as part of the EIA, BIA or Environmental Management Plan [EMP], to the PHRA if established in the province or to SAHRA. SAHRA will be ultimately responsible for the professional evaluation of Phase 1 AIA reports upon which review comments will be issued. 'Best practice' requires Phase 1 AIA reports and required additional development information, as per the EIA, BIA / EMP, to be submitted in duplicate to SAHRA after completion of the study. SAHRA accepts Phase 1 AIA reports authored by professional archaeologists, accredited with ASAPA. Minimum accreditation requirements

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include an Honours degree in archaeology or related discipline and 3 years post-university CRM experience (field supervisor level).

Minimum standards for reports, site documentation and descriptions are set by the Association of Southern African Professional Archaeologists [ASAPA] in collaboration with SAHRA. ASAPA is a legal body, based in South Africa, representing professional archaeology in the Southern African Development Community [SADC] region. ASAPA is primarily involved in the overseeing of archaeological ethical practice and standards. Membership is based on proposal and secondment by other professional members.

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

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

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

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

After mitigation is conducted on a site, a destruction permit must be applied for from SAHRA before development may proceed.

Human remains older than 60 years are protected by the National Heritage Resources Act, with reference to Section 36. Graves older than 60 years, but younger than 100 years fall under Section 36 of Act 25 of 1999 (National Heritage Resources Act) as well as the Human Tissues Act (Act 65 of 1983) and are the jurisdiction of the South African Heritage Resource Agency (SAHRA). The procedure for Consultation Regarding Burial Grounds and Graves (Section 36(5) of Act 25 of 1999) is applicable to graves older than 60 years that are situated outside a formal cemetery administrated by a local authority. Graves in the category located inside a formal cemetery administrated by a local authority will also require the same authorisation as set out for graves younger than 60 years over and above SAHRA

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authorisation. If the grave is not situated inside a formal cemetery but is to be relocated to one, permission from the local authority is required and all regulations, laws and by-laws set by the cemetery authority must be adhered to.

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

.5. ASSESSMENT CRITERIA

5.1 Evaluation of Heritage sites

This chapter describes the evaluation criteria used for determining the significance of archaeological and heritage sites. The following criteria were used to establish site significance:

- The unique nature of a site
- The integrity of the archaeological 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
- Uniqueness of the site and
- potential to answer present research questions.

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5.1.1 Heritage Site Significance and Mitigation Measures

Site significance classification standards prescribed by the South African Heritage Resources Agency (2006) and approved by the Association for Southern African Professional Archaeologists (ASAPA) for the Southern African Development Community (SADC) region, were used for the purpose of this report.

<i>FIELD RATING</i>	<i>GRADE</i>	<i>SIGNIFICANCE</i>	<i>RECOMMENDED MITIGATION</i>
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

5.1 IMPACT

The assessment of impacts will largely be based on DEAT's (1998) Guideline Document: EIA Regulations. The assessment will consider impacts arising from the construction and operation phases of the proposed project both before and after the implementation of appropriate mitigation measures.

It is proposed that the impacts will be assessed according to the criteria outlined below. Each issue is ranked according to extent, duration, magnitude (intensity) and probability. From these criteria, a significance rating is obtained, the method and formula is described below. Please note that in this context the term environment include natural and cultural heritage.

Nature of Impact

The impacts are to be assessed as either having a:

- negative effect (i.e. at a 'cost' to the environment),
- positive effect (i.e. a 'benefit' to the environment), or
- neutral effect on the environment.

Extent of the Impact

- (1) Site (i.e. within the boundaries of the study area),
- (2) Local (i.e. the area within 10 km of the study area),
- (3) Municipal
- (4) Provincial (i.e. Gauteng),
- (5) National (i.e. South Africa), or

Duration of the Impact

The length that the impact will last for is described as either:

- (1) immediate (>1 year)
- (2) short term (1-5 years),
- (3) medium term (6-15 years),
- (4) long term (the impact will cease after the operational life span of the project),
- (5) permanent (no mitigation measure of natural process will reduce the impact after construction).

Magnitude of the Impact

The intensity or severity of the impacts is indicated as either:

- (0) none (where the aspect will have no impact on the environment),

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- **(2)** Minor (where the impact affects the environment in such a way that natural, cultural and social functions and processes are not affected),
- **(4)** Low (where the impact affects the environment in such a way that natural, cultural and social functions and processes are slightly affected),
- **(6)** Moderate (where the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way),
- **(8)** High (where natural, cultural or social functions or processes are altered to the extent that it will temporarily cease), or
- **(10)** Very high / don't know (where natural, cultural or social functions or processes are altered to the extent that it will permanently cease).

Probability of Occurrence

The likelihood of the impact actually occurring is indicated as either:

- **(0)** None (the impact will not occur),
- **(1)** improbable (the possibility of the impact materializing is very low as a result of design, historic experience, or implementation of adequate corrective actions)
- **(2)** low probability (there is a possibility that the impact will occur),
- **(3)** medium probability (the impact may occur),
- **(4)** high probability (it is most likely that the impact will occur), or
- **(5)** definite / don't know (the impact will occur regardless of the implementation of any prevention or corrective actions, or you don't know what the probability will be based on too little published information).

Significance of the Impact

Based on the information contained in the points above, the potential impacts are assigned a significance weighting (**S**). This weighting is formulated by adding the sum of the numbers assigned to extent (**E**), duration (**D**) and magnitude (**M**) and multiplying this sum by the probability (**P**) of the impact.

$$S=(E+D+M)P$$

The significance weightings are given below:

- **(<30)** low (i.e. where this impact would not have a direct influence on the decision to develop in the area),
- **(30-60)** medium (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated),
- **(>60)** high (i.e. where the impact must have an influence on the decision process to develop in the area).

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Evaluation

Issue/Impact	Corrective measures	Impact					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Loss of Red Data Species	No	Negative	1	5	10	4	64 High
	Yes	Negative	1	4	6	2	22 Low
Corrective / Mitigation Measures	<ul style="list-style-type: none"> Relocation of species into a similar safe environment; Fence off area containing RD species (insitu conservation); Etc... 						

The above heritage significance rating and impact of the development is presented in tabular form below:

Example

Impact	Impact Significance	Heritage Significance	Certainty	Duration	Mitigation
Negative	Moderate	Grade GP.B	Possible	Short term	Destruct

.5. Archaeological Context of study area

The historical background and timeframe of the study area can be divided into the Stone Age, Iron Age and Historical timeframe. These can be divided as follows:

Stone Age

The Stone Age is divided in Early; Middle and Late Stone Age and refers to the earliest people of South Africa who mainly relied on stone for their tools.

Early Stone Age: The period from ± 2.5 million yrs - $\pm 250\ 000$ yrs ago. Acheulean stone tools are dominant.

Middle Stone Age: Various lithic industries in SA dating from $\pm 250\ 000$ yrs – 25 000 yrs before present. This period is first associated with archaic *Homo sapiens* and later *Homo sapiens sapiens*. Material culture includes stone tools with prepared platforms and stone tools attached to handles.

Late Stone Age: The period from $\pm 25\ 000$ -yrs before present to the period of contact with either Iron Age farmers or European colonists. This period is associated with *Homo sapiens sapiens*. Material culture from this period includes: microlithic stone tools; ostrich eggshell beads and rock art.

Iron Age

The Iron Age as a whole represents the spread of Bantu speaking people and includes both the Pre-Historic and Historic periods. Similar to the Stone Age it can be divided into three 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.

Historic Timeframe

17th Century to present AD (1600 – 2000)

The historic timeframe intermingles with the later parts of the Stone and Iron Age, and can loosely be regarded as times when written and oral recounts of incidents became available.

5.1 Archival study

As heritage surveys deal with the locating of heritage resources in a prescribed cartographic landscape, the study of archival and historical data, and especially cartographic material, can represent a very valuable supporting tool in finding and identifying such heritage resources. Sections of the Second Edition of the Topographical Maps applicable to the study area was consulted but no features or structures were indicated with in the study areas..

5.2 Probability of occurrence of sites

From the above information it is clear that a medium possibility of the occurrence of cultural heritage sites could be expected in the study area.

A. PALAEOLOGICAL LANDSCAPE

CONTEXT

Fossil remains. Such resources are typically found in specific geographical areas, e.g. the Karoo and are embedded in ancient rock and limestone/calcrete formations. Exposed by road cuttings and quarry excavation: *Low Probability*

B. ARCHAEOLOGICAL LANDSCAPE

CONTEXT

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 with in the study area:

Stone Age finds

- ESA: *Medium Probability*
- MSA: *Medium Probability*
- LSA: *Medium Probability*
- LSA –Herder: *Low Probability*

Iron Age Finds

- EIA: *Low Probability*
- MIA: *Medium Probability*
- LIA: *High Probability*

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Historical finds

- Historical period: *High Probability*
- *Historical dumps: Medium Probability*
- *Structural remains: Medium Probability*

Military Finds

- *Battle and military sites: Medium Probability*

Burial/Cemeteries

- *Burials over 100 years: Medium Probability*
- *Burials younger than 60 years: High Probability*

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

.6. SITES OF SIGNIFICANCE

NMPP ID	ID on Map	Property Description	Co-ordinates
KW BP1	BP_KDL_WAO_01	Nooitgedacht 525JR Ptn 113	28°45'40.15"E; 25°51'29.55"S
JA BP1	BP_JMP_ALR_01	Koppieskraal 157 IR Ptn 1	28°15'20.84"E; 26°23'17.17"S
JA BP 2	BP_JMP_ALR_03	Uitkyk 159-IR	28°15'39.83"E; 26°24'22.27"S
JA BP3	BP_JMP_ALR_02	Klippoortje 187IR, Ptn 3	28°24'03.38"E; 26°28'29.43"S

6.1 BP_KDL_WAO_01

Borrow pit KW BP1 is in close proximity to an existing borrow pit next to a gravel road on portion 113 of the farm Nooitgedacht 525 JR. The area is disturbed by agricultural activities and ground moving activity associated with the existing borrow pit. Ground visibility is medium.

Heritage significance: *No significance*



Figure 1: Existing Borrow pit at KW BP1

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Figure 2: General site conditions at borrow pit KW BP1

6.2 BP_LMP_ALR_01

Borrow pit JA BP1 is located between the N3 and the R 103 outside Vosloorus on the way to Heidelberg on portion 1 of the farm Knoppieskraal 157 IR. The area is disturbed by intensive agricultural activities. Ground visibility is excellent. *eritage significance*

Heritage significance: *No significance*



Figure 3: General site conditions at JA BP1

6.3 BP_JMP_ALR_02

Borrow pit JA BP 3 is located just north of the R51 from Heidelberg to Nigel on portion 3 of the farm Klippoortjie 187 IR. The area is disturbed by ground moving activities. Ground visibility is medium.

Heritage significance: *No significance*



Figure 4: General site conditions at borrow pit JA BP 3

6.4 BP_JMP_ALR_03

Borrow pit JA BP 2 is located ext to the N3 between Voslorus and Heidelberg on portion 3 of the farm Klippoortjie 187 IR This is also the location of an existing borrow pit. The area is disturbed by ground moving activities associated with the excising borrow pit. Ground visibility is high.

Heritage significance: *No significance*



Figure 5: Existing borrow pit at JA BP 2

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.7. ASSUMPTIONS AND LIMITATIONS

Due to the nature of cultural remains that occur, in most cases, below surface, the possibility remains that some cultural remains may not have been discovered during the survey. Low ground visibility is present on site due to exceptional high vegetation growth and the possibility of the occurrence of unmarked graves can not be excluded. Although Wits Heritage Contracts unit surveyed the area as thorough as possible, it is incumbent upon the developer to inform the relevant heritage agency should further cultural remains be unearthed or laid open during the process of development.

.8. ASSESSMENT AND RECOMMENDATIONS

A locality map is provided in **Annexure A**

No sites of heritage significance were found on the property. A search on the archaeological Wits data base also yielded no known sites around the study areas.

From a Heritage point of view there is no reason why the development can not commence.

General

Low ground visibility is present on parts of the sites due to high vegetation growth and the possibility of the occurrence of unmarked graves and subsurface finds can not be excluded. If during construction any possible finds are made, the operations must be stopped and a qualified archaeologist be contacted for an assessment of the find.

.9. LIST OF PREPARES

Jaco van der Walt, BA (Hon) Archaeology (Wits)

.10. REFERENCES

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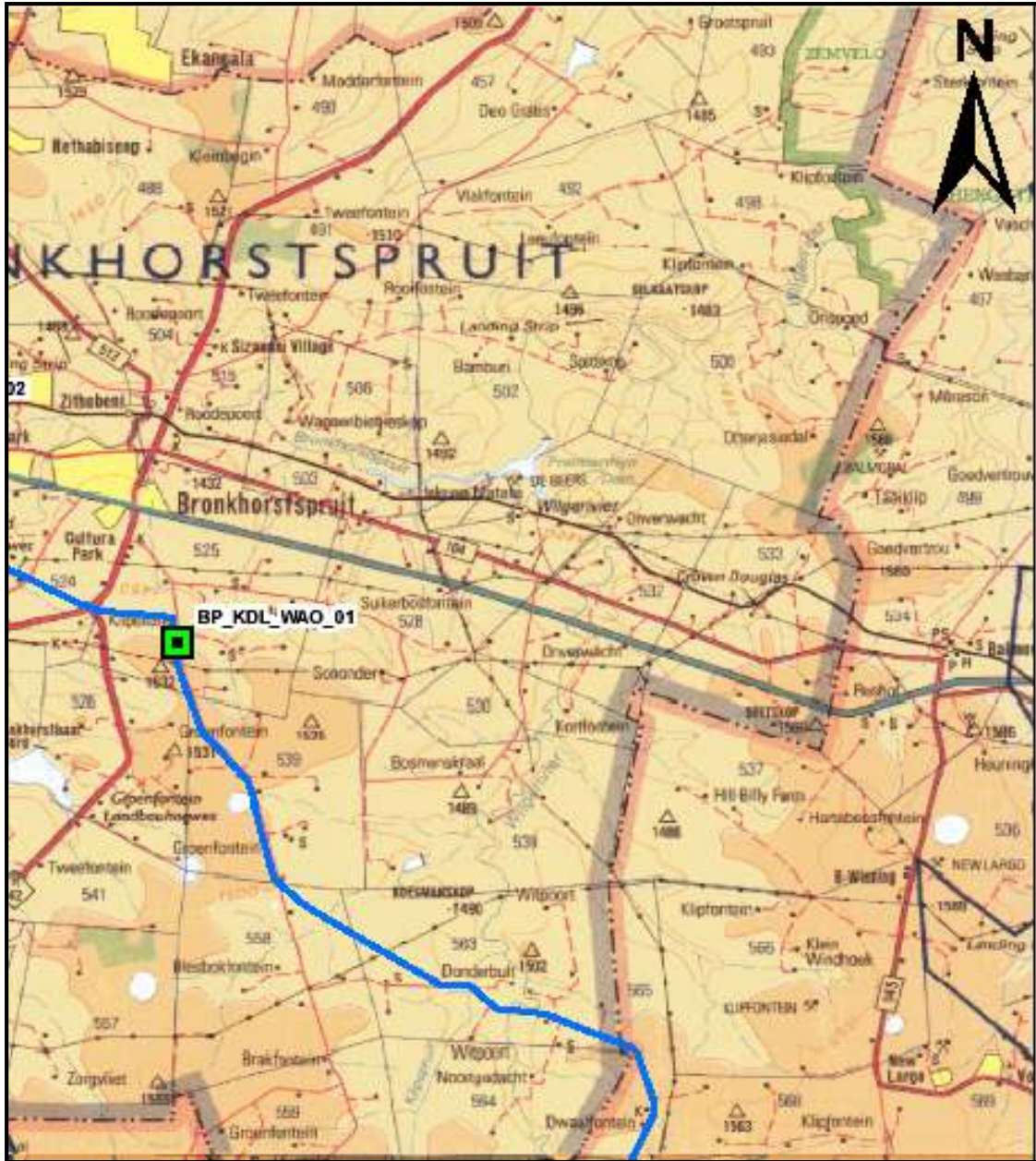
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ANNEXURE A: Locality Map

TRANSNET BORROW PITS - AIA



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