

**PHASE 1 ARCHAEOLOGICAL  
IMPACT ASSESSMENT**

**for**

**ENVASS (Pty) Ltd**

**on**

**erf 1 of Masehlaneng and erf  
1480 of Sekgakgapeng,  
Mokopane, Limpopo**

**Author ©:**

**Tobias Coetzee, BA (Hons) (Archaeology) (UP)**

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## Executive Summary

The author was appointed by Environmental Assurance (Pty) Ltd to undertake an Archaeological Phase 1 study for the Mogalakwena Local Municipality on a portion of erf one of the Masehlaneng area and erf 1480 of the Sekgakgapeng area, Mokopane, Limpopo Province. The study consists of two oxidation pond sites, roughly 4km apart, in the town of Mokopane, Limpopo. The aim of the study is to determine the scope of archaeological resources which could be impacted on by the proposed decommissioning and rehabilitation of the oxidation ponds.

Due to the structures within the boundaries of the oxidation ponds being of recent origin, no other visible material remains pertaining to heritage resources and subject to adherence of the recommendations and approval by SAHRA the decommissioning process and associated rehabilitation of the oxidation ponds may continue. Should skeletal remains be exposed during development and construction phases, all activities must be suspended and the relevant heritage resources authority contacted (See National Heritage and Resources Act, 25 of 1999 section 36 (6)). Also, should culturally significant material be discovered during the course of the said development, all activities must be suspended pending further investigation by a qualified archaeologist.

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# 1. Project Background

## 1.1 Introduction

Environmental Assurance (Pty) Ltd appointed the author to undertake an Archaeological Phase 1 study for the Mogalakwena Local Municipality on a portion of erf one of the Masehlaneng area and erf 1480 of the Sekgakgapeng area, Mokopane, Limpopo Province (**Figures 1 & 2**). The purpose of this study is to examine the demarcated portions in order to determine if any archaeological resources of heritage value will be impacted on by the proposed decommissioning of the oxidation ponds, as well as to archaeologically contextualise the general study area. The aim of this report is to provide the developer with information regarding the location of heritage resources on the portions demarcated for development.

In the following report, I discuss the implication for the decommissioning of the oxidation ponds located on a portion of erf one of the Masehlaneng area and erf 1480 of the Sekgakgapeng area with regard to heritage resources. The legislation section included serves as a guide towards the effective identification and protection of heritage resources and will apply to any such material unearthed during development and construction phases on the demarcated study area.

## 1.2 Legislation

The South African Heritage Resources Agency (SAHRA) aims to conserve and control the management, research, alteration and destruction of cultural resources of South Africa and to prosecute if necessary. It is therefore crucially important to adhere to heritage resource legislation contained in the Government Gazette of the Republic of South Africa (Act No.25 of 1999), as many heritage sites are threatened daily by development. Conservation legislation requires an impact assessment report to be submitted for development authorisation that must include an AIA if triggered.

AIAs should be done by qualified professionals with adequate knowledge to (a) identify all heritage resources that might occur in areas of development and (b) make recommendations for protection or mitigation of the impact of the sites.

### 1.2.1 The EIA and AIA processes

Phase 1 Archaeological Impact Assessments generally involve the identification of sites during a field survey with assessment of their significance, the possible impact development might have and relevant recommendations.

All Archaeological Impact Assessment reports should include:

- a. Location of the sites that are found;

- b. Short descriptions of the characteristics of each site;
- c. Short assessments of how important each site is, indicating which should be conserved and which mitigated;
- d. Assessments of the potential impact of the development on the site(s);
- e. In some cases a shovel test, to establish the extent of a site, or collection of material, to identify the associations of the site, may be necessary (a pre-arranged SAHRA permit is required); and
- f. Recommendations for conservation or mitigation.

This AIA report is intended to inform the client about the legislative protection of heritage resources and their significance and make appropriate recommendations. It is essential to also provide the heritage authority with sufficient information about the sites to enable the authority to assess with confidence:

- a. Whether or not it has objections to a development;
- b. What the conditions are upon which such development might proceed;
- c. Which sites require permits for mitigation or destruction;
- d. Which sites require mitigation and what this should comprise;
- e. Whether sites must be conserved and what alternatives can be proposed to relocate the development in such a way as to conserve other sites; and
- f. What measures should or could be put in place to protect the sites which should be conserved.

When a Phase 1 AIA is part of an EIA, wider issues such as public consultation and assessment of the spatial and visual impacts of the development may be undertaken as part of the general study and may not be required from the archaeologist. If, however, the Phase 1 project forms a major component of an AIA it will be necessary to ensure that the study addresses such issues and complies with Section 38 of the National Heritage Resources Act.

## **1.2.2 Legislation regarding archaeology and heritage sites**

*National Heritage Resource Act No.25 of April 1999*

Buildings are among the most enduring features of human occupation, and this definition therefore includes all buildings older than 60 years, modern architecture as well as ruins, fortifications and Farming Community settlements. The Act identifies heritage objects as:

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- objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects, meteorites and rare geological specimens;
- visual art objects;
- military objects;
- numismatic objects;
- objects of cultural and historical significance;
- objects to which oral traditions are attached and which are associated with living heritage;
- objects of scientific or technological interest;
- books, records, documents, photographic positives and negatives, graphic material, film or video or sound recordings, excluding those that are public records as defined in section 1(xiv) of the National Archives of South Africa Act, 1996 (Act No. 43 of 1996), or in a provincial law pertaining to records or archives;
- any other prescribed category.

With regards to activities and work on archaeological and heritage sites this Act states that:

*“No person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority.” (34. [1] 1999:58)*

and

*“No person may, without a permit issued by the responsible heritage resources authority:*

- (a) *destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;*
- (b) *destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;*
- (c) *trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or palaeontological material or object, or any meteorite; or*
- (d) *bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assist in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites.”(35. [4] 1999:58)*

and

*“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;*
- (c) bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) and excavation equipment, or any equipment which assists in the detection or recovery of metals.” (36. [3] 1999:60)*

On the development of any area the gazette states that:

*“...any person who intends to undertake a development categorised as:*

- (a) the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;*
- (b) the construction of a bridge or similar structure exceeding 50m in length;*
- (c) any development or other activity which will change the character of a site-*
  - i. exceeding 5000m<sup>2</sup> in extent; or*
  - ii. involving three or more existing erven or subdivisions thereof; or*
  - iii. involving three or more erven or divisions thereof which have been consolidated within the past five years; or*
  - iv. the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;*
- (d) the re-zoning of a site exceeding 10000m<sup>2</sup> in extent; or*
- (e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, 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.” (38. [1] 1999:62-64)*

and



*“The responsible heritage resources authority must specify the information to be provided in a report required in terms of subsection (2)(a): Provided that the following must be included:*

- (a) The identification and mapping of all heritage resources in the area affected;*
- (b) an assessment of the significance of such resources in terms of the heritage assessment criteria set out in section 6(2) or prescribed under section 7;*
- (c) an assessment of the impact of the development on such heritage resources;*
- (d) an evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development;*
- (e) the results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources;*
- (f) if heritage resources will be adversely affected by the proposed development, the consideration of alternatives; and*
- (g) plans for mitigation of any adverse effects during and after the completion of the proposed development.”*  
*(38. [3] 1999:64)*

#### *Human Tissue Act and Ordinance 7 of 1925*

The Human Tissues Act (65 of 1983) and Ordinance on the Removal of Graves and Dead Bodies (Ordinance 7 of 1925) protects graves younger than 60 years. These fall under the jurisdiction of the National Department of Health and the Provincial Health Departments. Approval for the exhumation and re-burial must be obtained from the relevant Provincial MEC as well as the relevant Local Authorities. Graves 60 years or older fall under the jurisdiction of the National Heritage Resources Act as well as the Human Tissues Act, 1983.

## 2. Study Area and Project Description

### Location & Physical environment

The study area consists of two sites: Oxidation Pond A and Oxidation Pond B. Both sites are located within the town of Mokopane (previously Potgietersrus) in the Limpopo Province and are approximately 4km apart. Each site consists of several individual dams, is fenced-off, and is guarded. Mokopane lies 55km southwest of Polokwane, 50km northeast of Mookgopong and falls within the Waterberg District Municipality and Mogalakwena Local Municipality (**Figure 1**). Oxidation Pond A is located 4km northwest of the Mokopane town centre and about 150m west of the N11 national road. Oxidation Pond B borders the R518 to the south and lies roughly 7km northwest from the town centre.

In terms of vegetation the study area falls within the Savannah Biome, Central Bushveld Bioregion and Makhado Sweet Bushveld vegetation unit. The Savannah Biome covers approximately 32.8% of South Africa (Mucina & Rutherford 2006). The Makhado Sweet Bushveld vegetation unit is found in the Limpopo Province and covers the plains south of the Soutpansberg, the area east of the Waterberg and on the apron surrounding Blouberg and Lerataupje Mountains. It also extends to Mokopane in the south, as well as north towards Vivo. Erosion varying from low to high is associated with this vegetation unit (Mucina & Rutherford 2006). According to Mucina & Rutherford (2006) the Makhado Sweet Bushveld vegetation unit has a conservation status of vulnerable. The conservation target for this area is 19% with about 1% statutorily conserved. About 27% is transformed, mainly by cultivation, but also by urban built-up areas. The southwestern half of this vegetation unit has densely populated rural communities.

In terms of geology the general area is underlain by migmatites and gneisses from the Hout River Gneiss, as well as the potassium-deficient gneisses of the Goudplaats Gneiss. Matlabas Subgroup formations, in the form of sandstones and mudstones, are also found in the area.

Soils found in the area are deep, greyish sands, as well as eutrophic plinthic catenas and red-yellow apedal freely drained soils with high base status. Clayey is found in bottomlands. The associated soil types are mainly: Bd, Bc, Ae and La.

The study area falls within the summer rainfall region and is associated with dry winters. Mean Annual Precipitation is about 472mm. The annual average temperatures may vary between a maximum of 27.8 °C in summer and a minimum of 3.4 °C during winter months (Sa Explorer 2017).

In terms of topography the general study area is associated with moderately undulating plains sloping down

towards the north, while hills are found in the southwest. On a local scale both sites are located on fairly level terrain. The elevation of the project area is roughly 1085 metres above sea level.

The study area falls within the Quaternary Drainage Region A61F of the Limpopo Water Management Area. The closest surface water to Oxidation Pond A is the Ngwaditse River, a non-perennial river located roughly 150m to the south of the site. The Rooisloot River, also a non-perennial river, borders Oxidation Pond B to the south. The Nearest perennial river is the Mogalakwena and flows about 4km to the west of the oxidation ponds.

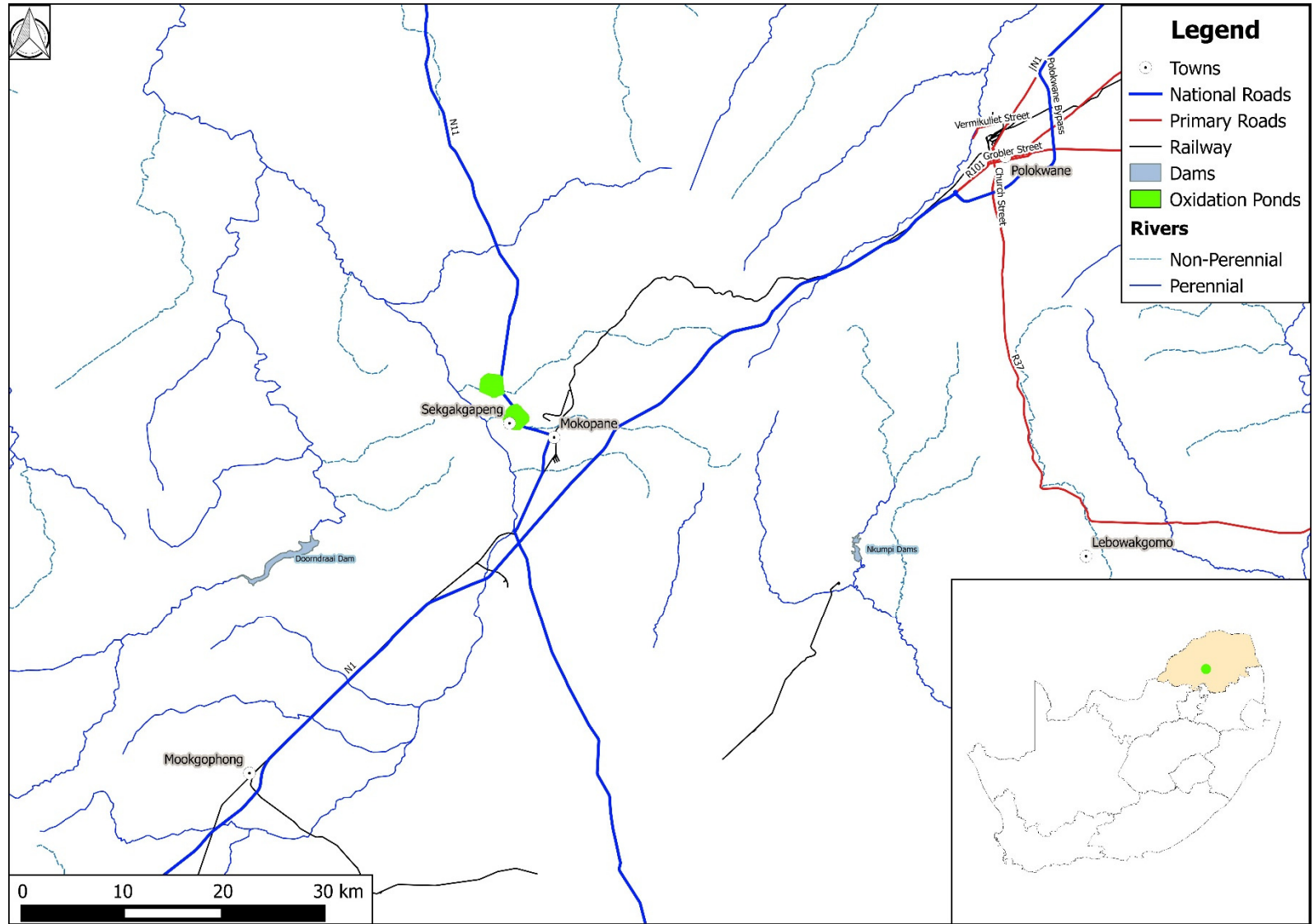
### Project description

The proposed project is to decommission both oxidation ponds (Oxidation Pond A & Oxidation Pond B) (**Table 1 & Figure 2**). Oxidation Pond A is about 10ha in size and consists of 10 individual dams. Oxidation Pond B is roughly 12ha in size and contains 11 individual dams. The process will entail rerouting water from the sites towards a new treatment works via existing pipelines. Thereafter the oxidation ponds will be dried out and sludge removed. Soil will then be brought in from elsewhere to create a recreation area for the use of the local community.

Although both sites are fenced-off, some holes were made in the fences to allow cattle to pass through for grazing. No cattle, however, were observed during the time of surveying. Some of the existing infrastructure appear to be out of order and not well maintained. A few informal houses are also located in the south-eastern corner Oxidation Pond A (**Figure 4 – POI d**). The length of their occupation is unknown, but exceed eight years, which is the duration of employment of the current security guard.

**Table 1:** Property name & coordinates

| Property     | Site & Portion                     | Map Reference (1:50 000) | Coordinates                   |
|--------------|------------------------------------|--------------------------|-------------------------------|
| Sekgakgapeng | Oxidation Pond A: erf 1480         | 2428 BB                  | S: -24.163885<br>E: 28.979646 |
| Masehlaneng  | Oxidation Pond B: Portion of erf 1 | 2428 BB                  | S: -24.132208<br>E: 28.955906 |



**Figure 1:** Regional and Provincial location of the study area.

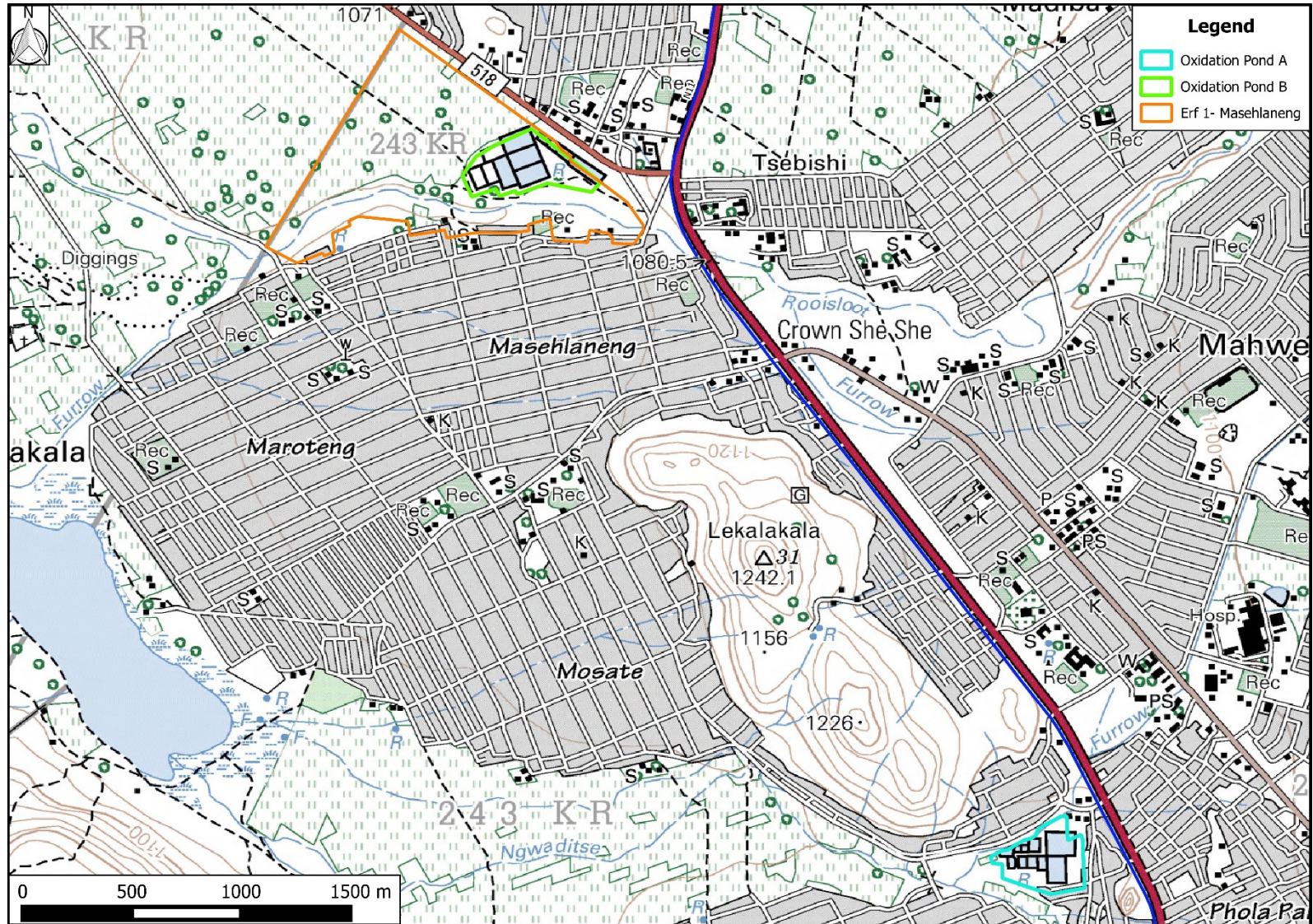


Figure 2: Segment of SA 1: 50 000 2428 BB indicating the study area.

## 2.1 Archaeological Background

Southern African archaeology is broadly divided into the Early, Middle and Later Stone Ages; Early, Middle and Late Iron Ages; and Historical or Colonial Periods. This section of the report provides a general background to archaeology in South Africa and also focuses on more site specific elements where relevant.

### 2.1.1 General Archaeological Context

#### The Stone Age

The earliest stone tool industry, the Oldowan, was developed by early human ancestors which were the earliest members of the genus *Homo*, such as *Homo habilis*, around 2.6 million years ago. It comprises tools such as cobble cores and pebble choppers (Toth & Schick 2007). Archaeologists suggest these stone tools are the earliest direct evidence for culture in southern Africa (Clarke & Kuman 2000). The advent of culture indicates the advent of more cognitively modern hominins (Mitchell 2002: 56, 57)

The Acheulean industry completely replaced the Oldowan industry. The Acheulian industry was first developed by *Homo ergaster* between 1.8 to 1.65 million years ago and lasted until around 300 000 years ago. Archaeological evidence from this period is also found at Swartkrans, Kromdraai and Sterkfontein. The most typical tools of the ESA are handaxes, cleavers, choppers and spheroids. Although hominins seemingly used handaxes often, scholars disagree about their use. There are no indications of hafting, and some artefacts are far too large for it. Hominins likely used choppers and scrapers for skinning and butchering scavenged animals and often obtained sharp ended sticks for digging up edible roots. Presumably, early humans used wooden spears as early as 5 million years ago to hunt small animals.

Middle Stone Age artefacts started appearing about 250 000 years ago and replaced the larger Early Stone Age bifaces, handaxes and cleavers with smaller flake industries consisting of scrapers, points and blades. These artefacts roughly fall in the 40-100 mm size range and were, in some cases, attached to handles, indicating a significant technical advance. The first *Homo sapiens* species also emerged during this period. Associated sites are Klasies River Mouth, Blombos Cave and Border Cave (Deacon & Deacon 1999).

Although the transition from the Middle Stone Age to the Later Stone Age did not occur simultaneously across the whole of southern Africa, the Later Stone Age ranges from about 20 000 to 2000 years ago. Stone tools from this period are generally smaller, but were used to do the same job as those from previous periods; only in a different, more efficient way. The Later Stone Age is associated with: rock art, smaller stone tools (microliths), bows and arrows, bored stones, grooved stones, polished bone tools, earthenware pottery and beads. Examples of Later Stone Age sites are Nelson Bay Cave, Rose Cottage Cave and Boomplaas Cave (Deacon & Deacon 1999).

## The Iron Age & Historical Period

The Early Iron Age marks the movement of farming communities into South Africa in the first millennium AD, or around 2500 years ago (Mitchell 2002:259, 260). These groups were agro-pastoralist communities that settled in the vicinity of water in order to provide subsistence for their cattle and crops. Archaeological evidence from Early Iron Age sites is mostly artefacts in the form of ceramic assemblages. The origins and archaeological identities of this period are largely based upon ceramic typologies. Some scholars classify Early Iron Age ceramic traditions into different “streams” or “trends” in pot types and decoration, which emerged over time in southern Africa. These “streams” are identified as the Kwale Branch (east), the Nkope Branch (central) and the Kalundu Branch (west). Early Iron Age ceramics typically display features such as large and prominent inverted rims, large neck areas and fine elaborate decorations. This period continued until the end of the first millennium AD (Mitchell 2002; Huffman 2007). Some well-known Early Iron Age sites include the Lydenburg Heads in Mpumalanga, Happy Rest in the Limpopo Province and Mzonjani in Kwa-Zulu Natal.

The Middle Iron Age roughly stretches from AD 900 to 1300 and marks the origins of the Zimbabwe culture. During this period cattle herding appeared to play an increasingly important role in society. However, it was proved that cattle remained an important source of wealth throughout the Iron Age. An important shift in the Iron Age of southern Africa took place in the Shashe-Limpopo basin during this period, namely the development of class distinction and sacred leadership. The Zimbabwe culture can be divided into three periods based on certain capitals. Mapungubwe, the first period, dates from AD 1220 to 1300, Great Zimbabwe from AD 1300 to 1450, and Khami from AD 1450 to 1820 (Huffman 2007: 361, 362).

The Late Iron Age roughly dates from AD 1300 to 1840. It is generally accepted that Great Zimbabwe replaced Mapungubwe. Some characteristics include a greater focus on economic growth and the increased importance of trade. Specialisation in terms of natural resources also started to play a role, as can be seen from the distribution of iron slag which tend to occur only in certain localities compared to a wide distribution during earlier times. It was also during the Late Iron Age that different areas of South Africa were populated, such as the interior of KwaZulu Natal, the Free State, the Gauteng Highveld and the Transkei. Another characteristic is the increased use of stone as building material. Some artefacts associated with this period are knife-blades, hoes, adzes, awls, other metal objects as well as bone tools and grinding stones.

The Historical period mainly deals with Europe’s discovery, settlement and impact on southern Africa. Some topics covered by the Historical period include Dutch settlement in the Western Cape, early mission stations, Voortrekker routes and the Anglo Boer War. This time period also saw the compilation of early maps by missionaries, explorers, military personnel, etc. **Figure 3** indicates the rough location of the study area as perceived by Merensky in 1875.



**Figure 3:** Rough indication of the study area on a map compiled by Merensky (Extract from: Merensky 1875).

### **Mokopane Archaeo-History**

During the time period prior to the *difaqane* the following Northern Ndebele groups were located in the vicinity of Mokopane: The Langa of Mapela on the farm Zuid-Holland to the north of Mokopane and the Kekana (Mathombeni/Yangalala) to the southeast of Mokopane at Moletlane. The Kekana of Mugombhane later split from the rest of the Kekana at Moletlane and moved to the present day farm Pruisen about 10km southeast of Mokopane (Bergh 1999a: 108). Around the 1850's, with increased Voortrekkers settling in the vicinity and the Kekana subsequently losing land, several skirmishes took place around Mokopane. This conflict led to the murders of 12 Voortrekkers in September of 1854 at Moorddrif 10km southeast of Mokopane. The commandos of M.W Pretorius joined forces with those of Piet Potgieter in October 1854 and moved to Makapansgat, the cave where Mugombhane and his followers resided. After the several failed attempt by the commandos to defeat Mugombhane they decided to lay a siege and cut all water and food from the cave. On 21 November the siege was stopped and Mugombhane defeated (Bergh 1999b: 160). During later years the Kekana made several attacks on the town of Piet Potgietersrus with the result of additional commandos being sent to the town (Bergh 1999b: 190).

The town of Vredenburg was founded in 1852, but in 1854 basically all that remained was the name. A strong possibility exists that the reason for this might be conflict related, especially after the murders at Moorddrif. In



1855 it was decided to rename Vredenburg to Piet Potgietersrus (Du Plooy 1990). In 2003 the name of the town was changed to Mokopane.

### 3. Methodology

I conducted archaeological reconnaissance of the study area through an unsystematic pedestrian site survey. A systematic pedestrian survey was not possible due to extremely dense vegetation. However, I was accompanied by Tshepo Thobejane and Isaac Ramahala who are both employed at Oxidation Pond A. Both provided valuable input in terms of possible site locations and general site conditions. Thabo Kwakwa, who provides security at Oxidation Pond B, accompanied me to the accessible areas. Ydean Hartzenberg, a representative from Aurecon Group (Pty) Ltd accompanied me to both sites and shed some light on the processes to follow to decommission the oxidation ponds. Sites or points of interest were recorded via GPS (Global Positioning System) location and photographic record (**Figures 4 & 5; Table 2**). Also, the sites were inspected beforehand on Google as well as black and white aerial imagery in order to identify possible heritage remains.

The reconnaissance of the area under investigation served a twofold purpose:

- To obtain an indication of heritage material found in the general area as well as to identify or locate archaeological sites on the demarcated oxidation ponds. This was done in order to establish a heritage context and to supplement background information that would benefit the developer through identifying areas that are sensitive from a heritage perspective.
- All archaeological and historical events have spatial definitions in addition to their cultural and chronological context. Where applicable, spatial recording of these definitions were done by means of a handheld GPS during the site visit.

**Table 2:** POI coordinates

| Site / POI | Longitude | Latitude   |
|------------|-----------|------------|
| POI a      | 28.981012 | -24.163088 |
| POI b      | 28.981051 | -24.163392 |
| POI c      | 28.980817 | -24.163384 |
| POI d      | 28.980870 | -24.164511 |
| POI e      | 28.956208 | -24.130708 |
| POI f      | 28.956384 | -24.132167 |



Figure 4: Oxidation Pond A.



**Figure 5:** Oxidation Pond B.

### 3.1 Sources of information

At all times during the survey I followed standard archaeological procedures for the observation of heritage resources. As most archaeological material occurs in single or multiple stratified layers beneath the soil surface, I paid special attention to disturbances; both man-made such as roads and clearings, and those made by natural agents such as burrowing animals and erosion. I recorded general conditions on the terrain with a Sony Cyber-shot camera and recorded GPS tracks with a Garmin Oregon 550 GPS.

I conducted a literature study, which incorporated previous work done in the region, in order to place the study area into context from a heritage perspective.

Personal communication with Tshepo Thobejane and Isaac Ramahala at Oxidation Pond A, and Thabo Kwakwa at Oxidation Pond B, revealed that they are not aware of any heritage material or sites within the boundaries of the oxidation ponds. Mr. Thobejane has been employed at Oxidation Pond A for eight years and Mr. Kwakwa at Oxidation Pond B for a few months (Tshepo Thobejane & Thabo Kwakwa, pers. Comm. 2017).

#### 3.1.1 Previous studies

##### **Platreef mining project, Mokopane, Limpopo**

A Heritage Impact Assessment was done for Platreef Resources (Pty) Ltd on the farms Bultongfontein 866 LR, Turfspruit 241 KR, Macalacaskop 243 KR and Rietfontein 2 KS. This project area is located in the general vicinity of Mokopane and covers 7841.264 ha. Findings include 55 burial grounds, 25 isolated surface occurrences and 3 archaeological sites. Heritage remains found during the project include Stone Age artefacts dating to the MSA, Iron Age stone-walling, potsherds, grinding stones and an Iron Age smelting site etc. (Digby Wells 2013).

##### **Mogalakwena Water Supply Infrastructure Project**

The HIA done for the construction of water supply infrastructure for the residential clusters of Tshamahansi, Sekuruwe, Seema, Phafola, Maala Perekisi, Witriver and Millennium Park in the Mogalakwena Local Municipality revealed the stone packed insignia of a ZCC-church (PGS Heritage 2013).

### 3.2 Limitations

The vegetation at Oxidation Pond A is extremely dense and limited movement to a great extent (**Figures 6 & 7**). The vegetation at Oxidation Pond B is less dense compared to Oxidation Pond A, but is still largely inaccessible (**Figures 8 & 9**). Visibility was extremely poor during the time of surveying as a result of dense vegetation (February 2017). The general area within the boundaries of the Oxidation Ponds are disturbed as a result of the dams, as well as roads in areas with less dense vegetation.



**Figure 6:** Dense vegetation at Oxidation Pond A.



**Figure 7:** One of the dams at Oxidation Pond A.



**Figure 8:** More accessible section at Oxidation Pond B.



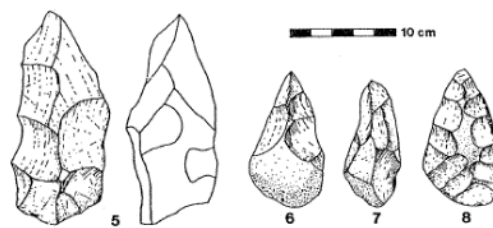
**Figure 9:** Inaccessible area at Oxidation Pond B.

## 4. Archaeological and Historical Remains

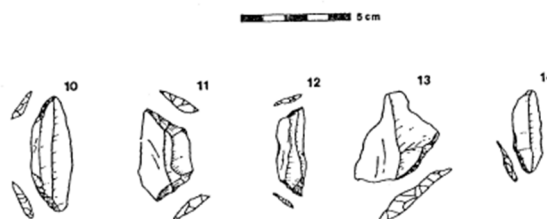
### 4.1 Stone Age Remains

I found no Stone Age archaeological remains within the boundaries of Oxidation Ponds A & B.

Although no Stone Age archaeological remains were visible, remains might occur in the area. These artefacts are often associated with rocky outcrops or water sources. **Figures 10 - 12** below are examples of stone tools often associated with the Early, Middle and Later Stone Age of southern Africa.



**Figure 10:** ESA artefacts from Sterkfontein (Volman 1984).



**Figure 11:** MSA artefacts from Howiesons Poort (Volman 1984).



**Figure 12:** LSA scrapers (Klein 1984).

## 4.2 Iron Age Farmer Remains

I found no Iron Age Farmer archaeological remains within the boundaries of Oxidation Ponds A & B.

## 4.3 Historical Remains

I found no Historical archaeological remains within the boundaries of Oxidation Ponds A & B.

## 4.4 Recent remains

I observed no recent remains within the boundaries of Oxidation Ponds A & B. It should be noted, however, that several structures that are still in use exist within the boundaries of the oxidation ponds (**Figures 4 & 5: POI a-f; Figures 13-17**). The majority of these structures are either guard houses, storerooms or pump houses.



**Figure 13:** POI a & c at Oxidation Pond A.





**Figure 14:** POI b at Oxidation Pond A.



**Figure 15:** Informal housing at Oxidation Pond A.



**Figure 16:** POI e at Oxidation Pond B.



**Figure 17:** POI f at Oxidation Pond B.

## 4.5 Graves

No graves were observed during the survey.

## 5. Evaluation

The significance of an archaeological site is based on the amount of deposit, the integrity of the context, the kind of deposit and the potential to help answer present research questions. Historical structures are defined by Section 34 of the National Heritage Resources Act, 1999, while other historical and cultural significant sites, places and features, are generally determined by community preferences.

A fundamental aspect in the conservation of a heritage resource relates to whether the sustainable social and economic benefits of a proposed development outweigh the conservation issues at stake. There are many aspects that must be taken into consideration when determining significance, such as rarity, national significance, scientific importance, cultural and religious significance, and not least, community preferences. When, for whatever reason the protection of a heritage site is not deemed necessary or practical, its research potential must be assessed and if appropriate mitigated in order to gain data / information which would otherwise be lost. Such sites must be adequately recorded and sampled before being destroyed.

### 5.1 Field Rating

All sites should include a field rating in order to comply with section 38 of the National Heritage Resources Act (Act No. 25 of 1999). The field rating and classification in this report is prescribed by SAHRA.

**Table 3:** Field Ratings

| <b>Rating</b>        | <b>Field Rating/Grade</b> | <b>Significance</b> | <b>Recommendation</b>           |
|----------------------|---------------------------|---------------------|---------------------------------|
| National             | Grade 1                   |                     | National site                   |
| Provincial           | Grade 2                   |                     | Provincial site                 |
| Local                | Grade 3 A                 | High                | Mitigation not advised          |
| Local                | Grade 3 B                 | High                | Part of site should be retained |
| General protection A | 4 A                       | High/Medium         | Mitigate site                   |
| General Protection B | 4 B                       | Medium              | Record site                     |
| General Protection C | 4 C                       | Low                 | No recording necessary          |

**Table 4:** Individual site rating

| Site / Survey Point Name | Type              | Rating               | Field Rating/Grade | Significance | Recommendation         |
|--------------------------|-------------------|----------------------|--------------------|--------------|------------------------|
| POI a                    | Modern structure  | General Protection B | 4 B                | Medium       | Record site            |
| POI b                    | Modern structure  | General Protection B | 4 B                | Medium       | Record site            |
| POI c                    | Modern structure  | Local                | Grade 3 A          | High         | Mitigation not advised |
| POI d                    | Modern settlement | General Protection B | 4 B                | Medium       | Record site            |
| POI e                    | Modern structure  | General Protection B | 4 B                | Medium       | Record site            |
| POI f                    | Modern structure  | General Protection B | 4 B                | Medium       | Record site            |

## 6. Statement of Significance & Recommendations

### 6.1 Statement of significance

#### **The demarcated oxidation ponds (Oxidation Pond A & Oxidation Pond B)**

I observed no material of heritage importance within the two demarcated study areas. It should be noted that the both sites are covered by dense vegetation and have partially disturbed areas. The structures on both sites appear to be of modern origin and although they are not well maintained are still operational. The informal housing located within the boundary of Oxidation Pond A are not at risk of impact from the decommissioning of the oxidation ponds and not directly adjacent to any of the dams.

The general Mogalakwena area is rich in archaeological evidence which include Stone Age, Iron Age and historical remains. The two oxidation pond sites, however, are isolated, disturbed and no material culture of heritage importance were observed on the demarcated portions.

## 6.2 Recommendations

The following recommendations are made in terms with the National Heritage Resources Act (25 of 1999) in order to avoid the destruction of heritage remains in areas demarcated for development:

- Because archaeological artefacts generally occur below surface and because the associated sites are covered by dense vegetation, the possibility exists that culturally significant material may be exposed during the development and construction phases, in which case all activities must be suspended pending further archaeological investigations by a qualified archaeologist. Also, should skeletal remains be exposed during development and construction phases, all activities must be suspended and the relevant heritage resources authority contacted (See National Heritage Resources Act, 25 of 1999 section 36 (6)).
- Should the need arise to expand the development beyond the surveyed area mentioned in this study, the following applies: a qualified archaeologist must conduct a full Phase 1 Archaeological Impact Assessment (AIA) on the sections beyond the demarcated areas which will be affected by the development, in order to determine the occurrence and extent of any archaeological sites and the impact development might have on these sites.
- It is recommended that the modern structures located on both oxidation pond sites be left intact. Should the need arise to demolish these structures it is recommended that a destruction permit be obtained and the structures be recorded prior to any destruction.
- From a heritage point of view, the decommissioning of the oxidation ponds and associated development may proceed on the demarcated portions, subject to the abovementioned conditions, recommendations and approval by the South African Heritage Resources Agency.

## 7. Addendum: Terminology

### **Archaeology:**

The study of the human past through its material remains.

### **Artefact:**

Any portable object used, modified, or made by humans; e.g. pottery and metal objects.

### **Assemblage:**

A group of artefacts occurring together at a particular time and place, and representing the sum of human activities.

### **Context:**

An artefact's context usually consist of its immediate *matrix* (the material surrounding it e.g. gravel, clay or sand), its *provenience* (horizontal and vertical position within the matrix), and its *association* with other artefacts (occurrence together with other archaeological remains, usually in the same matrix).

### **Cultural Resource Management (CRM):**

The safeguarding of the archaeological heritage through the protection of sites and through salvage archaeology (rescue archaeology), generally within the framework of legislation designed to safeguard the past.

### **Excavation:**

The principal method of data acquisition in archaeology, involving the systematic uncovering of archaeological remains through the removal of the deposits of soil and other material covering and accompanying it.

### **Feature:**

An irremovable artefact; e.g. hearths or architectural elements.

### **Ground Reconnaissance:**

A collective name for a wide variety of methods for identifying individual archaeological sites, including consultation of documentary sources, place-name evidence, local folklore, and legend, but primarily actual fieldwork.

### **Matrix:**

The physical material within which artefacts is embedded or supported, i.e. the material surrounding it e.g. gravel, clay or sand.

### **Phase 1 Assessments:**

Scoping surveys to establish the presence of and to evaluate heritage resources in a given area.

### **Phase 2 Assessments:**

In-depth culture resources management studies which could include major archaeological excavations, detailed site surveys and mapping / plans of sites, including historical / architectural structures and features. Alternatively, the sampling of sites by collecting material, small test pit excavations or auger sampling is required.

### **Sensitive:**

Often refers to graves and burial sites although not necessarily a heritage place, as well as ideologically significant sites such as ritual / religious places. *Sensitive* may also refer to an entire landscape / area known for its significant heritage remains.

### **Site:**

A distinct spatial clustering of artefacts, features, structures, and organic and environmental remains, as the residue of human activity.

### **Surface survey:**

There are two kinds: (1) unsystematic and (2) systematic. The former involves field walking, i.e. scanning the ground along one's path and recording the location of artefacts and surface features. Systematic survey by comparison is less subjective and involves a grid system, such that the survey area is divided into sectors and these are walked ally, thus making the recording of finds more accurate.

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## **Maps**

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