

ARCHAEOLOGICAL IMPACT ASSESSMENT

For the proposed upgrading of the Rietfontein Oxidation Ponds near Rietfontein in
the Northern Cape Province

Prepared for

Van Zyl Environmental Consultants cc.

BY

UBIQUE HERITAGE CONSULTANTS PTY (LTD)

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I, Jan Engelbrecht, as Director of Ubique Heritage Consultants (Pty) Ltd, hereby confirm my independence as a heritage specialist and declare that we have no interest in the business of our client, other than fair remuneration for work performed on this project/contract as well as the execution of archaeological sound fieldwork and the submission of a professional report to our client.

J.A.C. ENGELBRECHT

UBIQUE HERITAGE CONSULTANTS (PTY) LTD

DIRECTOR

EXECUTIVE SUMMARY

Site Name and Location:

The Rietfontein oxidation ponds are located at GPS coordinate 26.74766° South 20.04505° East. It is situated near the town (approximately 1km) of Rietfontein within the Mier local Municipality and in the greater ZF Mgcawu District Municipality in the Northern Cape. The proposed upgrade of the Rietfontein oxidation ponds will be conducted at Rietfontein on the remaining extent of the Farm 585 Gordonia Road. The site is in close proximity of the R 31 secondary road, which also forms the northern boundary of the site.

Image 1: Locality Plan:

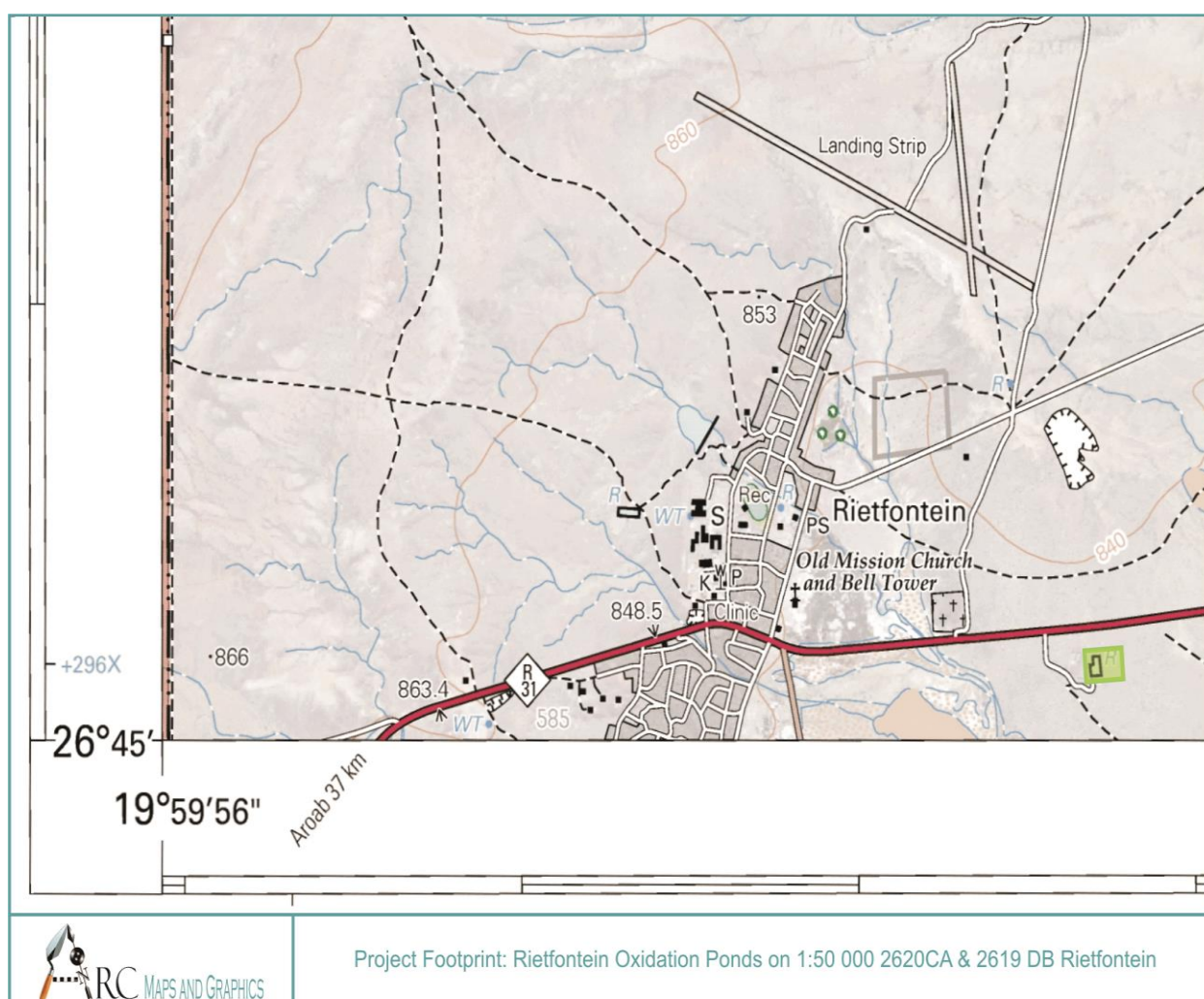


Image 2: Google Map Development Footprint (<http://www.google earth.com>)



Proposed Development:

The proposed upgrading of the existing Rietfontein oxidation ponds on the remaining extent of the farm 585, Gordonia Road. The project to be delivered and completed in accordance with BID 11/2013 OF Van Zyl Environmental Consultantscc., as well as the Terms of Reference supplied by the mentioned client. Therefore a Phase 1 Archaeological Impact Assessment is to be conducted by Ubique Heritage Consultants (Pty) Ltd, as appointed by the client, to identify the impact of development on possible heritage present on the site.

Heritage Recourses Identified:

DESCRIPTION	PERIOD	GRID
Scattered Stone Flakes	MSA/LSA	26.74647° S 20.04481° E
Upper Grinder	MSA/LSA	26.74606° S 20.04523° E
Single Stone Flake	MSA/LSA	26.74882° S 20.04562° E
Single Stone Flake	MSA/LSA	26.74807° S 20.04510° E
Upper Grinder	MSA/LSA	26.74854° S 20.04667° E
Single Stone Flake	MSA/LSA	26.74845° S 20.04819° E

Findings and Impacts on Heritage Resources:

The topography of the assessment area (2 ha) includes an open and level plain, with a few small elevated natural sand dunes and a non perennial riverbed flowing from north to south adjacent to the development footprint. To the south a two track gravel road is present, running from North West to South East, but this road is also outside the development footprint. To the west of the existing oxidation ponds there are a number of refuse dumping sites, which indicates previous disturbance of the area, but these dumping sites are also outside the development footprint. To the North of the assessment area the R31 secondary road links up with Rietfontein village from the South East. The existing oxidation ponds are situated within the assessment area and consist of two ponds. The area to the east of the existing oxidation ponds is included in the development footprint and was assessed accordingly as indicated on the included maps.

Archaeological findings within the assessment area consist of a number of stone tools of MSA/LSA artefacts as indicated above. MSA and LSA artefacts consisted of two worked upper grinders, end scrapers, larger retouched blade tools and retouched flakes. The sources of raw materials for the production of stone tools were predominantly fine grained quartzite and sandstone.

The assessment area for development has no significant archaeological places or structures. The area is clear and consists of an open field and two existing oxidation ponds situated on the South eastern periphery of Rietfontein village. There are no colonial/historical or pre-historical structures 60 years and older, neither are there any places or equipment of significance. It is likely that places, structures and equipment has low heritage significance at the community specific, local and regional levels at least for its historic values. No significant archaeological remains and material were detected on the site, except for scattered stone tools (MSA, LSA) in the proposed development site. The one Riverine bed was thoroughly surveyed to ensure if any archaeological material were exposed by means of erosion. Places associated with archaeology have at least low heritage significance at the community specific and local levels for its cultural and historic values.

No traditional burial places were recorded in the proposed development site. In addition, consultation with several traditional local inhabitants revealed no oral history or evidence of any traditional graves and burial places within the site. Rietfontein town has an existing municipal cemetery. Traditional burial places has at least low heritage significance for its cultural and historic values.

It is likely that living heritage has low heritage significance at the community specific, local and regional levels at least for its historic values.

The impact on all heritage resources located within the proposed development site at Rietfontein is rated as low and the proposed development will possibly have an impact on such resources. Heritage resources include the presence of MSA and LSA

artefacts on the proposed development site. It is however imperative to keep previous disturbances on the site in mind.

Recommendations:

Ubique Heritage Consultants (Pty) Ltd recommend that the development can proceed, subject to the following recommended mitigation procedures:

- **Rescue archaeology:** Due to the low impact on heritage resources, the removal/salvage of the identified artefacts as discovered on the development site according to the correct procedures, The SAHRA Minimum Standards for impact assessments and in accordance with the National/Provincial heritage legislation is recommended.

General:

Due to extensive sand cover, in certain areas on the development footprint, ground visibility was low on portions of the site during survey. The possible occurrence of unmarked or informal graves and subsurface finds can thus not be excluded. If during construction any possible finds such as stone tool scatters, artefacts or bone and fossil remains are made, the operations must be stopped and a qualified archaeologist must be contacted for an assessment of the find.

Although all possible care is taken to identify 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 assessment. Ubique Heritage Consultants (Pty) Ltd and its personnel will not be held liable for such oversights or for costs incurred as a result of such oversights.

CONCLUSION:

We recommend that the development proceed with the proposed heritage mitigation and have submitted this report to SAHRA in fulfilment of the requirements of the NHRA. The South African Heritage Resources Agency may be contacted at the SAHRA Head office (South African Heritage Resources Agency 111 Harrington Street Cape Town 8001, Kathryn Smuts, and Tel: (+27) 21-4624502, E-mail: ksmuts@sahra.org.za

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We thus recommend that permission is granted, subject to the mitigation recommendations, for development to proceed, the client is reminded that the NHRA requires that a developer cease all work immediately and follow the protocol contained in this report should any heritage resources, as defined in the Act, be discovered during the course of development activities.

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

CONTENTS

EXECUTIVE SUMMARY.....	3
ABBREVIATIONS.....	9
GLOSSARY.....	9
ELABORATION ON GLOSSARY.....	9
1. INTRODUCTION.....	14
2. TERMS OF REFERENCE.....	15
3. PROJECT DESCRIPTION.....	24
4. PROJECT LOCATION & ENVIRONMENTAL DISCRPTION.....	24
5. METHODOLOGY.....	26
6. OBSERVATIONS.....	35
7. ASSESSMENT OF DEVELOPMENT IMPACTS.....	51
8. PALAEONTOLOGY.....	55
9. GRAVES & BURIAL GROUNDS.....	55
10. PUBLIC MONUMENTS & MEMORIALS.....	55
11. HISTORY.....	55
12. MITIGATION & RECOMMENDADTION.....	56
13. PROTOCOL.....	57
14. CONCLUSION.....	58
15. STATEMENT OF COMPETENCY.....	59
16. REFERENCES.....	61

FIGURES

FIGURE 1: LOCATION MAP.....	25
FIGURE 2: FOOTPRINT OF DEVELOPMENT	26
FIGURE 3: GOOGLE EARTH TRACK & FINDS.....	28
FIGURE 4: TRACK SURVEY ON FOOTPRINT.....	38
FIGURE 5: STONE TOOL 1.....	39
FIGURE 6: STONE TOOL 2.....	39
FIGURE 7: MSA/LSA UPPER GRINDER.....	40
FIGURE 8: MSA/LSA UPPER GRINDER.....	41
FIGURE 9: SCATTERED STONE TOOLS MSA/LSA.....	42
FIGURE 10: SINGLE FLAKE LSA.....	42
FIGURE 11: MSA/LSA UPPER GRINDER.....	43
FIGURE 12: SINGLE FLAKE LSA.....	44
FIGURE 13 TO 16: RIETFONTEIN OXIDATION PONDS AND STRUCTURES.....	44-47
FIGURE 17 TO 19: ENVIRONMENTAL RISKS.....	48-50
FIGURE 20: OXIDATION DRAIN AT PONDS.....	50
FIGURE 21 TO 24: GEMEENTESDAM ARTEFACTS.....	51-54
FIGURE 25: RIETFONTEIN CHURCH MONUMENT.....	56

ABBREVIATIONS

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

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

GLOSSARY

Archaeological site (remains of human activity over 100 years old)
 Early Stone Age (~ 2.6 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)
 The Iron Age (~ AD 400 to 1840)
 Historic (~ AD 1840 to 1950)
 Historic building (over 60 years old)

ELABORATION ON GLOSSARY

The Stone Age

No systematic Early and Middle Stone Age research has been undertaken in the proposed development area, hence the general nature of this section. Open air scatters of stone artefacts, probably with low heritage significance, could be expected in areas with minimal environmental disturbance. Previous development on the site is evident.

South Africa's prehistory has been divided into a series of phases based on broad patterns of technology. The primary distinction is between a reliance on chipped and flaked stone implements (the Stone Age) and the ability to work iron (the Iron Age). Spanning a large proportion of human history, the Stone Age in Southern Africa is further divided into the Early Stone Age, or Paleolithic Period (about 2 500 000–150 000 years ago), the Middle Stone Age, or Mesolithic Period (about 150 000–30 000 years ago), and the Late Stone Age, or Neolithic Period (about 30 000–2 000 years ago). The simple stone tools found with australopithecine fossil bones fall into the earliest part of the Early Stone Age.

- **The Early Stone Age**

Most Early Stone Age sites in South Africa can probably be connected with the hominin species known as *Homo erectus*. Simply modified stones, hand axes, scraping tools, and other bifacial artifacts had a wide variety of purposes, including butchering animal carcasses, scraping hides, and digging for plant foods. Most South African archaeological sites from this period are the remains of open camps, often by the sides of rivers and lakes, although some are rock shelters, such as Montagu Cave in the Cape region.

- **The Middle Stone Age**

The long episode of cultural and physical evolution gave way to a period of more rapid change about 200 000 years ago. Hand axes and large bifacial stone tools were replaced by stone flakes and blades that were fashioned into scrapers, spear points, and parts for hafted, composite implements. This technological stage, now known as the Middle Stone Age, is represented by numerous sites in South Africa.

Open camps and rock overhangs were used for shelter. Day-to-day debris has survived to provide some evidence of early ways of life, although plant foods have rarely been preserved. Middle Stone Age bands hunted medium-sized and large prey, including antelope and zebra, although they tended to avoid the largest and most dangerous animals, such as the elephant and the rhinoceros. They also ate seabirds and marine mammals that could be found along the shore and sometimes collected tortoises and ostrich eggs in large quantities.

- **The Late Stone Age**

Basic tool making techniques began to undergo additional change about 40 000 years ago. Small finely worked stone implements known as microliths became more common, while the heavier scrapers and points of the Middle Stone Age appeared less frequently. Archaeologists refer to this technological stage as the Late Stone Age. The numerous collections of stone tools from South African archaeological sites show a great degree of variation through time and across the subcontinent.

The remains of plant foods have been well preserved at such sites as Melkhoutboom Cave, De Hangen, and Diepkloof in the Cape region. Animals were trapped and hunted with spears and arrows on which were mounted well-crafted stone blades. Bands moved with the seasons as they followed game into higher lands in the spring and early summer months, when plant foods could also be found. When available, rock overhangs became shelters; otherwise, windbreaks were built. Shellfish, crayfish, seals, and seabirds were also important sources of food, as were fish caught on lines, with spears, in traps, and possibly with nets.

Dating from this period are numerous engravings on rock surfaces, mostly on the interior plateau, and paintings on the walls of rock shelters in the mountainous regions, such as the Drakensberg and Cederberg ranges. The images were made over a period of at least 25 000 years. Although scholars originally saw the South African rock art as the work of exotic foreigners such as Minoans or Phoenicians or as the product of primitive minds, they now believe that the paintings were closely associated with the work of medicine men, shamans who were involved in the well-being of the band and often worked in a state of trance. Specific representations include depictions of trance dances, metaphors for trance such as death and flight, rainmaking, and control of the movement of antelope herds.

Iron Age

Archaeological evidence shows that Bantu-speaking agriculturists first settled in southern Africa around AD 300. Bantu-speakers originated in the vicinity of modern Cameroon from where they began to move eastwards and southwards, some time after 400 BC, skirting around the equatorial forest. An extremely rapid spread throughout much of sub-equatorial Africa followed: dating shows that the earliest communities in Tanzania and South Africa are separated in time by only 200 years, despite the 3 000 km distance between the two regions. It seems likely that the speed of the spread was a consequence of agriculturists deliberately seeking iron ore sources and particular combinations of soil and climate suitable for the cultivation of their crops.

Metal production was a key activity since it provided the tools of cultivation and hunting. The evidence indicates that people who worked metal lived in almost every village, even those that were considerable distances from ore sources.

Large-scale excavations in recent years have provided data indicating that first-millennium agriculturist society was patrilineal and that men used cattle as bride wealth in exchange for wives. On a political level, society was organised into chiefdoms that, in our region, may have had up to three hierarchical levels. The villages of chiefs tended to be larger than others, with several livestock enclosures, and some were occupied continuously for lengthy periods. Social forces of the time resulted in the concentration of unusual items on these sites. These include artefacts that originated from great distances, ivory items (which as early as AD 700 appear to have been a symbol of chieftainship), and initiation paraphernalia.

This particular way of life came to an end around AD 1000, for reasons that we do not yet fully understand. There was a radical change in the decorative style of agriculturist ceramics at this time, while the preferred village locations of the last four centuries were abandoned in favour of sites along the coastal littoral. In general, sites dating to between 1050 and 1250 are smaller than most earlier agriculturist settlements. It is tempting to see in this change the origin of the Nguni settlement pattern. Indeed, some archaeologists have suggested that the changes were a result of the movement into the region of people who were directly ancestral to the Nguni-speakers of today. Others prefer to see the change as the product of social and cultural restructuring within resident agriculturist communities.

Whatever the case, it seems likely that this new pattern of settlement was in some way influenced by a changing climate, for there is evidence of increasing aridity from about AD 900. A new pattern of economic inter-dependence evolved that is substantially different from that of earlier centuries, and is one that continued into the colonial period nearly 500 years later.

Colonial rule

By the closing decades of the 18th century, South Africa had fallen into two broad regions: west and east. Colonial settlement dominated the west, including the winter rainfall region around the Cape of Good Hope, the coastal hinterland northward toward the present-day border with Namibia, and the dry lands of the interior. Trekboers took increasingly more land from the Khoekhoe and from remnant hunter-gatherer communities, who were killed, were forced into marginal areas, or became labourers tied to the farms of their new overlords. Indigenous farmers controlled both the coastal and valley lowlands and the Highveld of the interior in the east, where summer rainfall and good grazing made mixed farming economies possible.

The specific region of interest in the Kgalagadi includes the settlement of the Khomani San. There is however no evidence of Khomani San settlement at Rietfontein, but more to the south and to the east into Botswana. The area was encroached by European farmers, pastoralists and missionaries and the subsequent settlement of European farmers, trekboers and missionaries took place from the 18th to 19th centuries. The area was also populated by Griqua, Nama and Khoikhoi farmers whom reside in the area to the present day. Certain groups were dislocated and after much consultation, the traditional Khomani San land was handed back to them by means of restitution by the RSA Government. Cooke (1985:78) describes the Kalahari as follows:

“The Kalahari has long been regarded as a hostile environment, in fact as a desert, inhabited only by Bushmen (more correctly San, or in Botswana, Basarwa) who had been pushed there as a last refuge by more powerful peoples. These ideas are no longer completely accepted, and it is considered more likely that the various San groups have developed in situ from earlier, possibly Stone Age stock (Campbell, 1982; Hitchcock, 1982; Denbow, 1983). They are hunter-gatherers and their foraging strategy is well adapted to the environment in which they live. The widespread occurrence of Stone Age artefacts throughout the Kalahari testifies to a very long occupation by Man through a series of climatic vicissitudes (for the latter, see Grey and Cooke, 1977). The first black peoples to enter the area came possibly as early as 200 AD and this early movement continued up until about 900 AD. There is evidence of settlement in the Francistown area from about 400 AD; as far west as Tsodilo and the Boteti river region around 700 AD; and from about 850 AD in the middle of the present-day Central District. The period from 850 AD is well represented in eastern Botswana where more than 200 hilltop sites have been identified by Denbow and others (Denbow, 1982). These people were primarily cattle herders, but also tillers of the soil, and skilled in pottery making and iron working. The importance of cattle raising was probably linked to the freedom of the Kalahari and its margins (except in the north) from tsetse fly infestation. From about 1300 AD there appears a gap in the archaeological record, and a withdrawal of these pastoralist people seems to have taken place. It was possibly caused by progressive environmental deterioration linked to a postulated long drought in southern Africa at this time. From about 1500 AD a reinvasion of black pastoralists and cultivators took place, and ultimately led to the occupation of the country by the present dominant Tswana groups. The Bakgalagadi, who occupy parts of the Kalahari, were probably early arrivals who were forced into the less hospitable areas by later, better organized groups, and there developed a mixed foraging and stock-keeping economy. It is considered highly likely that these pastoral and cultivating peoples, who have occupied the Kalahari margins at various times in the past two millennia, would have naturally penetrated the sandveld to utilize its excellent grazing potential. Such movements would have been controlled by the availability of surface water during the wet season, and for varying periods into the dry season, depending on the amount of water remaining in pans and fossil valleys. They must also have used the

wild resources both plant and animal, as a direct source of human food, especially in years of drought stress. They would thus come into close contact with the indigenous peoples of the Kalahari. Some archaeological evidence of such contacts is coming to light, and the Tswana peoples have certainly made extensive use of Kalahari resources, and in so doing have employed the Basarwa and Bakgalagadi as hunters and herdsmen. Denbow (1983) and Wilmsen (1982) have suggested from their archaeological and anthropological researches that a close interaction between hunter-gatherer and pastoralist/ cultivator groups must have existed over a very long period of time. Climatic oscillations between groups of wetter and groups of drier years, and the endemic occurrence of serious drought must have greatly influenced changes in emphasis between the opportunities offered by the Kalahari and its margins for hunting, food-gathering, pastoralism, and, more rarely, cultivating”.

It is imperative to keep in mind the contact between the various ethnic groups in the area of interest. Development at the assessment area might reveal sub-surface artefacts from any period as described above. The developer should comply with the protocol as described in this report as well as the NHRA.

1. INTRODUCTION

Ubique Heritage Consultants Pty (Ltd) was appointed by Van Zyl Environmental Consultants cc. to undertake a Phase 1 Archaeological Impact Assessment of a proposed upgrade of existing oxidation ponds at Rietfontein in the Northern Cape Province, in terms of the National Environmental Management Act 107 of 1998 as amended (NEMA), in compliance with Section 38 of the National Heritage Resources Act 25 of 1999, as amended (NHRA) (refer to Appendix A).

South Africa's heritage resources are both rich and widely diverse, encompassing sites from all periods of human history. Resources may be tangible, such as buildings and archaeological artefacts, or intangible, such as landscapes and living heritage. Their significance is based upon their aesthetic, architectural, historical, scientific, social, spiritual, linguistic, economic or technological values; their representivity of a particular time period or group; their rarity; and their sphere of influence.

The integrity and significance of heritage resources can be jeopardized by natural (e.g. erosion) and human (e.g. development) activities. In the case of human activities, a range of legislation exists to ensure the timeous and accurate identification and effective management of heritage resources for present and future generations.

This report represents compliance with a full Phase 1 AIA for the proposed development, excluding a specialist social, Palaeontological or meteorite site study.

2. TERMS OF REFERENCE

An AIA must address the following key aspects:

- the identification and mapping of all heritage resources in the area affected;
- an assessment of the significance of such resources in terms of heritage assessment criteria set out in regulations;
- an assessment of the impact of the development on heritage resources;
- 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;
- if heritage resources will be adversely affected by the proposed development, the consideration of alternatives; and
- plans for mitigation of any adverse effects during and after completion of the proposed development.

In addition, the AIA should comply with the requirements of NEMA, including providing the assumptions and limitations associated with the study; the details, qualifications and expertise of the person who prepared the report; and a statement of competency.

2.1. Field study

Conduct a field study to establish and ensure the following:

2.1.1. Systematically survey the proposed project area to locate, identify, record, photograph and describe sites of archaeological, historical or cultural interest.

2.1.2. Record GPS points of identified as significant areas.

2.1.3. Determine the levels of significance of the various types of heritage resources recorded in the project area.

2.2. Reporting

Report on the identification of anticipated and cumulative impacts the development of the proposed project activities may have on the identified heritage resources during the execution of the entire project. Consider alternatives, should any significant sites be impacted adversely by the proposed project. Ensure that all studies, assessments and results comply with the relevant legislation and the code of ethics and guidelines of ASAPA. To assist the developer in managing the discovered heritage resources in a responsible

manner, and to protect, preserve, and develop them within the framework provided by the National Heritage Resources Act of 1999 (Act 25 of 1999).

2.3. Statutory Requirements

2.3.1. General

The Constitution of the Republic of South Africa Act 108 of 1996 is the source of all legislation. Within the Constitution the Bill of Rights is fundamental, with the principle that the environment should be protected for present and future generations by preventing pollution, promoting conservation and practising ecologically sustainable development. With regard to spatial planning and related legislation at national and provincial levels the following legislation may be relevant:

- Physical Planning Act 125 of 1991
- Municipal Structures Act 117 of 1998
- Municipal Systems Act 32 of 2000
- Development Facilitation Act 67 of 1995 (DFA)

The identification, evaluation and management of heritage resources in South Africa is required and governed by the following legislation:

- National Environmental Management Act 107 of 1998 (NEMA)
- KwaZulu-Natal Heritage Act 4 of 2008 (KZNHA)
- National Heritage Resources Act 25 of 1999 (NHRA)
- Minerals and Petroleum Resources Development Act 28 of 2002 (MPRDA)

2.3.2. National Heritage Resources Act 25 of 1999

The NHRA established the South African Heritage Resources Agency (SAHRA) together with its Council to fulfil the following functions:

- co-ordinate and promote the management of heritage resources at national level;
- set norms and maintain essential national standards for the management of heritage resources in the Republic and to protect heritage resources of national significance;
- control the export of nationally significant heritage objects and the import into the Republic of cultural property illegally exported from foreign countries;
- enable the provinces to establish heritage authorities which must adopt powers to protect and manage certain categories of heritage resources; and
- provide for the protection and management of conservation-worthy places and areas by local authorities.

2.3.3. Heritage Impact Assessments/Archaeological Impact Assessments

Section 38(1) of the NHRA of 1999 requires **the responsible heritage resources authority to notify the person who intends to undertake a development that fulfils the following criteria to submit an impact assessment report if there is reason to believe that heritage resources will be affected by such development:**

- the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
- the construction of a bridge or similar structure exceeding 50m in length;
- any development or other activity which will change the character of a site—
 - (i) exceeding 5 000m² 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;
- the re-zoning of a site exceeding 10 000m² in extent; or
- any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority.

Reports in fulfilment of Section 38(3) of the Act must include the following information:

- the identification and mapping of all heritage resources in the area affected;
- an assessment of the significance of such resources in terms of the heritage assessment criteria set out in regulations;
- an assessment of the impact of the development on such heritage resources;
- 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;
- the results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources;
- if heritage resources will be adversely affected by the proposed development, the consideration of alternatives; and
- plans for mitigation of any adverse effects during and after completion of the proposed development.

The AIA or HIA, as a specialist sub-section of the EIA, is required under the National Heritage Resources Act NHRA of 1999 (Act 25 of 1999), Section 38(1), Section 38(8) of the NEMA and the MPRDA. The AIA should be submitted, as part of the EIA, BIA or 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 where after review comments will be issued. 'Best practice' requires Phase 1 AIA reports and additional development information, as per the EIA, BIA/EMP, to be submitted in duplicate to SAHRA after completion of the study. The heritage practitioner in consultation with the client is responsible for uploading the full report on SAHRIS, which is the official information system of SAHRA.

SAHRA accepts Phase 1 AIA reports authored by professional archaeologists, accredited with ASAPA. Minimum accreditation requirements 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 ASAPA in collaboration with SAHRA.

ASAPA is based in South Africa, representing professional archaeology in the SADC region. ASAPA is primarily involved in the overseeing of ethical practice and standards regarding the archaeological profession. Membership is based on proposal and secondment by other professional members. Phase 1 AIAs 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 guidelines 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 can only be conducted with 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 an 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 of a site, a destruction permit must be applied for from SAHRA by the client before development may proceed.

2.3.4. Definitions of heritage resources

The NHRA defines a heritage resource as any place or object of cultural significance i.e. of aesthetic, architectural, historical, scientific, social, spiritual, linguistic or

technological value or significance. This includes, but is not limited to, the following wide range of places and objects:

- living heritage as defined in the National Heritage Council Act No 11 of 1999 (cultural tradition; oral history; performance; ritual; popular memory; skills and techniques; indigenous knowledge systems; and the holistic approach to nature, society and social relationships);
- ecofacts (non-artefactual organic or environmental remains that may reveal aspects of past human activity; definition used in KwaZulu-Natal Heritage Act 2008);
- places, buildings, structures and equipment;
- places to which oral traditions are attached or which are associated with living heritage;
- historical settlements and townscapes;
- landscapes and natural features;
- geological sites of scientific or cultural importance;
- archaeological and palaeontological sites;
- graves and burial grounds;
- public monuments and memorials;
- sites of significance relating to the history of slavery in South Africa;
- movable objects, but excluding any object made by a living person; and
- battlefields.

Furthermore, a place or object is to be considered part of the national estate if it has cultural significance or other special value because of—

- its importance in the community, or pattern of South Africa's history;
- its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;
- its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;
- its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;
- its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
- its importance in demonstrating a high degree of creative or technical achievement at a particular period;
- its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons; and
- its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa.

'Archaeological' means –

- material remains resulting from human activity which are in a state of disuse and are in or on land and 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 is older than 100 years including any area within 10 m of such representation;
- 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 culture zone of the Republic, as defined respectively in sections 3, 4 and 6 of the Maritime Zones Act, 1994 (Act No. 15 of 1994), 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;
- features, structures and artefacts associated with military history which are older than 75 years and the sites on which they are found.

- **'Palaeontological'** means any fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or trace.

A **'place'** is defined as:

- a site, area or region;
- a building or other structure which may include equipment, furniture, fittings and articles associated with or connected with such building or other structure;
- a group of buildings or other structures which may include equipment, furniture, fittings and articles associated with or connected with such group of buildings or other structures;
- an open space, including a public square, street or park; and
- in relation to the management of a place, includes the immediate surroundings of a place.

'Public monuments and memorials' means all monuments and memorials—

- erected on land belonging to any branch of central, provincial or local government, or on land belonging to any organisation funded by or established in terms of the legislation of such a branch of government; or
- which were paid for by public subscription, government funds, or a public-spirited or military organisation, and are on land belonging to any private individual;

'Structures' means any building, works, device or other facility made by people and which is fixed to land, and includes any fixtures, fittings and equipment associated therewith.

2.3.5. Management of Graves and Burial Grounds

- **Graves younger than 60 years** are protected in terms of Section 2(1) of the Removal of Graves and Dead Bodies Ordinance 7 of 1925 as well as the Human Tissues Act 65 of 1983. Such graves 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 Member of the Executive Council 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 the Human Tissues Act 65 of 1983.

- **Graves older than 60 years situated outside a formal cemetery administered by a local authority** are protected in terms of Section 36 of the NHRA as well as the Human Tissues Act of 1983. Accordingly, such graves are the jurisdiction of SAHRA. The procedure for Consultation Regarding Burial Grounds and Graves (Section 36(5) of NHRA) is applicable to graves older than 60 years that are situated outside a formal cemetery administered by a local authority. Graves in the category located inside a formal cemetery administered by a local authority will also require the same authorisation as set out for graves younger than 60 years over and above SAHRA 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.

The **protocol for the management of graves older than 60 years situated outside a formal cemetery administered by a local authority** is detailed in Section 36 of the NHRA:

(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.

The Vermillion Accord on Human Remains¹

Adopted in 1989 at WAC Inter-Congress, South Dakota, USA

1. Respect for the mortal remains of the dead shall be accorded to all, irrespective of origin, race, religion, nationality, custom and tradition.
2. Respect for the wishes of the dead concerning disposition shall be accorded whenever possible, reasonable and lawful, when they are known or can be reasonably inferred.
3. Respect for the wishes of the local community and of relatives or guardians of the dead shall be accorded whenever possible, reasonable and lawful.
4. Respect for the scientific research value of skeletal, mummified and other human remains (including fossil hominids) shall be accorded when such value is demonstrated to exist.
5. Agreement on the disposition of fossil, skeletal, mummified and other remains shall be reached by negotiation on the basis of mutual respect for the legitimate concerns of communities for the proper disposition of their ancestors, as well as the legitimate concerns of science and education.
6. The express recognition that the concerns of various ethnic groups, as well as those of science are legitimate and to be respected, will permit acceptable agreements to be reached and honoured.

3. PROJECT DESCRIPTION

Z.F. Mgcawu District Municipality in agreement with Mier Local Municipality are planning the development and upgrading of the existing oxidation ponds within the

¹ <http://www.worldarchaeologicalcongress.org/>

assessment area near Rietfontein village. Van Zyl Environmental Consultants cc. was appointed as the environmental specialist company to complete an Environmental Impact Assessment of the area of proposed development (See location map) in accordance with the National Environmental Management Act (Act 107 of 1998 as amended).

The site is under jurisdiction of Z.F. Mgcawu District Municipality and locally under jurisdiction of the Mier local Municipality. There are no existing structures, houses, developments in the pathway of the proposed development, except for the existing oxidation ponds that are to be upgraded. According to the BID additional oxidation ponds will be constructed to enlarge the capacity of the oxidation facility. This escalation of construction will be within the development footprint as indicated on the included maps. The presence of Stone Age artefacts in the proposed development site implies a low impact on heritage resources on such heritage resources. There will be no physical or economical displacement of communities, but rather a significant progress in the living conditions of many members of the community at Rietfontein after completion of the proposed project.

4. PROJECT LOCATION AND ENVIRONMENTAL DESCRIPTION

The project covers the areas within the jurisdictions of Mier Local Municipality and Z.F. MGCawu District Municipality. The relevant Surveyor-General 1:50 000 map sheets are as follows:

- i. Rietfontein Locality Map
- ii. 1:50000 Rietfontein 2620 CA and 2619 DB
- iii. Rietfontein Site Oxidation Ponds Development Footprint and Survey track Map
- iv. Garmin Maps (Map source) Footprint and Survey track
- v. Afrigis Google Satellite Image of riverbeds and roads on site
- vi. Afrigis Google Satellite Image of Rietfontein Oxidation Pond Site

The proposed development site consists of an open field of 2 ha with two existing oxidation ponds present on the site. The assessment area directly east of the existing oxidation ponds is filled with stones (Quartzite, sandstone, quartz, jaspilite, jasper and chert). To the east the site borders with one non-perennial dry riverine bed indicating flow from North to South. Along the South western boundary of the site there is a two track sand road present, running from North west to South east. The site is also in fairly close proximity of the international Namibia border and Rietfontein border post to the West of the site. The site is situated on the edge of Rietfontein town (semi-urban), along the west- south-western periphery. The micro-environment of the site is flat; with barely significant contour variation (Approximately 800m above sea level throughout) accept for a few small sand dunes.

The R31 main road runs through the area and almost forms the Northern border of the site as well as through the town of Rietfontein, ending at the Rietfontein Border Post. The R31, however, is spatially removed from the site and has no influence on the site regarding heritage resources. There is no population density on the site; neither are there any commercial farming activities. The only farming activities detected were a herd of small stock (goats) roaming the adjacent dumping site. There are two water bodies present on the site, as mentioned above. The site consists of a typical arid-Kalahari Desert Savanna biome with scattered stones, shrubs, a degree of savanna grass and some *Acacia erioloba* (Kameeldoring) as well as *Acacia haematoxylon* (Vaal Kameeldoring) trees.

Figure 1: RSA Location Map of Proposed Development Area

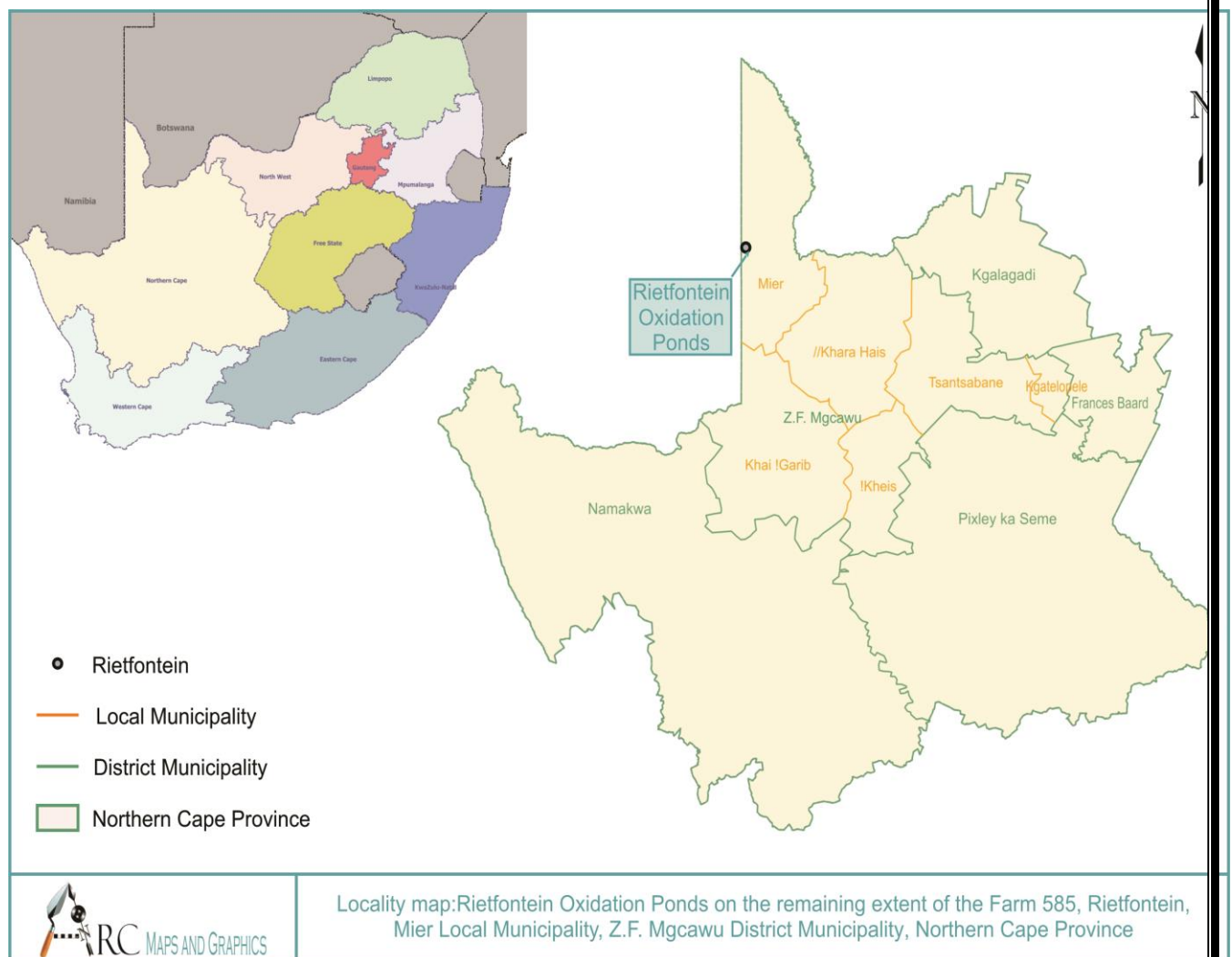
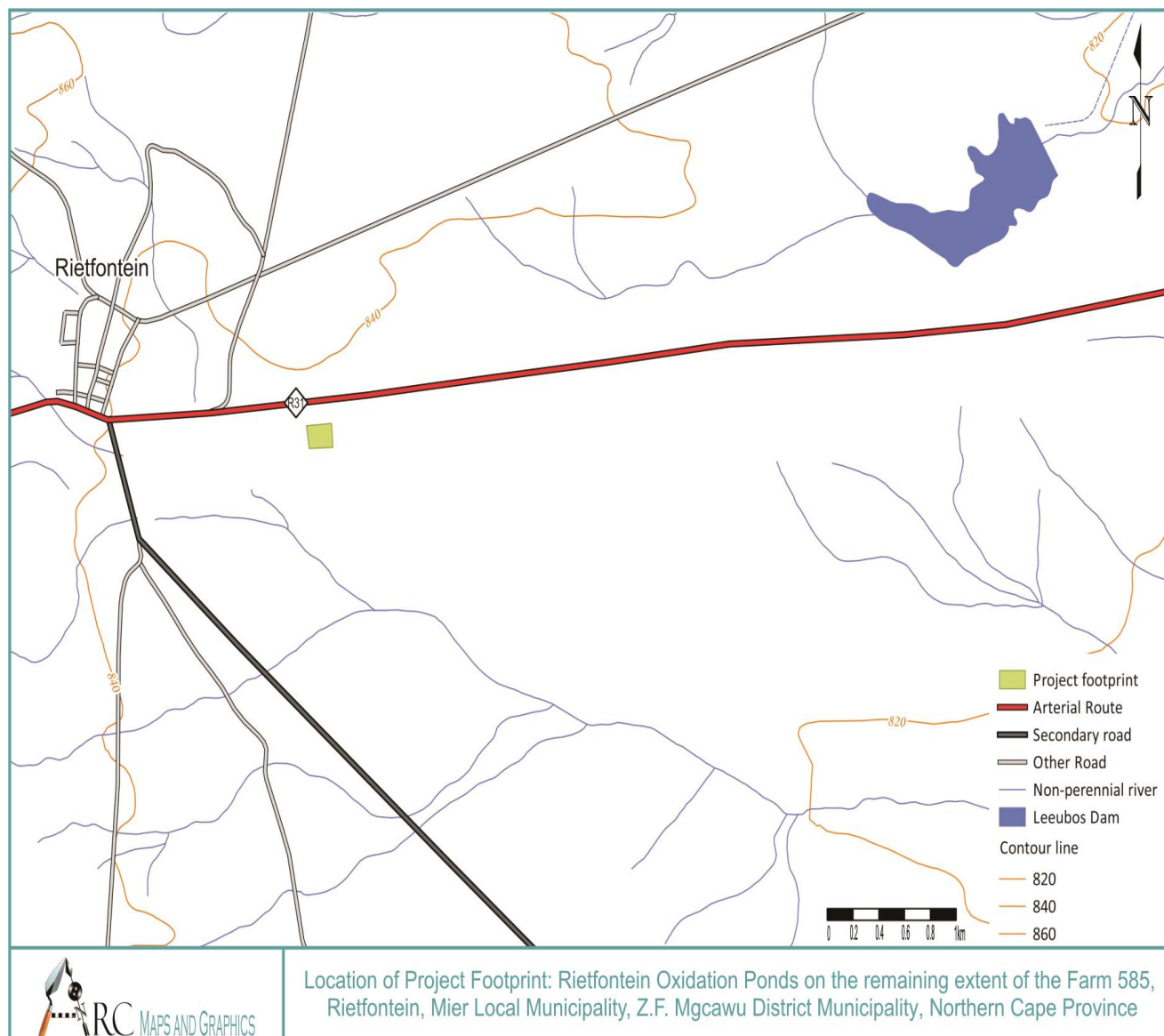


Figure 2: Footprint Location Map of Proposed Development Area (1:50000 2620 CA & 2619 DB Rietfontein)



Regarding the surface mineral deposit of the site, there are no mineral deposits observed on the site, except for scattered pieces of presumably banded iron ore. Subsurface mineral deposits might be possible.

5. METHODOLOGY

5.1. Desktop Study

The first step in the methodology was to conduct a desktop study of the heritage background of the area and the site of the proposed development. This entailed the scoping and scanning of historical texts/records as well as previous heritage studies and research around the study area.

5.2. Literature Research

By incorporating data from previous CRM reports done in the area and an archival search, the study area is contextualised. The objective of this is to extract data and information on the area in question, looking at archaeological sites, historical sites and graves of the area.

5.3. Data Collection

SAHRIS was consulted to collect data from previously conducted CRM projects in the region to provide a comprehensive account of the history of the study area. Three studies were conducted in the immediate vicinity by Engelbrecht (2013) and Van Pletzen-Vos & Rust (2013).

5.4. Consultation

A public participation process is facilitated by the Environmental Consultant for the project.

5.5. Mapping Survey

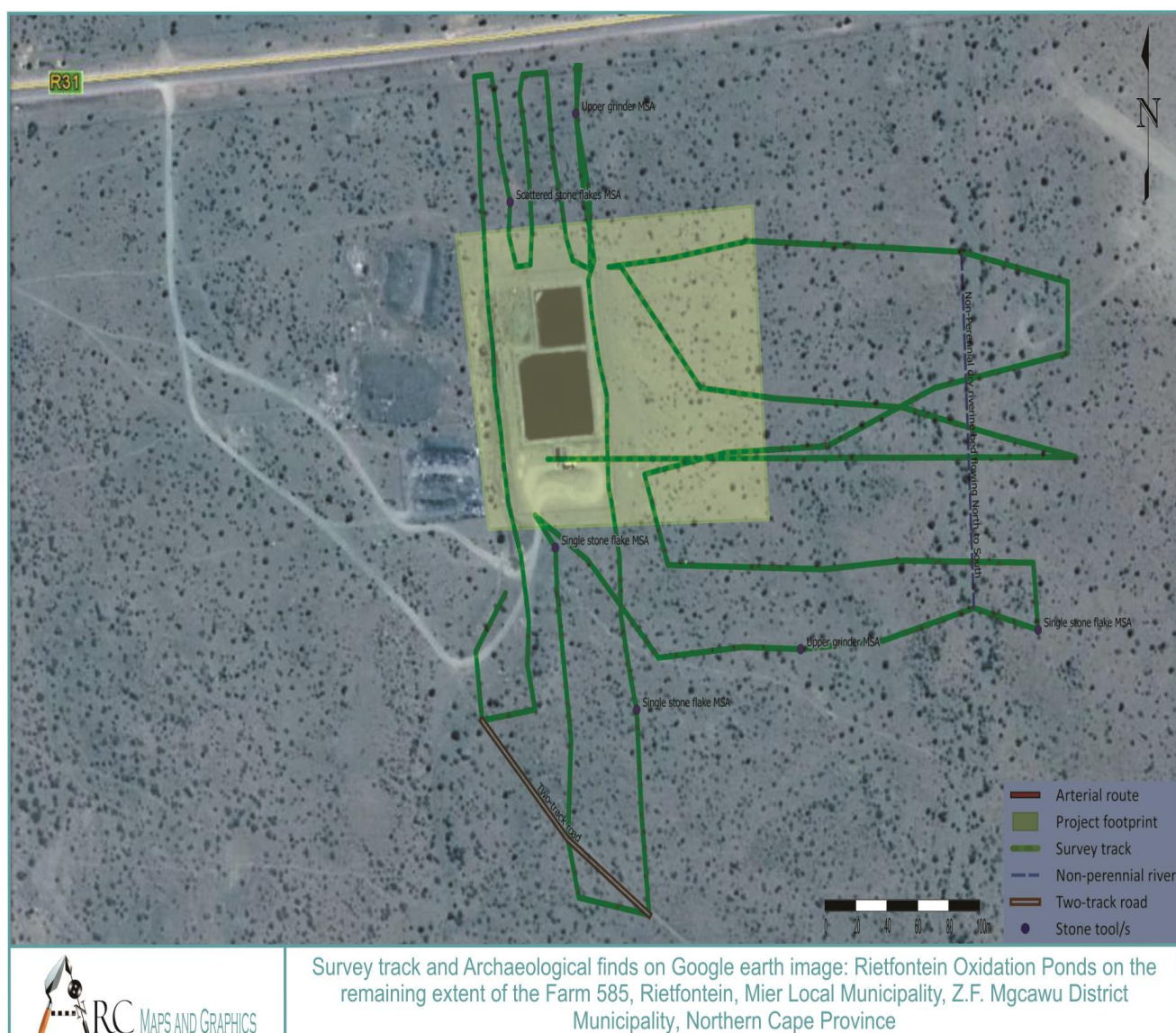
The GIS and mapping consultants; "ARC MAPS AND GRAPHICS" were contracted to develop all professional Google Maps, 1:50000 Maps, Location Maps, Footprint Maps and Track Maps (see included in this report).

5.6. Site Survey

Ubique Heritage Consultants, heritage specialist inspected the proposed development and surrounding areas on 5 and 6 November 2014 and completed a controlled-exclusive surface survey, where sufficient information exists on an area to make solid and defensible assumptions and judgements about where (heritage resource) sites may and may not be and we conducted an inspection of the surface of the ground, wherever this surface is visible. This was done with no substantial attempt to clear brush, turf, deadfall, leaves or other material that may cover the surface and with no attempt to look beneath the surface beyond the inspection of rodent burrows, cut banks and other exposures that are observed by accident (King 1978).

The site survey comprised walks along the proposed development site. Photographs were taken with a Samsung Android S5 camera and a representative selection is included in this report. Geographic coordinates were obtained using a handheld Garmin global positioning unit (Garmin V).

Figure 3: Google Earth Image of Survey Track and Archaeological Finds



5.7. Database and literature review

No archaeological site data was available for the project area. A concise account of the archaeology and history of the broader study area was compiled from sources including those listed in the bibliography.

5.8. Assessment of heritage resource value and significance

Heritage resources are significant only to the extent that they have public value, as demonstrated by the following guidelines for determining site significance developed by Heritage Western Cape in 2007 and utilised during this assessment.

5.8.1. Grade I Sites (National Heritage Sites)

Regulation 43 Government Gazette no 6820. 8 No. 24893 30 May 2003, Notice No. 694 states that:

Grade I heritage resources are heritage resources with qualities so exceptional that they are of special national significance should be applied to any heritage resource which is:

- a) Of outstanding significance in terms of one or more of the criteria set out in section 3(3) of the NHRA;
- b) Authentic in terms of design, materials, workmanship or setting; and is of such universal value and symbolic importance that it can promote human understanding and contribute to nation building, and its loss would significantly diminish the national heritage. The following assessment guidelines were followed:
 - 1. Is the site of outstanding national significance?
 - 2. Is the site the best possible representative of a national issue, event or group or person of national historical importance?
 - 3. Does it fall within the proposed themes that are to be represented by National Heritage Sites?
 - 4. Does the site contribute to nation building and reconciliation?
 - 5. Does the site illustrate an issue or theme, or the side of an issue already represented by an existing National Heritage Site – or would the issue be better represented by another site?
 - 6. Is the site authentic and intact?
 - 7. Should the declaration be part of a serial declaration?
 - 8. Is it appropriate that this site be managed at a national level?
 - 9. What are the implications of not managing the site at national level?

5.8.2. Grade II Sites (Provincial Heritage Sites)

Regulation 43 Government Gazette no 6820. 8 No. 24893 30 May 2003, Notice No. 694 states that:

Grade II heritage resources are those with special qualities which make them significant in the context of a province or region and should be applied to any heritage resource which -

- a) is of great significance in terms of one or more of the criteria set out in section 3(3) of the NHRA; and
- (b) enriches the understanding of cultural, historical, social and scientific development in the province or region in which it is situated, but that does not fulfil the criteria for Grade 1 status.

Grade II sites may include, but are not limited to:

- (a) places, buildings, structures and immovable equipment of cultural significance;
- (b) places to which oral traditions are attached or which are associated with living heritage;
- (c) historical settlements and townscapes;
- (d) landscapes and natural features of cultural significance;
- (e) geological sites of scientific or cultural importance;
- (f) archaeological and palaeontological sites; and
- (g) graves and burial grounds.

The cultural significance or other special value that Grade II sites may have, could include, but are not limited to:

- (a) its importance in the community or pattern of the history of the province;
- (b) the uncommon, rare or endangered aspects that it possess reflecting the province's natural or cultural heritage
- (c) the potential that the site may yield information that will contribute to an understanding of the province's natural or cultural heritage;
- (d) its importance in demonstrating the principal characteristics of a particular class of the province's natural or cultural places or objects;
- (e) its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group in the province;
- (f) its importance in demonstrating a high degree of creative or technical achievement at a particular period in the development or history of the province;
- (g) its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons; and
- (h) its strong or special association with the life or work of a person, group or organization of importance in the history of the province.

5.8.3. Grade III (Local Heritage Resources)

Regulation 43 Government Gazette no 6820. 8 No. 24893 30 May 2003, Notice No. 694 states that:

Grade III heritage status should be applied to any heritage resource which

- (a) fulfils one or more of the criteria set out in section 3(3) of the NHRA; or
- (b) in the case of a site contributes to the environmental quality or cultural significance of a larger area which fulfils one of the above criteria, but that does not fulfill the criteria for Grade 2 status.

Grade IIIA

This grading is applied to buildings and sites that have sufficient intrinsic significance to be regarded as local heritage resources; and are significant enough to warrant *any* alteration being regulated. The significances of these buildings and/or sites should include at least some of the following characteristics:

- Highly significant association with a
 - historic person
 - social grouping
 - historic events
 - historical activities or roles
 - public memory
- Historical and/or visual-spatial landmark within a place
- High architectural quality, well-constructed and of fine materials
- Historical fabric is mostly intact (this fabric may be layered historically and/or past damage should be easily reversible)
- Fabric dates to the early origins of a place
- Fabric clearly illustrates an historical period in the evolution of a place
- Fabric clearly illustrates the key uses and roles of a place over time
- Contributes significantly to the environmental quality of a Grade I or Grade II heritage resource or a conservation/heritage area

Such buildings and sites may be representative, being excellent examples of their kind, or may be rare: as such they should receive maximum protection at local level.

Grade IIIB

This grading is applied to buildings and/or sites of a marginally lesser significance than grade IIIA; and such marginally lesser significance argues against the regulation of internal alterations. Such buildings and sites may have similar significances to those of a grade IIIA building or site, but to a lesser degree. Like grade IIIA buildings and sites, such buildings and sites may be representative, being excellent examples of their kind, or may be rare, but less so than grade IIIA examples: as such they should receive less stringent protection than grade IIIA buildings and sites at local level and internal alterations should not be regulated (in this context).

Grade IIIC

This grading is applied to buildings and/or sites whose significance is, in large part, a significance that contributes to the character or significance of the environments. These buildings and sites should, as a consequence, only be protected and regulated *if the significance of the environs is sufficient to warrant protective*

measures. In other words, these buildings and/or sites will only be protected if they are within declared conservation or heritage areas.

5.9. Assessment of development impacts

A heritage resource impact may be defined broadly as the net change, either beneficial or adverse, between the integrity of a heritage site with and without the proposed development. Beneficial impacts occur wherever a proposed development actively protects, preserves or enhances a heritage resource, by minimising natural site erosion or facilitating non-destructive public use, for example. More commonly, development impacts are of an adverse nature and can include:

- destruction or alteration of all or part of a heritage site;
- isolation of a site from its natural setting; and / or
- introduction of physical, chemical or visual elements that are out of character with the heritage resource and its setting.

Beneficial and adverse impacts can be direct or indirect, as well as cumulative, as implied by the aforementioned examples. Although indirect impacts may be more difficult to foresee, assess and quantify, they must form part of the assessment process. The following assessment criteria have been used to assess the impacts of the proposed development on possible identified heritage resources:

Criteria	Rating Scales	Notes
Nature	Positive	An evaluation of the type of effect the construction, operation and management of the proposed development would have on the heritage resource.
	Negative	
	Neutral	
Extent	Low	Site-specific, affects only the development footprint.
	Medium	Local (limited to the site and its immediate surroundings, including the surrounding towns and settlements within a 10 km radius);
	High	Regional (beyond a 10 km radius) to national.
Duration	Low	0-4 years (i.e. duration of construction phase).
	Medium	5-10 years.

Criteria	Rating Scales	Notes
	High	More than 10 years to permanent.
Intensity	Low	Where the impact affects the heritage resource in such a way that its significance and value are minimally affected.
	Medium	Where the heritage resource is altered and its significance and value are measurably reduced.
	High	Where the heritage resource is altered or destroyed to the extent that its significance and value cease to exist.
Potential for impact on irreplaceable resources	Low	No irreplaceable resources will be impacted.
	Medium	Resources that will be impacted can be replaced, with effort.
	High	There is no potential for replacing a particular vulnerable resource that will be impacted.
Consequence a combination of extent, duration, intensity and the potential for impact on irreplaceable resources).	Low	A combination of any of the following: <ul style="list-style-type: none"> - Intensity, duration, extent and impact on irreplaceable resources are all rated low. - Intensity is low and up to two of the other criteria are rated medium. - Intensity is medium and all three other criteria are rated low.
	Medium	Intensity is medium and at least two of the other criteria are rated medium.
	High	Intensity and impact on irreplaceable resources are rated high, with any combination of extent and duration. Intensity is rated high, with all of the other criteria being rated medium or higher.
Probability (the likelihood of the	Low	It is highly unlikely or less than 50 % likely that an impact will occur.

Criteria	Rating Scales	Notes
impact occurring)	Medium	It is between 50 and 70 % certain that the impact will occur.
	High	It is more than 75 % certain that the impact will occur or it is definite that the impact will occur.
Significance (all impacts including potential cumulative impacts)	Low	Low consequence and low probability. Low consequence and medium probability. Low consequence and high probability.
	Medium	Medium consequence and low probability. Medium consequence and medium probability. Medium consequence and high probability. High consequence and low probability.
	High	High consequence and medium probability. High consequence and high probability.

5.10. Assumptions and limitations of this AIA

- The description of the proposed project, provided by the client, is assumed to be accurate.
- The public consultation process undertaken as part of the Environmental Impact Assessment is sufficient and adequate and does not require repetition as part of the heritage impact assessment.
- Soil surface visibility was good. Heritage resources might be present below the surface and we remind the client that the NHRA requires that a developer cease all work immediately and observe the protocol in this report should any heritage resources, as defined in the Act, be discovered during the course of development activities.
- No subsurface investigation (including excavations or sampling) were undertaken, since a permit from SAHRA is required to disturb a heritage resource.

- A key concept in the management of heritage resources is that of non-renewability: damage to or destruction of most resources, including that caused by bona fide research endeavours, cannot be reversed or undone. Accordingly, management recommendations for heritage resources in the context of development are as conservative as possible.
- Human sciences are necessarily both subjective and objective in nature. Ubique Heritage Consultants (Pty) Ltd strive to manage heritage resources to the highest standards in accordance with national and international best practice, but recognise that their opinions might differ from those of other heritage practitioners.
- Staff members involved in this project have no vested interest in it; are qualified to undertake the tasks as described in the executive summary and terms of reference in this report and comply at all times with the Codes of Ethics and Conduct of the Association of Southern African Professional Archaeologists.
- Ubique Heritage Consultants staff members take no personal or professional responsibility for the misuse of the information contained in this report, although they will take all reasonable precautions against such misuse.

6. **OBSERVATIONS**

No development activities associated with the proposed project had begun at the time of our survey. The following table summarises the heritage resource types assessed, and our observations.

6.1. **HERITAGE RESOURCES: OBSERVATION AND FINDINGS**

Heritage resource type	Observation
Places, buildings, structures and equipment	None were identified within the proposed development area.
Places associated with oral traditions or living heritage	None were identified within the proposed development area.
Landscapes	None were identified within the proposed development area except for one existing gravel road. Two existing oxidation ponds are present on the development footprint. Access routes are permanent and indicated on the included maps. These will be the access routes to be used by any contractor involved in the proposed development and construction.
Natural features	None were identified within the proposed development area, except for one dry riverine bed, which is adjacent to the

	development footprint..
Traditional burial places	None were identified within the proposed development area.
Ecofacts	None were identified within the proposed development area.
Geological sites of scientific or cultural importance	None were identified within the proposed development area.
Archaeological sites	Apart from scattered stone tool residue of MSA and LSA provenance, as indicated on included maps and descriptions, no significant residues of heritage artefacts were recorded in the survey.
Historical settlements and townscapes	None were identified within the proposed development area; however Rietfontein town has a recorded history of missionary activity during the 19 th and 20 th century as well as battles during the 19 th century. The assessment area is however excluded from these historical events. The entire Rietfontein area is however sensitive in terms of colonial historical events and should be kept in mind by the developer.
Public monuments and memorials	None were identified within the proposed development area. The historical church of the “Rynse Sending Gemeente” at Rietfontein however is a declared National museum.
Battlefields	None were identified within the proposed development area. There are historical texts evident of a battle that occurred on 19 March 1915 between SA Union soldiers and German forces apparently during the period of the Boer Rebellion which commenced during 1914. The historical evidence does not elaborate on the exact fixation of the battle in relation to the development footprint.

The following is a summary of archaeological finds:

DESCRIPTION	PERIOD	GRID
Scattered Stone Flakes	MSA	26.74647° S 20.04481° E
Upper Grinder	MSA	26.74606° S 20.04523° E
Single Stone Flake	MSA	26.74882° S 20.04562° E
Single Stone Flake	MSA	26.74807° S 20.04510° E
Upper Grinder	MSA	26.74854° S 20.04667° E
Single Stone Flake	MSA	26.74845° S 20.04819° E

The Rietfontein oxidation ponds site was surveyed and as indicated above, low significance MSA and LSA archaeological material was observed on the site. Images of the site are as follows:

FIGURE 4: Track Survey on Footprint - 1:50000 2620CA & 2619 DB: Rietfontein Oxidation Ponds



FIGURE 5: Stone Tool (MSA/LSA)



FIGURE 6: Stone Tool (MSA/LSA)



FIGURE 7: Stone Tool – Upper Grinder (MSA/LSA)



FIGURE 8: Stone Tool: Upper Grinder (MSA/LSA)

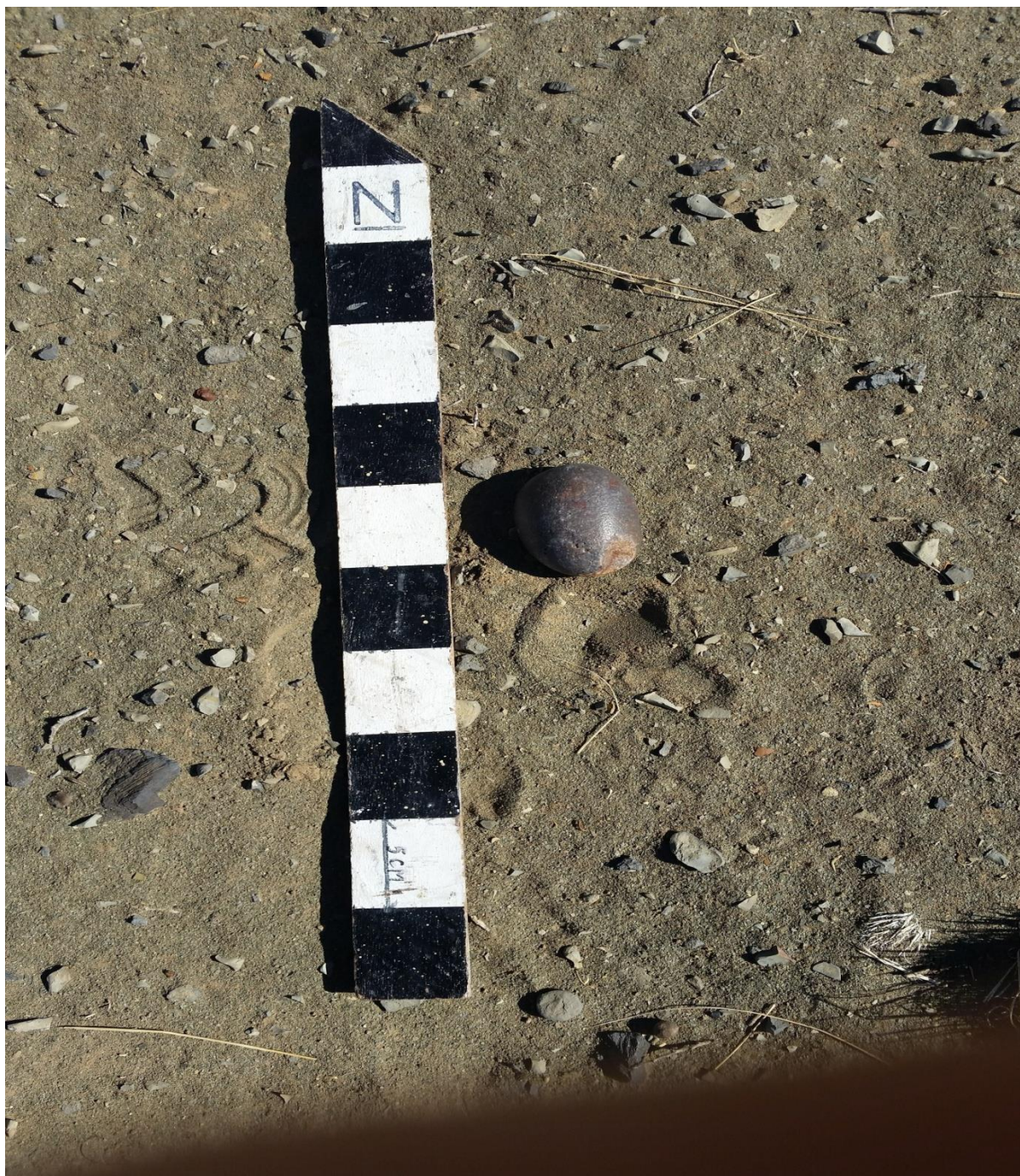


FIGURE 9: Scattered Stone Tools (MSA/LSA)

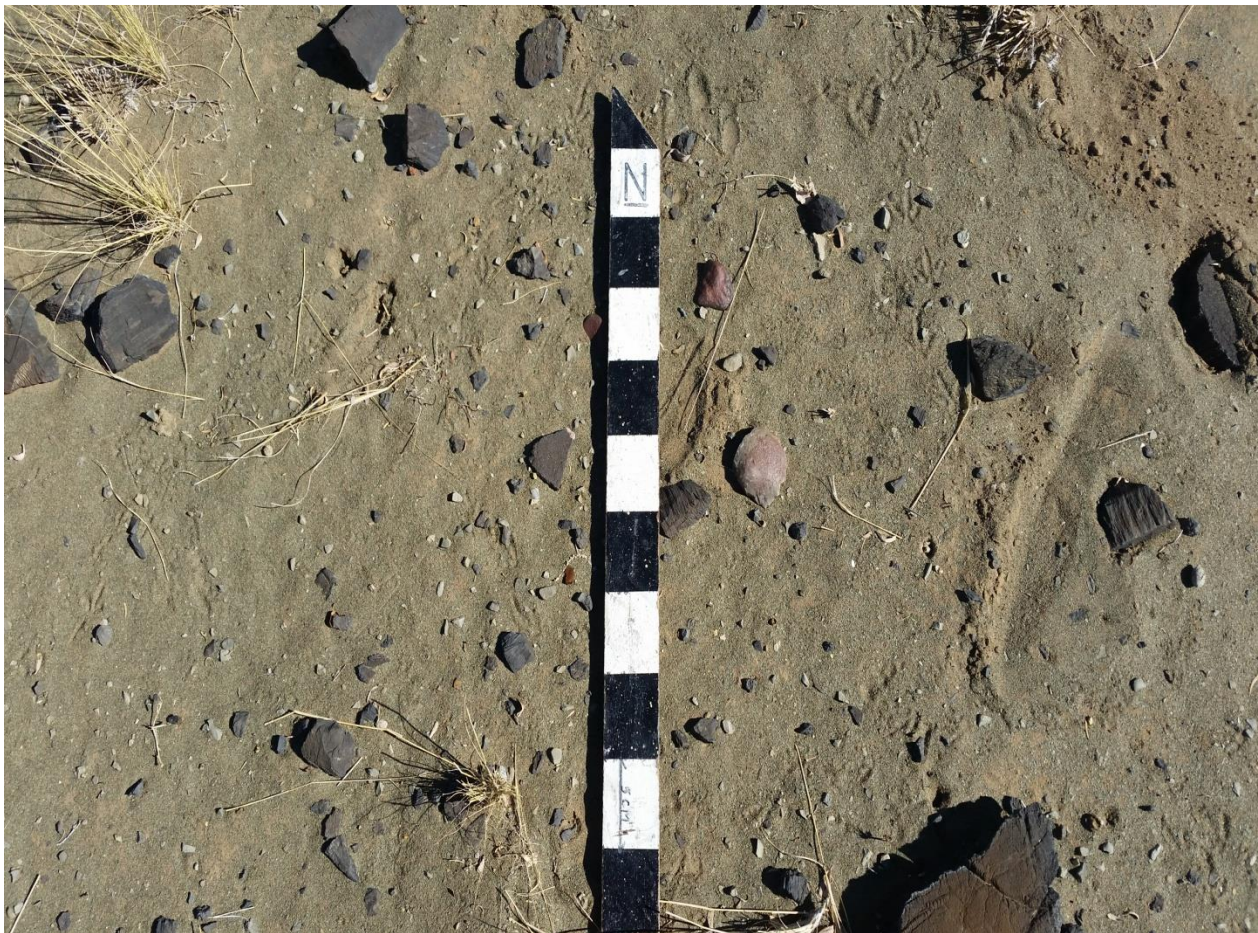


FIGURE 10: Flake Possibly MSA/LSA



FIGURE 11: Stone Tool – Upper Grinder (MSA/LSA)



FIGURE 12: Stone Tool- Single Flake (Triangular/LSA)



FIGURE 13: Oxidation Ponds at Rietfontein Proposed Development Site



FIGURE 14: Existing Structures at Rietfontein Oxidation Ponds to be Upgraded



FIGURE 15: Existing Oxidation Pond to be upgraded



FIGURE 16: Oxidation Ponds to be upgraded at Rietfontein (Two existing ponds)



FIGURE 17: Environmental Risk 1



FIGURE I8: Environmental Risk 2



FIGURE 19: Environmental Risk 3



FIGURE 20: Two Oxidation Ponds to be Upgraded



FIGURE 21: Existing Dumping Drain at Rietfontein Oxidation Ponds



7. ASSESSMENT OF DEVELOPMENT IMPACTS

7.1. Living Heritage

It is likely that living heritage has low heritage significance at the community specific, local and regional levels at least for its historic, social, cultural and spiritual values.

7.2. Places, buildings, structures and Equipment

It is likely that places, buildings, structures and equipment related to heritage has a low heritage significance at the community specific, local and regional levels at least for its historic, social, cultural and spiritual values.

7.3. Places of Oral Traditions Associated with Living Heritage

It is likely that places of oral traditions associated with living heritage has a low heritage significance at the community specific, local and regional levels at least for its historic, social, cultural and spiritual values.

7.4. Historical Settlements and Townscapes

It is likely that historical settlements and townscapes related to heritage on the development footprint has a low heritage significance at the community specific, local and regional levels at least for its historic, social, cultural and spiritual values.

No historical settlements were recorded on the site and the development will ensure enhanced social and physical conditions in terms of hygiene, safety and health.

7.5. Landscapes and Natural Features

As noted in this report, an AIA is required to identify all heritage resources, including landscapes and natural features that may be affected by a proposed development, both directly and indirectly. Landscapes and natural features directly affected by the proposed development is absent except for the construction and upgrading of existing infrastructure, as well as adjacent areas that will experience probable high levels of traffic, noise and dust, and light at night. These areas will also be subject to significant visual and ecosystem changes. Regarding the cultural landscape of the Rietfontein oxidation Pond site and surrounds, we have not undertaken a specialist social and Palaeontological assessment of this landscape, since such a study is not within our field of expertise. However, we have observed that the overall topography within the proposed development area is flat and comprises some low sand dunes, a dry riverine bed and an external two track gravel road. The entire assessment area is a flat plain and the only disturbances, apart from existing structures, is the natural riverine. The dumping site and road adjacent to the development footprint are also disturbances to be kept in mind.

7.6. Archaeology

The impact on archaeological remains, material and objects is significantly low. Archaeological objects were recorded and scattered stone tools as indicated per GPS fixation on the site are present. The stone tool residue recorded on the site dates from the Middle and Later Stone age (See images). It is however likely that archaeological remains on the site has low heritage significance at the community specific, local and regional levels at least for its historic and, cultural values. Development can thus continue.

The nearest LSA site discovered by Ubique Heritage Consultants was approximately 20 km North of Rietfontein (Gemeentesdam Farm Grid: 26° 38' 55,4" S 20° 00' 00,3" E) within the red dunes of the Kalahari (See images). It is therefore possible that the provenance of manufactured stone tools might have been by the San people (Khomani San). Further South at Bakrivier Farm (Approximately 30km from Nakop Border Post Grid: 27° 58' 40,6" S 19° 59' 57,3" E) another LSA site was discovered by Ubique Heritage Consultants. These San groupings utilised Noenieput as their stone resource/raw material for tool manufacturing. The reason for including the Gemeentesdam and Bakrivier material is to draw a comparison between the material used, as well as the physical archaeological material. The material used at the Dune sites is similar to that material found at the Rietfontein oxidation ponds and the propose development site. Comparison of the physical traits of the stone tools however does show similarity between the Rietfontein sites and the Dune sites. The

following images comprise of the artefacts discovered at the Gemeentesdam 585 Farm area:

FIGURE 22: Gemeentesdam 585 Artefacts



FIGURE 23: Gemeentesdam 585 Artefacts Continue



FIGURE 24: Gemeentesdam 585 Artefacts



8. PALAEONTOLOGY

No Palaeontological Impact Assessment (PIA) was conducted by Ubique Heritage Consultants (Pty) Ltd. According to the client, any Palaeontological studies will be conducted by a specialist appointed by the client if necessary.

9. GRAVES AND BURIAL GROUNDS

The Rietfontein town has its own Municipal cemetery to the south of Rietfontein town. No burial grounds or graves were recorded during our survey and consultation with the local community confirmed the absence of any graves on the site. Graves, burial sites and human remains have no heritage significance at all levels for their social, cultural and spiritual values.

10. PUBLIC MONUMENTS AND MEMORIALS

No public monuments or memorials were recorded on the site. The historical missionary church (Rynse Sending Gemeente) in Rietfontein town is a declared National Monument. Public monuments or memorials have no heritage significance at all levels for their social, cultural and spiritual values within the proposed development footprint.

11. HISTORY

The area surrounding Rietfontein and the general Kalahari region was traditionally inhabited by the San people until 1867. Rietfontein was historically a farm, named "Has", but after the first minister of the "Rynse" church in "Has", found a fountain in the area, overgrown with reeds, the name soon changed to "Rietfontein". This name prevailed until today. During 1867 communities settled in and around Rietfontein with Dirk Vilander as the leader of the local community at Rietfontein from 1867 to 1888. The establishment of a mission station at Rietfontein, as well as the attractive hunting fields, lead to the growth and expansion of Rietfontein. People settled in Rietfontein from as far as Grootfontein in Namibia and even the Cape Colony. The first mission station at Rietfontein was affiliated under the "Rynse Sending Genootskap" and the first minister was Reverend Pabst.

Around the time of the Great War (1914-1918) an offensive was launched against enemy soldiers from the current Namibia (presumably Germans) in the Rietfontein area. The campaign was lead by one Capt van Vuuren on 19 March 1915 who was in command of one squadron (100rifles) of South African Union soldiers. Their resistance consisted of 200 enemy soldiers, but Van Vuuren and his men defeated the enemy at Rietfontein.

"The enemy retired with the loss of their transport and supplies, and left 4 killed, 20 wounded and 2 captured on the field." The great war-official history (1924:64).

The importance of water at Rietfontein (Has) was the centre of gravity and the main reason of settlement and growth at Rietfontein. Secondary to that was the rich hunting opportunities. The mission station closed during 1935 and a large number of the community relocated to Rehoboth, Keetmanshoop and the Cape Colony.

FIGURE 25: National Monument at Rietfontein (Rynse sending gemeente ca. 1885-1935)



12. MITIGATION AND RECOMMENDATIONS

Regarding the impact on heritage on the proposed development site, the impact on Stone Age material will be significantly low to medium in our professional point of view. We see no reason for the development not to continue, as it will improve the livelihood of many people in a region where poverty is at its worse. The upgrading of the Rietfontein oxidation ponds will enhance the basic human conditions, safety and health of the community.

Due to the low impact of development on heritage resources, we thus recommend the upgrade of the existing oxidation ponds as described by the client. The assessment is however subject to the approval of SAHRA in terms of salvage of artefacts by means of rescue archaeology. If this is recommended and approved by SAHRA, as mentioned, it will entail a Phase 2 AIA and the application of a permit accordingly. We do not foresee such an instruction.

13. PROTOCOL DURING DEVELOPMENT

It is possible that sub-surface heritage resources might be encountered during the construction phase of this project. The Project Engineer, Environmental Control Officer and all other persons responsible for site management and excavation should be aware that indicators of sub-surface sites could include:

- Ash deposits (unnaturally grey appearance of soil compared to the surrounding substrate);
- Bone concentrations, either animal or human;
- Ceramic fragments, including potsherds;
- Stone concentrations that appear to be formally arranged (may indicate the presence of an underlying burial)
- Fossilised remains of fauna and flora, including trees.
- Stone tool concentrations from San origin.

In the event that such indicator(s) of heritage resources are identified, the following actions should be taken immediately:

- All construction within a radius of at least 20m of the indicator should cease. This distance should be increased at the discretion of supervisory staff if heavy machinery or explosives could cause further disturbance to the suspected heritage resource.
- This area must be marked using clearly visible means, such as barrier tape, and all personnel should be informed that it is a no-go area.
- A guard should be appointed to enforce this no-go area if there is any possibility that it could be violated, whether intentionally or inadvertently, by construction staff or members of the public.
- No measures should be taken to cover up the suspected heritage resource with soil, or to collect any remains such as bone, ceramics or stone.
- If a heritage practitioner has been appointed to monitor the project, s/he should be contacted and a site inspection arranged as soon as possible.
- If no heritage practitioner has been appointed to monitor the project, SAHRA or Dr. D. Morris must be contacted at the SAHRA head office or at the McGregor museum.
- The South African Police Services should be notified by a SAHRA staff member or an independent heritage practitioner if human remains are identified. No SAPS official may disturb or exhume such remains, whether of recent origin or not.
- All parties concerned should respect the potentially sensitive and confidential nature of the heritage resources, particularly human remains, and refrain from making public statements until a mutually agreed time.
- Any extension of the project beyond its current footprint involving vegetation and/or earth clearance should be subject to prior assessment by a qualified

heritage practitioner, taking into account all information gathered during this initial heritage impact assessment.

14. CONCLUSION

We recommend that the development proceed with the proposed heritage mitigation and have submitted this report to SAHRA in fulfilment of the requirements of the NHRA. According to Section 38(4) of the Act the report shall be considered timeously by the Council which shall, after consultation with the person proposing the development, decide –

- whether or not the development may proceed;
- any limitations or conditions are to be applied to the development;
- what general protections in terms of this Act apply, and what formal protections may be applied to such heritage resources;
- whether compensatory action shall be required in respect of any heritage resources damaged or destroyed as a result of the development; and
- Whether the appointment of specialists is required as a condition of approval of the proposal.

SAHRA head office may be contacted (South African Heritage Resources Agency, 111 Harrington Street Cape Town 8001; E-mail: ksmuts@sahra.org.za Tel: (+27) 21-4624502.

If permission is granted for development to proceed, we confirm that the client is reminded that the NHRA requires that a developer cease all work immediately and follow the protocol in this report should any heritage resources, as defined in the Act, be discovered during the course of development activities.

15. STATEMENT OF COMPETENCY

15.1. Specialist competency

Jan Engelbrecht is accredited by the Cultural Resources Management section of the Association of Southern African Professional Archaeologists (ASAPA) to undertake Phase 1 AIA's and HIA's in South Africa. He is also a member of the Association for Professional Archaeologists (ASAPA). Mr Engelbrecht has an honours degree in archaeology (specialising in the history of early farmers in southern Africa (Iron Age and Colonial period) from the University of South Africa and has 7 years' experience in heritage management. He has worked on projects as diverse as the Zulti South HIA project of Richards Bay Minerals for mining activities, research on the David Bruce heritage site at Ubombo in Kwa-Zulu Natal and various archaeological excavations and historical projects. He has worked with many rural communities to establish integrated heritage and land use plans and speaks Zulu fluently.

Mr. Engelbrecht established Ubique Heritage Consultants during 2012. The company moved from KZN to the Northern Cape and is currently based at Askham in the Northern Cape under Mier local municipality in the Kgalagadi region. He followed a significant military career as an officer, where after he qualified as an Animal Health Technician at Technikon RSA. He is currently studying for his MA Degree in Archaeology. Experience in heritage related work is as follows:

HERITAGE IMPACT ASSESSMENT EXPERIENCE – Assistant/Technician/Archaeologist

- **Note:** All Heritage related work as well as surveys and other archaeological related work was done under the supervision of a professional archaeologist and in an assisting or technical capacity until 2009.

PERIOD: 2006

- ❖ Hlabayalingana Palaeontological Site Survey and Impact Study under supervision of AMAFA.
- ❖ Pongola Site Survey – Ntshangase Tribal Trust under supervision of AMAFA.
- ❖ Ithala Game Reserve Heritage Impact Assessment under supervision of AMAFA.
- ❖ Isandlwana Site Survey and assistance with Heritage Management Plan under supervision of AMAFA.
- ❖ Border Cave Site Monitoring and assistance with Heritage Management Plan under supervision of AMAFA.
- ❖ Muden (KZN) (eThembeni Heritage) Assisting in Heritage Impact Assessment together with professional archaeologist Mr. Len van Schalkwyk.

PERIOD: 2007

- ❖ Blood River Site Investigation under supervision of professional archaeologist, Ms. E. Becker.
- ❖ Bergville Iron Age Site Survey and Heritage Impact Assessment under supervision of AMAFA.
- ❖ Golela Nature Reserve Heritage Impact Assessment under supervision of AMAFA.
- ❖ Bizana Eastern Cape Heritage Impact Assessment under supervision of professional archaeologist Ms. E. Becker.
- ❖ David Bruce (Ubombo) Historical Heritage Impact Assessment and Site Investigation under supervision of AMAFA.

PERIOD: 2008

- ❖ Sodwana Bay Heritage Impact Assessment under supervision of professional archaeologist Ms. E. Becker.
- ❖ Port Nolloth Local Museum Upgrade – Assistance with research and Anthropological Interviews under supervision of professional archaeologist Ms. E. Becker.
- ❖ Brussels Estate North West Province Site Survey under supervision of professional archaeologist Prof J.C.A Boeyens, Dr. M.M. van der Ryst, Mr. F.P. Coetzee and Ms. E. Becker.
- ❖ Assist with HIA for Eskom line between Volksrust and Ladysmith under supervision of professional archaeologist Ms. E. Becker and Knights Piesold Consulting.

PERIOD: 2010-2013

- ❖ Registration and establishment of Ubique Heritage Consultants
- ❖ Assist eThembeni Heritage with Heritage & Archaeological impact assessment at Richards Bay Minerals (Zulti South region)
- ❖ Rietfontein HIA completed for Enviroafrica cc. – RDP Housing Project



J.A.C. ENGELBRECHT

UBIQUE HERITAGE CONSULTANTS Pty (Ltd)

PROFESSIONAL ARCHAEOLOGIST

DATE: 2014-11-12

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