

HERITAGE IMPACT ASSESSMENT REPORT

PORTION 26 OF THE FARM KROMDRAAI 520JQ, CRADLE OF
HUMANKIND WORLD HERITAGE SITE, SOUTH AFRICA

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EXECUTIVE BRIEF

The Cradle of Humankind World Heritage Site (COHWHS) (Fig 1) is located near Krugersdorp, in the north-western border of Gauteng Province and extends into the North West Province. It was listed as a United Nations Educational and Scientific Committee (UNESCO) World Heritage Site in 1999 owing to the extremely significant evidence of human evolution that it hosts. In 2005, the Makapans Valley in Limpopo and Taung in the North West were added to create a serial listing known as the Fossil Hominid Sites of South Africa World Heritage Site. Some of the most prominent hominid finds from this World Heritage Site include the Taung Child, Mrs Ples, Little Foot and Karabo (*Australopithecus sediba*) (COHWHS Management Plan 2013).

This just over 50 000 hectare COHWHS spans across 1247 subdivided farm portions. It is approximately 2km to the north of Krugersdorp, 50km from Johannesburg City Centre – to the South East, 12km from Randburg to the South East and 40km from Pretoria to the North East (Cradle of Humankind Management Plan 2014-17). Local authorities include the West Rand District Municipality (WRDM) and the Mogale City Local Municipality (MCLM) in Gauteng and the Bojanala Platinum District Municipality and the Madibeng Local Municipality in North West Province (ibid). Excluding a portion of land owned by the WRDM, the demarcated site is entirely privately-owned.

The COHWHS site is managed by a Management Authority on behalf of the State Party represented by the South African Minister of Environmental Affairs. The Management Authority is responsible for day to day management and falls under the MEC for Economic Development in Gauteng Province. To achieve long term sustainability and effectiveness, a Master Plan was developed in 2000 and has since then guided all conservation, development and research work at the site.

According to the COHWHS Management Plan (2014-2017), the primary aim of the Management Authority is to protect and preserve the site, promote further scientific research, encourage community participation and stimulate tourism development that will benefit local communities and ultimately contribute to Local Economic Development (LED). Indeed, many of the private landowners in the area significantly derive economic benefits from the COHWHS.

The Cradle of Humankind World Heritage Site contributes significantly to Gauteng's economy. For example, the COHWHS's total GDP contribution to Gauteng in 2004 was estimated at 0.59% which is not insignificant.

During the same time, the COH WHS consumption activity was estimated at R 1.58 billion with direct employment amounting to 10 484 and indirect employment to 11 226. With this solid performance, the COH WHS is making a real contribution to job creation and economic growth. While the Master Plan emphasises the need to achieve conservation alongside sustainable economic growth, it has been silent on how previously disadvantaged populations, particularly the descendants of the farm labourers and communities that used to occupy the area may benefit from the World Heritage property. This is essential because the benefits from the World Heritage Site must filter across different segments of the population. As such, any management and conservation of the site should ensure that previously marginalised groups also directly benefit from this windfall of economic benefits.

In view of the urgent need to achieve equity and redress past imbalances, West Rand District Municipality purchased Portion 26 of the farm Kromdraai 520JQ to settle about 72 families that used to work on the farms. These people were settled as part of a government initiative called the Comprehensive Rural Development Programme (CRDP). In the absence of a comprehensive impact assessment, the structures that were built are comprised of shacks that may have to be upgraded to provide decent accommodation to previously disadvantaged groups. This land was previously farmland and is adjacent to an existing development. Upgrading will achieve a better visual impact which will enhance the values of the landscape overall.

It is anticipated that should it be determined that the upgrading goes ahead, the project will involve the following:

- Upgrade of existing dwellings
- Upgrade of existing soccer pitch
- Upgrade of existing nursery and community garden
- Creation of roads on already disturbed ground

The major challenge is that portion 26 of Kromdraai 520JQ is situated within the boundary of the Cradle of Humankind World Heritage Site. In particular, it is about 2.4 kilometres from the fossil and hominin bearing sites of Kromdraai to the south and Plover's Lake to the northwest (Durand 2014). West Rand District Municipality and Mogale City Local Municipality engaged with the State Party represented by the Department of Environmental Affairs and the Management Authority to find a way to balance service provisioning with sustainable World Heritage conservation.

The State Party requested that a comprehensive impact assessment process be carried out using ICOMOS Guidelines (2011) to evaluate the potential direct and indirect impact of the upgrade or any anticipated future development on attributes that convey the Cradle of Humankind World Heritage Site's Outstanding Universal Value (OUV). Mogale City Local Municipality contracted Naledzi Environmental Consultants who enlisted the services of Siyathembana Trading 293 (Pty) Ltd, an independent consulting company to carry out this assessment.

The terms of reference required a two part HIA process. The first is an assessment of the direct and indirect impact of the upgrade/formalisation of existing facilities on attributes that convey the OUV of the Cradle of Humankind using ICOMOS guidelines. Attributes that convey OUV are mostly fossil bearing sites and the Bankenveld grasslands which together form an internationally significant cultural and natural landscape. The second is a thorough assessment of the direct and indirect impact of the proposed upgrade/formalisation on heritage sites situated on portion 26 of the farm Kromdraai 520JQ using the National Heritage Resources Act of 1999.

A multi-stepped methodology was used to address the terms of reference. To begin with, a robust desktop study was carried out to understand the framework for managing and assessing impact near World Heritage Sites. This included consulting the 1972 Convention, the operational guidelines of 2013, the ICOMOS (2011) guidelines on assessing impact near World Heritage sites. The IUCN guidelines and standards of best practice were also consulted. Subsequently, a review of the palaeontology and archaeology of the area was carried out using contract archaeology reports, research reports and academic publications.

Desktop studies were followed by fieldwork carried out by expert palaeontologists, archaeologists and heritage managers in conformity with the National Heritage Resources Act of 1999. During fieldwork, a hundred percent coverage was carried out for the area already occupied by the development. A stakeholder engagement process was also carried out, mainly with compliance authorities. The concerns of interested and affected parties were integrated into this report.

RESULTS OF THE POTENTIAL DIRECT AND INDIRECT IMPACTS OF ANY ANTICIPATED INFRASTRUCTURE DEVELOPMENT ON PORTION 26 OF KROMDRAAI ON THE ATTRIBUTES THAT CONVEY COHWHS OUTSTANDING UNIVERSAL VALUE (OUV)

Based on an interdisciplinary methodology, that combined ICOMOS methodology with several techniques from various disciplines, the impact of the upgrade/formalisation of existing facilities on the attributes that convey COHWHS was considered. The following conclusions were reached:

- The upgrade/formalisation of existing facilities is to take place or has taken place approximately 2.4 kilometres from the palaeontologically and archaeologically rich sites of Kromdraai and Plover's Lake where significant fossils and tools were recovered. It is important to understand the historical relationship between the upgrade/formalisation and the World Heritage site. Kromdraai and Plover's Lake are located on private property and are thus not accessible to residents of portion 26. The area of the proposed upgrade was previously farmland and currently there are a lot of shacks with no basic services.
- The upgrade/formalisation is small scale and is topographically lower than the area where fossils were recovered. It is adjacent to other farm houses and agricultural land. Ecologically, no rare grasses are threatened as the vegetation is all secondary. The footprint has been affected already.
- The infrastructure on site is mostly single story such that no negative visual impacts will emanate from the upgrade/formalisation.

- The COHWHS is well managed such that the various activities carried out by the private land owners such as cattle raising, farming, and game ranching have a longstanding historical relationship with attributes that convey OUV.
- The upgrade/formalisation will not affect the historical sites and burials identified on portion 26 of the farm Kromdraai 520JQ.
- A detailed palaeontological study identified no fossils on the footprint of the settlement or its vicinity.
- Cumulatively, the upgrade and/or formalisation will have no direct or cumulative impact on the individual attributes that convey COHWHS's OUV. The only impacts that are possible are largely indirect but they must be monitored in the short to long term.

MANAGEMENT RECOMMENDATIONS FOR THE CRADLE OF HUMANKIND WORLD HERITAGE SITE

- The proposed upgrade/formalisation of existing facilities will take place on a ground that is already developed and in an area that is historically part of the COHWHS. The main activities will be restricted to this disturbed area but must be managed and monitored to ensure that attributes that convey OUV are not eroded.
- A monitoring plan and management plan must be developed to manage the indirect impacts
- The settlement offers previously disadvantaged communities a chance to participate in the management and conservation of the Cradle of Humankind World Heritage Site.
- Stakeholders should consider ways in which the residents may economically benefit from the World Heritage Site.
- A palaeontologist must inspect the dolomites for fossils during developments that expose this type of rock as it is known to be fossil bearing.

CONCLUSIONS RELATING TO IMPACT ASSESSMENT ON PORTION 26 OF THE FARM KROMDRAAI 520JQ

The part of the assessment which followed the requirements of the National Heritage Resources Act reached the following conclusions:

- The upgrade/formalisation of existing facilities will take place on an already disturbed area. No historical buildings, Stone Age sites and Iron Age sites will be affected by the upgrade.
- There is an Anglo-Boer War fort on top of a ridge on portion 26 of the farm Kromdraai but this will not be affected by the development.
- A recent cemetery was also identified on the southern extreme boundary of portion 26 but this will not be affected by the development.
- There are also historical mines dating to the late 19th century. These are not affected by the development and must be protected.
- In terms of the National Heritage Resources Act, burials have a huge significance but the other sites were classified as Grade 3 sites of low Local Significance. The sites must be protected and conserved since they are in an area that will not be affected by development.

MANAGEMENT RECOMMENDATIONS

All archaeological, paleontological and burial grounds and graves have general protection under the NHRA Act 25 of 1999. As such, all sites known or unknown situated within Portion 26 of the farm Kromdraai may not be disturbed or destroyed without authorisation from the compliance agency, SAHRA. In brief, the following overall recommendations apply:

- Should any new roads be constructed in areas outside the already disturbed area, the process must be monitored for archaeological and paleontological materials.
- Paleontological study concluded that no fossils were visible on the surface and already exposed areas. Monitoring is required in the event that excavations are required.

- In the chance finds event, should archaeological materials or human burials remains be exposed during subsurface construction work on any section of the mine laydown sites, operations should cease on the affected area and the discovery must be reported to the heritage authorities immediately so that an investigation and evaluation of the finds can be made. The overriding objective, where remedial action is warranted, is to minimize disruption in construction scheduling while recovering archaeological and any affected cultural heritage data as stipulated by the PHRA and NHRA regulations.
- A professional palaeontologist and archaeologist must be retained to monitor all significant earth moving activities that may be implemented. The monitoring process would ensure that should any fossils, archaeological or human remains be disturbed during excavations, immediate remedial rescue and salvage work would be actioned without delay.
- Subject to the recommendations herein there are no significant cultural heritage resources barriers to the upgrade/formalisation of existing facilities on portion 26 of the farm Kromdraai. The Heritage authority may approve the proposed development to proceed as planned with special commendations to implement the recommendations here in made.

RESPONSIBILITIES IN THE HERITAGE MANAGEMENT RECOMMENDATIONS

- Mogale City Local Municipality (*the Developer*) should ensure that no heritage sites are destroyed without permission from the relevant compliance authority and that chance finds are reported to the relevant authorities.
- The South African Heritage Resources Agency should ensure that the developer complies with applicable sections of NHRA 25: 1999 on on-going basis throughout the lifetime of the settlement.
- SAHRA (*custodians of heritage resources*) and the COHWHS Management Authority should work with Mogale City Local Municipality to ensure that attributes that convey OUV of COHWHS are not eroded.
- The Management authority, Mogale City Local Municipality and other stakeholders must ensure that this community also participates in the conservation of the site and that it also derives economic benefits.

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1 PART 1: HIA TO ASSESS THE IMPACT OF DEVELOPMENT

This section deals with the Heritage Impact Assessment to assess impacts of any anticipated development activities or structures on Portion 26 of the Farm Kromdraai on attributes that convey COHWHS' OUV.

1.1 INTRODUCTION

The Cradle of Humankind World Heritage Site (COHWHS) is one of South Africa's eight UNESCO World Heritage Sites (Fig 1). It was listed on the World Heritage List in December 1999 after meeting both cultural and natural criteria in terms of the 1972 World Heritage Convention. Set in a staggeringly fossil rich karst environment, the Cradle of Humankind is nearly 52 000 hectares in spatial extent. Taung in the North West Province and the Makapan Valley in Limpopo Province were added to the World Heritage list to create a serially listed site known as the Fossil Hominid Sites of South Africa in 2005 (COHWHS Management Plan 2014-17).

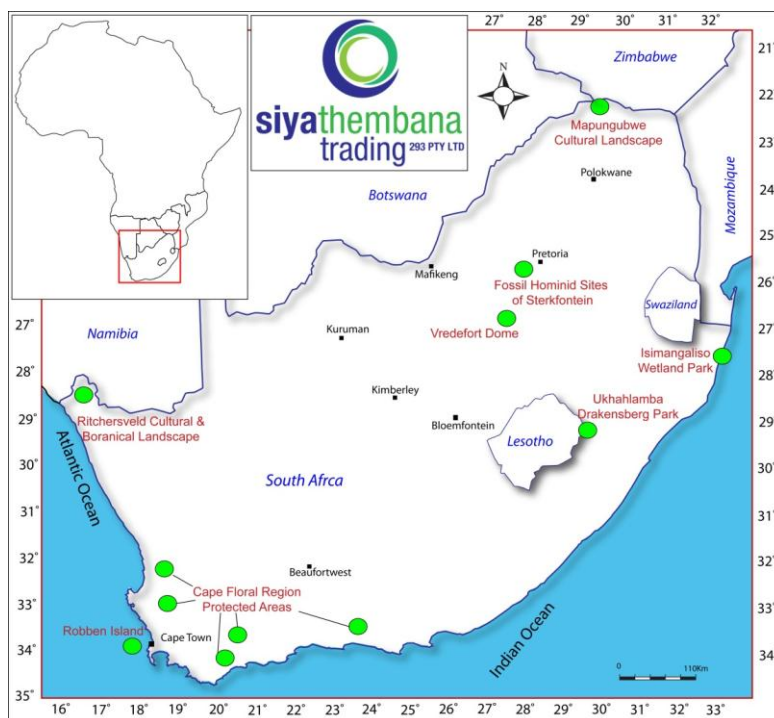


Figure 1: South Africa's eight World Heritage sites including the Cradle of Humankind World Heritage site labelled the Fossil Hominid Sites on the map

Globally, the COHWHS is well known for yielding prominent hominid fossils such as Mrs Ples, Little Foot, Taung Child skull and Karabo which have exposed three or so million years of human evolution. This very rich cultural and natural landscape demands sustainable and effective management to ensure that the integrity and authenticity of attributes that convey its Outstanding Universal Value (OUV) is not eroded. For a decade or so, the management of the Cradle of Humankind was based on a Master Plan developed between 1999 and 2000. The first Integrated Management Plan flowed from the Master Plan and combined best practice from nature and culture conservation within a framework of local and international laws and conventions. The second management plan (Integrated Management Plan for 2014-18), is an update of the first one and provides a robust framework for sustainable heritage management. Not surprisingly, and because of a consistent desire to outperform benchmarks, the COHWHS has received many international accolades for good management and conservation efforts. As a stakeholder and landowner in the Cradle of Humankind, Mogale City Municipality understands the need to sustain the integrity and authenticity of individual attributes that convey COHWHS's OUV.

Mogale City Local Municipality seeks to upgrade or formalise existing facilities at the informal settlement on portion 26 of the farm Kromdraai 520JQ. Currently, there are a number of shacks, a small nursery, a sports field and a shop all built on ground that was farmed for a greater part of the twentieth century. This settlement has a very long history of co-existence with the World Heritage site (Jiyane 2011) such that the new Integrated Management Plan for the Cradle acknowledges its residents as part of the local community whose say is crucial for the long term management of the site. The proposed upgrade is part of Comprehensive Rural Development Programs (CRDP) that are sponsored by the government.

A stakeholder engagement process involving Mogale City Local Municipality, the Department of Environmental Affairs and the COHWHS Management Authority noted the importance of providing decent accommodation to the inhabitants of the settlement on portion 26 of the farm Kromdraai 520JQ. The Department of Environmental Affairs requested that a Heritage Impact Assessment be conducted following ICOMOS Guidelines for Assessing Impact near World Heritage Places (ICOMOS 2011) and the provisions of the National Heritage Resources Act of 1999.

Given that the COHWHS is also listed in terms of natural criteria, recourse was also made to IUCN Best Practice Guidelines (Thomas and Middleton: 2003) and the guidelines provided by the National Environmental Management: Protected Areas Act, Act 57 of 2003 (Environmental Affairs: 2006).

The UNESCO Operational Guidelines of 2013 were also consulted to develop an HIA that robustly assesses the impact of the proposed upgrade on the cultural and natural attributes that convey the COHWHS's OUV. Overall, the framework and approach adopted achieved national and international compliance while safeguarding the values of this iconic World Heritage landscape.

1.2 COHWHS SITE DESCRIPTION AND LOCATION

The approximately 52 000 hectare large Cradle of Humankind World Heritage Site (COHWHS) (Figure 2) is located in north-western Gauteng Province. Part of it extends into North West Province. This area hosts dolomitic caves that are rich in hominid fossils that have so far exposed humanity's evolution since the last 3 million years (Durand 2014). Culture historically, the area of the COHWHS yielded Stone Age (3, 5 million to 2000 years ago), Iron Age (AD300-1850), and recent historical sites such as Anglo-Boer War relics and the first gold mine on the Witwatersrand (COHWHS Management Plan 2014-18). The karst environment promotes the growth of unique grasslands and supports rare flora and fauna which like the fossil sites must be protected for the benefit of present and future generations.

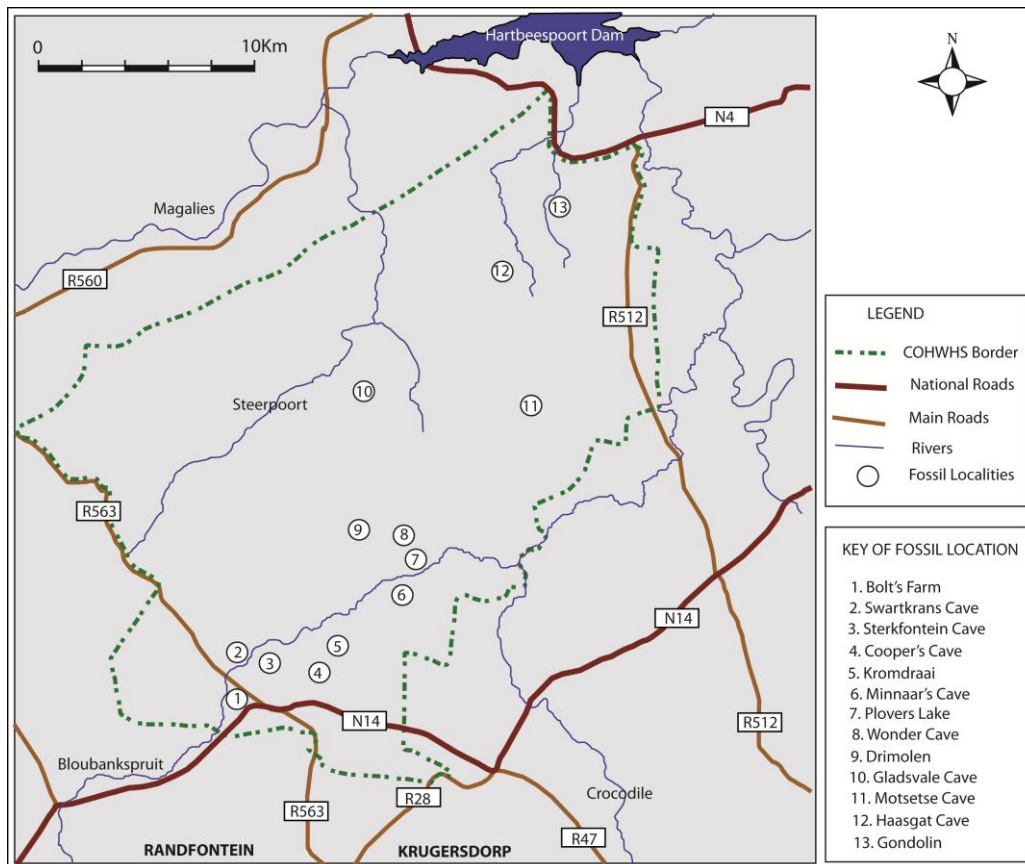


Figure 2: Location of the COHWS and some of the prominent fossil sites such as Kromdraai labelled 5 on the map

According to the Integrated Management Plan (2014-2018), the Geographical Coordinates of the COHWS are as follows:

Centre of World Heritage Site (Core): - 27° 47' 20" E, 25° 55' 45" S

Buffer SW corner: - 27° 42' 50" E, 26° 01' 40" S

Buffer NE corner: - 27° 51' 45" E, 25° 49' 45" S

For management purposes, the site was zoned into a fossil rich Zone 1 and a fairly rich Zone 2 where fossils are likely to occur.

1.2 ATTRIBUTES THAT CONVEY OUV OF COHWS

The description of the attributes that convey Outstanding Universal Value of COHWS was adapted from COHWS Management Plan 2014-2017. The COHWS was inscribed onto the UNESCO World Heritage list because of unique cultural and natural attributes of huge international significance. Meeting criteria iii and iv, these attributes are as follows:

a. Cultural attributes

- Hominid fossils dating from 3.3 million years ago
- Stone tools associated with the Early, Middle and Late Stone Ages
- Historical mines including the first gold mine on the Witwatersrand
- Early and Late Iron Age sites



Figure 3: Photograph of Sterkfontein Caves where the globally significant Mrs Ples was found. The associated grassland is an important element of biodiversity in the COHWHS (source: S Chirikure)

b. Natural

- The karst landscapes and associated ecosystem
- Unique Bankenveld grasslands (Fig 4)

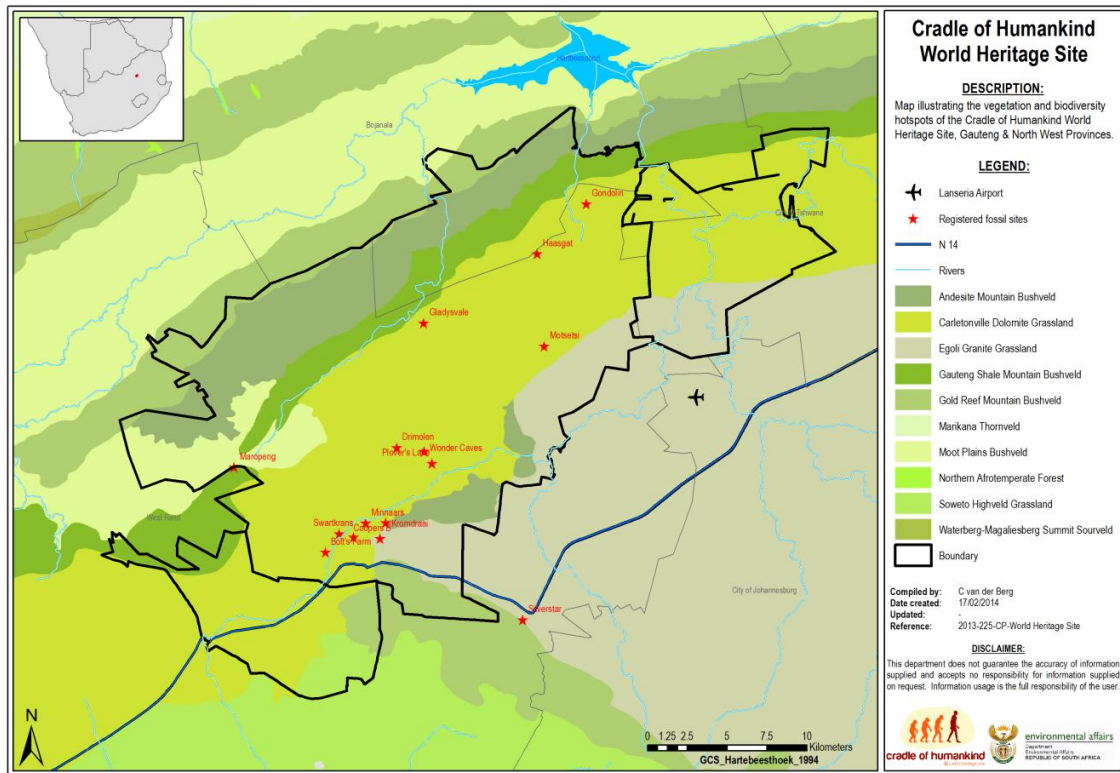


Figure 4: Main Vegetation Zones in the COHWHS (Source: COHWHS Management Plan 2014-2018)

In terms of cultural attributes, it is the abundance of hominin fossils that are trapped in the Karst (dolomitic) environment which strongly contributes to the site's OUV. There are more than 13 original fossil sites (see Fig 2) (12 of them registered) in the COHWHS but new sites such Malapa and Rising Star were recently discovered. Naturally, the karst environment and the associated ecosystem are important attributes which individually and in combination with cultural ones contribute to the Outstanding Universal Value of the COHWHS. All developments must be monitored to ensure that the integrity of these tangible and intangible values is not eroded.

The proposed upgrade of existing facilities on portion 26 of the farm Kromdraai 520JQ is 2.4 kilometres to the south of Kromdraai and a similar distance from Plover's Lake to the northwest. Kromdraai is well known for the first discovery of *Paranthropus robustus* in 1938 while Plover's Lake has yielded important fossils. The site has since yielded other hominid specimens, stone tools and faunal remains of extinct animals.

1.3 COHWHS RETROSPECTIVE STATEMENT ON OUV

The COHWHS Retrospective Statement of Outstanding Universal Value was adapted from the UNESCO World Heritage Centre.

Name of Site: Fossil Hominid sites of Sterkfontein, Swartkrans, Kromdraai and Environs, South Africa (915 bis)

Statement of Outstanding Universal Value (SOUV)

Date of Inscription: 1999; extended 2005 to include Makapan Valley and Taung Skull Fossil Site

Criteria: (iii), (vi)

Date of SOUV: 2010

1.3.1 Brief Synthesis

The undulating landscape containing the Fossil Hominid Sites of South Africa comprises dolomitic limestone ridges with rocky outcrops and valley grasslands, wooded along watercourses and in areas of natural springs. Most sites are in caves or are associated with rocky outcrops or water sources.

The serial listing includes the Fossil Hominid Sites of Sterkfontein, Swartkrans, Kromdraai and Environs, and the Makapan Valley and Taung Skull Fossil Site. The Taung Skull, found in a limestone quarry at Dart Pinnacle amongst numerous archaeological and palaeontological sites south-west of the Sterkfontein Valley area, is a specimen of the species *Australopithecus africanus*.

Fossils found in the many archaeological caves of the Makapan Valley have enabled the identification of several specimens of early hominids, more particularly of *Paranthropus*, dating back between 4.5 million and 2.5 million years, as well as evidence of the domestication of fire 1.8 million to 1 million years ago. Collectively these sites have produced abundant scientific information on the evolution of modern humans over at least the past 3.5 million years. They constitute a vast reserve of scientific information, with enormous potential. The sites contain within their deposits all of the key interrelated and interdependent elements in their palaeontological relationships. Alongside and predating the hominid period of occupation is a sequence of fossil mammals, micro-mammals and invertebrates which provide a window onto faunal evolution, palaeobiology and palaeoecology stretching back into the Pliocene.

This record has come to play a crucial role in furthering our understanding of human evolution and the appearance of modern human behaviour.

The fossil evidence contained within these sites proves conclusively that the African continent is the undisputed Cradle of Humankind.

1.3.2 Criteria (1997/99)

The Fossil Hominid Sites of Sterkfontein, Swartkrans, Kromdraai and Environs were inscribed on the World Heritage List in 1999 under Cultural criteria (iii) and (vi). The Makapan Valley and Taung Skull Fossil Site were added in 2005 under the same criteria.

Criterion iii: The nominated serial site bears exceptional testimony to some of the most important Australopithecine specimens dating back more than 3.5 million years. This therefore throws light on to the origins and then the evolution of humankind, through the hominisation process.

Criterion vi: The serially nominated sites are situated in unique natural settings that have created a suitable environment for the capture and preservation of human and animal remains that have allowed scientists a window into the past. Thus, this site constitutes a vast reserve of scientific data of universal scope and considerable potential, linked to the history of the most ancient periods of humankind.

1.3.3 Integrity/Authenticity (2005)

The Cradle of Humankind together with Makapan Valley and Taung Skull Fossil Site comprise three separate components situated in different provinces that make up the Fossil Hominid Sites of South Africa. Collectively these components contain the necessary evidence of sites where abundant scientific information on the evolution of modern humans over the past 3.5 million years was uncovered.

Furthermore, the nominated serial site covers an area big enough to constitute a vast reserve of scientific information, with enormous potential. As regards authenticity, the sites contain within their deposits all of the key interrelated and interdependent elements in their natural palaeontological relationships.

Thus, the breccia representing the cave fillings contains the fossilised remains of hominids, their lithicultural remains (from about 3.0 million years onwards), fossils of other animals, plants and pollen, as well as geochemical and sedimentological evidence of the conditions under which each member of the deposits was laid down.

They represent a succession of palaeo ecosystems. The caves, breccias and strata from which quantities of fossils or tools have been extracted, together with the landscape are generally intact, but are vulnerable to development pressures, villagers' use of the environment and tourism.

1.3.4 Management and Protection Requirements necessary to maintain OUV (2005)

The components of the Fossil Hominid Sites of South Africa are currently protected as National Heritage sites in terms of the National Heritage Resources Act, 1999 (Act No. 25 of 1999). In terms of this legislation, no person may destroy damage, deface, excavate, alter, remove from its original position, subdivide or change the planning status of any heritage site without a permit issued by the heritage resources authority responsible for the protection of such site.

Management of each site is guided by the World Heritage Convention Act (Act No 49 of 1999); the National Environmental Protected Areas Act (Act No 57 of 2003), the National Environmental Management Act (No 107 of 1998), the National Environmental Management Biodiversity Act (Act No 10 of 2004) and the Physical Planning Act, 1967 (Act No. 88 of 1967) .

In terms of these pieces of legislation, mining or prospecting is completely prohibited in a World Heritage Site and all developments are subjected to environmental impact assessments.

There are also site management plans for each of the sites as well as monitoring and evaluation programmes for each.

The five components of the property are situated in separate provinces in South Africa, each with a different combination of structures dealing with its management. Management issues at the three serial sites differ significantly. At the time of inscription of the first site it was envisaged that there would be a joint World Heritage Property Management Committee and that each Province and Site Management Authority would nominate members to the joint World Heritage Property Management Committee. The function of the committee is to

streamline inter-site management, to discuss common management problems and to function as a communications forum for the sites. The equitable sharing of the benefits of increased tourism, joint funding proposals and the sharing of heritage-based skills are all issues to be considered.

1.3.5 COHWHS Integrated Management Plan (2014-2018)

Between 1999 and 2001, an Integrated Environment and Conservation Management Plan (IECMP) was developed as part of the master planning process (COHWHS 2014-2018). This was updated and revised in 2014 to create the second Integrated Management Plan with the following objectives:

- *“To ensure that all relevant guidelines are in place for the coordinated management and administration of the Cradle of Humankind World Heritage Site (COHWHS) and*
- *To comply with international, regional and local legal requirements for the proper management and administration of the site.”*

The second management plan was informed by IUCN Best Practice Guidelines, Guidelines provided by the National Environmental Management: Protected Areas Act, Act 57 of 2003 (Environmental Affairs: 2006), provisions of the World Heritage Convention Act, No. 49 of 1999 (WHCA). Because the plan covers all aspects of site management including those specifically related to the protection of the OUV, it was heavily consulted in the impact assessment process for the existing upgrade of the existing development. The management plan covers the core area and the buffer zone (Fig 5).

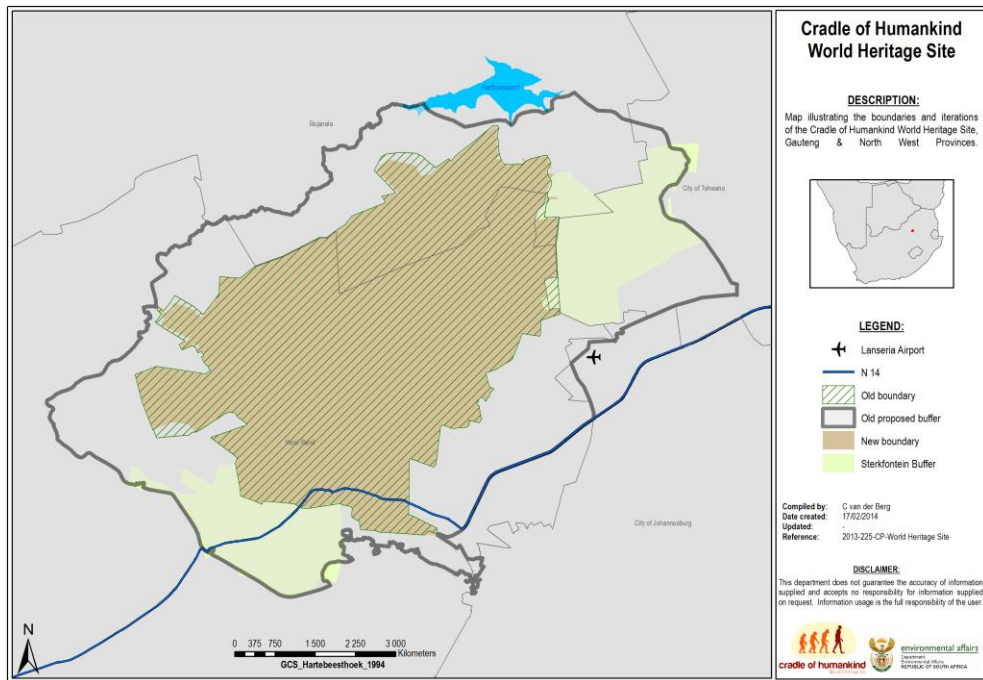


Figure 5: Boundaries of the COHWHS and the newly added buffer zones (adapted from Integrated Management Plan 2014-2018)

1.4 LEGISLATION AND CONVENTIONS

The attributes that convey the COHWHS’s OUV must be sustainably protected such that activities with potential to destroy or alter them must be avoided and prevented. However, World Heritage sites must also contribute to local community upliftment. The COHWHS is managed in terms of a basket of local legislation and international conventions such as:

National Environmental Management Act, 1998 (Act 107 of 1998), as amended

National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004)

National Environmental Management: Protected Areas Act, 2003 (Act 57 of 2003), as amended

National Forests Act 84 of 1998, National Parks Act (Act 57 of 1976)

National Water Act, 1998 (Act 36 of 1998)

Nature Conservation Ordinance, Number 12 of 1983.

World Heritage Convention Act, Act 49 of 1999

National Heritage Resources Act, No 25 of 1999, sections 32 & 35

Government Gazette Vol. 240, No. 21297. 1972 UNESCO Convention and associated operational guidelines

1.5 INSTITUTIONAL STRUCTURE OF THE COHWHS

World Heritage sites in South Africa are managed by the State Party represented by the Minister of Environmental Affairs. However, there are separate arrangements for each individual World Heritage site. For the COHWHS, up to until two years ago, there was a Management Authority (MA) which was responsible for the management of the listed area. The South African Heritage Resources Agency implements the National Heritage Resources Act and control research and conservation through permits and monitoring reports. Landowners and other communities are also involved in an all-inclusive stakeholder engagement driven process. The MA of the COHWHS is now under the Gauteng Department of Economic Development. The structure of the MA in relation to the provincial Government is illustrated by the following and could change over time:

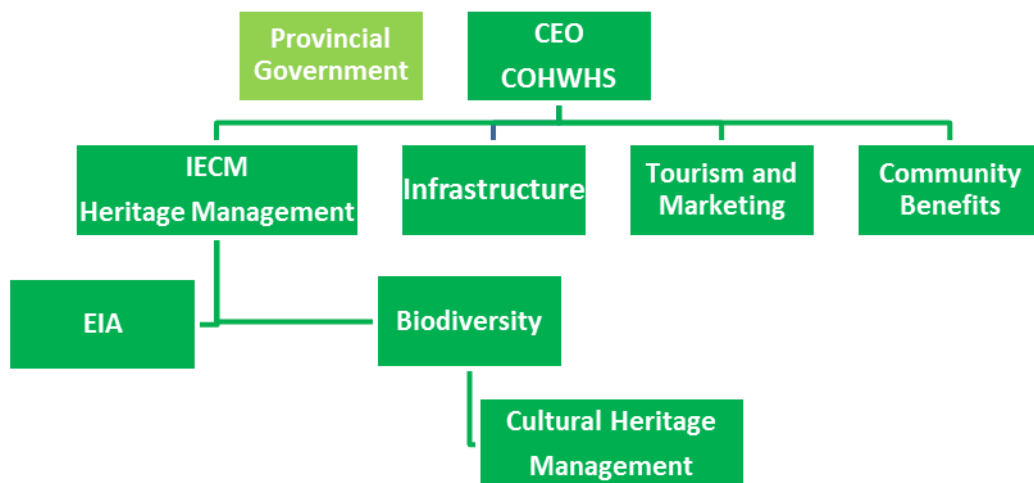


Figure 6: Organisation of the COHWHS

The State Party receives periodic reports from the MA relating to the state of conservation for these sites. Due to the many stakeholders in and around the COHWHS, stakeholder consultation is an important management tool. Stakeholders include landowners, informal settlement residents, government departments, developers, and among others tourists. The management plan also cites Mogale City Local Municipality as an important stakeholder in the management of the World Heritage site.

1.6 ZONING PLAN

In order to effectively manage areas of the COHWHS based on their sensitivity, a zoning plan was developed (Fig 7). This plan is motivated by the need to conserve the Outstanding Universal Value of the site by focusing on individual attributes, singly and in combination.

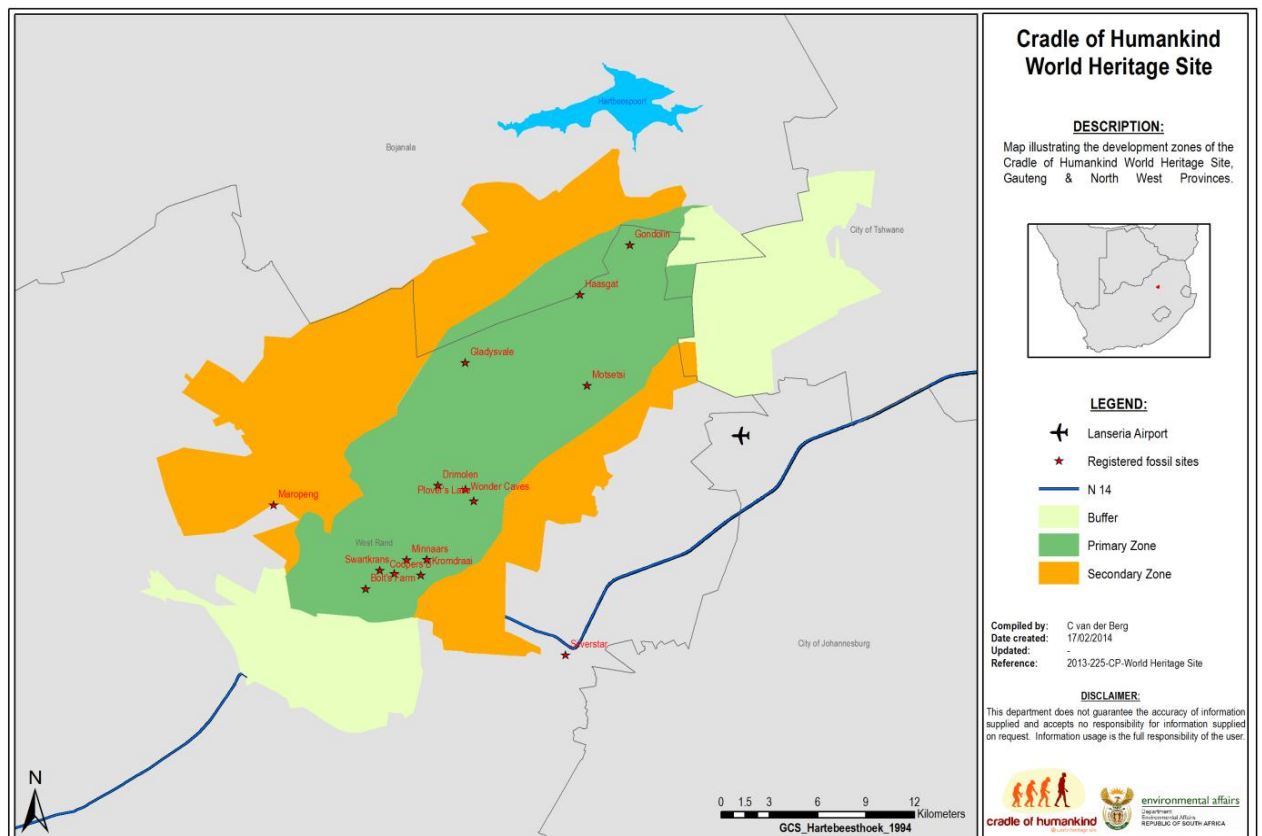


Figure 7: Sensitivity zones in the COHWHS (adapted from Integrated Management Plan 2014-18)

1.7 CONSERVATION CHALLENGES AND MONITORING FOR THE COHWHS

According to the Integrated Management Plan (2014-2018), the conservation of the COHWHS is faced with a number of challenges such as the Acid Mine Drainage that decants from the gold mines on the Witwatersrand. This Acid Mine Drainage slowly dissolves limestone thereby affecting not just already formed fossils, but also fossil formation and the host karst environment.

Other conservation challenges emanate from the sub division of land which often results in the creation of several small holdings as well as development that is inappropriate within the context of the conservation of the integrity and authenticity of the World Heritage site. In view of these conservation challenges, a monitoring plan was designed to ensure that attributes that convey OUV of COHWHS are sustainably protected. The monitoring plan was guided by the following:

- detect and evaluate changes in the biophysical/cultural environment;
- measure project performance indicators within the socio-economic environment;
- meet both present and future needs;
- maintain the productive capacity of natural resources and systems; and
- maintain a balance between human needs and the needs of the ecosystem to maintain the productive capacity. These principles acknowledge that there are limits and requirements for balance.
- To meet the various reporting requirements at local, national and international levels.

Continuous monitoring of the threats highlighted above ensures that the integrity of attributes that convey OUV individually and collectively is safeguarded. Any negative activities are detected early while positive ones are encouraged.

1.8 ICOMOS GUIDANCE ON HIA FOR CWH PROPERTIES (2011)

Given that World Heritage sites are becoming increasingly threatened by various factors with potential to erode their OUV, the International Council of Monuments and Sites (ICOMOS) has established guidelines for carrying out impact assessments to ensure that the sustainable conservation of OUV is achieved. The guidelines state that the statement of Outstanding Universal Value is the pedestal on which impacts, direct and indirect can be assessed. The major advantage of these guidelines is that they are customized to the needs of World Heritage properties and still call for professional judgment on a case-by-case basis. This assessment makes use of 2011 ICOMOS guidelines.

The ICOMOS Guidelines define direct, indirect and cumulative impacts. Direct impacts are those which result in the total destruction or altering of attributes that convey OUV of a World Heritage property. Indirect impacts are those whose impact is not clearly visible and quantifiable while cumulative impacts refer to the sum of direct and indirect impacts in the short and medium to long term (ICOMOS 2011).

1.9 OUV IMPACT ASSESSMENT METHODOLOGY

The methodology employed in the HIA relating to the upgrade of existing structures on portion 26 of the farm Kromdraai 520JQ is primarily based on the ICOMOS Guidance on Heritage Impact Assessments for Cultural World Heritage Properties (ICOMOS 2011), IUCN guidelines and various NEMA guidelines. Given the importance of the grasslands of the COHWHS, IUCN and NEMA guidelines were essential in plugging any limitations that may be inherent in the ICOMOS Guidelines.

The combined methodology sets out an approach that allows impact assessments to respond to the needs of World Heritage sites, through considering them as discrete entities and evaluating impact on the attributes that convey OUV in a systematic and coherent way. Importantly, ICOMOS states that any World Heritage property's OUV is fixed by the World Heritage Committee at the time of inscription and is non-negotiable.

The methodology was robust consisting of desk based research, dedicated field evaluations, GIS mapping and plan viewing, spatial rendering, interviews with stakeholders and peer review. The literature search indicated that while international best practice is vital, ultimately, it is the local situation and local history that is important in determining risk profile, potential benefits to conservation and other potential impacts of any proposed development on heritage. The rest of the methodology is explained in the sections below.

1.10 DATA SOURCES

Objective and useful impact assessments depend on good quality data and are thus key to effective decision making. A stepped approach was developed to collect data for this study. To begin with, a desktop study was carried to search for information in both published and unpublished sources. Online databases such as Google Earth and Google Scholar were consulted together with that hosted by the COHWHS and the Gauteng Department of Economic Development.

The Master Plan of 2001 as well as the various COHWHS management plans were also consulted. Interviews were also carried with representatives of the developer, site managers, environmental managers, local planners and other officials responsible for cultural heritage management in South Africa.

1.11 PUBLISHED WORKS

A number of published works on the archaeology, history, palaeoanthropology and palaeontology of the COHWHS were consulted extensively. These include research papers published in leading journals such as *Science* and *Nature* as well as other international and local journals. The published information assisted in the identification of individual attributes that convey COHWHS' OUV.

Furthermore, they also contain significant information on threats posed to the World Heritage Site by various forces. Such a comprehensive overview was critical to meet one of the main recommendations by ICOMOS (2011) that the 'basis for management and decision making is a good understanding of the World Heritage Property, its significance and OUV, its attributes and its context'. This was also fundamental for laying a platform for objective impact assessment.

1.12 UNPUBLISHED REPORTS

A significant number of unpublished reports were also consulted. These include previous archaeological impact assessment reports, Environmental Management Plans and biodiversity and heritage conservation documents for the area. Various states of conservation reports submitted to UNESCO as part of periodic monitoring were also consulted.

1.13 EXPERT ANALYSIS

To ensure that an objective assessment was carried out, further to the skills of our team, an independent palaeoanthropologist, palaeontologist and karst ecologist was asked to carry out a study to determine the fossil and palaeoanthropological sensitivity of the area to be affected by the upgrade. Dr Durand has extensive experience of working in the COHWHS. His expert view and analysis formed the basis of the major conclusions reached in this study.

1.14 DATABASES

Our team consulted various databases such as Google Earth, South African Heritage Resources Information Service (SAHRIS) and maps. The University of the Witwatersrand researchers carried out important work over the years which were also consulted together with various maps published by the Council for Geosciences.

1.15 FIELD SURVEYS

Field surveys were informed by the need to clearly and objectively assess impact on individual attributes such as the site of Kromdraai and the surrounding grassland. Based on the desktop study and interviews, very few sites were found on portion 26 of the farm Kromdraai 520JQ.

The fieldwork took place in two phases: the first assessed the archaeological and historical sensitivity of the area looking at both tangible and intangible heritage. The second was carried out by Dr Francois Durand to determine the potential of fossils and the fossil sensitivity of the proposed development footprint. From a visual impact point of view and a sense of place perspective, the assessors visited several high points on the COHWHS landscape. Photography formed an important part of the documentation process.

1.16 STAKEHOLDER ENGAGEMENT

Best practice in heritage management emphasise the importance of stakeholder engagement around World Heritage properties (ICOMOS 2011). A number of problems which threaten the integrity of heritage resources may result from a lack of stakeholder consultation. This HIA also benefited from a stakeholder engagement process.

The local municipality (Mogale City) was consulted together with the Gauteng Department of Economic Development, the Department of Environmental Affairs, the South African Heritage Resources Agency and the African World Heritage Fund. The main sentiment was that although the upgrade is proposed to take place in Zone 1 of the COHWHS which is highly fossil sensitive, it was important to upgrade the facilities for a better visual impact and to include a significant local community.

Accommodating this community is likely to ensure that OUV is sustainably safeguarded. Other stakeholders also noted an opportunity for previously marginalised communities to be involved in the COHWHS. However, the number must be kept to 72 and the population must be monitored.

1.17 ASSUMPTIONS AND LIMITATIONS

Field work conducted for the HIA did not include any form of subsurface inspection beyond the inspection of burrows, disturbed ground, and the sections exposed by erosion or other forms of disturbances.

Some assumptions were made as part of the study and therefore some limitations, uncertainties and gaps in information would apply. It should however, be noted that these do not invalidate the findings of this study in any significant way. No excavations or sampling were undertaken, since a permit from heritage authorities is required to disturb a heritage resource or landscape. As such the results herein discussed are based on surface indicators including the density and concentration of archaeological objects.

1.18 SCOPE OF ASSESSMENT

The proposed upgrade of existing structures on portion 26 of the farm Kromdraai 520JQ will take place on an already disturbed ground. The assessment covered the entire portion 26. In order to address this project brief, an inter-disciplinary team with experience in the attributes that convey OUV from palaeontology and palaeoanthropology to the Stone Age, through the Iron Age to the recent history and intangible heritage was assembled. Some of the specialists have huge experience in nominating World Heritage sites, understanding risk assessment at World Heritage Sites and developing Integrated Conservation Management plans.

1.19 EVALUATION OF HERITAGE RESOURCE

Good quality information is essential for developing a robust impact evaluation system. The core documentation is the Statement of OUV and the identification of attributes that convey OUV. Hence this portion of the study concentrated on identifying impact on attributes that convey OUV individually and collectively. Based on the information from the ICOMOS Guidance, IUCN standards of best practice, requirements of the NEMA Biodiversity Act of 2003 and the South African Heritage Resources Agency standards of best practice, data capture forms were used to collect information from the field through condition surveys and observations. After the data was gathered from the field was combined with information from other sources it was deemed essential to establish the value and significance of individual sites as well as to identify any threats to the heritage. The ICOMOS grading system was combined with that enshrined in the South African National Heritage Resources Act 25 of 1999. The following scale was used to assess significance:

ICOMOS Ranking	South African Legislation (National Heritage Resources Act Ranking)
Very high (World Heritage Sites)	National Heritage Sites (Grade 1)
High (Nationally significant sites)	National Heritage Sites (Grade 1), Grade 2 (Provincial Heritage Sites), burials
Medium (regionally significant sites)	Grade 3a
Low (locally significant sites)	Grade 3b
Negligible	Grade 3c
Unknown	Grade 3a

Table 1: Classification Scale for Heritage sites significance.

This scale was combined with data from desktop studies and stakeholder consultations to come up with objective impact evaluation systems. All in all, the database contained useful information for a systematic and consistent approach, which is suitable to the needs of natural and cultural attributes of World Heritage landscapes.

Furthermore, it allowed a consideration of the cumulative significance for example; a group of low value sites may have a high significance because they cumulatively tell a story that can enhance OUV.

1.20 ASSESSMENT OF SCALE OF SPECIFIC IMPACT AND CHANGE

After valuing the resources, the next step was to look at the scale of specific impact and change on the OUV. Positive and negative impacts on heritage resources take many forms: they may be direct or indirect; cumulative, short term or long term, reversible or irreversible, visual, and physical. For these impacts to be relevant to the HIA study, they must be triggered by the proposed development (ICOMOS 2011).

Direct impacts are those that arise as a primary consequence of the proposed development or change of use. They can result in the physical loss of part or all of an attribute, and/or changes to its setting - the surroundings in which a place is experienced, its local context, embracing present and past relationships to the adjacent landscape (ICOMOS 2011). In the process of identifying direct impacts effort must be invested in considering cumulative impact because little impact on a few sites may cause extensive damage on a large scale.

By their nature, direct impacts are associated with the development footprint and result in physical loss such that they constitute a major threat to OUV. Direct impacts resulting in physical loss are usually permanent and irreversible.

Indirect impacts occur as a secondary consequence of construction or operation of the development, and can result in physical loss or changes to the setting of an asset beyond the development footprint.

The scale or severity of impacts or changes can be judged taking into account their direct and indirect effects and whether they are short or long term, reversible or irreversible. The cumulative effect of separate impacts should also be considered. The scale or severity of impact was ranked qualitatively without regard to the value of the asset as follows:

- No change
- Negligible change
- Minor change
- Moderate change
- Major change

NB: Major change refers to change that is irreversible and would result in the loss of physical integrity of the heritage resource (ICOMOS 2011).

The overall impact on an attribute is a function of the importance of the attribute and the scale of change as recorded on data capture forms. Following ICOMOS Guidelines this was summarized for individual attributes using the following nine descriptors from major beneficial on one end of the scale to major adverse on the other with neutral as its centre point.

- Major beneficial
- Moderate beneficial
- Minor beneficial
- Negligible beneficial
- Neutral
- Negligible adverse
- Minor adverse
- Moderate adverse
- Major adverse

NB. Beneficial refers to actions that enhance the value of heritage assets, while adverse refers to actions that result in the erosion of value.

International best practice indicates that every reasonable effort should be made to avoid, eliminate or minimise adverse impacts on attributes that convey OUV and other significant places. Ultimately, however, it may be necessary to balance the public benefit of the proposed change against the harm to the place (*ICOMOS 2011; UNESCO et al. 2010*). In the case of World Heritage properties this balance is crucial.

1.21 EVALUATION OF OVERALL IMPACT

The production of themed maps was important in the evaluation of overall impact. Spatial rendering exposed the disposition of attributes; the relationships between the attributes (*which may be processes*), and the association's attributes have such as visual, historical, religious, communal, aesthetic or evidential. The data captured on the forms was carefully studied to assess the overall impact; the comments and issues raised by stakeholders during the EIA and EMP Public Consultations and during this HIA phase were all considered to identify the overall impact. In the end, positive and negative as well as direct and indirect impacts of the proposed upgrade of existing structures were measured based on the data collected through the methods outlined.

1.22 DEFINITION OF THE ASSESSMENT AREA

As required by the project brief, the area of the assessment was portion 26 of the farm Kromdraai 520JQ. Impact was therefore assessed on an almost continuous stretch of cultural landscape. The nature of some risks also forced us to consider the potential impact in areas that are far away. For example, dust can travel far while noise can cause damage in multiple ways.

1.23 DESCRIPTION OF CHANGES OR DEVELOPMENTS PROPOSED

Mogale City Municipality proposes to upgrade existing structures making up an informal settlement on portion 26 of the farm Kromdraai 520JQ. The proposed upgrade will involve the following:

- Replacing shacks with decent brick and mortar housing
- Construction of a nursery
- Upgrading of football pitch
- Community garden

All these activities will take place on heavily disturbed ground which was farmland for a greater part of the 20th century.

1.24 EVALUATION OF OVERALL IMPACT OF PROPOSED CHANGES

The proposed upgrade will take place within the boundaries of the COHWHS. This settlement has a historical relationship with the COHWHS in as far as it houses families that used to work on the farms in the area. While fossils are mostly located on dolomitic areas the proposed upgrade will take place on level ground and is adjacent to a built up area. No high rise buildings will be erected such that the visual impact will be minimal. Therefore, the proposed upgrade does not directly affect individual attributes that convey COHWHS. The only impacts that may be there are indirect. The visual impact of the development is very negligible. By looking at the viewing zones, it is clear that the development is adjacent to historic developments in the area and is not on high rise ground.

1.24.1 Fossil Sites

Kromdraai which is near portion 26 of the farm Kromdraai 520JQ is one of the fossil sites that convey COHWHS's OUV. This is located on private property and will not be affected by the upgrade of existing settlement. A robust monitoring regime is required to ensure that the indirect impacts may not affect the OUV.



Figure 8: Map showing location of activity areas



Figure 9: Dolomite from excavations for pipeline (source: Durand 2014)

1.25 RESULTS OF IMPACTS ON THE COHWHS OUV ATTRIBUTES

Results of the potential direct and indirect impacts of the upgrade of existing facilities on the attributes that convey COHWHS OUV

Based on an interdisciplinary methodology, that combined ICOMOS methodology with several techniques from various disciplines, the impact of the proposed upgrade of existing facilities on the attributes that convey COHWHS was considered. The following conclusions were reached:

- The proposed upgrade of existing facilities is scheduled to take place near the site of Kromdraai which is associated with the discovery of very significant fossils. It is important to understand the historical relationship between the upgrade and the World Heritage site. The area was previously farmland and currently there are a lot of shacks which lack basic services.
- The proposed upgrade is small scale and is topographically lower than the area where fossils were recovered. It is adjacent to other farm houses and agricultural land.
- The proposed houses will be single storey such that no negative visual impact will emanate from the upgrade.
- The COHWHS is well managed and there are a number of activities taking place such as cattle raising, farming, and game ranching and so on. There are very strict codes of conduct that govern these activities and their impact on biodiversity.
- The upgrade will not affect a number of historical sites on portion 26 of the farm Kromdraai.
- Cumulatively, the proposed upgrade will have no direct impact on the individual attributes that convey COHWHS.

2.1 INTRODUCTION

This section of the report assesses the impact of the proposed upgrade/formalisation of existing structures on portion 26 of the farm Kromdraai 520JQ on archaeological and palaeontological sites in terms of the National Heritage Resources Act of 1999. As part of Comprehensive Rural Development Programme pilot projects, the West Rand District Municipality and the Department of Land Affairs purchased 65.4 hectares of land, on portion 26 of the farm Kromdraai 520JQ and donated it to farm dwellers to meet the requirements of land restitution, redistribution and tenure reforms. About 72 households benefited from this land redistribution. Because this area is within the boundary of the COHWHS, West Rand District Municipality engaged with the Management Authority and the State Party to ensure that this noble exercise does not negatively affect the World Heritage site's OUV. It was agreed that the families could be settled on this land but their impact on attributes that convey COHWHS's OUV must be considered in detail.

In terms of the National Heritage Resources Act, the South African Heritage Resources Agency developed Minimum Standards for Archaeological Impact Assessment to guide impact assessors. This section of the assessment makes use of the NHRA Act and the SAHRA Minimum Standards to assess the impact of the proposed development on sites of national, provincial and local significance. It also utilises other international standards of best practice as enshrined in the highly esteemed Burra Charter of Australia.

2.2 LEGISLATION

The National Heritage Resources Act (25 of 1999) legislates for the identification and protection of heritage resources such as fossils, archaeological sites and among others cultural landscapes of national, provincial and local significance. Various sections protect this national estate as follows:

In terms of Section 34 (1) 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 authority. Section 35(3) states that any person who discovers archaeological or paleontological objects and meteorites must inform the responsible heritage resource. In terms of Section 35 (4), no person may, without a permit issued by the responsible heritage resources authority:

- destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;
- destroy, damage, excavate, remove from its original position, collect or own any archaeological or paleontological material or object or any meteorite;
- trade in ,sell for private gain, export or attempt to export from republic any category of archaeological or paleontological material or object or any meteorite; or
- bring onto or use at an archaeological or paleontological site any excavation equipment or any equipment which assist with the detection or recovery of metal or archaeological material or object or such equipment for the recovery of meteorites.

Section 36 (3) states that no person may, without a permit issued by SAHRA or a provincial heritage resources authority:

- (i) 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
- (ii) bring onto or use at a burial ground or grave any excavation equipment, or any equipment which assists in detection or recovery of metals.

Finally, Section 38(1) states subject to the provisions of subsection (7), (8) and (9), that any person who intends to undertake a development must at the very earliest stages of initiating such development notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

2.3 BACKGROUND OF THE AREA

The COHWHS and its surrounding area are rich in world renowned palaeoanthropological, palaeontological, Stone Age, Iron Age and historical sites. Within the COHWHS, there are at least 13 prominent fossil sites such as Sterkfontein, Swartkrans, Kromdraai and their environs (Tobias, 1986; COHWHS IMP 20014-17). Generally, the archaeology of human occupation within the study area stretches from the Early Stone Age up to the recent past (Calabrese, 1996; Huffman, 2007). As such, the COHWHS and surrounding environs host significant evidence of the biological and cultural evolution of humanity as well as other animals.

2.4 PALAEOANTHROPOLOGICAL AND PALAEOONTOLOGY OF THE AREA

The discovery of the Taung Child, a juvenile Australopithecine in 1924 by Raymond Dart firmly placed South Africa on the human origins map. This find was followed by other equally important ones at localities such as Sterkfontein, Kromdraai, and Swartkrans (Fig 9). In recent years Drimolen and the Malapa sites have yielded important hominin fossils. The evidence from the COHWHS consists of australopithecines, *Homo habilis*, and *Homo erectus* which are all important ancestors in the human lineage. Furthermore, these sites have yielded important fossils of extinct animals which expose the environment of the time.



Figure 10: Location of the proposed development in relation to some prominent sites (source: Durand 2014)

Due to the variability of fossil distribution in the COHWHS, an initial terrain visit was deemed necessary in order to ascertain the nature of the geology of the study site and the proximity to known fossil sites before writing the report. The study site is situated adjacent to the Honingklipspruit (mistakenly called Bloubankspruit at the bridge at the T-junction on the other side of the study site).

The Kromdraai Gold Mine is situated to the south of the study site. The Kromdraai Gold Mine was historically the second gold mine to open on the Witwatersrand before the discovery of the Main Reef (Durand, 2012). No fossils were found on the proposed development footprint (see Appendix 2). It is important to monitor the dolomite rich areas should any excavations be carried out.

2.4.1 Stone Age (ESA, MSA and LSA)

The Early Stone Age of the area is fairly well understood and stretches from at least 3 million years ago to roughly about 250 000 years ago. The earliest stone tools are known as the Oldowan industry and are dominated by heavy butchering tools. Inferential evidence suggests that these simple tools were used to chop and butcher meat, de- skin animals and probably to smash bones to obtain marrow (Phillipson 2005). The presence of cut marks from animal fossil bones dating to this period has led to the conclusion by researchers that human ancestors were scavengers and not hunters (Wadley 2007; Esterhuysen, 2007). They may have preyed on drowned or crippled animals or shared a kill by other predators, which explains why some ESA sites contain high proportions of bone from large and dangerous game (Wadley, 2007). The fossil site of Kromdraai yielded Oldowan stone tools that were dated to nearly 2 million years ago.

The Oldowan industries were later replaced by the Acheulian characterised by the manufacture of hand axes and cleavers. These bifacial tools emerged started around 1.5 million years ago (mya) at places such as Sterkfontein. The Acheulian techno-complex was characterised by a great deal of standardisation of tools across widely separated areas from Africa to Eurasia (Sharon, 2009). Evidence presented from Sterkfontein cave shows that the first tool making hominids belong to either an early species of the Homo or an immediate ancestor which is yet to be discovered here in South Africa (Esterhuysen, 2007). Both the Oldowan and Acheulian industries are well represented in the archaeology of the Cradle of Humankind particularly at sites such as Sterkfontein and Kromdraai.

The Middle Stone Age dating between roughly 250 000 years ago and 25 000 years before present succeeded the Early Stone Age. Comparatively, Middle Stone Age tools are smaller than those of the Early Stone Age period. They are characterized by smaller hand axes, cleavers, and flake and blade industries (source).

The period is marked by the emergence of modern humans and is characterised by the appearance of fairly complex technology, modern human behaviour, art, and symbolism (Thompson & Marean, 2008). A variety of MSA tools includes blades, flakes, scraper and pointed tools that may have been hafted onto shafts or handles and used as spear heads. Residue analyses on some of the stone tools indicate that these tools were certainly used as spear heads (Wadley, 2007). The presence of spear heads on some of the MSA assemblages is an indication that these group of people were hunters who targeted middle sized game such as hartebeest, wildebeest and zebra (Wadley, 2007), Some assemblages are show the presence of bone tools such as bone points.

The Late Stone Age (LSA) which stretches from 25 000 years ago to about 2000 years ago is the last phase of the Stone Age. The LSA is characterised by the use of microlithic tools some of which were found in the COHWHS.

2.4.2 Early and Late Iron Ages

Although controversial for a while, it is now well established that the first black agriculturalists migrated into South Africa around AD300 from the north. This movement marked the beginning of the Early Iron Age (AD300-900) which is associated with the cultivation of crops, domestication of animals, pottery metallurgy and settled life (Huffman 2007). One of the most important Early Iron Age sites around the COHWHS is the site of Broederstroom near Hartebeestpoort Dam. Excavations initially by Mason (1986) and later by Huffman (2007) yielded a wide array of evidence from cattle kraals to house debris, pottery and metalwork. The Early Iron Age was succeeded by the Later Iron Age around AD1000. The site of Oliphantspoort in the Magaliesburg is one of the most well-known Late Iron Age sites near the COHWHS. The ceramic and other evidence from Oliphantspoort such as stone walling indicate that this material culture was authored by ancestral Tswana speakers. These groups continued into the historical period and they were displaced off their land as a result of colonialism. There was great deal of mobility for various Nguni groups also moved into the area, the most well-known being Mzilikazi.

2.4.3 Historical/colonial Period

From the early 19th century Boer farmers started expanding from the Cape and by the 1850s and 1860s had reached parts of Gauteng resulting in the establishment of the ZAR Republic. The Boers had skirmishes with the British that are famously chronicled in the Anglo Boer War of 1901-2.

Evidence of early settlements, Anglo-Boer War sites and early mines associated with the early colonial frontier is also found in the COHWHS and surrounding areas.

2.5 SITE LOCATION AND PROJECT DESCRIPTION

The site is situated approximately 12 kilometres north of Krugersdorp CBD, on portion 26 of farm Kromdraai 520JQ, within Mogale City Local Municipality, Gauteng Province, South Africa. The area is dominated by major chains of ridges and hills, creating moderately steep slopes with predominantly south and the northern aspects.

The project area border Ibis ridge where the first goldmine on the Witwatersrand was opened in early 1881 at Kromdraai near the tarred road. This decommissioned mine is now a tourist attraction where visitors can explore the open mine shafts and a mining museum. The study area is surrounded by farmland to the south, north and east. Several pre-existing infrastructure occur on site: an old farm shop, old farm house proposed to be used as offices, children's nursery, soccer field and several shacks or slums and a *Eucalyptus plantation*. A large section towards the west of the shacks is reserved for communal agricultural activities.

This area was farmed for a greater part of the twentieth century resulted in the degradation of the natural environment, including the vegetation. On the nearby farms to the west of the proposed study area the general vegetation is mostly dominated by isolated *Acacia species* and *Protea sp* scattered on the rocky ridge, and down slope and other habitats protected from fire. Shrubs and tall trees are denser along the river banks and drainage lines (Acocks 1975, Mucina & Rutherford, 2003).

The geology of the study area is generally characterized by the Malmani Dolomite formation of the Chuniesport group of the Transvaal super group (source). In certain areas this dolomite formations are overlain by a relatively thin cover of younger sedimentary rocks of the Transvaal super groups or unconsolidated materials. The Malmani Dolomite is just one rock formation of great interest as it is characterized by palaeocaves with fossil deposits. This type of rock formation makes up some of South Africa's best aquifers which yield good quality ground water.

The upgrade and or formalisation of the existing infrastructure on site entails the following elements:

- Demarcations of 72 residential units
- Construction of Multi-Purpose Community Centre, Library and parking facilities
- Redesign the Sports ground facility according to the proposed site plan



Figure 10: View of the proposed study area represented by a section of *Eucalyptus* plantation, the flat section of the area is characterized by previously cultivated land.

2.6 METHODOLOGY

Desktop studies were supplemented by interviews with residents of the informal settlement. The information gathered from the process was used to design a survey strategy. In view of the highly disturbed nature of the area on the one hand and the high significance of the heritage value of the area, it was decided to survey portion 26 of the farm Kromdraai in full. A total of seven days were spent in the field by Dr. Shadreck Chirikure and Mr. Mathoho Eric in July of 2014. Surveys proceeded in the form of linear transects resulting in a comprehensive coverage of the entire site. The locational details were recorded using a hand held Garmin GPS. Photographs were taken using a Canon 1000D Camera.

2.6.1 Assessment Criteria

This section describes the evaluation criteria used for determining the significance of archaeological and heritage sites. The significance of archaeological and heritage sites was based on the following criteria:

- The unique nature of a site.
- The amount/depth of the archaeological deposit and the range of features (stone walls, activity areas etc).
- The wider historic, archaeological and geographic context of the site.
- The preservation condition and integrity of the site.
- The potential to answer present and future research questions.

2.6.2 Site Significance

Significance assessment was based on the minimum standards published by the South African Heritage Resources Agency (2006) and approved by the Association for Southern African Professional Archaeologists (ASAPA) for the Southern African Development Community (SADC) region. Additionally, the Burra Charter was also used to determine the significance of the landscape.

The different significance assessment criteria were compressed into a classification index that is presented in Table 2 below.

FIELD RATING	GRADE	SIGNIFICANCE	RECOMMENDED MITIGATION
National Significance (NS)	Grade 1	-	Conservation; National Site nomination
Provincial Significance (PS)	Grade 2	-	Conservation; Provincial Site nomination
Local Significance (LS)	Grade 3A	High Significance	Conservation; Mitigation not advised

Local Significance (LS)	Grade 3B	High Significance	Mitigation (Part of site should be retained)
Local significance	Grade 3C	Medium Significance	Mitigation before destruction

Table 2: Grading and rating systems of heritage resources

2.6.3 Impact Rating

Very High

These impacts would constitute a major and usually permanent change to the (natural and/or cultural) environment, and usually result in severe or very severe negative effects, or beneficial or very beneficial effects.

Example: The loss of a site would be viewed as a negative impact.

Example: The establishment of a large amount of infrastructure in a rural area, which previously had very few services, would be regarded by the affected parties as resulting in benefits with VERY HIGH significance.

HIGH

These impacts will usually result in long term effects on the social and /or natural environment. Impacts rated as HIGH will need to be considered by society as constituting an important and usually long term change to the (natural and/or social) environment. Society would probably view these impacts in a serious light.

Example: The loss of a diverse vegetation type, which is fairly common elsewhere, would have a significance rating of HIGH over the long term, as the area could be rehabilitated.

Example: The change to soil conditions will impact the natural system, and the impact on affected parties (e.g. farmers) would be HIGH.

MODERATE

These impacts will usually result in medium- to long-term effects on the social and/or natural environment. Impacts rated as MODERATE will need to be considered by the public or the specialist as constituting a fairly unimportant and usually short term change to the (natural and/or social) environment. These impacts are real, but not substantial.

Example: The loss of a sparse, open vegetation type of low diversity may be regarded as MODERATELY significant.

Example: The provision of a clinic in a rural area would result in a benefit of MODERATE significance.

LOW

These impacts will usually result in medium to short term effects on the social and/or natural environment. Impacts rated as LOW will need to be considered by society as constituting a fairly important and usually medium term change to the (natural and/or social) environment. These impacts are not substantial and are likely to have little real effect.

Example: The temporary changes in the water table of a wetland habitat, as these systems are adapted to fluctuating water levels.

Example: The increased earning potential of people employed as a result of a development would only result in benefits of LOW significance to people living some distance away.

NO SIGNIFICANCE

There are no primary or secondary effects at all that are important to scientists or the public.

Example: A change to the geology of a certain formation may be regarded as severe from a geological perspective, but is of NO SIGNIFICANCE in the overall context.

2.6.4 Certainty

DEFINITE: More than 90% sure of a particular fact. Substantial supportive data exist to verify the assessment.

PROBABLE: Over 70% sure of a particular fact, or of the likelihood of an impact occurring.

POSSIBLE: Only over 40% sure of a particular fact, or of the likelihood of an impact occurring.

UNSURE: Less than 40% sure of a particular fact, or of the likelihood of an impact occurring.

2.6.5 Duration

SHORT TERM: 0 – 5 years

MEDIUM: 6 – 20 years

LONG TERM: more than 20 years

DEMOLISHED: site will be demolished or is already demolished

2.6.6 Mitigation

Management actions and recommended mitigation, which will result in a reduction in the impact on the sites, will be classified as follows:

- ✓ **A** – No further action necessary
- ✓ **B** – Mapping of the site and controlled sampling required
- ✓ **C** – Preserve site, or extensive data collection and mapping required; and
- ✓ **D** – Preserve site

2.7 ASSESSMENT OF THE SITES AND FINDS

This section contains the results of the heritage site/find assessment. The phase 1 heritage scoping assessment program as required in terms of section 38 of the National Heritage Resource Act (Act 25 of 1999) was carried out for the entire proposed development footprint. A previous survey of portion 26 of the farm Kromdraai 520 JQ was carried out for the proposed construction of a Multi- Purpose Community Centre by Mamoluane Seliane (2009). This work found that the area was highly disturbed and that there were no significant heritage sites. Our survey found the following sites:

2.7.1 Site 01 (Old Mine Area)

The area is located on the bottom slope of the ridge, situated at the following global positioning system co-ordinates (GPS S26°.00'. 20. 02" & E27°.46'.50.00").The site is characterized by an approximately 200metres long open trench. The trench edges were stabilized a terrace wall. An open shaft was found on the top of the trench.



Figure 12: View of the identified long mining trench, the side of the trench has been stabilized by parked stones with associated shaft.

2.7.1 Site 02 (Community Grave Yard)

The site is located on top of the ridge, in close proximity to the farm boundary fence. The site is located at the following global positioning system co-ordinates (GPS S26°.00'. 31.07" & E27°.46'.49.04"). Most of the graves were demarcated by packed stones. Few of the graves however have granite tombstones as grave dressings.



Figure 13: View of the identified burial grounds, some of the graves have granite tombstones while the majority do not have them

2.7.3 Site 03 (Stonewall Structure)

A stone wall structure has been noted on top of the ridge, the site is located at the following global positioning system co-ordinates (GPS S26°00'. 28.06". & E27°46'.42.06"). The structure is characterized by 1metre high stonewall arranged in a circular form. The inner section of the stonewall structure is filled up with rocks and stones.

A number of used bullet shell were noted on the surface. It is possible that the structure was used as a lookout or guard structure during the Anglo-Boer War.



Figure 14: view of the identified stonewalled structure on the top section of the hill, section of the structure is meter high, the interior of the structure is filled up with stones, possibly the stones form part of the collapsed wall.



Figure 15: Some of the empty bullet shells identified near the stonewall structure

2.8 STATEMENT OF SIGNIFICANCE (HERITAGE VALUE)

The statement of significance outlines the principal value that the above mentioned sites hold. The mine area seems to form part of the Historical diggings associated with the Kromdraai Goldmine on the Ibis ridge. The mine was discovered by Johannes Stephanus Minaar in 1881 on the farm Kromdraai. This discovery coincides with the War of Independence (1880-1881) which brought prospecting to a temporary halt. In 1885 the farm was declared open diggings. Certain geological features apparent at Kromdraai diverted attention to other parts of the Witwatersrand resulting in massive prospecting to the south-east of Kromdraai, where the Struben brothers H.W and F.P.T Struben started exploration in 1883. In 1884 Struben found a promising reef which they named the confidence Reef. Therefore, the mine workings are part of the history leading up to the discovery of the Witwatersrand. They will not be affected by the proposed development.

The identified cemetery is associated with the residents of the informal settlement. Like the Old Mine, the burial ground has very high significance. However, it will not be affected by the proposed upgrade of existing structures.

The overall significance was calculated based on the matrix presented earlier as follows:

Heritage Significance:		G. P. A; High/Medium Significance
Impact	:	Negative
Impact Significance	:	High
Certainty	:	Probable
Duration	:	Permanent
Mitigation	:	Preserve sites

2.9 CONCLUSION AND RECOMMENDATIONS

The mine /quarry site with shaft, and the identified burial grounds (Grave site) should be regarded as a “No Go Area” by the proposed comprehensive rural development activities. All these sites are located on the ridge which is known to potentially host hominin fossils and must be avoided.

The extent and the depth of the existing shaft is still not yet established however large amount of rocks and soil has been extracted. The planning team should ensure that a small management plan is set in place to ensure future safety of the identified areas (sites). All project activities should be centered on the disturbed agricultural lowered laying area to avoid the ridge, should this become unavoidable proposed activities should be altered and planned around these sites. However there are no fixed prescriptions according to the National Heritage Act 25, 1999 that enforces a safe distance that needs to be maintained between the sites or burial grounds and the proposed activities.

However if the above mentioned mitigation became un-avoidable a second mitigation measure will be to perform a Phase II which involved mine and associated shaft, stonewall structure to be surveyed and Mapped and the exhumation of the human remains from the identified graveyard to a safe area.

The process is very much costly and involves consultations with affected family members. This process can only be conducted by archaeologists accredited with the Association for Southern African Professional Archaeologist (ASAPA). The archaeologist has to obtain a permit from the South African Heritage Resources Authority (SAHRA) which will authorize mapping of the mine area and the exhumation process prior to the development of comprehensive rural pilot project.

Should above recommendations be viable to the developer there are no objections to the proposed comprehensive rural development programme and we recommend to Provincial Heritage Resources Authority or the South African Heritage Resource Agency to approve the project as planned. The developer in this case Mogale City Local Municipality is here by reminded of section 24F of the National Environmental Management Act, Act No 107 of 1998, as amended, that no activity may commence prior to an environmental authorization being granted by the Department.

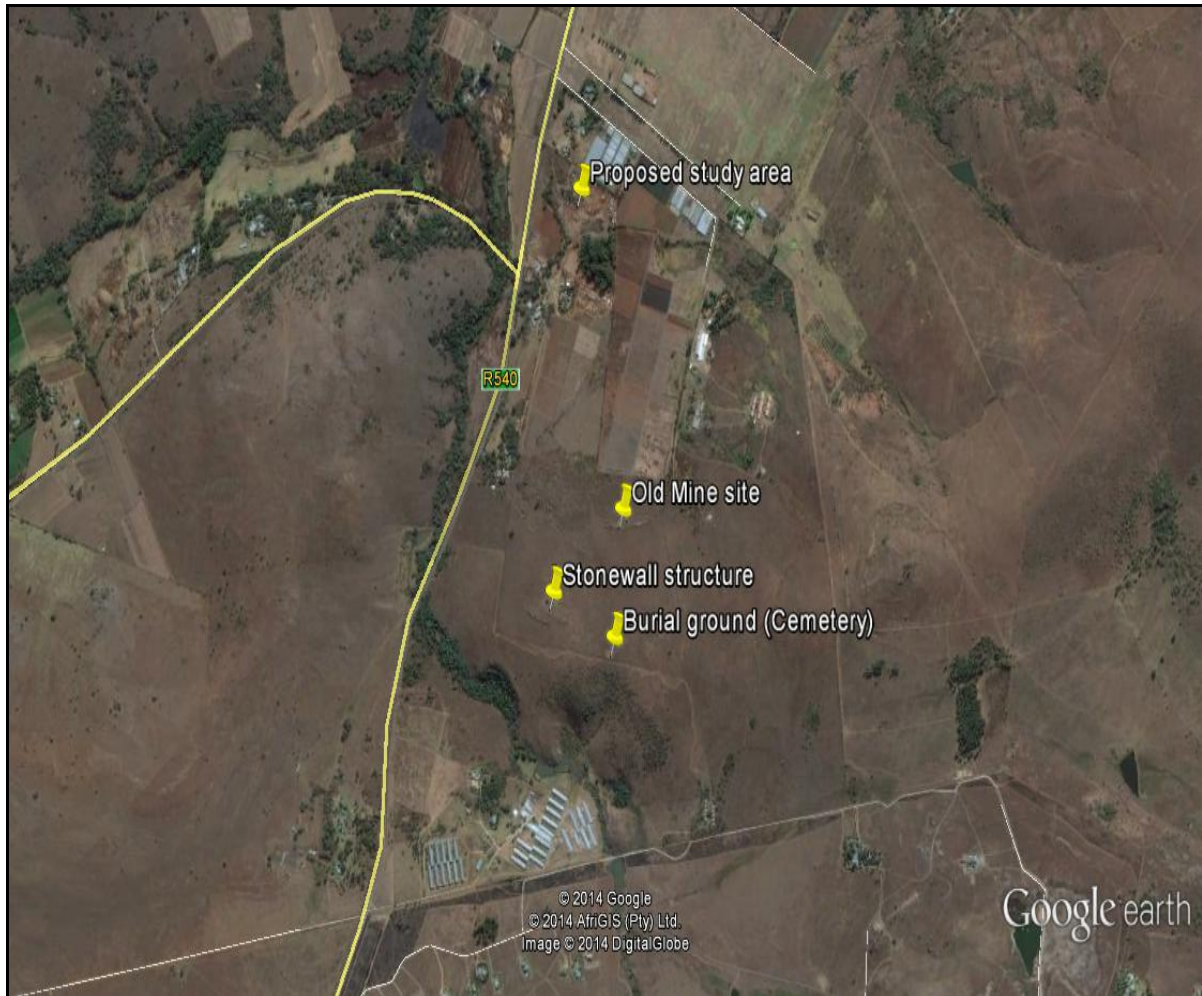


Figure 16: Areal view of portion 26 of farm Kromdraai 520JQ

2.9.1 Management Recommendations for the Cradle of Humankind

- The proposed upgrade of existing facilities will take place on a ground that is already developed and in an area that is historically part of the COHWHS. The main activities will be restricted to this disturbed area but must be managed and monitored to ensure that attributes that convey OUV are not eroded.
- A monitoring plan and management plan must be developed to manage the indirect impacts
- The settlement offers previously disadvantaged communities a chance to participate in the management and conservation of the Cradle of Humankind World Heritage Site.
- Stakeholders should consider ways in which the residents may economically benefit from the World Heritage Site.

- A palaeontologist must inspect the dolomites for fossils during developments that expose this type of rock as it is known to be fossil bearing.

2.9.2 Conclusions relating to impact assessment on Portion 26 of Kromdraai

The part of the assessment which followed the requirements of the National Heritage Resources Act reached the following conclusions:

- The proposed upgrade of existing facilities will take place on an already disturbed area. No historical buildings, Stone Age sites and Iron Age sites will be affected by the upgrade.
- There is an Anglo-Boer War fort on top of a ridge on portion 26 of the farm Kromdraai but this will not be affected by the development.
- A recent cemetery was also identified on the southern extreme boundary of portion 26 but this will not be affected by the development.
- There are also historical mines dating to the late 19th century. These are not affected by the development and must be protected.
- In terms of the National Heritage Resources Act, burials have a huge significance but the other sites were classified as Grade 3 sites of low Local Significance. The sites must be protected and conserved since they are in an area that will not be affected by development.

2.9.3 Management Recommendations

All archaeological, paleontological and burial grounds and graves have general protection under the NHRA Act 25 of 1999. As such, all sites known or unknown situated within Portion 26 of the farm Kromdraai may not be disturbed or destroyed without authorisation from the compliance agency, SAHRA. In brief, the following overall recommendations apply:

- Should any new roads be constructed in areas outside the already disturbed area, the process must be monitored for archaeological and paleontological materials.

- Paleontological study concluded that no fossils were visible on the surface and already exposed areas. Monitoring is required in the event that excavations are required.
- In the chance finds event, should archaeological materials or human burials remains be exposed during subsurface construction work on any section of the mine laydown sites, operations should cease on the affected area and the discovery must be reported to the heritage authorities immediately so that an investigation and evaluation of the finds can be made. The overriding objective, where remedial action is warranted, is to minimize disruption in construction scheduling while recovering archaeological and any affected cultural heritage data as stipulated by the PHRA and NHRA regulations.
- A professional palaeontologist and archaeologist must be retained to monitor all significant earth moving activities that may be implemented. The monitoring process would ensure that should any fossils, archaeological or human remains be disturbed during excavations, immediate remedial rescue and salvage work would be actioned without delay.
- Subject to the recommendations herein there are no significant cultural heritage resources barriers to the proposed upgrade of existing facilities on portion 26 of the farm Kromdraai. The Heritage authority may approve the proposed development to proceed as planned with special commendations to implement the recommendations here in made.

2.9.4 Responsibilities in the Heritage Management Recommendations

- Mogale City Local Municipality (*the Developer*) should ensure that no heritage sites are destroyed without permission from the relevant compliance authority and that chance finds are reported to the relevant authorities.
- The South African Heritage Resources Agency should ensure that the developer complies with applicable sections of NHRA 25: 1999 on on-going basis throughout the lifetime of the settlement.
- SAHRA (*custodians of heritage resources*) and the COHWHS Management Authority should work with Mogale City Local Municipality to ensure that attributes that convey OUV of COHWHS are not eroded.

- The Management authority, Mogale City and other stakeholders must ensure that this community also participates in the conservation of the site and that it also derives economic benefits.

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