



**HERITAGE IMPACT ASSESSMENT
FOR THE HARWAR COLLIERY, 2630AA
AND 2630AC, MPUMALANGA
PROVINCE**

MSOBO COAL (PTY) LTD

28 JUNE 2013

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This document has been prepared by **Digby Wells Environmental**.

Report Title: **Heritage Impact Assessment for the Harwar Colliery,
 2630AA and 2630AC, Mpumalanga Province**

Project Number: **MSO 1805**

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EXECUTIVE SUMMARY

Msobo Coal (Pty) Ltd (Msobo Coal) has commissioned Digby Wells Environmental (Digby Wells) to conduct environmental and social studies in support of a Mining Right Application (MRA) in accordance with the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA). Msobo Coal proposes to conduct opencast mining on Mooifontein 35 IT, De Goedverwachting 57 IT, Harwar 58 IT, Vryheid 59 IT, and Tevreden 56 IT (herewith referred to as the 'Harwar Project'). As per the MPRDA, an Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) will be compiled and submitted to the Department of Mineral Resources (DMR). This Heritage Impact Assessment (HIA) Report will form a component of the EIA and EMP.

From the research conducted on the Study Area, one can deduce that a great deal of cultural heritage exists in this area of Mpumalanga. The town of Chrissiesmeer has a long history stemming from the Stone Age to the Iron Age and flourishing in the Historic and Social periods and the town and its surrounding areas have embodied each of these periods of history. Heritage resources that can be found include rock art sites and Bushmen massacre sites, Anglo-Boer battle sites and cemeteries, sandstone, wood and iron, and brick buildings dating to the early 1800s to the 1900s. These heritage resources highlight the uniqueness of Chrissiesmeer and the surrounding area. Today, the people living in Chrissiesmeer and the surrounding area have a sense of authentic human attachment and belonging to the town.

During the HIA survey a total of two archaeological and historical sites, two built environment resources and three burial grounds were identified and recorded in the proposed Harwar Project Area. Six of these sites are located in the proposed opencast mining area. The archaeological and historical sites are of negligible heritage value and impacts on these heritage resources were not assessed in this HIA report. These sites were significantly recorded and no further mitigation measures are recommended.

The two informal burial grounds S.36-047 and S.36-048 are located in the opencast mine footprint and will be impacted on by the proposed development. No Project-related mitigation measures such as changes to design or mine plan were considered for the burial grounds as they are located within the opencast mine footprint and will never be preserved. It is therefore recommended that these burial grounds be relocated.

Potential impacts on the informal burials S.36-052 may be avoided through the implementation of feasible mitigation measures related to Project design and planning. The burial ground may therefore be preserved *in situ* ensuring protection during development and the long-term. Project-related mitigation measures and site managements should be implemented to reduce the significance of the impact. These include erecting a perimeter fence around the burial ground to create a 20 m buffer between the opencast mine and the burial ground. Access to the burial ground should be negotiated with communities in the immediate area.

Based on the above finds, it is recommended that a Phase 1 Paleontological Assessment and Phase 2 mitigation measures be implemented for the Harwar Project. The HIA survey could not be conducted on Harwar 58 IT, Vryheid 59 IT as site access could not be obtained. This represents a major gap in this HIA report as heritage sites could not be identified and recorded. It is therefore recommended that Phase 1 Palaeontological Assessment and Phase 2 mitigation be conducted on these farms.

Detailed surface infrastructure design plans were not available at the time of the HIA. Detailed HIAs may therefore be required on areas where infrastructure footprints will exceed minimum thresholds described in Section 38 of the NHRA, such as stockpiles, pollution control dams and other infrastructure. These HIAs should be undertaken after final designs have been completed and before construction occurs.

GLOSSARY OF ABBREVIATIONS AND TERMS

ASAPA	Association of Southern African Professional Archaeologists
BA	Bachelor of Arts
BGG	Burial Grounds and Graves
BSc	Bachelor of Science
CE	Common Era
CPE	Chrissiesmeer Protected Environment
CSG	Chief Surveyor General
DMR	Department of Mineral Resources
EAP	Environmental Authorisation Policy
EHS	Environmental Health and Safety
EIA	Environmental Impact Assessment
EMG	Environmental Monitoring Group
EMP	Environmental Management Plan
EP	Equator Principle
EPFI	Equator Principles Financial Institution
ESA	Early Stone Age
EWT	Endangered Wildlife Trust
FSE	Federation for a Sustainable Environment
GRP	Grave Relocation Plan
GS-IDP	Gert Sibande Integrated Development Plan
HIA	Heritage Impact Assessment
HRA	Heritage Resources Authority
HRM	Heritage Resources Management
I&APs	Interested and Affected Parties
IFC	International Finance Corporation
LIHRA	Limpopo Heritage Resources Agency
LSA	Later Stone Age
MEC	Minister of the Executive Council
MGDP	Mpumalanga Growth and Development Plan
MJS	Major Jackson Series
MPHRA	Mpumalanga Provincial Heritage Resources Authority
MPRDA	Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)
MRA	Mining Right Application
MSA	Middle Stone Age
MSc	Master of Science
Mt	Million tons
MTPA	Mpumalanga Tourism and Parks Agency
NAAIRS	National Automated Archival Information Retrieval System
NEMA	National Environment Management Act, 1998 (Act No. 107 of 1998)

NEMPA	National Environment Management: Protected Areas Act, 2003 (Act No. 57 of 2003)
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
OECD	Organisation for Economic Co-operation and Development
OES	Ostrich eggshell
OP	Operational Policies
PCD	Pollution Control Dam
PHRA	Provincial Heritage Resources Authority
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
SAPS	South African Police Service
SEP	Stakeholder Engagement Plan
SoW	Scope of Work
ToR	Terms of Reference
WESSA	Wildlife and Environmental Society of South Africa
WHCA	World Heritage Convention Act, 1999 (Act No. 49 of 1999)
WITS	University of the Witwatersrand
WWF - SA	World Wildlife Federation - South Africa
ZAR	<i>Zuid-Afrikaanse Republiek</i>

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1 INTRODUCTION

Msobo Coal (Pty) Ltd (Msobo Coal) commissioned Digby Wells Environmental (Digby Wells) to conduct environmental and social studies in support of a Mining Right Application (MRA) in accordance with the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA).

Msobo Coal proposes to conduct opencast mining on Mooifontein 35 IT, De Goedeverwachting 57 IT, Harwar 58 IT, Vryheid 59 IT, and Tevreden 56 IT (herewith referred to as the 'Harwar Project').

As per the MPRDA, an Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) will be compiled and submitted to the Department of Mineral Resources (DMR). This Heritage Impact Assessment (HIA) Report will form a component of the EIA and EMP.

2 BACKGROUND INFORMATION OF PROJECT

An application for a Mining Right (MRA) was lodged by Xstrata SA (through its subsidiary Duiker Mining (Pty) Ltd), with the DMR in November 2012 in respect of the properties Harwar 58 IT, De Goedeoverwachting 57 IT, Vryheid 59 IT, Tevreden 56 IT and Mooifontein 35 IT (the Prospecting Right). The application was accepted by the Regional Manager and the acknowledgement letter (with reference number MP/30/5/1/2/2/10061 MR) was received on 30 January 2013 permitting Xstrata to proceed with the necessary environmental process. Xstrata as the applicant has been directed to lodge an Environmental Management Programme Report (EMPR) as contemplated in Regulations 48, 50, and 51 of the MPRDA Regulations, by 29 July 2013. Although this directive has been addressed to Xstrata, subsequent to the MRA being submitted, the properties previously owned by Xstrata have been transferred and all rights in terms of the MPRDA have been ceded to Msobo Coal. This EMPR has accordingly been prepared under the name of Msobo Coal (Pty) Limited which is the current holder of the prospecting rights, and which will ultimately become the holder of the mining right.

2.1 Report type: NHRA Section 38(8) Heritage Impact Assessment (HIA)

Digby Wells was requested by Msobo Coal to conduct an EIA and EMP in support of the MRA in accordance with the MPRDA. This HIA forms part of the EIA and EMP undertaken for the proposed Harwar Project.

2.2 Context of Development

2.2.1 Type of development

The Harwar Project is proposed to be an extension of Msobo Coal's existing Tselentis operation in Mpumalanga. Opencast mining is proposed for the Harwar Project Area. The proposed Harwar Project Area is currently a greenfield area. The site was granted prospecting rights in 2008 under the previous ownership of Xstrata Coal (known then as Duiker Mining).

2.2.2 Mining activities

2.2.2.1 Resources and Reserves

The mineral to be mined is Bituminous coal located within the Ermelo Coal Field. The Harwar area is made up of three resource areas covering five farms. The B and C seams are developed in the Harwar prospecting areas. The A Seam has been removed by erosion over most of the area. It is too thin (<0.5 m) to be of economic importance. The B-seam is present over most of the area, but has been removed by weathering in the low lying areas. The C Seam group has been removed by channel sandstone in the Tevreden area. The B and C seams are relatively thin and mostly less than 2 m thick. The seams are shallow and preserved in three hills with an average depth to the top of the B and C seams of 22 m and 30 m respectively. A total of 15.1 Million tonnes (Mt) of resources can be mined by means of opencast methods. The 15.1 Mt of coal resource available is a measured resource however there are indications that another 15 Mt of coal is present. Further exploration is however required to determine its extent. The life of mine of the Harwar Colliery is estimated to be 28 years.

2.2.2.2 Mining Method

Both the B and C seams will be mined with the use of the opencast truck and shovel/rollover methods. The truck and shovel/rollover method will be applied allowing rehabilitation to be done closely following on the advanced cuts. The mined coal will be transported via the use of haul trucks to the Spitzkop Colliery Plant for processing. Therefore, there will be no coal processing plant on the proposed Harwar Colliery.

2.2.2.3 Mineral Processing

The mined coal from the Harwar Colliery will be transported approximately 40 km to the Spitzkop Colliery by haul trucks. The coal will be washed at the Spitzkop Colliery's beneficiation facility. The Spitzkop Colliery plant is a dense medium, single-stage wash plant with a feed capacity of 450 tons/hr.

2.2.2.4 Transportation

The mined coal from the Harwar Colliery will be transported approximately 40 km to the Spitzkop Colliery by haul trucks. After the beneficiation of coal at the Spitzkop Colliery Plant, the coal products will be loaded onto dedicated trains for transport either to the Richards Bay Terminal Facility for export, local ESKOM power station and/or other regional markets.

2.2.2.5 Coal Markets

The B seam can be beneficiated to supply an export quality steam coal. The C seam is better suited for the domestic power generation market although some areas are suitable to produce an export steam coal.

2.2.2.6 Infrastructure

The proposed infrastructure associated with the opencast activities at the proposed Harwar Colliery includes:

- Access roads;
- Electrical Substations;
- Security / access control checkpoint with entry and exit roadways;
- Topsoil storage areas;
- Waste rock stockpiles;
- Infrastructure for services including potable water and fire water, compressed air and sewage reticulation;
- Dirty water settling dams and pollution control dams (PCD's);
- Storm water diversion berms;
- Weigh bridges for outgoing haul trucks;
- Bus and taxi off-loading area;
- Parking for office and mine personal;
- Diesel, petrol and oil storage facilities;
- Vehicle and mechanical workshops;
- Employee change house facility and lamp house;
- Storage yard;
- Explosives storage;
- Salvage yard and waste storage facility; and
- Services such as power lines, pipelines, conveyors, roads, telephone lines, communication and lighting masts.

2.2.2.7 Waste Management

Waste management on site will entail temporary handling and storage of general and hazardous waste, on-site change houses and ablution facilities with sewage treatment plant. The storage and handling of hazardous substances will take place and these will include:

- Fuel;
- Lubricants;
- Various process input chemicals;
- Raw material stockpiles / bunkers;
- Gas;
- Burning oils; and
- Explosives.

2.2.3 Rezoning and/or land subdivision

The Harwar Project Area is currently a greenfields area. Rezoning will be required but this will be undertaken during a later phase in the Project.

2.2.4 Integrated Development Plan (IDP) of study area

The proposed Harwar Project is located in the Gert Sibande District Municipality. The 2012 Gert Sibande District Municipality Integrated Development Plan (GS-IDP) was reviewed to gain a more detailed understanding of the development context within which the proposed Harwar Project site is situated (Gert Sibande District Municipality IDP, 2012). The GS-IDP represented a five-year plan to guide socio-economic development within the district municipality. The proposed socio-economic development of the municipality was considered in order to better identify and assess cumulative environmental impacts on heritage resources in the Study Area.

Overall, the mining sector was identified as a key sector for facilitating economic growth and promoting job creation. The mining sector primarily involves infrastructure development, social development, municipal financial viability, economic development and institutional development.

The Mpumalanga Growth and Development Path (MGDP) – included in the GS-IDP - promotes local economic growth through the following sectors (Gert Sibande District Municipality IDP, 2012):

- Agriculture and forestry;
- Mining and energy;
- Conservation; and
- Tourism and cultural interests.

Each identified sector above comprises specific types or categories of development that may impact on heritage resources in various manners. The development context in Study Area must therefore be taken into account. The identified sectors are briefly discussed below.

2.2.4.1 Agriculture and Forestry

According to the GS-IDP, growth within the agriculture sector will include a massive drive on infrastructure development that may include, among other things:

- Dams;
- Irrigation;
- Farm roads;
- Silos;
- Pack houses;
- Mechanisation;
- Electricity; and
- Infrastructure for agro-processing.

2.2.4.2 Mining and Energy

The key areas that were identified within the mining sector to facilitate economic growth included:

- The upgrading and maintenance of the coal haulage network;
- The expansion of the water network and increased reliance on water transfer schemes;
- The increase of South Africa's energy load and the improvement of alternative energy supply;
- The establishment of a mining supplier park to enhance enterprise development in the province;
- The resolution of land claims to release land for development; and
- The provision of comprehensive support to small-scale mining enterprises.

2.2.4.3 Conservation

A number of conservation areas were identified by the GS-IDP. These included the town of Chrissiesmeer which has an important wetland system. The preservation of Chrissiesmeer and all its components, including heritage, is therefore important for conservation and economic development as identified in the GS-IDP.

In 2010, the Mpumalanga Tourism and Parks Agency (MTPA), together with landowners within the area and various NGOs such as the Endangered Wildlife Trust (EWT) and

Birdlife SA, were involved in a process to have the Chrissiesmeer Protected Environment (CPE) established (Morris, 2013). The properties included earmarked for declaration of the CPE area include Harwar 58 IT, De Goedverwachting 57 IT, Vryheid 59 IT, Tevreden 56 IT, and Mooifontein 35 IT (MTPA, 2013). The proposal for this declaration has been made in terms of Section 28(1) of the National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003) (NEMPA). On 21 June 2013, notice was given by the Minister of the Executive Council (MEC) for the Department of Economic Development, Environment and Tourism in the Mpumalanga Province, in terms of Section 33(1) of the NEMPA of the intention to declare the CPE. The proposed CPE will qualify to be registered as a Wetland of International Significance in terms of the RAMSAR Convention (Morris, 2013; MTPA, 2013).

2.2.4.4 Tourism and Culture

The GS-IDP also identified key areas to facilitate growth in the tourism and cultural industries, in Chrissiesmeer, in particular. The “Grass and Wetlands” areas were identified by the GS-IDP as tourism areas.

The development context of the Study Area, as discussed above, was considered in order to better identify and assess cumulative environmental impacts on heritage resources in the Study Area.

2.3 Client, Consultant and Land Owner Contact Details

Table 2-1: Client contact details

ITEM	COMPANY CONTACT DETAILS
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Fax no	011 789 9498
E-mail address	marcelle.radyn@digbywells.com
Postal address	Private Bag X10046, Randburg, 2125

Table 2-3: Land owner contact details for Mooifontein 35 IT Portion 2 & Portion 5, & De Goedeverwachting 57 IT Portion 5 & Portion 10

ITEM	CONTACT DETAILS
Contact person	Lourens Daniel Neethling
Tel no	017 843 1232
Cell no	082 821 3073
E-mail address	demooihof@gmail.com
Postal address	PO Box 210, Ermelo, 2350

Table 2-4: Land owner contact details for Harwar 58 IT RE

ITEM	CONTACT DETAILS
Contact person	Hannes Botha
Cell no	083 630 1251
Fax no	086 514 6085
E-mail address	d.zoekop@lando.co.za
Postal address	PO Box 201, Belfast, 1100

Table 2-5: Land owner contact details for Vryheid 59 IT RE

ITEM	CONTACT DETAILS
Contact person	Johannes Lodewikus Botha
Cell no	083 630 1251
Fax no	086 514 6085
E-mail address	d.zoekop@lando.co.za
Postal address	PO Box 201, Belfast, 1100

Table 2-6: Land owner contact details for Tevreden 56 IT Portion 4

ITEM	CONTACT DETAILS
Contact person	Johannes Hercules Du Preez
Tel no	082 775 2021

Table 2-7: Land owner contact details for Tevreden 56 IT Portion 9

ITEM	CONTACT DETAILS
Contact person	Anna Haasbroek
Cell no	072 469 4382

3 TERMS OF REFERENCE

3.1 Client Term of Reference

Msobo Coal has requested Digby Wells to undertake an EIA and EMP with associated studies for the MRA in accordance with the MPRDA. Digby Wells has developed a Heritage Resources Management (HRM) process that is firmly founded on the National Heritage Resources Act, 1999 (Act No 25 of 1999) (NHRA) and is aimed at expediting decisions by relevant Heritage Resources Authorities (HRAs). This process is a phased approach aimed at integrating HRM with the MPRDA and is described in more detail in the Methodology discussion in Section 4 on Page 14 of this HIA Report.

3.2 Heritage Resources Authority (HRA) Terms of Reference

Based on the Heritage Statement, the South African Heritage Resources Authority (SAHRA) stipulated that a HIA must be undertaken for the Harwar Project Area. SAHRA required that the HIA must include an assessment of following:

- Archaeological resources;
- Palaeontological resources;
- Built Environment resources, such as structures older than 60 years;
- Sites of cultural significance associated with oral histories;
- Burial grounds and graves; and
- Cultural landscapes or viewsapes.

Appropriate mitigation (Phase 2) which involves recording, sampling and dating sites that are to be destroyed must be recommended as required.

3.3 Scope of Work

As part of the EIA/EMP and Terms of Reference (ToR) received from SAHRA, the Scope of Work (SoW) for the heritage component of the Harwar Project consisted of compiling a HIA Report which included the Aims and Objectives discussed in Section 3.4 below. This report constitutes the HIA component of the Final EIA/EMP Report to be submitted in accordance with the MPRDA.

3.4 Aims and Objectives

The aim of this HIA was to assist the client in identifying, documenting and managing heritage resources found in the proposed Harwar Project Area in a responsible manner. This assessment also aimed to protect, preserve and develop resources within relative legislative frameworks. In essence, this HIA aimed to:

- Identify, record and document sites of cultural and historic sites, including graves and cemeteries within the proposed Harwar Project Area;
- Evaluate whether proposed Harwar Project activities will have any negative impacts on these heritage resources during construction, operation and decommissioning phases;
- Recommend Project-related mitigation and management measures to avoid or amend any negative impacts on objects or sites of cultural significance. Where Project-related mitigation measures cannot remove negative impacts, appropriate heritage-related mitigation of heritage resources were recommended; and
- Promote overall conservation and protection of natural and cultural resources in the proposed Harwar Project Area and its surroundings.

3.5 Legislative Requirements

This HIA is governed by national legislation and standards, and international Best Practice. These are discussed below.

3.5.1 Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA)

The MPRDA stipulates under Section 5(4) no person may prospect for or remove, mine, conduct technical co-operation operations, reconnaissance operations, explore for and produce any mineral or petroleum or commence with any work incidental thereto on any area without (a) an approved environmental management programme or approved environmental management plan, as the case may be.

3.5.2 National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA)

3.5.2.1 Section 34 – Structures older than 60 years

The proposed activities associated with the Harwar Project will include the construction, operation and maintenance of the opencast mine. This will require the removal of existing structures that may be older than 60 years.

Section 34 of the NHRA provides for general protection of structures older than 60 years. Most importantly, Section 34(1) clearly states that no structure or part thereof may be altered or demolished without a permit issued by the relevant Provincial Resources Heritage Authority (PHRA), in this case the Mpumalanga Provincial Heritage Resources Authority (MPHRA). These permits will not be granted without a HIA being completed.

A destruction permit will thus be required before any removal and/or demolition may take place, unless exempted by the MPHRA according to Section 34(2) of the NHRA.

3.5.2.2 Section 35 – Archaeological and palaeontological resources and meteorites

Construction and operation activities associated with the Harwar Project – in the immediate receiving environment – are likely to impact on archaeological resources

Section 35 of the NHRA provides for the general protection of archaeological and palaeontological resources, and meteorites. In the event that archaeological resources are discovered during the course of development, Section 38(3) specifically requires that the discovery must immediately be reported to the MPHRA, or local authority or museum who must notify the MPHRA. Furthermore, no person may without permits issued by SAHRA destroy, excavate, or make any alterations to archaeological or palaeontological resources encapsulated in Section 38(4).

3.5.2.3 Section 36 – Burial grounds and graves

Construction and operation activities associated with the Harwar Project – in the immediate receiving environment – are likely to impact on burial grounds and graves.

Section 36 of the NHRA allows for the general protection of burial grounds and graves. Should burial grounds or graves be found during the course of development, Section 36(6) stipulates that such activities must immediately cease and the discovery reported to the MPHRA and the South African Police Service (SAPS). Furthermore, as specified in Section 38(3) no person may destroy, damage, exhume or alter any burial site without a permit issued by SAHRA.

3.5.2.4 Section 37 – Public monuments and memorials

Section 37 makes provision for the protection of all public monuments and memorials in the same manner as places which are entered in a heritage register referred to in Section 30 of the NHRA.

3.5.2.5 Section 38 –Heritage Resources Management (HRM)

Section 38 (8): The provisions of this section do not apply to a development as described in Section 38 (1) if an evaluation of the impact of such development on heritage resources is required in terms of the Environment Conservation Act, 1989 (Act No. 73 of 1989), or the integrated environmental management guidelines issued by the Department of Environment Affairs and Tourism, or the Minerals Act, 1991 (Act No. 50 of 1991), or any other legislation. Section 38(8) ensures cooperative governance between all responsible authorities through ensuring that the evaluation fulfils the requirements of the relevant heritage resources authority in terms of Subsection (3), and any comments and recommendations of the relevant heritage resources authority with regard to such development have been taken into account prior to the granting of the consent.

Under this section of the NHRA, the following development categories will trigger an HIA:

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

3.5.3 International Council on Monuments and Sites (ICOMOS) Charters and Declarations

3.5.3.1 The Venice Charter, 1964

Article 1: The concept of a historic monument embraces not only the single architectural work but also the urban or rural setting in which is found the evidence of a particular civilization, a significant development or a historic event. This applies not only to great works of art but also to more modest works of the past which have acquired cultural significance with the passing of time.

Article 6: The conservation of a monument implies preserving a setting which is not out of scale. Wherever the traditional setting exists, it must be kept. No new construction, demolition or modification which would alter the relations of mass and colour must be allowed.

Article 7: A monument is inseparable from the history to which it bears witness and from the setting in which it occurs. The moving of all or part of a monument cannot be allowed except where the safeguarding of that monument demands it or where it is justified by national or international interest of paramount importance.

3.5.3.2 The Xi'an Declaration, 2005

The declaration talks to the conservation of the setting of heritage structures, sites and areas. The setting of a heritage structure, site or area is defined as the immediate and extended environment that is part of, or contributes to, its significance and distinctive character. This goes beyond the physical and visual aspects and includes the interaction with the natural environment; past or present social or spiritual practices, customs, traditional knowledge, use or activities and other forms of intangible cultural heritage aspects that created and form the space as well as the current and dynamic cultural, social and economic context.

Heritage structures, sites or areas of various scales, including individual buildings or designed spaces, historic cities or urban landscapes, landscapes, seascapes, cultural routes and archaeological sites, derive their significance and distinctive character from their perceived social and spiritual, historic, artistic, aesthetic, natural, scientific, or other cultural values. They also derive their significance and distinctive character from their meaningful relationships with their physical, visual, spiritual and other cultural context and settings. These relationships can be the result of a conscious and planned creative act, spiritual belief, historical events, use or a cumulative and organic process over time through cultural traditions.

3.6 Expertise of Specialists

Shahzaadee Karodia has completed a Bachelor of Arts (BA) degree in archaeology and anthropology, a Bachelor of Science (BSc) Honours degree in palaeontology, and a Master of Science (MSc) degree in archaeology at the University of the Witwatersrand. She currently holds the position of Archaeology Consultant at Digby Wells.

Natasha Higgitt has completed a BA Honours degree in archaeology at the University of Pretoria. She currently holds the position of Archaeology Consultant at Digby Wells.

Justin du Piesanie has completed an MSc degree in archaeology at the University of the Witwatersrand. He currently holds the position of Archaeology Consultant at Digby Wells.

Johan Nel has completed a BA degree in archaeology and anthropology and a BA Honours degree in archaeology at the University of Pretoria. Johan holds the position of Unit Manager for HRM in the Social Science Department at Digby Wells. All specialist CVs are located in Appendix A.

4 METHODOLOGY

This HIA consisted of a desktop study – including background literature reviews, aerial and historical map surveys and a review of relevant impact assessment reports, inferred information - and a pedestrian site survey. A heritage site visit was undertaken for the identification and documentation of potential heritage resources, as stipulated in the NHRA and the SAHRA Minimum Standards (SAHRA, 2006).

4.1 Survey and sampling

A vehicle and pedestrian survey was undertaken by Digby Wells' heritage specialists for five days on the farms Mooifontein 35 IT, De Goedeverwachting 57 IT, and Tevreden 56 IT from 22 April 2013 to 26 April 2013. The survey was conducted in the proposed Harwar Project Area on the opencast mine footprint areas.

The vehicle and pedestrian survey was aimed at locating and documenting potential sites of heritage significance located within the Harwar Project boundaries and its immediate surrounds. Agricultural fields were avoided as agricultural activities would have destroyed any archaeological or heritage sites that may have existed. General site conditions and features were recorded by means of photographs, GPS locations and descriptions. A pedestrian survey was done to identify and record any sites found *in situ*.

4.1.1 Site naming

Sites identified during the survey were named using the Digby Wells project number, followed by the map sheet number and the relevant NHRA section suffixed with the site number: **MSO1805/2630AA/S.35-001**

This number is abbreviated in tables and/or on plans or maps using the NHRA reference number suffixed with the site number: **S.35-001**.

4.2 Data acquisition

Data acquisition was aimed at information gathering relating to known heritage resources within and surrounding the proposed area for development. Project information and data was obtained through intensive research and data gathering, including a variety of primary and secondary sources such as academic journals, textbooks and records, national and provincial websites, archaeological field guides, national guidelines, maps, photographs and plans. Surveys of historical aerial photographs, historical maps, topographical maps and satellite imagery were undertaken to plot potential sites. Some older maps such as the Major Jackson Series (MJS) maps of the early 20th century were also consulted and integrated into the HIA where applicable. These are invaluable resources as they often include features and information not recorded on later maps.

4.2.1 Relevant Databases and Collections

The archival and database survey was conducted by consulting the following resources:

- Chief Surveyor General (CSG);
- Genealogical Society of South Africa;
- Geological Society of South Africa;
- National Automated Archival Information Retrieval System (NAAIRS);
- South African Heritage Resources Information Systems (SAHRIS); and
- University of the Witwatersrand (WITS) Archaeology Site Database.

The Genealogical Society of South Africa database was surveyed. The results showed that no burial grounds and graves were previously recorded in the Harwar Project Area. The Geological Society of South Africa database was surveyed and the results are discussed in Section 6.3.1. The NAAIRS database was surveyed and the following results were found:

- In March 1930, a farm school was present on the farm Mooifontein 218 IT (now Mooifontein 35 IT). Only four pupils attended this school at this time.

See Section 9.1 for a discussion on this farm school.

The SAHRIS database was surveyed and only two previous impact assessment reports were completed for near the Harwar Project Area. These are discussed in Section 4.2.3 below. The WITS Archaeological Site database was surveyed. The results showed that no archaeological sites were previously recorded in or around the Harwar Project Area.

4.2.2 Desktop cartographic survey

A desktop cartographic survey was conducted in order to determine the potential of sites to exist within the Harwar Project Area and the surrounding region, as well as relative age based on the dates of the maps. Historical aerial photographs, historical maps, current topographic maps and satellite imagery were used to this end. The results of the cartographic survey are discussed in Section 9.

4.2.3 Relevant Previous Impact Assessment Reports

The following previous impact assessment reports were consulted:

- Van Schalkwyk, J.A., 2003. *Archaeological Survey of a Section of the Secunda-Mozambique Gas Pipeline, Carolina District, Mpumalanga*. Unpublished Report for GLMC Joint Venture: On file at SAHRA as 2003-SAHRA-0042.

Van Schalkwyk (2003) identified four sites Witkranz 53 IT and De Goedverwachting 57 IT. These sites included a rock art site and three burial grounds. The sites are between 5 km and 8 km west of the Harwar Project Area and will not be impacted on (Plan 5).

- Murimbika, M., 2007. *Phase 1 Archaeological and Heritage Impact Assessment Study for the Proposed Extension of Coal Mining Area on Portion 1 of Goedverwachting 80 IT Farm, Mpumalanga Province*. Unpublished Report for Xstrata Coal: On file at SAHRA as 2007-SAHRA-0042.

Murimbika (2007) identified seven sites on Goedverwachting 80 IT Portion 1. These included an old farm entrance gate, a sandstone wall and a historic farm building with associated farm out buildings, stonewall remains of a historic building converted to a cattle holding kraal in recent years, two contemporary/historic burial grounds and a grave, and a collapsed stone wall. These sites are located approximately 6 km west and south west from the Project Area and will not be impacted on (Plan 5).

4.3 Stakeholder Engagement Plan

Stakeholder engagement is an essential and legislative requirement for environmental authorisation in a number of the major Acts applicable to the proposed Harwar Project. The principles that demand communication with society at large are best embodied in the principles of the MPRDA. In addition, the Stakeholder Engagement Plan (SEP) will be conducted in line with the EP.

The objectives of the SEP are to ensure that all stakeholders and interested and affected parties (I&APs) are given accurate and timeous Project information, and are given an opportunity to raise comments and concerns.

The assessment of heritage resources includes two distinct but complimentary stages: evaluation of a heritage resource's significance or value and assessment of impacts on the resource. A brief description of the assessment methodology will be presented here. See Appendix D for a full description of the assessment methodology.

4.3.1 Evaluation of Significance/Value

The significance of a heritage resource was evaluated in terms of four dimensions - aesthetic, scientific, historic and/or social value – and integrity. Each dimension included certain relevant assessment criteria defined in Section 3 of the NHRA and summarised in Table 4-1 below. The resource was further only evaluated in terms of relevant dimensions, for example burial grounds without any recorded historical significance would only be evaluated on a social level. The significance of a heritage resource in terms of its importance relative to a particular dimension was informed by accessing various credible information sources such as peer reviewed articles that contribute to establishing its authenticity. A heritage resource's value is a direct indication of its sensitivity to change (impacts) and must therefore be determined before any assessment of impacts can be completed.

Table 4-1: Criteria defined in the NHRA Section 3 that was used to determine value and significance of heritage resources

NHRA reference	Description of defining criteria
3(1)(a)	its importance in the community, or pattern of South Africa's history;
3(1)(b)	its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;
3(1)(c)	its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;
3(1)(d)	its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;
3(1)(e)	its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
3(1)(f)	its importance in demonstrating a high degree of creative or technical achievement at a particular period;
3(1)(g)	its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;
3(1)(h)	its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa; and
3(1)(i)	sites of significance relating to the history of slavery in South Africa.

4.3.2 Impact assessment

Potential impacts on the heritage resources were assessed in terms of Digby Wells' standard impact assessment methodology that has been adapted to consider the value of a resource. The impact rating takes into accounts the special scale, the expected duration, the severity, the consequence, and the probability of the impact as well as the value of the heritage resource. The impact rating is then applied to pre-mitigation and post-mitigation scenarios with the intention of removing all impacts on heritage resources.

As stated above, the value of a resource determines its sensitivity to change. As a result, low ranked impacts on highly valued heritage resources may result in high intensity changes to the resource. Conversely, high ranked impacts – such as destruction – on a resource of low or negligible value will result in low intensity change.

In addition, significance values assigned to heritage resources by the specialist (field ratings) places heritage resources in certain grades or levels of protection as defined in Section 7 of the NRHA. Field ratings or the proposed grading of heritage resources are required by SAHRA in terms of Section 7(1) of the NHRA and summarised in Table 4-2. Field ratings prescribe management and mitigation measures consistent with Section 3(3) of the NHRA. Consequently, field ratings and grades must be considered when management and mitigation measures are recommended subsequent to assessing impacts. As a result, a distinction is made between *project-related mitigation* and *mitigation of heritage resources*.

Project-related mitigation should ultimately aim to avoid any negative impacts on heritage resources, commensurate with the value and grading of a resource. Where impacts are not sufficiently mitigated through project-related actions, for example redesign of proposed infrastructure to avoid impacts, mitigation of the affected resources may be required.

Table 4-2: Field ratings

FR/Grade	Significance	Mitigation recommendation
<i>National and Provincial Protection, NHRA 7(1)(a, b)</i>		
I	National SAHRA responsibility High significance	Heritage resource conserved/preserved; No mitigation as part of development recommended
II	Provincial SAHRA responsibility High significance	Heritage resource conserved/preserved; No mitigation as part of development recommended
<i>Local Protection, NHRA 7(1)(c)</i>		
IIIA	Local PHRA responsibility High significance	Retained as heritage register site; Mitigation as part of development not advised
IIIB	Local PRHA responsibility High significance	Could be mitigated and part retained as heritage register site
<i>General Protection, NHRA 7(1)(c)</i>		
IV A	Local PRHA responsibility Medium significance	Heritage resource should be mitigated before destruction
IV B	Local PRHA responsibility Low significance	Heritage resource should be recorded before destruction
IV C	Local PRHA responsibility Negligible significance	Heritage resource has been sufficiently recorded and thus requires no further action

5 DESCRIPTION OF CONSULTATION WITH STAKEHOLDERS AND INTERESTED AND AFFECTED PARTIES

The SEP conducted for the Harwar Project followed a consultative and inclusive approach. This was achieved by encouraging active engagement from stakeholders so that suggestions and comments can be incorporated into the Project design and that concerns and conflicts can be openly addressed in an on-going manner. Through the SEP, adequate and timely information was provided to all I&AP to ensure they are given sufficient opportunity to voice their opinions, concerns and issues. The SEP provided a platform for issues and comments to be raised that will add value to the EIA process, thereby influencing the decision-making process. The following tasks were undertaken:

- Stakeholder identification;
- Development of appropriate documentation;
- Stakeholder notification (through the dissemination of information and meeting invitations);
- The compilation of a Scoping Report in terms of the MPRDA process which was made available to I&AP between 6 March 2013 and 9 April 2013;
- One-on-one meetings were undertaken with directly affected and surrounding landowners, farm occupiers, and land claimants;
- A public meeting was held on 26 March 2013 at the Chrissiesmeer Community Hall; and

See Appendix E for a complete list of all registered stakeholders.

5.1 Parties Consulted

Representatives of 16 registered conservation bodies were informed and/or consulted and are presented in Table 5-1 below. No dedicated local heritage conservation bodies were identified.

Table 5-1: Conservation bodies for the Harwar Project

Registered Conservation Bodies	
South African Heritage Resources Agency (SAHRA)	Yes
Mpumalanga Tourism and Parks Agency (MTPA)	No
Birdlife SA	No
Endangered Wildlife Trust (EWT)	No
Working for Wetlands	No
Water Forum	No
Olifants River Forum	No
Federation for a Sustainable Environment (FSE)	Yes
Upper Vaal Catchment Forum	No
Grass and Wetlands Regional Tourism Organisation	No
Green Trust	No
Chrissiesmeer Urban Conservancy	No
Environmental Monitoring Group (EMG)	No
Ekangala Grasslands Trust	No
Wildlife and Environmental Society of South Africa (WESSA)	No
World Wildlife Federation – South Africa (WWF-SA)	No

5.2 Results with Regard to Heritage Resources

The comments pertaining to heritage that were addressed in the Comments and Response Report are presented in Table 5-2 below.

Table 5-2: I&APs consulted and the comments pertaining to heritage resources that were raised during the SEP

I&APs	Date & Media	Issue or Concern	Response
HERITAGE			
Mr J.S.Davel	25 March 2013 Hand delivered issue letter on Harwar Colliery	How will the graves be handled? (inclusive of blasting damage)	Burial grounds and graves in the Project Area were assessed in the HIA. These are protected in terms of Section 36 of the NHRA. Appropriate management and mitigations measures will be included in the final HIA report that will be submitted to SAHRA and the MPHRA for Statutory Comment in terms of Section 38(8) of the NHRA.

I&APs	Date & Media	Issue or Concern	Response
HERITAGE			
Mr J.S.Davel	25 March 2013 Hand delivered issue letter on Harwar Colliery	What listed buildings are in the area?	There are no listed buildings in the SAHRA list of heritage sites.
Ms Jenna Lavin Heritage Officer South African Heritage Resources Agency	11 March 2013 Email correspondence	The site is situated at the edge of the Highveld Coal Field which forms part of the Karoo Basin. The predominant rocks in the area are sedimentary rocks of the Ecca Group which contain the coal-bearing Vryheid Formation. This formation is known to contain plant fossils and is therefore palaeontologically significant. The landscape is primarily agrarian with significant time depth. The likelihood of the proposed development impacting on significant heritage resources is therefore quite high.	This comment is taken verbatim from the Heritage Statement that was submitted to SAHRA and MPHRA. During the HIA field work, two palaeontological sites were identified that confirmed the assumption that plant fossil remains may occur in the Project Area. These and other potential sites are generally protected in terms of Section 35 of the NHRA. Appropriate management and mitigation measures will be included in the final HIA report that will be submitted to SAHRA and MPRHA for Statutory Comment in terms of Section 38(8) of the NHRA.

I&APs	Date & Media	Issue or Concern	Response
HERITAGE			
Ms Jenna Lavin Heritage Officer South African Heritage Resources Agency	11 March 2013 Email correspondence	SAHRA therefore requires that a Heritage Impact Assessment report be completed and submitted to SAHRA for assessment. This report should be inclusive of an assessment of impacts to archaeological resources and an assessment of impacts to paleontological resources by suitably qualified practitioners. This assessment of heritage resources must satisfy Section 38(3) of the NHRA. The requested Archaeological Report must identify all archaeological resources and assess their significance and make recommendations (as indicated in section 38(3) of the NHRA) about what mitigation may be required.	Comment based on Interim Comment received from SAHRA on Heritage Statement and NID that was submitted. Field work was completed from 20-26 April. Findings will be presented in the final HIA report and submitted to SAHRA and MPHRA.
Ms Jenna Lavin Heritage Officer South African Heritage Resources Agency	11 March 2013 Email correspondence	A Paleontological study must be undertaken to assess whether or not the development will impact upon significant paleontological resources. Alternatively, a letter of exemption from a Palaeontologist is required to indicate that this is unnecessary. If the area is deemed sensitive or if significant heritage is identified, a full Paleontological Report may be required.	See response above.

I&APs	Date & Media	Issue or Concern	Response
HERITAGE			
<p>Ms Jenna Lavin Heritage Officer South African Heritage Resources Agency</p>	<p>11 March 2013 Email correspondence</p>	<p>The impacts of the proposed development on any other heritage resources such as built structures over 60years old, sites of cultural significance associated with oral histories, burial grounds and graves, graves of victims of conflict, and significant cultural landscapes or viewsapes must also be assessed.</p>	<p>See response above.</p>

6 STATE OF RECEIVING ENVIRONMENTAL - CULTURAL LANDSCAPE

6.1 Details of Area Surveyed

Table 6-1: Location Data

Province	Mpumalanga
District Municipality	Gert Sibande
Local Municipality	Albert Luthuli
Property Name and Number	Mooifontein 35 IT De Goedverwachting 57 IT Harwar 58 IT, Vryheid 59 IT Tevreden 56 IT
1: 50 000 Map Sheet	2630AA Carolina 2630AC Chrissiesmeer
GPS Co-ordinates	South: 26°11'57.25"
(relative centre point of study area)	East: 30°12'40.01"

6.1.1 Location maps

The regional settings of the Harwar Project are depicted in Plan 1, Plan 2, and Plan 3 in Appendix B. The geology and surrounding mining areas are depicted in Plan 7 and Plan 8 respectively.

6.1.2 Site maps

The GPS track log and position of sites are depicted in Plan 4 and Plan 5 respectively in Appendix B. Results of the historical layering are depicted in Plan 6.

6.2 Site conditions and location data

In this particular environment heritage resources are, based on experience, known to exist in or near landscape features such as stands of *Eucalyptus* trees, sandstone outcrops and ridges. In addition, wetlands were avoided as the likelihood of visible heritage resources occurring in such areas is low. Areas that were densely overgrown with *Acacia mearnsii* (Black wattle) were also avoided, in part due to safety considerations but mainly due to general low visibility and difficult access in such areas. Existing agricultural fields were not surveyed as these features may have damaged or destroyed any archaeological sites that may have been present.

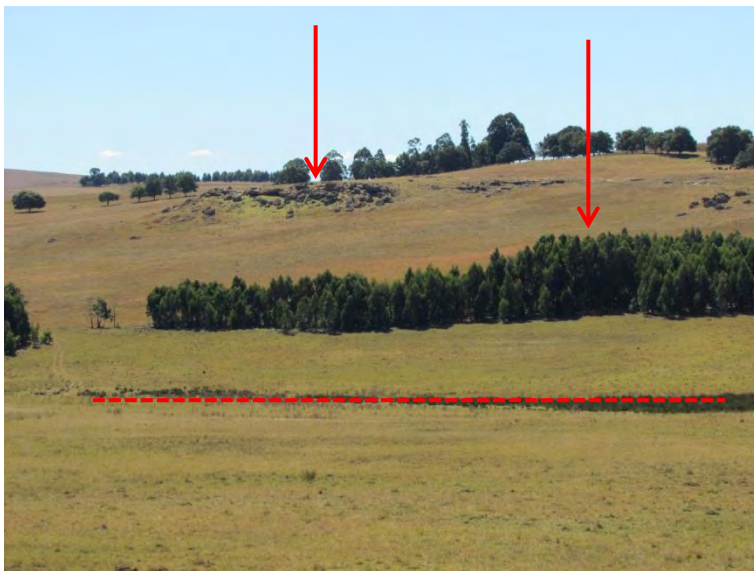


Figure 6-1: General conditions on site. The river and surrounding wetland is indicated by the red dotted line. The stand of trees and sandstone outcrops were surveyed for heritage resources (red arrow).

Table 6-2: GPS Data

GPS type and model used	Garmin eTrex Legend HCx		
Datum	WGS 1984		
Average accuracy	~5 m		
Site co-ordinates	Site Names	Location	Description
South: 26°09'41.70" East: 30°12'48.05"	S.35-045	In opencast mine area	A single, undiagnostic potsherd ceramic fragment
South: 26°09'26.83" East: 30°13'40.59"	S.34-046	In opencast mine area	A <i>werf</i> on Mooifontein 35 IT Portion
South: 26°09'26.10" East: 30°13'57.31"	S.36-047	In opencast mine area	An informal burial ground with eight stone-packed burials
South: 26°09'49.81" East: 30°13'21.83"	S.36-048	In opencast mine area	An informal burial ground with nine stone-packed burials and one formal burial
South: 26°09'30.47" East: 30°12'06.47"	S.35-049	Outside of Project Area	A Historic stonewalled site on De Goedverwachting 57 IT
South: 26°13'0.69" East: 30°11'8.25"	S.34-050	In opencast mine area	A <i>werf</i> on Tevreden 56 IT Portion 4
South: 26°12'28.00" East: 30°11'51.64"	S.35-051	300 m from opencast area	Seven undiagnostic potsherd ceramic fragments near Tevreden Pan
South: 26°13'14.11" East: 30°10'46.58"	S.36-052	400 m from opencast mine area	An informal burial ground on Tevreden 56 IT Portion 4
South: 26°12'59.04" East: 30°10'32.92"	S.34-053	300 m from Project Area	A historic farmhouse dating to 1929

South: 26°12'25.05" East: 30°10'11.06"	S.34-054	185 m from Project Area	A <i>werf</i> dating to 1883
South: 26°18'33.13" East: 30°12'59.49"	S.35-055	8 km from Project Area	Historic stonewalled enclosures on Lake Chrissie
South: 26°19'07.98" East: 30°13'00.45"	S.35-056	9 km from Project Area	Possible fossil on a sandstone ridge along Lake Chrissie
South: 26°19'05.77" East: 30°12'58.84"	S.35-057	9 km from Project Area	Stone flake on banks of Lake Chrissie

6.3 Literature Review

6.3.1 Palaeontological Heritage

6.3.1.1 Geological setting

The Study Area is situated near the edge of the Highveld Coal Field that forms part of the Karoo Basin. Much of this area has economically important coal seams that were formed in mostly fluvial settings where swamps developed in alluvial plains and interfluves (Cairncross, 2001; Mucina, et al., 2006). The lithologies consist of shales, sandstone, mudstones, and coals that are interrupted by intrusive dolerite dykes of the Jurassic period.

In the Harwar Project Area, the underlying stratigraphic unit is the *Madzaringwe Formation* which is roughly equivalent to the basal unit of the Ecca Group in the Karoo Supergroup. The basal Karoo sediments consist of rocks derived mainly from much older underlying strata known as diamictite deposits. The diamictite deposits are overlain by rocks of the *Madzaringwe Formation*. The *Madzaringwe Formation* consists primarily of shales with occasional lenses of red and yellow grit in the lower sequences. Higher up in the sequences the shales alternate with coal seams.

6.3.1.2 Expected palaeontology

There is a strong likelihood of fossil plants occurring in the shales and mudstones associated with the coals. The model which best describes the formation of the *Madzaringwe Formation* sequence would be a marsh that was periodically flooded. If this model is correct the fossils found between the shale sequences would include *Glossopteris* leaves, roots and inflorescences, lycopod and sphenophyte stems, ferns, and insects. Vertebrates that occurred at this time are seldom preserved with the plants (Bamford, 2012).



Figure 6-2: A fossil *Glossopteris* leaf (Maropeng, 2013).

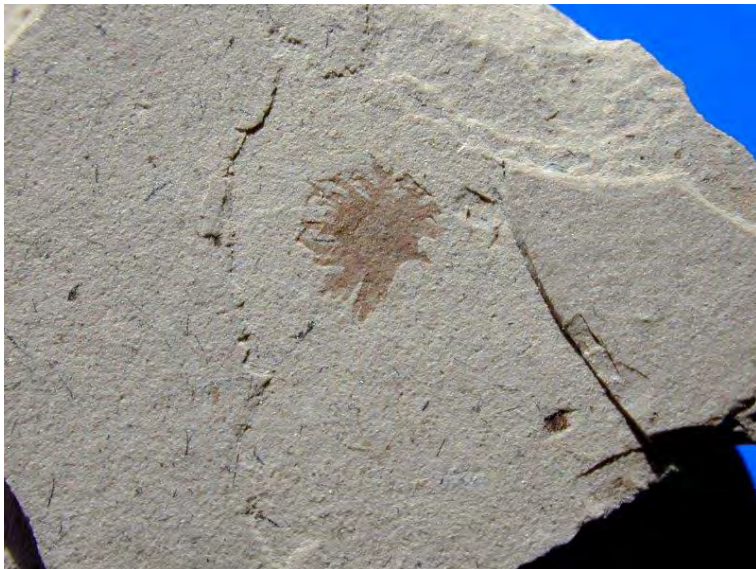


Figure 6-3: A fossil inflorescences (Fossil Mall, 2012).



Figure 6-4: A lycopod fossil (Paleo Scene, 2006).



Figure 6-5: A fossil sphenophyte (Fossil Museum, 2012).



Figure 6-6: A fossil fern (Ace of the Fungal Kingdom, 2006).

6.3.2 Stone Age

In the Mpumalanga Province, the Early Stone Age (ESA) and Middle Stone Age (MSA) are not well documented and are limited to a few well-known sites. Previous impact studies surrounding the Harwar Project Area yielded no Stone Age artefacts and as such, a description of their characteristics is excluded from this HIA report.

The Later Stone Age (LSA) dates between 20 000 and 40 000 years ago ('ka' – a thousand years ago). The economy of the LSA is commonly associated with Bushmen hunter-gatherer or Khoi herder societies. The LSA stone artefacts are generally microlithic and include a wide range of formal tools such as scrapers, backed artefacts, hafted stone and bone tools, borers, bored stones, upper and lower grindstones, grooved stones, bone tools, and fishing equipment. The LSA assemblages also include ostrich eggshell (OES) beads, undecorated and decorated OES fragments, and ceramics.

Rock art sites are also a common feature of LSA sites. LSA sites with associated rock art are typically found within rock shelters in sandstone cliffs and outcrops. These sandstone cliffs and outcrops are prominent in the Harwar Project Area and rock art sites are expected to occur here. Wetlands are a common occurrence in the Harwar Project Area and LSA stone assemblages are unlikely to occur in these areas. As a result, the most probable heritage resource to occur in the Harwar Project Area would be LSA rock art sites.

The Chrissiesmeer Lake District (Chrissiesmeer or Lake Chrissie), in which the Harwar Project Area is located, has been occupied by San (Bushmen) hunter-gatherers for many generations. A prominent site located 34 km to the west of the Harwar Project boundary is the De Wittekrans Complex. Ouzman (2009) describes the complex as consisting of four individual sites all with archaeological deposit of stone tools and pottery located on a sandstone outcrop. There are two types of rock art within the Complex. The first is fine-line, brush-painted rock paintings made by Bushmen hunter-gatherers and the second is finger-

painted rock paintings associated with Khoi herder people (Ouzman, 2009). Van Schalkwyk (2003) identified a Bushmen rock art site approximately 5 km north-west of the Harwar Project Area on the farm Witkranz 53 IT. The rock art site is located in a sandstone outcrop.

6.3.3 Iron Age

In southern Africa, the Stone Age is followed by the Iron Age. The Iron Age is divided into three periods: the Early Iron Age, the Middle Iron Age and the Late Iron Age. As a whole, the Iron Age represents the spread of Bantu-speaking people and includes both pre-Historic and Historic periods. One of the identifiers of Iron Age sites are stonewalled settlements. According to Maggs (1976), Type V and Type N stonewalling are present within Mpumalanga and may be found on the slopes of hills. Type V consists of the standard core of cattle enclosures surrounding beehive houses and grain bins. Corbelled huts may be present with this type of stonewalling. Type N stonewalling consists of a few cattle kraals in the centre of the settlement, linked by other stonewalling and a perimeter wall that encloses the entire settlement (Huffman, 2007).

Another identifier of Iron Age sites are ceramics. According to Murimbika (2007), during the Iron Age the region was predominantly occupied by Ndebele Nguni-speaking groups. The ceramics that can be identified include *Blackburn* (1050 CE – 1500 CE), *Moor Park* (1350 CE – 1700 CE), and *Nqabeni* (1700 CE – 1850 CE). Only one possible site dating to the Late Iron Age was documented in previous studies conducted in the surrounding area. The site consists of remnants of a stonewalled enclosure but no diagnostic ceramics were noted and thus the site could not be associated with a specific group (Murimbika, 2007). Within the Harwar Project Area, if stonewalled sites do exist, it is expected that they will occur without any diagnostic ceramics.

In the Mpumalanga area, the Early to Middle Iron Age had two different economies and life-styles: the first being that of the Bushmen hunter-gatherers and the second being of the Sotho Iron Age farmers. Initially, the Iron Age farmers entering the area were small groups and there was enough space for both the farmers and the hunter-gatherers. However, as the Iron Age population grew, the Bushmen retreated to the inaccessible hills. It is in these hills that the Bushmen rock art were identified and recorded.

During this time of early contact, the two populations interacted peacefully. This is supported by the archaeological evidence from Welgelegen Shelter (Schoonraad & Beaumont, 1971) approximately 33 km south west of the Harwar Project Area, and on the farm Honingklip approximately 40 km north east of the Harwar Project Area (Korsman, 1994). Sotho artefacts such as clay pots, hoes, blades and grain were acquired by the Bushmen from the Sotho in exchange for services (Tobias, 1978). Over time, the Sotho population increased and started encroaching on Bushmen areas in the hill tops. Towards the end of the 18th century, the only area left for the Bushmen was Chrissiesmeer.

By the Middle to Late Iron Age, Mpumalanga was occupied by numerous small Sotho chiefdoms who built stonewalled settlements. These Sotho groups were collectively known as the BaKoni. The Sotho inhabited the area peacefully for over a thousand years until the

19th century when this peace was shattered by the Mfecane/Difeqane which is discussed in more detail in Section 6.3.4 below.

6.3.4 Historic Period

The Historic Period is accepted to date from approximately the mid-19th century and is generally associated with the movement and contact with Europeans. It was during the Historic Period that the Mfecane took place in the region. The Mfecane was a period during the 18th and 19th centuries in which transformation in southern Africa occurred primarily through conflicts associated with the Zulu. The effect of the Mfecane on the Mpumalanga landscape was the dispersion of the Sotho population and the beginning of a Swazi and European presence (Sanders, 2013).

By 1839, the Swazi kingdom had conquered and assimilated numerous smaller Sotho groups (Prins, 1999). The Swazi king, Mswati II, sought to extend the kingdom over areas where other groups have settled. One of the areas Mswati laid claim to was Chrissiesmeer. However, the Swazi kingdom expansion coincided with increasing land appropriation by the Voortrekker Boers and for strategic reasons Mswati ceded large areas of land, including the Chrissiesmeer, to the Voortrekker Boers (Boers) (Bonner, 1983). In 1857, the Chrissiesmeer became part of the newly established *Zuid-Afrikaansche Republiek* (ZAR) (Sanders, 2013).

During the time of the Mfecane and the formation of the Swazi state, the Bushmen from the area made Chrissiesmeer their permanent home. They lived primarily near pans and watercourses and lived in simple grass huts. They also occupied suitable caves during the winter months and according to Potgieter (1955), also constructed reed platforms on the lakes during the summer months.

Initially during the time of the Swazi kingdom, the Bushmen of Chrissiesmeer continued to barter with the Swazi. However, when the Swazi herders started to encroach on the Bushmen areas in Chrissiesmeer, they were attacked and their cattle were raided. Mswati responded to the attack by sending impis to raid the Bushmen (Prins, 1999). Bushmen men were killed and the women and children were taken as slaves. One of these attacks occurred at Murder Rock near the town of Breyten and approximately 17 km west of the Harwar Project Area (Schoonraad & Schoonraad, 1972).

The Swazi attacks on the Bushmen came to a standstill when Mswati ceded the area to the Boers. The Boers, who left the Lydenburg area, arrived and settled in the Chrissiesmeer. The Boers provided protection for the Bushmen from the Swazi and soon the area became a safe haven for Bushmen refugees from KwaZulu-Natal and the Free State and by 1880 there was a sudden influx of Bushmen into Chrissiesmeer.

The Boers in Chrissiesmeer increasingly had to rely on the Bushmen as a labour force. The driving factor for this was the loss of a black labour force to the gold mines. The Boers began apprenticing young Bushmen children who were taken into the Boer household (Orpen, 1964; Prins, 1999).

During the 1800s, the town of Chrissiesmeer began to develop. In 1864, a Scot Alexander McCorkindale submitted a proposal to the ZAR to develop the area ceded by Mswati around Chrissiesmeer for sheep farming, mining enterprises and an industrial hub (Van Nierop, 1999). The ZAR accepted the proposal and in 1866 an agreement was made delineating the area as a Scottish settlement. However, after McCorkindale's death in 1872, the Scottish settlement disintegrated (Van Nierop, 1999). McCorkindale and his wife are said to have lived in a cave before building a cottage close by. Today, the cave and the cottage have become a tourist attraction.

Chrissiesmeer was the centre of business on the eastern Highveld complete with early traders and a post office that opened in 1888. Today, only three sandstone buildings remain on Percy Street which was once the central business district of Chrissiesmeer: the Parker Wood store, the stables, and the jail. Other buildings dating back to the town's early days are the Bothwell Mill and the post office. Bothwell Mill was the first mill in the town and today the post office is the only early building which still serves its original purpose (Sanders, 2013). There is only one single grave that remains from the original cemetery and meters away there is a deserted family cemetery dating back to the Anglo-Boer War.

The Anglo-Boer Wars are arguably the next most notable historical events to take place within the region in which Chrissiesmeer played a role. The role of the Bushmen in the Anglo-Boer War is informed only by oral history as there is virtually no documentation on this. According to the oral history, the Bushmen, who were servants to the Boers, were never armed for combat but instead were tasked to be assistants to the Boer combatants by carrying provisions and looking after horses (Prins, 1999).

Two events that occurred during the Anglo-Boer Wars stand out in Chrissiesmeer's history: 16 October 1900 and 6 February 1901. On 12 October 1900, the war had entered its second year when General Sir John French commenced his march from Machadodorp to Heidelberg. During the march, General French's army was constantly attacked by Boer Commandos. One such attack took place on 16 October near Tevreden Pan on the farm Tevreden 56 IT (Pistorius, 1998; Cloete, 2000). The battle between General French's army and the Boer commando was fatal and the graves of many British soldiers can be found in Lake Chrissie's cemetery (Figure 6-7).



Figure 6-7: One of many graves in the Chrissiesmeer cemetery of a British soldier who perished at the battle between the Boers near Tevreden Pan on the farm Tevreden 56 IT.

The second was the battle of Lake Chrissie which began on 6 February 1901 when the Boer Commandos under General Botha attacked the British who were camped near Chrissiesmeer (Reid, 1997). The Boers intended to conduct a surprise attack on the British and cripple the advance of General H.L. Smith-Doriens into the eastern Transvaal (Prins, 1999). The Boers enlisted the help of the local Bushmen community who were monitoring the British movements in the area. With the Bushmen's knowledge of the terrain, the Boers were able to launch the surprise attack and repel the British. The battle continued until 9 February 1901 when adverse weather caused the Boers to lose their advantage and was eventually forced to retreat (Jones, 1999; Delius & Cope, 2007). Today a monument commemorating those who died during the battle can be found in the town (Figure 6-8). The graves of British and Boer soldiers who died during this battle can be found today in the Lake Chrissie cemetery (Figure 6-9).



Figure 6-8: A monument commemorating those who died during the battle of Lake Chrissie in 1901.



Figure 6-9: The grave of a Boer soldier who died during the battle of Lake Chrissie in 1901.

6.3.5 Social History

In 1903 to 1904 and as part of Sir Alfred Milner's imperialism policy, a number of British immigrants and British residents who had lost their possessions during the war, were given government loans and were settled on abandoned farms in New Scotland. Chrissiesmeer was thus transformed from its previous trading post status to a proper village (Sanders, 2013).

In 1904, Chrissiesmeer was granted township status and was declared an urban area. New buildings were erected including a wood and iron police office which was destroyed by a fire in 1987, a wood and iron courthouse which was destroyed by a fire in the early 1990s, a small school, a sandstone Methodist church, the sandstone Barclays Bank building, the Lake Chrissie hotel, and the sandstone Anglican Chapel.

Milner's Native Pass Law restricted movement of black people and as a result numerous black townships or locations were created. In 1971, the population of Chrissiesmeer was 382 blacks and 144 Europeans. The blacks lived in the native location on the eastern outskirts of Chrissiesmeer. At that time the native location, which acted as a labour reserve, formed part of Chrissiesmeer and fell under government administration. The location had a stable population of Swazi-speaking descendants of the original Chrissiesmeer occupants, unlike the European population which was constantly in flux since the arrival of the Boers.

In 1984, the native location (known as KwaChibikhulu) was transferred under Bantu administration which meant that Chrissiesmeer and the native location functioned as two separate entities. This was met with resistance and under direction of the African National Congress (ANC) a boycott of the township administration was embarked upon. The boycott led to skirmishes between local authority representatives and the people leading to several

arrests. In 1992, peace was restored and it was agreed that Chrissiesmeer and KwaChibikhulu should function under one administration.

During the apartheid years, the native location consisted of 40 households and four churches: the Christian Apostolic Church, the Dutch Reformed Missionary Church, the Methodist Church, and the Swedish Alliance Mission. The first school building was erected on the Methodist Church premises and in 1994, the secondary school was built. In 2005, the primary and secondary school (known as the 'Combined School') was divided into KwaChibikhulu primary school and Lake Chrissie secondary school.

The end of apartheid was marked by the 1994 general election which for Chrissiesmeer meant that the town would have a council and a mayor for the first time (Sanders, 2013).

6.4 Summary of Heritage Resources Identified in the Project and Study Areas

Three categories of general protected heritage resources were identified and recorded in the Project Area. These resources included built environment resources as defined in Section 34, archaeological and palaeontological resources as defined in Section 35, and burial grounds and graves as defined in Section 36 of the NRHA.

Identified Section 35 archaeological resources included scattered concentrations of ceramic fragments. These resources were evaluated and determined as insignificant in terms of aesthetic historical, scientific and social significance as well as having no and/or negligible integrity. Identified section 34 built environment resources and Section 35 archaeological and palaeontological resources that lie outside of the Project Area and will not be impacted on by the proposed development have not been evaluated or assessed in this HIA. As a result, these resources have not been described further in this HIA report and potential impacts were not assessed sites. Illustrations and site descriptions are however included in Appendix C.

7 RESTRICTIONS, LIMITATIONS, AND KNOWLEDGE GAPS

The following restrictions occur in the Harwar Project Area:

- Site access to Harwar 58 IT RE and Vryheid 59 IT was denied. This presents a major gap in the HIA report as the fieldwork component of the HIA could not be conducted on these farms.
- Detailed surface infrastructure design plans were not available at the time of the HIA and as a result more detailed HIAs may be required should the finalised infrastructure footprints exceed minimum thresholds described in Section 38.

The following limitations occur in the Harwar Project Area:

- Existing agricultural fields and farm roads occur in the area. These features may have damaged or destroyed any archaeological sites that may have been present.



Figure 7-1: An existing agricultural field on Mooifontein 35 IT.



Figure 7-2: A farm road has been routed through the Harwar Project Area. This farm road may have disturbed or destroyed any archaeological sites that may have been present.

- Contemporary uses of historical structures as well as contemporary modifications of historical structures are a common occurrence in the Harwar Project Area.



Figure 7-3: A historical house identified on Tevreden 56 IT. Contemporary modifications have been made to the house.

The following knowledge gap was identified in the Harwar Project Area:

- Visible heritage resources are unlikely to occur in wetlands and as a result, these areas were avoided.

8 DESCRIPTION OF ARCHAEOLOGICAL AND HISTORICAL RESOURCES

The section aims to describe the identified and recorded heritage resources, discuss the values ascribed to the heritage resources, as well as to assess the impacts on the identified heritage resources. The heritage resources that have a negligible to low heritage value are briefly discussed. The full descriptions are provided in the site list in Appendix C. Impacts were only discussed for sites with low to high heritage value. Impacts on sites with a negligible heritage value were not discussed. For descriptions of the significance and the field rating system, see Appendix D.

8.1 Isolated Occurrences

One isolated Iron Age/Historic occurrence was identified and recorded in the opencast mine area on Mooifontein 35 IT Portion 5. The site S.35-045 represents a single, isolated occurrence of an undiagnostic potsherd ceramic fragment. The fragment was identified and recorded in a small rock shelter along a sandstone ridge. No other material culture or features were noted that might provide any further site context. No evidence of archaeological deposit was noted.

The fragment may have washed down from the primary site which may have been located above the sandstone ridge. However, the primary site may have been destroyed by agricultural activities as a field is located directly above the sandstone ridge.

Another isolated Iron Age occurrence was identified and recorded on Tevreden 56 IT Portion 4. The site S.35-051 represents seven un-diagnostic potsherd ceramic fragments approximately 300 m east of the opencast area. The site was recorded in a sandstone outcrop about 20 m east of a pan. No other material culture was noted that might provide any further site context. No evidence of archaeological deposit was noted.

8.1.1 Statement of value

Field value: No heritage mitigation required

The sites S.35-045 and S.35-051 have a negligible value in aesthetic and technical characteristics and scientific information because these are undiagnostic finds that cannot be associated with a particular group of people. The rating was informed by credible information sources such as other impact assessment reports which indicate that isolated occurrences of ceramics such as these are rare in the Mpumalanga region and where they do occur, they are of no information potential. No site context could be established as the heritage resources were degraded to the extent where no information potential exists. Single occurrences such as these sites are inherently without site integrity. Taking these characteristics into account, the heritage resources were given a negligible heritage value.



Figure 8-1: A single, isolated occurrence of a ceramic fragment at Site S.35-045 on Mooifontein 35 IT Portion 5.



Figure 8-2: Seven undiagnostic ceramic fragments identified at Site S.35-051 near a pan on Tevreden 56 IT Portion 4.

8.1.2 Recommendations

The heritage resources are of a negligible value and an impact assessment does not need to be conducted for the site. No Project-related mitigation measures such as changes to design or mine plan was considered necessary. No heritage-related mitigation measures were considered necessary. The sites may be destroyed.

9 DESCRIPTION OF BUILT ENVIRONMENT RESOURCES

The section aims to describe the identified and recorded heritage resources, discuss the values ascribed to the heritage resources, as well as to assess the impacts on the identified heritage resources. The heritage resources that have a negligible to low heritage value are briefly discussed. The full descriptions are provided in the site list in Appendix C. Impacts were only discussed for sites with low to high heritage value. Impacts on sites with a negligible heritage value were not discussed. For descriptions of the significance and the field rating system, see Appendix D.

9.1 MSO1805/2630AA/S.34-046 (*Werf*)

The site represents a single storey sandstone house, a sandstone barn, and two stonewalled enclosures most likely used as livestock pens identified and recorded on Mooifontein 35 IT Portion 2 (Table 9-1). These structures are collectively known as a *werf* - a term signifying the space surrounding a homestead in which outbuildings, gardens, orchards, small livestock pens or coops and a family cemetery or *kerkhof* may be present. There are several fields around the *werf*. Contemporary use of the house was noted (Figure 9-1). In addition, contemporary additions such as a metal window frame and bricks were recorded.

An entrance and a bay window are situated on the eastern elevation of the house (Figure 9-2). This entrance leads to the living room. A water pipe was identified along the exterior wall of the house (Figure 9-3). On the western elevation, steps leading into the kitchen with bedrooms on the right-hand side and far right-hand side were noted (Figure 9-4). The kitchen and a possible store room were noted on the northern elevation (Figure 9-5). There also appears to be fire damage on this side of the house. On the southern elevation, an entrance leading to an entrance hall was noted (Figure 9-6). On the left-hand side of the entrance hall there is a bedroom with a window and on the right-hand side of the entrance hall there is a possible bathroom with either a bath or basin (Figure 9-7). The water pipe identified on the eastern elevation leads to this bathroom. The left-hand side window and the entrance on the southern side of the house appear to be contemporary additions as the window has a metal frame and the entrance is made with bricks rather than sandstone (Figure 9-8).

The house has a corrugated iron roof with timber struts. There are also two chimneys, one leading to a fire place in the kitchen and the other leading to a fire place in the living room.

The sandstone barn has a corrugated iron door with a wooden door frame on the eastern elevation (Figure 9-9). The southern elevation has two windows with wooden frames and corrugated iron doors (Figure 9-10). The northern elevation has one door and one window (Figure 9-11) with stonewalling extending at the back of the barn (Figure 9-12). The western elevation has one window (Figure 9-13).

The two stonewalled enclosures have a metal gate and a trough (Figure 9-14). The larger of the two enclosures was most likely used for adult livestock whilst the smaller of the two was used for younger livestock.

The title deed for the house could not be located during the HIA phase of the Harwar Project and therefore the exact date of the house could not be established. During the 1900s the town of Chrissiesmeer began to develop with numerous sandstone structures being constructed. It may be possible for the sandstone house at Site S.34-046 to be associated with this development which would place it in the 1900s.

A document pertaining to a farm school on the farm Mooifontein 194 IT (now Mooifontein 35 IT) was found during the archive search. According to the document which dates to 7 March 1930, only four pupils attended this school. It may be possible that the house at S.34-054 is the farm school referred to in the archive document. Alternatively, the presence of a farm school implies that people were living in area. This house could have been occupied in the 1930s.

During a cartographic survey, historical aerial photographs were surveyed for structures. During a survey of historical aerial photographs from 1968, a structure was identified in the exact location where Site S.34-046 is today located.

Based on the above information, the *werf* at Site S.34-046 is between 45 and 83 years old. The exact age of the sandstone house can only be determined during Phase 2 mitigation. This site is located in the proposed opencast pit mining area.

Table 9-1: Summary of Site S.34-046

Site Type	<i>Werf</i>
Site category	Residential
Site location	<p>Site co-ordinates</p> <p>South: 26°09'26.83"</p> <p>East: 30°13'40.59"</p> <p>The site is located in the opencast footprint</p>
Context	The site is situated between approximately three fields
Age	Between 45 and 83 years old
Significant features	A sandstone house, a sandstone barn, and two stonewalled enclosures
Site extent	<p>House: 168 m² in extent</p> <p>Barn: 101.5 m² in extent</p> <p>Enclosure 1: 336 m²</p>

	Enclosure 2: 962.5
Threats or sources of risk	
The construction of the opencast pit will destroy the site. In addition, any removal of vegetation and ground clearing may expose more extensive deposit potentially existing subsurface.	
Description of artefacts present	
General farm implements and an old bed (recently occupied)	
Description of structure present	
The 168 m ² sandstone house with small addition on the southern elevation The 101.5 m ² sandstone barn with stonewalling The 336 m ² stonewalled enclosure with stonewalling The 962.5 m ² stonewalled enclosure with stonewalling and general farm implements	
Description of features present	
Corrugated iron roof with timber struts, one metal window frame, a bath/basin, two chimneys, a large bay window in the living room area, and a trough in stable 2.	
Condition of site	
Recently occupied	



Figure 9-1: Contemporary use of the house identified at Site S.34-046.



Figure 9-2: Detail of house at Site S.34-046. An entrance and a bay window (red square) are situated along the eastern elevation. This entrance leads into the living room which has a fireplace, indicated by the chimney (red circle). There is also a pipe on the exterior wall (red arrow).



Figure 9-3: A pipe noted on the eastern elevation of the house at Site S.34-046.



Figure 9-4: Detail of house Site S.34-046. The western elevation has steps leading in a kitchen (red arrow). There is a bedroom on the right-hand side and far right-hand side (red squares). The kitchen has a fireplace, indicated by the chimney (red circle).



Figure 9-5: Detail of house at Site S.34-046. The northern elevation shows the kitchen with chimney and a possible store room on the right-hand side.



Figure 9-6: Detail of house at Site S.34-046. There as an entrance hall on the southern elevation that appears to be a new addition. The bedroom window on the left-hand side of the entrance has a metal window frame.



Figure 9-7: Either a bath or a basin identified in the house at Site S.34-046.



Figure 9-8: The metal window frame on the southern elevation of the house identified at Site S.34-046.



Figure 9-9: The sandstone barn with a corrugated iron door and a wooden door frame on the eastern elevation at Site S.34-046.



Figure 9-10: The southern elevation of the barn has two windows with wooden frames and corrugated iron doors.



Figure 9-11: The northern elevation of the barn has one door and one window.



Figure 9-12: Stonewalling at the back of the barn.



Figure 9-13: The western elevation has one window.



Figure 9-14: Two stonewalled enclosures identified and recorded at Site S.34-046.

9.1.1 Statement of value

Field rating: IV B

The heritage resource has a low to medium heritage value in aesthetic and technical characteristics, historic association and social association. The rating was informed by credible information sources such as peer-reviewed publications and other impact assessment reports which indicate that *werfs* with sandstone houses are commonly found in around Chrissiesmeer.

The werf was identified, recorded and assessed by generalist heritage practitioners. As a result, the ascribed significance value was only evaluated on two dimensions – historical and social. A Phase 2 Built Environment Assessment will be required and this may affect the resource's value presented in this HIA report.

9.1.2 Rating of impact (pre-mitigation)

Type of Impact		Negative impact
Rating of Impacts		
Characteristic	Designation	Summary of Reasoning
Scale	Municiple Area	The impact will affect the whole municiple area.
Duration	Permanent/no mitigation	No mitigation measures of natural process will reduce the impact after implementation.
Severity	Medium	Significant damage to structures and items of cultural significance.
Probability	Certain/definate	The impact will occur as the <i>werfs</i> located in the opencast mine footprint.
Magnitude		Minor
Value of the heritage resource		Low to Medium
<p>The heritage resource is of a low to medium heritage value. Furthermore, the <i>werf</i> may have a strong association to the local community or farmworkers for social, cultural and spiritual reasons. Its importance is also based on highly credible information sources. Phase 2 mitigation is required so that the site is adequately recorded.</p>		

9.1.3 Rating of impact (post-mitigation)

Type of Impact		Positive change
Rating of Impacts		
Characteristic	Designation	Summary of Reasoning
Scale	Limited	If the impact occurs, it will be limited to the site and its immediate surrounding.
Duration	Permanent mitigated	Mitigation measures will reduce the impact.
Severity	Low to medium	If the impact occurs it will cause damage to items of cultural significance.
Probability	Unlikely/low probability	There is a possibility that the impact will occur.
Magnitude		Low to Minor

9.1.4 Recommendations

It is recommended that the werf S.34-046 undergo a Phase 2 Built Environment Assessment by a qualified historical architect to accurately determine the significance value of the resources and provide appropriate mitigation measures. If the site is not 60 years or older then it may not need to be assessed by the impact rating system.

9.2 MSO1805/2630AA/S.34-050 (*Werf*)

The site represents a sandstone house, garage, barn and two stables identified and recorded on Tevreden 56 IT Portion 4 (Table 9-2). There are several fields around the *werf*. Contemporary use of the house, barn and stables were noted. In addition, contemporary additions such were recorded.

The sandstone house has been modified and numerous additions have been made (Figure 9-15). The sandstone garage has a corrugated iron roof and three doors (Figure 9-16). The sandstone stable closest to the house is in a poor condition and contemporary use of the stable was noted (Figure 9-17). The sandstone barn has a corrugated iron roof, two corrugated iron doors and eight windows with iron bars (Figure 9-18). The second sandstone stable is located next to the barn (Figure 9-19). The stable is in a poor condition and contemporary use of the stable was noted.

According to the farm owner, Johannes Hercules Du Preez, the house was first owned by a family in 1903. This family, who have yet to be identified, occupied the farm for 15 years. The farm was later sold to another family who occupied it for 80 years. In 1993 to 1994, the house was sold to the Groenewald family before Mr Du Preez bought the farm in 2005.

The title deed for the house could not be located during the HIA phase of the Harwar Project and therefore the exact date of the house could not be established. During the 1900s the town of Chrissiesmeer began to develop with numerous sandstone structures being constructed. It may be possible for the sandstone house at Site S.34-050 to be associated with this development which would place it in the 1900s.

During a cartographic survey, historical aerial photographs were surveyed for structures. During a survey of historical aerial photographs from 1956, a structure was identified in the exact location where Site S.34-050 is today located.

Based on the above information, the *werf* at Site S.34-050 is between 57 and 110 years old. However, the exact age of the sandstone house can only be determined during Phase 2 mitigation. The site is located in the opencast mine area.

Table 9-2: Summary of Site S.34-050

Site Type	<i>Werf</i>
Site category	Residential and farming
Site location	<p>Site co-ordinates</p> <p>South: 26°13'00.69"</p> <p>East: 30°11'08.25"</p> <p>The <i>werf</i> is situated in the opencast mine area</p>
Context	The site is located on an existing farm
Age	Between 57 and 110 years old
Significant features	A sandstone house, barn and two stables
Threats or sources of risk	
The construction of the opencast pit will destroy the site. In addition, any removal of vegetation and ground clearing may expose more extensive deposit potentially existing subsurface.	
Description of artefacts present	
General farm instruments	
Description of features present	
Corrugated iron roof and door and windows with iron bars	
Condition of site	
The site is currently being used for residential and farming activities	



Figure 9-15: The eastern elevation of the sandstone house identified at Site S.34-050 with contemporary additions.



Figure 9-16: The northern elevation of the sandstone garage identified at Site S.34-050 with three doors.



Figure 9-17: The northern elevation of the sandstone stable identified at Site S.36-050. This stable is located close to the house.



Figure 9-18: The western elevation of the sandstone barn identified at Site S.34-050 with a corrugated iron door.



Figure 9-19: The southern elevation of the sandstone stable identified at Site S.36-050. The stable is in a dilapidated state.

9.2.1 Statement of value

Field rating: Grade IV B

The heritage resource has a low to medium heritage value in aesthetic and technical characteristics, historic association and social association. The rating was informed by credible information sources such as peer-reviewed publications and other impact assessment reports which indicate that *werfs* with sandstone houses are commonly found in around Chrissiesmeer.

The exact age of the site must first be determined and a conservation/historical architect opinion may be required. This could result in possible re-evaluation of significance. If the site is not 60 years or older then it may not need to be assessed by the impact rating system.

9.2.2 Rating of impact (pre-mitigation)

Type of Impact		Negative impact
Rating of Impacts		
Characteristic	Designation	Summary of Reasoning
Scale	Municiple area	The impact will affect the whole municiple area.
Duration	Permanent/no mitigation	No mitigation measures of natural process will reduce the impact after implementation.
Severity	Medium to high	Very serious widespread social impacts resulting in irreparable damage to structures.
Probability	Certain/definate	The impact will occur as the <i>werf</i> is located in the opencast mine footprint.
Magnitude		Minor
Value of the heritage resource		Low to Medium
<p>The heritage resource is of a low to medium heritage value. Furthermore, the <i>werf</i> may have a strong association to the local community or farmworkers for social, cultural and spiritual reasons. Its importance is also based on highly credible information sources. Phase 2 mitigation is required so that the site is adequately recorded.</p>		

9.2.3 Rating of impact (post-mitigation)

Type of Impact		Positive change
Rating of Impacts		
Characteristic	Designation	Summary of Reasoning
Scale	Limited	If the impact occurs, it will be limited to the site and its immediate surrounding.
Duration	Permanent mitigated	Mitigation measures will reduce the impact.
Severity	Low to medium	If the impact occurs, it will cause damage to items of cultural significance.
Probability	Unlikely/low probability	There is a possibility that the impact will occur.

Magnitude	Low to Minor
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9.2.4 Recommendations

It is recommended that the werf S.34-050 undergo a Phase 2 Built Environment Assessment by a qualified historical architect to accurately determine the significance value of the resources and provide appropriate mitigation measures. If the site is not 60 years or older then it may not need to be assessed by the impact rating system.

10 DESCRIPTION OF BURIAL GROUNDS AND GRAVES

The section aims to describe the identified and recorded heritage resources, discuss the values ascribed to the heritage resources, as well as to assess the impacts on the identified heritage resources. The heritage resources that have a negligible to low heritage value are briefly discussed. The full descriptions are provided in the site list in Appendix C. Impacts were only discussed for sites with low to high heritage value. Impacts on sites with a negligible heritage value were not discussed. For descriptions of the significance and the field rating system, see Appendix D.

10.1 MSO1805/2630AA/S.36-047 (Informal farm burial ground)

An informal burial ground was identified and recorded on Mooifontein 35 IT Portion 2 (Table 10-1). At least eight informal burials were noted. The burials ranged from being stone-packed burials with headstones to stone-packed burials without headstones. The burial ground is in a poor condition. The burial ground may be associated with the local community and/or the original occupants of the *werf* at Site S.34-046. The burial ground is located in the opencast mine area.

Table 10-1: Summary of Site S.36-047

Context	Informal farm burial ground
Site location	<p>Site co-ordinates</p> <p>South: 26°09'26.10"</p> <p>East: 30°13'57.31"</p> <p>The site is located in the opencast mine area</p>
Physical Description	Eight burials present
Condition	Fair to good condition
Age	1975 to 1997
Possible Affinity	The burials may possibly be associated with farm workers who once worked on the farm

Persons consulted	Farm owner - Danie Neethling
Threats or sources of risk and legal implications	
<ul style="list-style-type: none">■ Immediate threats include site clearance for development such as the opencast pit.■ Potential sources of threats and risk include vandalism by workers on site, accidental destruction or alteration of burial site by construction workers on site.■ Legal implications based on Section 36 of the NHRA and Regulations Chapter XI (Sections 38-40), consultation with affected families and permit application for possible grave relocation.	



Figure 10-1: Eight stone-packed burials at informal burial ground S.36-047.

10.1.1 Statement of value

Field rating: Grade IV A

The heritage resource has a high local heritage value in social association and integrity. The burial ground may have a strong association to the local community or farmworkers for social, cultural and spiritual reasons. Its importance is also based on highly credible information sources. It is in a fair to good condition. There is some decay present but it can easily be restored. Based on these attributes, the burial ground was given a low to medium heritage value.

Project-related mitigation measures such as changes to design or mine plan were not considered as the burials are located in the opencast pit and could never be preserved. It is therefore recommended that the burial ground be relocated.

10.1.2 Rating of impact (pre-mitigation)

Type of Impact		Negative impact
Rating of Impacts		
Characteristic	Designation	Summary of Reasoning
Scale	Municipal area	The impact will affect the whole municipal area.
Duration	Permanent/no mitigation	No mitigation measures of natural process will reduce the impact after implementation.
Severity	Medium to high	Very serious widespread social impacts resulting in irreparable damage to burials.
Probability	Certain/definite	The impact will occur as the burials are located in the opencast mine footprint.
Magnitude		Minor
Value of the heritage resource		Low to Medium
The heritage resource is of a low to medium heritage value. Furthermore, the burials may have a strong association to the local community or farmworkers for social, cultural and spiritual reasons. Its importance is also based on highly credible information sources.		

10.1.3 Rating of impact (post-mitigation)

Type of Impact		Positive change
Rating of Impacts		
Characteristic	Designation	Summary of Reasoning
Scale	Limited	If the impact occurs, it will be limited to the site and its immediate surrounding.
Duration	Project life	If the impact occurs, it will cease after the operational life span of the Harwar Project.
Severity	Low to medium	If the impact occurs, it will cause damage to burials and human remains.

Probability	Unlikely/low probability	There is a possibility that the impact will occur.
Magnitude		Low to Minor

10.1.4 Recommendations

The burial ground S.36-047 will be negatively impacted by the proposed mining activity as it lies directly in the proposed opencast pit. As such, it is recommended that the burial ground be relocated. A Grave Relocation Plan (GRP) must be drafted and implemented in accordance with Section 36 of the NHRA and NHRA Regulations.

10.2 MSO1805/2630AA/S.36-048 (Informal burial ground)

An informal burial ground was identified and recorded on Mooifontein 35 IT Portion 5. At least nine informal, stone-packed burials and one formal burial were noted. The burial ground is in a poor to fair condition and is overgrown. The burial ground may be associated with the local community and/or farmworkers. The burial ground is located in the opencast mine area.

Table 10-2: Summary of Site S.36-048

Context	Informal farm burial ground
Site location	<p>Site co-ordinates</p> <p>South: 26°09'49.81"</p> <p>East: 30°13'21.83"</p> <p>The burial ground is located in the opencast area</p>
Physical Description	Ten burials present
Condition	Poor to fair condition
Age	21 years
Possible Affinity	Possible affinity with local community and possibly associated with farmworkers
Persons consulted	Farm owner – Danie Neethling
Threats or sources of risk and legal implications	
<ul style="list-style-type: none"> ■ Immediate threats include site clearance for development such as the opencast pit. ■ Potential sources of threats and risk include vandalism by workers on site, accidental destruction or alteration of burial site by construction workers on site. ■ Legal implications based on Section 36 of the NHRA and Regulations Chapter XI (Sections 	

38-40), consultation with affected families and permit application for possible grave relocation.



Figure 10-2: General view of Site S.36-048 in landscape.

10.2.1 Statement of value

Field rating: Grade IV A

The heritage resource has a high local heritage value in social association and integrity. The burial ground may have a strong association to the local community or farmworkers for social, cultural and spiritual reasons. Its importance is also based on highly credible information sources. It is in a poor to fair condition with active decay visible and is overgrown. Some restoration is required. Based on these attributes, the burial ground was given a low to medium heritage value.

Project-related mitigation measures such as changes to design or mine plan were not considered as the burials are located in the opencast pit and could never be preserved. It is therefore recommended that the burial ground be relocated.

10.2.2 Rating of impact (pre-mitigation)

Type of Impact		Negative impact
Rating of Impacts		
Characteristic	Designation	Summary of Reasoning
Scale	Municiple area	The impact will affect the whole municiple area.
Duration	Permanent/no mitigation	No mitigation measures of natural process will reduce the impact after implementation.
Severity	Medium to high	Very serious widespread social impacts resulting in irreparable damage to burials.
Probability	Certain/definate	The impact will occur as the burials are located in the opencast mine footprint.
Magnitude		Minor
Value of the heritage resource		Low to Medium
<p>The heritage resource is of a low to medium heritage value. Furthermore, the burials may have a strong association to the local community or farmworkers for social, cultural and spiritual reasons. Its importance is also based on highly credible information sources.</p>		

10.2.3 Rating of impact (post-mitigation)

Type of Impact		Positive change
Rating of Impacts		
Characteristic	Designation	Summary of Reasoning
Scale	Limited	If the impact occurs, it will be limited to the site and its immediate surrounding.
Duration	Project life	If the impact occurs, it will cease after the operational life span of the Harwar Project.
Severity	Low to medium	If the impact occurs, it will cause damage to burials and human remains.
Probability	Unlikely/low probability	There is a possibility that the impact will occur.
Magnitude		Low to Minor

10.2.4 Recommendation

The burial ground S.36-048 will be negatively impacted by the proposed mining activity as it lies directly in the proposed opencast pit. As such, it is recommended that the burial ground be relocated. A GRP must be drafted and implemented in accordance with Section 36 of the NHRA and NHRA Regulations.

10.3 MSO1805/2630AA/S.36-052 (Informal burial ground)

An informal burial ground was identified and recorded on Tevreden 56 IT Portion 4. At least 23 informal, stone-packed burials were noted. The burial ground is in a poor to fair condition and is overgrown. The burial ground may be associated with the local community and/or farmworkers. The burial ground is located 400 m south west of the opencast mine area.

Table 10-3: Summary of Site S.36-052

Context	Informal farm burial ground
Site location	<p>Site co-ordinates</p> <p>South: 26°13'14.11"</p> <p>East: 30°10'46.58"</p> <p>The burial ground is located 400 m south west of the opencast mine area.</p>
Physical Description	23 graves present
Condition	Overgrown and in a poor condition
Age	Unknown
Possible Affinity	Possible affinity with local community and possibly associated with farmworkers
Persons consulted	Farm owner – Johannes Hercules Du Preez
Threats or sources of risk and legal implications	
<ul style="list-style-type: none"> ■ Immediate threats include site clearance for development such as the opencast pit. ■ Potential sources of threats and risk include vandalism by workers on site, accidental destruction or alteration of burial site by construction workers on site. ■ Legal implications based on Section 36 of the NHRA and Regulations Chapter XI (Sections 38-40), consultation with affected families and permit application for possible grave relocation. 	



Figure 10-3: General view of Site S.36-052.

10.3.1 Statement of value

Field rating: Grade IV A

The heritage resource has a high local heritage value in social association and integrity. The burial ground may have a strong association to the local community or farmworkers for social, cultural and spiritual reasons. Its importance is also based on highly credible information sources. It is in a poor to fair condition with active decay visible and is overgrown. Some restoration is required. Based on these attributes, the burial ground was given a low to medium heritage value.

The following Project-related mitigation measures and site management should be implemented in order to reduce the significance of the impact:

- The graves should be restored where these are dilapidated, protected and conserved in perpetuity. Access to this burial ground should be negotiated with communities in the immediate area.
- A perimeter fence should be built around the burial ground and placed two meters away from the perimeter of the graves. The perimeter fences should include an entry gate to allow visits from relatives and family friends. The mine should be responsible for the maintenance of these fences.
- The Environmental Control Officer (ECO) should be present on site when these fences are being erected around the burial ground.

10.3.2 Rating of impact (pre-mitigation)

Type of Impact		Negative impact
Rating of Impacts		
Characteristic	Designation	Summary of Reasoning
Scale	Municiple area	The impact will affect the whole municiple area.
Duration	Permanent/no mitigation	No mitigation measures of natural process will reduce the impact after implementation.
Severity	Medium to high	Very serious widespread social impacts resulting in irreparable damage to burials.
Probability	Probable	It is probably that the impact could occur as the burials are located 400 m from the opencast area.
Magnitude		Minor
Value of the heritage resource		Low to Medium
<p>The heritage resource is of a low to medium heritage value. Furthermore, the burials may have a strong association to the local community or farmworkers for social, cultural and spiritual reasons. Its importance is also based on highly credible information sources.</p>		

10.3.3 Rating of impact (post-mitigation)

Type of Impact		Positive change
Rating of Impacts		
Characteristic	Designation	Summary of Reasoning
Scale	Limited	If the impact occurs, it will be limited to the site and its immediate surrounding.
Duration	Project life	If the impact occurs, it will cease after the operational life span of the Harwar Project.
Severity	Medium	If the impact occurs, it will cause damage to burials and human remains.
Probability	Unlikely/low probability	There is a possibility that the impact will occur.
Magnitude		Low to Minor

10.3.4 Recommendations

The informal burial ground S.36-052 was identified during the survey and could be impacted on. The immediate threats include site clearance for development. Potential sources of threats and risk include vandalism by workers on site and/or accidental destruction or alteration of the burials and burial ground by construction workers on site.

Potential impacts on the burial ground S.36-052 may be avoided through the implementation of feasible mitigation measures related to Project design and planning. The burials and the burial ground may therefore be preserved *in situ* ensuring protection during development and the long-term. The following Project-related mitigation measures and site management should be implemented to reduce the significance of the impact:

- The burial ground S.36-052 should be restored where these are dilapidated, protected and conserved in perpetuity. Access to the burial grounds should be negotiated with communities in the immediate area.
- A perimeter fence should be built around the burial ground S.36-052. The perimeter fence must be placed two meters away from the perimeter of the burials. The perimeter fence should include an entry to allow visits from relatives and family friends. The mine should be responsible for the maintenance of this fence.
- Detailed Project design should ensure that there is a 20 m buffer between the perimeter fence and the proposed opencast mine.
- The ECO should be present on site when the perimeter fence is been erected around the burial ground S.36-052.

11 DISCUSSION OF RESULTS AND FINDINGS

The GS-IDP was reviewed to gain a more detailed understanding of the development context within which the Project Area is situated. The mining sector that has been identified as a key area for growth and development comprises specific types or categories of development that may impact on heritage resources in various manners. These may include increased prospecting activities and the construction of underground and opencast mines. The proposed development relative to the Project must therefore be taken into account when evaluating the impact on potential heritage resources.

A proposal was submitted by the MTPA together with local landowners and NGOs for the declaration of the Chrissiesmeer as a Protected Area. In April 2013, the MTPA submitted an Objection against the application for mining right for the Harwar Colliery to the DMR based on the following:

- The locality of the proposed opencast coal mine cannot be approved because it lies within an area designated to be declared as a Protected Environment in terms of the NEMPA;

Under Section 28 of the NEMPA, no person may conduct mining activities in a protected area. This has significant implication for the Harwar Project, because if the area is declared

a Protected Area, under NEMPA no development or mining can take place there. Furthermore, if the area is declared a Protected Area any heritage resources located within it will have a high sensitivity towards any form of development.

From the research conducted on the Study Area, one can deduce that a great deal of cultural heritage exists in this area of Mpumalanga. The town of Chrissiesmeer has a long history stemming from the Stone Age to the Iron Age and flourishing in the Historic and Social periods and the town and its surrounding areas have embodied each of these periods of history. The rock art sites and Bushmen massacre sites, for example, are symbolic of the oppression the Bushmen had undergone since the arrival of the Iron Age farmers right up until the formation of an apartheid state. Similarly, the Anglo-Boer battle sites and cemeteries attest to the rich European history of Chrissiesmeer. The preservation of the sandstone, wood and iron, and brick buildings symbolise the development of the town from the early 1800s to the 1900s. In the early 1800s, sandstone from a nearby quarry was used to construct houses and other buildings associated with the status of the town as a trading post. From there, the town was granted urban status in the mid-1800s and as a result wood and iron buildings were constructed. Later on, bricks were used either to construct houses or to modify the old sandstone houses. These characteristics highlight the uniqueness of Chrissiesmeer and the surrounding area and the people living their today have a sense of authentic human attachment and belonging to the town.

The immediate receiving environment which includes opencast mining is currently comprised of agricultural fields and small koppies. Informal and formal burials were identified and recorded in and around these features. Archaeological sites are rare and only two isolated Iron Age occurrences were identified and recorded. Structures that fall within legal parameters to be considered heritage resources include historical and contemporary *werfs* that were identified on Mooifontein 35 IT Portion 2 and Tevreden 56 IT Portion 4.

The results of the HIA survey have shown that the features associated with the different periods of history can still be found today, not only in the town itself but also on the farms surrounding the town. The most prominent of these features is the *werf*. The *werf* typically consists of a house, barn, and stable constructed from sandstone. Modern additions have been made to these structures and they are still used today for farming activities. Regardless of the contemporary use of these structures, their long history adds value to the town of Chrissiesmeer as a historical townscape with a rich history that extends back to the Stone Age.

Reconnaissance included pedestrian and vehicle survey. During the field survey, no surface fossils were identified in the opencast areas on Mooifontein 35 IT and Tevreden 56 IT. However, potential fossil sites may exist on Harwar 58 IT and Vryheid 59 IT but this can only be verified through a palaeontological assessment inclusive of a site visit. It is therefore recommended that a Phase 1 Palaeontological Assessment be conducted for the Harwar Project Area including the farms Harwar 58 IT and Vryheid 59 IT.

Fossils may also exist beneath the surface but their existence beneath the surface can only be verified through monitoring excavations. In this sense, the impact of construction activities

such as excavations is positive for palaeontology, provided that efforts are made to monitor and rescue the fossils.

Identified sites are summarised in Table 6-1. For a list of the field rating thresholds and descriptions see Table 4-2. All recorded heritage points are presented in Plan 5 in Appendix B and presented in the site list in Appendix C. The HIA survey could not be conducted on Harwar 58 IT, Vryheid 59 IT as site access could not be obtained. This represents a major gap in this HIA report as sites not identified and recorded.

12 CONCLUSION

Msobo Coal has commissioned Digby Wells to conduct environmental and social studies in support of a MRA in accordance with the MPRDA. Msobo Coal proposes to conduct opencast mining on Mooifontein 35 IT, De Goedverwachting 57 IT, Harwar 58 IT, Vryheid 59 IT, and Tevreden 56 IT. As per the MPRDA, EIA and EMP will be compiled and submitted to the DMR. This HIA Report will form a component of the EIA and EMP.

From the research conducted on the Study Area, one can deduce that a great deal of cultural heritage exists in this area of Mpumalanga. The town of Chrissiesmeer has a long history stemming from the Stone Age to the Iron Age and flourishing in the Historic and Social periods and the town and its surrounding areas have embodied each of these periods of history. Heritage resources that can be found include rock art sites and Bushmen massacre sites, Anglo-Boer battle sites and cemeteries, sandstone, wood and iron, and brick buildings dating to the early 1800s to the 1900s. These heritage resources highlight the uniqueness of Chrissiesmeer and the surrounding area. Today, the people living in Chrissiesmeer and the surrounding area have a sense of authentic human attachment and belonging to the town.

During the HIA survey a total of two archaeological and historical sites, two built environment resources and three burial grounds were identified and recorded in the proposed Harwar Project Area. Six of these sites are located in the proposed opencast mining area. The archaeological and historical sites are of negligible heritage value and impacts on these heritage resources were not assessed in this HIA report. These sites were significantly recorded and no further mitigation measures are recommended.

The two informal burial grounds S.36-047 and S.36-048 are located in the opencast mine footprint and will be impacted on by the proposed development. No Project-related mitigation measures such as changes to design or mine plan was considered for the burial grounds as they are located within the opencast mine footprint and will never be preserved. It is therefore recommended that these burial grounds be relocated.

Potential impacts on the informal burials S.36-052 may be avoided though the implementation of feasible mitigation measures related to Project design and planning. The burial ground may therefore be preserved *in situ* ensuring protection during development and the long-term. Project-related mitigation measures and site managements should be implemented to reduce the significance of the impact. These include erecting a perimeter fence around the burial ground to create a 20 m buffer between the opencast mine and the

burial ground. Access to the burial ground should be negotiated with communities in the immediate area.

Based on the above finds, it is recommended that a Phase 1 Paleontological Assessment and Phase 2 mitigation measures be implemented for the Harwar Project. The HIA survey could not be conducted on Harwar 58 IT, Vryheid 59 IT as site access could not be obtained. This represents a major gap in this HIA report as heritage sites could not be identified and recorded. It is therefore recommended that Phase 1 Palaeontological Assessment and Phase 2 mitigation be conducted on these farms.

Detailed surface infrastructure design plans were not available at the time of the HIA. Detailed HIAs may therefore be required on areas where infrastructure footprints will exceed minimum thresholds described in Section 38 of the NHRA, such as stockpiles, pollution control dams and other infrastructure. These HIAs should be undertaken after final designs have been completed and before construction occurs.

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Appendix A: Curriculum Vitae of Specialist



DIGBY WELLS
ENVIRONMENTAL

SHAHZAADEE KARODIA

Ms Shahzaadee Karodia
Archaeology Consultant
Social Science Department
Digby Wells Environmental

1 EDUCATION

- 2006 BA Anthropology & Archaeology, University of the Witwatersrand
- 2007 BSc Honours. Palaeontology, University of the Witwatersrand
 - Courses included: comparative vertebrate anatomy; cladistics analysis; primate and human evolution; Karoo biostratigraphy; dinosaurs and the origins of birds; Cenozoic mammals; taphonomy; and palaeoecology
 - Honours Thesis: "Encephalization and its relationship to orbit size in modern humans and a small bodied population from Palau, Micronesia".
- 2012 MSc Archaeology, University of the Witwatersrand
 - MSc Thesis: "Naturally mummified human remains from Historic Cave, Limpopo, South Africa".
 - Skills obtained during MSc included: stereo microscopy; light microscopy; scanning electron microscopy; and histology

2 LANGUAGE SKILLS

English (read, write, speak)

Currently completing French training for beginners

3 EMPLOYMENT

2012:	Archaeology consultant, Digby Wells Environmental
April 2012 – June 2012:	External archaeology research consultant, EcoAfrica
April 2011 – November 2011:	Archaeology intern, University of Pretoria



- 2007 – 2008: Palaeontology collections assistant, BPI
University of the Witwatersrand
- 2006 – 2007: Tour guide, Sterkfontein Caves

4 EXPERIENCE

- Archaeology Field School in Klipriviersberg with Dr Karim Sadr, University of the Witwatersrand
- Archaeology Field School in Swartkrans and Maropeng with Dr Kathy Kuman, University of the Witwatersrand
- Archaeology Field School in Ottosdaal with Dr Thembi Russell, University of the Witwatersrand
- Palaeontology Field School in the Karoo with Professor Bruce Rubidge, University of the Witwatersrand
- Palaeontology Field School in Gladysvale with Professor Lee Berger, University of the Witwatersrand
- Palaeontology Field School in Wonderkrater with Dr Lucinda Backwell, University of the Witwatersrand

5 PROJECT EXPERIENCE

- Heritage Statement and Letter of Recommendation from Exemption for the Central Basin, Witwatersrand Acid Mine Drainage Project
- Heritage Impact Assessment for the Witwatersrand Gold Fields Acid Mine Drainage Project (Western Basin)
- Archaeological Watching Brief on Access Road for Bokoni Platinum Ltd
- Heritage Statement and Notification of Intent to Develop for Eskom Transmission Division – Roodepoort Strengthening Project;
- Heritage Statement and Notification of Intent to Develop for the Zandbaken Coal Mine Project, Zandbaken 585 IR, Sandbaken 363 IR and Bosmans Spruit 364 IS, Standerton, Mpumalanga
- Heritage Statement and Notification of Intent to Develop for Rhodium Reef Limited Platinum Operation, 2430 CA & CC, De Goedverwachting 332 KT, Boschloof 331 KT and Belvedere 362 KT
- Heritage Statement and Notification of Intent to Develop for the Thabametsi Project, 2327CB, Vaalpensloop 313 LQ, Lephalale, Limpopo Province
- Heritage Impact Assessment for the Proposed Thabametsi Project, Lephalale, Limpopo Province



6 PROFESSIONAL AFFILIATIONS

- Association of Southern African Professional Archaeologists (ASAPA)
- The South African Archaeology Society (SAAS)
- Society of Africanist Archaeologists (SAfA)
- The Geological Survey of South Africa (GSSA)
- The Palaeontological Society of Southern Africa (PSSA)
- The South African Society for Amateur Palaeontologists (SASAP)



DIGBY WELLS
ENVIRONMENTAL

NATASHA HIGGITT

Ms Natasha Higgitt
Archaeology Consultant
Social Department
Digby Wells Environmental

1 EDUCATION

- University of Pretoria
- BA Degree (2008)
- Archaeology Honours (2009)
- Title of Dissertation- Pass the Salt: An Archaeological analysis of lithics and ceramics from Salt Pan Ledge, Soutpansberg, for evidence of salt working and interaction.

2 LANGUAGE SKILLS

- English - Excellent (read, write and speak)
- Afrikaans - Fair (read, write and speak)
- Italian – Poor (Speaking only)

3 EMPLOYMENT

- July 2011 to Present: Archaeology Consultant at Digby Wells Environmental
- April 2011 to June 2011: Lab assistant at the Albany Museum Archaeology Department, Grahamstown, Eastern Cape
- April 2010 to March 2011: Intern at the Archaeology Department, Albany Museum, Grahamstown, Eastern Cape under the Department of Sports, Recreation, Arts and Culture, Eastern Cape Government, South Africa (DSRAC)

4 EXPERIENCE

- Human remains rescue excavation at St Francis Bay, Eastern Cape
- Human remains rescue excavation at Wolwefontein, Eastern Cape

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*Non-Executive



- Recorded two rock art sites at Blaauwbosch Private Game Reserve, Eastern Cape
- Attended a 2 week excavation/study tour in the Friuli Region in Italy, organised by the *Società Friulana di Archeologia*, sponsored by *Ente Friuli nel Mondo*, and excavated a 12th century medieval castle
- Attended a 2 week excavation in Limpopo, Waterpoort Archaeological Project organised by Xander Antonites (Yale PhD Candidate)
- A total of 5 University of Pretoria Archaeology field schools in Limpopo and Gauteng spanning over 4 years

5 PROJECT EXPERIENCE

- Phase 1 Heritage Impact Assessment for the Thabametsi Coal Mine, Lephalale, Limpopo for Exxaro Coal (Digby Wells Environmental)
- Heritage Statement for the Zandbaken Coal Mine Project, Zandbaken 585 IR, Sandbaken 363 IR and Bosmans Spruit 364 IS, Standerton, Mpumalanga for Xtrata Coal South Africa (Digby Wells Environmental)
- Phase 1 Heritage Impact Assessment for the Brakfontein Thermal Coal Mine, Mpumalanga for Universal Coal (Digby Wells Environmental)
- Development of a RAP for Aureus Mining for the New Liberty Gold Mine Project, Liberia (Digby Wells Environmental)
- Phase 1 Archaeological Impact Assessment for the MBET Pipeline, Steenbokpan, Limpopo (Digby Wells Environmental)
- Notice of Intent to Develop and Cultural Resources Pre-Assessment for Orlight SA (PTY) Ltd Solar PV Project. 2012. (Digby Wells Environmental)
- Agricultural Survey for Platreef ESIA, Mokopane, Limpopo. 2011. (Digby Wells Environmental)
- Cultural Resources Pre-Assessment for the Proposed Sylvania Everest North Mining Development in Mpumalanga, near Lydenburg. 2011. (Digby Wells Environmental)
- Phase 2 Mitigation of Archaeological sites at Boikarabelo Coal Mine, Steenbokpan, Limpopo. 2011. (Digby Wells Environmental)
- Cultural Resources Pre-Assessment for Proposed Platinum Mine Prospecting in Mpumalanga, near Bethal for Anglo Platinum. 2011. (Digby Wells Environmental)
- Cultural Resources Pre-Assessment for proposed Platinum Mine at Mokopane, Limpopo for Ivanhoe Platinum. 2011. (Digby Wells Environmental)
- Phase 1 AIA Mixed-use housing Development, Kwanobuhle, Extension 11, Uitenhage, Eastern Cape. 2011.
- Phase 1 AIA Centane to Qholora and Kei River mouth road upgrade survey, Mnquma Municipality, Eastern Cape. 2011. (SRK Consulting)



- Phase 1 AIA Clidet Data Cable survey, Western Cape, Northern Cape, Free State and Eastern Cape. 2011. (SRK Consulting)
- Phase 1 AIA Karoo Renewable Energy Facility, Victoria West, Northern Cape. 2011. (Savannah Environmental)
- Phase 1 AIA Windfarm survey in Hamburg, Eastern Cape. 2010. (Savannah Environmental)
- Phase 1 AIA Windfarm survey in Molteno, Eastern Cape. 2010. (Savannah Environmental)
- Phase 1 AIA Housing Development at Motherwell, P.E. 2010. (SRK Consulting)
- Phase 1 AIA Sand quarry survey in Paterson, Eastern Cape. 2010. (SRK Consulting)
- Phase 1 AIA Quarry Survey at Victoria West. 2010. (Acer [Africa] Environmental Management Consultants)
- Phase 1 AIA Quarry Survey at Port Elizabeth. 2010. (E.P Brickfields)

6 PROFESSIONAL AFFILIATIONS

- Association of Southern African Professional Archaeologists (ASAPA): Professional member
- Association of Southern African Professional Archaeologists (ASAPA): CRM Practitioner (Field Supervisor: Stone Age, Iron Age and Rock Art)
- South African Museums Association: Member



DIGBY WELLS
ENVIRONMENTAL

JUSTIN DU PIESANIE

Mr. Justin du Piesanie
Archaeology Consultant
Social Sciences Department
Digby Wells Environmental

1 EDUCATION

University of the Witwatersrand

- BA Degree (2004)
- BA Honours Degree (2005) - Archaeology
 - Title of Dissertation - Seal Skeletal Distribution of Herder and Forager Sites at Kasteelberg, Western Cape Province of South Africa.
- Master of Science (MSc) Degree (2008) – Archaeology
 - Title of Dissertation – Understanding the Socio-Political Complexity of Leokwe Society during the Middle Iron Age in the Shashe-Limpopo Basin through a Landscape Approach

2 LANGUAGE SKILLS

English First Language
Afrikaans Second Language

3 EMPLOYMENT

2011 to Present: Archaeology Consultant at Digby Wells Environmental

2009 to 2011: Archaeology Collections Manager at the University of the Witwatersrand.

2009 to 2011: Freelance Archaeologist for Archaeology Resource Management (ARM), Matakoma Heritage Consultants, Wits Heritage Contracts Unit & Umlando Heritage Consultants.

2006 to 2007: Tour Guide at Sterkfontein Caves World Heritage Site.

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*Non-Executive

4 EXPERIENCE

- Wits Fieldschool - Excavation at Meyersdal, Klipriviersberg Johannesburg (Late Iron Age Settlement).
- Wits Fieldschool - Phase 1 Survey of Prentjiesberg in Ugie / Maclear area, Eastern Cape.
- Wits Fieldschool – Excavation at Kudu Kopje, Mapungubwe National Park Limpopo Province.
- Wits Fieldschool – Excavation of Weipe 508 (2229 AB 508) on farm Weipe, Limpopo Province.
- Survey at Meyersdal, Klipriviersberg Johannesburg.
- Mapping of Rock Art Engravings at Klipbak 1 & 2, Kalahari.
- Survey at Sonop Mines, Windsorton Northern Cape (Vaal Archaeological Research Unit).
- Excavation of Kudu Kopje, Mapungubwe National Park Limpopo Province.
- Excavation of KK (2229 AD 110), VK (2229 AD 109), VK2 (2229 AD 108) & Weipe 508 (2229 AB 508) (Origins of Mapungubwe Project)
- Phase 1 Survey of farms Venetia, Hamilton, Den Staat and Little Muck, Limpopo Province (Origins of Mapungubwe Project)
- Excavation of Canteen Kopje Stone Age site, Barkley West, Northern Cape
- Excavation of Khami Period site AB32 (2229 AB 32), Den Staat Farm, Limpopo Province

5 PROJECT EXPERIENCE

- Phase 2 Mitigation at Meyersdal, Klipriviersberg Johannesburg (ARM)
- Phase 1 Mitigation – Mapping of Late Iron Age Site in Pilansberg, Sun City (ARM)
- Phase 1 Mitigation – Survey of Witbank dam development (ARM)
- Phase 1 Mitigation – Survey of Glen Austin AH, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Modderfontein AH Holding 34, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Modderfontein AH Holding 38, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Modderfontein AH Holding 44, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Modderfontein AH Holding 46, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Modderfontein AH Holding 47, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Modderfontein AH Holding 48, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Modderfontein AH Holding 49, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Modderfontein AH Holding 50, Johannesburg (Matakoma)



- Phase 1 Mitigation – Survey of Modderfontein AH Holding 61, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Modderfontein AH Holding 62, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Modderfontein AH Holding 71, Johannesburg (Matakoma).
- Phase 1 Mitigation – Survey of Modderfontein AH Holding 72, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Modderfontein 35IR Portion 40, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Rhino Mines, Thabazimbi Limpopo Province (ARM)
- Phase 1 Mitigation – Survey of Moddergat 389KQ, Schilpadnest 385KQ, Swartkop 369KQ, Cronimet Project, Thabazimbi Limpopo Province (Matakoma)
- Desktop Study – Desktop study for the Eskom Thohoyandou SEA Project, Limpopo Province (Matakoma)
- Phase 2 Mitigation – Excavation of Iron Age site on Wenzelrust, Shoshanguve Gauteng (Heritage Contracts Unit)
- Phase 1 Mitigation – Mapping of Late Stone Age shelter, Parys, Free State
- Phase 1 Mitigation – Survey of Vaalkrans Battlefield for the Transnet NMPP Line (Umlando)
- Phase 1 Mitigation – Survey of Portion 222 of Mindale Ext 7 Witpoortjie 254 IQ & Portion 14 of Nooitgedacht 534 IQ, Johannesburg (ARM)
- Phase 2 Mitigation – Excavation of Site 19 for the Anglo Platinum Mines Der Brochen & Booyensdal, Steelpoort, Mpumalanga (Heritage Contracts Unit)
- Phase 1 Mitigation – Mapping of sites 23, 26, 27, 28a & b for the Anglo Platinum Mines Der Brochen & Booyensdal, Steelpoort, Mpumalanga (Heritage Contracts Unit)
- Desktop Study - Desktop study for the inclusion into the Thohoyandou Electricity Master Network for Eskom, Limpopo Province (Strategic Environmental Focus)
- Phase 1 Mitigation – Mapping of historical sites as part of the mitigation for the expansion of the Bathlako Mine's impact area (Heritage Contracts Unit).
- Phase 2 Mitigation – Kibali Grave Relocation Project (KGRP) for the Kibali Gold Project, Democratic Republic of Congo (Digby Wells)
- Phase 1 Mitigation – Heritage Assessment and Survey for the proposed Kibali Hydro Power Stations, Democratic Republic of Congo (Digby Wells)
- Phase 1 Mitigation – Heritage Impact Assessment & Survey of the farm Vygenhoek for Aquarius Resources Everest North Mining Project, Steelpoort, Mpumalanga (Digby Wells)
- Phase 1 Mitigation – Heritage Impact Assessment for the Gold One International Ltd Proposed Geluksdal Tailings Storage Facility and Pipeline Infrastructure, Johannesburg, Gauteng Province (Digby Wells)
- Phase 1 Mitigation – Burial Grounds and Graves Survey (BGGS) for Platreef Resources, Mokopane, Limpopo Province (Digby Wells)
- Phase 2 Mitigation – Archaeological Impact Assessment of sites for Resource Generation Boikarabelo Mine, Steenbokpan, Limpopo Province (Digby Wells)



- Phase 1 Mitigation – Watching Brief for Bokoni Platinum Mines (Pty) Ltd, Burgersfort, Limpopo Province (Digby Wells)
- Heritage Statement for Rhodium Reefs Limited Platinum Operations on the Farm Kennedy's Vale 361 KT, Steelpoort, Mpumalanga Province (Digby Wells).
- Socio-Economic and Asset Survey, SEGA Gold Mining Project, Cluff Gold PLC, Burkina Faso (Digby Wells)

6 PROFESSIONAL AFFILIATIONS

Society for Africanist Archaeologists (SAfA) Member

7 PROFESSIONAL REGISTRATION

Association of Southern African Professional Archaeologists (ASAPA): Professional & CRM Member

8 PUBLICATIONS

- Huffman, T.N. & du Piesanie, J.J. 2011. Khami and the Venda in the Mapungubwe Landscape. *Journal of African Archaeology* 9(2): 189-206



JOHAN NEL

Mr Johan Nel

Unit manager: Heritage Resources Management

Social Sciences

Digby Wells Environmental

1 EDUCATION

2002 BA Honours - Archaeology

2001 BA Anthropology & Archaeology

1997 Matriculated Brandwag Hoërskool

2 LANGUAGE SKILLS

Fluent in English and Afrikaans

3 EMPLOYMENT

2011 to present Unit manager: Heritage Resources Management, Digby Wells Environmental

2010-2011 Archaeologist, Digby Wells Environmental

2005-2010 Manager and co-owner, Archaic Heritage Project Management

2003-2005 Freelance archaeologist

Resident archaeologist, Rock Art Mapping Project, Ndidima, Ukhahlamba-Drakensberg World Heritage Site

2002-2003 Special Assistant: Anthropology, Department of Anatomy, University of Pretoria

2001-2002 Technical Assistant: Department of Anatomy, University of Pretoria

1999-2001 Assistant: Mapungubwe Project, National Cultural History Museum & Department of Anthropology and Archaeology, UP

4 EXPERIENCE

I have 13 years of combined experience in the field of cultural heritage resources management (HRM) including archaeological and heritage assessments, grave relocation, social consultation and mitigation of archaeological sites. I have gained experience both within urban settings and remote rural landscapes. Since 2010 I have been actively involved in environmental management that has allowed me to investigate and implement the integration of heritage resources management into environmental impact assessments (EIA). Many of the projects since have

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*Non-Executive

required compliance with International Finance Corporation (IFC) requirements and other World Bank standards. This exposure has allowed me to develop and implement a HRM approach that is founded on international best practice and leading international conservation bodies such as UNESCO and ICOMOS. I have worked in most South African Provinces, as well as Swaziland, the Democratic Republic of the Congo and Sierra Leone. I am fluent in English and Afrikaans, with excellent writing and research skills.

5 PROJECT EXPERIENCE

PHASE 1 ARCHAEOLOGICAL IMPACT ASSESSMENTS:

- Above Ground Storage Tanks survey, SASOL Oil (Pty) Ltd, Free State Province, South Africa
- Access road establishment , AGES-SA, Tzaneen, South Africa
- Boikarabelo Railway Link, Resgen South Africa, Steenbokpan, South Africa
- Conversion of prospecting rights to mining rights, Georock Environmental, Musina, South Africa
- Galaxy Gold Agnes Mine, Barberton, South Africa
- HCI Khusela Palesa Extension, Bronkhorstspuit, South Africa
- Kennedy's Vale township establishment, AGES-SA, Steelpoort, South Africa
- Koidu Diamond Mine, Koidu Holdings, Koidu, Sierra Leone
- Lonmin Platinum Mine water pipeline survey, AGES-SA, Lebowakgomo, South Africa
- Mining right application, DERA Environmental, Hekpoort, South Africa
- Mogalakwena water pipeline survey, AGES-SA, Limpopo Province, South Africa
- Nzoro Hydropower Station, Environmental and Social Impact Assessment, DRC
- Randgold Kibali Gold Project, Environmental and Social Impact Assessment, Kibali, Democratic Republic of the Congo
- Randwater Vlaktefontein-Mamelodi water pipeline survey, Archaeology Africa cc, Gauteng, South Africa
- Residential and commercial development, GO Enviroscience, Schoemanskloof, South Africa
- Temo Coal, Limpopo, South Africa
- Transnet Freight Line survey, Eastern Cape and Northern Cape, ERM, South Africa
- Van Reenen Eco-Agri Development Project, GO Enviroscience, South Africa
- Platreef Platinum Mine, Ivanhoe Nickel & Platinum, Mokopane, South Africa

MITIGATION PROJECTS:

- Mitigation of Iron Age archaeological sites: Kibali Gold Project, DRC



- Mitigation of Iron Age metalworking site: Koidu Diamond Mine, Sierra Leone
- Mitigation of Iron Age sites: Boikarabelo Coal Mine, South Africa
- Exploratory test excavations of alleged mass burial site: Rustenburg, Bigen Africa Consulting Engineers, South Africa
- Mitigation of Old Johannesburg Fort: Johannesburg Development Agency (JDA), South Africa
- Site monitoring and watching brief: Department of Foreign Affairs Head Office, Imbumba-Aganang Design & Construction Joint Venture, South Africa

GRAVE RELOCATION

- Du Preezhoek-Gautrain Construction, Bombela JV, Pretoria, South Africa
- Elawini Lifestyle Estate social consultation, PGS (Pty) Ltd, Nelspruit, South Africa;
- Motaganeng social consultation, PGS (Pty) Ltd Burgersfort, South Africa
- Randgold Kibali Mine, Relocation Action Plan, Kibali, DRC
- Repatriation of Mapungubwe National Park and World Heritage Site, DEAT, South Africa
- Smoky Hills Platinum Mine social consultation, PGS (Pty) Ltd Maandagshoek South Africa
- Southstock Colliery, Doves Funerals, Witbank, South Africa
- Tygervallei. D Georgiades East Farm (Pty) Ltd, Pretoria, South Africa
- Willowbrook Ext. 22, Ruimsig Manor cc, Ruimsig, South Africa
- Zondagskraal social consultation, PGS (Pty) Ltd, Ogies, South Africa
- Zonkezizwe Gautrain, PGS, (Pty) Ltd, Midrand, South Africa

OTHER HERITAGE ASSESSMENTS AND REVIEWS:

- Heritage Scoping Report on historical landscape and buildings in Port Elizabeth: ERM South Africa
- Heritage Statement and Cultural Resources Pre-assessment scoping report on Platreef Platinum Mine, Mokopane: Platreef Ltd
- Heritage Statement and Scoping Report on five proposed Photo Voltaic Solar Power farms, Northern Cape and Western Cape: Orlight SA
- Land claim research Badenhorst family vs Makokwe family regarding Makokskraal, Van Staden, Vorster & Nysschen Attorneys, Ventersdorp South Africa
- Research report on Cultural Symbols, Ministry for Intelligence Services, Pretoria, South Africa
- Research report on the location of the remains of kings Mampuru I and Nyabela, National Department of Arts and Culture, Pretoria, South Africa
- Review of Archaeological Assessment: Resources Generation, Coal Mine Project in the Waterberg area, Limpopo Province

- Review of CRM study and compilation of Impact Assessment report, Zod Gold Mine, Armenia

6 PROFESSIONAL AFFILIATIONS

Society for Africanist Archaeologists (SAfA)

7 PROFESSIONAL REGISTRATION

Association for Southern African Professional Archaeologists (ASAPA)

Accredited by ASAPA Cultural Resources Management section

International Association of Impact Assessors (IAIA)

8 PUBLICATIONS

Nel, J. 2001. Cycles of Initiation in Traditional South African Cultures. *South African Encyclopaedia* (MWEB).

Nel, J. 2001. *Social Consultation: Networking Human Remains and a Social Consultation Case Study*. Research poster presentations at the Bi-annual Conference (SA3) Association of Southern African Professional Archaeologists: National Museum, Cape Town.

Nel, J. 2002. *Collections policy for the WG de Haas Anatomy museum and associated Collections*. Unpublished. Department of Anatomy, School of Medicine: University of Pretoria.

Nel, J. 2004. Research and design of exhibition for Eloff Belting and Equipment CC for the Institute of Quarrying 35th Conference and Exhibition on 24 – 27 March 2004.

Nel, J. 2004. *Ritual and Symbolism in Archaeology, Does it exist?* Research paper presented at the Bi-annual Conference (SA3) Association of Southern African Professional Archaeologists: Kimberley

Nel, J & Tiley, S. 2004. The Archaeology of Mapungubwe: a World Heritage Site in the Central Limpopo Valley, Republic of South Africa. *Archaeology World Report*, (1) United Kingdom p.14-22.

Nel, J. 2007. *The Railway Code: Gautrain, NZASM and Heritage*. Public lecture for the South African Archaeological Society, Transvaal Branch: Roedeaan School, Parktown.

Nel, J. 2009. *Un-archaeologically speaking: the use, abuse and misuse of archaeology in popular culture*. *The Digging Stick*. April 2009. 26(1): 11-13: Johannesburg: The South African Archaeological Society.

Nel, J. 2011. 'Gods, Graves and Scholars' returning Mapungubwe human remains to their resting place.' In: *Mapungubwe Remembered*. University of Pretoria commemorative publication: Johannesburg: Chris van Rensburg Publishers.


Nel, J. 2012. *HIAs for EAPs*. Paper presented at IAIA annual conference: Somerset West.

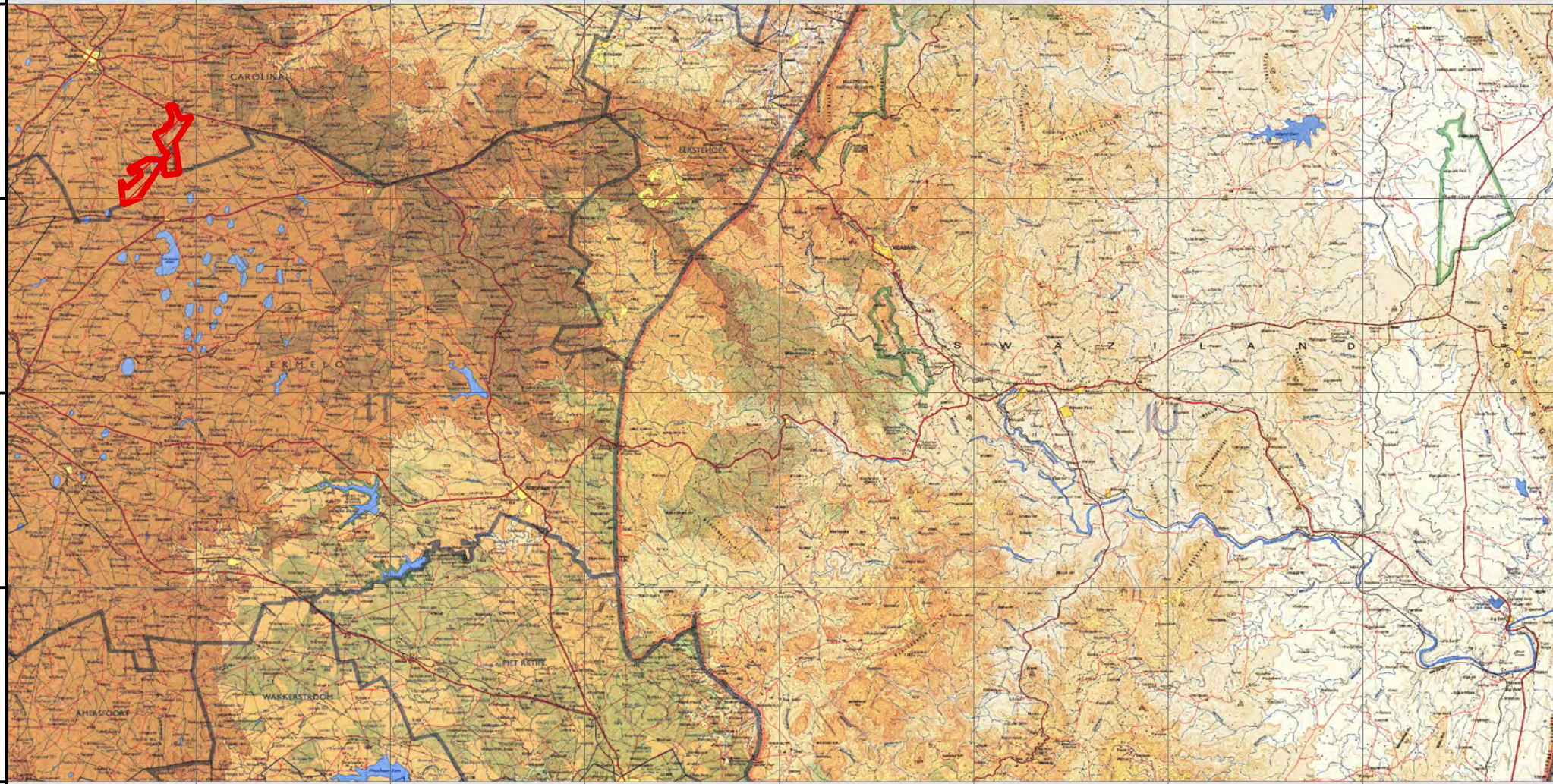
Appendix B: Location and Site Maps

Msobo Coal Harwar Project

Regional Setting
1:250000

Legend

 Harwar Project Area

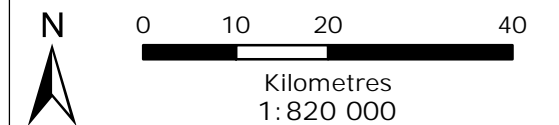


2630 Mbabane



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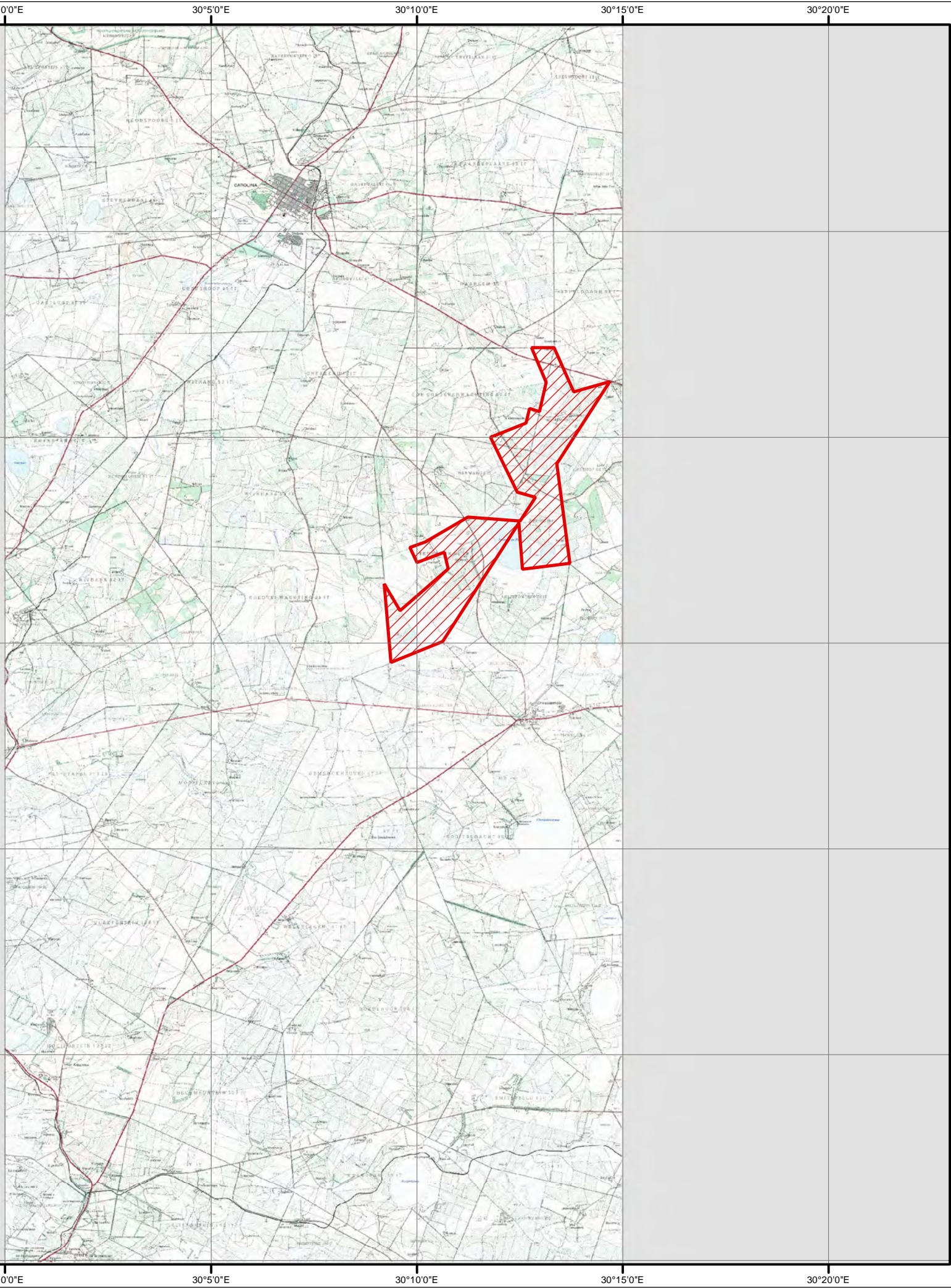


Msobo Coal Harwar Project

Regional Setting
1:50000

Legend

 Harwar Project Area

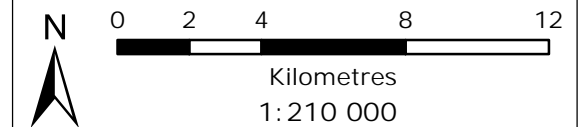


2630AA Carolina
2630AC Chrissiesmeer



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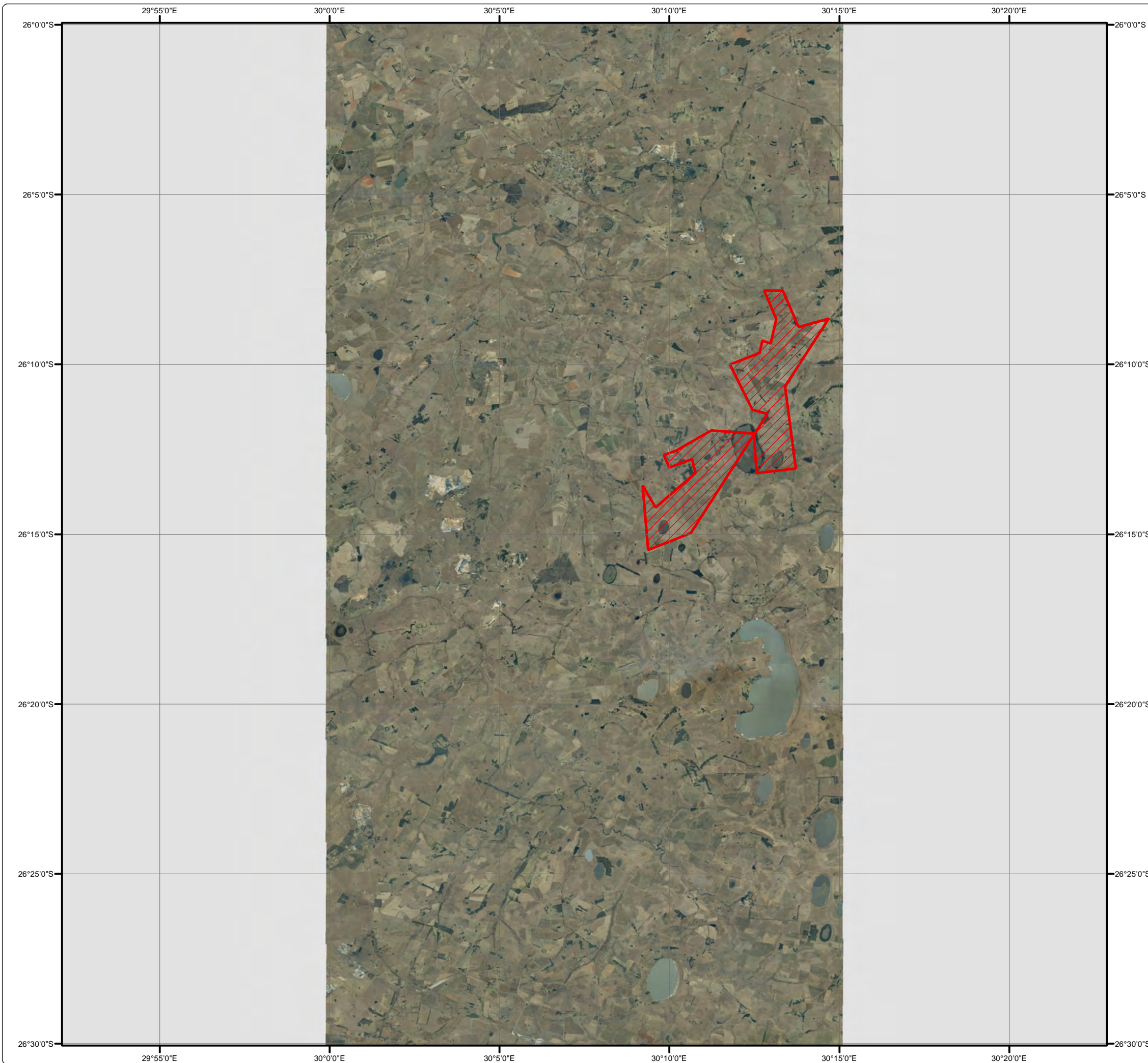


Msobo Coal Harwar Project

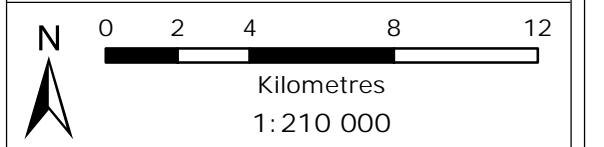
Regional Setting
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Legend

 Harwar Project Area



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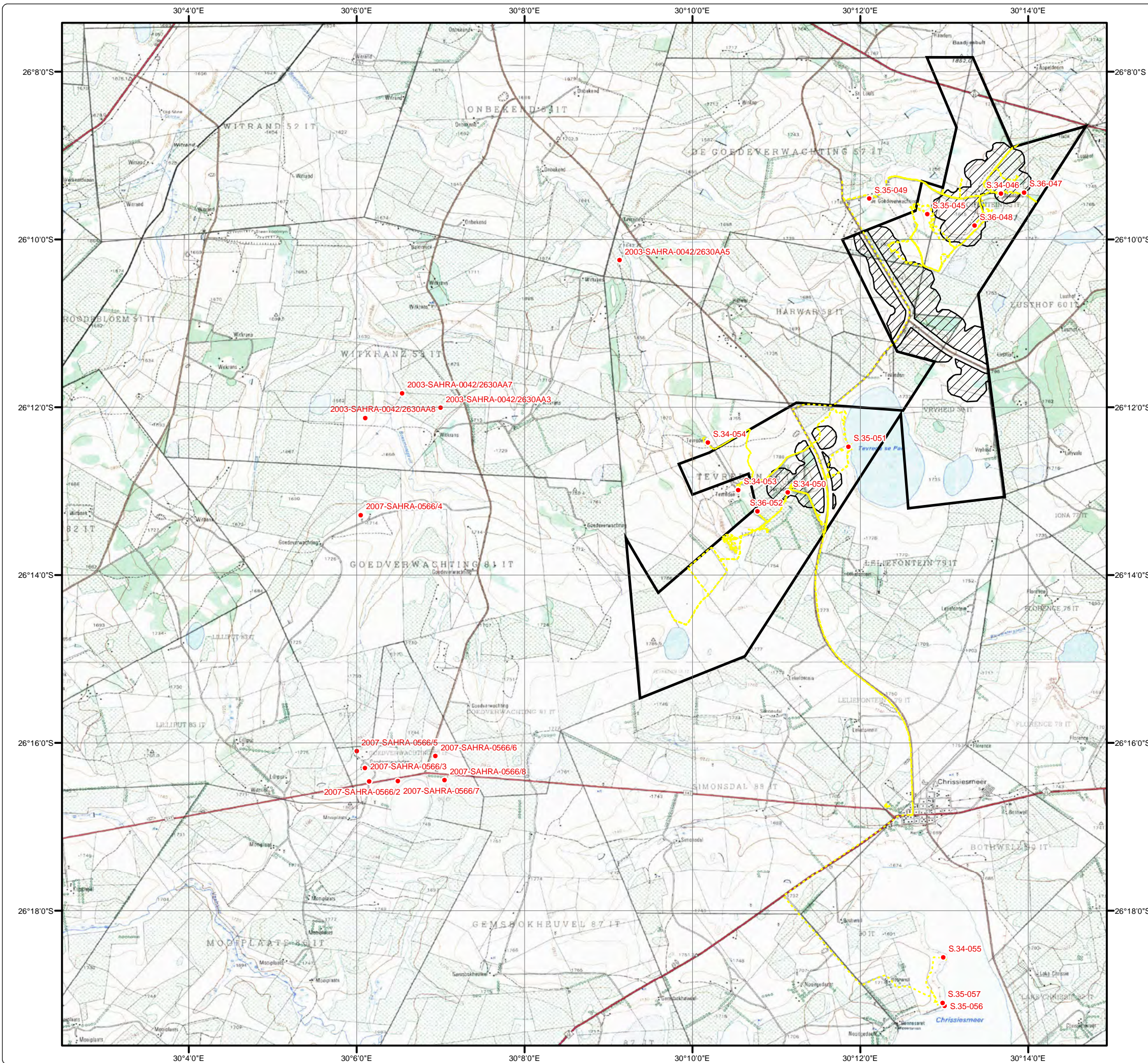


Msobo Coal Harwar Project

Heritage Resources & GPS Track Log

Legend

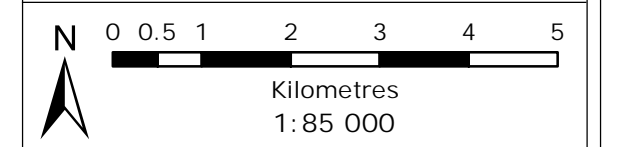
- Heritage Resources
- - - GPS Track Log
- Harwar Project Boundary
- Opencast Mining Areas



2630AA Carolina
2630AC Chrissiesmeer



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 Date: 01/05/2013

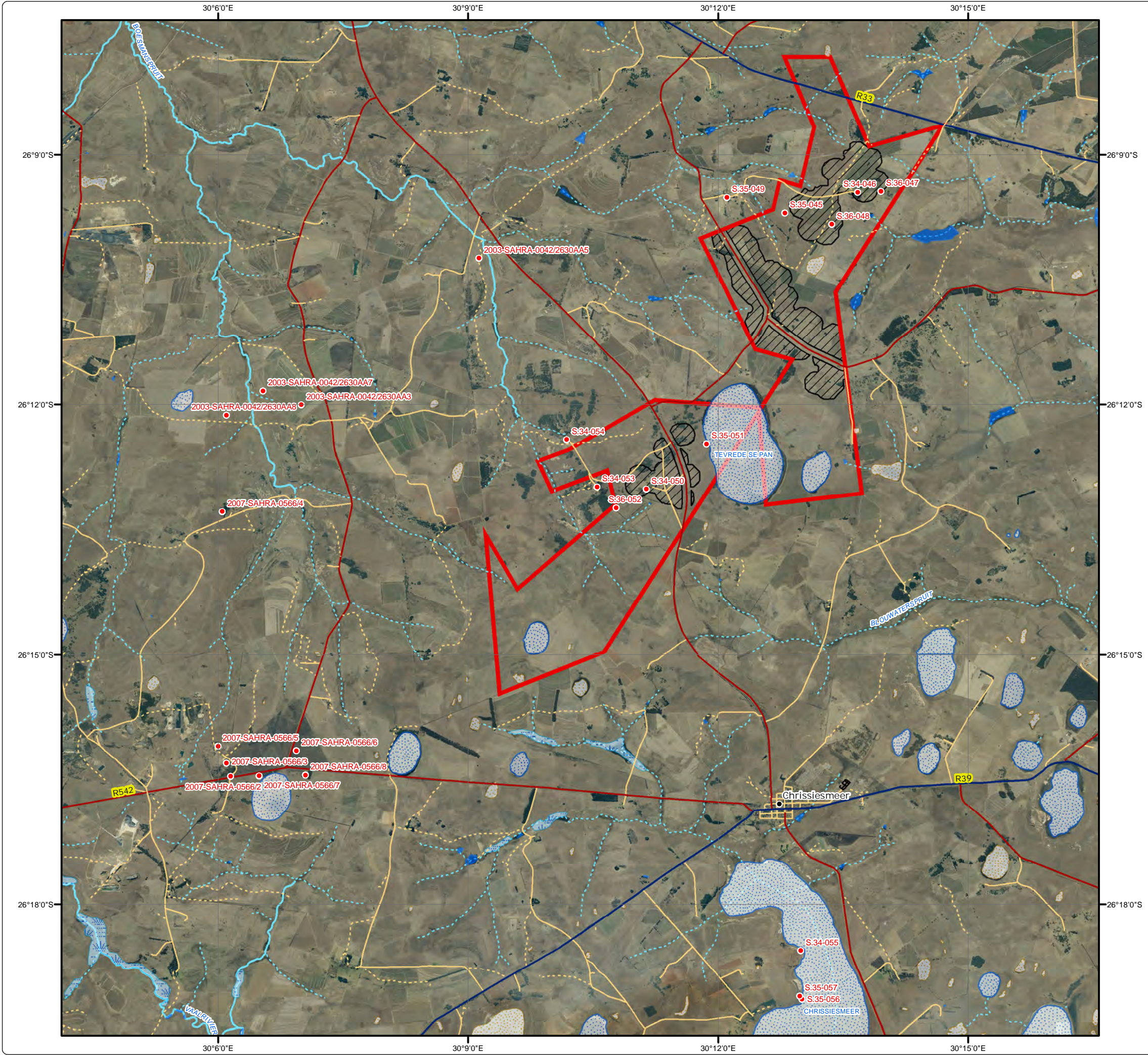


Msobo Coal Harwar Project

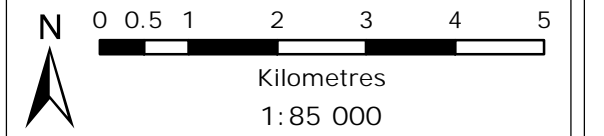
Heritage Resources

Legend

- Heritage Resources
- Settlement
- Harwar Project Boundary
- Arterial / National Route
- Main Road
- Other Access Road
- Street
- Track & Footpaths
- Perennial River
- Non-Perennial River
- Dam
- Wetland
- Perennial Pan
- Non-Perennial Pan
- Opencast Mining Areas












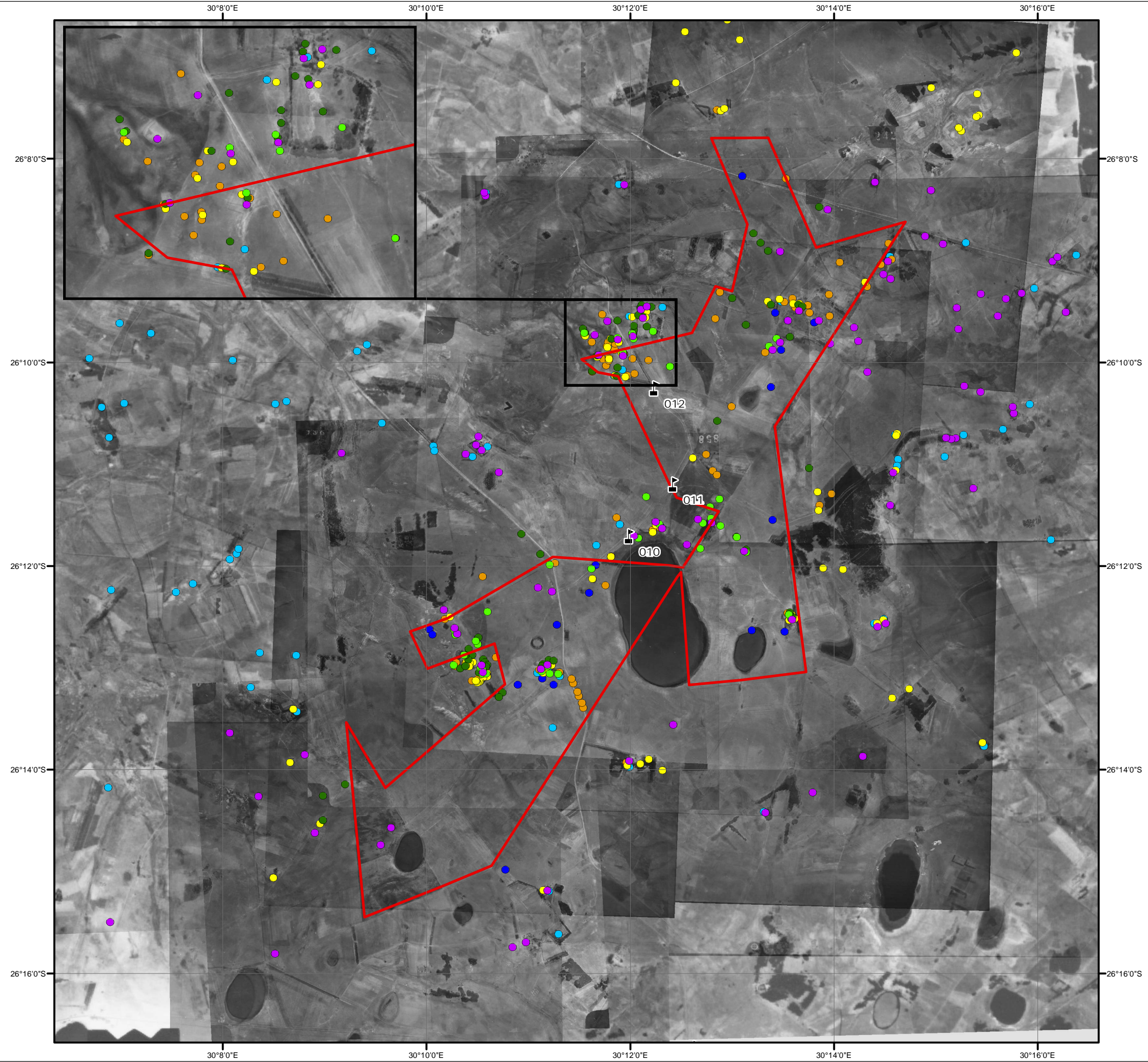
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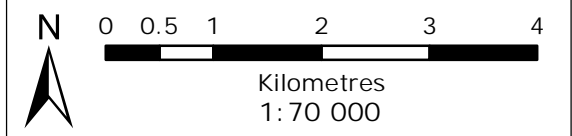
Msobo Coal Harwar Project Historical Layering

Legend

-  Harwar Project Area
-  Photo Points
-  Harwar 1956
-  Harwar 1962
-  Harwar 1968
-  Harwar 1977
-  Harwar 1984
-  Harwar 1990
-  Harwar 1998














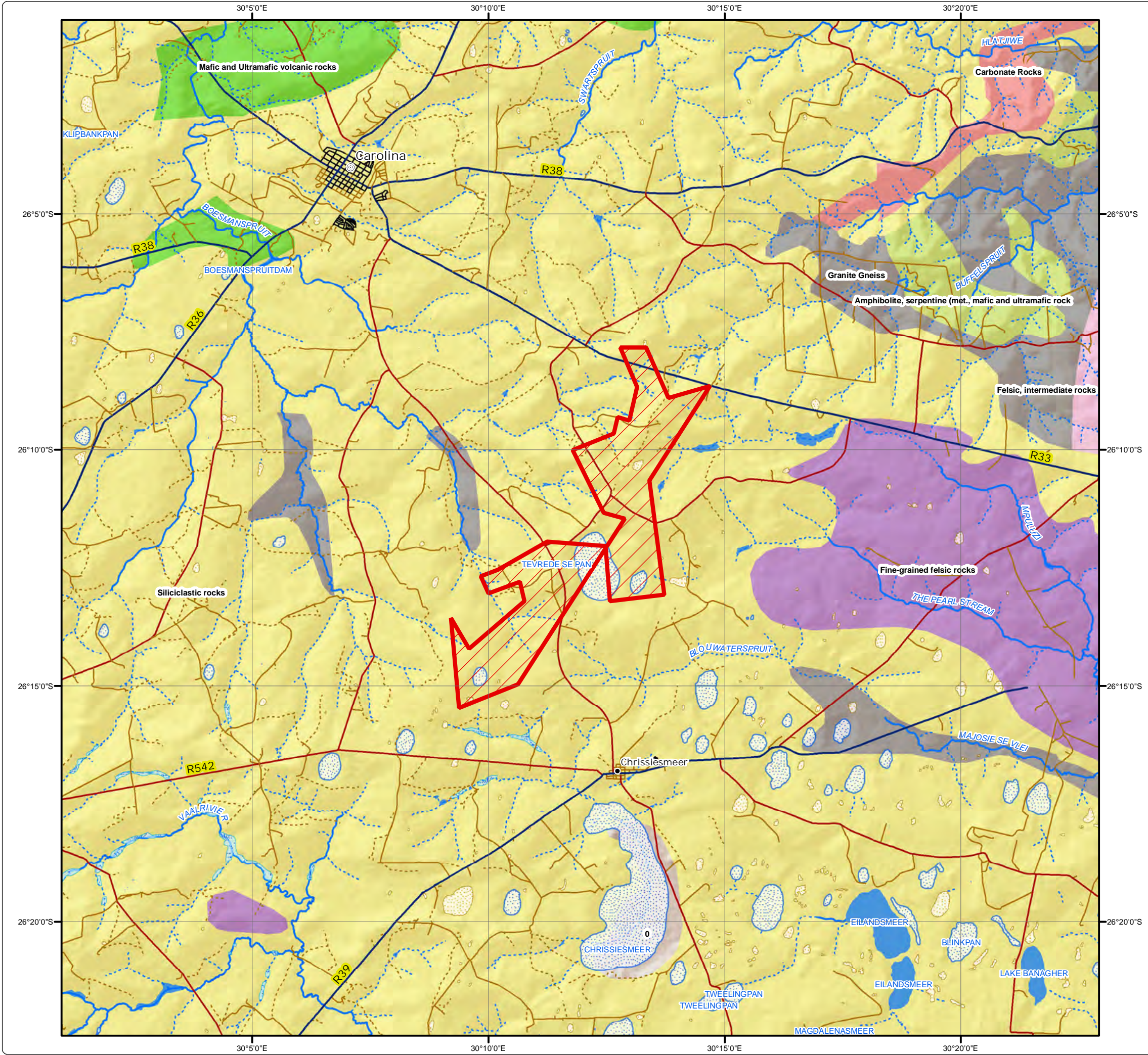
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Datum: WSG 1984 Revision Number: 1
Date: 27/02/2013



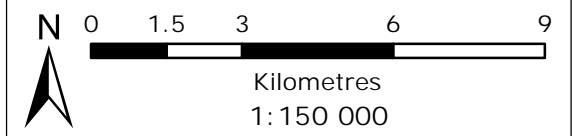
Msobo Coal Harwar Project Rock Type

Legend

-  Harwar Project Area
 -  Secondary Town
 -  Settlement
 -  Arterial / National Route
 -  Main Road
 -  Other Access Road
 -  Street
 -  Track & Footpaths
 -  Perennial River
 -  Non-Perennial River
 -  Dam
 -  Wetland
 -  Perennial Pan
 -  Non-Perennial Pan
- ### Rock Type
-  Amphibolite, Serpentine (Met., Mafic and Ultramafic Rock)
 -  Carbonate Rocks
 -  Felsic, Intermediate rocks
 -  Fine-Grained Felsic Rocks
 -  Granite Gneiss
 -  Mafic and Ultramafic Volcanic Rocks
 -  Siliciclastic Rocks



Geographic Coordinate System Ref #: amc.MSO1085.201304.271
 Datum: WSG 1984 Revision Number: 1
 Date: 18/04/2013

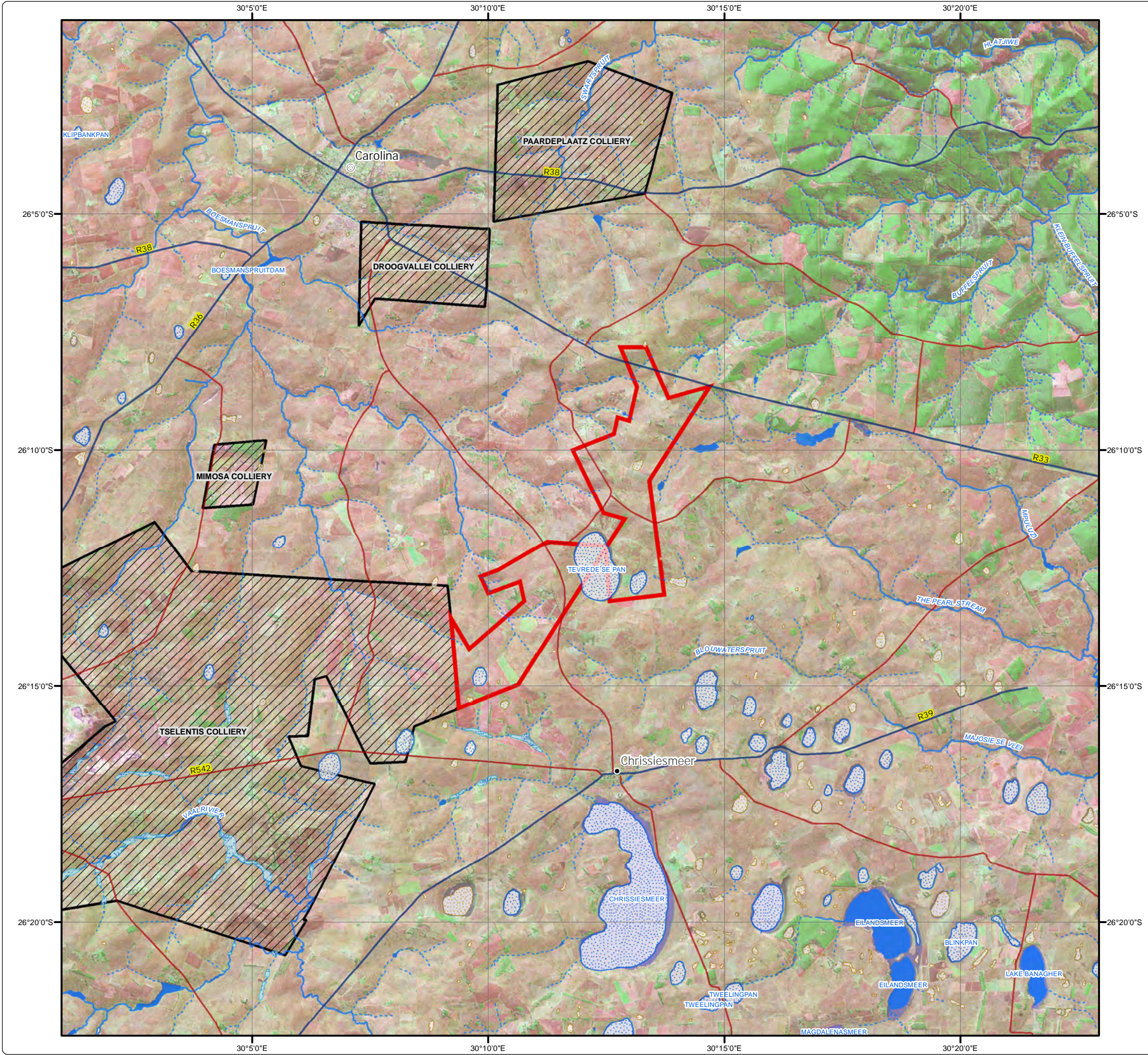


Msobo Coal Harwar Project

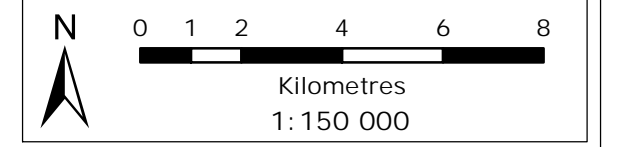
Surrounding Mining Areas

Legend

- ⊙ Secondary Town
 - Settlement
 - Arterial / National Route
 - Main Road
 - Perennial River
 - - - Non-Perennial River
 - Dam
 - Wetland
 - Perennial Pan
 - Non-Perennial Pan
 - ▭ Harwar Project Area
- ### Mining Areas
- ▨ Coal



Geographic Coordinate System Ref #: anp.MSO1805.201305.042
 Datum: WGS 1984 Revision Number: 1
 Date: 08/05/2013



Appendix C: Site List

1 IDENTIFIED SITES

1.1 MSO1805/2630AA/S.35-045 (Isolated Iron Age/Historic occurrence)

Site S.35-045 represents a single, isolated occurrence of an undiagnostic ceramic fragment (Figure 1-1). The site is located on a sandstone ridge on the farm Mooifontein 35 IT Portion 5. The coordinates for the site are S26°09'41.70" and E30°12'48.05".



Figure 1-1: A single, undiagnostic ceramic fragment found on a sandstone ridge on the farm Mooifontein 35 IT Portion 5.

1.2 MSO1805/2630AA/S.35-051 (Iron Age/Historic open scatter)

Site S.35-051 represents an open scatter of seven undiagnostic ceramic fragments (Figure 1-2). The site is located next to Tevreden Pan on the farm Tevreden 56 IT Portion 4. The coordinates for the site are S26°12'28.00" and E30°10'46.58".



Figure 1-2: Seven undiagnostic ceramic fragments found next to Tevreden Pan on the farm Tevreden 56 IT Portion 4.

1.3 MSO1805/2630AA/S.35-055 (Historic feature)

Site S.35-055 represents historic stone-walled enclosures next to Lake Chrissie (Figure 1-3). The site is located approximately 8 km south-east of the Project Area. The coordinates for the site are S26°18'33.13" and E30°12'59.49".



Figure 1-3: Historic stone-walled enclosures on the banks on Lake Chrissie.

1.4 MSO1805/2630AA/S.35-056 (Isolated fossil occurrence)

Site S.35-056 represents a single, isolated find of a possible fossil specimen (Figure 1-4). The specimen may be of the rare plant fossil *Breytenia* that was first described in the 1950s by Edna Plumstead. The site is located on a sandstone ridge next to Lake Chrissie approximately 9 km from the Project Area. The coordinates for the site are S26°19'07.98" and E30°13'00.45".



Figure 1-4: A possible fossil specimen of the rare fossil *Breytenia*.

1.5 MSO1805/2630AA/S.35-057 (Isolated Stone Age occurrence)

Site S.35-057 represents a single, isolated find of a stone flake on banks of Lake Chrissie. The site is located on the banks of Lake Chrissie approximately 9 km from the Project Area. The coordinates for the site are S26°19'05.77" and E30°12'58.84".

Appendix D: Impact Assessment Methodology and Impact Assessment



HERITAGE IMPACT MATRIX METHODOLOGY

CRM UNIT MANAGE: JOHAN NEL

MAY 2013



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1 INTRODUCTION

The impact assessment stage includes several steps aimed to evaluate the way in which environmental aspects will/may interact with the cultural landscape (the environment) resulting in environmental impacts to heritage resources. Environmental aspects and impacts are defined as:

- *Environmental aspects*: an element of an organisation's activities or products or services that can interact with the environment' (ISO 14001: 2004 - 3.6); and
- *Environmental impacts*: any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's environmental aspects (ISO 14001: 2004 - 3.7).

However, in terms of cultural heritage resources, environmental impacts should be assessed relative to the heritage value or significance of a resource. The methodology employed in the various stages of the impact assessment process is described in more detail below.

2 STATEMENT OF SIGNIFICANCE OR VALUE

Heritage resources – both cultural and natural – are finite, non-renewable and irreplaceable. They characterise community identity and cultures and are therefore are intrinsic to the history and beliefs of communities. As sources of information, heritage resources have inherent potential to contribute significantly to research, education and tourism, as well as allowing capacity for reconciliation, understanding and mutual respect.

Considering the innate value of heritage resources, the foundation of heritage resources management (HRM) is the acknowledgement that heritage resources have lasting worth as evidence of the origins of life, humanity and society. Every generation is therefore morally obligated to act as trustees of heritage for future generations through conservation, preservation and protection.

Accordingly, HRM must take into account rights of affected communities to be consulted and to participate. Where heritage resources are developed and presented the dignity and respect of diverse cultural values must be ensured. In addition, heritage in its broadest sense must never be used for sectarian purposed or political gain.

Notwithstanding the fundamental value ascribed to heritage, significance of individual resources needs to be determined to allow implementation of appropriate management measures. This is achieved through assessing a heritage resource's value relative to certain prescribed criteria, encapsulated in international conventions as well as national legislation. This is addressed in Section 2.1 below.

The significance/value is established by determining the level of importance taking and assessing the degree of integrity of cultural heritage resources. A resource's value thus influences the intensity of environmental impacts. As a result, environmental impacts that



are rated low may cause severe change in a heritage resources rated as highly significant. Vice versa, severe impacts may cause negligible change to an insignificant resource.

The steps involved in determining the value of a heritage resource is described in more detail below.

2.1 Importance

The importance of a heritage resource is determined on four dimensions – aesthetic, historic, scientific, and social. In turn, each dimension is measured against one or more descriptive attributes, defined in national legislation and international convention: NHRA (1999), UNESCO World Heritage Convention (1972), ICOMOS Guidance on Heritage Impact Assessments for Cultural World Heritage Properties and the Australian ICOMOS Charter for Places of Cultural Significance (1999) (Burra Charter). These attributes, or criteria, are aimed to provide a guide as to whether a resource should be included in the national estate as defined in these documents and presented in Table 2-1 below.

Importance of each dimension and subsequent attributes must be considered in relation to the resource's authenticity. Notions of authenticity are addressed under Section 2.1.1. Importance ratings must be informed and motivated by certain information sources. The credibility of information sources must therefore be evaluated and referred to when importance is discussed. Credibility is addressed under Section 2.1.2.

Table 2-1: Summary of dimensions and attributes

Dimension	Attributes considered		NHRA Ref.	UNESCO Ref.
Aesthetic & technical	1	Importance in aesthetic characteristics	S.3(3)(e)	
	2	Degree of technical / creative skill at a particular period	S.3(3)(f)	
Historical importance & associations	3	Importance to community or pattern in country's history	S.3(3)(a)	
	4	Site of significance relating to history of slavery	S.3(3)(i)	
	5	Association with life or work of a person, group or organisation of importance in the history of the country	S.3(3)(h)	
Information potential	6	Possession of uncommon, rare or endangered natural or cultural heritage aspects	S.3(3)(b)	
	7	Information potential	S.3(3)(c)	
	8	Importance in demonstrating principle characteristics	S.3(3)(d)	
Social	9	Association to community or cultural group for social, cultural or spiritual reasons	S.3(3)(g)	



2.1.1 Authenticity

Authenticity is an integral concept in cultural heritage resources management and must be considered when determining significance/value of cultural landscapes and heritage resources. The Nara Document on Authenticity (Nara Document) (1993) forms the basis of determining authenticity. Authenticity can refer to design, material, workmanship and setting of a resource. Aesthetic and historical aspects of a landscape or site including its physical, social and historical context, use and function are also covered (Winter & Baumann, 2005, p. 4).

Determining authenticity of a resource requires a sound knowledge of the type of heritage resource as well as the context within which occurs – the cultural landscape. This knowledge can only be gained through a detailed baseline accessing credible information sources.

2.1.2 Credibility

The Nara Document (1993) accepts that understanding authenticity and thus determining importance attributed to heritage resources rely on credible information sources. Information sources are defined as all physical, written, oral, and figurative sources, which make it possible to know the authenticity – nature, specificities, meaning, and history – of cultural heritage resources. This requires knowledge and understanding of information sources employed in relation to original and subsequent characteristics of heritage resources, and their meaning.

Information that should be considered are published, peer reviewed literature, archival research, popular publications, and any other information source that may be relevant (Nara Document on Authenticity, 1993).

Information sources need to be assessed as credible and truthful and referenced when determining importance of a resource and in motivation of its authenticity. Credibility of information sources forms the basis in determining the importance of heritage resources. The importance rating per dimension and attribute discussed above is thus intrinsically linked to the credibility of information sources used.

2.2 Integrity

Integrity is determined by examining the physical condition of a heritage resource – as witnessed at the time of assessment – compared to an ideal or other existing example. Integrity ought to be assessed only after the resource's authenticity has been determined, as the information source/s used should provide comparative examples against which its present condition may be measured. Thresholds and definitions for integrity are described in Table 2-2 below.

**Table 2-2: Integrity definitions**

Integrity	
0	Resource degraded to extent where no information potential exists; resource cannot be restored; single, isolated find, without any site context;
1	Poor condition, active decay visible; excessive restoration required; little information potential
2	Fair to good condition; well preserved; some decay present; can be easily restored/conserved/preserved; good information potential
3	Excellent/pristine; extremely well preserved; little to no decay present; little restoration required/restoration will greatly enhance resource; excellent information potential



3 IMPACT ASSESSMENT

Assessing environmental impacts on heritage resources are based first on the value of a resource and second how that value may change due to environmental aspects. Environmental management systems employ relative standard terminology that characterises impacts. This terminology has been adapted to provide a well-defined descriptive terminology for use in assessing environmental impacts on heritage resources summarised in Table 3-1.

Table 3-1: Impact characteristic terminology

Characteristic	Description	Designation
Type	Relationship of an assumed impact to a heritage resource (in terms of cause and effect)	Direct Indirect Induced
Scale of change	The physical area (size) of a heritage resource that may change	None Isolated parts / aspects will change Large parts / aspects will change Most or entire resource will change
Duration	Time period over which resource will change	Immediate, non-permanent and fully reversible Long-term, non-permanent and reversible Long-term, permanent and irreversible Immediate, permanent and irreversible
Intensity	How an impact could change the authenticity and integrity, thus importance, of a resource	None Change in integrity without affecting authenticity Change in integrity will affect aspects of authenticity Change in integrity will affect overall authenticity



Characteristic	Description	Designation
Probability	Likelihood of change occurring	None Project-related mitigation will remove change Project-related mitigation will reduce change Project-related mitigation will not reduce change

The rating takes into account:

- Spatial scale of impact;
- Expected duration of impact; and
- Severity of impact;
- Consequence of impact;
- Probability of impact occurring; and
- Value of heritage resource

$$\text{Impact significance} = \text{Value} \times \text{Magnitude}$$

Where

$$\text{Value} = \text{Importance} + \text{Credibility} + \text{Integrity}$$

And

$$\text{Magnitude} = \text{Consequence} \times \text{Probability}$$

And

$$\text{Consequence} = \text{Spatial scale} + \text{Duration} + \text{Severity}$$

The impact rating is applied to pre- and post-mitigation scenarios. The ideal is to remove all impacts to a heritage resource. Where post mitigation significance is not zero, the recommended field rating (heritage) mitigation must be undertaken. The tables below provide the various descriptions and thresholds applicable to the impact assessment ratings.



Table 3-2: Description of magnitude ratings

Score	Description	Rating
0	No/negligible environmental impacts expected on heritage resource	None/negligible
1-8	Low magnitude of environmental impacts on heritage resource	Low
9-16	Medium magnitude of environmental impacts on heritage resource	Medium
17-27	High/exceptional magnitude of environmental impacts on heritage resource	High

Magnitude											
		Consequence									
		0	1	2	3	4	5	6	7	8	9
Probability	0	0	0	0	0	0	0	0	0	0	0
	1	0	1	2	3	4	5	6	7	8	9
	2	0	2	4	6	8	10	12	14	16	18
	3	0	3	6	9	12	15	18	21	24	27

Magnitude = Consequence x Probability

where

Consequence = scale + duration + severity

**Table 3-3: Scores, descriptions and ratings determining consequence of impact**

Scale		
Score	Description	Rating
0	No effect on any part/aspect of heritage resource	None
1	Isolated parts/aspects of heritage resource will be affected	Low
2	Large parts/aspects of heritage resource will be affected	Medium
3	Most or entire heritage resource will be affected	High
Duration		
Score	Description	Rating
0	No impact will occur during life of project	None
1	Impact will be short and reversible	Low
2	Impact will occur throughout life of project, but is reversible	Medium
3	Impact is permanent and irreversible	High
Severity		
Score	Description	Rating
0	Negligible to no change/alteration/damage/destruction of heritage resource	None
1	Reversible changes/alterations to heritage resource	Low
2	Parts/aspects of heritage resource will be permanently altered/changed/destroyed	Medium
3	Entire heritage resource will be permanently altered/changed/destroyed	High



Probability		
Score	Description	Rating
0	Impact will not occur	None
1	Impact could occur, but implementation of appropriate project mitigation measures reduce/remove impacts	Unlikely
2	Impact may occur during life of project regardless of implementation of project mitigation measures	Probable
3	Impact will definitely occur, project mitigation measures will not reduce or remove impacts	Certain



Table 3-4: Significance of impact on categories of heritage resources

Score	Magnitude of Impact			
	Rating	Archaeology, Palaeontology	Built Environment/Structures	Historic Landscape
0	No change	No change	No change to fabric or setting	No changes to landscape elements, parcels or components; no visual or audible changes; no changes in amenity or community factors.
1-49	Low	Very minor changes to key archaeological materials, or setting.	Slight changes to historic building elements or setting that hardly affect it.	Very minor changes to key historic landscape elements, parcels or components; virtually unchanged visual effects; very slight changes in noise or sound quality; very slight changes to use or access; resulting in very small change to historic landscape character.
50-98	Medium	Changes to key archaeological materials, such that the resource is slightly altered; slight changes to the setting.	Change to key historic building elements, such that the resource is slightly different; change to setting of an historic building, such that it is noticeably changed.	Change to few key historic landscape elements, parcels or components; slight visual changes to few key aspects of the historic landscape; limited changes in noise or sound quality; slight changes to use or access; resulting in limited changes to historic landscape character.
99-147	High	Changes to many key archaeological materials, such that the resource is clearly modified; changes to the setting that affect the character of the asset	Change to many key historic building elements, such that the resource is significantly modified; change to setting of an historic building, such that it is significantly modified.	Change to many key historic landscape elements, parcels or components; visual change to many key aspects of the historic landscape; noticeable differences in noise or sound quality; considerable changes to use or access; resulting in moderate changes to historic landscape character.



Score	Magnitude of Impact			
	Rating	Archaeology, Palaeontology	Built Environment/Structures	Historic Landscape
		Changes to attributes that convey outstanding national value of national estate; Most or all key archaeological materials, including those that contribute to ONV such that the resource is totally altered; comprehensive changes to setting	Change to key historic building that contributes to outstanding national value of national estate such that the resource is totally altered; Comprehensive changes to setting.	Change to most or all key historic landscape elements, parcels or components; extreme visual effects; gross change of noise or change to sound quality; fundamental changes to use or access; resulting in total change to historic landscape character unit and loss on outstanding national value.



4 FIELD RATING (SOUTH AFRICAN PROJECT)

Field ratings, or proposed grading of heritage resources, are required by SAHRA in terms of Section 7(1) of the NHRA. Field ratings are based on the assessments of heritage resources in relation to criteria contained in Section 3(3) of the NHRA (see above). Section Y of the NHRA further outlines a three-tier system for heritage resources management of the national estate based on proposed grading:

- National: SAHRA is responsible for identification and managing of Grade I heritage resources;
- Provincial: Provincial Heritage Resources Authorities (PHRAs) are responsible for identification and managing of Grade II heritage resources; and
- Local: Local authorities (municipalities, metros, local government) are responsible for identification and managing of Grade III heritage resources.

Field ratings are based on (equal to) the value of a heritage resource. The thresholds for field ratings are present in Table 4-1 below.

Table 4-1: Field rating thresholds and descriptions

NHRA SECTION 7 GRADING			
Score	Grade	Protection	Recommended Heritage Mitigation
41-45	Grade I	National	Heritage resource should be nominated as a National Site/Object, included in National Estate
36-40	Grade II	Provincial	Heritage resource should be nominated as a Provincial Site/Object, included in National Estate
31-35	Grade III A	Local	Heritage resource should be nominated as a Regional Site/Object, included in National Estate
16-30	Grade III B	Local	The heritage resource must be mitigated and partly conserved/preserved
8-15	Grade IV A	General	The heritage resource must be mitigated before destruction
1-7	Grade IV B	General	The heritage resource must be recorded before destruction
0	Grade IV C	General	No mitigation required - application for destruction permit



5 REFERENCES

Nara Document on Authenticity, 1993. *ICOMOS: The Nara Document on Authenticity*, United Nations Educational, Scientific and Cultural Organisation: International Council on Monuments and Sites.

Winter, S. & Baumann, N., 2005. *Guideline for Involving Heritage Specialist in EIA Process Edition 1: CSIR Report No ENV-S-C 2005 E*, Cape Town: Republic of South Africa, Provincial Government of the Western Cape, Department of Environmental Affairs & Development Planning.



STATEMENT OF SIGNIFICANCE/HERITAGE VALUE										IMPACT ASSESSMENT													HERITAGE MITIGATION					
Details of Heritage Resource				STATEMENT OF SIGNIFICANCE/VALUE						NHRA Trigger	Source of Risk	Impact	Impact Rating							Impact Rating (after project mitigation)						FIELD RATING	MINIMUM REQUIRED MITIGATION	
				Authenticity				INTEGRITY	VALUE				Before project mitigation				After project mitigation											
Resource ID	Resource Type	Description	Reference in HIA	Artistic	Historic	Scientific	Social						Nature of Change (N/P)	Scale of Change	Duration of Change	Severity of Change	Consequence	Probability	MAGNITUDE	Nature of Change (N/P)	Scale of Change	Duration of Change	Severity of Change	Consequence	Probability	MAGNITUDE		
S.35-045	Isolated Iron Age/Historic occurrence	A single, isolated and undiagnostic potsherd ceramic fragment in a small rock shelter on a sandstone ridge on the farm Mooifontein 35 IT Portion 5.	8.1	0	-	0	-	0	0	38(c)(i)	Opencast mine	Destruction of site						0							0	0	No heritage mitigation required	None
S.34-046	Farmhouse complex	A farmhouse complex with a sandstone house, sandstone barn and two stonewalled enclosures on Mooifontein 35 IT Portion 2.	9.1	4	4	-	4	2	8	38(c)(i)	Opencast mine	Destruction of the farmhouse complex	N	4	7	4	7	7	47	P	2	6	3	10	3	29	Field Rating IV B - General	Record before destruction
S.36-047	Informal burial ground	Informal burial ground with eight stone-packed burials on Mooifontein 35 IT Portion 2.	10.1	-	-	-	5	2	10	38(c)(i)	Opencast mine	Destruction of the burial ground	N	4	7	5	9	7	62	P	2	5	4	12	3	37	Field Rating IV A - General	Mitigation before destruction
S.36-048	Informal burial ground	Informal burial ground with nine stone-packed burials and one formal burial on Mooifontein 35 IT Portion 5.	10.2	-	-	-	5	2	10	38(c)(i)	Opencast mine	Destruction of the burial ground	N	4	7	5	9	7	62	P	2	5	4	12	3	37	Field Rating IV A - General	Mitigation before destruction
S.35-049	Stonewalling	Iron Age/Historic stonewalled site on Mooifontein 35 IT - Outside of the Project Area.	6.2	1	1	-	1	2	2	38(c)(i)	Opencast mine	Destruction of site						0	0					0	0	No heritage mitigation required	None	
S.34-050	Farmhouse complex	Farmhouse complex with a house, garage, barn and two stables on Tevreden 56 IT Portion 4.	9.2	4	4	-	4	2	8	38(c)(i)	Opencast mine	Destruction of farmhouse complex	N	4	7	5	7	7	50	P	2	6	3	10	3	29	Field Rating IV B - General	Record before destruction



STATEMENT OF SIGNIFICANCE/HERITAGE VALUE										IMPACT ASSESSMENT												HERITAGE MITIGATION						
Details of Heritage Resource				STATEMENT OF SIGNIFICANCE/VALUE						NHRA Trigger	Source of Risk	Impact	Impact Rating						Impact Rating (after project mitigation)						FIELD RATING	MINIMUM REQUIRED MITIGATION		
				Authenticity				INTEGRITY	VALUE				Before project mitigation						After project mitigation									
Resource ID	Resource Type	Description	Reference in HIA	Artistic	Historic	Scientific	Social						Nature of Change (N/P)	Scale of Change	Duration of Change	Severity of Change	Consequence	Probability	MAGNITUDE	Nature of Change (N/P)	Scale of Change	Duration of Change	Severity of Change	Consequence	Probability	MAGNITUDE		
S.35-051	Isolated Iron Age/Historic occurrence	Seven undiagnostic potsherd ceramic fragments in a sandstone outcrop near the Teverden Pan on Teverden 56 IT Portion 4.	8.1	0	-	0	-	0	0	38(c)(i)	Opencast mine	Destruction of site	N				0	3	0					0			No heritage mitigation required	None
S.36-052	Informal burial ground	Informal burial ground with 23 stone-packed burials on Teverden 56 IT Portion 4.	10.3	-	-	-	5	2	10	38(c)(i)	Opencast mine	Destruction of site	N	4	7	5	9	4	36	P	2	5	4	12	3	37	Field Rating IV A - General	Mitigation before destruction

Appendix E: Registered Stakeholders

Farm name/Company	Contact Person	Tel/Fax No.	Cell No.	Email address	Postal Address
-	Chris Kritzinger	-	082 772 9028	oribi@lantic.net	PO Box 217,Carolina,1185
Florence 78 IT Ptn 3	Mr S J Nel	-	082 492 7031	1950@webmail.co.za	-
Goedverwachting 81 IT Ptn 16	Johannes Hercules Du Preez	-	082 775 2021	-	-
Goedverwachting 81 IT Ptn 17	Johannes Hercules Du Preez	-	082 775 2021	-	-
Haarlem 39 IT RE	-	-	-	-	-
Harwar 58 IT RE	Hannes Botha/Koos Pretorius	086 514 6085	083 630 1251 083 986 4400	d.zoekop@lando.co.za	PO Box 201,Belfast,1100
Harwar 58 IT Ptn 1	Chris Nel	086 514 6085	082 494 7533 079 493 6798	pantbeleggings@gmail.com 1950@webmail.co.za	PO Box 213,Carolina,1185
Iona 77 IT Ptn 5	Davel Jacobus Stephanus	-	082 338 7386	davels@wol.co.za	
Leliefontein 79 IT RE	Jacobus Stephanus Nel	-	082 494 7533	pantbeleggings@gmail.com	PO Box 213,Carolina,1185
Leliefontein 79 IT Ptn 2	Johannes Hercules Du Preez	-	082 775 2021	-	-

Farm name/Company	Contact Person	Tel/Fax No.	Cell No.	Email address	Postal Address
Leliefontein 79 IT Ptn 6	Johannes Lodewikus Botha	086 514 6085	083 630 1251 083 986 4400	d.zoekop@lando.co.za	PO Box 201,Belfast,1100
Lusthof 60 IT RE	Danie Neethling	-	076 067 7749	demooihof@gmail.com	-
Lusthof 60 IT Ptn 4	Johannes Lodewikus Botha	086 514 6085	083 630 1251 083 986 4400	d.zoekop@lando.co.za	PO Box 201,Belfast,1100
Lusthof 60 IT Ptn 6	Johannes Lodewikus Botha	086 514 6085	083 630 1251 083 986 4400	d.zoekop@lando.co.za	PO Box 201,Belfast,1100
Mooifontein 35 IT Ptn 4	-	-	-	-	-
Mooifontein 35 IT Ptn 5	-	-	-	-	-
Simonsdal 88 IT RE	Johannes Hercules Du Preez	-	082 775 2021	-	-
Tevreden 56 IT Ptn 1	Zicny Vera Stella	-	-	-	-
Tevreden 56 IT Ptn 4	Johannes Hercules Du Preez	-	082 775 2021	-	-
Tevreden 56 IT Ptn 5	Zicny Vera Stella	-	-	-	-

Farm name/Company	Contact Person	Tel/Fax No.	Cell No.	Email address	Postal Address
Tevreden 56 IT Ptn 6	Johannes Hercules Du Preez	-	082 775 2021	-	-
Tevreden 56 IT Ptn 8	Hannes Botha	086 514 6085	083 630 1251 083 986 4400	d.zoekop@lando.co.za	PO Box 201,Belfast,1100
Tevreden 56 IT Ptn 9	Zicny Vera Stella	-	-	-	-
Vryheid 59 IT RE	Johannes Lodewikus Botha	086 514 6085	083 630 1251 083 986 4400	d.zoekop@lando.co.za	PO Box 201,Belfast,1100
Songoba Home based Care	Stembile Mkhwanazi	-	073 871 3528		491 Kwa Zanele, Breyton, 2330
Escarpment Environment Protection Group (EEPG)	Koos Pretorius	013 253 0051	083 986 4400	d.zoekop@lando.co.za	PO Box 201, Belfast, 1100
Federation of Sustainable Environment	Koos Pretorius	013 253 0051	083 986 4400	d.zoekop@lando.co.za	PO Box 201, Belfast, 1100
Siyazinikola Old Age Centre	Khethile Makhubu	-	076 634 2727	-	200 Kwa Chibikhulu, Chrissiesmeer, 2332
Upper Vaal Catchment Forum	James Cooks	016 970 1753	-	-	-
Upper Vaal Catchment Forum	Ephraim Matseba	012 392 1307	082 809 5727	matsebe@dwa.gov.za	-

Farm name/Company	Contact Person	Tel/Fax No.	Cell No.	Email address	Postal Address
Environmental Justice Networking Forum	E Mkwanzani	013 656 3264	-	-	P O Box 3744, Witbank, 1035
COSTA	Dudzile Mbethe	-	079 510 3825	-	P O Box 506, Carolina, 1185
Upper Vaal Catchment Forum	Bishop Malatsi	012 392 1307 012 392 1359	-	malatsib@dwa.gov.za	-
Grass and Wetlands Regional Tourism Organisation	Athol Stark	017 819 4707	082 786 7959	tourism@webafrica.org.za	-
Green Trust	At Nel	013 686 9772	083 369 2210	-	P O Box 159, Ogies, 2230
Transvaalse Landbou Agriculture Unie (TLU)	Andries Jansie van Rensberg	017 819 4387 086 552 1534	083 454 4991	andriesjvr@skyafrica.co.za , tiu@axxess.co.za	PO Box 2601, Ermelo, 2351
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Motorland Eco Tourism	Tom Sanders	017 847 0008	-	-	-
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Sekiti Sabasotho	Makhosini Mkonto	086 247 8152	082 431 5742	-	-
SANCO	M.J Themekwayo	-	082 535 9985	-	-
SANCO	John Maseko	-	079 286 4709	-	-
SANCO	Ray Mathenjwa	-	078 190 4499	-	-
Ubuntu Boing Club	Victor Nyamuza	-	073 499 2889	-	-
Ubuntu Boing Club	Innocent Mkonza	-	079 647 7465	-	-
Civic SANCO	Thalitha Mkoza	-	072 783 5375	-	-
Local Business Forum	Sibusiso Hleza	-	072 734 1600	-	-
ANC youth league	Teddy Khumalo	-	071 958 8006	djteddy@yahoo.com	-

Farm name/Company	Contact Person	Tel/Fax No.	Cell No.	Email address	Postal Address
Tinasha Sawing Group	Jabulile Nkosi	-	076 378 7170	-	-
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Highvelder	Jerry Young	-	083 581 9525	news53@highvelder.co.za	-
Thabo village	Wonder Shongwe	013 764 3675	-	-	-
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Amanzanhlope Construction	Chris Zwane	-	082 290 1148	nathizwanekunene@gmail.com	-
Krasto trading.co.op	Westie Phakathi	-	073 435 0303	krastrotrading@yahoo.com	-

Farm name/Company	Contact Person	Tel/Fax No.	Cell No.	Email address	Postal Address
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Inzuzo Project	S.S Mhlanga	017 811 1944	082 090 0627	-	-
Rotiway PTY(Ltd)	Nkosinathi Thwala	-	084 777 2716	nkosinathi002@gmail.com	-
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Lofana Trading	David Mallang	-	084 021 2566	-	-
Alexineks Trading	C. Smith	017 811 1258	073 210 9347	-	-
Lungomosa Project	Ncane	017 811 1258	082 483 2441	-	-
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National Department of Agriculture	Ria Ntuli	013 755 1420	082 967 2662	dounaldm@nda.agric.za	PO Box 1665, Nelspruit, 1200
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Mpumalanga Department of Public Works, Roads & Transport	Mr Moloi	017 801 4000	-	-	-
Mpumalanga Department of Public Works, Roads & Transport	Mr Malatji	017 801 4000	082 921 0490	davisc@mpg.gov.za	-

Farm name/Company	Contact Person	Tel/Fax No.	Cell No.	Email address	Postal Address
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Bethal Roads	Nico Themba/Gila Nel	017 647 1112	072 501 2714	-	-

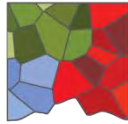
Appendix F: Chance Find Procedures, Fossil Find Procedures and Fossil Monitoring



**CHANCE FIND PROCEDURES (CFPS)
FOR THE HARWAR COLLIERY, 2630AA
AND 2630AC, MPUMALANGA
PROVINCE**

MSOBO COAL (PTY) LTD

28 JUNE 2013




DIGBY WELLS
ENVIRONMENTAL

This document has been prepared by **Digby Wells Environmental**.

Report Title: Chance Find Procedures (CFPs) for the Harwar Colliery, 2630AA and 2630AC, Mpumalanga Province

Project Number: MSO1805 CFPs Document

Name	Responsibility	Signature	Date
Justin du Piesanie: HRM Specialist	CFPs Compiler		28 June 2013

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ACRONYMS

BGG	Burial Grounds and Graves
CFPs	Chance Find Procedures
CL	Community Liaison
Digby Wells	Digby Wells Environmental
EC	Environmental Control
HIA	Heritage Impact Assessment
HRM	HRM Resources Management
HS	Health and Safety
ICOMOS	International Council on Monuments and Sites
LIHRA	Limpopo Heritage Resources Authority
NHRA	National Heritage Resources Act (Act No. 25 of 1999)
SAHRA	South African Heritage Resources Authority
SAPS	South African Police Service
UNESCO	United Nations Educational, Scientific and Cultural Organisation

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1 INTRODUCTION

The purpose of this document is to provide Msobo Coal (Pty) Ltd (Msobo Coal) and their contractors with the appropriate response guidelines (extracted and adapted from the National Heritage Resources Act (Act No. 25 of 1999) Regulations Reg No. 6820, GN: 548, taking into consideration international best practice based on World Bank, Equator Principles and the International Finance Corporation Performance Standards, 1972 UNESCO Convention on the Protection of World Cultural and Natural Heritage (World Heritage Convention), ICOMOS Guideline on Heritage Impact Assessment and the Australian ICOMOS Burra Charter (1999)) that should be implemented in the event of chance discovery of heritage resources. These guidelines or chance find procedures (CFPs) can be incorporated into Msobo Coal policies that may have relevance during construction and operational phases.

The CFPs presented by Digby Wells Environmental (Digby Wells) aim to avoid and/or reduce project risks that may result due to chance finds, whilst considering international best practice.

2 DEFINITIONS

For simplicity, the term 'heritage resource' includes structures, archaeology, palaeontology, meteors, and public monuments as defined in the South African National Heritage Resources Act (Act No. 25 of 1999) (NHRA) Sections 34, 35, and 37. Procedures specific to burial grounds and graves (BGG) as defined under NHRA Section 36 will be discussed separately as these require the implementation of separate criteria for CFPs.

3 CHANCE FIND PROCEDURES

The following procedural guidelines must be considered in the event that previously unknown heritage resources or burial grounds and graves (BGG) are exposed or found during the life of the project.

3.1 Initial Identification and/or Exposure

Heritage resources or BGG may be identified during construction or accidentally exposed. The initial procedure when such sites are found aim to avoid any further damage. The following steps and reporting structure must be observed in both instances:

1. The person or group (identifier) who identified or exposed the burial ground must cease all activity in the immediate vicinity of the site;
2. The identifier must immediately inform his/her supervisor of the discovery;
3. The supervisor must ensure that the site is secured and control access; and

4. The supervisor must then inform the relevant Msobo Coal personnel responsible for at least the following portfolios: Community Liaison (CL), Environmental Control (EC) and Health and Safety (HS).

3.2 Chance Find Procedure: Heritage Resources

In the event that previously unidentified heritage resources are identified and/or exposed during construction or operation of the Project, the following steps must be implemented subsequent to those outlined under Section 3.1 above:

1. The Digby Wells project manager and/or Heritage Resources Management (HRM) Unit must be notified of the discovery;
2. Digby Wells will assign a qualified specialist to consider the heritage resource, either via communicating with the EC Officer via telephone or email, or based on a site visit;
3. Appropriate measures will then be presented to Msobo Coal;
4. Should the specialist conclude that the find is a heritage resource protected in terms of the NHRA (1999) Sections 34, 35, 37 and NHRA (1999) Regulations (Regulation 38, 39, 40), Digby Wells will notify the South African Heritage Resources Agency (SAHRA) and/or the Mpumalanga Provincial Heritage Resources Agency (MPHRA) on behalf of Msobo Coal; and
5. Based on the comments received from SAHRA and/or MPHRA, Digby Wells will provide Msobo Coal with a Terms of References Report and relevant associated costs if necessary.

3.3 Chance Find Procedure: BGG

In the event that previously unidentified BGG are identified and/or exposed during construction or operation of the Project, the following steps must be implemented subsequent to those outlined under Section 3.1 above:

1. The Digby Wells project manager and/or the HRM Unit must immediately be notified of the discovery in order to take the required further steps:
 - i. The local South African Police Service (SAPS) will be notified on behalf of Msobo Coal;
 - ii. Digby Wells will deploy a suitably qualified specialist to inspect the exposed burial and determine in consultation with the SAPS:
 - The temporal context of the remains, i.e.:
 - a. forensic,

-
- b. authentic burial grave (informal or older than 60 years, NHRA (1999) Section 36); or
 - c. archaeological (older than 100 years, NHRA (1999) Section 38); and
 - If any additional graves may exist in the vicinity.
 2. Should the specialist conclude that the find is a heritage resource protected in terms of the NHRA (1999) Section 36 and NHRA (1999) Regulations (Regulation 38, 39, 40), Digby Wells will notify SAHRA and/or MPHRA on behalf of Msobo Coal;
 3. SAHRA/MPHRA may require that an identification of interested parties, consultation and /or grave relocation take place;
 4. Consultation must take place in terms of NHRA (1999) Regulations 39, 40, 42; and
 5. Grave relocation must take place in terms of NHRA (1999) Regulations 34.

4 CONCLUSION

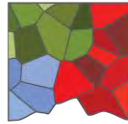
The CFP's presented in this document serve as international best practice policy for the accidental discovery of heritage resources and BGG. Based on the definitions provided within this document and the proposed lines of communication, Msobo Coal will be able to mitigate the accidental discovery of heritage resources and BGG throughout the various phases of the project. Where necessary, Digby Wells is available to assist with the recommendation of mitigations for the accidental discovery of heritage resources and BGG.



**FOSSIL FIND PROCEDURES (FFPS)
FOR THE HARWAR COLLIERY, 2630AA
AND 2630AC, MPUMALANGA
PROVINCE**

MSOBO COAL (PTY) LTD

28 JUNE 2013

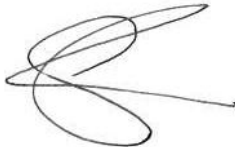


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ENVIRONMENTAL

This document has been prepared by **Digby Wells Environmental**.

Report Title: Fossil Find Procedures (FFPs) for the Harwar Colliery,
2630AA and 2630AC, Mpumalanga Province

Project Number: MSO1805 FFPs Document

Name	Responsibility	Signature	Date
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ACRONYMS

ECO	Environmental Control Officer
FFP	Fossil Find Procedure
MA	Monitoring for Fossils



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1 INTRODUCTION

In the context under consideration, it is improbable that fossil finds will require declarations of permanent “no go” zones. At most, a temporary pause in activity at a limited locale may be required. The strategy is to rescue the material as quickly as possible.

The procedures suggested below are in general terms, to be adapted as befits a context. They are described in terms of finds of fossil bones that usually occur sparsely. However, they may also serve as a guideline for other fossil material that may occur.

Bone finds can be classified as two types: isolated bone finds and bone cluster finds.

2 ISOLATED BONE FINDS

In the process of digging excavations, isolated bones may be spotted in the hole sides or bottom, or as they appear on the spoil heap. By this is meant bones that occur singly, in different parts of the excavation. If the number of distinct bones exceeds six pieces, the finds must be treated as a bone cluster (below).

2.1 Response by personnel in the event of isolated bone finds

The following responses should be undertaken by personnel in the event of isolated bone finds:

- **Action 1:** An isolated bone exposed in an excavation or spoil heap must be retrieved before it is covered by further spoil from the excavation and set aside;
- **Action 2:** The site foreman and Environmental Control Officer (ECO) must be informed;
- **Action 3:** The responsible field person (site foreman or ECO) must take custody of the fossil. The following information is to be recorded:
 - Position (excavation position);
 - Depth of find in hole;
 - Digital image of hole showing vertical section (side); and
 - Digital image of fossil.
- **Action 4:** The fossil should be placed in a bag (e.g. a Ziploc bag), along with any detached fragments. A label must be included with the date of the find, position information, and depth; and
- **Action 5:** The ECO is to inform the developer who then contacts the archaeologist and/or palaeontologist contracted to be on standby. The ECO is to describe the occurrence and provide images via email.

2.2 Response by Palaeontologist in the event of isolated bone finds

The palaeontologist will assess the information and liaise with the developer and the ECO and a suitable response will be established.

3 BONE CLUSTER FINDS

A bone cluster is a major find of bones (e.g. several bones in close proximity or bones resembling parts of a skeleton). These bones will likely be seen in broken sections of the sides of the hole and as bones appearing in the bottom of the hole and on the spoil heap.

3.1 Response by personnel in the event of a bone cluster find

The following responses should be undertaken by personnel in the event of bone cluster finds:

- **Action 1:** Immediately stop excavation in the vicinity of the potential material. Mark or flag the position as well as the spoil heap that may contain fossils;
- **Action 2:** Inform the site foreman and the ECO; and
- **Action 3:** The ECO is to inform the developer who must then contact the archaeologist and/or palaeontologist contracted to be on standby. The ECO is then to describe the occurrence and provide images via email.

3.2 Response by Palaeontologist in the event of a bone cluster find

The palaeontologist will assess the information and liaise with the developer and the ECO and a suitable response will be established. It is likely that a Field Assessment by the palaeontologist will be carried out.

It will probably be feasible to avoid the find and continue to the excavation farther along, or proceed to the next excavation, so that the work schedule is minimally disrupted. The response time/scheduling of the Field Assessment is to be decided in consultation with the developer/owner and the environmental consultant.

The Field Assessment could have the following outcomes:

- If a human burial, the appropriate authority is to be contacted. The find must be evaluated by a human burial specialist to decide if Rescue Excavation is feasible, or if it is a Major Find.
- If the fossils are in an archaeological context, an archaeologist must be contacted to evaluate the site and decide if Rescue Excavation is feasible, or if it is a Major Find.
- If the fossils are in a palaeontological context, the palaeontologist must evaluate the site and decide if Rescue Excavation is feasible, or if it is a Major Find.

4 RESCUE EXCAVATION

Rescue Excavation refers to the removal of the material from the “design” excavation. This would apply if the amount or significance of the exposed material appears to be relatively circumscribed and it is feasible to remove it without compromising contextual data. The time span for Rescue Excavation should be reasonable rapid to avoid any undue delays, e.g. one to three days and definitely less than one week.

In principle, the strategy during the mitigation is to “rescue” the fossil material as quickly as possible. The strategy to be adopted depends on the nature of the occurrence, particularly the density of the fossils. The methods of collection would depend on the preservation or fragility of the fossil and whether in loose or in lithified sediment. These could include:

- On-site selection and sieving in the case of robust material in sand; and
- Fragile material in loose sediment would be encased in blocks using Plaster-of-Paris or reinforced mortar.

If the fossil occurrence is dense and is assessed to be a “Major Find”, a carefully controlled excavation is required.

5 MAJOR FINDS

A Major Find is the occurrence of material that, by virtue of quantity, importance and time constraints, cannot be feasibly rescued without compromise of detailed material recovery and contextual observations.

5.1 Management Options for Major Finds

In consultation with the developer/owner and the environmental consultant, the following options should be considered when deciding on how to proceed in the event of a Major Find.

Option 1: Avoidance

Avoidance of the Major Find through project redesign or relocation. This ensures minimal impact to the site and is the preferred option from a heritage resource management perspective. When feasible, it can also be the least expensive option from a construction perspective.

The find site will require site protection measures, such as erecting fencing or barricades. Alternatively, the exposed finds can be stabilised and the site refilled or capped. The latter is preferred if excavation of the find will be delayed substantially or indefinitely. Appropriate protection measures should be identified on a site-specific basis and in wider consultation with the heritage and scientific communities.

This option is preferred as it will allow the later excavation of the finds with due scientific care and diligence.

Option 2: Emergency Excavation

Emergency excavation refers to the “no option” situation where avoidance is not feasible due to design, financial and time constraints. It can delay construction and emergency excavation itself will take place under tight time constraints, with the potential for irrevocable compromise of scientific quality. It could involve the removal of a large, disturbed sample by an excavator and conveying this by truck from the immediate site to a suitable place for “stockpiling”. This material could then be processed later.

Consequently, the emergency excavation is not the preferred option for a Major Find.

6 EXPOSURE OF FOSSIL SHELL BEDS

6.1 Response by personnel in the event of intersection of fossil shell beds

The following responses should be undertaken by personnel in the event of intersection with fossil shell beds:

- **Action 1:** The site foreman and ECO must be informed;
- **Action 2:** The responsible field person (site foreman or ECO) must record the following information:
 - Position (excavation position);
 - Depth of find in hole;
 - Digital image of the hole showing the vertical section (side); and
 - Digital images of the fossiliferous material.
- **Action 3:** A generous quantity of the excavated material containing the fossils should be stockpiled near the site, for later examination and sampling;
- **Action 4:** The ECO is to inform the developer who must then contact the archaeologist and/or palaeontologist contracted to be on standby. The ECO is to describe the occurrence and provide images via email.

6.2 Response by the palaeontologist in the event of fossil shell bed finds

The palaeontologist will assess the information and liaise with the developer and the ECO and a suitable response will be established. This will most likely be a site visit to document and sample the exposure in detail, before it is covered up.

7 EXPOSURE OF FOSSIL WOOD AND PEATS

7.1 Response by personnel in the event of exposure of fossil wood and peats

The following responses should be undertaken by personnel in the event of exposure of fossil wood and peats:

- **Action 1:** The site foreman and ECO must be informed;
- **Action 2:** The responsible field person (site foreman or ECO) must record the following information:
 - Position (excavation position);
 - Depth of find in hole;
 - Digital image of the hole showing the vertical section (side); and
 - Digital images of the fossiliferous material.
- **Action 3:** A generous quantity of the excavated material containing the fossils should be stockpiled near the site, for later examination and sampling;
- **Action 4:** The ECO is to inform the developer who must then contact the archaeologist and/or palaeontologist contracted to be on standby. The ECO is to describe the occurrence and provide images via email.

7.2 Response by the palaeontologist in the event of exposure of fossil wood and peats

The palaeontologist will assess the information and liaise with the developer and the ECO and a suitable response will be established. This will most likely be a site visit to document and sample the exposure in detail, before it is covered up.

8 MONITORING FOR FOSSILS

A regular monitoring presence over the period during which excavations are made, by either an archaeologist or palaeontologist, is generally not practical.

The field supervisor or foreman and workers involved in digging excavations must be encouraged and informed of the need to watch for potential fossil and buried archaeological material. Workers seeing potential objects are to report to the field supervisor who, in turn, will report to the ECO. The ECO will inform the archaeologist and/or palaeontologist contracted to be on standby in the case of fossil finds.

To this end, responsible persons must be designated. This will include hierarchically:

- The field supervisor or foreman who is going to be most often in the field;
- The ECO for the project;

- The Project Manager

Should the monitoring of excavations be stipulated in the Archaeological Impact Assessment and/or the Heritage Impact Assessment, the contracted Monitoring Archaeologist (MA) can also monitor for the presence of fossils and make a field assessment of any material brought to attention. The MA is usually sufficiently informed to identify fossil material and this avoids additional monitoring by a palaeontologist. In shallow coastal excavations, the fossils encountered are usually in an archaeological context.

The MA then becomes the responsible field person and fulfils the role of liaison with the palaeontologist and coordinates with the developer and the ECO. If fossils are exposed in non-archaeological contexts, the palaeontologist should be summoned to document and sample/collect them.