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Sibanye Gold Limited's West Rand Tailings Retreatment Project

Heritage Scoping Report

Project Number:

GOL2376

Prepared for:

Sibanye Gold Limited

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Digby Wells and Associates (South Africa) (Pty) Ltd
(Subsidiary of Digby Wells & Associates (Pty) Ltd). Co. Reg. No. 2010/008577/07. Turnberry Office Park, 48 Grosvenor Road, Bryanston, 2191. Private Bag X10046, Randburg, 2125, South Africa
Tel: +27 11 789 9495, Fax: +27 11 789 9498, info@digbywells.com, www.digbywells.com

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Name	Responsibility	Signature	Date
Natasha Higgitt Assistant Heritage Consultant ASAPA Member No.335	Heritage Screening Survey & Report Cultural Baseline Compilation		February 2015
Justin du Piesanie Heritage Management Consultant ASAPA Member No 270	Heritage Report Compilation		February 2015
Johan Nel HRM Unit Manager ASAPA Member No 095	1st Review		February 2015
Michael Hennessy	2nd Review		February 2015

Digby Wells and Associates (South Africa) (Pty) Ltd

Contact person: Justin du Piesanie

Turnberry Office Park
48 Grosvenor Road
Bryanston
2191
South Africa

Tel: 011 789 9495
Fax: 011 789 9498
E-mail: justin.dupiesanie@digbywells.com

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Full name:	Justin du Piesanie
Title/ Position:	Heritage Management Consultant: Archaeologist
Qualification(s):	MSc in Archaeology
Experience (years):	6 years' experience
Registration:	Association of Southern African Professional Archaeologists (ASAPA)
	International Council on Monuments and Sites (ICOMOS) South Africa

EXECUTIVE SUMMARY

Sibanye Gold Limited (hereafter SGL) intends to undertake a project known as the West Rand Tailings Retreatment Project (WRTRP). It is understood by SGL that many of the historical Tailings Storage Facilities (TSFs) have adverse impacts on society and the environment. In addition, many of these historical TSFs are on dolomitic strata, posing risks for ground water contamination through Acid Mine Drainage (AMD), radioactive contamination and instability through the possible development of sinkholes.

As part of the WRTP, SGL envisages that existing TSFs will be retreated, including those of the Driefontein Complex, Kloof Complex, Rand Uranium and Ezulwini. Future reclamation of other dumps in the area is also likely. Treatment of the dump material will take place at a proposed new Central Processing Plant (CPP); resultant tailings will be deposited on a proposed new Regional TSF (RTSF). A Pre-Feasibility Study (PFS) completed in 2013 proposed that the WRTRP be completed through a *phased* approach.

In 2014, Digby Wells Environmental (hereafter DWE) completed a gap analysis of available information that could be used for the authorisation of the WRTRP. The gap analysis recommended that the Environmental Authorisation of the WRTRP should be *staged* as per the economic imperatives. This report therefore constitutes the Heritage Scoping Report (HSR) for the activities of the initial implementation of the WRTRP

The study area for the initial implementation of the WRTRP are located roughly 55 km to the south-west of greater Johannesburg. This area is intrinsically associated with the mining heritage of the larger region.

Geologically, the project area is largely underlain by dolomitic rock that has the potential for karst topography. Karst topography refers to landscapes formed from the dissolution of soluble rocks, including dolomite and limestone. Karst topography is characterised by underground drainage systems with sinkholes, dolines and caves. This geological phenomenon creates karst caves that can be filled with fine to coarse-grained alluvium during periodic flooding. The alluvium may be represented by bodies of breccia, sandstone and siltstone which have an increased potential to contain archaeological material. This geological feature is one of the motivating factors in implementing the proposed project. Many of the historical TSFs are at risk as the potential for sinkholes is high in some areas.

Archaeologically, Stone Age and Late Farming Community sites have been recorded within the larger area under consideration here. Stone Age lithics recorded have been found as surface scatters outside of any discernible context thereby limiting the information potential and overall significance of these resources. Late Farming Community sites within the region have primarily been identified as stone walled settlements classified as Type N and Klipriviersberg. Only one potential stonewalled site has been identified in the farm Rietfontein 349 IQ which are located in a proposed power line routing from Kloof 1 to the CPP. No other archaeological sites have been identified within the development footprint of the proposed infrastructure.

Within regional, local and site specific contexts the project is located in historically significant mining-industrial and agricultural-rural cultural landscapes. In terms of the mining landscape, there are several features and markers such as many of the historical TSFs created by the original mines established during the first half of the 20th century. The agricultural landscape is represented in turn by several structures and werfs that were recorded during the scoping survey completed on 16 February 2015. The potential impacts to these will be assessed during the Impact Assessment phase of the project.

Based on the cultural baseline and understanding of the primary project activities as relevant to heritage, Digby Wells recommends the following:

Initial Implementation of the WRTRP	
Inclusion into Mining Right Area Activities	**Reclamation Activities**
▪ No physical activities are associated with the inclusion of the Venterspost North and South TSFs into mining right areas as part of the initial implementation of the WRTRP. This activity should be exempt from any further heritage studies.	▪ Exemption from further palaeontological assessment based on the current project activities; ▪ An HIA must be undertaken for the proposed infrastructure development footprint, including linear infrastructure outside of established servitudes. This must include the following components: ▪ An Archaeological Impact Assessment (AIA) including reconnaissance of the proposed development footprint of the CPP, RTSF, RWD and AWTF, and linear infrastructure outside of existing servitudes; ▪ An assessment of burial grounds and graves including reconnaissance to identify, record and document all burials that may exist in the development footprint; and ▪ Integration of additional specialist studies to determine any possible living heritage in the project area. ▪ Where linear infrastructure is contained within existing servitudes, these should be exempted from further heritage assessment

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

LIST OF ACRONYMS AND ABBREVIATIONS

Abbreviation	Description
ABA	Acid Base Accounting
ARD/AMD	Acid Rock Drainage/Acid Mine Drainage
CA	Competent Authority
CDP	Community Development Plan
CPP	Central Processing Plant
CRL	Community Rights Law
CTSF	Central Tailings Storage Facility (expansion of the Doornpoort TSF)
DWE	Digby Wells Environmental
DWAS	Department of Water Affairs and Sanitation
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EMP	Environmental Management Programme
EMS	Environmental Management Systems
ESIA	Environmental and Social Impact Assessment
Ezulwini	Ezulwini Mining Company Limited
GBV	Gender-Based Violence
GFIMSA	Gold Fields International Mining South Africa (Proprietary) Limited
Gold Fields	Gold Fields Limited
Golder	Golder Associates Ltd
ha	Hectare
HIA	Heritage Impact Assessment
I&APs	Interested and Affected Parties
IDP	Integrated Development Plan
IFC	International Finance Corporation
IHAS	Invertebrate Habitat Assessment System
IWRMP	Integrated Water Resources Management Plan
LoM	Life of Mine
mbgl	Metres below ground level
Mine Dumps	Deposits of Sand, Waste Rock and Overburden.

Abbreviation	Description
MWP	Mines Work Programme
NGO	Non-Governmental Organisation
PCDs	Pollution Control Dams
PM_{10}	Particle Matter 10 micrometres in diameter
$PM_{2.5}$	Particle Matter 2.5 micrometres in diameter
RU	Rand Uranium Limited
RAP	Resettlement Action Plan
ROM	Run of Mine
RTSF	Regional Tailings Storage Facility
SEP	Stakeholder Engagement Process
SIA	Socio-Economic Impact Assessment
SGL	Sibanye Gold Limited
SO_4	Sulphate
TDS	Total Dissolved Solids
TSF	Tailings Storage Facility
WRD	Waste Rock Dump
WRTRP	West Rand Tailings Retreatment Project

LIST OF ACRONYMS AND ABBREVIATIONS

Term	Definition
Alter	Any action affecting the structure, appearance or physical properties of a place or object, whether by way of structural or other works, by painting, plastering or other decoration or any other means.
Archaeological	Material remains resulting from human activity that are in a state of disuse and older than 100 years, including artefacts, human and hominid remains and artificial features and structures. Rock art created through human agency older than 100 years, including any area within 10 m of such representation. Wrecks older than 60 years - either vessels or aircraft - or any part thereof that was wrecked in South Africa on land, internal or territorial waters, and any cargo, debris or artefacts found or associated therewith. Features, structures and artefacts associated with military history that are older than 75 years and the sites on which they are found, e.g. battlefields.
Archaeologist	A trained professional who uses scientific methods to excavate, record and study archaeological sites and deposits.
Artefact	Any object manufactured or modified by human beings.
Burial Grounds and Graves Consultation (BGGC)	The regulated consultation process required in terms of Section 36 of the NHRA and Regulation GNR 548 to the Act when burial grounds and graves are identified within a project area.
Conservation	In relation to heritage resources includes the protection, maintenance, preservation and sustainable use of places or objects so as to safeguard their cultural significance.
Cultural significance (CS)	The aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance. A heritage may have cultural significance or other special value because of its: ▪ Importance in the community, or pattern of South Africa's history. ▪ Possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage ▪ Potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage. ▪ Importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects. ▪ Importance in exhibiting particular aesthetic characteristics valued by a community or cultural group. ▪ Importance in demonstrating a high degree of creative or technical achievement at a particular period. ▪ Strong or special association with a particular community or

Term	Definition
	cultural group for social, cultural or spiritual reasons. ▪ Strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa. ▪ Significance relating to the history of slavery in South Africa.
Development	Any physical intervention, excavation, or action, other than those caused by natural forces, which may in the opinion of a heritage authority in any way result in a change to the nature, appearance or physical nature of a place, or influence its stability and future well-being, including: ▪ Construction, alteration, demolition, removal or change of use of a place or a structure at a place. ▪ Carrying out any works on or over or under a place. ▪ Subdivision or consolidation of land comprising, a place, including the structures or airspace of a place. ▪ Constructing or putting up for display signs or hoardings. ▪ Any change to the natural or existing condition or topography of land. ▪ Any removal or destruction of trees, or removal of vegetation or topsoil.
Field Rating	SAHRA requires heritage resources to be provisionally rated in accordance with Section 7 of the NHRA that provides a three tier grading system of resources that form part of the national estate. The rating system distinguishes between four categories: ▪ Grade I: Heritage resources with qualities so exceptional that they are of special national significance. ▪ Grade II: Heritage resources which, although forming part of the national estate, can be considered to have special qualities which make them significant within the context of a province or a region. ▪ Grade III: Other heritage resources worthy of conservation. ▪ General Protected: i.e. generally protected in terms of Sections 33 to 37 of the NHRA.
Formal protection	Places with qualities so exceptional that they are of special national significance as national heritage sites or that have special qualities as provincial heritage sites.
General protection	General protections are afforded to: ▪ Objects protected in terms of laws of foreign states. ▪ Structures older than 60 years. ▪ Archaeological and palaeontological sites and material and meteorites. ▪ Burial grounds and graves. ▪ Public monuments and memorials.

Term	Definition
Grave	A place of interment and includes the contents, headstone or other marker of such a place, and any other structure on or associated with such place.
Heritage Impact Assessment (HIA)	An assessment of the cultural significance of, and possible impacts on, diverse heritage resources that may be affected by a proposed development. A HIA may include several specialist elements such as archaeological, built environment and palaeontological studies. The HIA must supply the heritage authority with sufficient information about the sites to assess, with confidence, whether or not it has any objection to a development, indicate the conditions upon which such development might proceed and assess which sites require permits for destruction, which sites require mitigation and what measures should be put in place to protect sites that should be conserved. The content of HIA reports are clearly outlined in Section 38(3) of the NHRA and SAHRA Minimum Standards.
Heritage resource	Any place or object of cultural significance.
Heritage resources management	Process required when development is intended categorised as: ▪ Any linear development exceeding 300m in length. ▪ Construction of a bridge or similar structure exceeding 50 m in length. ▪ Any activity which will change the character of a site exceeding 0.5 hectares in extent or involving three or more existing erven or subdivisions thereof or that have been consolidated within the past five years or costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority. ▪ Re-zoning of a site exceeding one hectare in extent. ▪ Any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority.
Heritage site	Any place declared to be a national heritage site by SAHRA or a place declared to be a provincial heritage site by a provincial heritage resources authority.
Living / intangible heritage	The intangible aspects of inherited culture that could include cultural tradition, oral history, performance, ritual, popular memory, skills and techniques, indigenous knowledge systems, the holistic approach to nature, society and social relationships.
Management	In relation to heritage resources, includes the conservation, presentation and improvement of a place protected in terms of the NHRA.
National estate	The national estate as defined in Section 3 of the NHRA, i.e. heritage resources of South Africa which are of cultural significance or other special value for the present community and for future generations. The national estate may include: ▪ Places, buildings, structures and equipment of cultural significance.

Term	Definition
	▪ Places to which oral traditions are attached or which are associated with living heritage. ▪ Historical settlements and townscapes. ▪ Landscapes and natural features of cultural significance. ▪ Geological sites of scientific or cultural importance. ▪ Archaeological and palaeontological sites. ▪ Graves and burial grounds, including ancestral graves, royal graves and graves of traditional leaders, graves of victims of conflict, graves of individuals designated by the Minister by notice in the Gazette, historical graves and cemeteries, and other human remains which are not covered in terms of the National Health Act, 2003. ▪ Sites of significance relating to the history of slavery in South Africa. ▪ Movable objects, including objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens; objects to which oral traditions are attached or which are associated with living heritage; ethnographic art and objects; military objects; objects of decorative or fine art; objects of scientific or technological interest. ▪ Books, records, documents, photographic positives and negatives, graphic, film or video material or sound recordings, excluding those that are public records as defined in section 1(xiv) of the National Archives of South Africa Act, 1996 (Act No. 43 of 1996).
Palaeontological	Any fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or trance.
Palaeontologist	A trained professional who uses scientific methods to excavate, collect, record and study palaeontological sites and fossils.
Phase 1 Archaeological Impact Assessment (AIA)	Phase 1 AIAs generally involve the identification and assessment of sites during a field survey of a portion of land that is going to be affected by a potentially destructive or landscape-altering activity.
Phase 2 Archaeological Impact Assessment (AIA)	Phase 2 AIAs are primarily based on salvage or mitigation excavations preceding development that will destroy or impact on a site. This may involve collecting of artefacts from the surface and / or excavation of representative samples of the artefactual material to allow characterisation of the site and the collection of suitable materials for dating the sites. Phase 2 AIAs aim to obtain a general idea of the age, significance and meaning of the site that is to be lost and to store a sample that can be consulted at a later date for research purposes. Phase 2 excavations can only be done under a permit issued by SAHRA, or other appropriate heritage agency, to the appointed archaeologist.

Term	Definition
Phase 3 Management Plan / Conservation Management Plan (CMP)	On occasion, a site may require a Phase 3 programme involving the modification of the site or the incorporation of the site into the development itself as a site museum, a special conservation area or a display. Alternatively it is often possible to relocate or plan the development in such a way as to conserve the archaeological site or any other special heritage significance the place may have. For example, in a wilderness area or open space when sites are of public interest the development of interpretative material is recommended and adds value to the development. Permission for the development to proceed can be given only once the heritage resources authority is satisfied that measures are in place to ensure that the archaeological sites will not be damaged by the impact of the development or that they have been adequately recorded and sampled. Careful planning can minimise the impact of archaeological surveys on development projects by selecting options that cause the least amount of inconvenience and delay. The process as explained above allows the rescue and preservation of information relating to our past heritage for future generations. It balances the requirements of developers and the conservation and protection of our cultural heritage as required of SAHRA and the provincial heritage resources authorities (ASAPA).
Pre-disturbance survey (syn. reconnaissance)	A survey to record a site as it exists, with all the topographical and other information that can be collected, without excavation or other disturbance of the site.
Provisional protection	A protected area or heritage resource provisionally protected by SAHRA or a provincial heritage resources authority by a notice in the Gazette or Provincial Gazette.
Reconnaissance	A broad range of techniques involved in the location of archaeological sites, e.g. surface survey and the recording of surface artefacts and features, the sampling of natural and mineral resources, and sometimes testing of an area to assess the number and extent of archaeological resources. However, in terms of South African practice, reconnaissance during a so-called Phase 1 AIA never includes sampling as this is a permitted activity, usually undertaken during so-called Phase 2 AIAs (ASAPA).
Structure	Any building, works, device or other facility made by people and which is fixed to land, and includes any fixtures, fittings and equipment associated therewith.
Tangible heritage	Physical heritage resources such as archaeological sites, historical buildings, burial grounds and graves, fossils, etc. Tangible heritage may be associated with intangible elements, e.g. the living cultural traditions, rituals and performances associated with burial grounds and graves and deceased persons.

Term	Definition
Werf (pl. werfs)	The Afrikaans word for ‘farmyard’, and a more correct one in the local context as it includes the buildings on it, more than just the space itself. It is the roughly level, uncultivated but close-cropped open space on which the buildings of a farm complex are arranged.

1 Introduction

There is a long history of gold and uranium mining in the broader West Rand area with an estimated 1.3 billion tonnes of surface tailings, containing in excess of 170 million pounds of uranium and 11 million ounces of gold. Sibanye Gold Limited (SGL) currently owns the majority of the tonnage and its gold and uranium content. SGL plans to ultimately exploit all these resources to develop a strong, long life and high yield surface business. Key to the successful execution of this development strategy is the West Rand Tailings Retreatment Project (WRTRP). The concept of the WRTRP is well understood with an 8 year history of extensive metallurgical test work, feasibility studies and design by a number of major mining houses. A pre-feasibility study (PFS) completed during 2013 for the WRTRP has confirmed that there is a significant opportunity to extract value from the SGL surface resources in a cost effective sequence.

The ultimate WRTRP involves the construction of a large-scale Central Processing Plant (CPP) for the recovery of gold, uranium and sulfur from the available resources. The CPP, centrally located to the West Rand resources, will be developed in phases to eventually treat up to 4mt/month of tailings inclusive of current arisings. The resultant tailings will be deposited on a modern tailings storage facility (TSF) called the regional TSF (RTSF).

In 2014, Digby Wells Environmental (hereafter DWE) completed a gap analysis of available information that could be used for the authorisation of the WRTRP. The gap analysis recommended that the Environmental Authorisation of the WRTRP should be *staged* as per the economic imperatives.

This report therefore constitutes the Heritage Scoping Report (HSR) for the activities of the initial implementation of the WRTRP, as defined in the under Section 3.2 below.

1.1 Terms of Reference

The Terms of Reference (ToR) for the HSR were to:

- Describe the baseline cultural landscape within which the ultimate WRTRP is located; and
- Identify potential heritage risks and impacts that may arise as a result of the proposed activities of initial implementation of the WRTRP.

Heritage impacts will be investigated in greater detail during the Environmental Impact Assessment (EIA) component of the project.

1.2 Scope of Work

The Scope of Work for this assignment included the compilation and submission of a HSR for the activities of the WRTRP to:

- The South African Heritage Resources Agency (SAHRA); and

- The Gauteng Provincial Heritage Resources Authority (PHRA-G).

The HSR is submitted to the above named heritage authorities for Statutory Comment as required under Section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA).

1.3 Policy and Legal Framework

This section briefly presents national legislation for the overall project requirements including policies and plans. This is followed by legislation pertinent to heritage resources management (HRM).

1.3.1 Overall Project Requirements

1.3.1.1 The South African Constitution

The South African Constitution supersedes all other legislation, entitling every South African citizen to certain rights (with responsibilities), and imposes obligations and restrictions on individuals or entities. In terms of heritage, the Constitution entitles every person or community to the right to enjoy their culture, practise their religion and use their language.

1.3.1.2 Mineral and Petroleum Resource Development Act. 2002 (Act No. 28 of 2002) (MPRDA)

A Mining Right Application submitted to the Department of Mineral Resources (DMR) in terms of the Mineral and Petroleum Resources Act, 2002 (Act No.28 of 2002) (MPRDA) must be succeeded by various documents including a Scoping Report, EIA Report and an EMP.

The MPRDA requires that mining companies assess the socio-economic impacts of their activities from start to closure and beyond. Companies must develop and implement a comprehensive Social and Labour Plan (SLP) to promote socio-economic development in their host communities and to prevent or lessen negative social impacts.

1.3.1.3 National Environmental Management Act, 1998 (Act No 107 of 1998) (NEMA) and EIA Regulations (December 2014)

The National Environmental Management Act, 1998 (Act No 107 of 1998) (NEMA), as amended was set in place in accordance with Section 24 of the Constitution of the Republic of South Africa. Certain environmental principles under NEMA have to be adhered to, to inform decision making for issues affecting the environment. Section 24 (1)(a) and (b) of NEMA state that:

The potential impact on the environment and socio-economic conditions of activities that require authorisation or permission by law and which may significantly affect the environment, must be considered, investigated and assessed prior to their implementation and reported to the organ of state charged by law with authorizing, permitting, or otherwise allowing the implementation of an activity.

The Environmental Impact Assessment (EIA) Regulations, Government Notice Regulation (GN) R982 were published on 04 December 2014 and promulgated on 08 December 2014. Together with the EIA Regulations, the Minister also published GN R 983 (Listing Notice No. 1), GN 984 (Listing Notice No. 2) and GN R 985 (Listing Notice No. 3) in terms of Sections 24(2) and 24D of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA), as amended.

1.3.1.4 National Water Act, 1998 (Act No. 36 of 1998) (NWA)

The National Water Act (Act No. 36 of 1998) (NWA) provides for the sustainable and equitable use and protection of water resources. It is founded on the principle that the National Government has overall responsibility for and authority over water resource management, including the equitable allocation and beneficial use of water in the public interest, and that a person can only be entitled to use water if the use is permissible under the NWA.

1.3.1.4.1 GN R704 National Water Act, 1998 (Act No. 36 of 1998)

Regulations 4, 5 and 6 of the regulation on use of water for mining and related activities aimed at the protection of water resources, Government Notice Regulation 704 (GN R No. 704) published in June 1999, states the following:

- Regulation 4: No residue deposit, reservoir or dam may be located within the 1:100 year flood line, or less than a horizontal distance of 100 m from the nearest watercourse. Furthermore, person(s) may not dispose of any substance that may cause water pollution
- Regulation 5: No person(s) may use substances for the construction of a dam or impoundment if that substance will cause water pollution.
- Regulation 6 is concerned with the capacity requirements of clean and dirty water systems, while Regulation 7 details the requirements necessary for the protection of water resources.

1.3.1.5 National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) (NEM:AQA)

According to the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) (NEM: AQA) the Department of Environmental Affairs (DEA), the provincial environmental departments and local authorities (district and local municipalities) are separately and jointly responsible for the implementation and enforcement of various aspects of NEM: AQA. A fundamental aspect of the new approach to the air quality regulation, as reflected in the NEM: AQA is the establishment of National Ambient Air Quality Standards (NAAQS) (GN R 1210 of 2009). These standards provide the goals for air quality management plans and also provide the benchmark by which the effectiveness of these management plans is measured.

1.3.1.6 National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEM:BA)

The National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEM:BA) regulates the management and conservation of the biodiversity of South Africa within the framework provided under NEMA. This Act also regulates the protection of species and ecosystems that require national protection and also takes into account the management of alien and invasive species. This Act works in accordance to the framework set under NEMA. The following regulations which have been promulgated in terms of the NEM:BA are also of relevance:

- Alien and Invasive Species Lists, 2014 published (GN R599 in GG 37886 of 1 August 2014) ;
- National Environmental Management: Biodiversity Act, 2004: Threatened and Protected Species Regulations;
- National list of Ecosystems Threatened and in need of Protection under Section 52(1) (a) of the Biodiversity Act (GG 34809, GN 1002, 9 December 2011).

1.3.1.7 Integrated Development Plans (IDPs)

Development policies comprise initiatives and plans intended to guide development on national, provincial, district and local levels. These documents also include spatial and economic development frameworks and plans. This section briefly outlines development policies relevant to this HSR. More information and additional documents are discussed in more detail in the socio-economic scoping report.

Five Integrated Development Plans (IDPs) were reviewed in this study: the West Rand District Municipality IDP; Merafong City Local Municipality IDP; Randfontein Local Municipality IDP; Westonaria Local Municipality IDP and City of Johannesburg Integrated IDP. An IDP is a municipal-level planning document that aims to provide a developmental framework for regional and local government, in which municipalities must provide leadership, management, budgeting, and direction in the provision of services and infrastructure. The IDPs serve to guide developmental planning and community development. Municipal IDPs highlight local needs and priorities that could be considered by the project.

1.3.2 Heritage Specific

1.3.2.1 National Heritage Resources Act, 1999 (NHRA)

The NHRA is the overarching legislation that protects and regulates the management of heritage resources in South Africa. This Act considers various heritage resources as forming part of the national estate, contemplated in Section 3. In addition, certain other categories are afforded automatic formal or general protection. Sections considered relevant to this project are outlined below:

- Formal protection:
  - National and provincial heritage sites, Section 27;
  - Certain types of protected areas, Section 28; and
  - Heritage areas, Section 32.
- General protection:
  - Certain structures with demonstrable cultural significance or that are older than 60 years, Section 34;
  - Archaeological and palaeontological resources, Section 35;
  - Certain categories of burial grounds and graves, Section 36; and
  - All public monuments and memorials, Section 37.

Section 5 of the NHRA encapsulates general principles for HRM that this specialist heritage component of the WRTRP aims to adhere to. Section 38 outlines the HRM process and minimum requirements that need to be complied with namely:

- Subsection (8) requires a Heritage Impact Assessment (HIA) study to be conducted if an impact assessment is required in terms of any other Act. In this instance impact assessments are required by several Acts, but notably the NEMA and MPRDA; and
- Subsection (3) outlines the minimum information that must be included in a HIA report.

This HSR was completed to comply with the above sections of the Act.

1.3.2.2 Extension of Security of Tenure Act (ESTA) (Act No. 62 of 1997)

This Act confers certain rights to non-landowning residents of a property, where such rights are linked to the period of time in which persons have been resident on the land. The Act applies to all rural areas in South Africa, regardless of whether the land is used for farming or mining purposes. **The application of this Act to this study is specific to provisions regarding burial grounds and graves.**

1.4 Constraints and Limitations

The following constraints and limitations were experienced as part of the HSR:

- This report represents a scoping report that is limited to descriptions of a cultural heritage baseline profile and possible heritage risks and impacts. It does not evaluate cultural significance or assess any impacts on heritage resources. This will be completed during the impact assessment phase;
- The HSR is not intended to present an exhaustive list and description of heritage resources. All identified heritage resources will be presented in the HIA;

- The NEMA EIA Regulations that came into effect on 8 December 2014 significantly constrain timeframes within which studies can be completed;
- The HSR is primarily desktop based – field work was limited to a scoping site visit undertaken over 1 day that focused on the proposed infrastructure footprint of the initial implementation phase of the WRTRP (*Refer to Section 2.2 below for detailed methodology*);
- The purpose of the scoping site visit was to document the current conservation status of the cultural landscape, and to ground-truth certain tangible heritage resources identified in the literature review. The scoping survey did not use systematic, controlled survey techniques, nor was it intended to be a comprehensive survey of the proposed project area;
- Desktop findings are based on available research from credible sources listed in the body of this report and cited in the attached literature review. Whilst every attempt to obtain the latest available information was made, reviewed literature does not represent an exhaustive list of information sources for the study area;
- The nature of the project did not allow the heritage specialists to engage any stakeholders in respect of heritage resources: should heritage-focussed stakeholder engagement be required this will take place as part of the wider Stakeholder Engagement Process and Environmental Impact Assessment;
- Many tangible heritage resources, specifically archaeological resources, commonly occur below the visible surface, and may not be adequately recorded, documented and assessed without intrusive and destructive methods. Therefore, the literature that was reviewed, and especially existing HIA reports, are in themselves limited to surface observations
- Routing options and infrastructure footprints were amended subsequent to the scoping survey completed for this report. These options must be considered during the impact assessment;
- Access to certain properties within the project area was restricted. Properties that were accessed included Cardoville 358 IQ Portion 3, and Wildebeestkuil 360 IQ Portion 7 and 18;
- Where powerline and pipeline routings exited accessible servitudes and entered private property, access was restricted and these routing options were not included in the scoping survey. These areas will be investigated during the impact assessment.

1.5 Expertise of the Specialist[1]

Natasha Higgitt undertook the heritage scoping survey and compiled parts of the cultural heritage baseline profile. She obtained her Bachelor of Arts (BA) Honours degree in Archaeology in 2010 from the University of Pretoria. She currently holds the position of Assistant Heritage Consultant: Archaeology Specialist at DWE. She has more than 4 years' experience in archaeological survey and gained further generalist heritage experience since her appointment at DWE in South Africa and Liberia.

Natasha is a professional member of the Association of Southern African Archaeologists (ASAPA) (*Member No. 335*).

Justin du Piesanie compiled the geological and palaeontological sensitivity component of the cultural baseline, and the overall HSR. He obtained his Master of Science (MSc) degree in Archaeology from the University of the Witwatersrand in 2008, specialising in the Southern African Iron Age. He currently holds the position of Heritage Management Consultant: Archaeologist at DWE. He has over 6 years combined experience in HRM in South Africa, including heritage assessments, archaeological mitigation and grave relocation. Justin has gained further generalist experience since his appointment at DWE in Burkina Faso, the Democratic Republic of Congo, Liberia and Mali on projects that have required compliance with International Finance Corporation (IFC) requirements such as Performance Standard 8: Cultural Heritage.

Justin is a professional member of ASAPA (*Member No. 270*) and the International Council on Monuments and Sites (ICOMOS) South Africa (*Member No. 14274*).

Johan Nel undertook the technical review of this HSR. He has more than 13 years of combined experience in the field of HRM including archaeological and heritage assessments, grave relocation, social consultation and mitigation of archaeological sites. He has gained experience both within urban settings and remote rural landscapes. Since 2010 he has been actively involved in environmental management that has allowed him to investigate and implement the integration of heritage resources management into environmental impact assessments (EIA). Many of the projects since have required compliance with IFC requirements such as Performance Standard 8: Cultural Heritage. This exposure has allowed Johan to develop and implement a HRM approach that is founded on international best practice, leading international conservation bodies such as the United Nations Educational, Scientific and Cultural Organisation (UNESCO) and ICOMOS and aligned to the South African legislation. Johan has worked in most South African Provinces, as well as Swaziland, the Democratic Republic of the Congo, Liberia and Sierra Leone.

Johan is a professional member of ASAPA (*Member No. 095*) and ICOMOS South Africa (*Member No. 13839*).

[1] Detailed curricula vitae of the specialists are attached as Appendix A

1.6 Structure of the Heritage Scoping Report

The remainder of this HSR is structured as follows:

- Section 2 describes the methodology adopted for this study and includes descriptions on the study areas, data collection and compilation of the cultural heritage baseline profile;
- Section 3 provides a summary of the project background, the ultimate WRTRP, a description of the initial implementation phase of the WRTRP, and a summary of project activities and alternatives;
- Section 4 introduces the screening assessment as a cultural heritage baseline profile of the ultimate WRTRP based on the literature review attached as Appendix B and the results of the pre-development survey;
- Section 5 presents a provisional Statement of Cultural Significance for the project area;
- Section 6 presents a discussion of the findings of the cultural baseline in relation to the proposed initial implementation phase of the WRTRP;
- Section 7 outlines possible heritage risks to the project;
- Section 8 discusses possible heritage impacts that may likely occur by the proposed project activities, and provides recommendations regarding aspects that will require specific attention during the impact assessment; and
- Section 9 concludes the study by highlighting the most salient points presented within the HSR.

2 Methodology

The main purpose of the HSR is to provide a salient background to the project and present a cultural heritage baseline profile. The baseline profile provides the context within which cultural significance will be evaluated and heritage impacts assessed during the subsequent HIA. The described project background and context further enables relevant heritage authorities to specify information that must be included in the HIA in accordance with Sections 38(3) and (8) of the NHRA. This section describes the activities used to develop the cultural heritage baseline profile and compile the HSR.

2.1 Defining Study Areas

Notwithstanding that this is a scoping study; it forms the foundation on which the evaluation of cultural significance and HIA will be based. Defined study areas must therefore be useful for the impact assessment phase. The International Finance Corporation (IFC) (2012) generally defines a “study area” for an impact assessment as the area most likely to experience impacts arising from or to exert an influence on, the project or activity being assessed.

In terms of heritage impact assessments this is complicated by the fact that different heritage impacts may manifest in different geographical areas and diverse communities. For instance, heritage impacts can simultaneously affect the physical resource and have social repercussions: this is compounded when the intensity of physical impacts and social repercussions differ significantly. In addition, heritage impacts can influence the cultural significance of heritage resources without any actual physical impact on the resources taking place. Heritage impacts can, therefore, generally be placed into three broad categories (adapted from Winter & Bauman 2005: 36):

- **Direct or primary heritage impacts** affect the fabric or physical integrity of the heritage resource, for example destruction of an archaeological site or historical building. Direct or primary impacts may be the most immediate and noticeable. Such impacts are usually ranked as the most intense, but can often be erroneously assessed as high-ranking.
- **Indirect, induced or secondary heritage impacts** can occur later in time or at a different place from the causal activity, or as a result of a complex pathway. For example, restricted access to a heritage resource resulting in the gradual erosion of its cultural significance that may be dependent on ritual patterns of access. Although the physical fabric of the resource is not affected through any primary impact, its significance is affected to the extent that it can ultimately result in the loss of the resource itself.
- **Cumulative heritage impacts** result from in-combination effects on heritage resources acting within a host of processes that are insignificant when seen in isolation, but which collectively have a significant effect. Cumulative effects can be:
  - **Additive**: the simple sum of all the effects, e.g. the reclamation of a historical TSF will minimise the sense of the historic mining landscape.
  - **Synergistic**: effects interact to produce a total effect greater than the sum of the individual effects, e.g. the removal of all historical TSFs will sterilise the historic mining landscape, to be replaced by a modern mining landscape represented by the RTSF.
  - **Time crowding**: frequent, repetitive impacts on a particular resource at the same time, e.g. the effect of regular blasting activities on a nearby rock art site or protected historical building high.
  - **Neutralizing**: where the effects may counteract each other to reduce the overall effect, e.g. the effect of changes from a historic to modern mining landscape could reduce the overall impact on the sense-of-place of the study area.
  - **Space crowding**: high spatial density of impacts on a heritage resource, e.g. density of new buildings resulting in suburbanisation of a historical rural landscape.

The relevance of the above distinction to defining the study area arises from the fact that heritage resources do not exist in isolation to the greater natural and social (including socio-cultural, -economic and -political).environment. In addition, the NHRA requires that heritage resources are graded in terms of national, provincial and local concern based on their importance and consequent official (i.e. State) management effort required. The type and level of baseline information required to adequately predict heritage impacts varies between these categories. Three 'concentric' study areas were defined for the purposes of this study. These areas are defined below; each one encompasses its precursor and exceeds it in scale:

- The *regional study area* - : this area was defined as the district municipality. Where necessary, the regional study area was extended outside the boundaries of the district municipality to include much wider regional expressions of specific types of heritage resources and historical events. The regional study area also provided the regional development and planning context that may contribute to cumulative impacts (Figure 2-1)
- The *local study area* – the area most likely to be influenced by any changes to heritage resources in the project area, or where project development could cause heritage impacts. This area was defined as the immediate surrounding properties / farms, as well as the affected local municipality. The local study area was specifically examined to provide a backdrop to the socio-economic conditions within which the proposed development will occur. The local study area furthermore provided the local development and planning context that may contribute to cumulative impacts (See Figure 2-2)

The *site-specific study area* – this is the area where heritage impacts are most probable due to development. This area is defined as the extent of the farm portions of the proposed project area including a 500 m buffer area around project area. The site-specific study area may extend linearly. In such instances, the linear development, e.g. a road, is defined as the site-specific area including a 200 m buffer either side of the development footprint (See Figure 2-3).

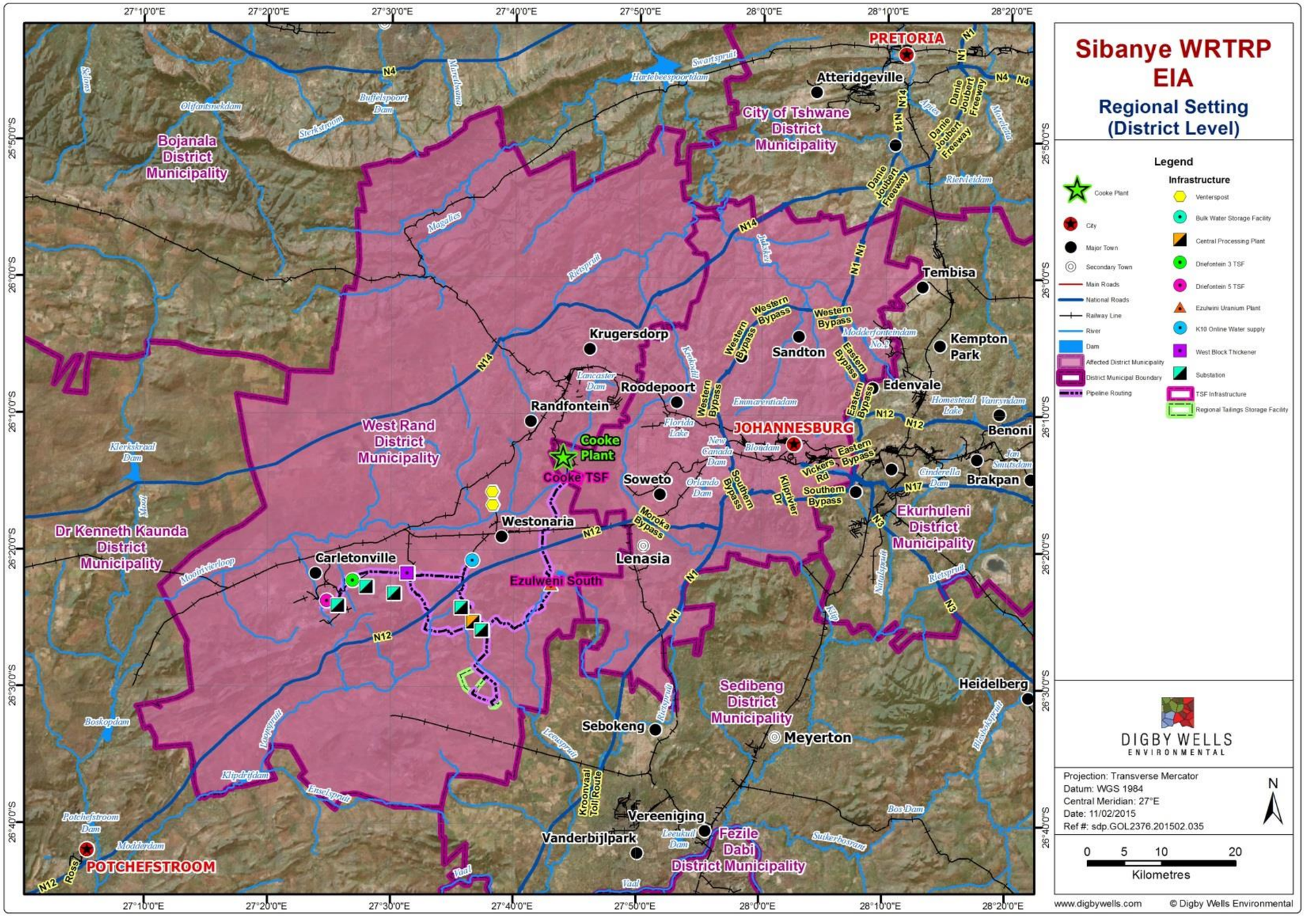

Figure 2-1: Regional Study Area for initial implementation of the WRTRP

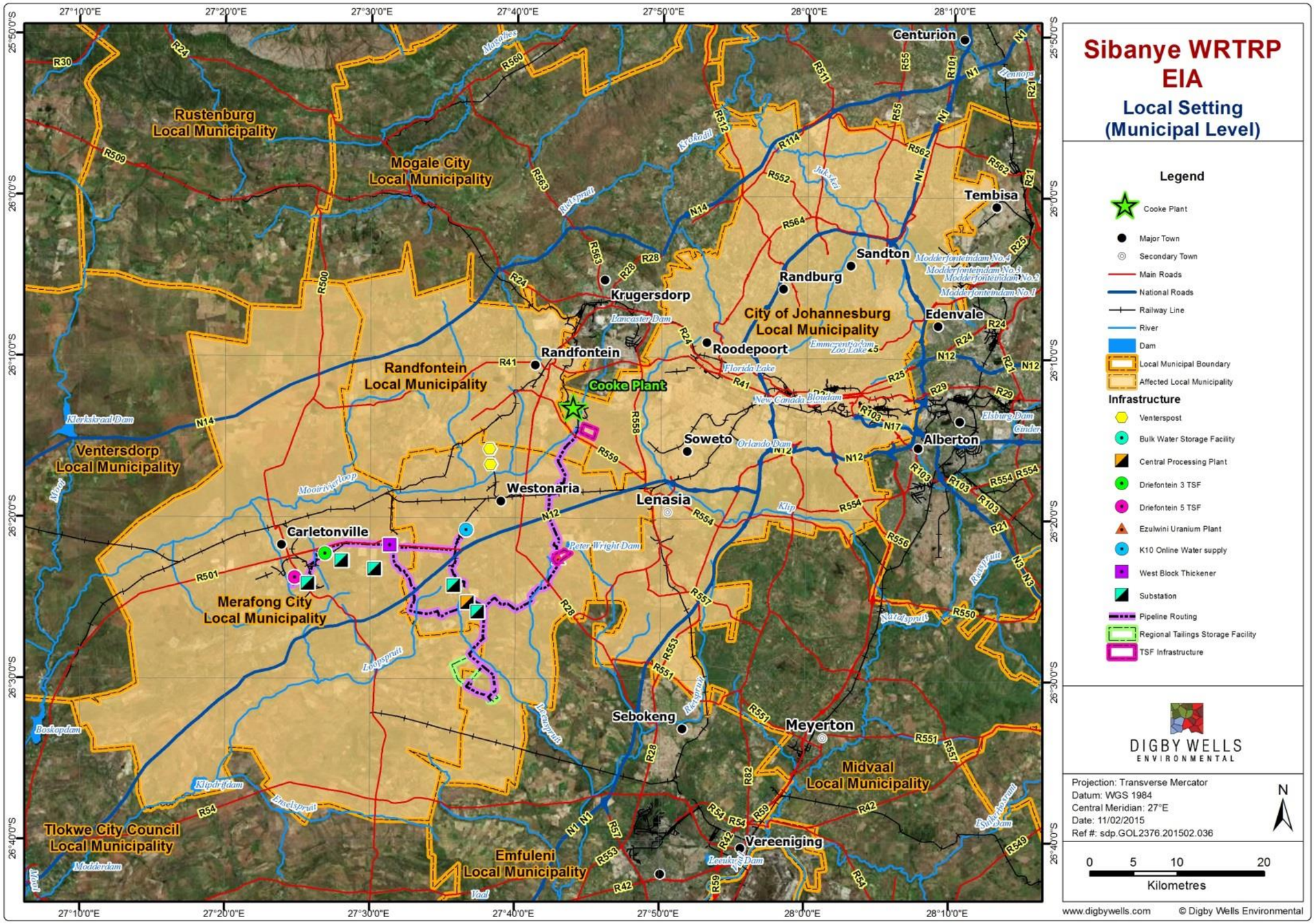

Figure 2-2: Local Study Area for initial implementation of the WRTRP

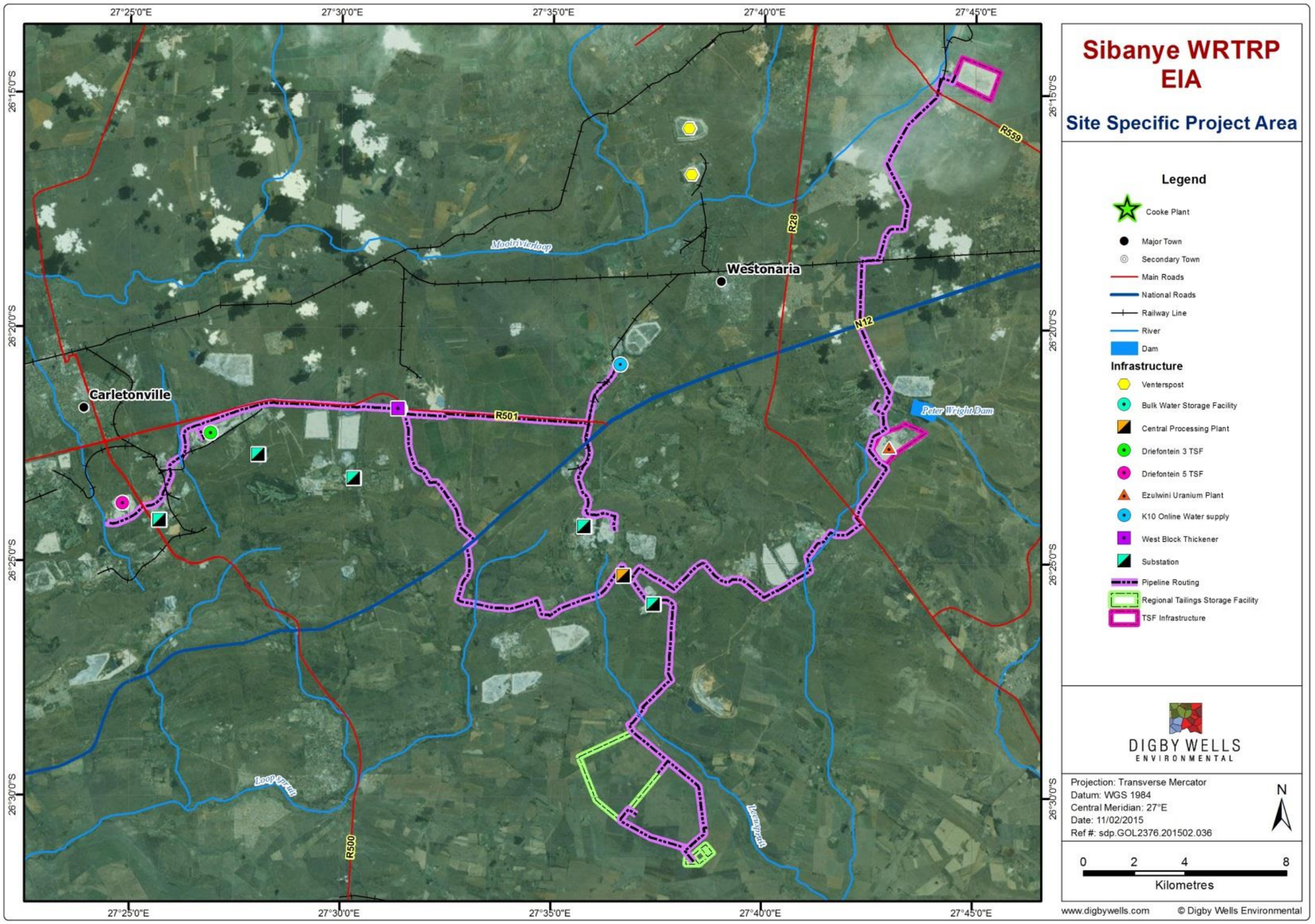

Figure 2-3: Site Specific Study Area

2.2 Data Collection

Data collection assists in the development of a cultural heritage baseline profile for the proposed WRTRP area. Both qualitative and quantitative data was collected, although this HSR is mainly qualitative. Qualitative data was primarily obtained through secondary information sources, i.e. desktop literature review and historical layering. Quantitative data was obtained through field surveys where primary, raw data was collected – for example observed historical sites. Both methods are described in more detail below.

2.2.1 Qualitative Data Collection[2]

A survey of diverse information repositories was made to identify appropriate relevant information sources. These sources were analysed for credibility and relevance. Credible, relevant sources were then critically reviewed. The objectives of the literature review were to:

- Gain an understanding of the cultural landscape within which the proposed ultimate WRTRP is located;
- Identify any potential fatal flaws, sensitive areas, current social complexities / issues and known or possible tangible heritage; and
- Inform the scoping site visit.

Repositories that were surveyed included the SAHRIS, online / electronic journals and platforms, and certain internet sources. This HSR only includes a summary and discussion of the most relevant findings: please refer to Appendix B for the complete literature review. For ease of reading and to reduce the length of this report, references summarised in Table 2-1 below were not cited in the text of the HSR. Relevant sources were cited and included in the literature review's reference list;

Historical layering is a process whereby diverse cartographic sources from various time periods are layered chronologically using Geographic Information System (GIS). The rationale behind historical layering is threefold, as it:

- Enables a virtual representation of changes in the land use of a particular area over time;
- Provides relative dates based on the presence/absence of visible features; and
- Identifies potential locations where heritage resources may exist within an area.

Cartographic sources referred to in this report are listed in Table 2-2.

[2] Qualitative data collection considered the ultimate WRTRP area to identify the any potential heritage related fatal flaws. The primary focus however, was on the defined study areas for the initial implementation of the WRTRP.

Table 2-1: Summary of reviewed information sources[3]

Reviewed Literature		
Vegetation, Climate, Geology and Palaeontology		
▪ Barras, 2014; ▪ Eriksson, Altermann, & Hartzer, 2006; ▪ Hilton-Barber & Berger, 2002; ▪ Johanson, et al., 2006; ▪ Knight, Grab, & Esterhuysen, 2014;	▪ Martini, 2006; ▪ McCarthy, 2006; ▪ Mucina & Rutherford, 2006; ▪ SAHRA, 2013a;	▪ SAHRA, 2013b; ▪ SAHRA, 2013c; ▪ Sinclair, McCraith, & Nelson, 2003; and ▪ UNESCO, 2015.
Stone Age		
▪ Brodie, 2008; ▪ Deacon & Deacon, 1999;	▪ Hilton-Barber & Berger, 2002; ▪ Lombard, et al., 2012;	▪ Mitchell, 2002; and ▪ van Eeden, 1988.
Farming Communities		
▪ Brodie, 2008; ▪ Dalby, 1975; ▪ Garstang, Coleman, & Therrell, 2014; ▪ Golan, 1990;	▪ Huffman, 1980; ▪ Huffman, 2002; ▪ Huffman, et al., 2006/2007;	▪ Huffman, 2007; ▪ Maggs, 1976; and ▪ Mitchell, 2002.
Colonial / Historical		
▪ Brodie, 2008; ▪ Krige & Austin, 1980; ▪ Renwick, 2009; ▪ Shorten, 1970; ▪ Sibanye Gold, 2015a;	▪ Sibanye Gold, 2015b; ▪ South African History Online, 2014a; ▪ South African History Online, 2014b; ▪ South African History Online, 2014c; ▪ South African History Online, 2014d;	▪ The Voortrekkers, 2014; ▪ du Plooy, 2004; ▪ van Eeden, 1988; ▪ van den Bergh, 2009; and ▪ von Ketelhodt, 2007.
General & Planning Documents		
▪ Winter & Bauman 2005 ▪ Merafong City Local Municipality, 2014/2015; ▪ Randfontein Local Municipality, 2014;	▪ Stats SA, 2012a; ▪ Stats SA, 2012b; ▪ Stats SA, 2012c;	▪ Stats SA, 2012d; ▪ West Rand District Municipality, 2014/2015; and ▪ Westonaria Local Municipality, 2014/2015.

[3] The sources listed in this table are not cited in the HSR, but are referenced in the literature review attached as Appendix B

Reviewed Literature		
Author	**Report Type**	**Area/development**
Du Piesanie, 2012	HIA	Geluksdal Tailings Facility
Huffman, van der Merwe, & Steel, 1994	AIA	East and West Driefontein Mines
Huffman, 2007	AIA	Portions 66 and 67 of the Farm Luipaardsvlei 243 IQ
Kusel, 2008	HIA	Portion 11 of Leeuspruit 184IQ
Schoeman & Barry, 2004	AIA	South Deep Tailings Dam
Van Shalkwyk, 2008	HIA	Droogheuvel and Middlevlei Townships, Randfontein

Table 2-2: Relevant reviewed cartographic sources

Historical maps		
Map series	**Name / number**	**Date**
1: 100 000 South Africa	Krugersdorp 2627B	1943

Aerial photographs						
Job no.	**Flight plan**	**Photo no.**	**Map ref.**	**Area**	**Date**	**Reference**
129	022	52958	2626	Wes Rand	1938	129/1938
	029	53140				
	030	54943 - 54948				
	031	54959 - 53163				
	032	74650 - 74664				
	033	82878-82893				
	034	74675-74684				
	036	20216-20217				
	037	74762				
	038	74825 - 74827				
	040	74846 - 74849				
158	14	48156	2626	Wes Rand	1941	158/1941

Aerial photographs						
Job no.	**Flight plan**	**Photo no.**	**Map ref.**	**Area**	**Date**	**Reference**
	15	48128				
	18	56152				
	19	56186 - 56197				
	20	56904				
314	7	44555	2626,2628	Wes Rand, East Rand	1952	314/1952
	9	43561 - 43570				
	10	41168 - 41179				
	11	43425 - 43434				
	12	43039 - 43040				
603	024	1190	2526,2528,2626,2628	Rustenburg, Pretoria, Wes -Rand, East-Rand	1968	603/1968
	027	09181 - 09194				
	028	09644 - 09639				
	029	3311				
	030	09688 - 09695				
	031	00024				
	032	00161 - 00163				
273	003	7515	2526,2528,2626,2628	Rustenburg, Pretoria, Wes -Rand, East-Rand	1969	273/1969
	004	07523 - 07527				

Aerial photographs						
Job no.	**Flight plan**	**Photo no.**	**Map ref.**	**Area**	**Date**	**Reference**
	005	07565 - 07566				
	3	00361 - 00375				
498_58	4	452	2626	Wes Rand	1974	498_58/1974
	4	5028				
	6	00137 - 00142		Wes Rand, East Rand, Mbabane		
952	7	5146	2626,2628,2630		1991	952/1991

2.2.2 Quantitative Data Collection

A scoping survey of the proposed initial implementation phase of the WRTRP area was conducted by Natasha Higgitt. The survey was completed over one day, 16 January 2015 and focused mainly on the RTSF and CPP footprint and proposed routing options of the pipelines and power lines.

The survey was a non-intrusive (i.e. no sampling of any kind took place) vehicular survey. The objectives of the scoping survey to:

- Record the current state of the cultural landscape;
- Ground-truth certain sites identified in the literature; and
- Record a representative sample of visible tangible heritage resources present in the project area.

Visible tangible heritage resources were recorded as waypoints using a handheld GPS and documented through written and photographic records. The survey itself was recorded as a track log.

2.3 Site Naming

Sites identified during the field survey are prefixed by the map sheet number, relevant period / feature code and site number, e.g. **2627DC/BGG-001.**

This number may be shortened on any plans or maps to the period / feature code with the site number used in that report. For example: **BGG-001**

Site identified in previous relevant studies are prefixed by the SAHRIS case or map number and the original site name used by the author, i.e**. 2702/MF001**

Table 2-3: Period codes used in this HSR

Period / Feature	Period / Feature Code
Burial Grounds and Graves	BGG
Ft	Feature
Ste	Structure
Wf	Werf

2.4 Developing a Cultural Heritage Baseline Profile for the Ultimate WRTRP

A cultural heritage baseline profile was developed based on the information collected through the literature review and scoping survey. This profile focussed on the following:

- Local geology and palaeontological sensitivity, including karst topography;
- The archaeological record considering Stone Age, Farming Communities and Colonial / Historical periods; and
- The current development context within which the WRTRP is situated.

3 Project Background

This section summarises basic project information for the WRTRP. A detailed project description is provided within the integrated environmental Scoping Report. The primary elements discussed in this section include a general overview of the ultimate WRTRP and a summary of the current or initial project activities and possible alternatives.

3.1 Ultimate WRTRP

Simplistically, SGL's surface historical TSF holdings in the West Rand can be divided into three blocks; the Northern, Southern and Western Blocks. Each of these blocks contains a number of historical TSFs. Each of the blocks will be reclaimed in a phased approach. Initially the Driefontein 3 TSF (Western Block) together with the Cooke TSF (Northern Block) will be reclaimed first. Following reclamation of Driefontein 3 TSF, Driefontein 5 TSF (Western Block) and Cooke 4 Dam south (C4S) (Southern Block) will be reclaimed.

- Western Block comprises: Driefontein 1, 2, 3, 4 and 5 TSF, and Libanon TSF. Once the Driefontein 3 and 5 TSFs have been depleted the remainder of the Driefontein TSFs, namely Driefontein 1, 2 and 4 and the Libanon TSF, will be processed through the CPP;
- Northern Block comprises: Cooke TSF, Venterspost North TSF, Venterspost South TSF and Millsite Complex (38, 39 and 40/41 and Valley). Venterspost North and South TSFs and Millsite Complex (38, 39 and 40/41 and Valley) will be processed with the concurrent construction of Module 2 float and gold plants; and
- Southern Block comprises: Kloof No.1 TSF, Kloof No.2 TSF, South Shaft TSF (future), Twin Shaft TSF (future), Leeudoorn TSF and C4S TSF. Following completion of the Module 3 float and gold plants, Kloof 1 and 2 TSFs, South Shaft TSF (future), Twin Shaft TSF (future) and Leeudoorn TSF will be reclaimed.

Once commissioned the project will initially reclaim and treat the TSFs at a rate of 1.5 Mt/m (1Mt/m from Driefontein 3 (followed sequentially by Driefontein 5 and C4S) and 0.5 Mt/m from Cooke TSF). Reclamation and processing capacity will ultimately ramp up to 4 Mt/m

over an anticipated period of 8 years. At the 4Mt/m tailings retreatment capacity, each of the blocks will be reclaimed and processed simultaneously.

The tailings material will be centrally treated in a CPP. In addition to gold and uranium extraction, sulfur will be extracted to produce sulphuric acid, an important reagent required for uranium leaching.

To minimise the upfront capital required for the WRTRP, only essential infrastructure will be developed during initial implementation. Use of existing and available infrastructure may be used to process gold and uranium until the volumetric increase in tonnage necessitates the need to expand the CPP.

The authorisation, construction and operation of a new deposition site for the residue from the CPP will be located in an area that has been extensively studied as part of the original WWP (GoldFields Project) and CUP (Rand Uranium Project) projects. The “deposition area” on which the project is focussing, has been termed the RTSF and is anticipated to accommodate the entire tonnage from the district. The RTSF if proved viable will be one large facility as opposed to the two independent deposition facilities proposed by the WWP and CUP respectively.

Note: Amendments to various MWPs and EMPs will be applied for in due course pending the inclusion of additional TSFs as the WRTRP grows to process 4 Mt/m. The RTSF will be assessed for the complete footprint necessary to ensure that the site is suitable for all future deposition requirements.

3.2 Initial Implementation

Due to capital constraints in developing a project of this magnitude, it needs to be implemented over time. The initial investment and development will be focused on those assets that will put the project in a position to partially fund the remaining development.

This entails the design and construction of the initial phase of the CPP (gold module No 1, floatation plant, uranium plant No 1, acid plant No 1and a roaster No1), to retreat up to 1.5 Mt/m from the Driefontein 3 and 5 TSFs, C4S TSF (@1 Mt/m) and the Cooke TSF (@0.5Mt/m). Driefontein 3, 5 and C4S TSFs will be mined sequentially over 11 years, whilst the Cooke TSF will be mined concurrent to these for a period of 16 years. The resultant tailings will be deposited onto the new RTSF.

A high grade uranium concentrate, produced at the CPP, has the option to be transported to Ezulwini (50k tonnes per month) for the extraction of uranium and gold. The tailings from this process will be deposited on the existing operational Ezulwini North TSF should this option be pursued.

3.2.1 Resources outside of a Mining Right Area

The Venterspost North and South TSFs currently fall either partially or entirely outside of the Kloof Mining Right area. It is proposed to bring them into the mining right areas during this application by simple inclusion. No other activities are proposed for these facilities in the initial phase.

To comply with Section 38(8) of the NHRA, which requires the integration of specialist heritage input on an appropriate level into assessments required in terms of other relevant Acts, in this instance the MPRDA, an HRM process is required.

3.2.2 Reclamation Activities

Reclamation activities are concerned with the amendment of the Driefontein and Kloof Environmental Management Programmes (EMPs) and Mine Works Programmes (MWPs) in terms of the provisions of Section 102 of the MPRDA. The Section 102 Amendment is specifically for the inclusion of reclamation sequentially of the Driefontein 3 and 5 TSFs through the new CPP and deposition of tailings on the new RTSF. In addition to this, an amendment of the Ezulwini EMP will also be completed to treat uranium concentrate from the CPP and deposit it on the Ezulwini North TSF if required. The sequential treatment of C4S and the Cooke Dump (CD) similarly will require amendments to the Rand Uranium Mining Right.

To comply with Section 38(8) of the NHRA, which requires the integration of specialist heritage input on an appropriate level into assessments required in terms of other relevant Acts, in this instance the MPRDA, an HRM process is required.

3.2.3 Project Activities

The primary project activities are presented in the integrated environmental Scoping Report. The activities presented in Table 3-1 below are those that have bearing on HSR for the initial implementation phase of the WRTRP:

Table 3-1: Relevant activities of the initial implementation phase of the WRTRP

Category	Activity
Infrastructure	Pipeline Routes (water, slurry and tailings).
	West Block and Cooke Thickeners (WBT and CT) and West and North Bulk Water Storage (BWS) complexes.
	Collection sumps and pump stations at the Driefontein TSF 3 and 5, Ezulwini South TSF and Cooke TSF.
	Central processing Plant (CPP) incorporating Module 1 float and gold plants and No1 uranium, roaster and acid plants) and Regional Tailings Storage Facility (RTSF) stage 1.

Category	Activity
	RTSF Return Water Dams (RWD) and the Advanced Water Treatment Facility (AWTF).
Processes	Abstraction of water: K10 shaft, Cooke 1 and 2 Cooke 4 shaft
	Disposal of the residue from the AWTF.
	Hydraulic reclamation of the TSFs (which include surge storage of the slurry in a sump/tank).
	Gold, uranium and sulfur extraction at the CPP (tailings to RTSF) and possible uranium extraction at Ezulwini (tailings to Ezulwini North Dump).
	Water distribution at the AWTF for discharge or sale.
Pumping in Western Block	Pumping water from K10 to the BWSF located next to the WBT.
	Pumping water from the BWSF to the Driefontein TSFs that will be reclaimed.
	Pumping slurry from the TSF sump to the WBT (for Driefontein TSF 3 and 5).
	Pumping the thickened slurry from the WBT to the CPP (2 pipeline route options).
Pumping in Southern Block	Pumping 50 kt/m of uranium and sulfur rich slurry from the CPP to Ezulwini for extraction of uranium.
	Pumping of up to 1.5Mt/m of tailings to the RTSF.
	Pumping water from the RTSF return water dams to the AWTF.
	Discharging treated water to the Leeuspruit or end user.
	Pumping of 1Mt/m of tailings from the C4S to the SBT.
	Pumping residue from the AWTF to the RTSF.
Pumping in Northern Block	Pumping 500 kt/m of tailings from the Cooke Dump to the Cooke thickener and ultimately the northern TSF @1Mt/m to the NBT and on to the CPP
	Pumping from the Cooke thickener to the CPP.
Electricity supply	Power supply from West Drie 6 substation to Driefontein TSF 3.
	Power supply from West Drie Gold substation to Driefontein TSF 5.
	Power supply from East Drie Shaft substation to WBT and BWSF.
	Power supply from Kloof 1 substation to the CPP.
	Power supply from Kloof 4 substation to the RTSF and AWTF.
	Power supply from the Cooke Plant to the Cooke TSF
	Power supply from Ezulwini plant to the C4S TSF

3.3 CUP - Cooke Plant to Ezulwini Pipeline (Initial Phase)

DWE completed an HIA[4] for the Gold One International Limited (Gold One) CUP in May 2012. At this time, Gold One intended to reclaim historical TSF's in Westonaria, Randfontein, Mogale City and Johannesburg regions and establish a new TSF at Geluksdal in the Westonaria area.

Some infrastructures considered as part of the CUP now form part of the WRTRP, specifically the northern portion of the pipeline between the Cooke Dump and Ezulwini. This routing runs from the Cooke Dump to the R28 road largely within existing servitudes, traversing mine owned land and crossing under the N12 and R559 via existing culverts. In light of the proposed routing options, no direct impacts to heritage resources were identified during the HIA. Only two built structures, generally protected under Section 34 of the NHRA, were identified in close proximity to the proposed pipeline routing. Recommendations provided in the assessment included the implementation of a Watching Brief during the construction phase of the pipeline to ensure no direct impact on these structures would occur.

[4] This report was submitted to SAHRA via SAHRIS (Case ID: 871) in July 2012 for Statutory Comment. The HIA and final comment issued on Case ID: 871 is available online at the following link: http://www.sahra.org.za/sahris/cases/geluksdal-tailings

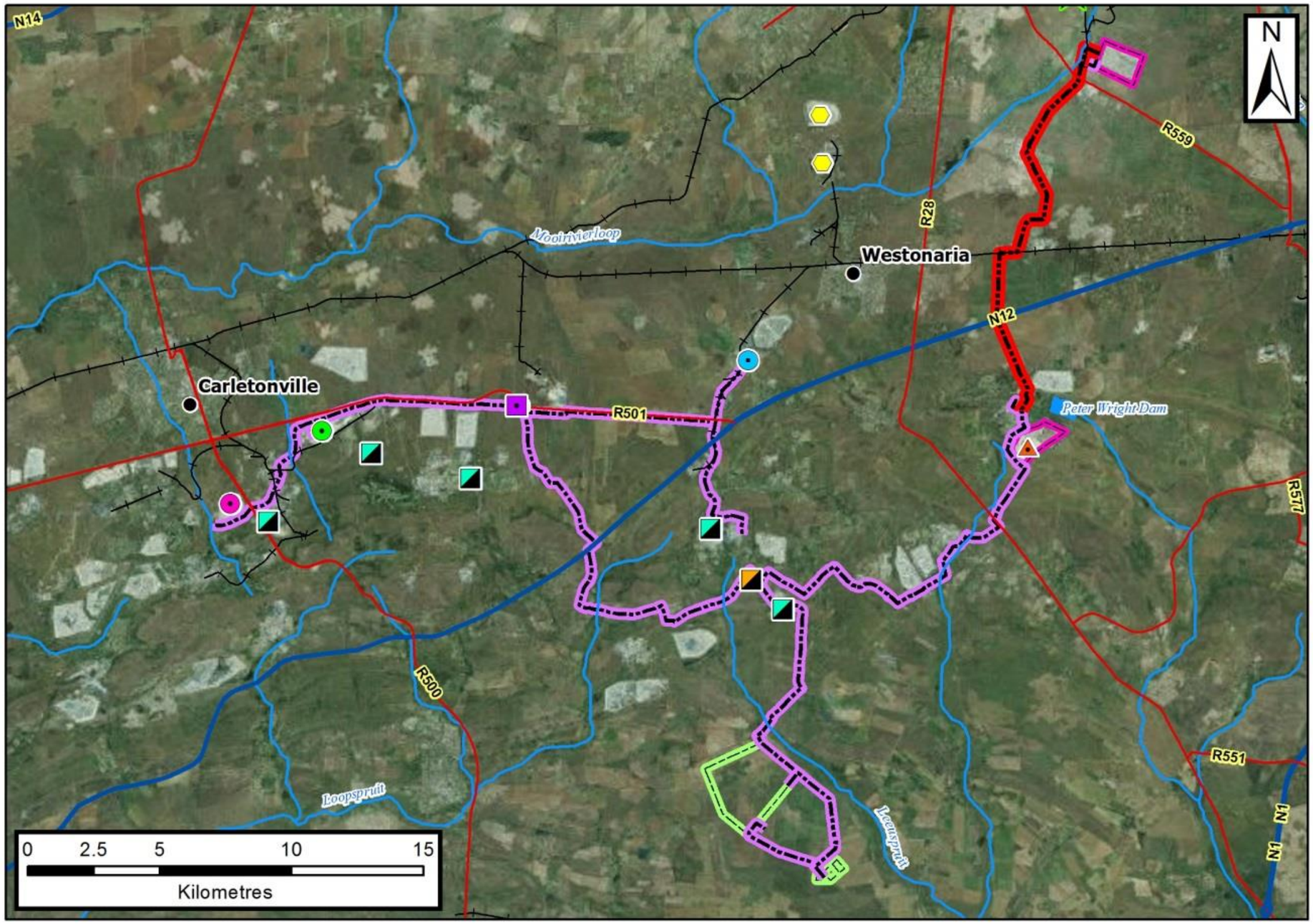

Figure 3-1: CUP pipeline routing (see red) previously considered under Case ID: 871

SAHRA issued final comment on the Geluksdal TSF and Pipeline in January 2014. The SAHRA Archaeology, Palaeontology and Meteorites Unit had no objection to the development on condition that if any new evidence of archaeological sites or artefacts, palaeontological fossils, graves or other heritage resources are found during the implementation of the project, SAHRA or an archaeologist be informed immediately.

As this portion of the WRTRP was considered previously as part of Case ID 871, and final comment has been received, this portion of the WRTRP was **not further considered** in this report.

3.4 Project Alternatives

Project alternatives considered in this section are categorised into two types:

- Alternatives *to* the Project (in terms of the "no-go" option and alternative uses of the Project area in the event that the Project is not implemented); and
- Alternatives *involving* the Project (in terms of alternative infrastructure layout and routings).

3.4.1 The "No-Go" Option and Land Use Alternatives

Consideration of land use alternatives is imperative for planning, to ensure that the development is justified and viable. Decisions must be evaluated in terms of sustainability, broadly defined as balancing environmental, economic and social equity concerns.

The current primary land uses for the region, as defined in Section 2.1, are mining, agriculture, and in some areas, residential. The proposed location of the RTSF is currently being used for agricultural purposes. If not used for mining (the no-go option), possible alternative land uses for the proposed RTSF and associated infrastructure site include commercial agriculture, grazing, or low-cost housing. The proposed location of the CPP is also currently situated on historical agricultural land between historical TSFs. If not used for mining, the potential contamination from the historical TSFs negates the possibility of viable alternative land uses. Existing / historical TSFs will remain on their present locations together with associated impacts.

3.4.2 Mining Method and Infrastructure

Reclamation of the historical TSFs is bound by the current footprint of these resources. The proposed RTSF site is situated on unmined land over agricultural fields. This location is primarily selected by positive underlying geological strata, i.e. not underlain by dolomite, and the available land area to allow for the proposed tonnage capacity.

Alternative routing options for linear infrastructure and the proposed CPP and RTSF locations can be re-considered to minimise or remove negative impacts on heritage resources.

4 Cultural Heritage Baseline Description[5]

The cultural baseline considers the regional and local context of the WRTRP as defined in Section 2.1 above. The initial implementation phase of the WRTRP as outlined in Section 3.2 clearly indicates that activities are primarily associated with the reclamation of historical TSFs and the depositions of tailings on the new RTSF, the proposed location of which is to a large extent based on the absence of underlying dolomite but has been the outcome of two independent site selection studies. Based on these primary activities, impacts to palaeontological and archaeological resources are fairly limited. As such, these periods are briefly described.

The structure of the cultural heritage baseline is as follows:

- The first part of this section summarise the regional and local study areas as defined in Section 2.1 above. Here information in regards to the geology and archaeology are briefly described. The historical period of the landscape is described in more detail. A brief description of the development context as relevant to heritage is also presented herewith;
- The second part focusses on the site-specific study area of the initial implementation phase of the WRTRP. Here, specific possible issues of concern are highlighted.

The various periods considered as part of this baseline are summarised in Table 4-1 below.

Table 4-1: Periods considered in the cultural heritage baseline profile (adapted from Winter & Bauman 2005)

1 Palaeontological and geological
Precambrian to late Pleistocene (1.2 billion to approximately 20 000 years ago)
2 Indigenous
Early Stone Age: approximately (ca.) 3 million years ago (Ma) to 300 000 years ago (Ka) (ESA)
Middle Stone Age: ca. 300 Ka to 30 Ka (MSA)
Later Stone Age: ca. 30 Ka to 2000 years ago (LSA)
Late Farming Communities (c. 1000 to 1840) (LFC)
3 Colonial
British colony (1814 -1910)
4 Historical
Union of South Africa (1910-1961)
Apartheid Republic of South Africa (1961-1994)
Democratic Republic of South Africa (1994-Present)

[5] As stated in Section 2.2.1, the cultural heritage baseline profile is summarised from the literature review attached as Appendix B; sources are not cited in the text of this report, but are referenced in the Appendix.

4.1 Screening Assessment: Regional and Local Study Area

4.1.1 Regional Geology

The Karoo Supergroup is underlain by the Transvaal Supergroup, which is preserved in three structural basins. Of these basins, the Transvaal Basin is of consequence here and dates from 2650 – 290 mya (*The Vaalian Erathem*). The Transvaal Supergroup comprises of the Pretoria and Chuniespoort Group formations.

The regional geology based on the 1:250 000 Geological Map 2626 West Rand series suggests that the lithographies are associated with the Pretoria Group. The Pretoria Group comprises of several formations including Rooihoogte, Timeball Hill, Boshoek, Hekpoort, Strubenkop, Daspoort and Silverton. The upper Pretoria Group is approximately 6 – 7 km thick and comprises of predominant mudrock alternating with quartzitic sandstone, significant interbedded basaltic-andesitic lavas and subordinate conglomerate, diamictite and carbonate rocks, all of which have been subject to low-grade metamorphism. This group forms a prominent east-west trending ridges in the vicinity of the WRTRP. Extensive diabase sill intrusions, as characterised by its highly positive magnetic signature in the aeromagnetic survey, is evident as intrusions in the Silverton shale and Timeball Hill siltstone-shale sequences.

The Malmani Subgroup dolomite of the Chuniespoort Group has an inherent stromatolitic nature and has the potential for karst topography to develop. Karst topography refers to landscapes formed from the dissolution of soluble rocks, including dolomite and limestone. Dissolution of these soluble Malmani dolomites created voids – karst caves – that filled with fine- to coarse-grained alluvium during periodic flooding. The alluvium may be represented by bodies of breccia, sandstone and siltstone.

The Witwatersrand Supergroup lithostratigraphy dates to 2800 – 2650 mya. The West Rand Group of the Witwatersrand Supergroup comprise of formations consisting of quartzite, shale and minor / subordinate conglomerate.

4.1.2 Local Geology

The geology map of the area indicates that the development footprint is covered with Quaternary age sediment. However, the quaternary sediment was only found partially on site while shale and diabase outcrop are common. Information regarding the local geology of the WRTRP was obtained from percussion-drilled borehole logs for this project and data collected by Golder in 2009. Twenty-eight boreholes from around the vicinity of the proposed development footprint of the RTSF were drilled.

The ultimate WRTRP area is underlain by a gentle sloping stratum, dipping toward the south at angles between 10˚ to 20˚. The stratigraphic succession along three deep exploration boreholes (more than 3000 m) in a north-south geological cross section is illustrated in Figure 4-1.

The geological profiles of the boreholes show that the development footprint of the proposed RTSF is underlain (from north to south) by Strubenkop shale, Daspoort quartzite and Silverton shale units. In addition to shales, sills of diabase intrusions were also encountered in some boreholes. No dolomite was encountered in any of the boreholes. The dolomite is expected to be more than 1500 km underneath the proposed RTSF development footprint, based on deep exploration boreholes drilled at the Goldfields TSF site.

In addition to this stratigraphic profile, two north-south striking negative magnetic diabase dykes (Gemsbokfontein No.1 and No.2 dykes), associated with the Pilanesburg tectonic event (~1 300 Ma) pass approximately 1 km east of the proposed RTSF development footprint area.

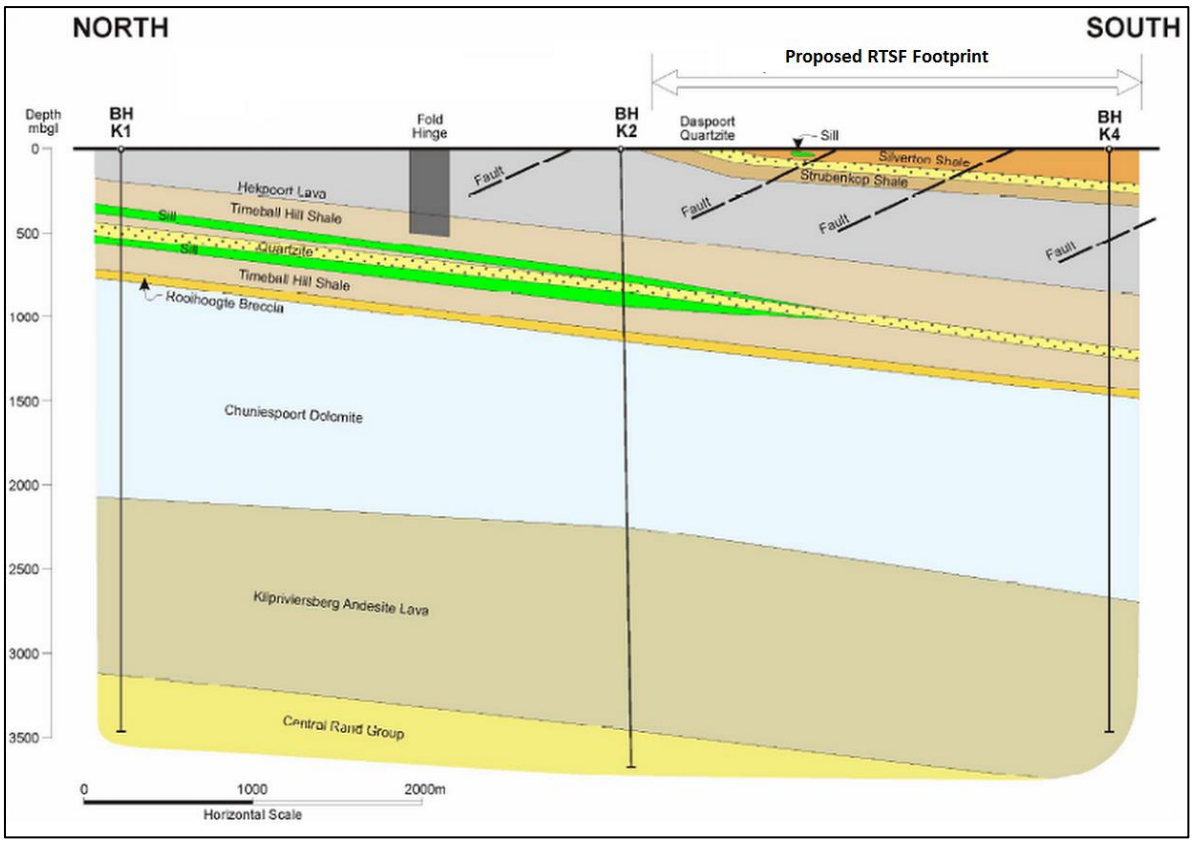

Figure 4-1: Geological cross-section over the proposed development footprint of the RTSF

4.1.3 Palaeontological Sensitivity[6]

Palaeontologically, the lithostratigraphic units underlying the study area have a palaeo-sensitivity ranging from zero to high. The most sensitivity lithologies are associated with the Malmani Subgroup. The detritus associated with karst caves can include diverse animal bone fragments including hominid remains and tools, similar to those excavated from the Sterkfontein Caves in the Cradle of Humankind (CoH) Wold Heritage Site (WHS), which is the most significant example of a karst landscape in the region.

Significantly, the International Union for Conservation of Nature (IUCN) considers caves and karsts as generally protected world heritage. The IUCN Wold Commission on Protected Area (WCPA) created two working groups which focus on the management of geological protected areas and heritage: the Geoheritage Specialist Group (GSG) and the Caves and Karst Specialist Group (CKSG). These two groups have published guidelines that need to be considered within the South African legal framework pertaining to both protected areas and world heritage.

Palaeontologically the West Rand Group is not sensitive and has insignificant / zero fossil potential. It is not considered further in this report.

[6] This section was compiled by Justin du Piesanie (based on literature cited in the Literature Review and palaeontological information obtained from the SAHRIS).

Table 4-2: Underlying geology of the WRTRP

Ma	Eon	Era	Period	Lithostratigraphic units			Lithology	Sensitivity	Fossils
266-	PHANEROZOIC	PALAEOZOIC	Permian	Karoo Supergroup	Ecca Group	Waterford Formation	Shale, with sandstone-rich units present towards the basin margins in the south, west and northeast and coal seams in the northeast	Moderate	Range of non-marine trace fossils, vascular plants (including petrified wood) and palynomorphs of Glossopteris flora, mesosaurid reptiles, fish (including microvertebrate remains, coprolites), crustaceans, sparse marine shelly invertebrates (molluscs, brachiopods), microfossils (radiolarians etc), and insects.
						Fort Brown Formation			
						Ripon Formation			
						Collingham Formation			
						White Hill Formation			
290-						Prince Albert Formation			
	PROTEROZOIC	EOPROTEROZOIC	Vaalian	Transvaal Supergroup	Pretoria Group	Silverton Formation	High-alumina shale, marine mudrock with minor carbonate	Moderate	Pretoria Group subunits with stromatolites may also contain microfossils
						Daspoort Formation	Sandstone and mudrock	High	Potential fossileferous late Cenozoic cave breccias within outcrop area of carbonate
						Strubenkop Formation	Lacustrine mudrock with minor sandstone	Low	Potential fossileferous late Cenozoic cave breccias within outcrop area of carbonate
						Hekpoort Formation	Basalts and pyroclastics with minor lacustrine shale	Moderate	Potential fossileferous late Cenozoic cave breccias within outcrop area of carbonate
						Boshoek Formation	Sandstone, conglomerat, diamictite	Low	Potential fossileferous late Cenozoic cave breccias within outcrop area of carbonate
						Timeball Hill Formation / Klapperkop Quartzite Member	Lacustrine and fluvio-deltaic mudrock with diamictite, conglomerate, quartzite and minor lava	High	Potential fossileferous late Cenozoic cave breccias within 'Transvaal Dolomite' outcrop
2420-						Rooihoogte Formation	Basal breccio-conglomerate, quartzite, mudrock and carbonate	Low	Possible microfossils
						Duitsland Formation	Carbonaceous mudrock, limestone, dolomite with subordinate conglomerate, diamictite and lava		
						Penge Formation	Banded iron formation with iron ore, chert, ferruginous mudrock		
					Chuniespoort Group / Malmani Subgroup	Frisco Formation	Mainly stromatolitic dolomite, shale	High	Range of shallow marine to intertidal stromatolites (domes, columns etc), organic-walled microfossils. Early continental shelf environments (margins of Kaapvaal Craton). Potential fossileferous late Cenozoic cave breccias within 'Transvaal Dolomite' outcrop area, similar to Sterkfontein karst topography
						Eccles Formation	Cherty dolomites, erosion breccias		
						Lyttelton Formation	Shales, quartzites and stromatolitic dolomite		
						Monte Christo Formation	Erosive breccia, stromatolitic and oolitic platformal dolomite		
2500-						Oaktree Formation	Carbonaceous shale, stromatolitic dolomite, locally developed quartzite		
2650-						Black Reef Formation	Relatively mature quartz arenites with lesser conglomerate and sub-ordinate mudrock		
	ARCHAEAN	MESOARCHAEAN	Randian	Witwatersrand Supergroup	West Rand Group / Government Subgroup	Afrikander Formation	Quartzite, shale, minor/subordinate conglomerate	Zero	None
						Elandslaagte Formation			
						Palmietfontein Formation			
						Tusschenin Formation			
						Coronation Formation			
						Promise Formation			
					West Rand Group / Hospital Hill Subgroup	Bonanza Formation	Subequal shale and quartzite, minor conglomerate		
						Brixton Formation			
						Parktown Formation			
2800-						Orange Grove Formation			

4.1.4 The Stone Age

The cave system associated with the Fossil Sites of South Africa World Heritage Site (*colloquially referred to as the Cradle of Humankind*) provides evidence for occupation dating back at least 2.3 mya. The CoH is located some 40 km north-east of the southern extent of the project area. Fossil remains found within this region have been associated with *Australopithecus africanus*, *Paranthropus*, *Homo habilis* and recently a new hominid species, *Australopithecus sediba.*

Homo habilis is considered the first stone tool producer and has long been associated with the crude Oldowan tool industry of the Early Stone Age (ESA). These tools are known to occur within the CoH.

Surface scatters of Middle Stone Age (MSA) and Late Stone Age (LSA) lithics have been recorded throughout the region, however these finds are commonly not found *in situ* and provide limited contextual information. *In situ* deposits such as those found at Uitkomst Cave located 23 km north of Krugersdorp provide more reliable contextual information. LSA lithics are commonly associated with the San, the original hunter-gatherer inhabitants of the region before the arrival of farming communities. The San refined lithic technologies during the LSA, producing a micro-lithic tool kit. In addition to this, the San are also producers of rock art and rock engravings. These sites have been recorded within the Magaliesberg region to the north of the SGL Project Area.

4.1.5 Farming Communities

In addition to the Stone Age, Uitkomst Cave also produced stratigraphic evidence for farming community occupation dating from the 15th century onwards. This period marks the arrival of Bantu-speakers who brought with them agriculture and iron making skills. Archaeologically, common identifiers of this period include ceramics and stone walled settlements.

Ceramics commonly found in this region are associated with the *Uitkomst* and *Ntsuanatsatsi facies*. *Uitkomst* is characterised by the presence of comb stamping in pendant triangles and horizontal bands below the rim, pots and bowls in combinations with burnish or ochre burnish, rim notches, applied bands, small amount of decorated pieces, spherical or bag shaped and open bowls. *Ntsuanatsatsi* is characterised by comb stamping and finger pinching decoration techniques and has been identified as a local variant of the *Uitkomst facies.*

Stone walled settlements identified in the region are classified as Type N and Klipriviersberg. Type N settlements are characterised by a group of primary enclosures arranged in a ring and linked by secondary walling to form a secondary enclosure. Some detached structures occur within the enclosure and these settlements. Klipriviersberg type sites occur in southern Gauteng and consist of scalloped stone walled structures, small stock kraals and surrounded by residential zones. These sites are believed to date to between the 16th and 18th century.

Farming community stone-walled settlements have been recorded on historic topographic maps and specifically the farms of Driefontein 113 IQ and Driefontein 355 IQ. These stone-

walled settlements each comprise central cattle kraals and are surrounded by residential zones and small stock enclosures, possibly dating to 1650-1750 AD. Undiagnostic ceramic potsherds and grindstones were found scattered on the surface of the enclosures.

Farming community settlements within this region are thought to be associated ethnographically with the baTswana and Fokeng. The Fokeng are believed to have moved into the region during the 16th century, sometime after the baTswana. The baTswana of this region are affiliated primarily with three chiefs, namely Morolong, Masilo, and Mokgatla. Morolong established the baRolong. Masilo (who ruled in northern Witwatersrand during the 15th century) founded the baHurutshe group and after his death, the baKwena group was formed. Mokgatla, who governed over the north-eastern Witwatersrand and Pretoria area during the 15th and 16th centuries, started the baKgatla lineage which subsequently founded the baTlokwa and the baPedi groups.

With the influx of farming communities and the subsequent divisions and assimilations of groups, the region still remained relatively stable from a political perspective. This was disrupted by the period referred to as the *Mfecane* of the 19th century, a period of great political and social upheaval.

4.1.6 The Historical Period

The historical period is commonly associated with contact between white Europeans with black Bantu-speaking African groups, and consequent *written* records[7]. The first large immigration into the region by whites is associated with the 1830s Voortrekker migrations from the Cape Colony. This migration closely coincided with the aftermath of the *Mfecane*.

The *Mfecane* refers to the period 1815 to 1840 during which large-scale population displacement occurred in the South African interior. The Mfecane stemmed from expansion spearheaded by the Zulu general Mzilikazi and his army out of KwaZulu-Natal. During this time, different groups assimilated and realigned political affiliations to increase their political strength. In some instances this manifested as new identities. As the *Mfecane* spread, they would attack and pillage settlements, displacing large groups of people.

As the early white migrants entered the interior during the 1830s, they found large areas apparently uninhabited, due to *Mfecane* displacement. These 'empty lands' were claimed as sovereign white European property on which they established settlements and towns as they journeyed northwards. However, the Voortrekkers and later Boers encountered resistance from the original black inhabitants as evidenced in the many historically recorded skirmishes, battles and wars between the Voortrekkers / Boers and various tribes during the 19th century.

[7] The author acknowledges that in southern Africa the last 500 years represents a formative period that is marked by enormous internal economic invention and political experimentation that shaped the cultural contours and categories of modern identities outside of European contact. This period is currently not well documented and is being explored through the 500 year initiative.

The Boers were soon followed into the interior by the British who sought to instate British Imperial rule over the newly established Boer Republics. From the 1880s, Boer – British tensions heightened, culminating in the Transvaal War of 1880-1881. Potchefstroom, one of the first established towns in the region, was occupied by the British who established a fort there. After the end of this war, animosity between these two groups remained.

Although evidence of gold bearing deposits in the region was reported as early as 1834, these claims were not explored thoroughly until the late 1880s. In 1886 the Witwatersrand Reef was discovered and resulted in the Transvaal gold rush. George Harrison, an Australian prospector, discovered gold between the farms of Wilgespruit and Langlaagte. An informal tented mining settlement known as Ferreira's Camp was established on the farm Turffontein. This camp grew extensively after the *Zuid Afrikaansche Republiek* (ZAR) president Paul Kruger declared the area as public diggings. Ferreira's Camp expanded within a short period, resulting in the official establishment of Johannesburg on the 20 September 1886.

The population expanded from 300 to 3000 within one year of the establishment of Johannesburg. By the mid-1890s more than10 000 people were living in the city, including black labourers from all over the country. During this time, many of the large mining companies still in operation today were established, such as Gold Fields of South Africa Limited founded in 1887. Johannesburg was soon followed by other mining towns that included the West Rand towns of Krugersdorp (1887) and Randfontein (1890).

The discovery of gold exacerbated tensions that remained after the Transvaal War. The British sought to bring the then ZAR / Transvaal goldfields under British control. This resulted in the failed 1895 Jameson Raid led by Leander Jameson. Jameson was a close ally of Cecil John Rhodes, 7th Prime Minister of the British Cape Colony and co-founder of Gold Fields of South Africa Limited. The raid was intended to cause an uprising among British subjects in the Witwatersrand area. However, due to communication errors, the Boers were warned of the raid and captured Jameson and his men at Doornkop, near Krugersdorp. This was an important catalyst for the South African War of 1899 to 1902.

During this war gold prospecting on the West Rand was actively pursued. However, the main West Rand gold deposit of Gatsrand was only discovered in the 1930s. Guy Carleton Jones, a mining engineer, bought the prospecting rights for the area and formed the West Witwatersrand Area Limited mining company in 1932.

From the 1930s, mining became the primary economic activity within the urban and industrial areas of the West Rand. This increased and diversified the population through the introduction on mainly black migrant labour to work on the mines. Active segregation between whites and blacks occurred early on under the British Union of South Africa (1910 to 1961). However, it became institutionalised after the National Party rose to power in 1940s, giving rise to the Apartheid Government.

From 1948, several laws such as the Group Areas Act (1950), the Natives Laws Amendment Act (1952) and the Bantu Homelands Citizens Act (1970) were promulgated. These Acts

strictly controlled the movement of non-whites, including areas they were permitted to settle. One result was the creation of the 'Khutsong Location' (now Township) in 1958. Many black people who had formerly lived on farms as labourers or in the mining compounds, but were forcibly relocated into the location.

4.1.7 Current Development Context

The proposed project is situated within the municipalities as presented in Table 4-3.

Table 4-3: Municipalities within which the proposed project is situated

District Municipality	Local Municipality
West Rand District Municipality (WRDM)	Merafong City Local Municipality (MCLM)
	Randfontein Local Municipality (RLM)
	Westonaria Local Municipality (WLM)
City of Johannesburg Metropolitan Municipality (CoJ)	

The West Rand local municipalities comprise a combined population of 458 573 individuals, of which 27.6% are unemployed. Demographically, these municipalities contain low numbers of skilled individuals (*less than 16% of individuals completed secondary school*), high unemployment rates and high dependency ratios.

The various IDPs contain plans and initiative to address the economic climate of the region and stimulate economic growth. The primary economic drivers within these municipalities are mining and agricultural industries, although these have limited employment opportunities for unskilled persons. Tourism is identified as a viable alternative to these industries, and a potential alleviator of pressure on the economically disenfranchised.

The emphasis within the WRDM-IDP is the heritage tourism associated with the Fossil Hominid Sites of South Africa World Heritage Site, referred to colloquially as the Cradle of Humankind (CoH) situated within the WRDM. Currently with the pressure experienced between mining, agriculture and tourism, the municipality has developed an Environmental Management Framework (EMF) in accordance with Section 24(2) of the NEMA that considers all heritage resources. The objectives of this framework include:

- Identification of the key environmental parameters;
- Define and spatially represent the status quo emphasising sensitive environments;
- Identify and develop an outline of the strategies required to reach the desired state; and
- Develop implementation / action plans for the various strategies.

The CoJ covers an area of 1 645 km^2 with a total population of 4 434 827, contributing approximately 17% to the South African economy. At a regional level, Region D, within which the project is located, is the most densely populated region of Johannesburg comprising 24.4% of the population.

Although financial services remain the primary contributor to the CoJ's economy, other sectors that will absorb skills and provide employment opportunities have been identified as key economic developments. The CoJ IDP identified ten priorities to achieve economic development, one of which was 'resource resilience'. Here, economic growth is strongly inter-related with the demand for water, electricity, liquid fuel and *mining*. The CoJ IDP identified management of limited natural resources as important, emphasising sustainable use principles of "reduce, reuse and recycle". Significantly, the CoJ IDP considers mine dumps in the context of limited resources.

Another priority identified in the 2013/16 IDP is infrastructure development. The Spatial Development Framework (SDF) defines the principles of sustainability where one of the desired outcomes is the responsible use, protection and conservation of the city's cultural heritage resources. If the desired outcomes of the 2013/16 IDP are achieved, consideration of the cumulative impacts on diverse heritage resources within the CoJ must be made to ensure the sustainable use, protection and conservation of the city's cultural heritage resources.

4.2 Site Specific Study Area (Initial Phase)

4.2.1 Geology and Palaeontological Sensitivity[8]

The Karoo Supergroup is known for its terrestrial fossil heritage. However, the Ecca Group lithostratigraphy has been assigned with a moderate palaeosensitivity. Potential fossil heritage include a range of non-marine trace fossils, vascular plants (including petrified wood) palynomorphs of Glossopteris flora, mesosaurid reptiles, fish (including microvertebrate remains, coprolites), crustaceans, sparse marine shelly invertebrates (molluscs, brachiopods), microfossils (radiolarians), and insects.

The Malmani Subgroup as described under Section 4.1.3 has a high palaeontological sensitivity for two reasons. First, stromatolitic dolomite contains stromatolites and organic-walled microfossils: stromatolites represent the oldest fossil evidence of cyanobacteria. Second, the dolomite is conducive to karst topography and associated cave formation and breccia. The presence of Malmani dolomite in the project area should therefore be highlighted as a sensitive area, probably associated with the more extensive CoH karst landscape and therefore under possible protection. In fact, one of the reasons this project is considered is that historical TSFs are situated above the dolomite that if under the correct conditions have the potential to be unstable and create sinkholes.

[8] This section was compiled by Justin du Piesanie based on literature cited in text and palaeontological information obtained from the SAHRIS.

The Pretoria Group formations have a palaeontological sensitivity ranging from low to high. This sensitivity rating is based on the potential for fossilserous cave breccia located within outcrops of the carbonate subunits associated with the Malmani dolomite, rather than the various formations associated with it.

4.2.2 The Stone Age

Studies conducted within the study area south of Westonaria have identified lithics affiliated with the MSA and LSA. These lithics were identified in isolated surface scatters and outside of discernible context, therefore providing limited scientific information beyond form, function and technique of manufacture.

4.2.3 Farming Communities

Evidence for Late Farming Community occupation within the study area has been recorded. Stone walled settlements categorised as Type N were identified on the farms Driefontein 113 IQ and Driefontein 355 IQ. These sites were however damaged and/or destroyed through mining activities during the 1990s.

A review of the historic aerial imagery suggests that stone walled settlements occur on the farms Rietfontein 349 IQ Portion 73, Doornkloof 350 IQ Portions 1, 21 & Re within the ultimate project area. The presence of these sites was not confirmed during the scoping site visit as they were outside of the proposed routing options, existing servitudes and development footprint of the CPP and RTSF.

4.2.4 The Historical Period

As discussed under Section 4.1.6, when the Voortrekkers moved into the region it was perceived as uninhabited and large tracks of land were divided and distributed amongst the settlers. The area east of Potchefstroom became known as Gatsrand.

With the discovery of gold and the establishment of more towns came an increase in the population. This necessitated the establishment of services. These came in the form of postal services and routes through the farms Kalabasfontein and Cardoville, establishment of a railway, schools and health services.

During the Transvaal and South African Wars, Gatsrand was used as a tactical position by the British as it was close to the western railway and occupied Potchefstroom. Three blockhouses were built on the Gatsrand on the farms of Modderfontein, Bank Station and Vlakfontein, and temporary camps are suggested to have been located on the farms of Driefontein 113 IQ and Driefontein 355 IQ.

Large commercial mining was established in the project area during the 1930s onwards. These included Venterspost (1934), Libanon (1936), West Driefontein (1945), East Driefontein (1968) and later Kloof (1968). This became the primary economic stimulant within the West Rand, attracting migrant work seekers into the region.

In 1973, 12 mine workers were shot by police during riots at Anglo American's Western Deep Levels Mine near Carletonville. The reason behind the protest was claimed as a wage dispute between mine workers and mine management. The incident sparked international interest and several other violent protest and riots broke out at mines across the country. The riots were handled with violent actions from police and this had appeared to be successful in the short term. Long-term effects of this approach became clear when mine unions were established. The mine workers were unhappy about how they were treated in compounds and dissatisfied with their wages, so unions were established to negotiate with mine management. By 1975 Anglo American supported the idea of African unions and pledged to work with them. Today, the main mine union in the area is the National Union of Mineworkers (NUM) which was established in 1982 although currently being challenged by the AMCU.

As discussed under Section 4.1.6 the formalisation of segregation under the Apartheid government came into force during this time. A number of political events happened in the study area during the Apartheid era, some of which were recorded through the Truth and Reconciliation Commission.

One such event occurred in 1986, where Zondo Sithole and Shadrack Mzimkhulu "Mzoozie" Goliath were killed by police officers. They were allegedly planning to bomb the Khutsong Police Station and the Khutsong Municipal Offices. A protest was organised at the Khutsong Stadium which turned violent and 10 people were killed. This sparked a consumer boycott on all shops in the Carletonville and Khutsong area. Another in 1989 consisted of a mock trial held against the Apartheid government and residents joined in the movement "Operation Vula" which sought to disrupt government activities, private business and courts. Accounts of police brutality were recorded, as police in the area claimed that individuals who had died in police custody had died due to alleged epileptic fits. Later the Truth and Reconciliation Commission found these reports to be false and found the police guilty of the death of individuals such as Eugene Mbulawa and Nixon Phiri.

4.3 Scoping Survey Findings

A scoping survey was undertaken by Natasha Higgitt on 16 February 2015. The proposed routing options, WBT and BWS, and RTSF, RWD and AWTF development footprint were assessed as far as possible through vehicular survey, employing non-intrusive techniques. (Refer to Section 2.2.2 for a detailed description of the methodology employed).

A total of nine heritage resources were identified during the reconnaissance survey. This does not represent an exhaustive list of heritage resources within the site specific study area, but does reinforce our understanding of the types of heritage resources that are likely to occur.

The results from the reconnaissance survey are summarised in Table 4-4 below. A plan of the area covered and identified heritage resources is provided in Appendix C.

Table 4-4: Identified Heritage Resources within the initial implementation phase of the WRTRP

4.3.1 Ste-001 / Historical Structure

	Co-ordinates	
	-26.471092	27.618616
Abandoned dwelling. Structure is constructed with a stone façade. Ste-001 is located approximately 50 m from the proposed CPP to RTSF tailings pipeline route. The structure has three rooms and some wooden windows are still intact. No other structures or heritage resources were identified within close proximity to Ste-001.		
		

Figure 4-2: View of Ste-001

4.3.2 Wf-002 / Werf

	Co-ordinates	
	-26.478533	27.617049
Identified abandoned werf located within the proposed RTSF development footprint. The werf comprises of an abandoned, dilapidated residential structure with a corrugated iron roof and wrap around porch, outbuildings, water tank and reservoir. The extent of the site is approximately 200 m x 100 m.		
		

Figure 4-3: View of the house of Wf-002

4.3.3 Wf-003 / Werf

	Co-ordinates	
	-26.475071	27.614659
Identified abandoned werf located within the proposed RTSF development footprint. The werf comprises of an abandoned, dilapidated residential structure with a corrugated iron roof and farmworker housing some 300 m north-west. A small brick structure is located directly adjacent to the main house.		

Figure 4-4: View of the house of Wf-003

4.3.4 Ste-004 / Historical Structure

	Co-ordinates	
	-26.480402	27.634173
Abandoned dwelling that is in a state of ruin. The structure is built of stone and has through time collapsed. Only some of the outer walling still stands. The internal structure has collapsed and no roof remains. The ruined dwelling is situated approximately 600 m north-east outside of the proposed RTSF development footprint. No other structures or heritage resources were identified within close proximity to Ste-004		

Figure 4-5: View of Ste-004

4.3.5 Wf-005 / Werf

	Co-ordinates	
	-26.478758	27.628762
Identified historical werf that comprises of primary three structures. The thatch rondavel appears to be more recent and maintained, whereas the other structures appear abandoned. The werf comprises of the three primary structures and a reservoir covering an extent of approximately 150 m x 120 m. It is located approximately 500 m from the proposed RTSF development footprint.		
  Figure 4-6: View of structures associated with Wf-005		

4.3.6 Ste-006 / Historical Structure

	Co-ordinates	
	-26.423656	27.635826
Abandoned structure that is in a state of ruin. Only larger primary walling remain, and no evidence of windows or roof remains. The structure was built of stone. Ste-006 is located approximately 900 m from the proposed CPP to Ezulwini Uranium Rich Tailings pipeline route.		
 Figure 4-7: View of Ste-006		

4.3.7 Wf-007 / Werf

	Co-ordinates	
	-26.421532	27.684837
Identified werf situated approximately 150 m from the proposed CPP to Ezulwini Uranium Rich Tailings pipeline route. The werf comprises of historical residential structures, water tower and storage silos. The werf can also be identified by three large oak trees that are located around the residential structures. The werf is abandoned and the structures are dilapidated. The primary outside and inside walls of some of the structures remains, but no roofs, windows, doors or fixtures remain.		

Figure 4-8: View of one of the residential structures of Wf-007

4.3.8 Wf-008 / Werf

	Co-ordinates	
	-26.419910	27.621394
Modern werf that is still occupied and in good condition. One residential structure and other outbuildings were recorded. The werf extent is approximately 150 m x 200 m. The residential structure is situated approximately 30 m from the road, which is a proposed routing for the CPP to Ezulwini Uranium Rich Tailings pipeline. The werf is also located approximately 100 m from the proposed CPP development footprint.		

Figure 4-9: View of residential structure within Wf-008

4.3.9 Wf-009 / Werf

	Co-ordinates	
	-26.404282	27.413655
Identified abandoned werf. Remaining structures are in a state of ruin and collapse. Only foundations and remnants of a reservoir remain. The extent of the werf is indicated by 'ornamental' trees that surround the location of ruined structures. The approximate extent of the werf is 50 m x 70 m. The werf is situated approximately 100 m from the proposed Driefontein 3 to Driefontein 5 Slurry pipeline route.		

Figure 4-10: Location of Wf-009 marked by trees

5 Provisional Statement of Significance

Heritage resources are intrinsic to the history and beliefs of communities. They characterise community identity and cultures, are finite, non-renewable and irreplaceable. Considering the innate value of heritage resources, the foundation of HRM is the acknowledgment that heritage resources have lasting worth as evidence of the origins of life, humanity and society. Notwithstanding the inherent value ascribed to heritage, significance of resources needs to be determined to allow implementation of appropriate management. This is achieved through assessing heritage resources value relative to certain prescribed criteria encapsulated in policies and legal frameworks as discussed under Section 1.3.

The importance of a heritage resource is determined on four dimensions – aesthetic, historic, scientific and social which in turn are measured against one or more descriptive attributes. This aims to guide whether a resource should be included in the national estate as defined in the NHRA and international conventions.

Table 5-1: Summary of dimensions and attributes

Dimension	Attributes considered		NHRA 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)

To provide a provisional Statement of Significance for the cultural landscape, the various types of potential heritage resources located within the ultimate WRTRP were assessed against the dimensions and attributes presented in Table 5-2.

The DWE Heritage Impact Matrix Methodology can be made available to interested parties on request.

Table 5-2: Provisional Statement of Significance

Resource ID	Aesthetic	Historic	Scientific	Social	INTEGRITY	VALUE
Malmani Subgroup and karst caves	-	-	5	-	4	20
Archaeological sites with good integrity	4	4	4	-	3	12
Archaeological sites with poor integrity	0	5	2	-	1	2
Historical sites associated with living communities - good integrity	4	3	3	3	4	13
Historical sites associated with living communities - poor integrity	1	3	2	3	1	2
Historical sites not associated with living communities - good integrity	4	3	3	-	4	13

Resource ID	Aesthetic	Historic	Scientific	Social	INTEGRITY	VALUE
Historical sites not associated with living communities - poor integrity	1	3	2	-	1	2
Burial grounds and graves	-	-	-	5	4	20

The provisional statement of significance takes into consideration the various heritage resources known to occur within the region that contribute to the cultural landscape. Archaeological and historical sites were assessed on all dimensions and attributes. Palaeontological sites, karst caves and burial grounds and graves were assessed on select dimensions as applicable.

The result of the provisional assessment indicates that the cultural landscape within which the WRTRP is situated ranges predominantly from negligible to medium-high, with palaeontological sites / karst caves and burial grounds and graves being the notable exception.

These findings are congruent with our understanding of the cultural landscape as described in Section 4.

6 Discussion

Activities associated with the inclusion of the Venterspost North and South TSFs into the mining right area as outlined under Section 3.2.1 will have no physical impact. This activity of the initial implementation of the WRTRP poses no heritage risks or impacts, and is not considered further as part of HSR discussion or identification of potential heritage risks and impacts. The discussion presented below summaries the salient points of the cultural baseline in relation to the ultimate WRTRP with specific focus on reclamation activities of the initial implementation.

The regional study area is situated in a landscape that spans an extensive time period. Geologically, the project area is underlain by complex lithostratigraphy associated with the Witwatersrand, Transvaal and Karoo Supergroups. One of the reasons this project has been considered by SGL is that select historical TSFs are currently underlain by dolomites of the Malmani Subgroup. This increases the potential for groundwater contamination through AMD, radioactive contamination and historical TSFs to succumb to localised instability through the development of sinkholes. These factors highlight the need for the reclamation of these resources in addition to economic drivers.

Archaeologically, Stone Age sites are known to occur within the regional and local study area. When one considers the regional context, Stone Age sites associated with the CoH are highly significant. Geologically, the historical TSFs and some pipe routes of the site specific study area is underlain by the same dolomitic strata, therefore increasing the potential for similar deposits to those within the CoH. Identified Stone Age sites within the site specific study area are limited to surface scatters outside of any discernible context. These sites have been designated with low significance. No additional Stone Age sites were identified during the heritage scoping survey.

Stone walled settlements associated with late farming communities are known to occur within the regional and local study area. A review of the historic aerial imagery has demonstrated that sites identified on the farms Driefontein 113 IQ and Driefontein 355 IQ were damaged and/or destroyed through mining activities during the 1990s. Other sites found in the local study area however are situated outside of the current proposed development footprint of the WRTRP, with the exception of stonewalled settlements on the farm Rietfontein 349 IQ which are located in a proposed powerline routing from Kloof 1 to the CPP.

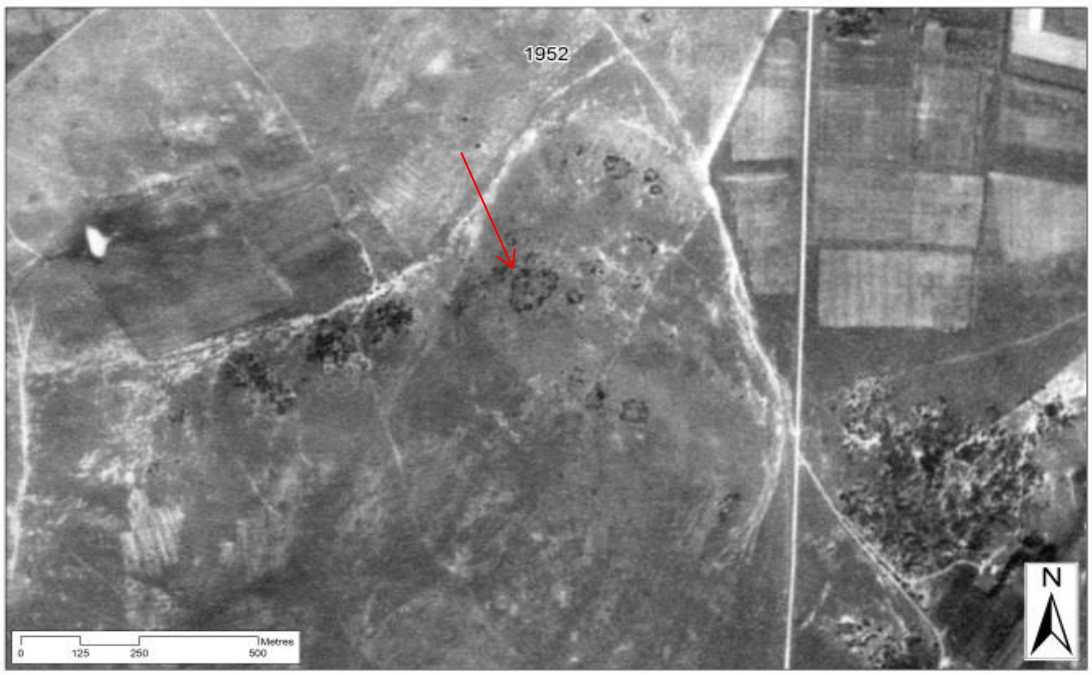

Figure 6-1: Identified stonewalled settlement on Rietfontein 349 IQ Portion 73 in 1952

The regional and local study area is strongly affiliated with the settlement of the region by the Voortrekkers and subsequent historical events. With the onset of the Transvaal and South African Wars, Gatsrand became a strategic location for British troops who occupied Potchefstroom. This region was located in close proximity to the Western Railway, which provided a tactical advantage. To exploit and protect this advantage, three blockhouses were constructed on the farms Driefontein 113 IQ and Driefontein 355 IQ. The presence of these structures will be confirmed during the impact assessment. The next major event to

take place on this region was the discovery of gold, which facilitated the establishment of several towns from the 1920s, an increase in population and an increase in services. Early mines established include Venterspost (1934), Libanon (1936), West Driefontein (1945), East Driefontein (1968) and later Kloof (1968). Shaped by these events and activities the study area has through time transformed into a historic mining landscape.

When one considers the cultural baseline as presented in Section 4 and summarised here, there is the potential for a diverse range of heritage resources within the study area. Although the potential for hominid sites and archaeological sites to occur is there, the study area is predominantly associated with the mining history of the West Rand. These findings contribute to the understanding of the sensitivities of the proposed project footprint. A sensitivity plan is presented in Figure 6-2, which assists in the identification of possible heritage risks to the WRTRP and potential impacts on heritage resources.

Plan 17

Sibanye WRTRP EIA

Heritage Sensitivity

Legend

- Infrastructure Points
- Identified Heritage Sites
- Historical Layering Points (1938)
- Historical Layering Points (1952)
- Major Town
- Other Town
- Settlement
- Pipeline Routing
- National / Arterial Route
- Main Road
- Railway Line
- Non-Perennial Stream
- Perennial Stream
- Dam Wall
- Dam / Lake
- Non-Perennial Pan
- Wetland
- Kloof Mining Right
- Driefontein Mining Right
- Cooke Mining Right
- Ezulwini Mining Right

Heritage Sensitivity

- High
- Medium - High
- Medium

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7 Possible Heritage Risks[9]

Heritage risks refer to potential issues that could arise *for* the proposed WRTRP based on both tangible and intangible heritage resources. Potential heritage risks are associated with:

- Risk of significant resources to project development; and
- Impact on heritage resources that may have repercussions to SGL.

These are discussed separately below.

7.1 Heritage Resources with High Significance

Heritage resources with a high significance are inherently sensitive to any development in so far that the continued survival of the resource could be threatened. In addition to this, certain heritage resources are formally protected thereby restricting various development activities. An example here would be the identification of historical and architecturally significant built structures within the development footprint of the RTSF.

One must also consider the contribution of the historical TSFs as tangible markers to the historic mining landscape, that when removed will alter the landscape to a modern mining landscape. This may result in opposition from conservation bodies to the complete change of sense-of-place through the removal of sensitive heritage features and indicators.

The primary risk associated with these types of resources is a negative Record of Decision and/or restrictions imposed on development activities.

7.2 Impacts on Heritage Resources

Project activities that impact negatively on heritage resources, such as burial grounds and graves, may have social repercussions. These could range from low-level issues to public confrontation and litigation. Reputational risk to SGL may also be experienced.

In addition, impacts on any heritage resource formally or generally protected in terms of the NHRA are an offence. Any impact that will change the nature or integrity of such resources must be permitted by SAHRA and / or PHRA-G. Failure to apply for the necessary permits may results in fines, penalties, seizure of equipment, compulsory repair or cease work orders, or imprisonment.

[9]The inclusion of the Venterspost North and South TSFs into the existing mining right area does not entail any physical impacts to the landscape. No heritage impacts are envisaged through the securing of Venterspost North and South. This activity is not considered under Possible Heritage Risks.

8 Possible Heritage Impacts[10]

Possible heritage impacts refers to the direct, indirect or cumulative impacts as defined in Section 2.1 on heritage resources through the proposed activities presented in Table 3-1. These are discussed per project phase separately below, and relevant recommendations are provided for each phase.

8.1 Heritage Impacts during Construction Phase

The construction phase poses a risk of direct negative impacts on heritage resources. Construction of the primary infrastructure will result in clearing activities including the development of access roads that may directly impact on heritage resources. Here, negative impacts such as damage and/or destruction are the greatest risk. Activities identified as sources of risk during construction include:

- Construction of the WBT, BWSF, CPP, RTSF, RWD and AWTF on unmined land will cause damage to or destroy any physical heritage resources that may be present in the development footprint areas;
- The construction of access roads in support of the infrastructure construction will cause damage to or destroy any physical heritage resources that may be present in the proposed routing and development footprint; and
- The installation of pipelines and power lines outside of existing servitudes will cause damage to or destroy any physical heritage resources that may be present within the development footprint.

8.1.1 Recommendations for Identified Construction Phase Heritage Impacts

It is recommended that development footprints associated with the construction of the primary infrastructure (i.e. CPP and RTSF) and access roads be assessed as part of the HIA. Where pipelines and power lines routings deviate outside of existing servitudes, these too must be considered during the HIA.

It is recommended that existing pipeline and power line servitudes be exempt from any further heritage assessment as these routings have already been disturbed.

All proposed activities will occur on the surface and not impact geological strata with palaeontological significance. It is recommended that exemption be granted from further palaeontological assessment.

[10] The inclusion of the Venterspost North and South TSFs into the existing mining right area does not entail any physical impacts to the landscape. No heritage impacts are envisaged through the securing of Venterspost North and South. This activity is not considered under Possible Heritage Impacts.

8.2 Operational Phase

During operation, the sources of risk to heritage resources are primarily restricted to the processes associated with the hydraulic reclamation of the historical TSFs. Here, the potential for exposure of heritage resources located beneath historical TSFs is high. An example is the discovery of Chinese indentured workers burial grounds during reclamation activities associated with the Crown Mines in Johannesburg. Reclamation activities will also result in a direct impact to the historic mining landscape.

To a lesser extent, the potential of pipe bursts and discharging of treated water into the Leeuspruit may also have negative direct impacts that damage or destroy physical heritage resources, for example a burst pipe discharging water may irreparably damage the structural integrity of historic built structures.

8.2.1 Recommendations for Identified Operational Phase Heritage Impacts

It is recommended that an HIA be undertaken that further considers the potential for heritage resources to be located within the existing footprints and takes into consideration the effect of reclamation activities to the historic sense-of-place.

All proposed activities will occur on the surface and not impact geological strata with palaeontological significance. It is recommended that exemption be granted from further palaeontological assessment.

8.3 Decommissioning Phase

No sources of risk to heritage resources are envisaged for the decommissioning phase of the project at this stage. However, if structures older than 60 or 100 years at the time of decommissioning exist, these may be impacted upon by decommissioning.

8.4 Cumulative Impacts

Cumulative impacts that may occur as a result of reclamation activities of the ultimate WRTRP include:

- An additive cumulative impact where with the gradual reclamation of individual historical TSFs will result in a reduction in the historic mining landscape;
- A synergistic cumulative impact will result when all historical TSFs have been reclaimed, resulting in a loss of the historic mining landscape, sterilising the historic landscape;
- Loss of the historic mining landscape could decrease the significance of the landscape on the West Rand while increasing the significance of the remaining *in situ* mining heritage resources in the greater Johannesburg region; and
- A neutralising cumulative impact may occur with the establishment of a modern mining landscape through the construction of the RTSF;

8.4.1 Recommendations for Identified Cumulative Heritage Impacts

It is recommended that an HIA be undertaken that takes into consideration the effect of reclamation activities to the historic sense-of-place.

9 Conclusion and Recommendations

The project area for the initial implementation phase of the WRTRP is located roughly 55 km to the south-west of greater Johannesburg. This area is intrinsically associated with the mining heritage of the larger region.

Geologically, the parts of the project area (specifically the historical TSFs) are underlain by dolomitic rock that has the potential for karst topography. Karst topography refers to landscapes formed from the dissolution of soluble rocks, including dolomite and limestone. Karst topography is characterised by underground drainage systems with sinkholes, dolines, and caves. This geological phenomenon creates karst caves that can filled with fine- to coarse-grained alluvium during periodic flooding. The alluvium may be represented by bodies of breccia, sandstone and siltstone which have an increased potential to contain archaeological material. This geological feature is one of the motivating factors in implementing the proposed project. Many of the historical TSFs are at risk of localised instability as the potential for sinkholes is high.

Archaeologically, Stone Age and Late Farming Community sites have been recorded within the larger area under consideration here. Stone Age lithics recorded have been found as surface scatters outside of any discernible context thereby limiting the information potential and overall significance of these resources. Late Farming Community sites within the region have primarily been identified as stone walled settlements classified as Type N and Klipriviersberg. One possible Late Farming Community site has been noted within the development footprint of the proposed linear infrastructure. This will be investigated further during the impact assessment.

Within regional, local and site specific contexts the project is located in historically significant mining-industrial and agricultural-rural cultural landscapes. In terms of the mining landscape, there are several features and markers such as the many of the historical TSFs created by the original mines established during the first half of the 20th century. The agricultural landscape is represented in turn by several werwe that were recorded.

9.1 Recommendations

The ultimate project falls within a predominantly historic mining landscape. The ultimate project will be assessed in the same manner as this report through time, however, these recommendations are focussed on the initial implementation of the WRTRP summarised as per Table 9-1.

Table 9-1: Recommendations for further study

Initial Implementation of the WRTRP	
Inclusion into Mining Right Area Activities	**Reclamation Activities**
▪ No physical activities are associated with the inclusion of the Venterspost North and South TSFs into mining right areas as part of the initial implementation of the WRTRP. This activity should be exempt from any further heritage studies.	▪ Exemption from further palaeontological assessment based on the current project activities; ▪ An HIA must be undertaken for the proposed infrastructure development footprint, including linear infrastructure outside of established servitudes. This must include the following components: ▪ An Archaeological Impact Assessment (AIA) including reconnaissance of the proposed development footprint of the CPP, RTSF, RWD and AWTF, and linear infrastructure outside of existing servitudes; ▪ An assessment of burial grounds and graves including reconnaissance to identify, record and document all burials that may exist in the development footprint; and ▪ Integration of additional specialist studies to determine any possible living heritage in the project area. ▪ Where linear infrastructure is contained within existing servitudes, these should be exempted from further heritage assessment

Appendix A: Specialist CV

Mr. Justin du Piesanie

Heritage Management Consultant: Archaeologist

Social Sciences Department

Digby Wells Environmental

1 Education

Date	Degree(s) or Diploma(s) obtained	Institution
2013	Continued Professional Development Programme, Architectural and Urban Conservation: Researching and Assessing Local Environments	University of Cape Town
2008	MSc	University of the Witwatersrand
2005	BA (Honours) (Archaeology)	University of the Witwatersrand
2004	BA	University of the Witwatersrand
2001	Matric	Norkem Park High School

2 Language Skills

Language	Written	Spoken
English	Excellent	Excellent
Afrikaans	Proficient	Good

3 Employment

Period	Company	Title/position
08/2011 to present	Digby Wells Environmental	Heritage Management Consultant: Archaeologist

Period	Company	Title/position
2009-2011	University of the Witwatersrand	Archaeology Collections Manager
2009-2011	Independent	Archaeologist
2006-2007	Maropeng & Sterkfontein Caves UNESCO World Heritage Site	Tour guide

4 Professional Affiliations

Position	Professional Body	Registration Number
Member	Association for Southern African Professional Archaeologists (ASAPA); ASAPA Cultural Resources Management (CRM) section	270
Member	International Council on Monuments and Sites (ICOMOS)	14274
Member	Society for Africanist Archaeologists (SAfA)	N/A

5 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

6 Experience

I have 5 years experiences in the field of heritage resources management (HRM) including archaeological and heritage assessments, grave relocation, social consultation and mitigation of archaeological sites. During my studies I was involved in academic research projects associated with the Stone Age, Iron Age, and Rock Art. These are summarised below:

- 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 Meyerdal, 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

Since 2011 I have been actively involved in environmental management throughout Africa, focusing on heritage assessments incompliance with International Finance Corporation (IFC) Performance Standards and other World Bank Standards and Equator Principles. This exposure to environmental, and specifically heritage management has allowed me to work to international best practice standards in accordance with international conservation bodies such as UNESCO and ICOMOS. In addition, I have also been involved in the collection of quantitative data for a Relocation Action Plan (RAP) in Burkina Faso. The exposure to this aspect of environmental management has afforded me the opportunity to understand the significance of integration of various studies in the assessment of heritage resources and recommendations for feasible mitigation measures. I have work throughout South Africa, as well as Burkina Faso, the Democratic Republic of Congo, Liberia and Mali.

7 Project Experience

Please see the following table for relevant project experience:

Project Title	Project Location	Date:	Description of the Project	Role of Firm in the Project	Own Role in the Project	Time involved (man months)	Name of Client	Contract Outcomes	Reference
Klipriviersberg Archaeological Survey	Meyersdal, Gauteng, South Africa	2005 2006	Survey of residential development in Meyersdal. This included the recording of identified stone walled settlements through detailed mapping and photographs. Included was the Phase 2 Mitigation of two stone walled settlements	Archaeological Impact Assessments	Researcher, Archaeological Assistant	2 months		Completed survey, excavations and reporting	Archaeological Resource Management (ARM) Prof T.N. Huffman thomas.huffman@wits.ac.za
Sun City Archaeological Site Mapping	Sun City, Pilanesberg, North West Province, South Africa	2006 2006	Recording of an identified Late Iron Age stonewalled settlement through detailed mapping	Mapping	Archaeological Assistant, Mapper	1 month	Sun City	Completed mapping	Archaeological Resources Management (ARM) Prof T.N. Huffman thomas.huffman@wits.ac.za
Witbank Dam Archaeological Impact Assessment	Witbank, Mpumalanga, South Africa	2007 2007	Archaeological survey for proposed residential development at the Witbank dam	Archaeological Impact Assessment	Archaeological Assistant	1 week		Completed Archaeological Impact Assessment report	Archaeological Resources Management (ARM) Prof T.N. Huffman thomas.huffman@wits.ac.za
Archaeological Assessment of Modderfontein AH Holdings	Johannesburg, Gauteng, South Africa	2008 2008	Archaeological survey and basic assessment of Modderfontein Holdings	Archaeological Impact Assessment	Archaeologist	1 month		Completed the assessment of 13 properties	Heritage Contracts Unit Jaco van der Walt jaco.heritage@gmail.com
Heritage Assessment of Rhino Mines	Thabazimbi, Limpopo Province, South Africa	2008 2008	Heritage Assessment for expansion of mining area at Rhino Mines	Heritage Impact Assessment	Archaeologist	2 weeks	Rhino Mines	Completed the assessment	Archaeological Resources Management (ARM) Prof T.N. Huffman thomas.huffman@wits.ac.za
Cronimet Project	Thabazimbi, Limpopo Province, South Africa	2008 2008	Archaeological survey of Moddergat 389 KQ, Schilpadnest 385 KQ, and Swartkop 369 KQ,	Archaeological Impact Assessment	Archaeologist	1 weeks	Cronimet	Completed field survey and reporting	Heritage Contracts Unit Jaco van der Walt jaco.heritage@gmail.com

Eskom Thohoyandou SEA Project	Limpopo Province, South Africa	2008 2008	Heritage Statement defining the cultural landscape of the Limpopo Province to assist in establishing sensitive receptors for the Eskom Thohoyadou SEA Project	Heritage Statement	Archaeologist	2 months	Eskom	Completed Heritage Statement	Heritage Contracts Unit Jaco van der Walt jaco.heritage@gmail.com
Wenzelrust Excavations	Shoshanguve, Gauteng, South Africa	2009 2009	Contracted by the Heritage Contracts Unit to help facilitate the Phase 2 excavations of a Late Iron Age / historical site identified in Shoshanguve	Excavation and Mapping	Archaeologist	1 week	Heritage Contracts Unit	Completed excavations	Heritage Contracts Unit Jaco van der Walt jaco.heritage@gmail.com
University of the Witwatersrand Parys LIA Shelter Project	Parys, Free State, South Africa	2009 2009	Mapping of a Late Iron Age rock shelter being studied by the Archaeology Department of the University of the Witwatersrand	Mapping	Archaeologist	1 day	University of the Witwatersrand	Completed mapping of the shelter	University of the Witwatersrand Karim Sadr karim.sadr@wits.ac.za
Transnet NMPP Line	Kwa-Zulu Natal, South Africa	2010 2010	Heritage Survey of the Anglo-Boer War Vaalkrans Battlefield where the servitude of the NMP pipeline	Heritage Impact Assessment	Archaeologist	1 week	Umlando Consultants	Completed survey	Umlando Consultants Gavin Anderson umlando@gmail.com
Archaeological Impact Assessment – Witpoortjie Project	Johannesburg, Gauteng, South Africa	2010 2010	Heritage survey of Witpoortjie 254 IQ, Mindale Ext 7 and Nooitgedacht 534 IQ for residential development project	Archaeological Impact Assessment	Archaeologist	1 week	ARM	Completed survey for the AIA	Archaeological Resources Management (ARM) Prof T.N. Huffman thomas.huffman@wits.ac.za
Der Brochen Archaeological Excavations	Steelpoort, Mpumalanga, South Africa	2010 2010	Phase 2 archaeological excavations of Late Iron Age Site	Archaeological Excavation	Archaeologist	2 weeks	Heritage Contracts Unit	Completed excavations	Heritage Contracts Unit Jaco van der Walt jaco.heritage@gmail.com
De Brochen and Booysendal Archaeology Project	Steelpoort, Mpumalanga, South Africa	2010 2010	Mapping of archaeological sites 23, 26, 27, 28a & b on the Anglo Platinum Mines De Brochen and Booysendal	Mapping	Archaeologist	1 week	Heritage Contracts Unit	Completed Mapping	Heritage Contracts Unit Jaco van der Walt jaco.heritage@gmail.com

Eskom Thohoyandou Electricity Master Network	Limpopo Province, South Africa	2010	2010	Desktop study to identify heritage sensitivity of the Limpopo Province	Desktop Study	Archaeologist	1 Month	Strategic Environmental Focus	Completed Report	Strategic Environmental Focus (SEF) Vici Napier vici@sefsa.co.za
Batlhako Mine Expansion	North-West Province, South Africa	2010	2010	Mapping of historical sites located within the Batlhako Mine Expansion Area	Mapping	Archaeologist	1 week	Heritage Contracts Unit	Completed Mapping	Heritage Contracts Unit Jaco van der Walt jaco.heritage@gmail.com
Kibali Gold Project Grave Relocation Plan	Orientale Province, Democratic Republic of Congo	2011	2013	Implementation of the Grave Relocation Project for the Randgold Kibali Gold Project	Grave Relocation	Archaeologist	2 years	Randgold Resources	Successful relocation of approximately 3000 graves	Kibali Gold Mine Cyrille Mutombo Cyrille.c.mutombo@kibaligold.com
Kibali Gold Hydro-Power Project	Orientale Province, Democratic Republic of Congo	2012	2014	Assessment of 7 proposed hydro-power stations along the Kibali River	Heritage Impact Assessment	Heritage Consultant	2 years	Randgold Resources	Completed Heritage Impact Assessment	Randgold Resources Charles Wells Charles.wells@randgoldreources.com
Everest North Mining Project	Steelpoort, Mpumalanga, South Africa	2012	2012	Heritage Impact Assessment on the farm Vygenhoek	Heritage Impact Assessment	Heritage Consultant	6 months	Aquarius Resources	Completed Heritage Impact Assessment	Aquarius Resources
Environmental Authorisation for the Gold One Geluksdal TSF and Pipeline	Gauteng, South Africa	2012	2012	Heritage impact Assessment for the proposed TSF and Pipeline of Geluksdal Mine	Heritage Impact Assessment	Heritage Consultant	4 months	Gold One International	Completed Heritage Impact Assessment	Gold One International
Platreef Burial Grounds and Graves Survey	Mokopane, Limpopo Province, South Africa	2012	2012	Survey for Burial Grounds and Graves	Burial Grounds and Graves Management Plan	Heritage Consultant	4 months	Platreef Resources	Project closed by client due to safety risks	Platreef Resources Gerick Mouton
Resgen Boikarabelo Coal Mine	Limpopo Province, South Africa	2012	2012	Archaeological Excavation of identified sites	Archaeological Excavation	Heritage Consultant	4 months	Resources Generation	Completed excavation and reporting, destruction permits approved	Resources Generation Louise Nicolai
Bokoni Platinum Road Watching Brief	Burgersfort, Limpopo Province, South Africa	2012	2012	Watching brief for construction of new road	Watching Brief	Heritage Consultant	1 week	Bokoni Platinum Mine	Completed watching brief, reviewed report	Bokoni Platinum Mines (Pty) Ltd

SEGA Gold Mining Project	Burkina Faso	2012 2013	Socio Economic and Asset Survey	RAP	Social Consultant	3 months	Cluff Gold PLC	Completed field survey and data collection	Cluff Gold PLC
SEGA Gold Mining Project	Burkina Faso	2013 2013	Specialist Review of Heritage Impact Assessment	Reviewer	Heritage Consultant	1 week	Cluff Gold PLC	Reviewed specialist report and made appropriate recommendations	Cluff Gold PLC
Consbrey and Harwar Collieries Project	Breyton, Mpumalanga, South Africa	2013 2013	Heritage Impact Assessment for the proposed Consbrey and Harwar Collieries	Heritage Impact Assessment	Heritage Consultant	2 months	Msobo	Completed Heritage Impact Assessments	Msobo
New Liberty Gold Project	Liberia	2013 2014	Implementation of the Grave Relocation Project for the New Liberty Gold Project	Grave Relocation	Heritage Consultant	On-going	Aureus Mining	Project is on-going	Aureus Mining
Falea Uranium Mine Environmental Assessment	Falea, Mali	2013 2013	Heritage Scoping for the proposed Falea Uranium Mine	Heritage Scoping	Heritage Consultant	2 months	Rockgate Capital	Completed scoping report and recommended further studies	Rockgate Capital
Putu Iron Ore Mine Project	Petroken, Liberia	2013 2014	Heritage impact Assessment for the proposed Putu Iron Ore Mine, road extension and railway line	Heritage Impact Assessment	Heritage Consultant	6 months	Atkins Limited	Completed Heritage Impact Assessment and provided recommendations for further studies	Atkins Limited Irene Bopp Irene.Bopp@atkinsglobal.com
Sasol Twistdraai Project	Secunda, Mpumalanga, South Africa	2013 2014	Notification of intent to Develop and Heritage Statement for the Sasol Twistdraai Expansion	NID	Heritage Consultant	2 months	ERM Southern Africa	Completed NID and Heritage Statement	ERM Southern Africa Alan Cochran Alan.Cochran@erm.com
Daleside Acetylene Gas Production Facility	Gauteng, South Africa	2013 2013	Project Management of the heritage study	NID	Project Manager	3 months	ERM Southern Africa	Project completed	ERM Southern Africa Kasantha Moodley Kasantha.Moodley@erm.com
Exxaro Belfast, Paardeplaats and Eerstelingsfontein GRP	Belfast, Mpumalanga, South Africa	2013 2014	Grave Relocation Plan for the Belfast, Paardeplaats and Eerstelingsfontein Projects	GRP	Project Manager, Heritage Consultant	On-going	Exxaro	Project is on-going	Exxaro Johan van der Bijl Johan.vanderbijl@exxaro.com

Nzoro 2 Hydro Power Project	Orientale Province, Democratic Republic of Congo	2014 2014	Social consultation for the Relocation Action Plan component of the Nzoro 2 Hydro Power Station	RAP	Social Consultant	On-going	Randgold Resources	Completed introductory meetings – project on-going	Kibali Gold Mine Cyrille Mutombo Cyrille.c.mutombo@kibaligold.com
Eastern Basin AMD Project	Springs, Gauteng, South Africa	2014 2014	Heritage Impact Assessment for the proposed new sludge storage facility and pipeline	Heritage Impact Assessment	Heritage Consultant	On-going	AECOM	Project is on-going	AECOM
Soweto Cluster Reclamation Project	Soweto, Gauteng, South Africa	2014 2014	Heritage Impact Assessment for reclamation activities associated with the Soweto Cluster Dumps	Heritage Impact Assessment	Heritage Consultant	On-going	ERGO	Project is on-going	ERGO Greg Ovens Greg.ovens@drdgold.com
Klipspruit South Project	Ogies, Mpumalanga, South Africa	2014 2014	NID and Heritage Statement for the Section 102 Amendment of the Klipspruit Mine EMP	NID	Heritage Consultant	On-going	BHP Billiton	Project is on-going	BHP Billiton
Klipspruit Extension: Weltevreden Project	Ogies, Mpumalanga, South Africa	2014 2014	NID and Heritage Statement for the expansion of the Klipspruit Mine	NID	Heritage Consultant	On-going	BHP Billiton	Project is on-going	BHP Billiton
Ergo Rondebult Pipeline Basic Assessment	Johannesburg, South Africa	2014 2014	NID and Heritage Statement for the construction of the Rondebult Pipeline	NID	Heritage Consultant	1 Week	ERGO	Completed screening assessment and NID	ERGO
Kibali ESIA Update Project	Orientale Province, Democratic Republic of Congo	2014 2014	Update of the Kibali ESIA for the inclusion of new open-cast pit areas	Heritage Impact Assessment	Heritage Consultant	On-going	Randgold Resources	Project is on-going	Randgold Resources Charles Wells Charles.wells@randgoldresources.com
GoldOne EMP Consolidation	Westonaria, Gauteng, South Africa	2014 2014	Gap analysis for the EMP consolidation of operations west of Johannesburg	Gap Analysis	Heritage Consultant	On-going	Gold One International	Project is on-going	Gold One International

JOHAN NEL

Mr Johan Nel

Unit manager: Heritage Resources Management

Social Sciences

Digby Wells Environmental

1 EDUCATION

Date	Degree(s) or Diploma(s) obtained	Institution
2014	Integrated Heritage Resources Management Certificate, NQF Level 6	Rhodes University
2002	BA (Honours) (Archaeology)	University of Pretoria
2001	BA	University of Pretoria
1997	Matric with exemption	Brandwag Hoërskool

2 LANGUAGE SKILLS

Language	Speaking	Writing	Reading
English	Excellent	Excellent	Excellent
Afrikaans	Excellent	Excellent	Excellent

3 EMPLOYMENT

Period	Company	Title/position
09/2011 to present	Digby Wells Environmental	Manager: Heritage Resources Management unit
05/2010-2011	Digby Wells Environmental	Archaeologist
10/2005-05/2010	Archaic Heritage Project Management	Manager and co-owner
2003-2007		Freelance archaeologist
	Rock Art Mapping Project	Resident archaeologist

2002-2003	Department of Anatomy, University of Pretoria	Special assistant: Anthropology
2001-2002	Department of Anatomy, University of Pretoria	Technical assistant
1999-2001	National Cultural History Museum & Department of Anthropology and Archaeology, UP	Assistant: Mapungubwe Project,

4 EXPERIENCE

Johan Nel has 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 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, Liberia and Sierra Leone. I am fluent in English and Afrikaans, with excellent writing and research skills.

5 PROFESSIONAL REGISTRATION

Position	Professional Body	Registration Number
Council member	Association for Southern African Professional Archaeologists (ASAPA); ASAPA Cultural Resources Management (CRM) section	095
Member	International Association of Impact Assessors (IAIA)	N/A
Member	International Council on Monuments and Sites (ICOMOS)	
Member	Society for Africanist Archaeologists (SAfA)	N/A

6 PUBLICATIONS AND CONFERENCE PAPERS

Authors and Year	Title	Published in/presented at
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 the 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	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: Roedean 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.
Nel, J. 2013.	The Matrix: A proposed method to evaluate significance of, and change to, heritage resources.	Paper presented at the 2013 ASAPA Biennial conference: Gaborone, Botswana.
Nel, J. 2013	HRM and EMS: Uncomfortable fit or separate process.	. Paper presented at the 2013 ASAPA Biennial conference: Gaborone, Botswana.

7 PROJECT EXPERIENCE

7.1 Archaeological Surveys and Impact Assessments

- 2003-2004. Freelance consulting archaeologist. Roodt & Roodt CC. RSA. Archaeological surveys. Specialist.
- 2004-2005. Resident archaeologist Rock Art Mapping Project. University of KwaZulu-Natal. Kwazulu-Natal, RSA. Rock art mapping & recording. Specialist.

7.2 Archaeological Mitigation

- 2007. Archaeological investigation of Old Johannesburg Fort. Johannesburg Development Agency. Gauteng, RSA. Archaeological mitigation. Project manager.
- 2008. Final consolidated report: Watching Brief on Soutpansberg Road Site for the new Head Offices of the Department of Foreign Affairs, Pretoria Gauteng. Imbumba-Aganang D & C Joint Venture. Gauteng, RSA. Watching Brief. Project manager.
- 2011. Sessenge archaeological site mitigation. Randgold Resources. Doko, DRC. Archaeological mitigation. Specialist.
- 2011. Mitigation of three sites, Koidu Kimberlite Project. Koidu Holdings SA. Koidu, Sierra Leone. Archaeological mitigation. Project manager.
- 2012. Boikarabelo Phase 2 Mitigation of Archaeological Sites. Ledjadja Coal (Pty) Ltd. Limpopo, RSA. Archaeological permitting and mitigation. Project manager.
- 2012. Additional Archaeology Mitigation of Sites. Ledjadja Coal (Pty) Ltd. Limpopo, RSA. Archaeological permitting and mitigation. Project manager.
- 2013. Archaeological Excavations of Old Well, Rhodes University, Grahamstown. Rhodes University. Eastern Cape, RSA. Archaeological mitigation. Specialist.
- 2014. Archaeological Site Destruction. Ledjadja Coal (Pty) Ltd. Limpopo, RSA. Archaeological permitting and mitigation. Project manager.

7.3 Heritage Impact Assessments

- 2005. Final consolidated Heritage Impact Assessment report: Proposed development of high-cost housing and filling station, Portion of the farm Mooiplaats 147 JT. Go-Enviroscience. Mpumalanga, RSA. Heritage Impact Assessment. Project manager.
- 2006. Final report: Heritage resources Scoping survey and preliminary assessment for the Transnet Freight Line EIA, Eastern Cape and Northern Cape. ERM Southern Africa (Pty) Ltd. Northern & Eastern Cape, RSA. Heritage Scoping Assessment. Project manager.
- 2007. Proposed road upgrade of existing, and construction of new roads in Burgersfort, Limpopo Province. AGES South Africa (Polokwane). Limpopo, RSA. Heritage Impact Assessment. Project manager.
- 2007. Recommendation of Exemption: Above-ground SASOL fuel storage tanks located at grain silos in localities in the Eastern Free State. Sasol Group Services (Pty) Ltd. Free State, RSA. Letter of Exemption. Project manager.
- 2008. Summary report: Old dump on premises of the new Head Offices, Department of Foreign Affairs, Pretoria, Gauteng. Imbumba-Aganang D & C Joint Venture. Gauteng, RSA. Archaeological Impact Assessment. Project manager.
- 2008. Van Reenen Eco-Agri Development Project. Go-Enviroscience. Kwazulu-Natal & Free State, RSA. Heritage Impact Assessment. Project manager.
- 2008. Heritage Impact Assessment for proposed water pipeline routes, Mogalakwena District, Limpopo Province. AGES South Africa (Polokwane). Limpopo, RSA. Heritage Impact Assessment. Project manager.
- 2008. Phase 1 Heritage and Archaeological Impact Assessment: Proposed establishment of an access road between Sapekoe Drive and Koedoe Street, Erf 3366 (Extension 22) and the Remainder of Erf 430 (Extension 4). AGES South Africa (Polokwane). Limpopo, RSA. Heritage Impact Assessment. Project manager.
- 2008. Heritage resources scoping survey and preliminary assessment: Proposed establishment of township on Portion 28 of the farm Kennedy's Vale 362 KT, Steelpoort, Limpopo Province. AGES South Africa (Polokwane). Limpopo, RSA. Heritage Scoping Assessment. Project manager.
- 2008. Randwater Vlakfontein-Mamelodi water pipeline survey. Archaeology Africa CC. Gauteng, RSA. Heritage Impact Assessment. Specialist.
- 2010. Heritage Impact Assessment for conversion of PR to MRA. Georock Environmental. Northwest, RSA. Heritage Impact Assessment. Project manager.
- 2010. Temo Coal Project. Namane Commodities (Pty) Ltd. Limpopo, RSA. Heritage Impact Assessment. Specialist.
- 2011. Marapong Treatment Works. Ceenex (Pty) Ltd. Limpopo, RSA. Archaeological Impact Assessment. Project manager.

- 2011. Complete Environmental Authorisation. Rhodium Reefs Ltd. Limpopo, RSA. Archaeological Impact Assessment. Specialist.
- 2011. Big 5 PV Solar Plants. Orlight (Pty) Ltd. Western and Northern Cape, RSA. Heritage Impact Assessment. Specialist.
- 2011. Heritage Impact Assessment for Koidu Diamond Mine. Koidu Holdings SA. Koidu, Sierra Leone. Heritage Impact Assessment. Specialist.
- 2012. TSF and Pipeline. Gold One. Gauteng, RSA. Heritage Impact Assessment. Project manager.
- 2012. Kangra Coal Heritage Screening Assessment. ERM Southern Africa (Pty) Ltd. Mpumalanga, RSA. Heritage Screening Assessment. Project manager.
- 2012. Environmental and Social Studies. Platreef Resources (Pty) Ltd. Limpopo, RSA. Heritage specialist advice. Project manager.
- 2012. ESKOM Powerline EIA. Ledjadja Coal (Pty) Ltd. Limpopo, RSA. Notification of Intent to Develop. Project manager.
- 2012. Falea Project ESIA. Denison Mines Corp. (Rockgate Capital Corp). Falea, Mali. Heritage Impact Assessment. Specialist.
- 2012. EIA for Proposed Emergency Measures to Pump and Treat. AECOM SA (Pty) Ltd. Gauteng, RSA. Heritage Impact Assessment. Specialist.
- 2012. Tonguma Baseline Studies. Koidu Holdings SA. Tonguma, Sierra Leone. Heritage Impact Assessment. Specialist.
- 2012. Vedanta IPP. Black Mountain Mining (Pty) Ltd. Limpopo, RSA. Heritage Impact Assessment. Specialist.
- 2012. Boikarabelo Railway Realignment. Ledjadja Coal (Pty) Ltd. Limpopo, RSA. Heritage Impact Assessment. Specialist.
- 2012. Platreef ESIA. Platreef Resources (Pty) Ltd. Limpopo, RSA. Heritage Impact Assessment. Specialist.
- 2012. Roodekop EIA. Universal Coal Development 4 (Pty) Ltd. Mpumalanga, RSA. Heritage Impact Assessment. Specialist.
- 2012. Kangala HIA. Universal Coal Development 1 (Pty) Ltd. Mpumalanga, RSA. Heritage Impact Assessment and permitting. Specialist.
- 2012. Roodepoort Strengthening. Eskom Holdings SOC Ltd. Gauteng, RSA. Notification of Intent to Develop. Specialist.
- 2012. Trichardtsfontein EIA / EMP. Xstrata Coal South Africa. Limpopo, RSA. Heritage Impact Assessment. Specialist.
- 2012. Zandbaken EIA/EMPR. Xstrata Coal South Africa. Limpopo, RSA. Heritage Impact Assessment. Specialist.

- 2013. ATCOM Tweefontein NID. Jones & Wagener (Pty) Ltd. Mpumalanga, RSA. Burial grounds and graves consultation, permitting and relocation. Project manager.
- 2013. Roodepoort Heritage Impact Assessment. Fourth Element Consulting (Pty) Ltd. Gauteng, RSA. Heritage Impact Assessment. Project manager.
- 2013. JHB BRT Phase 2 Heritage Impact Assessment. Iliso Consulting (Pty) Ltd. Gauteng, RSA. Heritage Impact Assessment. Project manager.
- 2013. Kangra Coal HIA. ERM Southern Africa (Pty) Ltd. Mpumalanga, RSA. Heritage Impact Assessment. Project manager.
- 2013. Slypsteen Bulk Sample Application. Summer Season Trading (Pty) Limited. Northern Cape, RSA. Heritage Impact Assessment. Project manager.
- 2013. Kempton Park Heritage Statement and NID. ERM Southern Africa (Pty) Ltd. Gauteng, RSA. Notification of Intent to Develop. Project manager.
- 2013. Sasol Twistdraai CFD. ERM Southern Africa (Pty) Ltd. Gauteng, RSA. Notification of Intent to Develop. Project manager.
- 2013. HRS & NID - River Crossings Upgrade. Iliso Consulting (Pty) Ltd. Gauteng, RSA. Notification of Intent to Develop. Project manager.
- 2013. Waterberg Prospecting Right Applications. Platinum Group Metals (Pty) Ltd. Limpopo, RSA. Notification of Intent to Develop. Project manager.
- 2013. Landau Waste Licence Application. Anglo Operations (Pty) Limited. Mpumalanga, RSA. Notification of Intent to Develop. Reviewer / specialist.
- 2013. Prospecting Right Consultation Report. Rustenburg Platinum Mines Limited. Mpumalanga, RSA. Notification of Intent to Develop. Reviewer / specialist.
- 2013. Witrand Prospecting EMP. Rustenburg Platinum Mines Limited. Mpumalanga, RSA. Notification of Intent to Develop. Reviewer / specialist.
- 2013. EMP Amendment for CST. Copper Sunset Trading (Pty) Ltd. Mpumalanga, RSA. Notification of Intent to Develop. Reviewer / specialist.
- 2013. Maseve IFC ESHIA. Maseve Investment (Pty) Ltd. Mpumalanga, RSA. Notification of Intent to Develop. Reviewer / specialist.
- 2013. Dalyshope ESIA. Anglo Operations (Pty) Limited. Limpopo, RSA. Heritage Impact Assessment. Specialist.
- 2013. Klipfontein Opencast Project. Bokoni Platinum Mines (Pty) Ltd. Limpopo, RSA. Heritage Impact Assessment. Specialist.
- 2013. Consbrey and Harwar MPRDA EIA/EMP. Msobo Coal (Pty) Ltd. Mpumalanga, RSA. Heritage Impact Assessment. Specialist.
- 2013. Slypsteen 102 EMP Amendment. Summer Season Trading (Pty) Limited. Northern Cape, RSA. Heritage Impact Assessment. Specialist.

- 2013. Putu Iron Ore ESIA. Atkins Limited Incorporated. Putu, Liberia. Heritage Impact Assessment. Specialist.
- 2013. Ash backfilling at Sigma Colliery. Sasol Mining (Pty) Ltd. Gauteng, RSA. Notification of Intent to Develop. Specialist.
- 2013. Syferfontein Block 4 - Underground Coal Mining for Sasol. Sasol Mining (Pty) Ltd. Mpumalanga, RSA. Notification of Intent to Develop. Specialist.
- 2013. Prospecting Right Amendment to Include Bulk Sampling. Sikhuliso Resources (Pty) Ltd. Mpumalanga, RSA. Notification of Intent to Develop. Specialist.
- 2013. Nooitgedacht EIA, EMP Amendment & Gap Analysis. Xstrata Coal South Africa. Limpopo, RSA. Heritage Impact Assessment. Specialist.
- 2014. Gold One EMP Consolidation Phase 0. Gold One. Gauteng, RSA. Heritage Impact Assessment. Reviewer / specialist.
- 2014. Kilbarchan Audit and EIA. Eskom Holdings SOC Ltd. Kwazulu-Natal, RSA. Heritage Impact Assessment. Reviewer / specialist.
- 2014. Klipspruit Extension Environmental Assessment. BHP Billiton Energy Coal South Africa Limited. Mpumalanga, RSA. Heritage Impact Assessment. Reviewer / specialist.
- 2014. Klipspruit South BECSA EIA. BHP Billiton Energy Coal South Africa Limited. Mpumalanga, RSA. Heritage Impact Assessment. Reviewer / specialist.
- 2014. EIA/EMP Soweto Cluster. DRD GOLD ERGO (Ergo Mining (Pty) Ltd. Gauteng, RSA. Notification of Intent to Develop. Reviewer / specialist.
- 2014. London Road Heritage Statement. ERM Southern Africa (Pty) Ltd. Gauteng, RSA. Notification of Intent to Develop. Reviewer / specialist.
- 2014. Grootegeluk MPRDA, NEMA and IWULA. Exxaro Coal (Pty) Ltd. Limpopo, RSA. Notification of Intent to Develop. Reviewer / specialist.
- 2014. Kibali ESIA & EMP Update. Randgold Resources. Doko, DRC. Heritage Impact Assessment. Specialist.
- 2014. Nokuhle Colliery NEMA Process. HCI Coal (Pty) Ltd. Mpumalanga, RSA. Heritage Impact Assessment. Specialist.
- 2014. HRM Process for Hendrina Wet Ashing. Lidwala Consulting Engineers (Pty) Ltd. Mpumalanga, RSA. Heritage Impact Assessment. Specialist.
- 2014. Weltevreden NEMA. Northern Coal (Pty) Ltd. Mpumalanga, RSA. Heritage Impact Assessment. Specialist.
- 2014. Sasol Sigma Mooikraal Pipeline BA. Sasol Mining (Pty) Ltd. Mpumalanga, RSA. Notification of Intent to Develop. Specialist.

7.4 Burial Grounds and Graves Consultation and Relocation

- 2005. Report on exhumation, relocation and re-internment of 49 graves on Portion 10 of the farm Tygervallei 334 JR, Kungwini Municipality, Gauteng D Georgiades East Farm (Pty) Ltd. Gauteng, RSA. Burial grounds and graves consultation, permitting and relocation. Project manager.
- 2005. Southstock Collieries Grave Relocation. Doves Funerals, Witbank. Mpumalanga, RSA. Burial grounds and graves consultation, permitting and relocation. Project manager.
- 2005. Social consultation for Smoky Hills Platinum Mine Grave Relocation. PGS (Pty) Ltd. Limpopo, RSA. Stakeholder consultation on burial grounds and graves. Social consultant.
- 2005. Social consultation for Elawini Lifestyle Estate Grave Relocation. PGS (Pty) Ltd. Mpumalanga, RSA. Stakeholder consultation on burial grounds and graves. Social consultant.
- 2006. Social consultation for Zonkezizwe Grave Relocation. PGS (Pty) Ltd. Gauteng, RSA. Stakeholder consultation on burial grounds and graves. Social consultant.
- 2006. Social consultation for Motaganeng Residential Development Grave Relocation. PGS (Pty) Ltd. Mpumalanga, RSA. Stakeholder consultation on burial grounds and graves. Social consultant.
- 2006. Social consultation for Zondagskraal Coal Mine Grave (Pty) Ltd. Mpumalanga, RSA. Stakeholder consultation on burial grounds and graves. Social consultant.
- 2007. Exploratory excavation of an unknown cemetery at Du Preezhoek, Fountains Valley, Portion 383 of the farm Elandspoort 357 JR, Pretoria, Gauteng. Bombela Civil Joint Venture. Gauteng, RSA. Burial grounds and graves consultation, permitting and relocation. Project manager.
- 2007. Final consolidated report: Phase 2 test excavations ascertaining the existence of alleged mass graves, Tlhabane West, Extension 2, Rustenburg, Northwest Province. Bigen Africa Consulting Engineers. Northwest, RSA. Burial grounds and graves consultation, permitting and relocation. Project manager.
- 2007. Repatriation of Mapungubwe Human Remains. Department of Environmental Affairs and Tourism. Limpopo, RSA. Repatriation. Project manager.
- 2008. Report on skeletal material found at Pier 30, R21 Jones Street off-ramp, Kempton Park. Bombela Civil Joint Venture. Gauteng, RSA. Heritage Scoping Assessment. Project manager.
- 2011. Kibali Grave Relocation. Randgold Resources. Doko, DRC. International grave relocation. Specialist.
- 2012. Platreef Platinum Mine Burial Grounds and Graves Census. Platreef Resources (Pty) Ltd. Limpopo, RSA. Stakeholder consultation on burial grounds and graves. Project manager.

- 2013. New Liberty Grave Relocation Process. Aureus Mining Inc. Kinjor, Liberia. International grave relocation. Project manager.
- 2013. Bokoni Burial Grounds and Grave Census and Grave Relocation Plan. Bokoni Platinum Mines (Pty) Ltd. Limpopo, RSA. Stakeholder consultation on burial grounds and graves. Project manager.
- 2014. Arnot Colliery Grave Relocation Project. Exxaro Coal (Pty) Ltd. Mpumalanga, RSA. Burial grounds and graves consultation, permitting and relocation. Project manager.
- 2014. Paardeplaats and Belfast RAPs. Exxaro Coal (Pty) Ltd. Mpumalanga, RSA. Burial grounds and graves consultation, permitting and relocation. Reviewer / specialist.
- 2014. Thabametsi EIA, EMP, IWULA, IWWMP and PPP. Exxaro Coal (Pty) Ltd. Limpopo, RSA. Stakeholder consultation on burial grounds and graves. Specialist.

7.5 Research Reports and Reviews

- 2007. Research report on cultural symbols. Ministry of Intelligence Services. RSA. Research report. Project manager.
- 2007. Research report on the remains of kings Mampuru I and Nyabela. National Department of Arts and Culture. RSA. Research report. Project manager.
- 2012. Baseline Scoping and Pre-feasibility Songwe Rare Earth Element Project. Mkango Resources Limited. Songwe, Malawi. Heritage Impact Assessment. Reviewer / specialist.
- 2013. Fatal Flaw Analysis and EIA Process for AMD Man in Eastern Basin. AECOM SA (Pty) Ltd. Gauteng, RSA. Heritage Impact Assessment. Reviewer / specialist.

NATASHA HIGGITT

Ms Natasha Higgitt

Assistant Heritage Consultant

Social Department

Digby Wells Environmental

1 EDUCATION

- University of Pretoria
- BA Degree (2008)
- Archaeology Honours (2010)
- 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: Assistant Heritage 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 FIELD EXPERIENCE

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

- Notification of Intent to Develop for the Doornkloof Flood Remedial Measures Project, Centurion, Gauteng Province for Iliso Consulting (Pty) Ltd (Digby Wells Environmental)
- Notification of Intent to Develop for the Oakleaf Open Cast Coal Mine, Bronkhorstspruit, Gauteng Province for Oakleaf Resources (Digby Wells Environmental)
- Notification of Intent to Develop for the Rietfontein 101IS Prospecting Project for Rustenburg Platinum (Digby Wells Environmental)
- Heritage Impact Assessment for the Weltevreden Open Cast Coal Mine, Belfast, Mpumalanga for Northern Coal (Pty) Ltd (Digby Wells Environmental)
- Notification of Intent to Develop for the Grootegeluk Expansion Project, Lephalale, Limpopo Province for Exxaro Resources (Pty) Ltd (Digby Wells Environmental)
- Notification of Intent to Develop and Heritage Statement for the London Road Petrol Station, Alexandria, Gauteng for ERM Southern Africa (Pty) Ltd (Digby Wells Environmental)
- Heritage Impact Assessment for the Roodepoort Strengthening Project, Roodepoort, Gauteng for Fourth Element (Digby Wells Environmental)
- Heritage Statement for the Stoffel Park Bridge Upgrade, Mamelodi, Gauteng for Iliso Consulting (Pty) Ltd (Digby Wells Environmental)
- Heritage Statement for the Witrand Prospecting EMP, Bethal, Mpumalanga for Rustenburg Platinum (Digby Wells Environmental)
- Heritage Statement for the Onverwacht Prospecting EMP, Kinross, Mpumalanga for Rustenburg Platinum (Digby Wells Environmental)
- Heritage Statement for a Proposed Acetylene Gas Production Facility, located near Witkopdorp, Daleside, south of Johannesburg, Gauteng Province for Erm Southern Africa (Pty) Ltd (Digby Wells Environmental)
- Heritage Impact Assessment for the Platreef Platinum Project, Mokopane, Limpopo for Platreef Resources (Digby Wells Environmental)
- Heritage Statement for ATCOM and Tweefontein Dragline Relocation Project, near Witbank, Mpumalanga Province for Jones and Wagner Consulting Civil Engineers (Digby Wells Environmental)

- Heritage Statement Report for the Wilgespruit Bridge Upgrade, Pretoria, Gauteng Province for Iliso Consulting (Pty) Ltd (Digby Wells Environmental)
- Heritage Statement Report for the Kosmosdal sewer pipe bridge upgrade, Pretoria, Gauteng Province for Iliso Consulting (Pty) Ltd (Digby Wells Environmental)
- 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)

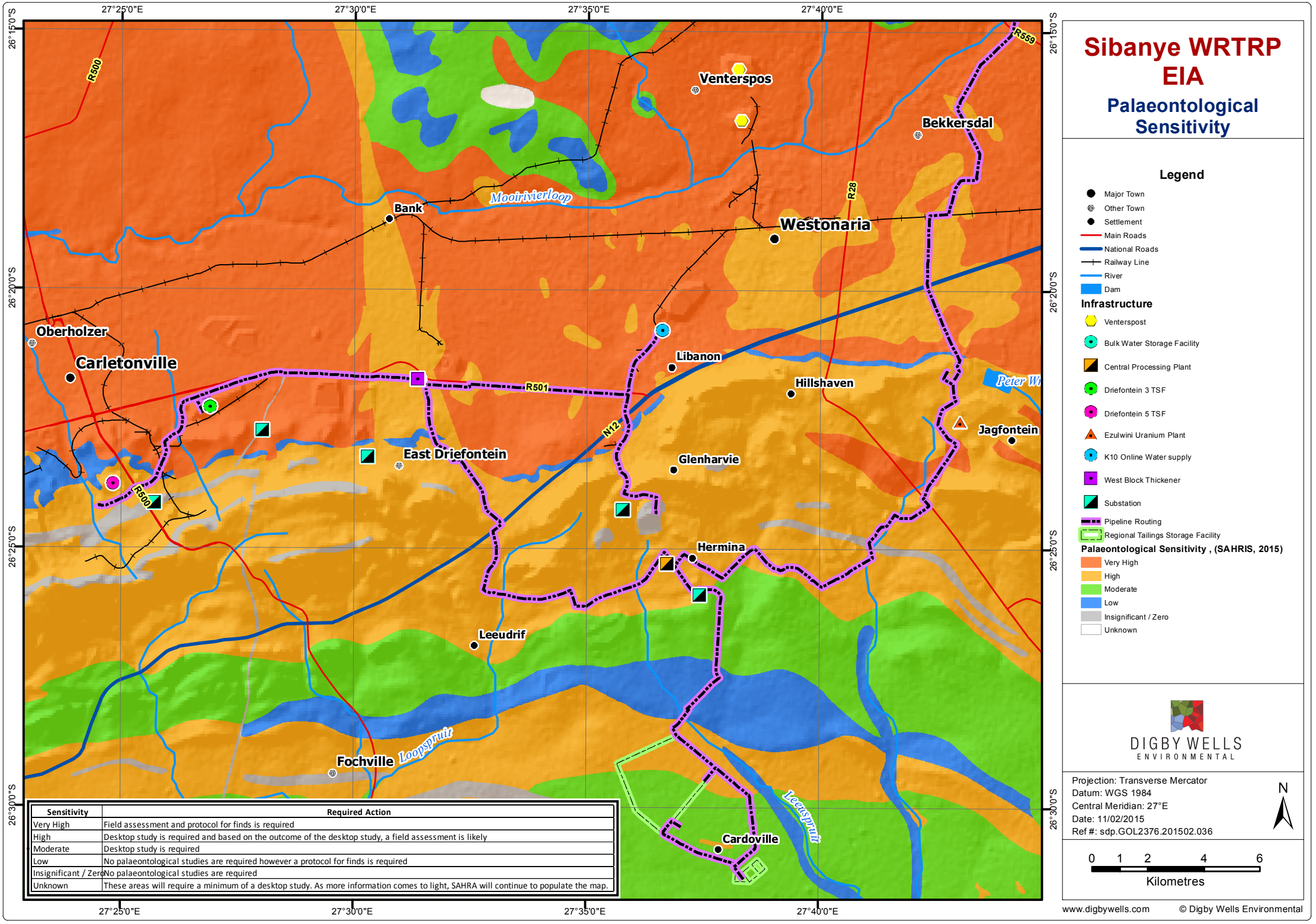
- Phase 1 AIA Windfarm survey in Molteno, Eastern Cape. 2010. (Savannah Environmental)
- Phase 1 AIA Housing Development at Motherwell, P.E. 2010. (SRK Consulting)
- Phase 1 AIA Sand quarry survey in Paterson, Eastern Cape. 2010. (SRK Consulting)
- Phase 1 AIA Quarry Survey at Victoria West. 2010. (Acer [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 (SAMA): Member

Appendix B: Heritage Literature Review

Appendix C: Plans



Sibanye WRTRP EIA

Palaeontological Sensitivity

Legend

- Major Town
- Other Town
- Settlement
- Main Roads
- National Roads
- Railway Line
- River
- Dam

Infrastructure

- Venterspost
- Bulk Water Storage Facility
- Central Processing Plant
- Driefontein 3 TSF
- Driefontein 5 TSF
- Ezulwini Uranium Plant
- K10 Online Water supply
- West Block Thickener
- Substation
- Pipeline Routing
- Regional Tailings Storage Facility

Palaeontological Sensitivity , (SAHRIS, 2015)

- Very High
- High
- Moderate
- Low
- Insignificant / Zero
- Unknown

Sensitivity	Required Action
Very High	Field assessment and protocol for finds is required
High	Desktop study is required and based on the outcome of the desktop study, a field assessment is likely
Moderate	Desktop study is required
Low	No palaeontological studies are required however a protocol for finds is required
Insignificant / Zero	No palaeontological studies are required
Unknown	These areas will require a minimum of a desktop study. As more information comes to light, SAHRA will continue to populate the map.

DIGBY WELLS ENVIRONMENTAL

Projection: Transverse Mercator
Datum: WGS 1984
Central Meridian: 27°E
Date: 11/02/2015
Ref #: sdp.GOL2376.201502.036

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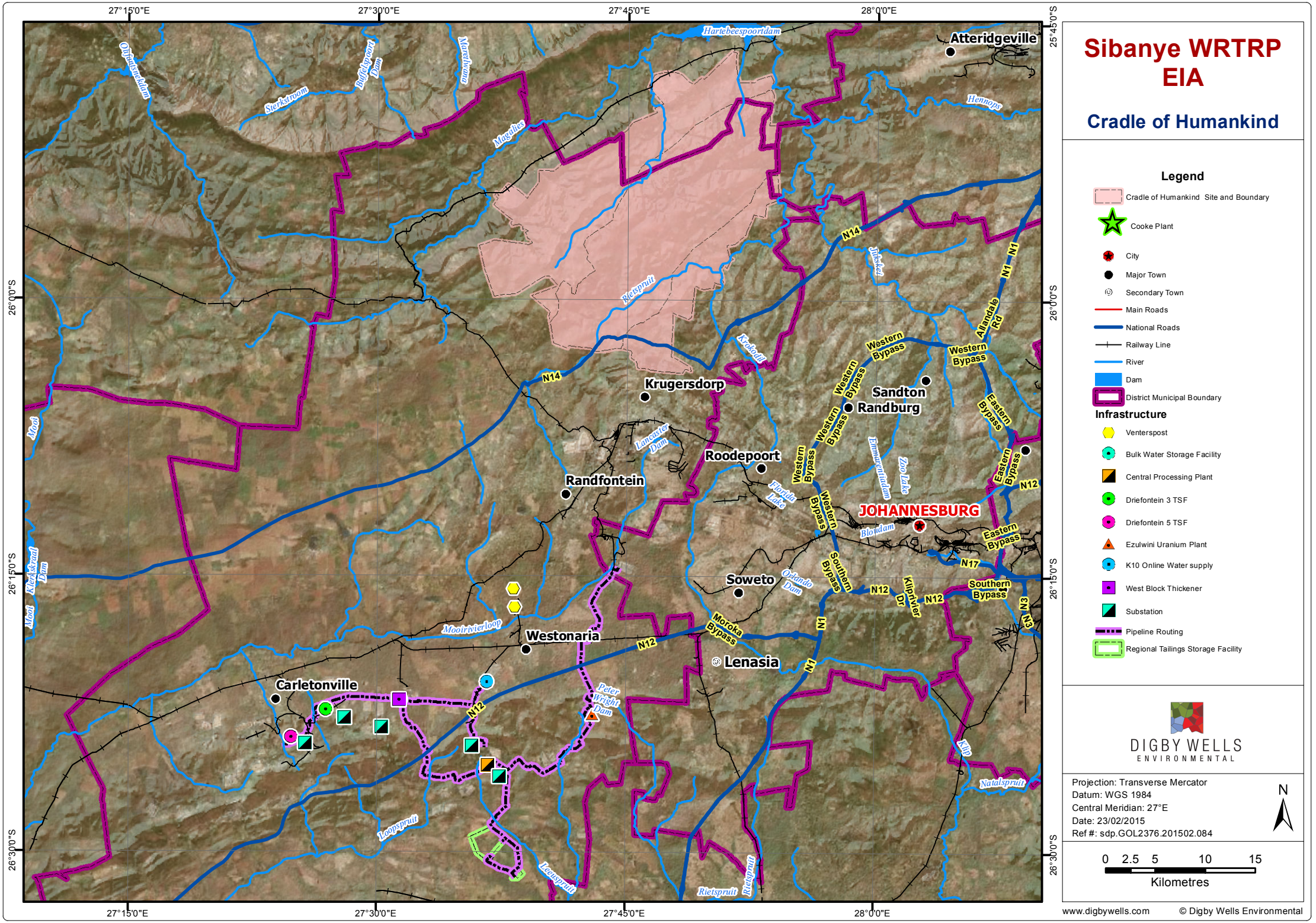
Kilometres



Sibanye WRTRP EIA

Cradle of Humankind

Legend

- Cradle of Humankind Site and Boundary
- Cooke Plant
- City
- Major Town
- Secondary Town
- Main Roads
- National Roads
- Railway Line
- River
- Dam
- District Municipal Boundary

Infrastructure

- Venterspost
- Bulk Water Storage Facility
- Central Processing Plant
- Driefontein 3 TSF
- Driefontein 5 TSF
- Ezulwini Uranium Plant
- K10 Online Water supply
- West Block Thickener
- Substation
- Pipeline Routing
- Regional Tailings Storage Facility

DIGBY WELLS ENVIRONMENTAL

Projection: Transverse Mercator
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Date: 23/02/2015
Ref #: sdp.GOL2376.201502.084

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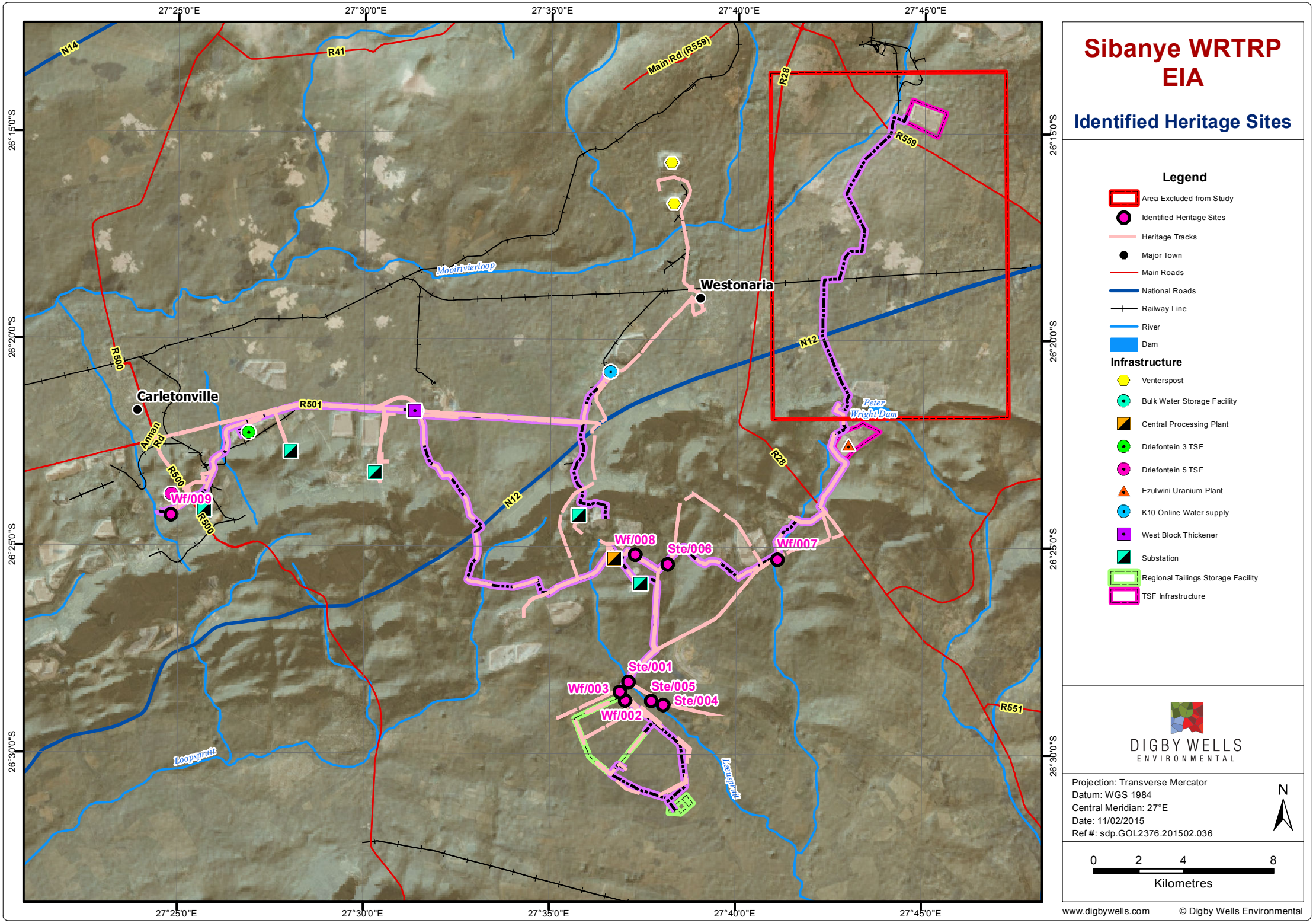

Sibanye WRTRP EIA

Identified Heritage Sites

Legend

- Area Excluded from Study
- Identified Heritage Sites
- Heritage Tracks
- Major Town
- Main Roads
- National Roads
- Railway Line
- River
- Dam

Infrastructure

- Venterspost
- Bulk Water Storage Facility
- Central Processing Plant
- Driefontein 3 TSF
- Driefontein 5 TSF
- Ezulwini Uranium Plant
- K10 Online Water supply
- West Block Thickener
- Substation
- Regional Tailings Storage Facility
- TSF Infrastructure

DIGBY WELLS ENVIRONMENTAL

Projection: Transverse Mercator
Datum: WGS 1984
Central Meridian: 27°E
Date: 11/02/2015
Ref #: sdp.GOL2376.201502.036

N

0 2 4 8
Kilometres

Appendix D: Landowner Information

PROPERTY INFORMATION			OWNER OF PROPERTY	OCCUPIER OF PROPERTY
FARM NAME	NO	PTN		
DROOGHEUVEL	521	RE	Dr Johannes Cornelius Coetzee Badenhorst	
RIETFONTEIN	519	1	Dr Johannes Cornelius Coetzee Badenhorst	
RIETFONTEIN	519	2	Dr Johannes Cornelius Coetzee Badenhorst	
RIETFONTEIN	519	21	Ignatius Stephanus Badenhorst	
RIETFONTEIN	519	RE	Dr Johannes Cornelius Coetzee Badenhorst	
RIETFONTEIN	519	8	Andre Herman Berry	
WILDEBEESTKUIL	360	14	Ignatius Stephanus Badenhorst	
WILDEBEESTKUIL	360	16	Andre Badenhorst	
KALBASFONTEIN	365	66	Mr Sylvester Tshilwane - Department of Public Works	
CARDOVILLE	364	2	Sibanye Gold Ltd	Bernard Rabe

KALBASFONTEIN	365	67	Mr Sylvester Tshilwane - Department of Public Works	
WILDEBEESTKUIL	360	3	Mr Pieter Johannes Davidtsz	
WILDEBEESTKUIL	360	5	GFI Joint Venture Holdings (Pty) Ltd (Goldfields)	
WILDEBEESTKUIL	360	6	Frans Roelf Johannes De Bruyn	
WILDEBEESTKUIL	360	7 & 8	Andre Swanepoel (was JGM Oosthuizen)	
WILDEBEESTKUIL	360	2	Dr Johannes Cornelius Coetzee Badenhorst	
WILDEBEESTKUIL	360	4	GFI Joint Venture Holdings (Pty) Ltd (Goldfields)	Barry van Wyk
WILDEBEESTKUIL	360	1	Goldfields	Koos van Rensburg
WILDEBEESTKUIL	360	18	Andre Swanepoel	
KALBASFONTEIN	365	27	GFI Joint Venture Holdings (Pty) Ltd (Goldfields)	Barry van Wyk
KALBASFONTEIN	365	51	Goldfields	Barry van Wyk
CARDOVILLE	358	1	Dr Johannes Cornelius Coetzee Badenhorst	

CARDOVILLE	358	2	Dr Johannes Cornelius Coetzee Badenhorst	
CARDOVILLE	358	4	Dr Johannes Cornelius Coetzee Badenhorst	
CARDOVILLE	364	3	Goldfields	Barry van Wyk
CARDOVILLE	364	4	Goldfields	Dr Johannes Cornelius Coetzee Badenhorst
CARDOVILLE	364	8	Goldfields	Barry van Wyk
CARDOVILLE	364	13	Goldfields	Barry van Wyk Andre Swanepoel
CARDOVILLE	364	7	Dr Johannes Cornelius Coetzee Badenhorst	
CARDOVILLE	358	RE	Dr Johannes Cornelius Coetzee Badenhorst	
CARDOVILLE	358	3	Dr Johannes Cornelius Coetzee Badenhorst	
CARDOVILLE	364	1	Goldfields	Dr Johannes Cornelius Coetzee Badenhorst
CARDOVILLE	364	11	Goldfields	Dr Johannes Cornelius Coetzee Badenhorst
CARDOVILLE	364	6	Goldfields	Barry van Wyk

BARNARDSRUS	628	RE	Bernard Rabe	
RIETFONTEIN	519	25	Andre Herman Berry	
RIETFONTEIN	519	17	James Cecil Keyser	
RIETFONTEIN	519	3	James Cecil Keyser	
WELTEVREDEN	357	25	Armand Pieter De Villiers	
WELTEVREDEN	357	30	Armand Pieter De Villiers	
KALBASFONTEIN	365	31	Dr Johannes Cornelius Coetzee Badenhorst	
KALBASFONTEIN	365	57	William Alfred Rudman	
KALBASFONTEIN	365	58	William Alfred Rudman	
KALBASFONTEIN	365	59	William Alfred Rudman	
KALBASFONTEIN	365	74	Dr Johannes Cornelius Coetzee Badenhorst	
KALBASFONTEIN	365	4	William Alfred Rudman	

KALBASFONTEIN	365	24	Barry van Wyk	
KALBASFONTEIN	365	25	Barry van Wyk	
BARNARDSRUS	628	RE	Sibanye Gold Ltd	Bernard Rabe
KALBASFONTEIN	365	5	Mr Sylvester Tshilwane - Department of Public Works	
KALBASFONTEIN	365	9	William Alfred Rudman	
GELUKSDAL	396	RE	Sibanye Gold Ltd	Bernard Rabe
SPRINGBOK KRAAL	359	1	Goldfields	Koos van Rensburg
UITVAL	280	RE	Far West Rand Dolomitic Water Association Philemon Sefoshe (083) 261 3743	J.J Oberholzer 082 5873 579 butunyane@telkomsa.net
UITVAL	280	8	Far West Rand Dolomitic Water Association Philemon Sefoshe (083) 261 3743	P.J Henning 082 8527 280 phening@gweb.co.za
UITVAL	280	9	Far West Rand Dolomitic Water Association Philemon Sefoshe (083) 261 3743	P.J Henning 082 8527 280 phening@gweb.co.za
DOORNKLOOF	350	5	Far West Rand Dolomitic Water Association Philemon Sefoshe (083) 261 3743	Johan Burger 082 8212 393
LEEUWPOORT	356	71	Far West Rand Dolomitic Water Association Philemon Sefoshe (083) 261 3743	P. J Henning 082 8527 280 phening@gweb.co.za

LEEUWPOORT	356	70	Far West Rand Dolomitic Water Association Philemon Sefoshe (083) 261 3743	P.J Henning 082 8527 280 phening@gweb.co.za
DOORNKLOOF	350	6	Paul Da Cruz	
DOORNKLOOF	350	21	Kloof Gold Mining Company (Sibanye)	Rudi Leibenberg Mike Eksteen
DOORNKLOOF	350	RE/1	Kloof Gold Mining Company (Sibanye)	Rudi Liebenberg
DOORNKLOOF	350	22	Bergdeel CC	Jan Mare Deon Beets
DRIEFONTEIN	355	22	Driefontein Consolidated (Sibanye)	Pieter Henning
DRIEFONTEIN	355	4	Driefontein Consolidated (Sibanye)	
DRIEFONTEIN	355	10	Driefontein Consolidated (Sibanye)	
DRIEFONTEIN	355	11	Driefontein Consolidated (Sibanye)	
DRIEFONTEIN	355	20	Murray & Roberts Cementation Pty Ltd Gerrie Pieters Training Centre	(018) 781 7000
DRIEFONTEIN	113	2	Driefontein Consolidated (Sibanye)	J Mahne
DRIEFONTEIN	355	R	Driefontein Consolidated (Sibanye)	

BLYVOORUITZICHT	116	6	Driefontein Consolidated (Sibanye)	
BLYVOORUITZICHT	116	7	Driefontein Consolidated (Sibanye)	
BLYVOORUITZICHT	116	24	Blywonder Trust Pty Ltd	
BLYVOORUITZICHT	116	8	Nortjie Elizabeth Margaritha	
DOORNKLOOF	350	4	Kloof Gold Mining Company (Sibanye)	
RIETFONTEIN	349	35	Kloof Gold Mining Company (Sibanye)	Diane Breedt
RIETFONTEIN	349	73	Kloof Gold Mining Company (Sibanye)	
DOORNKLOOF	350	R	Kloof Gold Mining Company (Sibanye)	
DOORNKLOOF	350	13	Kloof Gold Mining Company (Sibanye)	Mike Eksteen
RIETFONTEIN	349	36	Kloof Gold Mining Company (Sibanye)	Mike Eksteen
RIETFONTEIN	349	5	Kloof Gold Mining Company (Sibanye)	Mike Eksteen
DOORNKLOOF	350	12	Kloof Gold Mining Company (Sibanye)	Rudi Liebenberg

LEEUDOORN	351	0	Kloof Gold Mining Company (Sibanye)	Rudi Liebenberg
DOORNKLOOF	350	33	Kloof Gold Mining Company (Sibanye)	Mike Eksteen
RIETFONTEIN	349	35	Kloof Gold Mining Company (Sibanye)	
LIBANON OR WITKLEIGAT	283	R	Sibanye Gold Ltd	
RIETFONTEIN	349	7	Sibanye Gold Ltd	
RIETFONTEIN	349	12	Sibanye Gold Ltd	
RIETFONTEIN	349	25	Sibanye Gold Ltd	
RIETFONTEIN	349	31	UNKNOWN	
DOORNKLOOF	350	20	Sibanye Gold Ltd	Jan Mare Deon Beets
DRIEFONTEIN	355	2	Driefontein Consolidated (Sibanye)	
RIETFONTEIN	349	19	Sibanye Gold Ltd	
RIETFONTEIN	349	20	Sibanye Gold Ltd	

RIETFONTEIN	349	32	Sibanye Gold Ltd	
RIETFONTEIN	349	2	Sibanye Gold Ltd	Johan Burger
DOORNPOORT	347	30	Johan Louis Goosen	
DOORNPOORT	347	29	Birks Hyram	
DOORNPOORT	347	2	Goldfields	Vacant
DOORNPOORT	347	37	Johannes Momberg (Johnny)	
RIETFONTEIN	349	RE	UNKNOWN	
RIETFONTEIN	349	14	Sibanye Gold Ltd	
RIETFONTEIN	349	21	Sibanye Gold Ltd	
RIETFONTEIN	349	22	Sibanye Gold Ltd	Peet Bornman
RIETFONTEIN	349	47	Sibanye Gold Ltd	
RIETFONTEIN	349	72	Sibanye Gold Ltd	

DOORNKLOOF	350	19	Sibanye Gold Ltd	
RIETFONTEIN	349	13	Sibanye Gold Ltd	
WATERPAN	292	4	Rand Uranium (Sibanye Gold)	
WATERPAN	292	24	Rand Uranium (Sibanye Gold)	
WATERPAN	292	26	Rand Uranium (Sibanye Gold)	
WATERPAN	292	13	Rand Uranium (Sibanye Gold)	
MODDERFONTEIN	345	24	Rand Uranium (Sibanye Gold)	
MODDERFONTEIN	345	23	South Deep (Goldfields)	Vacant
MODDERFONTEIN	345	RE\Farm	South Deep (Goldfields)	Vacant
MODDERFONTEIN	345	28	South Deep (Goldfields)	Vacant
MODDERFONTEIN	345	10	South Deep (Goldfields)	Mine Infrastructure
MODDERFONTEIN	345	63	South Deep (Goldfields)	Mine Infrastructure

MODDERFONTEIN	345	30	South Deep (Goldfields)	Mine Infrastructure
MODDERFONTEIN	345	41	South Deep (Goldfields)	Mine Infrastructure
DOORNPOORT	347	12	South Deep (Goldfields)	Vacant
DOORNPOORT	347	2	South Deep (Goldfields)	Vacant
RIETFONTEIN	349	41	Kloof Gold Mining Company (Sibanye)	Chris Hatting
MODDERFONTEIN	345	44	South Deep (Goldfields)	Vacant
DOORNPOORT	347	7	South Deep (Goldfields)	Mine Infrastructure
RIETFONTEIN	349	35	Kloof Gold Mining Company (Sibanye)	
RIETFONTEIN	349	73	Kloof Gold Mining Company (Sibanye)	
RIETFONTEIN	349	34	Kloof Gold Mining Company (Sibanye)	
DOORNPOORT	347	39	South Deep (Goldfields)	Mine Infrastructure
MODDERFONTEIN	345	3	South Deep (Goldfields)	Mine Infrastructure

DOORNPOORT	347	26	Kloof Gold Mining Company (Sibanye)	
RIETFONTEIN	349	42	Kloof Gold Mining Company (Sibanye)	
DOORNPOORT	347	40	South Deep (Goldfields)	Mine Infrastructure
DOORNPOORT	347	???	South Deep (Goldfields)	
MODDERFONTEIN	345	52	South Deep (Goldfields)	Mine Infrastructure
MODDERFONTEIN	345	45	WESTERN AREAS LTD (Goldfields)	
DOORNPOORT	347	35	South Deep (Goldfields)	Mine Infrastructure
DOORNPOORT	347	29	Birks Hyram	
MODDERFONTEIN	345	69	South Deep (Goldfields)	Vacant
JACHTFONTEIN	344	41	Rand Uranium (Sibanye Gold)	
MODDERFONTEIN	345	60	Interstate Logistics CC	
MODDERFONTEIN	345	65	South Deep (Goldfields)	Mine Infrastructure

RIETFONTEIN	349	41	Kloof Gold Mining Company (Sibanye)	Chris Hatting
RIETFONTEIN	349	35	Kloof Gold Mining Company (Sibanye)	
RIETFONTEIN	349	73	Kloof Gold Mining Company (Sibanye)	
DOORNPOORT	347	29	Birks Hyram	
DOORNPOORT	347	28	Kloof Gold Mining Company (Sibanye)	
DOORNPOORT	347	11	South Deep (Goldfields)	PTN Doornkloof TSF
DOORNPOORT	347	37	Johannes Momberg (Johnny)	
DOORNPOORT	347	5 & 38	Willie Moller	
DAVONIA	363	R	Sibanye Gold Ltd	Mike Eksteen
WILDEBEESTKUIL	360	1	South Deep (Goldfields)	
DOORNPOORT	347	1	South Deep (Goldfields)	Koos van Rensburg
DOORNPOORT	347	19	South Deep (Goldfields)	PTN Doornkloof TSF

DOORNPOORT	347	18	South Deep (Goldfields)	PTN Doornkloof TSF
KALBASFONTEIN	365	RE/1	South Deep (Goldfields)	National Government Republic Of South Africa
CARDOVILLE	364	11	South Deep (Goldfields)	Dr Johannes Cornelius Coetzee Badenhorst
CARDOVILLE	364	RE/3	South Deep (Goldfields)	Armand De Villiers
CARDOVILLE	364	8	South Deep (Goldfields)	Armand De Villiers
KALBASFONTEIN	365	51	South Deep (Goldfields)	Barry Van Wyk
CARDOVILLE	364	RE/6	South Deep (Goldfields)	Barry Van Wyk
KALBASFONTEIN	365	50	South Deep (Goldfields)	Barry Van Wyk
CARDOVILLE	364	13	South Deep (Goldfields)	Armand De Villiers
CARDOVILLE	364	RE/5	South Deep (Goldfields)	Armand De Villiers
SPRINGBOK KRAAL	359	1	South Deep (Goldfields)	Koos van Rensburg
WILDEBEESTKUIL	360	1	South Deep (Goldfields)	Koos van Rensburg

WILDEBEESTKUIL	360	6	Frans Roelf Johannes De Bruyn	
WILDEBEESTKUIL	360	7 & 8	Andre Swanepoel (was JGM Oosthuizen)	
WILDEBEESTKUIL	360	18	Andre Swanepoel	
WILDEBEESTKUIL	360	5	GFI Joint Venture Holdings (Pty) Ltd (Goldfields)	Frans Roelf Johannes De Bruyn
WILDEBEESTKUIL	360	2	Dr Johannes Cornelius Coetzee Badenhorst	
DROOGHEUVEL	521	2	Dr Johannes Cornelius Coetzee Badenhorst	
CARDOVILLE	358	4	Dr Johannes Cornelius Coetzee Badenhorst	
CARDOVILLE	358	7	Dr Johannes Cornelius Coetzee Badenhorst	
CARDOVILLE	358	0	Dr Johannes Cornelius Coetzee Badenhorst	
CARDOVILLE	358	3	Dr Johannes Cornelius Coetzee Badenhorst	
GEMSBOKFONTEIN	290	13	Sibanye Gold Ltd	
GEMSPOST	288	RE	Sibanye Gold Ltd	

MIDDELVLEI	255	2	Impafa Resources Pty Ltd (Mr Loyiso Mangena)	
MIDDELVLEI	255	6	Montrose Farms Pty Ltd	
GEMSPOST	288	5	Sibanye Gold Ltd	
GEMSPOST	288	7	Venterspost Municipality (MD Mokeona)	
GEMSPOST	288	11	Mr Sylvester Tshilwane - Department of Public Works	
GEMSPOST	288	19	Far West Rand Dolomitic Water Association Philemon Sefoshe (083) 261 3743	F.A Gerber 083 3066 386
GEMSPOST	288	34	Westonaria Local Municipality - Mr Thabo Ndlovu	
GEMSPOST	288	35	Far West Rand Dolomitic Water Association Philemon Sefoshe (083) 261 3743	F.A Gerber 083 3066 386
GEMSPOST	288	37	Kevin Khoza	
GEMSPOST	288	40	NO INFO	
VENTERSPOST	284	4	Far West Rand Dolomitic Water Association Philemon Sefoshe (083) 261 3743	F.A Gerber 083 3066 386
GEMSPOST	288	43	Westonaria Local Municipality - Mr Thabo Ndlovu	

GEMSPOST	288	45	Transnet Ltd (Mafudi Molelekeng)	
GEMSPOST	288	49	Westonaria Local Municipality - Mr Thabo Ndlovu	
GEMSBOKFONTEIN	290	8	Molly Becker	
GEMSBOKFONTEIN	290	12	Far West Rand Dolomitic Water Association Philemon Sefoshe (083) 261 3743	Philemon Mantjane
GEMSBOKFONTEIN	290	14	Far West Rand Dolomitic Water Association Philemon Sefoshe (083) 261 3743	Philemon Mantjane
VENTERSPOST	284	60	Westonaria Local Municipality - Mr Thabo Ndlovu	
VENTERSPOST	284	66	NO INFO	
VENTERSPOST	284	77	Far West Rand Dolomitic Water Association Philemon Sefoshe (083) 261 3743	F.A Gerber 083 3066 386
VENTERSPOST	284	103	Transnet Ltd (Mafudi Molelekeng)	
GEMSPOST	288	4	Sibanye Gold Ltd	
GEMSPOST	288	33	Westonaria Local Municipality - Mr Thabo Ndlovu	
GEMSPOST	288	44	Transnet Ltd (Mafudi Molelekeng)	

GEMSBOKFONTEIN	290	6	Rand Uranium (Sibanye Gold)	
GEMSBOKFONTEIN	290	13	Sibanye Gold Ltd	
GEMSBOKFONTEIN	290	20	Sibanye Gold Ltd	Vacant
VENTERSPOST	284	59	Westonaria Local Municipality - Mr Thabo Ndlovu	
VENTERSPOST	284	67	NO INFO	
VENTERSPOST	284	76	Far West Rand Dolomitic Water Association Philemon Sefoshe (083) 261 3743	F.A Gerber 083 3066 386
GEMSPOST	288	RE	Sibanye Gold Ltd	
GEMSPOST	288	29	Westrand District Municipality (MD Mokoena)	
GEMSBOKFONTEIN	290	23	Westonaria Local Municipality - Mr Thabo Ndlovu	
CARDOVILLE	358	1	Dr Johannes Cornelius Coetzee Badenhorst	
CARDOVILLE	358	2	Dr Johannes Cornelius Coetzee Badenhorst	
CARDOVILLE	358	4	Dr Johannes Cornelius Coetzee Badenhorst	

KALBASFONTEIN (Cardonville 647 Ptn RE)	365	27	Goldfields	Barry van Wyk
KALBASFONTEIN	365	50	South Deep (Goldfields)	Barry van Wyk
KALBASFONTEIN	365	51	Goldfields	Barry van Wyk
WILDEBEESTKUIL	360	2	Dr Johannes Cornelius Coetzee Badenhorst	
WILDEBEESTKUIL	360	4	Goldfields	Mike Eksteen
WILDEBEESTKUIL	360	1	Goldfields	Koos van Rensburg
DROOGHEUVEL	521	RE	Dr Johannes Cornelius Coetzee Badenhorst	
DROOGHEUVEL	521	1	Dr Johannes Cornelius Coetzee Badenhorst	
RIETFONTEIN	519	18	Mrs Martha Jakoba Van Heerden Mr Karl van Heerden	
KALBASFONTEIN	365	9	William Alfred Rudman	
GELUKSDAL	396	RE	Sibanye Gold Ltd	Bernard Rabe
SPRINGBOK KRAAL	359	1	Goldfields	Koos van Rensburg

DOORNKLOOF	350	4	Kloof Gold Mining Company (Sibanye)	
DOORNKLOOF	350	RE/1	Kloof Gold Mining Company (Sibanye)	Mike Eksteen
DOORNKLOOF	350	R	Kloof Gold Mining Company (Sibanye)	Mike Eksteen
DRIEFONTEIN	355	15	Driefontein Consolidated (Sibanye)	Johan Burger
WONDERFONTEIN	103	106	Far West Rand Dolomitic Water Association Philemon Sefoshe (083) 261 3743	Philemon Mantjane
BLAAUWBANK	278	13	Far West Rand Dolomitic Water Association Philemon Sefoshe (083) 261 3743	C.R Liebenberg 083 6501 492
ROOIPOORT	109	72	Far West Rand Dolomitic Water Association Philemon Sefoshe (083) 261 3743	J.C.R Burger 082 3789 678
WONDERFONTEIN	103	72	Far West Rand Dolomitic Water Association Philemon Sefoshe (083) 261 3743	Philemon Mantjane
DOORNKLOOF	350	5	Far West Rand Dolomitic Water Association Philemon Sefoshe (083) 261 3743	Peter Henning Johan Burger
GEMSBOKFONTEIN	290	20	Sibanye Gold Ltd	Vacant
DOORNKLOOF	350	7	Paul Da Cruz	
DOORNKLOOF	350	8	Paul Da Cruz	

DOORNKLOOF	348	R	Sibanye Gold Ltd	
RIETFONTEIN	349	0	Barry van Wyk	
RIETFONTEIN	349	11	Sibanye Gold Ltd	
DOORNKLOOF	350	34	Far West Rand Dolomitic Water Association Philemon Sefoshe (083) 261 3743	Redlex. J.P.S Da Cruz
DOORNKLOOF	350	73	NO INFO	
DOORNKLOOF	350	27	Jacobs Family Trust	
DOORNPOORT	347	73	NO INFO	
BLYVOORUITZICHT	166	9	NO INFO	
DRIEFONTEIN	113	RE/1	Driefontein Consolidated (Sibanye)	J Mahne
DRIEFONTEIN	355	21	Golden Dries Developments CC	
BLYVOORUITZICHT	166	10	Blyvooruitzicht Gold Mining Co Ltd	

ROOIPOORT	109	66	Far West Rand Dolomitic Water Association Philemon Sefoshe (083) 261 3743	J.H Burger
DOORNPOORT	347	22	WESTERN AREAS LTD (Goldfields)	
DOORNPOORT	347	21	South Deep Joint Venture - Mr Micheal Diseko	
DOORNFONTEIN	522	11	Sibanye Gold Ltd	
DOORNFONTEIN	522	14	WESTERN AREAS LTD (Goldfields)	
DOORNFONTEIN	522	16	Gogia Inv Pty LTD - Mr. Henk Jooste	
DOORNFONTEIN	522	17	Garry Noel Lancaster	
DOORNFONTEIN	522	24	Willem Johannes Davel	
DOORNFONTEIN	522	25	Josias Renieris Laubscher Rossouw	
DOORNFONTEIN	522	5	Elandsfontein Q 561 Boerdery CC	
DOORNFONTEIN	522	12	Willem Johannes Davel	
DOORNFONTEIN	522	15	Garry Noel Lancaster	

DOORNFONTEIN	522	23	Hendrik Willem Faurie	
RIETFONTEIN	519	4	James Cecil Keyser	
RIETFONTEIN	519	12	Barry van Wyk	
RIETFONTEIN	519	14	Gerhardus Johannes Janse Van Rensburg	
RIETFONTEIN	519	15	William David Lourens	
RIETFONTEIN	519	13	Barry van Wyk	
RIETFONTEIN	519	16	WESTERN AREAS LTD (Goldfields)	
WILDEBEESTKUIL	360	13	Sibanye Gold Ltd	
WELTEVREDEN	357	7	Sibanye Gold Ltd	
WELTEVREDEN	357	9	Phillipus Jacobus Johannes Labuschange	
WELTEVREDEN	357	31	Sibanye Gold Ltd	
WELTEVREDEN	357	3	Mr Pieter Johannes Davidtsz	

KALBASFONTEIN	365	82	Letlolo aaron Mokotedi	
KALBASFONTEIN	365	32	Johanna Cornelia Geldenhuys	
KALBASFONTEIN	365	33	Willem Adolf Coetzee	
KALBASFONTEIN	365	34	Willem Adolf Coetzee Bryan Robertson (Farm manager)	
KALBASFONTEIN	365	35	Willem Adolf Coetzee Christiaan	
KALBASFONTEIN	365	36	Jacoba Magrieta Schutte	
KALBASFONTEIN	365	40	Willie Otto Theodore Lutt	Maryna Lutt (Wife)
KALBASFONTEIN	365	41	Willie Otto Theodore Lutt	Maryna Lutt (Wife)
KALBASFONTEIN	365	46	Jacobus Percival Barnard	
KALBASFONTEIN	365	47	Stephanus Phillipus Potgieter	
KALBASFONTEIN	365	49	Willie Otto Theodore Lutt	Maryna Lutt (Wife)
KALBASFONTEIN	365	52	David Stephanus Pretorius	

KALBASFONTEIN	365	53	Roelef Jacobus Nothnagel	
KALBASFONTEIN	365	54	Coetezer Jean	
DOORNPOORT	347	49	Eskom	
KALBASFONTEIN	365	55	Adam Adriaan Van Niekerk	
KALBASFONTEIN	365	56	SIMPSON NICOLA JEAN	
KALBASFONTEIN	365	60	Mlanjeni Dodo	
KALBASFONTEIN	365	61	Rene Constance Laubscher	
KALBASFONTEIN	365	68	Cornelia Saal Vereniging	
RAATSKRAAL	524	RE	Rand Uranium (Sibanye Gold)	
KALBASFONTEIN	365	76	Jaco Burger (son) Marisca (wife of son) Hendrik Stefanus Burger (Dad has died)	
KALBASFONTEIN	365	77	Hermann Johan Heunis	
RAATSKRAAL	524	2	OLIVIER JAN ALBERTUS	

KALBASFONTEIN	365	1	Mr Sylvester Tshilwane - Department of Public Works	
KALBASFONTEIN	365	10	Mr Sylvester Tshilwane - Department of Public Works	
KALBASFONTEIN	365	19	Mr Sylvester Tshilwane - Department of Public Works	
DOORNPOORT	347	3	Reinhardt Jacobus Van Graan	
DOORNPOORT	347	4	RAMAHLALERWA NCHABENG NELSON	
DOORNPOORT	347	6	Reinhardt Jacobus Van Graan Nelson Ranahlalerwa	
DOORNKLOOF	350	10	Sibanye Gold Ltd	
KALBASFONTEIN	365	23	Mr Sylvester Tshilwane - Department of Public Works	
KALBASFONTEIN	365	39	SCHUTTE JACOBA MAGRIETA Jannie de Wet	
KALBASFONTEIN	365	42	Hendrik Simon Dercksen	
KALBASFONTEIN	365	48	RHEEDER PIETER WILLEM	
KALBASFONTEIN	365	62	Rene Constance Laubscher	

RAATSKRAAL	524	1	Willem Johannes Davel	
RAATSKRAAL	524	8	NO INFO	
KAALFONTEIN	529	5	Jacobus Percival Barnard	
DAVONIA	363	RE	Sibanye Gold Ltd	
KALBASFONTEIN	365	38	GFI Joint Venture Holdings (Pty) Ltd (Goldfields)	
DOORNPOORT	347	47	WESTERN AREAS LTD (Goldfields)	
DOORNPOORT	347	51	WESTERN AREAS LTD (Goldfields)	
DOORNKLOOF	348	RE	Sibanye Gold Ltd	
DOORNKLOOF	350	11	Sibanye Gold Ltd	
CARDOVILLE	364	42	NO INFO	
CARDOVILLE	364	45	NO INFO	
CARDOVILLE	364	52	NO INFO	

CARDOVILLE	364	53	NO INFO	
KALBASFONTEIN	365	26	GFI Joint Venture Holdings (Pty) Ltd (Goldfields)	
DOORNPOORT	347	5	Estelle Moller Jonathan Kometsi	
DOORNPOORT	347	8	Reinhardt Jacobus Van Graan	
DOORNPOORT	347	10	Anna Susanna Mienie	
DOORNPOORT	347	18	Barrick Gold South Africa (Pty) Ltd	
DOORNPOORT	347	20	Barrick Gold South Africa (Pty) Ltd	
DOORNKLOOF	350	33	Sibanye Gold Ltd	
DOORNKLOOF	350	39	Sibanye Gold Ltd	
LEEUDOORN	351	1	RUDOSHAP SYNDICATE PTY LTD	
DOORNPOORT	347	28	Komaja Inv CC	
DOORNPOORT	347	11	Barrick Gold South Africa (Pty) Ltd	

DOORNPOORT	347	19	WESTERN AREAS LTD (Goldfields)	
DOORNPOORT	347	37	Johannes Momberg (Johnny)	
DOORNPOORT	347	44	WESTERN AREAS LTD (Goldfields)	
DOORNPOORT	347	48	WESTERN AREAS LTD (Goldfields)	
DOORNPOORT	347	50	Barrick Gold South Africa (Pty) Ltd	
DOORNPOORT	347	73	NO INFO	
DOORNKLOOF	350	13	Sibanye Gold Ltd	
LEEUDOORN	351	RE	Sibanye Gold Ltd	
CARDOVILLE	364	41	NO INFO	
CARDOVILLE	364	43	NO INFO	
CARDOVILLE	364	46	NO INFO	
KALBASFONTEIN	365	RE	Goldfields	

DOORNKLOOF	348	1	Sibanye Gold Ltd	
KALBASFONTEIN	365	37	GFI Joint Venture Holdings (Pty) Ltd (Goldfields)	
KALBASFONTEIN	365	39	Sarel Cilliers	
DRIEFONTEIN	355	0	Sibanye Gold Ltd	
DRIEFONTEIN	355	8	Sibanye Gold Ltd	
DRIEFONTEIN	355	5	Sibanye Gold Ltd	
OOG VAN ELANDSFONTEIN	114	0	Sibanye Gold Ltd	
LEEUWPOORT	356	12	Daniel Frederick Oberholzer	
LEEUWPOORT	356	3	Malhil Trading Group CC	
DRIEFONTEIN	113	3	Sibanye Gold Ltd	
DRIEFONTEIN	113	7	GFI Mining South Africa Pty Ltd	
DRIEFONTEIN	355	6	Sibanye Gold Ltd	

DRIEFONTEIN	355	13	Sibanye Gold Ltd	
DRIEFONTEIN	355	15	Sibanye Gold Ltd	
DRIEFONTEIN	355	20	Murray & Roberts Cementation Pty Ltd Gerrie Pieters	(018) 781 7000
DRIEFONTEIN	355	25	Eskom	
DRIEFONTEIN	113	2	Sibanye Gold Ltd	
DRIEFONTEIN	113	14	Eskom	
DRIEFONTEIN	355	2	Sibanye Gold Ltd	
DRIEFONTEIN	355	12	Sibanye Gold Ltd	
DRIEFONTEIN	355	18	Sibanye Gold Ltd	
DRIEFONTEIN	355	21	Golden Dries Developments CC	Murray & Roberts Cementation Training Centre
RIETFONTEIN	349	12	Sibanye Gold Ltd	
RIETFONTEIN	349	31	NO INFO	

DOORNKLOOF	350	20	Sibanye Gold Ltd	**Jan Mare** **Deon Beets**
RIETFONTEIN	349	13	Sibanye Gold Ltd	
RIETFONTEIN	349	32	Sibanye Gold Ltd	
RIETFONTEIN	349	0	NO INFO	
RIETFONTEIN	349	7	Sibanye Gold Ltd	
RIETFONTEIN	349	14	Sibanye Gold Ltd	
RIETFONTEIN	349	21	Sibanye Gold Ltd	
RIETFONTEIN	349	25	Sibanye Gold Ltd	
RIETFONTEIN	349	47	Sibanye Gold Ltd	
RIETFONTEIN	349	74	Sibanye Gold Ltd	
DOORNKLOOF	350	4	Sibanye Gold Ltd	
DOORNPOORT	347	73	NO INFO	

DOORNKLOOF	350	2	Sibanye Gold Ltd	
DOORNKLOOF	350	19	Sibanye Gold Ltd	
RIETFONTEIN	349	19	Sibanye Gold Ltd	
RIETFONTEIN	349	20	Sibanye Gold Ltd	
RIETFONTEIN	349	35	Sibanye Gold Ltd	
PANVLAKTE	291	37	NO INFO	
STRYDPAN	243	0	Du Toit Ebenhaezer-Administrators/Rand Uranium	
STRYDPAN	243	3	Rand Uranium (Sibanye Gold)	
STRYDPAN	243	126	Rand Uranium (Sibanye Gold)	
STRYDPAN	243	127	Zacharias Johannes Van Greuning	
STRYDPAN	243	134	Randfontein Estates Gold Mining CO Witwatersrand Ltd	
STRYDPAN	243	5	Mr Sylvester Tshilwane - Department of Public Works	

STRYDPAN	243	31	Rand Uranium (Sibanye Gold)	
STRYDPAN	243	33	Rand Uranium (Sibanye Gold)	
STRYDPAN	243	58	Rand Uranium (Sibanye Gold)	
STRYDPAN	243	59	Arch Import & ExportX CC	
GEMSBOKFONTEIN	290	5	Rand Uranium (Sibanye Gold)	
GEMSBOKFONTEIN	290	6	Rand Uranium (Sibanye Gold)	
PANVLAKTE	291	0	Rand Uranium (Sibanye Gold)	
WATERPAN	292	9	Mr Sylvester Tshilwane - Department of Public Works	
WATERPAN	292	13	Rand Uranium (Sibanye Gold)	
WATERPAN	292	27	Ezulwini mining Co Pty Ltd	
STRYDPAN	243	2	Rand Uranium (Sibanye Gold)	
STRYDPAN	243	34	Provincial Government of Gauteng	

STRYDPAN	243	46	Hermanus Antonie Conradie	
STRYDPAN	243	64	Rand Uranium (Sibanye Gold)	
WATERPAN	292	8	Rand Uranium (Sibanye Gold)	
STRYDPAN	243	4	Hendrikz Christoffel Frederik Theodorus	
STRYDPAN	243	103	Griebenow Anna Magrietha-Administrators	
STRYDPAN	243	114	Jan Harm Du Plessis	
STRYDPAN	243	6	Rand Uranium (Sibanye Gold)	
STRYDPAN	243	8	Rand Uranium (Sibanye Gold)	
STRYDPAN	243	20	Provincial Government of Gauteng	
STRYDPAN	243	21	Provincial Government of Gauteng	
STRYDPAN	243	32	Rand Uranium (Sibanye Gold)	
STRYDPAN	243	39	Charles Katz	

STRYDPAN	243	40	MV Ngcobela Family Trust	
STRYDPAN	243	41	Rand Uranium (Sibanye Gold)	
STRYDPAN	243	42	Rand Uranium (Sibanye Gold)	
STRYDPAN	243	43	Rand Uranium (Sibanye Gold)	
STRYDPAN	243	45	Rand Uranium (Sibanye Gold)	
STRYDPAN	243	47	Rand Uranium (Sibanye Gold)	
STRYDPAN	243	48	Rand Uranium (Sibanye Gold)	
STRYDPAN	243	49	Rand Uranium (Sibanye Gold)	
MIDDELVLEI	255	4	Plaaslike Oorgangsraad van Randfontein	
ZUURBULT	240	0	Mr Sylvester Tshilwane - Department of Public Works	
STRYDPAN	243	60	Jonas Gutu	
STRYDPAN	243	62	Rand Uranium (Sibanye Gold)	

STRYDPAN	243	63	Kenneth Moloko	
STRYDPAN	243	74	Rand Uranium (Sibanye Gold)	
STRYDPAN	243	76	Rand Uranium (Sibanye Gold)	
STRYDPAN	243	77	Rand Uranium (Sibanye Gold)	
STRYDPAN	243	88	Rand Uranium (Sibanye Gold)	
STRYDPAN	243	97	Mr Sylvester Tshilwane - Department of Public Works	
STRYDPAN	243	100	Mr Sylvester Tshilwane - Department of Public Works	
LIBANON OR WITKLEIGAT	283	3	Westonaria Local Municipality - Mr Thabo Ndlovu	
GEMSPOST	288	38	Angelo and Maria De Andrade	
GEMSPOST	288	42	Angelo and Maria De Andrade	
GEMSPOST	288	43	Westonaria Local Municipality - Mr Thabo Ndlovu	
GEMSBOKFONTEIN	290	16	NO INFO	

PANVLAKTE	291	1	Calcined Products Pty Ltd	
WATERPAN	292	2	Far West Rand Dolomitic Water Association Philemon Sefoshe (083) 261 3743	A. Janse Van Rensburg 082 5611 604
WATERPAN	292	3	Ezulwini mining Co Pty Ltd	
WATERPAN	292	4	Rand Uranium (Sibanye Gold)	
WATERPAN	292	6	Rand Uranium (Sibanye Gold)	
WATERPAN	292	11	Rand Uranium (Sibanye Gold)	
WATERPAN	292	14	Ezulwini mining Co Pty Ltd	
WATERPAN	292	18	Far West Rand Dolomitic Water Association Philemon Sefoshe (083) 261 3743	P.A Van Graan 082 5700 518
WATERPAN	292	26	Ezulwini mining Co Pty Ltd	Kevin Khoza
NELSHOOGTE	286	1	Westrand District Municipality (MD Mokoena)	
JACHTFONTEIN	344	2	LI Tongming	
ELANDSFONTEIN	346	20	Esau Mogole	

ELANDSFONTEIN	346	23	Esau Mogole	
JACHTFONTEIN	344	41	Rand Uranium (Sibanye Gold)	
ELANDSFONTEIN	346	29	WESTERN AREAS LTD (Goldfields)	
ELANDSFONTEIN	346	38	Esau Mogole	
STRYDPAN	243	75	Rand Uranium (Sibanye Gold)	
STRYDPAN	243	78	Rand Uranium (Sibanye Gold)	
STRYDPAN	243	104	Losberg Inv Pty Ltd Ian De Kock	
STRYDPAN	243	121	Jan Harm Du Plessis	
STRYDPAN	243	133	Jan Harm Du Plessis	
GEMSPOST	288	46	Transnet Ltd (Mafudi Molelekeng)	
GEMSPOST	288	48	Westonaria Local Municipality - Mr Thabo Ndlovu	
ELANDSFONTEIN	346	1	Rudolph Visser Von Abo Maria Mpfuka	

GEMSBOKFONTEIN	290	20	Sibanye Gold Ltd	
PANVLAKTE	291	14	Westonaria Local Municipality - Mr Thabo Ndlovu	
WATERPAN	292	15	Far West Rand Dolomitic Water Association Philemon Sefoshe (083) 261 3743	P.A Van Graan 082 5700 518
LIBANON OR WITKLEIGAT	283	0	Sibanye Gold Ltd	
STRYDPAN	243	1	Jose Manuel Vicente	
WATERPAN	292	32	Mr Sylvester Tshilwane - Department of Public Works	
BEKKERSDAL	294	0	Westonaria Local Municipality - Mr Thabo Ndlovu	
STRYDPAN	243	19	Provincial Government of Gauteng	
GEMSPOST	288	0	Sibanye Gold Ltd	
GEMSPOST	288	29	Westrand District Municipality (MD Mokoena)	
STRYDPAN	243	29	Rand Uranium (Sibanye Gold)	
STRYDPAN	243	44	Portion 4 of the Farm Luipaardsvlei CC	

STRYDPAN	243	50	Gieljam Christoffel Kotze	
STRYDPAN	243	57	Pierdomenico Rizzo	
STRYDPAN	243	61	Rand Uranium (Sibanye Gold)	
LEEUWKRAAL	50	0	NO INFO	
HAAKDOORNBULT	49	0	NO INFO	
BUFFELSDRIFT	51	0	Jacob Francois Kok	
BOSCHRUST	52	0	Elsie Magdalina Lubbe	
STRYDPAN	243	136	Transitional Local Council of randfontein	
Waterpan	292	4	Rand Uranium (Sibanye Gold)	
Waterpan	292	6	Rand Uranium (Sibanye Gold)	
Jachtfontein	344	41	Rand Uranium (Sibanye Gold)	
Waterpan	292	13	Rand Uranium (Sibanye Gold)	

Modderfontein	345	24	Rand Uranium (Sibanye Gold)	
Waterpan	292	5	Rand Uranium (Sibanye Gold)	
Waterpan	292	11	Rand Uranium (Sibanye Gold)	
Waterpan	292	14	Ezulwini mining Co Pty Ltd	
Waterpan	292	18	Far West Rand Dolomitic Water Association Philemon Sefoshe (083) 261 3743	P.A Van Graan 082 5700 518
Waterpan	292	23	Mitchell Projecte Pty Ltd	
Waterpan	292	24	Rand Uranium (Sibanye Gold)	
Waterpan	292	26	Ezulwini mining Co Pty Ltd	
Waterpan	292	28	Rand Uranium (Sibanye Gold)	
Waterpan	292	29	Rand Uranium (Sibanye Gold)	
Waterpan	292	26	Ezulwini mining Co Pty Ltd	Kevin Khoza
Modderfontein	345	28	GFI Joint Venture Holdings (Pty) Ltd (Goldfields)	

Jachtfontein	344	2	LI Tongming	Piet Hems
Modderfontein	345	4	Mr Sylvester Tshilwane - Department of Public Works	
Waterpan	292	15	Far West Rand Dolomitic Water Association Philemon Sefoshe (083) 261 3743	P.A Van Graan 082 5700 518
Waterpan	292	22	Mitchell Projecte Pty Ltd	
Waterpan	292	25	Rand Uranium (Sibanye Gold)	
Waterpan	292	27	Ezulwini mining Co Pty Ltd	
Jachtfontein	344	42	Mr Sylvester Tshilwane - Department of Public Works	
Modderfontein	345	23	GFI Joint Venture Holdings (Pty) Ltd (Goldfields)	
Waterpan	292	49	Morgan Creek Prop 346 Pty Ltd	
Luipaardsvlei	243	134	Randfontein Estates Gold Mining Co Witwatersrand Ltd	
Luipaardsvlei	243	RE	Du Toit Ebenhaezer-Administrators/Rand Uranium	
Luipaardsvlei	243	8	Rand Uranium (Sibanye Gold)	

Luipaardsvlei	243	39	Charles Katz	
Luipaardsvlei	243	40	MV Ngcobela Family Trust	
Luipaardsvlei	243	41	Rand Uranium (Sibanye Gold)	
Luipaardsvlei	243	42	Rand Uranium (Sibanye Gold)	
Luipaardsvlei	243	43	Rand Uranium (Sibanye Gold)	
Luipaardsvlei	243	45	Rand Uranium (Sibanye Gold)	
Zuurbult	240	RE	Rand Uranium (Sibanye Gold)	
Luipaardsvlei	243	88	Rand Uranium (Sibanye Gold)	
Luipaardsvlei	243	90	Nicolas Johannes Erasmus Coetzee	
Luipaardsvlei	243	121	Jan Harm Du Plessis	
Luipaardsvlei	243	133	Jan Harm Du Plessis	
Luipaardsvlei	243	44	Portion 4 of the Farm Luipaardsvlei CC	

DRIEFONTEIN	355	0	Sibanye Gold Ltd	
DRIEFONTEIN	355	8	Sibanye Gold Ltd	
DRIEFONTEIN	355	5	Sibanye Gold Ltd	
OOG VAN ELANDSFONTEIN	114	0	Sibanye Gold Ltd	
LEEUWPOORT	356	12	Daniel Frederick Oberholzer	
LEEUWPOORT	356	3	Malhil Trading Group CC	
DRIEFONTEIN	113	3	Sibanye Gold Ltd	
DRIEFONTEIN	113	7	GFI Mining South Africa Pty Ltd	
DRIEFONTEIN	355	6	Sibanye Gold Ltd	
DRIEFONTEIN	355	13	Sibanye Gold Ltd	
DRIEFONTEIN	355	15	Sibanye Gold Ltd	
DRIEFONTEIN	355	20	Murray & Roberts Cementation Pty Ltd Gerrie Pieters	

DRIEFONTEIN	113	2	Sibanye Gold Ltd	
DRIEFONTEIN	355	2	Sibanye Gold Ltd	
DRIEFONTEIN	355	12	Sibanye Gold Ltd	
DRIEFONTEIN	355	18	Sibanye Gold Ltd	
DRIEFONTEIN	355	21	Golden Dries Developments CC	Murray & Roberts Cementation Training Centre
KALBASFONTEIN\	365	77	Sarel Cilliers	