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ENVIRONMENTAL



Environmental Impact Assessment for the Proposed Open Pit Coal Mine and Associated Infrastructure, near Bronkhorstspuit, Gauteng

Heritage Impact Assessment

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Prepared for:

Oakleaf Investment Holdings 95 (Pty) Ltd



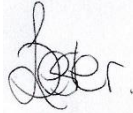


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Project Code:	FOU2191		
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I, Justin du Piesanie as duly authorised representative of Digby Wells and Associates (Pty) Ltd., hereby confirm my independence (as well as that of Digby Wells and Associates (Pty) Ltd.) and declare that neither I nor Digby Wells and Associates (Pty) Ltd. have any interest, be it business, financial, personal or other, in any proposed activity, application or appeal in respect of Oakleaf Investment Holdings 95 (Pty) Ltd, other than fair remuneration for work performed, specifically in connection with the Heritage Resources Management (HRM) Process for the proposed Oakleaf Open Pit Coal Mine Project, Gauteng Province.



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ACRONYMS

AMD	Acid Mine Drainage
ASAPA	Association of Southern African Professional Archaeologists
BGG	Burial Ground and Graves
BID	Background Information Document
CMP	Conservation Management Plan
CRR	Comments and Response Report
Digby Wells	Digby Wells Environmental
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EMP	Environmental Management Programme
GRP	Grave Relocation Plan
HIA	Heritage Impact Assessment
HRM	Heritage Resources Management
IAIA	International Association for Impact Assessment
ICOMOS	International Council on Monuments and Sites
IWULA	Integrated Water Use Licence Application
MPRDA	Minerals and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)
Mt	Monument
NASA	National Archives of South Africa
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEM:WA	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NID	Notification of Intent to Develop
NoK	Next-of-Kin

NWA	National Water Act, 1998 (Act No. 36 of 1998)
Oakleaf	Oakleaf Investment Holdings 95 (Pty) Ltd
PHRA-G	Gauteng Provincial Heritage Resources Authority
Premier Mine	Premier Mine
RoM	Run of Mine
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
SAMA	South African Museum Association
SEP	Stakeholder Engagement Process
SoW	Scope of Work
Ste	Structure
STP	Shovel Test Pit
Wf	Werf



GLOSSARY¹

Archaeological	<p>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.</p> <p>Rock art created through human agency older than 100 years, including any area within 10 m of such representation.</p> <p>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.</p> <p>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.</p>
Cultural significance (CS)	The aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance (NHRA Section 2).
Development	<p>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:</p> <p>Construction, alteration, demolition, removal or change of use of a place or a structure at a place.</p> <p>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.</p> <p>Constructing or putting up for display signs or hoardings; any change to the natural or existing condition or topography of land.</p> <p>Any removal or destruction of trees, or removal of vegetation or topsoil.</p>
Field Rating	<p>SAHRA requires heritage resources to be provisionally rated in accordance with Section 7 of the NHRA, which provides a three tier grading system of resources that form part of the national estate. The rating system distinguishes between four categories:</p> <p>Grade I - national significance.</p> <p>Grade II - provincial significance.</p> <p>Grade III - local significance.</p> <p>General Protected, i.e. generally protected in terms of Sections 33 to 37 of the NHRA.</p>
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

¹ The glossary includes definitions contained in the NHRA, Winter & Bauman 2005 and other documents and websites.



	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.
Intangible / living 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.
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 trace.
Pedestrian survey	A method of examining a site in which surveyors, spaced at regular intervals, systematically walk over the area being investigated.
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)	<p>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.</p> <p>Phase 2 excavations can only be done under a permit issued by SAHRA, or other appropriate heritage agency, to the appointed archaeologist.</p>
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



	<p>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).</p>
Reconnaissance	<p>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).</p>
Run of Mine (RoM)	<p>Coal delivered from the mine that reports to the coal preparation plant, i.e. the raw material consisting of coal, rocks, middlings, minerals and contamination.</p>
Tangible heritage	<p>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.</p>

EXECUTIVE SUMMARY

Introduction

Digby Wells Environmental (hereafter Digby Wells) was requested to serve as the independent Environmental Assessment Practitioner (EAP) for the proposed Oakleaf Investment Holdings 95 (Pty) Ltd (hereafter Oakleaf) Open Pit Coal Mine Project.

Digby Wells completed a Notification of Intent to Develop (NID) during the Scoping Phase of the project as part of the specialist heritage study. The NID provided a cultural heritage baseline and provided specialist motivation for appropriate studies to be included in this Heritage Impact Assessment (HIA).

The NID was submitted to the South African Heritage Resources Agency (SAHRA) (Case ID: 6669) and Gauteng Provincial Heritage Resources Authority (PHRA-G) in October 2014 for Statutory Comment in accordance with Section 38(2) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA). Statutory comment from SAHRA was received on 10 December 2014.

Project Description

Oakleaf proposes the development of an open pit coal mine approximately 5.5 km northeast of Bronkhorstspuit town, within the City of Tshwane Municipality, Gauteng Province. Oakleaf have identified several layout and routing alternatives, including:

- Rail Siding Layouts; and
- Transfer via Haul Road; or
- Transfer via Conveyor System.

Terms of Reference

Based on information provided in the NID, SAHRA required that a Heritage Impact Assessment (HIA) be completed and submitted to SAHRA and PHRA-G prior to the development.

The HIA needed to include:

- A Phase 1 Archaeological Impact Assessment (AIA) and any other applicable heritage components;
- A palaeontological desktop assessment and/or Letter of Request for Exemption (LRE) from a Palaeontologist; and
- Identification of heritage sites, assessment of significance, and recommendations for appropriate mitigations.

Scope of Work

The Scope of Work (SoW) for the HIA was based on the interim comment issued by SAHRA and included:

- A palaeontological desktop assessment of the site specific study area;
- Field survey of the site specific study area to verify and record heritage resources;
- An assessment of cultural significance of the identified heritage resources in accordance with Section 3 of the NHRA;
- An assessment of the direct, indirect, induced and cumulative impacts of project related activities on identified heritage resources; and
- Consideration of alternatives and recommendations for feasible mitigation measures.

Constraints and Limitations

The following constraints and limitations were experienced as part of this HIA:

- Archival material on specific portions of properties was erratic, leaving an incomplete record of events;
- The proposed mine infrastructure designs were conceptual at the time that this HIA report was compiled; and
- Heritage resources, specifically archaeological remains, are often within a sub-surface context. Although every attempt to identify archaeological resources was made, there remains a high likelihood that such resources will be exposed during construction and operation of the mine.

Consultation Undertaken

No direct consultation was undertaken by the heritage specialists during the assessment or reconnaissance of the proposed project. Comments and responses were recorded as part of the Stakeholder Engagement Process (SEP) undertaken as part of the environmental authorisation process as regulated by the Environmental Impact Assessment (EIA) Regulations.

The proposed project was announced through distribution of an announcement letter and Background Information Document (BID) to identified stakeholders on 26 January 2015. Advertisements were placed in the Pretoria News and Streeknuus newspapers on 28 January and 30 January 2015 respectively. In addition, site notices were placed at the Bronkhorstspuit Public Library, City of Tshwane Municipality, and various locations surrounding the project area on 2 February 2015. All comments and responses were recorded in the Comments and Response Report (CRR).



Statement of Significance

Eight heritage resources were recorded during the reconnaissance, and the cultural significance and anticipated impacts on these resources were assessed against the available information.

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 identified 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 needed to be determined to allow implementation of appropriate management. This was achieved through assessing heritage resources value relative to certain prescribed criteria encapsulated in policies and legal frameworks as discussed in the NID.

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

The following heritage/cultural features were identified:

Burial ground containing at least 50 graves. This cemetery was first identified by Pistorius (2010), and contains graves with granite tombstones and others with stone surface dressing. The site is located within the proposed south pit.

Cemetery of approximately 30 graves. Some graves comprised of concrete surface dressing and tombstone, while the majority has stone surface dressing.

Monument erected in 1966 by the National Monuments Council to commemorate the Battle of Bronkhorstspuit of December 1880. The monument is located approximately 5.5km south of the project site. The extent of the battlefield is unknown. At present, the area has been encroached upon through agricultural activities and urbanisation. The historic sense-of-place has thus been affected.

The Premier Mine commissioned the Wilge River Scheme in the early 1900s to supply water from the Premier Mine Dam built in the Wilge and Bronkhorstspuit Rivers to supply clean water to the Mine's operations approximately 40 km northwest from the Dam. Water is currently still supplied via a pipeline that was laid in 1905. This pipeline crosses the Bronkhorstspuit River at the Premier Mine Pump house. In general the pipeline is underground. The pipeline traverses a small section of the northern boundary of the proposed open pit.

A four room historical stone structure with a fireplace in the main sitting room. No electrical wirings or plumbing was identified within the house, and roof was presumably thatch.

Located adjacent to the proposed south pit.

Rectangular stone walls covering an area that measures approximately 100m x 300m. These structures were presumably used as cattle kraals. The site is located adjacent to the proposed haul road.

Remains of rectangular stone walling, possibly the foundations of a historic house or animal kraal. The site is located adjacent to the proposed rail siding area.

Fossilised ripple impressions were also identified in close proximity to the proposed haul road. Located adjacent to the proposed haul road

Impact Assessment

Only three heritage impacts were considered, two were related to impacts on burial grounds and graves and one to a section of the Wilge River Scheme pipeline. These are summarised in the following table.

Code	Impact	Pre-mitigation:						Recommended mitigation	Post-mitigation:					
		Duration	Extent	Intensity	Consequence	Probability	Significance		Duration	Extent	Intensity	Consequence	Probability	Significance
Very High-CS	Potential damage and/or destruction of burial grounds	Permanent	International	Extremely high - negative	Extremely detrimental	Certain	Major - negative	As far as is feasible, mine infrastructure design and siting should be amended to remove any physical, direct impacts on the burial ground. Irrespective of whether the burial ground will be directly or indirectly affected, agreement regarding the future of the site must be reached between Oakleaf and NoK through the implementation of a Burial Grounds and Graves Consultation process in accordance with Section 36 of the NHRA and Chapter XI of the Regulations. This process must include agreements in respect of a Conservation Management Plan and possible Grave Relocation Plan.	Beyond project life	Limited	Very low - negative	Slightly detrimental	Highly probable	Minor - negative
Very High-CS	Loss of access to burial grounds	Project Life	Limited	Very high - negative	Moderately detrimental	Certain	Moderate - negative	Consult with bona fide NoK regulated under Chapter XI of the NHRA regulations, and any other applicable legislation. Develop an entitlement framework for NoK in which the terms and conditions for access to the burial ground are agreed upon.	Project Life	Limited	Extremely high - positive	Highly beneficial	Highly probable	Moderate - positive



High-CS	Destruction of Premier Mine Wilge River Scheme Pipeline	Permanent	Local	Extremely high - negative	Highly detrimental	Certain	Major - negative	Given that the section of the pipeline that will be impacted on is below ground, any changes to it will not diminish the collective significance assigned to the Premier Mine infrastructure associated with it. As a result, it is recommended that the pipeline be rerouted to allow continued use of it as part of the historical industrial heritage of the Cullinan Mine and Premier Mine Dam. It is further recommended that a Watching Brief be implemented during removal of the existing section of pipeline and a permit be applied for in terms of section 35 of the NHRA to collect any significant artefacts that may have been deposited during the original construction of this section. Collected material should be deposited with the Cullinan Mine Museum, or other recognised repository.	Short term	Very limited	Extremely high - positive	Moderately beneficial	Certain	Minor - positive
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Unplanned Events and Low Risks

Certain project activities were considered that may present low risks or cause unplanned events to heritage resources. These are associated with the Premier Mine Dam and Cullinan Diamond Mine and the 1880 Battle of Bronkhorstspuit site and monuments, summarised in the table following.

Unplanned event	Potential impact	Mitigation/ Management/ Monitoring
Degraded water quality	Erosion of cultural significance of Premier Mine Dam and Cullinan Diamond Mine via the Wilge River Scheme.	Mitigation measures to manage water quality must be implemented.
Physical and/or visual intrusion into site.	Erosion of cultural significance and degradation of sense of place of the battlefield.	The visual impact of the proposed mine should be mitigated as far as is feasible to reduce the intensity of the alteration to the current sense-of-place.



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1 Introduction

1.1 Project Background

Digby Wells Environmental (hereafter Digby Wells) was requested to serve as the independent Environmental Assessment Practitioner (EAP) for the proposed Oakleaf Investment Holdings 95 (Pty) Ltd (hereafter Oakleaf) Open Pit Coal Mine Project.

An Environmental Impact Assessment (EIA), Environmental Management Programme (EMP) and Integrated Water Use Licence Application (IWULA) are required to obtain environmental authorisation for the proposed project. This will be completed in accordance with the, National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA), Minerals and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA), National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) (NEM: WA) and the National Water Act, 1998 (Act No. 36 of 1998) (NWA).

Digby Wells completed a Notification of Intent to Develop (NID) during the Scoping Phase of the project as part of the specialist heritage study. The NID provided a cultural heritage baseline and provided specialist motivation for appropriate studies to be included in this Heritage Impact Assessment (HIA).

The NID was submitted to the South African Heritage Resources Agency (SAHRA) (Case ID: 6669) and Gauteng Provincial Heritage Resources Authority (PHRA-G)² in October 2014 for Statutory Comment in accordance with Section 38(2) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA). Statutory comment from SAHRA was received on 10 December 2014. These comments provided the Terms of Reference for this study, as outlined under Section 1.3 below.

1.2 Project Description³

Oakleaf is proposing the development of an open pit coal mine approximately 5.5 km northeast of Bronkhorstspruit town, within the City of Tshwane Municipality, Gauteng Province. The project will comprise a north and south pit, exploited through a combination of bench and strip mining methods. The Run of Mine (RoM) coal will be transported to the crushing and washing plant via a conveyor belt after which the coal will be discharged onto the product stockpile. The coal washing plant will produce both coal discard and slurry. These will be stored at the temporary discard dump and slurry dam respectively. It is planned for the coal discard to be disposed of within the open pit.

² No comment has yet been received from PHRA-G.

³ Detailed project descriptions, including relevant contact details, development context, legal frameworks and baseline cultural landscape description were reported on in the NID available from <http://www.sahra.org.za/cases/proposed-oakleaf-open-pit-coal-mine>

1.2.1 Project Alternatives⁴

Oakleaf have identified several layout and routing alternatives, including:

- Rail siding layouts;
- Conveyor system routing alternatives to a new proposed rail siding; and
- Hauling coal to the existing Bronkhorstspuit rail siding.

The no-go alternative would entail maintaining the status quo. The current land use is primarily maize and soya bean farming, with some small scale cattle farming. The no-go option would result in the continuation of such land use.

1.3 Terms of Reference

Based on information provided in the NID, SAHRA required that a Heritage Impact Assessment (HIA) be completed and submitted to SAHRA and PHRA-G prior to the development.

The HIA needed to include:

- A Phase 1 Archaeological Impact Assessment (AIA) and any other applicable heritage components;
- A palaeontological desktop assessment and/or Letter of Request for Exemption (LRE) from a Palaeontologist; and
- Identification of heritage sites, assessment of significance, and recommendations for appropriate mitigations.

1.4 Scope of Work

The Scope of Work (SoW) for the HIA was based on the interim comment issued by SAHRA and included:

- A palaeontological desktop assessment of the site specific study area;
- Field survey of the site specific study area to verify and record heritage resources;
- An assessment of cultural significance of the identified heritage resources in accordance with Section 3 of the NHRA;
- An assessment of the direct, indirect, induced and cumulative impacts of project related activities on identified heritage resources; and
- Consideration of alternatives and recommendations for feasible mitigation measures.

⁴ Refer to the EIA for detailed descriptions of the Project Alternatives. Routing options are depicted on Plan 1 of this report.



1.5 Expertise of the Specialist

Natasha Higgitt completed the reconnaissance. 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 Digby Wells. She has more than 4 years' experience in archaeological survey and gained further generalist heritage experience since her appointment at Digby Wells in South Africa and Liberia.

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

Justin du Piesanie completed the reconnaissance and compiled the HIA report. 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 Digby Wells. He has over 6 years combined experience in Heritage Resources Management (HRM) in South Africa, gaining further generalist experience since his appointment at Digby Wells in Botswana, Burkina Faso, the Democratic Republic of Congo, Liberia and Mali.

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

Prof. Marion Bamford completed the specialist Palaeontological Assessment. She obtained her Doctor of Philosophy (PhD) degree in Palaeobotany from the University of the Witwatersrand in 1990. She currently holds the position of Professor and Senior Management Committee Member at the Evolutionary Studies Institute at the School of Geosciences at the University of the Witwatersrand. She has over 15 year's professional experience throughout southern Africa and has completed over 25 Palaeontological Impact Assessments since 2004.

Liesl Bester conducted historical research and compiled the archival report, as an addendum to the HIA report. She obtained her Honours Degree (BHCS Honours) in Heritage and Cultural Studies, with History as a major, at the University of Pretoria in 2008. She is currently working as a Researcher for The Heritage Foundation (Die Erfenisstigting). She has 7 years' experience in historical and archival research and the writing of academic reports for a range of clients including local and foreign academics, other individuals and companies.

Liesl is a member of the South African Museum Association (SAMA) (*Member No. SNM 110*) and the International Association for Impact Assessment (IAIA), South Africa (*Member No. 3666*).

Johan Nel undertook the technical review of this HIA. 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 me to investigate and implement the integration of heritage resources management into EIAs. 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*).

1.6 Constraints and Limitations

The following constraints and limitations were experienced as part of this HIA:

- Archival material on specific portions of properties was erratic, leaving an incomplete record of events;
- The proposed mine infrastructure designs were highly conceptual at the time that this HIA report was compiled; and
- Heritage resources, specifically archaeological remains, are often within a sub-surface context. Although every attempt to identify archaeological resources was made, there remains a high likelihood that such resources will be exposed during construction and operation of the mine.

2 Methodology

2.1 Data Collection

Gathered information assists in the development of the cultural heritage baseline profile, determination of cultural significance, and assessment of impacts. Both qualitative (*i.e. documentary information*) and quantitative (*i.e. field based*) data were collected for the HIA. Both methods are described in more detail below.

2.1.1 Archival Data Collection⁵

Several information repositories were utilised to identify relevant information sources, including secondary source material, topographical historic maps and archival documents held within the National Archives of South Africa (NASA) in Pretoria. The objectives of the archival data collection were to:

⁵ This HIA only includes a summary and discussion of the most relevant findings. Please refer to Appendix B for the complete Archival Research Report and list of sources cited.



- Supplement and elaborate on the cultural baseline provided in the NID;
- Identify any potential fatal flaws, sensitive areas, current social complexities and known or possible tangible heritage resources; and
- Inform the HIA reconnaissance.

2.1.2 Field Based Data Collection

Natasha Higgitt and Justin du Piesanie (refer to Appendix A for detailed CVs) collected field based data for the HIA on 16 March 2015. The survey focused on the proposed development impact footprint of the proposed project.

The pre-disturbance survey was non-intrusive, i.e. no sampling of any kind took place, using a vehicular strategy along linear infrastructure and disturbed areas, i.e. relative undisturbed areas were surveyed using a pedestrian strategy, i.e. on foot. The objectives of the pre-disturbance survey were to:

- Verify heritage resources identified during the scoping assessment;
- Visually record the current state of the cultural landscape;
- Ground truth certain heritage identified in the literature; and
- Record all tangible heritage resources within the proposed Oakleaf impact footprint.

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

2.2 Impact Assessment and Recommendations

The desired outcome of an impact assessment is the removal of negative impacts on heritage resources through the implementation of feasible mitigation measures. The mitigation and management measures recommended comply with the General Principles set out under Section 5 of the NHRA. The recommendations further considered the cultural significance of heritage resources and the recommended minimum level of mitigation as

Designation	Recommended mitigation
Negligible	Sufficiently recorded, no mitigation required
Low	Resource must be recorded before destruction, including detailed site mapping, surface sampling may be required
Medium	Mitigation of resource to include detailed recording and mapping, and limited sampling, e.g. STPs.
Medium High	Project design should aim to reduce or remove changes; Mitigation of resource to include extensive sampling and recording, e.g. test excavation, analyses, etc.
High	Project design must aim to avoid change to resource; Partly conserved, Conservation Management Plan (CMP)
Very High	Project design must change to avoid all change to resource; Conserved in entirety, CMP

Box 1: Recommended minimum level of required mitigation



published in the South African Heritage Resources Agency (SAHRA) Minimum Standards⁶ (See Box 1).

Recommended mitigation is therefore divided into two categories: *project related* and *mitigation of heritage resources* defined below.

- Project-related mitigation requires changes or amendments to project design, planning and siting of infrastructure to avoid or reduce physical impacts on heritage resources. Project-related mitigation measures are always the preferred option, especially where heritage resources with higher cultural significance will be impacted on. Project-related mitigation may include:
 - *In situ* preservation (i.e. no-development) of heritage resources for which Conservation Management Plans (CMPs) are required; and
 - Conservation of heritage resources through, for example, incorporating the resources into project design and planning, for which CMPs are also required.
- Mitigation of heritage resources may be necessary where project-related mitigation will not sufficiently conserve or preserve heritage resources, thus resulting in partial or complete changes (including destruction) to a resource. Such resources need to be mitigated to ensure that they are fully recorded, documented and researched before any negative change occurs. This may require mitigation such as:
 - Intensive detailed recording of sites through various non-intrusive techniques to create a documentary record of the site – “preservation by record”;
 - Intrusive recording and sampling such as shovel test pits (STPs) and excavations, relocation (usually burial grounds and graves, but certain types of sites may be relocated), restoration and alteration. Any form of intrusive mitigation is a regulated permitted activity for which permits need to be issued by the relevant heritage authorities. Such mitigation may result in a reassessment of the value of a resource that could require conservation measures to be implemented. Alternatively, an application for a destruction permit may be made if the resource has been sufficiently sampled; and
 - Where resources have negligible significance the specialist may recommend that no further mitigation is required and the site may be destroyed, for which a destruction permit must be applied for.

Appropriate mitigation measures were identified for each impact, and the procedure discussed above was to assess the possible consequence, probability and significance of each impact post-mitigation.

⁶ It must be noted that these minimum standards serve as a guide, and the recommendations provided in this HIA are project specific.

The post-mitigation rating provides an indication of the significance of residual impacts, while the difference between an impact's pre- and post-mitigation ratings represents the degree to which the recommended mitigation measures are expected to be effective in reducing or ameliorating that impact.

3 Consultation Undertaken

No direct consultation was undertaken by the heritage specialists during the assessment or reconnaissance of the proposed project. Comments and responses were recorded as part of the Stakeholder Engagement Process (SEP) undertaken as part of the EIA process. The proposed project was announced through the distribution of an announcement letter and Background Information Document (BID) to identified stakeholders on 26 January 2015. Advertisements were placed in the Pretoria News and Streeknuus newspapers on 28 January and 30 January 2015 respectively. In addition, site notices were placed at the Bronkhorstspuit Public Library, City of Tshwane Municipality, and various locations surrounding the project area on 2 February 2015. This section provides the heritage related comments and responses received during the commenting period dated 2 March to 5 May 2015.

Table 3-1: Extract of the Comments and Response Table from the CRR

COMMENT RAISED	CONTRIBUTOR	ORGANISATION/ COMMUNITY	DATE	METHOD	RESPONSE
Heritage					
What will the Heritage implications on the Premier Mine dam be?	Hennie Cronje	Landowner	7 October 2014	One-on-one Consultations	Please refer to Section 7 of the HIA. The Premier Mine (Premier Mine) dam was built in 1909 as part of the Premier Mine (today known as the Cullinan Diamond Mine) and is owned by Petra Diamonds. The dam is situated over 5 km from the proposed project area. No direct impacts on the heritage value of the dam are envisaged. Secondary impact may occur if water quality is compromised. This could result in the erosion of the significance and integrity of the dam as a heritage resource.
It was noted that Digby Wells will submit a Heritage Impact Assessment (HIA) when this is ready. Please remember to do so, for the committees' inputs.	Tebogo Molokomme	For the HIA committee Provincial Heritage Resources Authority – Gauteng (PHRA-G)	11 December 2014	Written Comment	Noted. The HIA was submitted on SAHRIS under Case ID: 6669 for comment. A hardcopy was delivered to PHRA-G offices in Johannesburg for Statutory Comment as required under Section 38(8) of the NHRA.
Seems reasonable although the Cultural Sensitivity Rating calculation will disregard artefacts of extreme importance in one aspect alone, one should still apply a cognitive process to artefacts, to establish if such a loss will be tenable.	Ina Venter	Spatial Ecological Consulting CC	3 April 2015	Written Comment	The methodology for determining Cultural Significance is provided under Section 2.2 and 4 of the HIA. The importance / significance take into consideration four dimensions – aesthetic, historic, scientific and social as under Section 3 of the National Heritage Resources Act, 1999 (Act No. 25 of 1999). The cognitive process in the development of heritage resources is assessed under the aesthetic dimension where the degree of technical / creative skill at a particular time (Section 3(3)(f) of the NHRA) is considered.
How will graves be handled? (Inclusive of blasting damage)		The Bronkhorstspuit and Wilge River Conservancy Organisation	4 May 2015	Written Comment	Digby Wells understands that graves are very sensitive heritage resources. All graves are protected under South African (SA) legislation.

COMMENT RAISED	CONTRIBUTOR	ORGANISATION/ COMMUNITY	DATE	METHOD	RESPONSE
					A Burial Grounds and Graves Consultation (BGGC) process need to be implemented in accordance with the NHRA Regulations to identify relatives and consult with them to reach agreements on the future of the gravesites that may include a Conservation Management Plan (CMP) or Grave Relocation Process (GRP).
What listed buildings are in the area?		The Bronkhorstspuit and Wilge River Conservancy Organisation	4 May 2015	Written Comment	No listed buildings, i.e. formally declared buildings, were identified on the South African Heritage Resources Agency (SAHRA) heritage site register.
What will happen to the graves on the site?	Mandy van der Westhuizen	NuLeaf Planning & Environmental (Representative of Rhenosterpoort Owner Society)	11 May 2015	Written Comment	A Burial Grounds and Graves Consultation (BGGC) process need to be implemented in accordance with the NHRA Regulations to identify relatives and consult with them to reach agreements on the future of the gravesites that may include a Conservation Management Plan (CMP) or Grave Relocation Process (GRP).



4 Updated Cultural Baseline

4.1 Palaeontological Context⁷

As indicated in the NID, the project area will be situated within the Wilge River Formation of the Waterberg Group. The Waterberg Group occurs in two basins: the main Waterberg Basin together with a smaller adjacent basin called the Nylstroom Basin; and a second basin called the Middelburg Basin.

The project area is situated within the Middelburg Basin.

Table 4-1: Stratigraphic subdivision of the Waterberg Group in the Main Waterberg Basin and Middleburg Basin

Ma	Eon	Era	Period	Group	Subgroups	Formations										
						South / Southwest and Central Area	North / Northeast and central area	Nylstroom Basin		Middelburg Basin						
1.88	Proterozoic	Palaeoproterozoic	Mokolian	Kheisian	Waterberg Group	Kransberg	Vaalwater	Vaalwater		Discontinuity						
							Cleremont	Cleremont								
							Sandriversberg	Mogalakwena								
							Matlabas	Aasvoëlkop				Makgabeng				
								Skilpadkop				Setlaole				
							Nylstroom	Alma					Alma			
						Swaershoek			Swaershoek							
						2.06										
															Wilge River	

In the Middelburg Basin the Wilge River Formation is the only Waterberg Group formation present. This formation uncomfortably overlies the Loskop Formation along the northern, eastern and southern margins, and rocks of the Pretoria Group on the south-western margin. The Karoo Supergroup, including coal deposits, unconformably overlies the Wilge River Formation. This geological formation has moderate palaeo-sensitivity.

Much research has been conducted on pre-vegetated braided river deposits, massive sandstones and some aeolianites of the Waterberg Group, which dates to 2.06 – 1.88 Ma. Studies have identified microbial mats within the Makgabeng Formation (*younger than the Wilge River Formation*); but, this formation does not occur within the Middelburg Basin. Although possible, no published evidence was found to indicate that these fossils occur within the Wilge River Formation.

⁷ The palaeontological context presents an update and specialists' assessment of the project area as required in statutory comments received on the NID (Case ID: 6669). Please refer to Appendix C for the Palaeontological Letter of Exemption and references cited.



4.2 Colonial and Historical Period⁸

As demonstrated in the NID, all identified heritage resources within the site specific study area were associated with the Colonial and Historical Period. A brief summary of this period is discussed below.

Boers living in the Cape became discontent after final British annexation of the Cape in 1806. The dissatisfied Boers chose to move into the interior of southern Africa, eventually establishing two Boer Republics, the *Zuid Afrikaansche Republiek* (ZAR, South African Republic, also known as the Transvaal Republic) and Republic of the Orange Free State. The farms under consideration in HIA, namely Wachtenbietjieskop 506 JR, Resurgam 515 JR and Tweefontein 491 JR, were surveyed and demarcated between 1839 and 1840, very soon after the emigration from the Cape Colony.

After the Sand River Convention of 1852, the two Republics officially obtained independence from Britain. Archival information dating to 1857 indicated that the aforementioned properties officially formed part of the Pretoria District of the ZAR. Shortly after, in 1858, a group of Voortrekkers settled along the Bronkhorstspuit, originally named the Kalkoenkransrivier, after which they purchased various surveyed farms from the ZAR Government: Resurgam 515 JR, Wachtenbietjieskop 506 JR, and Tweefontein 491 JR were purchased in 1861, 1865 and 1866 respectively.

In 1877, the British annexed the ZAR in support of their plans to establish a confederation of southern African states. The Boers regarded the annexation as a direct violation of the Sand River Convention, and a disregard of the Boers' independence. Tensions grew over the following years, culminating in December 1880 with the first uprising in Potchefstroom. This event marked the outbreak of the First War of Independence, also known as the Transvaal War or First Anglo-Boer War.

The Battle of Bronkhorstspuit was the results of a column of British soldiers, the 94th Regiment, despatched from around Lydenburg to reinforce the Pretoria garrison in fear of an armed Boer incursion. To prevent a concentration of British troops in Pretoria, a Boer commando under Commandant (Cmdt) Frans Joubert was sent towards Middelburg to oppose the advancing British. Boer movements were, however, noticed; the British column under command of Lieutenant Colonel (Lt Col.) Anstruther moved its wagons in laager style every night as a precautionary matter.

On 20 December, Boers approached the column and demanded that they halt their advance on Pretoria. Although accurate figures are not available, 78 British soldiers were killed and 79 wounded within minutes, compared to a single casualty on the Boers' side and five wounded and one casualty from wounds sustained. Anstruther died of wounds six days later.

⁸ The updated baseline provides a summary of the colonial and historical context presented within the NID, supplemented with the most salient findings from the Archival Research Report available as Appendix B. Please note that no references are cited within this report. These can be found within the NID and Archival Research Report.



After the Battle of Bronkhorstspuit, the next significant occurrence in the study area is the purchasing of land by Samuel (Sammy) Marks from 1886, specifically portions of Resurgam 515 JR and Wachtenbietjieskop 506 JR.

Marks was a Jewish business magnate with interests in the mining industry. Moving to Pretoria in 1881, he gained the confidence of President Kruger of the ZAR, to whom he recommended the construction of a railway from Pretoria to Lourenço Marques (now Maputo) in Moçambique (Mozambique). This historic railway crossed both Marks' properties. No archival documents could be found to support a notion that the properties were purchased as part of the railway construction. Officially opened in 1894, a railway station was established in the present day town of Bronkhorstspuit, that same year. Bronkhorstspuit was only granted approval as a town Bronkhorstspuit by the ZAR in June 1897.

Archival records suggest that, subsequent to these major historical events, the study area took on a primarily residential and agricultural character. This remains the current land use.

Although not located in the site specific study area, the history of the Cullinan Diamond Mine has bearing. The mine was established as the Premier Mine after the Cullinan kimberlite pipe was discovered in 1902. Open pit mining started in 1903 and around two years later the famous Cullinan Diamond was discovered. The mine was renamed Cullinan Diamond Mine in honour of Sir Thomas Major Cullinan as part of its centenary celebrations in 2003. The Mine is currently owned by Petra Diamonds.

The tangible heritage of the Premier Mine comprises several associated complexes, in Cullinan and outside Bronkhorstspuit. In context of this study, an important aspect is the Wilge River Scheme that was initiated soon after the Premier Mine commenced operations. This Scheme was conceived to provide clean water to the Mine from the confluence of the Bronkhorstspuit and Wilge Rivers, approximately 40 km southeast of the Mine. Important industrial infrastructure was developed in late 1905 including the Wilge River Pumping Station, a boiler house, economiser, weir and construction of the road and drift across the river connecting the Mine with Pumping Station. Water was, and still is, transported from the Pumping Station to the Cullinan Diamond Mine via a pipeline originating at the Pump Station on the southern banks of the Premier Mine Dam. The Premier Mine Dam was constructed in 1909.

5 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 identified 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 needed to be determined to allow implementation of appropriate management.

This was achieved through assessing heritage resources value relative to certain prescribed criteria encapsulated in policies and legal frameworks as discussed in the NID.

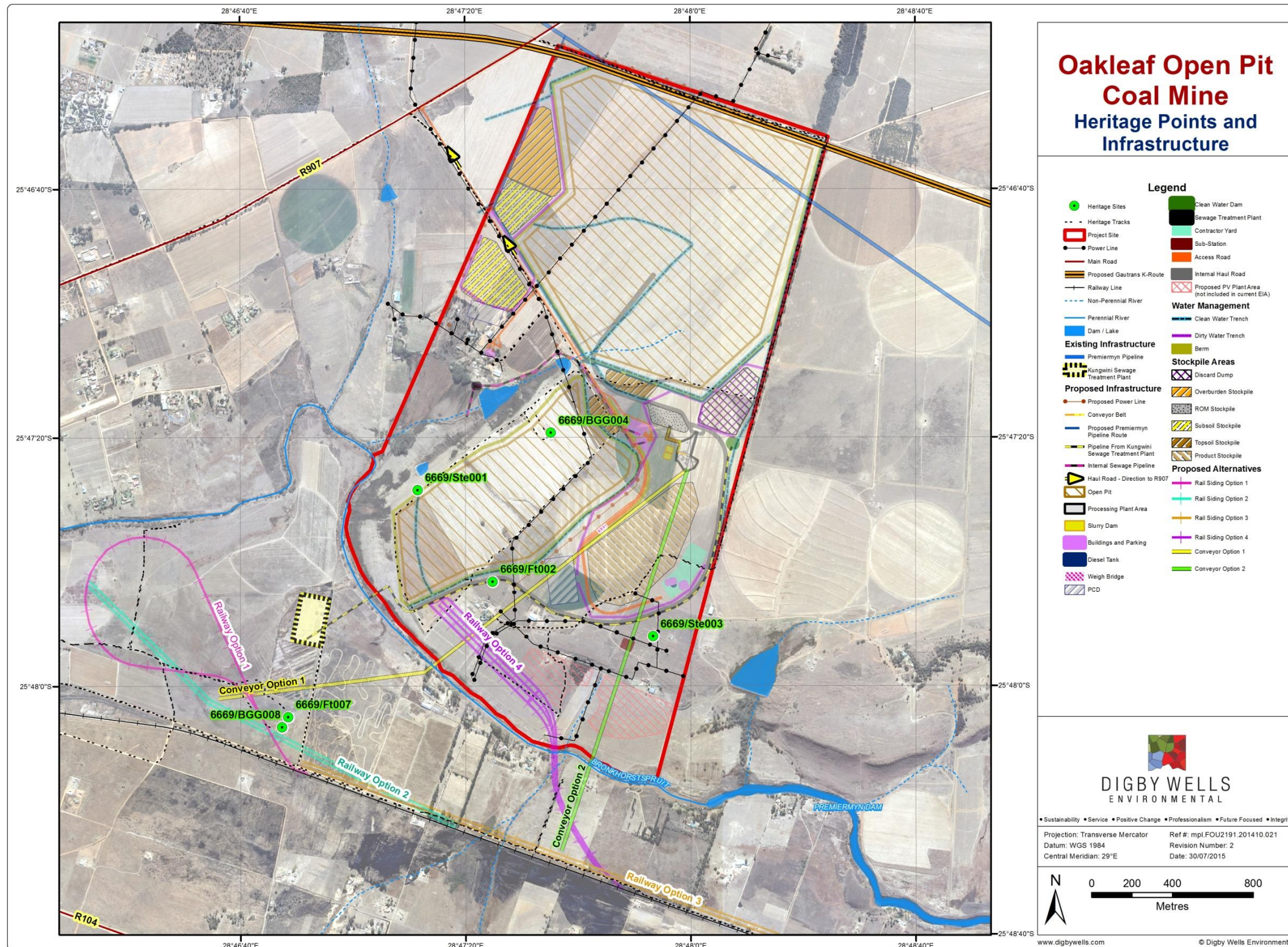
The importance of a heritage resource was determined on four dimensions – aesthetic, historic, scientific and social which in turn are measured against one or more descriptive attributes. This aimed to guide whether a resource should be included in the national estate as defined in the NHRA and international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

Table 5-1: Statement of Significance of identified heritage resources and the historic landscape

Resource ID	Type	Description	Cultural Significance	CS Motivation	Field Rating	Field Rating Motivation	Mitigation	Latitude	Longitude
6669/Ste001	Site	A four room historical stone structure with a fireplace in the main sitting room. No electrical wirings or plumbing was identified within the house, and roof was presumably thatch. Located adjacent to the proposed south pit.	Negligible	The structure was evaluated in terms of aesthetic, historic, scientific and social aspects. Its potential to contribute to any one of these aspects are very low, based largely due to the physical integrity of the site.	General Protection IV C	Although the site is afforded general protection in terms of section 34 of the NHRA, its cultural significance is negligible.	Notwithstanding the negligible cultural significance and low field rating, a destruction permit will still need to be issued for this site by the MPHRA.	-25.791248	28.786547
6669/Ft002	Natural feature	Fossilised ripple impressions. Located adjacent to the proposed haul road	Negligible	The fossilised ripple impressions were only evaluated in terms of its scientific importance. Although the integrity is excellent, the possible contribution to scientific importance was negligible.	General Protection IV C	The site does not represent fossilised animal or plant remains.	No further palaeontological mitigation will be required for this site.	-25.795355	28.790237
6669/Ste003	Site	Rectangular stone walls covering an area that measures approximately 100m x 300m. These structures were presumably used as cattle kraals. The site is located adjacent to the proposed haul road.	Negligible	The structure was evaluated in terms of aesthetic, historic, scientific and social aspects. Its potential to contribute to any one of these aspects are very low, based largely due to the physical integrity of the site.	General Protection IV C	Although the site is afforded general protection in terms of section 34 of the NHRA, its cultural significance is negligible.	Notwithstanding the negligible cultural significance and low field rating, a destruction permit will still need to be issued for this site by the MPHRA.	-25.797801	28.798163
6669/BGG004	Burial / grave	Burial ground containing at least 50 graves. This cemetery was first identified by Pistorius (2010), and contains graves with granite tombstones and others with stone surface dressing. The site is located within the proposed south pit.	Very High	All burial grounds and graves are considered to have high social value to various communities. In addition, graves may also have inherent historical significance. The CS assessment did not take into account aesthetic or scientific importance of the sites.	Grade III A	Burial grounds are afforded general protection in terms of NHRA section 36 - as such, no changes to the status quo of such sites can be made without consulting next of kin and obtaining prerequisite permits.	An extensive Burial Grounds and Graves Consultation process must be implemented in accordance with NHRA Regulations to identify bona fide next of kin and reach agreement regarding the future of the graves. Gravesites should ideally be conserved in situ, and the consultation process must enable a mutually agreed Conservation Management Plan to be developed and approved, allowing for visitation rights by families. In the event that grave relocation is determined to be necessary, the Client will need to ensure that next of kin provide informed consent, and implement the permit application process as per the NHRA Regulations.	-25.788695	28.793123
6669/Mt005	Monument	Monument commemorating the British soldiers who died during the Battle of Bronkhorstspuit in December 1880. The monument is located approximately 5.5km south of the project area	Very High	These sites were evaluated in terms of historic and social importance, in relation to the 1880 Battle of Bronkhorstspuit. Although the fabric and settings of these sites are degraded, the intrinsic meaning and associations of these sites are well established.	Grade III A	Both sites are public monuments and therefore afforded general protection in terms of section 37 of the NHRA.		-25.84041	28.74198
6669/Mt006	Monument	Monument erected in 1966 by the National Monuments Council to commemorate the Battle of Bronkhorstspuit of December 1880. The monument is located approximately 5.5km south of the project area.	Very High	These sites were evaluated in terms of historic and social importance, in relation to the 1880 Battle of Bronkhorstspuit. Although the fabric and settings of these sites are degraded, the intrinsic meaning and associations of these sites are well established.	Grade III A	Both sites are public monuments and therefore afforded general protection in terms of section 37 of the NHRA.		-25.84004	28.74106

6669/Ft007	Feature	Remains of rectangular stone walling, possibly the foundations of a historic house or animal kraal. The site is located adjacent to the proposed rail loop	Negligible	The structure was evaluated in terms of aesthetic, historic, scientific and social aspects. Its potential to contribute to any one of these aspects are very low, based largely due to the physical integrity of the site.	General Protection IV C	Although the site is afforded general protection in terms of section 34 of the NHRA, its cultural significance is negligible.	Notwithstanding the negligible cultural significance and low field rating, a destruction permit will still need to be issued for this site by the MPHRA.	-25.80139	28.78013
6669/BGG008	Burial / grave	Cemetery of approximately 30 graves. Some graves comprised of concrete surface dressing and tombstone, while the majority has stone surface dressing. The graves are in close proximity to Ft007 and the proposed rail loop	Very High	All burial grounds and graves are considered to have high social value to various communities. In addition, graves may also have inherent historical significance. The CS assessment did not take into account aesthetic or scientific importance of the sites	General Protection IV B	Burial grounds are afforded general protection in terms of NHRA section 36 - as such, no changes to the status quo of such sites can be made without consulting next of kin and obtaining prerequisite permits.	An extensive Burial Grounds and Graves Consultation process must be implemented in accordance with NHRA Regulations to identify bona fide next of kin and reach agreement regarding the future of the graves. Gravesites should ideally be conserved in situ, and the consultation process must enable a mutually agreed Conservation Management Plan to be developed and approved, allowing for visitation rights by families. In the event that grave relocation is determined to be necessary, the Client will need to ensure that next of kin provide informed consent, and implement the permit application process as per the NHRA Regulations.	-25.80185	28.77984
1880 Battle of Bronkhorstspuit Landscape	Battlefield	The approximate location of the 1880 Battle of Bronkhorstspuit as marked by 6669/Mt005 and 6669/Mt006 is located approximately 5.5km south of the proposed project. The extent of the battlefield is unknown. At present, the area has been encroached upon through agricultural activities and urbanisation. The historic sense-of-place has been affected through this encroachment.	Very High	The battlefield was evaluated in terms of historic and social importance. Notwithstanding that its physical character has changed, and that over the years agricultural and urban encroachment has occurred, the site's intrinsic meaning and associations is well established.	Grade III A	Battlefield are afforded general protection in terms of section 35 of the NHRA.			

Plan 1: Proposed Oakleaf Coal Mine Infrastructures and Distribution of Identified Heritage Resources





The cultural significance of the identified heritage resources located within the proposed site specific study area is presented in Table 5-1. The assigned values took into consideration the importance of the individual resources and landscape in relation to the aesthetic, historic, scientific and social criteria, as well as the integrity of the resource. The Statement of Significance indicates that the identified heritage resources designation range from negligible to very high significance.

6 Heritage Impact Assessment

6.1 Methodology

6.1.1 Evaluation of Significance

The significance rating process is designed to provide a numerical rating of the cultural significance⁹ of identified heritage resources. The evaluation was done as objectively as possible through a matrix developed by Digby Wells for this purpose. In addition, the methodology aims to allow ratings to be reproduced independently should it be required, provided that the same information sources are used.

This matrix takes into account heritage resources assessment criteria set out in subsection 3(3) of the NHRA (see

Box 2), which determines the intrinsic, comparative and contextual significance of identified heritage resources. A resource's importance rating is based on information obtained through review of available credible sources and representivity or uniqueness (i.e. known examples of similar resources to exist). The final significance attributed to a resource furthermore takes into account the physical integrity of the fabric of the resource. The formula used to determine significance can be summarised in Box 3.

The rationale behind the heritage value matrix takes into account the fact that a heritage resource's value is a

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)

Box 2: NHRA section 3 criteria

$$\text{Value} = \text{Importance} \times \text{Integrity}$$

where

$$\text{Importance} = \text{average sum}$$

of

$$\text{Aesthetic} + \text{Historic} + \text{Scientific} + \text{Social}$$

Box 3: CS formula

⁹ Cultural significance is defined in the NHRA as the intrinsic "aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance" of a heritage resource. These attributes are combined and reduced to four themes used in the Digby Wells significance matrix: aesthetic, historical, scientific and social.



direct indication of its sensitivity to change (impacts). Value therefore needs to be determined prior to the completion of any assessment of impacts.

This matrix rates the potential, or importance, of an identified resource relative to its contribution to certain values – aesthetic, historical, scientific and social.

The significance of a resource is directly related to the impact on it that could result from project-related activities, as it provides minimum accepted levels of change to the resource. SAHRA has published minimum standards that include minimum required mitigation of heritage resources. These minimum requirements are integrated into the matrix to guide both assessments of impacts and recommendations for mitigation and management of resources.

The weight assigned to the various parameters for significance in the formula, significance ratings and recommended mitigation are presented in Table 6-1.

6.1.2 Field Ratings

Although grading of heritage resources remains the responsibility of heritage resources authorities, SAHRA requires in terms of its Minimum Standards that heritage reports include Field Ratings for identified resources to comply with section 38 of the NHRA. The NHRA in terms of section 7 provides for a system of grading of heritage resources that form part of the national estate, distinguishing between three categories.

The field rating process is designed to provide a numerical rating of the recommended grading of identified heritage resources. The evaluation was done as objectively as possible by integrating the field rating into the significance matrix. Field ratings guide decision-making in terms of appropriate minimum required mitigation measures and consequent management responsibilities in accordance with section 8 of the NHRA. The formula used to determine field ratings is summarised in Box 4. The weight assigned to the various field rating parameters in the formula and the sum of the average ratings are presented in Table 6-1.

$$\text{Field Rating} = \text{average sum} \\ \text{of} \\ \text{Aesthetic} + \text{Historic} + \text{Scientific} + \text{Social}$$

Box 4: Field rating formula

Table 6-1: Ratings and descriptions used in determining CS and field ratings

Rating	IMPORTANCE <i>A heritage resource's contribution to aesthetic, historic, scientific and social value.</i>	INTEGRITY <i>The undivided or unbroken state, material wholeness, completeness or entirety of a resource or site</i>	FIELD RATING <i>Recommended grading of identified heritage resources in terms of NHRA Section 7</i>
-	Not assessed - dimension and/or attribute not considered in determining value.		Not assessed - dimension and/or attribute not considered in field rating.
0	The resource exhibits attributes that may be considered in a particular dimension, but it is so poorly represented that it cannot or does not contribute to the resource's overall value.	No information potential, complete loss of meaning, Fabric completely degraded, original setting lost	
1	Common, well represented throughout diverse cultural landscapes	Fabric poorly preserved, limited information, little meaning ascribed, extensive encroachment on setting	Resources under general protection in terms of NHRA sections 34 to 37 with Negligible significance
2	Generally well represented but exhibits superior qualities in comparison to other similar examples	Fabric is preserved, some information potential (quality questionable) and meaning evident, some encroachment on setting	Resources under general protection in terms of NHRA sections 34 to 37 with Low significance
3	The resource exhibits attributes that are rare and uncommon within a region. It is important to specific communities.	Fabric well preserved, good quality information and meaning evident, limited encroachment	Resources under general protection in terms of NHRA sections 34 to 37 with Medium to Medium-High significance
4	Rare and uncommon, value of national importance	Excellent preservation of fabric, high information potential of high quality, meaning is well established, no encroachment on setting	Resources under general protection in terms of NHRA sections 34 to 37 with High significance
5	The resource exhibits attributes that are considered singular, unique and/or irreplaceable to the degree that its significance can be universally accepted.		Resources under general protection in terms of NHRA sections 34 to 37 with Very High significance
6			Heritage resources under formal protection that can be considered to have special qualities which make them significant within the context of a province or a region
7			Heritage resources under formal protection that can be considered to have special qualities which make them significant within a national and / or international context.



6.1.3 Impact Assessment

The potential impacts were considered through an examination of the project phase and activity, the environmental aspect, the interdependencies between aspects, an assessment and classification of categories, and consideration of the potential impact on heritage resources.

6.1.3.1 Defining Heritage Impacts

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 that 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 total number of development activities that will occur within the study area.
 - **Synergistic:** effects interact to produce a total effect greater than the sum of the individual effects, e.g. the effect of each different activity on the archaeological landscape in the study area.
 - **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 in land use could reduce the overall impact on sites within the archaeological landscape 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 areas in the HSR arises from the fact that heritage resources do not exist in isolation to the wider natural, social, cultural and heritage landscape: cultural significance is therefore also linked to rarity / uniqueness, physical integrity and importance to diverse communities.

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 and are discussed in detail in the HSR.

6.1.3.2 Impact Assessment

The impact rating process is designed to provide a numerical rating of the identified heritage impacts. The significance rating follows an established impact/risk assessment formula is shown in Box 5.

The weight assigned to the various parameters for positive and negative impacts in the formula is presented in Table 6-3 below.

Project-related impacts on heritage resources have taken into account the inherent value of heritage resources, described above, and only applied to resources with values above negligible. As a result, the impact assessment did not consider individual resources, but was applied to diverse resources grouped in terms of similar values.

The magnitude will then be applied to pre- and post-mitigation scenarios with the intention of removing all impacts on heritage resources. Where project related mitigation does not avoid or sufficiently reduce negative changes/impacts on heritage resources with high values, mitigation of these resources may be required.

This may include alteration, restoration or demolition of structures under a permit issued by the HRAs.

Impacts were rated prior to mitigation and again after consideration of the proposed mitigation measures. Impacts were then categories into one of eight categories listed in

Significance = consequence of an event x probability of the event occurring

where:

Consequence = type of impact x (Intensity + Spatial Scale + Duration)

and

Probability = Likelihood of an impact occurring

In the formula for calculating consequence:

Type of impact = +1 (positive) or -1 (negative)

Box 5: Impact assessment formula

Table 6-3. The relationship between the consequence, probability and significance ratings is also graphically depicted in Table 6-3.

Table 6-2: Description of duration, extent, intensity and probability ratings used in impact assessment

Value	DURATION RATING - A measure of the lifespan of the impact		EXTENT RATING A measure of how wide the impact would occur		INTENSITY RATING- A measure of the degree of harm, injury or loss.		PROBABILITY RATING - A measure of the chance that consequences of that selected level of severity could occur during the exposure window.	
	Probability	Description	Exposure	Description	Intensity	Description	Probability	Description
7	Permanent	Impact will permanently alter or change the heritage resource and/or value (Complete loss of information)	International	Impacts on heritage resources will have international repercussions, issues or effects, i.e. in context of international cultural significance, legislation, associations, etc.	Extremely high	Major change to Heritage Resource with High-Very High Value	Certain/Definite	Happens frequently. The impact will occur regardless of the implementation of any preventative or corrective actions.
6	Beyond Project Life	Impact will reduce over time after project life (Mainly renewable resources and indirect impacts)	National	Impacts on heritage resources will have national repercussions, issues or effects, i.e. in context of national cultural significance, legislation, associations, etc.	Very high	Moderate change to Heritage Resource with High-Very High Value	High probability	Happens often. It is most likely that the impact will occur.
5	Project Life	The impact will cease after project life.	Region	Impacts on heritage resources will have provincial repercussions, issues or effects, i.e. in context of provincial cultural significance, legislation, associations, etc.	High	Minor change to Heritage Resource with High-Very High Value	Likely	Could easily happen. The impact may occur.
4	Long Term	Impact will remain for >50% - Project Life	Municipal area	Impacts on heritage resources will have regional repercussions, issues or effects, i.e. in context of the regional study area.	Moderately high	Major change to Heritage Resource with Medium-Medium High Value	Probable	Could happen. Has occurred here or elsewhere
3	Medium Term	Impact will remain for >10% - 50% of Project Life	Local	Impacts on heritage resources will have local repercussions, issues or effects, i.e. in context of the local study area.	Moderate	Moderate change to Heritage Resource with Medium - Medium High Value	Unlikely / Low probability	Has not happened yet, but could happen once in a lifetime of the project. There is a possibility that the impact will occur.
2	Short Term	Impact will remain for <10% of Project Life	Limited	Impacts on heritage resources will have site specific repercussions, issues or effects, i.e. in context of the site specific study area.	Low	Minor change to Heritage Resource with Medium - Medium High Value	Rare / Improbable	Conceivable, but only in extreme circumstances. Have not happened during the lifetime of the project, but has happened elsewhere. The possibility of the impact materialising is very low as a result of design, historic experience or implementation of adequate mitigation measures
1	Transient	Impact may be sporadic/limited duration and can occur at any time. E.g. Only during specific times of operation, and not affecting heritage value.	Very Limited	Impacts on heritage resources will be limited to the identified resource and its immediate surroundings, i.e. in context of the specific heritage site.	Very low	No change to Heritage Resource with values medium or higher, or Any change to Heritage Resource with Low Value	Highly Unlikely /None	Expected never to happen. Impact will not occur.

Table 6-3: Impact significance ratings, categories and relationship between consequence, probability and significance

Score	Description	Rating
109 to 147	A very beneficial impact which may be sufficient by itself to justify implementation of the project. The impact may result in permanent positive change.	Major (positive)
73 to 108	A beneficial impact which may help to justify the implementation of the project. These impacts would be considered by society as constituting a major and usually a long-term positive change to the heritage resources.	Moderate (positive)
36 to 72	An important positive impact. The impact is insufficient by itself to justify the implementation of the project. These impacts will usually result in positive medium to long-term effect on the heritage resources.	Minor (positive)
3 to 35	A small positive impact. The impact will result in medium to short term effects on the heritage resources.	Negligible (positive)
-3 to -35	An acceptable negative impact for which mitigation is desirable but not essential. The impact by itself is insufficient even in combination with other low impacts to prevent the development being approved. These impacts will result in negative medium to short term effects on the heritage resources.	Negligible (negative)
-36 to -72	An important negative impact which requires mitigation. The impact is insufficient by itself to prevent the implementation of the project but which in conjunction with other impacts may prevent its implementation. These impacts will usually result in negative medium to long-term effect on the heritage resources.	Minor (negative)
-73 to -108	A serious negative impact which may prevent the implementation of the project. These impacts would be considered by society as constituting a major and usually a long-term change to the heritage resources and result in severe effects.	Moderate (negative)
-109 to -147	A very serious negative impact which may be sufficient by itself to prevent implementation of the project. The impact may result in permanent change. Very often these impacts are immitigable and usually result in very severe effects.	Major (negative)

Relationship between consequence, probability and significance ratings																																						
Probability	Significance																																					
	-21	-20	-19	-18	-17	-16	-15	-14	-13	-12	-11	-10	-9	-8	-7	-6	-5	-4	-3	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
7	-147	-140	-133	-126	-119	-112	-105	-98	-91	-84	-77	-70	-63	-56	-49	-42	-35	-28	-21	21	28	35	42	49	56	63	70	77	84	91	98	105	112	119	126	133	140	147
6	-126	-120	-114	-108	-102	-96	-90	-84	-78	-72	-66	-60	-54	-48	-42	-36	-30	-24	-18	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120	126
5	-105	-100	-95	-90	-85	-80	-75	-70	-65	-60	-55	-50	-45	-40	-35	-30	-25	-20	-15	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105
4	-84	-80	-76	-72	-68	-64	-60	-56	-52	-48	-44	-40	-36	-32	-28	-24	-20	-16	-12	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80	84
3	-63	-60	-57	-54	-51	-48	-45	-42	-39	-36	-33	-30	-27	-24	-21	-18	-15	-12	-9	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60	63
2	-42	-40	-38	-36	-34	-32	-30	-28	-26	-24	-22	-20	-18	-16	-14	-12	-10	-8	-6	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42
1	-21	-20	-19	-18	-17	-16	-15	-14	-13	-12	-11	-10	-9	-8	-7	-6	-5	-4	-3	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21



6.2 Risk versus Impact

Risk is defined as the potential consequence(s) of an interaction combined with its likelihood. Should a risk eventuate, it will manifest as an impact. These concepts are often misconstrued and lead to disproportionate amounts of effort spent on assessing minor risks with potentially insignificant impacts, at the cost of overlooking more important ones. The identification of project risks should take place during the scoping phase of the EIA. This allows for input from stakeholders prior to commencement of the impact assessment phase.

Example: The presence of vehicles on a site obviously creates the potential for hydrocarbon spills, but it cannot be seen as a foregone conclusion. Therefore hydrocarbon spillage is treated as a risk, as it has not yet eventuated.

Risks include:

- Hydrocarbon spills from vehicles and machinery;
- Spills or leaks from pipelines, storage areas, berms and channels etc.; and
- Increased crime and breakdown of social order.

Broad mitigation measures and monitoring were provided for low risks and unplanned events, however, they **were not assessed in detail** (i.e., with significance ratings). In general monitoring is an accepted form of mitigation for low risks.

6.3 Impact Assessment

This chapter considers the potential direct and indirect impacts on heritage resources identified within the development footprint of the proposed project, as well as those within the greater surrounding landscape. These impacts are considered in relation to the project related activities outlined in the Scoping Report.

The impact assessment and mitigations measures chapter is as a narrative description of the sources of risk and potential impacts, and as a discussion of feasible mitigation measures to avoid and/or better negative impacts and enhance positive one.

The proposed activities for which environmental authorisation are being applied for correspond to Listing Notices GNR 544, 545 and 546. Detailed descriptions were provided in the Scoping Report and summarised in Table 6-4 below.


Table 6-4: Project activities

Activity No	Description of the Activity
Construction Phase	
1	Site clearance and vegetation removal
2	Use of heavy machinery e.g. excavator
3	Establishment of box cut (drill and blast of overburden)
4	Establishment of dumps and stockpiles
5	Establishment of Run of Mine stockpile area
6	Establishment of Product stockpile area
7	Preparation of Discard Facility area
8	Construction of surface infrastructure
9	Construction of roads and new rail siding (alternative rail siding options)
10	Relocation of the water pipeline
11	Relocation of the 11 kV and 88kV distribution power line
12	Water abstraction and storage
13	Generation and storage of waste material
14	Electricity generation (i.e. diesel generator)
Operational Phase	
15	Drill and Blast (overburden and coal seam)
16	Development of dumps (hards and softs)
17	Use of heavy machinery and equipment
18	Transport of coal via haul roads/conveyor (to a new proposed rail siding)
19	Transport of coal via external haul roads
20	Transport of coal via rail siding (stockpiling and loading)
21	Plant Operations
22	Operation/Maintenance of surface infrastructure
23	Handling slurry
24	Operation of the sewage treatment plant
25	Water use and storage
26	Waste generation and storage
Decommissioning Phase	
27	Removal of all infrastructure

Activity No	Description of the Activity
28	Waste generation, storage and disposal
29	Backfilling of the open pits
30	Backfilling of the Discard Facility
31	Rehabilitation of disturbed areas
32	Post-closure monitoring

6.3.1 Direct Impacts on Burial Grounds and Graves

Project related activities during the construction and operation phases of the proposed project will have direct impacts on the identified burial grounds and graves. Identified burial ground 6669/BGG004 is located within the proposed south pit, and burial ground 6669/BGG008 adjacent to the proposed rail loop and siding.

The environmental aspects considered were the construction and operational activities associated with the mining of the proposed south pit and construction and operation of the railway. Interdependencies between the tangible burial grounds and the intangible connection to the graves by *bona fide* NoK were considered when completing this assessment. Identified issues include the mining of the south pit and construction and operation of the railway, potentially resulting in burial grounds and graves being damaged or destroyed.

The impact assessment for the potential damage and/or destruction of burial grounds is summarised in Table 6-5.

Table 6-5: Summary of direct impacts on burial grounds and graves

IMPACT DESCRIPTION: Potential damage and/or destruction of burial grounds				
Predicted for project phase:	Pre-construction	Construction	Operation	Decommissioning
Dimension	Rating	Motivation		
PRE-MITIGATION				
Duration	Permanent (7)	Where mitigations are not implemented, project related activities will result in major changes to the burial ground.		
Extent	International (7)	The major changes to the burial ground may have international repercussions to the reputation of Fountain Capital. Additionally, bona fide NoK may be located outside of South Africa, therefore impacts on these graves could have international repercussions for those NoK	Consequence: Extremely detrimental (-21)	Significance: Major - negative (-147)



Intensity x type of impact	Extremely high - negative (-7)	Without appropriate mitigation, a major change to a resource with a high significance will occur		
Probability	Certain (7)	Without appropriate mitigation, project related activities related activities will result in a major change to the burial ground.		
MITIGATION:				
As far as is feasible, mine infrastructure design and siting should be amended to remove any physical, direct impacts on the burial ground. Irrespective of whether the burial ground will be directly or indirectly affected, agreement regarding the future of the site must be reached between Oakleaf and NoK through the implementation of a Burial Grounds and Graves Consultation process in accordance with Section 36 of the NHRA and Chapter XI of the Regulations. This process must include agreements in respect of a Conservation Management Plan and possible Grave Relocation Plan.				
POST-MITIGATION				
Duration	Beyond project life (6)	If mitigation measures are implement, the change to the burial grounds and graves will extend beyond the project life	Consequence: Slightly detrimental (-9)	Significance: Minor - negative (-54)
Extent	Limited (2)	The proper management of the burial grounds and graves will have an impact on the national reputation of Fountain Capital		
Intensity x type of impact	Very low - negative (-1)	Mitigation measures will ensure the retention and management of the burial grounds, although <i>in situ</i> management may still result in change to the intangible aspects of the resource		
Probability	Highly probable (6)	If mitigation measures are implemented, it is still probable that change on both the tangible and intangible aspects of the burial ground may occur		

6.3.2 Loss of or Restricted Access to Burial Grounds and Graves

In this instance, burial ground 6669/BGG008 is located outside of the direct impact footprint of the proposed rail loop and sidings; therefore if not relocated as part of a GRP will result in loss of and/or restricted access to the site by NoK. The associated impact will be the degradation of the sites cultural fabric.

The impact assessment for the degradation of cultural significance through loss of access to burial grounds is summarised in Table 6-6.

However, based on the location of burial ground 6669/BGG008, there will be an increased health and safety risk to NoK who are granted access through the implementation of the proposed consultation process. Although this can be considered an indirect heritage impact, it must be considered as a part of this assessment as it is directly associated with the outcome of the NHRA Chapter XI Regulations mitigation measure.

The impact assessment for the health and safety risks to NoK when accessing burial grounds is summarised in Table 6-6.


Table 6-6: Summary of indirect impacts on burial grounds and graves

IMPACT DESCRIPTION: Loss of access to burial grounds				
Predicted for project phase:	Pre-construction	Construction	Operation	Decommissioning
Dimension	Rating	Motivation		
PRE-MITIGATION				
Duration	Project Life (5)	The loss of access to burial grounds will occur throughout the project life	Consequence: Moderately detrimental (-13)	Significance: Moderate - negative (-91)
Extent	Limited (2)	The impact will be limited to select heritage resources		
Intensity x type of impact	Very high - negative (-6)	Loss of access to burial grounds will have a high significance to NoK who may want to visit and attend to graves. This may result in the deterioration of the historical fabric of the burial and may be considered a major change to the resource		
Probability	Certain (7)	It is certain that loss of access to the burial grounds will occur if no mitigation measures are implemented as the burial grounds are not located near the periphery of the project area		
MITIGATION:				
Consult with bona fide NoK regulated under Chapter XI of the NHRA regulations, and any other applicable legislation Develop an entitlement framework for NoK in which the terms and conditions for access to the burial ground are agreed upon				
POST-MITIGATION				
Duration	Project Life (5)	Where access to burial grounds is encapsulated within an Entitlement Framework, NoK should have a right to access the burial ground throughout the project life.	Consequence: Highly beneficial (14)	Significance: Moderate - positive (84)
Extent	Limited (2)	The extent of the impact will be very limited as NoK will be granted access through prior arrangement as agreed upon within an Entitlement Framework		
Intensity x type of impact	Extremely high - positive (7)	Mitigation will result in a positive major change to a heritage resource with high significance has both the tangible and intangible aspects of the burial ground will be managed and maintained.		
Probability	Highly probable (6)	It is highly probable that proposed mitigation measures will result in a positive major change to the tangible and intangible aspects of the burial ground.		



6.3.3 Destruction of a Section of the Premier Diamond Mine Wilge Scheme Pipeline

In this instance, a section of the Wilge River Scheme pipeline traverses a small part of the proposed open pit. This section will inevitably be destroyed through open pit mining. Unmitigated changes will impact the historical fabric of the Cullinan Diamond Mine and the Wilge River Pumping Station.

The impact assessment for destruction of this section of the Wilge River Scheme pipeline is summarised in Table 6-7.

Table 6-7: Summary of impacts related to destruction of a section of the Wilge River Scheme pipeline

IMPACT DESCRIPTION: Destruction of Premier Mine Wilge River Scheme Pipeline				
Predicted for project phase:	Pre-construction	Construction	Operation	Decommissioning
Dimension	Rating	Motivation		
PRE-MITIGATION				
Duration	Permanent (7)	Unmitigated changes to the pipeline will result in changes to the associated historical industrial heritage of the Cullinan Diamond Mine and the Premier Mine Dam complex.	Consequence: Highly detrimental (-17)	Significance: Major - negative (-119)
Extent	Local (3)	Changes would mainly manifest as local heritage impacts, increased loss of diminishing local heritage.		
Intensity x type of impact	Extremely high - negative (-7)	Given the high collective CS of the associated Premier Mine Dam and Cullinan Diamond Mine industrial heritage, any unmitigated changes to the pipeline will have extremely negative effects.		
Probability	Certain (7)	If the pipeline is not rerouted, the continued operation of the industrial heritage will be affected.		
MITIGATION:				
Given that the section of the pipeline that will be impacted on is below ground, any changes to it will not diminish the collective significance assigned to the Premier Mine infrastructure associated with it. As a result, it is recommended that the pipeline be rerouted to allow continued use of it as part of the historical industrial heritage of the Cullinan Mine and Premier Mine Dam. It is further recommended that a Watching Brief be implemented during removal of the existing section of pipeline and a permit be applied for in terms of section 35 of the NHRA to collect any Signiant artefacts that may have been deposited during the original construction of this section. Collected material should be deposited with the Cullinan Mine Museum, or other recognised repository.				



POST-MITIGATION				
Duration	Short term (2)	Rerouting and consequent effects on the existing industrial heritage will be short term.	Consequence: Moderately beneficial (10)	Significance: Minor - positive (70)
Extent	Very limited (1)	Impacts will be limited to the existing section of the pipeline traversing the proposed open pit.		
Intensity x type of impact	Extremely high - positive (7)	Rerouting the pipeline, and collecting any artefacts that may have been deposited during the original construction thereof, will be extremely positive to continuous, sustainable use of the Cullinan - Premier Mine industrial heritage.		
Probability	Certain (7)	It is certain that rerouting the pipeline will ensure the continuous, sustainable use of the Cullinan - Premier Mine industrial heritage.		

6.3.4 Comparative Assessment of Project Alternatives

Consideration of project alternatives was required. This section provides a comparative assessment of the potential impacts per alternative to identify a 'preferred' option in relation to the heritage aspect. The findings are summarised in Table 6-8 below.

Table 6-8: Comparative Assessment of Project Alternatives

Project Layout Alternatives				
Rail Siding Alternatives				
Option 1 – New rail siding	Option 2 – New rail siding	Option 3 – New rail siding	Option 4 – New rail siding	Option 5 – Existing rail siding (Hauling Coal using existing road network)
The establishment of rail siding options 1 and 2 may result in the degradation of cultural significance through loss of access to burial ground 6669/BGG-008, and health and safety risks to NoK when accessing the burial ground.		No heritage resources have been identified within the impact footprint of these options. No direct impacts on heritage resources are envisaged.		
Project Activity Alternatives				
Conveyor System Alternative				
Option 1	Option 2			
The establishment of Conveyor System option 1 may result in the degradation of cultural significance through loss of access to burial ground 6669/BGG-008, and health and safety risks to NoK when accessing the burial ground.	Conveyor System option 2 routing is situated in close proximity to 6669/Ste-003. This resource has negligible significance and has been sufficiently recorded. No further mitigation is required.			
No-Go Alternative				
As stated in Section 1.2.1, no-go alternative would entail maintaining the status quo. Identified impacts on heritage resources will be nullified.				



7 Unplanned Events and Low Risks

Certain project activities may represent low risks or cause unplanned events. Low risks can be monitored to gauge if the baseline changes and mitigation is required. Unplanned events may happen on any project.

Information on potential impacts of those events and management plans are provided in this section. Table 7-1 summarises possible low risks and unplanned events that could potential impact on certain heritage resources.

Table 7-1: Unplanned events, low risks and their management measures

Unplanned event	Potential impact	Mitigation/ Management/ Monitoring
Degraded water quality	Erosion of cultural significance of Premier Mine Dam	Mitigation measures to manage water quality must be implemented.
Physical and/or visual intrusion into site.	Erosion of cultural significance and degradation of sense of place of the battlefield.	The visual impact of the proposed mine should be mitigated as far as is feasible to reduce the intensity of the alteration to the current sense-of-place.

7.1 Low Risk to the Premier Mine Dam and Cullinan Diamond Mine

A comment made by Hennie Cronje, included in the CRR, raised issues regarding the Premier Mine Dam and impacts to its heritage value. This section addresses this concern.

The Dam is situated over 5 km east from the proposed project, and no direct impacts on the heritage value of the Dam are envisaged.

Indirect, induced or secondary effects on heritage resources, however, could occur later in time or at a different place from the causal activity, or as a result of a complex pathway. As described in the Surface Water Scoping Report, project related activities undertaken during the construction and operational phases of the proposed project may have a direct impact on the water quality:

- Siltation of surface water bodies;
- Increased run-off velocity;
- Contamination of surface water with nitrates;
- Potential Acid Mine Drainage (AMD) formation from prolonged exposure of overburden to water and air; and
- Leakage and spillages of oil, diesel and hazardous waste.

Although these are not *heritage impacts* per se, there is a low level risk that water impacts could degrade the cultural significance of the Premier Mine Dam and the Cullinan Diamond Mine via the Wilge River Scheme.



7.2 Low Risk to the Battle of Bronkhorstspuit Battlefield

The historic landscape associated with the 1880 Battle of Bronkhorstspuit, and the associated public monuments 6669/Mt005 and 6669/Mt006 are located approximately 5.5 km south of the proposed impact footprint of the proposed project. The construction and operation of the proposed mine could pose unintended risks to cultural significance and sense-of-place of the historic landscape.

The environmental aspect considered was the construction and operation activities of the proposed mine. Interdependencies between the intangible perception of the historic landscape and the social repercussion of alteration to the specific sense-of-place may result in an issue where individuals or groups perceiving the impact that the mine is sterilising the associated history of the battlefield.

8 Conclusion and Recommendations

Digby Wells completed a NID during the Scoping Phase of as part of the specialist heritage study for the proposed project. The NID was submitted to SAHRA (Case ID: 6669) and PHRA-G in October 2014 for Statutory Comment in accordance with Section 38(2) of the NHRA. SAHRA required that an HIA be completed and submitted to SAHRA and PHRA-G prior to the development. This report constitutes the specialist HIA as part of the EIA.

Eight heritage resources were recorded during the reconnaissance of the field survey, and the cultural significance and anticipated impacts on these resources were assessed against the available information summarised in Section 2.2 and the NID. The results were that the identified heritage resources had a cultural significance ranging from negligible to very high.

In relation to the impacts identified under Section 6 the following recommendations apply:

- As per Table 6-8, the most feasible option for the rail siding options are 3, 4 and 5 and option 2 for the conveyor. Hauling coal to the existing Bronkhorstspuit rail siding may however eliminate these potential impacts;
- The section of the Wilge River Scheme pipeline traversing the proposed open pit must be rerouted. Given its age and association with the historical Premier Mine and Wilge River Scheme, it is further recommended that a Watching Brief be implemented during removal of the existing section of pipeline and a permit be applied for in terms of section 35 of the NHRA to collect any Significant artefacts that may have been deposited during the original construction of this section. Collected material should be deposited with the Cullinan Mine Museum, or other recognised repository;
- The proposed project should be exempt from further palaeontological assessment;
- Where microbial mats are identified in the Wilge River Formation and disturbed by coal mining operations, a palaeontologist should be notified and called to collect a representative sample for curation in a recognised institute, such as the Council for Geosciences or the Evolutionary Studies Institute;



-
- As far as is feasible, mine infrastructure design and siting should be amended to remove any physical, direct impacts on burial grounds;
 - Irrespective of whether the burial grounds will be directly or indirectly affected, agreement regarding the future of the site must be reached between Oakleaf and NoK through the implementation of a Burial Grounds and Graves Consultation process in accordance with Section 36 of the NHRA and Chapter XI of the Regulations. This process must include agreements in respect of a Conservation Management Plan and possible Grave Relocation Plan; and
 - The visual impact of the proposed mine should be mitigated as far as is feasible to reduce the intensity of the alteration to the current sense-of-place. This may include limiting the height of infrastructure or vegetating berms. Detailed recommendations are provided in the Visual Impact Assessment Report.



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- Schlanger, N. (2005). The history of a special relationship: prehistoric terminology and lithic technology between French and South African research traditions. In F. d'Errico, & L. Backwell, *From Tools to Symbols: From Early Hominids to Modern Humans* (pp. 9-37). Johannesburg: Witwatersrand University Press.
- Swanepoel, B. A. (2006). *The vegetation ecology of Ezemvelo Nature Reserve, Bronkhorstspuit, South Africa*. University of Pretoria: Unpublished thesis for Magister Scientia.
- van der Walt, J. (2007). *Archaeological Impact Assessment: Wachtenbietjeskop Eco-Estate located on Portion 79 of the Farm Wachtenbietjeskop 506 JR, Bronkhorstspuit Gauteng Province*. Unpublished report: MapID: 01267.
- van der Walt, J. (2008a). *Heritage Impact Assessment: Application for Mining Permits for the ARUP Transnet NMPP Alliance Borrow-Pits, Gauteng*. Unpublished report: MapID: 02170.
- van der Walt, J. (2008b). *Archaeological Impact Assessment for the Proposed Bronkhorstspuit Primary School, Riamar Park, Gauteng Province*. Unpublished report: MapID: 02284.
- van Schalkwyk, J. (2007a). *Heritage Survey Report of Portion 9 of the Farm Nooitgedacht 525 JR, Bronkhorstspuit District, Gauteng*. Unpublished report: MapID: 00858.
- van Schalkwyk, J. (2007b). *Heritage Survey Report of Portion 75 of the Farm Nooitgedacht 525 JR, Bronkhorstspuit Magisterial District, Gauteng*. Unpublished report: MapID: 02474.
- van Schalkwyk, J. (2008). *Heritage Survey Report of Portion 100 of the Farm Nooitgedacht 525 JR, Bronkhorstspuit Magisterial District*. Unpublished report: MapID: 02471.
- Von der Hyde, N. (2013). *Field Guide to the Battlefields of South Africa* (1st ed.). Cape Town: Struik Travel & Heritage.

Heritage Impact Assessment

Environmental Impact Assessment for the Proposed Open Pit Coal Mine and Associated Infrastructure, near Bronkhorstspuit, Gauteng

FOU2191



DIGBY WELLS
ENVIRONMENTAL

Appendix A: Specialist CV

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	Rock Art Mapping Project	Freelance archaeologist 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

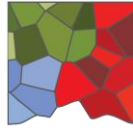
- 2005. Report on exhumation, relocation and re-internment of 49 graves on Portion 10 of the farm Tygervallei 334 JR, Kungwini Municipality, Gauteng D Georgiades East Farm (Pty) Ltd. Gauteng, RSA. Burial grounds and graves consultation, permitting and relocation. Project manager.
- 2005. Southstock Collieries 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.



DIGBY WELLS

ENVIRONMENTAL

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

Digby Wells and Associates (South Africa) (Pty) Ltd (Subsidiary of Digby Wells & Associates (Pty) Ltd). Co. Reg. No. 2010/008577/07. Fern Isle, Section 10, 359 Pretoria Ave Randburg Private Bag X10046, Randburg, 2125, South Africa
Tel: +27 11 789 9495, Fax: +27 11 789 9498, info@digbywells.com, www.digbywells.com

Directors: A Sing*, AR Wilke, DJ Otto, GB Beringer, LF Koeslag, AJ Reynolds (Chairman) (British)*, J Leaver*, GE Trusler (C.E.O)
*Non-Executive

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 in compliance 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 worked 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 Thohoyadou 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 Booyensdal 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 Booyensdal	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
Bathhako Mine Expansion	North-West Province, South Africa	2010 2010	Mapping of historical sites located within the Bathhako 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	Oriental 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	Oriental 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@randgoldresources.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@atkinglobal.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	Oriental 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	Oriental 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



DIGBY WELLS
ENVIRONMENTAL

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, Bronkhorstspuit, 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 Grootegeeluk 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, Mquma 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

Marion K Bamford, PhD

May 2014

Personal Professor and Senior Management Committee Member
Evolutionary Studies Institute (formerly Bernard Price Institute) and NRF-DST Centre of Excellence; School of Geosciences, University of the Witwatersrand
P Bag 3, WITS 2050, Johannesburg, South Africa
Tel: +27 11 717 6690, Fax: +27 11 717 6694, e-mail: marion.bamford@wits.ac.za

Education

1983: BSc University of the Witwatersrand; majors in Botany and Microbiology.
1984: BSc Honours, University of the Witwatersrand; Botany and Palaeobotany.
1986: MSc University of the Witwatersrand; Palaeobotany. Graduated with Distinction
1990: PhD University of the Witwatersrand; Palaeobotany..
1994 - Service d'Anatomie des Bois, Musée Royal de l'Afrique Centrale, Tervuren, Belgium, by Roger Dechamps – training in wood anatomy
1997 - Université Pierre et Marie Curie, Paris, France, ditto by Dr Jean-Claude Koeniguer

Professional experience

1989: Research Officer, Geological Survey, Pretoria
1991-1992: Research Associate, BPI, University of the Witwatersrand (external funding)
1993-2000: Research Officer, BPI, University of the Witwatersrand (includes teaching)
1999: Professeur Invitée, Université Claude Bernard, Lyon, France.
2001-2006: Senior Research Officer, BPI, University of the Witwatersrand
2007 – Associate Professor, BPI, University of the Witwatersrand
2014 – Personal Professor, ESI, University of the Witwatersrand
Research Rating (South African NRF international and peer review): B3
Fellow of the Royal Society of South Africa – 2007 onwards

Field Experience

1982-present: Karoo palaeobotany, P-Tr boundary, Lower Cretaceous deposits; modern ecology in southern Africa
1986-1989: Kimberlite pipes, Botswana
1991-present: Tertiary fluvial deposits on west coast, Namibia, Botswana
1998-present: palaeobotany: eastern Australia, Argentina, Brazil, China, New Zealand
2000- present: East African hominin sites: Olduvai Gorge, Laetoli, Koobi Fora, Rusinga Island

Field of expertise

Palaeobotany: wood anatomy, charcoal, leaves, seeds, palynology, phytoliths (Palaeozoic to Cenozoic); Palaeoecology based on plants;
Palaeontological Impact Assessments 2004-2014: approx 25 projects.

Publications

Chapters in books: 5; Scientific peer-reviewed Journal articles: 83; Conference presentations: 45

Other experience/duties/professional societies

Post graduate Student Supervision: Honours completed: 4; Masters completed: 3. Masters current: 0. PhD completed: 3. PhD current: 8. Post docs completed: 3. Post docs current 4.
Lecturing 2001 to present: Geology II – Palaeontology; Biology III – Palaeontology; Honours – Palaeobotany module, Palynology module, Evolution of Terrestrial ecosystems module.
Geosciences representative on Graduate Studies Committee: 2008 – present
Editor – *Palaeontologia africana*: 2002-2013; associate editor: 2014 – present
SASQUA (Southern African Society for Quaternary Research): Vice president 2013-2015
PSSA (Palaeontological Society of southern Africa): Vice President 2012-2014
INQUA ICSU – Chairman South African section: 2014-2016
PAST (Palaeontological Scientific Trust): Chairman of Scientific Advisory Committee: 2010 +

Curriculum Vitae

L I E S L B E S T E R

Postal Address:	PO Box 1514 Groenkloof 0027 Pretoria
Residential Address:	44 Charles street Bailey's Muckleneuk 0181 Pretoria
Contact Number:	+277 929 022 21 +278 715 036 77
Email address:	Work: projects@es.org.za Personal: dupreezliesl@gmail.com

1. PERSONAL INFORMATION

Name:	Liesl
Surname:	Bester
ID Number:	8510080016082
Date of Birth:	8 October 1985
Sex:	Female
Nationality:	South-African
Marital Status:	Married

Language Competency:	Afrikaans - Excellent English - Excellent French - Good
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Driving Permit:	Code B
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Criminal Offenses:	None
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2. EDUCATIONAL QUALIFICATIONS

Last School Attended:	Hoërskool Reynopark Witbank (1999-2003)
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Highest Standard Passed:	Grade 12
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Subjects:	Mathematics (HG), Science (HG), *Hotel Management (SG), *Biology (HG), *English (HG) and Afrikaans (HG) (* Passed with distinction)
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3. HIGHER EDUCATION

Tourist Guide Training: Apr. 2006 – Aug. 2006	Registered as a Gauteng Provincial Tourist Guide (University of South Africa)
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Degrees Obtained:	<ol style="list-style-type: none"> 1. BHCS (Specializing in Heritage and Cultural Tourism, History and French), in 2004 - 2006 (University of Pretoria) 2. BHCS Honours (Specializing in Heritage and Cultural Tourism and History), in 2007 (Passed with distinction and received Academic Honorary Colours)
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4. ADDITIONAL COURSES

2004:	Tourism course on Resorts and Conservation Areas (Passed with distinction)
2006:	Tourism course on Cultural Historical Sites in South Africa
2007:	Course on the Socio Cultural History of South Africa, with specific emphasis on the Anglo Boer War 1899-1902 (GES 714), at the University of Pretoria (Passed with distinction)
2013:	Completion of Excel 2007 Intermediate Training – Assessment passed

5. EMPLOYMENT HISTORY

February to August 2007:	History Tutor for first year students at the Department of Historical and Heritage Studies at the University of Pretoria
October 2007 to April 2008:	English Language Assistant for French high school students at Lycée Louis Armand, Eaubonne, France
July to December 2008:	Assistant at the Archives of the University of Pretoria
August 2008 up to August 2012:	Partner and Research Consultant for Past Matters Historical and Heritage Research Services cc.; providing historical research services to companies and individuals
March 2010 up until December 2012:	Part-time Research Assistant for Professor Johan S. Bergh at the University of Pretoria (Kruger Project)
September 2010 up until July 2013:	Director of Timeline Research Solutions (Pty) Ltd; providing historical research services to companies and individuals
August 2013 up until the present:	Researcher and Conservation Officer at The Heritage Foundation (Die Erfenisstigting), Pretoria

6. SKILLS

- Fully computer literate
- Excellent research skills
- Extensive experience in writing academic reports
- Excellent writing skills
- Good translation skills, specifically in Afrikaans and English
- Experience in proofreading and editing
- Experience in analysing a variety of sources, such as aerial photographs and current and historical maps
- Very good communication skills
- Excellent interpersonal skills

I specialize in archival document retrieval from various archive repositories in South Africa, as well as the writing of historical reports. I have written a large number of academic reports on the historical and cultural significance of properties and sites.

I have been involved in land claims research in Mpumalanga for the South African Pulp and Paper Industries Ltd. (SAPPI) since 2008, and my experience also includes four years of research for heritage impact assessments. Since August 2013, I have been involved in conducting studies and writing historical reports, exhibition texts and brochures for the Heritage Foundation.

I furthermore possess strong IT and administration skills, and work equally well with a team and individually. I am passionate about heritage and the past, and believe in upholding the highest standards of academic integrity in all of my work.

7. REFERENCES

Cecilia Kruger Senior Manager: Heritage Conservation at THE HERITAGE FOUNDATION, Pretoria	Tel: +278 715 036 78 Email: bewaring@es.org.za
Estelle Pretorius Senior Manager of Research and Information Services at THE HERITAGE FOUNDATION, Pretoria	Tel: +278 715 065 86 Email: navorsing@es.org.za
Jaco van der Walt Heritage Contracts and Archaeological Consulting cc. (Regular Client)	Tel: +2782 373 8491 Email: jaco.heritage@gmail.com
JP Celliers Kudzala Antiquity cc. (Regular Client)	Tel: +27827793748 Email: kudzala@lantic.net
Prof K. L. Harris Director of University of Pretoria Archives UNIVERSITY OF PRETORIA	Tel: +27124202665 Email: karin.harris@up.ac.za
Prof J. S. Bergh Head of Department of Historical and Heritage Studies UNIVERSITY OF PRETORIA	Tel: +27124203749 / +27839688229 Email: johan.bergh@up.ac.za
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Heritage Impact Assessment

Environmental Impact Assessment for the Proposed Open Pit Coal Mine and Associated Infrastructure, near Bronkhorstspuit, Gauteng

FOU2191



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ENVIRONMENTAL

Appendix B: Archival Research Report



ARCHIVAL RESEARCH REPORT:

**WACHTENBIETJIESKOP 506 JR, RESURGAM 515 JR AND
TWEEFONTEIN 491 JR, BRONKHORSTSPRUIT, GAUTENG
PROVINCE**

Prepared by:

L. Bester

6 March 2015

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2. Historiography and methodology	2
3. Maps of the area under investigation	3
4. A brief history of human settlement in the Bronkhorstspruit area	12
5. Historical overview of the ownership and development of Wachtenbietjieskop 506 JR, Resurgam 515 JR and Tweefontein 491 JR	20
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1. INTRODUCTION

Die Erfenisstigting (The Heritage Foundation) has been contracted to write a report based on archival documents regarding the following properties:

Wachtenbietjieskop 506 JR

Portions 1, 69, 75, 76, 87, 113, 122, 123, 124, 125, 139, 140, 141, 142, 143, 144, 145 & 150

Resurgam 515 JR

Portion 1 and the Remaining Extent (RE)

Twefontein 491 JR

Portion 12

At present these properties fall within the Tshwane Metro in the Gauteng Province.

The following report is an account of the history of these properties and also a brief overview of the history of the area and district in which it is located. The report has been divided into several sections that will focus on the following aspects:

- General history of human settlement in the area
- A history of specific land ownership and development of these farms, where this could be traced

2. HISTORIOGRAPHY AND METHODOLOGY

It was necessary to use a range of sources in order to give an accurate account of the history of the area in which the farms are located. Sources include secondary source material, maps and archival documents. More detailed information regarding the methodology used will be provided under the headings for each individual farm.

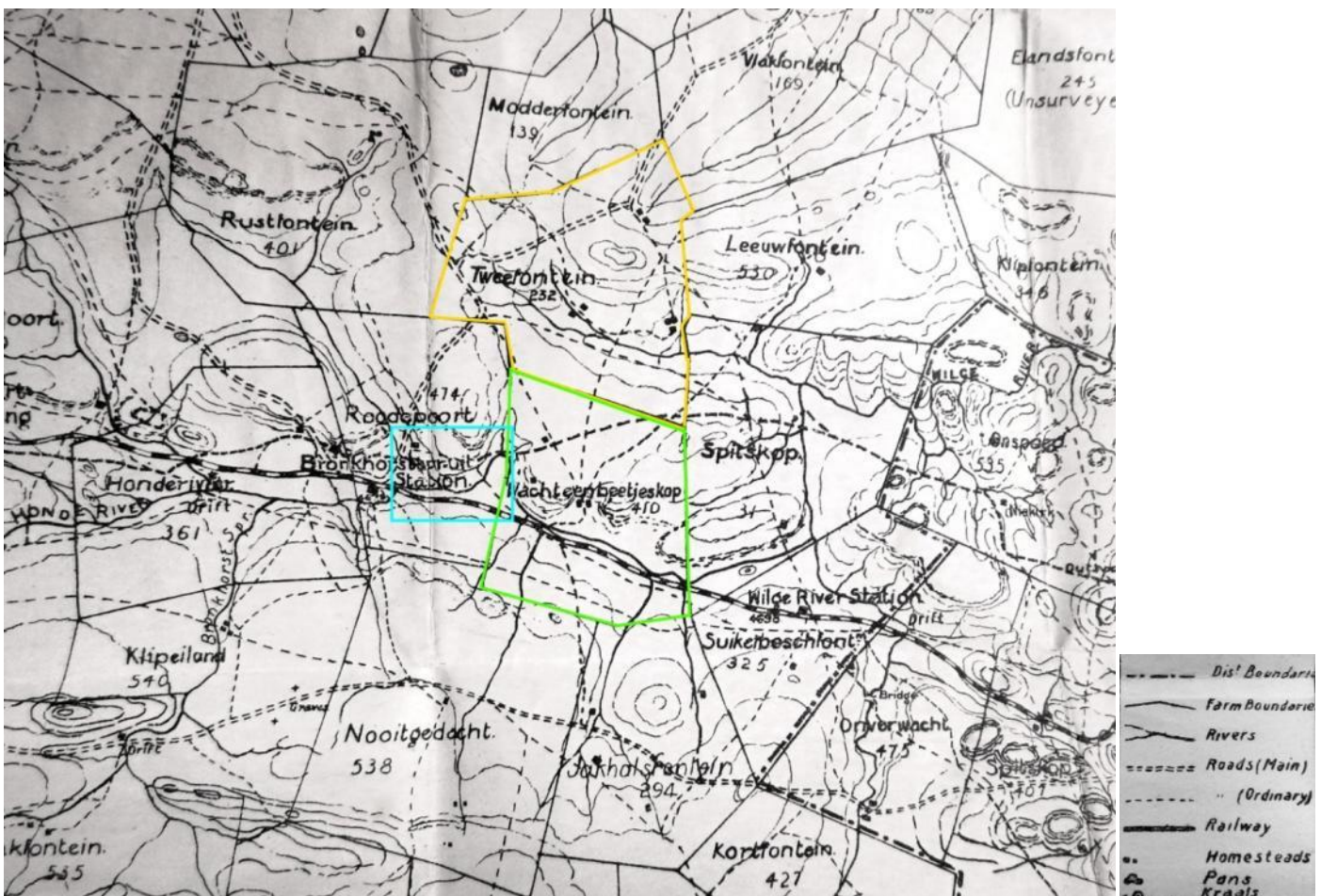
Some information could be found regarding the current geographical makeup of the town of Bronkhorstspuit. Here follows some statistics calculated during the 2001 census:

Area	
• Total	70.76 km ² (27.32 sq mi)
Population (2001)	
• Total	7,909
• Density	110/km ² (290/sq mi)
Racial makeup (2001)	
• Black African	32.5%
• Coloured	1.5%
• Indian/Asian	1.5%
• White	64.4%
First languages (2001)	
• Afrikaans	60.5%
• Southern Ndebele	8.8%
• Zulu	7.2%
• English	6.8%
• Other	16.7%

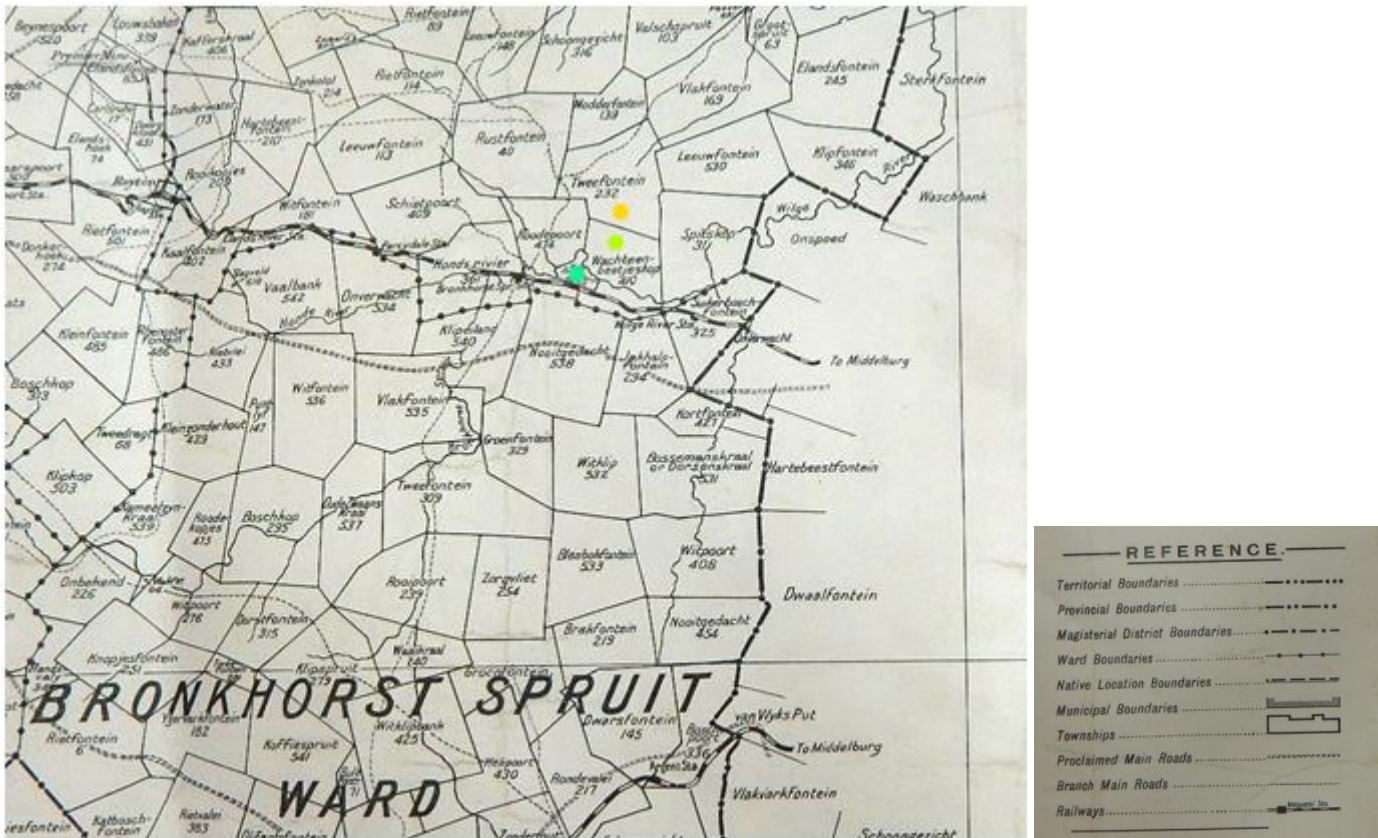
(Census 2001)

3. MAPS OF THE AREA UNDER INVESTIGATION

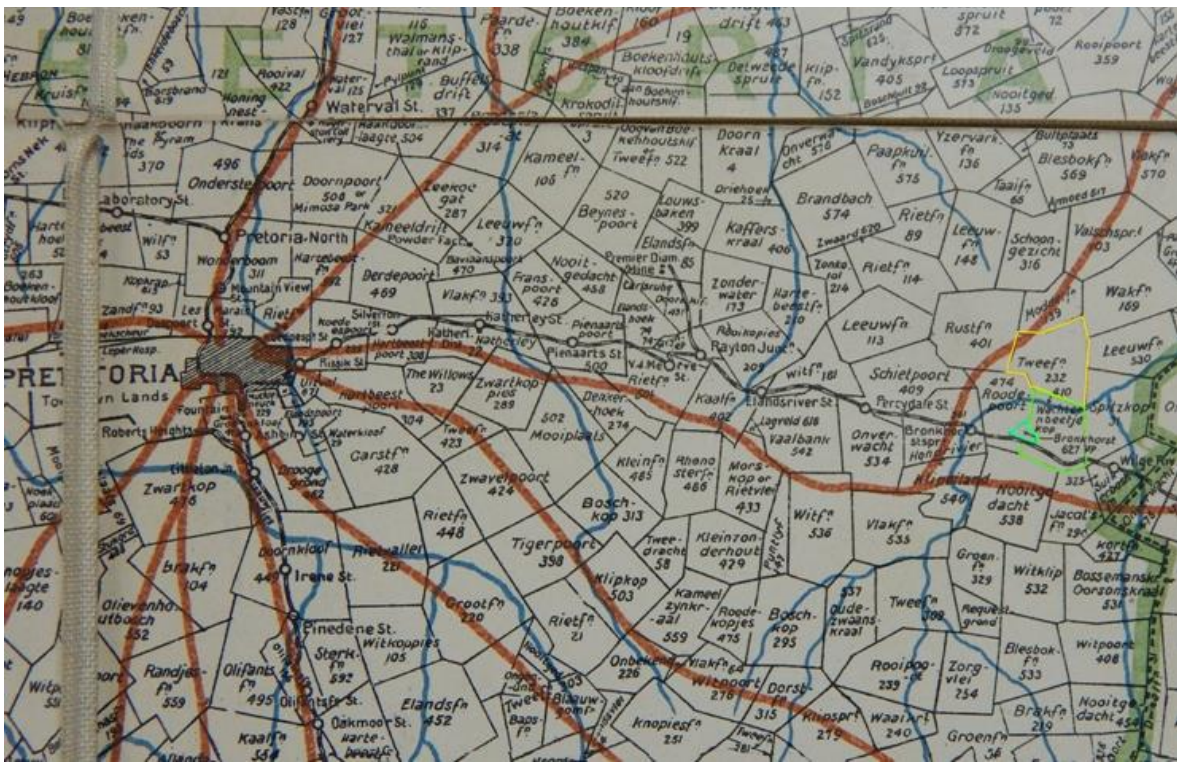
Since the mid 1800s up until the present, South Africa has been divided and re-divided into various different districts. Since 1857, the farms under investigation formed part of the Pretoria district. As of 1902 the properties fell within the ward Bronkhorstspuit within the Pretoria district. This remained the case up until 1977, when South Africa was divided into various smaller magisterial districts. The farm area became part of the Bronkhorstspuit magisterial district. Today, this area forms part of the Tshwane Metro within the Gauteng Province. (Geskiedenisatlas van Suid-Afrika 1999: 17; 25-27)



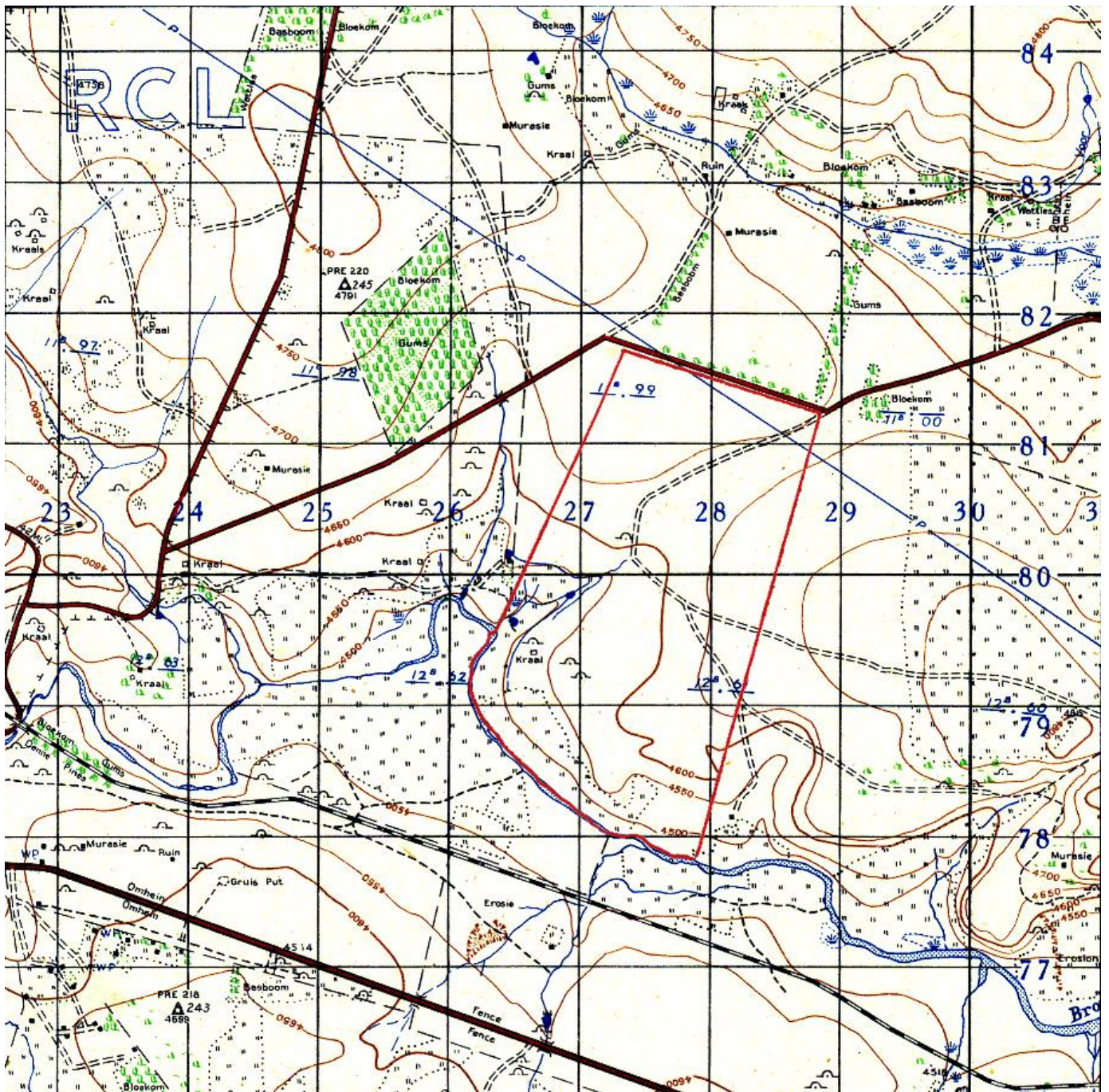
Map 1: 1902 Major Jackson Map of the Pretoria-Middelburg district. The location of the farms Tweefontein 232 (yellow) and Wachteenbeetjeskop 410 (green) are indicated. At this time the farm Resurgam had not yet been proclaimed, but the approximate location of this farm would be within the blue border, just to the north of the railway line and located between the Bronkhorstspuit Railway Station (west) and Wachteenbeetjeskop 410 (east). One can see that two main roads traversed Tweefontein 232 at the time, as well as a number of ordinary roads. A total of about four homesteads are visible at various places along the smaller roads. Wachteenbeetjeskop was crossed by a railway line, in the southern half of the property. Some smaller roads also crisscrossed this farm, and about four homesteads are visible. One ordinary road ran through the area where Resurgam would later be proclaimed. No other developments are visible. (Major Jackson Series 1902)



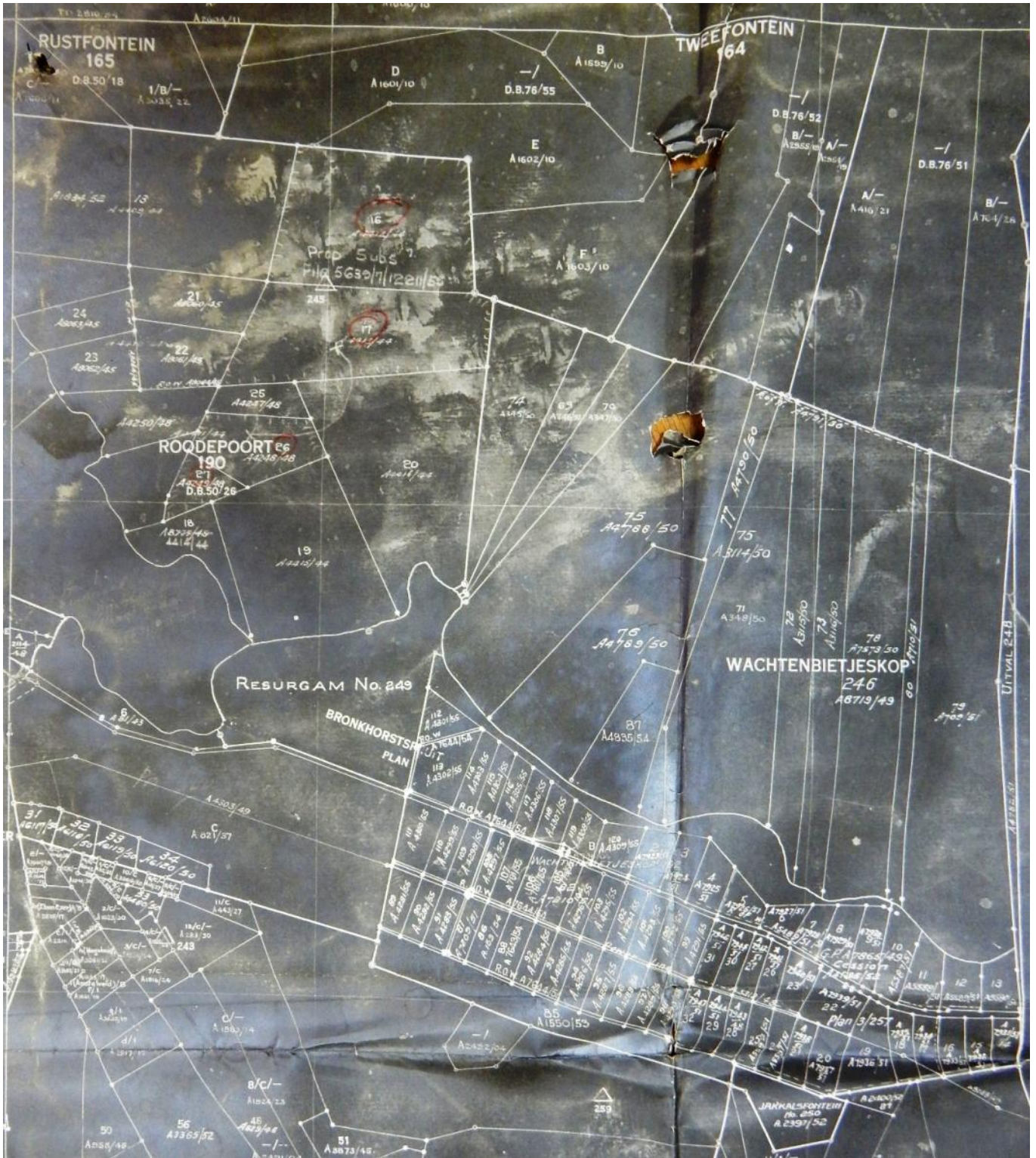
Map 2: By September 1917 the farms under investigation formed part of the Bronkhorstspruit ward of the Pretoria district. These properties were still known as Tweefontein 232 and Wachenbeetjekop 410. The property that would later be known as Resurgam had been surveyed by this time, and was known as Bronkhorstspruit 627. (NASA Maps: 3/299)



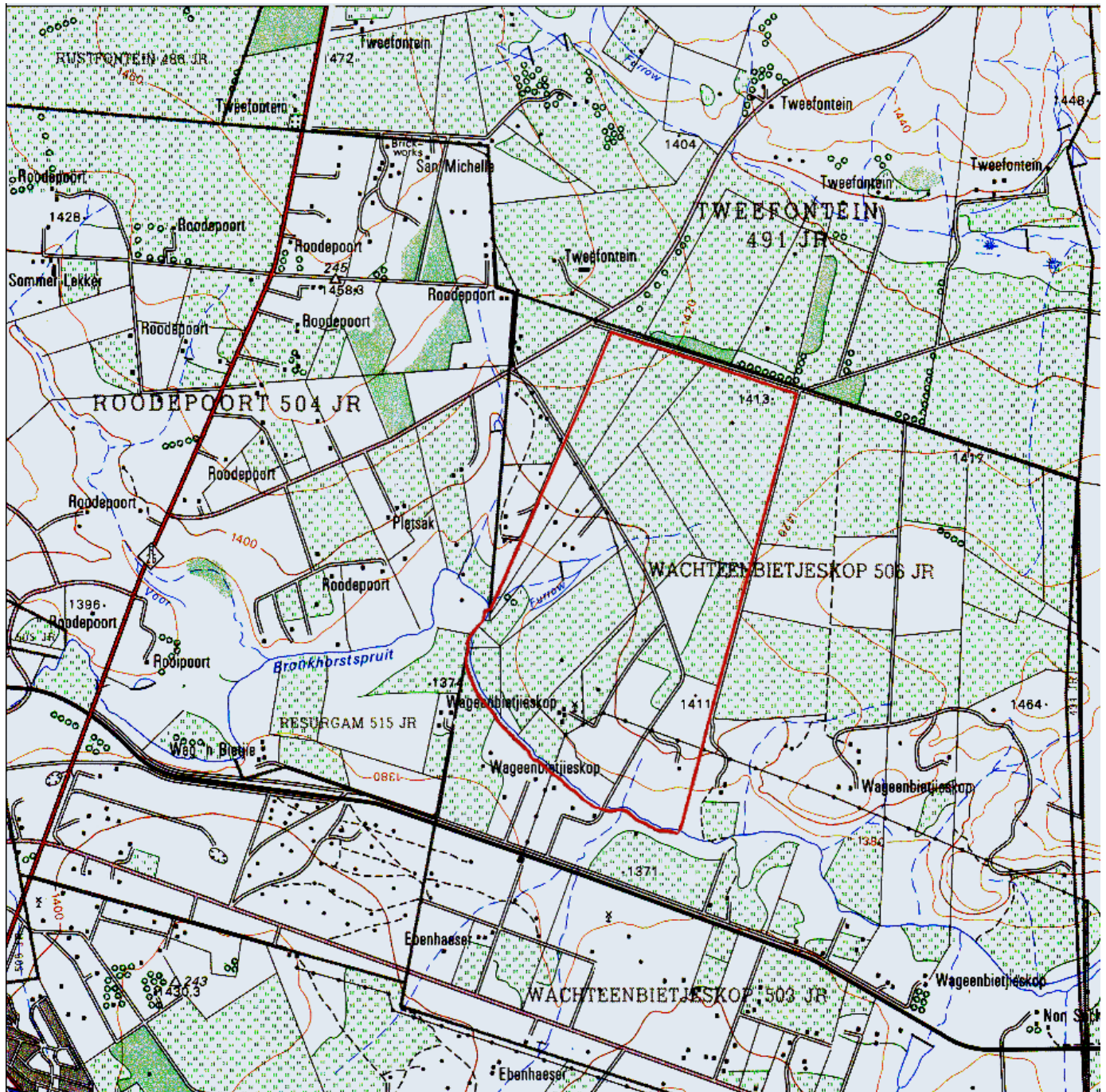
Map 3: By the 1920s, the farms under investigation formed part of the Pretoria district. These properties were still known as Tweefontein 232, Wachenbeetjekop 410 and Bronkhorstspruit 627. (Anon 1920s)



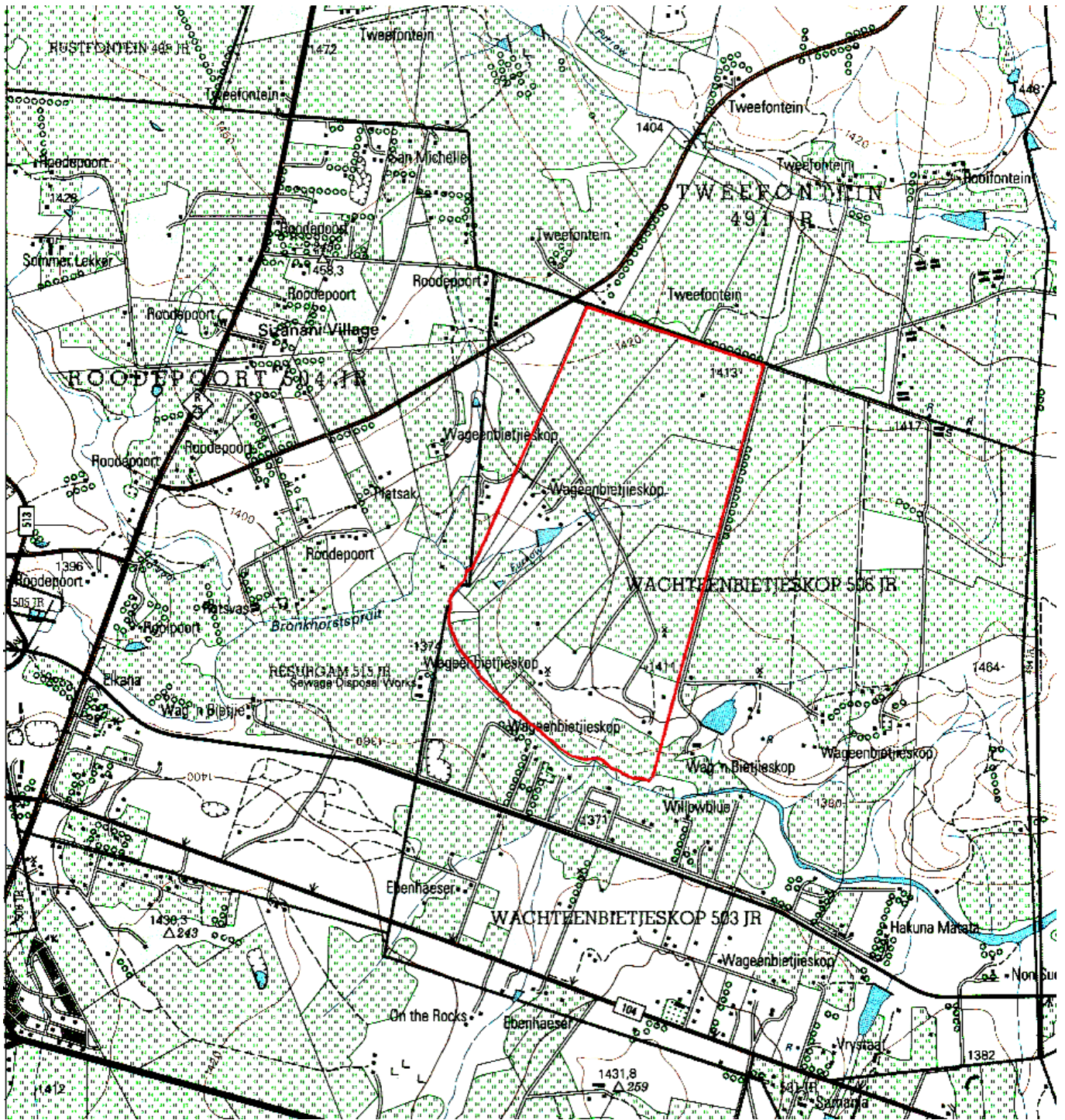
Map 4: 1941 Topographical map of the area under investigation. By this time the farm boundaries have not yet been drawn in, and the area was still mostly undeveloped. Three kraals (traditional black settlements) are however visible near the left corner of the area under investigation (area marked by a red border, located on the farm Wachtenbietjeskop). Another kraal is visible to the north thereof, close to a secondary road. Two secondary roads in the northeastern part of the area are the only other signs of development. A water furrow connected small dams near the western border of this property. Only orchards are visible in the area where Resurgam would later be located. A ruin and another kraal is indicated on Tweefontein, both some distance to the north of the red border (portion of Wachtenbietjeskop of special interest for this report). (Topographical Map 1941)



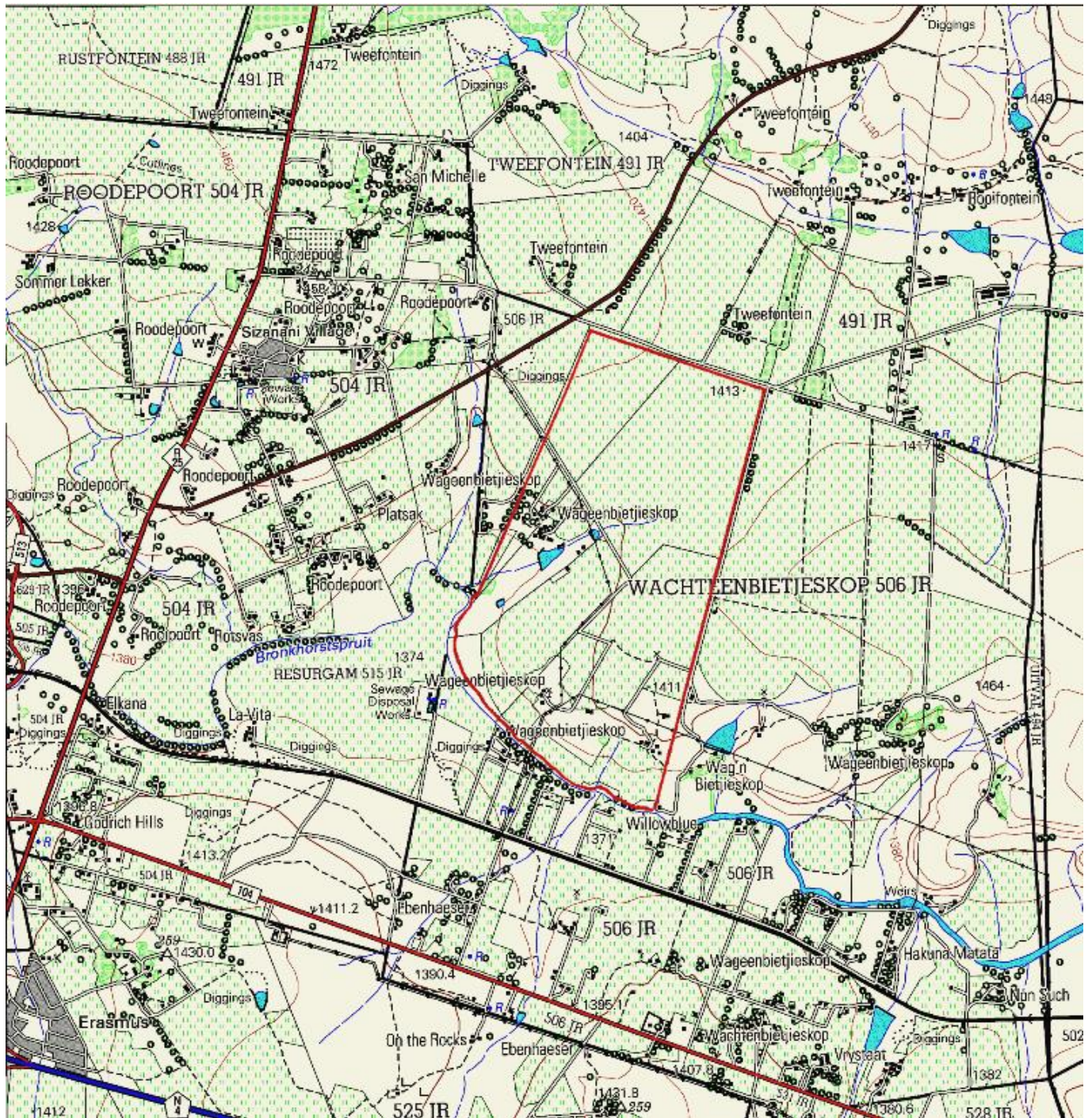
Map 5: 1955 map showing Roodepoort 190 and Wachtenbietjeskop 246, as well as Resurgam 249, which no longer formed part of the farm Roodepoort. Resurgam was located to the south of Portion 19 of Roodepoort. One can see the subdivision of Wachtenbietjeskop 246 into, among others, Portions 69, 70, 75, 76 and 87 (these form part of the core interest area) (NASA SAB, CDB: 3/865 TAD9/37/23)



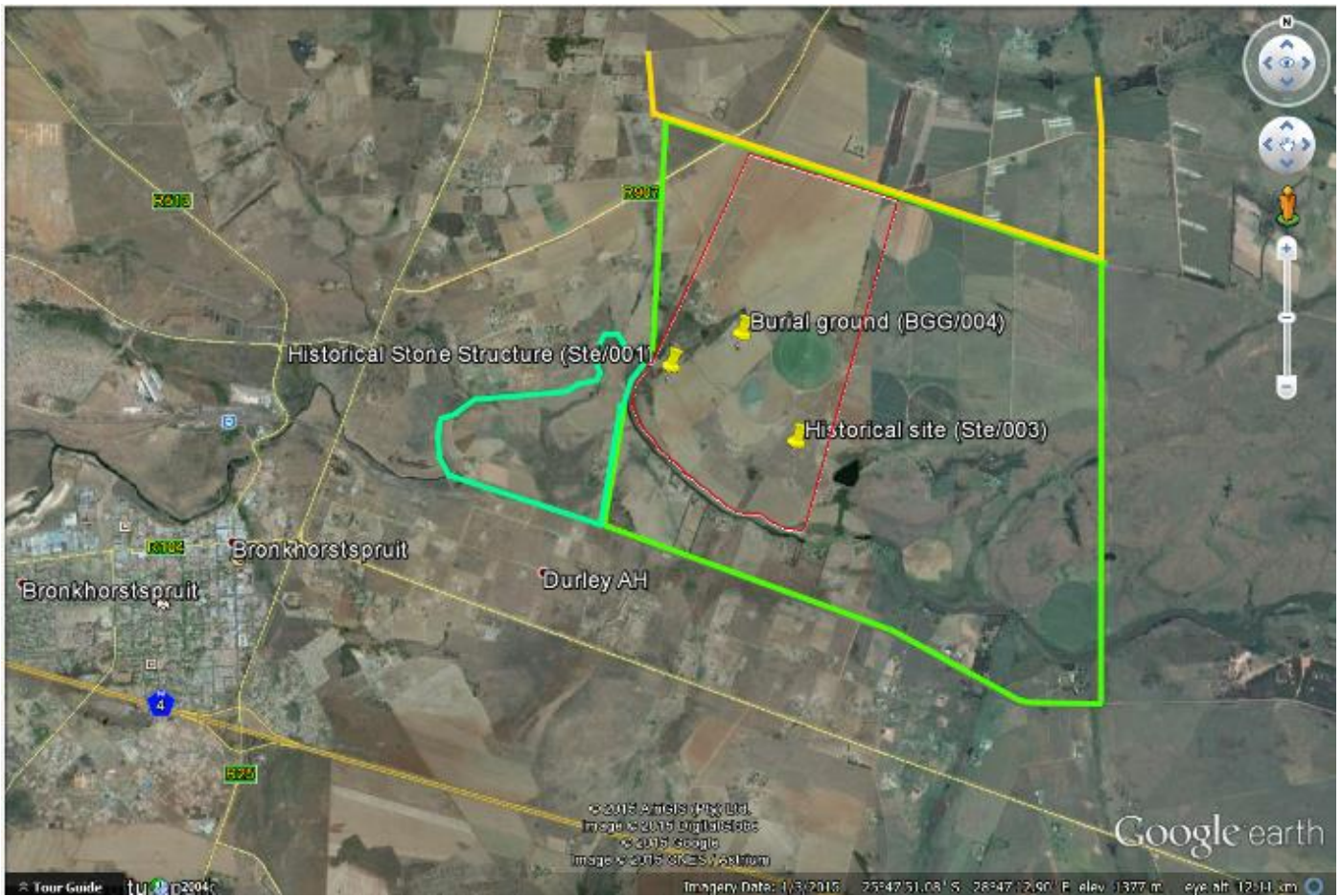
Map 7: 1984 Topographical map of the area under investigation. Little had changed since 1970. It seems that the area within the red border was mainly used as farmland. More buildings and a dam are visible near the western border (about seven). Tweefontein, to the north, was also cultivated as farmland, with only two or three buildings visible near the area under investigation. Three buildings are visible near the eastern border of Resurgam, and many buildings are visible south of this property. (Topographical Map 1984)



Map 8: 1995 Topographical map of the area under investigation. The situation on Wachtenbietjeskop remained much the same as in 1884, but a furrow is indicated between three small dams near the western border. The situation on Tweefontein remained unchanged and at this time all of Resurgam was planted with crops. A sewerage Disposal Works had been established adjacent to the eastern border of this property. (Topographical Map 1995)



Map 9: 2003 Topographical map of the area under investigation. The situation on the area under investigation remained mostly unchanged since 1995. A diggings site is visible near the southern border of Resurgam. (Topographical Map 2003)



Map 10: 2015 Google Earth image, showing the location of the farms Wachtenbietjeskop 506 JR (green border), Resurgam 515 JR (blue border) and Tweefontein 491 JR (yellow border). The area of specific interest is located within the red border, on Wachtenbietjeskop. Some sites of historical interest have been marked on this section. (Refer to “Notification of Intent to Develop” report by Digby Wells Environmental) (Digby Wells Environmental 1914)

The following historical terrains were marked:

1. 6669/2528DD/Ste/001

Structure

(-25.791248/28.786547)

Visible at this site is the ruin of a four room historical stone structure with a fireplace in the main sitting room. No electrical wirings or plumbing was identified within the house, and roof was presumably thatch. The date of the house is unknown and is assumed to be historical at this point.

Significantly, the 1941 Topographical map of this area indicated the presence of three kraals near this site. There was however no sign of a European-style settlement yet. (Topographical Map 1941)

2. 6669/2528DD/Ste/003

Historical site

(-25.797801/28.798163)

This is an area measuring approximately 100 m x 300 m with rectangular stone walls, presumably cattle kraals.

3. 6669/2528DD/BGG/004

Burial ground

(-25.788695/28.793123)

Approximately 30 graves first identified by Pistorius 2010.

On the 1941 topographical map one can see the site of a kraal in the vicinity of this burial ground. In 1970 it was indicated that there was a building near this site. (Topographical Map 1941; Topographical Map 1970)

4. A BRIEF HISTORY OF HUMAN SETTLEMENT IN THE BRONKHORSTSPRUIT AREA

Long before European settlers moved inland, Stone Age and Iron Age communities had left their mark on the old Transvaal landscape. The focus of this report is however to provide information regarding the properties under investigation, based on primary documentary research. With their migration into the northern provinces, white settlers brought a tradition of record-keeping, and today these archival records are a priceless testimony to how the South African landscape was structured in the past.

It was only by the late 1830s that a mass-movement of Dutch speaking people in the Cape Colony started advancing into the northern areas. This was due to feelings of mounting dissatisfaction caused by economical and other circumstances under British rule in the Cape. This movement later became known as the Great Trek. This migration resulted in a massive increase in the extent of that proportion of modern South Africa dominated by people of European descent. (Ross 2002: 39)

As can be expected, the movement of whites into the interior would have a significant impact on the black people who populated the land. This was also the case in the

area where the farms under investigation are located, today known as Gauteng. Farms were surveyed in a large area, which included the present-day Bronkhorstspuit area, between 1839 and 1840. By 1860, the population of whites in the central Transvaal was already very dense and the administrative machinery of their leaders was firmly in place. Many of the policies that would later be entrenched as legislation during the period of apartheid had already been developed. (Gesiedenisatlas van Suid-Afrika 1999: 15, 170)

An important conflict took place at Bronkhorstspuit during the First Anglo-Boer War in December 1880. This event will now be discussed in some detail.

The First War Of Independence, 1880-1881 – The ‘Battle’ Of Bronkhorstspuit (20 December 1880)

Background

The final British annexation of the Cape in 1806 marked the beginning of a strong rift between the inhabitants of the Cape who were mainly from Dutch, French and later German descent and the new British Cape Colonial government.

The community at the Cape and the cattle farmers further north east, towards Port Elizabeth, Grahamstown and Colesberg had developed a unique African character and a strong sense of independence and self rule. When this was threatened by the Colonial Government they chose to move into the interior of South Africa in pursuit of their own, independent republic. Eventually two Boer Republics then known as the Transvaal Republic and the Republic of the Orange Free State were established. They first obtained independence from Britain in 1852 after the Sand River Convention and for nearly 30 years the Boers led a mainly agrarian existence. (Duxbury 1981: 1-8)

Causes of the war.

The two Boer republics were however in the way of Britain's plans for a confederation of the states in Southern Africa and in 1877 they annexed the Transvaal. The Boers regarded this as a direct violation of the Sand River Convention and a threat to their hard earned independence and many protest meetings were held across this Republic. In the three years after annexation, the British failed to acknowledge the

smouldering discontent and when the authorities began to clamp down on non payment of taxes, it sparked the first uprising of many in the small town of Potchefstroom in the then western Transvaal in December 1880. This marked the outbreak of what later became known as the First War of Independence or the Transvaal War. As early as November, however, British Forces were ordered to Pretoria as the hostile attitude of the Boers became more imminent. Other forces were stationed at Rustenburg, Lydenburg, Marabastad, Wakkerstroom and Standerton. (Duxbury 1981: 1-8)

Bronkhorstspuit.

British forces, (the 94th Regiment) stationed at Lydenburg received orders to move to Pretoria and reached Middelburg on 15 December. Boer movements and gatherings were noticed and the column under command of Lt. Col. Anstruther moved its wagons in laager style every night as a precautionary matter. On 20 December the column reached a small stream called the Bronkhorstspuit. It was then that a party of 150 Boers were noticed on a nearby ridge. The column stopped and a Boer messenger delivered a note to Anstruther giving him two minutes to answer. Meanwhile the Boers under command of Cmdt Frans Joubert grew in numbers and moved closer. There was no way that Anstruther would negotiate as he had orders to obey. There is ambiguity as to what happened next, but fire was opened which lasted for about 15 minutes. (Duxbury 1981: 9-18)

Although accurate figures are not available, names on monuments indicate that the British suffered 78 killed, 79 wounded and several prisoners of war taken. Anstruther died of wounds six days later. On Boer side one was killed in action, one died of wounds and five were wounded. (Duxbury 1981: 9-18)



Image 1: The British Monument outside Bronkhorstspuit.
Photograph: C Kruger, Heritage Foundation

Joubert allowed for the establishment of a camp for the wounded and for 20 men to assist in the burying of the dead and caring for the wounded. The remainder were taken prisoner. (Duxbury 1981: 9-18)



Image 2: The Boer Monument, Bronkhorstspuit.
Photograph: C Kruger, Heritage Foundation

After the Bronkhorstspuit incident the Boers besieged British garrisons at Lydenburg, Rustenburg, Standerton and Wakkerstroom. This was followed by the three major defeats of the British at Laingsnek, Schuinshoogte and eventually, Majuba. (Duxbury 1981: 17-44)

The Twentieth Century

The Anglo-Boer War, which took place between 1899 and 1902 in South Africa, was one of the most turbulent times in South Africa's history. Even before the outbreak of war in October 1899 British politicians, including Sir Alfred Milner and Mr. Chamberlain, had declared that should Britain's differences with the South African Republic result in violence, it would mean the end of republican independence. This decision was not immediately publicized, and as a consequence republican leaders based their assessment of British intentions on the more moderate public utterances of British leaders. Consequently, in March 1900, they asked Lord Salisbury to agree to peace on the basis of the status quo ante bellum. Salisbury's reply was, however, a clear statement of British war aims. (Du Preez 1977)

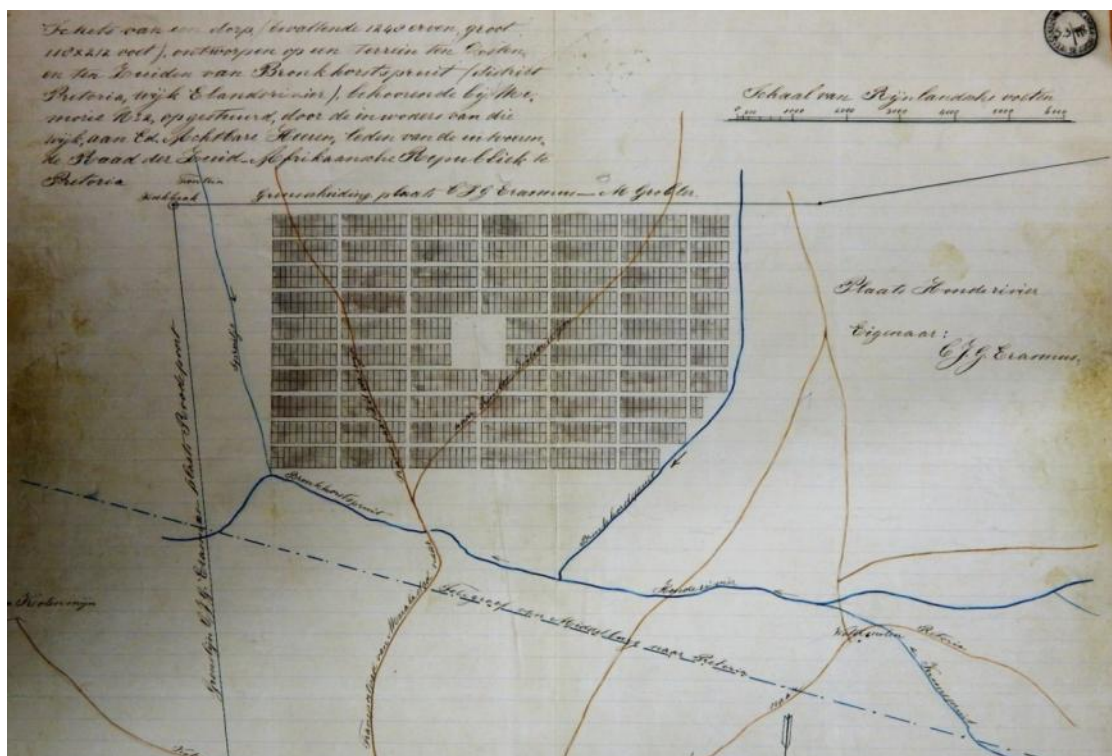
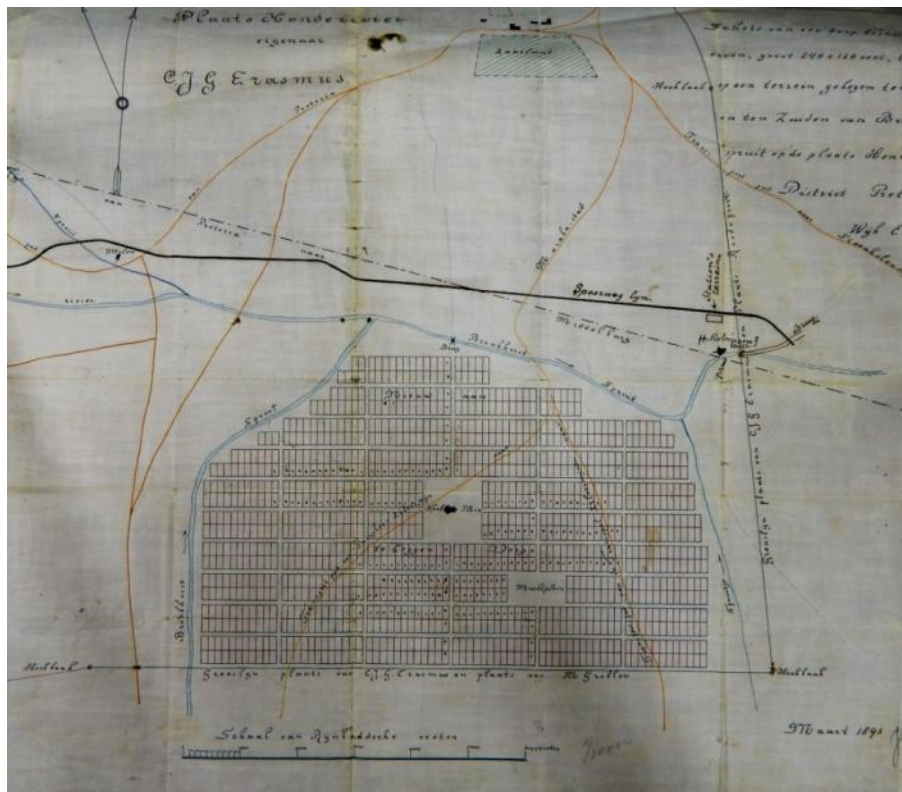
A black concentration camp was located next to the railway station at Bronkhorstspuit during the Anglo-Boer War. One of the conflicts of the war also took place a small distance to the southeast of the town. The battalion of B. Viljoen attacked that of the British commander Garrison on 18 November 1900. (Geskiedenisatlas van Suid-Afrika 1999: 15)



Image 3: Historical aerial photograph of Bronkhorstspuit with the Dutch Reformed Church in the forefront. (Anon 1949)

Since the development of Bronkhorstspuit undoubtedly had an influence on the properties surrounding it, some information on the history of this town will also be given. Bronkhorstspuit is a small town 50 kilometers east of Pretoria in Gauteng, South Africa, along the N4 highway towards Witbank. It lies on the border between the Gauteng and Mpumalanga Provinces. Before the establishment of the town, in 1858, a group of Voortrekkers settled in the Bronkhorstspuit creek, which was originally called Kalkoenkransrivier. A railway station was established on the present-day site of Bronkhorstspuit in 1894. In June 1897, the South African Republic gave its approval for the establishment of the town, by that time already named Bronkhorstspuit by locals. It was however only in 1905 that Bronkhorstspuit was officially proclaimed as a town. There is disagreement about how the town originally got its name. Some say that it was named after the farmer J. G. Bronkhorst, whereas

others believe that it was named after the plant *bronkors* (the Afrikaans name for watercress), that grew in the region of the creek. (Internet Archive N/d; Routes 2013)



Images 4 & 5: Two 1891 Maps with designs for the town Bronkhorstspuit. (NASA Maps: S3/964; NASA Maps: S3/998)

5. HISTORICAL OVERVIEW OF THE OWNERSHIP AND DEVELOPMENT OF WACHTENBIETJIESKOP 506 JR, RESURGAM 515 JR AND TWEEFONTEIN 491 JR

The incidence of archival material on specific portions of properties can be very erratic, and one is often left with an incomplete record of events. Historical data regarding specific areas often come to the fore incidentally, and it is therefore necessary to look at a wide range of archival (and other) sources to get the clearest picture of the past. Historical maps are a very useful supplementary source, and can help to “fill in the gaps” in the record.

This section will deal with each property individually, drawing on all the available sources. Issues of special interest in this study are historical land use and the structures it left behind, as well as the history of ownership on the properties under investigation.

1. Wachtenbietjeskop 506 JR

There are numerous variations to the name Wachtenbietjeskop, (Wachtenbietjieskop, Wachtenbietjiekop, Wachteenbietjieskop, Wachtenbeetjekop, Wachtenbeetjeskop and Wag ‘n Bietjie Kop, to name but a few) and the names in this report are spelled as they were given in the original text.

Since the 19th century, South Africa has been divided and re-divided into different districts, wards and registration divisions, not to mention that the original farms were often subdivided into properties with new names. For this reason, most properties underwent at least three name changes since its registration in the 1800s. Ever since its registration in 1865, Wachtenbietjeskop was known as Wachtenbeetjekop 410. By the 1950s, this property was known as Wachtenbietjeskop 246, and by 1970 the name Wachtenbietjeskop 506 JR was in use.

HISTORICAL LAND USE AND HISTORICAL STRUCTURES

General information

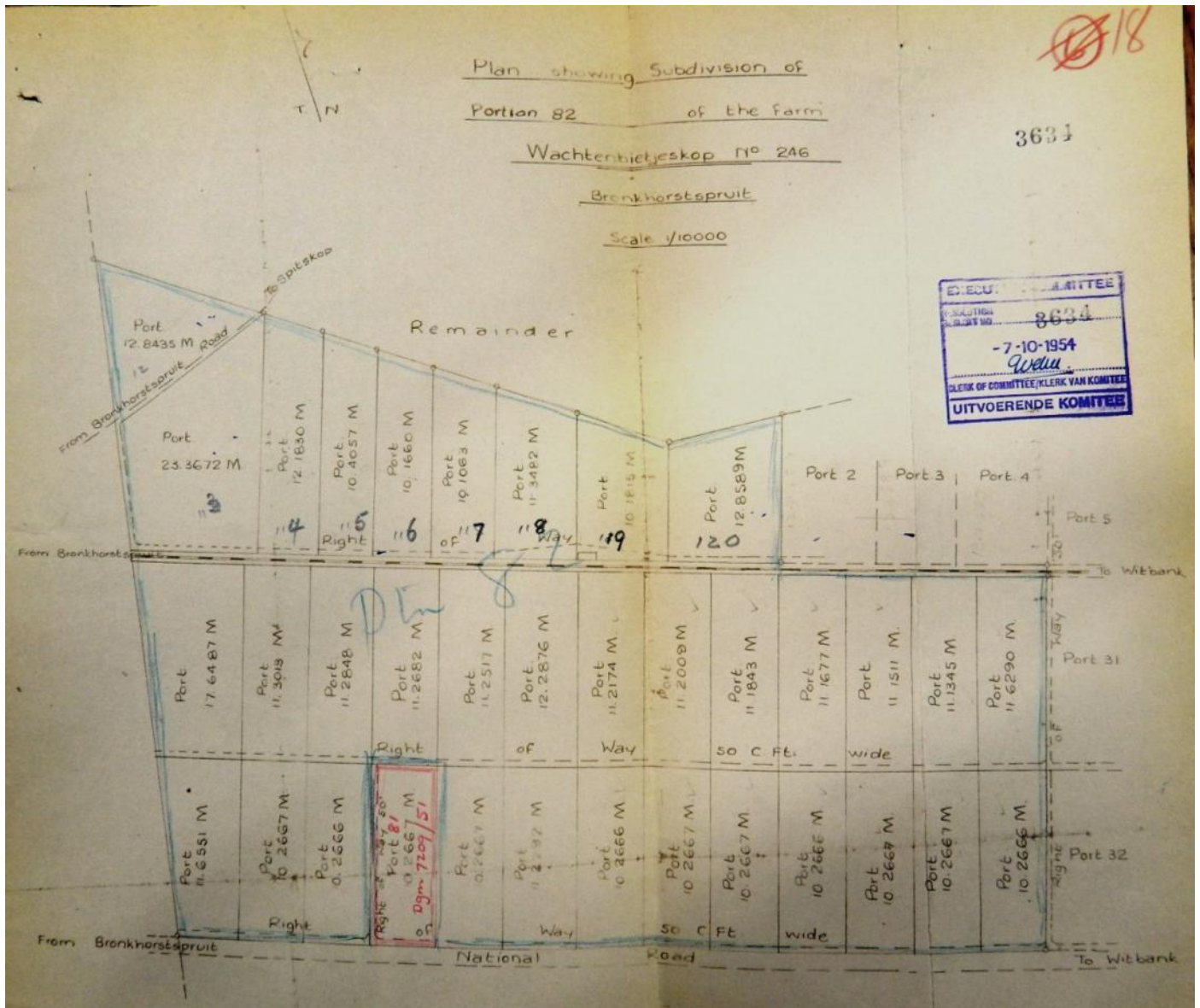


Image 6: 1954 Subdivision of the farm Wachtenbietjeskop No. 246. (NASA SAB, CBD: 3/868 TAD9/37/45)

In June 1954, application was made for the subdivision of Portion 82 of Wachtenbietjeskop 264, district Bronkhorstspruit. By September of that year the Peri-Urban Area Health Board however advised against the subdivision, giving a number of reasons. According to the Board this portion could not be intensively cultivated, due to the soil being very poor and the land not irrigable. Interestingly, it is also noted that there was no demand for land of

such small sizes in that area, mainly because of the poor nature of the soil. Furthermore, it was recommended that no business rights would be attached to any one of the portions, as adequate shopping facilities were available in the area and because Bronkhorstspuit was approximately only three miles away. (NASA SAB, CBD: 3/868 TAD9/37/45)

By August 1954 the subdivision of properties in this area were subject to the following conditions:

- a) That all right-of-way intersections would be splayed back at least 20 feet;
- b) That no right-of-way would be less than 50 feet wide;
- c) That the right-of-way would be beacons on both sides; and
- d) That the service road and the rights-of-way would be registered in favour of the general public. (NASA SAB, CBD: 3/868 TAD9/37/45)

Further conditions were given as follows:

1. The land may not be subdivided without the written approval of the controlling authority.
2. Not more than one dwelling house, together with such outbuildings as are ordinarily required to be used in connection therewith, shall be erected on the land except with the written approval of the controlling authority.
3. The land shall be used for residential and agricultural purposes only and no store or place of business or industry whatsoever may be opened or conducted on the land without the written approval of the controlling authority.
4. No building or any structure whatsoever shall be erected within a distance of 300 foot from the centre line of the national road, without the written approval of the controlling authority.
5. Except with the written approval of the controlling authority, the use of a strip 50 foot in width immediately adjacent to the northern boundary of the 140 foot national road reserve shall be limited to a servitude or of right of way in favour of the general public. (NASA SAB, CBD: 3/868 TAD9/37/45)

In 1957 Nonus Hamman (14/07/1908) became the owner of Portions 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103 and 104 (portions of Portion 82) of Wachtenbietjeskop 506 JR. All of these portions were at least 10 morgen in extent. The African and European Investment Co. Ltd. was the registered owner of mineral rights on these properties. No prospecting deeds had been registered on this property at the time. The properties were used for agricultural purposes. In 1963 the possibility however stated to emerge that N. Hamman's portions could be used for industrial development. In a letter dated 15 May 1964, the then Minister of Economic Affairs explained that a question existed at the time regarding how to achieve greater industrial development in rural areas to relieve the burden on large urban industrial centres. Though the government did not mean to interfere by forcing industrialists to settle in specific areas, they could be encouraged individually by means of tax concessions. It was however necessary to keep in mind considerations like the availability and cost of electricity and water, as well as transport costs for raw materials and manufactured products. By 1966 it however came to light that Mr. Hamman was not planning to apply for business rights on his property. He was however actively encouraging a number of institutions to consider the possibility of industrial development in the countryside. (NASA SAB, CBD: 3/868 TAD9/37/45)

In the mid 1960s there was a court case implicating the government of the Republic of South Africa, Premier (Tvl.) Diamond Mining Co. Ltd and other landowners. Among the respondents in this case were the landowners Dennilton Land Co. (Pty) Ltd, J. C. Botha, Outspan Properties (Pty.) Ltd., H. J. Du Preez, B. Mocke, c. H. Boshoff, J. Myburgh, J. G. Froneman, C. J. Prinsloo, J. Prinsloo, N. H. Louw, G. D. Pretorius, G. P. Van Niekerk, J. G. M. Van Straaten, S. J. J. V. Geldenhuys, G. Stroh, J. A. Jacob C. T. J. Malan and P. E. Hamman. (NASA TAB, WAT: 594/1965)

The case addressed the matter of a seemingly illegal pipeline traversing a number of properties, including Wachtenbietjeskop. It came to light that the government of the Republic of South Africa had used these properties during the war years and that water purification works had been established at the

Wilge River Works of the Premier Transvaal Diamond Mining Co. Ltd. Several landowners, including P. E. Hamman and his predecessors were however not aware that the said company and the government had a shared arrangement whereby the company supplied the government with water by way of a pipeline that crossed their properties. Hamman was the registered owner of Portions 79 and 80 of Wachtenbietjesrust at the time. Their argument was that the government had been using this pipeline unlawfully for years. A servitude would therefore have to be issued for the pipeline on these properties, which some landowners could perceive as an inconvenience. (NASA TAB, WAT: 594/1965)

The government therefore requested the affected landowners to permit the registration of a perpetual servitude of aqueduct, 25 inches wide, with which water could be channelled from the Premier Mine Dam in the Wilge River (to which the government had a right), to the Zonderwater Italian Prisoner of War Camp (1941-1947). The government already had the permission of the Premier (Transvaal) Diamond Mining Company Limited. P. E. Hamman, who bought his properties in August 1964, however refused to allow the registration of a servitude on his land. Likewise, the Dennilton Land Co (Pty.) Ltd. insisted that compensation had to be paid by the government, as deemed reasonable by the court. (NASA TAB, WAT: 594/1965)

The mining company would be held responsible for the maintenance of the aqueduct. No work would be carried out on the properties and the government therefore did not believe that the landowners would suffer any damages. Furthermore, the pipe was buried underground and only took up a very small surface of the landowners' properties. The Bronkhorstspruit Dam formed part of the state water works at the time, and the government therefore did not need to apply for permission to use this water. (NASA TAB, WAT: 594/1965)

By 1965, Portion 69 (a portion of Portion 1) of Wachtenbietjieskop 506 JR belonged to Ester Schlosberg, the Director of Nelspruit Citrus Dale (Pty.) Ltd. This owner, as well as several others gave consent to grant to the government the servitude of aqueduct over their properties. These

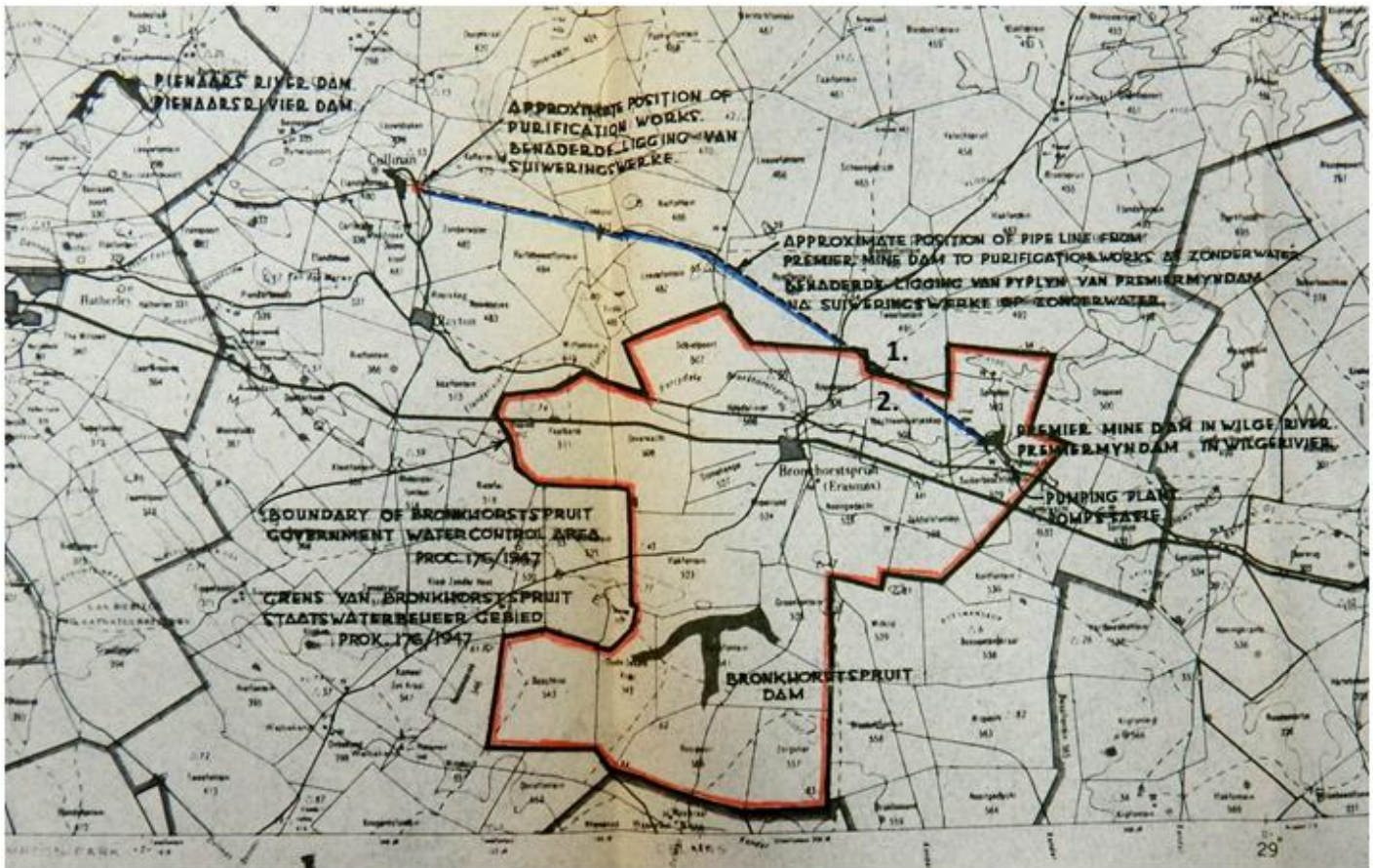


Image 8: 1961 Map showing the approximate position of the Purification Works, the pipeline from Premier Mine Dam to the purification works at Zonderwater, the Premier Mine Dam in Wilge River and the Pumping Plant. 1 & 2 show the positions of Tweefontein and Wachtenbietjeskop, respectively. (NASA TAB, WAT: 594/1965)

At the end of the trial it was concluded that all those landowners in the area affected by the government's water pipes, including those who refused to grant a servitude to the government, would receive no compensation for damages. This was due to the fact that there was no practical reason to believe that they would suffer any damages due to the pipelines on their properties. (NASA TAB, WAT: 594/1965)

Of general interest, by 1965, Portion 70 of the farm belonged to Dennilton Land Co. (Pty) Ltd, but was sold to Mrs. A. E. Kruger under a leasehold contract. She was not yet the owner of the property. Likewise, Portions 71 and 77 (portions of Portion 1) of Wachtenbietjeskop 506 JR belonged to one George Stroh by 1965. Dennilton Land Co. (Pty) Ltd. owned the Remaining Extent of Portion 1 as well as Portion 70 (portion of Portion 1) of Wachtenbietjeskop 506 JR, with J. G. Froneman as the lessee on the latter portion. Portions 72 and 73 (portions of Portion 1) of Wachtenbietjeskop 506 JR belonged to N. H. Louw. (NASA TAB, WAT: 594/1965)

In 1970 the National Route 4/7 Bronkhorstspuit was being planned. This road would traverse Portions 30, 31, 93 and 98 of the farm Wachtenbietjeskop 506 JR, district Bronkhorstspuit. This plan was approved in 1971. (NASA SAB, CBD: 3/868 TAD9/37/45)

Portion 1

No documents were found specifically dealing with this property.

Portion 69

By 1965, Portion 69 (a portion of Portion 1) of Wachtenbietjeskop 506 JR belonged to Ester Schlosberg, the Director of Nelspruit Citrus Dale (Pty.) Ltd. This owner, as well as several others gave consent to grant to the government the Servitude of Aqueduct over their properties.

Portion 75

In September 1959 one Stephanus Andries Alberts, at that time living in Mosselbaai, applied to purchase Portion 75 (a portion of Portion 1) of the farm Wachtenbietjeskop 246 in the Bronkhorstspuit district. Though his application was ultimately unsuccessful, some details with regards to the property come to light. It seems that this part of the property was a private farm at the time, and therefore not owned by the state. Alberts planned to use the property for milk farming, sheep and general farming. The previous owner of the land was one Dr. Anthonie Botha (29-12-1920), a medical doctor, who in turn had bought the land from Dennilton Land Company (Pty.) Ltd. The property measured 300 morgen. At the time of the application, the Groblersdal Road was the most accessible road to this part of the land. The property did not fall under the area of the Irrigation Board. In order to irrigate the land it would be necessary to install both pipes and pumps, as well as water furrows. The land was fenced at the time. Other developments included three earth dams and irrigation furrows, as well as a stone building. Alberts offered to buy Portion 75 of Wachtenbietjeskop, sometimes referred to as "Wag 'n Bietjie Kop", for

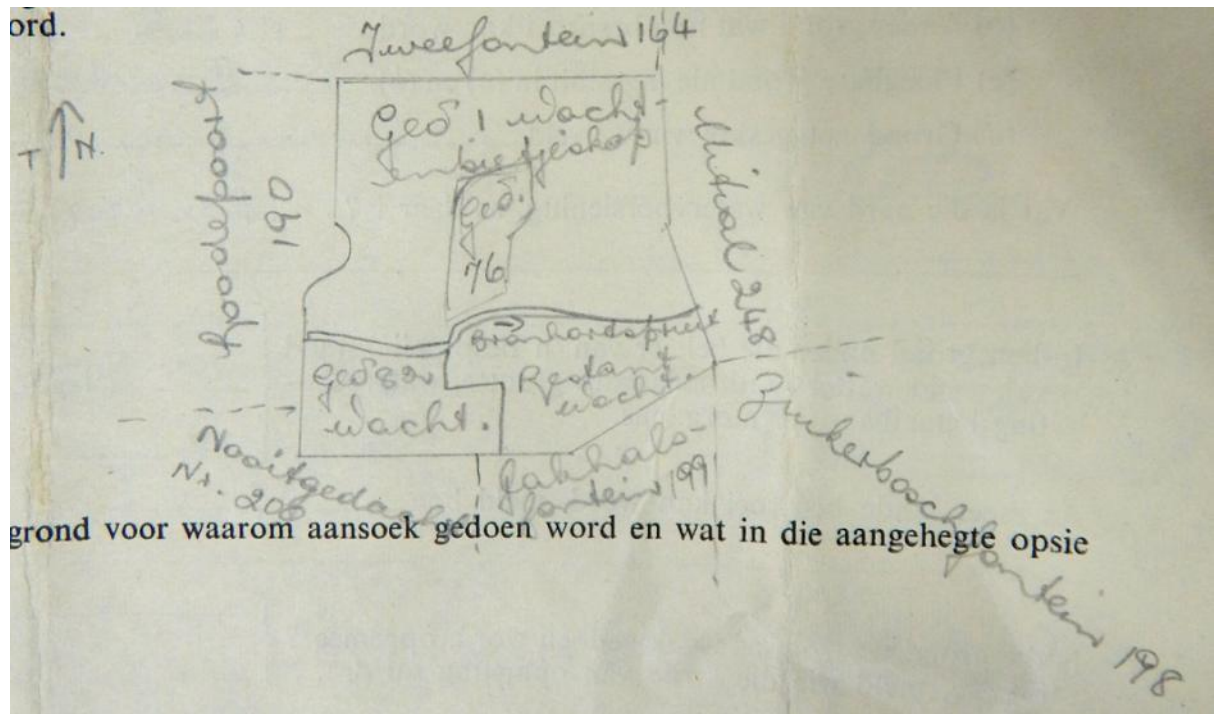


Image 10: Rough sketch of Wachtenbietjeskop. Portions 1, 76, 82 and the Remaining Extent of the property are indicated. (NASA SAB, LDE: 2111 44187)

Portion 87

No documents were found specifically dealing with this property.

Portion 113

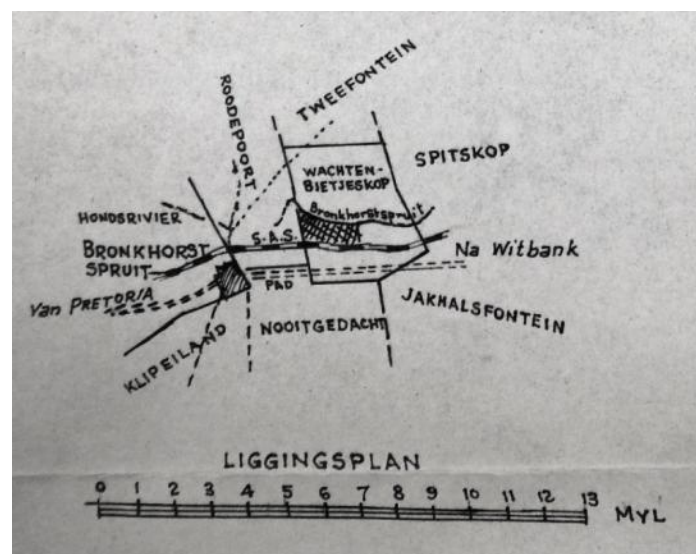


Image 11: 1959 Locality Map of Wachtenbietjeskop.

In 1959 the registered owner of Portion 121 (a portion of Portion 82) of the farm Wachtenbietjeskop 506 JR, Pieter Eduard Hamman (11/12/1929), applied to consolidate Portion 121 with Portions 112, 114, 115, 116, 117, 118, 119 and 120 of the farm. Hamman was the owner of all of these portions. The following servitudes have been registered on the land by then:

1. Mineral Rights reserved in favour of The African and European Investment Co. Ltd – Acts No. 331/1950 r. M and 127/535.
2. Servitude of an ESCOM Power Cable No. 83/515
3. Right of Way No. 1157/555
4. Servitude regarding M. J. Grieff No. 9042/59.

The land would be used for agricultural and residential purposes. The reason for the subdivision was given as follows: Portions 112, 114, 115, 116, 117, 118, 119 and 120 were separated from the river by Portion 121. It was necessary that these portions would border on a water source. For agricultural purposes, these arid properties required access to water. At the same time, these portions would be enlarged. After consolidation the entire area would measure 10.8160 morgen. It was only in 1960 that Hamman had permission from all the relevant authorities to consolidate this land. (NASA SAB, CBD: 3/868 TAD9/37/45)

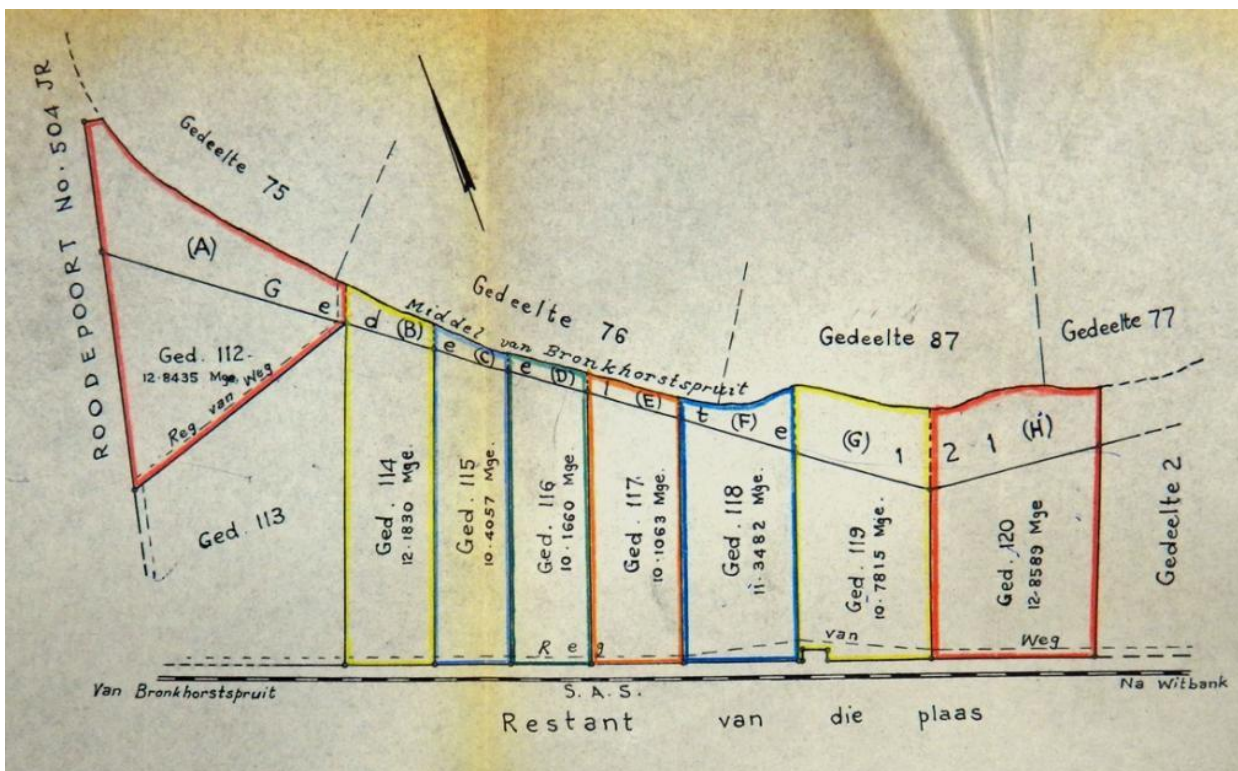


Image 12: Maps showing the area of Wachtenbietjeskop to be consolidated (Portions 121, 112, 113, 114, 115, 116, 117, 118 and 119). Portions 75, 76, 77 and 87 are visible to the north thereof. (NASA SAB, CBD: 3/868 TAD9/37/45)

Portions 122 -125

No documents were found specifically dealing with these properties.

Portions 139 - 143

No documents were found specifically dealing with these properties.

Portion 144

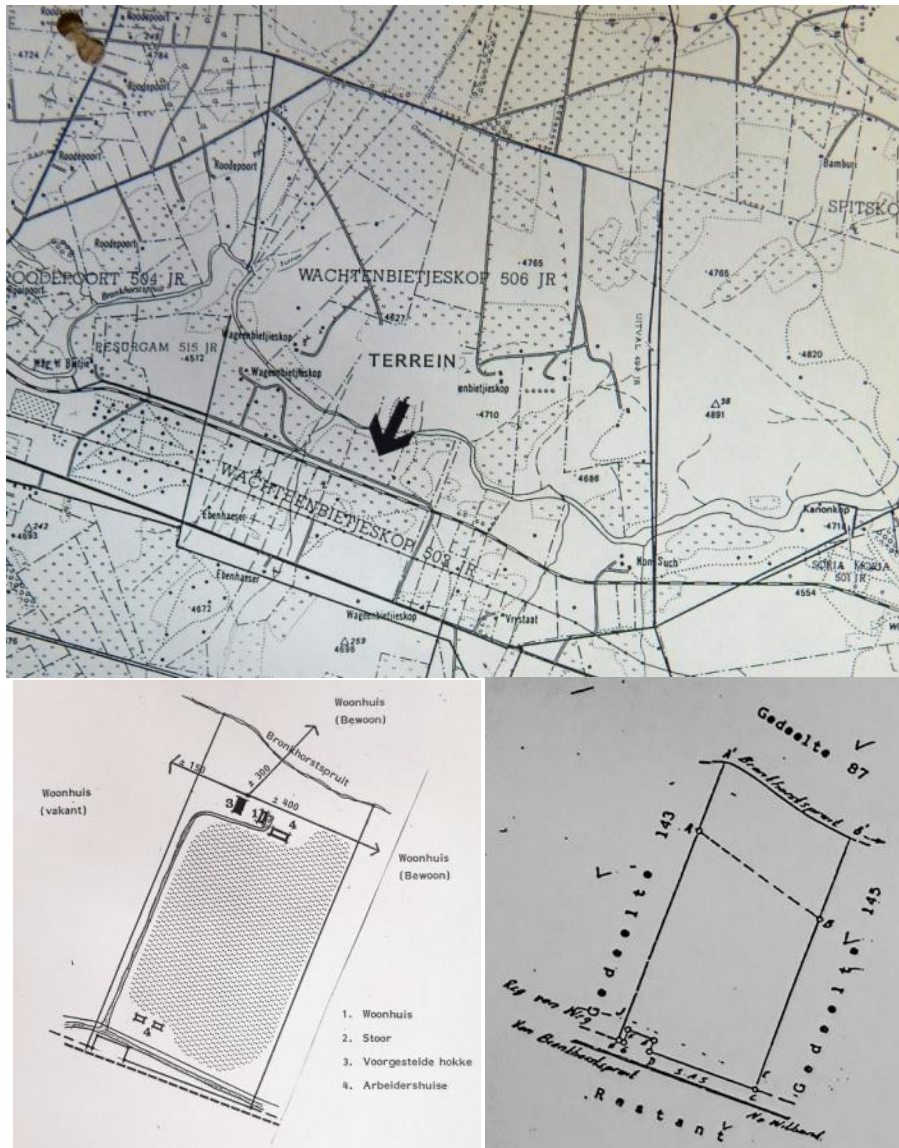


Image 13: 1984 Area map of Wachtenbietjeskop 506 JR and maps of Portion 144 of farm. A residence (1), store room (2) and labourers' houses (4) existed on the property at the time. The kennels (4) would be located close to the residence. (NASA SAB, CDB: 14921 PB4/19/2/11/506/1)

On 5 October 1984 Jan Hendrik Jooste (4011215006001) sold his Deed of Transport to Portion 144 of Wachtenbietjeskop to Johan Tjaard du Plessis (4908185040003). Mineral and prospecting rights on the farm were held by the African and European Investment Company Limited at the time. A servitude of aqueduct for the purpose of conveying water in favour of the Premier (Transvaal) Diamond Mining Company Ltd. was still in power on the property. The land was sold to be used for residential and agricultural purposes only, with the condition that no store or place of business or industry could be opened or conducted on the land. (NASA SAB, CDB: 14921 PB4/19/2/11/506/1)

In 1985 the landowner, Mr. Du Plessis, however applied to the Controlling Authority to open a place of business on Portion 144 of Wachtenbietjeskop. He wished to establish a grooming salon for pets that would sell products related to the outward appearance of pets, as well as dog and cat boarding kennels. At that time no such business existed in the immediate area of Bronkhorstspuit. The property was located about 4.5 km from the town. On 5 February 1986, Du Plessis received his permit to use Portion 144 of Wachtenbietjeskop 506 JR, measuring 12.7721 hectares, as a grooming salon and pet kennels facility. (NASA SAB, CDB: 14921 PB4/19/2/11/506/1)

Portion 145

No documents were found specifically dealing with this property.

Portion 150

No documents were found specifically dealing with these properties.

LAND OWNERSHIP

This property was first inspected on 27 December 1861 by D. J. Erasmus. It measured 2679 morgen 400 square roods.

	Date of Transfer	Farm	Portion	District	Transferor	Transferee
1	30-09-1865	Wachteenbeetjeskop 410	Whole farm	Pretoria district, ward Elands River	Government transport	George Diederik Petrus Prinsloo Senior
2	09-10-1874	Wachteenbeetjeskop 410	1/8 share of farm	Pretoria district, ward Elands River	George Diederik Petrus Prinsloo Senior	Jacobus Johannes Prinsloo and George Diederick Petrus Prinsloo Junior
3	29-04-1876	Wachteenbeetjeskop 410	Whole farm	Pretoria district, ward Elands River	J. J. Prinsloo, G. D. P. Prinsloo Jr & G. D. P. Prinsloo Sr	Anthony Lennox Devenish Sr
4	18-10-1886	Wachteenbeetjeskop 410	1/6 share of farm	Pretoria district, ward Elands River	Anthony Lennox Devenish Sr	Thomas William Becket & Samuel Marks
5	18-07-1904	Wachteenbeetjeskop 410	Certain portion	Pretoria district, ward Elands River	Thomas William Beckett	Samuel Marks
6	25-11-1904	Wachteenbeetjeskop 410	2/3 share in RE of farm	Pretoria district, ward Elands River	Samuel Marks	1. I. L. Bernst 2. Lewis & Samuel Marks
7	25-11-1904	Wachteenbeetjeskop 410	2/3 share in RE of farm	Pretoria district, ward Elands River	The firm of Lewis Marks	African & European Investment Co. Ltd
8	06-04-1906	Wachteenbeetjeskop 410	1/3 share in RE of farm	Pretoria district, ward Elands River	T. W. Becket	The L & B Exploration Co. Ltd
9	10-04-1906	Wachteenbeetjeskop 410	2/3 share in RE of farm	Pretoria district, ward Elands River	African and European Investment Co. Ltd.	The L & B Exploration Co. Ltd
10	31-12-1912	Wachteenbeetjeskop 410	RE	Pretoria district, ward Elands River	African and European Investment Co. Ltd. liquidation	African and European Investment Co. Ltd.
11	22-08-1918	Wachteenbeetjeskop 410	Portion B	Pretoria district, ward Elands River	African and European Investment Co. Ltd.	Government of the Union of South Africa

(NASA RAK: 2991; NASA RAK: 3005)

2. Resurgam 515 JR

The farm Resurgam did not exist since the 19th century, but rather formed part of the farm Roodepoort. When this farm was registered in 1861, it was known as Roodepoort 474. (By the 1950s, this property was known as Roodepoort 190, and by 1961 the name Roodepoort 504 JR was already in use) The earliest signs that a new farm had been cut off from Roodepoort appeared on a 1917 map of the Bronkhorstspuit ward. This property, located where Resurgam would later be registered, was known as Bronkhorstspuit 627. By 1955 the farm Resurgam 249 started appearing on maps of the area. (NASA Maps: 3/299)

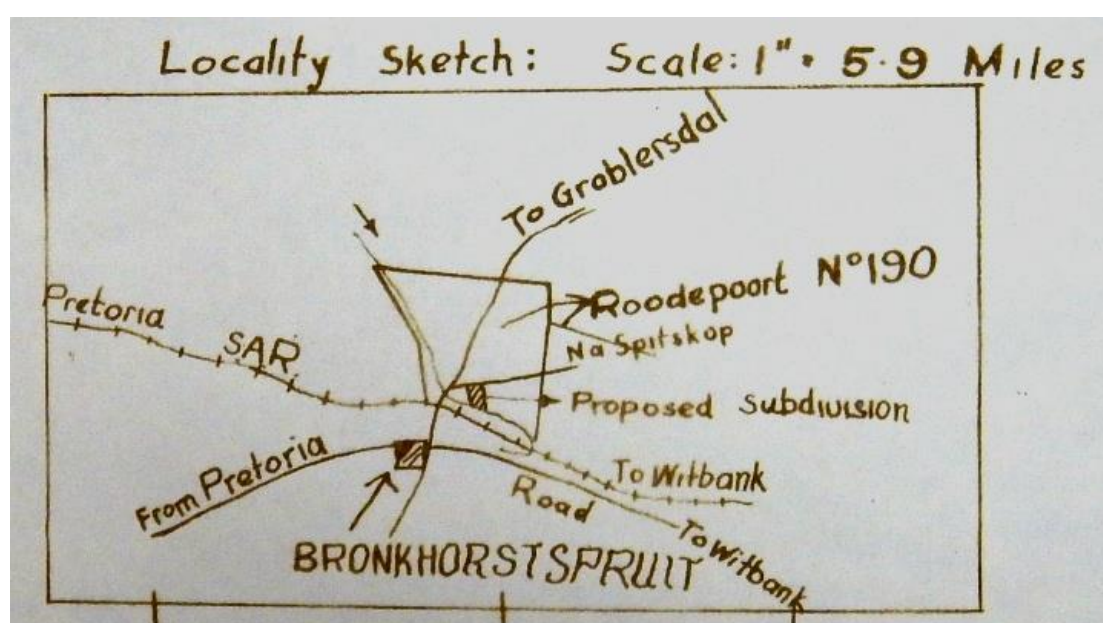


Image 14: 1955 Locality sketch of the farm Roodepoort 190. (NASA SAB, CDB: 3/865 TAD9/37/23)

Searches in the National Archives of South Africa regarding this property yielded almost no results, and very little of value for the sake of this study. In this case cartographic material serves as one of the only historical sources. The little available sources will however be examined.

HISTORICAL LAND USE AND HISTORICAL STRUCTURES

No archival documents could be found referring to this property. (See **6. Conclusion** for more information)

LAND OWNERSHIP

	Date of Transfer	Farm	Portion	District	Transferor	Transferee
	21-02-1861	Roodepoort 474	Whole farm	Pretoria district, ward Elands River	Government Transport	David Jacobus Pietersen
1	10-12-1877	Roodepoort 474	Whole farm	Pretoria district, ward Elands River	David Jacobus Pietersen	Anthony Lennox Devenish Sr.
2	18-10-1886	Roodepoort 474	Whole farm	Pretoria district, ward Elands River	Anthony Lennox Devenish Sr.	George Pigott Moodie
3	18-10-1886	Roodepoort 474	Whole farm	Pretoria district, ward Elands River	G. P. Moodie	Thomas William Becket and Samuel Marks
4	18-07-1904	Roodepoort 474	1/6 share in farm	Pretoria district, ward Elands River	Thomas W. Beckett	Samuel marks
5	18-07-1904	Roodepoort 474	Certain portion	Pretoria district, ward Elands River	Thomas William Beckett & Samuel Marks	Thomas William Beckett & Samuel Marks, constitution the "Bronkhorstspruit Township Syndicate"
6	25-11-1904	Roodepoort 474	2/3 share of RE of farm	Pretoria district, ward Elands River	Samuel Marks	Isaac Lewis Bennet (?), Lewis & Samuel Marks trading as Lewis & Marks
7	25-11-1904	Roodepoort 474	2/3 share of RE of farm	Pretoria district, ward Elands River	Firm of Lewis Marks	African and European Investment Co. Ltd.
8	06-04-1904	Roodepoort 474	1/3 share of RE of farm	Pretoria district, ward Elands River	Beckett & African & European Investment Co. Ltd	The L & B Exploration Co. Ltd
9	10-04-1904	Roodepoort 474	2/3 share of RE of farm	Pretoria district, ward Elands River	African & European Investment Co. Ltd	The L & B Exploration Co. Ltd
10	21-12-12	Roodepoort 474	RE	Pretoria district, ward Elands River	L&B Exploration Co. Ltd in liquidation	The African & European Investment Co. Ltd
11	05-04-1918	Roodepoort 474	RE	Pretoria district, ward Elands River	The African & European Investment Co. Ltd	Government of the Union of South Africa

(NASA RAK: 2991)

3. Tweefontein 491 JR

Ever since its registration in 1866, Tweefontein was known as Tweefontein 232. In 1928 the name Tweefontein 164 was first used, and by 1965 the name Tweefontein 491 JR was in use.

The land ownership table (see below) shows that this property had been subdivided many times since it was first proclaimed. Unfortunately the ownership record ends in 1949 and it is therefore not possible to link the old portion names with the new. No specific mention is made of Portion 12 in the archival record. It is therefore only possible to give general information regarding this farm, some of which may apply to the portion in question.

HISTORICAL LAND USE AND HISTORICAL STRUCTURES

In 1905 Johannes Georg Hamman received the certificate of Registered Title for a certain five-ninths part of the freehold farm Tweefontein 232, situated in the district of Pretoria, ward Elandsrivier. This land measured 1429 morgen 391 square roods. The original Government Transfer document of the farm, believed to have been dated 24th December 1866, was either lost or destroyed. (NASA SAB, MNW: 640 MM3007/22)

Shortly before November 1922 the government of the Union of South Africa had purchased the Remaining Extent and Portion B of Tweefontein 232, measuring 317 morgen 421 square roods. At this time, the farm was withdrawn from prospecting, and no mining rights existed on the land from there on. On 28 April 1923, one William John Gregan signed a five year lease contract on both the Remaining Extent and Portion B of Tweefontein, which still belonged to the government at the time. These properties together measured 317 morgen 421 square roods. (NASA SAB, MNW: 640 MM3007/22; NASA SAB, URU: 581 2452)

By this time a number of conditions were in place with regards to water provision on the Remaining Extent of Tweefontein 232. This included the

lessee's exclusive right to use all the water from the dam and fountain marked "b" situate on portion "D" of the farm, transferred to Jochemus Johannes Hamman in 1910, for one day in each week. The lessee was furthermore entitled to exclusive use of all the water from the fountain marked "f" situate on Portion "D" of the farm, for three days each week. The lessee also had the exclusive use of all the water from the dam marked "h" situate on Portion "E" of the farm, which was transferred to Johannes Hamman in 1910, for three days per week. Various furrows connected the water sources and farmers' lands. (NASA SAB, MNW: 640 MM3007/22)

On 2 June 1927 Portion F of Tweefontein 232, measuring 158 morgen 510 square roods, as well as the Remaining Extent of the same farm, measuring 242 morgen 163 square roods, was sold to the government of the Union of South Africa. (NASA SAB, URU: 907 1615)

On 12 July 1928, the government purchased Portion "D" and "E" of the farm Tweefontein 232, together measuring 317 morgen 420 square roods. (NASA SAB, URU: 995 2426)

Before 1928, the Remaining Extent of Tweefontein 164 was at one time known as Section B of the property. This property was transported to one John Herbert Fordred on 23 April 1928, by means of the Deed of Transport Nr. 4178/1928. The following conditions were provided:

The landowner of the Remaining Extent of the farm would receive one inch of water from the fountain situated on Portion B of the land. A one inch pipe would be used to transport the water, which the owner of Portion D would have to install between his property and the existing dam on Portion B of the property. The owner of the Remaining Extent was furthermore entitled to the use of the water furrow which ran between the said dam and the Remaining Extent, provided that the owner of Portion B could also use this furrow for the irrigation of his crops. (NASA SAB, LDE: 2113 44232)

On 19 February 1931 William John Gregan, at the time the lessee of the Remaining Extent and Portion B of Tweefontein 232, was issued with a notice

By 1962 the Remaining Extent of the farm Tweefontein 164 belonged to one A. A. J. Botes. The property measured 228 morgen 573 square roods. This farm was located six miles from Bronkhorstspuit, as well as the closest train station, and could be reached via the Grobbelaarsdal-Brakfontein-Spitskop road. The land under irrigation at the time measured eight morgen. Arable land measured 100 morgen and 120 morgen was suitable for grazing. The ground ranged from pale sand to gravel. The high country was very rocky. Two fountains, situated rather far apart, provided water for the property. One of the fountains fed a ground dam of more or less 10 by 20 by 3 foot in size. The water supply was not deemed sufficient for stock water dams, residential use and irrigation. Improvements on the Remaining Extent of the property included a garage, work room and storage room, a shed, cow stall, dam and about 250 fruit trees. A neat 10 room residence, built by the landowner himself, was also visible on the property. The land was split into five camps with sturdy fences and the farm was about 45% fenced. This was a small mixed farm, of which 10 morgen was planted with crops. 15 heads of cattle were kept. The farmer made an income selling cream and cash crops. The farm was viewed as an uneconomic unit. The following was said regarding mining: As far as this department is aware (Department of Mining), no prospecting or mining operations are currently being performed on the land and it is not likely that such activities will take place in the future. (NASA SAB, LDE: 2113 44232)

In 1965 G. D. Pretorius was the owner of Portion 18 (a portion of Portion D) of Tweefontein 491 JR. Albertus Stefanus Schutte owned Section D of Tweefontein and H. P. J. Goosen, was the owner of Section F of the property. (NASA TAB, WAT: 594/1965; NASA TAB, WAT: 594/1965)

LAND OWNERSHIP

This property was inspected by D. J. Erasmus on 21 January 1862.

	Date of Transfer	Farm	Portion	District	Transferor	Transferee
1	24-12-1866	Tweefontein 232	Whole farm (fountain on the farm belonged to Theunis Botha and M. J. Steenberg.	Pretoria district, ward Elands River	Granted by Government	Michiel Wilhelm Hamman & Johan George Hamman
2	25-01-1871	Tweefontein 232	Whole farm	Pretoria district, ward Elands River	Michiel Wilhelm Hamman	2/3 share of this portion: Theunis Christoffel Botha 1/3 share of this portion: Matthys Jacobus Steenberg
3	30-04-1875	Tweefontein 232	2/3 share in farm	Pretoria district, ward Elands River	Theunis Christoffel Botha	Maria Magdalena Botha, born Steenberg
4	08-12-1881	Tweefontein 232	1/3 portion of farm	Pretoria district, ward Elands River	Matthys Jacobus Steenberg	Daniel Hardus Erasmus & Pieter Barend Elardus Erasmus
5	24-12-1886	Tweefontein 232	1/6 portion of farm	Pretoria district, ward Elands River	Pieter Barend Elardus Erasmus	Arend Johannes Meyer, minor
6	26-02-1887	Tweefontein 232	1/6 portion of farm	Pretoria district, ward Elands River	Daniel Hardus Erasmus	Hendrik Jan van der Veen
7	20-03-1888	Tweefontein 232	1/3 portion of farm	Pretoria district, ward Elands River	Maria Magdalena Botha	Johan George Duvenage
8	01-03-1889	Tweefontein 232	1/6 portion of farm	Pretoria district, ward Elands River	A. J. Meyer & H. J. van der Veen	Frederik Christoffel Eloff
9	22-03-1889	Tweefontein 232	1/9 share in RE of farm	Pretoria district, ward Elands River	J. G. Hamman	Jochemus Johannes Hamman, minor
10	22-03-1889	Tweefontein 232	1/9 share in RE of farm	Pretoria district, ward Elands River	J. G. Hamman	Abraham Benjamin Joubert, married in community of

						property to Elizabetha Loretta Hamman
11	17-06-1896	Tweefontein 232	2/9 share in RE of farm	Pretoria district, ward Elands River	J. G. Hamman	Michiel Wilhelm Hamman
12	05-08-1902	Tweefontein 232	1/3 share of farm	Pretoria district, ward Elands River	J. G. Duvenage	Abraham Christiaan Johannes Duvenage
13	29-01-1903	Tweefontein 232	¼ share of farm	Pretoria district, ward Elands River	Estate late m. M. Du Plooy, born Steenberg	Theunis Christoffel Botha
14	29-01-1903	Tweefontein 232	¼ share of farm	Pretoria district, ward Elands River	Estate late m. M. Du Plooy, born Steenberg	Petrus Willem Botha
15	29-01-1903	Tweefontein 232	¼ share of farm	Pretoria district, ward Elands River	Estate late m. M. Du Plooy, born Steenberg	Willem Frederik Botha
16	29-01-1903	Tweefontein 232	¼ share of farm	Pretoria district, ward Elands River	Estate late m. M. Du Plooy, born Steenberg	Estate late Cornelia Margaretha Prinsloo, born Botha
17	18-03-1903	Tweefontein 232	¼ share of farm	Pretoria district, ward Elands River	Estate late C. M. Prinsloo, born Botha	Petrus Willem Botha
18	10-05-1905	Tweefontein 232	1/9 share of RE of farm	Pretoria district, ward Elands River	A. B. Joubert	Joseph Jackson
19	31-05-1905	Tweefontein 232	5/9 share of farm	Pretoria district, ward Elands River	Certificate of Registered Title in lieu of Transfer deed 24 Dec 1866, lost or destroyed	Johannes Georg Hamman
20	31-05-1905	Tweefontein 232	2/9 share of farm	Pretoria district, ward Elands River	M. W. Hamman	Joseph Jackson
21	07-10-1905	Tweefontein 232	1/9 share of farm	Pretoria district, ward Elands River	J. G. Hamman & Estate late M. F. F. Hamman, Born Prinsloo	Petrus Ludolf Steyn
22	07-10-1905	Tweefontein 232	1/9 share of farm	Pretoria district, ward Elands River	J. G. Hamman & Estate late M. F. F. Hamman, Born Prinsloo	Johannes Hamman

23	07-10-1905	Tweefontein 232	1/9 share of farm	Pretoria district, ward Elands River	J. G. Hamman & Estate late M. F. F. Hamman, Born Prinsloo	Philippus Albertus Steenkamp
24	07-10-1905	Tweefontein 232	1/9 share of farm	Pretoria district, ward Elands River	J. G. Hamman & Estate late M. F. F. Hamman, Born Prinsloo	Willem Petrus Hamman
25	07-10-1905	Tweefontein 232	1/9 share of farm	Pretoria district, ward Elands River	J. G. Hamman & Estate late M. F. F. Hamman, Born Prinsloo	Johannes Jacobus Prinsloo
26	22-01-1906	Tweefontein 232	1/9 share of farm	Pretoria district, ward Elands River	P. L. Steyn	Charles Jackson
27	18-05-1906	Tweefontein 232	1/3 share of farm	Pretoria district, ward Elands River	J. G. Duvenage	Foscus Leonard Posthumus Meyjes
28	01-09-1906	Tweefontein 232	1/3 share of farm	Pretoria district, ward Elands River	Estate late A. C. J. Duvenage	David Daniel Malan
29	01-09-1906	Tweefontein 232	RE of 1/3 share of farm	Pretoria district, ward Elands River	Estate late A. C. J. Duvenage	Cornelis Johannes Gerhardus Erasmus
30	24-10-1910	Tweefontein 232	RE of 1/3 share of farm	Pretoria district, ward Elands River	J. G. Duvenage	Cornelis Johannes Gerhardus Erasmus
31	09-05-1921	Tweefontein 232	1/9 share of farm	Pretoria district, ward Elands River	W. P. Hamman	Petrus Willem Botha
32	09-05-1921	Tweefontein 232	1/9 share of farm	Pretoria district, ward Elands River	P. A. Steenkamp	Jeremiah Menanto Grimbeek Born Auret, married in community of property
33	28-02-1908	Tweefontein 232	1/9 share in farm	Pretoria district, ward Elands River	Insolvent Estate of C. Jackson	Netherlands Bank of South Africa
34	10-03-1908	Tweefontein 232	2/9 share in farm	Pretoria district, ward Elands River	Insolvent Estate of J. Jackson	Edward Philip Solomon
35	10-03-1908	Tweefontein 232	1/9 share in farm	Pretoria district, ward Elands River	Insolvent Estate of J. Jackson	Netherlands Bank of South Africa
36	01-02-1910	Tweefontein 232	RE of 1/3 share of farm	Pretoria district, ward Elands River	C.S. Erasmus, born Erasmus & Estate late C. J. G. Erasmus	Catherina Eizabetha Erasmus, born Erasmus, widow

37	01-02-1910	Twefontein 232	RE of 1/3 share of farm	Pretoria district, ward Elands River	C.S. Erasmus, born Erasmus & Estate late C. J. G. Erasmus	Catherina Eizabetha Erasmus, born Erasmus, widow
38	07-11-1910	Twefontein 232	1/3 share of farm	Pretoria district, ward Elands River	D. D. Malan	Catherina Eizabetha Erasmus, born Erasmus, widow

In 1910 the property was subdivided by Deed of Partition as follows:

39	29-12-1910	Twefontein 232	Portion B	Pretoria district, ward Elands River	Joint Owners	Johannes Jacobus Prinsloo
40	29-12-1910	Twefontein 232	½ share in Portion C	Pretoria district, ward Elands River	Joint Owners	Edward Philip Solomon
41	29-12-1910	Twefontein 232	½ share in Portion C	Pretoria district, ward Elands River	Joint Owners	Netherlands Bank of South Africa
42	29-12-1910	Twefontein 232	Portion D	Pretoria district, ward Elands River	Joint Owners	Jochemus Johannes Hamman
43	29-12-1910	Twefontein 232	Portion E	Pretoria district, ward Elands River	Joint Owners	Johannes Hamman
44	29-12-1910	Twefontein 232	Portion F	Pretoria district, ward Elands River	Joint Owners	Petrus Willem Botha
45	29-12-1910	Twefontein 232	RE	Pretoria district, ward Elands River	Joint Owners	Jeremiah Menanto Grimbeek born Auret, married in community of property
46	06-03-1911	Twefontein 232	1/3 share of farm	Pretoria district, ward Elands River	F. L. Meyjes	Johannes Lodewicus Snyman
47	18-04-1911	Twefontein 232	Portion D	Pretoria district, ward Elands River	J. J. Hamman	Petrus Willem Botha
48	18-04-1911	Twefontein 232	Portion E	Pretoria district, ward Elands River	J. Hamman	“
49	10-06-1911	Twefontein 232	Portion B	Pretoria district, ward Elands River	J. J. Prinsloo	Jeremiah Menanto Grimbeek, born Auret, MICP
50	13-06-1911	Twefontein 232	¼ share of farm	Pretoria district, ward Elands River	W. F. Botha	Andries Hendrik Potgieter
51	09-10-1912	Twefontein 232	RE of farm	Pretoria district, ward Elands River	Transvaal Land & Agric. Bank (J. M. Grimbeek)	Ring & Robinson

52	09-10-1912	Twefontein 232	Portion B	Pretoria district, ward Elands River	Transvaal Land & Agric. Bank (J. M. Grimbeek)	Ring & Robinson
53	25-11-1912	Twefontein 232	1/3 share of farm	Pretoria district, ward Elands River	J. L. Snyman	John Smith
54	05-09-1913	Twefontein 232	RE of farm	Pretoria district, ward Elands River	Ring & Robinson	Percy Jarvis
55	05-09-1913	Twefontein 232	Portion B	Pretoria district, ward Elands River	Ring & Robinson	Percy Jarvis
56	20-01-1915	Twefontein 232	1/3 share of farm	Pretoria district, ward Elands River	J. Smith	Platt & Ireland
57	26-04-1918	Twefontein 232	Portion C	Pretoria district, ward Elands River	Estate late E. P. Solomon & Netherlands Bank of South Africa	Nicolaas Gabriel van Schalkwijk
58	16-11-1918	Twefontein 232	1/6 share of farm	Pretoria district, ward Elands River	F. C. Eloff	Andries Hendrik Potgieter
59	12-01-1920	Twefontein 232	¼ share of farm	Pretoria district, ward Elands River	A.H. Potgieter	Hermanus Cornelis Martinus Fourie

By Deed of Partition, the farm was partitioned by the Joint Owners as follows:

60	09-05-1921	Twefontein 232	Portion A	Pretoria district, ward Elands River	Joint Owners	Hermanus Cornelis Martinus Fourie
61	09-05-1921	Twefontein 232	Portion B	Pretoria district, ward Elands River	Joint Owners	Theunis Christoffel Botha
62	09-05-1921	Twefontein 232	RE	Pretoria district, ward Elands River	Joint Owners	Petrus Willem Botha
63	09-12-1921	Twefontein 232	Portion A	Pretoria district, ward Elands River	A.H. Potgieter	Hermanus Cornelis Martinus Fourie
64	04-02-1922	Twefontein 232	1/3 share of farm	Pretoria district, ward Elands River	Platt & Ireland	Willie Heron
65	25-09-1922	Twefontein 232	RE	Pretoria district, ward Elands River	P. Jarvis	Government of the Union of South Africa
66	25-09-1922	Twefontein 232	Portion B	Pretoria district, ward Elands River	P. Jarvis	Government of the Union of South Africa
67	19-08-1925	Twefontein 232	RE	Pretoria district, ward Elands River	A.S. Erasmus, born Erasmus, widow	1. Hendrik Petrus Prinsloo 2. Jacobus Lourens Rasmus Erasmus

						3. Johannes Jacobus Erasmus 4. Theodorus Cornelis Johannes Erasmus
68	19-08- 1925	Tweefontein 232	RE	Pretoria district, ward Elands River	A.S. Erasmus, born Erasmus, widow	1. Hendrik Petrus Prinsloo 2. Jacobus Lourens Rasmus Erasmus 3. Johannes Jacobus Erasmus 4. Theodorus Cornelis Johannes Erasmus
69	02-10- 1926	Tweefontein 232	¼ share in RE of farm	Pretoria district, ward Elands River	Estate late J. J. Erasmus	1. Maria Isabella Erasmus, born Erasmus, widow (3/5 share) 2. Daniel Jacobus Elardus Erasmus (1/10 share) 3. Antonie Philippus Erasmus (1/10 share) 4. Cornelis Johannes Gerhardus Erasmus, minor (1/10 share) 5. Johanna Petronella Fransina Erasmus, minor spinster (1/10 share)
70	"	Tweefontein 232	¼ share in RE of farm	Pretoria district, ward Elands River	Estate late J. J. Erasmus	1. Maria Isabella Erasmus, born Erasmus, widow (3/5 share) 2. Daniel Jacobus Elardus Erasmus (1/10 share) 3. Antonie Philippus Erasmus (1/10 share) 4. Cornelis Johannes Gerhardus Erasmus, minor (1/10 share) 5. Johanna Petronella Fransina Erasmus, minor spinster (1/10 share)
71	23-11- 1926	Tweefontein 232	1/40 share in RE of farm	Pretoria district, ward Elands River	Certificate of Registered Title	Daniel Jacobus Elardus Erasmus
72	23-11-	Tweefontein 232	1/40	Pretoria	Certificate	Antonie Philippus

	1926		share in RE of farm	district, ward Elands River	of Registered Title	Erasmus
73	23-11-1926	Tweefontein 232	1/40 share in RE of farm	Pretoria district, ward Elands River	Certificate of Registered Title	Antonie Philippus Erasmus
74	23-11-1926	Tweefontein 232	1/40 share in RE of farm	Pretoria district, ward Elands River	Certificate of Registered Title	Antonie Philippus Erasmus
75	08-11-1927	Tweefontein 232	RE	Pretoria district, ward Elands River	P. W. Botha	Government of the Union of South Africa
76		Tweefontein 232	Portion F	Pretoria district, ward Elands River	P. W. Botha	Government of the Union of South Africa
77	23-04-1928	Tweefontein 232	Portion B	Pretoria district, ward Elands River	A.H. Potgieter	John Herbert Fordred
78	23-04-1928	Tweefontein 232	RE	Pretoria district, ward Elands River	A.H. Potgieter	Harold Churchill
79	12-02-1929	Tweefontein 232	1/40 share in RE of farm	Pretoria district, ward Elands River	Insolvent Estate A. P. Erasmus	Jacob Bernstein
80	12-02-1929	Tweefontein 232	1/40 share in RE of farm	Pretoria district, ward Elands River	Insolvent Estate A. P. Erasmus	Jacob Bernstein
81	14-10-1929	Tweefontein 232	1/40 share in RE of farm	Pretoria district, ward Elands River	Certificate of Registered Title	Theodorus Cornelis Johannes Erasmus
82	14-10-1929	Tweefontein 232	1/40 share in RE of farm	Pretoria district, ward Elands River	Certificate of Registered Title	Theodorus Cornelis Johannes Erasmus
83	05-08-1930	Tweefontein 232	1/3 share of farm	Pretoria district, ward Elands River	Estate late C. E. Erasmus born Erasmus, widow	1. Jacobus Lourens Rasmus Erasmus 2. Hendrik Petrus Prinsloo 3. Maria Isabella Erasmus, born Erasmus, widow 4. Theodorus Cornelis Johannes Erasmus
84	05-08-1930	Tweefontein 232	½ share of RE of farm	Pretoria district, ward Elands River	T. C. J. & J. L. R. Erasmus	Nicolaas Gabriel van Schalkwijk
85	05-08-1930	Tweefontein 232	½ share of RE of farm	Pretoria district, ward Elands River	T. C. J. & J. L. R. Erasmus	Nicolaas Gabriel van Schalkwijk
86	05-08-1930	Tweefontein 232	½ share of RE of farm	Pretoria district, ward Elands River	T. C. J. & J. L. R. Erasmus	Nicolaas Gabriel van Schalkwijk

87	22-05-1931	Tweefontein 232	3/20 share of RE of farm	Pretoria district, ward Elands River	M. J. Erasmus, born Erasmus, widow	Jochemus Johannes Prinsloo
88	22-05-1931	Tweefontein 232	3/20 share of RE of farm	Pretoria district, ward Elands River	M. J. Erasmus, born Erasmus, widow	Jochemus Johannes Prinsloo
89	22-05-1931	Tweefontein 232	¼ share of 1/3 share of farm	Pretoria district, ward Elands River	M. J. Erasmus, born Erasmus, widow	Jochemus Johannes Prinsloo
90	27-06-1932	Tweefontein 232	1/10 share in RE of farm	Pretoria district, ward Elands River	D.J. E., C. J. G. & J. P. F. Erasmus & J. Bernstein	Jochemus Johannes Prinsloo
91	27-06-1932	Tweefontein 232	1/10 share in RE of farm	Pretoria district, ward Elands River	D.J. E., C. J. G. & J. P. F. Erasmus & J. Bernstein	Jochemus Johannes Prinsloo

By Deed of Partition, the Remaining Extent of the farm was subdivided as follows:

92	27-06-1932	Tweefontein 232	Portion 2	Pretoria district, ward Elands River	Joint Owners	Nicolaas Gabriel van Schalkwijk
93	27-06-1932	Tweefontein 232	Portion C	Pretoria district, ward Elands River	Joint Owners	Nicolaas Gabriel van Schalkwijk
94	27-06-1932	Tweefontein 232	RE	Pretoria district, ward Elands River	Joint Owners	Hendrik Petrus Prinsloo & his son Jochemus Johannes Prinsloo
95	27-06-1932	Tweefontein 232	RE	Pretoria district, ward Elands River	Joint Owners	Hendrik Petrus Prinsloo & his son Jochemus Johannes Prinsloo
96	27-06-1932	Tweefontein 232	Portion	Pretoria district, ward Elands River	Joint Owners	Hendrik Petrus Prinsloo & his son Jochemus Johannes Prinsloo
97	13-01-1933	Tweefontein 232	Portion B	Pretoria district, ward Elands River	Estate late J. C. Botha	Susara Maria Margretha Botha , born Van Jaarsveld, Widow
98	03-11-1934	Tweefontein 232	Portion B	Pretoria district, ward Elands River	J. H. Fordred	Petrus Jacobus Nell
99	24-11-1934	Tweefontein 232	Portion D	Pretoria district, ward Elands River	Estate late P. S. Botha	Aletta Jacoba Botha , born Pretorius, widow

100	24-11-1934	Twefontein 232	Portion E	Pretoria district, ward Elands River	Estate late P. S. Botha	Aletta Jacoba Botha , born Pretorius, widow
101	20-08-1937	Twefontein 232	Portion of 1/3 share of farm	Pretoria district, ward Elands River	W. Heron	Johannes Petrus van der Walt
102	20-08-1937	Twefontein 232	Portion 2	Pretoria district, ward Elands River	N. G. Van Schalkwijk	Government of the Union of South Africa
103	20-08-1937	Twefontein 232	Portion C	Pretoria district, ward Elands River	N. G. Van Schalkwijk	Government of the Union of South Africa
104	09-07-1940	Twefontein 232	Portion A	Pretoria district, ward Elands River	Estate late H. C. Fourie & his wife	Joanna Everharda Fourie, born De la Riviere, widow
105	09-07-1940	Twefontein 232	Portion H	Pretoria district, ward Elands River	Estate late H. C. Fourie & his wife	Joanna Everharda Fourie, born De la Riviere, widow
106	10-10-1940	Twefontein 232	Portion	Pretoria district, ward Elands River	J. P. Van der Walt	Gert Dreves Pretorius
107	29-10-1941	Twefontein 232	Portion C	Pretoria district, ward Elands River	N. G. Van Schalkwijk	Daniel Jacobus Coetzee
108	30-03-1943	Twefontein 232	½ share of Portion D	Pretoria district, ward Elands River	Estate A. J. Botha, born Pretorius	Theunis Christoffel Botha
109	30-03-1943	Twefontein 232	½ share of Portion E	Pretoria district, ward Elands River	Estate A. J. Botha, born Pretorius	Theunis Christoffel Botha
110	30-03-1943	Twefontein 232	½ share of Portion D	Pretoria district, ward Elands River	Estate A. J. Botha, born Pretorius	M. Christoffel Botha
111	30-03-1943	Twefontein 232	½ share of Portion E	Pretoria district, ward Elands River	Estate A. J. Botha, born Pretorius	M. Christoffel Botha
112	30-03-1943	Twefontein 232	½ share of Portion D	Pretoria district, ward Elands River	M. C. Botha	Theunis Christoffel Botha
113	30-03-1943	Twefontein 232	½ share of Portion E	Pretoria district, ward Elands River	M. C. Botha	Theunis Christoffel Botha
114	03-04-1943	Twefontein 232	Portion A	Pretoria district, ward Elands River	J. E. Fourie, widow	Christoffel Pieter Lycee
115	03-04-1943	Twefontein 232	Portion A	Pretoria district, ward Elands River	J. E. Fourie, widow	Christoffel Pieter Lycee
116	09-06-1943	Twefontein 232	Portion B	Pretoria district, ward Elands River	P. J. Nel	1. Gerhardus Andries Petrus Britz 2. Maria Salomina Botha, spinster 3. Johanna

						Willamina Britz, spinster 4. Hermanus Stephanus Britz Theunis Botha Elizabeth Petronella Britz, minor, spinster
117	16-09-1946	Tweefontein 232	Portion B	Pretoria district, ward Elands River	J. A. P. Britz & 4 others	Marthinus Wilhelmus Pretorius
118	15-11-1946	Tweefontein 232	Portion	Pretoria district, ward Elands River	J. D. Pretorius	Government of the Union of South Africa
119	05-12-1946	Tweefontein 232	½ share of RE	Pretoria district, ward Elands River	Estate H. P. Prinsloo & another	Jochemus Johannes Prinsloo
120	05-12-1946	Tweefontein 232	½ share of RE	Pretoria district, ward Elands River	Estate H. P. Prinsloo & another	Jochemus Johannes Prinsloo
121	05-12-1946	Tweefontein 232	½ share of RE	Pretoria district, ward Elands River	Estate H. P. Prinsloo & another	Jochemus Johannes Prinsloo
122	12-02-1947	Tweefontein 232	Portion B	Pretoria district, ward Elands River	M. W. Pretorius	David Petrus Johannes Botes
123	19-03-1947	Tweefontein 232	Portion C	Pretoria district, ward Elands River	D.J. Coetzee	Martha Johanna Hamman (?)
124	09-09-1947	Tweefontein 232	RE	Pretoria district, ward Elands River	Estate J. J. Churchill & another	Adriaan Antonie Jacobus Botes
125	04-02-1949	Tweefontein 232	Portion B	Pretoria district, ward Elands River	D. P. J. Botes	Theunis Frederick Jacobus Steyn

(NASA RAK: 2989) (NASA RAK: 3002)

- *Note that the ownership record ends in 1949. The subsequent land register could not be located within the National Archives of South Africa.*

6. CONCLUSION

This report endeavoured to give an account of the history of certain portions of the properties Wachtenbietjeskop 506 JR, Resurgam 515 JR and Tweefontein 491 JR. The history of human settlement in the farm area was discussed. Finally, all available information on the concerned farm was taken into account to write up a short history of the developments that had taken place. Herewith a short summary of the findings on each property:

Wachtenbietjeskop 506 JR

This property was of greatest interest for the purpose of this study, and the research was focused on specifically finding information on the following portions: 1, 69, 75, 76, 87, 113, 122, 123, 124, 125, 139, 140, 141, 142, 143, 144, 145 & 150. (**See Map 4 & 6-9.** The area of interest is located within the red border.)

Ever since its registration in 1865, Wachtenbietjeskop was known as Wachtenbeetjekop 410. By the 1950s, this property was known as Wachtenbietjeskop 246, and by 1970 the name Wachtenbietjeskop 506 JR was in use. Interestingly, there is evidence that Samuel (Sammy) Marks owned portions of Wachteenbeetjeskop between 1886 and 1904. In November 1904 a 2/3 share of the farm belonged to Lewis & Marks, who sold it to the African and European Investment Co. Ltd. soon thereafter.

By 1902 secondary roads crisscrossed this farm, and about four homesteads were visible. A railway line also crossed the southern part of the property. On a 1941 map it was indicated that three kraals were visible near the left corner of the area under investigation. Another kraal is visible to the north thereof, close to a secondary road. A water furrow connected a number of small dams near the western border of this property. Two secondary roads in the north-eastern part of the area were the only other signs of development.

By 1970 an underground pipeline was present in the north-eastern corner of the property. Four buildings, two ruins and a windmill were located in the southern part of the property, and two more buildings were visible to the north, near the western border. In 1984 the area under investigation was mainly used as farmland. More

buildings and a dam were visible near the western border (about four). 1995 and 2003 maps of the property shows little change.

Digby Wells Environmental recently identified a number of historical terrains on the property under investigation, and these were discussed. (**Refer to Map 10**) It was not possible to ascertain the exact age of any of the remains on these sites through documentary research. Regarding the historical structure (**Ste/001**), there were no signs of a European-style building or ruin in this area by 1941. Three kraals were however located near this site. Likewise, the 1970 topographical map also does not show signs of such a development. 1959 archival documents on Portion 75 of the property however provide some intriguing details regarding this land, which was located near three earth dams and a number of irrigation furrows. It is noted that one Dr. Anthonie Botha owned the property at the time, and had in turn bought the land from Dennilton Land Company (Pty.) Ltd. One of the developments listed was a stone building. This could be the structure at Ste/001. Three fountains were present on the property by 1959. (See Image 9)

In 1954 it was reported that land in this area could not be intensively cultivated, due to the poor nature of the soil. It however seems that not many people had applied for business rights in the area, and that properties were generally used for residential and agricultural purposes.

By the early 1960s some landowners in the area started showing an interest in industrial development in the countryside, but it seems that this did not really affect the portions under investigation. Portion 76, owned by Dennilton Land Company Co. Ltd. in 1962, was almost completely undeveloped.

In the mid 1960s a number of landowners became aware of an underground pipeline that traversed their properties that had been constructed during the 1940s. After a court trial involving the government and various land owners a Servitude of Aqueduct was registered for the pipeline. Among these properties was Portion 69 of Wachtenbietjeskop.

In 1971 the National Route 4/7 Bronkhorstspruit, which would traverse Portions 30, 31, 93 and 98 of the farm Wachtenbietjeskop 506 JR, was approved.

In 1984 a pet grooming business and kennels were opened on Portion 144 of Wachtenbietjeskop. At the time other developments on the property included a residence, store room and labourers' houses.

Resurgam 515 JR

The farm Resurgam did not exist since the 19th century, but rather formed part of the farm Roodepoort. When this farm was registered in 1861, it was known as Roodepoort 474. The earliest signs that a new farm had been cut off from Roodepoort appeared on a 1917 map of the Bronkhorstspruit ward. This property, located where Resurgam would later be registered, was known as Bronkhorstspruit 627. By 1955 the farm Resurgam 249 started appearing on maps of the area.

Almost no archival evidence could be found regarding this property. Cartographic material revealed that little had changed on this land since the early 1900s. By 1941 the land seemed to be cultivated as farmland, but no other developments are visible. This remained the case by 1970, but by 1984 three buildings are visible near the eastern border of Resurgam. In 1995 this development was labelled as "Sewage Disposal Works", and the rest of the property was cultivated as farmland. This was still the state of affairs in 2003, but diggings were also visible near the southern border of the property.

Tweefontein 491 J

Ever since its registration in 1866, Tweefontein was known as Tweefontein 232. In 1928 the name Tweefontein 164 was first used, and by 1965 the name Tweefontein 491 JR was in use. The property had been subdivided many times since it was first proclaimed. No specific mention is made of Portion 12 in the archival record, and it was therefore only possible to give general information regarding this property.

The first owners of Tweefontein were Michiel Wilhelm Hamman and Johan George Hamman, who acquired the property in 1866. By 1905 J. G. Hamman was still one of the prominent landowners, and owned five-ninths part of the freehold farm Tweefontein. On a 1902 map of the property one can see that two main roads as well

as a number of secondary roads. A total of about seven homesteads, as well as some smaller roads were visible.

By the 1920s various furrows connected a number of fountains on the property to the farmlands. This property was mainly used for agricultural purposes. Some of the portions were leased to farmers by the government between the 1920s and 1940s, possibly to alleviate the burden of farmers struggling due to the International Depression.

A 1941 map of Tweefontein indicates the presence of a ruin and a kraal, some distance to the north of Wachtenbietjeskop.

Tweefontein was still mainly used for agricultural purposes in the 1950s and 1960s, and water was guided to farms from a number of fountains by means of furrows. For instance, by 1962 the RE of the farm was used by one A. A. J. Botes for mixed farming. He made his income selling cream and cash crops. Some of the most prominent landowners on Tweefontein, up until 1950, were the Hamman, Prinsloo, Erasmus, Steenberg and Botha families.

By 1971 some scattered buildings and a number of secondary roads were present on Tweefontein, some distance north of Wachtenbietjeskop. A 1984 map shows that the property was still mainly cultivated as farmland, and only two or three buildings were visible near the area of investigation. This was still the case by 2003.

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Heritage Impact Assessment

Environmental Impact Assessment for the Proposed Open Pit Coal Mine and Associated Infrastructure, near Bronkhorstspuit, Gauteng

FOU2191



DIGBY WELLS
ENVIRONMENTAL

Appendix C: Palaeontological Letter of Exemption

UNIVERSITY OF THE
WITWATERSRAND,
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08 April 2015

Mr Justin du Piesanie
Digby Wells Environmental
Private Bag X10046,
Randburg, 2125,
South Africa

Dear Justin

**RE: Palaeontological Impact Assessment for proposed Oakleaf opencast coalmine
near Bronkhorstspuit (SAHRIS Case id: 6669)**

Summary

A review of the SAHRIS palaeo-sensitivity map (PSM) indicated that the palaeo-sensitivity of the geological formation within which the project area is situated is of moderate sensitivity. The proposed project area is situated within the Wilge River Formation of the Waterberg Group which is part of the Waterberg Group. Although the Waterberg Group occurs in two basins, namely the main or Waterberg Basin with an adjacent smaller Nylstroom Basin and a separate basin to the southeast called the Middleberg Basin (location of site) the Wilge River Formation occurs only in the latter basin and is the only formation there. Much research has been done on the massive sandstones, aeolian deposits and braided river systems of the Waterberg Group as well as the oldest microbial mats preserved in the Makgabeng Group, but there is no published evidence that microbial mats occur in the Wilge River Formation.

Recommendation

This has caused some confusion so there is no need for a palaeontological impact assessment for microbial mats in the proposed mining area.

Geology and Palaeontology of the Waterberg Group

According to Barker et al., (2006) the Waterberg Group occurs in two basins in the northern part of South Africa: the main basin or Waterberg Basin together with a smaller adjacent basin called the Nylstroom Basin, and a second basin called the Middleberg Basin to the south east of the main basin.

In the Waterberg basin the following formations occur, from older to younger: Glentig Formation and Waterberg Group comprising three subgroups: Nylstroom Subgroup

(Swaershoek Fm, Alma Fm), Matlabas Subgroup (Skilpadkop Fm, Setlaole Fm, Aasvoëlskop, Makgabeng Fm) and Kransberg Subgroup (Sandriviersberg Fm, Mogalakwena Fm, Cleremont Fm, Vaalwater Fm). In the Middleberg Basin there is only one formation of the Waterberg Group, the Wilge River Formation. This formation overlies the Loskop Formation unconformably along the northern, eastern and southern margins, and rocks of the Pretoria Group on the southwestern margin (Barker et al., 2006). The Wilge River Formation is overlain unconformably by the Karroo Supergroup (with coal deposits).

The Wilge River Formation is regarded as being equivalent to the Swaershoek Formation in the Waterberg Basin (SACS, 1980; Jansen, 1981; Barker et al., 2006). The Waterberg Group has been dated at 2.06-1.88 Ga (Erikssen et al., 2006, 2008; Simpson et al., 2004, 2013) and has predominantly pre-vegetated braided river deposits, massive sandstones and some aeolianites. Simpson and colleagues (2013) described microbial mats from the Makgabeng Formation (younger than the Wilge River Formation) in the wet interdune deposits and playa lakes. The Makgabeng Formation does not occur in the Middleberg Basin and although it is possible that microbial mats may occur in the Wilge River Formation they have not yet been published (cf. Barker et al., 2006; Maré et al., 2006; Simpson et al., 2013). Swanepoel (2006) is an unpublished Masters dissertation and not easily available.

Therefore it is not necessary to do a Palaeontological Impact Assessment for the proposed Oakleaf opencast mining project. If microbial mats do occur in the underlying Wilge River Formation and are disturbed by the coal mining operation in the overlying Ecca deposits, then a palaeontologist should be called to collect a representative sample for curation in a recognised institute such as the Council for Geosciences or the Evolutionary Studies Institute.

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Yours sincerely

A handwritten signature in blue ink, reading "MK Bamford", with a horizontal line underneath.

Prof Marion K Bamford
Palaeobotanist
Evolutionary Studies Institute

Heritage Impact Assessment

Environmental Impact Assessment for the Proposed Open Pit Coal Mine and Associated Infrastructure, near Bronkhorstspuit, Gauteng

FOU2191



DIGBY WELLS
ENVIRONMENTAL

Appendix D: Heritage Scoping Report



DIGBY WELLS
ENVIRONMENTAL



Proposed Oakleaf Opencast Coal Mine, Gauteng

Notification of Intent to Develop

Project Number:

FOU2191

Prepared for:

Oakleaf Investment Holdings Holdings 95 (Pty) Ltd

October 2014


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Directors: AR Wilke, DJ Otto, GB Beringer, LF Koeslag, AJ Reynolds (Chairman) (British)*, J Leaver*, GE
Trusler (C.E.O)
*Non-Executive



This document has been prepared by Digby Wells Environmental.

Report Type:	Notification of Intent to Develop
Project Name:	Proposed Oakleaf Opencast Coal Mine, Gauteng
Project Code:	FOU2191

Name	Responsibility	Signature	Date
Justin du Piesanie Heritage Management Consultant ASAPA No. 270	Data collection Historical Layering Report Writing Specialist Recommendations		31 October 2014
Johan Nel HRM Unit Manager ASAPA No. 095	Review		13 October 2014

This report is provided solely for the purposes set out in it and may not, in whole or in part, be used for any other purpose without Digby Wells Environmental prior written consent.



DECLARATION OF INDEPENDENCE

Digby Wells and Associates (Pty) Ltd

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E-mail: justin.dupiesanie@digbywells.com

I, Justin du Piesanie as duly authorised representative of Digby Wells and Associates (Pty) Ltd., hereby confirm my independence (as well as that of Digby Wells and Associates (Pty) Ltd.) and declare that neither I nor Digby Wells and Associates (Pty) Ltd. have any interest, be it business, financial, personal or other, in any proposed activity, application or appeal in respect of Oakleaf Investment Holdings' 95 (Pty) Ltd, other than fair remuneration for work performed, specifically in connection with the Notification of Intent to Develop (NID) for the proposed Greenfield Coal Mining Project in the City of Tshwane Metropolitan Municipality, Gauteng Province.



Full name: Justin du Piesanie
Title/ Position: Heritage Management Consultant: Archaeologist
Qualification(s): MSc in Archaeology
Experience (years): 5 years' experience
Registration: Association of Southern African Professional Archaeologists (ASAPA)
International Council on Monuments and Sites (ICOMOS) South Africa

Notification of Intent to Develop

Introduction

Oakleaf Investment Holdings (hereafter Oakleaf) intend to develop an opencast coal mine with associated infrastructure on a site located approximately 5.5 km north east of the Bronkhorstspuit town in the Gauteng Province.

An Environmental Impact Assessment (EIA), Environmental Management Programme (EMP), and Integrated Water Use Licence Application (IWULA) are required to obtain environmental authorisation for the proposed project. This will be completed in accordance with the, National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA), Minerals and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA), National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) (NEMWA) and the National Water Act, 1998 (Act No. 36 of 1998) (NWA).

Oakleaf requested Digby Wells Environmental (hereafter Digby Wells) to conduct the EIA, EMP and IWULA in support of environmental authorisation for submission to the relevant Competent Authorities (CA).

Project Location

Province	Gauteng Province
Metropolitan Municipality	City of Tshwane
Nearest Town	Bronkhorstspuit
Property Name and Number	Wachtenbietjieskop 506 JS Portions 1, 69, 75, 76, 87, 113, 122, 1233, 124, 125, 139 – 145, 150 Resurgam 506 JR portion 1 and Re Tweefontein 491 JR Portion 12
1: 50 000 Map Sheet	2528DD Balmoral
GPS Co-ordinates (relative centre point of study area)	28.79507 -25.78755

Registered Owners

Farm	Pt	Contact	Tel No	Postal Address
WACHTENBIETJESKOP 506	1	Hennie Boshoff	(083)2836616	
	69	Anna Maria Louw van Zyl	(072)8478397	
	75	Gustav Potgieter	(082)3882915	P O BOX 588 BRONKHORSTSPRUIT

Farm	Pt	Contact	Tel No	Postal Address
				1020
	76	Andre du Toit	(083)4534487	
	87	Oakleaf Investment Holdings 95 (Pty) Ltd (leased by Chris Krause)	(011)0350800 (083)2341944 (Chris)	
	113	Municipality of Bronkhorstspuit	(013)9326200 (013)9320641	P.O. Box 40 BRONKHORSTSPRUIT 1020
	122	Ivan Raubenheimer	(076)7520100	
	123	Jan Britz		
	124	Nagypro 010 (Pty) Ltd		
	125	Joan Willson	(013)2146412/(013)2146412/ (071)2553882	P O BOX 2278 BRONKHORSTSPRUIT, 1020
	139	El Shadai (Pty) Ltd (Hennie Swanepoel)	(082)5609101	
	140	El Shadai (Pty) Ltd (Hennie Swanepoel)	(082)5609101	
	141	George Pieterse		
	142	La Vita Impex (Pty) Ltd		P O BOX 1419 PRETORIA 0001
	143	La Vita Impex (Pty) Ltd		P O BOX 1419 PRETORIA 0001
	144	Wilma Pieterse	(071)2631078	P O BOX 15011 LYNN EAST 0039
	145	Quintin Cooper	(082)7818323	P O BOX 2113 BRONKHORSTSPRUIT 1560
	150	Sandile Terrence Khumalo	(017)6101951 (083)7604862	P O BOX 10617 SECUNDA 2302
RESURGAM 515	RE	Hennie Cronje	(083)6303267	P O BOX 133 BRONKHORSTSPRUIT 1020
	1	Municipality of Bronkhorstspuit	(013)9326200 (013)9320641	P.O. Box 40 BRONKHORSTSPRUIT 1020

Project / Development Details

NHRA Section 38 Triggers

The following aspects of Section 38 of the NHRA may be triggered by the proposed project.

NHRA Section 38 (1) Activities / Triggers		Summary description (e.g. 500 m conveyor belt, open cast pit, etc.)	
<input checked="" type="checkbox"/>	a	Any linear development or barrier >300 m	The construction of pipelines, conveyors or haul roads.
<input type="checkbox"/>	b	Any bridge or similar structure >50 m	
<input type="checkbox"/>	c	Any development or activity that will change the character of a site:	
<input checked="" type="checkbox"/>	i	≥5 000m ² in extent	Opencast mine
<input type="checkbox"/>	ii	Involving ≥3 existing erven/ subdivisions	
<input type="checkbox"/>	iii	Involving ≥3 or more erven/ divisions consolidated within past 5 years.	
<input type="checkbox"/>	d	Rezoning of a site ≥10 000m ² in extent.	
<input checked="" type="checkbox"/>	e	Other triggers, e.g.: in terms of other legislation, (i.e.: National Environment Management Act, etc.)	MPRDA NEMA NEM:WA

Activities

The following activities will take place during the lifespan of the proposed project.

GNR	Activity	Description
	Activity 9	The construction of facilities or infrastructure exceeding 1000 meters in length for the bulk transportation of water, sewage or storm water - (i) with an internal diameter of 0,36 meters or more; or (ii) with a peak throughput of 120 liters per second or more, excluding where: a. such facilities or infrastructure are for bulk transportation of water, sewage or storm water or storm water drainage inside a road reserve; or b. where such construction will occur within urban areas but further than 32 meters from a watercourse, measured from the edge of the watercourse.
	Activity 11	The construction of (iii) bridges and (iv) dams where such construction occurs within 32 meters of a watercourse measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.
	Activity 18	The infilling or depositing of any material of more than 5 cubic metres into,

		or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic meters from: (i) a watercourse
	Activity 22	The construction of a road, outside urban areas: (i) with a reserve wider than 13,5 meters or, (ii) where no reserve exists where the road is wider than 8 meters.
	Activity 24	The transformation of land bigger than 1000 square meters in size, to residential, retail, commercial, industrial or institutional use, where, at the time of the coming into effect of this Schedule such land was zoned open space, conservation or had an equivalent zoning.
	Activity 26	Any process or activity identified in terms of section 53(1) of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004).
	Activity 47	The widening of a road by more than 6 meters, or the lengthening of a road by more than 1 kilometer - (i) where the existing reserve is wider than 13,5 meters; or (ii) where no reserve exists, where the existing road is wider than 8 meters – excluding widening or lengthening occurring inside urban areas.
	Activity 55A	The construction of facilities for the treatment of effluent, wastewater or sewage with a daily throughput capacity of more than 2000 cubic meters but less than 15 000 cubic meters .
545	Activity 3	The construction of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of more than 500 cubic metres.
	Activity 5	The construction of facilities or infrastructure for any process or activity which requires a permit or license in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent and which is not identified in Notice No. 544 of 2010 or included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case that Act will apply.
	Activity 6	The construction of facilities or infrastructure for the bulk transportation of dangerous goods - (i) in gas form, outside an industrial complex, using pipelines, exceeding 1000 metres in length, with a throughput capacity of more than 700 tons per day; (ii) in liquid form, outside an industrial complex, using pipelines, exceeding 1000 metres in length, with a throughput capacity more than 50 cubic metres per day; or (iii) in solid form, outside an industrial complex, using funiculars or conveyors with a throughput capacity of more than 50 tons day.
	Activity 11	The construction of railway lines, stations or shunting yards, excluding - (i) railway lines, shunting yards and railway stations in industrial

		complexes or (iii) additional railway lines within the reserve of an existing railway line.
	Activity 15	Physical alteration of undeveloped, vacant or derelict land for residential, retail, commercial, recreational, industrial or institutional use where the total area to be transformed is 20 hectares or more; except where such physical alteration takes place for: (i) linear development activities; or (ii) agriculture or afforestation where activity 16 in this Schedule will apply.

Additional Impact Assessment Process

The following impact assessment process/es are currently being undertaken for the proposed project.

Legislation, i.e. NEMA, MPRDA, etc.	MPRDA, NEMA, NEMWA, WULA
Consenting Authority that has/will receive information	DMR, GDARD, DEA, DWS
Present phase of process at Authority, e.g. Draft Scoping Report	Application Phase

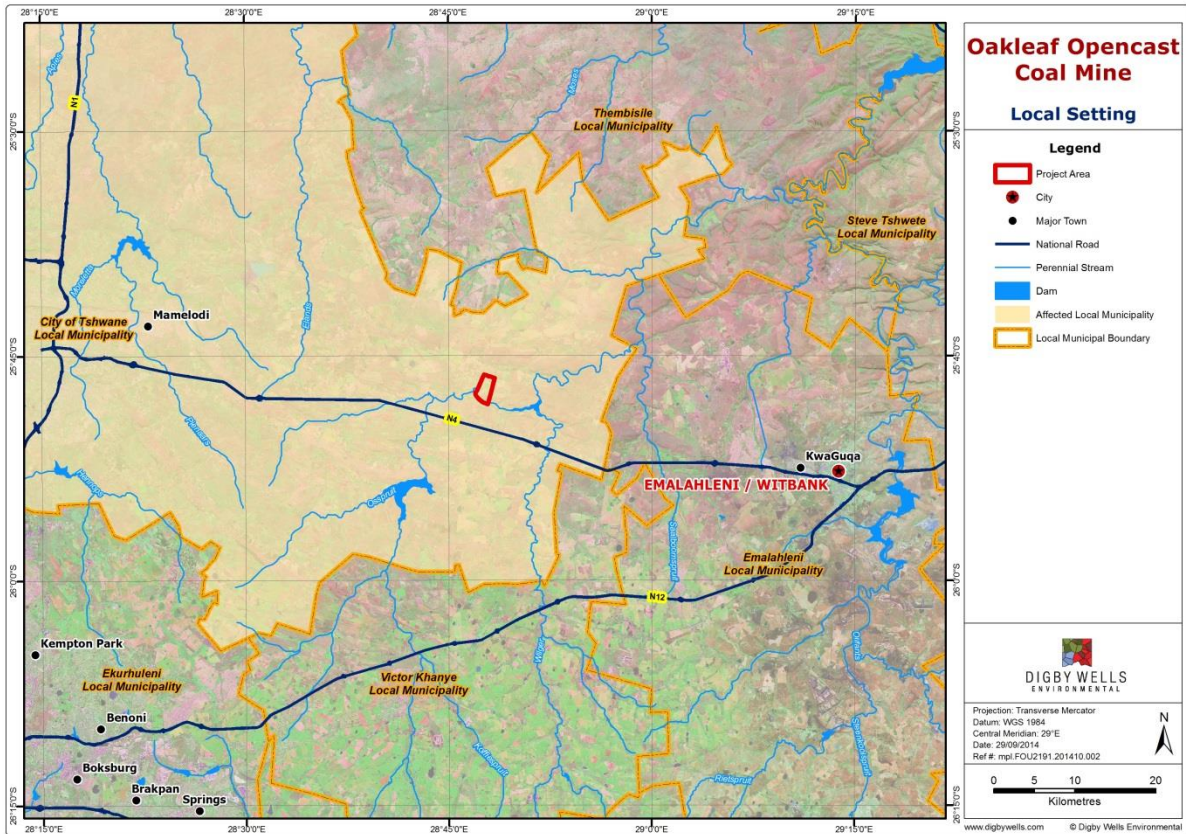
Identified / Known Heritage Resources and Potential Impacts

The following categories of heritage resources as defined in Section 3 of the NHRA are known to occur within the proposed project area.

<input checked="" type="checkbox"/>	3(2)(a)	Places, buildings, structures and equipment of cultural significance
		Description of resource: Ste/001 & Ste/003 – historical structures and the Premiermyn dam
		Potential impact: Potential damage and/or destruction to Ste/001 and Ste/003, however no direct impact to the Premiermyn dam.
<input type="checkbox"/>	3(2)(b)	Places to which oral traditions are attached or which are associated with living heritage
		Description of resource: <i>None</i>
		Potential impact: <i>None</i>
<input type="checkbox"/>	3(2)(c)	Historical settlements and townscapes
		Description of resource: <i>None</i>
		Potential impact: <i>None</i>

<input checked="" type="checkbox"/>	3(2)(d)	Landscapes and natural features of cultural significance
		Description of resource: Battle of Bronkhorstspuit Battlefield
		Potential impact: Alteration to sense-of-place
<input checked="" type="checkbox"/>	3(2)(e)	Geological resources of scientific or cultural importance
		Description of resource: Waterberg Group
		Potential impact: Damage and/or destruction of moderately sensitive resource
<input checked="" type="checkbox"/>	3(2)(f)	Archaeology and/or palaeontology (<i>Including archaeological sites and material, fossils, rock art, battlefields & wrecks</i>)
		Description of resource: Archaeological sites within the Ezemvelo Nature Reserve
		Potential impact: Cumulative impacts on rock art and alteration of sense-of-place
<input checked="" type="checkbox"/>	3(2)(g)	Graves and burial grounds (<i>eg: ancestral graves, graves of victims of conflict, historical graves & cemeteries</i>)
		Description of resource: BGG/004 – Informal cemetery
		Potential impact: Damage and/or destruction
<input type="checkbox"/>	3(2)(a)	Other human remains
		Description of resource: <i>None</i>
		Potential impact: <i>None</i>
<input type="checkbox"/>	3(2)(h)	Sites of significance relating to the history of slavery in South Africa
		Description of resource: <i>None</i>
		Potential impact: <i>None</i>
<input type="checkbox"/>	3(2)(i)	Movable objects
		Description of resource: <i>None</i>
		Potential impact: <i>None</i>

Illustrative Material



Recommendation

Is a Heritage Impact Assessment required?		<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
If NO, provide motivation:			
If YES, provide suggested components that may be required or undertaken during HIA.			
<input checked="" type="checkbox"/>	Archaeology	<input type="checkbox"/>	Architecture
<input checked="" type="checkbox"/>	Built Environment	<input checked="" type="checkbox"/>	Burial Grounds and Graves
<input checked="" type="checkbox"/>	Palaeontology	<input checked="" type="checkbox"/>	Public Participation
<input type="checkbox"/>	Townscapes	<input type="checkbox"/>	Visual Impact
<input type="checkbox"/>	Other:		
Based on the findings of this study and the identified heritage resources within the study area, the following recommendations are provided:			

- Complete a Heritage Impact Assessment for the Oakleaf Project taking into consideration the following requirements:
 - Dedicated consultation with Interested and Affected Parties including the Association of Southern African Professional Archaeologists (ASAPA); the Rock Art Research Institute (RARI); the Archaeological Society (ArcSoc); Heritage South Africa; Historical Association of South Africa; South African Military History Society; National Museum of Cultural History; the Simon van der Stel Foundation; and Ezemvelo Nature Reserve;
 - Assessment of the proposed project on the Battle of Bronkhorstspuit Battlefield taking into consideration the integrity of the site, and the direct, secondary and cumulative impacts, and the management of the site;
 - A review of the palaeontological assessment by a qualified palaeontologist to provide recommendations on the way forward;
 - A built environment assessment to consider the sources of risk of the project on Ste/001 and any additional structures identified; and

Consideration of the direct, secondary and cumulative impacts of the proposed project on BGG/004 and any additional burial grounds identified

Recommendation made by:

Name: Justin du Piesanie

Capacity: Heritage Management Consultant: Archaeologist

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1 Project Background

1.1 Introduction

Oakleaf Investment Holdings (hereafter Oakleaf) intend to develop an opencast coal mine with associated infrastructure on a site located approximately 5.5 km north east of the Bronkhorstspuit town in the Gauteng Province.

An Environmental Impact Assessment (EIA), Environmental Management Programme (EMP), and Integrated Water Use Licence Application (IWULA) are required to obtain environmental authorisation for the proposed project. This will be completed in accordance with the, National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA), Minerals and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA), National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) (NEMWA) and the National Water Act, 1998 (Act No. 36 of 1998) (NWA).

Oakleaf requested Digby Wells Environmental (hereafter Digby Wells) to conduct the EIA, EMP and IWULA in support of environmental authorisation for submission to the relevant Competent Authorities (CA).

1.2 Terms of Reference

To complete the EIA, EMP in support of the environmental authorisation, a specialist heritage study in accordance with the following legislation was required:

- National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA);
- National Water Act, 1998 (Act No. 36 of 1998) (NWA);
- National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA);
- Minerals and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA); and
- National Environmental Management: Waste Act, 2008 (Act No 59 of 2008) (NEM:WA).

1.3 Scope of Work

Section 38 of the NHRA, the relevant heritage resources authority (HRA) must provide Statutory Comment to the consenting authority, in this case the DEA, DMR and GDARD, where the evaluation of impacts on heritage resources is required in terms of the NEMA, NEMWA and MPRDA.

The Scope of Work (SoW) as agreed upon by Oakleaf and Digby Wells was for completion of an NID comprising of:

- Review of relevant literature and archival sources;
- Conducting historical layering of the proposed project area;

- Screening survey;
- Reporting; and
- Providing recommendations for further heritage assessments.

1.4 Project Details

The DMR issued a Prospecting Right (PR) (Ref: GP 30/5/1/1/2(292) to Muhanga Mines (Pty) Ltd (hereafter Muhanga) on 14 November 2007. Muhanga launched exploration activities in 2008: Oakleaf, however, filed for transfer of the PR under Section 11 of the MPRDA in 2013. Oakleaf's exploration activities continued up to September 2014.

Oakleaf now proposes the development of an opencast coal mine approximately 5.5 km northeast of Bronkhorstspuit. The project will comprise a north and south pit, exploited through bench mining. The Run of Mine (RoM) coal will be transported to the crushing plant either via a conveyor belt or haul road, and discharged into the product stockpile after screening. The RoM coal will then be processed through the washing plant, which will have a 250 tonnes per hour (tpa) capacity.

The coal washing plant will produce both coal discard and slurry. These will be disposed of at the discard dump and slurry dam respectively.

Table 1-1: Location of the Oakleaf Project

Province	Gauteng Province
Metropolitan Municipality	City of Tshwane
Nearest Town	Bronkhorstspuit
Property Name and Number	Wachtenbietjieskop 506 JS
1: 50 000 Map Sheet	2528DD Balmoral
GPS Co-ordinates	28.79507
(relative centre point of study area)	-25.78755

1.5 Project Activities

Activities associated with the project are summarised below.

Table 1-2: Listed activities for the proposed project

GNR	Activity	Description
	Activity 9	The construction of facilities or infrastructure exceeding 1000 meters in length for the bulk transportation of water, sewage or storm water - (i) with an internal diameter of 0,36 meters or more; or (ii) with a peak throughput of 120 liters per second or more, excluding where: a. such facilities or



		infrastructure are for bulk transportation of water, sewage or storm water or storm water drainage inside a road reserve; or b. where such construction will occur within urban areas but further than 32 meters from a watercourse, measured from the edge of the watercourse.
	Activity 11	The construction of (iii) bridges and (iv) dams where such construction occurs within 32 meters of a watercourse measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.
	Activity 18	The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic meters from: (i) a watercourse
	Activity 22	The construction of a road, outside urban areas: (i) with a reserve wider than 13,5 meters or, (ii) where no reserve exists where the road is wider than 8 meters.
	Activity 24	The transformation of land bigger than 1000 square meters in size, to residential, retail, commercial, industrial or institutional use, where, at the time of the coming into effect of this Schedule such land was zoned open space, conservation or had an equivalent zoning.
	Activity 26	Any process or activity identified in terms of section 53(1) of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004).
	Activity 47	The widening of a road by more than 6 meters, or the lengthening of a road by more than 1 kilometer - (i) where the existing reserve is wider than 13,5 meters; or (ii) where no reserve exists, where the existing road is wider than 8 meters – excluding widening or lengthening occurring inside urban areas.
	Activity 55A	The construction of facilities for the treatment of effluent, wastewater or sewage with a daily throughput capacity of more than 2000 cubic meters but less than 15 000 cubic meters .
545	Activity 3	The construction of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of more than 500 cubic metres.
	Activity 5	The construction of facilities or infrastructure for any process or activity which requires a permit or license in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent and which is not identified in Notice No. 544 of 2010 or included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case that Act will apply.

	Activity 6	The construction of facilities or infrastructure for the bulk transportation of dangerous goods - (i) in gas form, outside an industrial complex, using pipelines, exceeding 1000 metres in length, with a throughput capacity of more than 700 tons per day; (ii) in liquid form, outside an industrial complex, using pipelines, exceeding 1000 metres in length, with a throughput capacity more than 50 cubic metres per day; or (iii) in solid form, outside an industrial complex, using funiculars or conveyors with a throughput capacity of more than 50 tons day.
	Activity 11	The construction of railway lines, stations or shunting yards, excluding - (i) railway lines, shunting yards and railway stations in industrial complexes or (iii) additional railway lines within the reserve of an existing railway line.
	Activity 15	Physical alteration of undeveloped, vacant or derelict land for residential, retail, commercial, recreational, industrial or institutional use where the total area to be transformed is 20 hectares or more; except where such physical alteration takes place for: (i) linear development activities; or (ii) agriculture or afforestation where activity 16 in this Schedule will apply.

1.6 Relevant Contact Details

The relevant contact details for the proposed project are presented below:

Table 1-3: Digby Wells Project Manager Contact Details

Contact Person	Kasantha Moodley
Tel No	011 789 9495
Cell No	082 290 1440
Email Address	kasantha.moodley@digbywells.com
Postal Address	Private Bag X10046, Randburg, 2125

Table 1-4: Fountain Capital Project Manager Contact Details

Contact Person	Clifford Hallat
Tel No	011 035 0800

Cell No	084 468 8559
Email Address	clifford@fountaincapital.co.za
Postal Address	PO Box 653749, Benmore, 2010

Table 1-5: Landowner Contact Details

Farm	Pt	Contact	Tel No	Postal Address
WACHTENBIETJESKOP 506	1	Hennie Boshoff	(083)2836616	
	69	Anna Maria Louw van Zyl	(072)8478397	
	75	Gustav Potgieter	(082)3882915	P O BOX 588 BRONKHORSTSPRUIT 1020
	76	Andre du Toit	(083)4534487	
	87	Oakleaf Investment Holdings 95 (Pty) Ltd (leased by Chris Krause)	(011)0350800 (083)2341944 (Chris)	
	113	Municipality of Bronkhorstspuit	(013)9326200 (013)9320641	P.O. Box 40 BRONKHORSTSPRUIT 1020
	122	Ivan Raubenheimer	(076)7520100	
	123	Jan Britz		
	124	Nagypro 010 (Pty) Ltd		
	125	Joan Willson	(013)2146412/(013)2146412/ (071)2553882	P O BOX 2278 BRONKHORSTSPRUIT, 1020
	139	El Shadai (Pty) Ltd (Hennie Swanepoel)	(082)5609101	
	140	El Shadai (Pty) Ltd (Hennie Swanepoel)	(082)5609101	
	141	George Pieterse		
	142	La Vita Impex (Pty) Ltd		P O BOX 1419 PRETORIA 0001
143	La Vita Impex (Pty) Ltd		P O BOX 1419 PRETORIA 0001	

Farm	Pt	Contact	Tel No	Postal Address
	144	Wilma Pieterse	(071)2631078	P O BOX 15011 LYNN EAST 0039
	145	Quintin Cooper	(082)7818323	P O BOX 2113 BRONKHORSTSPRUIT 1560
	150	Sandile Terrence Khumalo	(017)6101951 (083)7604862	P O BOX 10617 SECUNDA 2302
RESURGAM 515	RE	Hennie Cronje	(083)6303267	P O BOX 133 BRONKHORSTSPRUIT 1020
	1	Municipality of Bronkhorstspuit	(013)9326200 (013)9320641	P.O. Box 40 BRONKHORSTSPRUIT 1020

1.7 Expertise of the Specialist

Justin du Piesanie 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 Digby Wells. He has over 5 years combined experience in Heritage Resources Management (HRM) in South Africa, gaining further generalist experience since his appointment at Digby Wells in Burkina Faso, the Democratic Republic of Congo, Liberia and Mali.

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

The curricula vita of the specialist is attached as Appendix A.

1.8 Restrictions and Limitations

The following restrictions and limitations were experienced as part of this study:

- Access to Wachteenbietjeskop 506 JR Portion 69 was not permitted by the landowner, Anna Maria Louw van Zyl;
- Evidence of archaeology, palaeontology and at times burial grounds are often located below the surface and may not be identified during field surveys. This fact notwithstanding, attention is drawn to the general protection provided to such resources in terms of sections 35 and 36 of the NHRA, discussed below;
- Identification of resources and the relative age through the review of aerial imagery is dependent on the quality of the image; and

- This report does not constitute an impact assessment.

2 Policy and Legal Framework

2.1 Introduction

The NHRA is the overarching legislation that protects and regulates the management of heritage resources in South Africa. This report was completed in accordance with Section 38(8).

2.2 NHRA

The Heritage Resources Management (HRM) approach developed and implemented by Digby Wells is founded on Section 38(1) and 38(2) of the NHRA. These sections of the NHRA require that HRAs, in this case the South African Heritage Resources Agency (SAHRA) and Gauteng Provincial Heritage Resources Authority (PHRA-G), be notified as early as possible of any developments that may exceed certain minimum thresholds. The heritage specialist is required to provide the SAHRA and PHRA-G with sufficient information regarding the proposed development in order to determine whether a comprehensive Heritage Impact Assessment (HIA) is required. SAHRA and PHRA-G should respond within 14 days whether or not a HIA is required, and if required should state which specialist studies should be included.

The NHRA furthermore affords general and formal protection of certain categories of heritage resources, including:

- Formal protection:
 - National and provincial heritage sites under Section 27;
 - Certain types of protected areas under Section 28; and
 - Heritage areas under Section 32.
- General protection:
 - Certain structures under Section 34;
 - Archaeological and palaeontological resources, and meteorites under Section 35;
 - Certain categories of burial grounds and graves under Section 36; and
 - All public monuments and memorial under Section 37.

Any activity that will result in the change of the status quo of any heritage resources protected in terms of the above sections of the Act may, must be considered as a *permitted activity*. Changes to such resources will therefore require authorisation through permits issued by either SAHRA or PHRA-G.

2.3 MPRDA

The MPRDA stipulates under Section 5(4) that no person may ...mine... on any area without (a) an approved environmental management programme or approved environmental management plan, as the case may be.

Furthermore, the Mineral and Petroleum Resources Development Amendment Bill, 2013 (Bill 13 of 2013) (MPRDAB) states under Section 17 as an amendment to Section 22 of the MPRDA that, “Any person who wishes to apply for a mining right must simultaneously apply for an environmental authorisation...”

2.4 NEMA

The NEMA stipulates under Section 2(4)(a) that sustainable development requires the consideration of all relevant factors including (iii) the disturbance of landscapes and sites that constitute the nation’s cultural heritage must be avoided, or where it cannot be altogether avoided, is minimised and remedied.

Under Section 23(2)(b) it is required to “identify, predict and evaluate the actual and potential impact on the ... cultural heritage... the risks and consequences and alternatives and options for mitigation of activities, with a view to minimizing negative impacts, maximising benefits and promoting compliance with the principles of environmental management set out in Section 2”.

Section 24(1)(c) and 24(7)(b) state “the potential impact on... cultural heritage of the 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 authorising, permitting or otherwise allowing the implementation of an activity.”

2.5 NEM:WA

Section 48 of this Act requires consideration of cultural heritage. Here, the licensing authority must take into account effects on cultural heritage and the best practicable environmental options and alternative to protect cultural heritage.

3 NID Methodology

3.1 Definitions

Sources of risk to heritage resources can, essentially, be divided into three broad categories, as follows:

- **Direct or primary effects** on heritage resources occur at the same time and in the same space as the activity, e.g. loss of historical fabric through demolition work.
- **Indirect, induced or secondary effects** on heritage resources occur later in time or at a different place from the causal activity, or as a result of a complex pathway, e.g.

restriction of access to a heritage resource resulting in the gradual erosion of its significance, which is dependent on ritual patterns of access.

- **Cumulative effects** on heritage resources result from in-combination effects on heritage resources acting with 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 total number of new buildings within a historical rural landscape
 - **Synergistic:** effects interact to produce a total effect greater than the sum of the individual effects, e.g. the visual effect of the increase of new buildings within a historical rural landscape.
 - **Time crowding:** frequent, repetitive impacts on a particular resource at the same time, e.g. the high rate of increase of new buildings within a historical rural landscape.
 - **Neutralizing:** where the effects may counteract each other to reduce the overall effect, e.g. the effect of changes in patterns of cultivation could reduce the overall visual impact of additional new buildings within a historical rural landscape.
 - **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.

(Winter & Bauman 2005: 36)

Given that no individual identified heritage resource can exist in isolation to the wider natural, social, cultural and heritage landscape, three concentric study areas were defined for the purposes of this study. Defining these 'zones of influence' had a two-fold purpose:

- First, it provided the context within which identified heritage resources need to be interpreted and understood to determine cultural significance; and
- Second, assessing the significance of impacts on heritage resources corresponding to the three impact categories listed above.

The three zones of influence are as follows:

- **Primary Zone of Influence** (also referred to as the *site-specific* study area): This area was defined as the bounded project area i.e. the farm portions, within which the development will physically intrude through the construction of project infrastructure and project-related activities. The site-specific study area depicted in Figure 3-1.
- **The Secondary Zone of Influence** (also referred to as *local* study area): 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. The local study area is depicted in Figure 3-2.

- **The Tertiary Zone of Influence** (also referred to as 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, depicted in Figure 3-3, also provided the regional development and planning context that may contribute to cumulative impacts.

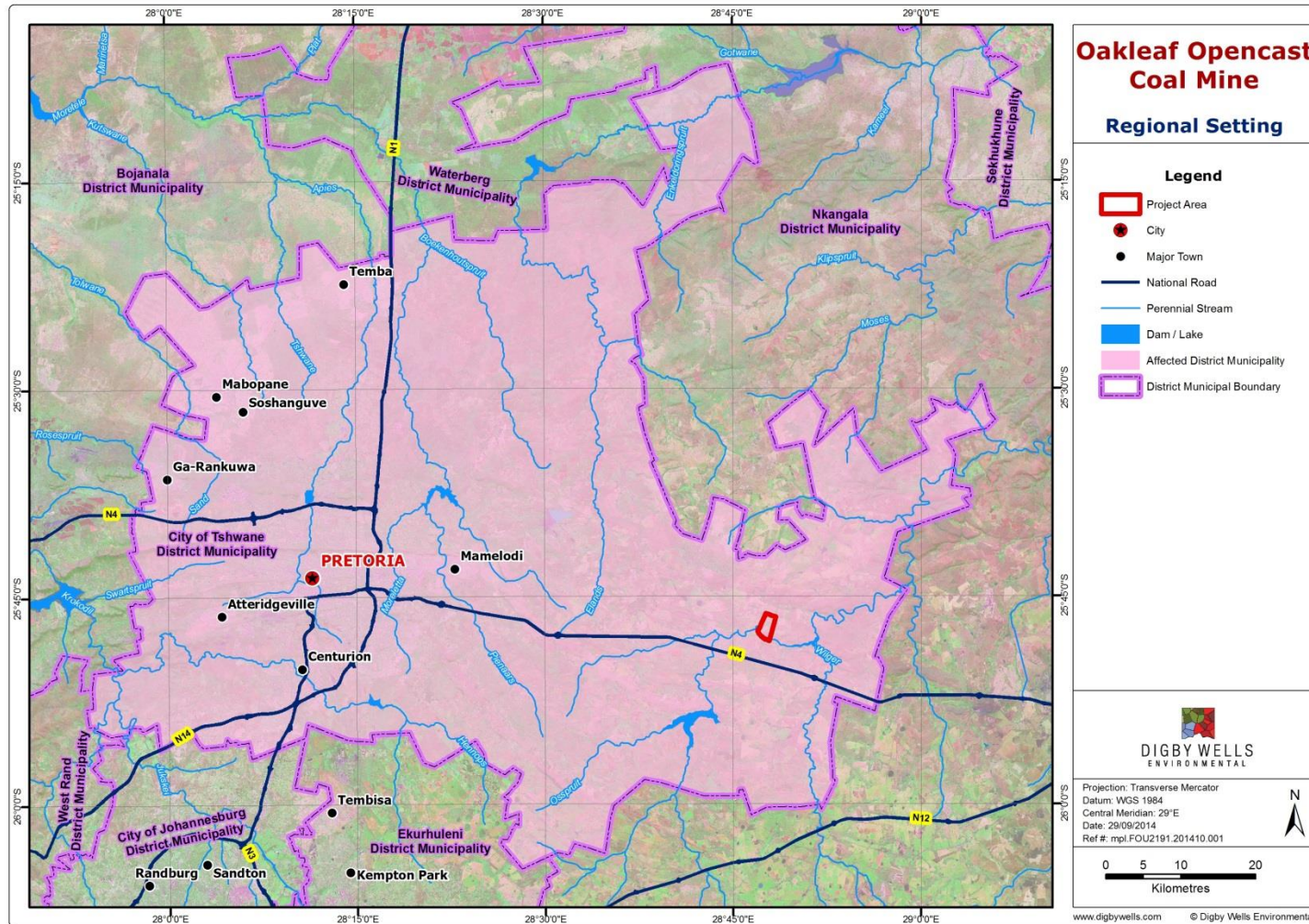


Figure 3-1: Regional study area

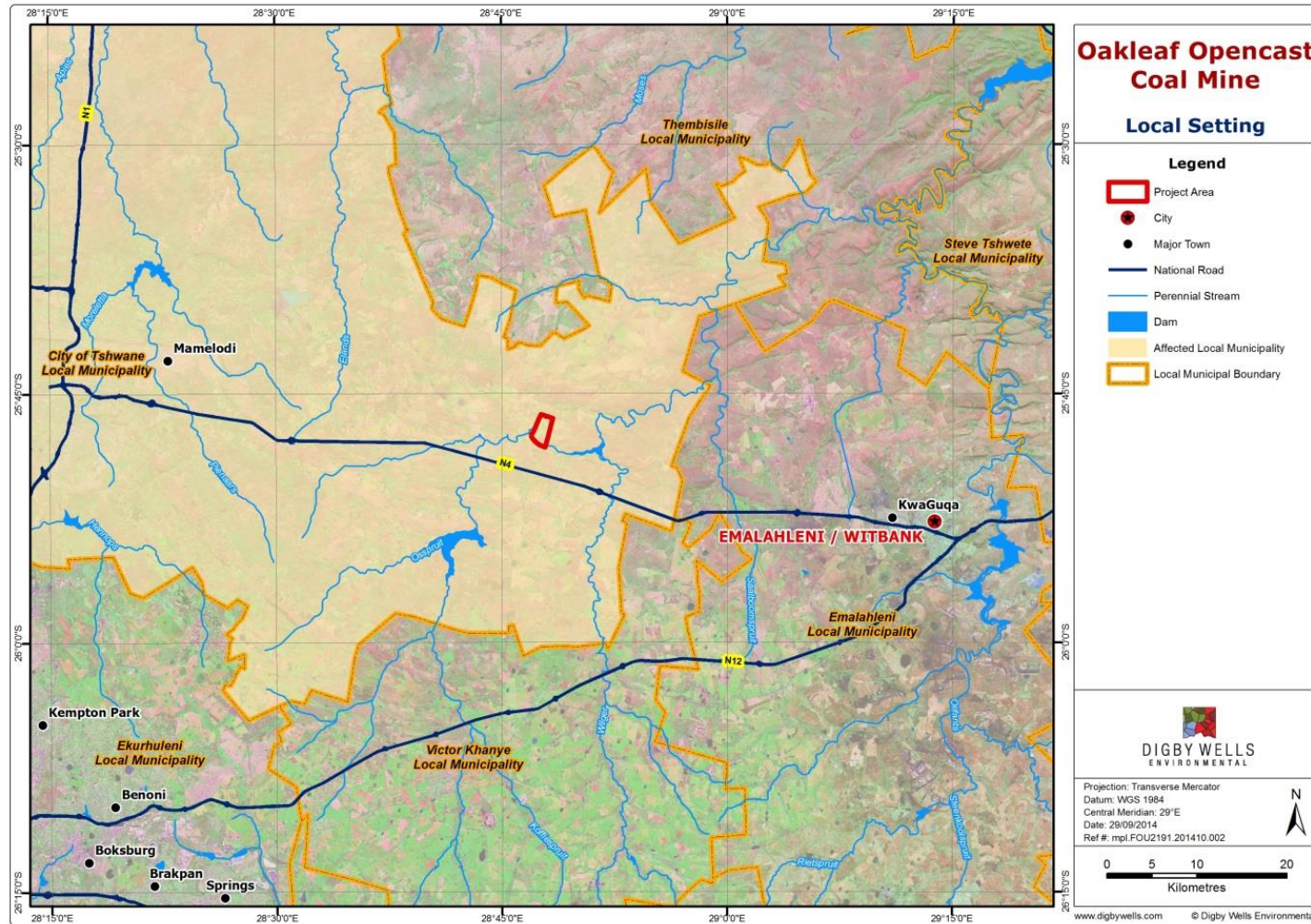


Figure 3-2: Local study area

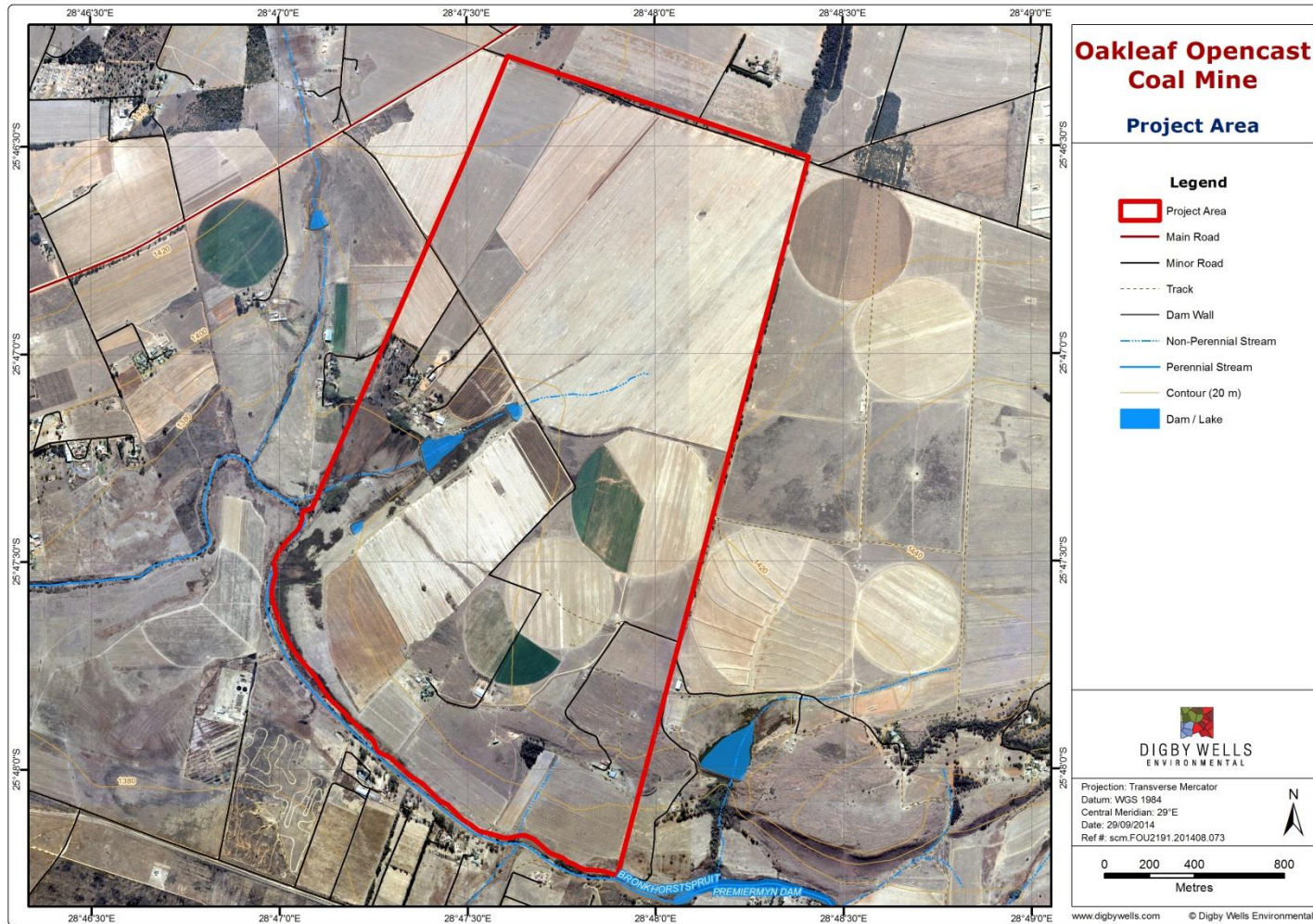


Figure 3-3: Site specific study area

3.2 Data Collection

3.2.1 Desktop and text based data collection

Data collection aimed to gather information relating to known heritage resources within the local study area. Information was obtained through intensive research using a variety of primary and secondary sources such as peer reviewed journals, textbooks and records, maps, photographs and plans.

Published literature was collated and analysed to determine relevance to this NID. Sources used to inform the findings are fully referenced under Section 8 of this report and are briefly listed below.

Table 3-1: Relevant reviewed published sources

Palaeontology	<ul style="list-style-type: none"> ■ SAHRIS, 2014 ■ Swanepoel, 2006
Stone Age	<ul style="list-style-type: none"> ■ Deacon & Deacon, 1999 ■ Esterhuysen & Smith, 2007 ■ Goodwin & Van Riet Lowe, 1929 ■ Lombard, et al., 2012 ■ Mitchell, 2002 ■ Schlanger, 2005
Iron Age	<ul style="list-style-type: none"> ■ Huffman, 1980 ■ Huffman, 2007 ■ Maggs, 1974
Colonial / Historical	<ul style="list-style-type: none"> ■ Delius & Cope, 2007 ■ Makhura, 2007 ■ Von der Hyde, 2013
Planning documents	<ul style="list-style-type: none"> ■ City of Tshwane Metropolitan Municipality, 2011 ■ City of Tshwane Metropolitan Municipality, 2014

Previously completed heritage studies that were conducted in the surrounding areas were reviewed to expand on the background information discussed. The findings provide evidence-based inferences to be made with regard to the potential for, and description of

heritage resources that are likely to occur in the project region. Heritage cases and reports found to be relevant are listed in Table 3-2 below, and fully referenced under Section 8.

Table 3-2: Relevant reviewed studies

Author	Report type	Area / property / project
Coetzee, F. P (2008)	HIA	Roodepoort 504 JR
Kitto, J (2013)	HIA	Modderfontein 490 JR
Kusel, U (2009)	HIA	Roodepoort 504 JR
Pistorius, J (2010)	HIA	Wachteenbietjeskop 506 JR
Van der Walt, J (2007)	AIA	Wachteenbietjeskop 506 JR
Van der Walt, J (2008a)	HIA	Bronkhorstspruit
Van der Walt, J (2008b)	AIA	Bronkhorstspruit
Van Schalkwyk, J (2007a)	HIA	Nooitgedacht 525 JR
Van Schalkwyk, J (2007b)	HIA	Nooitgedacht 525 JR
Van Schalkwyk, J (2008)	HIA	Nooitgedacht 525 JR

In addition, a database survey was conducted by consulting the following repositories:

- South African Heritage Resources Information System (SAHRIS); and
- University of the Witwatersrand Archaeology Site Database

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 3-3.

Table 3-3: Cartographic sources relevant to the project

Cartographic Sources and Aerial Imagery						
Map series		Name / number			Date	
Jeppe		05_Transvaal			1899	
TVL Degree Sheets		19_Pretoria			1909	
Imperial		106_Heidelberg			1919	
Aerial photographs						
Job no.	Flight plan	Photo no.	Map ref.	Area	Date	Reference
145	11	14499	2528	Pretoria	1939	145/1939
	12	14461				
426	8	1935	2528, 2628	Pretoria, East Rand	1961	426/1961
769	15	9578	2528, 2428, 2628, 2426, 2526, 2626, 2430, 2530, 2630	Pretoria, Nylstroom, East Rand, Thabazimbi, Rustenburg, Wes-Rand, Pilgrim's Rest, Barberton, Mbabane	1976	769/1976
		9577				
881	8	1410	2526, 2528, 2530, 2626, 2628, 2630	Rustenburg, Pretoria, Barberton, Wes-Rand, East Rand, Mbabane	1984	881/1984

3.3 Field Based Data Collection

Natasha Higgitt (Digby Wells) completed a Heritage Screening Survey (HSS) of the project area on 30 September 2014. Quantitative data collection was completed through non-intrusive pedestrian surveys of the project area, focusing on undisturbed areas.

Information was recorded using GPS technology and consisted of:

- Marking the location of identified heritage resources with waypoints; and
- Recording areas surveyed by means of track log.

This information was supplemented with photographs and detailed notes.

3.4 Site Naming

Sites identified during the field survey are prefixed by the SAHRIS case number assigned to the study followed by the map sheet number, relevant period / feature code and site number, i.e. **6669/2528DD/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 3-4: Period codes used in this NID

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

4 Cultural Heritage Baseline Description

4.1 Introduction

The cultural heritage baseline describes the regional, local and site specific areas defined under Section 3.1, and considered the following relevant time periods:

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 late 20 000 years ago)
2 Indigenous
Early Stone Age (3 million to 300 00ya) (ESA)
Middle Stone Age (c 300 000 to 30 000 ya) (MSA)
Later Stone Age (c 30 000 to 2000 ya) (LSA)
Late Iron Age (1500's to 1850's) (LIA)
3 Colonial
British colony (1814 -1910)
4 Historical
Union of South Africa (1911-1961)
Apartheid Republic of South Africa (1961-1994)
Democratic Republic of South Africa (1994-Present)

4.2 Regional Study Area

4.2.1 The Stone Age

Goodwin and Van Riet Lowe divided the Stone Age in southern Africa into three phases, namely the Early, Middle and Late Stone Age (ESA, MSA, LSA) (Goodwin & Van Riet Lowe, 1929; Mitchell, 2002; Schlanger, 2005).

Within the regional study area, the ESA has been identified by large stone tools found in layers dating between ± 2 Million years and 250 000 years ago (kya) (Mitchell, 2002; Esterhuysen & Smith, 2007), the most common associated with the Oldowan Technocomplex is the chopper core (Figure 4-1). The Acheulean Technocomplex occurs throughout southern Africa and is the longest lasting artefact tradition. The hallmark of this complex is the production of bifacial implements, namely the hand axe and cleaver (Figure 4-2) (Mitchell, 2002).

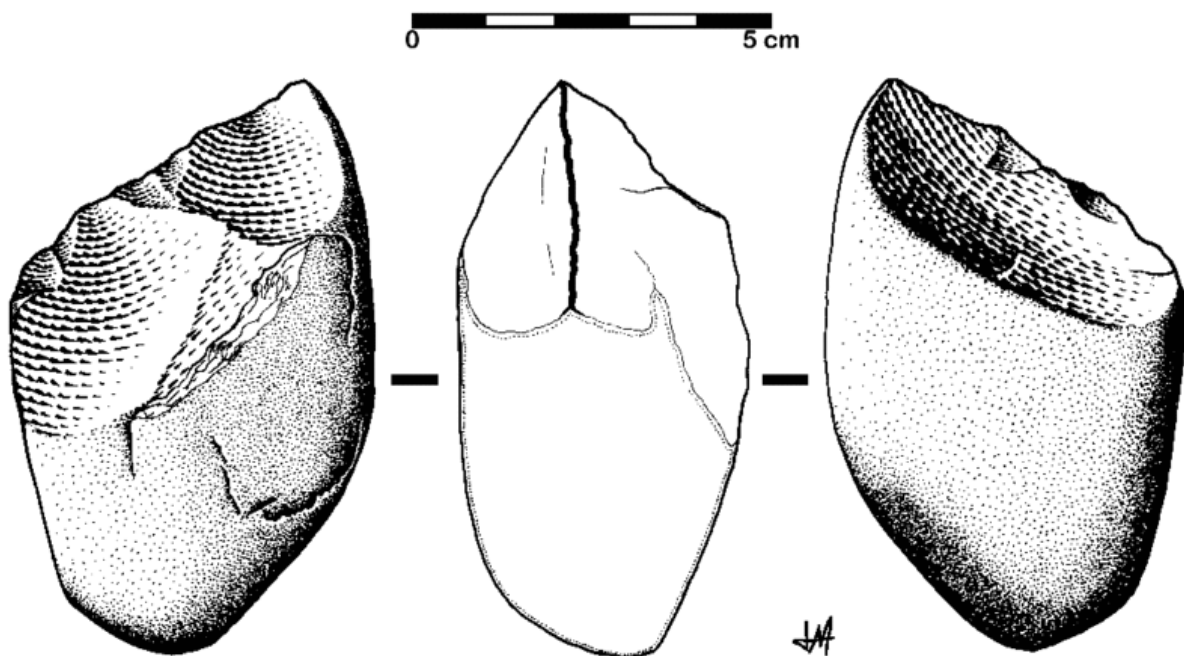


Figure 4-1: Example of Oldowan chopper core (Benito Álvarez, 1987)

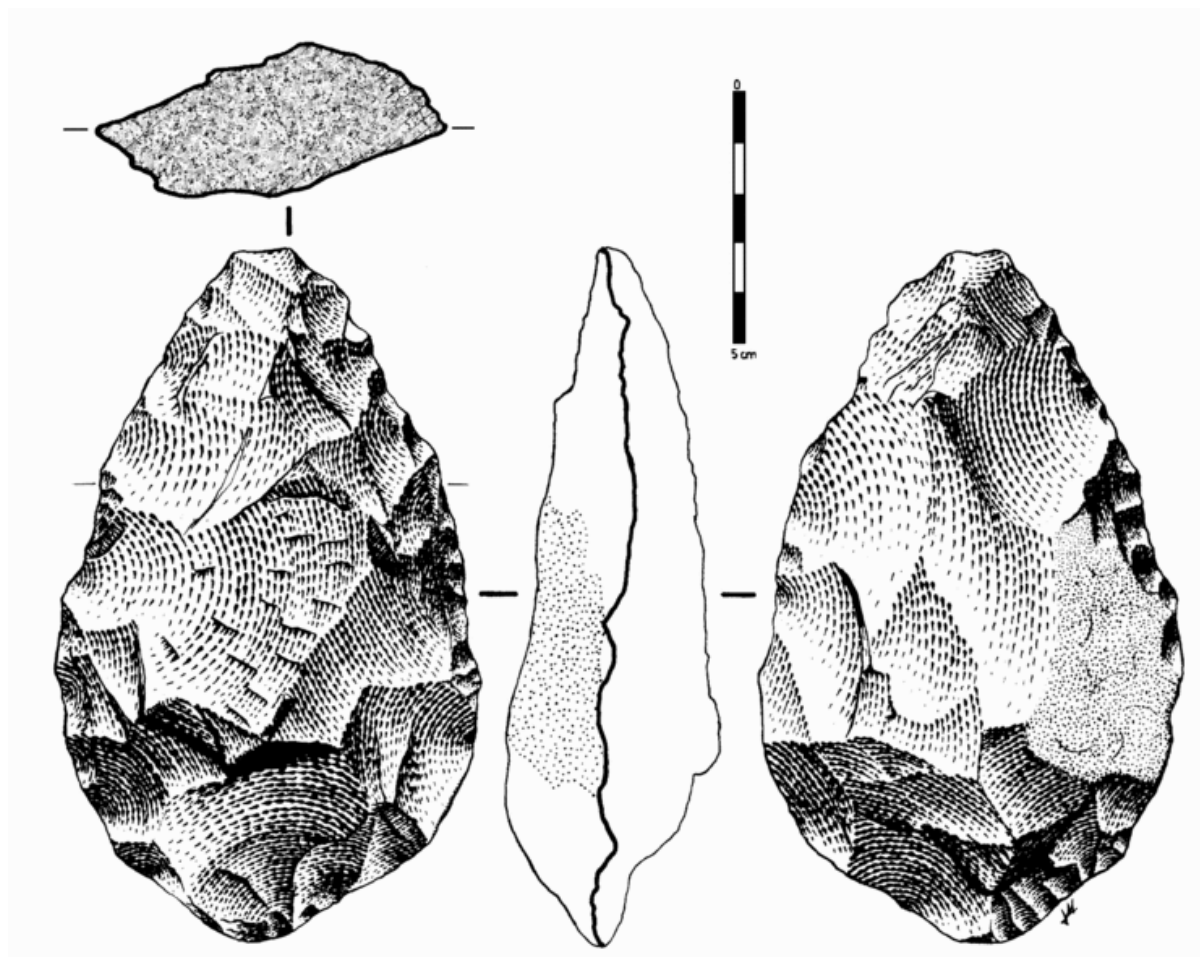


Figure 4-2: Example of Acheulean hand-axe (Benito Alvarez, 2002)

The MSA dates to ± 250 to 20 kya. It is during this period that modern humans evolved and the emergence of behavioural patterns comparable to contemporary humans can be identified in the archaeological record (Mitchell, 2002). The MSA can be defined by the occurrence of blades and points produced from good quality raw material. (Deacon & Deacon, 1999). However, the study area primarily comprises of sandstone which is of poor quality to produce MSA blades and points.

The shift to microlithic technology produced from very fine-grained material such as quartz or chert characterises the beginning of the LSA. This period begins at approximately 20 kya. Lithics were often used as composite tools during this period and hafted to be utilised as projectiles for hunting. Additionally, evidence for ritual practices, including rock art, and complex societies are associated with this period. (Deacon & Deacon, 1999).

Table 4-2: The South African and Lesotho Stone Age sequence (Lombard, et al., 2012)

Period	Technocomplex	Also known as (including regional variants)
Later Stone Age <40 ka	ceramic final LSA <2 ka	Ceramic post-classic Wilton, Late Holocene with pottery (Doornfontein, Swartkop)
	final LSA 0.1-4 ka	Post-classic Wilton, Holocene microlithic (Smithfield, Kabeljous, Wilton)
	Wilton 4-8 ka	Holocene microlithic
	Oakhurst 7-1 ka	Terminal Pleistocene / early Holocene non-microlithic (Albany, Lockshoek, Kuruman)
	Robberg 12-18 ka	Late Pleistocene microlithic
	early LSA 18-40 ka	(informal designation) Late Pleistocene microlithic
Middle Stone Age >20 ka - <300 ka	final MSA 20-40 ka	(informal designation) MSA IV at Klasies River, MSA 4 generally
	Sibudu 45-58 ka	late MSA / post-Howieson's Poort or MSA III at Klasies and MSA 3 generally (all informal designations)
	Howieson's Poort 58-66 ka	
	Still Bay 70-77 ka	
	pre-Still Bay 72-96 ka	(informal designation)
	Mossel Bay 77-105 ka	MSA II at Klasies River, MSA 2b generally (Pietersburg, Orangian)
	Klasies River 105-130 ka	MSA I at Klasies River, MSA 2a generally (Pietersburg)
	early MSA 130-300 ka	(informal designation)
Early Stone Age >200 ka	ESA-MSA transition >200-600 ka	(informal designation) (Fauresmith, Sangoan)
	Acheulean 300-1.5 Ma	
	Oldowan 1.5-2 Ma	

4.2.2 The Iron Age

The LSA overlaps in time with the spread of Bantu speakers into southern Africa (Makhura, 2007). These people brought with them a different worldview and economy, opting rather for permanent settlement, cultivation of land, and herding of livestock. As with the Stone Age,

this period is broadly divided into Early, Middle (*restricted to the Limpopo Province*) and Late Iron Age (EIA, MIA, LIA) (Huffman, 2007). Iron Age sites are predominantly identified through the material cultural remains most often dominated by ceramics, and during the LIA, stone walled settlements.

Huffman (1980) demonstrates that by considering three dimensions of ceramics, stylistic groups can be reliably identified. The larger groups are termed ‘traditions’ and sub-groups termed ‘facies’. These facies can be employed as temporal markers that provide tentative dates for sites where diagnostic ceramics are found. Guided by this process of ceramic analysis, the most common ceramic facies’ identified in the region are summarised in Table 4-3.

Table 4-3: Common ceramics facies found in region

Facies	Period	Key Characteristics
Mzonjani	450 CE – 750 CE	Punctates in rim, spaced motifs on shoulder
Olifantspoort	1500 CE – 1700 CE	Multiple bands of fine stamping or narrow incisions separated by colour
Uitkomst	1650 CE – 1820 CE	Stamped arcades, appliqué and blocks of parallel incisions, stamping and chord impressions
Buispoort	1700 CE – 1840 CE	Rim notching, broadly incised chevrons and white bands, all with red ochre

Permanent intensive settlement by these Iron Age communities in the region only began from approximately the 16th century onwards due to the adverse climatic conditions prior to this (Maggs, 1974). Generally, these groups preferred to settle along rivers to utilise alluvial soils suited for agricultural purposes and near natural outcrops to provide material for the construction of settlements.

Stonewalled settlements occur over much of southern Africa and are the most visible sign of agro-pastoralist settlement. Classification is based on techniques, shapes and internal divisions and within a larger framework that includes the relationships of features (Huffman, 2007, p. 31). Stonewalling is divided into two clusters summarised in Table 4-4 below:

Table 4-4: Stone walling clusters associated with the CCP

Central Cattle Pattern			
Moor Park Cluster		Ntsuanatsatsi Cluster	
Moor Park	14 th -16 th Century	Type N	15 th -17 th Century
Melora	16 th Century - ?	Badfontein	16 th Century
Kwamaza	18 th Century – Historic	Doornspruit	19 th Century

	Klipriviersberg	19 th Century
	Type V	19 th Century
	Molokwane	19 th Century
	Type Z	19 th Century
	Type B	19 th Century
	Tukela	19 th Century

In relation to the project area, Badfontein is found in Mpumalanga to the east, and Klipriviersberg south of Johannesburg to the west.

The Koni, an Nguni group in Mpumalanga, have circular settlements that consist of cattle lanes and terrace walls. Usually the cattle lane leads into a central enclosure, an exit on the opposite side allowed access to kraals attached to the central wall. This organisation may represent a left / right division. Later, Ledwaba Ndbele built similar walling around Polokwane. Huffman (2007: 41) refers to this type as Badfontein.

Klipriviersberg walling comprises of aggregated settlements. The outer wall sometimes includes scallops to mark back courtyards, there are small stock kraals, and straight walls separate households in the residential zone. These settlements were built by the Fokeng during the 18th and 19th century.

4.2.3 The Colonial and Historical Period

The wider region was disrupted during the 18th and 19th century by the rise of power blocks with a wide range of political centralisation and waves of violent population displacements (Makhura, 2007). This period is known as the *Difeqane* (Sotho) / *Mfecane* (Zulu) which created political unrest in the region that enabled largely unhindered incursion by the Voortrekkers into the interior. During this period, large groups were dispersed leaving what was perceived as an unoccupied landscape.

To the east of the project area, Boers moved in and began to exploit the coal reserves for domestic use (Delius & Cope, 2007). It is not until the demand from the mining industry associated with the discovery of diamonds in Kimberly in 1867 that commercial exploitation of the coal deposit was required.

Shortly after the move into the interior, the first Anglo-Boer War, dated to 1880 – 1881 erupted. This war was as a result of resistance from Boers to the annexation of the Transvaal Boer Republic (Von der Hyde, 2013).

4.2.4 Development Context

The project area is situated in the greater City of Tshwane Metropolitan Municipality (CoT). The development context of the CoT is encapsulated in the City of Tshwane Integrated Development Plan (CoT-IDP) (City of Tshwane Metropolitan Municipality, 2011). The

objective of the document is to provide improved implementation of dispensations in order to improve the quality of life for residents; respond to the community's needs and align with the national and provincial priorities, policies and strategies.

The CoT-IDP was reviewed to assist in the assessment of potential sources of risk that may occur through the proposed activities associated with the project. Focus within the CoT-IDP in regards to heritage resources is the continued maintenance of and access to such resources (City of Tshwane Metropolitan Municipality, 2011). No emphasis is placed on how to utilise these to promote economic development.

4.3 Local Study Area

4.3.1 Geology and Palaeontology

A review of the SAHRIS palaeo-sensitivity map (PSM) indicated that the palaeo-sensitivity of the geological formation within which the project area is situated is of moderate sensitivity (See Figure 4-3).

The proposed project area is situated within the Wilge River Formation of the Waterberg Group (See Plan 4). The age of the Waterberg Group is approximately 1800 – 1700 million years and occurs in two basins, namely the Warmbaths and Middelburg basins (Swanepoel, 2006).

Geologically the Waterberg Group consists predominantly of braided stream deposits, including sandstones, conglomerates with minor mudrock, beach, tidal flat, lacustrine, Aeolian and possible marine shelf sediments. Palaeontologically, terrestrial cyanobacterial mats have been recorded within formations of the Waterberg Group, including the earliest known examples in the Makabeng Formation (SAHRIS, 2014).

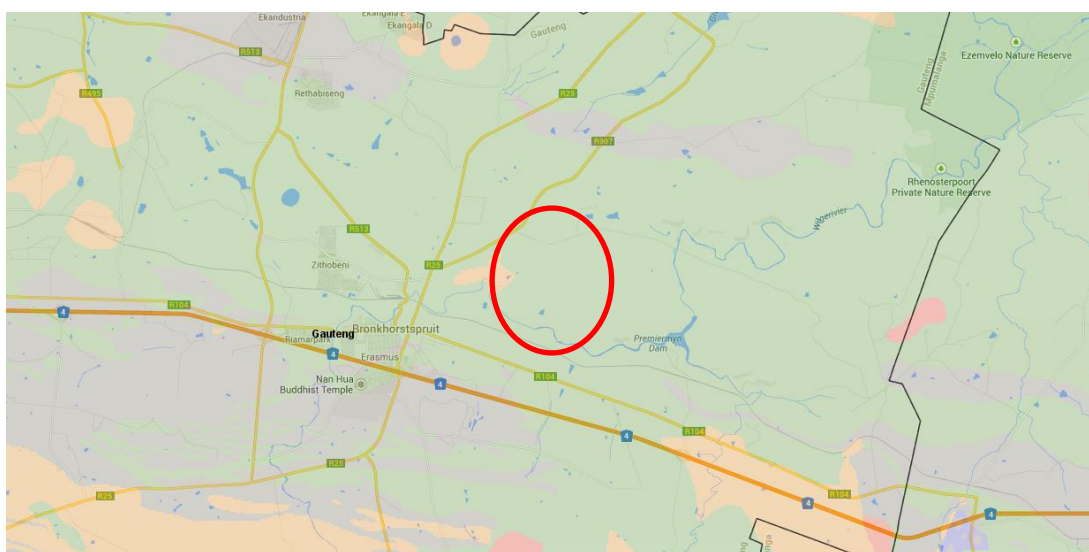


Figure 4-3: PSM of the local study area. Approximate location of project area indicated in red.

4.3.2 The Stone Age

Stone Age deposits and rock art sites have been identified in the local study area at the Ezemvelo Nature reserve some 20 km north of Bronkhorstspuit. Microliths from the LSA have been recorded in rock shelters along the Wilge River attesting to the long occupation in the area. In addition, traces of San Rock Art have also been recorded, including handprints, geometric designs associated with pastoralists, and white finger paintings of the Sotho-Tswana (Anonymous, 2008).

4.3.3 The Colonial and Historical Period

Through a review of relevant previously completed studies (van der Walt, 2007; van Schalkwyk, 2007a; van Schalkwyk, 2007b; van der Walt, 2008a; van der Walt, 2008b; van Schalkwyk, 2008; Kusel, 2009; Kitto, 2013), no heritage resources associated with the Stone Age or Iron Age were identified. All identified sites were associated with the Colonial and Historical Period, therefore, the focus of further discussion will be focused on this time period.

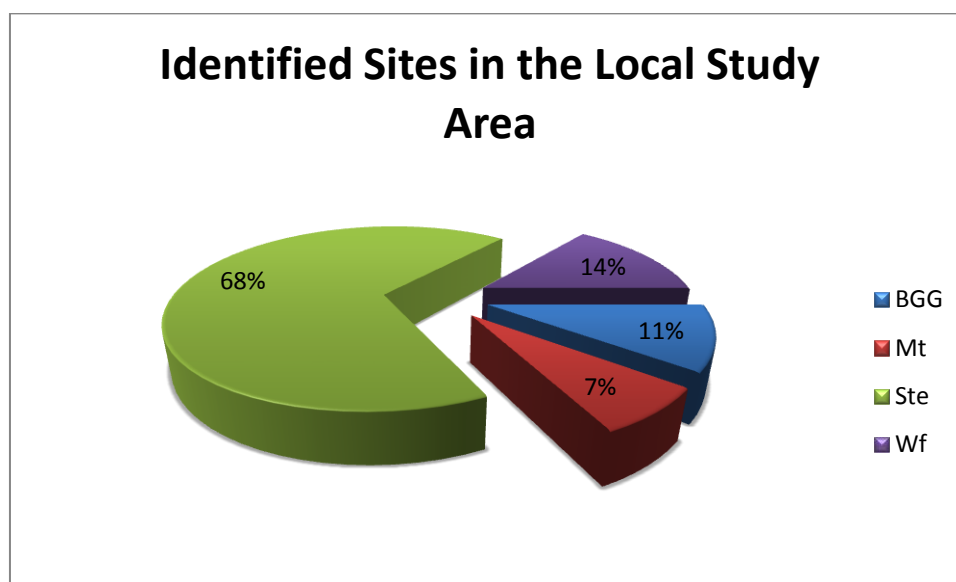


Figure 4-4: Identified sites in the local study area

The outbreak of the First Anglo-Boer War occurred in Potchestroom in December 1880 as a result of an uprising by burghers and the subsequent proclamation reinstating the Boer Republic (Von der Hyde, 2013).

A column of British soldiers despatched from the east around Lydenburg to reinforce the Pretoria garrison for fear of an armed Boer incursion. In order to prevent a concentration of British troops in Pretoria, a commando under Frans Joubert was sent toward Middelburg to oppose the approaching British column (Von der Hyde, 2013).

Nine days after receiving the order, Lieutenant Colonel Phillip Anstruther departed for Pretoria along with 247 men and 34 wagons that included three women and children. On 20

December, the British column were ambushed which resulted in the Battle of Bronkhorstspuit directly adjacent to the project area (See Figure 4-6 and Figure 4-7 for the location). Approximately 1.5 km from their intended camp in Bronkhorstspuit, the battle occurred. Boers approached the column and demanded that they halt their advance on Pretoria. The British refused to the halt and as a result were ambushed. Within minutes, 77 British soldiers were killed and 80 wounded, opposed to the Boer's one casualty and one wounded (Von der Hyde, 2013).

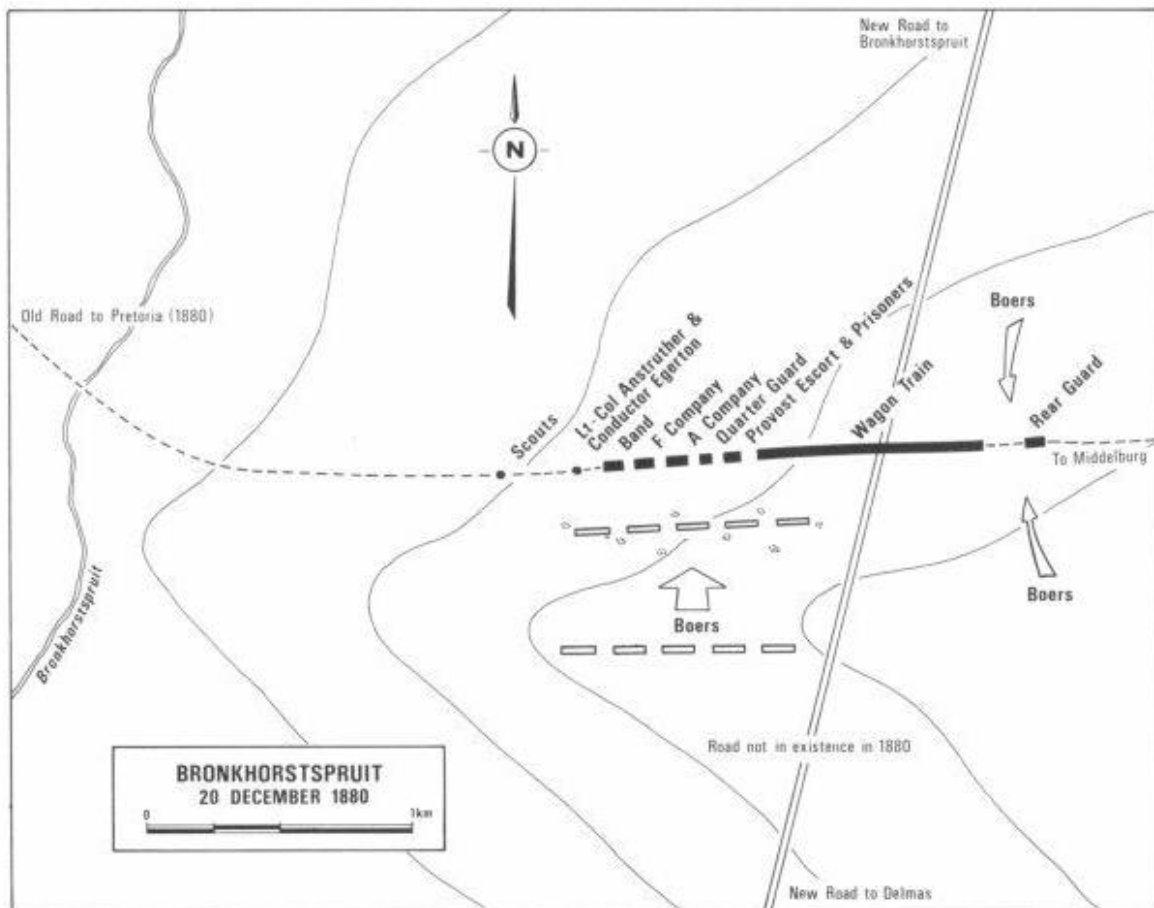


Figure 4-5: Depiction of the Battle of Bronkhorstspuit dated 20 December 1880

In 1894, the railway between Johannesburg and Lourenço Marques (now Maputo) opened. This railway and the Bronkhorstspuit Station are clearly depicted on the Jeppes 1899 Map of the Transvaal (Figure 4-6). The town of Bronkhorstspuit was laid out in 1904 on the farm Hondsrivier, the same property as the station. Originally named after the owner of the farm, C.J.G. Erasmus, the name was changed from Erasmus to Bronkhorstspuit in 1935 (Kitto, 2013).

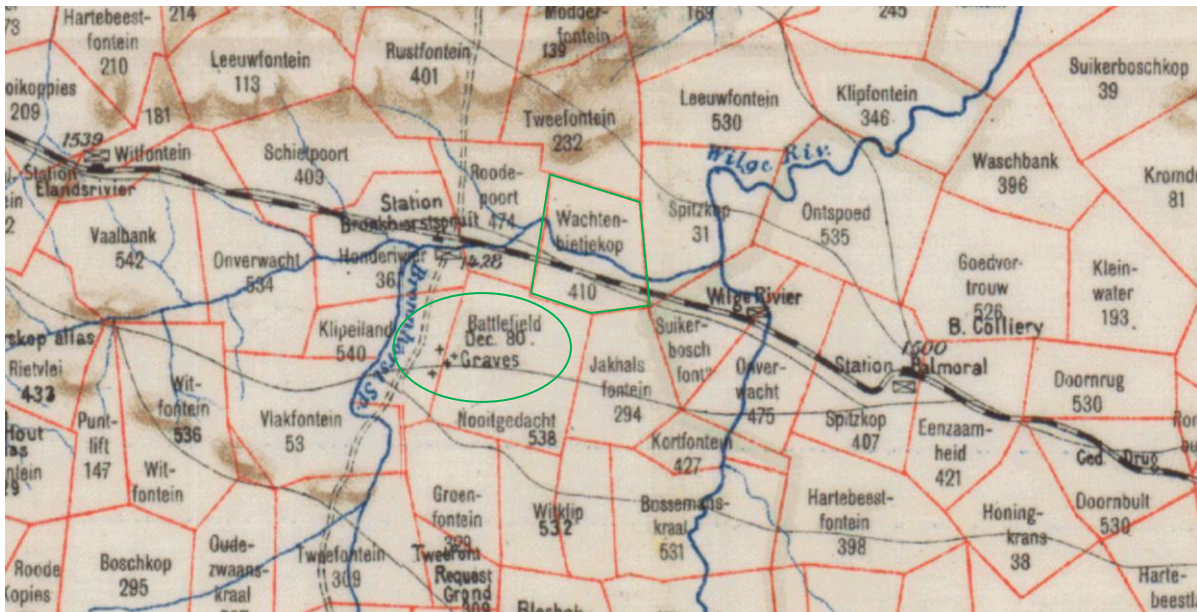


Figure 4-6: Extract from Jeppes 1899 Map of the Transvaal. The Battle of Bronkhorstspuit and associated graves indicated in green circle. Project area on Wachtenbietekop 410 demarcated in green.

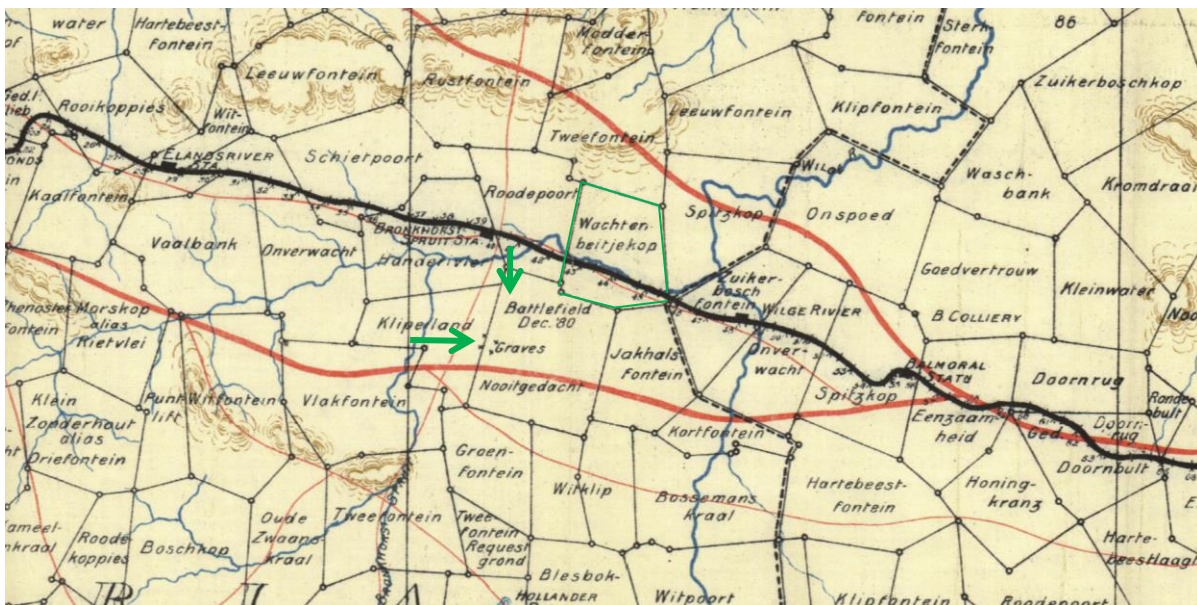


Figure 4-7: Extract from the 1900 – 1919 South Africa Imperial Map Series. Project area, Battle of Bronkhorstspuit and graves indicated in green.

4.3.4 Development Context

The project area is situated in Region 7 of the CoT. According to the Region 7 Integrated Development Plan (City of Tshwane Metropolitan Municipality, 2014) the population as per the 2011 census data was 109 766 people. This population lives within a predominantly rural area in informal settlements. Statistically, 26% of the economically active are permanently

unemployed within Region 7 and the highest population concentrations within Region 7 include Ekangala and Bronkhorstspuit. Of this population, 7% of adults do not have an education, and only 19% are schooled up to grade 12 (City of Tshwane Metropolitan Municipality, 2014).

As indicated in Figure 4-8 ‘conservation’ areas have been identified as areas with tourism potential. However, as identified in the SWOT analysis within the Region 7 IDP, few of these areas have the infrastructure necessary to support tourism development (City of Tshwane Metropolitan Municipality, 2014). No reference to the promotion of heritage within Region 7 to contribute to the economic develop of the area is made.

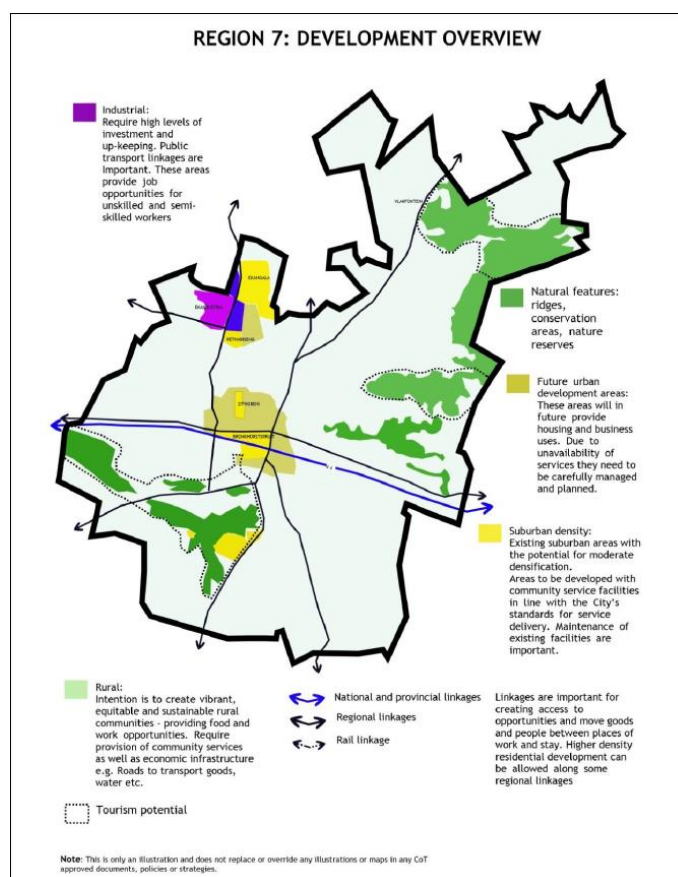


Figure 4-8: Development overview of Region 7 (City of Tshwane Metropolitan Municipality, 2014)

4.4 Site Specific Study Area

Historic aerial imagery indicates that through time, the project area has been predominantly used for agricultural purposes. Potential structures were identified in the 1939 aerial imagery, which appear to have been removed by 1976 (See Figure 4-9 and Figure 4-11).

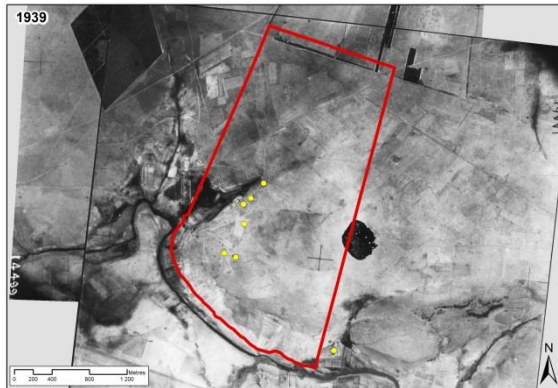


Figure 4-9: Aerial imagery dated 1939.



Figure 4-11: Aerial imagery dated 1976.



Figure 4-10: Aerial imagery dated 1961.

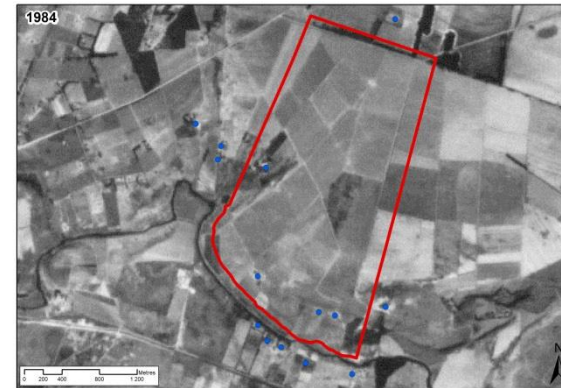


Figure 4-12: Aerial imagery dated 1984.

The present environment is still dominated by agricultural fields and grazing land (See Figure 4-13). Rocky outcrops were identified within the project area, to the south in close proximity to the Bronkhorstspuit River as depicted in Figure 4-14.





Figure 4-13: Agricultural fields within the project area





Figure 4-14: Exposed bedrock adjacent the Bronkhorstspuit River in the southwestern section of the project area

In addition to the identification of the Battle of Bronkhorstspuit battlefield, a total of four heritage resources were identified within the project area during the HSS and are presented in Table 4-5.

Table 4-5: Identified heritage resources within the project area

Site number	Site type	GPS Co-ordinates	Description	Images
6669/2528DD/Ste/001	Structure	-25.791248/ 28.786547	<p>A four room historical stone structure with a fireplace in the main sitting room. No electrical wirings or plumbing was identified within the house, and roof was presumably thatch. The date of the house is unknown and is assumed to be historical at this point.</p> <p>The site is located less than 5 m from the berm for the open cast pit.</p>	
6669/2528DD/Ft/002	Potential Palaeontological site	-25.795355/ 28.790237	<p>Possible fossilised sea bed.</p> <p>These are located 10 m from proposed haul road.</p>	

6669/2528DD/Ste/003	Historical site	-25.797801/ 28.798163	<p>An area measuring approximately 100 m x 300 m with rectangular stone walls, presumably cattle kraals.</p> <p>This site is located 100 m from the proposed haul road.</p>	
6669/2528DD/BGG/004	Burial ground	-25.788695/ 28.793123	<p>Approximately 30 graves first identified by Pistorius 2010.</p> <p>The burial ground is located in the proposed open pit area.</p>	

5 Stakeholder Concerns

Initial stakeholder concerns regarding impacts on heritage include the following (Table 5-1).

Table 5-1: Stakeholder concerns

Comment raised	Contributor	Organisation/Community	Date	Method
What will the Heritage implications on the Premiermyn dam be?	Hennie Cronje	Landowner of Resurgam 515 Remaining Extent	7 October 2014	One-on-one Consultations

The Premiermyn (Premier Mine) dam was built in 1909 as part of the Premier Mine (currently known as the Cullinan Diamond Mine) and is owned by Petra Diamonds. The dam is situated over 3 km from the proposed project area and there is likely to be no direct impact on the structure of the dam.

6 Sources of Risk

The sources of risk to heritage resources are primarily associated with the project related activities and can be divided into the three categories as defined under Section 3.1 above. These include the following:

- Direct or primary effects;
- Indirect, induced or secondary effects; and
- Cumulative effects.

Activities associated with the development of the project are provided in Table 1-2 and can be summarised as the construction of facilities and infrastructure, and the physical alteration of land. These activities will first and foremost have a direct effect on heritage resources that could potentially lead to the damage to and/or total destruction of these resources. This will alter the significance of the resource and result in a loss of the historical fabric of the resource.

Indirect or secondary effects may occur in relation to the battlefield and identified burial ground (BGG/004). The proposed mining activities will dramatically alter the landscape and sense-of-place of the site. If the BGG/004 is to remain *in situ* an indirect effect could be the restricted or permanent loss of access to the site by next-of-kin.

Cumulatively, the project will result in an increase in industrial expansion within the area, as well as the human footprint through influx of contractors and labourers over the Life of Mine. The increase in individuals will create a higher potential for accidental damage to or deliberate vandalism of tangible heritage resources, including built structures or burial

grounds. The effects of this could lead to the ultimate destruction of heritage resources thereby resulting in a loss of historical fabric of the resource and area.

7 Conclusion and Recommendations

Oakleaf intend to undertake opencast coal mining operations with an associated rail link on a greenfields site in close proximity to the town Bronkhorstspuit in the Gauteng Province.

As evident from the findings of relevant previously completed studies, no significant palaeontological or archaeological sites have been identified in the local study area. Due to this, it is imperative that the project area undergo intensive reconnaissance survey to ensure that no palaeontological or archaeological sites will be negatively impacted upon by the proposed mining activities.

Colonial and/or historical sites with heritage significance are known to occur within the local study area and project boundaries. The most significant identified site includes the location and memorial monument of the First Anglo Boer War - Battle of Bronkhorstspuit, and the burial ground located within the project boundary.

Based on the findings of this study and the identified heritage resources within the study area, the following recommendations are provided:

- Complete a Heritage Impact Assessment for the Oakleaf Project taking into consideration the following requirements:
 - Dedicated consultation with Interested and Affected Parties including the Association of Southern African Professional Archaeologists (ASAPA); the Rock Art Research Institute (RARI); the Archaeological Society (ArcSoc); Heritage South Africa; Historical Association of South Africa; South African Military History Society; National Museum of Cultural History; the Simon van der Stel Foundation; and Ezemvelo Nature Reserve;
 - Assessment of the proposed project on the Battle of Bronkhorstspuit Battlefield taking into consideration the integrity of the site, and the direct, secondary and cumulative impacts, and the management of the site;
 - A review of the palaeontological assessment by a qualified palaeontologist to provide recommendations on the way forward;
 - A built environment assessment to consider the sources of risk of the project on Ste/001 and any additional structures identified; and
 - Consideration of the direct, secondary and cumulative impacts of the proposed project on BGG/004 and any additional burial grounds identified.

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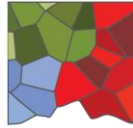
van Schalkwyk, J., 2008. *Heritage Survey Report of Portion 100 of the Farm Nooitgedacht 525 JR, Bronkhorstspuit Magisterial District*, Unpublished report: MapID: 02471.

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Notification of Intent to Develop
Proposed Oakleaf Opencast Coal Mine, Gauteng
FOU2191



Appendix A: Specialist CV



DIGBY WELLS

ENVIRONMENTAL

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

Digby Wells and Associates (South Africa) (Pty) Ltd (Subsidiary of Digby Wells & Associates (Pty) Ltd). Co. Reg. No. 2010/008577/07. Fern Isle, Section 10, 359 Pretoria Ave Randburg Private Bag X10046, Randburg, 2125, South Africa
Tel: +27 11 789 9495, Fax: +27 11 789 9498, info@digbywells.com, www.digbywells.com

Directors: A Sing*, AR Wilke, DJ Otto, GB Beringer, LF Koeslag, AJ Reynolds (Chairman) (British)*, J Leaver*, GE Trusler (C.E.O)
*Non-Executive

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 in compliance 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 worked 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 Thohoyadou 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 Booyensdal 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 Booyensdal	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
Bathhako Mine Expansion	North-West Province, South Africa	2010 2010	Mapping of historical sites located within the Bathhako 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	Oriental 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	Oriental 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@randgoldresources.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



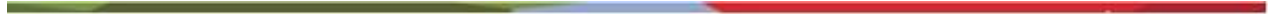
SEGA Gold Mining Project	Burkina Faso	2012 2013	Socio Economic and Asset Survey	RAP	Social Consultant	3 months	Cluff Gold PLC	Completed field survey and data collection	Cluff Gold PLC
SEGA Gold Mining Project	Burkina Faso	2013 2013	Specialist Review of Heritage Impact Assessment	Reviewer	Heritage Consultant	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@atkinglobal.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	Oriental 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	Oriental 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



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Appendix B: Plans

Oakleaf Opencast Coal Mine

Regional Setting

1:250 000

Legend

 Project Area



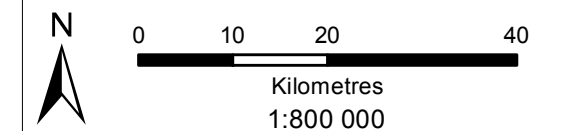
2528 Pretoria



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Projection: Transverse Mercator Ref #: mpl.FOU2191.201409.150
Datum: WGS 1984 Revision Number: 1
Central Meridian: 29°E Date: 29/09/2014

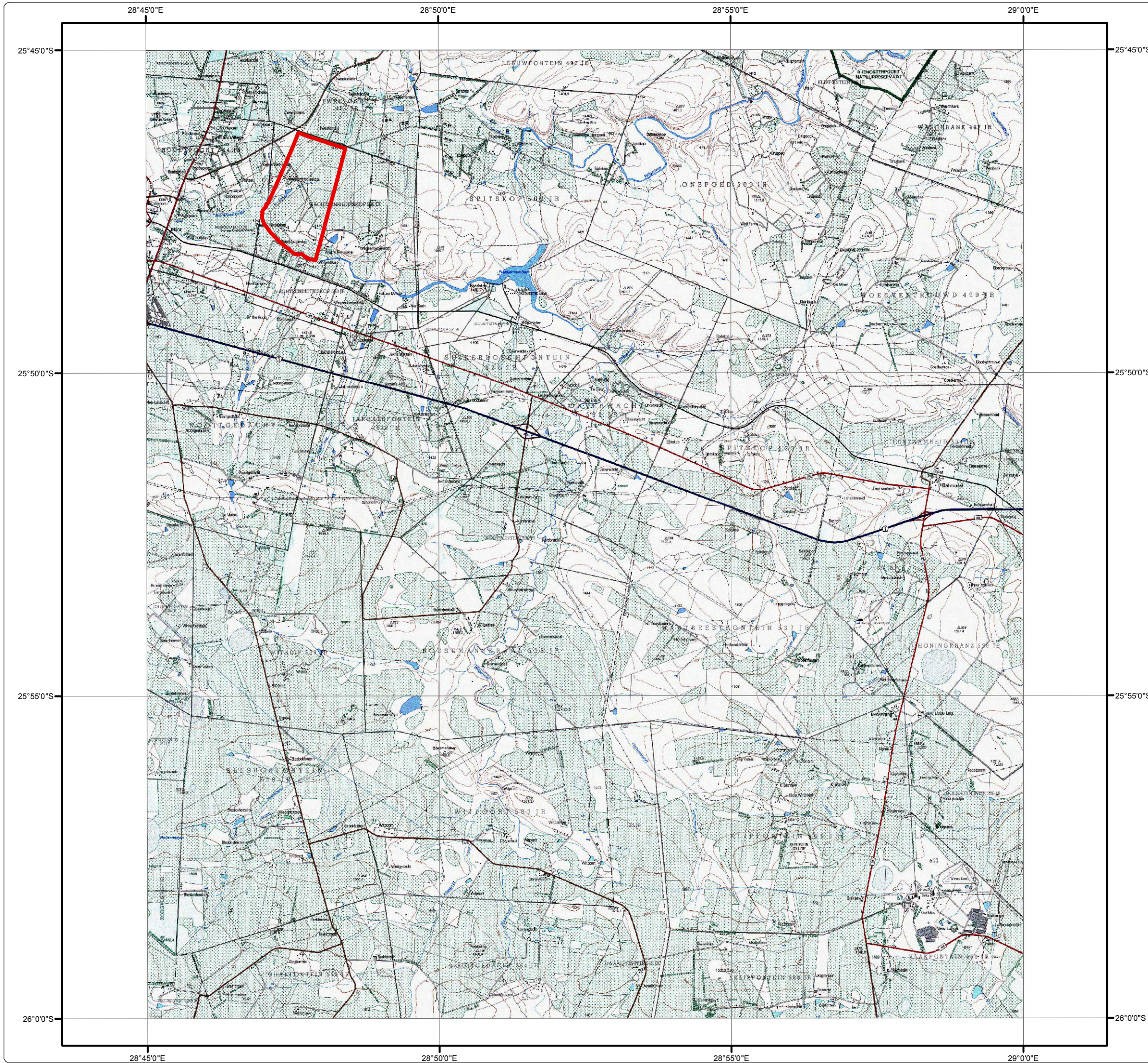


Oakleaf Opencast Coal Mine

Regional Setting
1:50 000

Legend

 Project Area



2528DD Balmoral

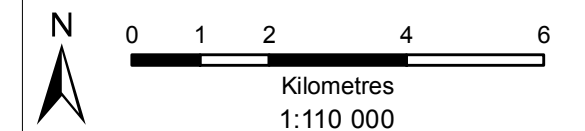


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Projection: Transverse Mercator
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Ref #: mpl.FOU2191.201409.151
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Date: 29/09/2014

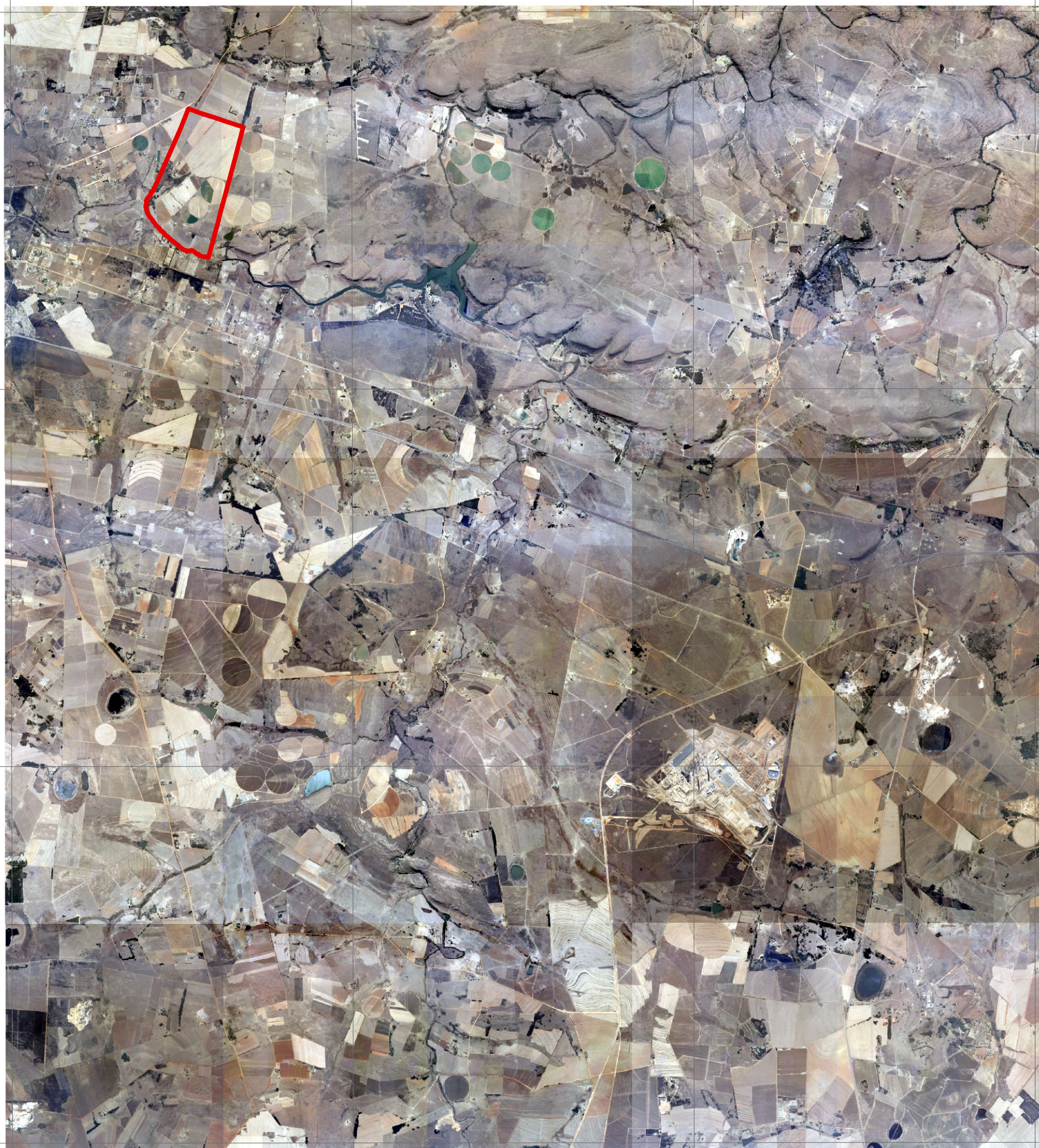


Oakleaf Opencast Coal Mine

Regional Setting
1:10 000

Legend

 Project Area

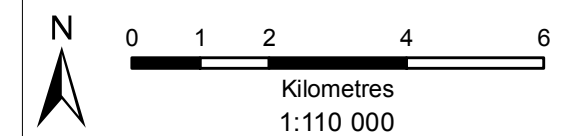


2528DD



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Projection: Transverse Mercator Ref #: mpl.FOU2191.201409.152
Datum: WGS 1984 Revision Number: 1
Central Meridian: 29°E Date: 29/09/2014

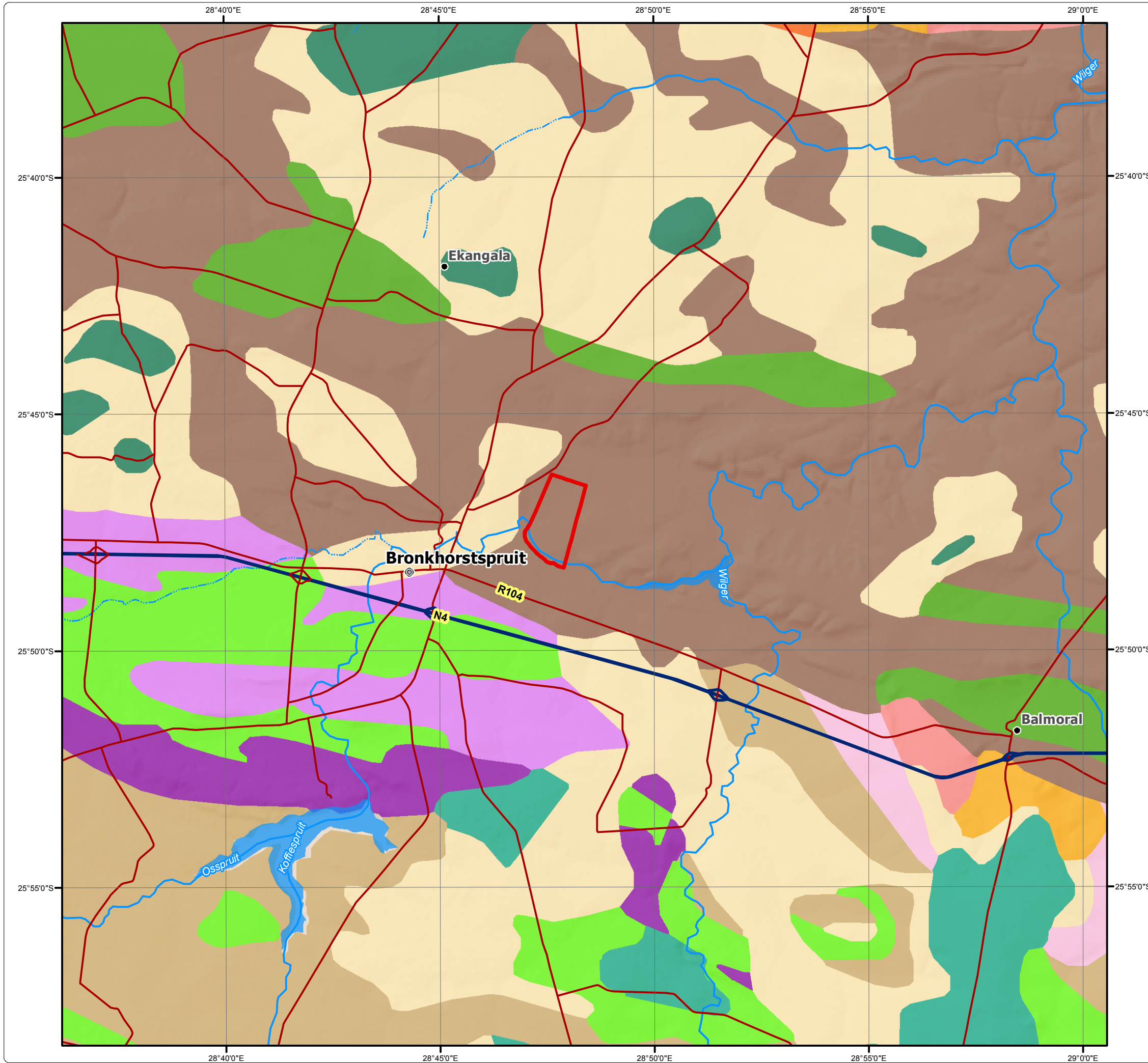


Oakleaf Opencast Coal Mine

Regional Geology

Legend

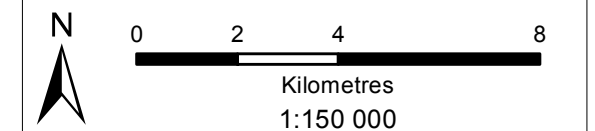
- Project Area
 - Other Town
 - Settlement
 - Main Road
 - Arterial / National Route
 - Perennial Stream
 - Non-Perennial Stream
 - Dam / Lake
- Regional Geology**
- Daspoort Fm, Pretoria Grp
 - Dwyka Grp, Karoo Spgrp
 - Ecca Grp, Karoo Spgrp
 - Lebowa Granite Sui, Bushveld Cplx
 - Loskop Fm, Transvaal Spgrp
 - Madzaringwe Fm, Karoo Spgrp
 - Magaliesberg Fm, Pretoria Grp
 - Mokolian Erathem
 - Rayton Fm, Pretoria Grp
 - Rooiberg Grp, Transvaal Spgrp
 - Silverton Fm, Pretoria Grp
 - Vaalian Erathem
 - Wilge River Fm, Waterberg Grp



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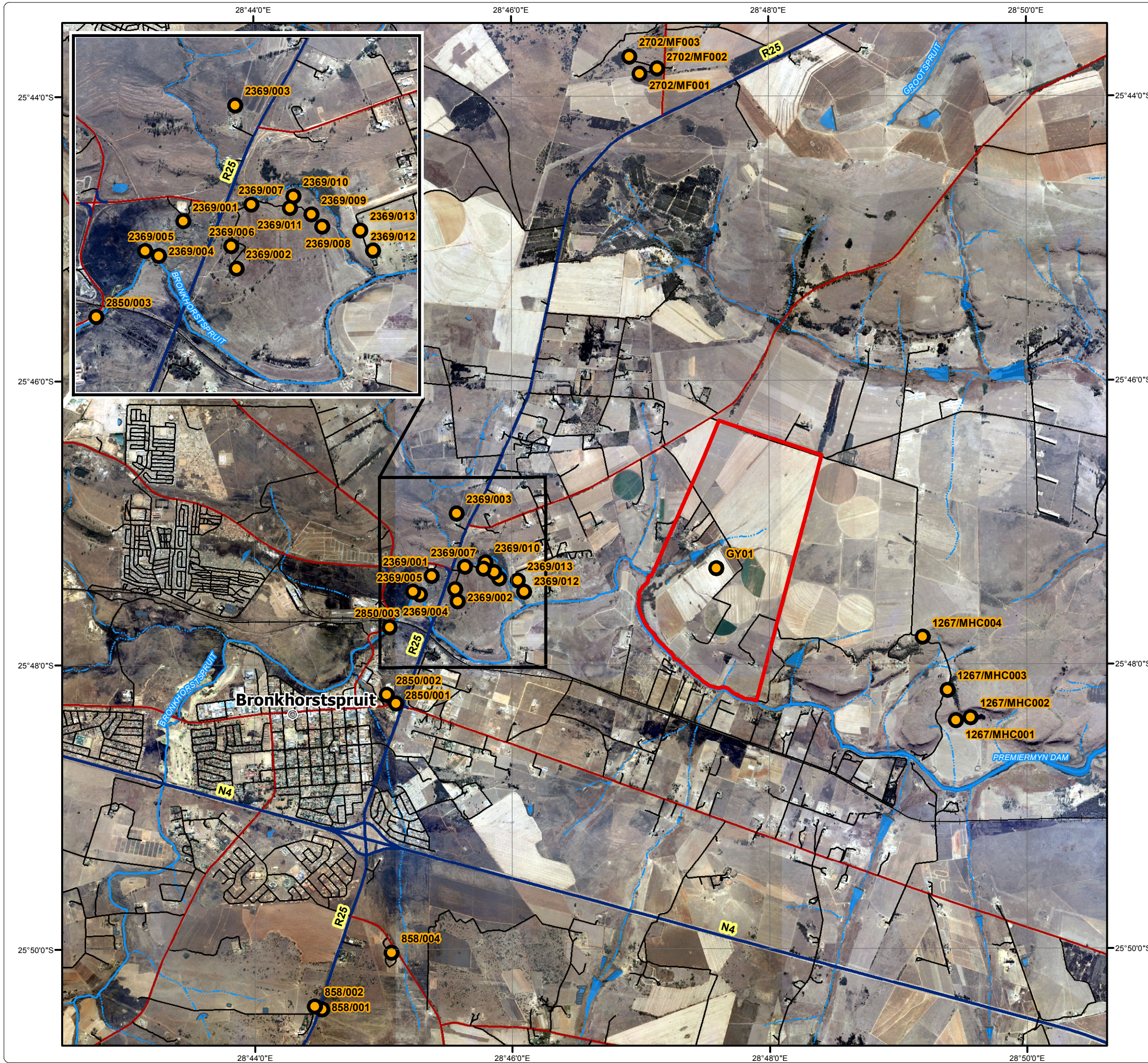


Oakleaf Opencast Coal Mine

Identified Heritage Resources

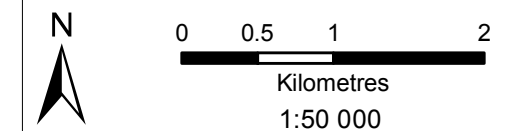
Legend

- Project Area
- Identified Heritage Sites
- ⊙ Other Town
- Arterial/ National Route
- Main Road
- Minor Road
- +— Railway Line
- Dam Wall
- - - Non-Perennial Stream
- Perennial Stream
- Dam / Lake



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Projection: Transverse Mercator Ref #: mpl.FOU2191.201410.030
 Datum: WGS 1984 Revision Number: 1
 Central Meridian: 29°E Date: 06/10/2014



Oakleaf Opencast Coal Mine Heritage Screening Survey Results



Legend

- | | |
|----------------------|-------------------------|
| Project Area | Clean Water Drain |
| Main Road | Polluted Water Drain |
| Minor Road | Fence |
| Track | Powerline |
| Railway Line | Access Road |
| Dam Wall | Haul Road |
| Non-Perennial Stream | Berm |
| Perennial Stream | Premiermyn Pipeline |
| Dam / Lake | Pipeline Proposed Route |
| Site Visit Points | North Pit |
| Ste/003 Site Extent | South Pit |
| Option 1 | Plant Area |
| Option 2 | PCD |
| Option 3 | Slurry Dam |
| Option 1 | Hards Dump |
| Option 2 | Stockpile ROM |
| | Topsoil Dump |
| | Diesel Tank |



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Projection: Transverse Mercator Ref #: mpl.FOU2191.201410.031
 Datum: WGS 1984 Revision Number: 1
 Central Meridian: 29°E Date: 06/10/2014

