



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


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: 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

Contact person: Justin du Piesanie

Fern Isle, Section 10
359 Pretoria Avenue
Randburg
2125

Tel: 011 789 9495
Fax: 011 789 9498
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

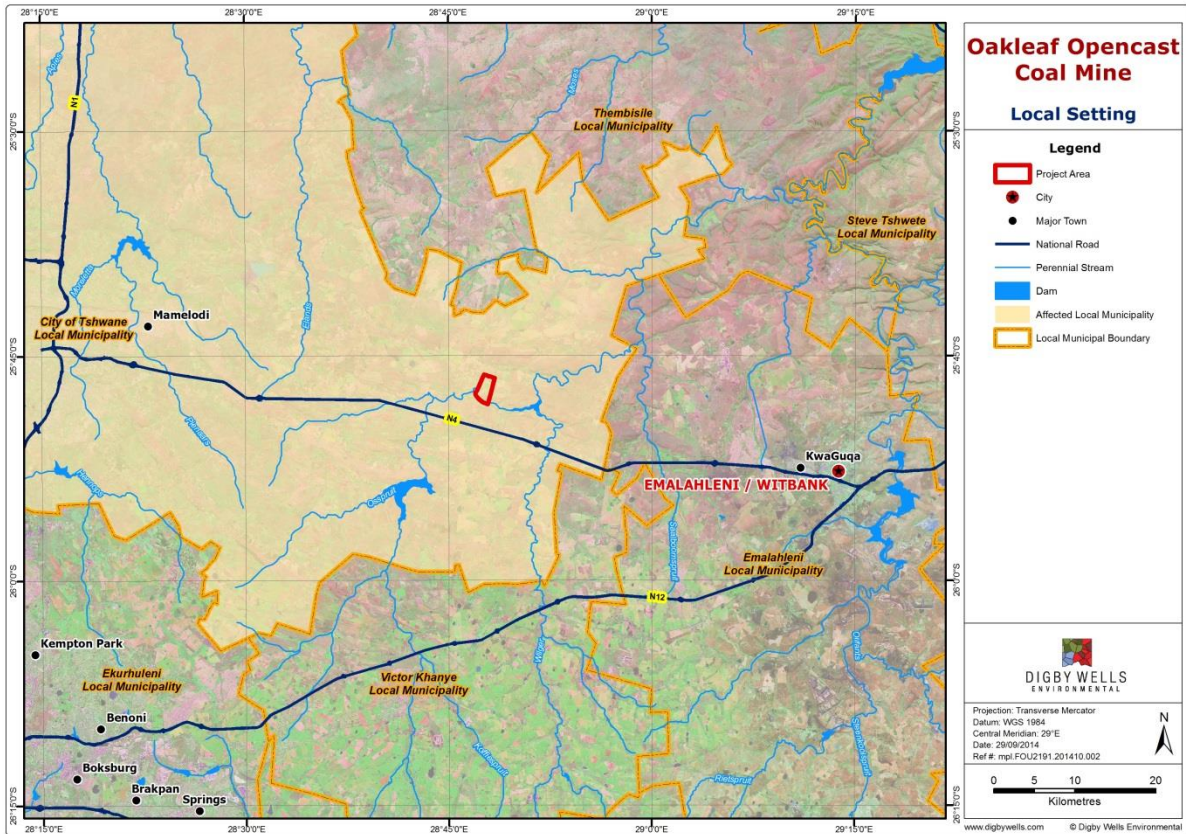
Identified / Known Heritage Resources and Potential Impacts

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

TABLE OF CONTENTS

1	Project Background.....	1
1.1	Introduction	1
1.2	Terms of Reference.....	1
1.3	Scope of Work.....	1
1.4	Project Details	2
1.5	Project Activities	2
1.6	Relevant Contact Details	4
1.7	Expertise of the Specialist	6
1.8	Restrictions and Limitations.....	6
2	Policy and Legal Framework.....	7
2.1	Introduction	7
2.2	NHRA.....	7
2.3	MPRDA.....	8
2.4	NEMA.....	8
2.5	NEM:WA	8
3	NID Methodology	8
3.1	Definitions	8
3.2	Data Collection.....	1
3.2.1	<i>Desktop and text based data collection</i>	<i>1</i>
3.3	Field Based Data Collection	3
3.4	Site Naming.....	3
4	Cultural Heritage Baseline Description	4
4.1	Introduction	4
4.2	Regional Study Area	5
4.2.1	<i>The Stone Age</i>	<i>5</i>
4.2.2	<i>The Iron Age.....</i>	<i>7</i>
4.2.3	<i>The Colonial and Historical Period.....</i>	<i>9</i>
4.2.4	<i>Development Context.....</i>	<i>9</i>

4.3	Local Study Area	10
4.3.1	<i>Geology and Palaeontology</i>	10
4.3.2	<i>The Stone Age</i>	11
4.3.3	<i>The Colonial and Historical Period</i>	11
4.3.4	<i>Development Context</i>	13
4.4	Site Specific Study Area	14
5	Stakeholder Concerns.....	28
6	Sources of Risk	28
7	Conclusion and Recommendations	29
8	Bibliography	30

LIST OF FIGURES

Figure 3-1:	Regional study area	1
Figure 3-2:	Local study area.....	2
Figure 3-3:	Site specific study area	3
Figure 4-1:	Example of Oldowan chopper core (Benito Álvarez, 1987)	5
Figure 4-2:	Example of Acheulean hand-axe (Benito Alvarez, 2002).....	6
Figure 4-3:	PSM of the local study area. Approximate location of project area indicated in red.	10
Figure 4-4:	Identified sites in the local study area.....	11
Figure 4-5:	Depiction of the Battle of Bronkhorstspuit dated 20 December 1880.....	12
Figure 4-6:	Extract from Jeppes1899 Map of the Transvaal. The Battle of Bronkhorstspuit and associated graves indicated in green circle. Project area on Wachtenbietiekop 410 demarcated in green.	13
Figure 4-7:	Extract from the 1900 – 1919 South Africa Imperial Map Series. Project area, Battle of Bronkhorstspuit and graves indicated in green.....	13
Figure 4-8:	Development overview of Region 7 (City of Tshwane Metropolitan Municipality, 2014)	14
Figure 4-9:	Aerial imagery dated 1939.	15
Figure 4-10:	Aerial imagery dated 1961.	15

Figure 4-11: Aerial imagery dated 1976.	15
Figure 4-12: Aerial imagery dated 1984.	15
Figure 4-13: Agricultural fields within the project area	25
Figure 4-14: Exposed bedrock adjacent the Bronkhorstspuit River in the south-western section of the project area	25

LIST OF TABLES

Table 1-1: Location of the Oakleaf Project	2
Table 1-2: Listed activities for the proposed project	2
Table 1-3: Digby Wells Project Manager Contact Details	4
Table 1-4: Fountain Capital Project Manager Contact Details	4
Table 1-5: Landowner Contact Details	5
Table 3-1: Relevant reviewed published sources	1
Table 3-2: Relevant reviewed studies	2
Table 3-3: Cartographic sources relevant to the project	3
Table 3-4: Period codes used in this NID	4
Table 4-1: Periods considered in the cultural heritage baseline profile (adapted from Winter & Bauman 2005)	4
Table 4-2: The South African and Lesotho Stone Age sequence (Lombard, et al., 2012).....	7
Table 4-3: Common ceramics facies found in region.....	8
Table 4-4: Stone walling clusters associated with the CCP	8
Table 4-5: Identified heritage resources within the project area.....	26
Table 5-1: Stakeholder concerns	28

LIST OF APPENDICES

Appendix A: Specialist CV
Appendix B: Plans

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.

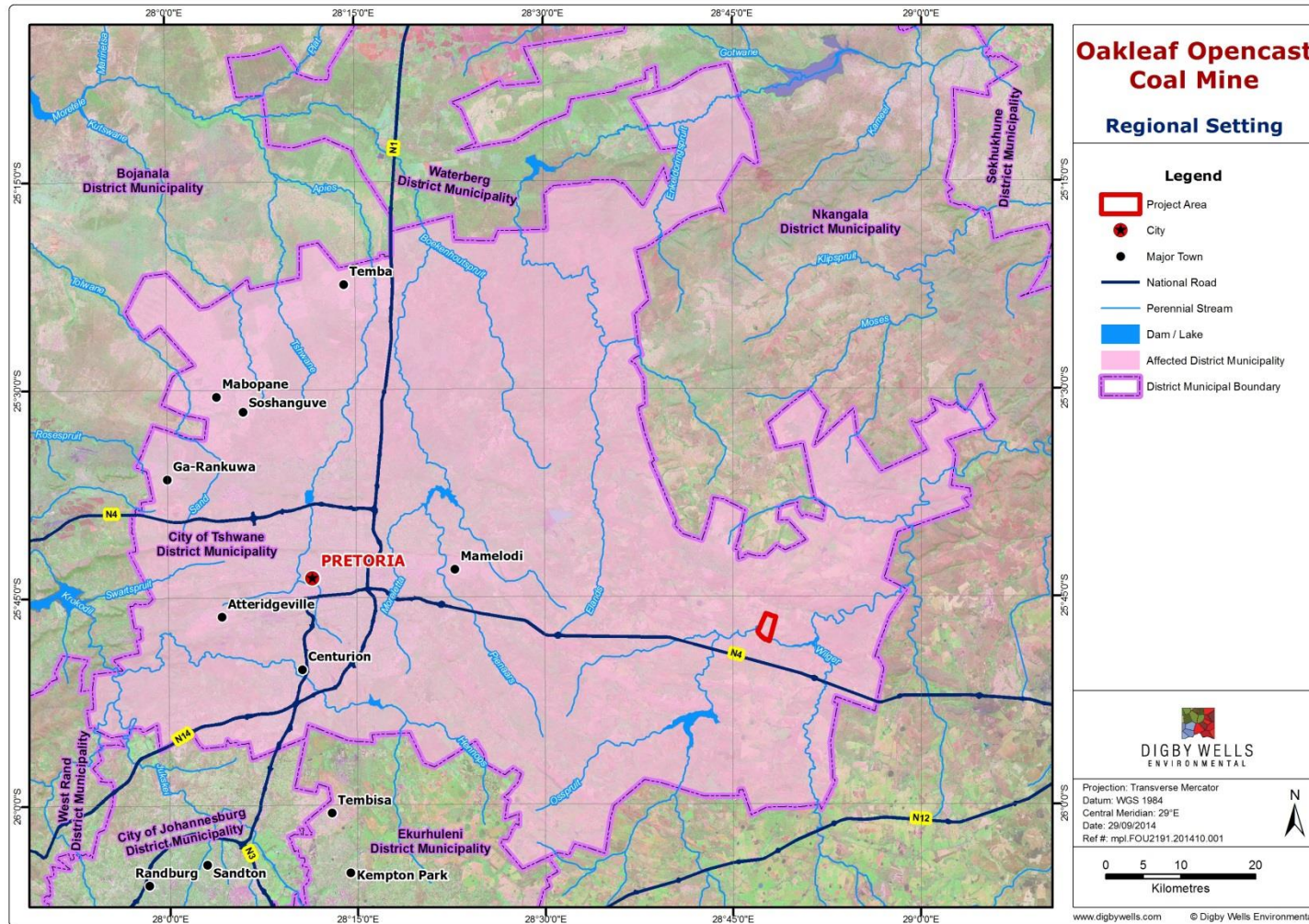


Figure 3-1: Regional study area

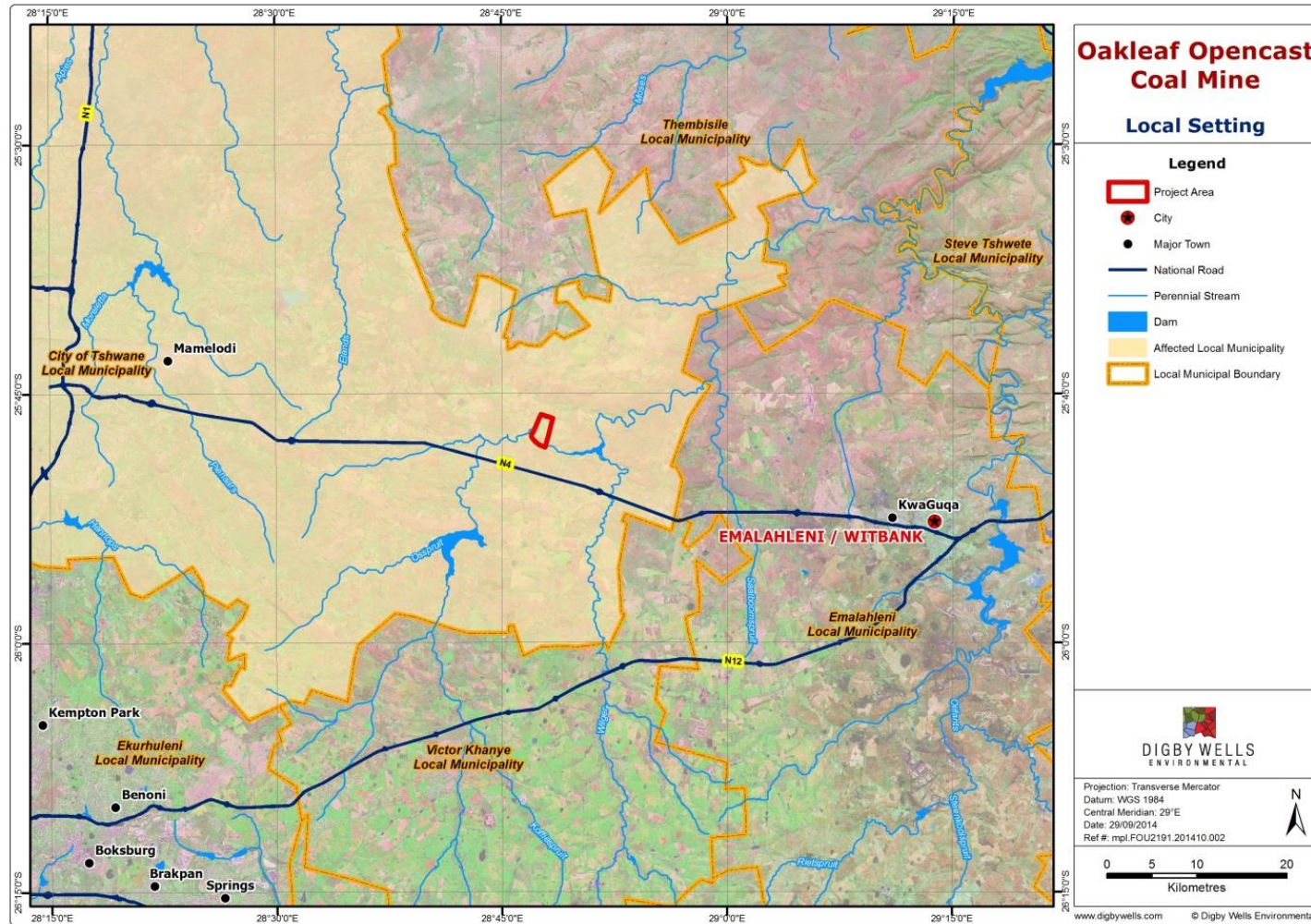


Figure 3-2: Local study area

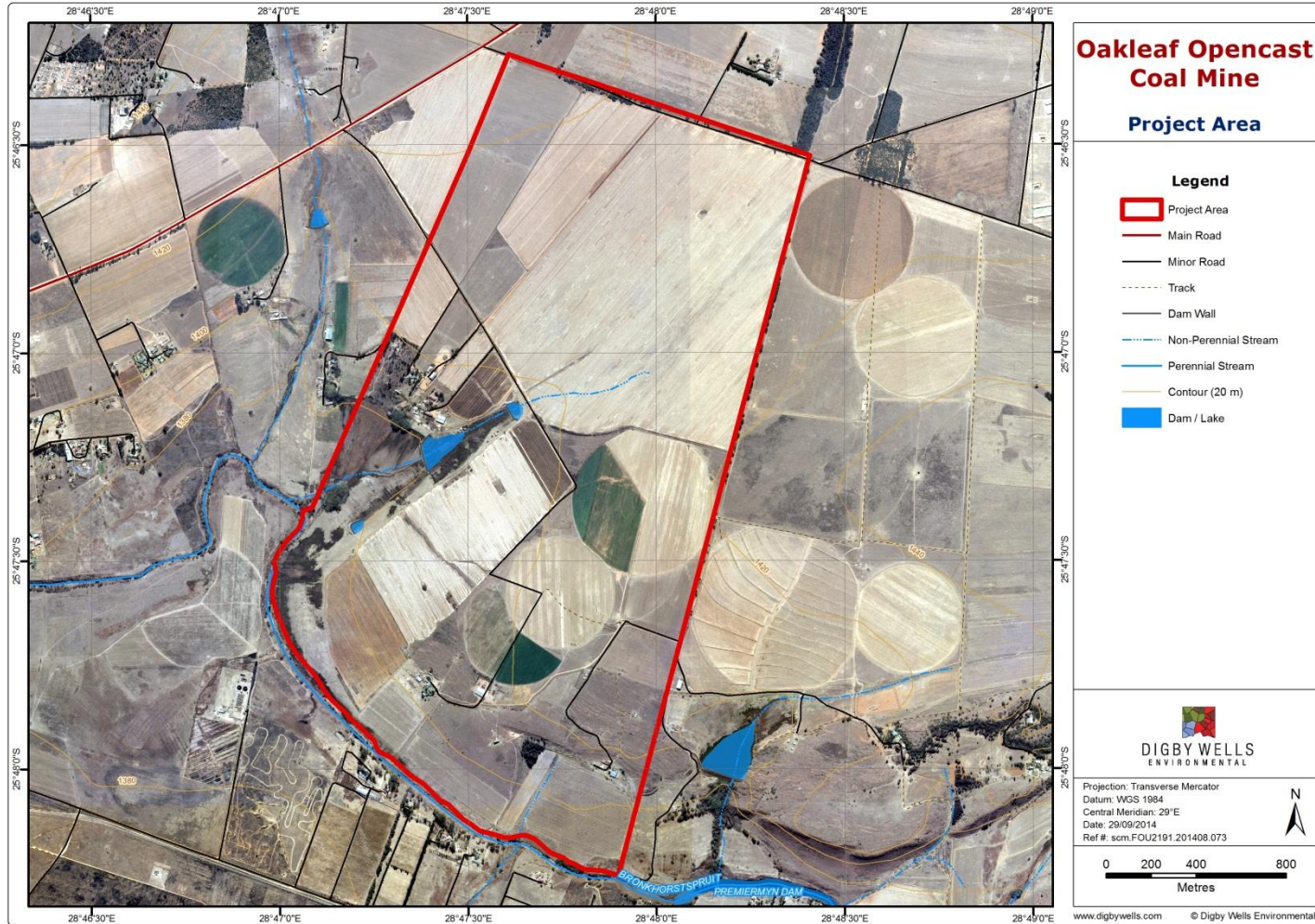


Figure 3-3: Site specific study area

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).

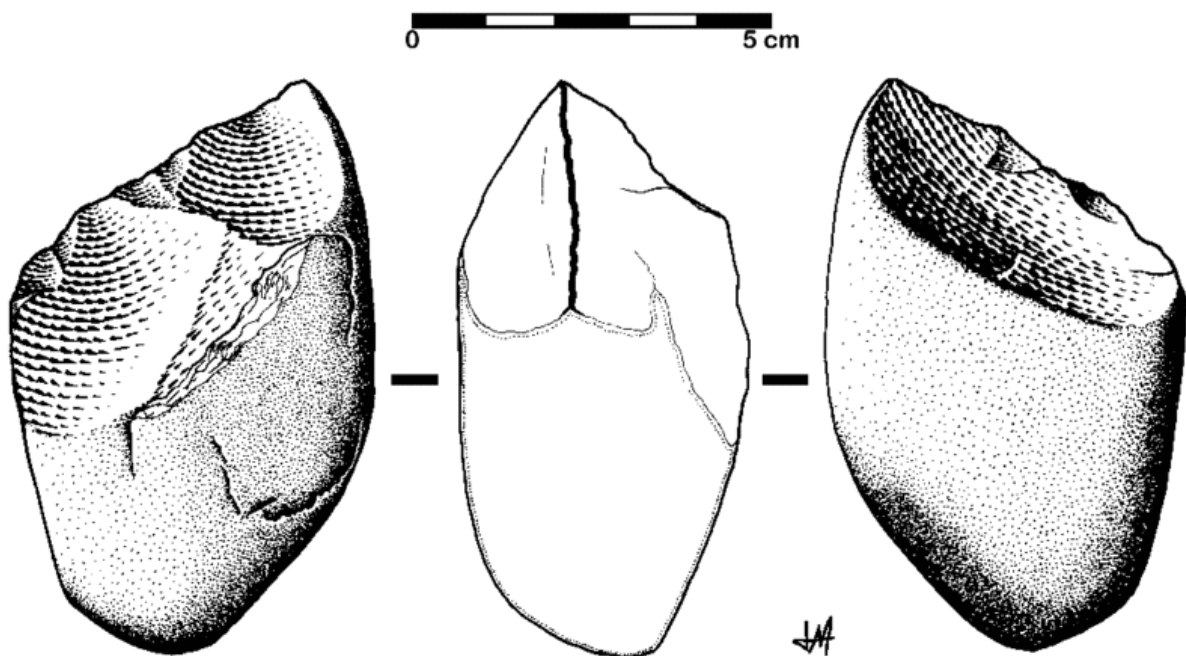


Figure 4-1: Example of Oldowan chopper core (Benito Álvarez, 1987)

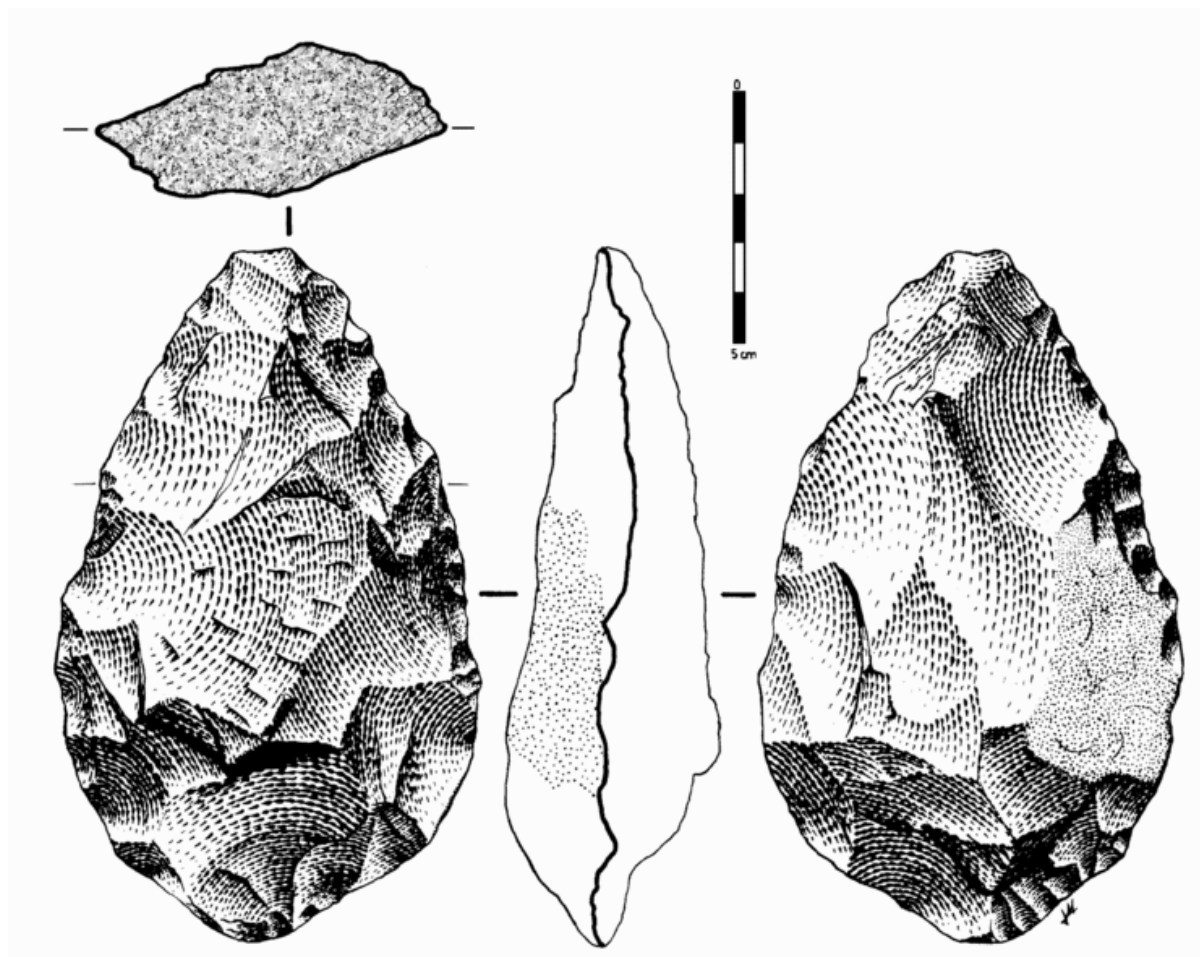


Figure 4-2: Example of Acheulean hand-axe (Benito Alvarez, 2002)

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).

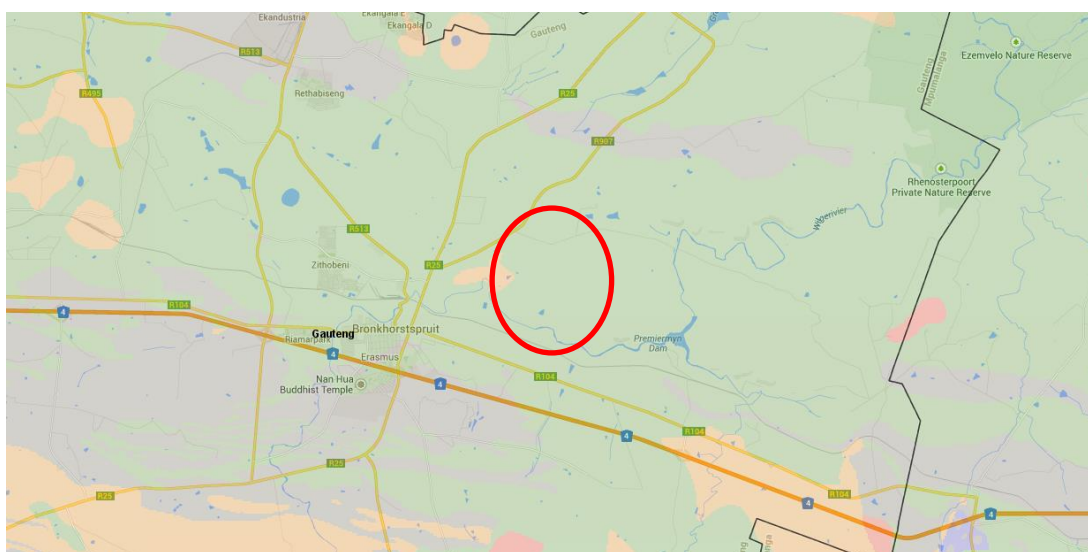


Figure 4-3: PSM of the local study area. Approximate location of project area indicated in red.

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.

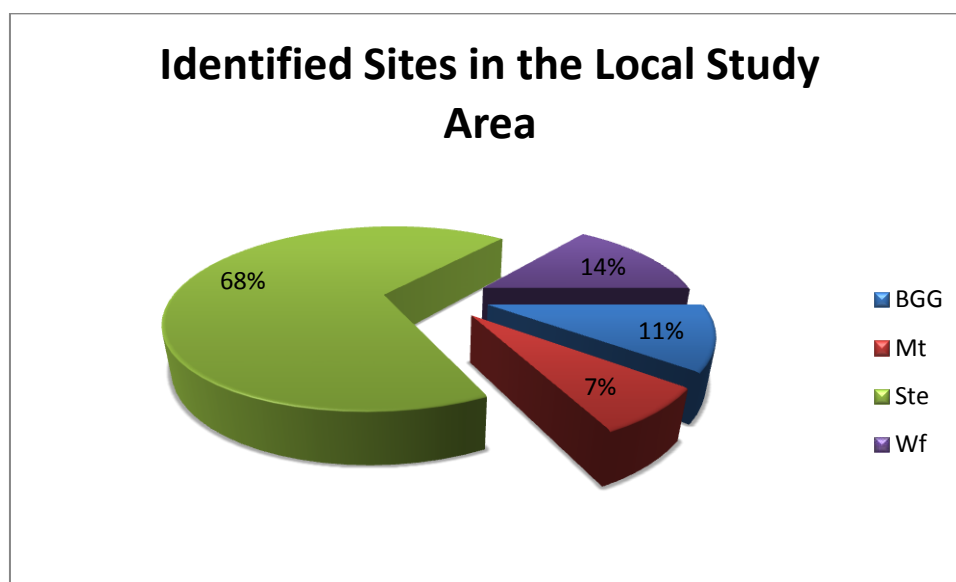


Figure 4-4: Identified sites in the local study area

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).

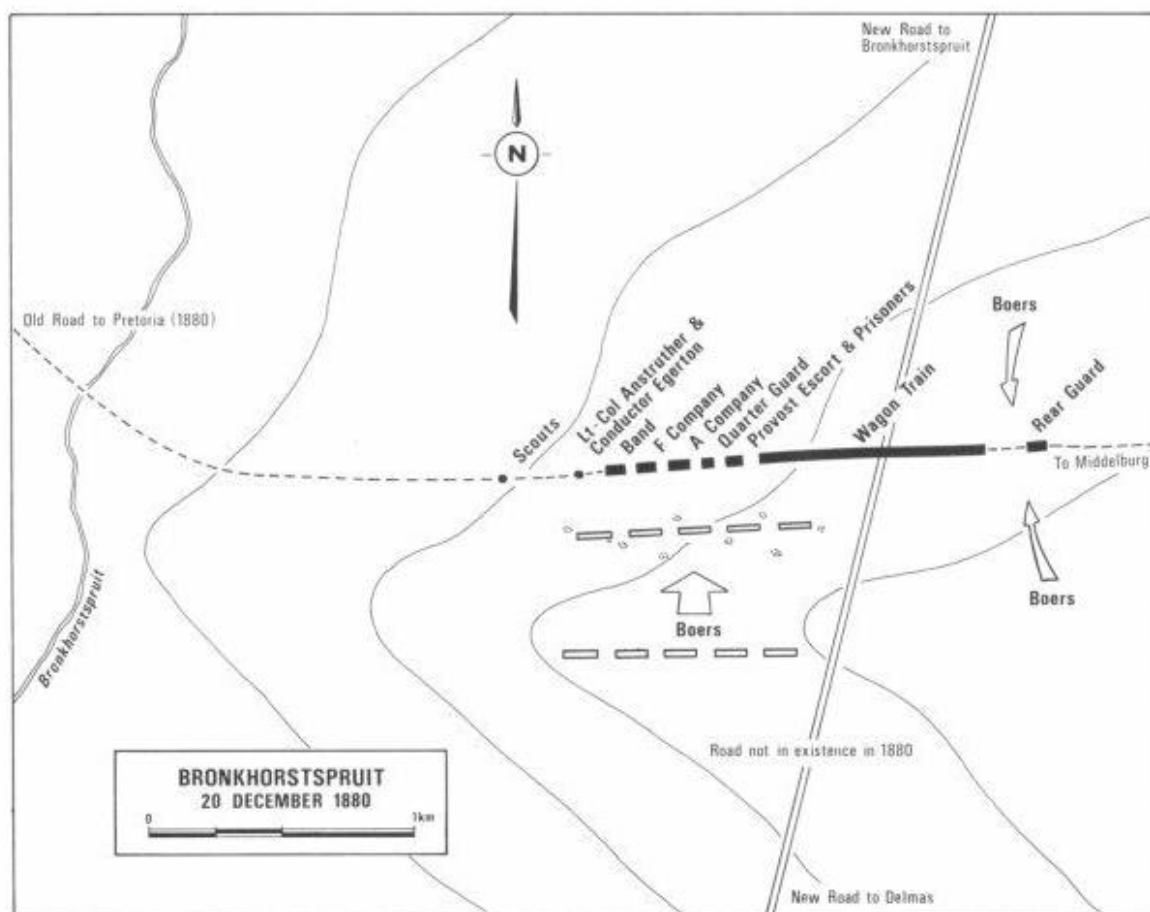


Figure 4-5: Depiction of the Battle of Bronkhorstspuit dated 20 December 1880

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).

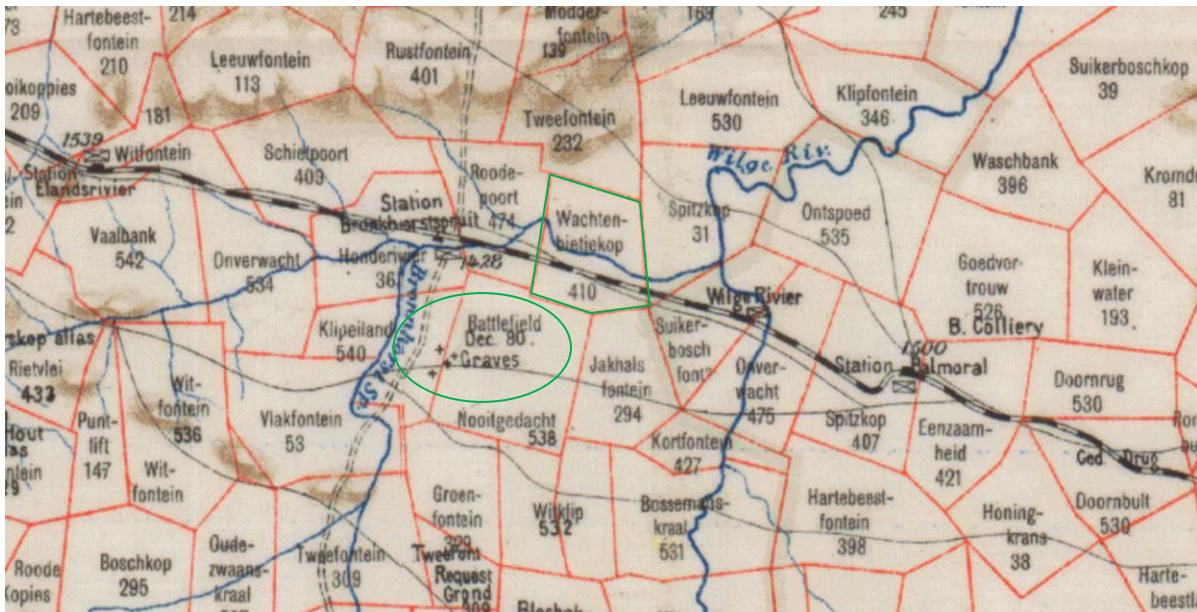


Figure 4-6: Extract from Jeppes 1899 Map of the Transvaal. The Battle of Bronkhorstspuit and associated graves indicated in green circle. Project area on Wachtenbietekop 410 demarcated in green.

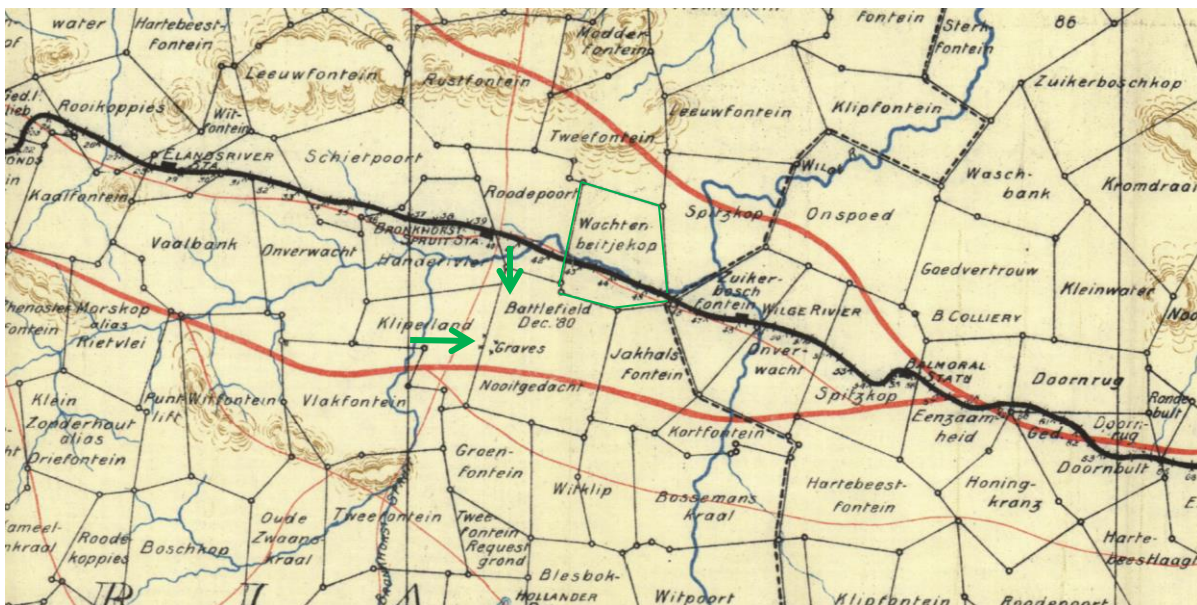


Figure 4-7: Extract from the 1900 – 1919 South Africa Imperial Map Series. Project area, Battle of Bronkhorstspuit and graves indicated in green.

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.

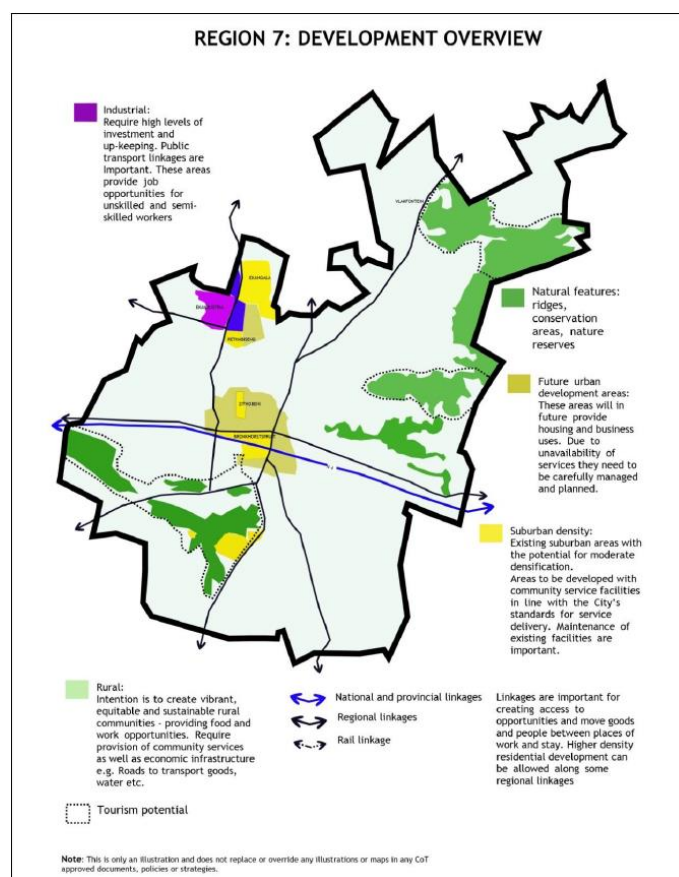


Figure 4-8: Development overview of Region 7 (City of Tshwane Metropolitan Municipality, 2014)

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).

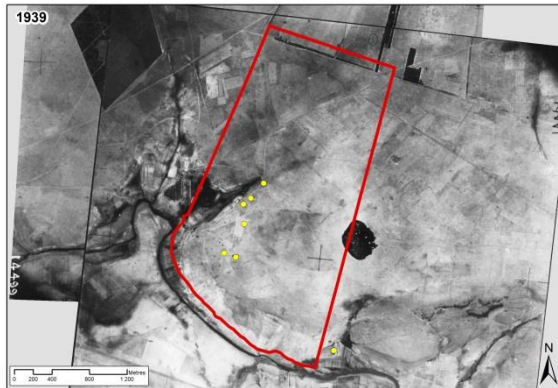


Figure 4-9: Aerial imagery dated 1939.



Figure 4-11: Aerial imagery dated 1976.



Figure 4-10: Aerial imagery dated 1961.

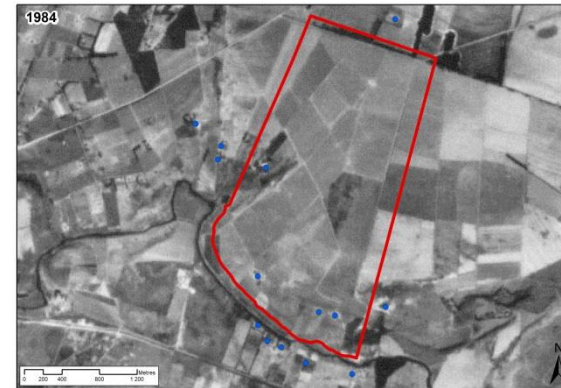


Figure 4-12: Aerial imagery dated 1984.

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.

8 Bibliography

- Anonymous, 2008. *Ezemvelo Nature Reserve: What is there to see?*. [Online] Available at: www.ezemvelo.co.za [Accessed 14 October 2014].
- Benito Álvarez, J. M., 1987. *Chopping tool*. [Art].
- Benito Alvarez, J. M., 2002. *Acheulean hand-axe*. [Art].
- City of Tshwane Metropolitan Municipality, 2011. *Integrated Development Plan 2011-2016*, Pretoria: City of Tshwane Metropolitan Municipality.
- City of Tshwane Metropolitan Municipality, 2014. *Region 7: Regional Integrated Development Plan 2014-15*, Pretoria: City of Tshwane Metropolitan Municipality.
- Deacon, H. & Deacon, J., 1999. *Human Beginnings in South Africa*. Cape Town: David Phillip.
- Delius, P. & Cope, R., 2007. Hard-fought frontiers: 1845 - 1883. In: P. Delius, ed. *Mpumalanga: History and Heritage*. Pietermaritzburg: University of KwaZulu-Natal Press, pp. 137 - 199.
- Esterhuysen, A. & Smith, J., 2007. Stories in Stone. In: P. Delius, ed. *Mapumalanga: History and Heritage*. Pietermaritzburg: University of Kwa-Zulu Natal Press, pp. 41-68.
- Goodwin, A. J. & Van Riet Lowe, C., 1929. The Stone Age Culture of South Africa. *Annals of the South African Museum*, Volume 27, pp. 1-289.
- Huffman, T. N., 1980. Ceramics, classification and Iron Age entities. *African Studies*, 39(2), pp. 123-174.
- Huffman, T. N., 2007. *Handbook to the Iron Age: The Archaeology of Pre-Colonial Farming Societies in Southern Africa*. Cape Town: University of KwaZulu-Natal Press.
- Huffman, T. N., 2007. *Handbook to the Iron Age: The Archaeology of Pre-Colonial Farming Societies in Southern Africa*. Durban: University of KwaZulu-Natal Press.
- Kitto, J., 2013. *Proposed Waste Recycling Plant Portion 1 Modderfontein 490 JR, Bronkhorstspruit, City of Tshwane Metropolitan Municipality, Gauteng Province: Heritage Impact Assessment Report*, Unpublished report: CaselD: 2702.
- Kusel, U., 2009. *Cultural Heritage Resources Impact Assessment of Remainder of Portion 4 of the Farm Roodepoort 504 JR Bronkhorstspruit Gauteng*, Unpublished report: CaselD: 2850.
- Lombard, M. et al., 2012. South African and Lesotho Stone Age Sequence Updated (I). *South African Archaeological Bulletin*, 67(195), pp. 123-144.
- Maggs, T. M., 1974. *Early farming communities of the southern Highveld: a survey of Iron Age settlement*, University of Cape Town: Unpublished PhD Thesis.

Makhura, T., 2007. Early inhabitants. In: P. Delius, ed. *Mpumalanga: History and Heritage*. Pietermaritzburg: Univeristy of KwaZulu-Natal Press, pp. 91-135.

Mitchell, P., 2002. *The Archaeology of Southern Africa*. Cambridge: Cambridge University Press.

SAHRIS, 2014. *Fossil Heritage Layer Browser*. [Online] Available at: <http://www.sahra.org.za/fossil-heritage-layer-browser> [Accessed 11 October 2014].

Schlanger, N., 2005. The history of a special relationship: prehistoric terminology and lithic technology between French and South African research traditions. In: *From Tools to Symbols: From Early Hominids to Modern Humans*. Johannesburg: Witwatersrand University Press, pp. 9-37.

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.

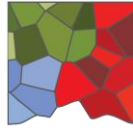
van Schalkwyk, J., 2008. *Heritage Survey Report of Portion 100 of the Farm Nooitgedacht 525 JR, Bronkhorstspuit Magisterial District*, Unpublished report: MapID: 02471.

Von der Hyde, N., 2013. *Field Guide to the Battlefields of South Africa*. 1st ed. Cape Town: Struik Travel & Heritage.

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



DIGBY WELLS
ENVIRONMENTAL



Appendix B: Plans

Oakleaf Opencast Coal Mine

Regional Setting

1:250 000

Legend

 Project Area



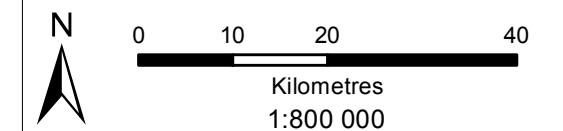
2528 Pretoria



DIGBY WELLS
ENVIRONMENTAL

• Sustainability • Service • Positive Change • Professionalism • Future Focused • Integrity

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



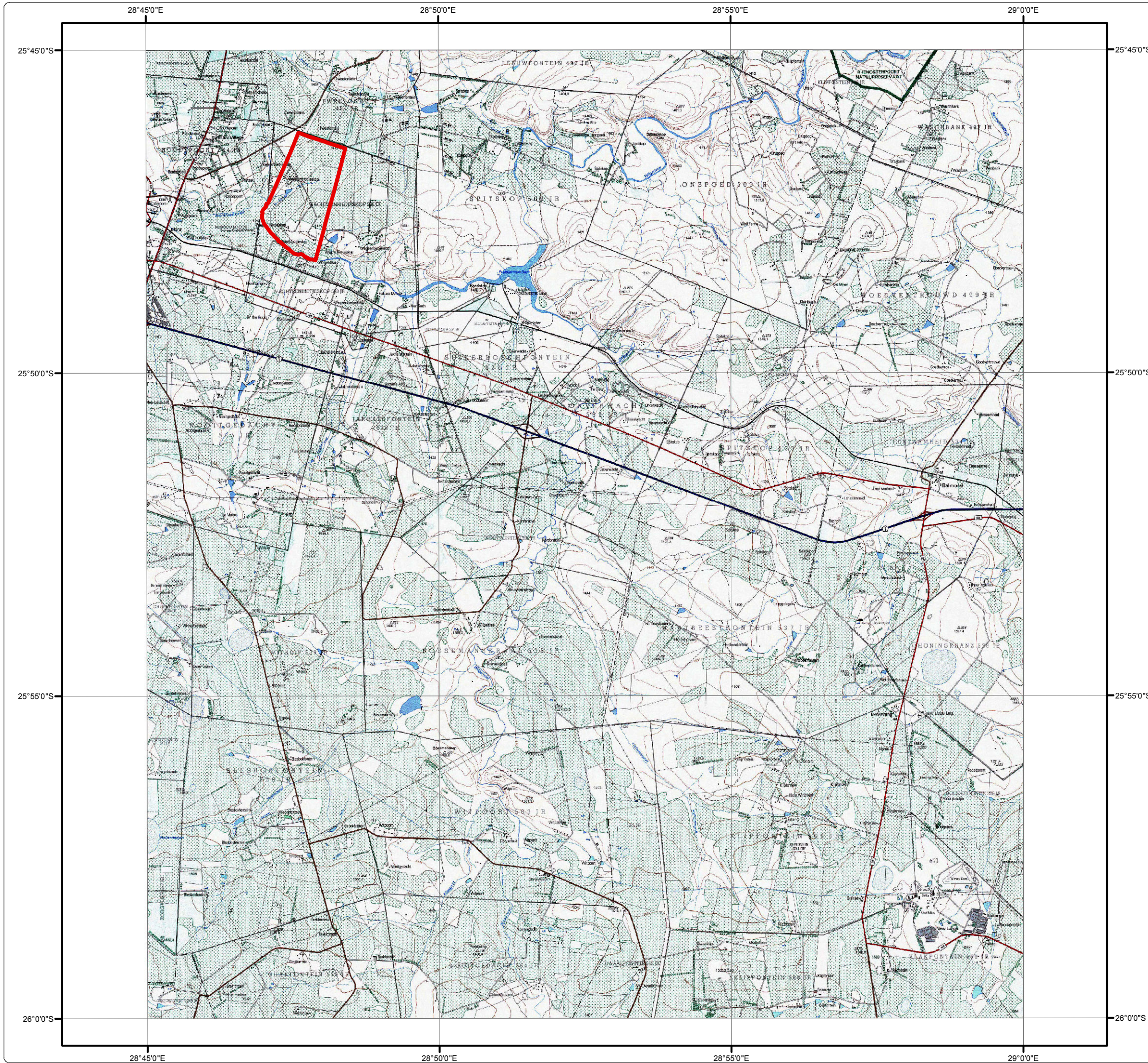
Oakleaf Opencast Coal Mine

Regional Setting

1:50 000

Legend

 Project Area



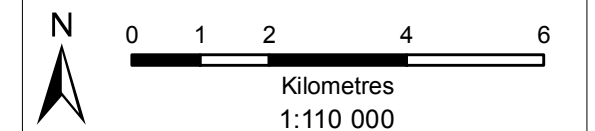
2528DD Balmoral



DIGBY WELLS
ENVIRONMENTAL

• Sustainability • Service • Positive Change • Professionalism • Future Focused • Integrity

Projection: Transverse Mercator Ref #: mpl.FOU2191.201409.151
Datum: WGS 1984 Revision Number: 1
Central Meridian: 29°E Date: 29/09/2014



Oakleaf Opencast Coal Mine

Regional Setting
1:10 000

Legend

 Project Area

2528DD



DIGBY WELLS
ENVIRONMENTAL

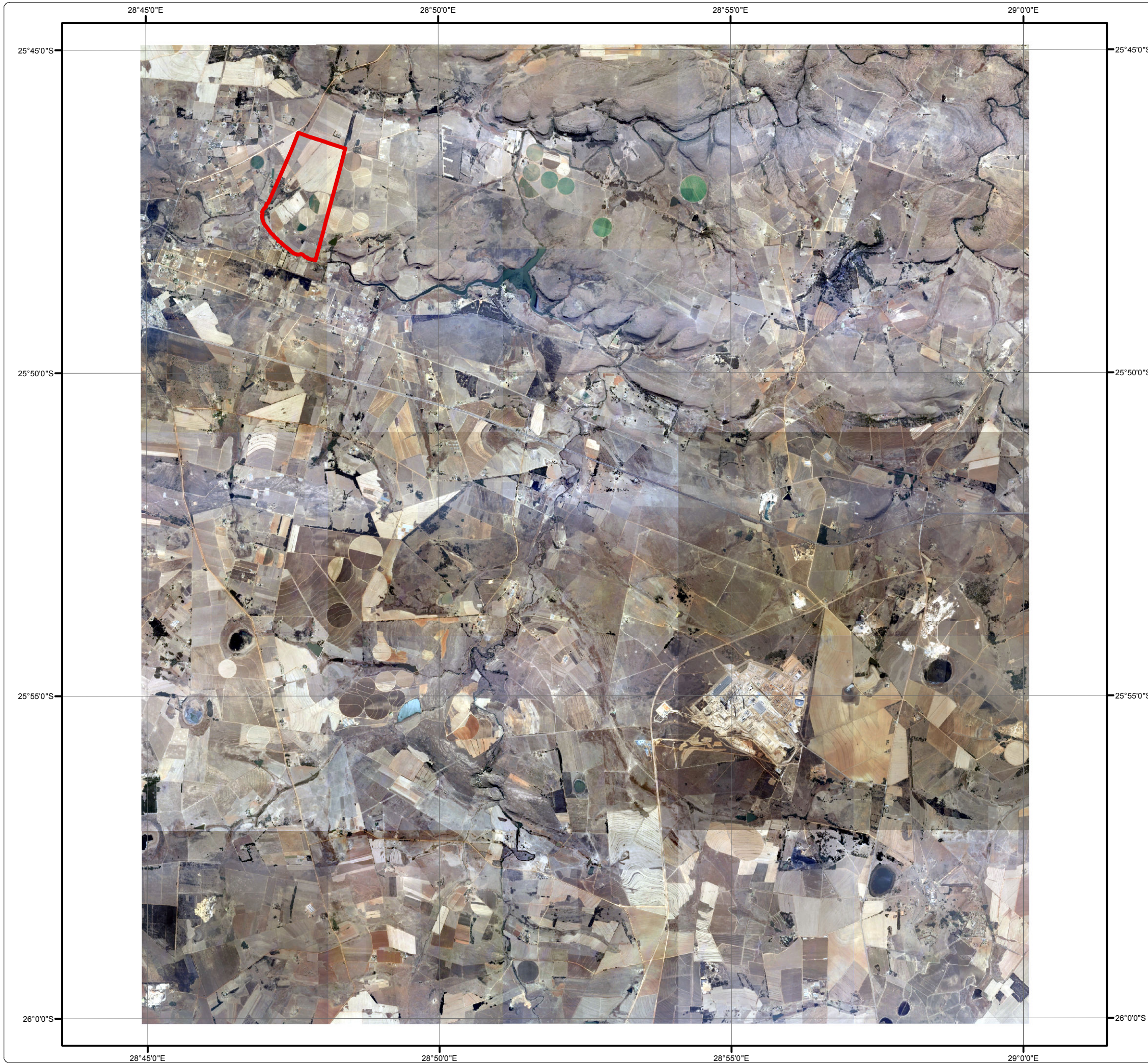
• Sustainability • Service • Positive Change • Professionalism • Future Focused • Integrity

Projection: Transverse Mercator
Datum: WGS 1984
Central Meridian: 29°E

Ref #: mpl.FOU2191.201409.152
Revision Number: 1
Date: 29/09/2014



Kilometres
1:110 000

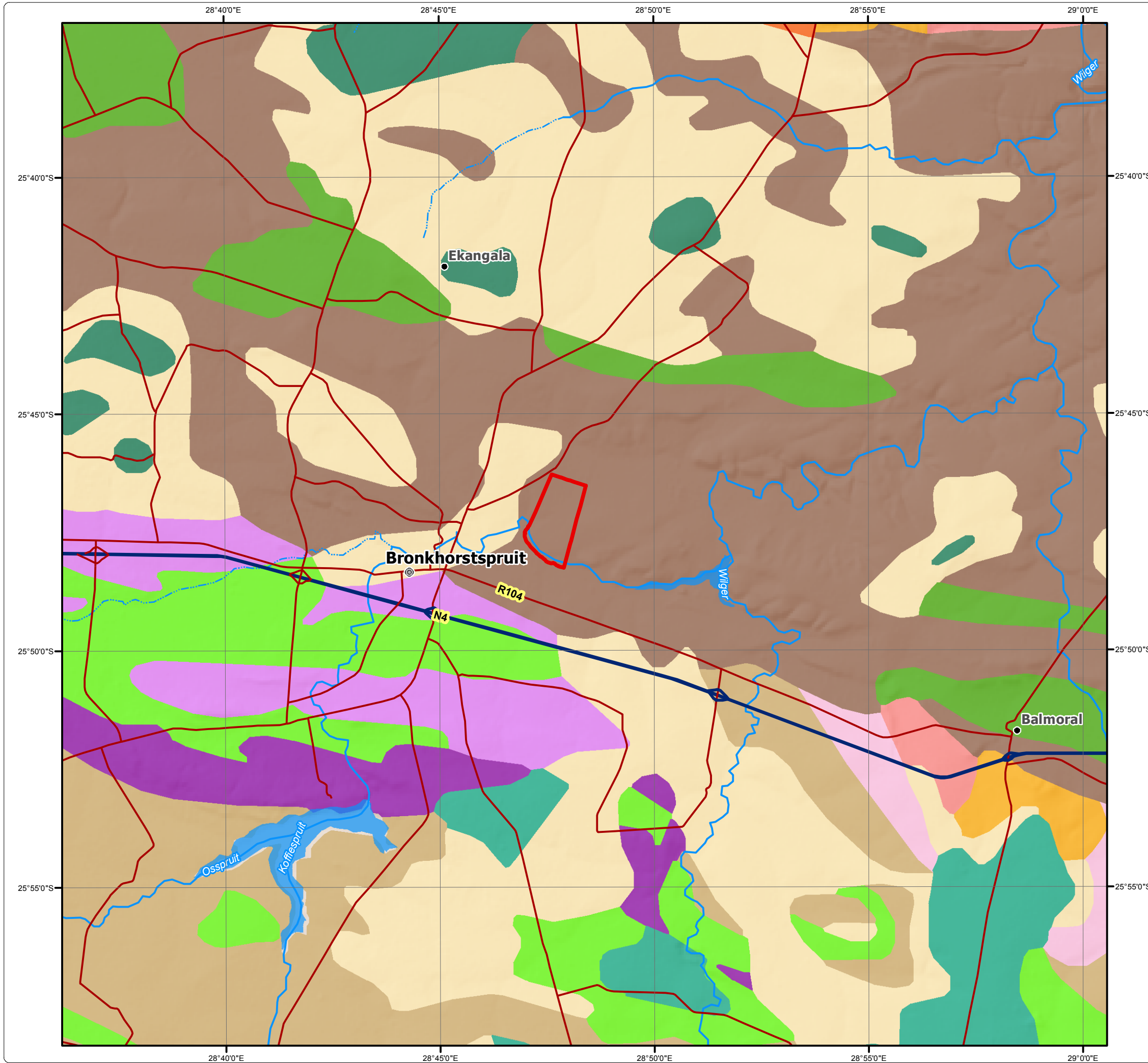


Oakleaf Opencast Coal Mine

Regional Geology

Legend

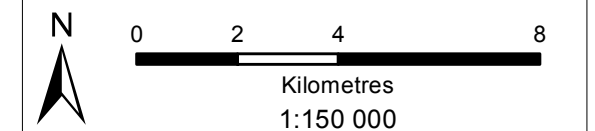
- Project Area
 - Other Town
 - Settlement
 - Main Road
 - Arterial / National Route
 - Perennial Stream
 - Non-Perennial Stream
 - Dam / Lake
- Regional Geology**
- Daspoort Fm, Pretoria Grp
 - Dwyka Grp, Karoo Spgrp
 - Ecca Grp, Karoo Spgrp
 - Lebowa Granite Sui, Bushveld Cplx
 - Loskop Fm, Transvaal 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



DIGBY WELLS
ENVIRONMENTAL

• Sustainability • Service • Positive Change • Professionalism • Future Focused • Integrity

Projection: Transverse Mercator Ref #: mpl.FOU2191.201409.153
 Datum: WGS 1984 Revision Number: 1
 Central Meridian: 29°E Date: 29/09/2014

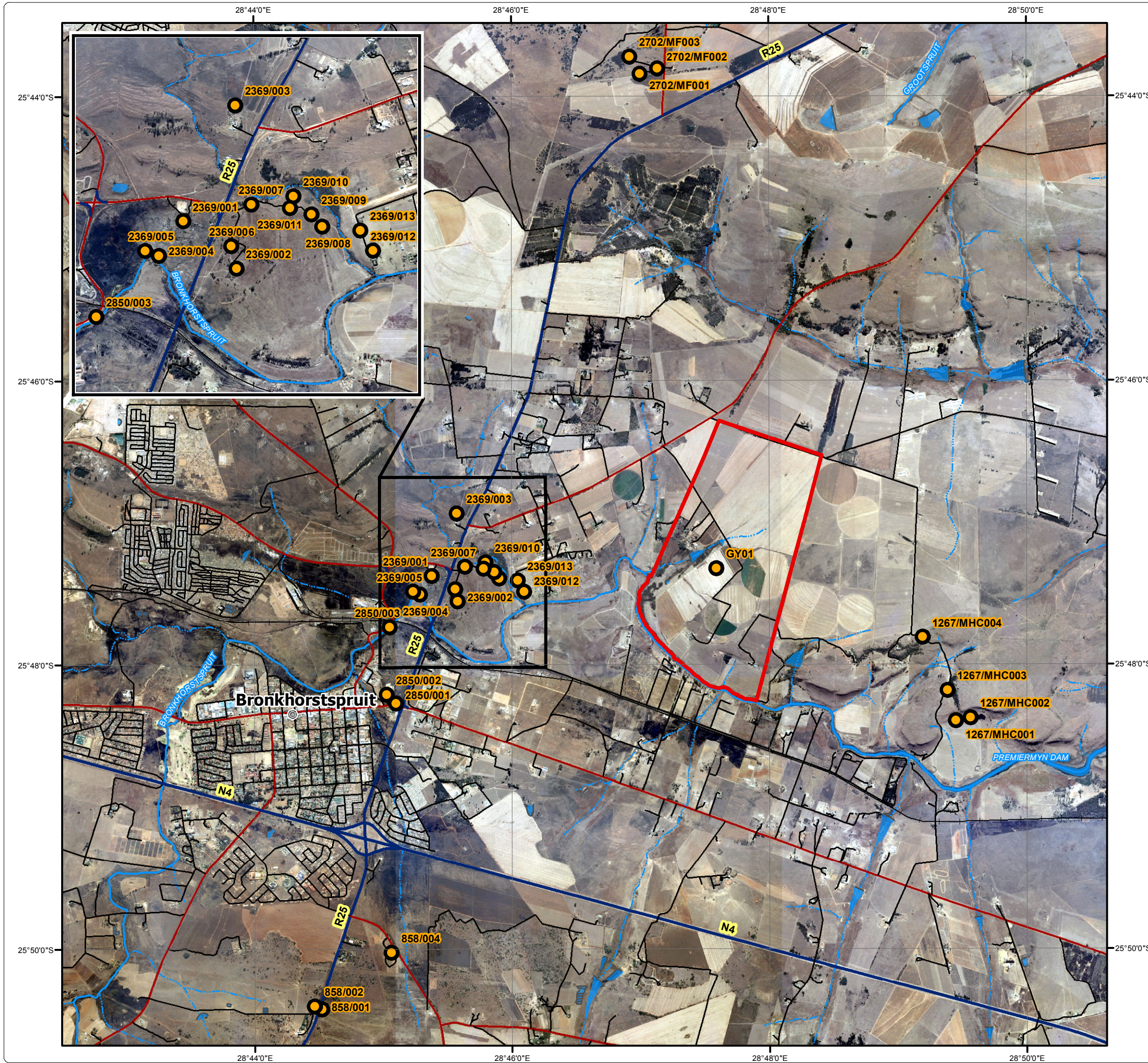


Oakleaf Opencast Coal Mine

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



• Sustainability • Service • Positive Change • Professionalism • Future Focused • Integrity

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

