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ENVIRONMENTAL

Environmental Authorisation for the Klipspruit South Project

Notification of Intent to Develop

Project Number:

BHP1591

Prepared for:

BHP Billition Energy Coal South Africa (Pty) Ltd

Digby Wells and Associates (South Africa) (Pty) Ltd
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This document has been prepared by Digby Wells Environmental.

Report Type:	**Notification of Intent to Develop**
Project Name:	**Environmental Authorisation for the Klipspruit South Project**
Project Code:	**BHP1591**

Name	Responsibility	Signature	Date
Justin du Piesanie: Heritage Consultant ASAPA Member: 270	Researcher Field Survey Report Writer		August 2014
Johan Nel: HRM Unit: Manager ASAPA Member: 95	Report Review		

Notification of Intent to Develop

Project Location

Province	Mpumalanga
Magisterial District	Witbank Magisterial District
District Municipality	Nkangala District Municipality
Local Municipality	eMalahleni Local Municipality
Nearest town	Ogies
Property	Klipfontein 3 IS Smaldeel 1 IS
1:50 000 topographical map	2629AA
Relative centre coordinates of project area	South: 26 03 40.14 East: 29 01 14.73
Recording method	ArcGIS 10.2
Rezoning requirements	None, property is currently zoned for mining

Registered Owner/s of Property/ies

Farm	Portion	Landowner	Contact Details	
Klipfontein 3 IS	1	Adam Vadma	Contact Person	Adam Vadma
			Postal Address	P. O. Box 37, Ogies
			Postal Code	2230
			Contact Details	013 643 2048 / 013 503 1334
	3	Ganbros Prop CC	Contact Person	Butie Ganie
			Postal Address	P. O. Box 5,Ogies
	36		Postal Code	2230
			E-mail	ganbros@netactive.co.za
	6	Philips Edith Wilhelmina; and	Contact Person	Mayet Salima

Farm	Portion	Landowner	Contact Details	
		Mayet Salima	Postal Address	P. O. Box 5 Ogies
			Postal Code	2230
			Contact Details	013 643 1527 / 013 643 2294
			E-mail	dworld@webmail.co.za
	7	Mayet Ahmed Fakir; Mayet Goolam Mahomed Hassan; and Mayet Fatima	Contact Person	Mayet Goolam Mahomed Hassan
			Postal Address	7894 Perseus Street, Ext 9, Lenasia
			Postal Code	1820
	8	Mayet Ahmed Fakir; Mayet Goolam Mahomed Hassan; Mayet Salojee Mahomed; Mphahlele Zuzani Soloman; and Mphahlele Elsie Mathilda	Contact Person	Mayet Goolam Mahomed Hassan
			Postal Address	7894 Perseus Street, Ext 9, Lenasia
			Postal Code	1820
	9	Teixeira Jose Silvino	Contact Details	Unknown
	11	Ivan Enslin Boerdery CC	Contact Details	Unknown
	15	Stathakis Anthony Michael	Postal Address	P. O. Box 100, Crown Mines, Newlands, Ext 2, Wapadrand
			Postal Code	2025
			Contact Details	012 807 6080 / 082 410 3661
	16	V A INV Pty Ltd	Contact Details	Unknown
	17	Companario Jose Rodrigues	Postal Address	17 Klipfontein Road, Ogies
			Postal Code	2230
	19	Ingwe Surface Holdings Ltd	Contact Details	Unknown
Smaldeel 1 IS	1			

Farm	Portion	Landowner	Contact Details	
	5			
Zondagsvlei 9 IS	RE			
Klipfontein 3 IS	30	Transnet Ltd	Contact Person	Philip De Klerk
	31			
	32			
	33		Contact Details	012 315 2021 / 011 744 9565 / 083 308 9669
Smaldeel 1 IS	6		E-mail	philip.deklerk@transnet.net
	7			
Henma 291 IR		Unknown	Contact Details	Unknown
Oggiesfontein 4 IS	43	Unknown	Contact Details	Unknown

Project / Development Details

The KPSX: South Project is a brown field's project focusing on the mining of the KPSX: South pit as part of the overall mining sequencing at BECSA's existing Klipspruit Colliery. Presently, the main pit is supplemented by coal from the neighbouring Smaldeel mini pit, which is due to be mined out. The KPSX: South pit is estimated to produce 26 million tons (Mt) of coal.

The approved EIA, EMP and Integrated Water Use Licence (IWUL) specify the KPSX: South reserve as an underground mining area, however, economic conditions now favour an opencast development for KPSX: South.

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.)
☐	a		Any linear development or barrier >300 m	
☐	b		Any bridge or similar structure >50 m	
☒	c		Any development or activity that will change the character of a site:	
	☒	i	≥5 000m^2 in extent	Intend to mine via opencast pit
	☐	ii	Involving ≥3 existing erven/ subdivisions	

	NHRA Section 38 (1) Activities / Triggers			Summary description (e.g. 500 m conveyor belt, open cast pit, etc.)
	☐	iii	Involving ≥3 or more erven/ divisions consolidated within past 5 years.	
☐	d	Rezoning of a site ≥10 000m^2 in extent.		
☒	e	Other triggers, e.g.: in terms of other legislation, (i.e.: National Environment Management Act, etc.)		MPRDA NEMA

Activities

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

GNR	Activity No (s)	Description
R 544, 18 June 2010	2	The construction of facilities or infrastructure for the storage of ore or coal that requires an atmospheric emissions license in terms of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004)
	12	The construction of facilities or infrastructure for the off-stream storage of water including dams and reservoirs, with a combined capacity of 50 000 cubic metres or more, unless such storage falls within the ambit of activity 19 of Notice 545 of 2010
	22	The construction of a road, outside urban areas, i. With a reserve wider than 13.5 metres or; ii. Where no reserve exist the road is wider than 8 metres; or iii. For which an environmental authorisation was obtained for the route determination in terms of activity 5 in GN 387 of 2006 or activity 18 in Notice 545 of 2010.
	39	The expansion of i. Canals; ii. Channels; iii. Bridges; iv. Weirs; v. Bulk storm water outlet structures; vi. Marinas; Within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, where such expansion will result in an increased development footprint but excluding where such expansion will occur behind the development setback

GNR	Activity No (s)	Description
		line.
	47	The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre – i. Where the existing reserve is wider than 13.5 metres; or ii. Where no reserve exists, where the road is wider than 8 metres.
R 545, 18 June 2010	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 R 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 the Act will apply.
	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 ha or more.
	18	The route determination of roads and design of associated physical infrastructure, including roads that have not yet been built for which routes have been determined before 3 July 2006 and which have not been authorised by a competent authority in terms of the Environmental Impacts Assessment Regulations, 2006 or 2009, made under Section 24 (5) of the Act and published in GN R 385 of 2006, - i. It is a national road as defined in Section 40 of the South African National Roads Agency Limited and National Roads Act, 1998 (Act No. 7 of 1998); ii. It is a road administered by a provincial authority; iii. The road reserve is wider than 30 metres; or iv. The road will cater for more than one lane of traffic in both directions.
	20	Any activity which requires a mining right or renewal thereof as contemplated in Sections 22 and 24 respectively of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).

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
Consenting Authority that has/will receive information	DMR
Present phase of process at Authority, e.g. Draft Scoping Report	Scoping Report

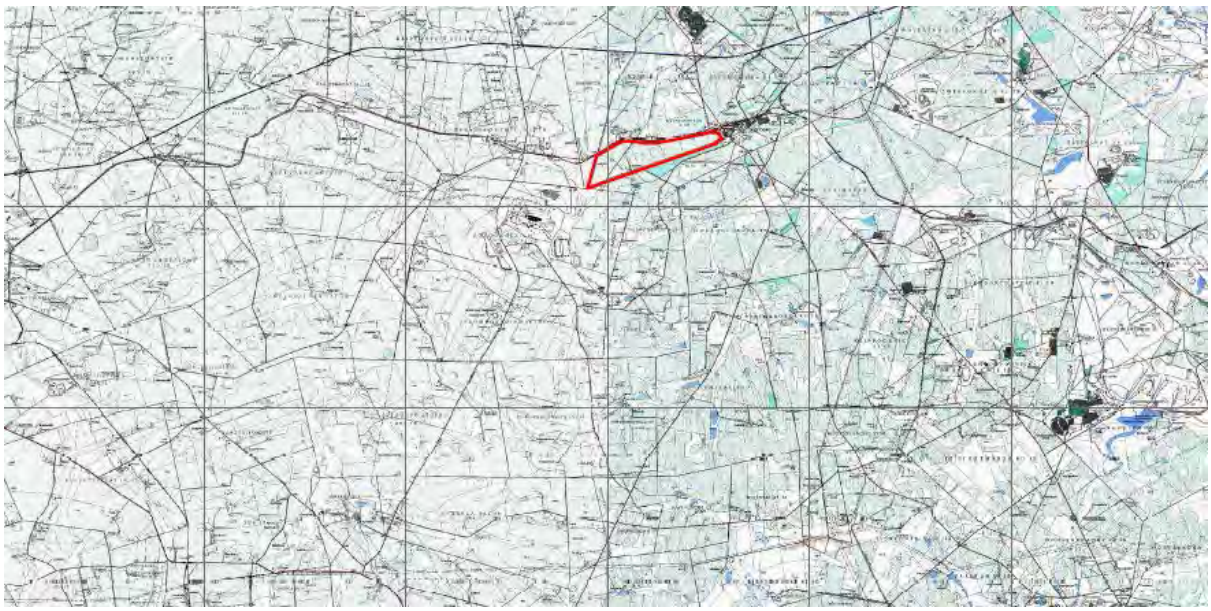
Identified / Known Heritage Resources and Potential Impacts

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

☒	**3(2)(a)**	**Places, buildings, structures and equipment of cultural significance**
		Description of resource: Farmsteads and Homesteads older than 60 years
		Potential impact: Damage and/or destruction
☐	**3(2)(b)**	**Places to which oral traditions are attached or which are associated with living heritage**
		Description of resource: None
		Potential impact: None
☐	**3(2)(c)**	**Historical settlements and townscapes**
		Description of resource: None
		Potential impact: None
☐	**3(2)(d)**	**Landscapes and natural features of cultural significance**
		Description of resource: None
		Potential impact: None
☒	**3(2)(e)**	**Geological resources of scientific or cultural importance**
		Description of resource: Vryheid Formation
		Potential impact: Damage and/or destruction
☐	**3(2)(f)**	**Archaeology and/or palaeontology *(Including archaeological sites and material, fossils, rock art, battlefields & wrecks)***
		Description of resource: None

		Potential impact: None
☒	**3(2)(g)**	**Graves and burial grounds *(eg: ancestral graves, graves of victims of conflict, historical graves & cemeteries)***
		Description of resource: Potential burial grounds affiliated with homesteads
		Potential impact: Damage and/or destruction
☐	**3(2)(a)**	**Other human remains**
		Description of resource: None
		Potential impact: None
☐	**3(2)(h)**	**Sites of significance relating to the history of slavery in South Africa**
		Description of resource: None
		Potential impact: None
☐	**3(2)(i)**	**Movable objects**
		Description of resource: None
		Potential impact: None

Illustrative Material



Recommendation

Is a Heritage Impact Assessment required?		☒ Yes	☐ No
If NO, provide motivation:			
If YES, provide suggested components that may be required or undertaken during HIA.			
☐	Archaeology	☐	Architecture
☒	Built Environment	☒	Burial Grounds and Graves
☐	Palaeontology	☐	Public Participation
☐	Townscapes	☐	Visual Impact
☐	Other:		

Based on the findings in this report, Digby Wells recommends that an HIA be completed for the BECSA KPSX: South Project. The HIA should include a field survey to identify, record, evaluate and assess the following:

- Built Environment; and
- Burial Grounds and Graves.

It is important to note that the MPRHA will be responsible to provide comment and decisions on the Built Environment, and the SAHRA Burial Grounds and Graves (BGG) Unit comment and decisions on burial grounds and graves.

Given the current state of the project area and further informed by the findings, Digby Wells is of the opinion that the HIA should be exempted from an archaeological component within the HIA.

In terms of a palaeontological component, the high sensitivity is probably due to the extensive coal deposits that are typical of the region. As a result, Digby Wells is of the opinion that a palaeontological component in the HIA is not required. However, Digby Wells does recommend that a suitably qualified palaeontologist reviews this recommendation and provide additional input.

Recommendation made by:

Name: Justin du Piesanie

Capacity: Heritage Management Consultant

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LIST OF ABBREVIATIONS AND TERMS

AIA	Archaeological Impact Assessment
BECSA	BHP Billiton Energy Coal South Africa (Pty) Limited
DEA	Department of Environmental Affairs
Digby Wells	Digby Wells Environmental
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
ELM	eMalahleni Local Municipality
EMP	Environmental Management Programme
GSSA	Genealogical Society of South Africa
HIA	Heritage Impact Assessment
HRA	Heritage Resources Authority
IDP	Integrated Development Plan
JV	Joint Venture
KPSX	Klipspruit
LIA	Late Iron Age
LoM	Life of Mine
LSA	Late Stone Age
MSA	Middle Stone Age
Mt	Million ton
Mtpa	Million ton per annum
NASA	National Archives of South Africa
NDM	Nkangala District Municipality
NEM:WA	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NID	Notification of Intent to Develop
NoK	Next-of-Kin
NWA	National Water Act, 1998 (Act No. 36 of 1998)
PCPP	Phola Coal Processing Plant
RBCT	Richards Bay Coal Terminal
RoM	Run of Mine
s.	section
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System

1 Introduction

BHP Billiton Energy Coal South Africa (Pty) Limited (BECSA) enlisted the services of Digby Wells Environmental (Digby Wells) to conduct and Environmental Impact Assessment (EIA), public consultation and specialist studies for the proposed inclusion of the Klipspruit South (KPSX: South) opencast pit and associated infrastructure into the existing authorised Klipspruit mine plan.

1.1 Terms of Reference

In order to obtain environmental authorisation for the inclusion of the KPSX: South area into the existing Klipspruit mine plan, specialist studies in support of the Minerals and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA) and National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) was required.

1.2 Scope of Work

In order to comply with the legislative requirements, a heritage study for the KPSX: South Project inclusive of a Notification of Intent to Develop (NID) for submission to the relevant Heritage Resources Authority (HRA) was required. This included:

- Review of relevant previous heritage studies in the study area;
- Conducting historical layering for the project area;
- Contextualising the study area;
- A screening survey to verify identified heritage resources and present condition of the project area;
- Reporting; and
- Providing recommendations for further heritage assessments.

2 Project Background Information

Klipspruit Colliery lies within the Springs-Witbank Coalfield and produces both high and low quality coal. It received authorisation in 2003 in terms of section 39 of the Minerals Act (Act No. 50 of 1991) (Ref: OT6/2/2/495 EM). In 2009, the existing environmental documentation with amendments was consolidated into one EIA and Environmental Management Plan Report (EMP) to meet the requirements of the MPRDA.

2.1 Project Description

The KPSX: South Project is a brown field's project focusing on the mining of the KPSX: South pit as part of the overall mining sequencing at BECSA's existing Klipspruit Colliery. Presently, the main pit is supplemented by coal from the neighbouring Smaldeel mini pit, which is due to be mined out. The KPSX: South pit is estimated to produce 26 million tons (Mt) of coal.

The approved EIA, EMP and Integrated Water Use Licence (IWUL) specify the KPSX: South reserve as an underground mining area, however, economic conditions now favour an opencast development for KPSX: South.

2.2 Relevant Contact Details

The contact details of the developer, consultant and landowners are provided in Table 2-1, Table 2-2 and Table 2-3 respectively.

Table 2-1: Client contact details

ITEM	COMPANY CONTACT DETAILS
Company	BHP Billiton Energy Coal South Africa (Pty) Limited (BECSA)
Contact person	Lindie Moore
Tel no	013 643 3843
Fax no	013 653 1458
Cell no	082 379 8139
E-mail address	lindie.moore@bhpbilliton.com
Postal address	P.O. Box 61820, Marshalltown, 2107

Table 2-2: Consultant contact details

ITEM	COMPANY CONTACT DETAILS
Company	Digby Wells Environmental
Contact person	Renee Van Aardt
Tel no	011 789 9495
Fax no	011 789 9498
Cell no	072 369 2339
E-mail address	renee.vanaardt@digbywells.com
Postal address	Private Bag X10046, Randburg, 2125

Table 2-3: Landowner contact details

Farm	Portion	Landowner	Contact Details	
Klipfontein 3 IS	1	Adam Vadma	Contact Person	Adam Vadma
			Postal Address	P. O. Box 37, Ogies
			Postal Code	2230
			Contact Details	013 643 2048 / 013 503 1334
	3	Ganbros Prop CC	Contact Person	Butie Ganie
			Postal Address	P. O. Box 5,Ogies
	36		Postal Code	2230
			E-mail	ganbros@netactive.co.za
	6	Philips Edith Wilhelmina; and Mayet Salima	Contact Person	Mayet Salima
			Postal Address	P. O. Box 5 Ogies
			Postal Code	2230
			Contact Details	013 643 1527 / 013 643 2294
			E-mail	dworld@webmail.co.za
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			Postal Address	7894 Perseus Street, Ext 9, Lenasia
			Postal Code	1820

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			Contact Details	012 807 6080 / 082 410 3661
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	19	Ingwe Surface Holdings Ltd	Contact Details	Unknown
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Zondagsvlei 9 IS	RE			
Klipfontein 3 IS	30	Transnet Ltd	Contact Person	Philip De Klerk
	31			
	32			
	33		Contact Details	012 315 2021 / 011 744 9565 / 083 308 9669
Smaldeel 1 IS	6		E-mail	philip.deklerk@transnet.net
	7			
Henma 291 IR		Unknown	Contact Details	Unknown
Oggiesfontein 4 IS	43	Unknown	Contact Details	Unknown

3 Development Context of Study Area

The KPSX: South Project is located on portions of the farms Klipfontein 3 IS and Smaldeel 1 IS within the eMalahleni Local Municipality (ELM) of the Nkangala District Municipality in Mpumalanga. Detailed geographical information is provided within Table 3-1.

Table 3-1: Location details of the project

Province	Mpumalanga
Magisterial District	Witbank Magisterial District
District Municipality	Nkangala District Municipality
Local Municipality	eMalahleni Local Municipality
Nearest town	Ogies
Property	Klipfontein 3 IS Smaldeel 1 IS
1:50 000 topographical map	2629AA
Relative centre coordinates of project area	South: 26 03 40.14 East: 29 01 14.73
Recording method	ArcGIS 10.2
Rezoning requirements	None, property is currently zoned for mining

The development and planning context within which the KPSX: South Project will operate was summarised from the following relevant sources:

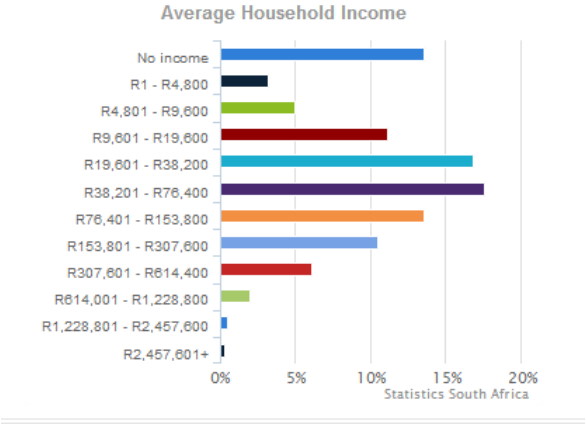
- Statistics South Africa (Statistics SA, 2011);
- eMalahleni Local Municipality Draft 2014/15 Integrated Development Plan (IDP) (eMalahleni Local Municipality, 2014); and
- Nkangala District Municipality 2013/14 IDP (Nkangala District Municipality, 2013)

Based on the 2011 census data, the ELM population stands at 395 466 with a population density of 148 persons/km^2. Of the total population, 190 662 people are considered economically active of which 27.3% are unemployed.

Economically, 13.5% of the population do not receive an income, where 36.1% receive less than R 3000.00 a month. This contributes to a dependency ratio of 40.4% for the ELM (Statistics SA, 2011).

Table 3-2: Summary of the employment status and household income of the eMalahleni Local Municipality population (Statistics SA, 2011)

Employment Status	Number
Employed	138548
Unemployed	52114
Discouraged Work Seeker	9612
Not Economically Active	81494



Income	Percentage
No income	13,5%
R1 - R4,800	3,2%
R4,801 - R9,600	5%
R9,601 - R19,600	11,1%
R19,601 - R38,200	16,8%
R38,201 - R76,4000	17,5%
R76,401 - R153,800	13,5%
R153,801 - R307,600	10,5%
R307,601 - R614,400	6,1%
R614,001 - R1,228,800	2%
R1,228,801 - R2,457,600	0,5%
R2,457,601+	0,3%

Industries leading employment growth include trade, mining and manufacturing. Comparing 2001 and 2011 statistics, indicates increased employment in the mining, construction, community services and finance sectors; trade decreased by 3% (eMalahleni Local Municipality, 2014).

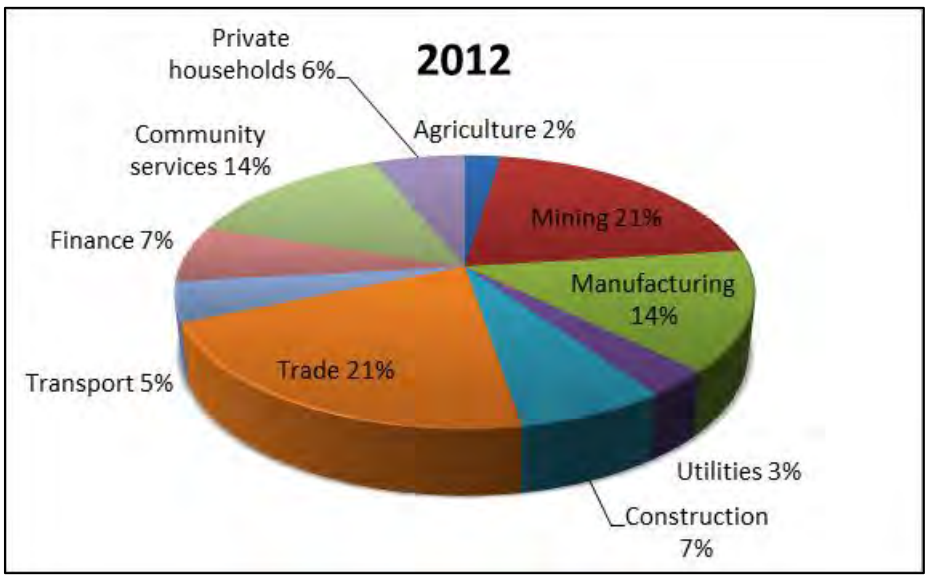


Figure 3-1: Employment sectors within the ELM (eMalahleni Local Municipality, 2014)

These dominant contributing sectors are reflected in the ELM IDP as the following key areas for economic development:

- Supporting industry to the mining sector;
- Diversification of the manufacturing sector;
- Establishing an Agriculture Development and Farmer Support Plan to stimulate the agricultural sector; and
- Facilitating the business tourism industry.

The Nkangala District Municipality (NDM) 2013/14 IDP identifies tourism growth promotion and the preservation and development of heritage sites as a “Programme of Action” within the Provincial Growth and Development Strategy (Nkangala District Municipality, 2013). Here, the primary corridors of the N4 and N12 routes present significant opportunities for economic spin-off and tourism potential, where it was noted that development opportunities in Ogies-Phola should be identified and developed (Nkangala District Municipality, 2013, p. 89). This has been done in part in the ELM IDP spatial and development plan (2014, p. 87), acknowledging the potential heritage significance in the study area.

In summary, the KPSX: South Project is located within a planning context that will increase potential development. This may present cumulative impacts on heritage resources over time. Industrialisation and emphasis on agricultural development within the municipal area also increase risk to heritage. Considering potential positive impacts, sound heritage management practices that aim to promote preservation of heritage sites could contribute to sustainable employment in the tourism and heritage sectors.

4 Legislative Framework

The NID considered a legal framework that includes the MPRDA, NEMA and National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA). The applications of these Acts are discussed below.

4.1 MPRDA

A Section 102 Amendment does not explicitly require a heritage study and therefore does not trigger a NHRA section 38(8) application (see below). However, a Section 102 Amendment does require that an existing EMP required in terms of section 39 of the MPRDA must be revised. Such revision must be made commensurate with requirements stipulated in section 22(4)(a) of the MPRDA that require the applicant to conduct an EIA and submit an EMP for approval.

The EIA must therefore be conducted in accordance with section 38 of the MPRDA that give effect to the general objectives of integrated environmental management encapsulated in Chapter 5 of the National Environmental Management Act, 1998 (Act No. 107 of 1999) (NEMA). The EIA must furthermore speak to impacts that the mining will have on the environment in accordance with section 24(7) of the NEMA.

The EIA consequently informs the EMP. Any subsequent revision of an EMP must then also consider and integrate possible management of environmental impacts on heritage resources.

4.2 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, maximizing benefits and promoting compliance with the principles of environmental management set out in section 2".

Sections 24(1)(c) and 24(7)(b) state "the potential impact on…the cultural heritage of activities that require authorisation or permission by law and which may significantly affect the environment, must be considered investigated and assessed prior to their implementation and reported to the organ of state charged by law with authorizing permitting, or otherwise allowing the implementation of an activity."

4.3 NHRA

The NID was completed in terms of section 38(8) of the NHRA where:

- Impacts on potential heritage resources must be assessed as part of the EIA required under sections 23(2)(b); 24(1)(c) and 24(7)(b) of the NEMA; and
- To give effect to the requirement that the consenting authority – in this case the Department of Minerals (DMR) – consider any comments and recommendations of the relevant HRA prior to the granting of consent.

5 Methodology

A landscape approach was adopted employing a qualitative (text-based) methodology. To provide the appropriate context for the interpretation of identified heritage resources, the connection between material culture, the cultural landscape and natural environment was required. In order to achieve this, several steps were undertaken and are outlined below.

5.1 Background Information

Background information was identified and reviewed (analysed) to obtain salient information summarised in this NID. Information sources that were consulted are summarised listed below and listed in section 9. It included text-based and cartographic sources, and database information.

5.1.1 Published Literature

Published literature that were found relevant included (full references are provided in section 9):

- Acocks, 1988;
- Bergh, 1999;
- Deacon & Deacon, 1999;
- Falconer, 1990;
- Goodwin & Van Riet Lowe, 1929;
- Lombard, et al., 2012
- Low & Rebelo, 1996
- Maggs, 1974; and
- Mucina, et al., 2006.

5.1.2 Reviewed Heritage Reports

Previously completed heritage studies 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. The following heritage cases and reports were found to be relevant:

- Birkholtz, P., 2013. *Addcar Project: Proposed Coal Mining on Sections of the Farms Blesbokfontein 31 IS, Klippoortje 32 IS, Nooitgedacht 37 IS, Blesbokfontein 38 IS, Hartebeestfontein 39 IS, Roodepoort 40 IS, Frischgewaagd 60 IS and Vierfontein 61 IS, eMalahleni Local Municipality, Mpumalanga Province*. Unpublished report (SAHRIS Case ID: 2261);
- De Jong, R.C., 2007. *Archaeological and Heritage Impact Assessment Report: Proposed New Goedgevonden Colliery Expansion Project on the Farms Goedgevonden 10 IS, Zaaiwater 11 IS and Kleinzuikerboschplaat 5 IS near Ogies, eMalahleni Local Municipality, Mpumalanga*. Unpublished report (SAHRA: 2007-SAHRA-0344);
- Fourie, W., Steyn, H.S., Birkholtz, P.D., and Salomon, A.P.R., 2000. *Phase 1 Archaeological Survey of the Impunzi Division of Duiker Mining – Witbank/Ogies Area*. Unpublished report (SAHRA: 2000-SAHRA-0057);
- Fourie, W., 2012. *ATCOM East Expansion of the Impunzi Colliery, on Portions of the Farms Steenkoolspruit 18 IS, Van Dyksdrift 19 IS and Kromfontein 30 IS, Emalahleni, Mapumalanga Province*. Unpublished report by PGS: Heritage and Grave Relocation Consultants;
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5.1.3 Databases

A review of relevant databases was completed to identify potential heritage resources within the KPSX: South project area. These included:

- The National Archives of South Africa (NASA);
- The Genealogical Society of South Africa (GSSA);
- The University of the Witwatersrand Archaeological Site Database;
- The South African Heritage Information System (SAHRIS); and
- The Artefacts Architectural Online Database.

5.1.4 Historical layering

Historical layering is a process whereby diverse cartographic sources from various time periods are layered chronologically using 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.

Historic cartographic sources reviewed in this report include:

- 1899 Jeppes Map of the Transvaal

Table 5-1: Aerial imagery reviewed in this report

Aerial photographs						
Job no.	**Flight plan**	**Photo no.**	**Map ref.**	**Area**	**Date**	**Reference**
340	2	16684 – 16690	2629	Bethal	1954	340/1954
	3	16725 - 16735				
556	7	35 – 45	2528, 2529	Bronkhorstspruit	1965	556/1965
548	1	5 – 15	2826, 2827	S of Brandfort	1967	584/1967
	2	1140 – 1150				
750	1	30 – 35	2628, 2629	Bethal	1975	750/1975
	2	75 – 85				
498/137	7	1265 – 1280	2529, 2628, 2629	Middelburg / Witbank	1979	498/137/1979
	8	1385 – 1400				
881	8	1398 – 1402	2527, 2528, 2529, 2530, 2627, 2628, 2629, 2630	Central/Eastern Tvl	1984	881/1984
	9	1187 – 1191				
952	1	220 – 230	2627, 2628, 2629	Johannesburg	1991	952/1991
	2	40 – 50				
498/337	6	695 – 705	2529, 2628, 2629	Witbank	1997	498/337/1997
	7	780 – 790				

5.2 Site Naming

For the purpose of this report, site naming employed the following conventions:

- Sites identified in previous assessments were referred to by their respective report site names and prefixed with the relevant South African Heritage Resources Agency (SAHRA) Case ID or report reference number;

- Sites identified in previous assessments without SAHRA references were referred to by their respective report site and prefixed with the report author and date;
- All newly identified sites were named using this heritage case ID, followed by the map sheet number and reference to the relevant NHRA section suffixed with the site number; and
- Reference to sites and resources that have been formally declared are made using the official gazetted names.

Sites discussed in the text of this report are summarised using only the site number, e.g. Site s.35-001.

6 Discussion

6.1 Geology and Palaeontology

The project area, including the Klipspruit reserve, lies within the greater Springs-Witbank Coalfield, comprising the coal-bearing Ecca Group of the Karoo Sequence (See Plan 4). The distribution and thickness of many of the sedimentary formations were influenced by an undulating pre-Karoo floor during deposition (van der Berg, 2009). The stratigraphic composition of the KPSX: South project area is summarised in Table 6-1.

Table 6-1: Stratigraphic composition from the KPSX: South project area

Description	Level
Overburden	UPPER
Sandy gravel	
Sandstone	
Mudstone	
Fines	
Shale (Carbonaceous)	
Coal	LOWER
Diamictite	

The diamictite deposits are overlain by rocks from the *Vryheid Formation* consisting mainly of shales alternating with coal seams (See Table 6-1). Palaeontologically[1], this formation has a high sensitivity rating (See Figure 6-1), due to the occurrence of coal beds that resulted from the accumulation of plant materials over a long period of time. Bamford (2012) suggested a model comparable to periodic flooding of marshes, which would suggest potential plant fossils may be found between the shale sequences. Vertebrates that occurred at this time are seldom preserved with the plants (Bamford, Palaeontological Impact Assessment for Majuba Underground Coal Gasification Project, Mpumalanga, 2012; SAHRIS, Fossil Heritage Layer Browser, 2014), and none have been recorded in the *Vryheid Formation*.

Plant fossils described by Bamford (2011) include; *Azanniodendron fertile. Cyclodendron leslii, sphenophyllum hammanskraalensis, Annularia sp., Raniganjia sp., Asterotheca spp, Liknopetalon enigmata, Glossopteris > 20 species, Hirsutum 4 spp., Scutm 4 spp, Ottokaria 3 spp., Estcourtia sp., Arberia 4 spp., Lidgetonnia sp., Noeggerathiopsis sp.* and *Podocarpidites sp.*

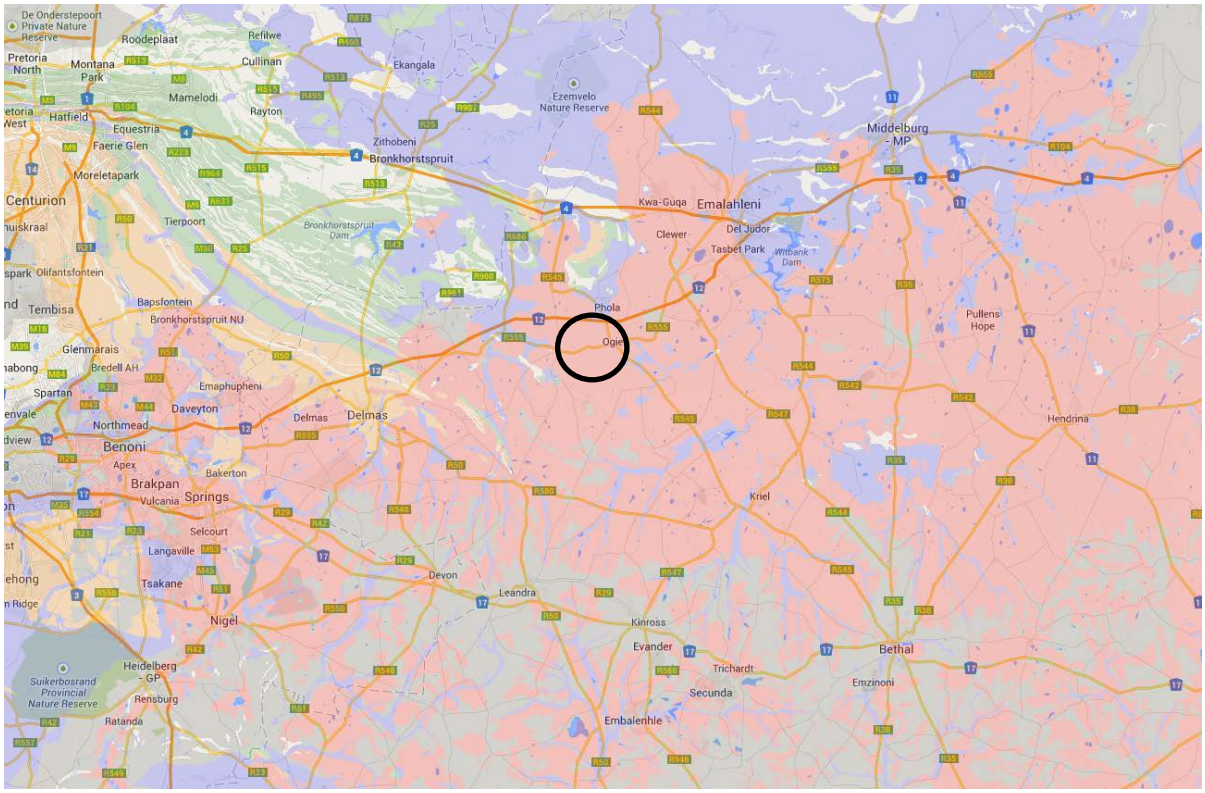

Figure 6-1: Palaeo-Sensitivity Map for the study area with project area indicated in black (SAHRIS, Fossil Heritage Layer Browser, 2014)

[1] Cf. NHRA Section 2(xxxi) ‘‘palaeontological’’ means any fossilised remains or fossil trace of animals or plants which lived in the geological past, ***other than fossil fuels or fossiliferous rock intended for industrial use***, and any site which contains such fossilised remains or trance;

6.2 Soils, Climate and Vegetation

Based on the underlying geology, soils found within the project area are represented by the Ba4 (69.83%) and Bb13 (30.17%) Land Types of the 2528 and 2628 Pretoria and East Rand Land Types. The natural fertility of this soil is low because of the high sand content influenced by the weathering of quartz rich parent material, and the natural low pH of the soil. Cultivation of these soils would require cognisance of the natural acidification process and act to neutralise it to prevent any further deterioration of the already low fertility status of the soil (Digby Wells, 2014).

The study area lies within the Grassland Biome of the high central plateau of South Africa. The grasslands are dominated by a single layer of grasses maintained largely by the combination of high summer rainfall and fires, frost and grazing (Low & Rebelo, 1996; Mucina, Rutherford, & Powrie, 2006). The KPSX: South project area specifically, is classified as Eastern Highveld Grassland according to the most recent vegetation classifications (Mucina, Rutherford, & Powrie, 2006) with a vegetation type that is predominantly sour (Acocks, 1988). This is consistent with the distribution of sour grasslands which occur in the high rainfall eastern grassland regions on relatively acidic (leached) soils of the project area.

From the summary of the geology, soils and vegetation, it is evident that sustainable grain-based agriculture in the region would have been limited in the past. The implications of this are discussed under the sections that follow.

6.3 The Historical Record

The majority of identified heritage resources are associated with the historic built environment (37%) and burial grounds and graves (56%), indicating a predominantly historical landscape, based on reviewed information source (Refer to section 5.1 and 9). As such, the discussion will mainly focus on the Historical Period.

Artefacts associated with the Middle and Late Stone Age have been identified in the study area, some 20 km from the project area (Fourie, Steyn, Birkholtz, & Salomon, 2000). Briefly, the Stone Age is associated with the manipulation of lithics to create tools. Through time, these tools become more specialised and varied. The Stone Age dates from as early as 2.5 million years ago (Early Stone Age) through to less than 150 years ago (Goodwin & Van Riet Lowe, 1929; Deacon & Deacon, 1999; Lombard, et al., 2012).

Late Iron Age (LIA) stonewalling were also identified along the Olifants River (Fourie, Steyn, Birkholtz, & Salomon, 2000). These are commonly associated with the Sotho, Swazi and Ndebele in this region of Mpumalanga, however the Eastern Highveld has not been extensively researched (Maggs, 1974).

Current understanding of the soils of the project area as discussed under section 6.2 suggest that the identification of archaeological remains associated with the Stone Age and Iron Age periods are exceptions rather than the rule. This is consistent with findings contained in heritage studies previously conducted in the region, where Stone Age and Iron

Age finds only constitute 6% of the identified heritage resources (See Figure 6-3). Of the 27 identified s.35 sites, 20 (74%) are associated with the LIA.

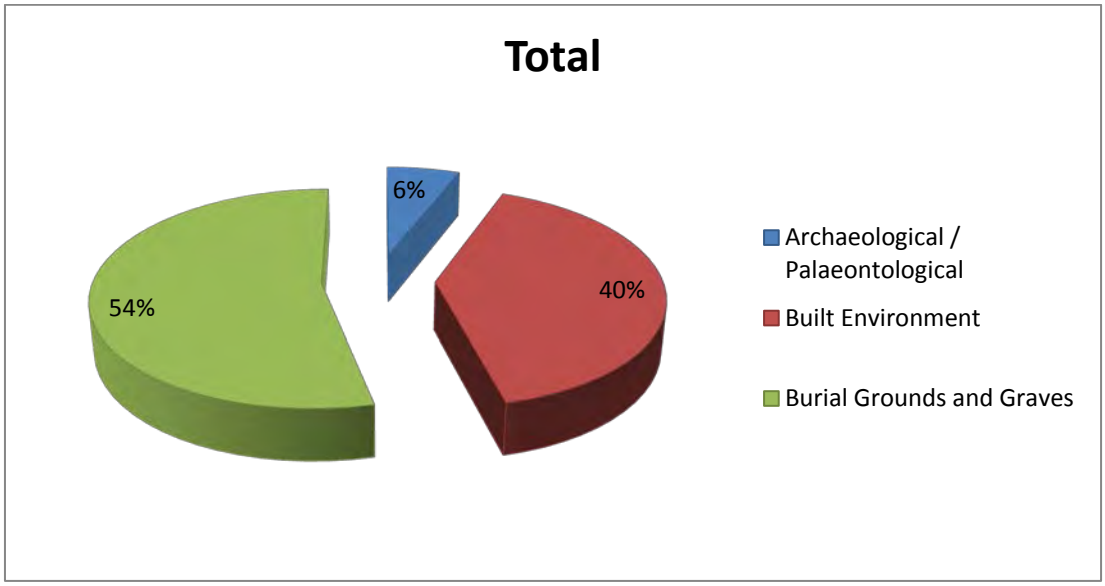

Figure 6-2: Identified heritage resources within the study area

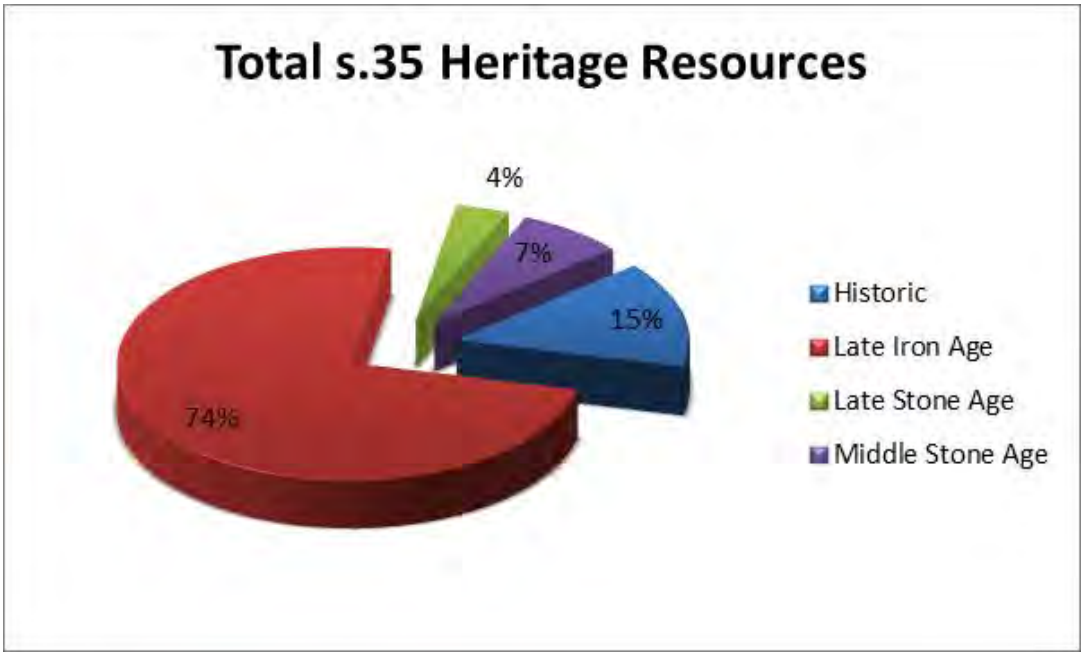

Figure 6-3: Identified s.35 heritage resources within the study area

The historical period is primarily considered as recorded history through written text. It is therefore is strongly associated with missionaries and/or European travellers. The earliest recorded date of European presence is 1836, when Robert Schoon and his party travelled to Lourenço Marques, followed closely by the Voortrekkers in 1840 (Bergh, 1999).

Coal deposits in the study area have been exploited by European settlers since the 1860s. Early coal mining was driven by other mining industries associated with, first the discovery of diamonds in Kimberley in 1867, and later with the discovery of gold on the Witwatersrand (Pistorius, 2008).

The town Ogies was established in 1885 on the farm Oogiesfontein as a direct result of the increasing coal mine industry as evident by the opening of the Steenkoolspruit Mine, Brugspruit Adit, Maggies Mine, and Douglas Mine (at Balmoral) in 1889 (Falconer, 1990). The town was established as a mining town to cater for the construction and subsequent operation of the Oogjes-Tweefontein Mine on the farm Klein Zuikerbosplaat. This mine was officially opened in 1903 (eMalahleni Local Municipality, 2014). Witbank (*today eMalahleni*) was established in 1903 as another coal mining town, mainly catering for the Neumann's Witbank Colliery. Commercial exploitation of the coal deposits were focused around present day eMalahleni (*approximately 25 km from the project area*). A railway line was constructed in 1894 to service the several collieries in the area (See Figure 6-4).

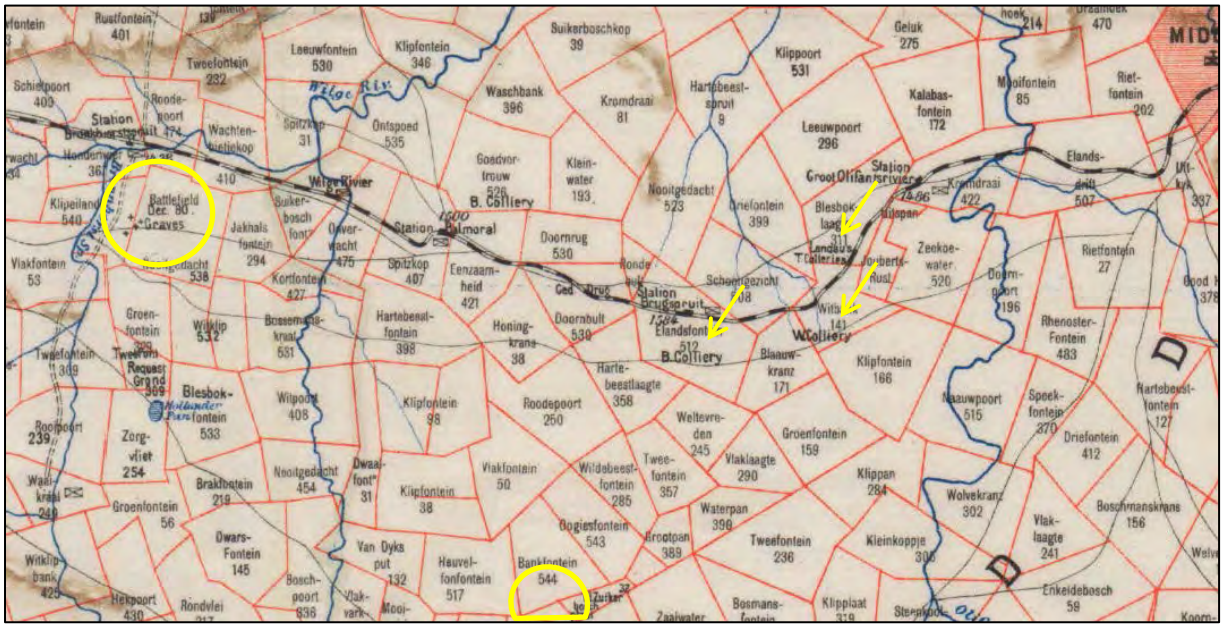

Figure 6-4: 1899 Jeppe Map with established collieries indicated. Also indicated are the locations of the Bronkhorstspruit Battle (c.1880) and the KPSX: South Project Area

As evident in the Jeppe's Map of the Transvaal (1899), the land use of study area already tended towards industrial-mining use, although the majority land use was still agricultural. The current farms on which the project is located - Klipspruit 3 IS and Smaldeel 1 IS – were originally part of Bankfontein 544 and were indicated as farmland.

Agriculture remained the primary land use in the project area for at least 50 years since the Jeppe's Map was published, indicated in a 1954 aerial imagery. The proposed footprint of the KPSX: South coal mine is in an area where, in 1954 (Figure 6-5), primarily agricultural fields with some infrastructure and development existed.

Development in the study area has been fairly limited through time. Notable exception to this is the construction of the Kendal Power Station between 1971 and 1982 (visible in Figure 6-5, less than 3 km from the project area) (eMalahleni Local Municipality, 2014), and the N12 highway to the north where aerial imagery from 1975 and 1979 clearly show the construction of this infrastructure (see Figure 6-5). Other than these developments, infrastructure has been mainly associated with homesteads on the various farms.

When one considers the changes through time, one can see an increase in the number of structures associated with the farms. There is likelihood that s.34 structures associated with the farmsteads may be present within the project area and a high likelihood that s.36 burial grounds and graves associated with those farmsteads may occur.

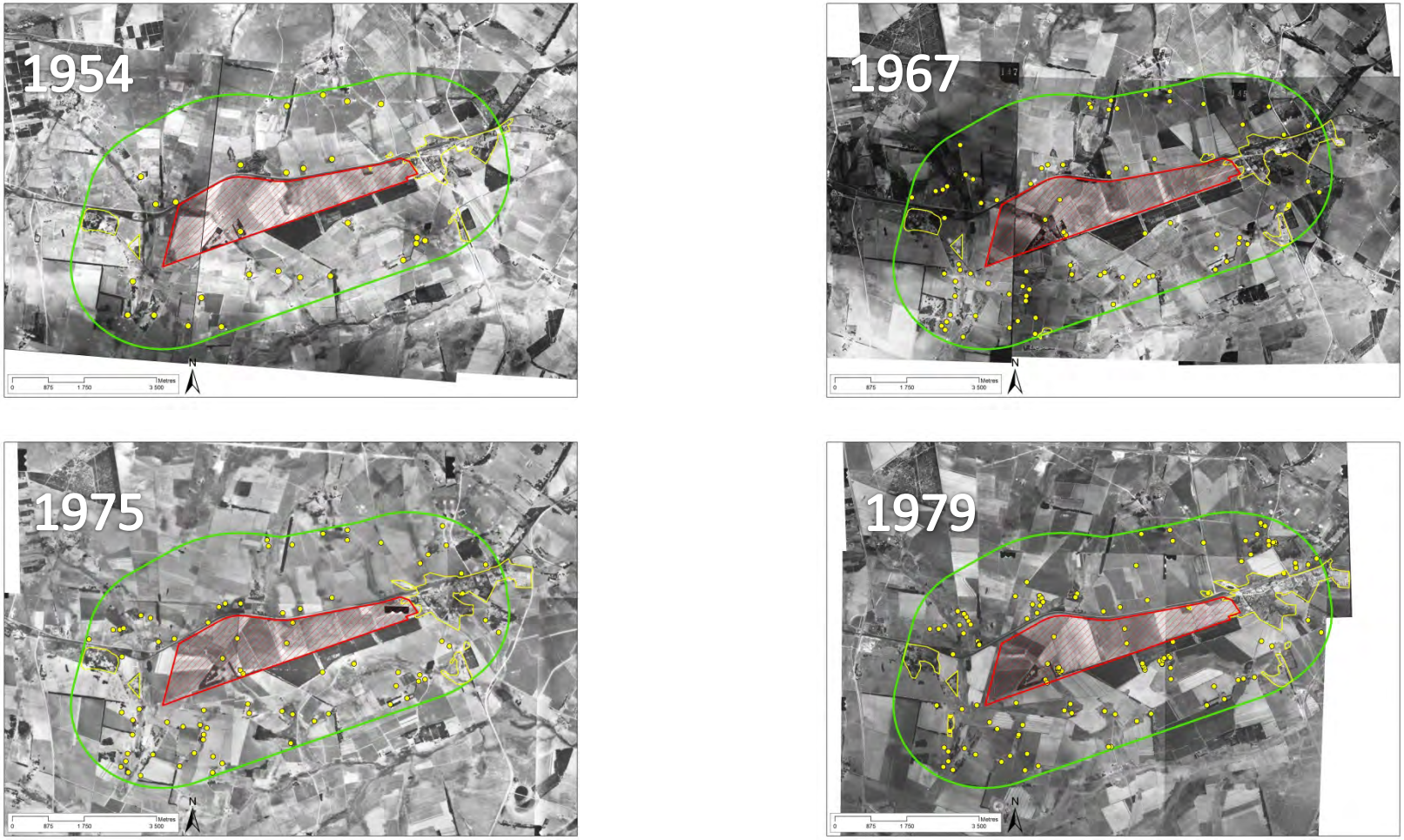

Figure 6-5: Aerial Imagery from 1954, 1967, 1975 and 1979. Project area demarcated in red, 2 km buffer in green, and visible structures in yellow

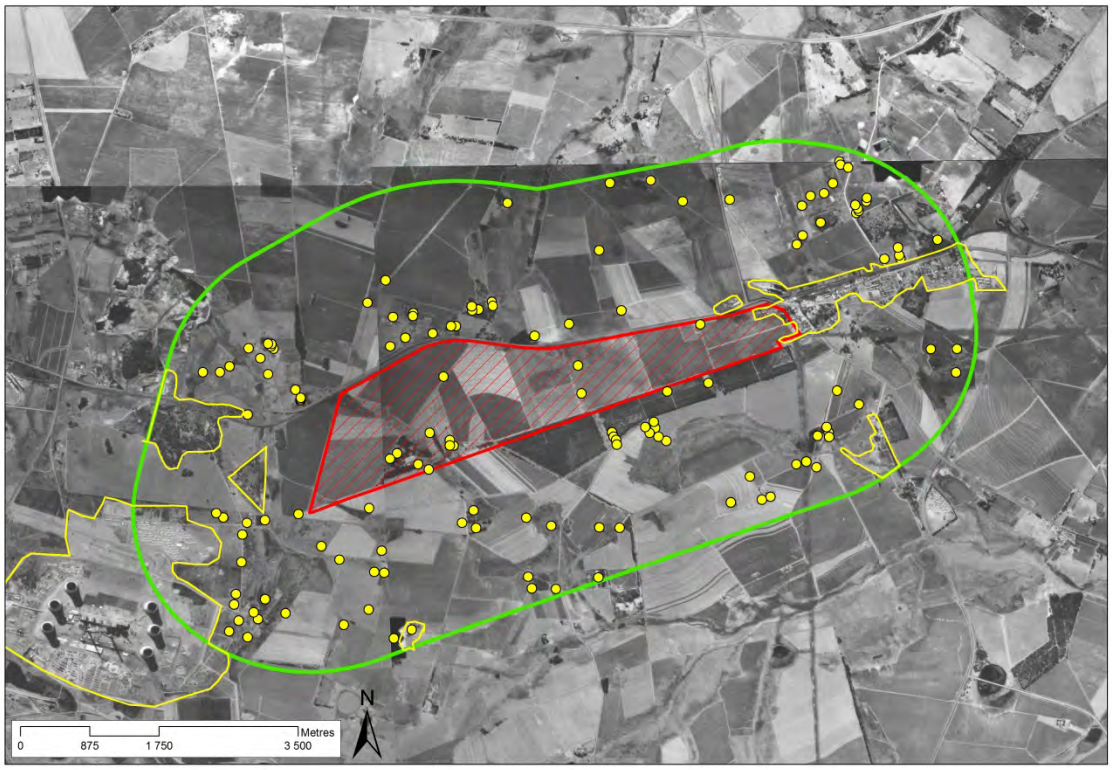

Figure 6-6: Aerial imagery of the project area dated 1991

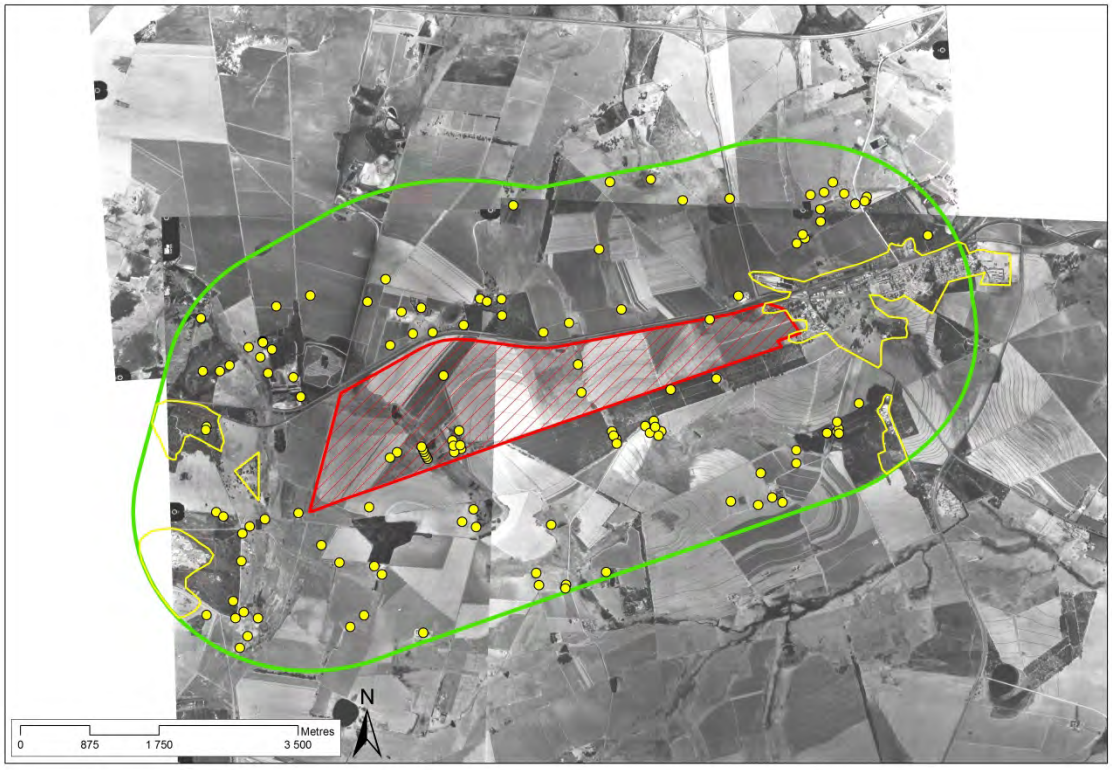

Figure 6-7: Aerial imagery of the project area dated 1997

7 Sources of Risk

Sources of risk were determined considering the potential of Listed Activities for which BHP Billiton is applying for environmental authorisation (listed in Table 7-1), to impact on heritage resources.

Table 7-1: Listed Activities for which environmental authorisation are being applied

GNR	Activity No (s)	Description
R 544, 18 June 2010	2	The construction of facilities or infrastructure for the storage of ore or coal that requires an atmospheric emissions license in terms of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004)
	12	The construction of facilities or infrastructure for the off-stream storage of water including dams and reservoirs, with a combined capacity of 50 000 cubic metres or more, unless such storage falls within the ambit of activity 19 of Notice 545 of 2010
	22	The construction of a road, outside urban areas, iv. With a reserve wider than 13.5 metres or; v. Where no reserve exist the road is wider than 8 metres; or vi. For which an environmental authorisation was obtained for the route determination in terms of activity 5 in GN 387 of 2006 or activity 18 in Notice 545 of 2010.
	39	The expansion of vii. Canals; viii. Channels; ix. Bridges; x. Weirs; xi. Bulk storm water outlet structures; xii. Marinas; Within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, where such expansion will result in an increased development footprint but excluding where such expansion will occur behind the development setback line.
	47	The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre – iii. Where the existing reserve is wider than 13.5 metres; or

GNR	Activity No (s)	Description
		iv. Where no reserve exists, where the road is wider than 8 metres.
R 545, 18 June 2010	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 R 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 the Act will apply.
	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 ha or more.
	18	The route determination of roads and design of associated physical infrastructure, including roads that have not yet been built for which routes have been determined before 3 July 2006 and which have not been authorised by a competent authority in terms of the Environmental Impacts Assessment Regulations, 2006 or 2009, made under Section 24 (5) of the Act and published in GN R 385 of 2006, - v. It is a national road as defined in Section 40 of the South African National Roads Agency Limited and National Roads Act, 1998 (Act No. 7 of 1998); vi. It is a road administered by a provincial authority; vii. The road reserve is wider than 30 metres; or viii. The road will cater for more than one lane of traffic in both directions.
	20	Any activity which requires a mining right or renewal thereof as contemplated in Sections 22 and 24 respectively of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).

7.1 Construction Phase

The highest likelihood of negative impacts on heritage resources to occur is associated with activities that will be undertaken during construction phase of the proposed projects. Here, the potential to negatively impact heritage resources, such as damage or destruction, is the greatest.

For the KPSX: South Project, activities identified as sources of risk during construction include:

- GN R 544 Activity 2 and 12; GN R 545 Activity 5: Construction of facilities and infrastructure will cause damage to or destroy any physical heritage resources that may be present in the footprint areas;
- GN R 545 Activity 15: Physical alteration of land in excess of 20 ha will change the character of the land and possible destroy *in situ* heritage resources; and
- GN R 544 Activity 22, 39, 47; GN R 545 Activity 18: The construction and/or widening of roads will cause damage to or destroy any physical heritage resources that may be present in the impact footprint.

7.2 Operational Phase

During the operation phase of the proposed project, sources of risk to heritage resources are limited. The primary risk during the operational phase will be associated with the alteration of the sense-of-place of the project area. However, as identified in previous sections, the study area is predominantly associated with a mining landscape, thus negating the intensity of this risk to heritage resources.

7.3 Decommissioning Phase

No sources of risk to heritage resources are envisaged for the decommissioning phase of the project.

7.4 Cumulative Impacts

Cumulative impacts on heritage resources have been identified in the discussion of the development context of the project under section 3. Additional cumulative impacts that may occur include:

- Enhancing of the industrial sense-of-place;
- Loss of identified heritage resources through the activities listed in Table 7-1 could decrease the significance of the landscape while increasing the significance of the remaining *in situ* heritage resources;
- Population increase through an influx of additional workers could potentially impact on tangible built environment and burial grounds and graves heritage resources in the surrounding study area, which if managed correctly in line with the development context, could be positive;

- Chance finds of palaeontological resources through extensive mining could contribute to the understanding of the palaeontological record thereby enhancing both the cultural and natural significance of the landscape;
- Loss of access to burial grounds and graves and/or intangible heritage.

8 Conclusion and Recommendations

The proposed KPSX: South Project is located directly to the west of Ogies in the Mpumalanga Province. The project is a Section 102 Amendment of the approved EMP for the Klipspruit Colliery. This NID presented a baseline of the cultural landscape and possible heritage resources to inform recommendations for heritage components that should be included a HIA, in terms of s. 38(8) of the NHRA.

The findings from a review of collected background information demonstrated that the natural environment was not conducive to sustainable Early Iron Age settlement in the past. Soil conditions indicate that the land is relatively infertile as well as acidic, which would have required concerted effort to neutralise and sustain crops. This is supported by previous studies done in the region, where only 6% of identified resources are classified as s.35. Of the s.35 heritage resources, 74% are classified as LIA. The majority of identified heritage resources relate to the historical period, with 54% being burial grounds and graves, and 40% relating to the historic built environment.

Historical settlement in the region began in the mid to late 19th century. Primarily a farming region, the commercial exploitation of coal began in support of the mining industry by 1870. As evident in Jeppe's Map of the Transvaal (1899), several collieries and the railway were well established before the start of the 20th century. This and the agricultural activity evident in the historical layering have transformed the project area extensively over time, to where the potential to identify significant archaeological resources is significantly reduced. Conversely, the potential of more historical heritage, including resources protected in terms of section 34 (structures older than 60 years) and section 36 (burial grounds and graves) of the NHRA increases. This is evident in the historical aerial imagery that clearly indicates the presence of structures within the project area from 1954. If these structures, and the potential burial grounds and graves associated with the farmsteads are still present, these will require further assessment.

8.1 Recommendations

Based on the findings in this report, Digby Wells recommends that an HIA be completed for the BECSA KPSX: South Project. The HIA should include a field survey to identify, record, evaluate and assess the following:

- A palaeontological desktop assessment to determine the real potential of significant fossils based on available geological and geochemical data. This assessment should provide further recommended mitigation and management measures;

- An assessment of the built environment including a field reconnaissance survey to identify, record, and document all structures that may exist in the project area; and
- An assessment of burial grounds and graves including a field reconnaissance survey to identify, record and document all burials that may exist in the project area.

It is important to note that the MPRHA will be responsible to provide comment and decisions on the Built Environment, and the SAHRA Burial Grounds and Graves (BGG) Unit comment and decisions on burial grounds and graves.

Given the current state of the project area and further informed by the findings, Digby Wells is of the opinion that the HIA should be exempted from an archaeological component – *Stone Age, Iron Age, and Rock Art* – within the HIA, as structures and burials older than 100 years will be addressed in the assessment of the built environment and burial grounds and graves.

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Appendix A: Curriculum Vitae

Mr. Justin du Piesanie

Heritage Management Consultant: Archaeologist

Social Sciences Department

Digby Wells Environmental

1 Education

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

2 Language Skills

Language	Written	Spoken
English	Excellent	Excellent
Afrikaans	Proficient	Good

3 Employment

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

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

4 Professional Affiliations

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

5 Publications

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

6 Experience

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

- Wits Fieldschool - Excavation at Meyersdal, Klipriviersberg Johannesburg (Late Iron Age Settlement).
- Wits Fieldschool - Phase 1 Survey of Prentjiesberg in Ugie / Maclear area, Eastern Cape.
- Wits Fieldschool – Excavation at Kudu Kopje, Mapungubwe National Park Limpopo Province.

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

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

7 Project Experience

Please see the following table for relevant project experience:

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

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

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

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

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

Appendix B: Location and Site Maps

Plan 1

KPSX South

Regional Setting
1-250 000

Legend

Project Area

2628 EAST RAND

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

Projection: Transverse Mercator	Ref #: idp.BHB1591.201404.079
Datum: WGS84	Revision Number: 1
Central Meridian: 29°E	Date: 16/04/2014

N

0 5 10 20 30

Kilometres

1:840 000

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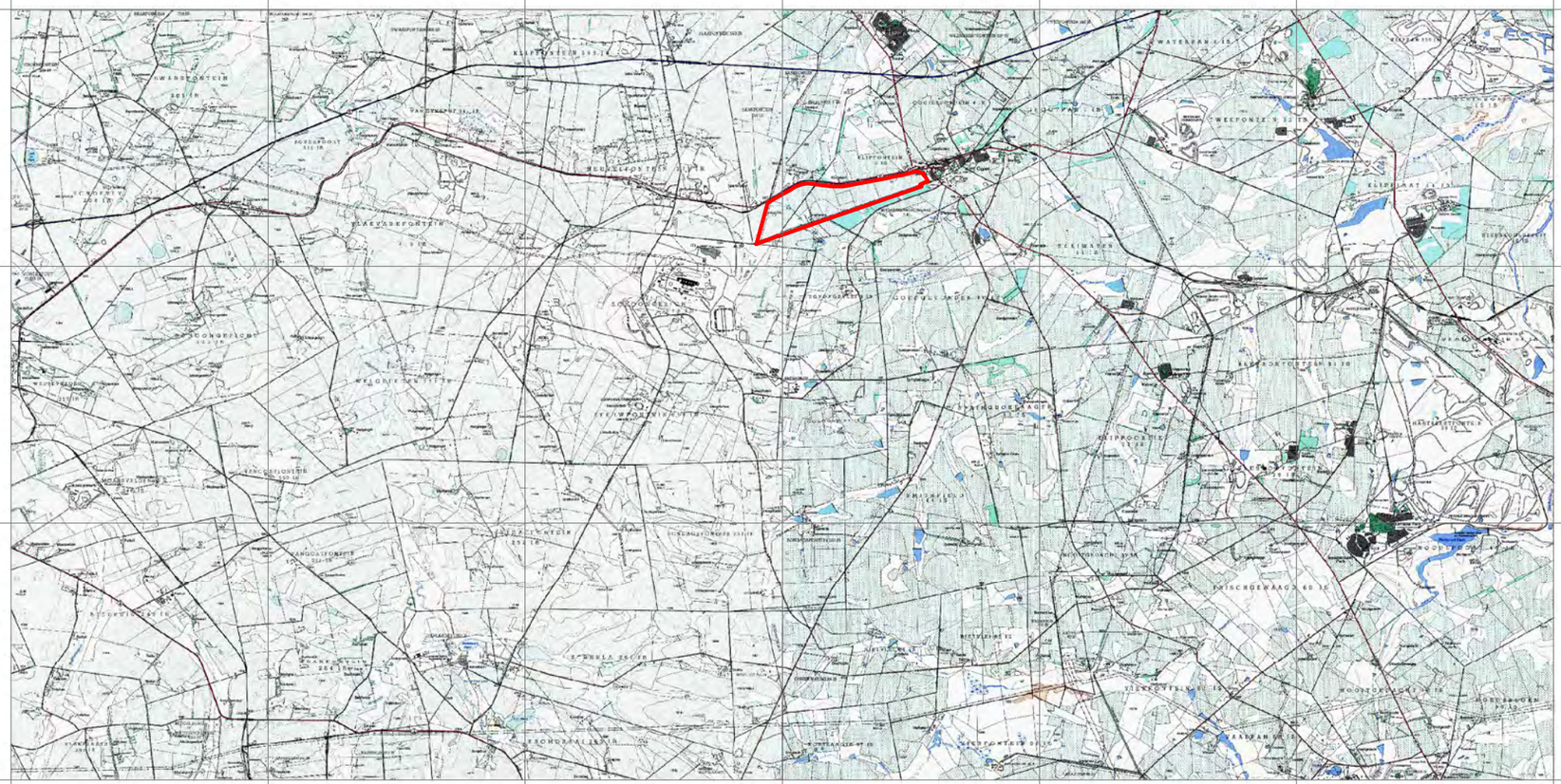
Plan 2

KPSX South

Regional Setting
1-50 000

28°45'0"E | 28°50'0"E | 28°55'0"E | 29°0'0"E | 29°5'0"E | 29°10'0"E | 29°15'0"E

25°55'0"S
26°0'0"S
26°5'0"S
26°10'0"S
26°15'0"S
26°20'0"S



Legend

Project Area

2628BB KENDAL
2629AA OGIES

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Projection: Transverse Mercator	Ref #: idp.BHB1591.201404.080
Datum: WGS84	Revision Number: 1
Central Meridian: 29°E	Date: 16/04/2014

N

0 1.75 3.5 7 10.5

Kilometres

1:210 000

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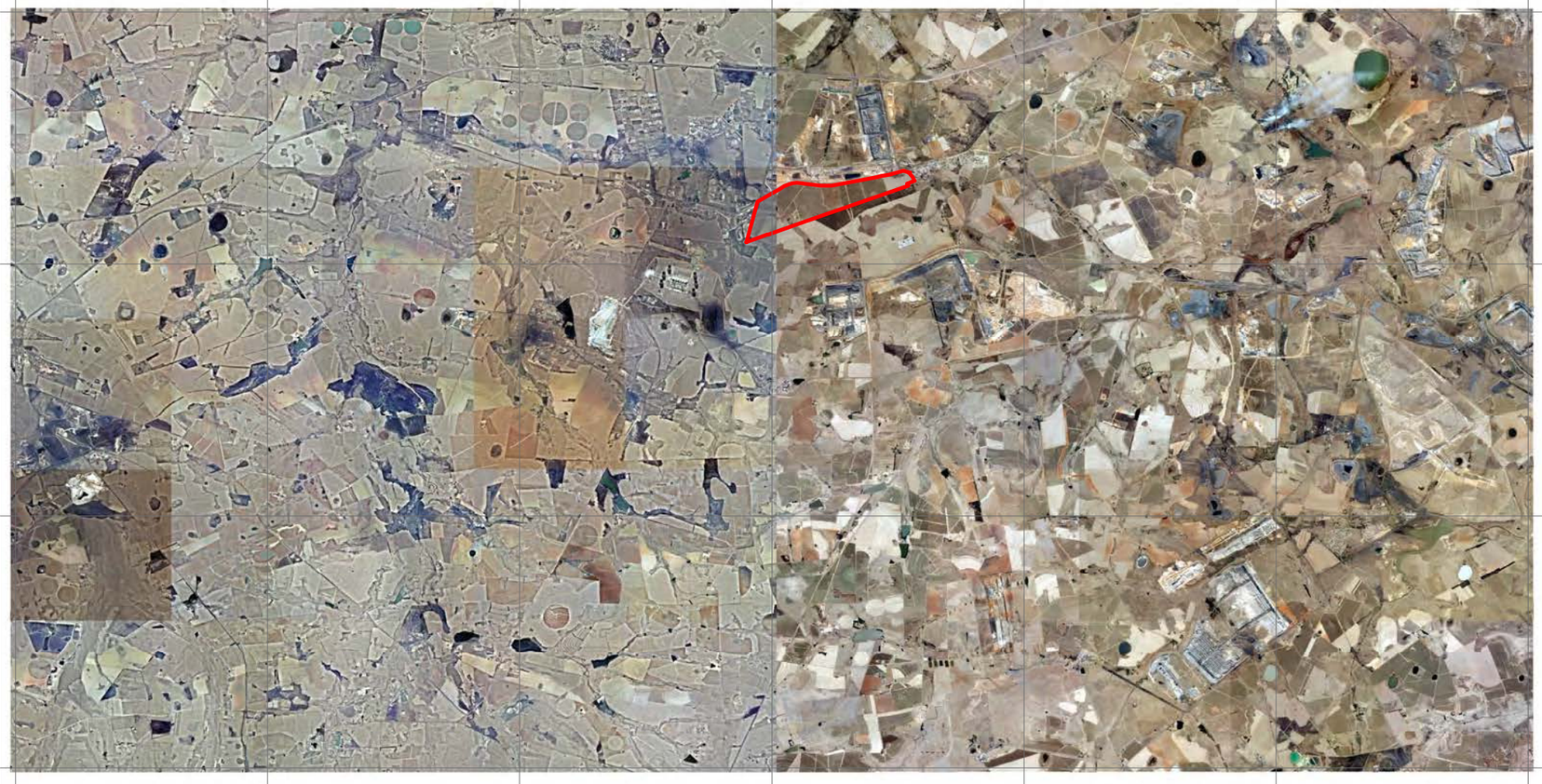
Plan 3

KPSX South

Regional Setting
1-10 000

28°45'0"E 28°50'0"E 28°55'0"E 29°0'0"E 29°5'0"E 29°10'0"E 29°15'0"E

25°55'0"S
26°0'0"S
26°5'0"S
26°10'0"S
26°15'0"S
26°20'0"S



Legend

Project Area

2628BB
2629AA

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Projection: Transverse Mercator	Ref #: idp.BHB1591.201404.081
Datum: WGS84	Revision Number: 1
Central Meridian: 29°E	Date: 16/04/2014

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Kilometres

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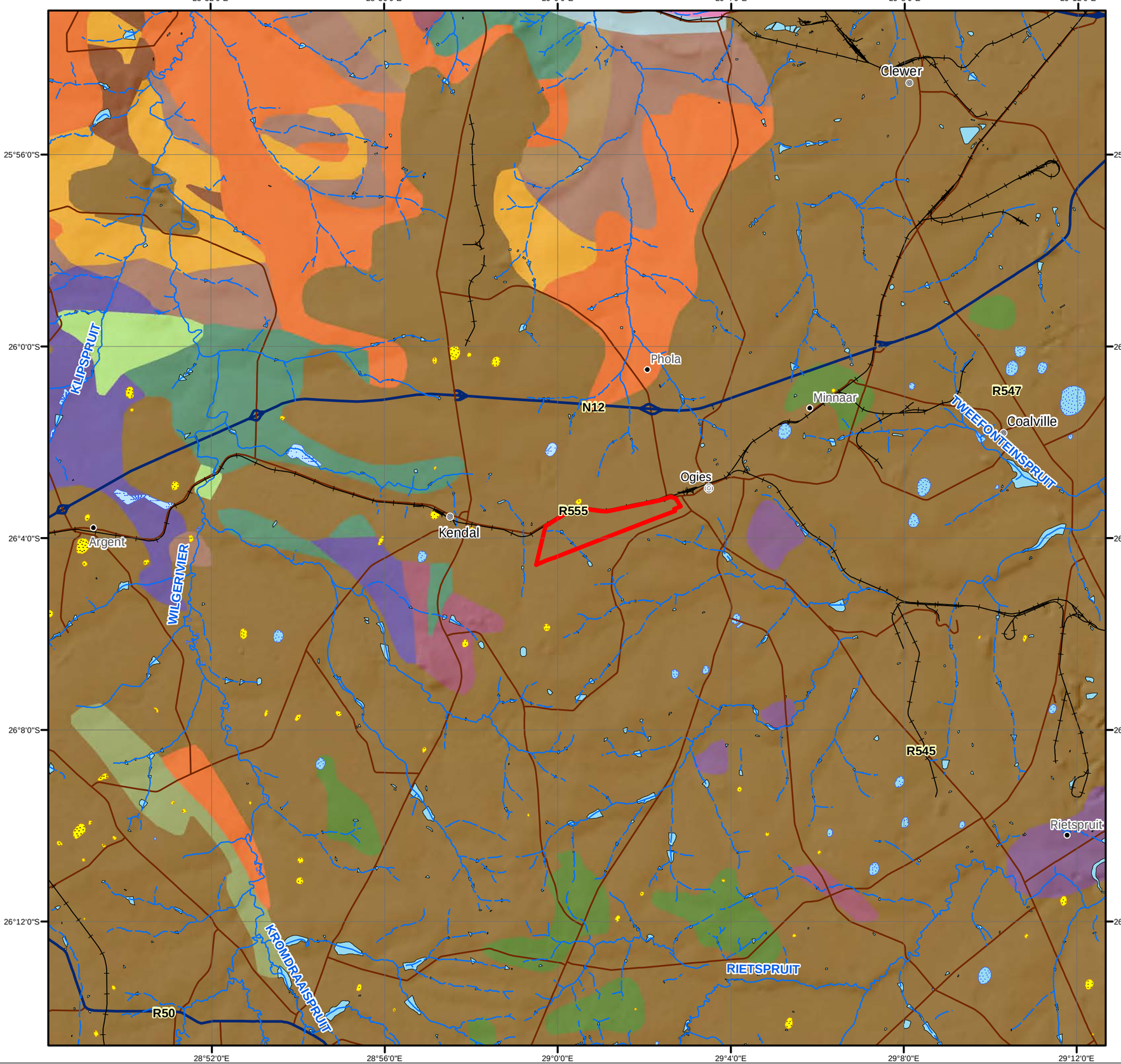
Plan 4

KPSX South

Regional Geology



Legend

- Project Area
- Secondary Town
- Other Town
- Settlement
- Arterial / National Route
- Main Road
- Railway Line
- Non-Perennial River
- Perennial River
- Perennial Pan
- Non-Perennial Pan
- Wetland
- Dam

Geology

- Daspoort Fm, Pretoria Grp
- Dwarsfontein Cplx
- Dwyka Grp, Karoo Spgrp
- Karoo Dolerite Sui
- Lebowa Granite Sui, Bushveld Cplx
- Loskop Fm, Transvaal Spgrp
- Madzaringwe Fm, Karoo Spgrp
- Magaliesberg Fm, Pretoria Grp
- Mokolian Erathem
- Pretoria Grp, Transvaal Spgrp
- Rashoop Granophyre Sui, Bushveld Cplx
- Rooiberg Grp, Transvaal Spgrp
- Silverton Fm, Pretoria Grp
- Vaalian Erathem
- Wilge River Fm, Waterberg Grp

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Date: 04/04/2014

N

0 1.5 3 6

Kilometres

1:150 000

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Plan 5a

KPSX South

Regional Heritage Resources

Legend

- Project Location
- Capital City
- Major Town
- Secondary Town
- Other Town
- National Roads
- Perennial Stream
- Dams

Historical Heritage Site

- Archaeological / Palaeontological
- Built Environment
- Burial Grounds and Graves

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Central Meridian: 29°E	Date: 04/04/2014

N

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Kilometres

1:660 000

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Plan 6a

KPSX South

Historical Layering 1954

29°0'0"E
29°2'0"E
29°4'0"E
26°2'0"S
26°4'0"S
26°6'0"S

Legend

- 1954
- 1954
- 2km Buffer
- Project Area

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Datum: WGS 1994	Revision Number: 1
Central Meridian: 29°E	Date: 10/04/2014

N

0 0.5 1 2

Kilometres

1:36 000

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Plan 6b

KPSX South

Historical Layering 1967

Legend

- 1967
- 1967
- 2km Buffer
- Project Area

28°59'0"E 29°0'0"E 29°1'0"E 29°2'0"E 29°3'0"E 29°4'0"E

26°2'0"S 26°3'0"S 26°4'0"S 26°5'0"S 26°6'0"S

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Projection: Transverse Mercator
Datum: WGS 1994
Central Meridian: 29°E

Ref #: idp.BHB1591.201404.022
Revision Number: 1
Date: 10/04/2014

N

0 0.5 1 2

Kilometres

1:36 000

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Plan 6c

KPSX South

Historical Layering 1975

Legend

- 1975
- 1975
- 2km Buffer
- Project Area

28°59'0"E 29°0'0"E 29°1'0"E 29°2'0"E 29°3'0"E 29°4'0"E

26°2'0"S 26°3'0"S 26°4'0"S 26°5'0"S 26°6'0"S

DIGBY WELLS ENVIRONMENTAL

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

Projection: Transverse Mercator
Datum: WGS 1994
Central Meridian: 29°E

Ref #: idp.BHB1591.201404.022
Revision Number: 1
Date: 10/04/2014

N

0 0.5 1 2

Kilometres

1:36 000

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Plan 6d

KPSX South

Historical Layering 1979

Legend

- 1979
- 1979
- 2km Buffer
- Project Area

28°59'0"E 29°0'0"E 29°1'0"E 29°2'0"E 29°3'0"E 29°4'0"E

26°2'0"S 26°3'0"S 26°4'0"S 26°5'0"S 26°6'0"S

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

Projection: Transverse Mercator	Ref #: idp.BHB1591.201404.022
Datum: WGS 1994	Revision Number: 1
Central Meridian: 29°E	Date: 10/04/2014

N

0 0.5 1 2

Kilometres

1:36 000

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Plan 6e

KPSX South

Historical Layering 1991

Legend

- 1991
- 1991
- 2km Buffer
- Project Area

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Projection: Transverse Mercator	Ref #: idp.BHB1591.201404.022
Datum: WGS 1994	Revision Number: 1
Central Meridian: 29°E	Date: 10/04/2014

N

0 0.5 1 2

Kilometres

1:36 000

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Plan 6f

KPSX South

Historical Layering 1997

28°59'0"E 29°0'0"E 29°1'0"E 29°2'0"E 29°3'0"E 29°4'0"E

26°2'0"S 26°3'0"S 26°4'0"S 26°5'0"S 26°6'0"S

Legend

- 1997
- 1997
- 2km Buffer
- Project Area

DIGBY WELLS ENVIRONMENTAL

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

Projection: Transverse Mercator	Ref #: idp.BHB1591.201404.022
Datum: WGS 1994	Revision Number: 1
Central Meridian: 29°E	Date: 10/04/2014

N

0 0.5 1 2

Kilometres

1:36 000