

TO:	Mellerson Pillay	DATE:	17 January 2014
FROM:	Justin du Piesanie	JOB NO:	AEC2588
RE:	HERITAGE INPUT TO THE AMD EASTERN BASIN FATAL FLAW ASSESSMENT		

1 INTRODUCTION

AECOM South Africa (Pty) Ltd (AECOM) has been appointed by the Trans-Caledon Tunnel Authority (TCTA) as the Principal Consultant in respect to the implementation of the Short Term Intervention (STI) measures for a sludge disposal facility and associated pipeline within the Eastern Basin of the Witwatersrand Gold Fields. Digby Wells Environmental (Digby Wells) has been appointed by AECOM as the Environmental Consultants to undertake a site screening and fatal flaw assessment (Phase 1 of the project) for the STI measures. The purpose of Phase 1 will serve to ensure that environmental and social consideration is given during the site selection process for the proposed sludge disposal facility and associated pipeline. Upon completion of Phase 1, Digby Wells will commence with the environmental authorisation process (Phase 2) for the construction of the sludge disposal facility associated with the treatment of AMD in the Eastern Basin of the Witwatersrand.

At this time, an assessment of the pipeline cannot be completed as the proposed route is a technical decision that must be completed by the project engineers based on the location of the sludge storage facility. An assessment of the proposed route of the pipeline must be incorporated during the environmental authorisation process.

This memo serves as the heritage specialist input of the fatal flaw assessment of the sludge storage facility.

2 PROJECT DESCRIPTION

This proposed project is limited to the consideration of the sludge disposal site for STI measures required for the management of AMD within the Eastern Basin of the Witwatersrand. Although the scope of this project is limited to the STI for the Eastern Basin, consideration will be given to the land requirements for the disposal of sludge and brine associated with the Long Term Intervention (LTI) measures. The STI and LTI require a total of 60 hectares of land. In doing so, the sites considered for the STI will consider the LTI requirements through the identification of feasible sites that can accommodate the development footprint. Consideration and consolidation of the planning for the STI and LTI is a preferred approach to this study.

2.1 Short Term Intervention Measures for the Eastern Basin

The proposed Eastern Basin AMD STI water treatment plant will be situated at the Grootvlei Mine Shaft No. 3 about 4,6km due east of the Springs Central Business District (CBD) (refer to Figure 2-1). The site is accessible via the R29 Ermelo Road and Grootvaly Road through the suburb of Casseldale. The activities associated with the STI measures will include:

- Abstraction of AMD via installed pumps in Grootvlei No. 3 shaft at a pump depth to achieve the ECL level outlined above;
- Construction of a new High Density Sludge (HDS) treatment plant adjacent to the Grootvlei No. 3 shaft;
- Construction of a waste sludge pipeline to link the proposed HDS plant to the preferred sludge disposal site; and
- Construction of a treated water pipeline to a suitable discharge point along the Blesbokspruit.

In light of the exemption received by the Department of Environmental Affairs in January 2013 (refer to Section 2 above), the scope of this Project is limited to the construction of the sludge disposal site and associated sludge pipeline. The remainder of the project scope has been approved in terms of the previous exemption issued.

Initially, four sites for the proposed sludge disposal facility were identified from a technical and financial perspective. To ensure environmental consideration into the site selection process for the proposed sludge disposal facility, Digby Wells have identified an additional five sites, mainly characterised as existing tailings facilities. A site screening process will be undertaken of all nine (9) sites, to identify any potential sensitivities or fatal flaws, in order to identify a preferred site (s) for detailed impact assessment.

As part of Phase 1, the screening and fatal flaw assessment will entail the following:

- Obtaining and reviewing all available information for the proposed project;
- Understanding and researching potential fatal flaws at each of the proposed sludge disposal sites in the Eastern Basin;
- Undertaking a legal review for the proposed sites, in terms of national legislation, that must be complied with;
- Undertaking a comparative assessment of the identified sites considering environmental, heritage and social criteria, to identify a preferred site (s); and
- Engagement with Key Stakeholders such as Non-Government Organisations (NGOs) and land owners;
- Compile the fatal flaw analysis and site selection report.

During the fatal flaw analysis, the Digby Wells specialists will undertake high level baseline studies of the proposed sludge disposal site options. This suggested approach would screen out site options, based on sensitivities and potential fatal flaws identified on each site, and will result in the identification of either one or two site options for detailed impact assessment during the Scoping and EIA stage of the project (Phase 2). The intent is to ensure that site

options which are environmentally, socially, technically and financially viable are taken forward to the detailed impact assessment and decision making phases of the project. A map of the site currently under consideration is attached for ease of reference. Upon completion of the site screening and fatal flaw analysis (Phase 1), the regulatory Scoping and EIA process (Phase 2) will commence based on the preferred sites identified.

2.2 Long Term Intervention Measures for the Eastern Basin

The LTI measures for the Eastern Basin will likely include a desalination process to treat AMD emanating from region. The process of desalination would likely result in the production of brine, and will thus require evaporation dams for associated treatment and management. This requirement will be considered in the site screening exercise proposed for the STI measures. It must be noted that the LTI measures do not form part of this Project, but rather considered for long term integrated planning purposes.

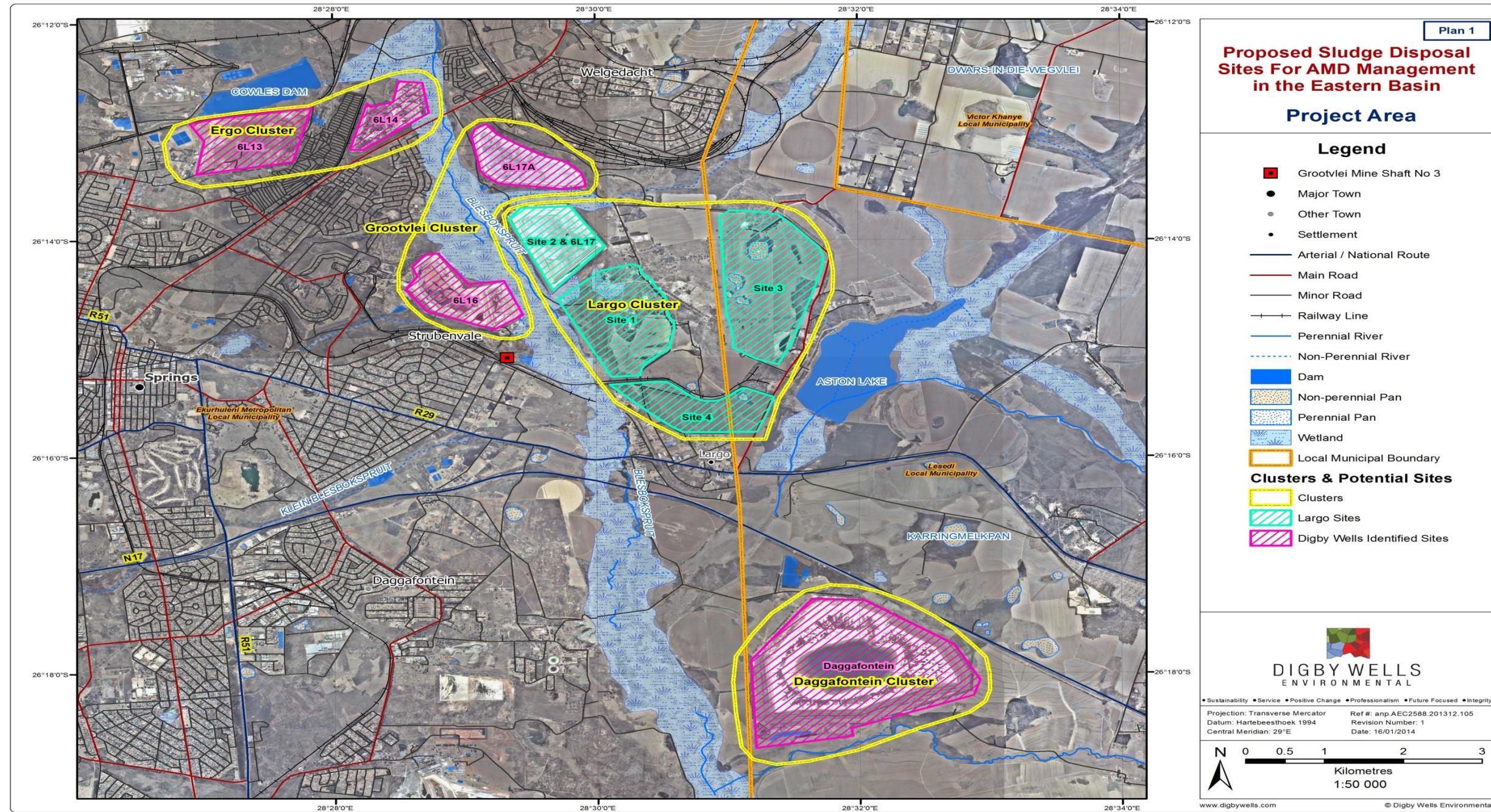


Figure 2-1: Project Area

3 METHODOLOGY

The approach adopted was a basic text-based research methodology. Information was collected through literature review, review of relevant impact assessments, databases and historical aerial imagery and topographic maps was undertaken to characterise the cultural landscape within which the project is located. A major aspect of the methodology was the historical layering of the cultural landscape, where a range of early to more recent cartographic sources were collated to determine the potential of tangible (i.e. physical) heritage resources to exist within given areas. This enabled heritage sensitivity mapping of proposed site locations of the sludge storage facility.

4 CHARACTERISATION OF THE CULTURAL LANDSCAPE

4.1 Literature Review

Geologically, the lowermost geological unit of the Karoo Supergroup is the *Dwyka Formation*. The *Dwyka Formation* is a glacial deposit laid down 300 million years ago (mya) when Gondwana was experiencing a melting of ice sheets. This formation is of low palaeontological significance (Lavin, 2013). The lithologies of the *Madzaringwe Formation* comprise of shales, sandstones, mudstones and coals. It corresponds to the basal unit of the Ecca Group and both of these rock units were deposited in a deltic environment in which rivers deposited shales and sandstones onto an alluvial plain. (Rubidge, 2013a; Rubidge, 2013b). This formation has a very high palaeontological significance and has a fossil heritage inclusive of glossopterid coal flora (Lavin, 2013).

The Transvaal Supergroup is an extensive sedimentary rock sequence of which the *Chuniespoort Group* is the lowermost sequence. The *Malmani Subgroup* is a singular rock formation within this sequence of the Transvaal Supergroup, typified by a thick succession of dolomites formed 2.6 - 2.5 billion year ago (Eriksson & Altermann, 1998). This group has a high palaeontological significance and has a fossil heritage inclusive of a range of shallow marine to intertidal stromatolites (Lavin, 2013).

The Stone Age is a period in time defined by the manipulation of lithics to produce tools. In an African context, this period can be broadly divided into three periods, the Early (ESA), Middle (MSA) and Late Stone Age (LSA) (Goodwin & Van Riet Lowe, 1929; Deacon & Deacon, 1999; Lombard, et al., 2012). Through time, an evolution in the production of tools is evident, with deliberate choices being made with regard to raw material and 'style' (Hilton-Barber & Berger, 2002). The MSA is identified as a flake-and-prepared-core industry dating to roughly 250 000 years ago (ka) – 20 ka. More significantly, it is during this period that technological complexity and abstract thought arises (Hilton-Barber & Berger, 2002) and the emergence of modern *H. sapiens* occurs.

The earliest formal settlement in the region may date to the Late Iron Age (LIA). A considerable number of LIA stone walled sites dating from the 18th and 19th centuries occur

along and on top of the rocky ridges of the eastern part of the Klipriviersberg towards Alberton (Mason, 1986). The occurrence of stone walled settlements similar to those identified by Maggs (1976) may be found within the study area. These have been defined as Type V and N where characteristically both settlement units consist of a number of primary enclosures grouped around in a ring. The primary difference is that the settlement unit in Type N is surrounded and defined by a wall which encloses all the structural components (Maggs, 1976).

The historical period is generally defined as the settlement of an area by and/or contact Europeans and indigenous peoples. Within the study area, this only occurred from the mid-19th century after the Voortrekkers migrated into the interior during the Great Trek. Prior to the 1880s, the area was open farm land until the discovery of gold on the Witwatersrand in 1886 and the establishment of its first coal mine 1888. Gold was first discovered in 1899 on the farm Geduld, and the main reef was discovered in 1902, ultimately leading to the establishment of the Grootvlei Proprietary Mine Limited and town of Springs in 1904. Architecturally, many mine and public buildings were designed by Sir Herbert Baker for the working middle class. (Mark, 2010). Additionally, Springs also holds the second largest collection of small scale Art Deco buildings in the world (Anonymous, 2000).

Prior to this, the Second Anglo-Boer War, which broke out on 11 October 1899, also impacted upon the region. Various battles occurred in areas surrounding the Eastern Basin, Witpoort being the most notable battle in close proximity to the project area. Remnants of skirmishes in this region can be seen in the form of 'sangars' – a line of stone shelters (Panagos, 1999). Migrant African mine workers suffered during this period. Those that remained in the mining compounds suffered through outbreaks of scurvy due to the lack of fresh produce, while those that fled were robbed of their wages and possessions by Boer commandos (Warwick, 1983). During 1901, 'native' concentration camps were established to deal with African refugees in the aftermath of the war.

Other heritage resources that add to the cultural landscape include historical burial grounds associated with homesteads and mining complexes. Such cemeteries may be perceived as intangible memorials of the workers who lived, worked and died on the mines. A case in point is the recent discovery of human remains exposed by erosion from beneath a reclaimed slimes dump opposite the Crown Mines Plant. The remains were determined to be of Chinese origin (Smillie, 2011). Between 1904 and 1908 labour was 'imported' from China and employed on several of the Witwatersrand mines (Richardson, 1977). One result thereof was the establishment of Chinese communities in 'pockets' around the region. The discovery of the Chinese cemetery is a very tangible example of intangible heritage.

4.2 Previous Reports Reviewed

In order to understand the cultural landscape in which the project is located, a review of relevant previous assessments was completed. Reports reviewed include:

- Huffman, T.N. and van der Merwe, H.D. 1993. *Archaeological survey of the Withoekspruit, Brakpan*. Unpublished report by Archaeological Resources Management on file at SAHRA as: 1993-SAHRA-0021.

- Van Schalkwyk, J.A. and Naude, M. 1995. *A survey of Cultural Resources along the proposed PWV 16 Road Corridor, Brakpan District*. An unpublished report by the National Cultural History Museum on file at SAHRA as: 1995-SAHRA-0012.
- Van Schalkwyk, J.A. 1997. *A Survey of Cultural Resources in the Proposed Erwat Sewer Outfall Route, North of Springs, Gauteng Province*. Unpublished Report by the National Cultural History Museum on file at SAHRA as: 1997-SAHRA-0012
- Fourie, W., Ramsden, M. 2002. *Cultural Heritage Assessment for Consolidated Modderfontein Mines, GEDEX Project*. Unpublished report by Matakoma Consultants on file at SAHRA as: 2002-SAHRA-0088
- Van Schalkwyk, J.A. 2004. *Heritage Impact Assessment: Payneville Ext. 3*. Unpublished report by the National Cultural History Museum on file at SAHRA as: 2004-SAHRA-0139
- Van Schalkwyk, J.A. 2004. *Heritage Impact Assessment: Vlaktefontein Ptn 35 and 36*. An unpublished report by the National Cultural History Museum on file at SAHRA as: 2004-SAHRA-0140
- Van Schalkwyk, J.A. 2005. *Heritage Impact Assessment: Leeupan*. An unpublished report by the National Cultural History Museum on file at SAHRA as 2005-SAHRA-0059.
- Huffman, T.N. 2006. *Archaeological Assessment for the Modder East Gold Mine: A phase I report prepared for Prime Resources*. Unpublished report completed by Archaeological Resources Management on file at SAHRA as: 2006-SAHRA-0102
- Küsel, U. 2007. *Cultural Heritage Resource Impact Assessment on the farm Vlaktefontein 161 Tsakane Benoni, Gauteng*. An unpublished report by African Heritage Consultants CC on file at SAHRA as: 2007-SAHRA-0143
- Birkholtz, P.D. 2008. *Heritage Impact Assessment proposed Selcourt Ext 5 Residential Development on Portion 3 of the farm Vlaktefontein 103 IR, Ekurhuleni Metropolitan Municipality, Gauteng Province*. An unpublished report by Archaeology Africa CC on file at SAHRA as: 2008-SAHRA-0015
- Coetzee, F.P. 2008. *Cultural Heritage Survey of Portion 1 of Portion 228 (a Portion of 213) and Portion 63 of the Farm Geduld 123 IR, Gauteng Province*. Unpublished report completed by the Department of Anthropology & Archaeology, University of South Africa on file at SAHRA as: 2008-SAHRA-0650
- Pelsler, A.J. and van Vollenhoven, A.C. 2008. *A Report on a Basic Archaeological and Cultural Resources Assessment for Apollo Bricks on the Farm Grootvaly 124 JR near Springs, Gauteng*. Unpublished report completed by Archaeos Culture & Cultural Resources Consultants on file at SAHRA as: 2008-SAHRA-0504
- Van der Walt, J. 2008. *Archaeological Impact Assessment: Sluice Gate Upgrade at the Marrievale Nature Reserve, Nigel, Gauteng*. Unpublished report completed by Matakoma-ARM Heritage Contracts Unit on file at SAHRA as: 2008-SAHRA-0180

- Van der Walt, J. 2008. *Archaeological Impact Assessment on Remainder of Portion 7 of the Farm Modderfontein East 72 IQ, Benoni, Gauteng Province*. Unpublished report completed by Heritage Contracts Unit on file at SAHRA as: 2008-SAHRA-0540
- Van Vollenhoven, A.C. 2012. *A Report on a Heritage Impact Assessment for the Steynol Umthombo Project near Springs in the Gauteng Province*. Unpublished report completed by Archaetnos Culture & Cultural Resources Consultants on file on SAHRIS as: Case ID 290

4.3 Historical Layering

A desktop cartographic survey was conducted in order to determine the potential of sites to exist within the project area and the surrounding region, as well as relative age based on the dates of the maps. Historical aerial photographs, historical maps, current topographic maps and satellite imagery were used to this end. Overall, the Eastern Basin area showed high levels of development associated with industrial and mining activities. Present satellite imagery indicates that the Eastern Basin has over time become progressively more industrial with an increase in residential settlements as well.

The earliest cartographic information for the study area is the 1899 Jeppe Map of the Transvaal. On this map, telegraph lines on Grootvlei 45 (now Grootvaly 124 IR) and on Daggafontein 94 intersected on G.G De Springs 396 (now Springs CBD) where it ran as an electrified railway to Pretoria in the north and Randfontein in the west. A station was indicated on G.G De Springs 396. The location of this station would suggest that the region was inhabited during this period and associated settlement infrastructure would have been located in the area.

The earliest aerial imagery of the study area dates to 1938. Within these photographs, it is evident that agricultural and mining operations within the region are well established. The existence of the mining and agriculture industries within the region suggest that built environments protected under Section 34 of the NHRA and burial grounds and graves protected under Section 36 of the NHRA are likely to occur.

4.4 Databases

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

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

5 IDENTIFIED HERITAGE RESOURCES

Table 5-1: Identified heritage resources from the desktop study (refer to Plan 2)

Site Number	Latitude	Longitude	Description
S.35-001	-26.24668702	28.49840121	Possible Iron Age stone walling
S.36-002	-26.24643307	28.50300275	Burial grounds and graves - possibly indentured Chinese labourers
S.36-003	-26.25112874	28.51852166	Military cemetery containing graves of coloured soldiers who perished during World War II. Also contains memorial for other soldiers who died outside of South Africa. Listed on the GSSA
S.36-004	-26.20738705	28.38234508	Fourie & Ramsden (2002-SAHRA-0088) CM1 Possible graves of Chinese mine labourers from turn of 20th century as suggested by Julian Baker in Van Schalkwyk 1997
S.34-005	-26.21448154	28.38448073	Built Environment associated with Modderfontein Mine Fourie & Ramsden (2002-SAHRA-0088) CM2 - CM5 dating from 1910 through 1930s
2008-SAHRA-0540/Site 1	-26.16732800	28.42861300	S.34-006 - Built Environment, Foundation remains of mining compound.
2008-SAHRA-0650/Site 1	-26.18830134	28.42600131	S.34-007 - Built Environment
2008-SAHRA-0650/Site 2	-26.18943100	28.43059500	S.36-008 - Burial Ground, Listed on GSSA
2008-SAHRA-0650/Site 3	-26.19645300	28.42698200	S.34-009 - Built Environment
2006-SAHRA-0102/Site 1	-26.18944444	28.45722222	S.36-010 - Burial ground, African cemetery
CaselD290/Site 1	-26.23873333	28.50578333	S.34-011 - Built Environment, Industrial remains
CaselD290/Site 2	-26.24015000	28.50541667	S.34-012 - Built Environment
CaselD290/Site 3	-26.24578333	28.50370000	S.36-013 - Built Environment
CaselD290/Site 4	-26.23675000	28.50315000	S.36-014 - Built Environment
CaselD290/Site 5	-26.24443580	28.50830241	S.34-015 - Built Environment

Site Number	Latitude	Longitude	Description
CaseID290/Site 6	-26.23521667	28.50558333	S.34-016 - Built Environment
CaseID290/Site 7	-26.23765000	28.50773333	S.34-017 - Built Environment
CaseID290/Site 9	-26.24513333	28.50533333	S.34-018 - Built Environment
CaseID290/Site10	-26.24070000	28.50676667	S.34-019 - Built Environment

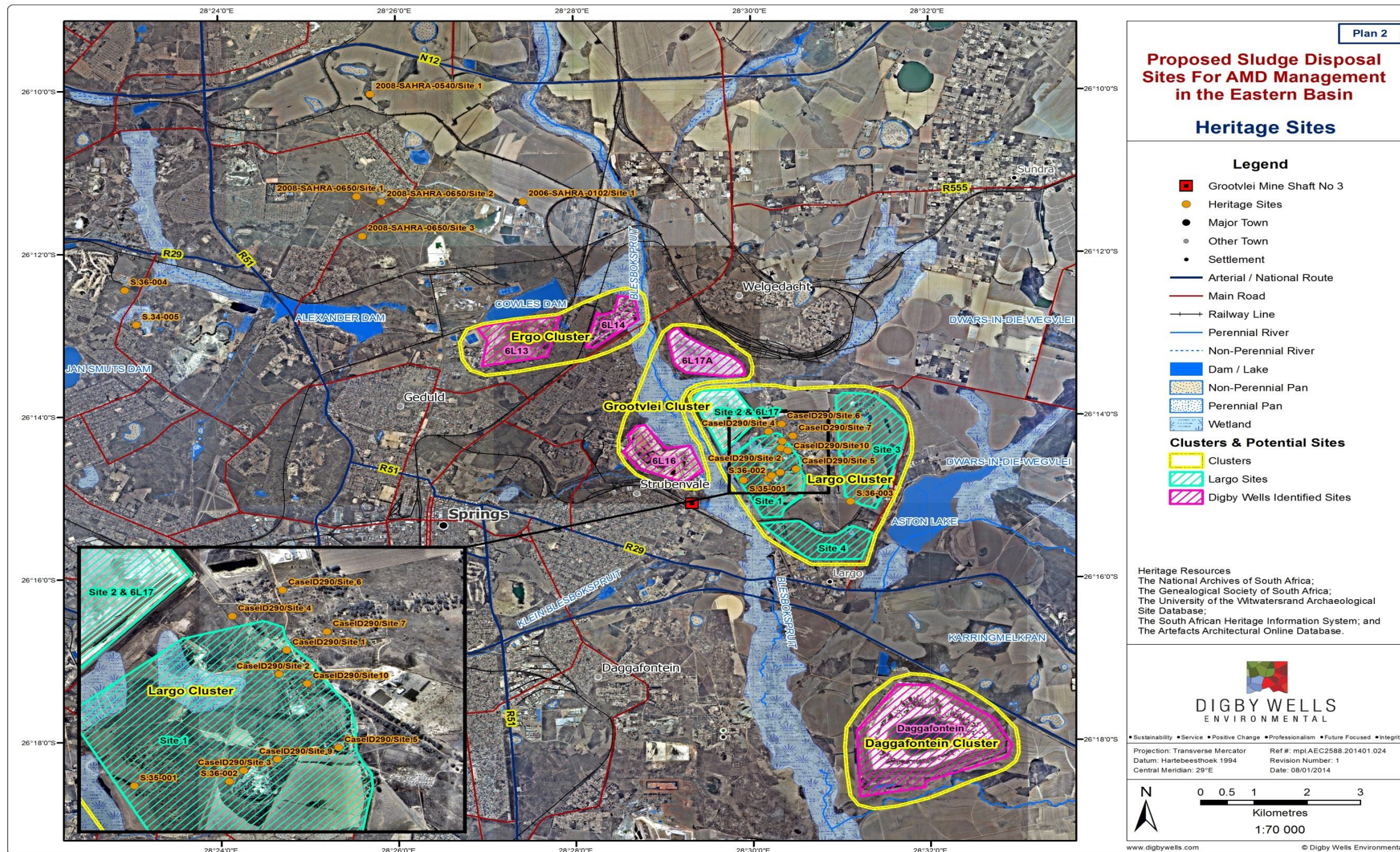


Figure 5-1: Heritage Sites

6 DISCUSSION

Palaeontologically, the project area is predominantly within a highly sensitive area, as indicated by the SAHRIS Palaeo-Sensitivity map (Figure 6-1).

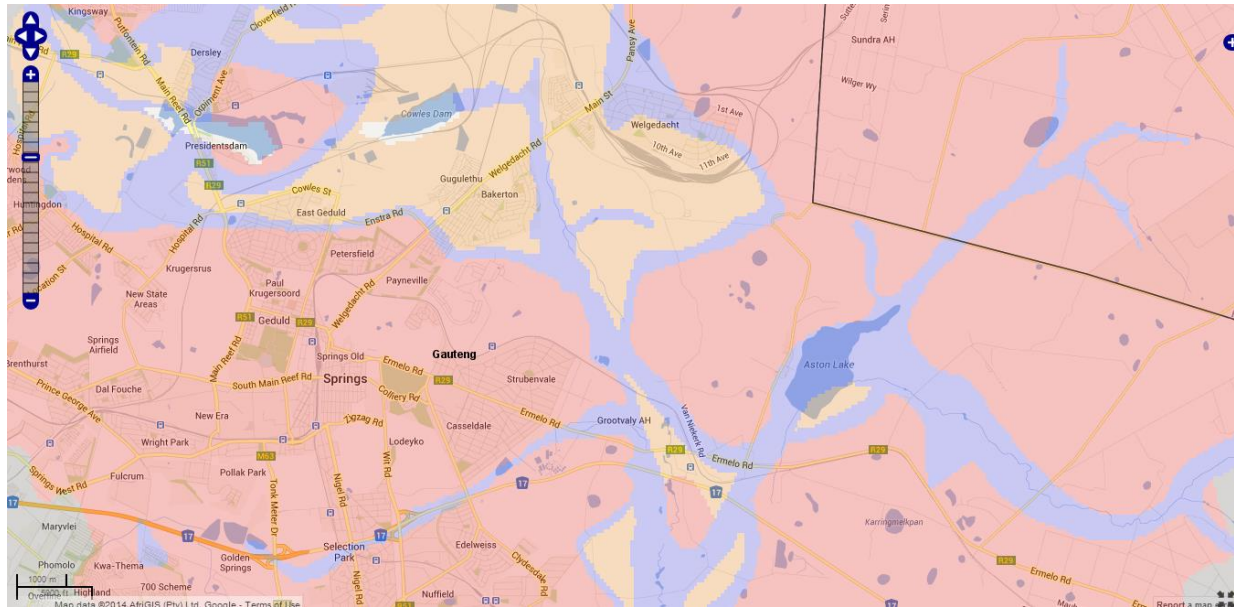


Figure 6-1: Palaeo-sensitivity Map of the project area (© SAHRIS 2014).

Outcrops associated with the *Madzaringwe Formations* and *Malmani Subgroup* that may possibly occur at the Largo Site 1 and 3 options will be negatively impacted upon by the development of a sludge storage facility. Based on the high palaeontological significance of these geological formations and the potential for fossil finds to exist within them, a palaeontological impact assessment will be required.

Historically, the study area is associated with an agricultural, but primarily mining landscape. Mining in the region began with the discovery of gold on the Witwatersrand in 1886 which resulted in the establishment of Grootvlei Proprietary Mine Limited and town of Springs in 1904. Architecturally, a number of mining and town buildings were designed by Sir Hebert Baker, the architect of the Union Buildings in Pretoria. Socially, the mining industry promoted an influx of mine workers, both African migrant labour and indentured Chinese labourers. The result of which was the construction of mining compounds and establishment of burial grounds for these workers. Other heritage resources identified during previous studies are primarily associated with the Stone Age, built environment and burial grounds and graves. A survey of historical aerial and satellite imagery has identified potential sites associated with the Iron Age, built environment and burial grounds and graves in areas previously not impacted upon by storage facilities.

Based on the review of available information, areas previously not impacted upon by sludge storage facilities are the most sensitive as *in situ* heritage resources may be present and would require mitigation. Existing sludge storage facilities are less sensitive as the footprint is already established, and potential damage to previously unidentified heritage resources is reduced. Having noted this, the age of the storage facility itself may deem it protected under Section 34 of the NHRA, in which provisional protection to structures older than 60 years is

granted. In order to alter these facilities, permitting would be required from the South African Heritage Resources Agency (SAHRA).

7 FATAL FLAWS

Largo Site 1, 3 and 4 have the potential to contain heritage resources that will be negatively impacted upon by the establishment of a sludge storage facility. Identified heritage resources located within or in close proximity to these potential sites include Section 34 Built Environment, Section 36 Burial Grounds and Graves, and Section 37 Monuments. Any impacts on these resources will require a comprehensive heritage impact assessment, and permitting from either SAHRA or PHRA-G to commence with the appropriate mitigation measures.

8 PREFERRED OPTIONS

Based on a tertiary review of the available information for the project area and the proposed options for the sludge storage facility, various criteria were weighted in order to assess the most suitable site for the sludge storage facility from a heritage perspective. The criteria used include the following:

1. Level of Disturbance;
2. Existing Infrastructure;
3. Identified Heritage Resources; and
4. Potential Permitting Requirements.

Table 8-1: Weighting of criteria for proposed locations of the sludge storage facility.

	Criteria 1	Criteria 2	Criteria 3	Criteria 4	Total
Daggafontein	5	5	5	5	20
6L17A	5	5	5	5	20
6L13	5	5	5	2	17
6L14	5	5	5	2	17
6L16	5	5	5	2	17

6L17 / Largo Site 2	5	5	5	2	17
Largo Site 4	4	2	4	2	12
Largo Site 3	4	2	1	1	8
Largo Site 1	4	2	1	1	8

Table 8-2: Definitions used in the scoring of the weighting of the proposed sludge facility locations

Score	Definition
5	Most suitable
4	Suitable
3	Negligible / insignificant
2	Less suitable
1	Unsuitable

Based on the result of the weighting summarised in Table 8-1 above, the preferred option for the sludge storage facility is Daggafontein and 6L17A. A summary of the reasoning of this recommendation is provided in Table 8-3 below.

Table 8-3: Preferred options for the sludge storage facility

No.	Option	Reasoning
1	Daggafontein	The sludge storage facility is in place, minimising potential risk to unidentified heritage resources. The structure is younger than 60 years – not established in 1958 as evident in aerial imagery.
2	6L17A	
3	6L13	The sludge storage facility is in place, minimising potential risk to unidentified heritage resources. The structure may be older than 60 years and require permitting – structure well established in 1958 aerial imagery
4	6L14	
5	6L16	
6	6L17 / Largo Site 2	

No.	Option	Reasoning
7	Largo Site 4	Area is undisturbed by sludge storage facility, but has been disturbed through agriculture potentially damaging <i>in situ</i> heritage resources. Potential Section 34 heritage resources occur within the proposed location and will require permitting and possible mitigation.
8	Largo Site 3	Area is undisturbed by sludge storage facility, but has been disturbed through agriculture potentially damaging <i>in situ</i> heritage resources. S.36-003 identified to the south, inclusive of military cemetery and memorial from World War II that will require permitting and mitigation.
9	Largo Site 1	Area is undisturbed by sludge storage facility, but has been disturbed. Several heritage resources identified within the footprint, including large cemetery which will require permitting and mitigation.

9 CONCLUSION

AECOM employed the services of Digby Wells to conduct a fatal flaw assessment for the construction of a sludge storage facility and ancillary pipelines associated with treatment of AMD in the Witwatersrand Eastern Basin. A review of the available literature, previous relevant reports, databases and aerial imagery has indicated the study area to have a significant mining history in which heritage resources are known to exist. Identified heritage resources include Section 34 Built Environment, Section 36 Burial Grounds and Graves, and Section 37 Monuments. Based on the findings, the preferred option for the sludge storage facility from a heritage perspective would either be Daggafontein or 6L17A.

10 REFERENCES

- Anonymous, 2000. *Springs*. [Online] Available at: <http://www.sahistory.org.za/places/springs> [Accessed 8 5 2012].
- Christopher, A. J., 1991. Apartheid and urban segregation levels in South Africa. *Progress in Human Geography*, Volume 15, pp. 311 - 321.
- Claassen, R. H., 1996. *Mining Rehabilitation Funds: Managing the Legislative and Organisational Process*, Johannesburg: A Dissertation submitted to the Faculty for Economic and Business Science. The Rand Afrikaans University.
- Crush, J. & James, W., 1991. Depopulating the compounds: Migrant labour and mine housing in South Africa. *World Development*, 19(4), pp. 301 - 316.
- Deacon, H. & Deacon, J., 1999. *Human Beginnings in South Africa*. Cape Town: David Phillip.
- Eriksson, P. G. & Altermann, W., 1998. An Overview of the Geology of the Transvaal Supergroup dolomites (South Africa). *Environmental Geology*, Volume 36, pp. 179-188.
- 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.
- Hilton-Barber, B. & Berger, L. R., 2002. *Field Guide to the Cradle of Humankind - Sterkfontein, Swartkrans, Kromdraai & Environs World Heritage Site*. Cape Town: Struik Publishers.
- Huffman, T. N., 1993. *aArchaeological Survey of the Withoekspruit, Brakpan*, An unpublished report by Archaeological Resources Management on file at SAHRA as: 1993-SAHRA-0021.
- Lavin, J., 2013. *SAHRIS Fossil Heritage Layers: Chuniespoort Group*. [Online] Available at: <http://www.sahra.org.za/fossil-layers/chuniespoort-group> [Accessed 08 01 2014].
- Lavin, J., 2013. *SAHRIS Fossil Heritage Layers: Dwyka Group*. [Online] Available at: <http://www.sahra.org.za/fossil-layers/dwyka-group> [Accessed 07 January 2014].
- Lavin, J., 2013. *SAHRIS Fossil Heritage Layers: Madzaringwe Formation*. [Online] Available at: <http://www.sahra.org.za/fossil-layers/madzaringwe-formation> [Accessed 07 January 2014].
- 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., 1976. *Iron Age Communities of the Southern Highveld*. Pietermaritzburg: Natal Museum.
- Mark, J., 2010. *The history and spirituality of the lay Dominicans in South Africa from 1926 - 1994*, Pietermaritzburg: Masters Thesis. University of KwaZulu-Natal.
- Mason, R., 1986. Origins of black people of Johannesburg and the south western central Transvaal, AD 350 - 1880. In: *Occasional Papers - University of the Witwatersrand, Archaeological Research Unit*. Johannesburg: University of the Witwatersrand.

O'Meara, D., 1975. The 1946 African mine workers' strike and the political economy of South Africa. *The Journal of Commonwealth and Comparative Politics*, 13(2), pp. 146 - 173.

Packard, R. M., 1989. *White Plague, Black Labor: Tuberculosis and the Political Economy of Health and Disease in South Africa*. California: The Regents of the University of California.

Panagos, D. C., 1999. Witpoort, 16 July 1900: Traces of an Anglo-Boer War battle. *Military History Journal*, 11(3/4), p. 1.

Richardson, P., 1977. The recruiting of Chinese and indentured labour for the South African gold mines, 1903 - 1908. *The Journal of African History*, 18(1), pp. 85 - 108.

Rubidge, B., 2013a. *Palaeontological Scoping Report - Dolerite burrow pits Sasol Mining (Pty) Ltd*, Delmas: JMA Consulting (Pty) Ltd.

Rubidge, B., 2013b. *Palaeontological Scoping Report - Sasol Shondoni conveyor*, Delmas: JMA Consulting (Pty) Ltd.

Smillie, S., 2011. *Experts work on mystery skeletons*. [Online] Available at: <http://www.iol.co.za/the-star/experts-work-on-mystery-skeletons-1.1107290> [Accessed 11 September 2012].

Uren, T. R., 2010. *Conservation of heritage buildings in Boksburg*, Johannesburg: University of the Witwatersrand.

Warwick, P., 1983. *Black People and the South African War 1899 - 1902*. Cambridge: Cambridge University Press.

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