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## Boikarabelo Coal Mine Archaeological Site Destruction (Permit IDs 1879 to 1882)

## NHRA Section 35(4) Destruction Permit Report

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**Project Number:**

LED 2867

**Prepared for:**

Ledjadja Coal (Pty) Ltd

November 2014

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<b>Project Name:</b>	<b>Boikarabelo Coal Mine Archaeological Site Destruction (Permit IDs 1879 to 1882)</b>
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## DECLARATION OF INDEPENDENCE

This report has been compiled by Johan Nel, a professional, qualified archaeologist and member of the Association of Southern African Professional Archaeologists (ASAPA) holds Field Director: Iron Age accreditation by ASAPA's Cultural Resources Management (CRM) section. The content of the report is based on field work undertaken in terms of a Destruction Permit issued to Johan Nel by the South African Heritage Resources Agency (SAHRA) in terms of Section 35 of the National Heritage Resources Act, 1999 Act No. 25 of 1999). The report was edited by Michael Hennessy and a technical review completed by Justin du Piesanie.

The relationship of Digby Wells and its employees with Boikarabelo Coal Mine, Ledjadja Coal (Pty) Ltd and Resgen South Africa (Pty) Ltd (Resgen) is solely one of professional association between client and independent consultant. All work undertaken was done in return for professional fees based upon agreed commercial rates paid to Digby Wells that were never in any manner contingent on the results of this report. As such, Digby Wells has no material interest in the Boikarabelo Coal Mine, Ledjadja Coal (Pty) Ltd or Resgen South Africa (Pty) Ltd (Resgen).

As salaried employees of Digby Wells, neither the author nor the reviewers receive any financial or other benefit from Boikarabelo Coal Mine, Ledjadja Coal (Pty) Ltd or Resgen South Africa (Pty) Ltd (Resgen).

The sole purpose of the client review completed by Louise van den Berg-Nicolai was to ensure that technical details related to Boikarabelo Coal Mine, Ledjadja Coal (Pty) Ltd or Resgen South Africa (Pty) Ltd (Resgen) were correct. This review did not influence the results presented in the report in any manner.

I, Johan Nel, therefore declare that all work and results presented in this report are wholly independent and free from any undue influence from Boikarabelo Coal Mine, Ledjadja Coal (Pty) Ltd or Resgen South Africa (Pty) Ltd (Resgen), or any their employees.

Signed in \_\_\_\_\_ on the \_\_\_\_\_ day of \_\_\_\_\_ 2015.

\_\_\_\_\_  
Johan Nel

\_\_\_\_\_  
As Witness

## EXECUTIVE SUMMARY

### Introduction

Resgen South Africa (Pty) Ltd (Resgen), as the controlling company of Ledjadja Coal (Pty) Ltd, which holds the mining right for the Boikarabelo Coal Mine appointed Digby Wells Environmental (Digby Wells) to undertake archaeological mitigation of several sites located in the Boikarabelo Coal Mine project area. This process followed an Archaeological Impact Assessment (AIA) undertaken as part of Environmental Authorisation and Mining Right Application processes completed for the mine in 2010. The mitigation process was undertaken and completed over two field seasons spanning 2011 to 2012 under a permit issued by SAHRA on 13 September 2011 (Permit No. 80/11/07/015/51). The final mitigation report was submitted to the South African Heritage Resources Agency (SAHRA) in September 2012. SAHRA required that applications for destruction permits be made for certain sites. Applications were made and a permit was issued in 2012 (Permit ID 84). Due to unforeseen delays in the mine's construction schedule, site destruction could not be implemented before the permit expired. An extension was requested and granted in 2013 (Permit ID 399). However, further delays resulted in the permit expiring again before site destruction was implemented. SAHRA requested a new application to be made, for which permits were granted in 2014 (Permit IDs 1879 to 1882). Site destruction finally commenced on 25 August 2014 and was completed on 5 September 2014.

### Elected methodology

A methodology was proposed to SAHRA as part of the 2014 permit applications that was subsequently approved through the issuing of the current permits. The elected methodology aimed to expose any possible deposit, features and objects through systematic mechanical excavations using a tractor-loader-backhoe (TLB). The Digby Wells archaeologist (legal permit holder) supervised and monitored the excavations.

### Constraints

The large surface areas of sites prohibited manual site destruction through archaeological excavations: costs and time required to complete site destruction in this manner was considered unrealistic and unfeasible. As a result, site destruction did not aim to record the archaeological record through any stratified excavations.

In addition, there is an inevitable probability that subsurface material may be exposed. Evidenced by the results of previous Phase 2 mitigation reports and the results of this destruction process, the general absence of surface indicators does not necessarily entail absence of subsurface deposits and other features. The presence of such can only be determined through archaeological excavations.



## Site Descriptions

SAHRA required destruction of five sites, listed in the table below. Detailed mapping completed in 2011 and 2012 provided an approximate total area of 41 ha. The elected methodology enabled destruction of nearly 2% of the total extent. Total site extent, trenches per site and percentage of each site destroyed are provided in the table below.

Site & trench name	Site extent	Trench distance	Trench area	Percentage site destroyed
<b>Site 009 / 10</b>	<b>5 ha</b>	<b>195.1 m</b>	<b>117.06 m<sup>2</sup></b>	<b>0.23%</b>
ST09/T1		40.6 m	24.36 m <sup>2</sup>	0.05%
ST09/T2		47.6 m	28.56 m <sup>2</sup>	0.06%
ST09/T3		66.2 m	39.72 m <sup>2</sup>	0.08%
ST10/T1		18.5 m	11.1 m <sup>2</sup>	0.02%
ST10/T2		22.2 m	13.32 m <sup>2</sup>	0.03%
<b>Site 011</b>	<b>13 ha</b>	<b>755.5 m</b>	<b>453.3 m<sup>2</sup></b>	<b>0.35%</b>
ST11/T1		72.8 m	43.68 m <sup>2</sup>	0.03%
ST11/T10		89.1 m	53.46 m <sup>2</sup>	0.04%
ST11/T2		90.5 m	54.3 m <sup>2</sup>	0.04%
ST11/T3		90.2 m	54.12 m <sup>2</sup>	0.04%
ST11/T4		91.3 m	54.78 m <sup>2</sup>	0.04%
ST11/T5		80.8 m	48.48 m <sup>2</sup>	0.04%
ST11/T6		15.9 m	9.54 m <sup>2</sup>	0.01%
ST11/T7		77.2 m	46.32 m <sup>2</sup>	0.04%
ST11/T8		76.2 m	45.72 m <sup>2</sup>	0.04%
ST11/T9		71.5 m	42.9 m <sup>2</sup>	0.03%
<b>Site 012 / 013</b>	<b>17 ha</b>	<b>512.4 m</b>	<b>307.44 m<sup>2</sup></b>	<b>0.18%</b>
ST013/T1		21.1 m	12.66 m <sup>2</sup>	0.01%
ST013/T2		21.5 m	12.9 m <sup>2</sup>	0.01%
ST013/T3		29.9 m	17.94 m <sup>2</sup>	0.01%
ST013/T4		35.9 m	21.54 m <sup>2</sup>	0.01%
ST013/T5		28 m	16.8 m <sup>2</sup>	0.01%
ST013/T6		79.5 m	47.7 m <sup>2</sup>	0.03%
ST12/T1		81 m	48.6 m <sup>2</sup>	0.03%
ST12/T2		81.4 m	48.84 m <sup>2</sup>	0.03%
ST12/T3		73.5 m	44.1 m <sup>2</sup>	0.03%
ST12/T4		60.6 m	36.36 m <sup>2</sup>	0.02%
<b>Site 018 /019</b>	<b>3 ha</b>	<b>199.9 m</b>	<b>119.94 m<sup>2</sup></b>	<b>0.40%</b>
ST18/T1		21.9 m	13.14 m <sup>2</sup>	0.04%
ST18/T2		49 m	29.4 m <sup>2</sup>	0.10%
ST18/T3		47.6 m	28.56 m <sup>2</sup>	0.10%
ST18/T4		41.5 m	24.9 m <sup>2</sup>	0.08%
ST18/T5		39.9 m	23.94 m <sup>2</sup>	0.08%



Site & trench name	Site extent	Trench distance	Trench area	Percentage site destroyed
<b>Site 020 / 021</b>	<b>3 ha</b>	<b>389.8 m</b>	<b>233.88 m<sup>2</sup></b>	<b>0.78%</b>
ST21/T1		39.4 m	23.64 m <sup>2</sup>	0.08%
ST21/T2		34.3 m	20.58 m <sup>2</sup>	0.07%
ST21/T3		37.7 m	22.62 m <sup>2</sup>	0.08%
ST21/T4		28.8 m	17.28 m <sup>2</sup>	0.06%
ST21/T5		83.2 m	49.92 m <sup>2</sup>	0.17%
ST21/T6		69.2 m	41.52 m <sup>2</sup>	0.14%
ST21/T7		97.2m	58.32 m <sup>2</sup>	0.19%
<b>Total</b>	<b>41 ha</b>	<b>2052.7 m</b>	<b>1231.62 m<sup>2</sup></b>	<b>1.94%</b>

## Results of Destruction and Recommendations

Destruction of sites 009 / 010, 011, 018 / 019 and 021 / 022 did not yield any significant results in addition to that of the 2011 and 2012 field seasons. No additional recommendations were made for these sites, provided that the Boikarabelo Coal Mine adopt and implement Chance Find Protocols that were developed by Digby Wells.

Site 012 / 013 similarly did not yield any significant results, with the exception of some deposit noted in two trenches and the exposure of human skeletal remains. The deposit itself was limited to ashy lenses, with no material culture present. The remains were exposed from less than 30 cm below the soil surface in the immediate vicinity of a large animal burrow. No context could be determined due to the animal burrow, nor were any artefacts recovered with the remains. The archaeologist on site collected the remains and delivered them to the Department of Anatomy, University of Pretoria for analysis. The remains will be returned to the project area and permanently stored in a subterranean space with three other sets of human skeletal remains exposed during construction activities in 2013. Although Boikarabelo Coal Mine indicated that its mine plans would be amended to avoid the placement of any infrastructure near site 012, the following recommendations are made:

- Boikarabelo should ensure that the site extent is demarcated as a sensitive area and avoid any development as far as possible in or near the site;
- Should any development take place within the site extent where the remains were exposed, the site must be investigated through archaeological excavations to determine better context and possible age of the site and remains – this recommendation was supported by Mr Coen Nienaber of the Department of Anatomy to which the remains have been delivered for analysis;
- Subject to findings of such an investigation, the site may require a reassessment in terms of its cultural significance and impacts on the site.





## Discussion

Site destruction largely confirmed findings from earlier site investigations reported on separately. Surface indicators were generally limited to low density scatters of ceramic fragments, grain bin foundations and lower and upper grindstones. However, with the possible exception of site 012, the destroyed sites showed little to no stratification, even in the immediate vicinity of surface indicators. Apart from site 012, evidence of material culture and / or deposit was limited to approximately 20 cm below surface, and mostly within the first 10 cm. This reiterates the premise developed in earlier reports that occupation and settlement in the area were transient. Site 012 was an exception to the rule as the depth at which deposit was noted exceeded evidence obtained at other sites. However, extensive animal activities were evident throughout the site: deeper deposits may be due to bioturbation<sup>1</sup>. Given that work completed from 2011 to 2014 was entirely development-driven, inherent restrictions due to time and financial limitations occurred. Interpretation of sites was further constrained by a general lack of comparable information and knowledge of the archaeological record of the region. However, the results still indicated an extensive Iron Age occupation of the Boikarabelo Coal Mine project area. By inference, this occupation is expected throughout the wider region. Future investigations are therefore highly recommended. First, any development-driven studies must be cognisant of the archaeological record identified through the Boikarabelo project. Second, longer term focussed academic research is needed to develop a comparative database of this record in the region. Collaborations and partnerships between the development and academic community can provide welcome opportunities, as demonstrated by the Boikarabelo Coal Mine who enabled postgraduate students to gain field experience and use sites and materials to further their studies.

## Conclusion

This report presents the results of permitted destruction of five sites in terms of SAHRA requirements. The presence of an archaeological record had been demonstrated, but the absence of archaeological indicators may inevitably result in the unknown and unintended destruction of sites. Although the findings presented in this and earlier reports were based on development-driven assessments, it has created an awareness of a potentially significant archaeological record that must be considered during future developments. The results may also provide sufficient incentive to motivate more structured archaeological research within the region.

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<sup>1</sup> Bioturbation refers to the physical displacement, modification or rearrangement of materials within a stratigraphic sequence by biological agents. These agents can include plants (e.g. roots), animal and human activities (e.g. termite and rodent nests, aardvark burrows).

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Appendix A: Skeletal Analysis Report

## 1 Project Background

### 1.1 Introduction

Resgen South Africa (Pty) Ltd (Resgen) as the controlling company of Ledjadja Coal (Pty) Ltd, which holds the mining right for the Boikarabelo Coal Mine, appointed Digby Wells Environmental (hereafter Digby Wells) to undertake archaeological mitigation of several sites located within the Boikarabelo Coal Mine project area. The mitigation process followed from an Archaeological Impact Assessment (AIA) undertaken as part of Environmental Authorisation and Mining Right Application processes completed for the mine in 2010.

The mitigation process was undertaken and completed over two field seasons spanning 2011 to 2012 under a permit issued by SAHRA on 13 September 2011 (Permit No. 80/11/07/015/51). The final mitigation report was submitted to the South African Heritage Resources Agency (SAHRA) online via the South African Heritage Resources Information System (SAHRIS). Consequently, SAHRA required that applications for destruction permits be made for certain sites. Digby Wells' archaeologist, Johan Nel, subsequently submitted permit applications. SAHRA granted a permit (Permit ID 84) on 24 July 2012 that required the archaeologist to be present during site destruction.

Due to unforeseen delays in the mine's construction schedule, the permit requirements could not be implemented before the permit expired. Digby Wells therefore requested a permit extension. SAHRA granted an extension valid for one year (Permit ID 399). However, site destruction could again not be implemented, and the permit expired. SAHRA then requested that a new application be submitted, for which new permits were granted, valid for five years (Permit IDs 1879 to 1882).

Site destruction finally commenced on 25 August 2014 and was completed on 5 September 2014.

### 1.2 Terms of Reference

The Terms of Reference for the site destruction project were based on the following stipulations contained in permits issued by SAHRA:

- Johan Nel (Digby Wells archaeologist) will be the permit holder on behalf of Mr Hennie van den Aardweg (Resgen);
- Johan Nel will monitor the destruction of five sites: 009/ 010, 011, 012 / 013, 018 / 019 and 021 / 022;
- A progress report on the results of the destruction must be submitted to SAHRA on or before the end of August of each year until the permit expires on 31 August 2019; and
- Reprints of all published papers or copies of theses and/or reports resulting from this work must be lodged with SAHRA.

## 2 Elected Methodology

The elected methodology aimed to expose any possible deposit, features and objects. Due to the large surface areas, systematic exposure of the entire site extent through manual excavation was considered unfeasible. Therefore, destruction was undertaken through mechanical means using a tractor-loader-backhoe (TLB), whilst still following accepted archaeological practice as far as possible. This method was proposed to SAHRA and subsequently approved through the issuing of the destruction permits.

The first step in the elected methodology required the removal of surface vegetation on sites where shrub and tree cover were too dense to allow the TLB unhindered access. Vegetation was removed through a mechanical mulcher that effectively removed most shrubs and trees without intruding into the ground surface.

Following site clearance, the TLB excavated trenches across sites, spaced approximately 10 m to 20 m apart in roughly parallel lines running north-south or east-west. These trenches were constrained by larger trees that could not be removed.

Each trench was excavated to an average depth of 100 cm to 150 cm, or until terminal depth was reached, indicated by sterile soil or bedrock layers. The archaeologist on site and a mine employee trained to identify archaeological deposit and material culture closely monitored the excavations.

Where any subsurface indicators were exposed, the location of artefacts or deposit was recorded. Trenches were inspected to determine the extent of the find. In most instances, finds were considered negligible, with no significant context or matrix present.

Trenches enabled representative sampling sites earmarked for destruction. Site-specific recommendations were based on the trenching results.

## 3 Constraints

As the project was entirely development-driven, the large surface areas of sites prohibited manual site destruction through archaeological excavations. Costs and time required to complete site destruction in this manner was considered unrealistic and unfeasible. As a result, site destruction did not aim to record the archaeological record through any stratified excavations.

In addition, there is an inevitable probability that subsurface material may be exposed. Evidenced by the results of both Phase 2 mitigation reports (Nel 2012; Nel & du Piesanie 2012) and the results of this destruction process, the general absence of surface indicators does not necessarily entail absence of subsurface deposits and other features. The presence of such can only be determined through archaeological excavations.

## 4 Site Descriptions

SAHRA required five sites to be subject to site destruction. Based on detailed mapping completed in 2011 and 2012, the extent of the five sites approximated to 41 ha. The



methodology employed enabled destruction of nearly 2% of the total approximate site extent. Total site extent, trenches per site and percentage of each site destroyed are provided in Table 1.

**Table 1: Site and destruction extent details**

Site & trench name	Site extent	Trench distance	Trench area	Percentage site destroyed
<b>Site 009 / 10</b>	<b>5 ha</b>	<b>195.1 m</b>	<b>117.06 m<sup>2</sup></b>	<b>0.23%</b>
ST09/T1		40.6 m	24.36 m <sup>2</sup>	0.05%
ST09/T2		47.6 m	28.56 m <sup>2</sup>	0.06%
ST09/T3		66.2 m	39.72 m <sup>2</sup>	0.08%
ST10/T1		18.5 m	11.1 m <sup>2</sup>	0.02%
ST10/T2		22.2 m	13.32 m <sup>2</sup>	0.03%
<b>Site 011</b>	<b>13 ha</b>	<b>755.5 m</b>	<b>453.3 m<sup>2</sup></b>	<b>0.35%</b>
ST11/T1		72.8 m	43.68 m <sup>2</sup>	0.03%
ST11/T10		89.1 m	53.46 m <sup>2</sup>	0.04%
ST11/T2		90.5 m	54.3 m <sup>2</sup>	0.04%
ST11/T3		90.2 m	54.12 m <sup>2</sup>	0.04%
ST11/T4		91.3 m	54.78 m <sup>2</sup>	0.04%
ST11/T5		80.8 m	48.48 m <sup>2</sup>	0.04%
ST11/T6		15.9 m	9.54 m <sup>2</sup>	0.01%
ST11/T7		77.2 m	46.32 m <sup>2</sup>	0.04%
ST11/T8		76.2 m	45.72 m <sup>2</sup>	0.04%
ST11/T9		71.5 m	42.9 m <sup>2</sup>	0.03%
<b>Site 012 / 013</b>	<b>17 ha</b>	<b>512.4 m</b>	<b>307.44 m<sup>2</sup></b>	<b>0.18%</b>
ST013/T1		21.1 m	12.66 m <sup>2</sup>	0.01%
ST013/T2		21.5 m	12.9 m <sup>2</sup>	0.01%
ST013/T3		29.9 m	17.94 m <sup>2</sup>	0.01%
ST013/T4		35.9 m	21.54 m <sup>2</sup>	0.01%
ST013/T5		28 m	16.8 m <sup>2</sup>	0.01%
ST013/T6		79.5 m	47.7 m <sup>2</sup>	0.03%
ST12/T1		81 m	48.6 m <sup>2</sup>	0.03%
ST12/T2		81.4 m	48.84 m <sup>2</sup>	0.03%
ST12/T3		73.5 m	44.1 m <sup>2</sup>	0.03%
ST12/T4		60.6 m	36.36 m <sup>2</sup>	0.02%
<b>Site 018 /019</b>	<b>3 ha</b>	<b>199.9 m</b>	<b>119.94 m<sup>2</sup></b>	<b>0.40%</b>
ST18/T1		21.9 m	13.14 m <sup>2</sup>	0.04%
ST18/T2		49 m	29.4 m <sup>2</sup>	0.10%
ST18/T3		47.6 m	28.56 m <sup>2</sup>	0.10%
ST18/T4		41.5 m	24.9 m <sup>2</sup>	0.08%
ST18/T5		39.9 m	23.94 m <sup>2</sup>	0.08%
<b>Site 020 / 021</b>	<b>3 ha</b>	<b>389.8 m</b>	<b>233.88 m<sup>2</sup></b>	<b>0.78%</b>



Site & trench name	Site extent	Trench distance	Trench area	Percentage site destroyed
ST21/T1		39.4 m	23.64 m <sup>2</sup>	0.08%
ST21/T2		34.3 m	20.58 m <sup>2</sup>	0.07%
ST21/T3		37.7 m	22.62 m <sup>2</sup>	0.08%
ST21/T4		28.8 m	17.28 m <sup>2</sup>	0.06%
ST21/T5		83.2 m	49.92 m <sup>2</sup>	0.17%
ST21/T6		69.2 m	41.52 m <sup>2</sup>	0.14%
ST21/T7		97.2m	58.32 m <sup>2</sup>	0.19%
<b>Total</b>	<b>41 ha</b>	<b>2052.7 m</b>	<b>1231.62 m<sup>2</sup></b>	<b>1.94%</b>

## 4.1 Site 009 / 010 Boikarabelo – Permit ID 1878

### 4.1.1 Site description

The original AIA report identified site 009 / 010 as two separate sites. Site 009 was described as "...a clearing in the natural bush. The remains of 7 possible grain bin foundations in various states of preservation were identified over an extended area. Two lower grinding stones were also found in this area. No other artefacts, structures or features were identified" (Fourie 2010: 44-46). The site was initially estimated to be approximately 150 m in diameter.

Site 010 was described as "...a clearing in the natural bush. A low density scatter of potsherds was observed and approximately 20 x non-diagnostic potsherds were recovered from and around several animal burrows in this area. On closer inspection of the animal burrows, thin layers with archaeological deposit were identified at a depth of approximately 10-15 cm. The layers were approximately 5 cm thick and consisted mostly of ash and dung deposits. A few potsherds were also recovered from these layers. No other artefacts, structures or features were identified" (Fourie 2010: 47-49). This site was estimated to be approximately 75 m in diameter.

Subsequent investigations undertaken in 2011 and 2012 found that sites 009 and 010 might be considered as a single site, approximately 5 ha in extent. The site was mitigated and results reported on in two reports submitted to SAHRA (Nel 2012; Nel & du Piesanie 2012).





**Figure 1: Site 009 as recorded in 2010 AIA report (© Fourie 2010). Note grain bin foundations in the left middle ground.**



**Figure 2: Site 010 as recorded in 2010 AIA report (© Fourie 2010). Note large burrow.**



#### **4.1.2 History of site mitigation**

Initial site mitigation was undertaken in 2011. Site extent was determined through feature mapping as well as random and stratified sampling, indicating an approximate extent of 21 ha. The 2011 field season included Shovel Test Pits (STPs) and test excavations at both 009 and 010 (Nel 2011). The STPs and test excavations did not provide any confirmation for the deposits noted in the AIA report (Fourie 2010).

More extensive excavations were completed during the 2012 field season that focussed on grain bin foundations visible on the surface (Nel & du Piesanie 2012). However, intensive investigation failed to yield any significant results. In general, the occupation layer was homogenous and sandy with limited material culture - primarily fragmented ceramics and faunal remains noted at an average depth up to 10 cm below surface.

#### **4.1.3 Results of destruction**

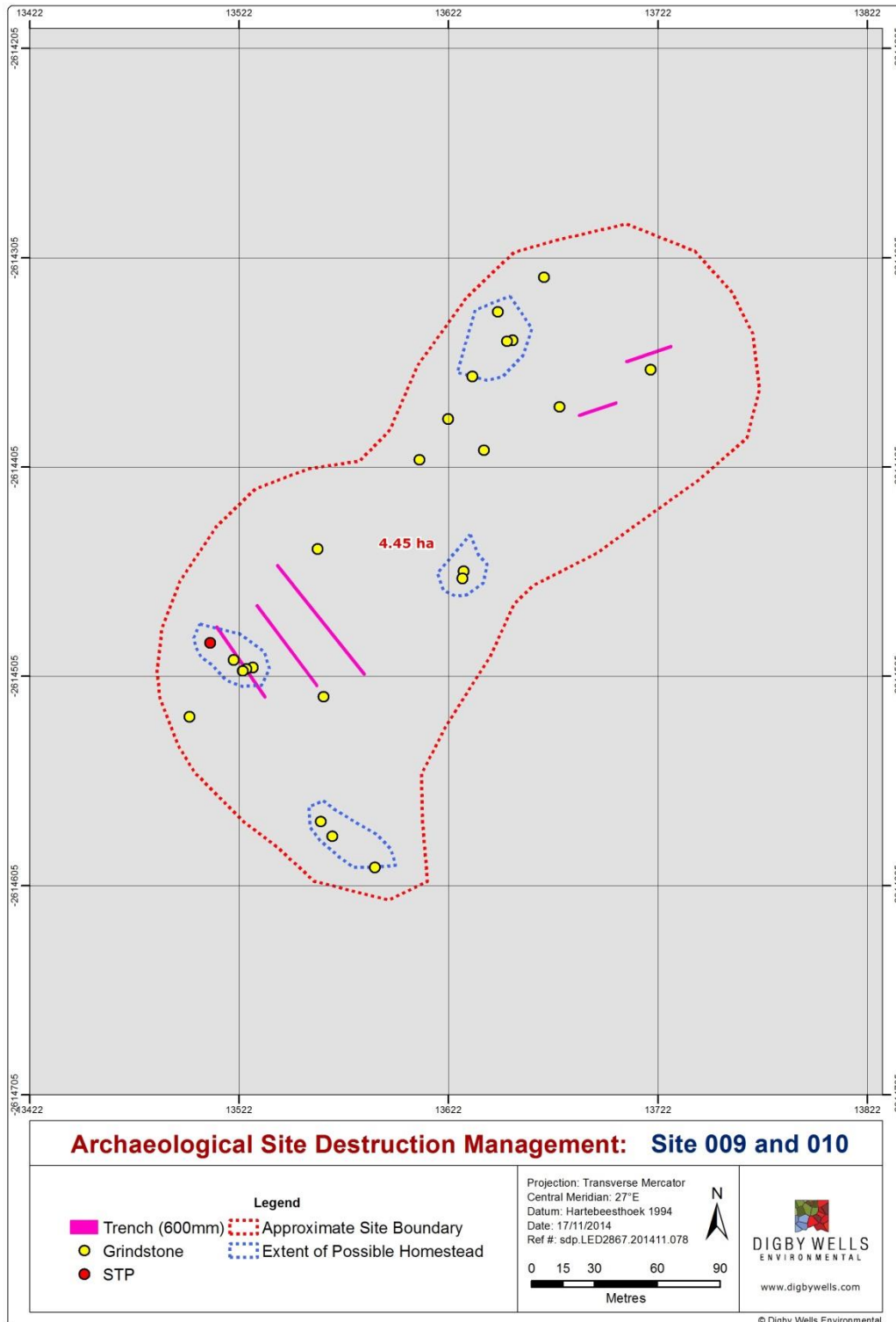
Site destruction focused on areas excavated in 2011 and 2012 (Nel 2012; Nel & du Piesanie 2012). Five trenches amounting to 195 m were excavated across site 009 / 010 to an average terminal depth of 100 cm. Details of trenches are provided in Table 1 above and depicted in Plan 1 below.

Site destruction corroborated findings of the 2011 and 2012 field seasons: average depth where cultural material was noted was limited to 10 to 20 cm below surface.

Material culture exposed during destruction was limited to a few undiagnostic ceramic fragments. No subsurface features or deposit were noted. Notwithstanding the recorded observations made by Fourie (2010), the trenches did not expose any deposit or material culture.

#### **4.1.4 Recommendations**

No further recommendations are made for site 009 / 010, with the provision that the Chance Find Protocols (CFPs) approved by the Boikarabelo Coal Mine are implemented.



**Plan 1: Approximate extent of site 009 / 010 indicating trench positions**

## 4.2 Site 011 Boikarabelo – Permit ID 1879

### 4.2.1 Description of surface features

The original AIA report described site 011 as a “...single, fragmented lower grinding stone was found at this location. The lower grinding stone was found amongst a loose scatter of other rocks. No other artefacts, structures or features were identified” (Fourie 2010: 50-51). The estimated extent was given as 25 m in diameter.

Site 011 was found to be far more extensive than initially assumed. Through detailed mapping and recording of visible surface features including grain bin foundations, ceramic scatters and lower grindstones, it was determined to be at least 13 ha in extent.



Figure 3: Site 011 as recorded in the AIA report (© Fourie 2010)

### 4.2.2 History of site mitigation

Initial site mitigation undertaken in 2011 included random auguring as well as structured STPs and test excavations in a grid laid out over the site. The STPs – 20 in total – indicated some deposit within the first 10 cm below surface. STPs and auger samples also did not yield any evidence of more extensive occupation such as *kraal* deposits or ash middens. Test excavations completed around grain bin foundations similarly did not provide significant results.

During the 2012 field season, test excavations were completed in four localities chosen for their potential to provide viable diagnostic material samples or features. These localities included grain bin foundations, relatively dense ceramic scatters (>10:1) and the

approximate centre of the site where a cattle *kraal* could be expected. In this manner, approximately 252 m<sup>2</sup> were exposed. However, results were negligible: where material culture was exposed, it consistently occurred between 0 – 10 cm below the surface after which the soil was sterile, homogenous yellow clay. No diagnostic material was identified at the site.

#### 4.2.3 Results of destruction

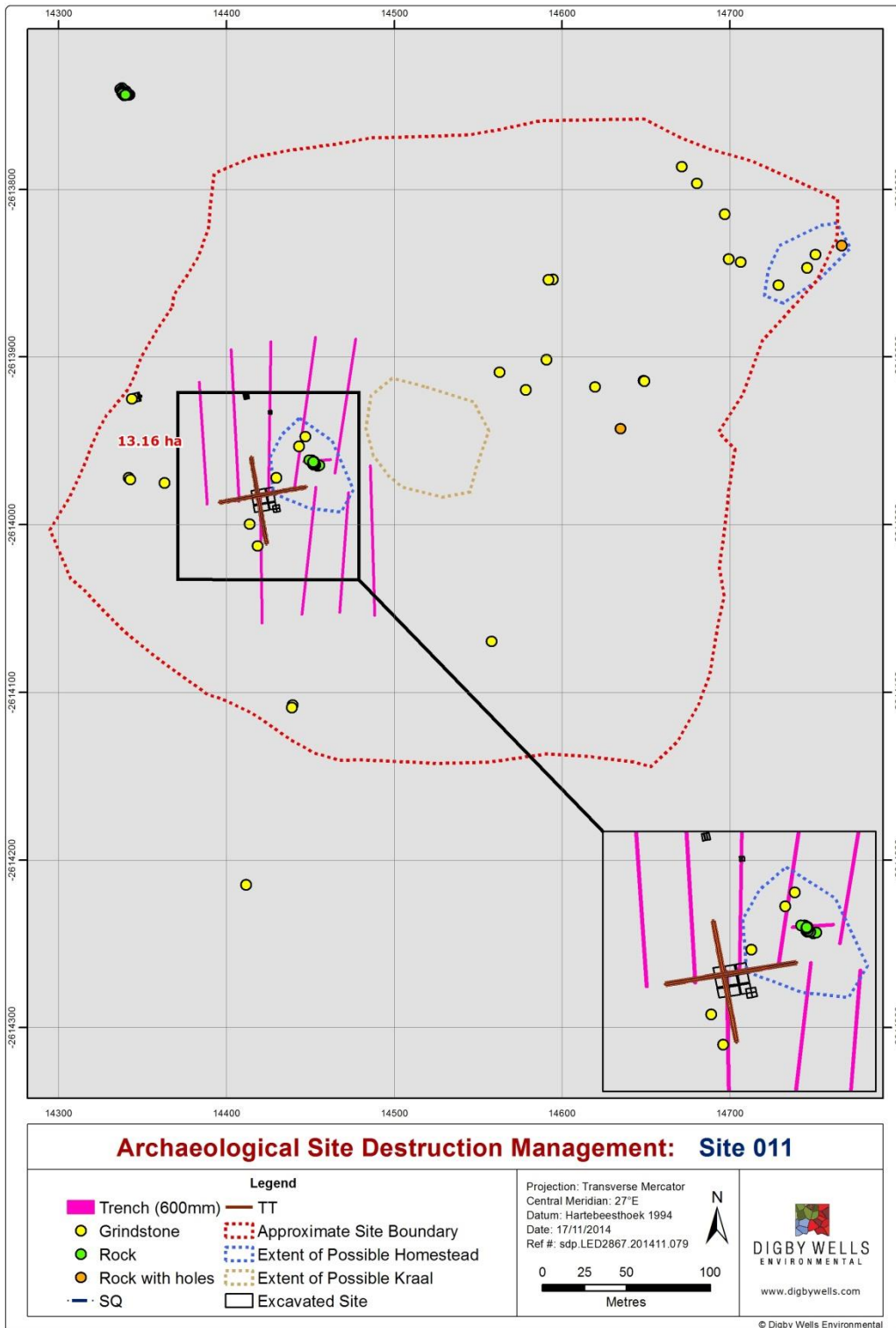
Site destruction focused on the central area of the site 011 where the probability of any viable deposit was assumed higher. Ten trenches (755.5 m in total) were excavated across site 011 to an average terminal depth of 100 cm. Details of the trenches are provided in Table 1 above and depicted in Plan 2 below.

Site destruction corroborated the findings contained in the two 2012 mitigation reports: the average depth where cultural material may be expected is limited to 10 cm to 20 cm below surface.

Material culture exposed during destruction was limited to a few undiagnostic ceramic fragments. No subsurface features or deposit were noted.

#### 4.2.4 Recommendations

No further recommendations are made for site 011, with the provision that the procedures included in the attached CFP are implemented.



**Plan 2: Approximate extent of site 011 indicating trench positions**





### 4.3 Site 012 / 013 Boikarabelo – Permit ID 1881

#### 4.3.1 Description of surface features

Site 012 and 013 were described in the AIA report as two separate sites, but included as a single site in both the mitigation and destruction permits issued by SAHRA. Site 012 was described as "...a clearing in the natural bush. A low-density scatter of potsherds was observed and approximately 15 x non-diagnostic potsherds were recovered from and around several animal burrows in this area. On closer inspection of the animal burrows, thin layers with archaeological deposit were identified at a depth of approximately 10-15 cm. The layers were approximately 8 cm thick and consisted mostly of ash and dung deposits. A few potsherds were also recovered from these layers. No other artefacts, structures or features were identified" (Fourie 2010: 52-54). The estimated extent was 50 m in diameter.

Site 013 was described as a "... single, fragmented lower grinding stone was found at this location. No other artefacts, structures or features were identified" (Fourie 2010: 55-56).

Site 012/013 was mapped and test excavations completed as per SAHRA requirements. The site extent was determined to be 17 ha, based on visible surface features and auguring.



Figure 4: Site 012 as recorded in the AIA report (© Fourie 2010)





**Figure 5: Detail of ash lens at site 012 recording in the AIA report (© Fourie 2012)**



**Figure 6: Site 013 as recorded in the AIA report (© Fourie 2010)**



### **4.3.2 History of site mitigation**

Site 012/013 was initially mapped and auger samples taken in 2011 to identify possible features and determine the extent of the occupation layer. The 2012 field season extended the mitigation to include test excavations that comprised 12 squares of 1 m x 4 m each. These excavations did not yield any significant deposit, features or material culture other than some ceramics. It was noted that site comprised a homogenous soil layer with ceramics limited to the first 10 cm.

### **4.3.3 Results of destruction**

Site destruction focused on the areas that had been excavated in 2011 and 2012 (Nel 2011, 2012). Ten trenches amounting to 512 m were excavated across site 012 / 013 to a terminal depth of approximately 100 cm. Details of trenches are provided in Table 1 above and depicted in Plan 3 below.

At site 013, destruction corroborated the findings in the 2011 and 2012 mitigation reports: the average depth where cultural material may be expected is limited to 10 to 20 cm below surface. Material culture exposed during destruction was limited to a few undiagnostic ceramic fragments. No subsurface features or deposit were noted.

Destruction of site 012 indicated subsurface deposit approximately 30 to 40 cm below ground level in two trenches. This was far deeper than found during the 2012 field season's test pits. The deposit comprised ashy lenses, approximately 40 cm wide with some ceramic fragments and very poorly preserved faunal remains. The deposit was noted at two localities in both trenches ST12T1 and ST12/T2. However, the deposit contained insignificant cultural or organic material to be employed for diagnostic purposes. No features such as hut floors or possible kraal deposits were noted. No other evidence of deposit was noted outside the small areas noted in trenches ST12T1 and ST12/T2.

However, human remains were exposed in the final trench by the TLB, the location of which is indicated in Plan 3. The remains were exposed during trench excavations adjacent to a large animal burrow, probably the same burrow reported on in the AIA report (Fourie 2010: 52-54) and depicted in Figure 4 and Figure 5 above. The remains were exposed from approximately 30 cm below surface, indicating an extremely shallow burial. In general, the trench extending from the find did not yield any significant material. This was consistent with the findings from the 2011 and 2012 seasons, as well as the destruction completed at site 013 and the remainder of site 012 with the exception of the small area in the first two trenches.

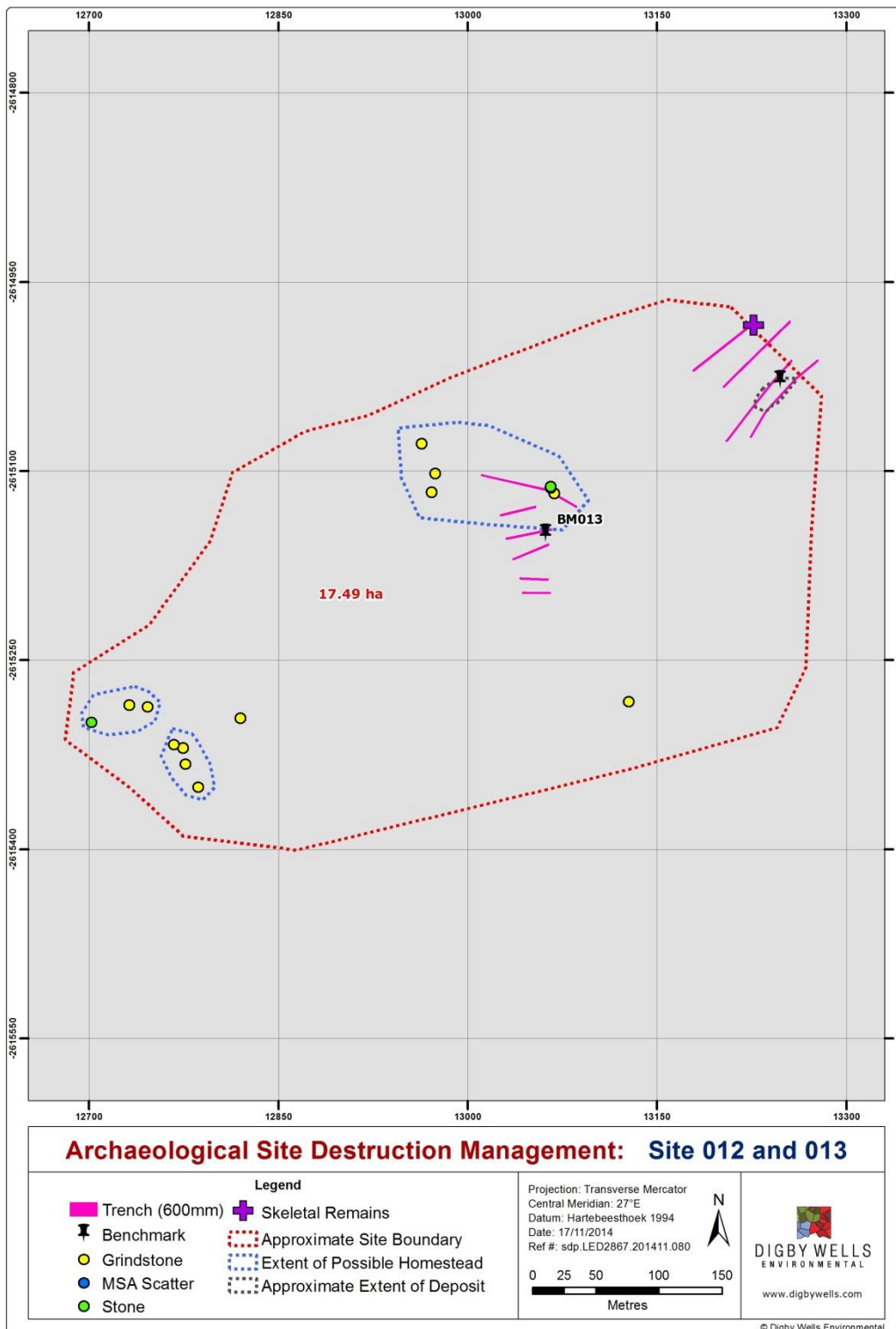
Work was immediately ceased and the reporting procedure developed by Digby Wells for the Boikarabelo Coal Mine was implemented. The spoil was screened to recover any fragments. There were no noticeable deposit in the surrounding exposed soil matrix, nor were any features or associated grave goods identified. The remains were exposed near a relatively large animal burrow that may have affected the burial site. The on-site

archaeologist collected the exposed remains for skeletal analysis by the Department of Anatomy, University of Pretoria.

#### 4.3.4 Recommendations

Boikarabelo Coal Mine indicated that its mine plans would be amended to avoid the placement of any infrastructure near site 012. In addition, the following recommendations are made:

- Boikarabelo should ensure that the site extent is demarcated as a sensitive area and avoid any development as far as possible in or near the site;
- Should any development take place within the site extent, the site must be investigated through archaeological excavations to determine better context and possible age of the site and remains – this recommendation was supported by Mr Coen Nienaber of the Department of Anatomy to which the remains have been delivered for analysis;
- Subject to findings of such an investigation, the site may require a reassessment in terms of its cultural significance and impacts on the site.



**Plan 3: Approximate extent of site 012 / 013 indicating trench positions**

## 4.4 Site 018 / 019 Boikarabelo – Permit ID 1880

### 4.4.1 Description of surface features

Site 018 and 019 were described as separate sites in the AIA report (Fourie 2010).

Site 018 was described as a "... a clearing in the dense natural bush. A low density scatter of potsherds was observed and 9 x non-diagnostic potsherds were recovered from the surface from within the clearing. These potsherds were all found in a small concentration and seemed to be from the same ceramic vessel. No other artefacts, structures or features were identified" (Fourie 2010: 64-65).

Site 019 was described as "...a small clearing in the dense natural bush was identified here. A low density scatter of potsherds was observed and 5 x non-diagnostic potsherds and 1x decorated potsherd were recovered from and around several animal burrows in the area. No other artefacts, structures or other features were identified here" (Fourie 2010: 66-67).

The extent of the two sites was estimated at 5 m and 20 m in diameter respectively. The two sites were subsequently mapped and interpreted as a single site 018/019 of 3 ha in extent based on SAHRA permit requirements.

### 4.4.2 History of site mitigation

Mitigation completed for site 018 / 019 during the 2011 field season included auger sampling and mapping of the site. The 2012 field season comprised test excavations to identify possible features and determine the extent of the occupation layer. The test excavations indicated a clear distinction between the soil and midden deposit, and an obvious lack of identifiable grain bin platforms. Material culture and faunal remains were recovered from 10 to 20 cm below surface, but the site was found to be sterile below 20 cm.

### 4.4.3 Results of destruction

Site destruction focused on the areas that had been excavated in 2011 and 2012 (Nel 2011, 2012). Five trenches amounting to 200 m were excavated on the western perimeter of site 018 / 019 to a terminal depth of approximately 100 cm. Details of trenches are provide in Table 1 above and depicted in Plan 4 below.

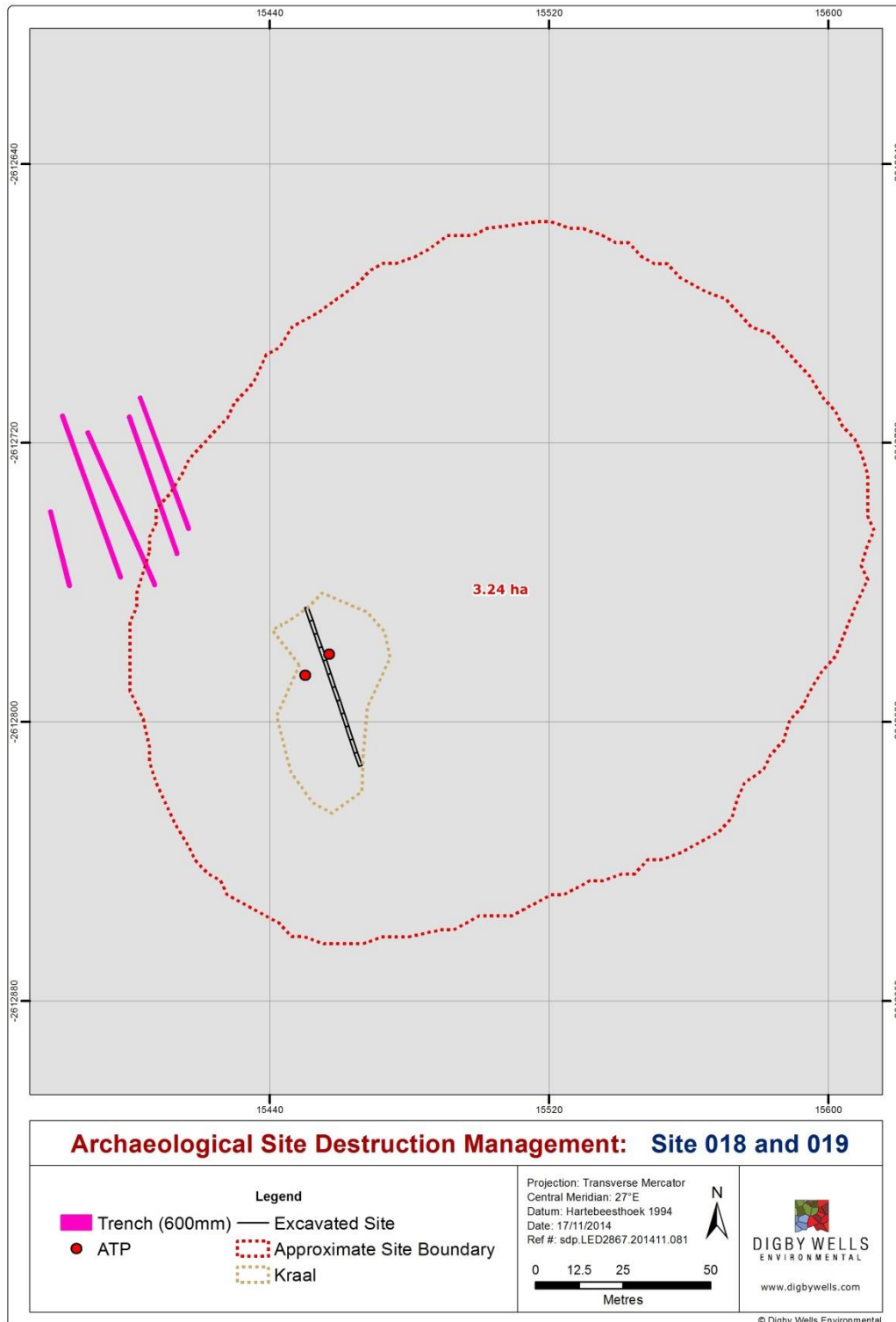
This location was chosen for two reasons. First, this locality represented the only part of the site where some surface material culture such as pottery and lower grinding stones was noted. Second, the locality was in close proximity to the haul road, construction of which increased the potential of any chance finds.

The site destruction corroborated the findings in the 2011 and 2012 mitigation reports: the average depth where cultural material may be expected is limited to 10 cm to 20 cm below surface.

Material culture exposed during destruction was limited to a few undiagnostic ceramic fragments. No subsurface features or deposit were noted.

#### **4.4.4 Recommendations**

No further recommendations are made for site 018 / 019, with the provision that the procedures included in the attached CFP are implemented.



**Plan 4: Approximate extent of site 018 / 019 indicating trench positions**

## 4.5 Site 021 / 022 Boikarabelo – Permit ID 1882

### 4.5.1 Description of surface features

This site was described as two separate sites in the AIA report (Fourie 2010). The estimated extents of the sites were 30 m and 40 m in diameter respectively.

Site 020 was described as “...small clearing in the dense natural bush was identified here. A low density scatter of potsherds was observed and 10 x non-diagnostic potsherds were recovered from and around several animal burrows in the area. No other artefacts, structures or other features were identified here” (Fourie 2010: 70-71).

Site 022 was described in the same manner and included “...10x non-diagnostic potsherds and 1 x lip shard ... recovered from the graded gravel road in this area” (Fourie 2010: 72-73).

These sites were determined to be part of one much larger site than first assumed, with an approximate extent of 3 ha.

### 4.5.2 History of site mitigation

Site 021 / 022 represented the only site recommended for mitigation that had clear evidence of viable deposit. Three localities were excavated during the 2011 field season. The excavations yielded material culture that included ceramics, a single metal bead and a soapstone pipe. However, only two distinct stratigraphic layers were noted in parts of the site. On average, cultural material was only found within 10 cm below surface, with the exception of the ash deposit that continued to a depth of 30 cm.

The 2012 field season extended the test excavations completed in 2011, in addition to two other localities. Extension of the 2011 test excavations included 11 test squares of 4 m x 4 m and one 1 m x 10 m squares. This exposed a large ash deposit that yielded the majority of faunal and cultural material. Test excavations were also completed in areas where grain bin foundations were noted, but finds were limited to undiagnostic ceramics and a single iron arrowhead.

### 4.5.3 Results of destruction

Site destruction focused on the areas that had been excavated in 2011 and 2012 (Nel 2011, 2012). Seven trenches amounting to 390 m were excavated across site 021 / 022 to a terminal depth of approximately 100 cm. Details of trenches are provide in Table 1 above and depicted in Plan 5 below.

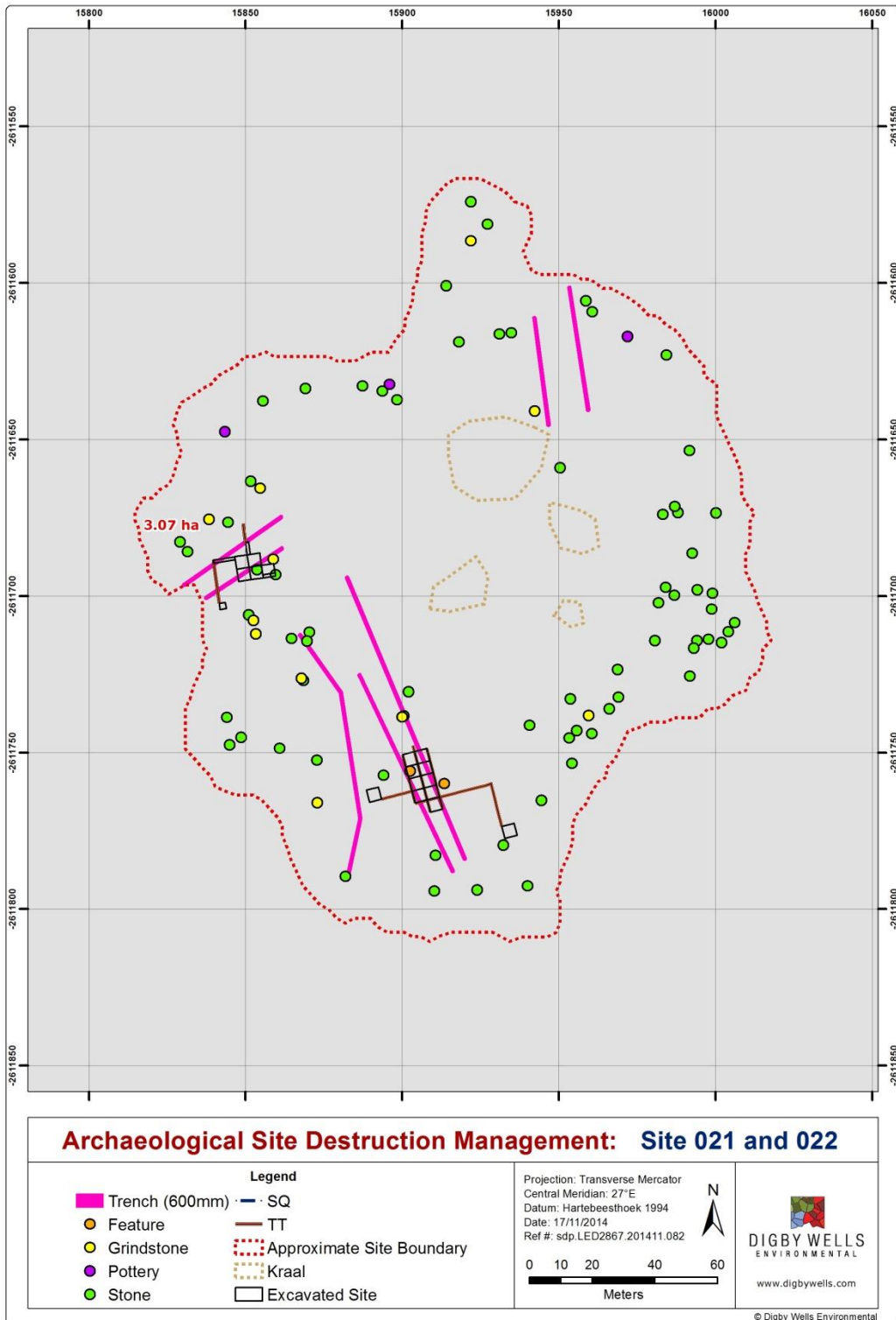
The site destruction corroborated the findings in the 2011 and 2012 mitigation reports: the average depth where cultural material may be expected is limited to 10 to 20 cm below surface.

Material culture exposed during destruction was limited to a few undiagnostic ceramic fragments. No subsurface features or deposit were noted.



#### **4.5.4 Recommendations**

No further recommendations are made for site 021 / 022, with the provision that the procedures included in the attached CFP are implemented.



**Plan 5: Approximate extent of site 021 / 022 indicating trench positions**



## 5 Discussion

Site destruction has largely confirmed findings from earlier site investigations reported on separately (Nel 2012; Nel & du Piesanie 2012). Surface indicators were generally limited to low density scatters of ceramic fragments, grain bin foundations and lower and upper grindstones. A concerted effort was made to include as many surface features such as grain bin foundations in the trench footprints. However, with the possible exception of site 012, the destroyed sites show little to no stratification, even in the immediate vicinity of surface indicators. Additionally, no diagnostic material was exposed or collected that could contribute to an overall understanding of the region's archaeological record.

Apart from site 012, any evidence of material culture and / or deposit was limited to approximately 20 cm below surface, and mostly within the first 10 cm. This reiterates the premise developed in earlier reports (Nel 2012; Nel & du Piesanie 2012) that occupation and settlement in the area were transient.

Site 012 is an exception to the rule: the depth at which the deposit was noted far exceeded any evidence obtained at any of the other sites, especially compared to other identified sites located on the same floodplain within an approximate 300 m to 800 m radius from site 012, e.g. sites 009, 011 and 018. However, extensive animal activities that have resulted in deep burrows are evident throughout the site. The deeper deposits may therefore be the results of bioturbation<sup>1</sup> that occurred sometime in the past. Surface or near surface deposit may have been displaced or washed into deeper cavities. These cavities may subsequently be sealed by further activity such as collapsing burrows – hence the absence of any surface indicators.

The human remains exposed less than 50 m from the nearest deeper deposit in trench ST12/T2 may support this assumption. The remains were exposed from within the first approximate 20 cm of soil, corresponding to the average depth where material was noted in all other sites. The assumption may need to be tested.

The exposure of the human remains further emphasise the notion that occupation and settlement was transient. Although the few ceramic fragments collected from site 012 and others indicated a very tenuous Tswana-speaking identity, it is sufficient to place the site into a Late Iron Age temporal context. The remains could not be associated with any features commonly observed with Late Iron Age archaeological burials, such as burial goods (e.g. ceramic vessels), midden or kraal deposit, or hut floors. The assumption is therefore that occupation was so ephemeral that it did not enable the development of deeper stratified deposits. Nor was longer-term maintenance of structures required that may have resulted in some evidence of settlement, such as more resilient (i.e. better compacted, thicker) hut floors.

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<sup>1</sup> Bioturbation refers to the physical displacement, modification or rearrangement of materials within a stratigraphic sequence by biological agents. These agents can include plants (e.g. roots), animal and human activities (e.g. termite and rodent nests, aardvark burrows).



The work undertaken from 2011 to 2014 was entirely development-driven and inherently restricted due to time and financial limitations. In addition, interpretation of the identified and investigated sites was constrained by a general lack of comparable information and knowledge of the archaeological record of the region.

Notwithstanding these limitations, the results indicated an extensive Iron Age occupation of the Boikarabelo Coal Mine project area. By inference, this occupation is expected throughout the wider region. Future investigations are therefore highly recommended. First, any development-driven studies must be cognisant of the archaeological record identified through the Boikarabelo project.

Second, longer term focussed academic research is needed to develop a comparative database of this record in the region. Future developers – be it within the mining sector or otherwise – can significantly contribute to such research. Collaborations and partnerships between the development and academic community can provide welcome opportunities.

Boikarabelo Coal Mine clearly demonstrated that such collaboration and partnership is possible. Through ongoing support, the Mine enabled postgraduate students to not only gain field experience on its properties, but also use the sites and materials to further their studies.

## 6 Conclusion

This report presents the results of permitted destruction of five sites in terms of SAHRA requirements: it is the culmination of a comprehensive archaeological assessment that commenced in 2009 (Fourie 2010).

The presence of an archaeological record had been demonstrated throughout. Unfortunately, the lack of archaeological indicators with which to identify sites and occupation or settlement layers will inevitably result in the unknown and unintended destruction of sites. This notwithstanding, the following recommendations are made that should be considered and implemented by Boikarabelo Coal Mine:

- No additional actions are required for sites 009 / 010, 011, 018 / 019 and 021 / 022, with the proviso that the procedures included in the attached CFP are adopted and implemented as part of the mine's Environmental Management Plan.
- Regarding site 012 / 013, the following actions must be considered:
  - The site extent as a sensitive area and any development avoided as far as possible in or near the site;
  - In the event that any development will take place, the site must be investigated through archaeological excavations to determine better context and possible age of the site and remains (supported by the Department of Anatomy to which the remains have been delivered for analysis); and
  - Subject to findings of such an investigation, the site may require a reassessment in terms of its cultural significance and impacts on the site.

The findings presented in this and earlier reports were wholly due to development-driven assessments. However, it has sensitised Boikarabelo Coal Mine to, and should make other future developers and assessors equally aware of, the existence of a potentially significant archaeological record. Although the impetus was development-driven, the results may also provide sufficient incentive to motivate more structured archaeological research within the region.

## 7 References

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NHRA Section 35(4) Destruction Permit Report

Boikarabelo Coal Mine Archaeological Site Destruction (Permit IDs 1879 to 1882)

LED 2867



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## Appendix A: Skeletal Analysis Report