



**PHASE 2 ARCHAEOLOGICAL IMPACT
ASSESSMENT**

FOR

**MITIGATION FOR BOIKARABELO COAL
MINE, LIMPOPO PROVINCE (SAHRA
PERMIT NO. 80/11/07/015/51)**

REGEN SOUTH AFRICA (PTY) LTD

SEPTEMBER 2012

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Report Title: Phase 2 Archaeological Impact Assessment Mitigation for the Boikarabelo Coal Mine (SAHRA PERMIT NO 80/11/07/015/51)

Project Number: LED1656

Name	Responsibility	Signature	Date
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Johan Nel	Specialist & Permit Holder		September 2012

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EXECUTIVE SUMMARY

This report summarises the results of archaeological fieldwork undertaken on sites located within the proposed Boikarabelo Coal Mine project area during the period May – July 2012. These sites were identified during an Archaeological Impact Assessment (AIA) which was undertaken in September 2009 and February 2010 as part of an Environmental Impact Assessment (EIA) for the proposed Boikarabelo Coal Mine, which were mitigated and reported on in an interim Phase 2 Archaeological Impact Assessment (Nel, 2012). At the request of Resource Generation (Resgen), additional archaeological mitigation on sites that are to be impacted upon was done.

A total of six sites were mitigated with test excavations and mapping. Sites 010, 013 and 018 were excavated in a single trench of 48 m consisting of twelve 1 m x 4 m squares. No discernible features were identified and the material culture observed was negligible. No further testing of these sites took place.

Site 011 was mitigated in three localities over identifiable features on the surface. Test Trenches 1 to 3 were placed over grain bin platforms on a diagonal baseline whereas Test Trench 4 was placed over a kraal deposit. Test Trench 4 consisted of nine 4 m x 4 m squares and two trench extensions 53 m in length and orientated north – south and west – east respectively. Site 014 consisted of one test trench placed over identifiable grain bin platforms. A total of three 4 m x 4 m, two 9 m x 1 m and one 4 m x 1 m squares were excavated and material culture was collected. Site 021 was mitigated in two localities. A total of nine 4 m x 4 m, one 2 m x 2 m, one 1 m x 8 m, one 1 m x 7 m and one 1 m x 4 m squares were excavated. A substantial amount of material culture was collected from Site 021.

In general, all sites had a limited deposit. Occupation levels were observed between 0 mm – 200 mm beneath the surface, and with the exception of Site 021, produced limited material culture. Interpretation of the sites suggests that occupation occurred over a limited period and that preservation is poor. No burials were identified during excavations.

Table 1: Mitigated archaeological sites in the Boikarabelo Coal Mine Project area

Site co-ordinates	Site Names	Mitigation
East/LON/X: 27.13388 South/LAT/Y:23.63040	Site 010	Test Excavation and Mapping
East/LON/X: 27.14091 South/LAT/Y:23.62635	Site 011	Test Excavation and Mapping
East/LON/X: 27.12823 South/LAT/Y: 23.63745	Site 013	Test Excavation and Mapping
East/LON/X: 27.12991 South/LAT/Y: 23.61938	Site 014	Test Excavation and Mapping
East/LON/X: 27.15096 South/LAT/Y: 23.61578	Site 018	Test Excavation and Mapping
East/LON/X: 27.15590	Site 021	Test Excavation and

Site co-ordinates	Site Names	Mitigation
South/LAT/Y: 23.60612		Mapping

No recommendations are put forth in this report. An application for a Destruction Permit was submitted to SAHRA and has subsequently been granted. Conditions contained within the destruction permit include:

- The permit is issued to Mr Nel as representative of Mr van den Aardweg, for Resgen South Africa.
- If the permit holder cannot be present on site at all times, then the heritage authority must be provided with the names and qualifications of the authorised representative.
- A progress report on the results of the destruction must be submitted to the heritage authority issuing this permit on or before the 1st of August 2013.
- Reprints of all published papers or copies of theses and/or reports resulting from this work must be lodged with the heritage authority.
- If a published report has not appeared within three years of the lapsing of this permit, the report required in terms of the permit will be made available to researchers on request.
- It is the responsibility of the permit holder to obtain permission from the landowner for each visit, and conditions of access imposed by the landowner must be observed.
- The heritage authority shall not be liable for any losses, damages or injuries to persons or properties as a result of any activities in connection with this permit.
- The heritage authority reserves the right to cancel this permit by notice to the permit holder.
- This permit is subject to a general appeal and may be suspended should an appeal against the decisions be received by SAHRA within 14 days from the date of the permit. SAHRA may not be held responsible for any costs or losses incurred in the event of the suspension or retraction of this permit.

GLOSSARY OF ABBREVIATIONS AND TERMS

AIA	Archaeological Impact Assessment
ATP	Auger Test Pit
autochthonous	Indigenous descent, or local existence of geological material
BCE	Before Common Era, synonymous with BC
BP	Before Present, i.e. 1950, used to describe calibrated radiocarbon dates
CE	Common Era (synonymous to AD)
CRM	Cultural Resources Management
daga	mud/clay mixture used to plaster wattle and daub walls. Sometimes mixed with cattle dung to smooth floors or walls. Usually only visible in archaeological record after burning that turns the mixture into a brick-like consistency and texture.
Digby Wells	Digby Wells Environmental
EDM	Electronic Distance Measurement instrument
EMP	Environmental Management Plan
ESIA	Environmental and Social Impact Assessment
Ha	Hectare
Historical	Alludes to European contact and subsequent settlement; includes colonial eras.
HSMP	Heritage Site Management Plan
Iron Age	Metals and metal working – including copper, gold, and iron – appears in archaeological record associated with more complex, stratified society, usually agropastoral economies; overlaps historical period in areas; ceases at various times during 19 th century with colonial expansion.
kya	thousand years ago
monitoring	Periodic monitoring of sites during the Life of Mine, typically applied to significant sites that won't be impacted on directly, but with a risk of secondary impacts.
mya	million years ago
project area	the boundaries of the Boikarabelo Coal Mine
radiocarbon dating	Absolute radiometric dating technique for carbon-bearing material
site	Used to refer to locality where archaeological record is visible or present. Can include single occurrences or scatters of artefacts, stonewalls, daga, dung or midden deposit.
STP	Shovel Test Pit
study area	The wider archaeological and historical socio-cultural environment and landscape, including south-eastern Botswana, north-west Limpopo and the Waterberg.
watching brief	The process where a qualified archaeologist is present on-site during any activity in, near or at a heritage resource site that may be impacted on, or where there is potential for exposing heritage resources during construction or other activities. Note that in context of this report it is distinct from monitoring

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1 INTRODUCTION

Digby Wells Environmental (Digby Wells) was appointed as an independent environmental consultant by Resgen South Africa (Pty) Ltd (Resgen), to undertake an Environmental Impact Assessment (EIA) for the proposed Boikarabelo Coal Mine. This assessment was concluded in 2010. As part of the EIA a Phase 1 Archaeological Impact Assessment (AIA) was conducted. This assessment was sub-contracted to Professional Grave Solutions (Pty) Ltd Heritage Unit (PGS-HU) by Digby Wells who conducted the assessment during 2009 and 2010. The AIA findings showed that certain heritage resources would be impacted on by the development of the Boikarabelo Coal Mine, and relevant mitigation measures were subsequently recommended.

In 2010, Digby Wells was reappointed by Resgen to undertake the necessary mitigation of the sites that would be impacted. Terms of Reference (ToR) for this stage of the project were in part obtained through the South African Heritage Resources Agency's (SAHRA) Review Comments of the Phase 1 AIA. Subsequently, Johan Nel on behalf of Digby Wells applied for and received a permit from SAHRA granting permission to conduct the required mitigation. Mitigation took place over a two week period in October 2012. Field assistance was supplied by students from the Department of Anthropology and Archaeology of the University of Pretoria (UP) under supervision of Dr Ceri Ashley (senior lecturer: Archaeology). Dr Maria van der Ryst of the Department of Anthropology and Archaeology, University of South Africa, undertook the role of Principle Investigator. Mr Wim Biemond provided input and assistance with the ceramic analysis.

A destruction permit was also applied for on behalf of Resgen for sites that would be destroyed during the course of construction activities and mining operations. Resgen however requested that more extensive mitigation be done of sites – after reviewing the interim report – with specific focus on sites that will be destroyed by mining infrastructure.

2 BACKGROUND INFORMATION OF PROJECT

2.1 Report type: Phase 2 Archaeological Impact Assessment

The initial Phase 2 archaeological mitigation was concluded in February 2012 and a report submitted to Resgen and SAHRA. This report was submitted as an interim report in motivation of a Destruction Permit application - permission to destroy archaeological sites - to SAHRA on behalf of Resgen in April 2012. The permit was granted in July 2012.

In addition to the concluded Phase 2 AIA, Resgen requested that a second phase be implemented to more accurately determine the extent of sites and specifically the potential existence of archaeological graves. In order to complete the second phase of mitigation, field assistance was provided by students from the Anthropology and Archaeology Department at UP, in conjunction with an excavation team sourced locally through LabourNet (recruitment agency). This phase commenced in May 2012 and fieldwork concluded in July 2012.

This report presents the findings of the final phase of mitigation.

2.2 Context of Development

2.2.1 Type of development

Resgen is in the process of developing a new coal mining complex in the Lephalale area, bordering the Limpopo River.

2.2.2 Development context of Study Area

Other similar projects in the area include the ESKOM Mafuta project. Additionally, several exploration licences exist, as well as Mining Right Applications. The existing Grootegeluk coal mine is located 40 km south of Steenbokpan, and is the largest operating mine in the region. A new development adjacent to Grootegeluk includes the Thabametsi coal mine. Existing power stations in the area include Matimba and Medupi, located near the town Lephalale.

2.3 Client, Consultant and Land Owner Contact Details

Table 2-1: Client Contact Details

ITEM	COMPANY CONTACT DETAILS
Company	Resgen South Africa (Pty) Ltd
Contact person	Hennie van den Aardweg
Tel no	012 345 1057 / 082 957 7130
E-mail address	haardweg@resgen.com.au
Postal address	PO Box 5384, Rietvalleirand, 0174

Table 2-2: Consultant Contact Details

ITEM	COMPANY CONTACT DETAILS
Company	Digby Wells Environmental
Contact person	Louise Nicolai
Tel no	011 789 9495
E-mail address	louise@digbywells.com
Postal address	Private Bag X10046, Randburg, Johannesburg, 2125

3 TERMS OF REFERENCE

3.1 Client Terms of Reference

In terms of the recommendations contained in the specialist archaeological impact assessment report (Fourie, 2010) and subsequent SAHRA Review Comments, sites of heritage significance, including archaeological, historical and palaeontological sites, must be mitigated before any activities can take place that may adversely affect such sites.

3.2 HRA Terms of Reference

The ToR are based on the recommendations provided in the Phase 1 AIA report, and the SAHRA Archaeological Review Comment (ARC) on that report. However, the permit requirements supplied in the SAHRA Phase 2 permit informed the primary ToR.

3.2.1 Permission granted (Permit No. 80/11/07/015/51)

The permit was issued under Section 35(4) of the National Heritage Resources Act, Act 25 of 1999 (NHRA). Permission was granted in terms of this permit to conduct:

- Shovel Test Pits (STP) for sites: 002, 003, 006, 011, 017, 018, 019, 020, 022, 026, and 027;
- Mapping and test excavations for sites: 009, 010, 012; and
- Monitoring for sites: 001, 013 (to be mapped with Site 012), 015 and 016.

3.2.2 Summary of Permit conditions

The permit was granted in terms of certain conditions being met. The most pertinent of these are summarised below:

- All sites affected by the Phase 2 project must be mapped, including sites for which only monitoring were required;
- Where STPs and test excavations yielded significant information SAHRA and the developer had to be notified to establish a way forward;
- Where STPs and test excavations yielded less significant results, application for site destruction needs to be applied for from SAHRA before destruction can take place;
- Human remains are ethically sensitive and when found accidentally, all necessary consultations as may be required by the NHRA must be undertaken; and
- The permit does not apply to any development activities that were not assessed as part of the Phase 1 AIA of this project.

3.3 Scope of Work

In order to comply with the ToR provided by SAHRA, sites with heritage significance required mitigation. Mitigation measures included:

- Phase 2 mapping and test excavation;
- Phase 2 assessments: shovel test pits;
- Extensive documentation; and

- Application of destruction permits from SAHRA.

3.4 Aims and objectives

The aim and objectives of this archaeological mitigation project were:

- To establish the site extent, integrity, approximate age and significance of sites identified during the Phase 1 AIA through various sampling techniques;
- To identify the spatial features and settlement layout of each site;
- To place the site within the broader chronological and cultural context;
- To analyse collected and excavated material culture, where relevant;
- To provide a report to Resource Generation that will explain the methodology, findings and results of the study; and
- Create an archive of the sites for future use, both in terms of academic interest and cultural resource management in the region.

3.5 Legislative Requirements

3.5.1 Summary

Resgen requested Digby Wells to undertake an EIA in accordance with the MPRDA and the NEMA. As part of the EIA, a Phase 1 AIA was conducted with certain recommendations. The Phase 1 AIA was submitted to SAHRA in accordance with the National Heritage Resources Act (25 of 1999) (NHRA).

This section summarises relevant parts of the following legislation:

- National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA);
- National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA); and
- Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA).

3.5.2 NHRA

The primary legislation that must be considered with regard to heritage resources is the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA). The sections of this act that are applicable to the Boikarabelo Coal Mine Project are discussed below.

3.5.2.1 Section 2

Section 2 of the NHRA contains definitions of certain terms used in heritage resources management. In terms of this report the following definitions must be considered:

- (ii) **Archaeological:** any material remains resulting from human activity older than 100 years; any form of rock art older than 100 years and the area within 10 m of the art; and any feature, structure or artefact associated with military history older than 75 years as well the sites on which they are found;

- (v) **cultural significance:** aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance;
- (viii) **development:** any physical intervention, excavation, or action, other than those caused by natural forces, which may in the opinion of a heritage authority in any way result in a change to the nature, appearance or physical nature of a place, or influence its stability and future well-being, including construction, alteration, demolition, removal or change of use of a place or a structure at a place; carrying out any works on or over or under a place; subdivision or consolidation of land comprising, a place, including the structures or airspace of a place; constructing or putting up for display signs or hoardings; any change to the natural or existing condition or topography of land; and any removal or destruction of trees, or removal of vegetation or topsoil;
- (xiii) **grave:** a place of interment and includes the contents, headstone or other marker of such a place, and any other structure on or associated with such place;
- (xvi) **heritage resource:** any place or object of cultural significance;
- (xxxii) **place:** a site, area or region; a building or other structure which may include equipment, furniture, fittings and articles associated with or connected with such building or other structure; a group of buildings or other structures which may include equipment, furniture, fittings and articles associated with or connected with such group of buildings or other structures; an open space, including a public square, street or park; and in relation to the management of a place, includes the immediate surroundings of a place;
- (xiii) **site:** any area of land, including land covered by water, and including any structures or objects thereon;
- (xivl) **structure:** any building, works, device or other facility made by people and which is fixed to land, and includes any fixtures, fittings and equipment associated therewith.

3.5.2.2 Section 35

Section 35 of the NHRA provides for the general protection of archaeological and palaeontological resources, and meteorites. In the event that archaeological resources are discovered during the course of development, Section 38(3) specifically requires that the discovery must immediately be reported to the PHRA, or local authority or museum who must notify the PHRA. Furthermore, no person may without permits issued by SAHRA destroy, excavate, or make any alterations to archaeological or palaeontological resources encapsulated in Section 38(4).

3.5.2.3 Section 36

Section 36 of the NHRA allows for the general protection of burial grounds and graves. Should burial grounds or graves be found during the course of development, Section 36(6) stipulates that such activities must immediately cease and the discovery reported to the responsible heritage resources authority and the South African Police Service (SAPS). Furthermore, as specified in Section 38(3) no person may destroy, damage, exhume or alter

any burial site without a permit issued by SAHRA. Chance find procedures are present to Resgen in Appendix C.

3.5.2.4 Heritage Resources Management

3.5.2.4.1 Section 38(1)

Section 38(1) stipulates that the relevant heritage authority must be notified of any development at the earliest opportunity possible, via a Notice of Intent to Develop (NID). The heritage authority is required to comment on the NID within 14 days stating whether a HIA is required or not. A Heritage Statement must be compiled to inform the NID.

The following activities, as stipulated in Section 38 of the NHRA, act as triggers for the undertaking of HIAs:

- (a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length;
- (b) the construction of a bridge or similar structure exceeding 50 m in length;
- (c) any development or other activity which will change the character of a site -
 - (i) exceeding 5 000 m² in extent; or
 - (ii) involving three or more existing erven or subdivisions thereof; or
 - (iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or
 - (iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;
- (d) the re-zoning of a site exceeding 10 000 m² in extent; or
- (e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

SAHRA and/or the PRHA are *consenting authorities* on any development undertaken in terms on Section 38(1).

3.5.2.4.2 Section 38(8)

HIAs are in general required in terms of Section 38(8) where development is undertaken in terms of other acts.

3.5.3 NEMA

HIAs are required in terms of the NEMA and relevant NEMA Regulations.

Principles for environmental management relevant to heritage resources management are highlighted in Section 2 of the NEMA:

- (2) Environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably.
- (3) Development must be socially, environmentally and economically sustainable.
- (4)(a) Sustainable development requires the consideration of all relevant factors including that the disturbance of landscapes and sites that constitute the nation's cultural heritage is avoided, or where it cannot be altogether avoided, is minimised and remedied;
- (4)(o) The environment is held in public trust for the people while the beneficial use of environmental resources must serve the public interest and the environment must be protected as the people's common heritage.

In addition to the above principles, the general objective of the environmental management relative to heritage resources management is illustrated in Section 23 of the NEMA:

- (2)(a) promote the integration of the principles of environmental management set out in [the Principles] into the making of all decisions which may have a significant effect on the environment;
- (2)(b) identify, predict and evaluate the actual and potential impact on the environment, socio-economic conditions and 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.

HIAs are implemented in terms of the NEMA Section 24 in order to give effect to the general objectives. Procedures in terms of the NEMA Section 24(7) considering heritage resources management are provided and must include:

- a. Investigation of the environment likely to be significantly affected by the proposed activity and alternatives thereto;
- b. Investigation of the potential impact, including cumulative effects, of the activity and its alternatives on the environment, socio-economic conditions and cultural heritage, and assessment of the significance of that potential impact;
- c. Investigation of mitigation measures to keep adverse impacts to a minimum, as well as the option of not implementing the activity;
- d. Public information and participation, independent review and conflict resolution in all phases of the investigation and assessment of impacts;
- e. Reporting on gaps in knowledge, the adequacy of predictive methods and underlying assumptions, and uncertainties encountered in compiling the required information;
- f. Investigation and formulation of arrangements for the monitoring and management of impacts, and the assessment of the effectiveness of such arrangements after their implementation;

- g. Co-ordination and co-operation between organs of state in the consideration of assessments where an activity falls under the jurisdiction of more than one organ of state;
- h. That the findings and recommendations flowing from such investigation, and the general objectives of integrated environmental management laid down in this Act and the principles of environmental management set out in Section 2 are taken into account in any decision made by an organ of state in relation to the proposed policy, programme, plan or project; and
- i. That environmental attributes identified in the compilation of information and maps as contemplated in subsection (2)(e) are considered.

3.5.4 MPRDA

The NEMA Principles outlined apply to all prospecting and mining operations in terms of the MPRDA Section 37.

HIAs are required in terms of integrated environmental management required in terms of Section 38 of the MPRDA, and that must reflect the general objective of the NEMA described above. In relation to heritage resources management, a specific MPRDA requirement in terms of Section 38 is to:

- (3)(b)(iii) investigate, assess and evaluate the impact of ... prospecting or mining operations on any national estate referred to in Section 3(2) of the NHRA with the exception of the national estate as contemplated in Section 3(2)(i)(vi) and (vii) [objects of scientific or technological interest and books, records, documents, etc.].

3.5.5 Additional minimum standards and best practice

- SAHRA Minimum Standards;
- Association of Southern African Professional Archaeologists (ASAPA) Constitution and Code of Ethics.

SAHRA and/or the PRHA are *commenting authorities* on any development undertaken in terms on Section 38(1).

4 EXPERTISE OF SPECIALIST

Johan Nel graduated with an Archaeology Honours degree in 2002 and is currently completing his Master of Arts degree in Archaeology at the University of Pretoria. He currently holds the position of CRM Unit Manager at Digby Wells Environmental. He has been involved in several Phase 2 mitigations within South Africa and internationally in the Democratic Republic of Congo and Sierra Leone.

Justin du Piesanie graduated with a Master of Science degree in Archaeology in 2008 from the University of the Witwatersrand. He currently holds the position of Archaeology

Consultant at Digby Wells Environmental and has been involved in three Phase 2 mitigations in South Africa.

CV's of specialists and declaration of independence are attached in Appendix A

5 METHODOLOGY

Internationally accepted archaeological field methods, techniques, standards and best practice were employed and adapted to suit site-specific conditions during this project. The methodology was primarily informed by the aim and objectives of the study: establishing site extent, integrity, approximate age, settlement layout and spatial features of a site. As a result, the methodology employed comprised of the following:

- Literature review to contextualise the study results;
- Site survey and mapping;
- Detailed test excavations and sampling;
- Cultural material analyses and documentation; and
- Collection management.

5.1 Literature Review

Published and unpublished literature was reviewed to provide a historical context within which the various sites could be described and interpreted. In general a lacuna was found in terms of existing material that could facilitate interpretation and comparison of sites. A broad overview was thus done in terms of the potential archaeological record that may be found in the region, focussing mainly on the three Stone Age periods and the Late Iron Age. Overall the interpretation of the Boikarabelo sites was thus partly inferred from sites within the area and further afield.

5.2 Survey and sampling

Site survey was done by flagging all evident archaeological features and artefacts to determine the approximate extent of the sites and settlements. Where visible, features such as cattle kraals and middens were included. The predominant features were however limited to concentrations of stones identified as grain bin platforms and upper and lower grindstones. Occurrences of pottery were not mapped, unless these could be determined to be *in situ*.

5.3 Detailed test excavations and sampling

Structured sampling included shovel test pits (STPs) and stratified test excavations. STPs were excavated at various intervals in grids laid out over parts of sites where higher information potential such as deposits or features were expected. The test excavations incorporated visible features or deposits. This was done to obtain material for analyses and to determine feature size, probable use and spatial layout. All test excavations were completed as square grids, where a 1 m x 1 m square was the base unit.

For consistency, sites were named based on sites recorded in the Phase 1 AIA. Individual areas where test excavations were done were termed Test Trench. Squares were referenced using a coordinate system based on an arbitrary datum taken at each test excavation locality. This system allows for a theoretical infinite extension of the grid along

the four cardinal directions to include as much or little of a site as required. Figure 5-1 provides an illustrated example of the grid system and referencing. The datum (red dot) at the locality represents a zero coordinate from where north-south and east-west baselines extends (represented by dashed lines). Each square is referenced to the south-western coordinate, for example square 0/0 will thus be immediately north-east of the datum, N1/0 will be the second square north of the datum along the north-south baseline, etc.

Soil and/or deposit was defined using a Munsell Soil Colour Chart.

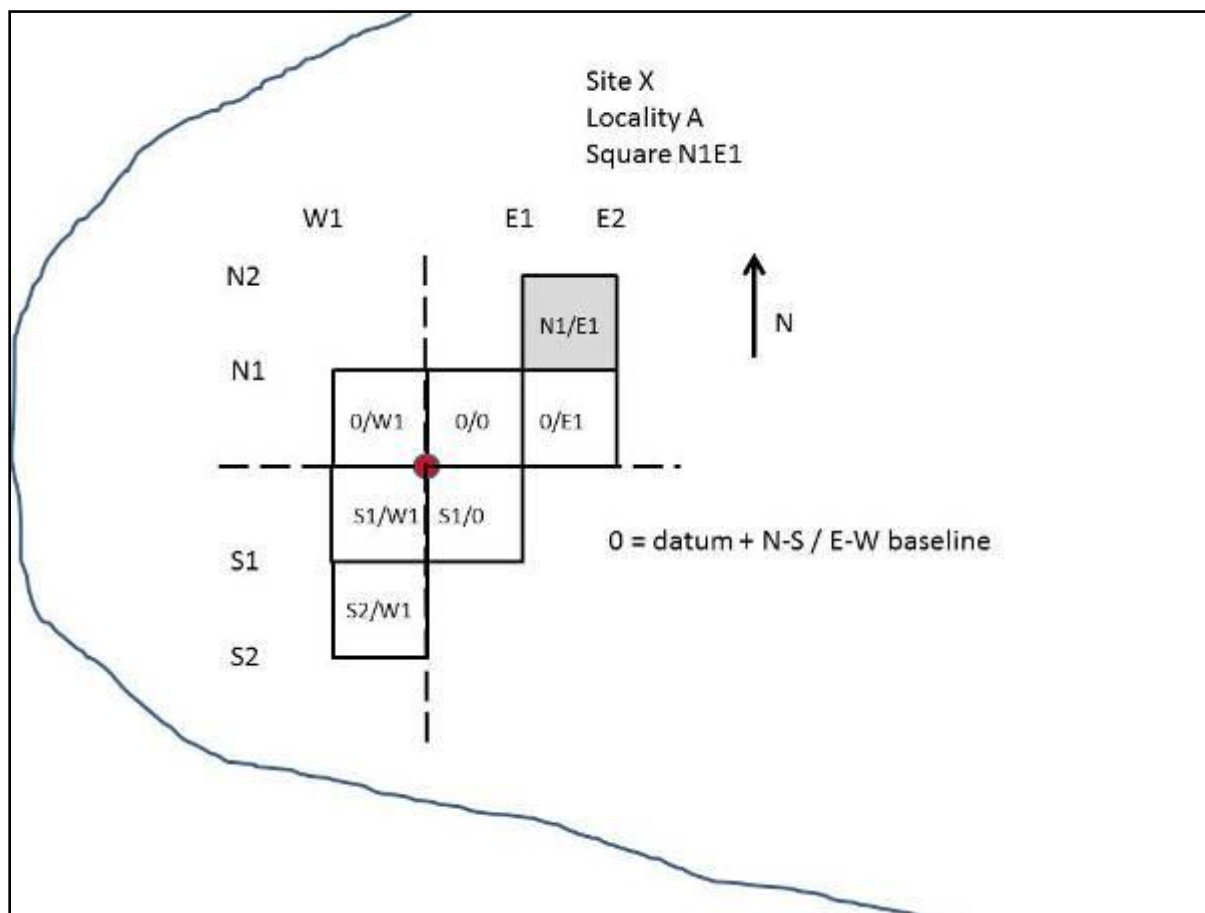


Figure 5-1: Schematic representation of test excavation reference system

5.4 Collections Management

Collections management was done both on and off site for the interim report compiled by Nel (2012). This included documentation, cataloguing, packaging, storage and cleaning of excavated material. For this report, on site management was conducted. The Department Anthropology and Archaeology, UP, will continue with the off-site collections management. Collections management complied with guidelines and minimum requirements provided by the Department of Anthropology and Archaeology of the University of South Africa (Unisa) – the legal repository as per permit requirements.

On site management included cleaning, sorting and packaging of excavated material according to material type. A site catalogue was compiled where provenance, material type, weight and quantity were described. Acid-free geological sample bags were used as containers in the field. Where charcoal was collected the samples were enclosed in tinfoil and placed in sample bags.

All excavated material will be cleaned and repackaged by the Department of Anthropology and Archaeology, UP, in preparation for analyses and storage by Unisa. Cleaning of material only consisted of removing excess soil and dust. Diagnostic potsherds were cleaned by brief rinsing of sherds. No interventive or preventive conservation took place, other than ensuring that packing material was acid free and no destructive cleaning or sampling was done.

6 DESCRIPTION OF PROPERTY AND/OR AFFECTED ENVIRONMENT

6.1 Details of Project Area

The project is located within the Waterberg coal field 75 km north east of the town of Lephalale in the Limpopo Province. The project area falls within the Lephalale Local Municipality and the Waterberg magisterial district. The nearest town is Stockpoort which is 25 km south from the main project area and Steenbokpan which is approximately 40 km from the siding located on Diepspruit 368 LQ.

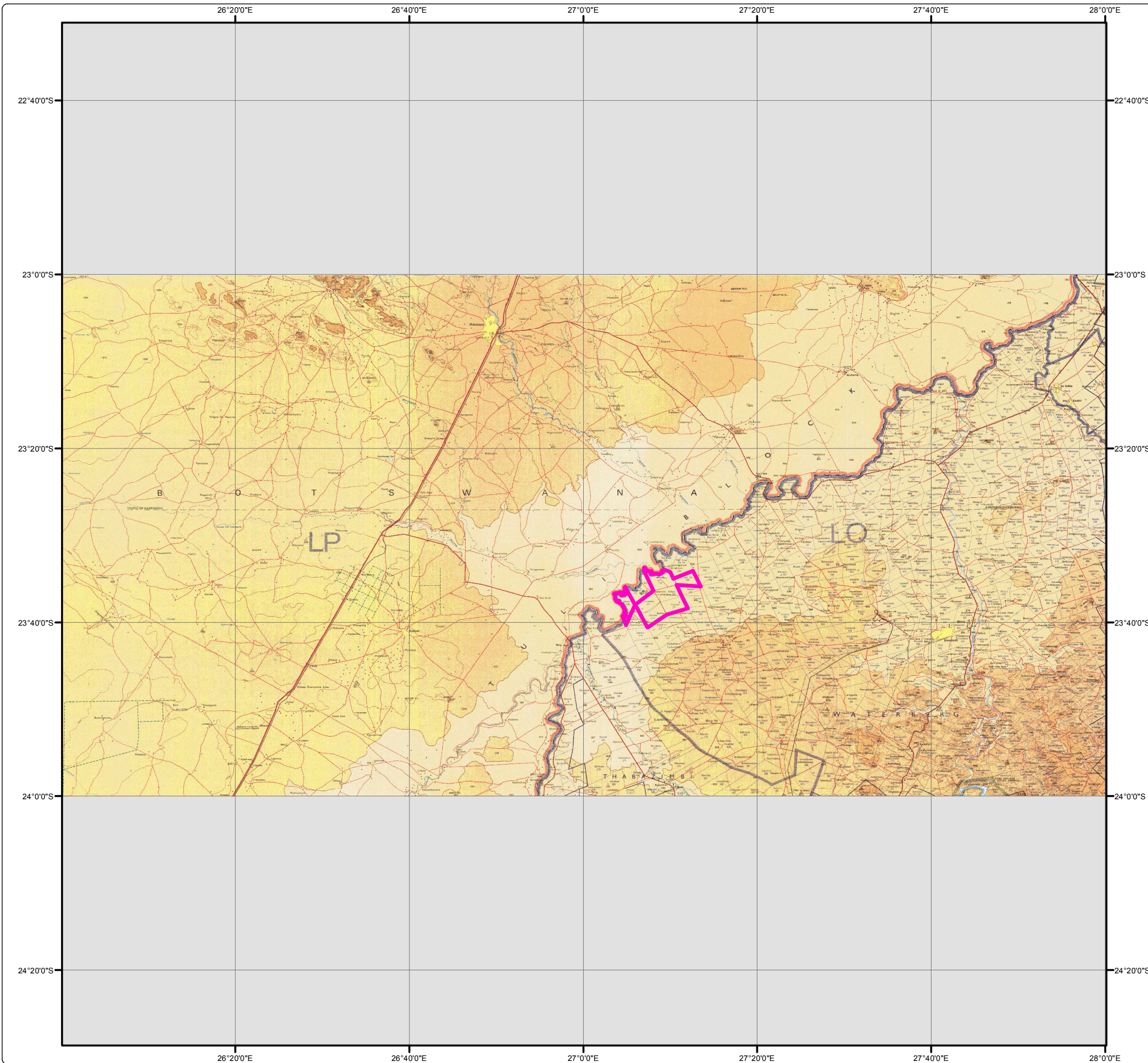
Table 6-1: Location Data

Province	Limpopo Province
Magisterial District / Local Authority	Waterberg Magisterial District
Municipality	Lephalale Local Municipality
Property Name and Number	Kalkpan 243 LQ; Witkopie 238 LQ; Zeekoevely 421 LQ
1: 50 000 Map Sheet	2327 CA Hardekraaltjie
GPS Co-ordinates (relative centre point of study area)	East/LON/X: 27.13514
	South/LAT/Y: 23.60710

Boikarabelo Additional Archeology Mitigation of Sites Project Location 1: 25000

Legend

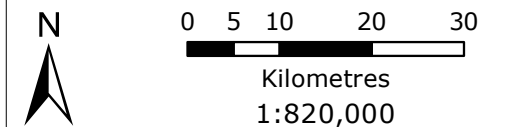
 Project Area



2326 Lephalale



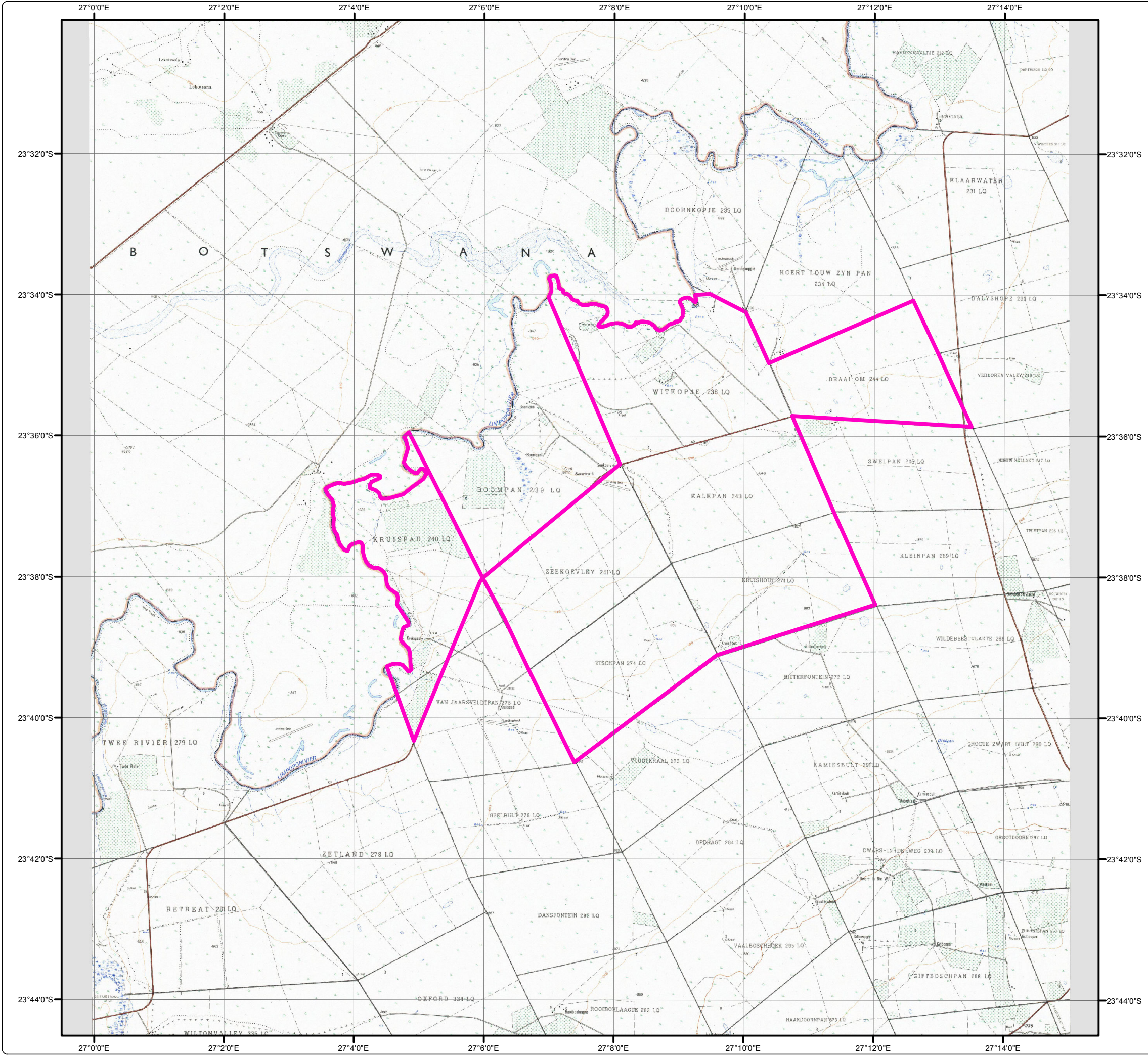
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Central Meridian: 27°E Date: 06/09/2012



Boikarabelo Additional Archeology Mitigation of Sites Project Location 1: 50000

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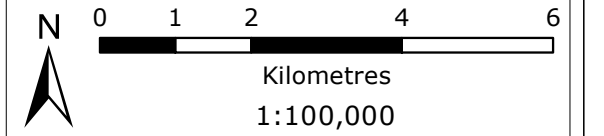
 Project Area



2327CA Hardekraaltjie



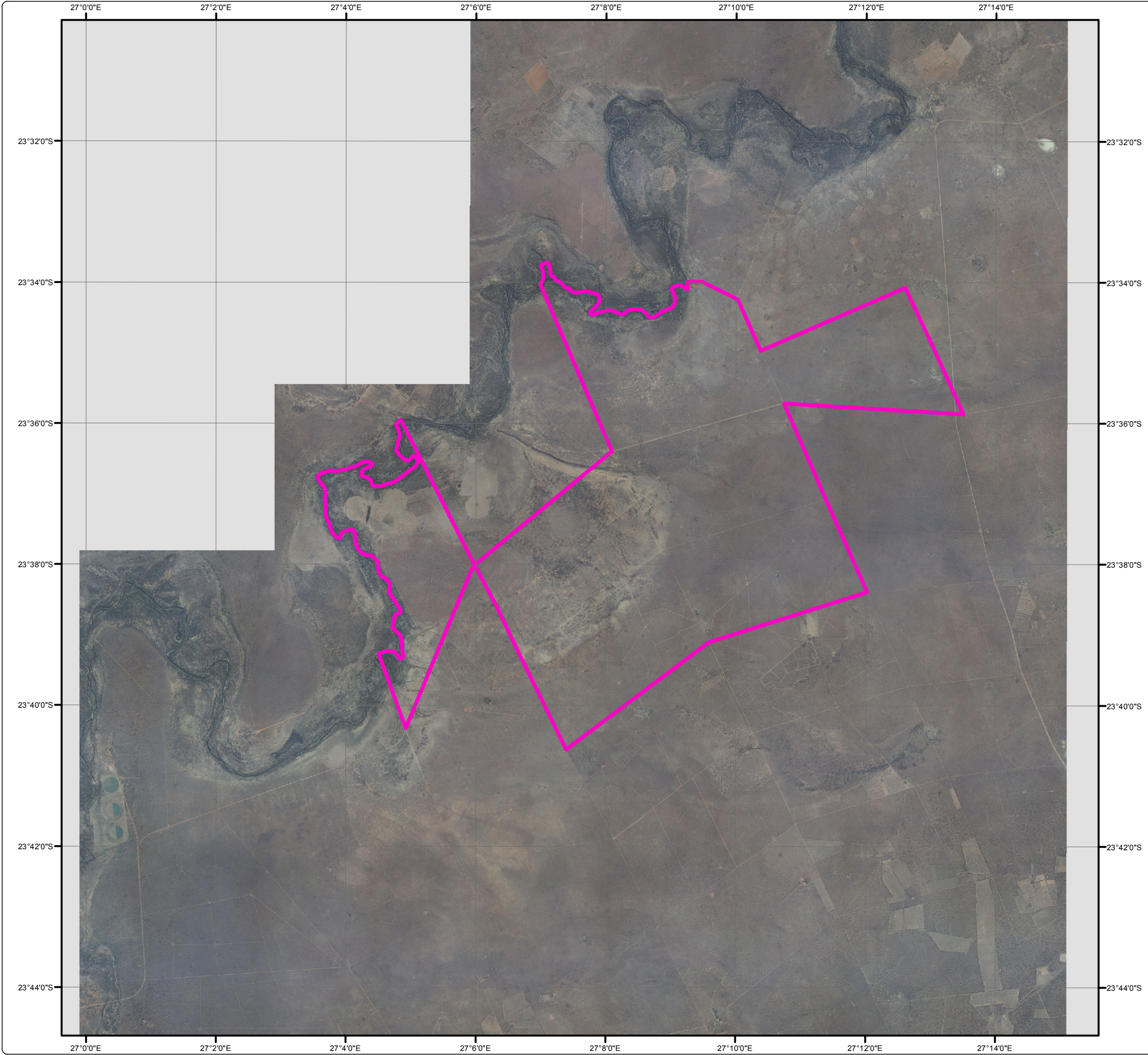
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 Central Meridian: 27°E Date: 06/09/2012



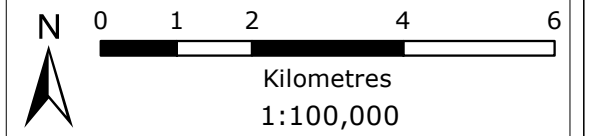
Boikarabelo Additional Archeology Mitigation of Sites Project Location 1: 10000

Legend

 Project Area



Projection: Transverse Mercator Ref #: mpl.LED1656.201209.078
Datum: Hartebeesthoek 1994 Revision Number: 1
Central Meridian: 27°E Date: 06/09/2012



7 RESTRICTIONS, LIMITATIONS, AND KNOWLEDGE GAPS

The Phase 2 project was based on the information provided in the Phase 1 AIA report and the subsequent SAHRA comments. A lack of comparative published information for the archaeological record in the region led to misidentification of sites in the Phase 1 AIA. Sites were in general identified as low density sites with low-medium significance ratings. However, some sites were shown to be much larger than originally anticipated.

The resulting limitations on fieldwork, as well as the authorization in terms of the SAHRA permit for mitigation of the specified sites only did not allow for the mitigation of additional sites identified during the Phase 2 mitigation process. These sites were only recorded and will be included as an Addendum to this report.

The lack of published information is perhaps the single largest knowledge gap in terms of interpretation of sites and artefacts. In addition, the relative paucity of material culture and deposit found during excavations, STPs and site mapping are limiting factors in reconstructing the cultural affinities and chronology of the Boikarabelo settlements. The ceramic analyses are, based on mainly undecorated vessel fragments, cannot provide firm dates for the sites at Boikarabelo Coal Mine, other than indicating a very broad and relative period of possible occupation. The research lacuna in the area did not allow positive contextual identity of the sites to be determined, other than placing the sites within a broad and generic Sotho-Tswana context dated to between ca 16th century and mid-19th century. This is based on some Letsibogo ceramics (16th century) and Bakwena багаSechele ethnohistory.

8 SITE CONDITIONS AND LOCATION DATA

The area is characterised by Western Sandy Bushveld vegetation, lying within the Savanna Biome approximately 60 km from Lephalale, Limpopo Province near the small town of Steenbokpan. This type of bushveld is defined by the occurrence of tall open woodland to low woodland, with trees such as *Acacia erubescens* on flat areas, *Combretum apiculatum* on shallow soils and *Terminalia sericea* on deep soils. Sandstone, mudstone, sandstone conglomerate, siltstone and shale of the Mokolian Waterberg group are found in the north of this region (Mucina, Rutherford, & Powrie, 2006). Topographically, the project area is relatively flat, decreasing in elevation toward the Limpopo River in the north. Most of the study area has gentle slopes of between 0% and 3%. Several steeper slopes of between 3% and 7.5% occur on the terraces down towards the Limpopo River floodplain. Slopes of between 7.5% and 16% occur in isolated sections of the terraced slopes. The slopes along the Zoetfontein Fault are between 16% and 30%.

Due to the predominant nature of land use – cattle and game farming – currently occurring fauna species may be described as having modified the natural environment from the natural state, due to the introduction of alien and non-naturally occurring species. During field investigations of the project area by Digby Wells faunal specialists, several mammal species were noted. The prominent abundance of wild ungulates (hooved animals) and small mammals were apparent, whilst an absence of large predators was evident. The game farm was previously stocked with wild herbivores, and small carnivores/scavengers and large predators were purposefully excluded. Animal numbers were artificially controlled by hunting.

During the mitigation of the archaeological sites, surface vegetation and brush were dense at some sites and site clearing was required. The climate was relatively dry and temperatures

were moderate to temperate. Wildlife in the area was primarily limited to antelopes, and no disturbance was encountered during mitigations.

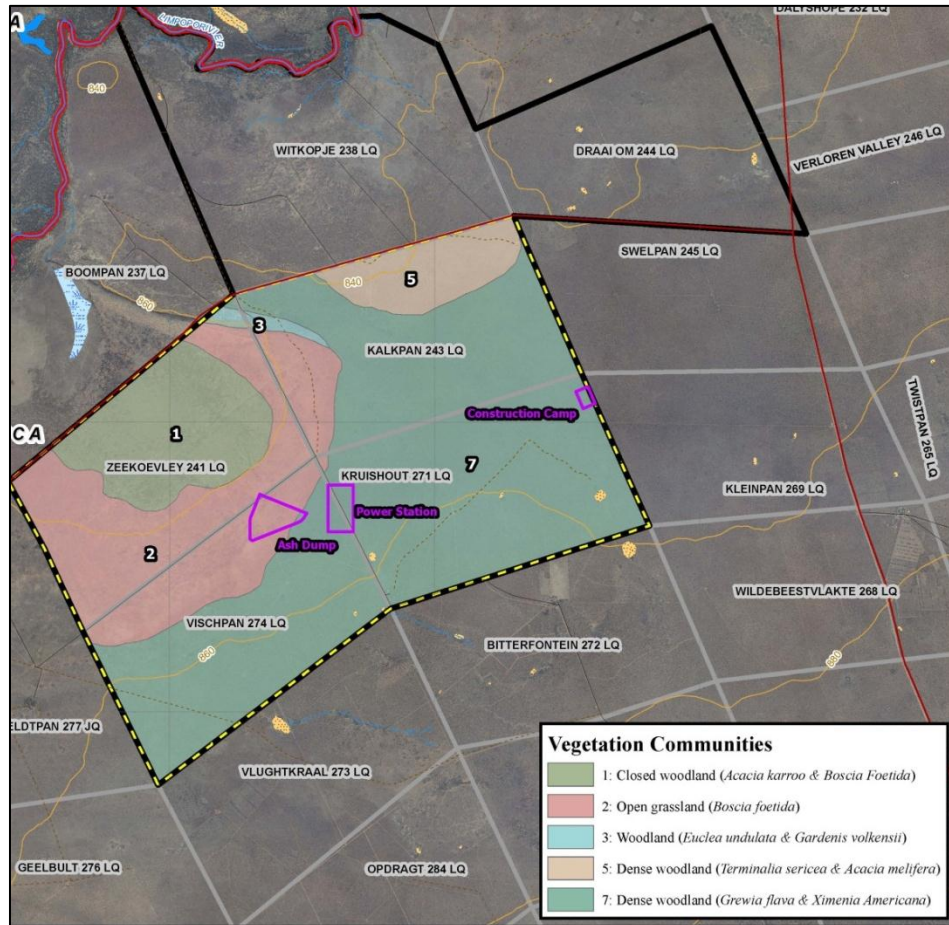


Figure 8-1: Vegetation communities present within the project area



Figure 8-2: Typical vegetation on Western side of the site; poor groundcover with dominance of Black thorn (*Acacia mellifera*) and Sickie bush (*Dichrostachys cinerea*)



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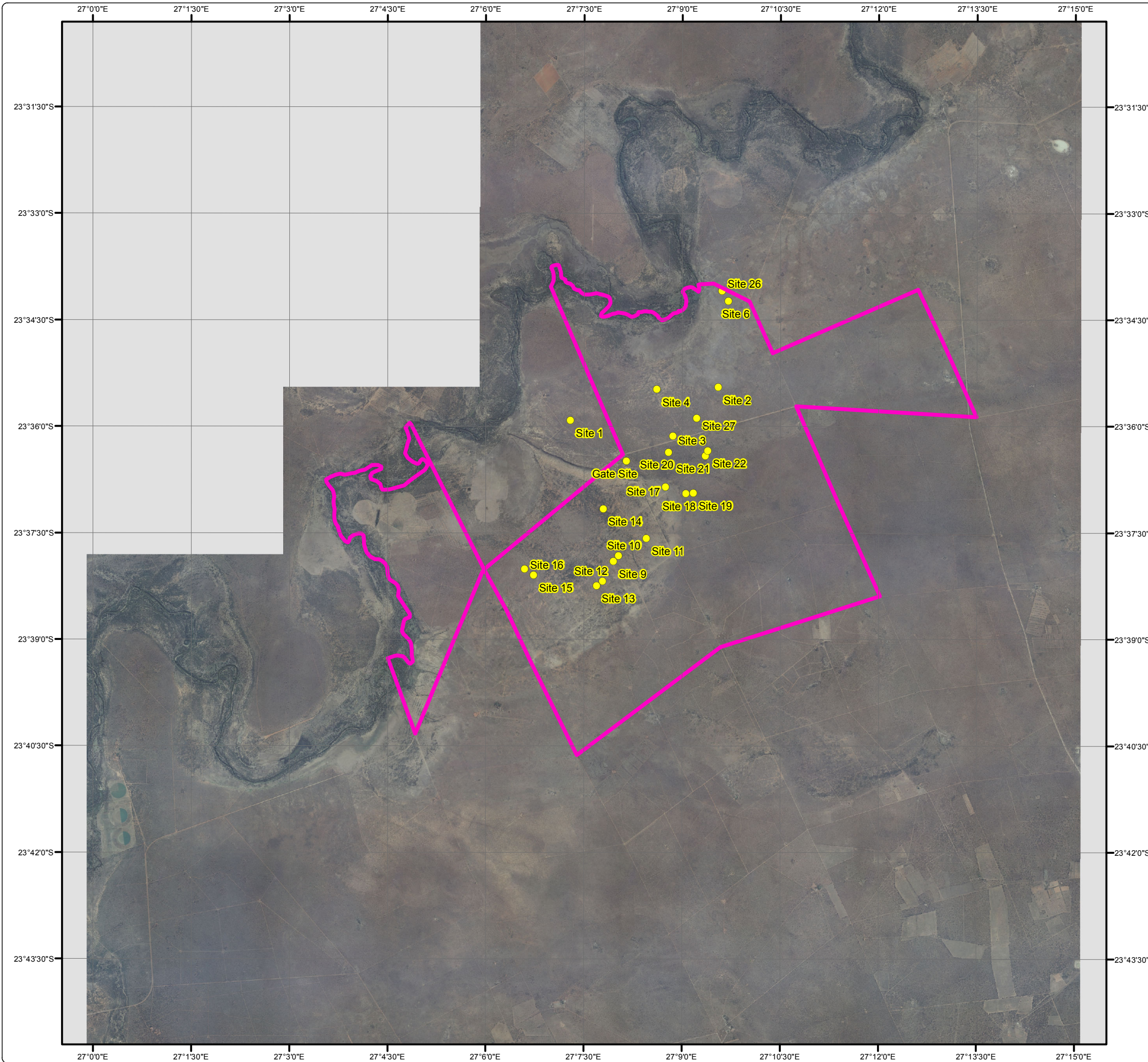
Table 8-1: GPS/GIS Data

GPS type and model used	Garmin ETrex
Datum	Hartebeeshoek 1994
Average accuracy	3 – 5 m
Site co-ordinates	Site Names
East/LON/X: 27.14765 South/LAT/Y:23.60233	Site 2327CA/003
East/LON/X: 27.13388 South/LAT/Y:23.63040	Site 2327CA/010
East/LON/X: 27.14091 South/LAT/Y:23.62635	Site 2327CA/011
East/LON/X: 27.12973 South/LAT/Y: 23.63640	Site 2327CA/012
East/LON/X: 27.12823 South/LAT/Y: 23.63745	Site 2327CA/013
East/LON/X: 27.12991 South/LAT/Y: 23.61938	Site 2327CA/014
East/LON/X: 27.11224 South/LAT/Y: 23.63492	Site 2327CA/015
East/LON/X: 27.10998 South/LAT/Y: 23.61427	Site 2327CA/016
East/LON/X: 27.14582 South/LAT/Y: 23.61427	Site 2327CA/017
East/LON/X: 27.15096 South/LAT/Y: 23.61578	Site 2327CA/018
East/LON/X: 27.15288 South/LAT/Y: 23.61565	Site 2327CA/019
East/LON/X: 27.15590 South/LAT/Y: 23.60612	Site 2327CA/021
East/LON/X: 27.15373 South/LAT/Y: 23.59810	Site 2327CA/027

Boikarabelo Additional Archeology Mitigation of Sites Archaeological Sites

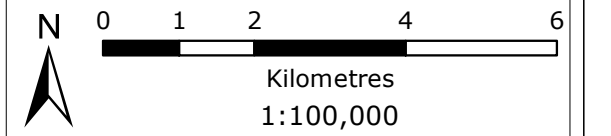
Legend

- Archaeological Sites
- ▭ Project Area



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Projection: Transverse Mercator Ref #: mpl.LED1656.201209.136
 Datum: Hartebeesthoek 1994 Revision Number: 1
 Central Meridian: 27°E Date: 13/09/2012



9 CHARACTERISATION OF CULTURAL LANDSCAPE

9.1 Literature Review

9.1.1 Archaeological Background

Identified heritage resources are placed within temporal classifications to understand the context within which they were created, manipulated and used. These timeframes in southern Africa, though not mutually exclusive, are broadly broken up into the Stone Age, Iron Age and Historical period.

9.1.1.1 The Stone Age

A representative Stone Age chronology was recognised during field survey for the initial Phase 2 mitigation. Representation included lithics from the Early Stone Age (ESA), Middle Stone Age (MSA) and Late Stone Age (LSA), as such a brief review of the Stone Age is required.

Human evolution is based on physical, social, and mental advance, most often observed in the use of stone tools that allowed exploitation of natural resources, access high protein foodstuff, and ultimately increased brain development. The Early Stone Age (ESA), dating from 2.5 million years ago (mya) to 200 000 years ago (kya), is marked by the use of large, fairly unsophisticated stone tool assemblages: the Oldowan (coarse simple flaked pebbles used as choppers) and the Acheulean (classic tear-drop shaped, bifacially flaked hand axes and cleavers). Acheulean tools were produced by *Homo* species roughly 1.4 million years ago (Deacon & Deacon, 1999) and are usually found near the raw materials from which they were quarried, butchery sites, or as isolated finds. Significant hominid evolutionary changes occurred during the later stages of the ESA, such as the appearance of *Homo erectus/ergaster* around 300 000 years ago with larger brain capacities

The MSA is marked by a significant trend in the manufacture of the tools to smaller dimensions and increasing variety. In Southern Africa the earliest MSA industries are characterised by high proportions of minimally modified blades, represented by the Levallois technique. Regional traditions become more varied with a greater degree of local differentiation, making the Southern African MSA difficult to interpret (Clark, 1982). Modern humans – *Homo sapiens sapiens* – appear during the MSA as well as the origins of culture and language. The exponential increase in human cognitive abilities (abstract thinking) is evident in the increased complexity of the stone tools created and the development of symbolic actions such as personal adornment, art and mortuary practice (Henshilwood, d'Errico *et al.* 2001). By 100 000 years ago the *Homo* species show clear evidence for cultural and anatomical modern behaviour.

LSA tool technology is highly sophisticated when compared to ESA and MSA industries, with specific tools being created for specific purposes, and the inclusion of bone tools into the assemblages (Mitchell, 2002). LSA sites commonly contain diagnostic artefacts, such as microlithic scrapers and segments. In a southern African context, the LSA is closely associated with hunter-gatherer groups, such as the San. Due to the nomadic nature of LSA people, open sites are difficult to identify and usually poorly preserved. It is also within this period that the autochthonous groups (ancestral San hunter-gatherers) came into contact with groups migrating (Bantu-speakers) into southern Africa. Initial contact occurred early 1st millennium CE between the hunter-gatherers and expanding Bantu-speaking farming societies in the northern and eastern parts of southern African. Later contact occurred in the

south (south-western Cape) with European traders and later colonists from the mid-17th century.

9.1.1.2 The Iron Age

The Iron Age as a whole represents the spread of Bantu-speaking people and includes both the pre-historic and historic periods. It can be divided into three periods:

- The Early Iron Age (EIA): early to late 1st millennium CE.
- The Middle Iron Age (MIA): 10th to 13th centuries CE
- The Late Iron Age (LIA): 14th century to colonial period.

The Iron Age is usually characterised by the appearance of metalworking in the archaeological record. However, iron and other metals are not as abundant. A more appropriate 'cultural marker' for the Iron Age is the regular manufacture of ceramic vessels and presence of domesticated animals, especially cattle. The southern African Iron Age immediately appears after the LSA, without intermediary stages – Neolithic, Copper and Bronze Ages – found in North Africa, Europe and Asia. As competition for natural resources intensified, Bantu-speakers gradually encroached and colonised traditional hunter-gatherer territories, subjugating them or forcing them into more marginal areas such as the Kalahari Desert. Metalworking appeared in southern Africa, already well advanced, with many gold, copper and iron smelted and worked. This fact emphasises the current theory that metalworking was not a local development, but rather introduced by Bantu-speakers from their northern homelands.

The migration of Iron Age societies is recognised through ceramic seriation: the premise that certain styles of ceramics, including vessel shape and decorative motifs, follow each other chronologically, and can be attributed to certain archaeological cultures. For example, by employing ceramic seriation, Huffman (1970) and Phillipson (1977) demonstrated that Bantu-speaking groups may have migrated southwards in three 'streams' from a possible central homeland, over different periods. These streams are generally associated with diverse Eastern Bantu-speaking societies and various Iron Age periods (See Figure 9-1). Although these hypotheses have since undergone meaningful reviews and received significant opposition, a general consensus remains that ceramic seriation can be used to reconstruct population movements.

Using Huffman's (2007) ceramic seriation and Bantu migration model, the distribution of various ceramic facies that occur in the landscape was determined: 8 ceramic facies were identified to possibly occur within the project area. These facies are summarised in Table 9-1 below.

Table 9-1: Possible ceramic facies in project area based on Huffman (2007). All dates are relative Common Era dates

Facies	Tradition	Time Range	Period	Characteristics
Bambata	Kalundu	350-650	Early	Fine decoration, multiple bands and cross hatching on long rim, alternating blocks of stamped and incised lines in the neck
Diamant	Kalundu	750-1000	Early	Tapered rims with broadly incised herringbone.



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Facies	Tradition	Time Range	Period	Characteristics
Baratani	Kalundu	850-1000	Early	Spaced motifs on rim and neck.
Eiland	Kalundu	1000-1300	Middle	Fine herringbone with ladder stamping
Broadhurst	Kalundu	1300-1430	Middle-Late	Finely incised and stamped herringbone.
Madikwe	Urewe	1500-1700	Late	Multiple bands of cord impressions, incisions, stabs and punctates separated by colour.
Letsibogo	Urewe	1500-1700	Late	Lines of punctates separating black and red zones
Buispoort	Urewe	1700-1840	Late	Rim notching, broadly incised chevrons, white bands all with red ochre.

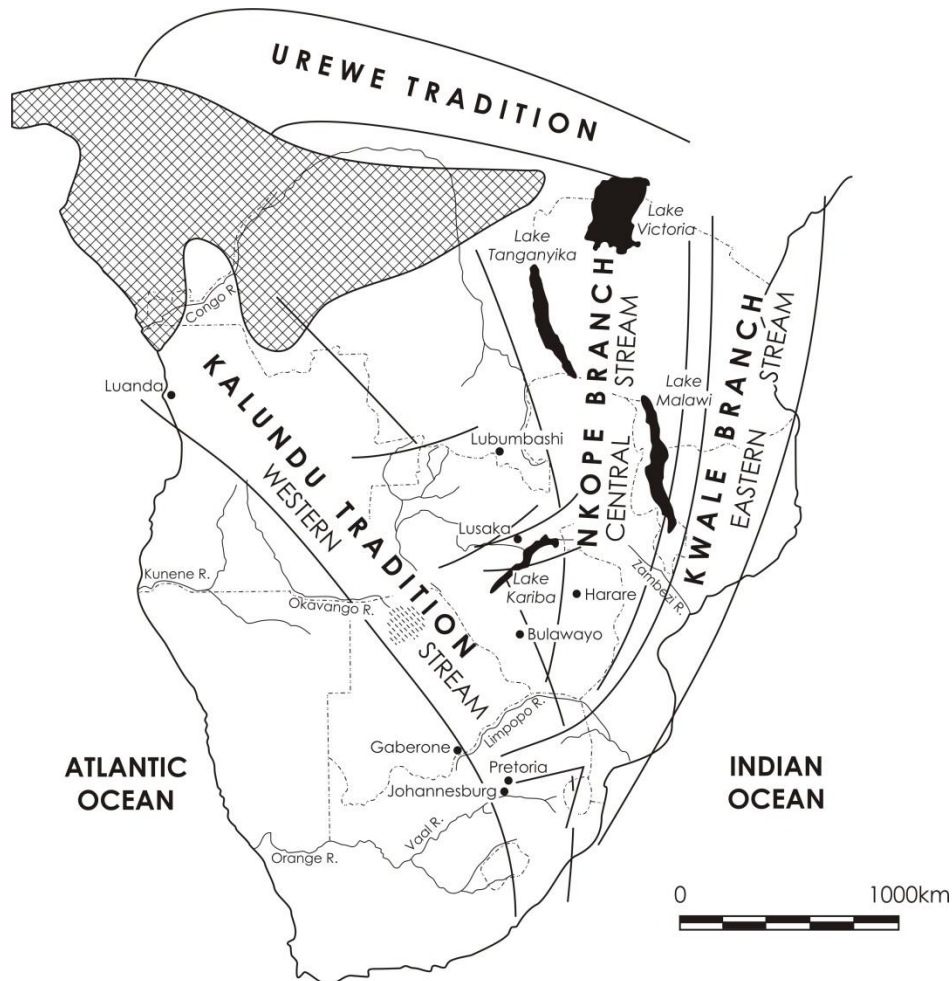


Figure 9-1: Migration Streams of Bantu Speakers (Adapted from Huffman 2007)

9.1.1.2.1 Iron Age of the project area

The following discussion is based on possible distribution of ceramic facies in the landscape within which the project area is located, and results obtained during the Phase 1 (Fourie, 2010) and initial Phase 2 Mitigation (Nel 2012; Biemond 2012).

Two significant population movements have occurred that may have left material traces in the project area. These movements represent different branches of the general southerly Bantu migration:

- The first forms part of the initial stages of the EIA Happy Rest sub- branch; and
- The second, later, migration can be attributed to the Moloko sub-branch.

The earliest facies in the Moloko Branch is *Icon* dating to between 1300 – 1500 CE. During this period *Icon* interacted with other ceramic facies, either incorporating elements as occurred between *Icon* and *Eiland*, or merging with another facies, as illustrated in the merger of *Icon* and the *Khami* facies resulting in the *Tavhatshena* facies. The supposition is that each facies, such as *Icon* represents a distinct society whose identity – including

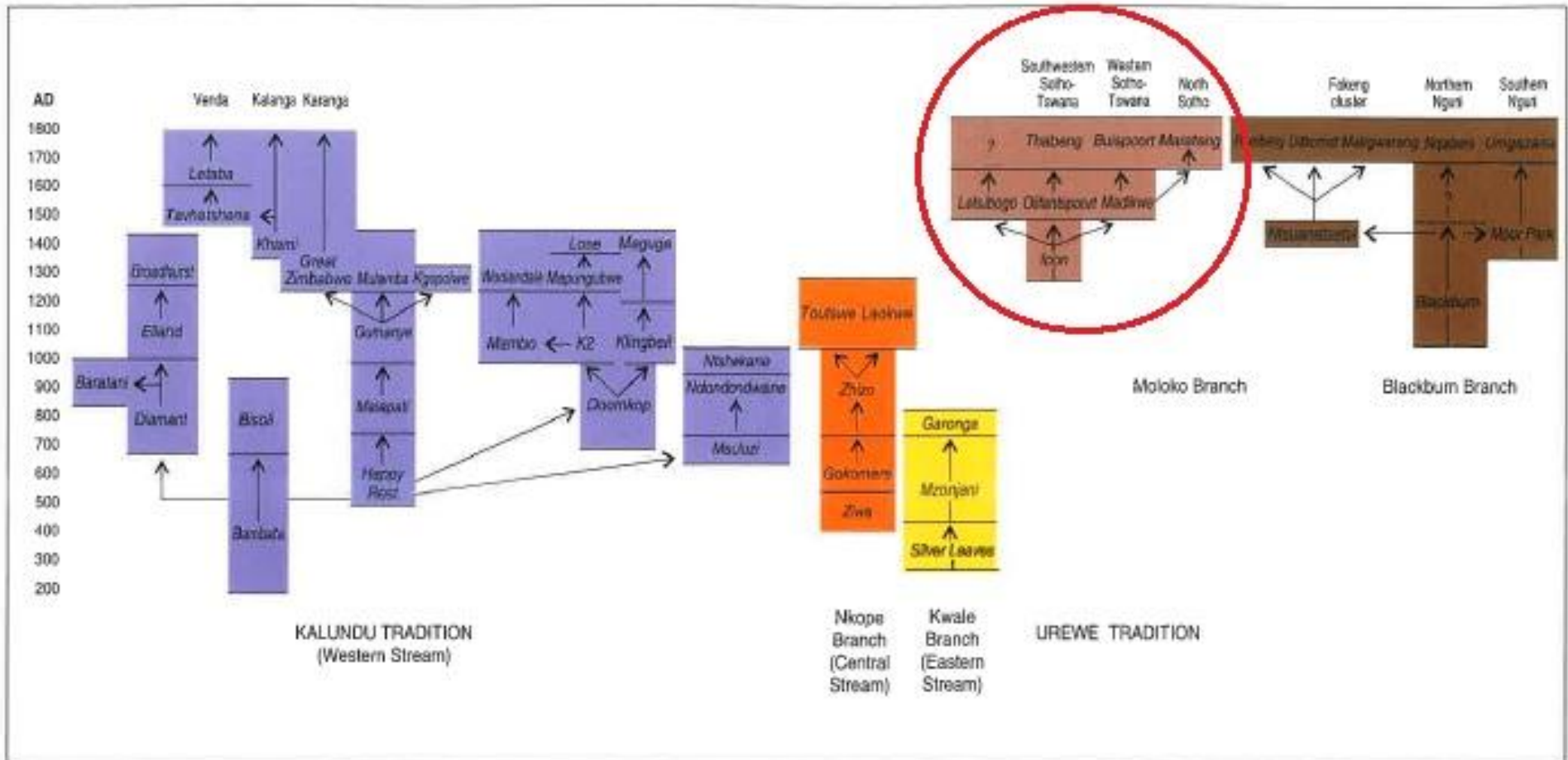
language and culture – is in part expressed in and through its ceramics. When and where different facies – societies – interact, new identities are created and expressed in the ceramics. This is based on the assumption that at least a limited level of mutual understanding exists that serves as a conduit for the change. Where breaks in ceramic facies are found the current, predominant notion is that a wholly new society appeared with its own, distinct ceramic tradition/s.

Around 1500 CE two different facies – Letsibogo and Madikwe – derived from *Icon* appears in the archaeological record indicating the second Moloko Branch phase. This phase predates stonewalling generally attributed to Sotho-Tswana speakers. The Letsibogo facies has been recorded in the Motloutse drainage in Botswana, as well as in the Blouberg in the Limpopo Province. Research on the oral traditions of the Tswana indicates that this ceramic facies is linked to the baKaa who originally occupied the Shoshong Hills until 1849 CE (Beimond, 2012). The Madikwe facies has been recorded from the Makapans Valley area west into Botswana. These facies differ stylistically based on decoration technique: Letsibogo emphasises punctates as opposed to stabs and fingernail impressions in Madikwe. Both these facies form part of the Moloko Sequence, and are intermediate between the *Icon* parent facies, and historical types such as Buispoort that is later associated with western Sotho-Tswana identity (Huffman 2007).



Figure 9-2: Surface Collections demonstrating *Letsibogo Facies*

Figure 9-3: Relationship of Moloko Branch ceramic facies (Huffman 2007)



9.1.2 Historical Background of the Sotho-Tswana

Discrepancies in oral traditions are inevitable when applied to large archaeological ceramic units. However, associations and meaningful conclusions may still be applicable between archaeological and historical groups to illustrate and recognise early Sotho-Tswana history (Huffman 2007). Four Sotho-Tswana clusters with separate origins have been identified (Legassick 1969), including baHurutshe, baKgatla, baRolong and baFokeng of which the Hurutshe cluster mainly applies to the study and project areas.

9.1.2.1 Kwena-Hurutshe

Ngcongco (1982) maintains that based on oral history the Hurutshe lineage can be traced to the baPhotu Kingdom that was located near the confluence of the Marico and Crocodile (Odi) Rivers between 1440 and 1560 CE. The 'king' Malope had two children, Mohurutshe, a daughter, and Kwena, a son, from which originated the Kwena-Hurutshe group. This group eventually split into the baKwena and baHurutshe (Sekgarametso, 2001). An additional baKwena genesis myth is that they emerged from the water at Lowe, north of Gabarone, Botswana (Huffman 2007: 429). Lowe is currently still considered a sacred place.

The Khurutshe (Shona equivalent of Hurutshe) who moved north into the Shoshong Hills area, were the first of the Hurutshe cluster to dominate parts of Botswana's Central District. Here the Khurutshe came into contact with baKaa, an early central Rolong offshoot that separated from the baRolong ca 1500 CE (Schapera, The Tswana, 1953). The baKaa subsequently travelled along the Limpopo River towards the Shoshong Hills. The baKaa and Khurutshe came into contact sometime after 1650 CE, with the baKaa initially paying tribute to the Khurutshe. However, during a period of famine, the Khurutshe left allowing the baKaa to become the dominant group in the Shoshong Hills.

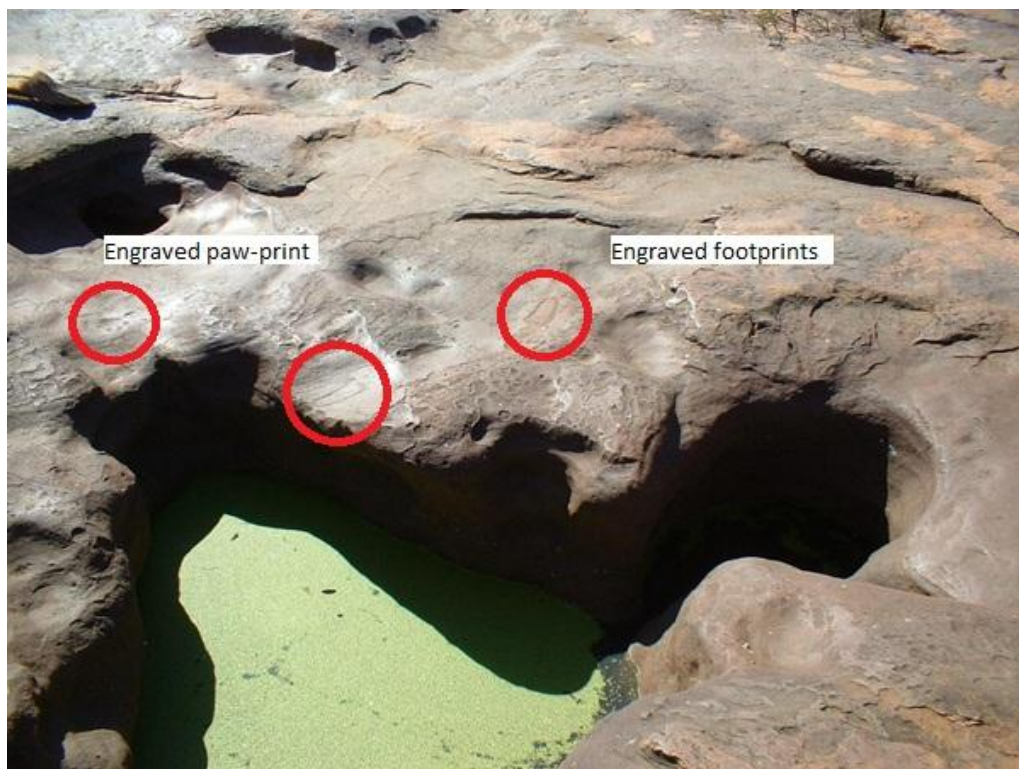


Figure 9-4: Engravings at waterhole in Lowe, place of origin for the Kwena



Figure 9-5: Photograph of engraved footprint at the waterhole at Lowe, Botswana

9.1.2.2 BaKwena

The baKwena of Molepolole traces their origins to the baKwena багаMogopa in the Rustenburg district, South Africa (Sekgarametso, 2001). The baKwena багаMogopa is referred to by Legassick (1969) as a separate Kgatla group based on their place of origin. However, the Kgatla are generally placed into the Hurutshe cluster by historians as the Kgatla refer to the Hurutshe as 'high Kgatla'. In terms of this report, the baKwena of Molepolole is therefore assumed to indeed be part of the Hurutshe cluster, and for the sake of simplicity only referred to as baKwena, although other distinct and separate Kwena exist.

The baKwena of Mogopa broke away after the death of his father kgosi Tebele, and settled at Mabyanamatswana near Brits. Mogopa's people were scattered for a time due to periods of drought, but returned to Mabyanamastwana afterwards. During this period, Kgabo, one of Mogopa's sons, who was also a ward head, seceded from the baKwena багаMogopa. He crossed the Marico River into Botswana and settled at Dithejwane Hill, where San and baKgalagadi¹ were already present (Schapera, 1980). These San and baKgalagadi groups were "expelled, driven west into the Kgalagari and maintained under a *symbiotic client* relationship by the baKwena" (Okihiro 1973 cited stated in Sekgarametso 2001).

¹ Bakgalagadi origins are vague. According to Lepekoane (2001) the baNgologa, a group forming part of the larger baKgalagadi cluster, claim their place of origin at Lowe. Huffman (2007) also regards Lowe as the origin of the Hurutshe cluster. Okihiro (1973) suggests that they are Rolong splinter groups, based on his interpretation of Kgalagadi oral history. However, linguistic evidence does not support Okihiro's interpretation, but rather suggests rather that the baKgalagadi belong to the Sotho group of languages (Mautle, 1986).

Kgabab was succeeded by his son Motshodi in ca 1740 CE. The baKwena then relocated to Odi (approximately 20 km north of Gabarone). From there they moved to Moseuw and then to Phuthadikobo (Mochudi), where Motshodi died ca 1770 (Schapera, 1980). The Ngwato and Ngwaketse are believed to have splintered from the main Kwena during this approximately 30 year relocation period. These various secessions resulted in the growth of dominant political groups such as:

- Kwena;
- Ngwaketse (a military state ca 1750 CE in control of the Kalahari west of Kanye); and,
- Ngwato (led by the Lesele-Khurutshe to Shoshong Hills and settled amongst the Kalanga under Mathiba).

(Parsons & Robinson, 2004).

After Mosthodi's death, a relatively long period of violence followed. Motshodi was succeeded by Motswasele who defeated the Ngwaketse at Dithejane – they subsequently fled south to the Molopo River close to Kanye. The Kwena then moved to Shokwane until Motswasele's death in ca. 1790 CE. Under his successor, Seithamo, the Kwena returned to Dithejane, but he was killed by the Ngwaketse ca 1795 CE. His son Legwale succeeded him and moved the baKwena again towards the Shoshong Hills. He was killed in ca 1798 during an attempted raid there. His brother Maleke became regent, as his sons were still too young. Another brother, Tshosa then succeeded Maleke as regent, under whom the baKwena returned to Shokwane. There, Tshosa entrusted the chieftaincy to Legwale's son Motswasele (II) in ca 1805 CE.

Motswasele II's reign saw a period characterised with great internal disputes, instability and disruptions. He was regarded as a cruel ruler with the result that some of the baKwena dissented to the Ngwaketse. Motswasele II was assassinated around 1821 by Moruakgomo and Segokotlo. The late 18th and early 19th centuries are furthermore closely associated with the *Difegane*, a period of violent and largescale upheavals and population movements. The *Difegane* was partly the result of Mzilikazi's Ndebele (Matabele) military expansion from northern KwaZulu-Natal into the South African interior. His armies finally reached the study area during the early 19th century. It is during this period that the Kwena were being attacked and raided by several groups, primarily the Sebetwane and Mzilikazi. This led not only to the deaths of Tshosa and Moruakgomo as described above, but also to the capture of Sechele by the Sebetwane occasioning the decision to reunite the Ngwato and Kwena.

During this period of instability, the baKwena splintered into groups loyal to either Segokotlo or Moruakgomo. Segokotlo's faction moved to Masipiana, but were soon followed by Moruakgomo. After an ensuing battle, Segokotlo fled to the Ngwato (Shoshong Hills) and his followers were scattered. Moruakgomo moved to Molepolole and came into conflict with the Ngwaketse: he then returned to the Dithejane Hills. Segokotlo and Motswasele II's sons were subsumed under the Ngwato chief Kgari. They were attacked by the Matabele in 1824 to 1826, causing them to take refuge in the Kutswe Hills. There they were again attacked by the Kololo and fled north to the Kalanga. At this time, the Ngwato was insignificant and weak and reverted to small itinerant clans drifting in a large poor landscape. Ngwato groups under Kgama moved east and established themselves on the banks of the Marico River, whilst Segokotlo's group moved to the Shoshong Hills. There they were defeated by baKaa who joined with baKwena. Segokotlo was also assassinated after which Molese assumed control of this group and moved to Lophepe (Lephepe, directly west of the project area) due to tensions with the Kololo, and drove the baKwena chief Sechele away. Sechele settled at

Moselebye River among the Ngwaketse. At Lophepe, Molese's Ngwato was attacked by the Matabele, causing them to scatter and flee. As the Ngwato moved across the desert to Letlhakeng they again came into contact with Moruakgoma, and ironically decided to reunite these two sections of the baKwena (Parsons 1973; Schapera 1970, 1980).

Sechele was captured by the Sebetwane, but Kgama II of the Ngwato secured his release and the Sebetwane settled with the Ngwato (Shapera, 1980). However, after his release, a succession dispute arose: Sechele wanted to usurp Molese's chieftaincy over Lophepe. Sechele loyalists under Molese managed in 1831 or 1832 to bring him back to Lophepe where he reclaimed the chieftaincy. The baKwena under Sechele's reign increased, absorbing both Tswana and other refugees, placing them directly under the royal authority (Sekgarametso, 2001). Sechele is generally regarded as the unifier of the baKwena, after which he took advantage of the well-established trade system: baKwena economic activities focused on farming, mining, manufacturing, transport and trade. They became known for their skill in mining, smelting and smithing metal ores, but were considered to be of lower status than those who practised pastoralism (Tlou & Campbell, 2003).

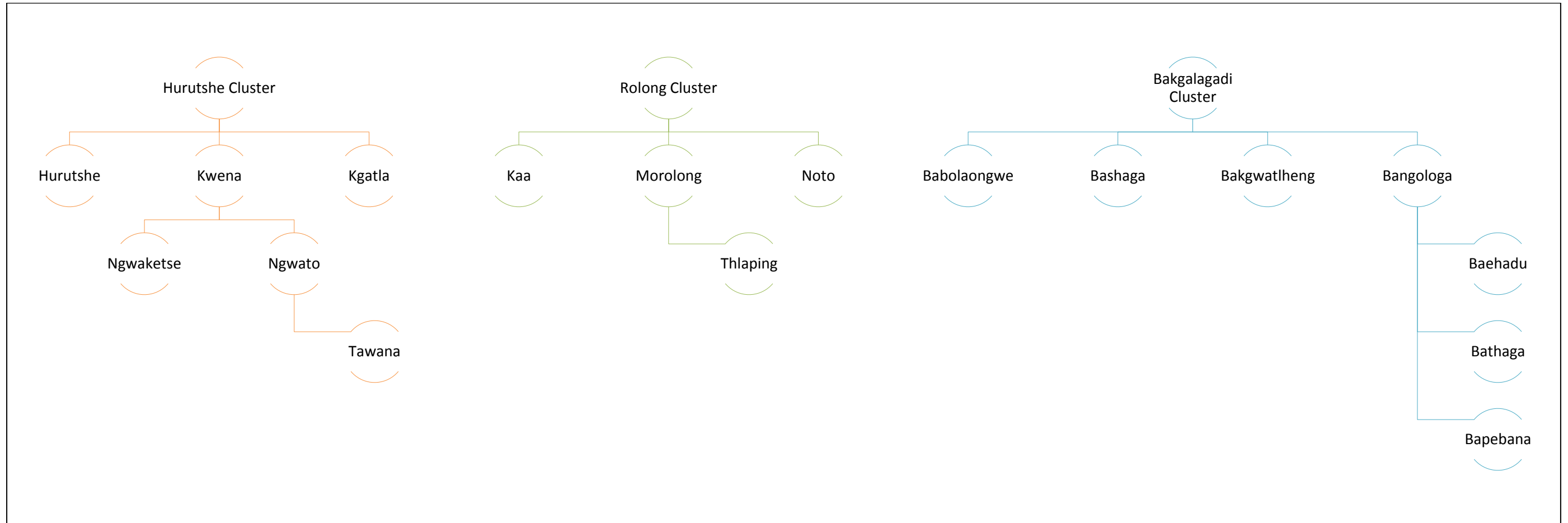


Figure 9-6: Various Sotho-Tswana Groups

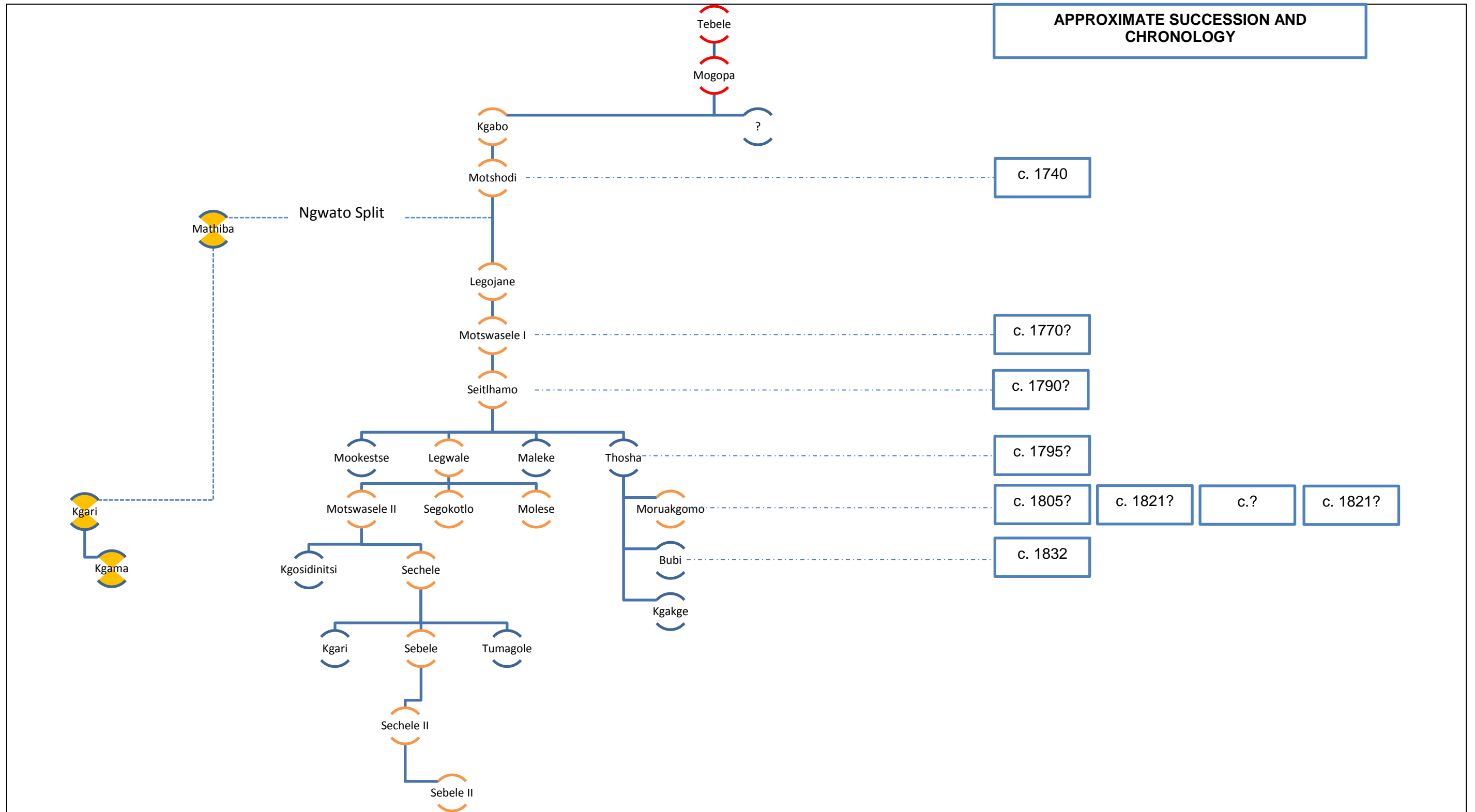


Figure 9-7: Lineage of the Bakwena-bagaSechele and approximate timeframe (after Schapera 1980)

10 MITIGATION RESULTS

Initial Phase 2 Mitigation, October 2011

Only three sites (009/10, 11 and 21) were considered to have sufficient integrity of deposit and/or features to conduct viable excavations. The results of those excavations were presented in an interim report submitted to Resgen and SAHRA (Digby Wells 2012). The remaining sites were mapped and each site randomly sampled in areas where deposit was expected using a 150 mm auger.

Additional Phase 2 Mitigation, April to July 2012

Excavations focused on sites 2327CA 009 (including 010), 011, 012 (including 013), 014, 018 and 021. The results from these excavations are discussed below. Material analyses completed as part of the initial project were included in interim report. However, analyses on materials sampled and collected during this phase will be conducted by the Department of Anthropology and Archaeology at UP and presented in a separate report.

Mitigated sites are discussed taking into account work that was completed in the initial Phase 2 mitigation followed by information relating to the second phase.

10.1 Site 2327CA/009&010

10.1.1 SAHRA Permit Requirements: Mapping and Test Excavations

10.1.1.1 Mitigation completed: Shovel Test Pits, Test Excavation and Mapping

Initial Phase

Site 009 was found to be part of Site 010. The extent of the site was determined by feature mapping as well as random and stratified sampling. Plan 5 illustrates the site extent and the localities where STPs were excavated. The site extent was determined to be approximately seven hectares.

At Locality A STPs (100 cm x 50 cm) were excavated at 10 m intervals and oriented north-south, incorporating features presumed to be grain bin platforms. In total, nine STPs were dug at Locality A. STPs were excavated at Locality B (Site 010 in the Phase 1 AIA) arranged in 5 m intervals north-south and east-west around a very large (>30 m²) disturbed area. In the Phase 1 report this area was described as consisting of ash lenses and possible midden deposit. However, no such evidence was found during the mitigation. This may be due to the fact that the area was still actively used by burrowing animals such as aardvark. Random auger samples were also taken in parts of the site where deposit could be expected, such as the relative centre of the site, around the stone features and in relative undisturbed areas adjacent to burrows where artefacts were exposed. None of these auger test points (ATP) found evidence of any significant deposit.

The stratified STP sampling at Locality A did not yield any significant results. Small fragments of pottery were found in some of the STPs. These fragments were found at a relatively shallow depth within the first 150 mm of soil. The STPs were excavated until a visible change in soil type, texture and colour was observed. This layer was determined to be archaeologically sterile, consisting of the Ah land type that contained red well-drained high base status soils. The Hutton soil form is the dominant soil in this land type. According

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to Smith (2011) the soils are non-structured with a clay content of 6% to 12%. The depth of this sterile layer was approximately 300 mm throughout the STPs at Locality A.

At Locality B, the stratified STPs sampling around the burrows exposed a fairly large sample of fragmented pottery. Comparative to Locality A, the average depth where these artefacts were found ranged from 50 mm to 200 mm below surface. However, this difference in depth can be attributed to soil being periodically deposited on the surface due to burrowing activities. A sterile layer similar to that found at Locality A was noted at an average depth of 300 mm to 400 mm below surface. Taking into account the slight gradient between Locality A and B, as well as the soil deposited at Locality B by animal burrowing activities, the depth of this sterile layer corresponded to the same layer at Locality A.

The presence of several relatively large pottery clusters found in the STPs at Locality B may indicate that some type of midden deposit does indeed exist. In spite of this, negligible faunal remains and no other material culture were recovered – probably due to the extensive nature of the burrows. The proposed test excavations were thus not undertaken, as no deposit was found where viable and meaningful excavations could be undertaken.

The predominant artefacts collected from Site 009 were pottery fragments described in more detail below. As stated above, Sites 009 and 010 were found to be a single large site. Site 009 is therefore referred to as Locality A and Site 010 as Locality B of Site 009.

A negligible sample of faunal remains was recovered from Site 009. No diagnostic remains were identified. Teeth fragments were excavated but these were too small to be diagnostic.

Charcoal was found in some of the STPs from Site 009 Locality B. However insufficient context could be established and the sample was too small for radiocarbon analysis.

Second Phase

During the second phase of mitigation, a new baseline was placed in close proximity to an animal burrow in which ceramics were exposed, and to the east of identified grain bin platforms. The test trench was orientated north – south and divided into twelve 4 m x 1 m squares. These squares were excavated to a depth of 100 mm with no discernible context identified. The sampling from the excavation did not yield any significant results. In general, the occupation layer was homogenous and sandy with only limited material culture - primarily fragmented ceramics and faunal remains being identified. Some stones were identified at the depth of 100 mm but lacked any context in which they could be interpreted.

Site 10 Test Trench 1

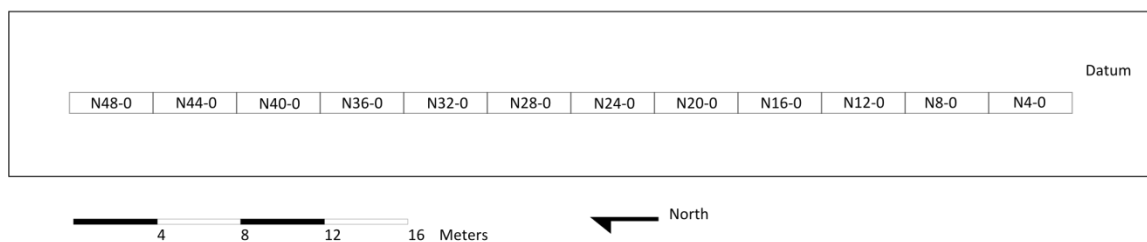


Figure 10-1: Plan of excavated squares at Site 2327CA/010

10.2 Site 2327CA/011

10.2.1 SAHRA Permit Requirements: Shovel Test Pits

10.2.1.1 Mitigation completed: Shovel Test Pits, Test Excavations and Mapping

Initial Phase

Site 011 was initially indicated as a small site with only limited surface features present. However, we subsequently established that the site was much more extensive and that the part identified merely represented a single grain bin of the much larger site. The approximate site boundary was established to be at least 13 ha, as indicated in Plan 6. It was therefore decided to extend the proposed mitigation measures (see Fourie, 2010) to include test excavations and mapping.

A datum was established in the relative centre of the site from which STPs were excavated. These were done at 20 m intervals over 200 m from the approximate centre of the site along north-south and east-west baselines. Two localities were also excavated.

In total 20 STPs were excavated across the site. The average depth of the pits was 300 mm where soil changes became apparent, similar to those noted at Site 009 (cf. Smith 2011). Only small pottery fragments were found within the initial 100 mm of soil. These were too small for any diagnostic analysis. Neither cattle dung nor any midden deposits were found. In order to determine whether any possible deposit was excluded, auger samples were taken at 10 m intervals along the two baselines as well as randomly at various other presumed grain bin platforms. These samples also did not expose any deposit.

The two localities that were excavated both included concentrations of stones presumed to be grain bin platforms. The features were chosen due to the perceived primary context of each (stones platforms arranged in regular patterns, mostly *in situ* and the presence of broken lower grindstones). The relationship relative to the distance between each also provided a measure of control in interpretation, which will be explained in more detail below. The two features were furthermore selected in terms of potential analytic cultural and organic material, such as floors and house rubble, possible carbonized grains, charcoal, beads and other artefacts in lieu of any visible midden or other deposit.

10.2.1.1.1 Locality A

Initially a square grid of 25 m² was set out over the grain bin platform as illustrated in Figure 10-5. The exposed feature was recorded and mapped before all surface material was collected by sieving using a compartmented screen. The sieve comprised an upper 10 mm x 10 mm diamond mesh and a lower 2 mm x 2 mm galvanised mesh. After surface cleaning, the feature was excavated in arbitrary 50 mm spits as no stratigraphy was observed. In total, five spits (250 mm) were removed from various squares. Squares were abandoned when no artefacts, organic or faunal material, features, structures or deposit were found.

The stone platform seemed to be *in situ* throughout the first two to three spits as shown in Figure 10-3. Below this, changes in soil became evident. The soil character changed to a homogenous red sandy loamy textured soil with practically no inclusions larger than 2 mm², indicating floodplain soil overlain with Kalahari windblown sand. This was found to be consistent with the specialist soil report undertaken as part of the environmental impact assessment (Smith 2011). This hard compact layer was excavated as a unit to a depth of

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over 300 mm at the conclusion of the test excavation. It was determined to be culturally sterile consistent with the soil layers identified in the STPs.



Figure 10-2: Site 2327CA/011, Locality A indicating the remains of the stone grain bin platform. The nine squares from the lower left hand corner are illustrated in Figure 10-3 above. Note the relative homogeneity of the soil from the surface to lower levels of the excavation (200 mm)

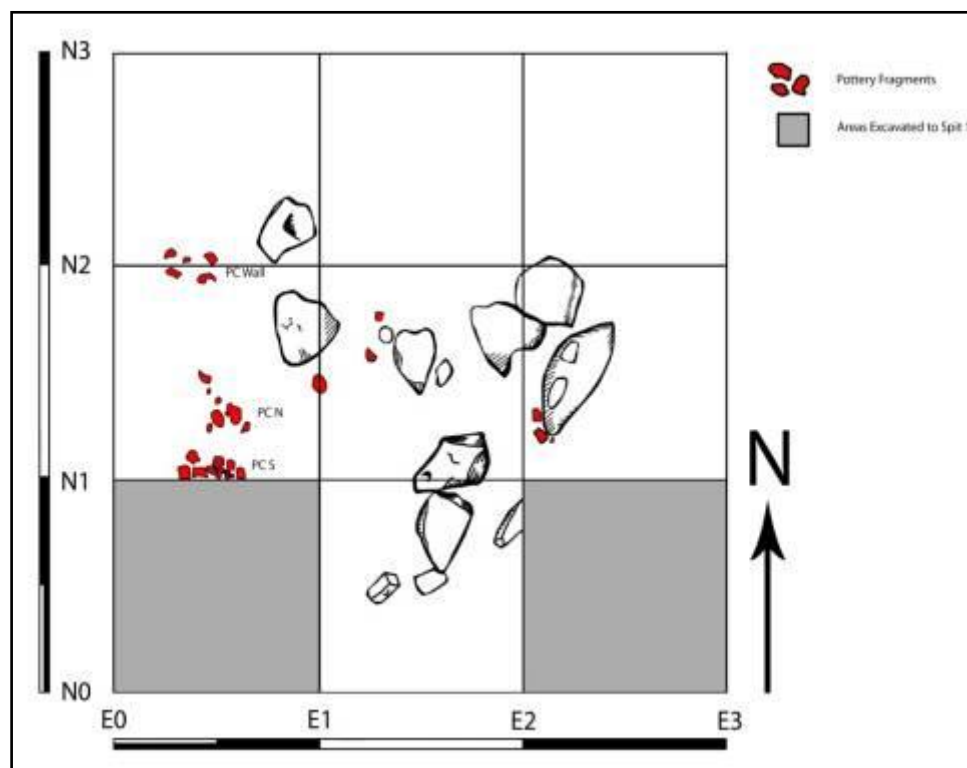


Figure 10-3: Sketch map of test excavation of Locality A, Site 2327CA/011, spit 2 (100 mm level) indicating shape and size of grain bin platform

The predominant material culture was pottery, although a small sample of faunal material was also collected. The fauna however was too fragmented to analyse other than a very tentative result that pointed to mammal remains. The species and size range could not be determined.

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The pottery sample from Site 011 was too small to determine any relative age or site identity. However, based on surface samples collected throughout the Boikarabelo Coal Mine project area it can tentatively be inferred that the site may fall within a Sotho-Tswana Kwena and/or Ngwato ceramic tradition from the late 17th to late 18th centuries CE (Biemond 2012).

10.2.1.1.2 Locality B

The excavation method at Locality B was the same as at Locality A. A square grid of 9 m² was set out over the feature as illustrated in Figure 10-4. The exposed feature was also recorded and mapped after which all surface material was collected by sieving. Arbitrary 50 mm spits were used as this feature also displayed no stratigraphy. Three spits (150 mm) were excavated for all nine squares. The three southern squares were deepened by another spit to a depth of 200 mm.

Feature 2 consisted of roughly equal-sized stones arranged in a circular pattern about 100 cm in diameter. Again, artefacts collected were mainly pottery fragments and fauna remains too fragmented for analyses. A small concentration of charcoal was found in Spit 2 (100 mm). This was collected but it was too small and out of context to consider submitting it for radiocarbon dating.

Below 150 mm soil changes occurred as at Locality A. This hard compact layer was also excavated as a unit in one square to a depth of over 300 mm. This was also a culturally sterile consistent with the soil layers identified in the STPs.

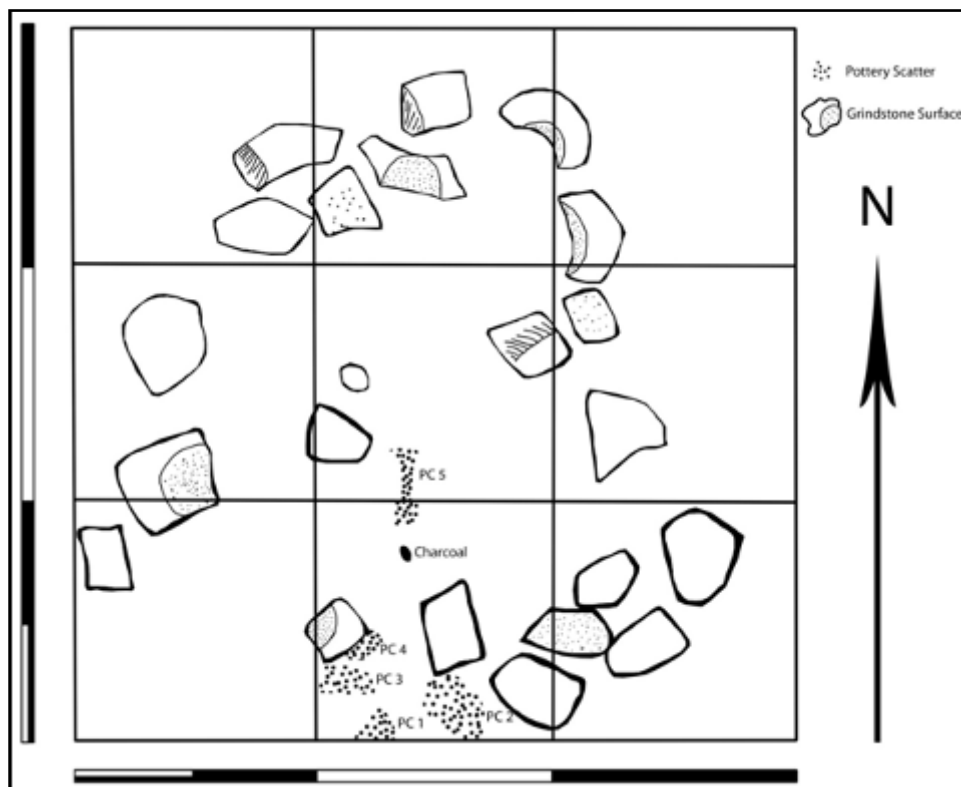


Figure 10-4: Site 2327CA/011, Locality B, Spit 2 (100 mm level): Note the occurrence of broken lower grindstones and pottery scatters



Figure 10-5: Site 2327CA/011, Locality B after removal of the southern half of the feature. Note again the relative homogeneity of the soil from the surface to lower levels of the excavation (200 mm). Also note the absence of any visible archaeological deposit or other remains

Second Phase

Four localities were identified for test trench excavation: TT1-4. Soil was loosened and removed mattocks and spades in 50 mm spits. Where features and/or signs of possible deposit were noted, excavation reverted to a trowel and brush technique. Excavated soil was screened using a sieve with galvanised mesh (2 mm x 2 mm) to collect the maximum amount of material culture as possible.

TT1 and TT2

TT1 and TT2 were placed over grain bin platforms and excavated to depths of 400 mm and 100 mm. No evidence of any other structures or deposit were noted and material culture were negligible.

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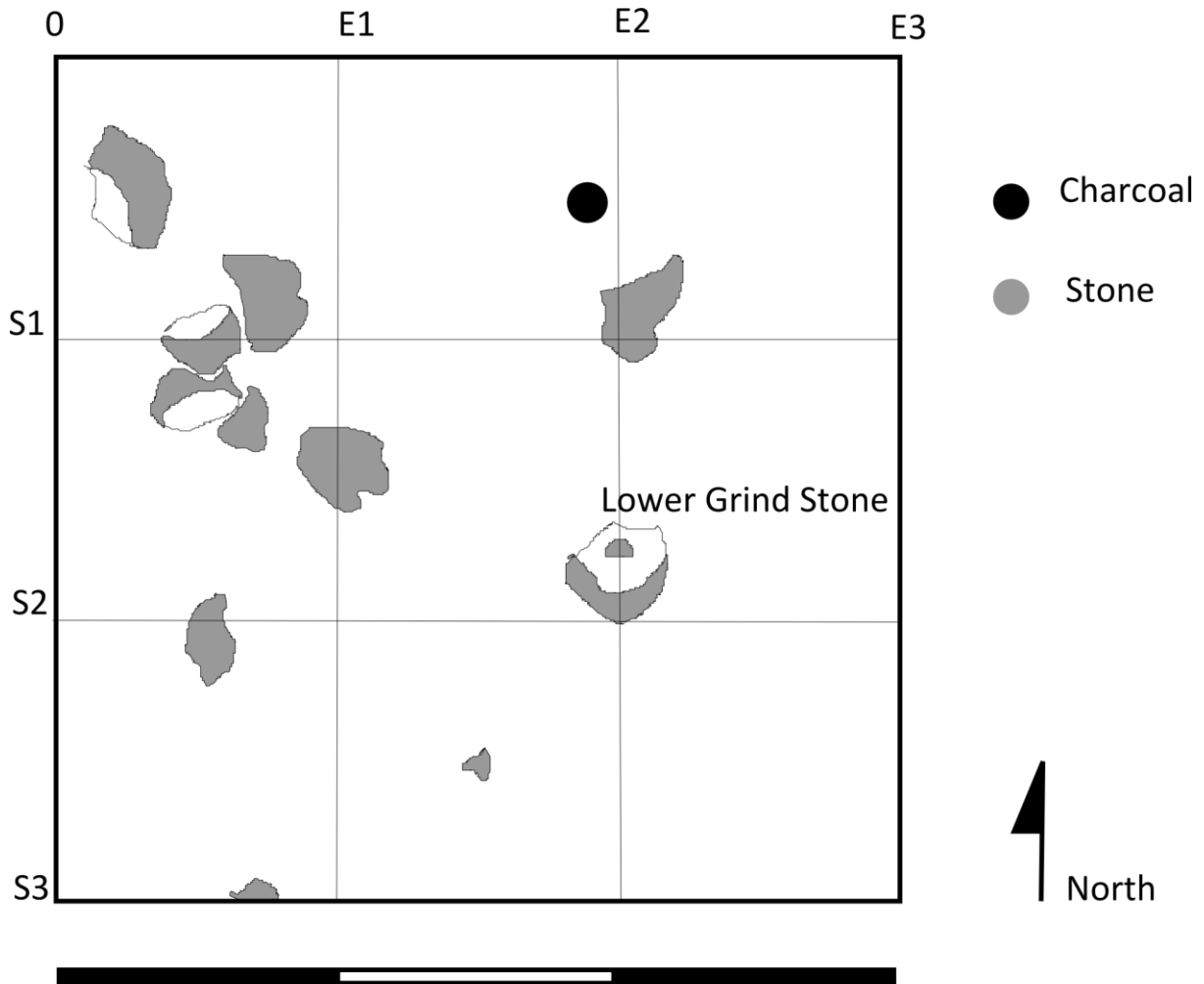


Figure 10-6: Plan of Site 2327CA/011/TT1 indicating grain bin foundation and lower grind stone



Figure 10-7: Excavation of Site 2327CA/011/TT1

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Figure 10-8: Site 2327CA/011/TT2 over lower grind stone and grain bin foundation.

TT3

Test Trench 3 was placed over a grain bin foundation with a lower grind stone. Excavations were extended to the south and east to include the entire grain bin foundation. A ceramic cluster was identified in the eastern portion of the excavation that may have represented remains of a single ceramic vessel (See Figure 10-10). No other material culture was identified.



Figure 10-9: Photograph of Site 2327CA/011/TT3 with grain bin platforms visible

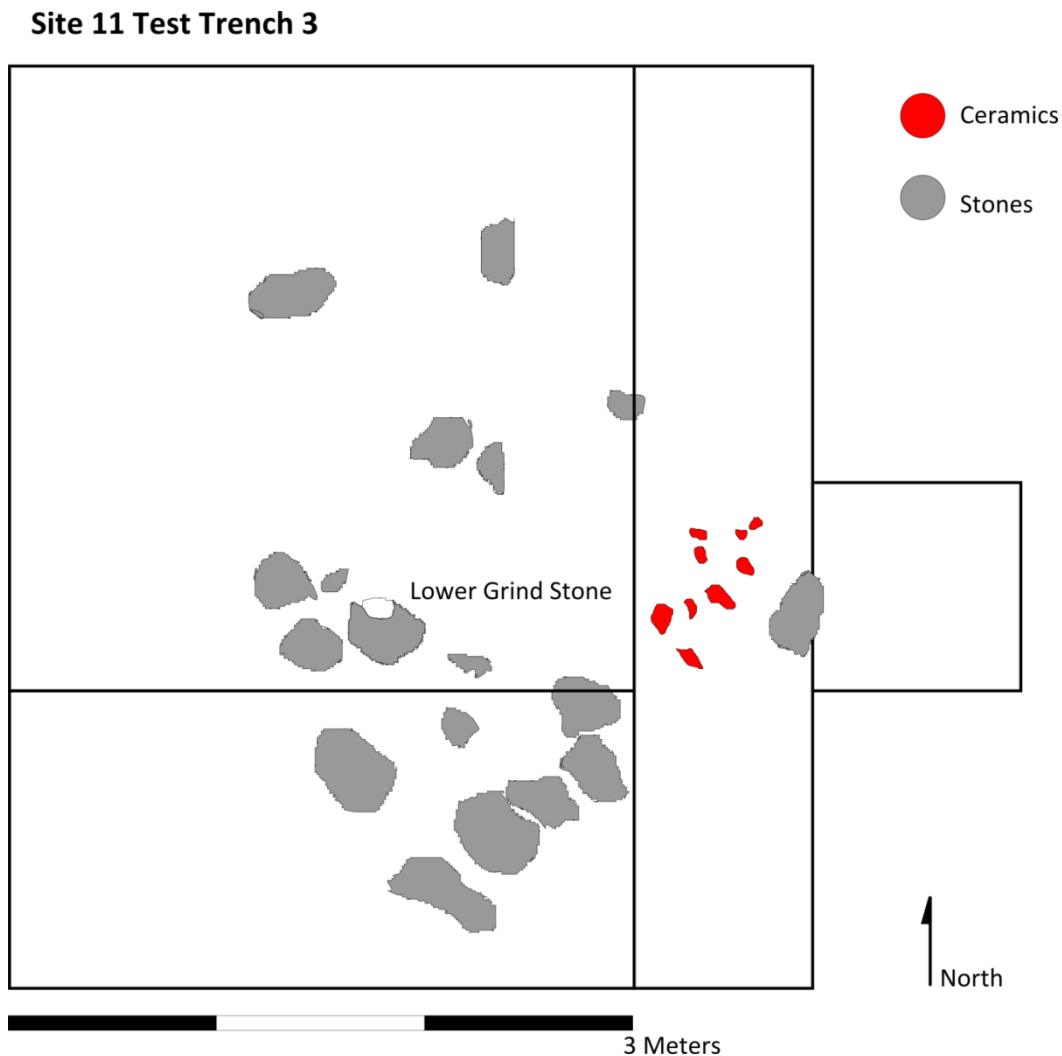


Figure 10-10: Identified grain bin foundation and ceramic cluster in Site 2327CA/011/TT3

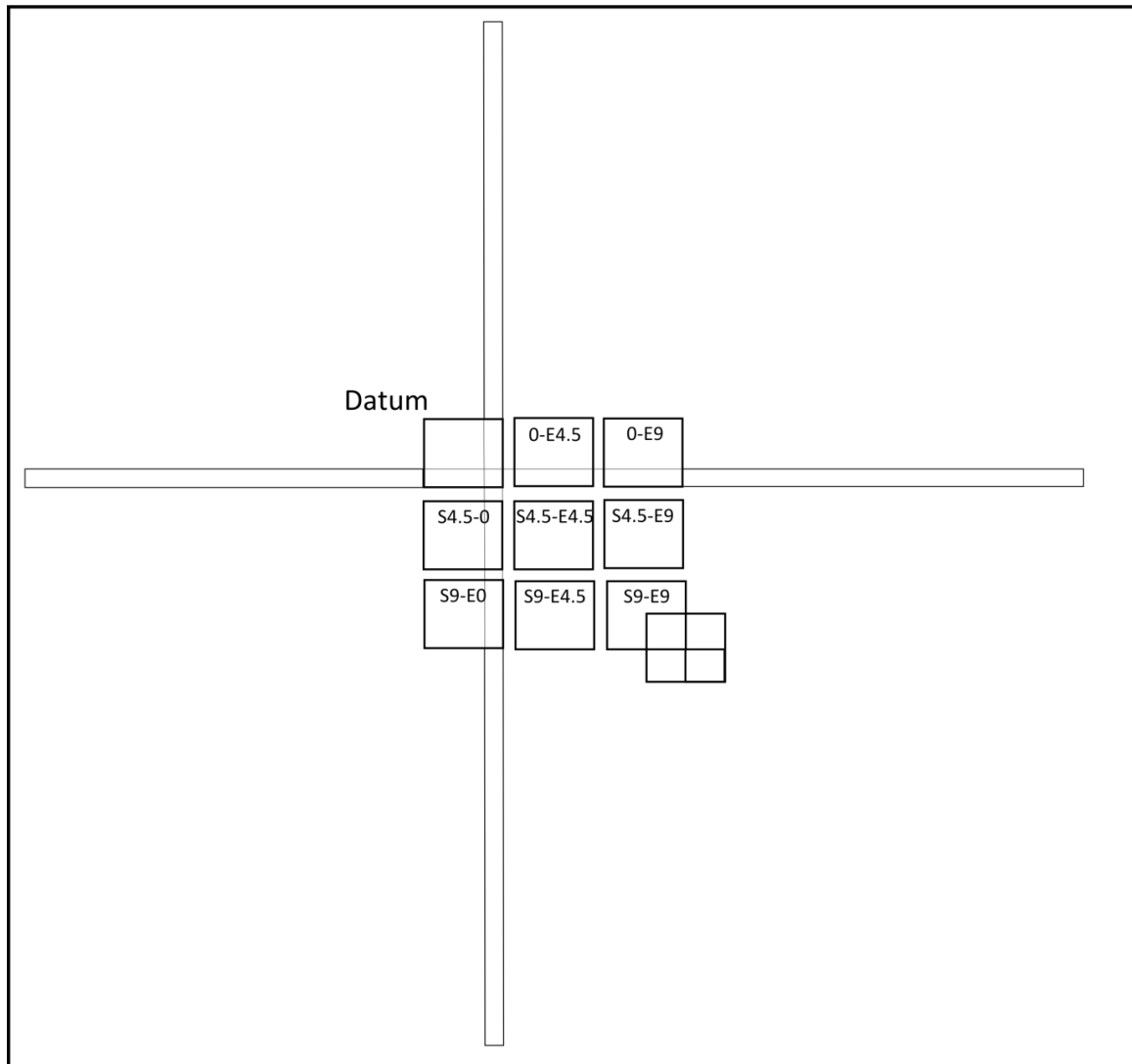
The grain bin platforms exposed at TT1-3 indicated a fairly consistent average diameter of ± 50 cm comprising at least three to five stones: the majority included lower grind stones.

TT4

The possible location of a cattle kraal was investigated at TT4. Surface soil conditions were visibly different from areas where TT1, 2 and 3 were excavated. The TT4 grid was laid out to include at least one visible stone feature. The grid consisted of nine 4 m x 4 m squares separated by 50 cm control walls. Excavation was done in arbitrary 50 mm spits. Compared to the other excavated areas TT4 presented greater faunal and ceramic samples.

In order to determine the extent of the cattle kraal, 1 m x 20 m extensions were added to the original grid orientated north/south and east/west and excavated to a depth of 500 mm. Only one additional feature was exposed: a grain bin platform was noted in the eastern extremity of the east/west extension.

Site 11 Test Trench 4



4 8 Meters

North

Figure 10-11: Plan of excavated squares in Site 2327CA/011/TT4



Figure 10-12: General view of Site 2327CA/011/TT4 during exposure of first spit



Figure 10-13: View of Site 2327CA/011/TT 4 after exposing spit 2 (100 mm) in general grid. Note the south-eastern extension exposing two grain bin platforms in the foreground, as well as the long east/west and north/south extensions

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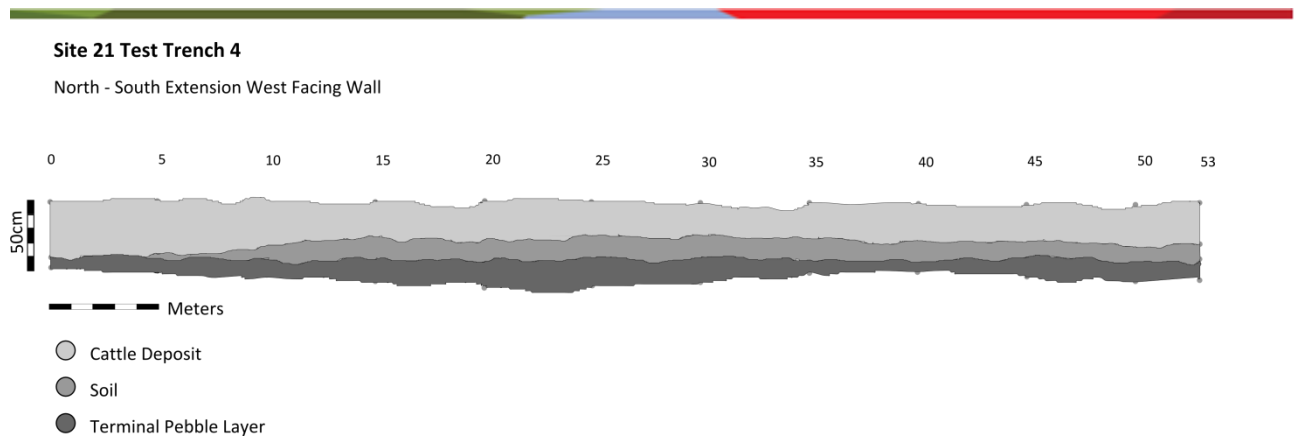


Figure 10-14: Section drawing of the north - south extension indicating soil profile at Site 2327CA/011/TT4



Figure 10-15: Detail of exposed grain bin platform located in square S11/E13 at Site 2327CA/011/TT4

Site 11 Test Trench 4

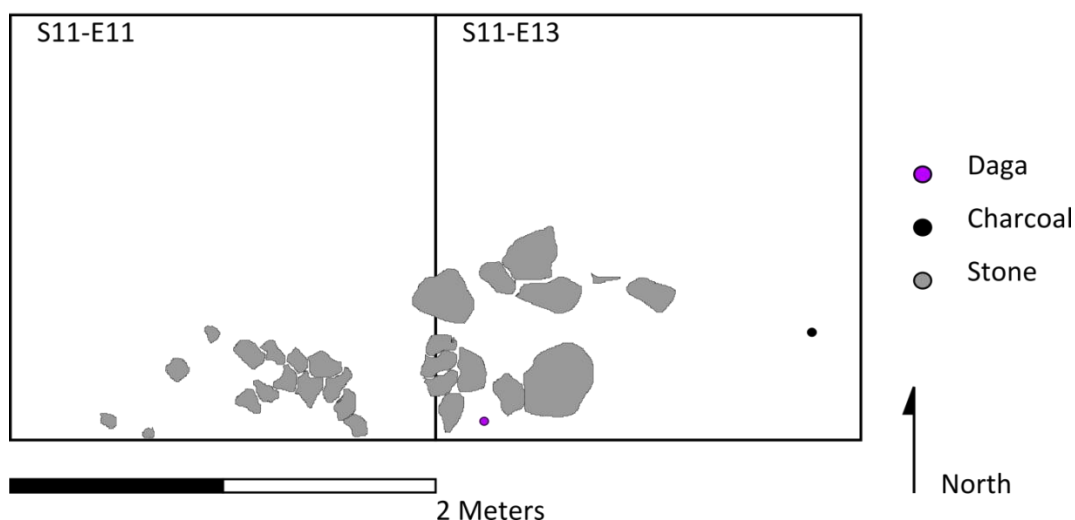


Figure 10-16: Exposed grain bin foundation in the south eastern section of 2327CA/TT4

In total an approximate 252 m² area was exposed at Site 011. Material culture occurred consistently between 0 – 100 mm below the surface after which the soil was sterile, homogenous yellow clay. No diagnostic material was identified at the site. Due to the low density of the site it would suggest that occupation was brief, where the stratigraphic occupation level terminates at approximately 100 mm beneath surface.

10.3 Site 2327CA/013

10.3.1 SAHRA Permit Requirements: Monitoring

10.3.1.1 Mitigation completed: Test Excavations

Previous work at site 13 included auger sampling and mapping of the site. During this phase of mitigation, test excavations were conducted to identify possible features and determine the extent of the occupation layer.

A baseline orientated north – south extended 48 m (see Figure 10-1 as comparison) was laid across the site and included one possible grain bin foundation. Twelve 1 m x 4 m squares were placed directly off the baseline and were excavated using a mattock and shovel in 100 mm spits. Soil texture was noted as being sandy and fine when compared to other excavated sites in the project area. No significant deposit was noted where the stratigraphy consisted of a homogenous soil layer. Material culture collected was limited to ceramics.

10.4 Site 2327CA/014

10.4.1 SAHRA Permit Requirements: None

10.4.1.1 Mitigation completed: Test Excavations and Mapping

Site 014 was not mitigated previously. The northern extent of the site was selected for excavation and a baseline was placed orientated north – south to incorporate identifiable features into the test trench grid. Six squares were excavated at the site, consisting of three 4 m x 4 m, two 1 m x 8 m and one 1 m x 4 m. Squares S5-W8 and S17-W9 were placed over identifiable features, S5-W4 to extend the area of S5-W8, S9-W5 over a possible midden area, S9-0 to determine the extent of the deposit, and N4-E6 to identify possible features. Excavations were conducted to an average depth of 100 mm with no discernible context, where S9-0 was dug to a depth of 300 mm to determine the extent of the occupational level.

Excavated material was screened using a 10 mm x 10 mm sieve. Sampling from the excavated squares did not yield any significant results. Material culture was limited to un-diagnostic ceramics and fragmented faunal remains. Stone features identified as grain bin platforms were on the surface and relatively disturbed and scattered. As with Site 011, the grain bin platforms were found in close context with lower grind stones. In general, the occupation layer was extremely shallow, homogenous and sandy with only limited material culture that lacked any context that could be meaningfully interpreted.

Site 14 Test Trench 1

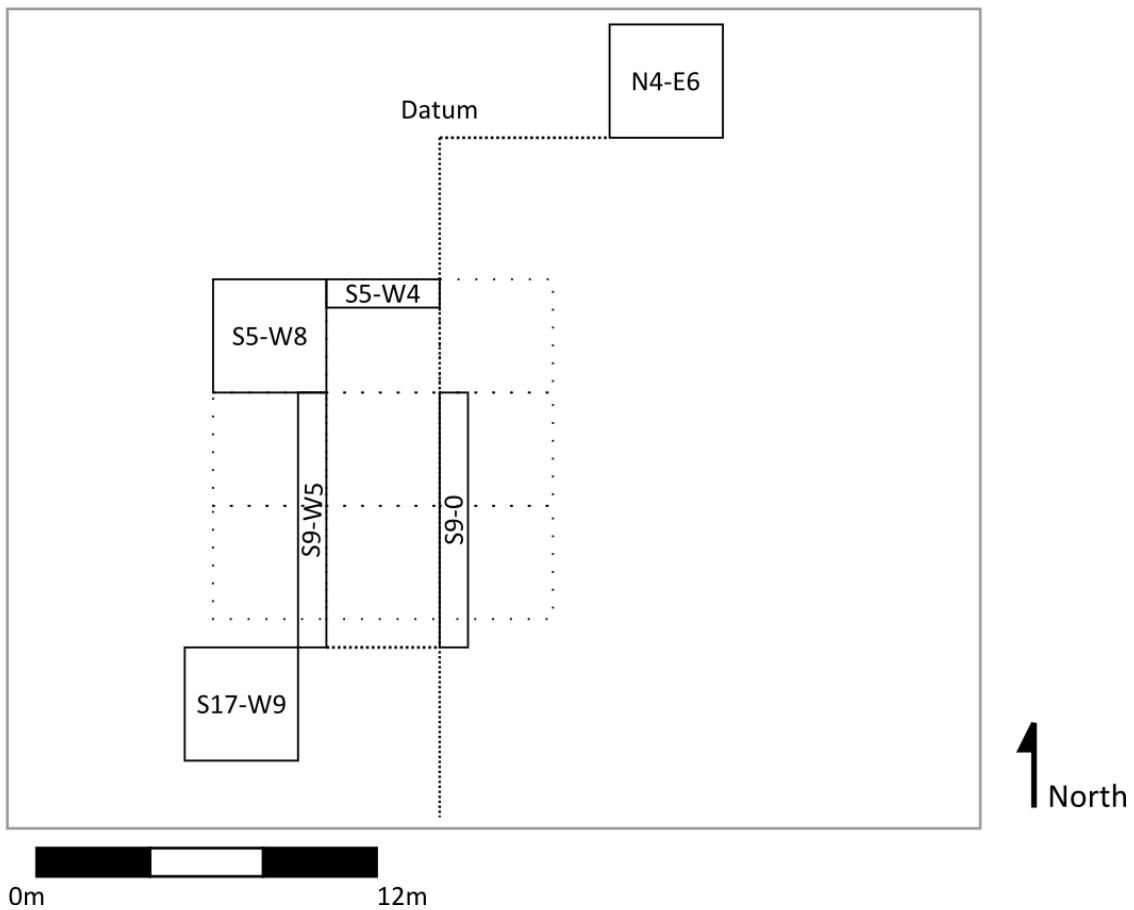


Figure 10-17: Plan of excavated squares at Site 2327CA/014



Figure 10-18: Southerly view of Site 2327CA/014 with Square N4-E6 in the foreground



Figure 10-19: An example of a lower grind stone identified throughout Site 2327CA/014



Figure 10-20: Photograph of identified grain bin foundation in Square S5-W8

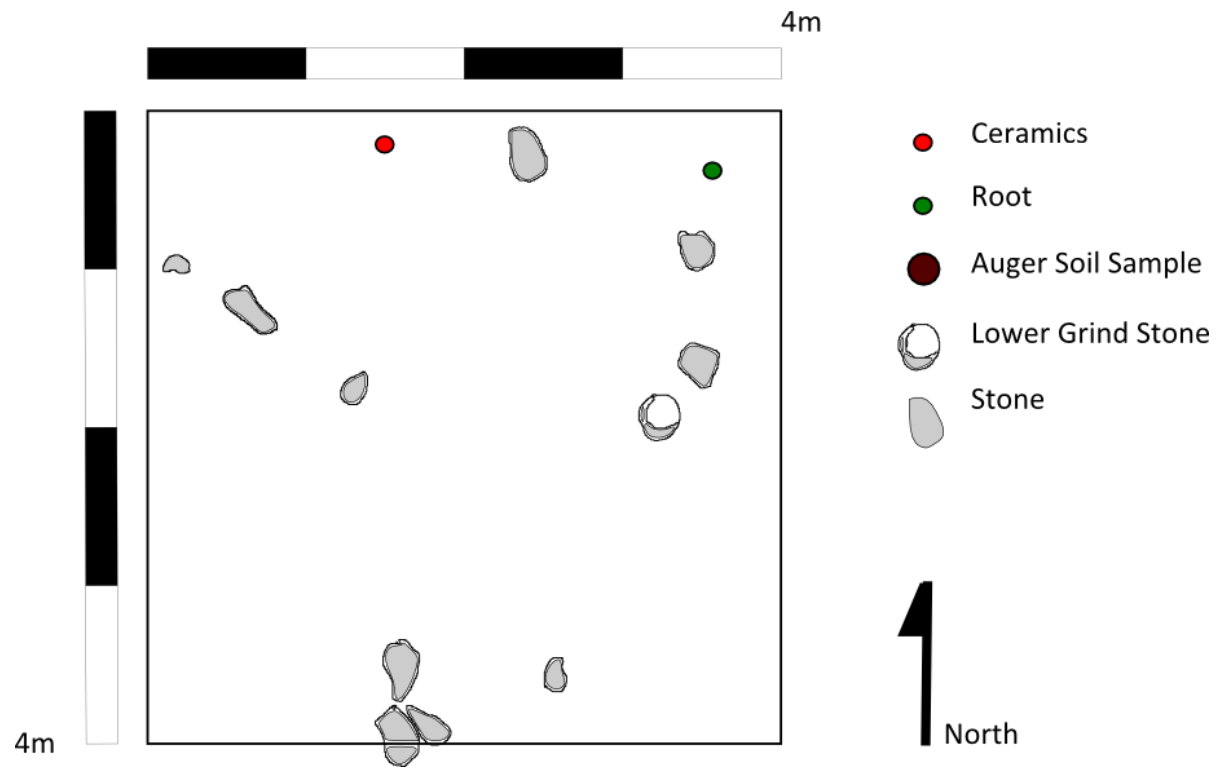


Figure 10-21: Grain bin platforms in Square S5-W8. Excavated to depth of 100 mm



Figure 10-22: Square S9-W5 between two features in S5-W8 and S17-W9

10.5 Site 2327CA/018

10.5.1 SAHRA Permit Requirements: Shovel Test Pits

10.5.1.1 Mitigation completed: Test Excavations

Previous work at Site 018 included auger sampling and mapping of the site. During this phase of mitigation, test excavations were conducted to identify possible features and determine the extent of the occupation layer.

A baseline orientated north – south and extended for 48 m (see Figure 10-1 for comparison) was laid across the site over a possible dung or midden deposit. Twelve 1 m x 4 m squares were placed directly off the baseline and were excavated using a mattock and shovel in 100 mm spits. There was a clear distinction between the soil and midden deposit, and an obvious lack of identifiable grain bin platforms.

Spit 1 and 2 yielded both material culture and faunal remains. Concentration of ceramics and faunal remains occurred in Spit 2 (100 mm – 200 mm), especially outside of the identified midden deposit which had an approximate diameter of ± 20 m and terminated at an average depth of 200 mm.

10.6 Site 2327CA/021

10.6.1 SAHRA Permit Requirements: Shovel Test Pits

10.6.1.1 Mitigation completed: Shovel Test Pits, Test Excavations and Mapping

Initial Phase

Site 021 and 022 was found to be a single site, and represented the only site recommended for mitigation that had clear evidence of a viable deposit. Three localities were therefore excavated in lieu of the recommended STPs as indicted in Plan 10. All three localities consisted of ash deposits. The aim was to obtain material that could be used for dating and to determine some cultural affinity. This was also the only site where faunal remains were found.

The excavations at Site 021 were undertaken in the relative centre of Site 021 where an ash deposit occurred. The test excavations were described as Locality A/Feature 1, Locality B/Feature 2 and Locality C/Feature 3.

Localities A and C were excavated in single 1 m x 1 m square grids each. Locality A was excavated in three 50 mm spits to a depth of 150 mm and then abandoned as the deposit yielded negligible results. Locality C was excavated in six 50 mm spits to a depth of 300 mm. This deposit also presented little to no viable material and the excavation was abandoned.

The grid at Locality B was extended 1 m x 2 m to include a seemingly good deposit as indicated by animal burrowing activities. The excavation was however completed in two spits (100 mm). The three localities indicated that the average deposit depth at Site 021 was less than 300 mm when sterile soil was reached. The sterile layer was consistent with that identified at sites 009 and 011, although Site 021 was located above the calcrete ridge to the north of the former sites.

Localities A and B consisted of two stratigraphic layers as indicated in Figure 10-24 and Figure 10-25. Only a single stratigraphic layer was identified at Locality C.

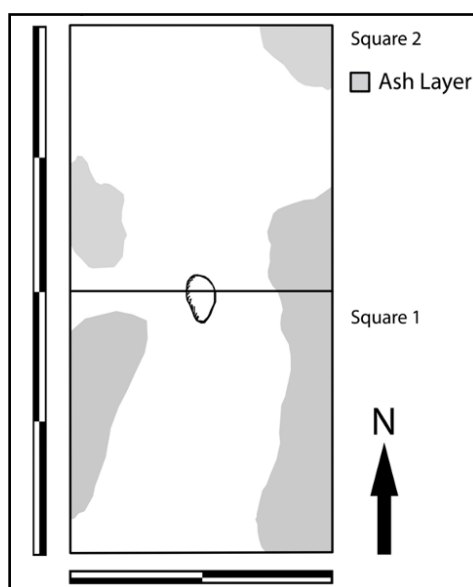


Figure 10-23: RES 021 Locality B Spit 1

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This site produced the only viable faunal sample for analysis as well as a relative good pottery sample. Two special finds were also recovered – a copper wire bead (Figure 10-26) and a carved soapstone pipe bowl (Figure 10-27 and Figure 10-28). The cultural material was mainly found in Locality B.

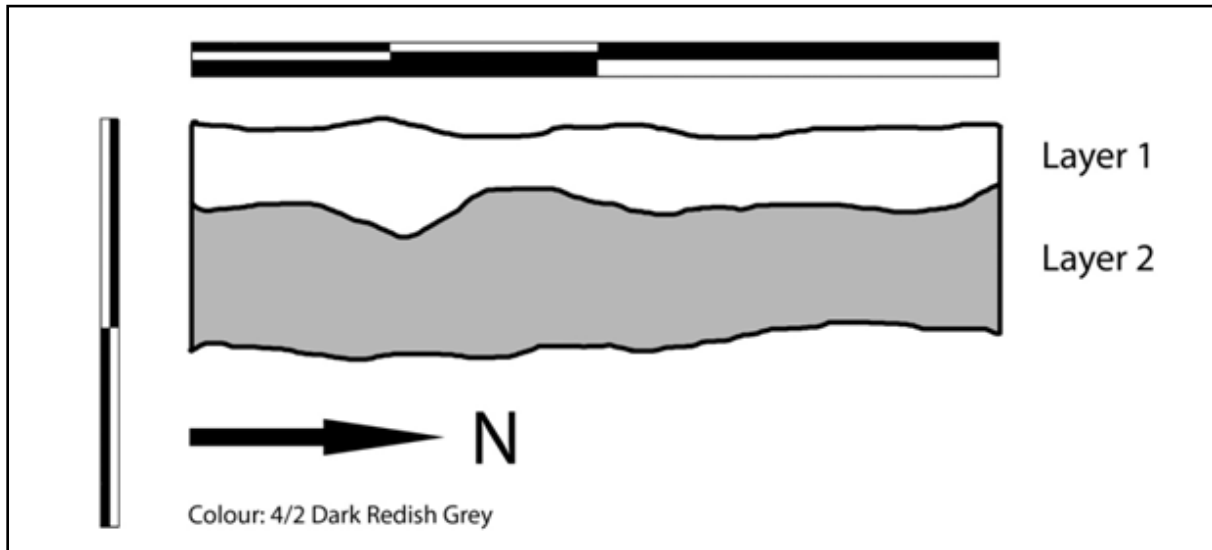


Figure 10-24: RES 021 Locality A section plan

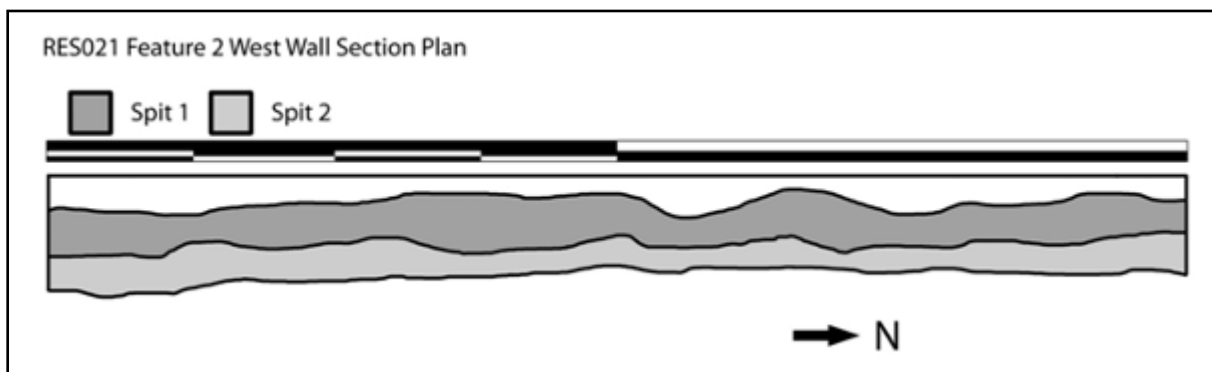


Figure 10-25: RES 021 Locality B section plan

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Figure 10-26: Wire-drawn metal bead recovered from Site 021 Locality B. Note the crimped ends



Figure 10-27: Side profile of soapstone pipe bowl from Site 021 Locality B. Note raised decorative motif

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Figure 10-28: Cross section of pipe from RES 021

Second Phase

During the second phase of mitigations, two localities were chosen for excavation and described as Test Trench 1 and 2. These test trenches focused on areas in Site 021 that contained visible ash deposit and identifiable stone features. Test Trench 1 was located on the southern extent of Site 021 and Test Trench 2 to the north.

Test Trench 1 consisted of eleven 4 m x 4 m and one 1 m x 10 m squares. A baseline of 22 m was laid across an identifiable ash deposit on the surface, and the grid of nine 4 m x 4 m squares was placed directly off this line, with excavations starting on Squares S2-0, S2-W4, S10-0 and S10-W4.

A large ashy deposit was noted in the southern third of S10-0 in Spit 1. This deposit was excavated as a single stratified unit up to 100 mm below the surface across squares S2-W4, S10-0 and S10-W4. Material culture and faunal remains were primarily found in Square S2-W4 (see Figure 10-32), where it would seem the ash deposit in Squares S10-0 and S10-W4 were wash flowing in an easterly direction as these deposits were fairly sterile with the exception of the ceramic and burnt bone cluster (see Figure 10-30).

Site 21 Test Trench 1

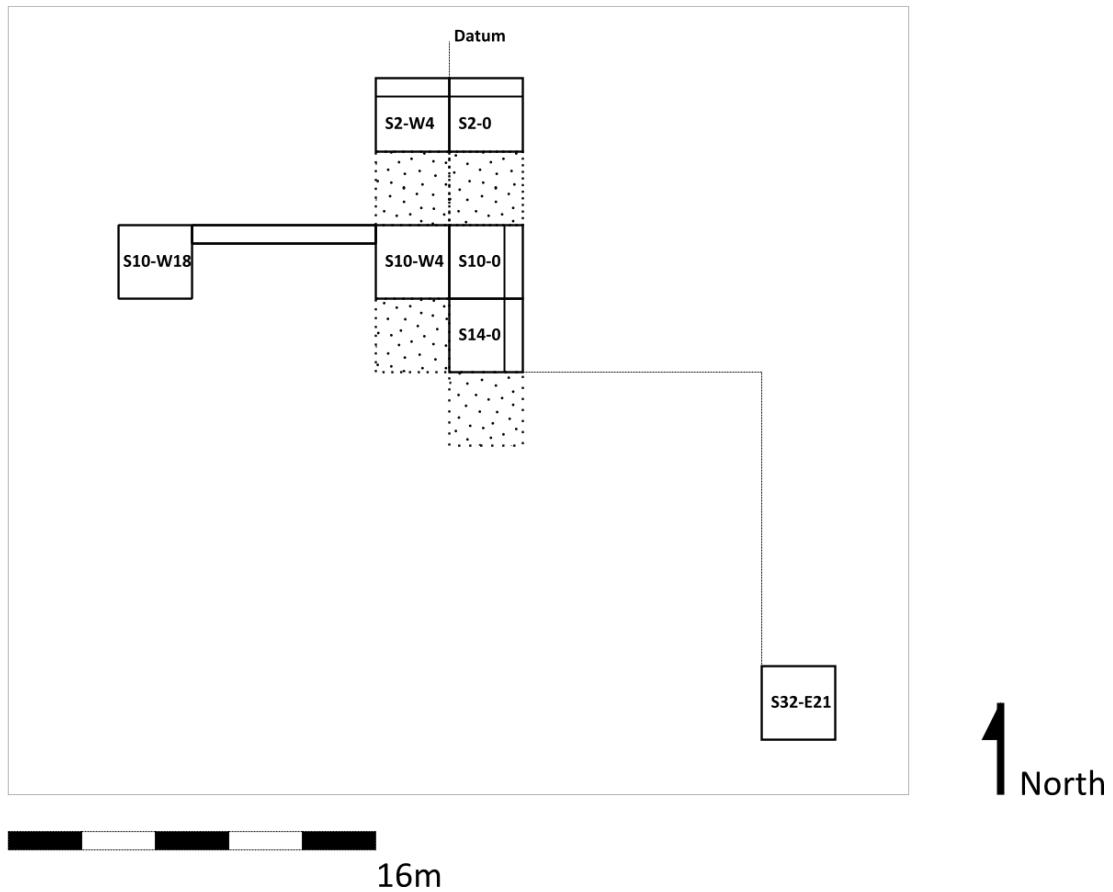


Figure 10-29: Plan of excavated squares at Site 2327CA/021/TT1
Site 21 Test Trench 1

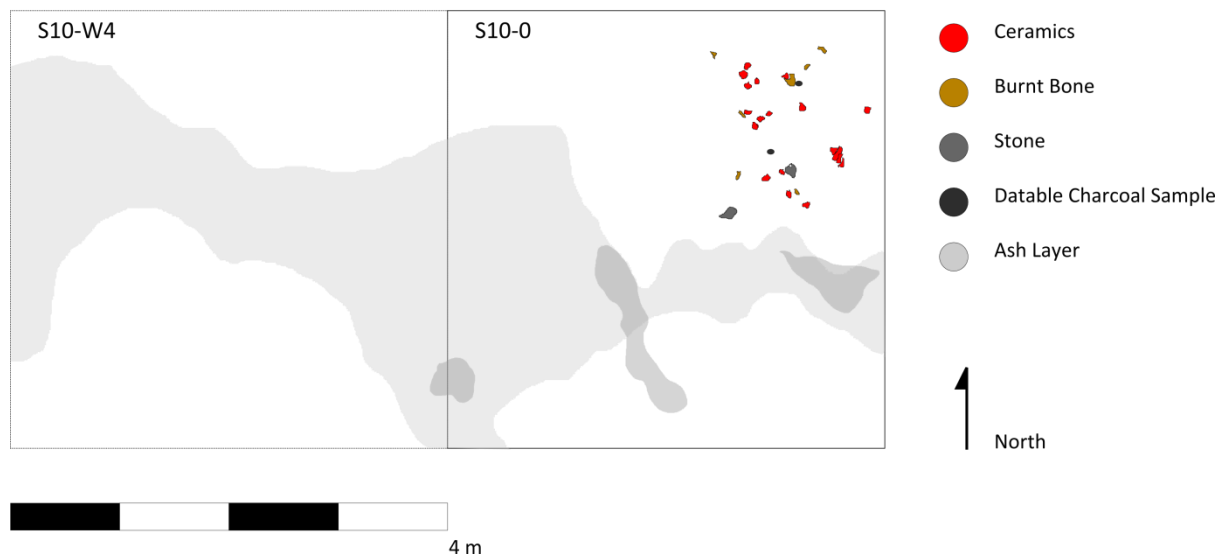


Figure 10-30: Ash flow in squares S10-W4 & S10-0

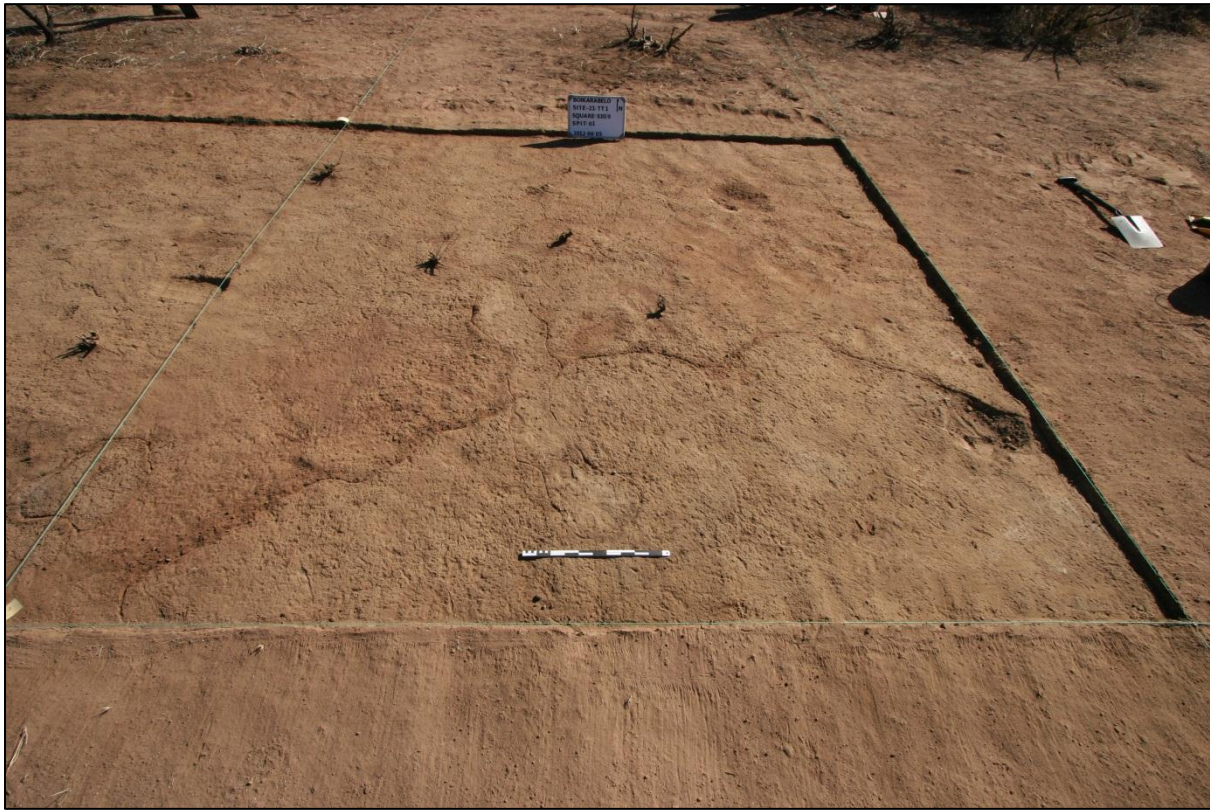


Figure 10-31: Photograph of ash flow in S10-0

Site 21 Test Trench 1 Square S2-W4

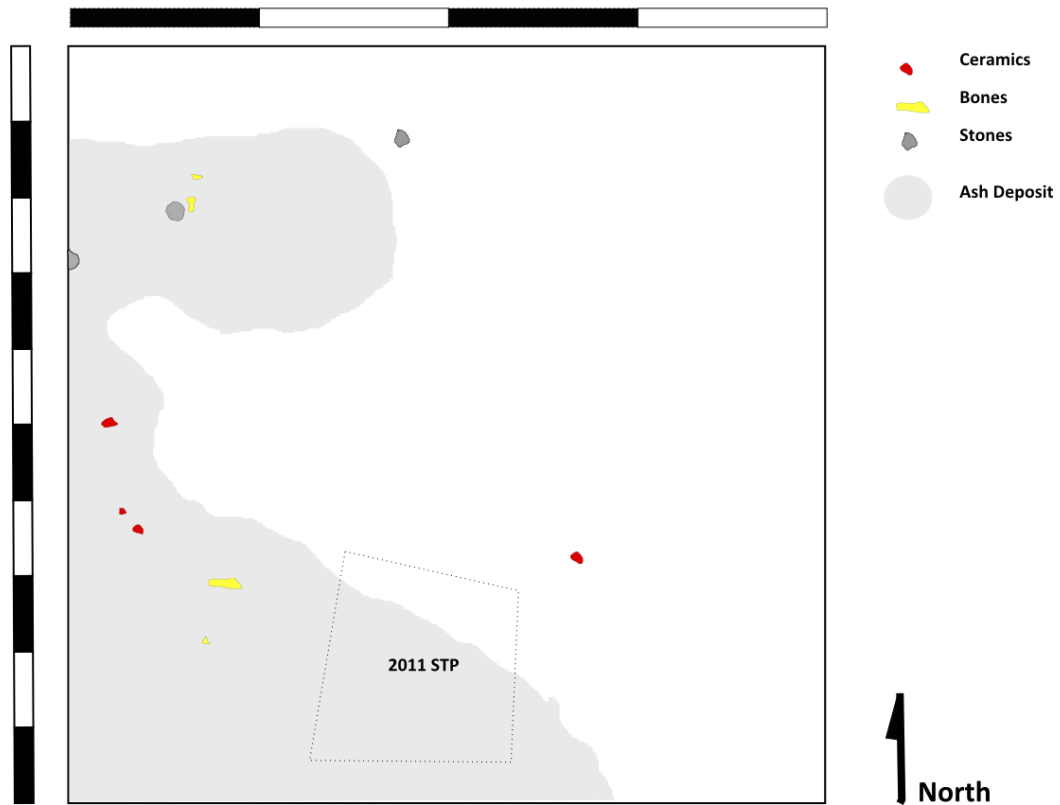


Figure 10-32: Ash / Midden deposit in square S2-W4 with material culture concentration

Site 21 Test Trench 1
S10- W8 North Facing Wall

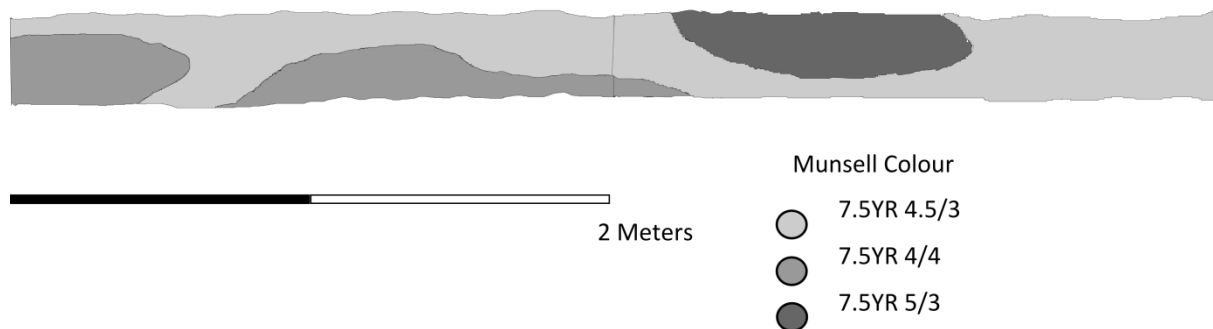


Figure 10-33: Section drawing displaying ash layers

Test Trench 2 was placed to the north of Test Trench 1. A baseline of 20 m orientated north – south was laid over identifiable stone features and a grid was placed directly off this line.

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Excavations started in squares S10-0, S10-W4, S14-0, S14-W4 and S14-E4. Material from all five squares was screened using a 10 mm x 10 mm sieve. The majority of material culture and faunal remains was concentrated in the western portion of the excavation in a clearly visible ash deposit (See Figure 10-37). Spit 1 terminated at 100 mm beneath the surface. A second spit – Spit 2 - was excavated in square S14-W4 to collect more material for analysis. An additional square – S10-W11 – was laid and excavated to determine the extent of the ash deposit. Limited material culture was obtained from this square.

Excavations over the grain bin platforms yielded material culture limited to un-diagnostic ceramic sherds. The square was excavated to a depth of 100 mm. An additional square – S17-E4 – was excavated in the southern portion of S14-E4 to determine the depth of the grain bin foundation and determine if a second occupational level occurred beneath it. The grain bin foundation terminated at approximately 100 mm and a sterile layer was found beneath. Material culture in the second spit was limited to un-diagnostic ceramics and a single arrowhead. Excavations in S17-E4 terminated at 150 mm.

Site 21 Test Trench 2

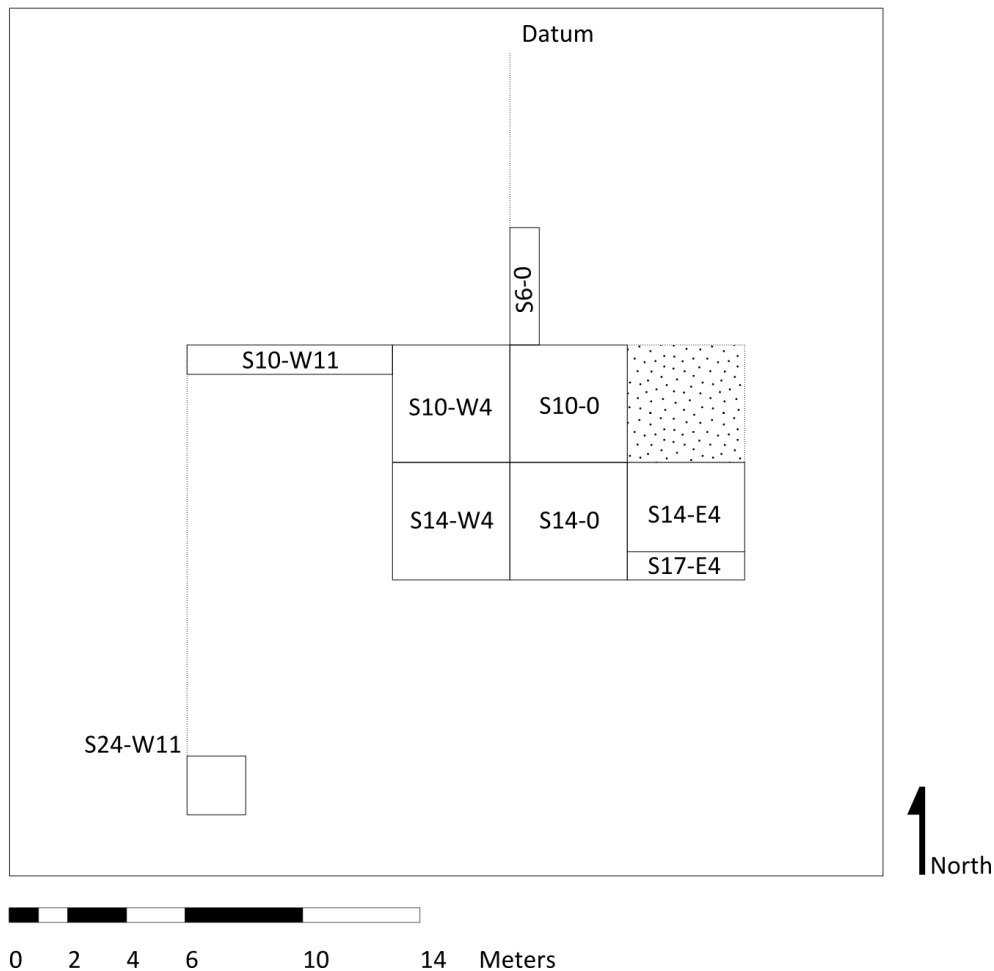


Figure 10-34: Plan of excavated squares at Site 2327CA/021 Test Trench 2

No discernible stratigraphy was identified at Site 021/TT2. Square S6-0 was excavated to a depth of 375 mm. Stratigraphy from this square indicated that the general levels consisted of

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the occupational level at the top, terminating at approximately 100 mm and a homogenous soil layer with pebble inclusion < 2 mm.

Site 21 Test Trench 2

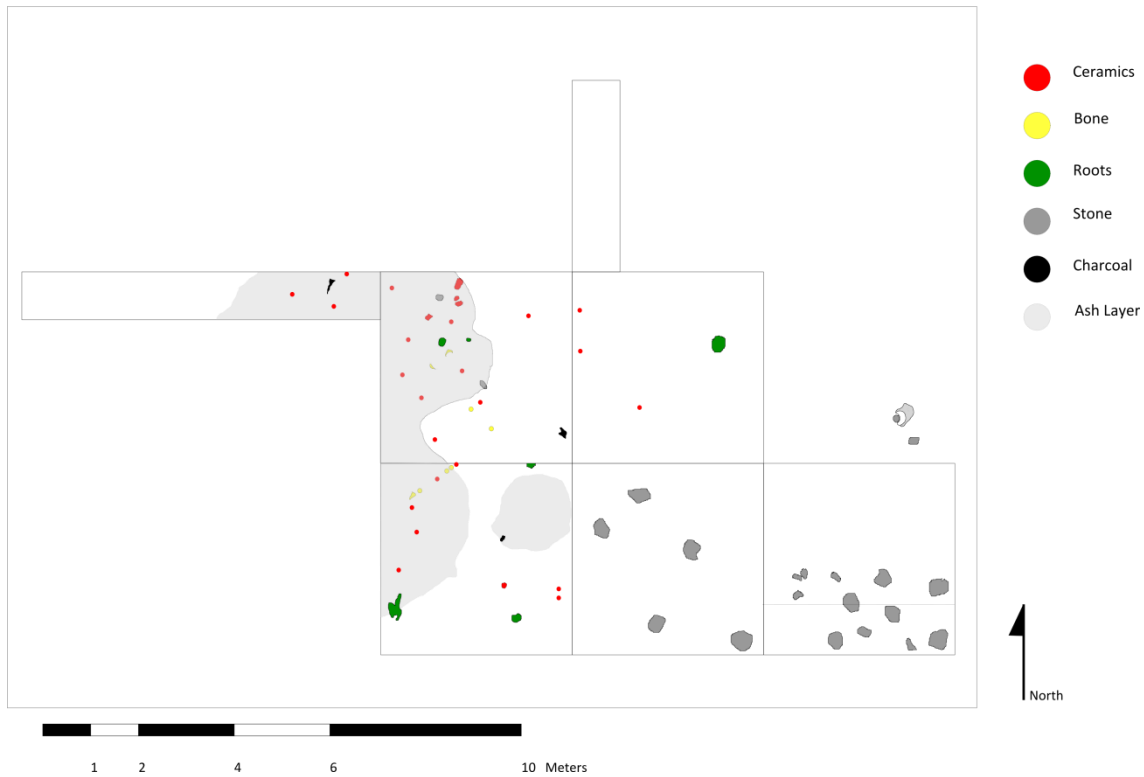


Figure 10-35: Exposed ash layer and grain bin platforms at Site 2327CA/021/TT2 during excavation



Figure 10-36: North-westerly view of Site 2327CA/021/TT2

Site 21 Test Trench 2

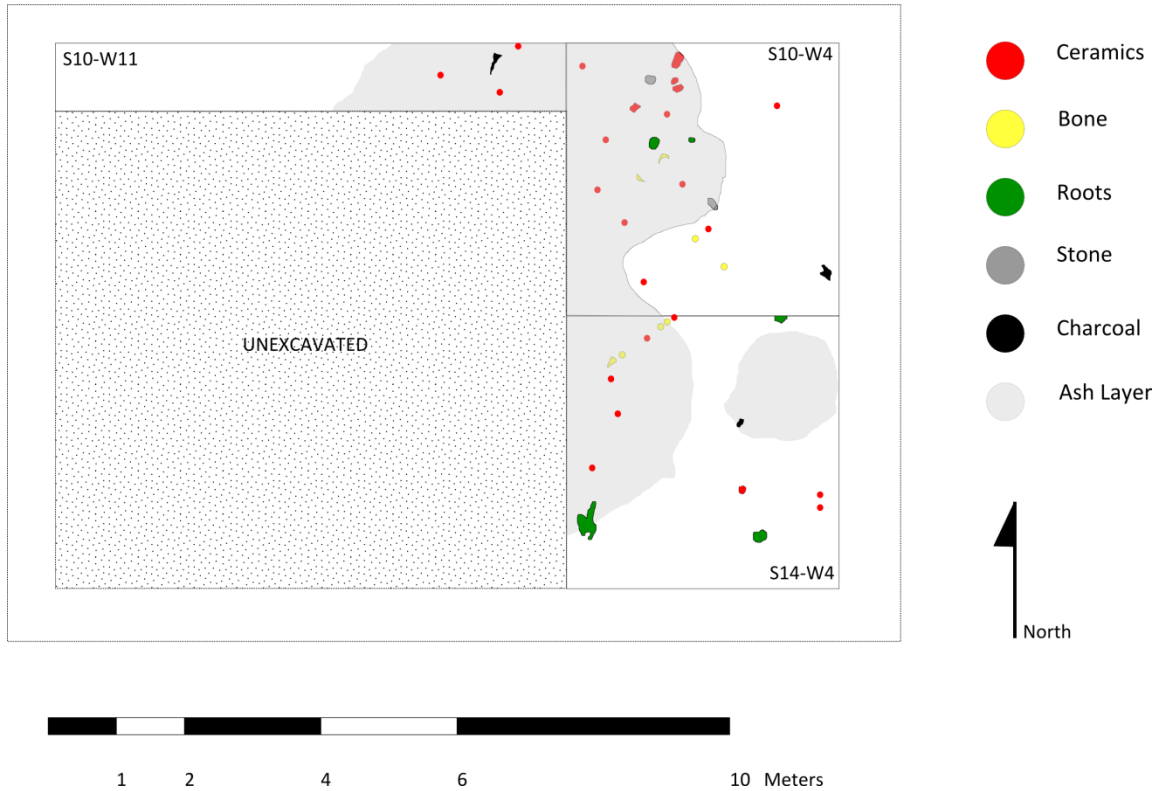


Figure 10-37: Ash / Midden deposit at Site 2327CA/021TT2

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Figure 10-38: Ceramic cluster identified in Spit 1 of S10-E4 midden deposit

Site 21 Test Trench 2

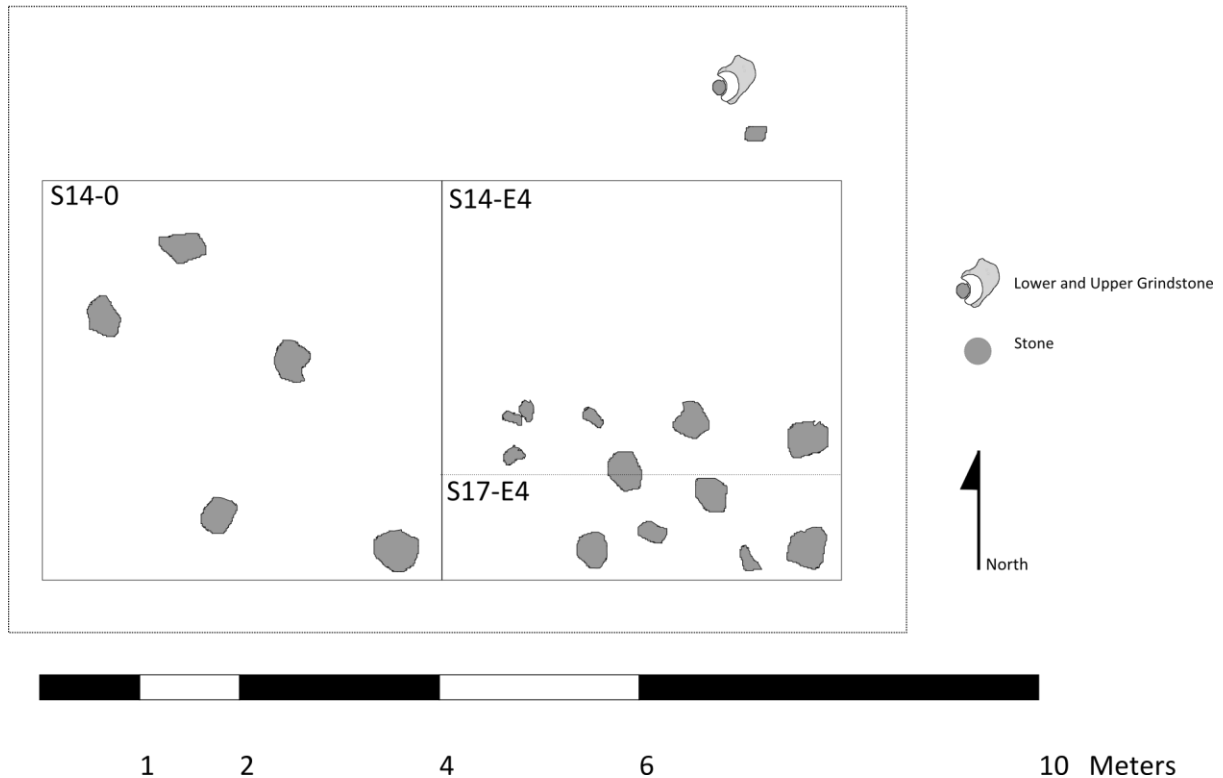


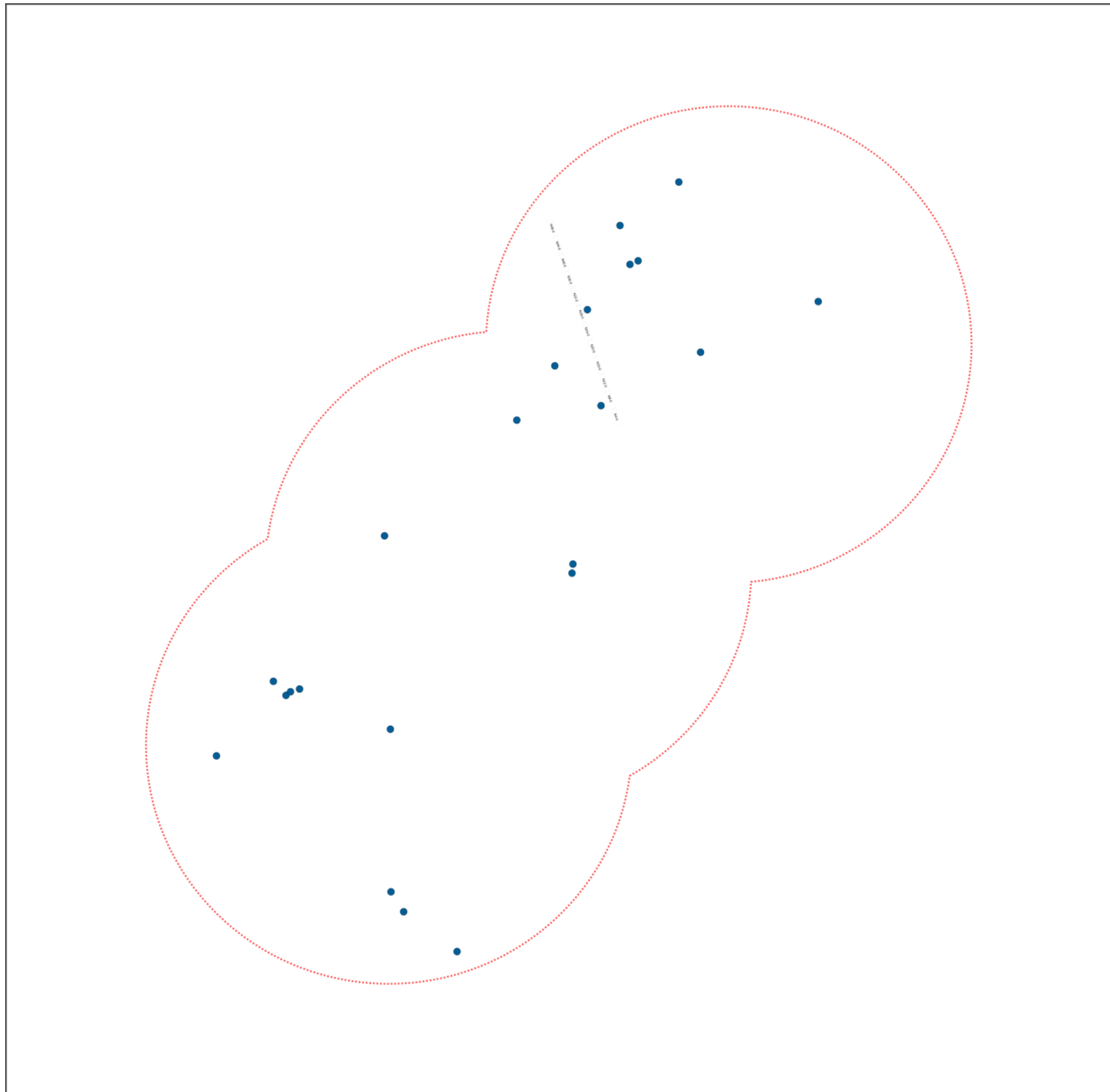
Figure 10-39: Grain bin foundation and lower grind stone identified at Site 2327CA/021/TT2

11 SITE MAPPING

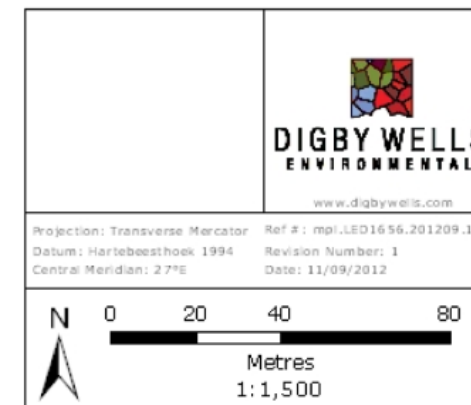
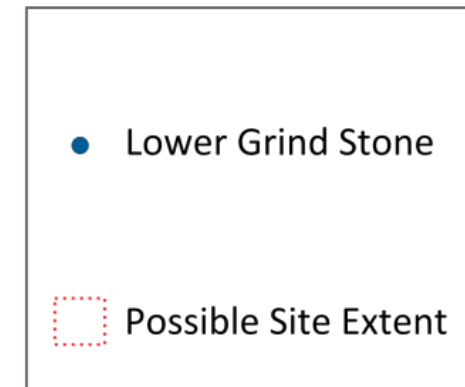
Sites were mapped during the initial mitigation phase to include all visible features to determine approximate site boundaries. Coordinates were taken where surface material was visible. Surface finds included stone features identified as grain bin platforms, lower grind stones, and ceramics.

Mapping was conducted using a handheld Trimble Juno to indicate the position of identifiable features, where during the second phase of mitigation the excavations were mapped with a Trimble R4 GNSS differential GPS to ensure maximum accuracy of data recording (20 mm accuracy). These maps have been updated to include the excavation trenches at each site mitigated.

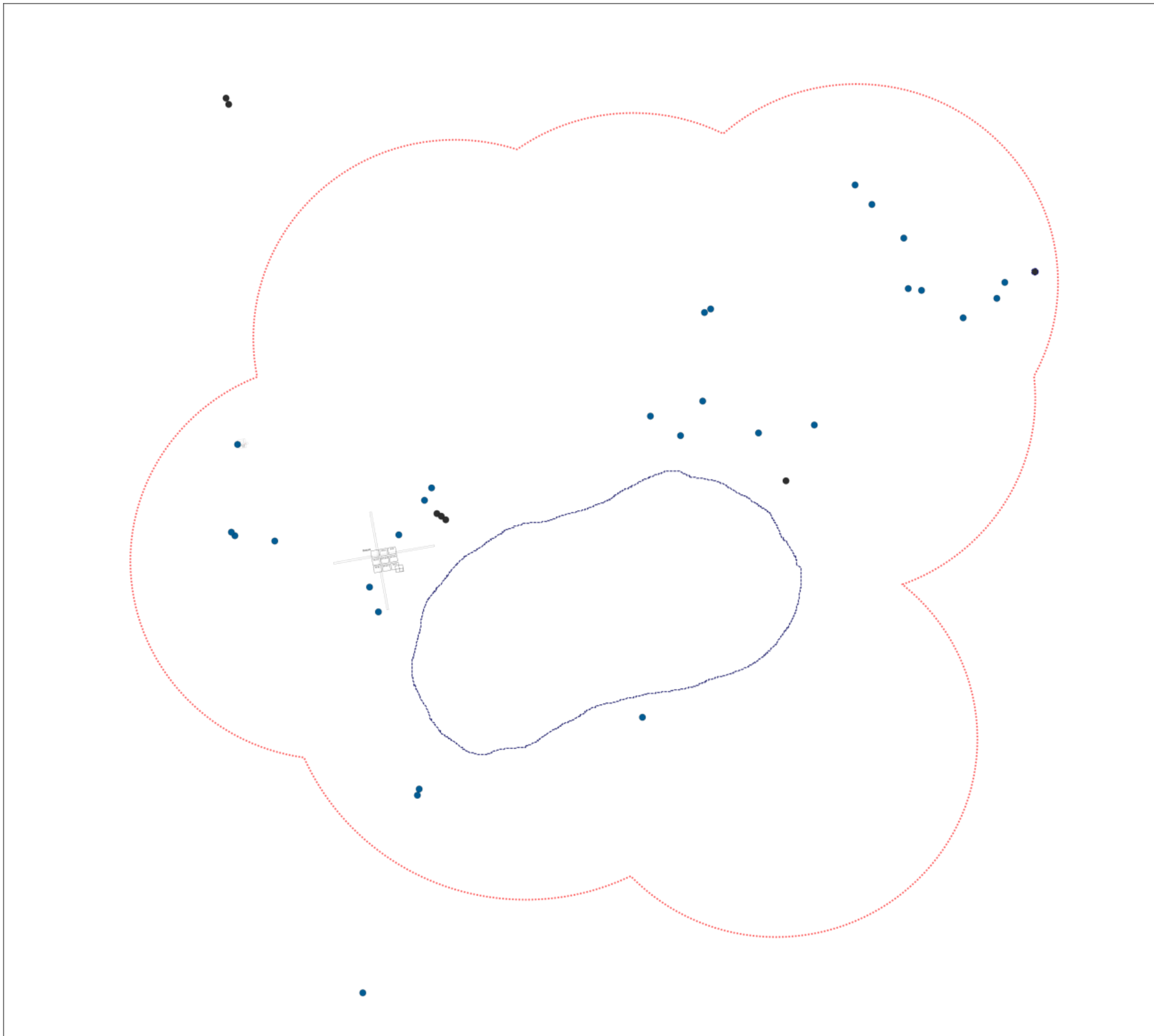
Plan 5: Map of Site 2327CA/010 indicating possible extent and excavation trench



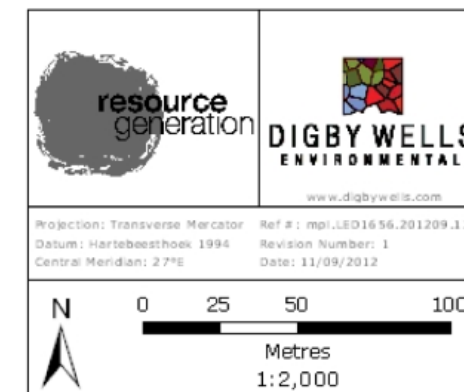
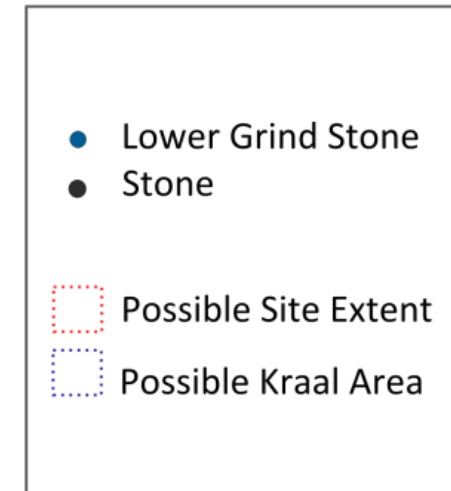
SITE 10



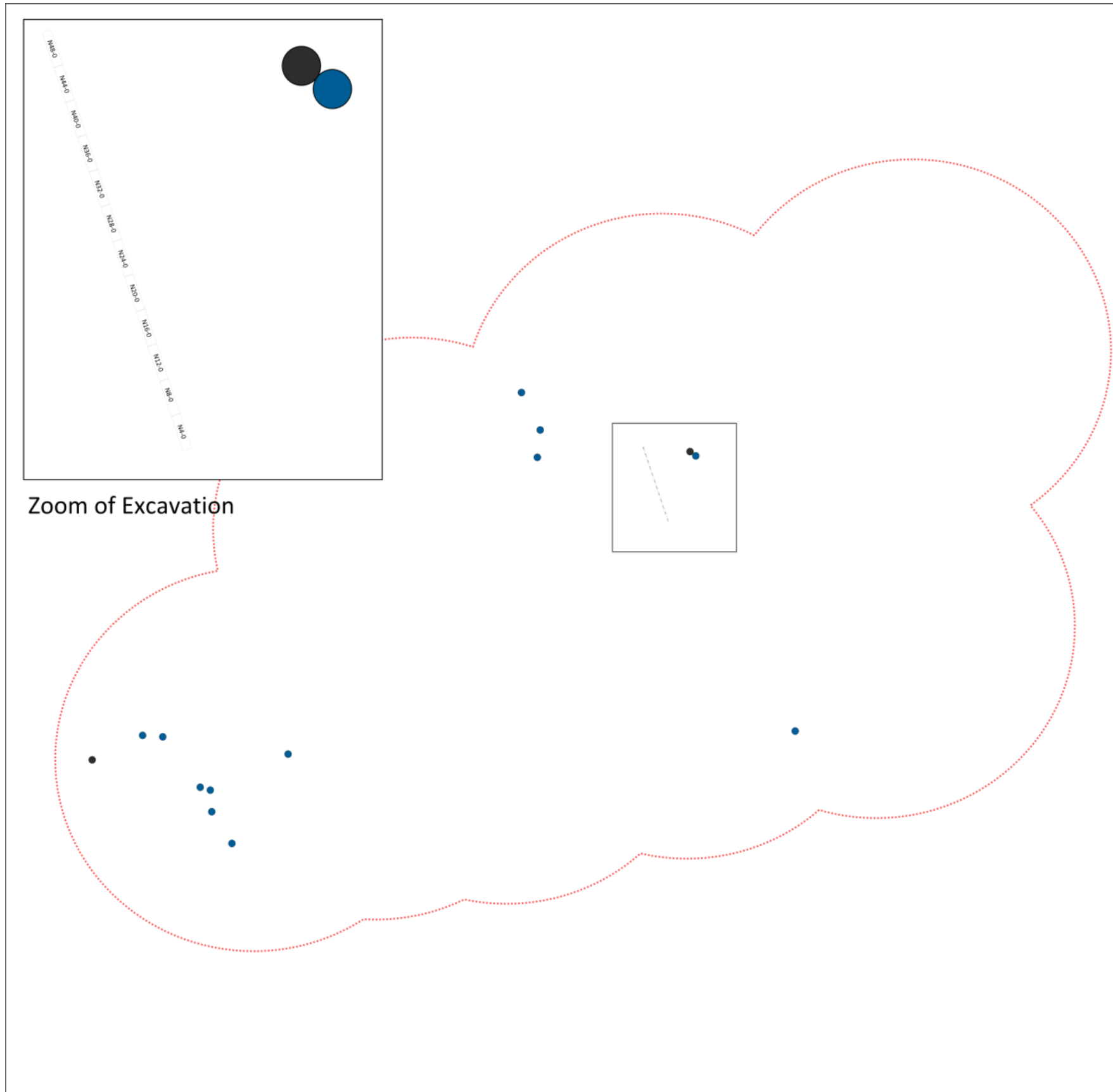
Plan 6: Map of Site 2327CA/011 indicating possible extent and excavation trenches



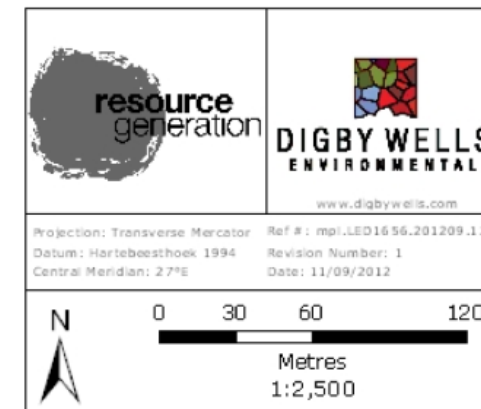
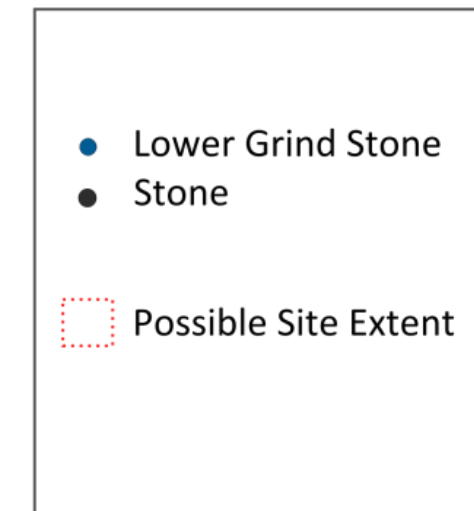
SITE 11



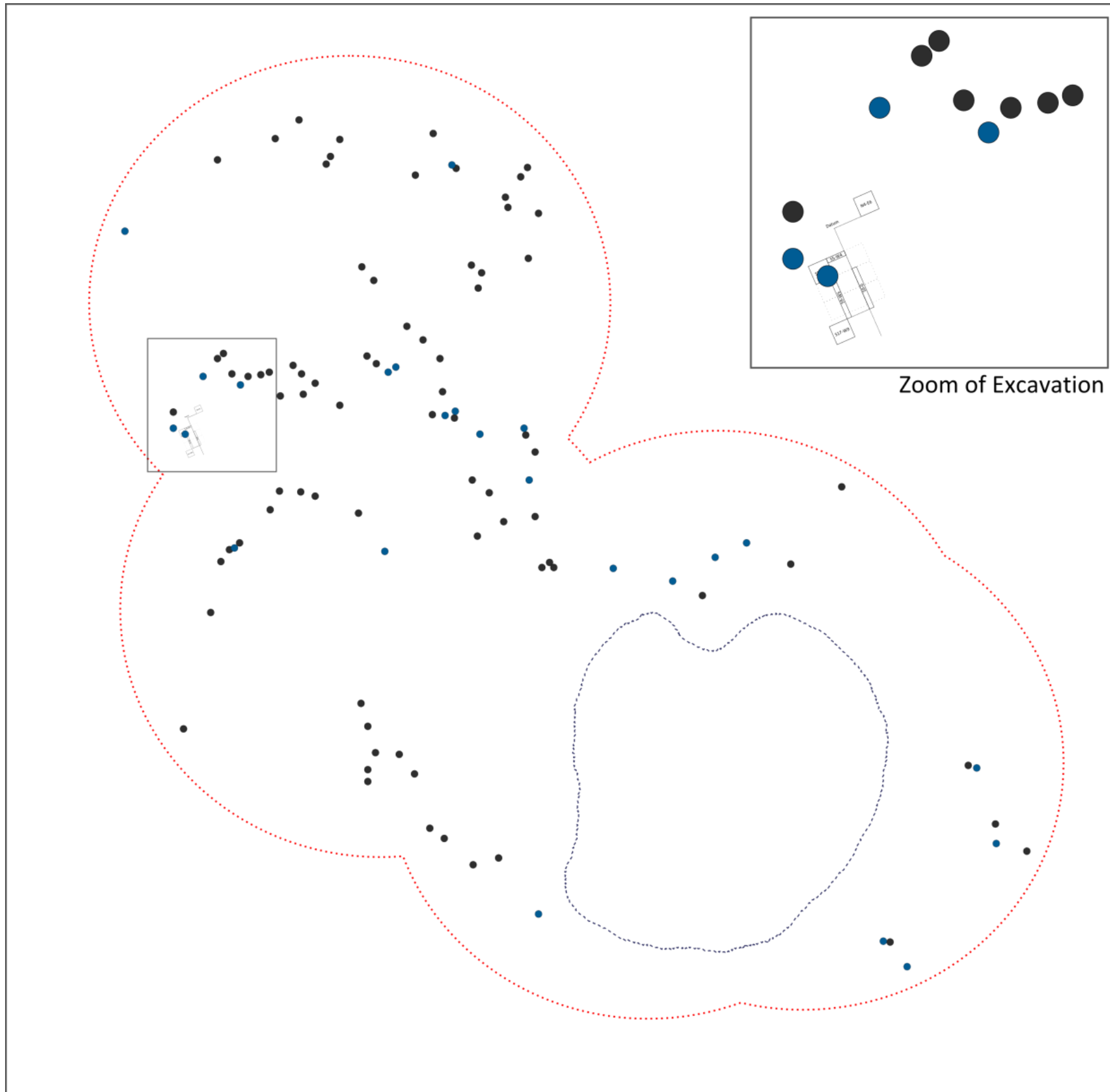
Plan 7: Map of Site 2327CA/013 indicating possible extent and excavation trench



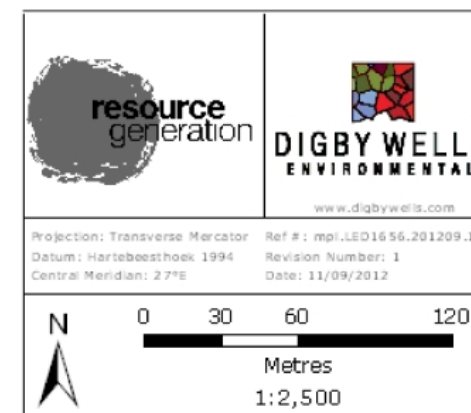
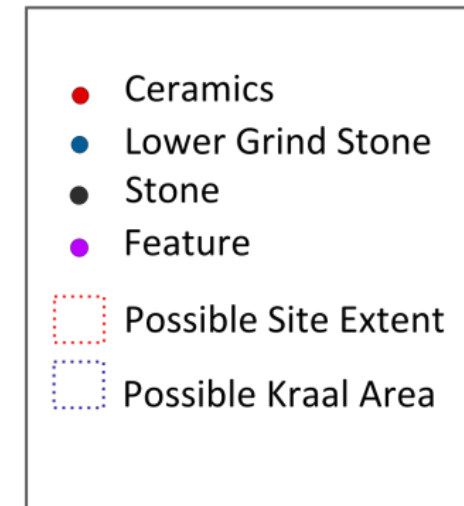
SITE 13



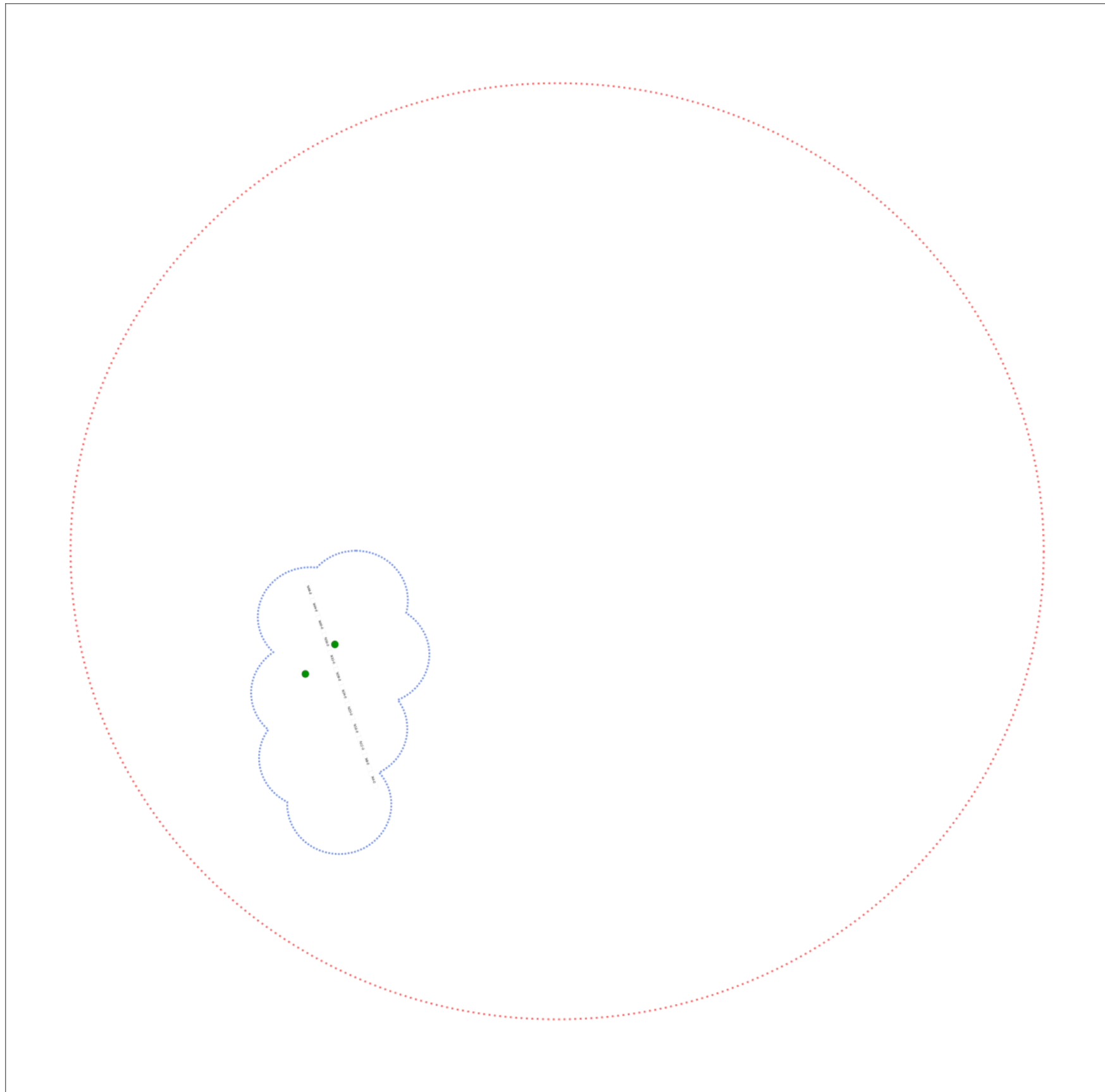
Plan 8: Map of Site 2327CA/014 indicating possible extent and excavation trenches



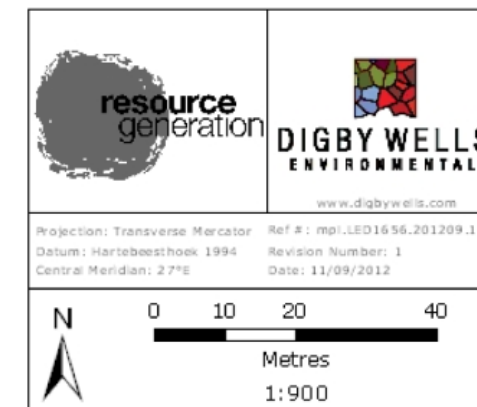
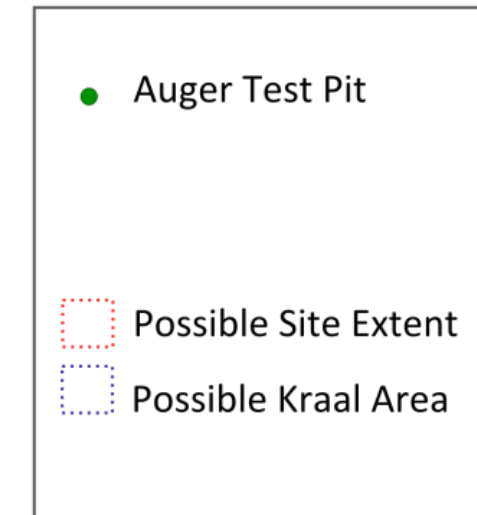
SITE 14



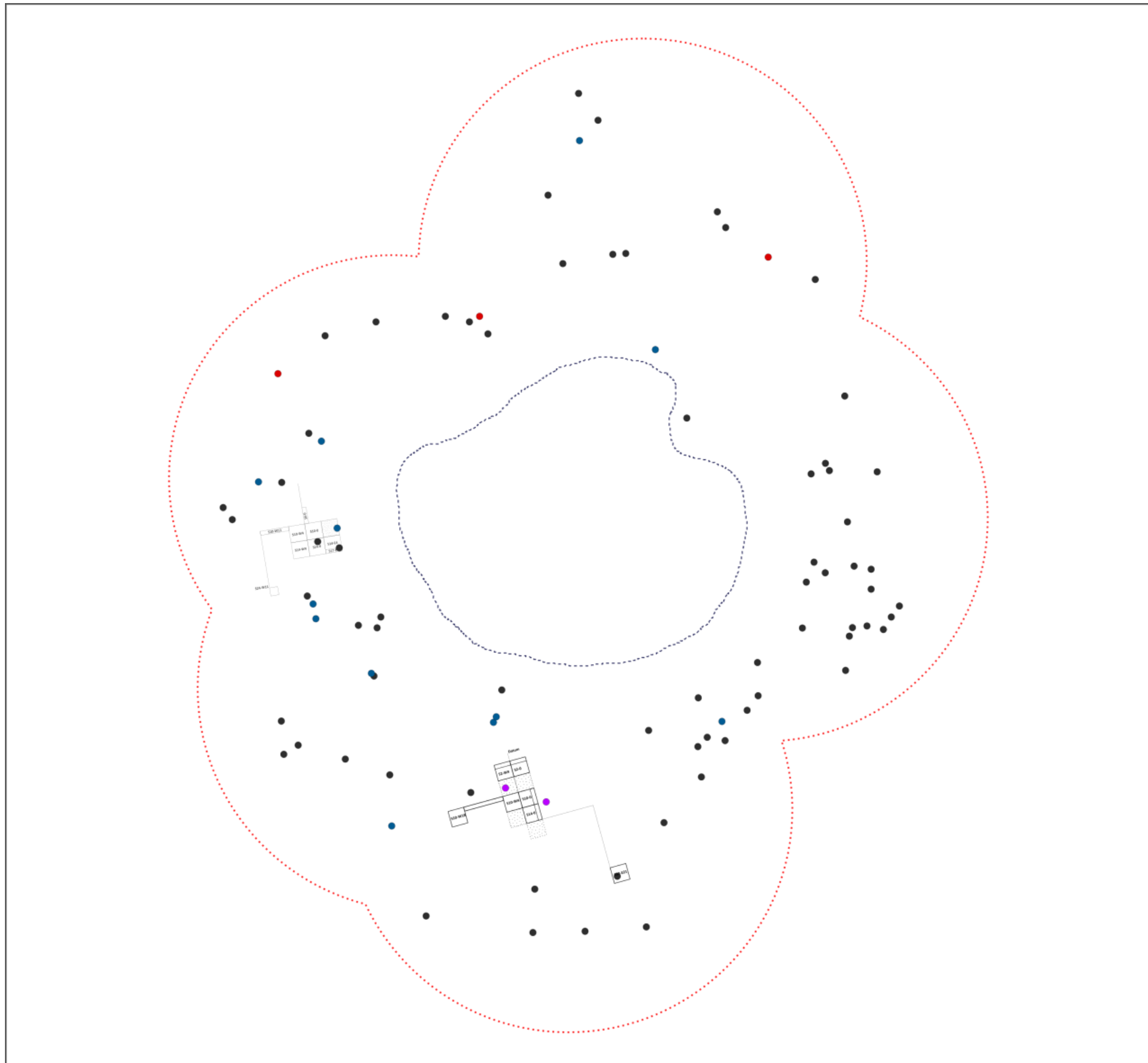
Plan 9: Map of Site 2327CA/018 indicating possible extent and excavation trench



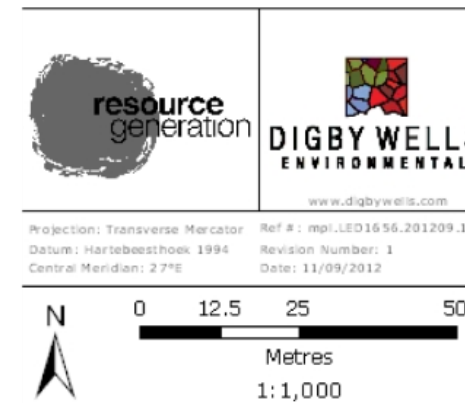
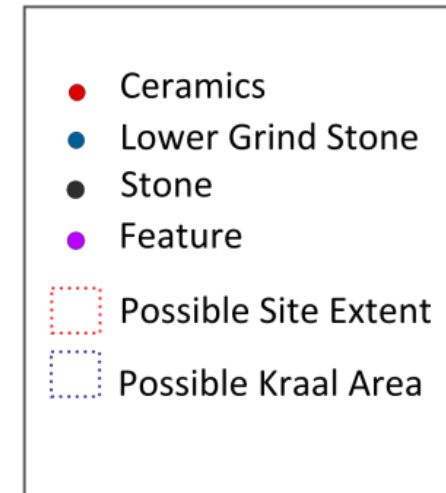
SITE 18



Plan 10: Map of Site 2327CA/021 indicating possible extent and excavation trenches



SITE 21



12 STATEMENT OF SIGNIFICANCE/HERITAGE VALUE

The significance ratings provided in the Phase 1 AIA were reviewed and reassessed following the mitigation of the sites and presented in the interim report (Nel, 2012). Fifteen sites were reviewed with their field ratings and statements of significance subsequently falling in the General Protected category as Grade IV A, B and C sites.

In total, nine sites were rated as General Protected: Field Rating IV C. Four sites were rated as General Protected: Field Rating IV B and only two sites were rated as General Protected: Field Rating IV A.

Table 12-1: Review of recommended site significance ratings post mitigation as presented in the interim Phase 2 report (Nel, 2012)

Site number	(A) Importance to community or pattern in country's history	(B) Possession of uncommon, rare or endangered natural or cultural heritage aspects	(C) Information potential	(D) Importance in demonstrating principle characteristics	(E) Importance in aesthetic characteristics	(F) Degree of technical / creative skill at a particular period	(G) Association to community or cultural group for social, cultural or spiritual reasons	(H) Association with life or work of a person, group or organisation of importance in the history of the country	(I) Site of significance relating to history of slavery	Site significance rating	Statement of Significance
Site 002	1	1	2	1	1	1	3	1	1	12	GP IV C
Site 003	1	1	2	1	1	1	1	1	1	10	GP IV C
Site 004	3	1	5	3	3	1	3	1	1	21	GP IV B
Site 009	2	1	3	2	1	1	3	1	1	15	GP IV C
Site 011	2	1	5	2	1	1	3	1	1	17	GP IV B
Site 014	2	1	3	2	1	1	3	1	1	15	GP IV C
Site 017	2	1	5	2	1	1	3	1	1	17	GP IV B
Site 018	1	1	1	1	1	1	1	1	1	9	GP IV C
Site 019	1	1	1	1	1	1	1	1	1	9	GP IV C
Site 020	1	1	1	1	1	1	1	1	1	9	GP IV C
Site 021	2	1	7	3	3	1	3	1	1	22	GP IV B
Site 024	1	1	1	1	1	1	1	1	1	9	GP IV C
Site 027	1	1	1	1	1	1	1	1	1	9	GP IV C
Site N028	4	3	7	3	1	1	3	1	1	24	GP IV A
Site N029	3	2	7	5	1	4	1	1	1	25	GP IV A

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Table 12-2: Criteria used to determine value and significance of heritage resources, NHRA Section 3

NHRA reference	Description of defining criteria
3(1)(a)	its importance in the community, or pattern of South Africa's history;
3(1)(b)	its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;
3(1)(c)	its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;
3(1)(d)	its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;
3(1)(e)	its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
3(1)(f)	its importance in demonstrating a high degree of creative or technical achievement at a particular period;
3(1)(g)	its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;
3(1)(h)	its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa; and
3(1)(i)	sites of significance relating to the history of slavery in South Africa.

Table 12-3: Proposed field ratings/grades describing value and significance of heritage resources of tangible heritage resources, based on NHRA Section 7(1) and SAHRA Minimum Standards

FR/Grade	Significance	Mitigation recommendation
<i>National and Provincial Protection, NHRA 7(1)(a, b)</i>		
I	National SAHRA responsibility High significance	Heritage resource conserved/preserved; No mitigation as part of development recommended
II	Provincial SAHRA responsibility High significance	Heritage resource conserved/preserved; No mitigation as part of development recommended
<i>Local Protection, NHRA 7(1)(c)</i>		
IIIA	Local PHRA responsibility High significance	Retained as heritage register site; Mitigation as part of development not advised
IIIB	Local	Could be mitigated and part retained as heritage

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	PRHA responsibility High significance	register site
General Protection, NHRA 7(1)(c)		
IV A	Local PRHA responsibility High/Medium significance	Heritage resource should be mitigated before destruction
IV B	Local PRHA responsibility Medium significance	Heritage resource should be recorded before destruction
IV C	Local PRHA responsibility Low significance	Heritage resource has been sufficiently recorded Phase 1 requiring no further recording before destruction

13 DISCUSSION OF RESULTS AND FINDINGS

The archaeological record identified in the Boikarabelo Coal Mine landscape has a deep time depth. This is evident with the identification of Stone Age heritage resources. Evidence from ESA through to the LSA was identified during previous heritage studies conducted within the project area and its immediate surrounds, and thus an argument for early occupation can be made. This is not unique when one considers the distribution of these resources throughout southern Africa, but due to the limited research conducted in the wider project area, the identification of ESA, MSA and LSA resources may have some significance in terms of future research potential. These sites however fell outside the ambit of this study and will not be discussed in more detail.

Earlier Iron Age occupations associated with facies such as Bambata, Diamant, Baratani or Icon were not identified in the project area. The potential for these sites to be found is still present, especially when one considers the general distribution of these facies, and that similar sites have been identified and recorded further north along the Limpopo River. In general, Iron Age occupation would appear to be associated with more recent groups of Sotho-Tswana speakers, most likely dating to the mid- to late 18th century. This assessment is primarily based on comparable sites identified by Biemond in Botswana, and the specialists report compiled during the interim Phase 2 Archaeology Report (Beimond, 2012).

Based on the identified occupation levels at the mitigated sites, where there was very limited stratification, it would appear that Iron Age occupation within the project area would have been relatively brief. Identifiable features on the surface were primarily limited to grain bin platforms and grinding stones. The majority of grain bin platforms were no longer intact and the stones were scattered in an average radius of 2 to 5 m. Subsurface features identified during mitigation include a cattle kraal at Site 2327CA/011, and a midden / ash deposit at Sites 2327CA/018 and 2327CA/021. With these exceptions, no other features such as floors, walls or daga structures were identified. Nevertheless, the principle organisation of the sites was in the form of grain bin remains positioned around a central open area (presumably the kraal).

Based on current knowledge of Late Iron Age socio-political organisation – excluding Great Zimbabwe and associated traditions – the sites do seem to conform to horizontal stratified societies, typical of archaeological and historical Sotho-Tswana societies in general. Notwithstanding the ephemeral nature of the sites at Boikarabelo, the general site layout consist of central open areas surrounded by family units (households) that are characteristic features of this settlement pattern. As previously mentioned, the only visible remains on the surface were the grain bin platforms, lower and upper grinding stones and ceramic scatters. With increasing population growth, wards would be added to the central settlement in a similar pattern but on a smaller scale. This type of spatial organisation and social stratification is known as the Central Cattle Pattern (CCP), developed by Kuper (1980) and refined by Huffman (1986, 2007).

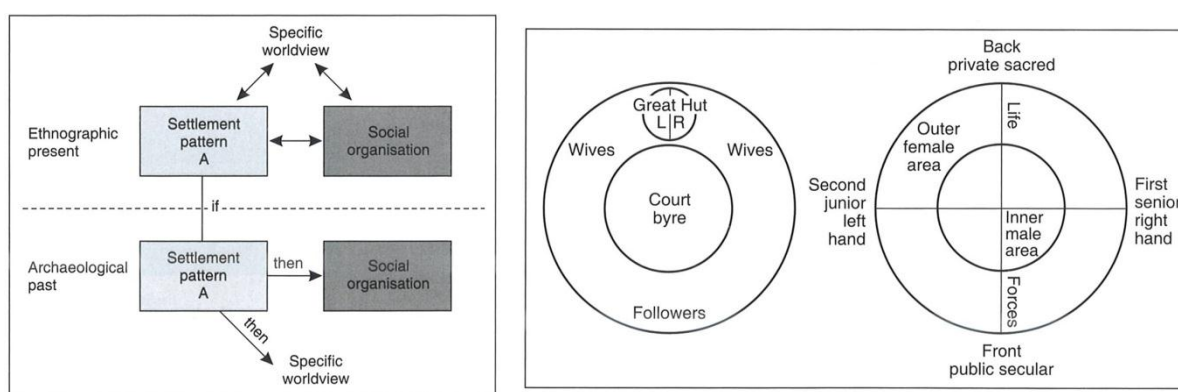


Figure 13-1: Organisation of the Central Cattle Pattern (adapted from Huffman 2007)

Based on a society's social organisation, specific worldview, comprehension of spatial organisation and comparison to similar sites, it is possible to predict the expected position of burials within the archaeological sites. Within the CCP, burial locations were predetermined for the inhabitants of the settlements based on their status within the group. Generalisations on this pattern include:

- Young children, infants and children up to two years, were buried inside the house under the floor or veranda walls;
- Children older than two years were buried in front of the household;
- Women were buried at the back of the household amongst the grain bins; and
- Men and other higher status individuals were buried in the cattle kraals.

This is an important consideration for the identified archaeological sites in terms of the Boikarabelo Coal Mine project. Based on this spatial organisation an average of at least one burial per household and two or more per cattle kraal can be present at any one site. Although no human remains or graves were identified during the archaeological mitigations of these sites, excavation revealed that the occupation level at all sites terminated at approximately 200 mm, suggesting that the sites were not inhabited for an extensive period of time. In addition to this, faunal remains collected from the excavations were fragmented and not well preserved; suggesting that preservation within the project area is not good. These two factors decrease the likelihood of human remains being identified but does not negate the possibility that they did occur.

The identified archaeological sites within the Boikarabelo Coal Mine project area are ephemeral and have a relatively low visibility, comprising primarily surface scatters and grain bin platforms and grinding stones. This does not however suggest a lower significance for the identified sites, but rather be considered an important factor both during the different phases at Boikarabelo and academically. The extensive mapping undertaken of visible features indicated evident that all sites conformed to the CCP as discussed above. The excavations revealed that occupation was brief. The relative paucity of material culture further suggests that the inhabitants may have been living in impoverished conditions. Additionally, the lack of diagnostic pottery recovered from excavations prevented the sites to be placed within any detailed temporal or cultural context.

13.1 Relative Dating of the Sites

Archaeologically, diagnostic ceramics were limited to surface finds and were associated with the *Letsibogo facies* (See Figure 9-2) (Beimond, 2012). These findings are consistent with other investigations in the surrounding areas, most notably Huffman & van der Walt (2010). The identified Letsibogo sites were categorised as cattle posts to the east of the Boikarabelo Coal Mine project area which were articulated with farming villages to the west in the Limpopo River Valley. This facies dates to the 16th century in central and eastern Botswana and is associated with the baKaa (Biemond, 2011a). The baKaa had their capital around the Shoshong Hills in Botswana, some 80 km away from the project area, from the 16th century up to 1849 CE when they were overpowered by Ngwato (refer to the Historical Background of the Sotho-Tswana, p. 25).

Biemond (2012) identified vessels described as short-necked jars and constricted jars. One vessel (described as a 'jar made by an apprentice') exhibits rim notching – a key feature in Kwena (Tswana) pottery decoration. The vessel profiles were also considered to be similar to Kwena pottery from large 18th and 19th century Tswana sites such as Molokwane (Pistorius, 1992).

Considering historical information presented in the Literature Review, and the ephemeral nature of the archaeological sites, a probable time range could be between the late 18th and early 19th centuries starting with the reign of Motswasele II. It was during this period that there was great political unrest internally amongst the baKwena, as well as coinciding with the *Difeqane* and Matabele raids. BaKwena and other groups were scattered due to conflict, and were forced to established settlements in, at times, poor locations. This is further supported by early European accounts such as that by Andrew Smith who explored the region in 1835, where he encountered "poor baKwena living in the bushes fleeing from man-eating lions" (Kirby 1940 cited in Biemond 2012). He was further informed that they lived on the banks of the Limpopo River but could not reap crops due to the constant disturbances from the Matabele of Mzilikatze.

As reflected in the Historical Background of the Sotho-Tswana, Sechele united the baKwena and consolidated other refugee groups thereby increasing the baKwena population. He also capitalised on the established trade network where trade beads are known to have been the primary monetary exchange medium. Examples of these were collected at Site 2327CA/021.

Taking into account the timeframe from Motswasele II to Sechele, it is a short period of approximately 30 years in which groups were in constant movement, not establishing extensive settlements. This period corresponds to the short occupation level identified during the archaeological mitigations of the sites. The lack of identity of the sites may also be the result of evident gaps in interpretation and analysis of existing ethnographies, oral histories

and current archaeological interpretation. Neither the ethnographic nor the linguistic evidence considers possible active attempts by lower status groups to conceal their status through claiming common origin with another group regarded to have a higher status as presented in Kopytoff's (1987) African Frontier Model.

Kopytoff's model can be briefly explained. The argument is that as groups move through the landscape, they do not do so in a vacuum: new areas are likely to be inhabited by other groups. Kopytoff proposes three possible scenarios that may occur in these situations, namely:

1. Displacement: the original inhabitants are removed and only the occupiers remain;
2. Incorporation: either the incumbent groups or the occupiers are incorporated based on, for example, claims to genealogical superiority, the incorporated group loses its identity; or
3. Subjugation: occupiers structurally suppress incumbent groups, imposing restrictions such as relegating them to specialised services based on their link to the land: both identities however remain.

Initial encounters during the mid-17th century between the baKgalagadi and baKwena resulted in battles in which the former were able to defend themselves. However the baKwena's numeric superiority ultimately resulted in defeat, allowing the baKwena to settle at Dithejwane Hill. The baKgalagadi were subsequently either absorbed through inter-marriages, or expelled and maintained under a symbiotic relationship (Okhiro 1973). Some of those who were expelled moved to the Shoshong Hills where they joined and paid tribute to the baKaa. During this time two other Tswana groups – the Ngwato and Ngwaketse – were in a process of separation from the baKwena. They established independent settlements but still considered themselves as part of the larger Kwena. Furthermore, the *Difeqane* finally reached this area during the early 18th century, with Mzilikazi and his Matabele raiding parties. By 1870, Europeans had divided the land and were occupying the farms that constitute the Boikarabelo Coal Mine project area (See Section Historical Background of the Sotho-Tswana).

13.2 Site Types

During the initial Phase 2 mitigation, three sites types were identified and discussed in Nel (2012). Archaeological mitigation during the second Phase 2 focused on sites affiliated with the 'Site Type 1'. This type is discussed below.

13.2.1 Site Type 1

Found primarily on the lower lying plains, with a few exceptions on or near the calcrete ridge or river plateau, these sites are similar to the 'grain bin sites'. Characterised by concentration of stones, often associated with lower grindstones surrounding a central open space, these stone features have been identified as grain bin platforms. With an understanding of spatial organisation within the CCP settlement pattern and when compared to comparative sites, an informed assumption is that these features formed part of the domestic space of the household. In Botswana some such complex sites exceeded 20 ha, with more than four wards attached to the central settlement (Biemond, 2011a). On-going research at Basinghall farm in Botswana and data generated through archaeological impact assessments for the Mmamabula Energy Project confirmed relative cultural affinities between the Boikarabelo

Phase 2 Archaeological Impact Assessment Mitigation for the Boikarabelo Coal Mine (SAHRA PERMIT NO 80/11/07/015/51)

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sites and those in Botswana (Biemond, 2011a & 2011b) (but see discussion of Kopytoff's African Frontier Model above).

Based on the identified settlement layout of the sites conforming to this type, other comparable sites may include early Tswana towns, such as Kaditswene (Boeyens, 1998) and Molokwane (Pistorius, 1992). It must be noted that these sites are much larger than those within the Boikarabelo Coal Mine project area, and consist of large stonewall enclosures. Nevertheless, even though the relative sizes of the Boikarabelo Coal Mine project sites are smaller and stonewalling is absent, the organisation and spatial layout is based on the same worldview. This is clearly illustrated in Figure 13-2 and Figure 13-3 where it is evident that the settlements are organised with a central area - presumably the kraal – surrounded by the households / wards. These examples are of stone walled sites, but one must consider the context of the settlements identified in the Boikarabelo Coal Mine project area. Spatial patterning can however be compared to the site plans above.

As discussed previously under Section 6, the environment has limited resources in terms of available material, and under Section 9 and 13, these sites were in all probability not permanent settlements but rather a 'refuge' location of groups scattered during periods on unrest within the Bakwena society.

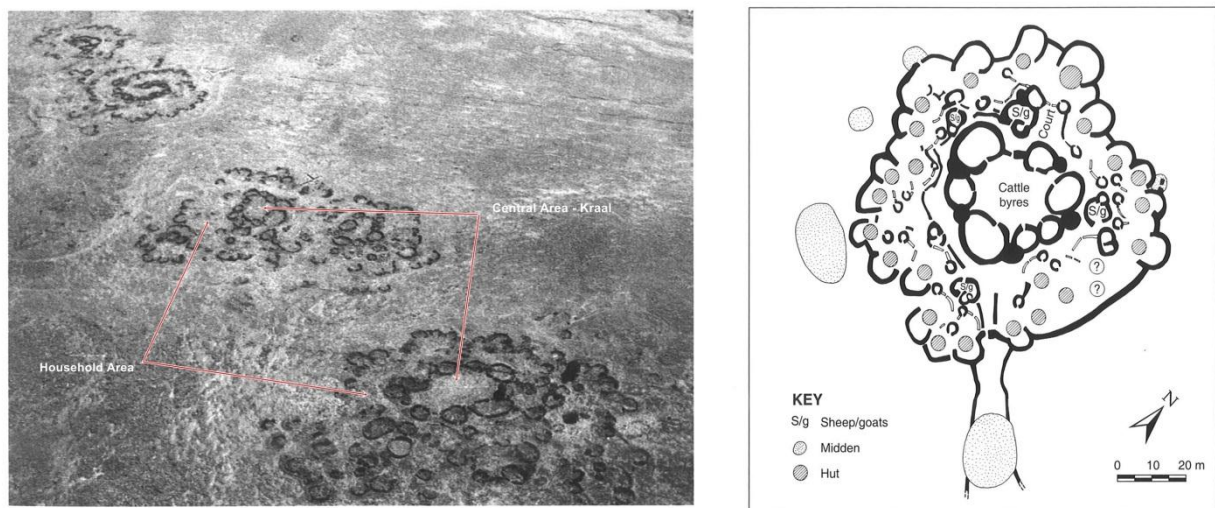


Figure 13-2: Example of stone walled Molokwane sites from Gauteng



Figure 13-3: Aerial view of the Molokwane Iron Age site. Note the large open space in the centre (red line) indicating central cattle kraal. The different wards are represented by the scalloped stonewalls radiating from centre (photo courtesy N. Kruger)

Biemond (2012) discussed the 1801 Somerville and Truter expedition from the Cape where they encountered the Tlhaping at Dithakong. The Tlhaping at that time was the southernmost Tswana-speaking group known or encountered. Among the expedition was an artist, Samuel Daniell, who recorded the Tlhaping settlement and sketched a household depicted in Figure 13-4, with a granary and reed walls. This may represent ethnographic evidence for the organisation of the settlements in the Boikarabelo Coal Mine project area, and the CCP in general.

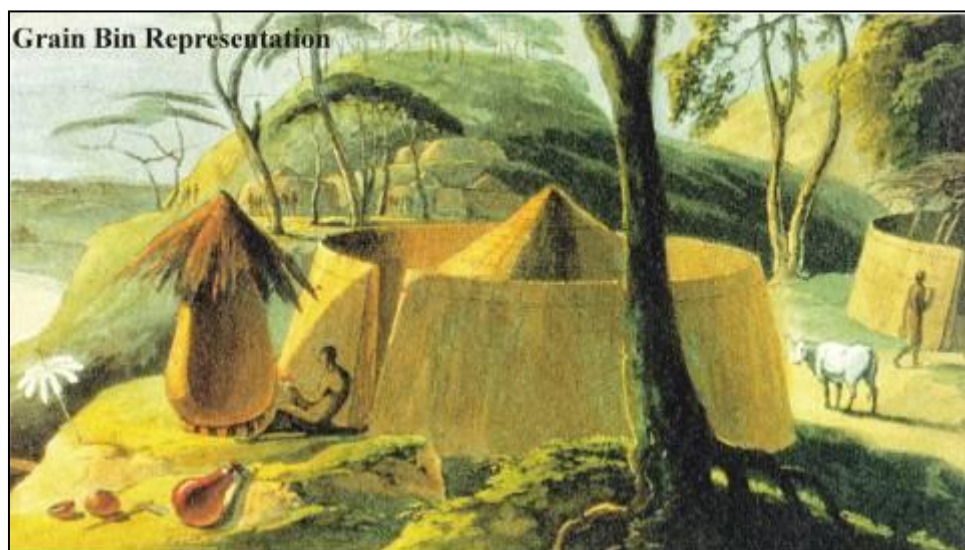


Figure 13-4: Daniell's 1801 depiction of a Tlhaping settlement at Dithakong. Note the granary to the left on a raised stone platform. Also note the reed walls. These would leave little to no trace post-site abandonment (Biemond 2012)

14 SAHRA DESTRUCTION PERMIT REQUIREMENTS

The interim report (Nel, 2012) was submitted as support for a destruction permit application. This permit was issued on 24 July 2012, and expires on 1 August 2013 (Appendix B). The following permit requirements apply:

- The permit is issued to Mr Nel as representative of Mr van den Aardweg, for Resgen South Africa;
- If the permit holder cannot be present on site at all times, then the heritage authority must be provided with the names and qualifications of the authorised representative;
- A progress report on the results of the destruction must be submitted to the heritage authority issuing this permit on or before the 1st of August 2013;
- Reprints of all published papers or copies of theses and/or reports resulting from this work must be lodged with the heritage authority;
- If a published report has not appeared within three years of the lapsing of this permit, the report required in terms of the permit will be made available to researchers on request;
- It is the responsibility of the permit holder to obtain permission from the landowner for each visit, and conditions of access imposed by the landowner must be observed;
- The heritage authority shall not be liable for any losses, damages or injuries to persons or properties as a result of any activities in connection with this permit;
- The heritage authority reserves the right to cancel this permit by notice to the permit holder;
- This permit is subject to a general appeal and may be suspended should an appeal against the decisions be received by SAHRA within 14 days from the date of the permit. SAHRA may not be held responsible for any costs or losses incurred in the event of the suspension or retraction of this permit.

15 POTENTIAL RISKS

Potential risks that were identified during the Phase 2 mitigation are as follows.

- The single largest risk is the accidental discovery of human remains during site clearing and construction. Given the type and estimated age of the sites found at Boikarabelo Coal Mine, the possibility exists that human remains can be present in the open pit areas where all the archaeological sites will be destroyed. At similar sites mitigated north of the Limpopo River archaeological burials were consistently found in the central cattle kraals and living spaces. Such remains are protected by legislation including the Human Tissues Act (Act No. 65 of 1983) and the National Heritage Resources Act (Act No. 25 of 1999). If any human remains are uncovered during construction and mining activities, the archaeologist or SAHRA must be informed immediately. The appointed archaeologist will apply for the removal of the human remains under an emergency permit. Note that this process will incur some expense as removal of human remains is at the cost of the developer. Time delays may result

while application is made to the authorities and an archaeologist is appointed to do the work.

- In terms of continuing development yet unidentified sites could be discovered during the course of development. According to the SAHRA minimum standards this must be reported to the archaeologist or to the heritage resources authority and the developer may need to give the archaeologist sufficient time to assess and document the finds and, if necessary, rescue a sample (SAHRA 2007:4).

16 CONCLUSION

The second phase of archaeological mitigation reaffirms the initial assessment that the Boikarabelo archaeological sequence can be assigned to Sotho-Tswana settlements. These settlements conform to the CCP settlement organisation and, even with the absence of stone walling, are comparable to the organisation of settlements associated with Molokwane walling. These settlements are arranged around an open central area (cattle kraal) with homesteads surrounding where granaries are found at the back, and where several wards can exist. Observations from field survey and site mitigations indicate that the sites commonly occur in association with grain bin platforms and lower grind stones. Through ethnographic study, it is known that these grind stones were used to process grains such as millet, sorghum and maize, which is associated with sedentary groups.

Ceramic analysis indicated that few diagnostic pieces were collected in which positive cultural affinity could be made. Surface collections indicated that the ceramic facies Letsibogo dating to the 15th and 16th century is present within the project area. This is consistent with other work conducted in the area where Letsibogo cattle posts have been identified. These ceramics were not identified from material screened during excavations, and thus the occupation of the sites is unlikely to be associated with the Letsibogo facies.

Analysis of the excavated ceramics was inconclusive. No decoration motifs were identified on any sherds from any of the sites. Key features that were identified include rim notching and the presence of short neck jars and constricted vessels (Beimond, 2012). These features, though not exclusive, suggest that the ceramics can be associated with Kwena ceramics from the 18th and 19th century. When viewed in conjunction with the ethnographic data discussed in Section 9.1.2, it would suggest that the occupation of the sites would have been by the Kwena from the late 17th century or early 18th century onwards.

As very little academic research has been done on this phase of the Iron Age in the immediate area to the Mine, no further in-depth interpretations of the sites can be made, as there is limited data to inform the archaeological sequence.

Excavations conducted on the archaeological sites fulfilled mitigation requirements for the current impacts. Though every effort was made to extensively gather as much information as possible, there is a high probability that archaeological material will be found during the construction phase of the project. Archaeological sites are often sub-surface and may not have been identified during the initial survey of the project area.

No burials were identified during the mitigations of sites 009/010, 011, 013, 014, 018 and 021. As discussed, the occupation levels at all these sites were between 0 – 200 mm with limited material culture and poor preservation of faunal remains. What this indicates is that the archaeological sites were not inhabited for an extended of time, and if burials were placed within these settlements, preservation of these remains would have been poor.

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Appendix A: Specialists CVs

JOHAN NEL

Mr. Johan Nel

Archaeologist

Unit Manager: Cultural Resources Management

Social Sciences Department

Digby Wells Environmental

1 EDUCATION

- 2001 BA Anthropology & Archaeology, University of Pretoria
- 2002 BA Honours Archaeology, University of Pretoria (UP) (2002)
- Current MA Archaeology

2 EMPLOYMENT

- 2010 – present: Archaeologist and CRM specialist, Digby Wells Environmental
- 2005 – 2010: Co-owner and manager of Archaic Heritage Project Management, Cultural Heritage Resources Management consultancy company;
- 2004 – 2005: Resident, professional archaeologist, Rock Art Mapping Project based at Didima / Cathedral Peak, Ukhahlamba-Drakensberg World Heritage Site, Department of Geomatics, University of KwaZulu-Natal;
- 2003 – 2004: Freelance, professional archaeologist;
- 2002 – 2003: Special Assistant, Physical Anthropology Unit, Department of Anatomy, University of Pretoria;
- 2000 – 2002: Technical Assistant, Physical Anthropology Unit, Department of Anatomy, University of Pretoria;
- 1999 – 2000: Assistant in Mapungubwe Project, Department of Anthropology and Archaeology, University of Pretoria;
- 1998 - 1999: Volunteer at National Cultural History Museum, Pretoria, Writer for BAT ('By About Town) arts section in Perdeby, official University of Pretoria student newspaper.

3 EXPERIENCE

PHASE 1 ARCHAEOLOGICAL IMPACT ASSESSMENTS:

- Above Ground Storage Tanks survey, SASOL Oil (Pty) Ltd, Free State Province, South Africa
- Access road establishment , AGES-SA, Tzaneen, South Africa
- Boikarabelo Railway Link, Resgen South Africa, Steenbokpan, South Africa
- Conversion of prospecting rights to mining rights, Georock Environmental, Musina, South Africa
- Galaxy Gold Agnes Mine, Barberton, South Africa
- HCI Khusela Palesa Extension, Bronkhorstspuit, South Africa
- Kennedy's Vale township establishment, AGES-SA, Steelpoort, South Africa
- Koidu Diamond Mine, Koidu Holdings, Koidu, Sierra Leone
- Lonmin Platinum Mine water pipeline survey, AGES-SA, Lebowakgomo, South Africa
- Mining right application, DERA Environmental, Hekpoort, South Africa
- Mogalakwena water pipeline survey, AGES-SA, Limpopo Province, South Africa
- Nzoro Hydropower Station, Environmental and Social Impact Assessment, DRC
- Randgold Kibali Gold Project, Environmental and Social Impact Assessment, Kibali, Democratic Republic of the Congo
- Randwater Vlakfontein-Mamelodi water pipeline survey, Archaeology Africa cc, Gauteng, South Africa
- Residential and commercial development, GO Enviroscience, Schoemanskloof, South Africa
- Temo Coal, Limpopo, South Africa
- Transnet Freight Line survey, Eastern Cape and Northern Cape, ERM, South Africa
- Van Reenen Eco-Agri Development Project, GO Enviroscience, South Africa
- Platreef Platinum Mine, Ivanhoe Nickel & Platinum, Mokopane, South Africa

MITIGATION PROJECTS:

- Mitigation of Iron Age archaeological sites: Kibali Gold Project, DRC
- Mitigation of Iron Age metalworking site: Koidu Diamond Mine, Sierra Leone
- Mitigation of Iron Age sites: Boikarabelo Coal Mine, South Africa
- Exploratory test excavations of alleged mass burial site: Rustenburg, Bigen Africa Consulting Engineers, South Africa
- Mitigation of Old Johannesburg Fort: Johannesburg Development Agency (JDA), South

Africa

- Site monitoring and watching brief: Department of Foreign Affairs Head Office, Imbumba-Aganang Design & Construction Joint Venture, South Africa

GRAVE RELOCATION

- Du Preezhoek-Gautrain Construction, Bombela JV, Pretoria, South Africa
- Elawini Lifestyle Estate social consultation, PGS (Pty) Ltd, Nelspruit, South Africa;
- Motaganeng social consultation, PGS (Pty) Ltd Burgersfort, South Africa
- Randgold Kibali Mine, Relocation Action Plan, Kibali, DRC
- Repatriation of Mapungubwe National Park and World Heritage Site, DEAT, South Africa
- Smoky Hills Platinum Mine social consultation, PGS (Pty) Ltd Maandagshoek South Africa
- Southstock Colliery, Doves Funerals, Witbank, South Africa
- Tygervallei. D Georgiades East Farm (Pty) Ltd, Pretoria, South Africa
- Willowbrook Ext. 22, Ruimsig Manor cc, Ruimsig, South Africa
- Zondagskraal social consultation, PGS (Pty) Ltd, Ogies, South Africa
- Zonkezizwe Gautrain, PGS, (Pty) Ltd, Midrand, South Africa

OTHER HERITAGE ASSESSMENTS AND REVIEWS:

- Heritage Scoping Report on historical landscape and buildings in Port Elizabeth: ERM South Africa
- Heritage Statement and Cultural Resources Pre-assessment scoping report on Platreef Platinum Mine, Mokopane: Platreef Ltd
- Heritage Statement and Scoping Report on five proposed Photo Voltaic Solar Power farms, Northern Cape and Western Cape: Orlight SA
- Land claim research Badenhorst family vs Makokwe family regarding Makokskraal, Van Staden, Vorster & Nysschen Attorneys, Ventersdorp South Africa
- Research report on Cultural Symbols, Ministry for Intelligence Services, Pretoria, South Africa
- Research report on the location of the remains of kings Mampuru I and Nyabela, National Department of Arts and Culture, Pretoria, South Africa
- Review of Archaeological Assessment: Resources Generation, Coal Mine Project in the Waterberg area, Limpopo Province
- Review of CRM study and compilation of Impact Assessment report, Zod Gold Mine, Armenia

ACADEMIC FIELDWORK

Five seasons hosted: survey, mapping and excavation historic / Late Farmer Community sites on farms Bivack 14 MR and Eerstekrans 16 MR for personal MA research, Department of Anthropology and Archaeology, UP.

Ten projects / seasons attended as Teaching Assistant / Member of Staff

Eight projects / field seasons attended on invitation as undergraduate and graduate student

4 PROFESSIONAL AFFILIATIONS

- Association of Southern African Professional Archaeologists (ASAPA): Professional Member
- ASAPA Cultural Resources Management (CRM) section: Accredited member
- International Association of Impact Assessors (South Africa)
- Society for Africanist Archaeologists (SAFA)

5 PUBLICATIONS

Nel, J & Tiley, S. 2004. The Archaeology of Mapungubwe: a World Heritage Site in the Central Limpopo Valley, Republic of South Africa. *Archaeology World Report*, (1) United Kingdom p.14-22.

Nel, J. 2001. 2001. Cycles of Initiation in Traditional South African Cultures. *South African Encyclopaedia (MWEB)*.

Nel, J. 2001. Social Consultation: Networking Human Remains and a Social Consultation Case Study. Research poster presentations at the Bi-annual Conference (SA3) Association of Southern African Professional Archaeologists: National Museum, Cape Town.

Nel, J. 2002. Collections policy for the WG de Haas Anatomy museum and associated Collections. Unpublished. Department of Anatomy, School of Medicine: University of Pretoria.

Nel, J. 2004. Research and design of exhibition for Eloff Belting and Equipment CC for the Institute of Quarrying 35th Conference and Exhibition on 24 – 27 March 2004.

Nel, J. 2004. Ritual and Symbolism in Archaeology, Does it exist? Research paper presented at the Bi-annual Conference (SA3) Association of Southern African Professional Archaeologists: Kimberley

Nel, J. 2007. The Railway Code: Gautrain, NZASM and Heritage. Public lecture for the South African Archaeological Society, Transvaal Branch: Roedean School, Parktown.

Nel, J. 2009. Un-archaeologically speaking: the use, abuse and misuse of archaeology in popular culture. *The Digging Stick*. April 2009. 26(1): 11-13: Johannesburg: The South African Archaeological Society.

Nel, J. 2011. 'Gods, Graves and Scholars' returning Mapungubwe human remains to their resting place.' In: *Mapungubwe Remembered*. University of Pretoria commemorative publication: Johannesburg: Chris van Rensburg Publishers.



DIGBY WELLS
ENVIRONMENTAL

JUSTIN DU PIESANIE

Mr Justin du Piesanie
Archaeology Consultant
Social Sciences Department
Digby Wells Environmental

1 EDUCATION

University of the Witwatersrand

- BA Degree (2004)
- BA Honours Degree (2005) - Archaeology
 - Title of Dissertation - Seal Skeletal Distribution of Herder and Forager Sites at Kasteelberg, Western Cape Province of South Africa.
- Master of Science (MSc) Degree (2008) – Archaeology
 - Title of Dissertation – Understanding the Socio-Political Complexity of Leokwe Society during the Middle Iron Age in the Shashe-Limpopo Basin through a Landscape Approach

2 COURSES

- Introduction into ArcGIS. GIMS Ltd, Midrand. Received Certificate (2006)
- French Institute of South Africa (IFAS) GIS Workshop, University of the Witwatersrand. Received Certificate (2010)

3 CONFERENCES

- ASAPA, University of Botswana, Gabarone, Botswana (2005).
- Mupungubwe Symposium, University of Pretoria, Pretoria, South Africa (2006) - Presented paper titled, “Social Complexity in the Shashe Limpopo Basin: The Case of K2 and Leokwe”
- ASAPA, University of Cape Town, Cape Town, South Africa (2008).
- SAfA, University of Frankfurt, Frankfurt, Germany (2008) - Presented paper titled, “Social Complexity in the Shashe Limpopo Basin: Conclusions”

4 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

5 EMPLOYMENT

Present:	Archaeology Consultant at Digby Wells Environmental
2009 to 2011:	Archaeology Collections Manager at the University of the Witwatersrand.
2009 to 2011:	Freelance Archaeologist for Archaeology Resource Management (ARM), Matakoma Heritage Consultants, Wits Heritage Contracts Unit & Umlando Heritage Consultants.
2006 to 2007:	Tour Guide at Sterkfontein Caves World Heritage Site.

6 PROJECT EXPERIENCE

- 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

Cultural Resource Management (CRM) Work

- Phase 2 Mitigation at Meyersdal, Klipriviersberg Johannesburg (ARM)
- Phase 1 Mitigation – Mapping of Late Iron Age Site in Pilansberg, Sun City (ARM)
- Phase 1 Mitigation – Survey of Witbank dam development (ARM)
- Phase 1 Mitigation – Survey of Glen Austin AH, Johannesburg (Matakoma)



- Phase 1 Mitigation – Survey of Modderfontein AH Holding 34, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Modderfontein AH Holding 38, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Modderfontein AH Holding 44, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Modderfontein AH Holding 46, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Modderfontein AH Holding 47, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Modderfontein AH Holding 48, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Modderfontein AH Holding 49, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Modderfontein AH Holding 50, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Modderfontein AH Holding 61, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Modderfontein AH Holding 62, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Modderfontein AH Holding 71, Johannesburg (Matakoma).
- Phase 1 Mitigation – Survey of Modderfontein AH Holding 72, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Modderfontein 35IR Portion 40, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Rhino Mines, Thabazimbi Limpopo Province (ARM)
- Phase 1 Mitigation – Survey of Moddergat 389KQ, Schilpadnest 385KQ, Swartkop 369KQ, Cronimet Project, Thabazimbi Limpopo Province (Matakoma)
- Desktop Study – Desktop study for the Eskom Thohoyandou SEA Project, Limpopo Province (Matakoma)
- Phase 2 Mitigation – Excavation of Iron Age site on Wenzelrust, Shoshanguve Gauteng (Heritage Contracts Unit)
- Phase 1 Mitigation – Mapping of Late Stone Age shelter, Parys, Free State
- Phase 1 Mitigation – Survey of Vaalkrans Battlefield for the Transnet NMPP Line (Umlando)
- Phase 1 Mitigation – Survey of Portion 222 of Mindale Ext 7 Witpoortjie 254 IQ & Portion 14 of Nooitgedacht 534 IQ, Johannesburg (ARM)
- Phase 2 Mitigation – Excavation of Site 19 for the Anglo Platinum Mines Der Brochen & Booyensdal, Steelpoort, Mpumalanga (Heritage Contracts Unit)
- Phase 1 Mitigation – Mapping of sites 23, 26, 27, 28a & b for the Anglo Platinum Mines Der Brochen & Booyensdal, Steelpoort, Mpumalanga (Heritage Contracts Unit)
- Desktop Study - Desktop study for the inclusion into the Thohoyandou Electricity Master Network for Eskom, Limpopo Province (Strategic Environmental Focus)
- Phase 1 Mitigation – Mapping of historical sites as part of the mitigation for the expansion of the Bathlako Mine's impact area (Heritage Contracts Unit).
- Phase 2 Mitigation – Grave Relocation Project (GRP) for the Kibali Gold Project, Democratic Republic of Congo (Digby Wells)
- Phase 1 Mitigation – Heritage Assessment and Survey for the proposed Kibali Hydro Power Stations, Democratic Republic of Congo (Digby Wells)



- Phase 1 Mitigation – Survey of the farm Vygenhoek for Sylvania Resources Everest North Mining Project, Steelpoort, Mpumalanga (Digby Wells)
- Phase 1 Mitigation – Heritage Impact Assessment for the Gold One International Ltd Proposed Geluksdal Tailings Storage Facility and Pipeline Infrastructure, Johannesburg, Gauteng Province (Digby Wells)
- Phase 1 Mitigation – Burial Grounds and Graves Survey (BGGS) for Platreef Resources, Mokopane, Limpopo Province (Digby Wells)
- Phase 2 Mitigation – Archaeological Impact Assessment of sites for Resource Generation Boikarabelo Mine, Steenbokpan, Limpopo Province (Digby Wells)
- Phase 1 Mitigation – Watching Brief for Bokoni Platinum Mines (Pty) Ltd, Burgersfort, Limpopo Province (Digby Wells)

7 PROFESSIONAL AFFILIATIONS

Association of Southern African Professional Archaeologists (ASAPA): Professional & CRM Member

Society for Africanist Archaeologists (SAfA) Member



Appendix B: Permits



SOUTH AFRICAN HERITAGE RESOURCES AGENCY

111 HARRINGTON STREET, CAPE TOWN, 8001
PO BOX 4637, CAPE TOWN, 8000
TEL: (021) 462 4502 FAX: (021) 462 4509

9/2/253/0003

PERMIT

No. 80/11/07/015/51

Issued under Section 35(4) of the National Heritage Resources Act, Act No. 25 of 1999. Permission is hereby given:

to: Mr J Nel in association with Dr M van der Ryst (Principal Investigator, Iron Age),
of: Digby Wells Environmental, Private Bag X10046, Randburg, 2125 and UNISA,
for: Phase 2 mitigation which will include the following: **shovel test pits** for sites 002, 003, 006, 011, 017, 018, 019, 020, 021, 022, 026 and 027; **mapping and test excavations** for sites 009, 010, 012 and **monitoring** for sites 001,013 (should be mapped with 012), 015 and 016,
at: Boikarabelo Coal Mine,
on: the farms Zeekoevley 421 LQ and Witkopje 238 LQ, near Lephalale,
in: the Waterberg District, Limpopo Province.

The following conditions apply:

1. If the permit holder is not to be present on the site at all times then SAHRA must be provided with the names and qualifications of the authorised representatives.
2. Adequate recording methods as specified in the Regulations and Guidelines pertaining to the National Heritage Resources Act must be used. Note that the position of all excavations must be marked on a plan of each site.
3. All sites affected in this phase 2 exercise must be mapped, including sites for which only monitoring was done, and this must be marked differently e.g. sites shovel tested, test excavated etc.
4. Where shovel tests and test excavations yield significant information SAHRA and the developer must be notified to establish a way forward.
5. A standard site record form must be lodged with the Polokwane Museum.
6. All material collected and excavated, as well as field notes and records, will be curated by the UNISA.
7. Where shovel tests and test excavations yield less significant results, such sites must not be destroyed without a permit from SAHRA, and application for destruction may only be applied for once a phase 2 report has been received and reviewed by SAHRA, and counsel on way forward given.
8. SAHRA must be updated where the archaeologists encounter challenges in implementation of the phase 2 program as currently anticipated.
9. Human remains are ethically sensitive, where these are accidentally discovered during this phase 2 exercise, all the necessary consultations, as may be required by NHRA, must be done.
10. This permit does not apply to any associated development activities to the mine which were not assessed as part of the phase 1 HIA of this project.
11. A report must be submitted to SAHRA on or before 01 October 2012. SAHRA reserves the right to withhold further permits if progress is not deemed satisfactory.
12. Reprints of all published papers, or copies of theses or reports resulting from this work must be lodged with SAHRA.

13. If a published report has not appeared within three years of the lapsing of this permit, the report required in terms of the permit will be made available to researchers on request.
14. It is the responsibility of the permit holder to obtain permission from the landowner for each visit, and conditions of access imposed by the landowner must be observed.
15. It is the responsibility of the permit holder to fill in excavations and protect sites during and after excavation to the satisfaction of SAHRA and the landowner.
16. SAHRA shall not be liable for any losses, damages or injuries to persons or properties as a result of any activities in connection with this permit.
17. SAHRA reserves the right to cancel this permit by notice to the permit holder.

This permit is valid until 01 October 2012.
for CHIEF EXECUTIVE OFFICER
Date: 13 September 2011



Place: Cape Town



Enquiries: Mariagrazia Galimberti
Tel: 021 462 4502
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CaseID: 177

Date: Tuesday July 24, 2012
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PermitID: 84

PERMIT: Destruction

In terms of section 35(4) of the National Heritage Resources Act (Act 25 of 1999)

Permit Holder:

Johan Nel
Digby Wells Environmental
Private Bag X10046
Randburg
2125

Site: Site 009/010 Boikarabelo (Site 009 Boikarabelo, Site 011 Boikarabelo, Site 021 Boikarabelo, Site 013 Boikarabelo, Site 018 Boikarabelo, Site 015 Boikarabelo) approximately at 23° 37' 54.084" S, 27° 7' 57.324" E

For: Destruction of archaeological sites after mitigation.

Conditions:

1. The permit is issued to Mr Nel as representative of Mr van den Aardweg, for Resgen South Africa.
2. If the permit holder cannot be present on site at all times, then the heritage authority must be provided with the names and qualifications of the authorised representative.
3. A progress report on the results of the destruction must be submitted to the heritage authority issuing this permit on or before the 1st of August 2013.
4. Reprints of all published papers or copies of theses and/or reports resulting from this work must be lodged with the heritage authority.
5. If a published report has not appeared within three years of the lapsing of this permit, the report required in terms of the permit will be made available to researchers on request.
6. It is the responsibility of the permit holder to obtain permission from the landowner for each visit, and conditions of access imposed by the landowner must be observed.
7. The heritage authority shall not be liable for any losses, damages or injuries to persons or properties as a result of any activities in connection with this permit.
8. The heritage authority reserves the right to cancel this permit by notice to the permit holder.
9. This permit is subject to a general appeal and may be suspended should an appeal against the decisions be received by SAHRA within 14 days from the date of the permit. SAHRA may not be held responsible for any costs or losses incurred in the event of the suspension or retraction of this permit.

This permit is valid from **20/07/2012 to 01/08/2013**.



The South African Heritage Resources Agency

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Boikarabelo
Our Ref: 9/2/281/0007



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Mariagrazia Galimberti
Heritage Officer: Archaeology
South African Heritage Resources Agency



Colette Scheermeyer
SAHRA Head Archaeologist
South African Heritage Resources Agency



The South African Heritage Resources Agency

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Appendix C: Chance Find Procedures

CHANCE FIND PROCEDURES FOR HERITAGE RESOURCES

The following procedures must be considered in the event that previously unknown heritage resources, including burial grounds or graves, are exposed or found during the life of the project (extracted and adapted from the National Heritage Resources Act, 1999 Regulations Reg No. 6820, GN: 548).

List of Acronyms

CRM	Cultural Resources Management
HIA	Heritage Impact Assessment
NHRA	National Heritage Resources Act
PHRA	Provincial Heritage Resources Authority
SAHRA	South African Heritage Resources Authority
SAPS	South African Police Service

For simplicity, the term 'heritage resource' includes burial grounds and graves, unless these are specifically addressed.

Heritage Resources: structures, archaeology, palaeontology, meteors, public monuments

1. The heritage resource must be avoided and all activities in the immediate vicinity temporarily ceased;
2. The Digby Wells project manager and/or CRM unit must be notified of the discovery;
3. Digby Wells will deploy a qualified specialist to consider the heritage resource, either via communicating with the Environmental Officer via telephone or email, or based on a site visit;
4. Appropriate measures will then be presented to Boikarabelo Coal Mine;
5. Should the specialist conclude that the find is a heritage resource protected in terms of the NRHA (Sections 34, 36, 37) and NHRA Regulations (Regulation 38, 39, 40), Digby Wells will notify SAHRA and/or PHRA on behalf of Boikarabelo Coal Mine;
6. SAHRA/PHRA may require that a HIA in terms of NHRA Section 38 must take place that may include rescue excavations, for which Digby Wells will submit costs and proposal as relevant;

Burial grounds and graves

1. In the event that human remains were accidentally exposed, the Digby Wells project manager and/or Cultural Resources Management (CRM) unit must immediately be notified of the discovery in order to take the required further steps:
 - a. The local SAPS will be notified on behalf of Boikarabelo Coal Mine;
 - b. Digby Wells will deploy a suitably qualified specialist to inspect the exposed burial and determine in consultation with the SAPS whether:
 - i. The temporal context of the remains, i.e.:
 - forensic,
 - authentic burial grave (informal or older than 60 years, NHRA Section 36); or
 - archaeological (older than 100 years, NHRA Section 38).
 - ii. Any additional graves may exist in the vicinity.
2. Should the specialist conclude that the find is a heritage resource protected in terms of the NRHA (Section 35) and NHRA Regulations (Regulation 38, 39, 40), Digby Wells will notify SAHRA and/or PHRA on behalf of Boikarabelo Coal Mine;
3. SAHRA/PHRA may require that an identification of interested parties, consultation and /or grave relocation take place;
4. Consultation must take place in terms of NHRA Regulations 39, 40, 42;
5. Grave relocation must take place in terms of NHRA Regulations 34

Digby Wells can facilitate and assist with all chance find procedures outlined above.

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