DUPLICATION OF THE VLAKFONTEIN (BENONI) – MAMELODI WATER SUPPLY PIPELINE WITHIN THE EXISTING SERVITUDE: R5 PHASE 2: FROM THE SOUTHERN BOUNDARY OF THE RIETVLEI NATURE RESERVE TO MAMELODI

ARCHAEOLOGICAL MITIGATION REPORT IN TERMS OF EIGHT LATE IRON AGE SITES

Version 2.0

14 March 2014

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EXECUTIVE SUMMARY

1 Introduction

PGS Heritage was appointed by Aurecon to undertake mitigation measures on the archaeological sites identified during the heritage impact assessment for the proposed duplication of the Vlakfontein (Benoni) – Mamelodi Water supply pipeline within the existing servitude: R5 Phase 2: from the southern boundary off the Rietvlei Nature Reserve to Mamelodi that was undertaken by the author of this report under the company Archaeology Africa during 2008. The mitigation outlined in this report deals with the archaeological sites identified between the Bronberg Mountains and Mamelodi and in particular the Late Iron Age sites identified there. A total of seven Late Iron Age sites were identified during the heritage impact assessment in this section of the proposed pipeline. These are P3-1, P3-2, P3-3, P3-4, P3-5, P3-8 and P3-9. Furthermore, during the fieldwork undertaken for the current archaeological mitigation an additional Late Iron Age site was identified and numbered P3-10. The basic mitigation measures undertaken for the other sites were undertaken for this site as well.

The mitigation measures undertaken on the nine Late Iron Age sites comprised the recording of detailed site layout plans as well as a basic description of each site. The layout plans were recorded using standard survey equipment including a total station and dumpy level.

2 Original Mitigation Measures and Recommended Changes to those Mitigation Measures

During the fieldwork for the 2008 heritage impact assessment the proposed pipeline routes were provided in the form of aerial photographs as well as the pipeline markers which existed at the time. To allow for discrepancies a 40m wide corridor was assessed during the fieldwork. At the beginning of this mitigation project the detailed position and layout relating to the proposed R5 Pipeline as well as the Rand Water servitude was requested and included on the recorded site layout plans where applicable. As a result it was now possible to accurately state which of the sites will be destroyed, disturbed or not impacted at all. As a result of this assessment some changes to the original recommended mitigation measures are made in this report.

Out of the total eight sites (including the newly identified site P3-10) only three are expected to be disturbed during the construction of the proposed pipeline. These include sites P3-1, P3-2 and P3-10. The remainder of the sites are not expected to be impacted upon by the proposed development of the pipeline. In the original heritage impact assessment the following mitigation measures were required for P3-1:

- *Although the proposed pipeline is a linear development that will only impact upon a section of the site, it is recommended that the entire site layout be documented by surveying and drawing a detailed Site Layout Plan.*
- *This will be followed by limited test excavations in a corridor of approximately 30 meters on each side of the pipeline route. These activities are aimed at documenting, recovering and recording enough data for future research from the component of the site being impacted upon.*
- *Compilation of a report containing all the research and findings of the study indicated above.*
- *Submission of this report with the archaeological permit application that will allow the pipeline to be constructed through the site.*

As a result of the recording of the site layout plan for site P3-1 it was found that the proposed pipeline will be established in an area which can already be considered disturbed with only little impact on the undisturbed sections of the site. As a result the archaeological excavations can be considered unnecessary. The following mitigation measures are recommended:

- It is recommended that the entire site layout be documented by surveying and drawing a detailed Site Layout Plan.
- Submission of a permit application to SAHRA to allow for disturbance (not destruction) of the site.
- Archaeological monitoring during construction activities.

In the original heritage impact assessment the following mitigation measures were required for P3-2:

- *The site layout must be documented by the surveying and drawing of a detailed Site Layout Plan. This can be undertaken as part of the mitigation of Site P3-1.*
- *Submission of this layout plan with the archaeological permit application that will allow the pipeline to be constructed through the site.*

After the site layout plan for P3-2 was recorded and the proposed pipeline and servitude indicated on it, it was found that for the most part the site will be located outside of the Rand Water servitude and away from the proposed pipeline route. The only component of the site located within the servitude is a cluster of three stone heaps located at its closest point roughly 4m from the proposed pipeline. In view of the information that is currently available with regard to the position of the proposed pipeline and the limited disturbance expected on the site, it is recommended that the abovementioned mitigation measures remain with the following addition:

- Archaeological monitoring during construction activities.

Site P3-10 is a newly identified site and was not included in the original heritage impact assessment. As indicated in this report, this omission may have been as a result of the low height of the of stone walls and heaps at this site as well as the possible presence of vegetation cover at the time of the 2008 fieldwork.

The same basic mitigation measure comprising the recording of a site layout plan as undertaken for the remainder of the sites was undertaken at P3-10 as well. When the servitude and proposed pipeline were plotted on the site layout plan it was found that roughly a third of the site comprising a section of stone walling, two stone heaps and two small oval stone enclosures appear to be located within the Rand Water servitude. Apart from the stone wall, the remainder of the features are more than 3.5m from the proposed pipeline. However, these features including a section of the stone wall will in all likelihood be impacted upon by the proposed pipeline. The following mitigation measures are required for P3-10:

- It is recommended that the entire site layout be documented by surveying and drawing a detailed Site Layout Plan.
- Submission of a permit application to SAHRA to allow for disturbance (not destruction) of the site.
- Archaeological monitoring during construction activities.

3 Completed Mitigation Measures

Detailed site layout plans were recorded for P3-1, P3-2, P3-3, P3-4, P3-5, P3-8, P3-9 and P3-10 and are included in this report. A description of each site accompanies the detailed site layout plans. An ethnographic and archaeological background to the Late Iron Age sites from this area and surrounding landscape is also provided in this mitigation report.

4 Required Mitigation Measures

4.1 Archaeological Sites not directly impacted upon by the Proposed Pipeline Development

The sites forming part of this category comprise P3-3, P3-4, P3-5, P3-8 and P3-9. No further mitigation measures would be required for these five sites. However, the following general recommendation is made and must be adhered to:

- All five these sites must be clearly marked in the field with danger tape by the heritage specialist before construction commences on the Phase 2 component of the proposed project to ensure that these sites are not impacted upon during these activities.

4.2 Archaeological Sites impacted upon by the Proposed Pipeline Development

The sites forming part of this category comprise P3-1, P3-2 and P3-10. With the recording of the layout plans completed for these sites, it is recommended that the following mitigation measures still be undertaken:

- Permit application to SAHRA to allow for the disturbance of the proposed pipeline development to these sites. In all instances only a disturbance permit will be required and not a destruction permit.
- Archaeological monitoring during construction activities at each of these sites. Should any subterranean archaeological material be uncovered during construction activities such work may have to be halted until such time that the archaeologist has assessed the significance of the exposed material and undertaken the necessary mitigation work should this be required.

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1. INTRODUCTION

PGS Heritage was appointed by Aurecon to undertake mitigation measures on the archaeological sites identified during the heritage impact assessment for the proposed R5 Pipeline of Rand Water undertaken by the author of this report under the company Archaeology Africa during 2008. The mitigation outlined in this report deals with the archaeological sites identified between the Bronberg Mountains and Mamelodi and in particular the Late Iron Age sites identified there. A total of seven Late Iron Age sites were identified during the heritage impact assessment in this section of the proposed pipeline. These are P3-1, P3-2, P3-3, P3-4, P3-5, P3-8 and P3-9. Furthermore, during the fieldwork undertaken for the current archaeological mitigation an additional Late Iron Age site was identified and numbered P3-10. The basic mitigation measures undertaken for the other sites were undertaken for this site as well.

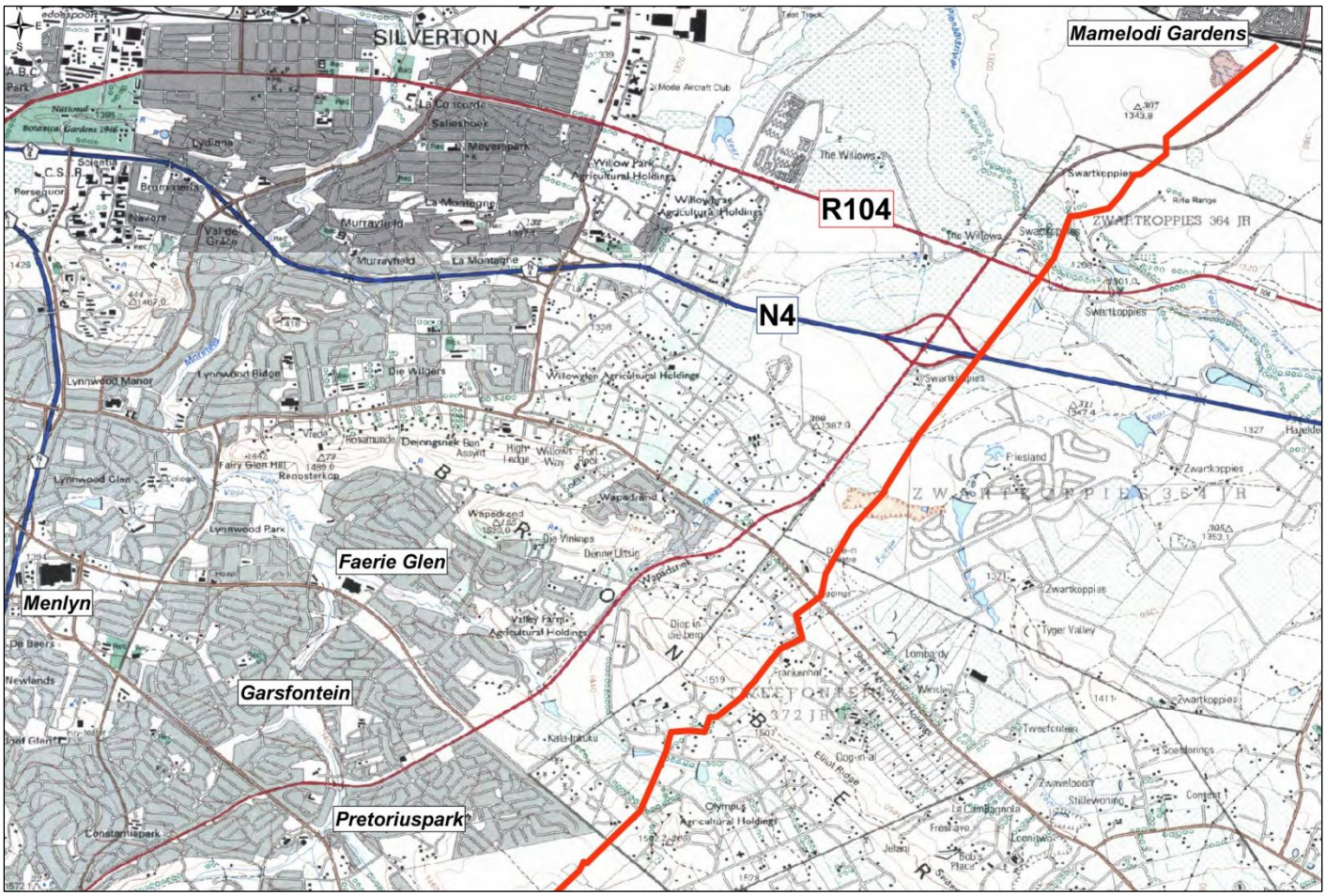

Figure 1 *Modified version of map that was supplied by the client and which depicts the northern sections of the proposed pipeline within its regional context.*

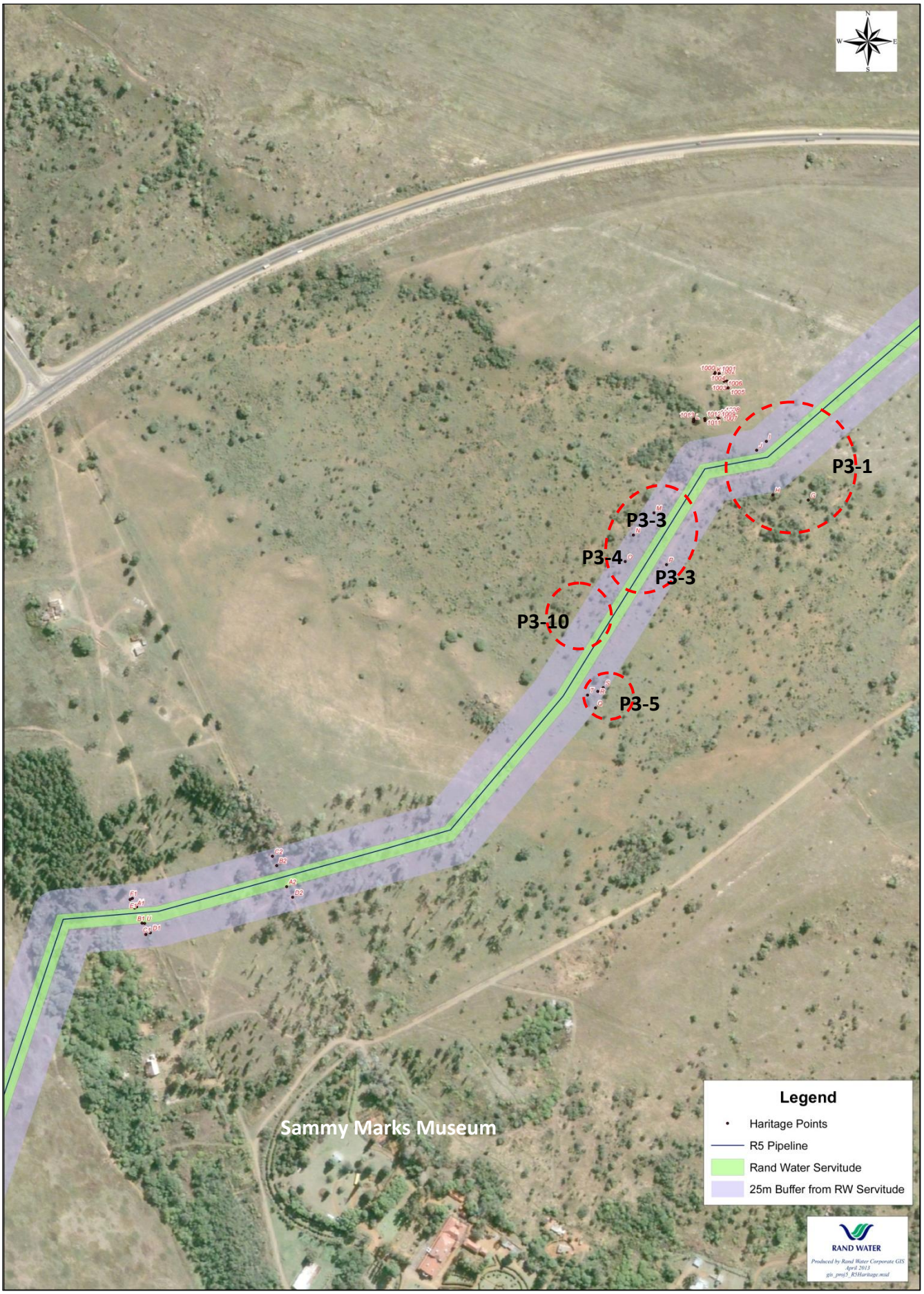

Figure 2 Site distribution map for the northern section of the proposed R5 Pipeline where sites were identified.

Figure 3 Site distribution map for the southern section of the proposed R5 Pipeline where sites were identified.

2. AIMS OF THE STUDY

The aims of this study are to undertake the necessary mitigation measures to allow for the construction of the R5 Pipeline.

3. METHODOLOGY

The study comprised the detailed recording of site layout plans for eight individual Late Iron Age sites. The steps undertaken at each of these sites to achieve this task are as follows:

- Vegetation Clearing

  At the start of the project a number of the sites were found to be densely overgrown with acacia trees and other vegetation. Furthermore, dense grass also covered many of the sites. As a result the first component in the mitigation of each site was vegetation clearing by both hand and machine.

- Reconnaissance Walkthroughs

  Once the vegetation has been cleared from each site intensive walkthroughs were undertaken to identify all the features from each site as well as make an assessment of the presence and location of cultural material such as upper and lower grinders, ceramic fragments and if present middens as well.

- Drawing of a Sketch Plan

  A sketch plan of the site, its features and overall layout was compiled next. The idea behind the sketch plan was to ensure that all components are recorded on it and to provide a preliminary record of each site to facilitate the measures drawing of the sites.

- Recording of Site Layout

  The site layouts were recorded using survey equipment including a dumpy level as well as a total station.

- Compiling the Final Layout Plan

  The final component of the mitigation undertaken on the Late Iron Sites comprised the compilation of the final layout plans using drawing software such as Corel Draw and Adope Photoshop Elements.

4. BACKGROUND TO THE LATE IRON AGE OF THE STUDY AREA AND SURROUNDING LANDSCAPE

4.1 Introduction

While the Late Iron Age of the Pretoria area is associated with both Sotho-Tswana and Nguni groups, the study area and direct surroundings are associated with Ndebele settlements. These sites are found in the area between Wallmannsthal and Roodeplaat Dam, but also stretch over an area along the Pienaars River to the south of the N4 Highway where the Bronberg Mountain is located. From available ethnographic information it is known that the study area and surrounding landscape area is essentially associated with the Ndebele group known as the Southern Ndebele and more particularly with the Southern Ndebele group known as the Manala Ndebele.

4.2 Oral History of the Southern Ndebele

The oral history of the Southern Ndebele has been extensively recorded by C.J. van Vuuren for his doctoral thesis in Anthropology at the University of Pretoria (Van Vuuren, 1992). The discussion on the oral history of the Southern Ndebele which follows was entirely based on the abovementioned doctoral thesis.

4.2.1 The early history of the Southern Ndebele

The earliest known settlement of the Southern Ndebele was at a place known as Emhlangeni (the place of reeds) which was located in the vicinity of present-day Randfontein. The earliest known ruler here was Mafana who came to power in approximately 1558. He was succeeded by his son Mhlanga.

Under the leadership of Mhlanga the Southern Ndebele moved their settlement from the Randfontein area to KwaMnyamana (the place of black hills) near present-day Bon Accord. The Southern Ndebele used this settlement for at least 26 years between 1610 and 1636 (or possibly 1644) and the settlement here extended over a wide area which included the present-day farms De Onderstepoort 300-JR and Doornpoort 295-JR. It is worth noting here that the farm Doornpoort is at its closest point approximately 14.9km north-west of the nearest site discussed in this report, while Bon Accord is approximately 22.5km to the north-west.

Mhlanga was succeeded as ruler by his son Musi. He had a number of sons (including Manala and Ndzundza) of which Manala was believed to be the legal successor to the throne. However, when it was time for Musi to pass the royal regalia on to the heir to his throne, Ndzundza was the recipient and not Manala. Two versions in the recorded oral histories exist as to exactly how this happened but both versions end with Ndzundza became the ruler of KwaMnyamana.

4.2.2 The oral history of the Ndzundza Ndebele

The succession of Ndzundza instead of Manala led to the division of Musi's household with Manala and his supporters staying in one section and Ndzundza and his supporters in another. In the end it was Manala's son Ncagu who instructed his followers to kill Ndzundza. As a result of this threat on his life Ndzundza and his followers left KwaManyamana and fled eastward. Although some disparity exists as to the exact route followed, it seems that from KwaManyamana they moved eastward toward the present-day Cullinan area, then on toward Bronkhorstspruit, past present-day Balmoral, Witbank and Middelburg to eventually settle at KwaSimkhulu on the Steelpoort River.

It is indicated in the recorded oral histories that two skirmishes took place between Ndzundza and Manala on the former's move eastward. The first took place on the farm Brandbach (east of present-day Cullinan) and the second on the farm Renosterkop situated further to the north. Eventually the two brothers made peace at KoQoli just below present-day Loskop Dam, from where Ndzundza and his followers moved to KwaSimkhulu while Manala and his followers returned to KwaManyamana.

The Ndzundza Ndebele occupied KwaSimkhulu from 1636 to 1688. In 1688 they moved to KwaMaza in the Stoffberg area. The occupation of KwaMaza continued for some 134 years. During 1822 (or 1845 according to some recorded oral histories) the Ndzundza moved further north to settle at KoNomtjarhelo in the Roossenekal area.

During the mid 1840s the first white people started appearing in the general vicinity of KoNomtjarhelo. From the start the relationship between white and black in this area was strained. This came to a head during the rule of Nyabela Mahlangu, who in 1879 had become regent for the three year old heir to the Ndzundza Ndebele throne, Fene Mahlangu. In 1882 the so-called Mapoch war took place between the *Zuid-Afrikaancshe Republiek* and the Ndzundza Ndebele which resulted in the defeat of the latter. Nyabela was arrested and taken to Pretoria where he spent the next 15 or so years in jail. After their defeat the Ndzundza Ndebele were moved from their ancestral land and in some cases went to settle as farm workers on land owned by white farmers or alternatively to settle on farms owned by the Manala Ndebele. In 1897 the Ndzundza Ndebele was indicated to be living on 18 farms to the east, south-east and south of Pretoria, including Doornrandjes, Witkoppies, Rietfontein, Olifantsfontein, Nietgedacht, Tygerpoort, Boschkop and Olievenpoort.

In 1898 Nyabela was released from prison after which he went to stay at Fene Mahlangu's settlement known as KwaMkhina or Emlalaganye (place where one will sleep only once) on the farm Derdepoort 320-JR. Although the actual position of this settlement is not known, it is worth noting that at its closest point the Derdepoort farm is just over 1km from the study area. In 1902 Nyabela Mahlangu died at KwaMkhina and Fene Mahlangu became the new ruler of the Ndzundza Ndebele. In approximately 1904 he moved with his followers away from Derdepoort and settled on the farm Welgelegen 221-IR in the vicinity of Delmas (Van Vuuren, 1992).

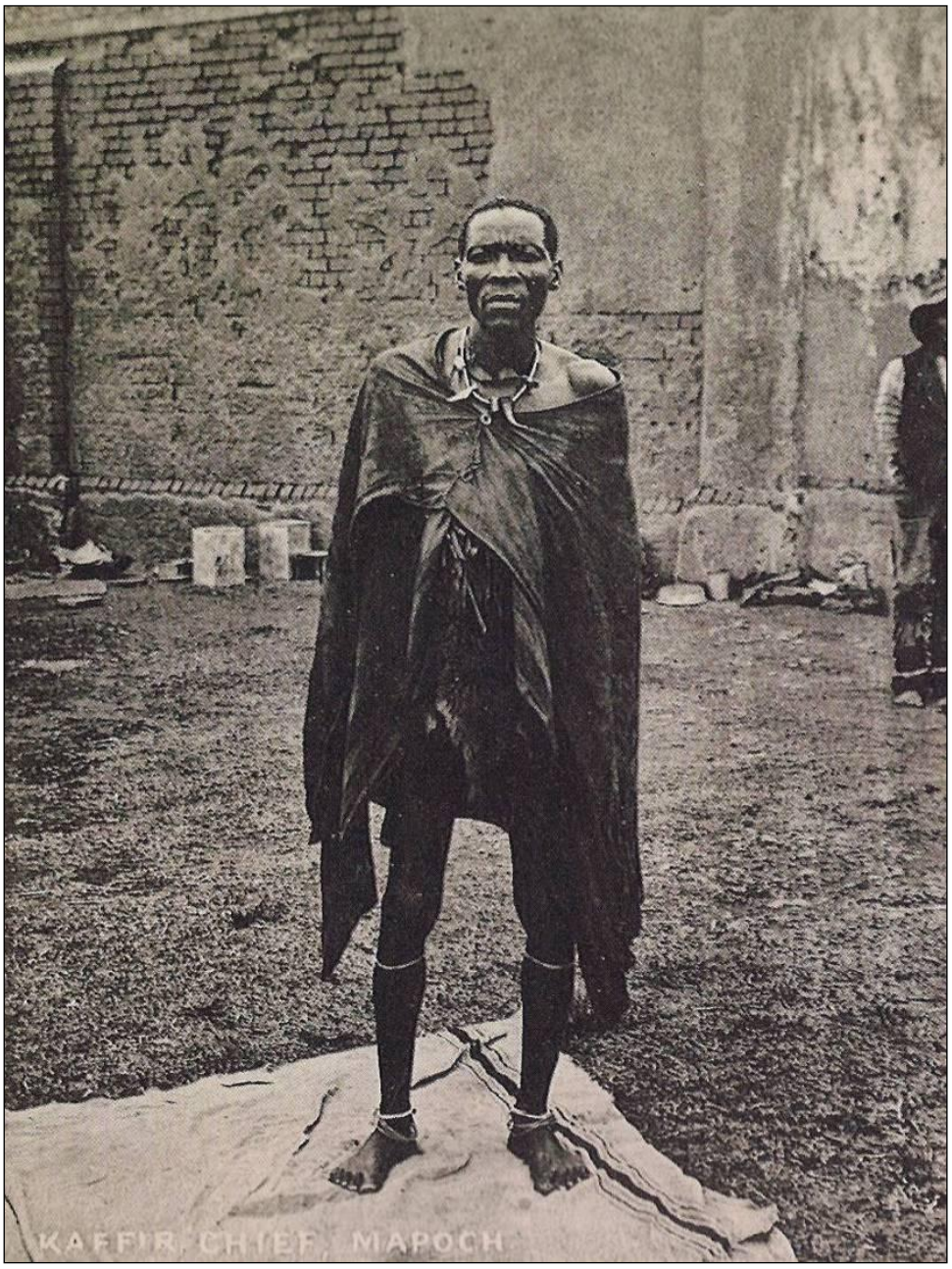

Figure 4 Historic photograph of Nyabela Mahlangu during his imprisonment (Delius, 2007:194)

4.2.3 The oral history of the Manala Ndebele

After making peace at KoQoli, Manala (or his son Ngacu) with his followers returned to the Pretoria area. While some versions of the recorded oral history indicate that they returned to their erstwhile settlement at KwaManyamana, others indicate that they established a new settlement called Ezotshaneni in the vicinity of present-day Donkerhoek.

The settlement of Ezothsaneni had the present-day farm Kleinsonderhout 519-JR as its core, and extended over numerous adjacent present-day farms such as Rhenosterfontein 7514-JR, Rietvlei 513-JR, Witfontein 521-JR, Puntlyf 520-JR, Boschkop 543-JR, Roodekoppies 546-JR, Kameel-zijn-kraal 547-JR, Onbekend 398-JR, Witpoort 551-JR, Knoppiesfontein 549-JR, Vlakfontein 548-JR and Boschkop 369-JR. The Ezotshaneni area lies east of Pretoria between the N14 highway and the Delmas road (R50) and is situated approximately 24km south-east of the present study area. The settlement was occupied over a period of 40 years from 1677 to 1717.

In 1717 the Manala Ndebele moved from Ezotshaneni to a place known as Embilaneni (place of dassies). The new settlement spread over the Bronberg mountains east of Pretoria and included an area that can be defined by a number of present-day farms including Rietfontein 395-JR, Tweedracht 516-JR, Tiegerpoort 371-JR, Kleinfontein 368-JR, Mooiplaats 367-JR, Donkerhoek 365-JR and Zwavelpoort 373-JR. It is apparent that the Embilaneni area extended further to the west than Ezotshaneni, the southern sections of the present study area located on the Bronbberge may very well have been located within the Manala area during the Embilaneni phase. The Embilaneni settlement was occupied over a period of 30 years between 1717 and 1747.

In approximately 1747 the Manala Ndebele moved from Embilaneni to KoNonduna (place of the king). It seems likely that while the areas defined during the previous two settlements were still occupied by the Manala Ndebele, their capital now moved to the present-day farm Klipkop 396-JR. Interestingly, a praise poem of Matshaba (one of the Manala Ndebele rulers from this period) refers to a place by the name of EmaKhopana (present-day Hatherley railway station) as a possible settlement area for him. The station is approximately 2km north-east of the northern components of the present study area.

During c.1825 the Manala Ndebele were attacked by the Khumalo Ndebele (or Matabele) of Mzilikazi and were almost annihilated. The small groups of Manala survivors established themselves in small clusters or settlements, and many of them were socio-economically forced to find work on the white farms established during the late 1830s and early 1840s. This means that it seems likely that KoNonduna was occupied by the Manala Ndebele for approximately 78 years from 1747 to c. 1825.

During this turbulent time the Manala Ndebele splintered into three main groups under the leadership of Mavula, Mgibe and Silamba. For the aims of the present report only the last two groups will be discussed further. The separation of the followers of Mgibe from the main Manala Ndebele group was caused by the fact that Mgibe acted as regent for Silamba, but when the latter was ready to take over Mgibe was not prepared to stand down as ruler. He left with his followers with the intention of meeting up with the Ndzundza Ndebele. The Manala Ndebele of Mgibe eventually settled at KoMrimitsha on the farm Aasvoelkrans 275-JS a short distance west of Middelburg.

While Mgibe and Mavula left the ancestral lands of the Manala Ndebele in the areas south-east of Pretoria, Silamba stayed behind. He was eventually forced to leave this area by the white farmers who came to settle her and were told to go to the missionaries who had just acquired land along the Pienaars River. In this way Silamba and his followers ended up with Reverend Knothe at Wallmannsthal. When they settled there on 1 September 1873 a group of Northern Ndebele under Jan Kekana was already there. The Manala Ndebele settlement at Wallmannstahl was known as KoMjekejeke, and their occupation of it lasted 53 years during which five of their rulers were buried. Although the Manala Ndebele moved away from KoMjekejeke between 1919 and 1926, it always held special significance for them. In 1986 the *Silamba Trust for the Manala* bought the land on which their old settlement and graves are located (Van Vuuren, 1992).

4.3 The Archaeology of the Southern Ndebele

4.3.1 Archaeology of the Ndzundza Ndebele

During the 1990s archaeological excavations were undertaken by M.H. Schoeman at the Ndzundza Ndebele settlement of KwaMaza (Schoeman, 1998). The research focussed on two stonewalled clusters approximately 80m apart named KwaMaza A and KwaMaza B.

4.3.1.1 KwaMaza A

The layout of KwaMaza A comprised three homesteads around a large central enclosure and also had two terraces associated with homesteads and middens. The cluster was located on the highest point of the site and this coupled with the exclusive use of walling was interpreted as an indication that the site was occupied by the ruling elite.

The central enclosure at KwaMaza A comprised both an upper and lower compartment and was interpreted as an assembly area for men as well as a court. Two circular stone enclosures located in the back wall of the enclosure were interpreted as homesteads for two indunas (headmen) while a larger circular enclosure on the right-hand side of the central enclosure's wall was interpreted as the paramount leader's homestead.

Each of the three homesteads surrounding the central enclosure from KwaMaza A comprised a central cattle kraal with associated domestic areas, middens and in some cases grain bin bases. Two house floors were located in one of the three homesteads.

Artefacts recovered from the excavations at KwaMaza A include 1,019 ceramic fragments (of which only 70 or 6.8% were decorated), a metal spear shaft, broken clay spoons, upper grinders, an ostrich eggshell fragment and glass beads.

4.3.1.2 KwaMaza B

The KwaMaza B cluster was located in a less conspicuous part of the site and is less well preserved. It comprised a large stone walled central enclosure and at least one smaller stone walled enclosure. A wall separated the central area from the area comprising the domestic zone, terracing and a number of the larger middens.

The large central enclosure at KwaMaza B also comprised two compartments though its preservation was poor. At least one homestead was observed outside this enclosure which comprised a small cattle enclosure with associated domestic areas and middens.

Artefacts recovered from the excavations at KwaMaza A include 239 ceramic fragments (of which only 22 or 9.2% were decorated), Middle Stone Age lithics, ostrich eggshell fragments and upper grinders (Schoeman, 1998).

4.3.1.3 Interpretation of KwaMaza

The difference in preservation of the stone walling from KwaMaza A and KwaMaza B was seen as evidence for the fact that KwaMaza B was older and that stone from its walls were 'robbed' to construct KwaMaza A.

Due to a lack of preservation the exact shape of the house structures were difficult to ascertain. The absence of mud plaster (known as dhaka) suggested that the houses were built of grass over a pole frame which correlate strongly with the typical Nguni house structure known as the beehive dwelling.

The archaeological evidence also supported the argument that Ndzundza Ndebele settlements were divided in a right hand side (*ubene*) which is the male and more senior side and a left hand side (*ikohlo*) which is the female and lower status side. The house is furthermore also divided into a front and back area, with the front the public space and the back more used for storing important items such as beer and ritual items such as the ancestral spear. In general the back is more associated with the ancestors (*umbundu*).

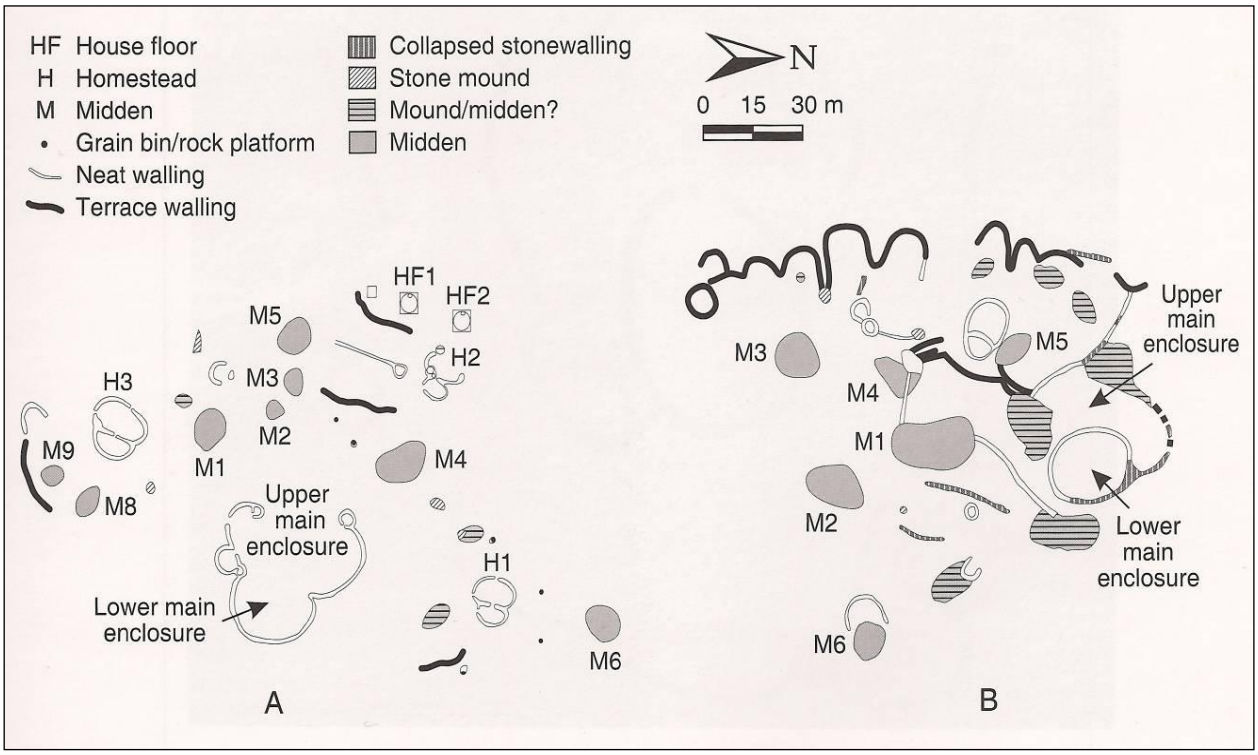

Figure 5 Site layout plan of KwaMaza A and KwaMaza B (Huffman, 2007:35)

4.3.2 Archaeology of the Manala Ndebele

4.3.2.1 Archaeological Excavations undertaken in 1996

During 1996 archaeological excavations and recording took place on three Late Iron Age sites affected by the proposed development of a rubbish dump. These three sites were located on the farm Hatherley 331-JR.

The archaeological research on Hatherley has revealed a three-tiered classification of settlements. The first of these were the homesteads of headmen (*induna* or *ikosana*), followed by multi-component sites that were occupied at various times by single family units. The third settlement type can be associated with agricultural activities.

The features documented on the first two settlement types include central circular cattle enclosures with clusters of homesteads or living units (*izindlu*) spaced around it. As hut structures of the Ndebele at the time were of the grass beehive type, the only evidence for homesteads which remained preserved were the small (4m x 2m) circular structures which had been built as perimeter walls (*isirhodlo*) around each homestead. Court areas where visitors were received and men gathered were also identified. The agricultural activity sites comprise large concentrations of stone heaps associated with small insignificant sections of stonewalling. The stone heaps are seen as the result of clearing of fields for cultivation. It is worth noting that stone heaps found on non-agricultural sites may be interpreted as collapsed medicine huts and granary platforms on which grain baskets (*isilulu*) were erected.

Very little cultural material was recovered during the excavation. These include ceramic fragments (of which a small number contained decorative patterning associated with Moloko ware), several fragments of animal bone, a number of upper and lower grinders as well as charcoal fragments. The lack of cultural remains on these sites may indicate that they were not occupied for long periods (Van Schalkwyk et al, 1996).

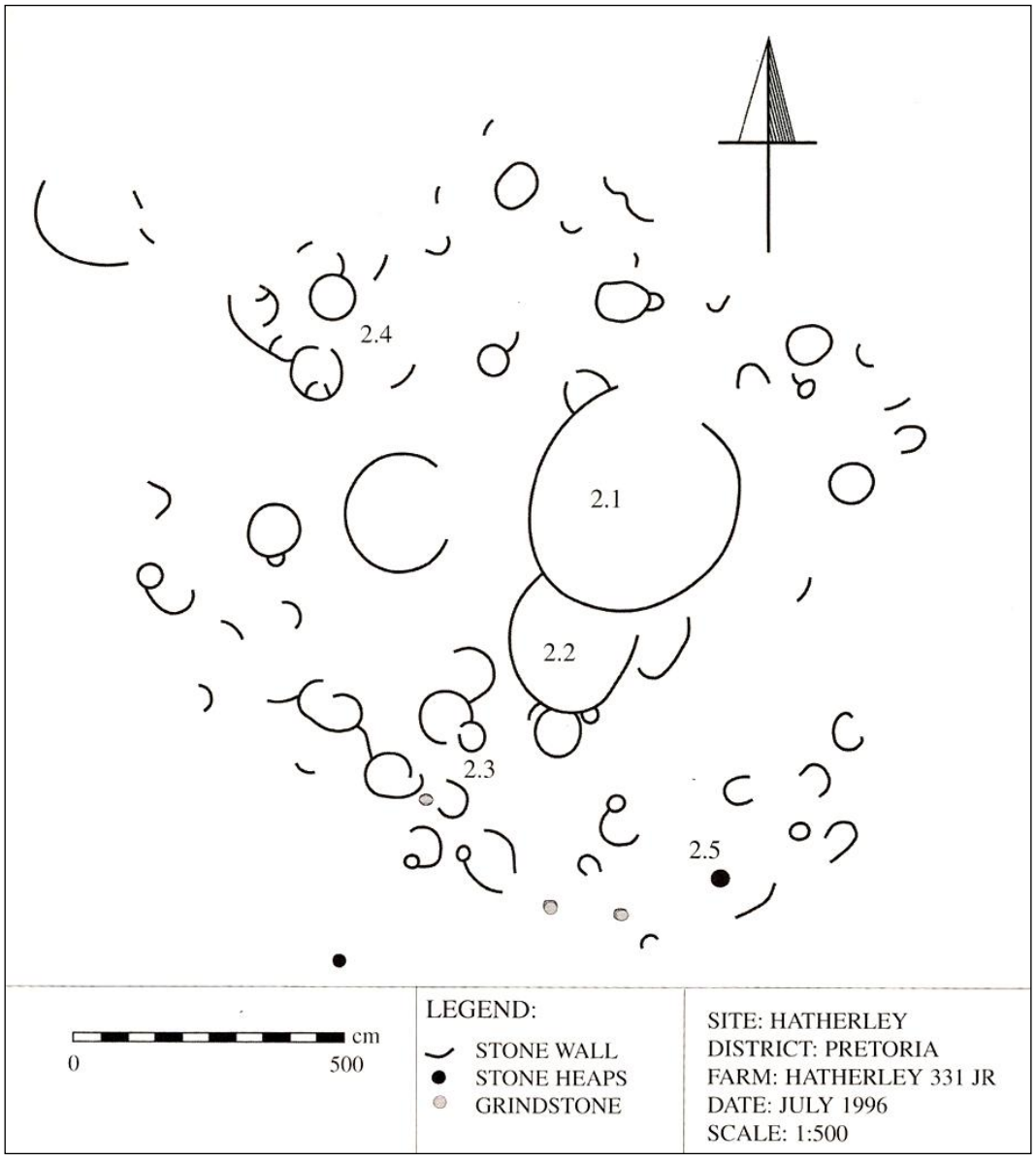

Figure 6 Site layout plan of one of the Manala Ndebele settlements on the farm Hatherley 331 JR (Van Schalkwyk et. al., 1996). The site depicted here is the homestead of a headman.

4.3.2.2 Archaeological Excavations undertaken in 2009

Archaeological excavations were undertaken on three Late Iron Age stonewalled sites during 2009 (Pelser and Van Vollenhoven, 2009). These archaeological excavations were undertaken on three sites (numbered from Site 1 to Site 3) located roughly 1.1km north-east of site P3-1. Site 1 comprised at least two (and possibly three) settlement units or homesteads each of which comprised domestic space surrounding a central livestock area. Site 2 in turn

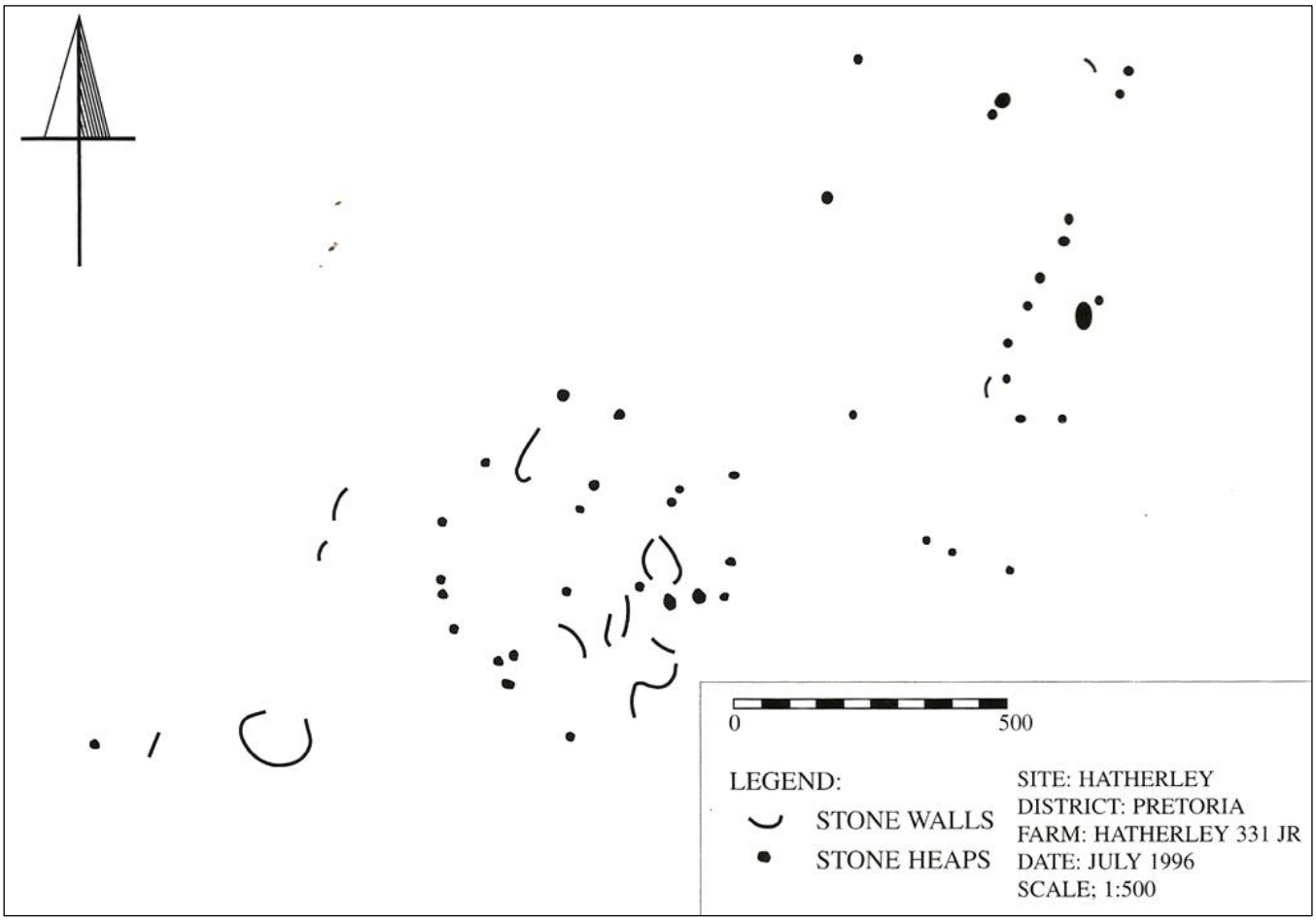

Figure 7 Site layout plan of one of the Manala Ndebele settlements on the farm Hatherley 331 JR (Van Schalkwyk et. al., 1996). The site depicted here is the agricultural site.

comprised a single homestead with an enclosing perimeter wall containing a central livestock enclosure surrounded by five possible huts. Site 3 consisted of a number of small sections of walling, an open area with surrounding wall containing large granary stands and a number of upper and lower grinders. This latter site was suggested to have been used for the storing of cereals such as maize and sorghum (Pelser & Van Vollenhoven, 2009).

A total of four excavations were undertaken comprising two excavations at Site 1 and two at Site 3. The first excavation at Site 1 was placed in a scallop where one of the huts of the site was believed to be located. A total of 71 undecorated and 20 decorated ceramic fragments were recovered from the first excavation at Site 1, with no faunal remains or other cultural material identified. Some of the decorated fragments were potentially identified as belonging to the Olifantspoort facies. Apart from two thin layers of reddish soil no indication of a hut could be found. The second excavation at Site 1 was placed within the livestock enclosure near it entrance. This excavation resulted in the recovery of two undecorated ceramic fragments as well as a possible hammer stone. The first excavation at Site 3 was conducted on one of the stone heaps which resulted in the identification of a circular feature of upright stones believed to be a granary stand. Three undecorated potsherds were recovered from this excavation. The second excavation at Site 3 was undertaken at one of the small stonewall sections. No cultural material apart from a small sample of charcoal was recovered. No evidence for a hut was found (Pelser & Van Vollenhoven, 2009).

5. DISCUSSION ON INDIVIDUAL SITES AND THE MITIGATION UNDERTAKEN AT EACH

5.1. Introduction

During the heritage survey undertaken in 2008 for the proposed R5 Pipeline of Rand Water between Mamelodi and Vlakfontein, a total nine archaeological sites were identified in proximity to the proposed pipeline route along the third phase of the route. Seven of these are Late Iron Age stonewalled sites (P3-1, P3-2, P3-3, P3-4, P3-5, P3-8 and P3-9) whereas the remaining two sites comprise an old road (P3-6) and historic wall (P3-7). This report addresses the Late Iron Age sites only with the mitigation undertaken in terms of the historic stonewall in a separate report.

5.2. Discussion on Identified Sites

5.2.1 P3-1

A Late Iron Age stonewalled site is located here and extends on both sides of the proposed pipeline route. In general, the site comprises an extensive enclosure which can be interpreted as a livestock enclosure (isibaya) with two smaller enclosures on the southern end of the Rand Water servitude with a second cluster of smaller enclosures located on the northern end of the servitude. These smaller enclosures located on both sides of the servitude were in all likelihood hut enclosures. The walling found throughout the site is roughly 1m wide and between 0.3m and 0.5m high and as a result can be described as collapsed. Moreover, sections of the walling were evidently robbed with only the foundations of some of these robbed sections remaining. While it would be very difficult to accurately identify when the robbing of the walling occurred, this may have taken place during the establishment of the Zwartkoppies farmstead during the time of Sammy Marks when extensive walling was erected there. As indicated by Küsel (2005) the stonewalling from sites such as these may have been robbed during historical times by the farmers on whose farms the sites are located due to the fact that the stone walled sites provided a good source of raw material for use on their farmsteads (see for example Küsel, 2005).

The remains of a large elongated enclosure on the south-eastern end of the site appear to represent the original livestock enclosure (isibaya). This enclosure has walling on its northern, western and southern ends with no evidence for walling remaining on its eastern which can in all likelihood be attributed to robbing activities. A large irregularly shaped loosely packed stone heap was identified on this end of the enclosure and may have been associated with the robbing of the stone from the structure. Two possible entrances were observed on the western end of the enclosure which due to their proximity to the nearby hut enclosures may have allowed human access into the kraal. The enclosure is by far the most extensive structure on the site and is roughly 54m in length and some 37m wide.

The remainder of the site comprises two clusters of two smaller enclosures each which can in all likelihood be interpreted as hut enclosures. The first of these clusters is located approximately 9m west of the large enclosure.

While one of these structures is circular with an entrance to the south the second has a more irregular shape also with an opening to the south. The second cluster is located roughly 35m to the north-west of the large enclosure and represents the only component of the site located north of the pipeline servitude. The structure nearest to the large enclosure on this side is 20m by 10m in extent, and appears to originally have comprised two attached circular structures. Two upright stones as well as three stone heaps were found to be associated with this structure. During the archaeological excavations undertaken by the National Cultural History Museum in 1996 (see above) informants speculated that the stone heaps observed at those sites may have been collapsed medicine huts or alternatively granary platforms on which grain baskets (isilulu) were placed (Van Schalkwyk et. al., 1996). Similarly, during archaeological excavations undertaken in 2009 a stone concentration was excavated and after the loose stones were removed a circular grain stand was identified (Pelser & Van Vollenhoven, 2009). The suggestion is that the three stone heaps at P3-1 can in all likelihood be interpreted as grain stands. The second small enclosure on this side of the site is circular in shape with an entrance to the east and is roughly 10m by 10m in extent. Although intensive walkthroughs of the site were undertaken during the recording of the site layout plan, no cultural material could be identified anywhere across the site.

From the description outlined above as well as the recorded site layout plan it is evident that the site had a residential use similar to Sites 1 and 2 excavated by Van Schalkwyk (et. al., 1996). Furthermore, as can be expected, the layout of the site conforms to the Central Cattle Pattern (see for example Huffman, 2007) according to which Iron Age settlements are defined in their layout with a strong emphasis placed on the symbolic wealth that livestock represented to the community. As a result the livestock were situated in the centre of the settlements with the domestic space comprising huts and living areas distributed around the central livestock enclosure. The central livestock area would also have been the section of the site associated with male activities where men were buried and meetings took place whereas the enclosing domestic area would have been the female areas. These latter areas contained features such as residential huts, cooking huts and grain stands.

The site can be associated with the Manala Ndebele and in all likelihood dates to the KoNonduna phase which lasted between 1747 and c. 1825.

At a distance of 50m north-west of the north-western end of the Late Iron Age site at P3-1 the remains of what appears to be a shallow trench that is circular in shape was identified on a low hill. Although this site will not be impacted upon it is mentioned here for recording purposes and to ensure that the site is not destroyed in the future. A representative of Rand Water was also taken to this site. The layout of the site suggests that it had a military function and as a result can in all likelihood be associated with the Battle of Diamond Hill (7 – 12 June 1900) during the Anglo-Boer War (1899-1902). After the identification of the site in the field it was established that it was originally identified by Dr. Udo Küsel and included in a report which he compiled for the Sammy Marks Museum (Küsel, 2005). Similarly, the Late Iron Age site at P3-1 is also included in this report.

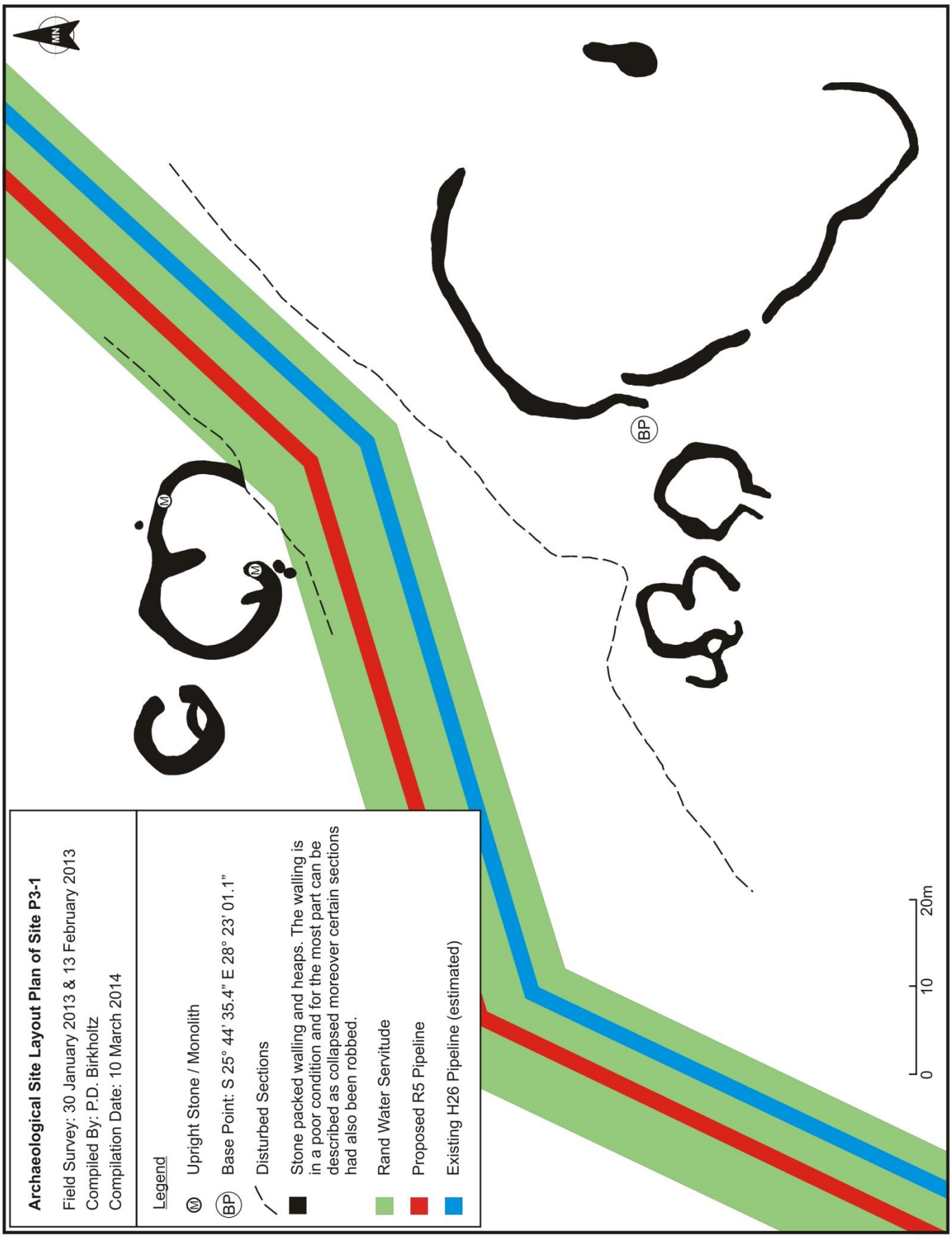

Figure 8 *Site Layout Plan for Site P3-1 depicting the position and extent of the stonewalling in relation to the proposed pipeline route.*

5.2.2 P3-2, P3-3 and P3-4

Although three individual sites were identified during the heritage survey undertaken in 2008, these sites are in close proximity to one another and as a result were recorded on a single site layout plan. A combined discussion of these three sites will follow.

A Late Iron Age stonewalled site is located here and extends on both sides of the proposed pipeline route. In general, the site comprises three poorly preserved sections of walling as well as a large number of stone heaps. A total of 18 such stone heaps were identified across the area, although at least five of these may be the remains of robbed sections of stonewalling.

Site P3-2 comprises the three sections of stonewalling as well as at least three stone heaps a short distance to the east. The walling is irregularly shaped and it would be difficult to identify any settlement features from these sections of walling. A stone on which a grinding surface was observed was identified on the northernmost section of walling from P3-2. Site P3-3 comprises a single stone heap which is located on the eastern side of pipeline servitude. This latter site represents the only component of the three sites under discussion here that is located on the eastern end of the servitude. Site P3-4 comprises seven stone heaps of varying sizes. One of these stone heaps contains a stone on which a grinding surface was observed.

Although intensive walkthroughs were undertaken of extent of the area where the three sites are located, the two stones with grinding surfaces represent the only cultural material identified here. Three stones were identified containing machine made marks. The conclusion to be drawn from this is that the site was impacted upon during the construction of the H26 pipeline.

The characteristics of P3-2, P3-3 and P3-4 combined as a single site corresponds with one of the sites from the farm Hatherley 331 JR that was excavated by the National Cultural History Museum. The site in question (indicated as Site 3) comprises a large number of stone heaps associated with small sections of stone walling. Site 3 was interpreted as an agricultural site and it was suggested that the large number of stone heaps were likely derived from the clearing of agricultural fields whereas the short sections of stonewalling were speculated to be part of shelters used by the people who looked after the agricultural fields and crops (Van Schalkwyk et. al., 1996). Similarly, the site also corresponds with the one of the three sites excavated by Pelser and Van Vollenhoven (2009). Their Site 3 comprises a large number of stone heaps as well as detached sections of walling.

The site can be associated with the Manala Ndebele and in all likelihood dates to the KoNonduna phase which lasted between 1747 and c. 1825.

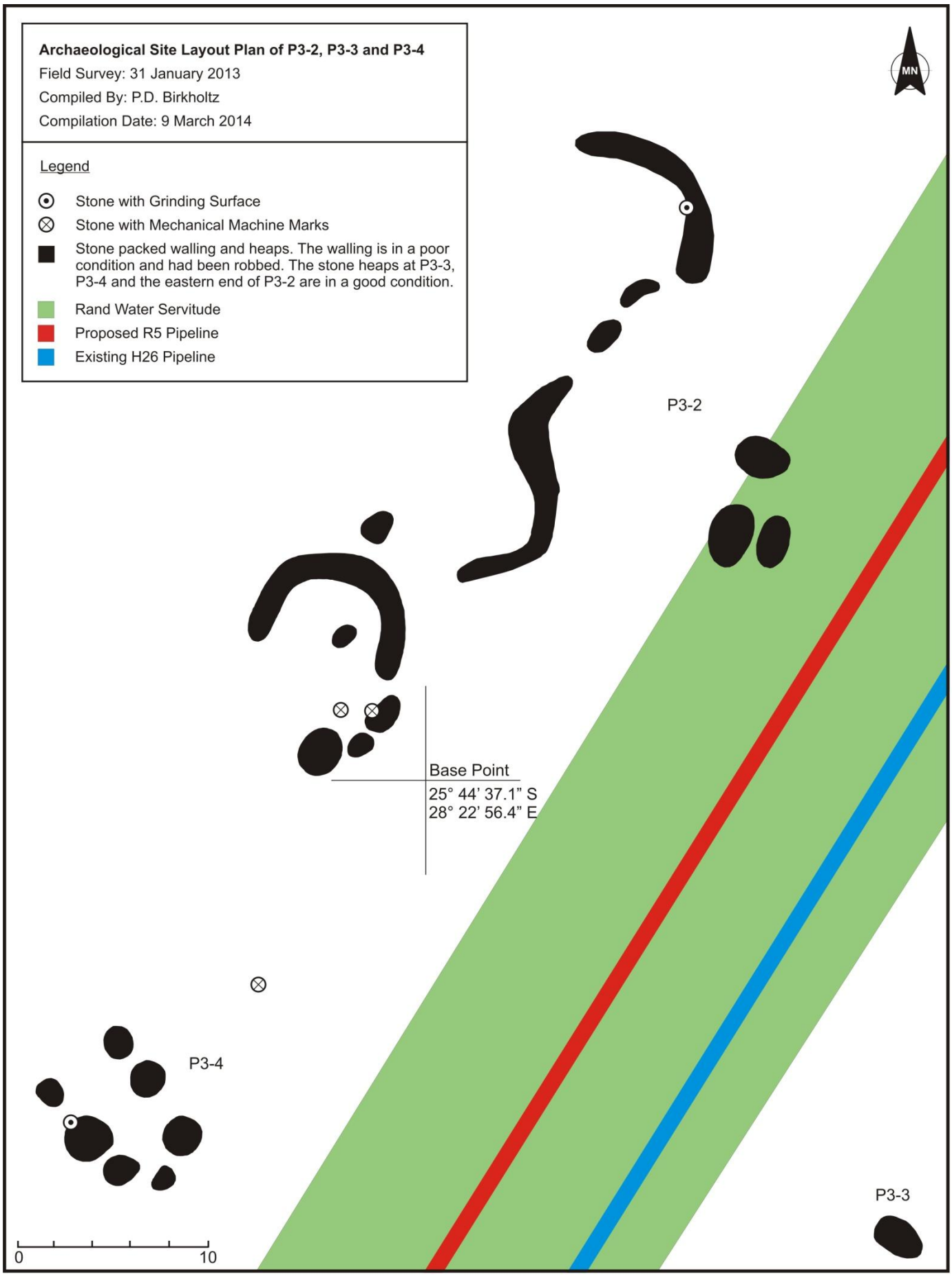

Figure 9 *Site layout plan for P3-2, P3-3 and P3-4 depicting the sites in relation to the proposed pipeline route.*

5.2.3 P3-5

A Late Iron Age stonewalled site is located here and is situated approximately 10m south-east of the Rand Water servitude and some 20m from the position of the proposed R5 Pipeline.

The site comprises eight stone heaps and one small section of walling. The eight stone heaps are of varying sizes and shapes. Only one poorly preserved section of stone walling was identified and extends over an area roughly 7m by 5m. One hammer stone was identified on the eastern end of the walling. Although intensive walkthroughs were undertaken across the site no further cultural material could be identified here.

Six stones were identified which contained marks that were caused by earthmoving machinery. The presence of these stones within the site indicates that some level of disturbance has occurred here. Between the western end of the site and the Rand Water servitude portions of land which had been disturbed were also observed. It seems likely that the site was disturbed during the construction of the H26 pipeline.

The characteristics of site P3-5 corresponds with one of the sites from the farm Hatherley 331 JR that was excavated by the National Cultural History Museum. The site in question (indicated as Site 3) comprises a large number of stone heaps associated with small sections of stone walling. Site 3 was interpreted as an agricultural site and it was suggested that the large number of stone heaps were likely derived from the clearing of agricultural fields whereas the short sections of stonewalling were speculated to be part of shelters used by the people who looked after the agricultural fields and crops (Van Schalkwyk et. al., 1996). Similarly, the site also corresponds with the one of the three sites excavated by Pelser and Van Vollenhoven (2009). Their Site 3 comprises a large number of stone heaps as well as detached sections of walling. At the same time site P3-5 is also similar to the combined site at P3-2, P3-3 and P3-4.

The site can be associated with the Manala Ndebele and in all likelihood dates to the KoNonduna phase which lasted between 1747 and c. 1825.

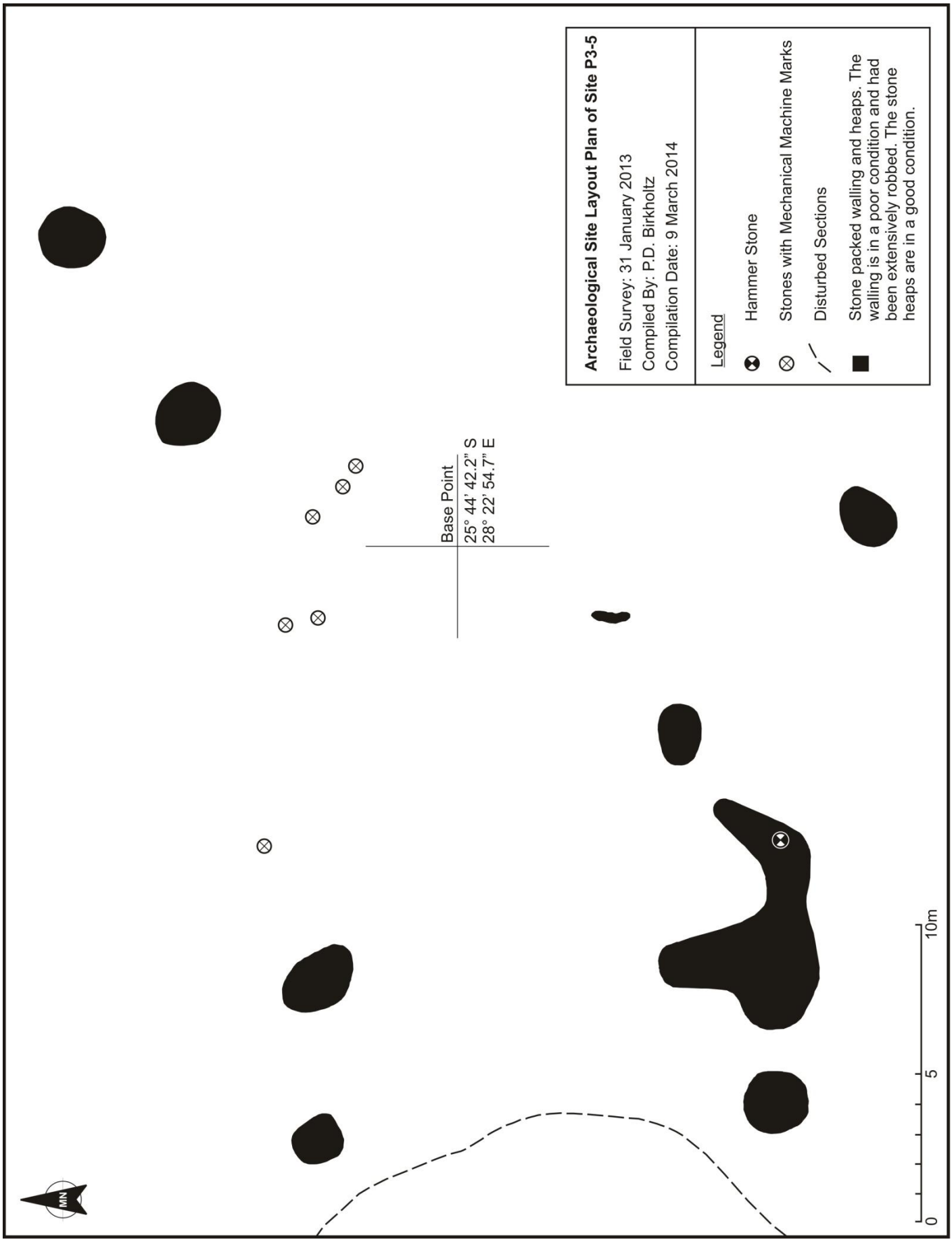

Figure 10 Site Layout Plan for Site P3-5.

5.2.4 P3-8

The site is located near the eastern foot of the Bronberg Mountain and comprises a Late Iron Age stonewalled site. It is approximately 30m west of the proposed R5 Pipeline.

The site consists of an extensive and elongated stone enclosure (roughly 40m by 20m) with one large (10m by 10m) and one small (7m x 5m) enclosure built into the wall of this large stone enclosure. Additionally, two small attached enclosures (both roughly 7m by 7m in extent) were identified near the north-western end of the site within the large enclosure. A low wall extends in a north-eastern direction from the large enclosure. At the point where this low wall connects with the large enclosure an upright stone was identified. The cultural material identified at the site consists of four undecorated ceramics observed on the surface of the site. Two of these ceramics were identified within one of the two attached enclosures from within the larger enclosure whereas the remaining two were observed a short distance to the south-east but still within the large enclosure.

When one looks at interpreting the settlement layout of P3-8 and based on the information that is presently available, two possibilities exist. The first of these is that the large enclosure represents an enclosing perimeter wall surrounding the entire site. Within this scenario both the livestock enclosures and domestic area would have been enclosed by this perimeter wall. The second possibility is that all the walling as depicted on the site layout plan represents a centrally located complex of structures associated with the keeping of livestock. In this scenario the domestic area comprising huts would have been located around the entire stonewalled complex.

It would be impossible to state at present which of these two possibilities can be considered true. In terms of ethnographic information the Bronberg Mountain formed part of the sphere of influence of the Manala Ndebele and the site can in all likelihood be associated with this group of people. It is worth noting however that although the remainder of the sites identified further to the north can also be associated with the Manala Ndebele, the settlement layout as found at P3-8 was not identified at any of the site further to the north. While this would be speculation at best, the possibility exists for the site to be associated with the period in the history of the Manala Ndebele following on the attacks by the Khumalo Ndebele (Matabele) of Mzilikazi when the Manala Ndebele was splintered into smaller groups.

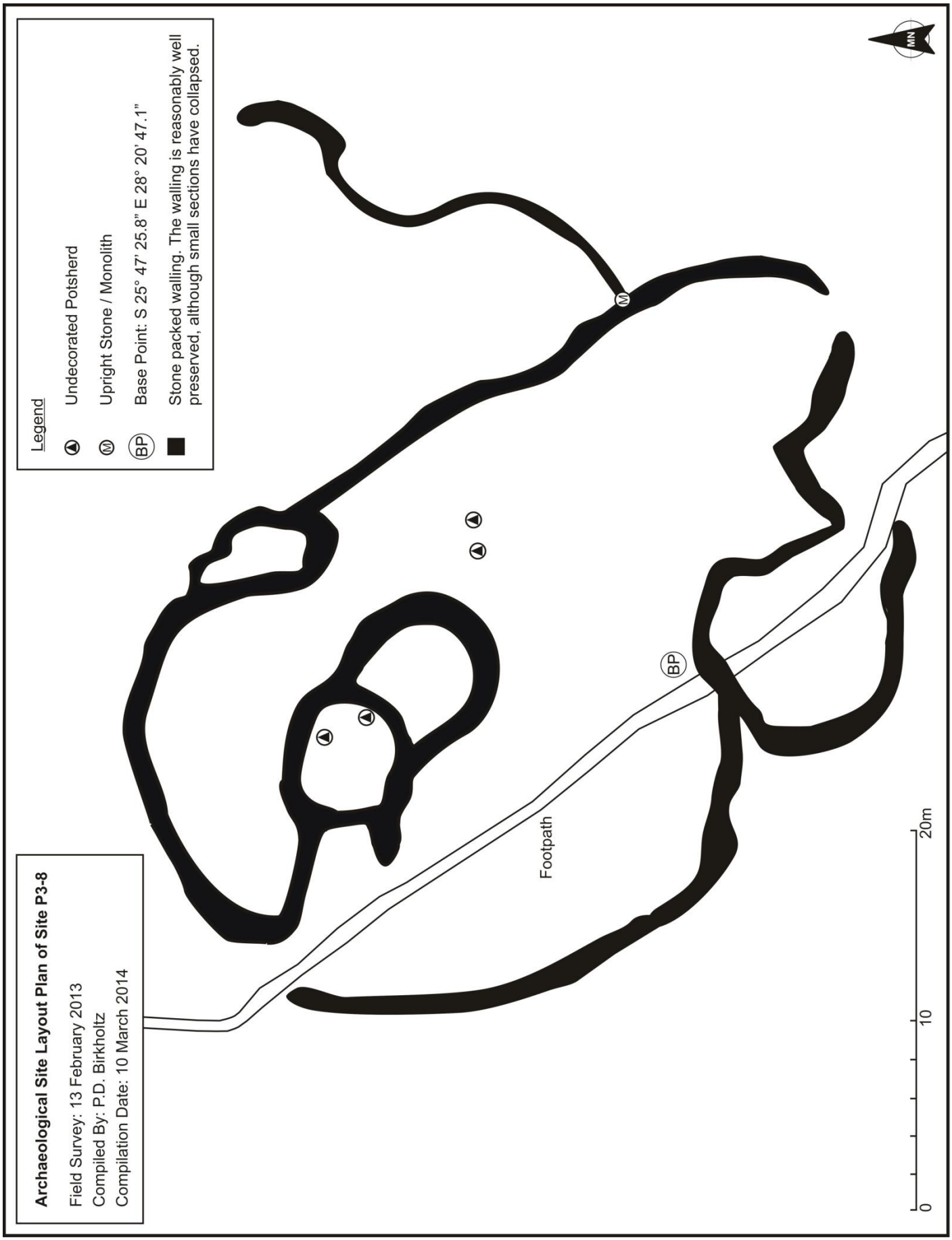

Figure 11 Site Layout Plan for Site P3-8.

5.2.5 P3-9

The site is located near the crest foot of the Bronberg Mountain and comprises a Late Iron Age stonewalled site. It is located approximately 25m east of the existing Rand Water Reservoir and approximately 70m from the proposed R5 Pipeline.

The site consists of an extensive and elongated stone enclosure which is 27m by 17m in extent. The builders of the structure made use of a natural rock outcrop to form the south-eastern end of the enclosure. Three smaller circular enclosures (all roughly 4m in diameter) were built into the large enclosure. Two similar sized attached enclosures are located roughly two meters to the east of the large enclosure. It would appear that the stonewalling identified at the site represents the original livestock enclosures of the site and that the domestic area would have been located around this centrally located cattle enclosures. The smaller circular enclosures may have been used to keep calves or other smaller livestock.

On undecorated ceramic was identified on the surface of the site roughly 5m north-west of the large enclosure. Although an intensive walkthrough of the site was undertaken, no further cultural material was observed.

Three loosely packed oval stone concentrations were identified on the north-western end of the site. These features appear to have resulted from the construction of the nearby water reservoir or alternatively from the construction of the road which passes the site on its north-eastern side.

In terms of ethnographic information the Bronberg Mountain formed part of the sphere of influence of the Manala Ndebele and the site can in all likelihood be associated with this group of people. While the site shows similarities to the site at P3-8, it does not appear similar to any of the stonewalled sites identified further to the north. While this would be speculation at best, the possibility exists for the site to be associated with the period in the history of the Manala Ndebele following on the attacks by the Khumalo Ndebele (Matabele) of Mzilikazi when the Manala Ndebele was splintered into smaller groups.

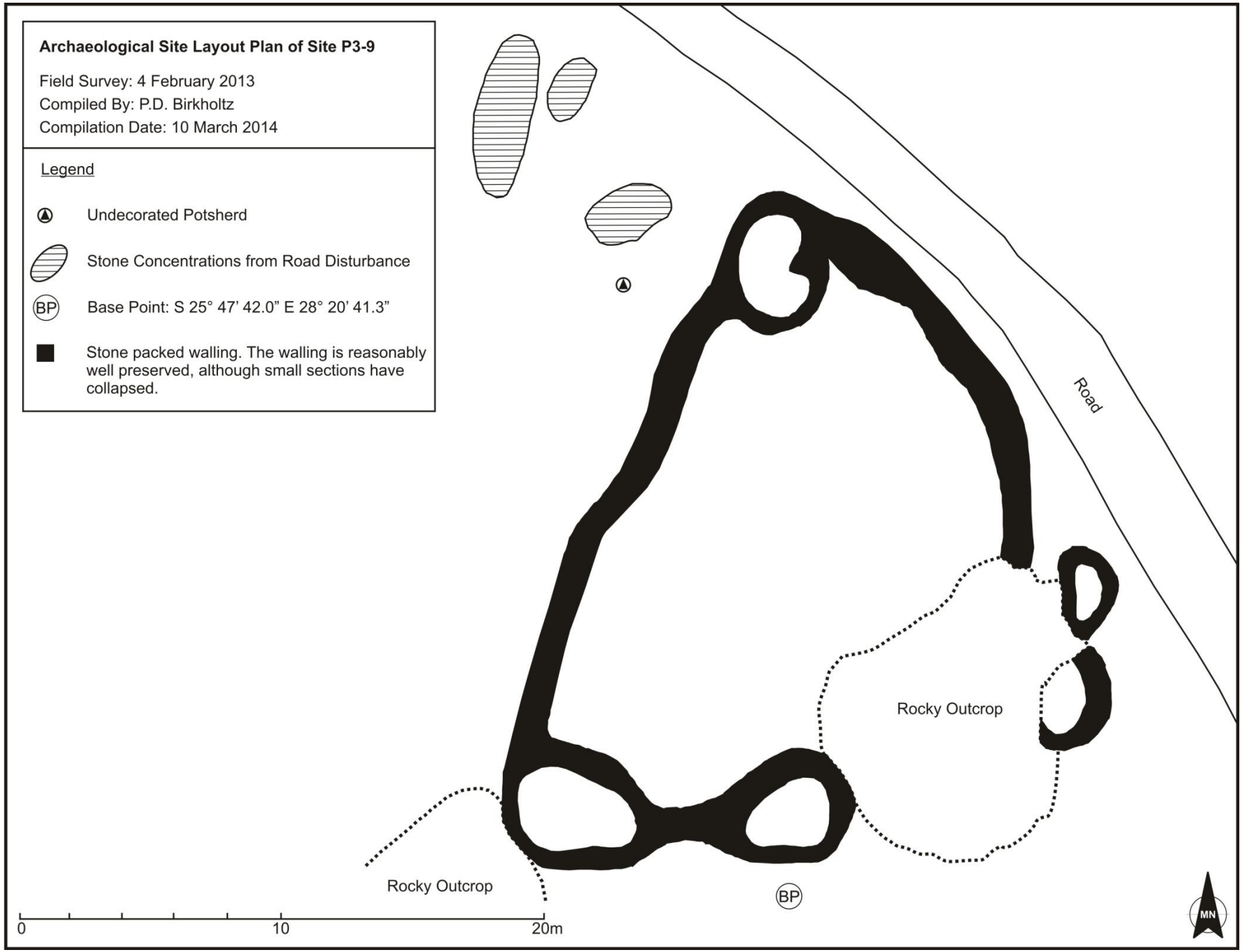

Figure 12 Site Layout Plan for Site P3-9.

5.2.6 P3-10

During the archaeological fieldwork undertaken for the present project a Late Iron Age stonewalled site was identified within the pipeline footprint which had not been identified during the survey undertaken by the author in 2008. The only explanation that can be given for this omission is that the site's walling and structures are very low and that these may have been obstructed from view during the survey of 2008 by vegetation cover such as grass. Nonetheless, the decision was made to also undertake the basic mitigation in the form of the recording of a site layout plan undertaken at all the other Late Iron Age sites at this site as well.

A third of the site comprising a section of stone walling, two stone heaps and two oval stone enclosures appear to be located within the Rand Water servitude. Apart from the stone wall, the remainder of the features are more than 3.5m from the proposed pipeline. However, the stonewall ends at a point roughly one meter west of the proposed pipeline and will be impacted upon by the proposed pipeline.

The site comprises eight stone heaps and three sections of walling. The eight stone heaps are of varying sizes and shapes. The three sections of stone walling are poorly preserved and appear to have been robbed. One hammer stone was identified on the southern end of the site. Although intensive walkthroughs were undertaken across the site no further cultural material could be identified here.

It is worth noting that seven stones which contained machine-made marks were identified on the south-western, south-eastern, western and north-eastern ends of the site. The inference to be drawn from this is that the site had been disturbed. It seems highly likely that this disturbance would have taken place during the erection of the H26 Pipeline.

The characteristics of site P3-5 corresponds with one of the sites from the farm Hatherley 331 JR that was excavated by the National Cultural History Museum. The site in question (indicated as Site 3) comprises a large number of stone heaps associated with small sections of stone walling. Site 3 was interpreted as an agricultural site and it was suggested that the large number of stone heaps were likely derived from the clearing of agricultural fields whereas the short sections of stonewalling were speculated to be part of shelters used by the people who looked after the agricultural fields and crops (Van Schalkwyk et. al., 1996). Similarly, the site also corresponds with the one of the three sites excavated by Pelser and Van Vollenhoven (2009). Their Site 3 comprises a large number of stone heaps as well as detached sections of walling. At the same time site P3-5 is also similar to the combined site at P3-2, P3-3 and P3-4.

The site can be associated with the Manala Ndebele and in all likelihood dates to the KoNonduna phase which lasted between 1747 and c. 1825.

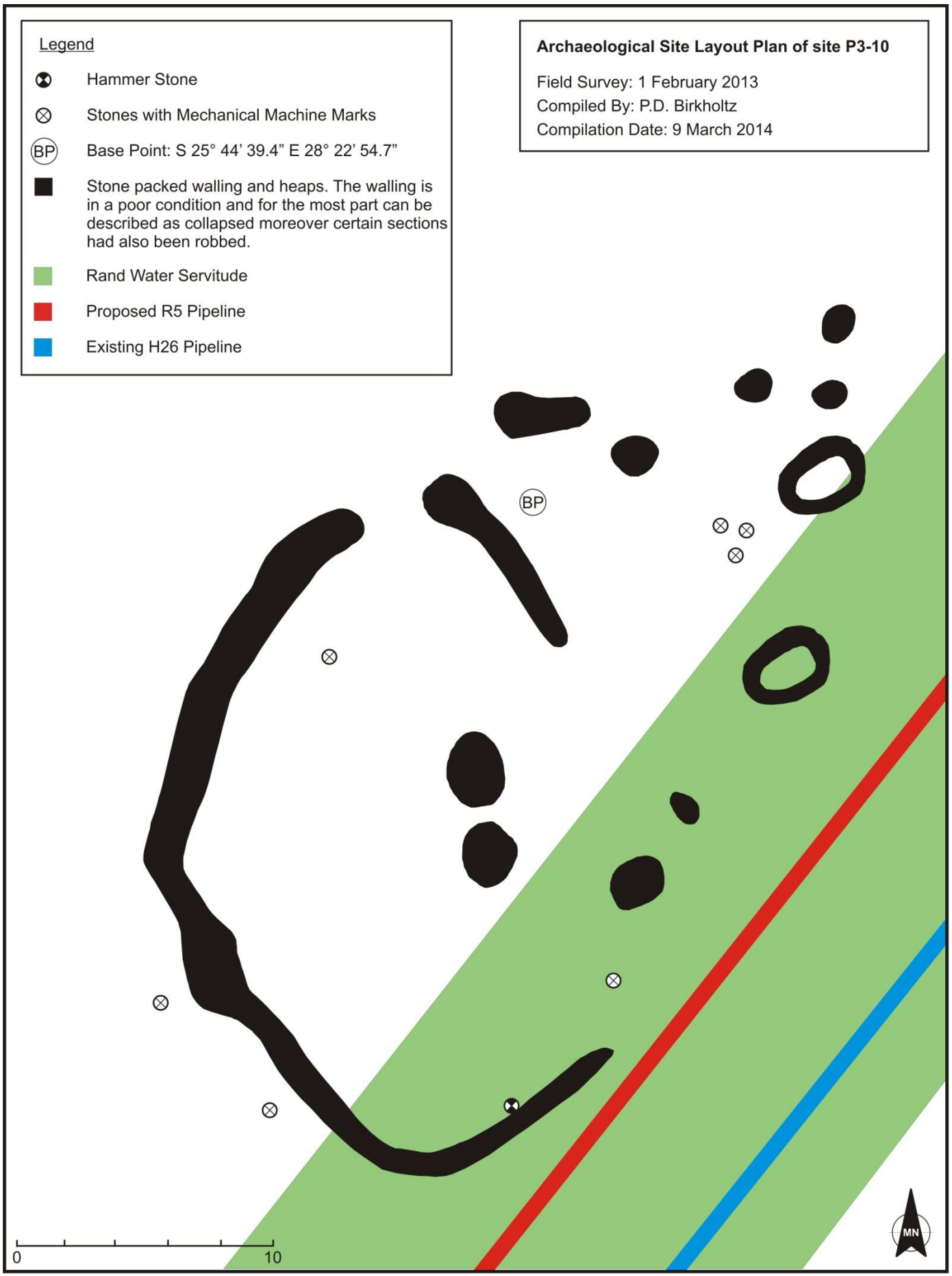

Figure 13 *Site layout plan for P3-10 depicting the site in relation to the proposed pipeline route.*

6. RECOMMENDED CHANGES TO MITIGATION MEASURES OUTLINED IN HERITAGE IMPACT REPORT

6.1. Introduction

The heritage impact assessment for the proposed R5 Pipeline was undertaken by the author of this report as part of the company Archaeology Africa in 2008. As indicated in that report, the proposed pipeline routes were provided in the form of aerial photographs as well as the pipeline markers which existed at the time. To allow for discrepancies a 40m wide corridor was assessed during the fieldwork for the heritage impact assessment.

When the mitigation project commenced the exact pipeline route with associated Rand Water servitude was requested and where applicable this data was added on the recorded site layout plans. The recording of the site layout plans with the positions of the proposed pipeline footprints has revealed the following:

- The proposed pipeline will pass through the middle of site P3-1. However, this section has already been disturbed during the construction of the existing H26 Pipeline. Limited disturbance to the remainder of the site is expected.
- For the most part site P3-2 is located outside of the proposed construction footprint. These sections of the site are not closer than 6.7m from the edge of the servitude and 16.7m from the proposed R5 pipeline. The only component of the site located closer to the proposed development is a cluster of three stone heaps situated within the servitude and located at is closest point 4m from the proposed pipeline.
- Site P3-3 is situated 8.5m from the Rand Water servitude and 18.5m from the proposed R5 Pipeline. As a result no impact is expected on the site.
- Site P3-4 is situated 6.4m from the Rand Water servitude and 14.2m from the proposed R5 Pipeline. As a result no impact is expected on the site.
- Site P3-5 is situated approximately10m from the Rand Water servitude and roughly 20m from the proposed R5 pipeline. As a result no impact is expected on the site.
- Site P3-8 is situated approximately 30m from the proposed R5 Pipeline.
- Site P3-9 is located approximately 25m east of the existing Rand Water Reservoir and approximately 70m from the proposed R5 Pipeline.
- During the fieldwork undertaken for the mitigation of the sites, a previously unidentified site (P3-10) was located. The same basic mitigation comprising the recording of a site layout plan as undertaken for the remainder of the sites was undertaken at P3-10 as well. When the servitude and proposed pipeline was plotted on the site layout plan it was found that roughly a third of the site comprising a section of stone walling, two stone heaps and two small oval stone enclosures appear to be located within the Rand Water servitude. Apart from the stone wall, the remainder of the features are more than 3.5m from the proposed

pipeline. However, these features including a section of the stone wall will be impacted upon by the proposed pipeline.

6.2. Discussion on Existing and Recommended Mitigation Measures

6.2.1 P3-1

The heritage impact assessment report provided the following recommendations with regard to site P3-1:

- Although the proposed pipeline is a linear development that will only impact upon a section of the site, it is recommended that the entire site layout be documented by surveying and drawing a detailed Site Layout Plan.
- This will be followed by limited test excavations in a corridor of approximately 30 meters on each side of the pipeline route. These activities are aimed at documenting, recovering and recording enough data for future research from the component of the site being impacted upon.
- Compilation of a report containing all the research and findings of the study indicated above.
- Submission of this report with the archaeological permit application that will allow the pipeline to be constructed through the site.

In view of the information that is currently available with regard to the position of the proposed pipeline and the limited disturbance expected on the site, it is recommended that the mitigation measures for the site be adjusted as follows:

- It is recommended that the entire site layout be documented by surveying and drawing a detailed Site Layout Plan.
- Submission of a permit application to SAHRA to allow for disturbance (not destruction) to the site.
- Archaeological monitoring during construction activities.

6.2.2 P3-2

The heritage impact assessment report provided the following recommendations for site P3-2:

- The site layout must be documented by the surveying and drawing of a detailed Site Layout Plan. This can be undertaken as part of the mitigation of Site P3-1.
- Submission of this layout plan with the archaeological permit application that will allow the pipeline to be constructed through the site.

In view of the information that is currently available with regard to the position of the proposed pipeline and the limited disturbance expected on the site, it is recommended that the abovementioned mitigation measures remain unchanged.

6.2.3 P3-3

The heritage impact assessment report provided the following recommendations for site P3-3:

"The stone concentration must be investigated by way of reconnaissance excavation. As the possibility exists for the site to be associated with the nearby archaeological sites, the test excavation can only be undertaken after the following steps have been taken:

- *The site must be documented by the surveying and drawing of a Site Layout Plan.*
- *Submission of this layout plan with an archaeological permit application that will allow the reconnaissance excavations to be undertaken.*

The excavations will result in one of two outcomes, namely that evidence (i.e. skeletal material, coffin remains etc.) for the existence of a grave is found, or alternatively that no such evidence is found. If no evidence for a grave is found, the site can be destroyed. However, should it be found, the excavation pit must be backfilled upon which a standard grave relocation process must take place. Such a relocation process must always be inclusive of a detailed social consultation process, must be respectful to the deceased and must be undertaken in cognisance of all the relevant legislation".

In view of the fact that the stone heap is located 8.5m from the Rand Water servitude and 18.5m from the proposed R5 Pipeline with a result that no impact is expected on this site, it is recommended that apart from the completed recording of the site layout plan, no further mitigation measures be required.

6.2.4 P3-4

The heritage impact assessment report provided the following recommendations:

"The stone concentration must be investigated by way of reconnaissance excavation. As the possibility exists for the site to be associated with the nearby archaeological sites, the test excavation can only be undertaken after the following steps have been taken:

- *The site must be documented by the surveying and drawing of a Site Layout Plan.*

- *Submission of this layout plan with an archaeological permit application that will allow the reconnaissance excavations to be undertaken.*

The excavations will result in one of two outcomes, namely that evidence (i.e. skeletal material, coffin remains etc.) for the existence of a grave is found, or alternatively that no such evidence is found. If no evidence for a grave is found, the site can be destroyed. However, should it be found, the excavation pit must be backfilled upon which a standard grave relocation process must take place. Such a relocation process must always be inclusive of a detailed social consultation process, must be respectful to the deceased and must be undertaken in cognisance of all the relevant legislation".

In view of the fact that the stone heap is located 8.5m from the Rand Water servitude and 18.5m from the proposed R5 Pipeline with a result that no impact is expected on this site, it is recommended that apart from the completed recording of the site layout plan, no further mitigation measures be required.

6.2.5 P3-5

The heritage impact assessment report provided the following recommendations:

- The site layout must be documented by the surveying and drawing of a detailed Site Layout Plan.
- Submission of this layout plan with the archaeological permit application that will allow the pipeline to be constructed through the site.

In view of the fact that the site is situated approximately 10m from the servitude and 20m from the proposed R5 Pipeline, it is recommended that apart from the completed recording of the site layout plan, no further mitigation measures are required.

6.2.6 P3-8

The heritage impact assessment report provided the following recommendations:

- The site layout must be documented by the surveying and drawing of a detailed Site Layout Plan.
- Submission of this layout plan with the archaeological permit application that will allow the pipeline to be constructed through the site.

In view of the fact that the site is situated approximately 30m from the proposed R5 Pipeline, it is recommended that apart from the completed recording of the site layout plan, no further mitigation measures are required.

6.2.7 P3-9

The heritage impact assessment report provided the following recommendations:

- The site layout must be documented by the surveying and drawing of a detailed Site Layout Plan.
- Submission of this layout plan with the archaeological permit application that will allow the pipeline to be constructed through the site.

In view of the fact that the site is situated approximately 25m from the existing Rand Water Reservoir and approximately 70m from the proposed R5 Pipeline, it is recommended that apart from the completed recording of the site layout plan no further mitigation measures are required.

6.2.8 P3-10

As indicated elsewhere, this site was not included in the heritage impact assessment report. A third of the site is located within the Rand Water Servitude and as a result the construction of the pipeline will impact the site. The site is however in a poor condition and of Medium to Low Significance. The following mitigation measures are required:

- The site layout must be documented by the surveying and drawing of a detailed Site Layout Plan.
- Submission of this layout plan with the archaeological permit application that will allow the pipeline to be constructed through the site.

7. CONCLUSIONS AND GENERAL RECOMMENDATIONS

7.1 Introduction

PGS Heritage was appointed by Aurecon to undertake mitigation measures on the archaeological sites identified during the heritage impact assessment for the proposed R5 Pipeline of Rand Water undertaken by the author of this report under the company Archaeology Africa during 2008. The mitigation outlined in this report deals with the archaeological sites identified on the so-called Phase 3 of the proposed pipeline and in particular the Late Iron Age sites identified there. A total of seven Late Iron Age sites were identified during the heritage impact assessment in this section of the proposed pipeline. These are P3-1, P3-2, P3-3, P3-4, P3-5, P3-8 and P3-9. Furthermore, during the fieldwork undertaken for the current archaeological mitigation an additional Late Iron Age site was identified and numbered P3-10. The basic mitigation measures undertaken for the other sites were undertaken for this site as well.

The mitigation measures undertaken on the nine Late Iron Age sites comprised the recording of detailed site layout plans as well as a basic description of each site. The layout plans were recorded using standard survey equipment including a total station and dumpy level.

7.2 Original Mitigation Measures and Recommended Changes to those Mitigation Measures

During the fieldwork for the 2008 heritage impact assessment the proposed pipeline routes were provided in the form of aerial photographs as well as the pipeline markers which existed at the time. To allow for discrepancies a 40m wide corridor was assessed during the fieldwork. At the beginning of this mitigation project the detailed position and layout relating to the proposed R5 Pipeline as well as the Rand Water servitude was requested and included on the recorded site layout plans where applicable. As a result it was now possible to accurately state which of the sites will be destroyed, disturbed or not impacted at all. As a result of this assessment some changes to the original recommended mitigation measures are made in this report.

Out of the total eight sites (including the newly identified site P3-10) only three are expected to be disturbed during the construction of the proposed pipeline. These include sites P3-1, P3-2 and P3-10. The remainder of the sites are not expected to be impacted upon by the proposed development of the pipeline. In the original heritage impact assessment the following mitigation measures were required for P3-1:

- *Although the proposed pipeline is a linear development that will only impact upon a section of the site, it is recommended that the entire site layout be documented by surveying and drawing a detailed Site Layout Plan.*

- *This will be followed by limited test excavations in a corridor of approximately 30 meters on each side of the pipeline route. These activities are aimed at documenting, recovering and recording enough data for future research from the component of the site being impacted upon.*
- *Compilation of a report containing all the research and findings of the study indicated above.*
- *Submission of this report with the archaeological permit application that will allow the pipeline to be constructed through the site.*

As a result of the recording of the site layout plan for site P3-1 it was found that the proposed pipeline will be established in an area which can already be considered disturbed with only little impact on the undisturbed sections of the site. As a result the archaeological excavations can be considered unnecessary. The following mitigation measures are recommended:

- It is recommended that the entire site layout be documented by surveying and drawing a detailed Site Layout Plan.
- Submission of a permit application to SAHRA to allow for disturbance (not destruction) of the site.
- Archaeological monitoring during construction activities.

In the original heritage impact assessment the following mitigation measures were required for P3-2:

- *The site layout must be documented by the surveying and drawing of a detailed Site Layout Plan. This can be undertaken as part of the mitigation of Site P3-1.*
- *Submission of this layout plan with the archaeological permit application that will allow the pipeline to be constructed through the site.*

After the site layout plan for P3-2 was recorded and the proposed pipeline and servitude indicated on it, it was found that for the most part the site will be located outside of the Rand Water servitude and away from the proposed pipeline route. The only component of the site located within the servitude is a cluster of three stone heaps located at its closest point roughly 4m from the proposed pipeline. In view of the information that is currently available with regard to the position of the proposed pipeline and the limited disturbance expected on the site, it is recommended that the abovementioned mitigation measures remain with the following addition:

- Archaeological monitoring during construction activities.

Site P3-10 is a newly identified site and was not included in the original heritage impact assessment. As indicated in this report, this omission may have been as a result of the low height of the of stone walls and heaps at this site as well as the possible presence of vegetation cover at the time of the 2008 fieldwork.

The same basic mitigation measure comprising the recording of a site layout plan as undertaken for the remainder of the sites was undertaken at P3-10 as well. When the servitude and proposed pipeline were plotted on the site layout plan it was found that roughly a third of the site comprising a section of stone walling, two stone heaps and two small oval stone enclosures appear to be located within the Rand Water servitude. Apart from the stone wall, the remainder of the features are more than 3.5m from the proposed pipeline. However, these features including a section of the stone wall will in all likelihood be impacted upon by the proposed pipeline. The following mitigation measures are required for P3-10:

- It is recommended that the entire site layout be documented by surveying and drawing a detailed Site Layout Plan.
- Submission of a permit application to SAHRA to allow for disturbance (not destruction) of the site.
- Archaeological monitoring during construction activities.

7.3 Completed Mitigation Measures

Detailed site layout plans were recorded for P3-1, P3-2, P3-3, P3-4, P3-5, P3-8, P3-9 and P3-10 and are included in this report. A description of each site accompanies the detailed site layout plans. An ethnographic and archaeological background to the Late Iron Age sites from this area and surrounding landscape is also provided in this mitigation report.

7.4 Required Mitigation Measures

7.4.1 Archaeological Sites not directly impacted upon by the Proposed Pipeline Development

The sites forming part of this category comprise P3-3, P3-4, P3-5, P3-8 and P3-9. No further mitigation measures would be required for these five sites. However, the following general recommendation is made and must be adhered to:

- All five these sites must be clearly marked in the field with danger tape by the heritage specialist before construction commences on Phase 3 of the proposed pipeline project to ensure that these sites are not impacted upon during these activities.

7.4.2 Archaeological Sites impacted upon by the Proposed Pipeline Development

The sites forming part of this category comprise P3-1, P3-2 and P3-10. With the recording of the layout plans completed for these sites, it is recommended that the following mitigation measures still be undertaken:

- Permit application to SAHRA to allow for the disturbance of the proposed pipeline development to these sites. In all instances only a disturbance permit will be required and not a destruction permit.
- Archaeological monitoring during construction activities at each of these sites. Should any subterranean archaeological material be uncovered during construction activities such work may have to be halted until such time that the archaeologist has assessed the significance of the exposed material and undertaken the necessary mitigation work should this be required.

8. REFERENCES

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