BERKENRODE: ARCHAEOLOGICAL INSIGHTS ON THE HISTORY OF A 20TH CENTURY ARTISANAL MINE IN THE LIMPOPO VALLEY

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Narratives about South African industrialisation, especially regarding the mining sector, have not paid adequate attention to small scale (artisanal) mining operations and the communities who worked them. This article reports on the archaeology of the artisanal copper mining site Berkenrode, also known as MNR211, located on the farm Berkenrode 45 MT, close to Musina in the extreme north of the Limpopo Province. Material culture from the site suggests it was likely active between 1937 and 1946. The architecture and material culture also inform on the industrial activities at the site and the domestic and social distinctions of the mining community on Berkenrode.

Keywords: artisanal mining, copper mining, historical archaeology, industrial history, Maremani Nature Reserve, Musina

Berkenrode: Argeologiese insigte in die geskiedenis van 'n 20ste-eeuse kleinskaalse myn in die Limpopovallei

Suid-Afrikaanse industrialisasienarratiewe, veral ten opsigte van die mynbedryf, neig om kleinskaalse mynaktiwiteite en hul verwante myngemeenskappe te ignoreer. Hierdie artikel doen verslag oor die argeologiese navorsing by die kleinskaalse kopermyn Berkenrode, ook bekend as MNR211, op die plaas Berkenrode 45 MT, geleë naby Musina in die noordelike Limpopoprovinsie. Kultuurvoorwerpe dui daarop dat die terrein waarskynlik tussen 1937 en 1946 in gebruik was. Die argitektuur en materiële kultuur werp ook lig op die industriële en huishoudelike aspekte van die myngemeenskap op Berkenrode.

Sleutelwoorde: ambagsmynbou, historiese argeologie, industriële geskiedenis, kopermynbou, Maremani Natuurreservaat, Musina

Introduction

The mining industry fundamentally shaped the history of modern South Africa.[1] While not as prominent as gold and diamond mining, copper mining also played an essential role in the industrialisation of 20th century South Africa.[2] Some of the most important copper mines in South Africa are those around the present-day town of Musina (earlier spelling Messina) in the northern Limpopo Province. Before European exploration of the South African interior, these deposits had been mined extensively by Iron Age communities up to the early nineteenth century.[3] Industrial exploitation of the Musina deposits started in 1905 with the Messina (Transvaal) Development Company Ltd. (MTD). As the mining operations grew, Musina became the largest settlement north of the Soutpansberg mountains.[4] However, the MTD operations are only a partial telling of the mining history of Musina. Artisanal and small-scale mining (ASM) sites operated by independent miners whose history is untold, are scattered throughout the area. One such ASM site is Berkenrode, located 8km south-east of the major mining operation of the MTD on the farm Berkenrode 45 MT, which falls within the Maremani Nature Reserve (Figure 1).[5] Further archaeological ground surveys of Maremani identified nine other ASM sites. The Berkenrode operation was the most spatially extensive and the only diggings with households directly associated with mining operations.

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1 RK Bright, *Chinese Labour in South Africa, 1902–10: Race, Violence, and Global Spectacle* (London, 2013); J Davenport, *Digging Deep: A History of Mining in South Africa* (Johannesburg, 2013); O Doughty, *Early Diamond Days: The opening of the diamond fields of South Africa* (London, 1963); I Herbert, *The Diamond Diggers* (London, 1971); C Newbury, The Diamond Ring Business*, in The Diamond Ring: Business, Politics and Precious Stones in South Africa 1867–1947* (Oxford, 1989); E Rosenthal, *Gold! Gold! Gold! The Johannesburg gold rush* (New York, 1970).

2 JM Smalberger, *A History of Copper Mining in the Namaqualand, 1846–1931* (1969); CO Beale, Copper in South Africa: Part I, *Journal of the South African Institute of Mining and Metallurgy* 85(3), 1985, pp 73-80; CO Beale, Copper in South Africa: Part II, *Journal of the South African Institute of Mining and Metallurgy* 84(4), 1985, pp 109-124.

3 EOM Hanisch, Copper working in the Messina district, *Journal of the South African Institute of Mining and Metallurgy*, 1974, 74(6), pp 250-253; H Stayt, *The Bavenda* (London, 1968); R Summers, *Ancient Mining in Rhodesia and Adjacent Areas* (Salsbury, 1969); NJ van Warmelo, *The Copper Miners of Musina and the Early History of the Zoutpansberg* (Pretoria, 1940).

4 ECI Hammerbeck and JJ Schoeman, *Copper in Mineral Resources of the Republic of South Africa* 7, 1976, pp 125-146, at p 143; PE Raper, *South African place names* (Johannesburg, 2004), p 238.

5 The site was identified during an archaeological survey of the Maremani Nature Reserve and recorded in the survey as site MNR211.

Problem statement

Artisanal mining is generally defined as independent, small-scale, and self-sufficient mining operations.[6] This type of mining ranges from gold-panning to underground workings and small-scale processing plants.[7] Past and present ASM miners typically used their resources with operations, ranging from seasonal to semi-permanent exploitation. The mineral deposits that artisanal miners exploited were neither rich enough to create a massive rush to attract significant external sources of capital nor sustain a substantial permanent settlement.[8] Women and children often formed an integral part of ASM operations: fathers and sons usually worked at the mining claims. Mothers and daughters were often responsible for farming or other subsistence activities and maintained home and community life.[9] Due to their small size, temporary nature, and lack of written and documentary records, ASM sites often go unnoticed.[10] However, archaeology with its primary emphasis on material culture can make a significant contribution to the study of technology, economy, class, hierarchy, gender and ethnicity at these sites.[11]

6 S Lawrence, Poor Man's Diggings: Subsistence Mining in the Nineteenth Century, *Australian Historical Archaeology* 13, 1995, pp 59-68, at p 59.

7 DL Hardesty, Class, gender strategies, and material culture in the mining west, *in* E Scott (ed), *Those of Little Note: Gender, Race and Class in Historical Archaeology* (Tucson, 1994), pp 129-145.

8 S Lawrence, Poor Man's Diggings…, *Australian Historical Archaeology* 13, 1995, p 59.

9 S Lawrence, Poor Man's Diggings…, *Australian Historical Archaeology* 13, 1995, p 66.

10 DL Hardesty, Class, gender strategies, and material culture..., in E Scott (ed), *Those of Little Note: Gender, Race and Class in Historical Archaeology,* (Tucson, 1994), pp 129-130.

11 Good examples include J Behrens, The Dynamite Factory: An Industrial Landscape in Late-Nineteenth-Century South Africa, *Historical Archaeology* 39(3), 2005, pp 61-74; J Behrens, 'Navigating the Liminal: An Archaeological Perspective on South African Industrialisation', *in* A Reid & P Lane (eds), *African Historical Archaeologies* (London, 2004), pp 347-373; WA Douglass, The Mining Camp as a Community, *in* EW Herbert, AB Knapp & VC Pigott (eds), *Social Approaches to an Industrial Past: The Archaeology and Anthropology of Mining* (London, 1998), pp 97-108; DL Hardesty, *The Archaeology of Mining and Miners: A View from the Silver State*, (Ann Arbor, 1988); DL Hardesty, Class, gender strategies, and material culture..., *in* E Scott (ed), *Those of Little Note: Gender, Race and Class in Historical Archaeology* (Tucson, 1994), pp 129-145; DN Schmitt and CD Zeier, Not by bones alone: Exploring household composition and socioeconomic status in an isolated historic mining community, *Historical Archaeology* 27(4), 1993, pp 20-38.

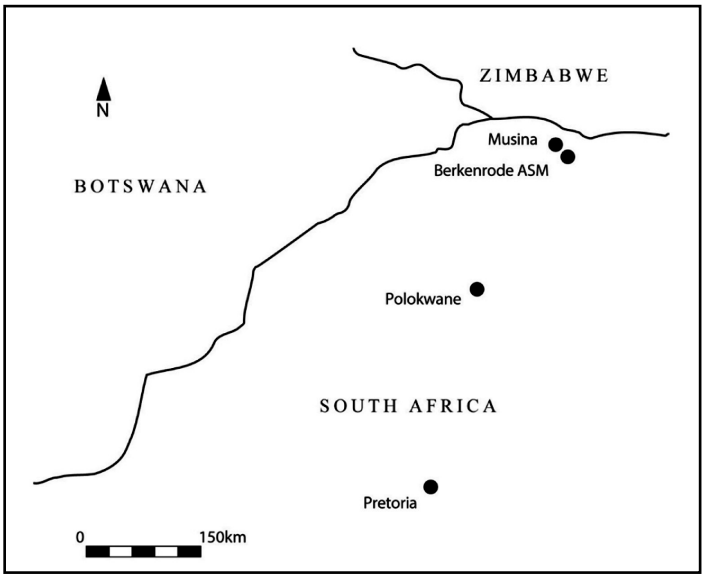

Figure 1: Regional map showing the location of Berkenrode (Source: A Antonites)

ASM operations like Berkenrode, which occur in the shadow of sizeable formal mining operations, are not limited to the past. By 2018, an estimated 20 000 men, women and children were directly involved in ASM in South Africa.[12]

While there has been increasing academic attention to ASM activities in present-day South Africa, historical ASM mining of the twentieth century and their contributions to the local economy remains largely unknown.[13] In other parts of the world, research on historical ASM communities has shown their essential role

12 Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development, *Global Trends in Artisanal and Small-Scale Mining (ASM): A review of key numbers and issues*, International Institute for Environment and Development, (Winnipeg, 2017), p 7.

13 For example G Hillson & C Garforth, "Agricultural Poverty" and the Expansion of Artisanal Mining in Sub-Saharan Africa: Experiences from Southwest Mali and Southeast Ghana, *Population Research and Policy Review* 31(3), 2012, pp 435-464; PF Ledwaba, The status of artisanal and small-scale mining sector in South Africa: tracking progress, *Journal of the South African Institute of Mining and Metallurgy* 117(1), 2017, pp 33-40; SJ Spiegel, Socioeconomic dimensions of mercury pollution abatement: Engaging artisanal mining communities in Sub-Saharan Africa, *Ecological Economics* 68(12), 2009, pp 3072-3083.

in understanding the different lifecycles of a mining landscape, how communities adapted to a particular environment and the obstacles it presented.[14]

Therefore, the Berkenrode ASM activities presented an opportunity to better understand the daily life of a neglected segment of South African economic history. This article reports on the historical documentary and archaeological research conducted at the Berkenrode ASM site and frames it within the regional context of twentieth-century South Africa.

Background of historical mining in the Musina area

During the South African War (Anglo-Boer War), Lieutenant Colonel John Pascoe Grenfell, stationed in Rhodesia (now Zimbabwe), heard rumours about abandoned African copper mines in the area. After the war, he conducted a prospecting mission searching for these diggings in the then Northern Transvaal. This mission subsequently led to the discovery of abandoned Iron Age copper mines on the farm Berkenrode 45 MT in 1904, which was, at the time, unproclaimed government land. Grenfell subsequently obtained the discoverer's certificate and sank the first prospect shaft (located in the present town of Musina). The MTD was established in 1905 as the official mining venture. Five shafts were eventually sunk, creating the first concentrated white settlement north of the Soutpansberg and proving an economic hub and centre of potential employment for migrant black labourers.[15] By the 1950s, 10 000 people had settled in Grenfell Camp, leading to its proclamation in 1957 as Messina (now Musina). However, mining prospects gradually waned over the years, and by the early 1990s, operations were officially shut down.[16]

Methods and sources of information

Documentary and archival research conducted at the National Archives in Pretoria and the Musina Municipal Records Office generally failed to uncover

14 Examples include P Bell, Essay on North Queensland Mining Settlement, *in* KH Kennedy (ed), *Readings in North Queensland Mining History 2* (Townsville, 1980), pp 1-46; DL Hardesty, *The Archaeology of Mining and Miners: A View…,* (Ann Arbor, 1988); DL Hardesty, *Mining Archaeology in the American West* (Nebraska, 2010); AB Knapp, VC Pigott, & EW Herbert (eds), *Social approaches to an industrial past: the archaeology and anthropology of mining* (New York, 1998); G Serle, *The Golden Age: A History of the Colony of Victoria 1851–1861* (Parkville, 1963); DA Smith, *Rocky Mountain Mining Camps: The Urban Frontier* (Lincoln, 1974).

15 M Bolt, *Zimbabwe's Migrants and South Africa's Border Farms* (Cambridge, 2015), p 79.

16 CR Anhaeusser & MGC Wilson, *The Minerals Resources of South Africa: Handbook* (Johannesburg, 1998), p 216; B Cairncross & R Dixon, *Minerals of South Africa* (Randburg, 1999), p 50.

information about the mining operations at Berkenrode. One of the authors (M. Joubert) interviewed two individuals currently living in Musina with links to and knowledge of historical mining in the town. The lack of historical information, therefore, added additional impetus to the archaeological investigation of the site.

Field research includes detailed site surveys in 2015 and 2016, during which surface material was recorded and collected for further analysis and archaeological excavations in 2017.[17] Large and immovable artefacts, exceedingly fragile artefacts and non-diagnostic items were recorded in the field but not collected. Excavations followed conventional archaeological techniques and practice.[18] Geological cores and ore samples from the diggings were collected, cross-compared, and identified by geologists from the Geology Department, University of Pretoria.

Glass[19] and ceramic[20] artefacts from excavation and surface collection were analysed by type according to standard archaeological methods.[21] Maker's marks indicated possible dates and origins of manufacture and potentially identified original vessel form and decoration from the maker's classification system.[22]

Metal artefacts followed a standard typological classification whereby items were categorised as domestic, industrial, or other (e.g., architecture, ammunition or unknown). Plastic and rubber artefacts were cleaned and counted separately (from each excavation unit and the surface scatter collections) before including them in the rest of the assemblage assigned into functional categories where possible.

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17 Excavations and collection conducted under South African Heritage Resource Agency (SAHRA) permit number 2509.

18 The archaeological recovery methods and techniques are described in M Joubert, "An Archaeological and Historical Investigation of 20th Century European Mining Activities on the Farm Berkenrode in the Maremani Nature Reserve" (MA thesis, University of Pretoria), 2019.

19 J Klose & A Malan, UCT *Ceramics Handbook* (Cape Town, 2009); J Klose and A Malan, *An Introduction to the Identification of Ceramics Excavated from 18th and 19th Century Archaeological Sites* (Cape Town, 2014); N Zachariou, "From Missionary to Merino: Identity, Economy and Material Culture in the Karoo, Northern Cape, South Africa, 1800 – ca" (Unpublished PhD, University of Cape Town), 2017.

20 Thomas Jefferson Foundation, *Digital Archaeological Archive of Comparative Slavery (DAACS),* https://www.daacs.org, viewed 2019-10-28; E Lastovica & A Lastovica, *Bottles and Bygones: a guide for South African collectors* (Cape Town, 1990); AC van Vollenhoven & AJ Pelser, A preliminary guide to the analysis of ceramic and glass assemblages from historical sites: an investigation of ceramics and glass bottles, found at 321 Du Toit Street, Pretoria, *Pretoriana* 114, July 2001, pp 2-9.

21 Rims, handles, lugs, and footrings were separated to determine the Minimum Number of Vessels (MNV) after which vessels were classified by form and function (e.g., tea ware, tableware, utilitarian). Within these categories, further distinction was made between flatware and hollowware.

22 N Zachariou, "From Missionary to Merino:…, 2017, pp 116-152.

Site description

The Berkenrode ASM site lies on a ridge on the western bank of the Sand River – a major tributary of the Limpopo River. The archaeological site comprises a concentration of diggings, building ruins, middens, and pathways, all within an approximate 500m x 500m area (Figure 2). The most prominent spatial features of the site are 30 diggings with low stone walls that encircle 21 of these and six other structures. Other features include three middens, a possible ore crushing site, a possible furnace, a geological core scatter, two metal claim boards and an activity area.

Geological samples from the site indicate that copper and mica were the primary deposits mined at Berkenrode. Most of the diggings and spoil heaps also contain large amounts of residual mica but given the large quantities of viable ore left behind, it seems mica was not a target. Iron and vermiculite are also present in the area, and these metals and minerals were among the geological samples collected from different historical diggings at the site.

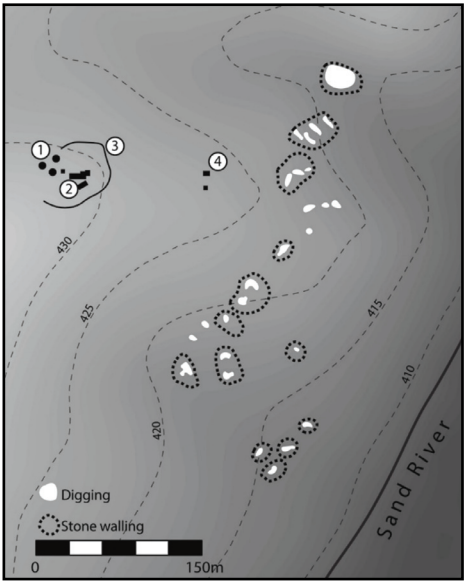

Figure 2: Map of the Berkenrode ASM indicating diggings, stone walls as well as middens 1-3 (1), Buildings B1 and B2 (2), Perimeter Wall (3), Small brick structure S1 and Possible furnace F1 (4) (Source: A Antonites)

Diggings

Diggings were classified as either shafts or trenches (Figure 3). Shafts are those diggings with a generally vertical profile, while trenches are narrow, shallow cuts across a mineral deposit. These are often dug to expose the lode by cutting across it.[23] Of the 30 diggings at Berkenrode, 17 are shafts, and 13 are trenches.

Figure 3: Diggings at Berkenrode ASM with examples of a trench (left) and shaft (right) (Photo: M Joubert)

The diggings generally range from a depth of 0.1m to 2m, with one shaft, MNR211/01, approximately 6m deep. This shaft is the largest and deepest and likely provided the bulk of ore excavated from the site. Within this digging, an adit (horizontal shaft) was created probably to explore surrounding deposits. A thick metal cable, likely used to haul ore to the surface, was found at this shaft. The diggings are mainly devoid of cultural material, and researchers only collected a few metal and glass fragments from the surface.

23 PW Thrush, *A Dictionary of Mining, Mineral and Related Terms* (Bureau of Mines, 1998), p 1163.

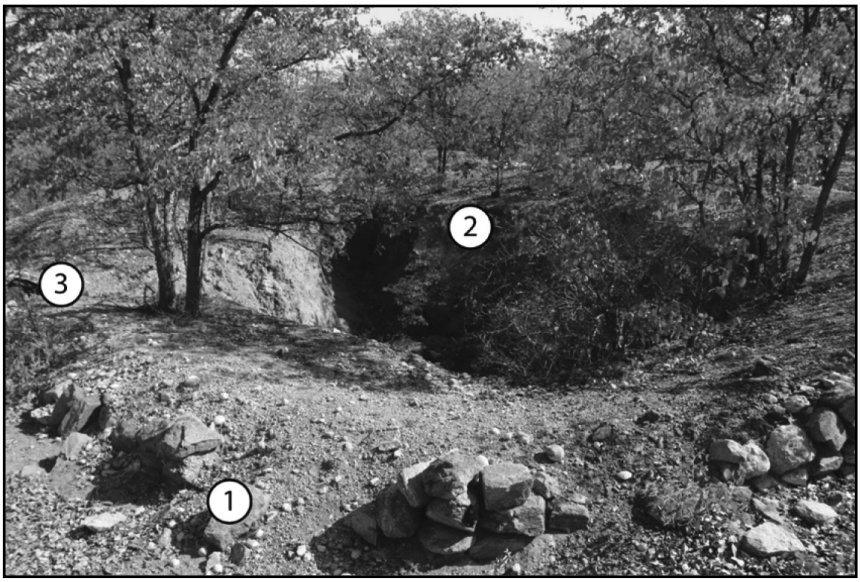

Figure 4: Example of a perimeter wall (1) around a digging (2) and spoil heaps (3) (Photo: A Antonites)

Most diggings had spoil heaps located directly next to them. These contained large amounts of mica, large rocks, soil, and residual ore. Given the shallow depths of most diggings, the spoil heaps were also low. The exception, however, was the spoil heap associated with the most extensive digging at the site, which stands around 1.5m high. Some of the diggings are encircled by low walls of roughly packed uncoursed stones and are usually less than 0.5m high (Figure 4).

Built environment and spatial features

The built environment includes two brick structures (B1 and B2) adjacent to one another and four smaller built features. A circular perimeter stone wall (W1) surrounds the two brick buildings and a concrete platform (P1). A stone wall enclosure (W2) is located approximately 100m east of the structures, with a small platform (P2) in its centre. There is a small brick structure (S1) located next to the stone wall.

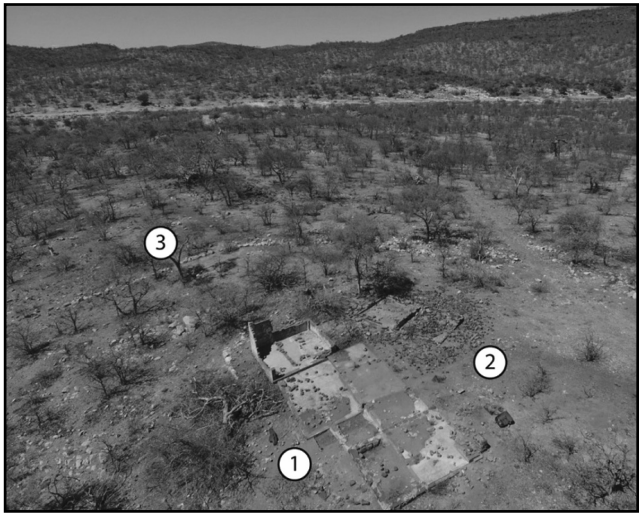

Figure 5: Aerial image looking towards the east with building B1 (1), B2 (2) and perimeter wall W1 (3) in the foreground. The Sand River is visible as a horizontal line in front of the mountains
(Photo: A Antonites)

Building 1 (B1) is an eight roomed, grey brick and stone building, roughly rectangular with a north-south orientation. It has a foundation of dressed stone with a cement floor and a superstructure of grey cement bricks (Figure 5). The building was not built from draughted plans since almost none of the walls are joined at right angles. The building was constructed in an ad-hoc manner, and the blocked-off doorways and changes to the floor indicate that alterations and additions took place over time. (Figure 6).

Nearby is Building 2 (B2), a rectangular two-room building constructed from red clinker bricks covered with plaster (2.1 and 2.2). The building faces north-north-west and is approximately 6m x 6m in size. Each room has an external doorway, but there is no passage connecting the rooms. As with building B1, this building also has a natural dressed stone foundation with a cement floor.

About 5m north-west of B1 is an approximately 2m x 2m square cement floor with a single row of packed stones around the perimeter and an opening in the south-east corner (entryway facing east). Its function is unclear, but it is likely that a superstructure of either perishable or reclaimed material once stood on the floor. (Figure 4)

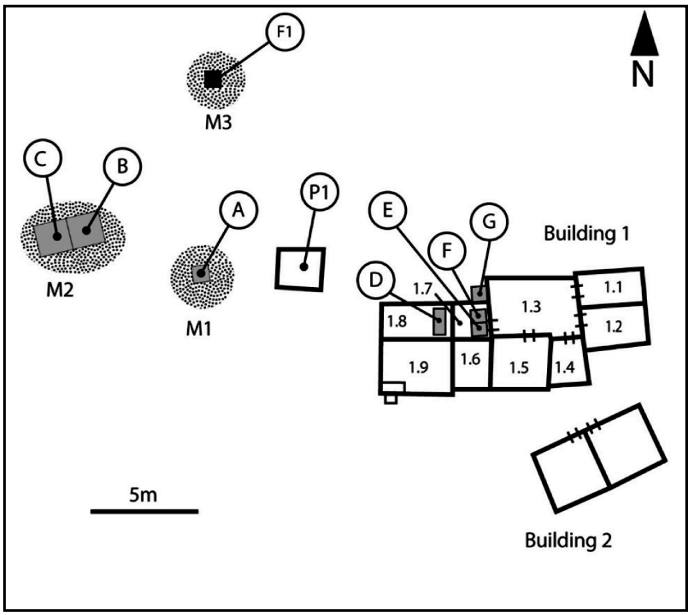

Figure 6: Map of Building 1 and 2, middens M1 – M3, platform P1, furnace F1 and excavation units A – G
(Source: A. Antonites)

Three ashy middens were identified at the site. A 1m² unit was excavated in midden M1. M2, the most extensive midden, was excavated using two 2m x 2m units. The third midden (M3) is located on the western edge of the site and contains ceramic, glass and metal artefacts in a very ashy matrix. Only surface artefacts were collected from M3, next to a clearly defined circular stone feature, about 0.5m across. This feature likely acted as a furnace, given that it contained numerous pieces of slag (Figure 7). A metal pipe found inserted into the structure could have been used to pump air into the furnace.

North-west of building B1, there is a scatter of geological coring samples. Cores are typically stored in containers known as drilling boxes or core trays, but these were likely dumped when the site was abandoned.

A clearly defined perimeter wall arches east around B1, B2 and P1 and includes the three middens (Figure 5). This wall is constructed from white rocks packed in a double row. The double row of stones suggests that it may have been the base for a fence. In the area immediately outside the domestic core are structures and

features that likely relate to the mining activities on the site. These include a 4m x 4m square stone enclosure (Figure 7.2). It has a single entrance, and in the centre of the section, there is a square cement platform (P2), around 0.1m high. Cement bricks, similar to those of B1, are scattered around the platform and likely formed part of a structure on top of it (Figure 7.1). A 1m x 1m plastered brick structure lies directly south of this feature (Figure 7.3). The structure may have been part of a rudimentary furnace since several pieces of slag and ore were scattered around it. Close by, a large stone anvil and numerous small fragments of iron ore were found. The anvil has clear marks where it has been hit. The area is more than a meter across and contains a small patch of ashy soil and a large stone (> 0.5m in length).

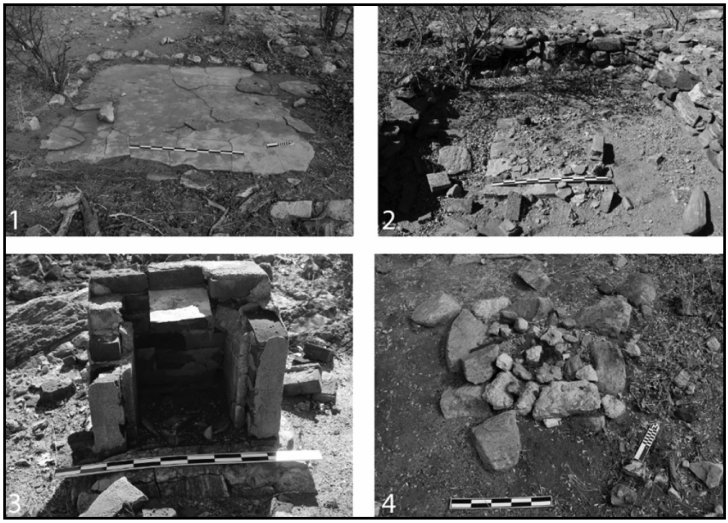

Figure 7: Images of (1) platform P1, (2) stone enclosure W2 and Platform P2, 3) small brick structure S1, and (4) the possible furnace F1 (Photo: A Antonites)

Two claim boards containing similar hand-painted black claim details were found approximately 300m west of the site (Figure 8). Only the order of the details differs. (Figure 9).

On the bank of the Sand River, just over 300m from building B1, there is a level area with grey soil and building material such as bits of concrete, corrugated iron, and fragments of bricks. This area is isolated from the rest of the site. While material culture seems to be generally contemporary with the mining activities, there were direct relationship other than spatial proximity.

Figure 8: Berkenrode ASM (1) claim boards with details (2 - 3)
(Photo: M Joubert)

Text on Plate 1 on the front and back	Text on the back of Plate 2
D.A. KRUGER	D.A. KRUGER
CORNER BEACON	50 B_ Claims
LIC NO 37348	LIC _ _ 37947
50 BM _ _ _ _ MS	CORNER BEACON
PEC 21 – 1_ – 76	_ _ _ _ _ _ _ _ _ 78

Figure 9: Text on claim boards. "_" indicates illegible character.

Excavations

In midden M1, a single 1m x 1m square was excavated (Figure 5). Inside the unit was loose surface deposits and ashy grey silty sand, which could be the residue of fires or household waste dumping. A 4m x 4m excavation was also completed in midden M2. Three discontinuous deposits were found. Layer 1 was a dark brown sandy silt, which represents deposits that accumulated after abandonment. Layer 2 was defined as light grey ash, which constituted the midden and contained the bulk of the material culture from this excavation. Layer 3 was a soft brown sandy silt, the original sterile surface with a slight admixture with Layer 2 above.

Three units inside room 1.7 of Building 1 were excavated (Figure 10), with an additional excavation against the southern exterior wall of room 1.3. These excavations indicated that the floor was either filled with large rocks or with gravel, soil, and cement fill. Excavations also identified two distinct wall types in B1. The first was an undressed stone and mortar wall, and the second type was a brick-and-mortar wall. Both the discontinuous floor and distinct wall types suggest multiple expansions to the building over time.

Figure 10: Excavation D, showing natural stone base and floor fill of building B1 (Photo: M Joubert)

Material culture

Initial surveys identified a dense scatter of material on the surface, primarily at and around the structures, dropping off moving away from the buildings. Among all the surface materials, metal artefacts are the most common, followed by glass and ceramics. The highest concentration of surface material is associated with the excavated middens. Many of the recovered glass artefacts, a small number present on the surface of the remains, are almost complete in vessel form.

The ceramics from the site fall into two primary ware-types: earthenware and porcelain. Earthenware includes 71 pieces of Refined Earthenware (REW), three bits of porcelain and three fragments of coarse redware. Most of the material is from the excavated middens. The identified shapes include bowls, cups, jugs, plates, and saucers. Five pieces have maker's marks on the bases, though all are fragmented and is difficult to discern.

The glass assemblage includes both pane glass and glassware fragments. The glassware fragments include flatware (plates) and hollowware (bottles, containers, and pots). Eight distinct colours were recorded, and three types of decoration were present: enamelled, feathering, and moulding (Figure 11).

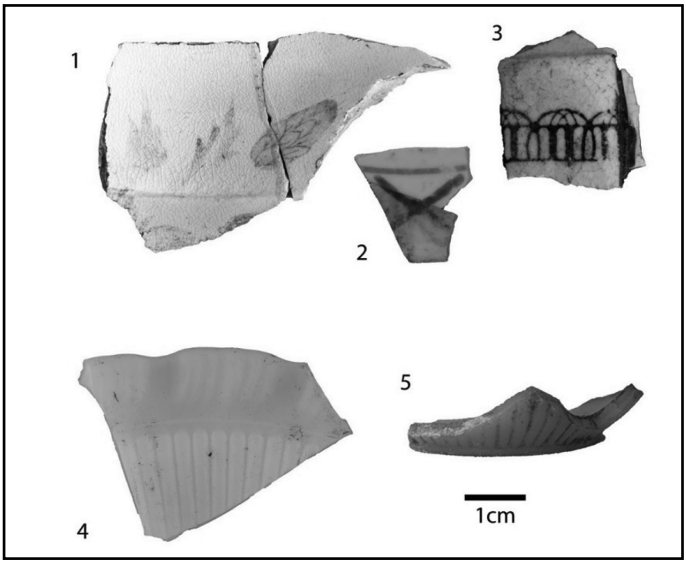

Figure 11: Examples of ceramic fragments decorated with transfer prints (1–3), feathering on white (4) and green milk glass pieces (5) (Photo: A Antonites)

Seventeen glass vessels have maker's marks, either on the base or on the body, some of which could be identified. One bottle has "Pretoria" marked on the bottom, which indicates that the Pretoria Glass Works made it. This company was established in 1937 and operated until 1946 when the owner, Anglovaal, formed the Consolidated Glass Works and changed the maker's mark to "CGW".[24] Three

vessels have "Talana" embossed on the base (Figure 12). The Talana factory opened in 1918 at Talana near Dundee, KwaZulu-Natal. In 1954, Consol Glass bought the factory and stopped using the Talana maker's mark. One clear glass container is embossed with "Chesebrough Manufacturing Company", the producers of the "Vaseline" brand of petroleum jelly. This bottle predated the 1970s when plastic containers were introduced.[25] Fragments of a brown glass Bovril bottle of undetermined age were also collected from the excavation of one midden. A glass marble, likely from a Codd-neck bottle used to seal carbonated soda bottles, was found in midden M1. These bottles were made well into the twentieth century.[26] Other glass items include nine glass beads recovered from excavated middens and on the surface.

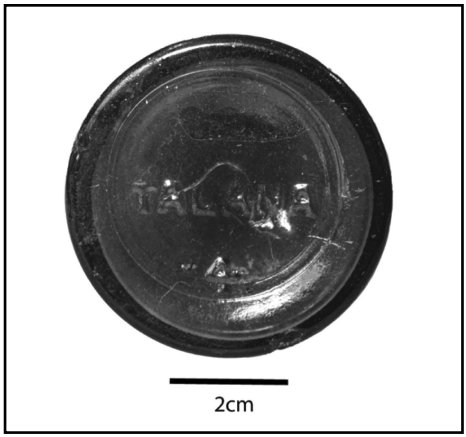

Figure 12: Example of brown glass bottle with the "Talana" maker's mark (Photo: A Antonites)

Many of the metal objects, including machinery parts, e.g., cables, nuts, bolts, tools and equipment, e.g., wrenches and saw blades, and smelting and smithing debris in the form of slag collected, are linked to the mining operations at the site. Other miscellaneous items include a metal piece from a door or window frame, wood, and roofing nails, and 13 spent bullet cartridges. Objects related to daily life and

24 E Lastovica & A Lastovica, *Bottles and Bygones*… (Cape Town 1990), p 24.

25 PG Homan, Vaseline: from trademark to noun, *The Pharmaceutical Journal*, 281(December), 2008, p 754.

26 C Munsey, Codd (Marble-In-The-Neck) Soda-Water Bottles: Then and Now, https://sha.org/bottle/pdffiles/coddarticleMunsey.pdf, viewed 2021-02-01.

domestic activities around the site include buttons, canned food tins and furniture components (e.g., bed springs). Two brass buttons have identifiable markings (Figure 13). One button is embossed with the pre-2000 South African coat of arms used on South African Defence Force uniforms. The second is an American military button known as a Great Seal Button. The maker's mark is partially visible, and comparisons to online catalogues suggest that it would originally have read as "AUSTIN CO. PROVIDENCE R.I.". No published information on this manufacturer is available. Still, online button collector forums indicate that the Austin Company supplied overcoat buttons to the United States military during the Second World War.[27]

Miscellaneous items from the site include a mother of pearl button and 27 plastic and rubber pieces, including plastic buttons, beads, and a rubber shoe sole. Some surface artefacts, such as beer bottles, also evidently post-date the mining activities at the site; however, these are generally rare finds.

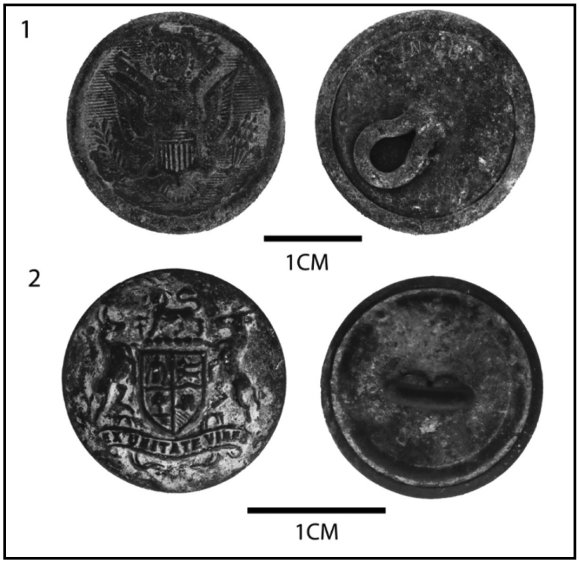

Figure 13: Great Seal button front and back (1) and South African military button front and back (2) (Photo: A Antonites)

27 Anonymous, Great Seal Buttons, https://inkspotantiques.com/index.php?main_page=page&id=10, viewed, 2021-02-01.

Discussion and conclusion

The research at Berkenrode offers a unique perspective on the mining history of South Africa. Although the material culture at the site generally speaks to the mining operations, there is a sizeable proportion that reflects aspects of daily life at the mine and the process of homemaking. Homes are complex and variable and reflect extant social systems and systems of meaning.[28] As such, regarding Berkenrode as a home as well as a mining site is significant. Unlike the typical conception of mining as a purely industrial activity, the archaeology of Berkenrode shows that when it comes to ASM, the boundaries between home-life and industrial activities become blurred. Table- and tea ware contrast the purely industrial nature of the diggings. The multiroom layout of B1 include both public and private rooms, and the excavations revealed expansion and alterations of the structure over time. Given the general social attitudes and gender roles in South Africa in the 1940s, it is unlikely that white men wore plastic and glass beads. This tradition can be more likely associated with either women or black miners at the site. It is also possible that they could have used beads to decorate items such as doilies and tobacco pouches. Identifying the purpose of other structures at the site is difficult given the general absence of material culture associated with the buildings. Structure B2, the two-roomed rectangular building, may have served various purposes related to the household or mining activities. Spatially, W1 (perimeter fence) separated the domestic space from the mining operations. It enclosed the house itself and the household middens (M1 and M2), which contained most household items from the site.

Apart from a claim board bearing the name D.A. Kruger, searches in the National Archives, mining offices and interviews with farmers and Musina residents, no information on this individual could be found. Archival records indicate that Grenfell – who 'discovered' the Musina deposits – purchased the farm Berkenrode in 1903 and was given a lease for the mineral rights in 1907.[29] A company document dated 1954 states that the MTD gave mining rights on its properties to "suitable candidates" at some point. Since the maker's marks of "Talana" and "Pretoria"

28 LJ Zimmerman, Homeless, home-making, and archaeology "To be at home wherever I find myself", *in* M Bille & TF Sørensen (eds), *Elements of architecture: assembling archaeology, atmosphere and the performance of building spaces*, Archaeological orientations (London, 2016), pp 256-272.

29 National Archives of South Africa (hereafter NASA), EC579/269/03: Purchase of Farm Berkenrode, Zoutpansberg District, by JP Grenfell – Secretary for Lands, 1903-09-10; NASA, MM1485/07: The Grant of the Mineral Rights of the Farm Berkenrode – Clerk to the Legislative Assembly, 1907-07-15.

suggest that mining took place between 1937 and 1946, D.A. Kruger was likely one of the "suitable candidates" who received mining rights on Berkenrode. After the Second World War, the Union of the South African government implemented several measures to find employment for veterans. Men were either returned to their pre-war jobs or received training, education, and new employment opportunities.[30] However, the process was drawn out and characterised by poor execution, and thousands of veterans were again unemployed by 1948.[31] It is within this context of demobilisation that the Musina mine granted mining rights to individuals. Therefore, the South African and American military buttons present a potential personal link between an individual(s) at the Berkenrode mine and South Africa's wartime activities.

Like the mining operations at the main Musina shafts, the Berkenrode miners targeted copper ores. However, the methods employed at Berkenrode stand in marked contrast to the large-scale industrial operations of MTD. While miners used mechanised methods to haul ore out of the 6m deep shaft, they dug the shallow shafts and stopes with hand tools such as picks and shovels as the shallow depth and uneven sides suggest. The largely manual mining methods at Berkenrode mean that the operation likely depended on the same pool of cheap African migrant labour as the MTD. Miners around Musina were primarily migrants from Botswana, Nyasaland (Malawi), Southern Rhodesia (Zimbabwe) and Northern Rhodesia (Zambia), with a minority of workers recruited from the surrounding Soutpansberg district.[32] At the MTD in the 1940s and 50s, miners entered a 12-month contract system and, unlike most other mines operating in South Africa at the time, did not rely on labour recruitment agents.[33] Instead,

> … every morning, African work-seekers assembled outside the offices of the chief compound manager. The latter would then invite Africans seeking work of the type, e.g., rock drilling, lashing, ore sorting, fitters and carpenters, messengers, clerks and sanitation for which vacancies existed, to step forward. Those Africans who were physically and mentally suitable for the jobs available were then selected. MTD turned the remainder out of the compound.[34]

30 F Oosthuizen, Demobilisation and the post-war employment of the white union defence forces soldier, *Scientia Militaria: South African Journal of Military Studies* 23(4), 1993, pp 32-38.
31 F Oosthuizen, Demobilisation and the post-war employment…, p 38.
32 F Malunga, Foreign African migrant labour at the Messina Copper Mines, 1905–1960, *Historia* 47(1), 2002, pp 270-290.
33 F Malunga, Foreign African migrant labour…, *Historia* 47(1), 2002, p 274.
34 F Malunga, Foreign African migrant labour…, *Historia* 47(1), 2002, p 272.

There was, therefore, a pool of mine labourers available for smaller operations such as Berkenrode.

The permanence and prominence of the architecture of B1 indicate that it is the likely residence of the foreman or owner. The spatial presence of miner labourers at Berkenrode is less clear. Before 1990, the movement and settlement of black people were tightly controlled and linked to access to accommodation. The contrast between the structures associated with the mine owner or foreman and the miners at Berkenrode are germane. Historically, black labourers on farms and mines mostly lived in compounds – regulated, austere, single-sex dormitories.[35] The existence or location of the miner compounds at Berkenrode remains uncertain. The concentration of ashy soil and building material located next to the Sand River at A1 is a likely location. The small amount of material culture visible in this area could result from poor preservation given its location next to the Sand River. Another possibility is that mine labourers were housed at the official mine compounds around the MTD shafts (the closest being 7km away) and transported to MNR211 daily.

Although large-scale mining fundamentally shaped the country's mining industry, artisanal (small-scale) mining operations also played an essential role in the history of this South African industry. Many small-scale artisanal mining sites are frequently overlooked or do not appear in the historical record, thereby ignoring archaeology's contribution to their study.

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35 M Bolt, *Zimbabwe's Migrants and South Africa's Border Farms*, (Cambridge, 2015), p 114-115.