

FINAL PERMIT REPORT

Final archaeological research excavation

Archaeological excavations at Damvlei, Free State Province: the 2021 season.

Permit number: 2862

SAHRIS Case ID: 13324

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Date: 10 February 2022

SAHRA permit officers: Ragna Redelstorff and Philip Hine

Date of permit issue: 4 February 2019 (amended on 12 March 2020)

Expiry date of permit: 28 February 2022

Permit holder: Dr. Lloyd Rossouw (holder), National Museum Bloemfontein; Dr. Michael Toffolo (co-holder), Bordeaux Montaigne University, France

Permit to: Dr. Lloyd Rossouw (National Museum Bloemfontein) and Dr. Michael Toffolo (Bordeaux Montaigne University, France), in collaboration with Prof. Britt Bousman (Texas State University, USA), Prof. Daryl Codron (University of the Free State, South Africa), Prof. Christopher Miller (University of Tübingen, Germany)

Site name: Damvlei

Object ID: 129111

Executive summary

The site was excavated between 22-27 September 2021, using the same site grid established in 2019. The 2021 season was dedicated to the full excavation of Unit 4, laid out in 2019 but not excavated. Unit 4 was excavated in arbitrary levels, 10 cm thick using pointing trowels, patches, and small picks due to the hardness of clay-rich layers, down to a depth of 50 cm below surface. All levels were photographed and recorded with a total station. Artifacts, bones, and sediment samples were 3D-plotted using a total station and labeled using progressive numbers, whereas excavated sediments were sieved through a 4-mm mesh to recover small lithic flakes and bone chips. Artifacts and bones were 3D-plotted and collected out of context at the bottom of the donga. Aerial photos of the site were taken using a drone. At the end of the season, trenches were backfilled with sandbags. Based on the results of the 2019 laboratory analyses, two sedimentary units were identified and described at the site. From top to bottom: a layer of eolian sand about 20 cm thick, and a layer of clayey silt 2 m thick, as shown in a profile that we cut back on the side of the donga in 2019. Variations in calcium carbonate nodule concentrations and bioturbation were observed throughout the profile and are interpreted as soil forming processes. Most artifacts recovered were concentrated in excavation levels 3-4 (20-40 cm below surface) and show characteristic features of Later Stone Age (LSA) technology, more specifically the Oakhurst (locally termed Lockshoek) and Wilton

technocomplexes. One bulk sample for optically stimulated luminescence (OSL) dating collected 30 cm below surface returned a date of 12,000 years, which is in agreement with the occurrence of Lockshoek artifacts at the same depth. Given the occurrence of artifacts below this level, we suspect that earlier occupations took place at this locality. Infrared spectroscopy determined the occurrence of burnt aggregates of sediment and chips of calcined bone in Unit 1, which could be the result of human-made fire or a natural fire. The analysis of phytoliths, fauna, and lithics, as well as further OSL dating, are currently underway.

SAHRIS object links

Damvlei: <https://sahris.sahra.org.za/sites/damvlei>

OSL samples: <https://sahris.sahra.org.za/objects/lov-dmv2019osl>

Sediment samples (2019): <https://sahris.sahra.org.za/objects/lov-dmv2019sediment>

Sediment samples (2021): <https://sahris.sahra.org.za/objects/lov-dmv2021sediment>

Bone samples (2019): <https://sahris.sahra.org.za/objects/lov-dmv2019bones>

Bone samples (2021): <https://sahris.sahra.org.za/objects/lov-dmv2021bones>

Export permit for OSL samples (2019): <https://sahris.sahra.org.za/cases/export-permit-2019-osl-samples-lovedale-and-damvlei>

Export permit for bone and sediment samples (2019): <https://sahris.sahra.org.za/cases/export-permit-2019-sediment-and-bone-samples-lovedale-and-damvlei>

Export permit for bone and sediment samples (2021): <https://sahris.sahra.org.za/cases/export-permit-2021-sediment-and-bone-samples-lovedale-and-damvlei>

Location details

Location name: Farm Strydomspan 29

GPS coordinates: 28°54'29.90"S 25°41'51.94"E

Nearest town: Dealesville

Local District: Petrusburg

Magisterial District: Petrusburg

Province: Free State

Approximate age of materials: the last 12,000 years (based on OSL dating)

List of all participating researchers (2019 and 2021 seasons together)

- Dr. Michael Toffolo, Bordeaux Montaigne University (France): director of excavations, infrared spectroscopy analysis of bones.
- Dr. Kristen Wroth, University of Tübingen (Germany): excavation, registrar, phytolith analysis, sediment analysis using infrared spectroscopy and micromorphology.
- Prof. Britt Bousman, Texas State University (USA): excavation, site survey, lithic analysis.
- Dr. Chantal Tribolo, Centre National de la Recherche Scientifique (France): OSL dating.
- Dr. Lloyd Rossouw, National Museum Bloemfontein: excavation, phytolith analysis, curation of artifacts and faunal material.
- Mr. Isaac Thapo, National Museum Bloemfontein: excavation.
- Mr. Jacob Maine, National Museum Bloemfontein: excavation.
- Mr. Abel Dichakane, National Museum Bloemfontein: excavation.
- Dr. Liora Kolska Horwitz, Hebrew University of Jerusalem (Israel): faunal analysis.
- Dr. Maily Richard, Centro Nacional de Investigación sobre la Evolución Humana (Spain): excavation.
- Prof. Daryl Codron, University of the Free State: stable isotopes analysis of tooth enamel.
- Prof. Christopher Miller, University of Tübingen (Germany): micromorphological analysis of sediments.
- Prof. Elisabetta Boaretto, Weizmann Institute of Science (Israel): excavation, radiocarbon dating.

Curation of materials

Name of institution: Florisbad Quaternary Research Department, National Museum Bloemfontein

Name of curator: Dr. Lloyd Rossouw

Phone number of curator: 0842505992

Email address of curator: lloyd@nasmus.co.za

Institutional address: 36 Aliwal Street, 9300 Bloemfontein

Storage: lithics and bones are stored in ziplock plastic bags labeled with progressive numbers, which are kept in labeled carton boxes. Each number corresponds to specific spatial coordinates and Unit/Level numbers. Bulk sediment samples are stored in plastic vials. A comprehensive list of all materials extracted from the excavation and their spatial coordinates is available in an Excel worksheet at the National Museum, as well as fieldwork photos.

Specific information

Responsible person 1 <i>Full name:</i> <i>Position/academic level:</i>	Dr. Michael Toffolo Associate researcher Bordeaux Montaigne University, France
Responsible person 2 <i>Full name:</i>	Dr. Kristen Wroth Postdoctoral researcher

<i>Position/academic level:</i>	University of Tübingen, Germany
Responsible person 3 <i>Full name:</i> <i>Position/academic level:</i>	Dr. Lloyd Rossouw Head of the Florisbad Quaternary Research Department National Museum Bloemfontein
Number of participants	4
Duration of field work (e.g., 3-15 May 2015)	22-27 September 2021
Excavation equipment used (e.g., trowels, picks, chisels, total station, screen mesh sizes)	Pointing trowels, patches and small picks were used for excavation; dentistry tools were used to uncover stone tools; pickaxes and shovels were used to clean dating profiles along exposed donga sections. All sediments were sieved through a 4 mm mesh. Excavation grid and units, artifacts, bones, sediment samples and off-excavation surface finds were 3D-plotted using a total station.
Indication of volume excavated numbers or names of stratigraphic units removed, approximate volume excavated (estimated bucket count)	Unit 4 (1x1 m), laid out in 2019, was excavated down to 50 cm depth below surface in arbitrary levels, 10 cm thick.
Samples provide a list of all samples taken and what analysis is planned to be carried out. (e.g. charcoal samples taken for radio-carbon dating, samples and placement of scimitars for TL dating)	List of bulk samples for infrared spectroscopy and magnetic susceptibility: DMV-SED-1 DMV-SED-2 DMV-SED-3 DMV-SED-4 DMV-SED-5 DMV-SED-6 DMV-SED-7 DMV-SED-8 DMV-SED-9 DMV-SED-10 DMV-SED-11 DMV-SED-12 DMV-SED-13 DMV-SED-14 DMV-SED-15 List of faunal samples for infrared spectroscopy: DMV-1489
Description of work/methodology excavation strategy, recording techniques used etc.	Units were excavated by arbitrary levels, 10 cm thick. All level surfaces, artifacts and sediment samples were 3D-plotted using a total station. Level surfaces and sediment sample locations were photographed. All sediments were described according to texture, structure, inclusions and color.

List of excavated artifacts and bones by Unit/Level. All artifacts are made of hornfels. Classification by type is not yet available, although artifacts show characteristic features of LSA technology, more specifically Oakhurst (Lockshoek) and Wilton technocomplexes.

	Unit 4
Level 1	0
Level 2	3
Level 3	6
Level 4	5
Level 5	0

Off-excavation surface lithics: 11 (two are made of banded ironstone, one is made of chalcedony); off-excavation surface bones and teeth: 4; off-excavation surface ochre: 2.

Conclusions reached

The site appears to be a palimpsest of multiple, short-lived occupations that took place in the donga over the past 12,000 years, as shown by OSL dating of levels bearing Lockshoek artifacts, which underlie levels with Wilton artifacts. The occurrence of possible Robberg artifacts at the surface of the donga begs the question of their presence *in situ* in the excavation trench. Robberg artifacts in the western Free State are known only at Erfkroon, 10 km downstream. The occurrence of LSA artifacts made of banded ironstone, as well as fragments of unworked slabs, implies long-distance transport, perhaps as a result of trade, since the closest outcrop is located in the Kuruman Hills (about 250 km to the northwest). The occupations were likely related to hunting, as indicated by the large number of *Equus capensis* teeth and postcranial bones recovered at the surface of the donga over two seasons of fieldwork.

Publications

We are currently completing paleoenvironmental analyses and OSL dating, and we plan to submit a manuscript about the geoarchaeology and chronology of the site by the end of 2022. After we will publish the full lithic assemblage.

Additional information



Figure 1. Map showing the location of Damvlei in the western Free State. The meandering green line running from east to west is the Modder River.



Figure 2. Aerial photo showing the location of the excavation site between the Modder River (grey line running east-west in the upper portion of the photo) and the donga (white patches). The green meandering feature running south-north in the left-hand side of the photo is the vlei.

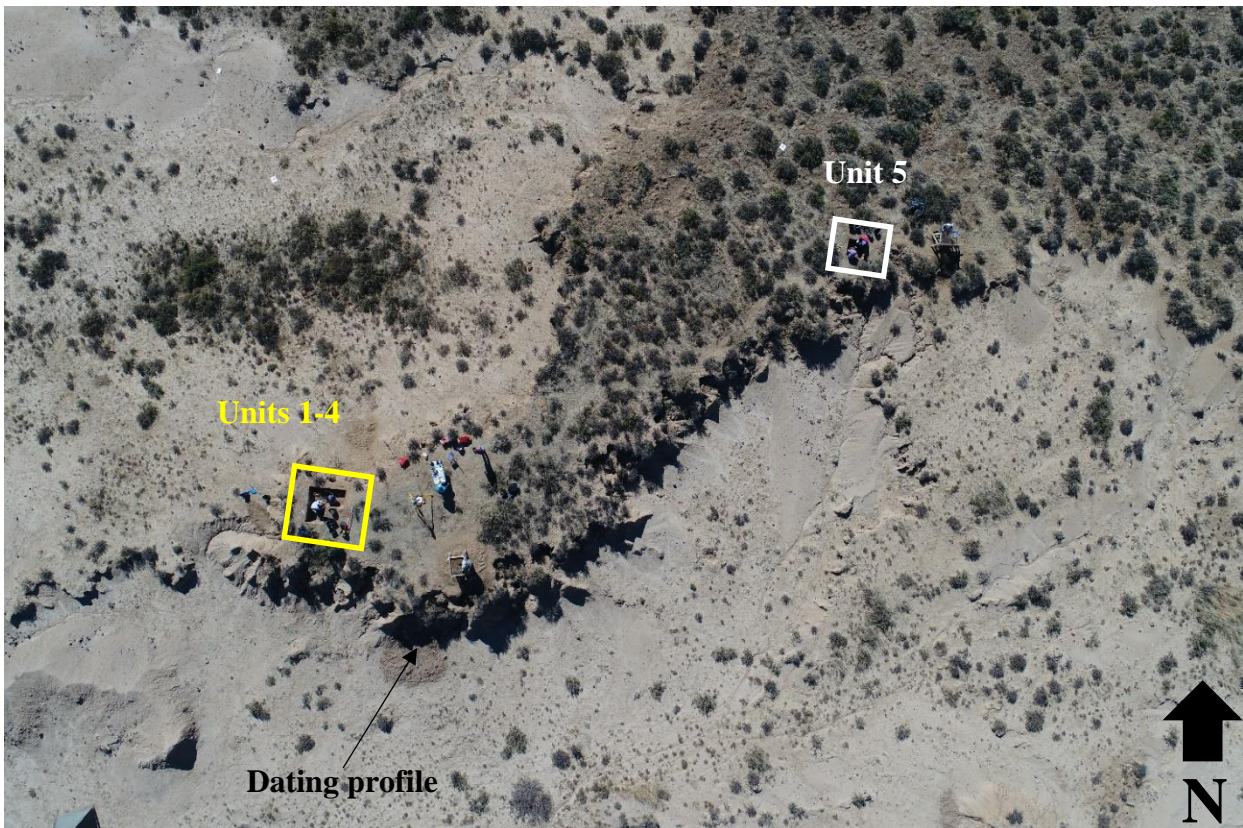


Figure 3. Aerial photo (2019 season) showing the location of excavation units and dating profile.



Figure 4. Unit 4 during excavation (2021 season).

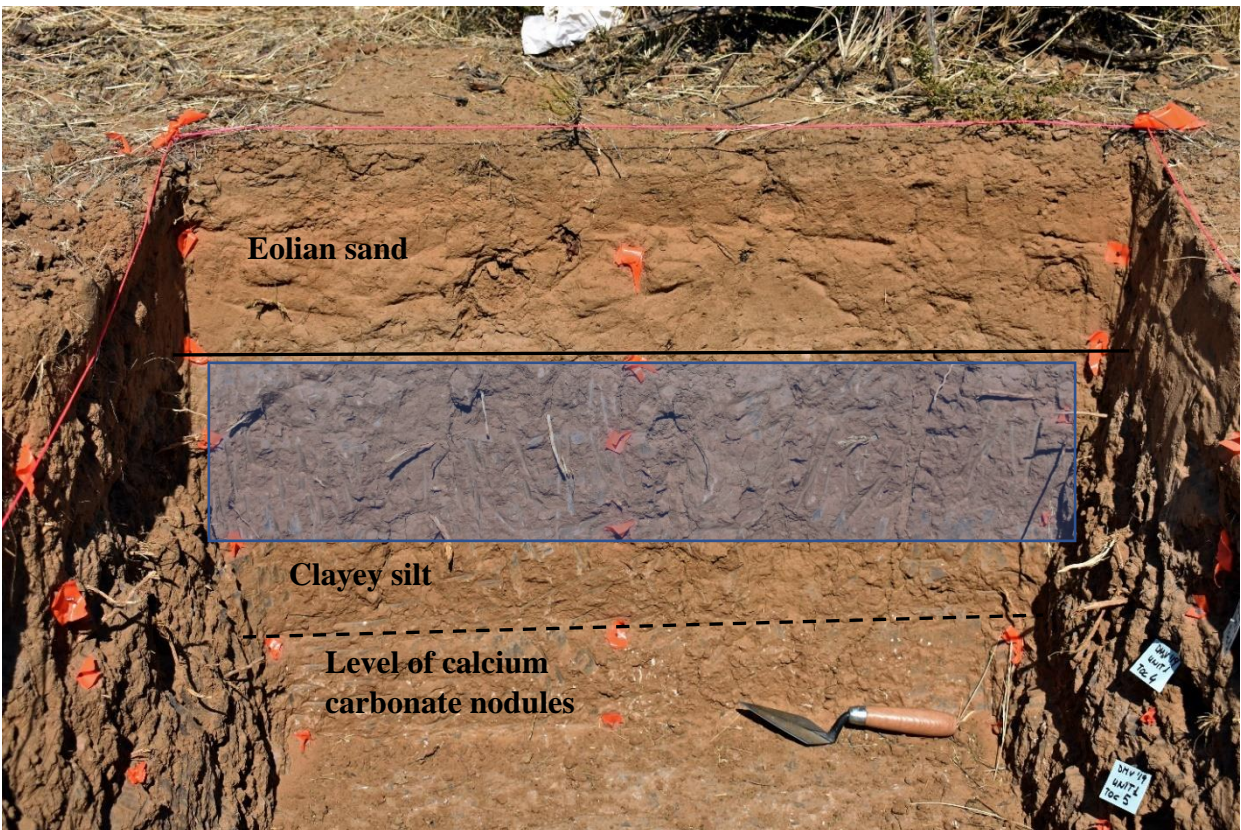


Figure 5. Profile photo of the south section of Unit 1, showing the stratigraphic sequence (2019 season). Orange tape marks the elevation of excavation levels, whereas the transparent rectangle marks the levels with the highest concentration of stone tools.



Figure 6. Photo of the dating profile, facing south (2019 season). The solid line marks the transition between eolian sand and clayey silt; dashed lines mark zones with varying content of calcium carbonate nodules. The hole is the collection site of a luminescence dating sample. Scale: 20 cm.



Figure 7. Thumbnail scraper made of hornfels, 2021 season.



Figure 8. Notched flake made of banded ironstone, 2021 season.