

Supplementary Material

1 Supplementary Figures and Tables

The illustrations and the table shown here are a supplement to the results discussed in chapter 4 and to the discussion in chapter 5.3.

1.1 Supplementary Table

Table S1: Field description of sedimentological units of the excavation quadrants F34, 35 and G34, 35. Information about grain size are according to the scale by Udden (1914) and Wentworth (1922).

Unit	Description
I	<p>Multi-layered anthropogenic surface unit: Grayish brown to light brown sediment with a main grain size of silt to fine sand and a moderate to poor sorting. The medium to coarse grained gravels are angular to subangular rounded with a high to medium sphericity. The gravels are identified as trachytic rock, from the common bed rock. The main sediment is compact and crumbly with firm aggregates. Macroscopic grading or bedding are absent.</p> <p>Only few charcoal fragments but also unburned botanical remains. Sherds of recent, black-colored pottery. The few obsidian lithics seem to be displaced. This is the only anthropogenic layer where bones are preserved. A pit filled with charcoal, ash and potsherds in square F35 extends down to Unit III.</p>
II	<p>Multi-layered geogenic unit with an upper light brownish grayish layer, a lighter colored tephra in the middle and a bright white to light gray tephra at the bottom of the unit. The upper layer has a main grain size of coarse silt to fine sand (medium sand). The coloration of this layer differs within the excavation squares, e.g. the brownish gray color in square G35 is much darker. Sediment aggregates and brown round lenses are included in a low frequency.</p> <p>The transition to the lower layer is gradual in F35, with thin brownish, discontinuous and horizontal microlamination (up to 2 mm thick). The lower situated tephra is thicker and lighter colored and has also a fine sand to coarse sand grain size. Brownish angular lenses (silt grains size) are less frequent and the main sediment is firm and seems well sorted and homogenous. The boundary to the lower layer is undulated and sharp.</p> <p>The lowest layer is not continuous, partly eroded and only exposed in square F34 and F35. The white to white gray colored tephra is very well sorted and homogenous. The main grain size is fine sand to medium sand.</p> <p>This unit is archaeological sterile.</p>

III	<p>Multi-layered anthropogenic unit with a dark greenish brown upper layer, a bright reddish-brown layer and a lower darker greenish brown layer. There is a sharp boundary to the above situated Unit II. The upper layer of this Unit III consists of clayish silt mixed with fine reddish lenses (0.5 - 1.0 cm) and charcoal (< 0.5 mm) particles. The reddish sediment layer also occurs as bright red and even orange red in square F35 and G35. This layer consists of particles with main grains size of fine sand to silt. Brownish angulate lenses are unevenly distributed in this layer. The lowest greenish-brown layer consists of fine silt with charcoal fragments and is enriched in organic material. This layer can be addressed as a transition area to the underlying unit IV, since thin volcanic ash lenses are intermingled. The change appears to be gradual.</p> <p>The sediment of this unit is very firm. Especially the bright red layers seem cemented and were hard to sample (sedimentology). Macroscopic bedding or grading are absent. The lower section of this unit is characterized by inhomogeneous distributed volcanic ash lenses (angular shape), that are comparable to the volcanic ash of Unit IV. Here the sediment seems disturbed.</p> <p>Archaeological finds are mainly obsidian stone artefacts and only few potsherds. Concentrations of charcoal fragments with some larger pieces up to 1 cm indicate the location of fireplaces. One hearth is bordered with big trachyte gravels. An artificial pit is documented in profile G35 and another pit filled with charcoal is preserved in square F35. Both pits extend into the underlying sediment Unit IV.</p>
IV	<p>Two-layered geogenic unit consisting of tephra with an upper greenish-gray layer and a lower grayish-white layer. This unit is discontinuous and tilts slightly in north direction (~10 %) as can be seen in the east profile of F35. Its thickness varies throughout the excavation squares. In square G35 the tephra layers are no longer a separate unit, but disturbed and mixed with the overlying anthropogenic sediment unit. The upper tephra has a main grain size of silty sand to medium sand and its boundary to the overlying unit is gradual with a color transition from gray to brown-gray. The frequency of intermingled brownish angular lenses decreases with increasing depth.</p> <p>A discontinuous transition with fine, brownish lamination (1mm thick) separates the upper layer from the lower part. The laminae have a fine clayish silt grain size. Single well-preserved charcoal pieces (≤ 1 cm) are distributed in the transition area.</p> <p>The lower layer of this unit is very well sorted and homogeneous. It has a main grain size of coarse silt to fine sand (medium sand). Grading or bedding is absent. Gravels or rock fragments are also absent. The boundary to the underlying Unit V is sharp and marked by a reddish-brown band (~ 0.5 mm) that has a clayish silt grain size.</p> <p>The origin of the charcoal is not yet clear, since there are no further archaeological remains in the layers. For this reason, this unit can be considered as archaeological sterile.</p>
V	<p>Multi-layered anthropogenic unit, with a clayish silt grain size. The main sediment of the upper layer is dark brown and relatively firm. Small gravels and single big subangular gravels with a medium to high sphericity are included. Their frequency is lower than in</p>

	<p>the above situated units. Isolated light-colored tephra lenses (2-4 cm thick) are found in the upper part of the unit. The tephra lenses have a similar composition as the tephra of Unit IV and seem to be displaced.</p> <p>The lower part of this unit is characterized by concentrations of charcoal fragments (up to 1.5 cm), indicating fireplaces. The sediment below the charcoal concentrations is red colored showing the impact of heat. Restricted to square F35 a discontinuous, irregular lens of light-colored tephra is situated directly underneath the reddish colored sediment below the hearth. The tephra seems dislocated and partly eroded. There is an extremely high density of archaeological finds, almost exclusively stone artefacts made of obsidian, in connection with the fireplaces. Remarkable are a large number of charred fruit kernels that were found in the fireplaces.</p> <p>The transition to the underlying Unit VI is gradual with an increase in clay content and red sediment color. It seems that both units V and VI are mixed in this transition area.</p>
VI	<p>Multi-layered geogenic unit. The thicker, upper layer is brown to reddish brown, followed by a yellowish layer and a brownish red layer.</p> <p>The sediment of the upper layer has a fine grain size from clayish silt to fine sandy silt. It is firm (cohesive), but with a crumbly and polyhedral fabric, caused by high clay content. The sediment is inhomogeneous with several lighter colored disturbances. The sediment is fine grained throughout, with a few isolated angular small gravels identified as trachyte.</p> <p>A slightly rounded trachytic boulder of 20 cm diameter with high sphericity marks the boundary to the underlying layer. This is brown colored with the same grain size as above, but with several small gravels. This layer is followed by a not continuous yellowish, firm layer with silt grain size that inclines slightly in square F35. The whole layer has a blocky structure, with thin brownish sediment in between the aggregate.</p> <p>This unit is archaeological sterile.</p>
VII	<p>Multi-layered anthropogenic unit. The upper part of this unit in square F35 and G35 is characterized by a rockfall layer of trachytic boulders with a maximum diameter of up to 70 cm (fig. 4). The boulders are irregular shaped, with a rounded upper surface and an angular lower surface. The finer grained (coarse silt to fine sand) sediment around the boulders includes several angular coarse gravels with a medium sphericity. There is a high density of lithic artefacts between and underneath the boulders, but only scattered charcoal pieces. In contrast to all other archaeological layers, the orientation of most stone artefacts is not horizontal but inclined.</p> <p>The sediment below is relative firm with a brown color and clayish silt to fine sandy silt grain size. It is not homogenous, with intermixed tephra in the lower part and seems disturbed. With increasing depth, the frequency of coarse gravel increases.</p>
VIII	<p>Thin light brownish geogenic unit with a sandy silt grainsize. The sediment is very firm with intermixed charcoal fragments. The frequency of angulate small gravels is much lower than in the unit above and the unit below. The lower section of this unit is</p>

	<p>characterized by several horizontal, yellow to gray colored layers, with a maximum thickness of < 0.5 mm. In some areas, these are interrupted by disturbances from the overlying anthropogenic Unit VII.</p> <p>The origin of the charcoal is not yet clear, since there are no further archaeological remains in the layers. For this reason, this unit can be considered as archaeological sterile.</p>
IX	<p>Multi-layered anthropogenic unit with a clayish silt to fine sandy silt grain size. The reddish-brown sediment is not homogeneous and seems slightly disturbed. This unit is very firm and includes medium to big angular/subangular trachytic gravels.</p> <p>Cultural material includes lithic artefacts mainly made of obsidian but also chert gains in importance as raw material for the stone tool production. Charcoal is rare but sometimes also larger pieces (≤ 1 cm) occur.</p>

1.2 Supplementary Figures

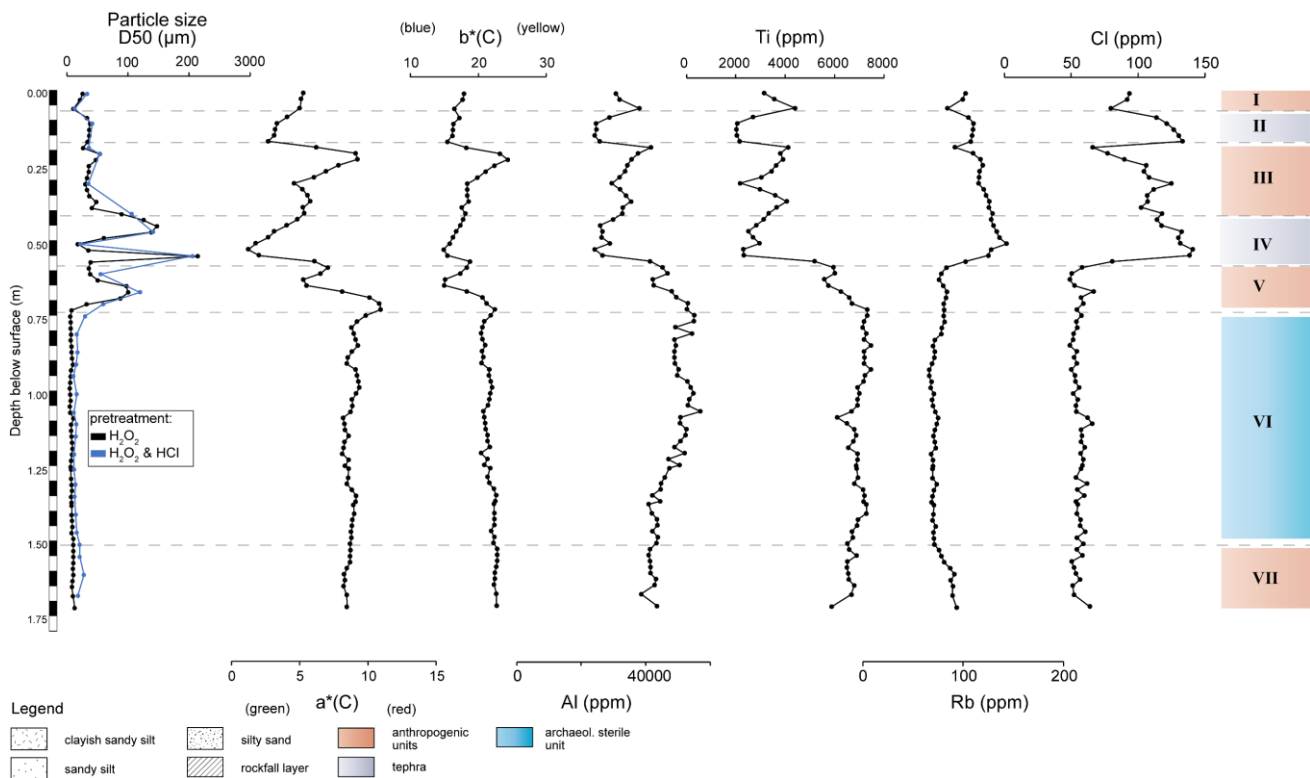


Figure S1. Further sedimentological and geochemical properties of the profile F35 at the Sodicho Rockshelter: median of particle size (pretreatment with H_2O_2 or H_2O_2 & HCl); CIELab color values a^* and b^* ; element trends (Al, Ti, Rb, Cl).

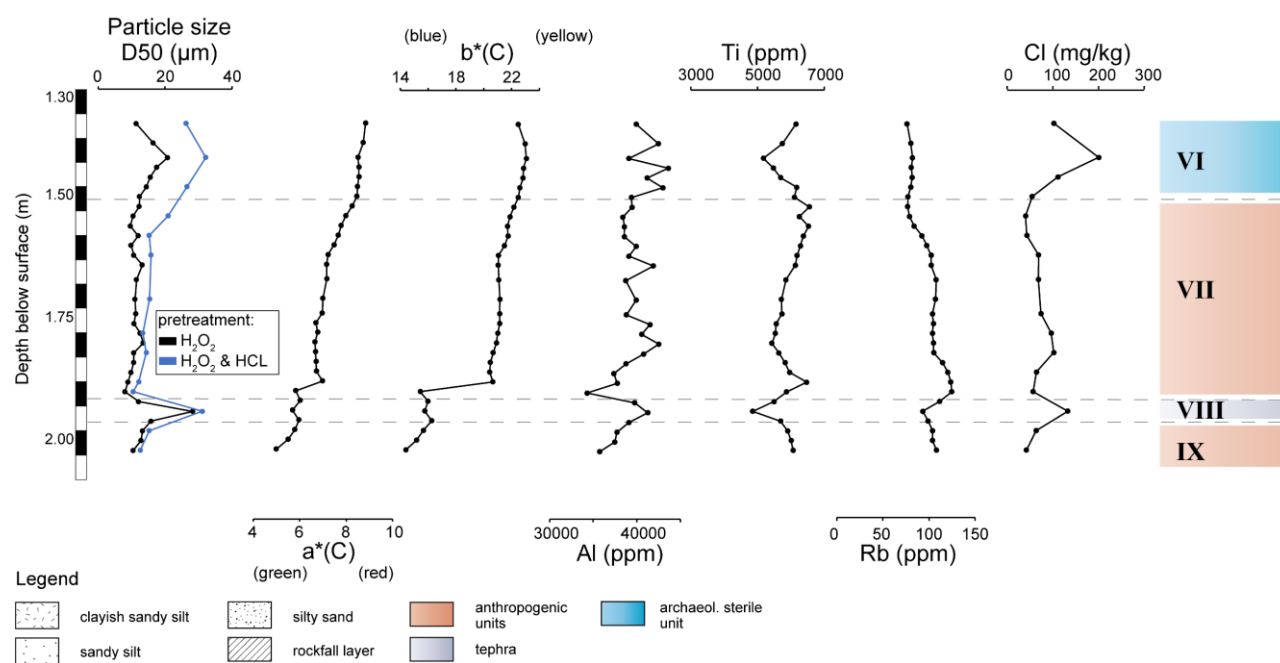


Figure S2. Further sedimentological and geochemical properties of the profile G35: median of particle size (pretreatment with H_2O_2 or H_2O_2 & HCL); CIELab color values a^* and b^* ; element trends (Al, Ti, Rb, Cl).

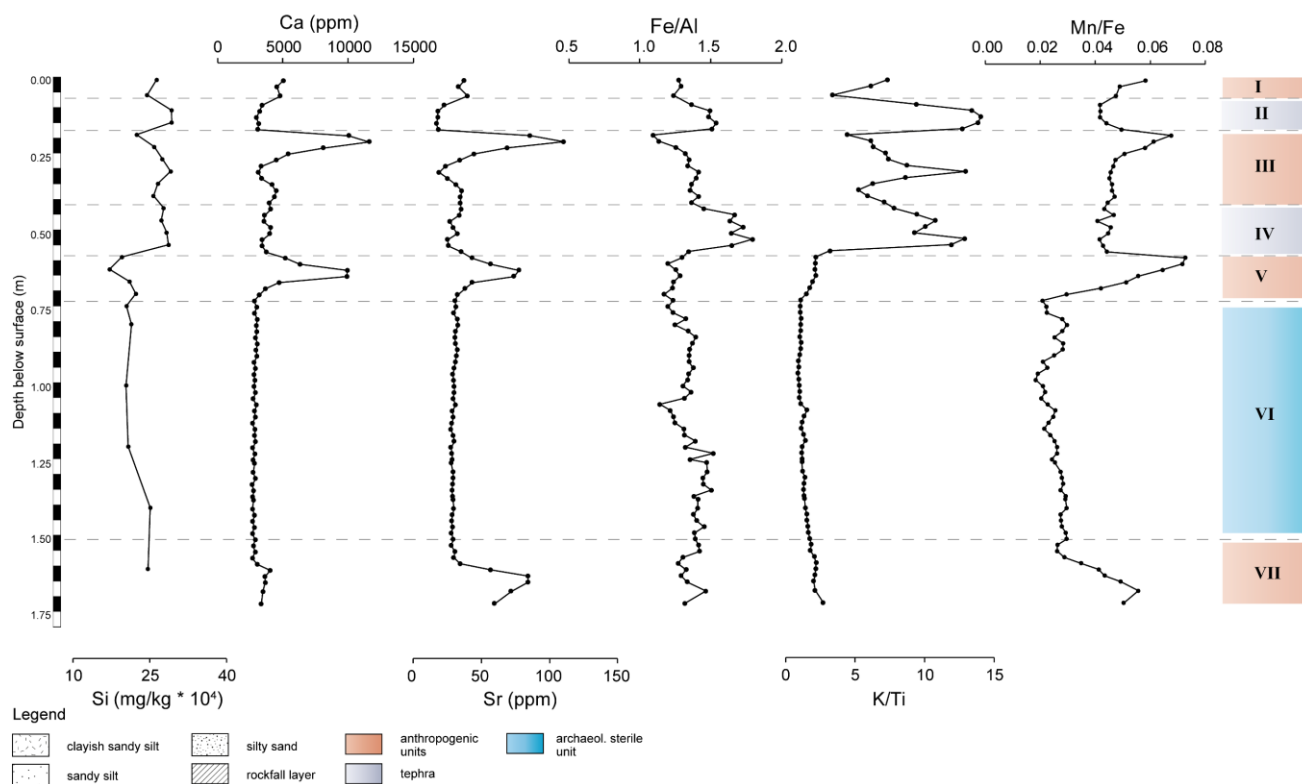


Figure S3. Further sedimentological and geochemical properties of the profile F35: element trends (Si, Ca, Sr); element ratios (Fe/Al, K/Ti, Mn/Fe).

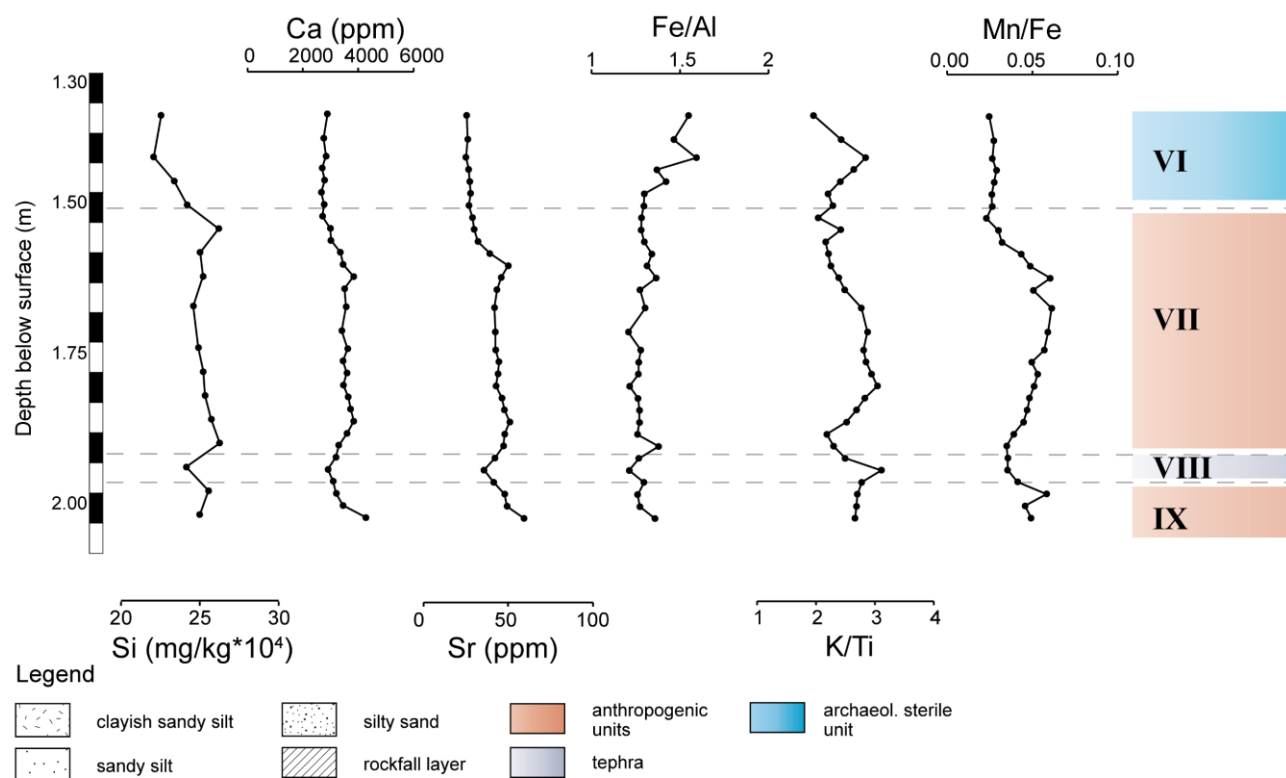


Figure S4. Further sedimentological and geochemical properties of the profile G35: element trends (Si, Ca, Sr); element ratios (Fe/Al, K/Ti, Mn/Fe).

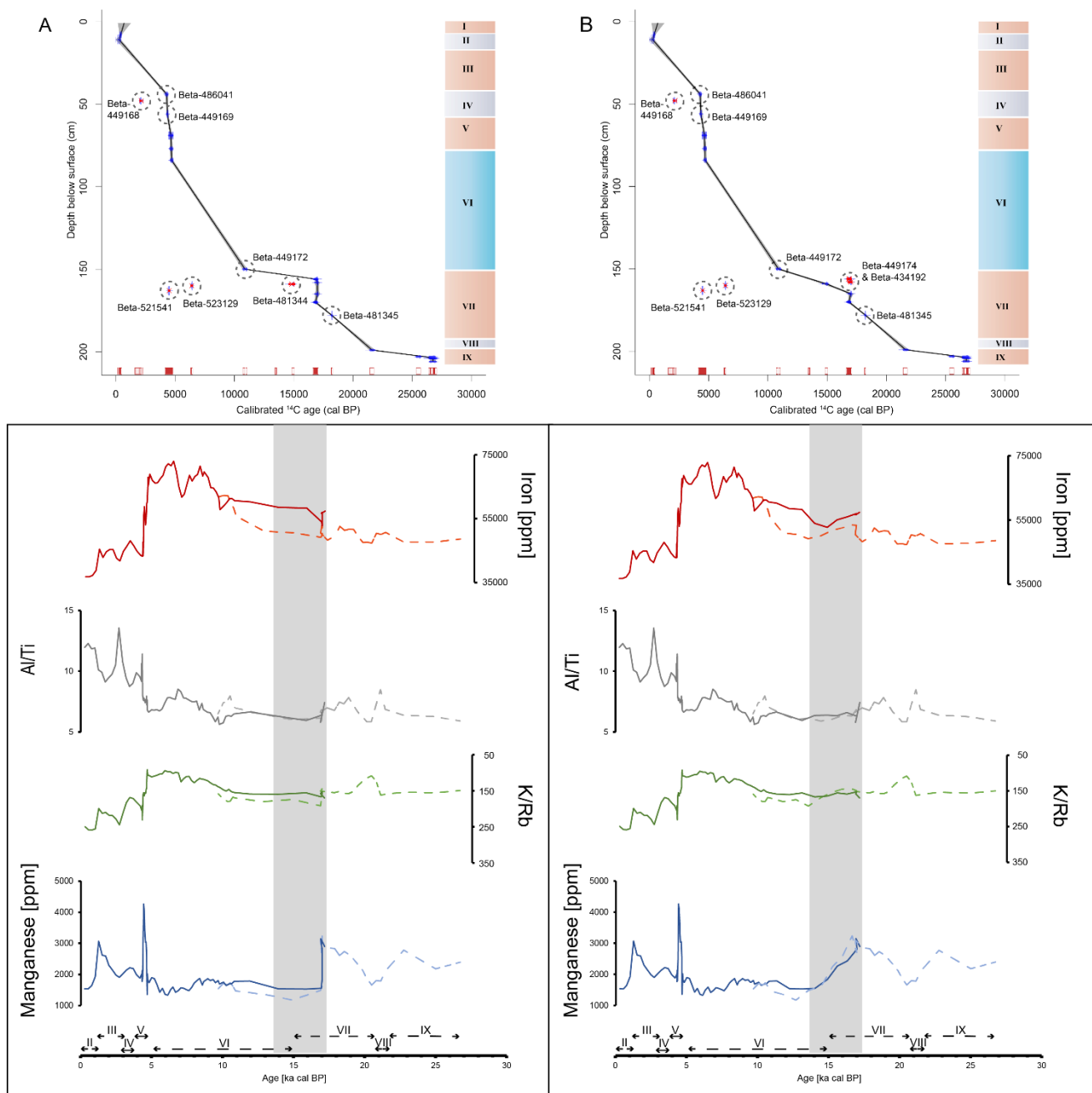


Figure S5. Comparison of two classical age-depth models for the Sodicho Rockshelter and the comparison of geochemical records calculated with the age data of the models; (A) For the age-depth model the sample Beta-481344 was excluded, resulting in a drop of Mn values and an increase in Fe values at ~ 17 ka cal BP; (B) For the age-depth model the sample Beta-481344 was included and the samples Beta-449174 and Beta-434192 were excluded, resulting in a gradual decrease in Mn values and a fluctuating increase in Fe values. There are only minor differences between the Al/Ti and K/Rb geochemical diagrams in A and B between 17 ka and 14 ka cal BP.