

Bat Archaeological Project Report of the 2018-19 Season



by

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Executive Summary

The 2018-19 season was concerned with identifying the intensity and kinds of land use in the Bat site. The study area consisted of a 0.23 km² space between the five main towers of Bat: Al-Rojoom, 1156, Al-Khafaji, Al-Ahliya, and Matariya. Thirty-nine transects were walked at 5 m intervals. All diagnostic finds were mapped and collected and a count of non-diagnostic finds kept for each transect. A total of 218 (180 previously undocumented) features were documented within the thirty-nine transects. The majority of identifiable feature types were walls, and the majority of artifacts represented belonged to the Bronze Age.

There is a clear variation in the distributions of ceramics across the site. Many of the transects indicate extensive use during the Umm an-Nar period. However, the transects around Matariya indicate use primarily during the early Umm an-Nar period and earlier; transects between Rojoom and Khafaji indicate use during the Iron Age and later; and transects between al-Ahliya and the Settlement Slope suggest use in the Pre-Modern period.

Petrographic analysis of ceramics from the Bat to 'Amlah areas show distinct changes both in time and in space. The ceramics from Bat South are the same as those from Bat, suggesting that the people lived and/or worked closely together.

The survey identified three areas for targeted excavation. These trenches focused on: (1) Hafit period mudbrick architecture east of Matariya tower; (2) intact Umm an-Nar deposits across from the Settlement Slope; and (3) varying ancient topography in the center of the site. Future fieldwork will focus on understanding the relationship between settlement, subsistence, and sociopolitical organization in prehistoric Bat and its environs.

Results of this research include: (1) presentation at the Seminar for Arabian Studies (July 2019) and (2) three separate presentations at the American Schools of Oriental Research conference (November 2019); (3) publication in the Proceedings of the Seminar for Arabian Studies (vol. 49); and (4) work on an article for *Arabian Archaeology and Epigraphy* (TBD).

Acknowledgments

We would like to thank His Excellency Undersecretary for Heritage Affairs Mr. Salim bin Mohammed Al-Mahruqi, Director General of Archaeology and Museums Mr. Sultan bin Saif Al-Bakri, Director of World Heritage Sites Mr. Sultan al Maqbali, Mr. Mohammed al-Waili, and all the staff members of the Department of Excavations and Archaeological Studies, the Ministry of Heritage and Culture, Sultanate of Oman, for their wonderful support to our mission.

We are also grateful to local staff members working in the field and offices, particularly to Ministry of Heritage and Culture Representatives at Bat Mr. Suleiman al-Jabri and Ms. 'Asma Al-Jassasi, for their tireless support in fieldwork and logistics.

We would also like to thank our friends and colleagues visiting us at Bat during the field season, in particular Dr. Selin Nugent (Oxford, UK).

Our project was financially supported by the Omani Ministry of Heritage and Culture and a grant from the Penn Museum Directors Fund to Dr. Jennifer Swerida.

1. Introduction

Jennifer L. Swerida and Charlotte M. Cable

1.1 Bat Archaeological Project (BAP)

The Bat Archaeological Project (BAP) began in 2007 under the direction of the late Professor Gregory L. Possehl. The first six seasons (2007-2012) focused in part on survey and excavation of the towers in and around Bat, focusing particularly on Kasr Al-Khafaji (Tower 1146), Matariya (Tower 1147), and Tower 1156 (Cable 2018; Thornton et al. 2016). The project joined forces for several seasons with the Japanese Team headed by Dr. Yasuhisa Kondo (Research Institute for Humanity and Nature, Japan) in what was known as the American-Japanese Bat Archaeological Project (AJBAP). Several field and study seasons followed with a new focus on third millennium BCE settlement and agriculture and resulted in the completion of two new PhD dissertations on the research at Bat.

Now in its 13th season, the Bat Archaeological Project (Penn Museum) continues its focus on the development of complex societies in the Greater Bat Area, but shifts its scale to encompass not only the well-studied towers, tombs, and Settlement Slope, but also paying greater attention to the areas that lie between them in order to understand Bronze Age subsistence practices and sociopolitical organization.

To this end, the project conducted intensive surveys and test excavations in the Bat heartland, in the southern quadrant of the UNESCO World Heritage Site at Bat. In addition, BAP has assisted the MHC by providing technical expertise in several areas:

- Identification of areas for further study in the face of modern development
- Providing feedback on the ongoing Visitor Center plans
- Proposing plans for tourist pathways
- Identifying areas for protection
- Develop tourism and outreach.

1.2 Research programs of the 2019 season

The 2019 season of the Bat Archaeological Project commenced on 25 December 2018 and ended on 31 January 2019. Research focused on the Bat “heartland”, a 23 ha area bounded by five third millennium towers and the Settlement Slope (Figure 1). The goals of this five-week season were four-fold:

- (1) to quantify artifact density variation and periodization;
- (2) to identify less visible architectural features;
- (3) to verify the extent of the buried deposits; and
- (4) to use these new data to inform site management.

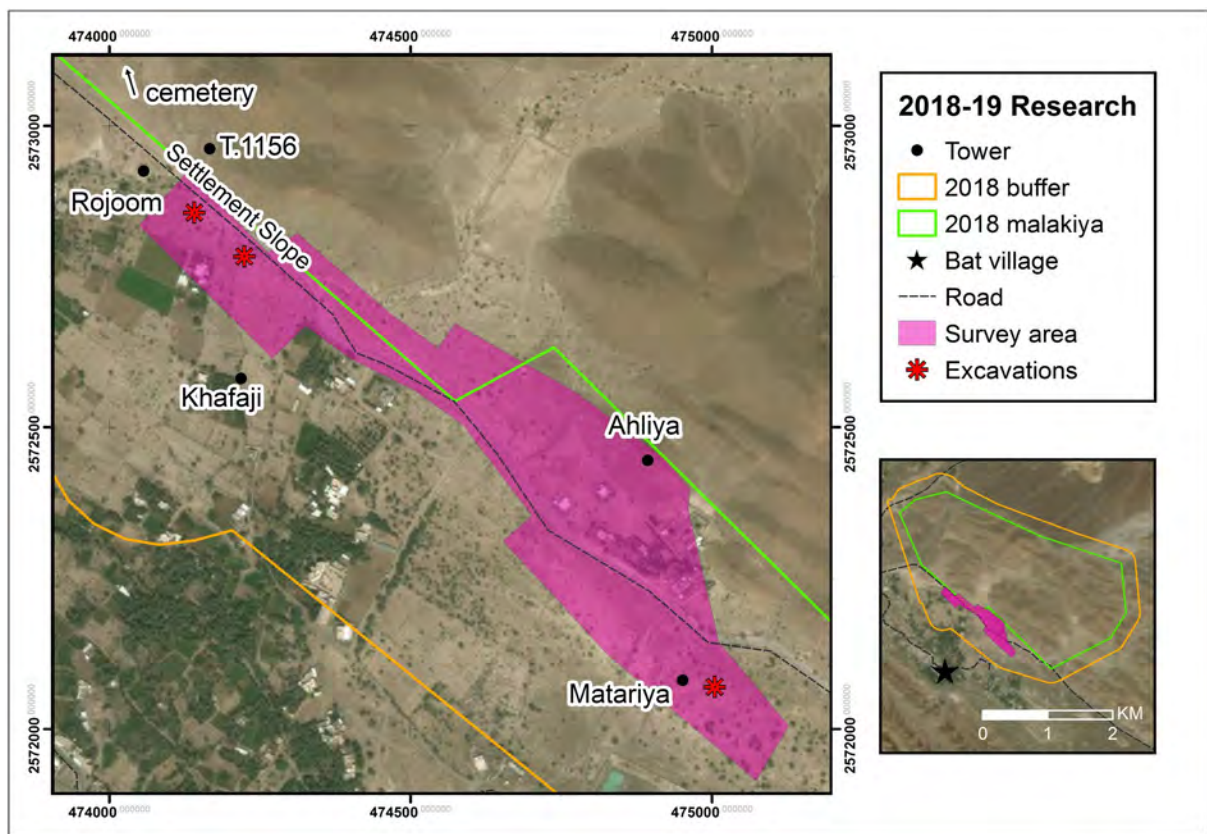


Figure 1. BAP's 2018-19 survey area and excavations.

1.2.1 Survey

The Bat site surveys were coordinated by Dr. Charlotte Cable and Dr. Jennifer Swerida. Intensive archaeological survey was conducted in the area from Rojoom to east of Matariya between 31 December 2018 and 9 January 2019 (Section 2).

1.2.2 Test excavations

Archaeological excavations were coordinated by Dr. Jennifer Swerida and Dr. Charlotte Cable. Based on results of the intensive survey four test trenches were opened:

- Trench 67001, near Matariya's enclosure, aimed to identify dating and land use practices;
- Trench 67002 expanded trench 67001 to the west in order to define possible Hafit mudbrick architecture;
- Trench 45001, east of Qasr al-Rojoom, aimed to identify the existence and depth of Umm an-Nar remains; and
- Trench 45002, north of Qasr al-Khafaji, south to determine the depth of cultural deposits.

1.2.3. BAP's team members

BAP's research programs this season involved the following members:

Co-directors

Dr. Charlotte M. Cable, University of New England, Australia

Dr. Jennifer L. Swerida, Penn Museum, USA

Dr. Christopher P. Thornton, Penn Museum, USA

Assistant director

Dr. Eli N. Dollarhide, New York University, USA

Survey & excavation team

Dr. Stefan L. Smith, University of Ghent, the Netherlands

Ms. Reilly Jensen, SWCA, USA

Mr. James Green, Oxford Archaeology Limited, UK

Ms. Maria Kia Ofelia Da Silva, University of Pennsylvania, USA

Ms. Sophie Walsh, University of Pennsylvania, USA

Dr. Selin Nugent, Oxford University, UK

2. Archaeological Survey at Bat

Charlotte M. Cable and Jennifer L. Swerida

2.1 Introduction

Thirty-five years after the inscription of the sites of Bat, Al-Khutm and Al-Ayn on the UNESCO World Heritage list, new archaeological remains are still being discovered in and around the World Heritage Site. This is due in large part to more intensive survey that is informed by increasing expertise in Bat prehistoric and historic archaeology. As the first of a multi-year program, the BAP 2018-19 season focused on the space between Khafaji, Rojoom, 1156, Matariya, and Ahliya towers, with additional areas (such as the Settlement Slope) marking known locations of Umm an-Nar activity. For practical reasons, the survey of this research area was broken into four zones: (1) the Matariya survey zone; (2) the Rojoom/Khafaji survey zone; (3) the Settlement Slope survey zone; and (4) the al-Ahliya survey zone (Figure 2).

2.2 Methods

Along with excavation units (described in Section 3), transects and features were assigned individual “lot” numbers with the project season prefix (19) plus a unique number—for example, 190132. Transects, features, and diagnostic artifacts were mapped by means of a stand-alone GPS receiver (Garmin eTrex x20), while basic metadata were assigned to points using a handheld data collector (Trimble Juno 3B). Coordinates, when mentioned, refer to the WGS 1984 geographic coordinate system (UTM Zone 40Q) and Datum. Finds data, dimensions, and other characteristics of individual lots were described on a paper-based form. Each lot was also photographed and the images logged. Later, during post-processing, the disparate data sets were partially integrated for spatial visualization.

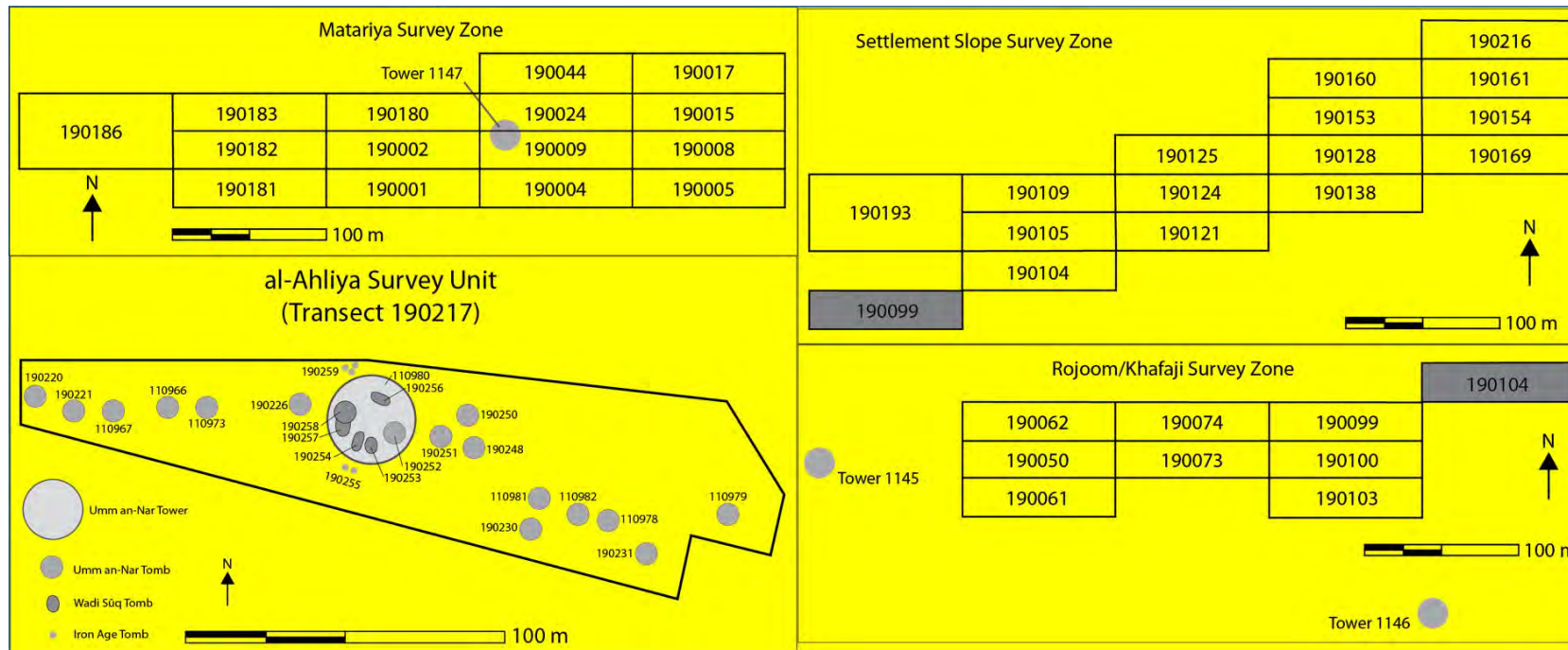


Figure 2. A schematic plan of the four survey zones, clockwise from upper left: Matariya, the Settlement Slope, Rojoom/Khafaji, and al-Ahliya.

2.3 Results

Thirty-seven transects, each roughly 25 m wide and 100 m long, and two “double-wide” transects (50 m wide and 100 m long) were undertaken within the study area (Figure 3; Appendix 7.1), amounting to ca. 10.25 ha. In that space 218 features were documented, 72 (33%) of which were datable to the Bronze Age -- accounting for nearly all (79%) of the identifiable features (Table 1, Figure 4, and Appendix 7.2).

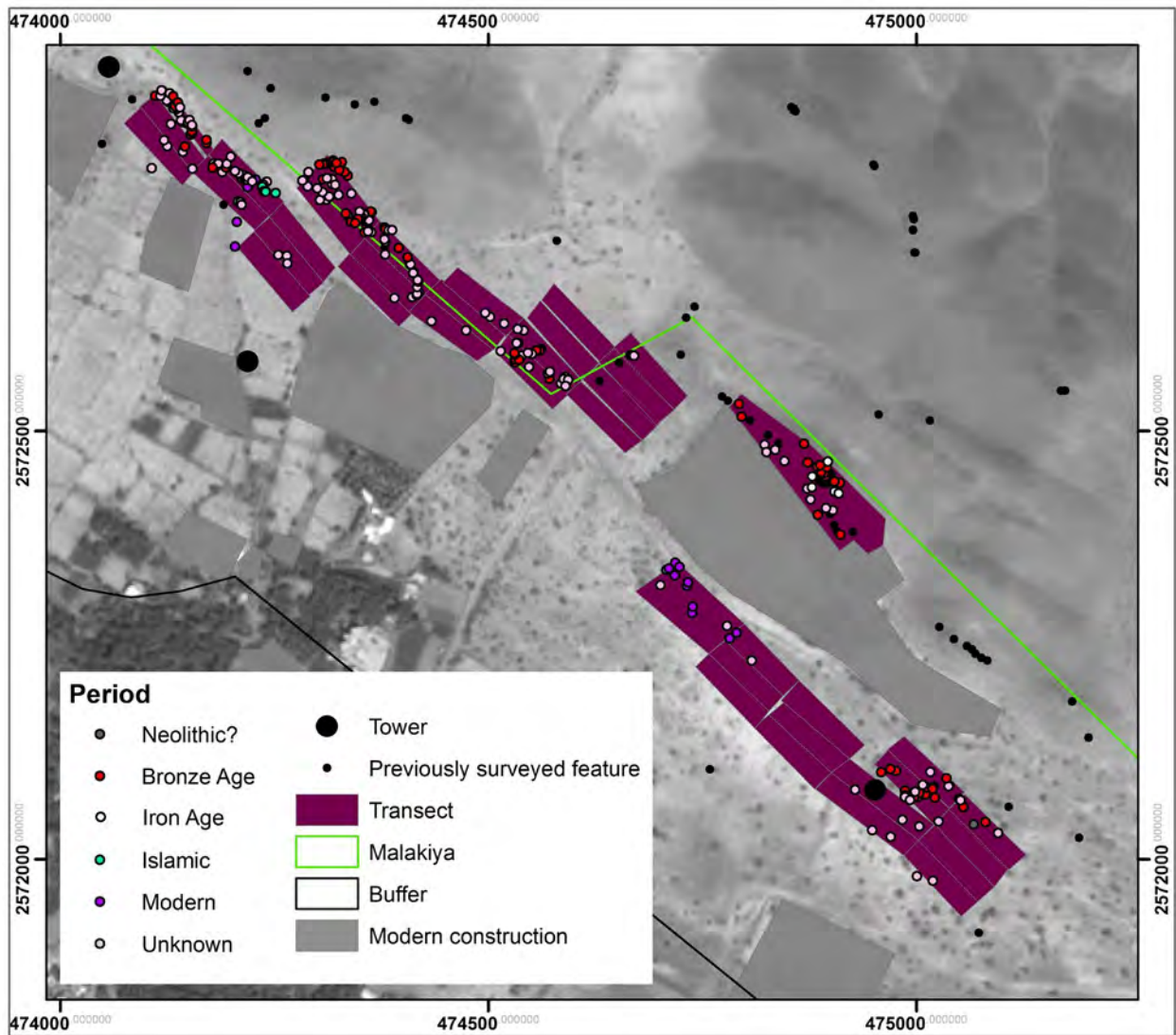


Figure 3. The 2018-19 survey area (in red) and the transects (in purple). The numbers (in white) are the lot numbers for each transect.

Table 1. Number of Features by Period.

| Period | number of features |
|------------|--------------------|
| pre-Bronze | 1 |
| Bronze Age | 72 |

| | |
|----------------|-----|
| Iron Age | 4 |
| Islamic period | 5 |
| Modern period | 9 |
| Unknown | 124 |

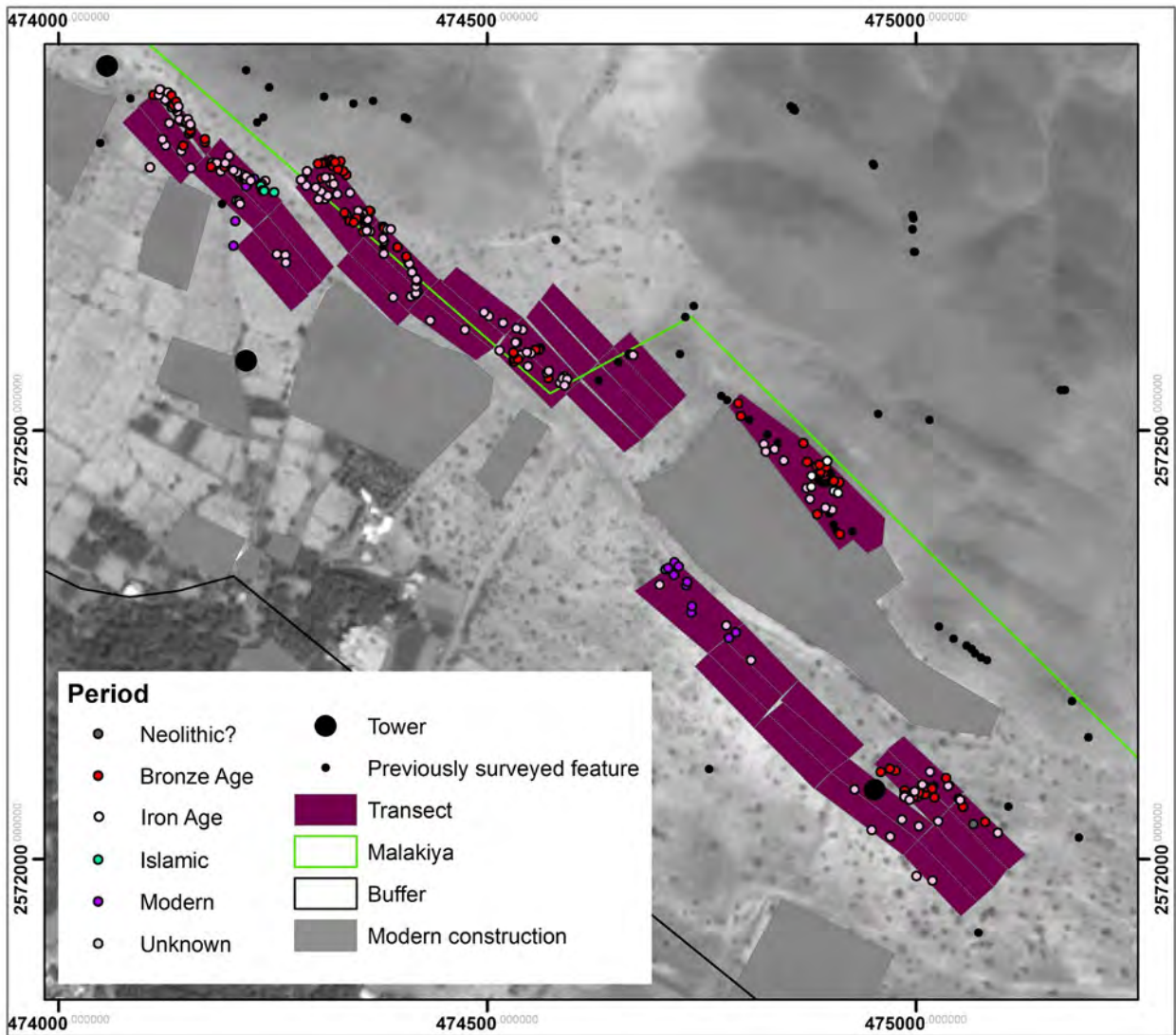


Figure 4. Overview of the distribution of features, documented in 2018-19, by time period.

Features were likely to be one of seven types: walls (n = 74); stone alignments (n = 45); stone concentrations (n = 31) or stone-and-soil mounds (n = 18); tombs (n = 18); dams or bunds (n = 5); or lithic concentrations (n = 3) (Table 2) (Figure 5). Walls were distinguished from stone alignments by the presence of even rough facing and tight spacing between individual stones. Stone concentrations were identified either within erosion cuts (where it is likely that other parts of the features were buried by alluvium and the exposed parts disturbed by erosion) or as possible clearance mounds on the surface.

Table 2. Number of Features by Type

| Feature type | Number of features |
|-------------------------|--------------------|
| wall | 74 |
| stone alignment | 45 |
| stone concentration | 31 |
| mound of stone and soil | 18 |
| tomb | 18 |
| dam/bund | 5 |
| lithic concentration | 3 |
| other | 24 |

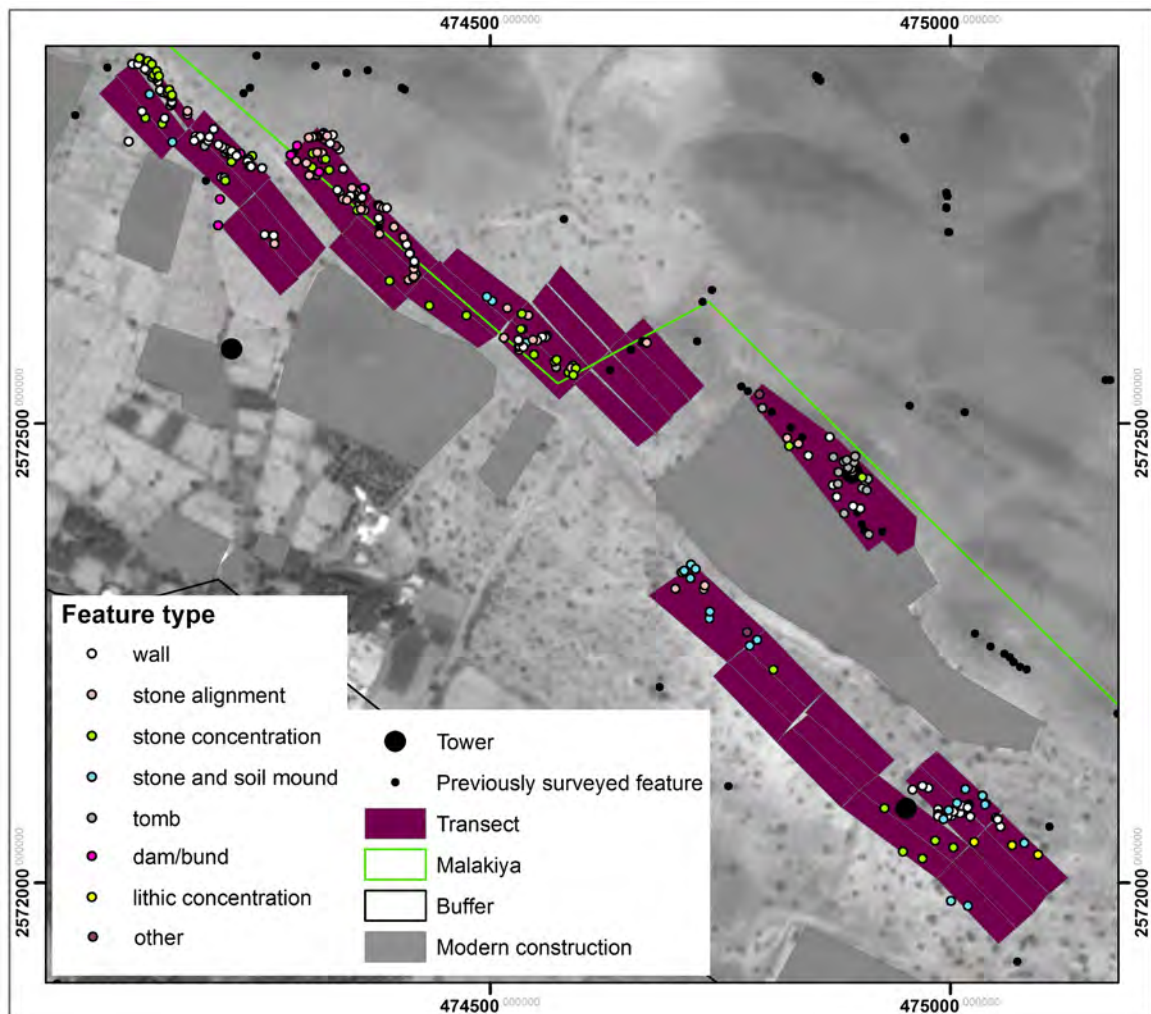


Figure 5. Overview of distribution of features, documented in 2018-19, by type.

Finds varied across transects. While lithics were somewhat ubiquitous (though see Section 4.4), ceramic counts varied considerably across space (Figure 6).

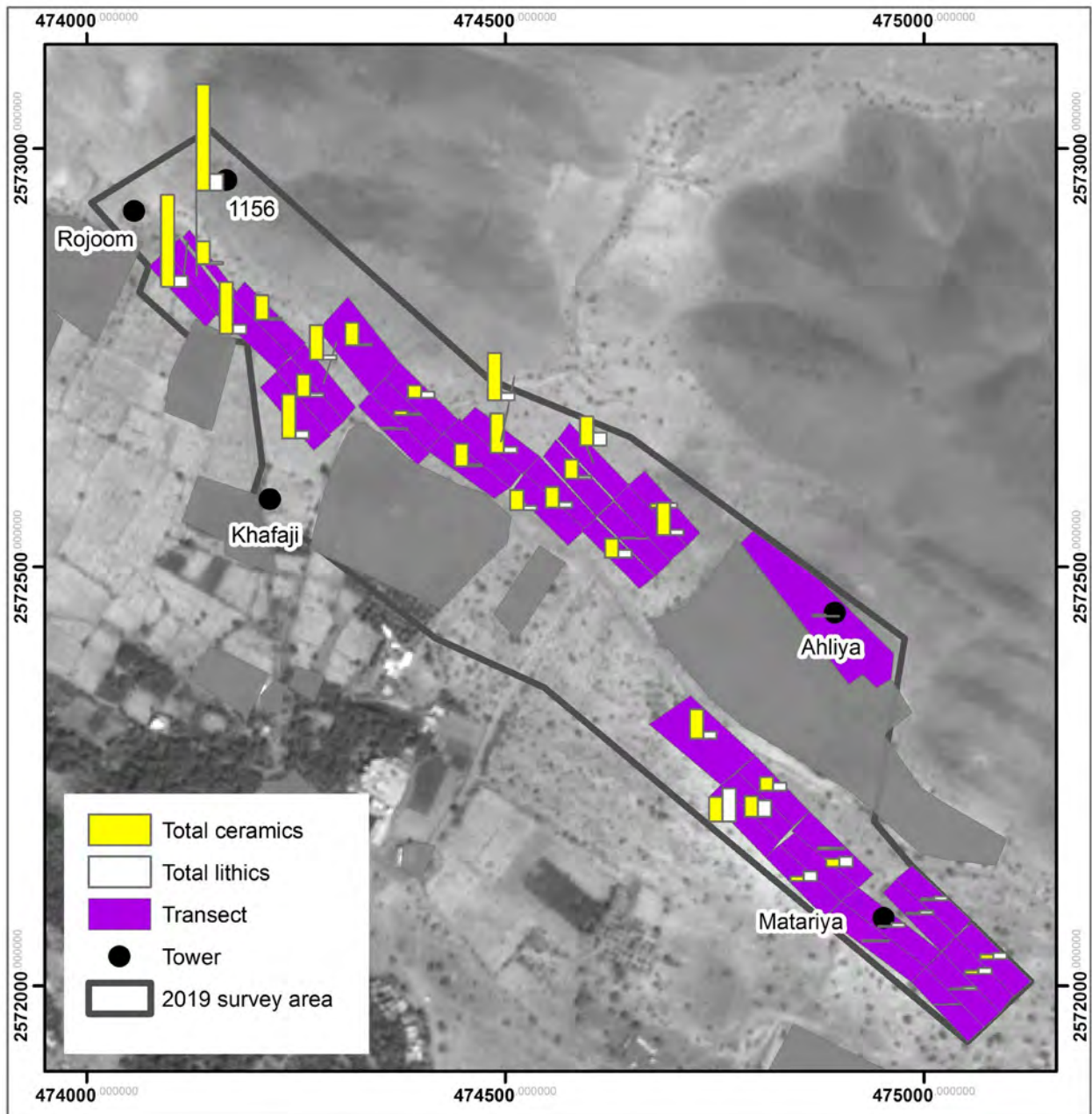


Figure 6. Map showing frequencies of ceramics (in yellow) and lithics (in white), by transect and normalized for area covered.

2.4 Documentation of rock art

Rock art was discovered on the face of a stone wall (Feature 190051) in Transect 190050, to the east of al-Rojoom (Figure 7). Petroglyphs were photographed in situ and GPS coordinates were recorded.



Figure 7. Rock art discovered on a wall. Top: Wall feature 190051, facing southeast. The rock art is on bottom course in the center, behind the sign. Below: close-up of the rock art. Note that the figures are upside down.

3. Test Excavations in Bat

Jennifer L. Swerida and Charlotte M. Cable

3.1.1 Introduction

Beginning in January of 2019, the Bat Archaeological Project (BAP) began the first of four planned seasons of excavation to investigate domestic structures and land-use strategies of the 3rd millennium BCE. Based on survey results, four locations were selected for targeted excavation this season (Figure 8):

- Trench 45001: Measuring 1 x 4 m. Located 125 m east of Qasr al-Rojoom and 100 m south of the Settlement Slope. The trench abuts an Umm an-Nar wall visible from the surface that runs parallel to the modern road and the Settlement Slope hill. This trench aimed to identify the existence and depth of Umm an-Nar remains in this part of the site.
- Trench 45002: Measuring 2 x 3 m. Located 200 m north of Qasr al-Khafaji and south of the modern road, in a location where a drainage channel has exposed stone and mudbrick walling. This trench aimed to determine the depth of cultural deposits.
- Trench 67001: Measuring 1 x 4 m. Located to the east of Matariya, partially within the circular “enclosure.” This trench aimed to date the stone features visible from the surface, to determine if earlier features existed beneath them, and to identify land use practices.
- Trench 67002: Measuring 1 x 1.5 m. Located immediately west of trench 67001. This trench expanded the north half of trench 67001 in order to define possible Hafit mudbrick architecture that was identified below the stone architecture visible on the surface.

The findings from these trenches will guide plans for excavation and geophysical analysis in future field seasons.

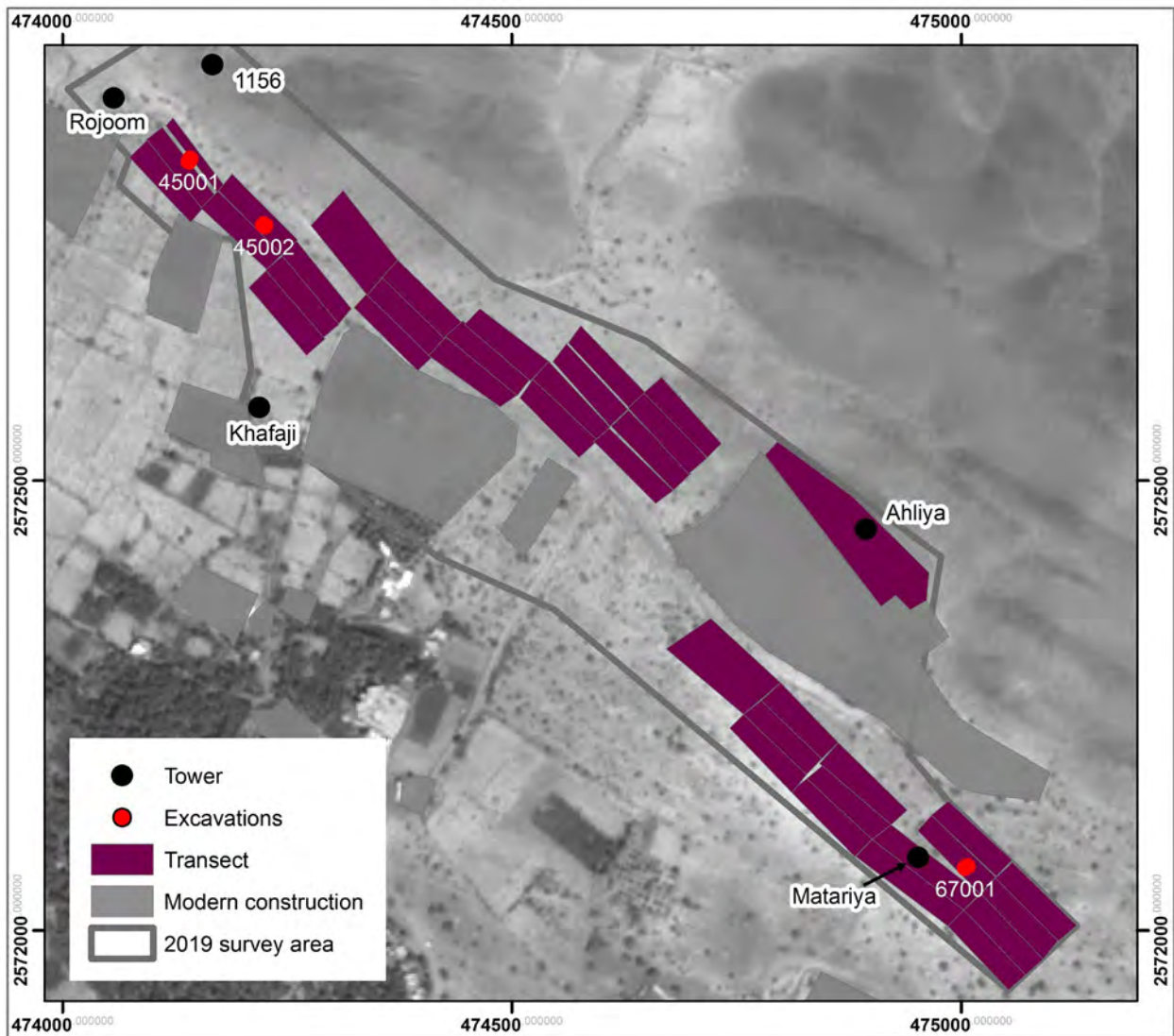


Figure 8. The locations of 2018-19 test trenches (in red).

3.2. Methodology

Test trenches were assigned unique “trench” numbers with a prefix taken from the published monument they are closest to (i.e., the trenches near to al-Rojoom (tower 1145) have the prefix “45” and the trenches near to the Matariya enclosure (feature 1167) begin with “67”) followed by a unique number – for example, Trench 45002. Trenches were aligned according to existing grids established by BAP for the Settlement Slope and Matariya in previous years. The locations of each trench and the excavated contexts within them were recorded by total station.

During excavation, all contexts or “lots” (dirt context, feature, or sample) were given a unique number consisting of the project season prefix (19) plus a unique number – for example, 190514. Each trench was assigned its own series of lot numbers (with the exception of Trench 67002, which continued the lot series from Trench 67001):

- Trench 45001 = Lot series 190600s
- Trench 45002 = Lot series 190700s

- Trenches 67001 and 67002 = Lot series 190500s

Finds data, dimensions, and other characteristics of individual lots were described on a paper-based form. Each lot was also photographed and the images logged. Later, during post-processing, the disparate data sets were partially integrated for spatial visualization.

3.3. Results

Three trenches were opened initially, with a fourth added to extend the horizontal exposure of 67001 (see Figure 8).

3.3.1 Trench 67001

Trench 67001 was the first of the three test trenches of the season, excavated from 8 to 10 January (see Figure 8). It was located on the Matariya grid and followed that orientation (56° off of magnetic North). The trench was 4 m long and 1 m wide and spanned a section of a wall identified by Frifelt (2002: Fig 3) as 1167a and 1167b, a double-phased “enclosure” wall. Within the enclosure Frifelt identified numerous fireplaces and deep cooking pits, while surrounding the enclosure she found evidence for wet and dry ditches. Frifelt hypothesized that the enclosure (1167) dates to “the last phase of the tower [Matariya]” (2002: 109)—i.e., mid- to late-Umm an-Nar—and suggested that the area was used as a caravanserai.

With the dating and the functional associations still in question, it was decided that a test trench along the enclosure wall (excavated as lot 190502) would prove profitable. Excavations proceeded separately on each side of the enclosure wall. The enclosure wall itself, in accordance with Frifelt’s own results, was only one to two courses tall with no trace of a superstructure. Nevertheless, the construction style of this wall is comparable to mid-Umm an-Nar period architecture elsewhere at Bat.

On the south side of Trench 67001, beyond the enclosure wall 190502, there appeared on the surface to be a small mound of silt and cobbles similar to those documented by Frifelt (Figure 9). Excavators encountered little material culture in this silt mound, suggesting that it was a natural accumulation. Below the silty topsoil, and running beneath stone wall 190502, is a thick (ca. 30-60 cm) layer of semi-compact silt, clay, and small cobbles. A small pit containing compact silt, stones, and a layer of hardened calcite deposit along its bottom was found cut into the semi-compact clay. Neither the pit nor the clay layer contained any material culture of note. Below the layer of semi-compact clay is a layer of dense, grey-brown clay with inclusions of small wadi cobbles and no material culture.

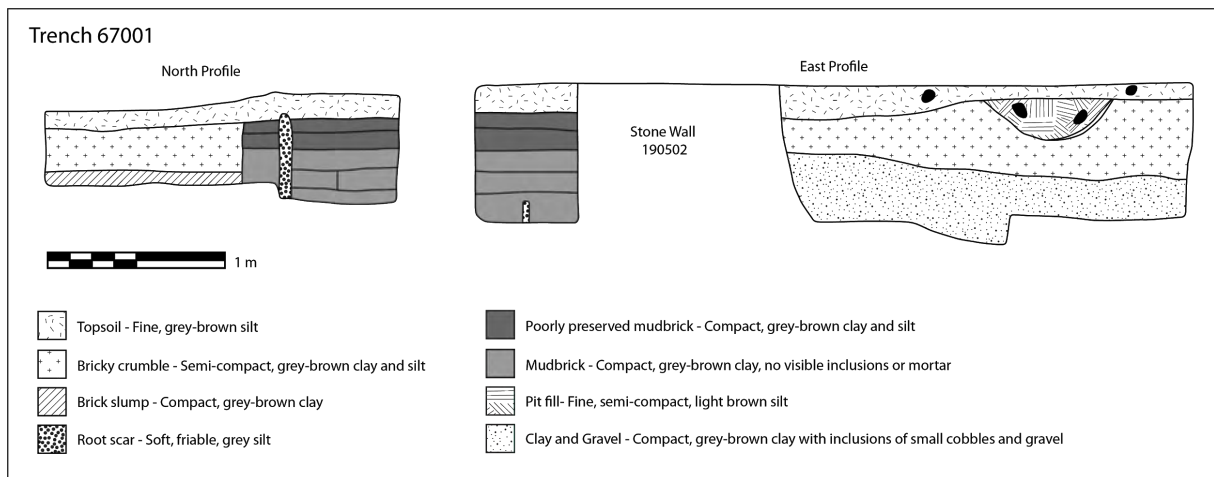


Figure 9. North and East profiles from Trench 67001.

On the north side of Trench 67001, within the enclosure wall 190502, excavators identified the top of what proved to be a mudbrick wall just beneath the topsoil (ca. 15 cm below the surface) (Figure 10). Although the upper two courses of mudbrick are poorly preserved, it is clear that they exist below, and thus predate, the enclosure wall 190502. The bricks are approximately 8–10 cm thick and are composed of a dense, grey-brown clay with no visible chaff. With one exception, no vertical breaks between bricks were visible.



Figure 10. The northern end of Trenches 67001 and 67002, looking northeast.

In order to further define and date the mudbrick, Trench 67002 was excavated in the space immediately west of Trench 67001 to the north of wall 190502. This new trench was approximately 1 m wide and 1.5 m long and was excavated from 21 to 22 January. Excavations revealed that the mudbrick formed a wall oriented north-south, in alignment with the trench, that is preserved at least five bricks in height. No ceramics or other material culture were

found in the contexts to the west of the mudbrick wall, raising the probability that this architectural phase dates to the Hafit period. An occupation dating to the Hafit period would correspond with the early phases of the nearby Matariya tower.

3.3.2 *Trench 45001*

Trench 54001 is located approximately 125 m east of Rojoom and 75 m south of the Settlement Slope hill, just south of the modern dirt road. This location was selected for excavation during pedestrian survey due to the presence of an Umm an-Nar wall (lot 190601) and ~1.5 m of accumulated sediment, visible in the road cut to the north. It was hoped that this trench would determine if Umm an-Nar contexts were preserved in the field to the east of Rojoom and, if so, the depth of those remains. The trench is 5 m long by 1 m wide, follows the orientation of the Settlement Slope grid, and was excavated between 11 and 14 January.

Contexts in trench 45001 were divided into two areas by the east-west wall 190601, which crosses the northern end of the trench: a ~1 x 1 m space to the north of the wall and a ~1 x 4 m space to the south of the wall. As contexts to the north of wall 190601 are heavily eroded by the nearby road cut, excavations were not necessary in this small area.

In the southern portion of the trench, the earliest context reached is an Umm an-Nar packed clay surface (lot 190615) on which wall 190601 is constructed, approximately 90 cm below the surface. The wall is constructed of two rows of horizontal limestone blocks, is preserved three large stone courses in height, and has a dense mud mortar—a construction style typical of mid-Umm an-Nar architecture at Bat (Figure 11). However, the scale of this wall is significantly larger than is typically found in Umm an-Nar domestic architecture. The clay surface slopes gently downhill to the south, possibly following the natural topography of the Settlement Slope hill's lower slope. No artifacts or additional features were found in association with this surface. The location of the wall and orientation of the surface slope suggests that this may be the outer edge of the Settlement Slope occupational zone.

Directly above the surface were a series of sand and gravel lenses consistent with wadi deposits (Figure 12). Few ceramics dating to the Iron Age suggest that the flooding event(s) that deposited these lenses took place significantly after the surface's primary period of use. A thick, ca. 50 cm layer of semi-compact clay and silt with irregular clumps of mudbrick is located above the wadi deposits. Ceramics from this layer date it to the early Islamic era. The mudbrick fragments suggest that architecture once existed in this area prior to its use as a modern field system. A large, silty pit containing ash, cobbles, and few pieces of Iron Age and Islamic pottery cuts the clay and mudbrick layer and runs up against the south face of wall 190601. These probable early Islamic period contexts are covered by 20 cm of fine, silty topsoil.

The results of Trench 45001 show that Umm an-Nar contexts may yet be preserved within the field system to the east of Rojoom at a depth of ~1 m. Any such contexts are likely impacted by flooding events. Nevertheless, this area has the potential to provide valuable information on Umm an-Nar land-use and site composition between the occupational contexts on the Settlement Slope and the monumental contexts at al-Rojoom.



Figure 11. Wall 190601 from the south.

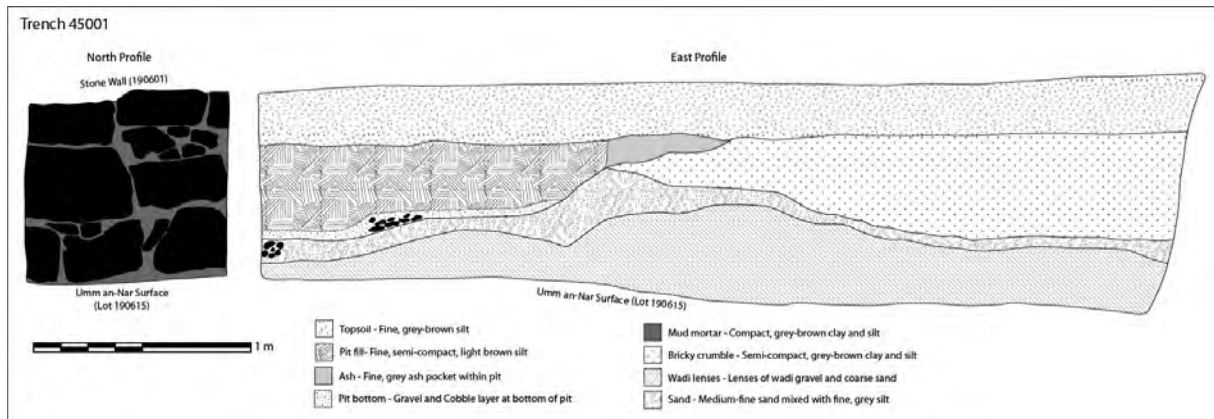


Figure 12. North and East profiles of Trench 45001.

3.3.3 Trench 45002

Trench 45002 is located 200 m north of Khafaji, 215 m southeast of Rojoom, and 108 m southeast of Trench 45001 (see Figure 8). The site was identified during pedestrian survey due to a series of deep erosion cuts that had laid bare the stone foundations of two large abutting walls (190084 and 190085). Though the construction style of the walls – upright stones forming the faces of the walls with rubble fill between them – was almost certainly of an Islamic date, the location was chosen for excavation as a means of identifying the depth of deposits and the likely intactness of the Umm an-Nar levels. To this end a 2 x 3 m trench, oriented on the same

grid as 45001 (i.e., the Settlement Slope grid), was laid out over the exposed walls. Excavations began on January 10 and continued until January 15, when excavations closed due to time constraints.

The earliest 35 cm of excavated deposits consisted of mudbrick material and pockets of sandy silt (Figure 13). In the southwest corner of the west and south sections it was possible to identify mudbrick laid down between regular layers of sandy silt, but this was only clear after excavation and no vertical mudbrick lines were visible. Above this deposit was a compact clay surface ca. 4 cm thick. As this level coincided with (and abutted) the base of the stones making up the foundations for walls 190084 and 190085, the floor deposit should be assumed to be contemporary with the walls.

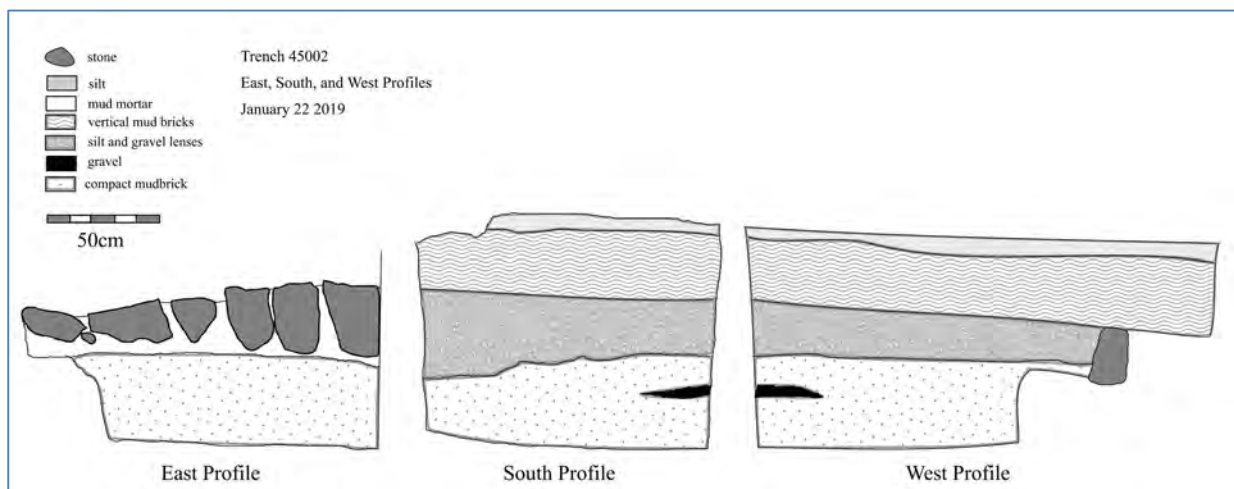


Figure 13. The east, south, and west sections of Trench 45002, showing four main phases.

Above the floor and inside the area defined by the walls were ca. 10 cm of loamy sand and lightly compacted silt with considerable pebble-sized stones, concentrated primarily in the northern half of the space. The deposit resembled that found in a stable, and there was a faint earthy smell to the matrix that strengthens this interpretation. A modern (post-1800) ceramic provides a rough *terminus ante quem* for this last use phase of the structure, and such reuse (i.e., as an animal pen) was not uncommon up until the mid-20th century). This phase was capped just below the top of the foundation stones by laminated layers of sandy silt that appears to have been wind and water deposited, suggesting that there was a final abandonment even after the structure's use as an animal pen.

The uppermost 45 cm began at the level of the top of the foundation stones of the wall. The deposit consisted of a silty clay matrix with *melanoides* shell, chaff voids, a few lithics, and small amounts of wadi gravel mixed in. Faint lines in the matrix formed rough outlines of bricks ca. 10 x 10 cm. The deposit ended at roughly the same level as the top of the stone foundations of 190084 and 190085. Based on the 40 cm-tall berms running along the entire terrace the current surface was likely the result of bulldozed mudbrick structures. Along with the ceramics, this indicates that the mudbrick structure likely dated to the late Islamic period.

While there is no direct way to know the dating of the mudbrick wall discovered below the Islamic period wall, the presence of such preserved materials 1m below the surface suggests that there is considerable depth to the deposits. This is somewhat surprising, as there are Umm an-Nar style walls visible on the surface a mere 40 m to the northwest of 45002. This suggests either that these Bronze Age walls are much later than expected or (more likely) that there is a strong drop in the Bronze or Iron Age surface in that direction.

4 Preliminary Finds Report

Eli Dollarhide, Charlotte Cable, and Jennifer Swerida

4.1 Ceramics

The ceramics analysis conducted as part of the Bat 2018-19 field season utilized a macro-stylistic approach and non-destructive techniques. Sherds were analyzed and sorted according to vessel form, ware/fabric type, surface treatment, and decoration. This information was then utilized to assess the time period in which each sherd was produced, in consultation with previous excavations at Bat and other published archaeological ceramic assemblages from the region.

All sherds were photographed in the context of their find-spot or associated lot and particularly interesting examples were illustrated (Figure 14).



Figure 14. A typical lot of diagnostic survey ceramics (in this case, from lot 190099) dominated by late Islamic ceramic fabric types.

4.1.1 Preliminary analysis

Table 3 shows the chronological periods used during the 2018-19 BAP field season (adapted from Thornton and Ghazal 2016, Potts 1992, Magee 1996, Whitcomb 1975, and Kennet 2004). In total, 1,339 ceramic sherds were examined during the 2019 season. Table 4 summarizes the sherd counts and archaeological periods represented in each lot from which pottery was collected.

An overwhelming majority of the ceramic assemblage (942, or 70%) was attributable to the Islamic period (Figure 15). Coarse Islamic combed wares known from across the peninsula (e.g. Sohar (Kervan 1994: 277); Layla and Jawf (Zarins *et al.* 1979)); glazed Bahla (Khunj) sherds (Kennet 2004: 42); and medium-coarse fabric impressed sherds, known from late Islamic through ethnographic contexts, were all common among the Islamic wares. In addition a few examples of Early Islamic turquoise glazed wares in buff fabrics (Kennet 2004: 29) were identified in Bat lots 190702, 190704, and 190184.

Table 3. Local Periodization Used in the Analyses Presented Here.

| | |
|--------------------------------------|---------------|
| Early Umm an-Nar | 2800–2500 BCE |
| Middle Umm an-Nar | 2500–2200 BCE |
| Late Umm an-Nar | 2200–2000 BCE |
| Wadi Suq | 2000–1300 BCE |
| Iron Age I | 1300–1100 BCE |
| Iron Age II | 1100–600 BCE |
| Iron Age III | 600–300 BCE |
| Late Pre-Islamic (Sasanian/Parthian) | 300 BC–635 CE |
| Early Islamic | 635–1055 CE |
| Middle Islamic | 1055–1500 CE |
| Late/Early Modern Islamic | 1500–1750 CE |
| Modern/Ethnographic | post 1750 CE |

Table 4. Sherd Counts by Period.

| Lot Number | Total Bronze Age | Total Iron Age / Late Pre-Islamic | Total Islamic | Modern | Unknown |
|------------|------------------|-----------------------------------|---------------|--------|---------|
| 110967 | 1 | 0 | 0 | 0 | 0 |
| 110968 | 1 | 0 | 0 | 0 | 0 |
| 190001 | 0 | 0 | 7 | 0 | 2 |
| 190002 | 0 | 1 | 9 | 0 | 0 |
| 190004 | 0 | 0 | 1 | 0 | 0 |
| 190008 | 0 | 1 | 0 | 0 | 0 |

| Lot Number | Total Bronze Age | Total Iron Age / Late Pre-Islamic | Total Islamic | Modern | Unknown |
|-------------------|-------------------------|--|----------------------|---------------|----------------|
| 190009 | 0 | 0 | 1 | 0 | 0 |
| 190015 | 0 | 1 | 4 | 0 | 0 |
| 190017 | 0 | 10 | 1 | 0 | 1 |
| 190020 | 0 | 0 | 0 | 0 | 1 |
| 190024 | 0 | 1 | 2 | 0 | 0 |
| 190050 | 2 | 12 | 108 | 1 | 12 |
| 190061 | 1 | 9 | 104 | 4 | 9 |
| 190062 | 0 | 0 | 21 | 0 | 0 |
| 190073 | 1 | 4 | 48 | 0 | 2 |
| 190074 | 1 | 2 | 26 | 0 | 2 |
| 190099 | 1 | 4 | 47 | 0 | 10 |
| 190100 | 3 | 6 | 27 | 0 | 10 |
| 190103 | 4 | 9 | 77 | 0 | 1 |
| 190104 | 0 | 0 | 1 | 0 | 0 |
| 190105 | 2 | 0 | 10 | 0 | 1 |
| 190106 | 0 | 0 | 2 | 0 | 0 |
| 190107 | 0 | 0 | 2 | 0 | 0 |
| 190109 | 2 | 5 | 8 | 0 | 0 |
| 190121 | 4 | 5 | 19 | 1 | 2 |
| 190125 | 10 | 3 | 23 | 0 | 7 |
| 190128 | 8 | 0 | 11 | 0 | 6 |
| 190138 | 15 | 1 | 4 | 0 | 3 |
| 190141 | 1 | 0 | 0 | 0 | 0 |
| 190153 | 6 | 0 | 11 | 0 | 0 |
| 190154 | 7 | 2 | 28 | 0 | 4 |
| 190155 | 1 | 0 | 1 | 0 | 0 |
| 190160 | 6 | 0 | 7 | 2 | 0 |
| 190161 | 0 | 3 | 15 | 0 | 5 |
| 190163 | 2 | 0 | 0 | 0 | 1 |
| 190169 | 5 | 1 | 4 | 0 | 3 |
| 190180 | 0 | 0 | 2 | 0 | 0 |
| 190181 | 0 | 0 | 32 | 0 | 0 |
| 190182 | 1 | 3 | 24 | 0 | 0 |

| Lot Number | Total Bronze Age | Total Iron Age/ Late Pre-Islamic | Total Islamic | Modern | Unknown |
|-------------------|-------------------------|---|----------------------|---------------|----------------|
| 190183 | 1 | 0 | 15 | 2 | 0 |
| 190184 | 0 | 4 | 24 | 0 | 1 |
| 190186 | 1 | 6 | 103 | 0 | 0 |
| 190188 | 0 | 1 | 4 | 0 | 0 |
| 190190 | 0 | 0 | 6 | 0 | 0 |
| 190193 | 59 | 9 | 18 | 0 | 6 |
| 190216 | 0 | 0 | 4 | 0 | 0 |
| 190217 | 13 | 0 | 0 | 0 | 3 |
| 190220 | 1 | 0 | 1 | 0 | 0 |
| 190233 | 1 | 0 | 0 | 0 | 0 |
| 190247 | 0 | 0 | 1 | 0 | 0 |
| 190249 | 0 | 1 | 0 | 0 | 0 |
| 190506 | 0 | 0 | 1 | 0 | 0 |
| 190600 | 0 | 1 | 13 | 0 | 0 |
| 190603 | 0 | 2 | 28 | 0 | 5 |
| 190604 | 0 | 0 | 2 | 0 | 1 |
| 190605 | 0 | 0 | 0 | 0 | 1 |
| 190606 | 0 | 2 | 7 | 0 | 2 |
| 190608 | 0 | 0 | 0 | 1 | 0 |
| 190610 | 0 | 0 | 0 | 0 | 1 |
| 190612 | 0 | 0 | 5 | 0 | 0 |
| 190613 | 0 | 2 | 1 | 0 | 1 |
| 190614 | 0 | 2 | 0 | 0 | 2 |
| 190700 | 0 | 0 | 0 | 1 | 0 |
| 190701 | 0 | 1 | 7 | 0 | 1 |
| 190702 | 0 | 0 | 11 | 0 | 3 |
| 190703 | 1 | 1 | 6 | 0 | 5 |
| 190704 | 0 | 1 | 5 | 1 | 0 |
| 190705 | 0 | 0 | 1 | 0 | 0 |
| 190706 | 0 | 0 | 0 | 0 | 1 |
| Total | 159 | 115 | 942 | 13 | 110 |

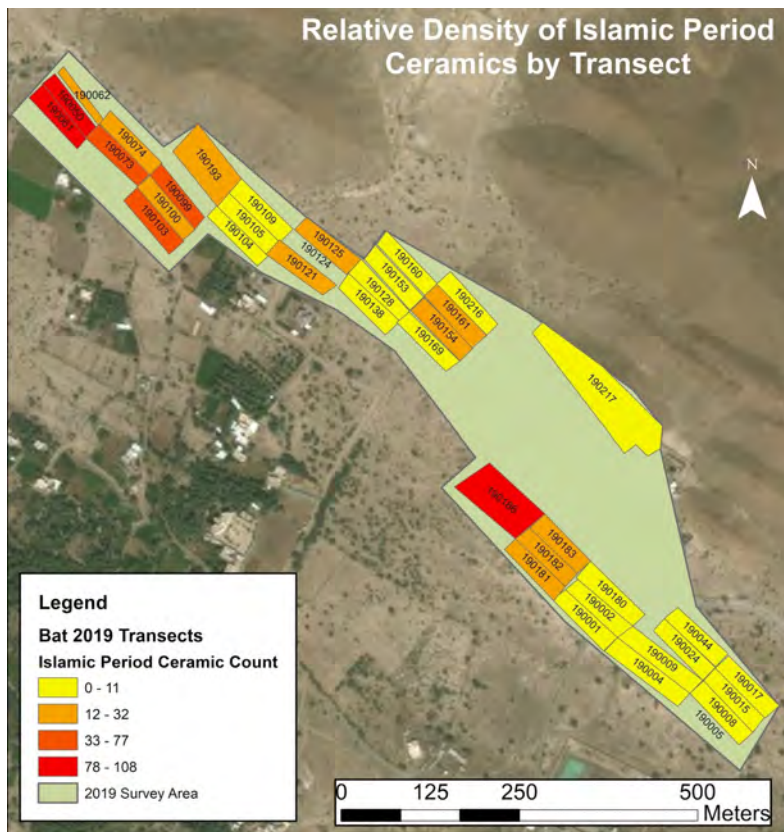


Figure 15. Density of Islamic period ceramics within transects.

Iron Age ceramics were a considerably rarer find in this season's survey operations (Figure 16). This is likely a product of a variety of factors including poor preservation conditions and, likely, a decreased intensity of occupation at Bat during the Iron Age. Of note among the Iron Age pottery collected is a slag-tempered Iron II/III period rim (lot 190184, Figure 17); a sherd from a large storage jar with a typical Iron Age raised band decoration (e.g. Boucharlat and Lombard 1985: pl 56) in lot 190188; a hand-formed handle in a typical Iron Age fabric in lot 190138; several late Iron Age and late pre-Islamic period rims in lot 190061; and a hand-formed, wheel-finished thin bowl fragment known from other Iron Age funerary contexts in the Bat region (Dollarhide *et al.* 2017: 26) in lot 190249.

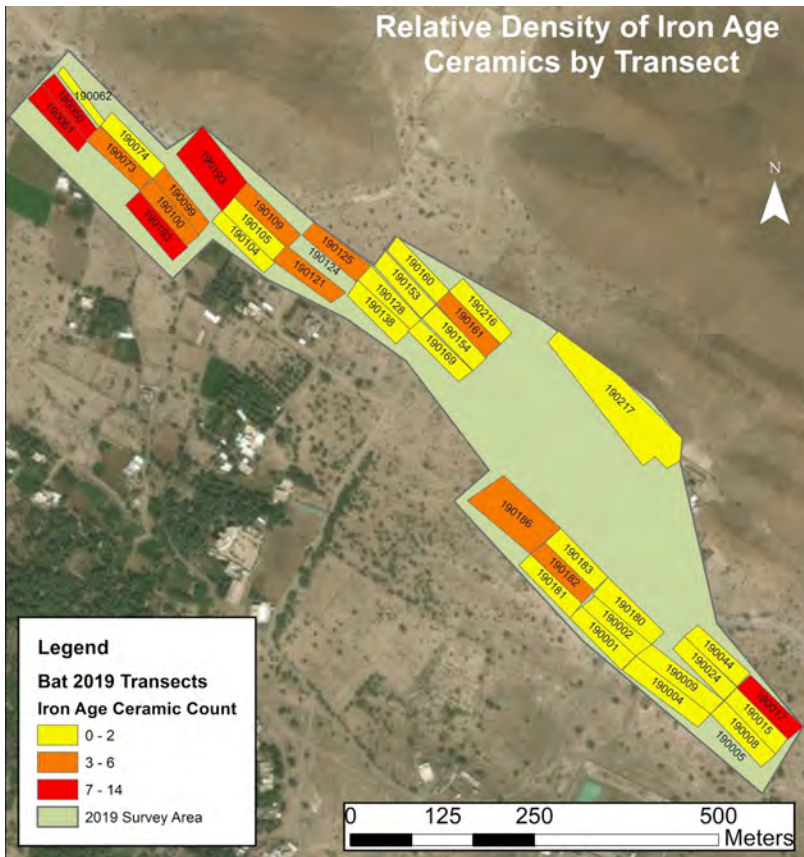


Figure 16. Density of Iron Age Ceramics within transects.

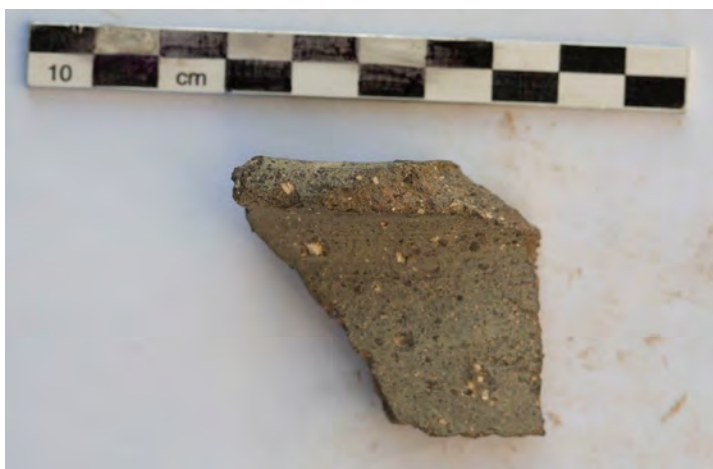


Figure 17. An Iron Age rim in a slag-tempered fabric (lot 190184).

Umm an-Nar period ceramics (Figure 18) were particularly well-represented in lots 190093; 190121; 190124; 190125; 190128; 190138; and 190193. The assemblage collected from lot 190193 is especially rich in both the quantity of Umm an-Nar sherds and the diversity of fabrics and forms present in its diagnostic assemblage. Included in lot 190193 are several fragments of Indus style black-slipped storage jar; many typical middle Umm an-Nar period rim sherds (analogous to Hili period IIC2/Bat Middle Umm an-Nar (Cleuziou 1989: 76; Thornton and Ghazal 2016); and a fragment of a black-on-grey ceramic vessel typical of Iran and commonly found in Umm an-Nar tombs (an additional example of an Iranian-style greyware was found in lot 190233; Figure 19). The relative chronological uniformity of the material from lot 190193 suggests a primary Bronze Age occupation of this area contemporaneous with the Settlement

Slope (Figure 20). Sherds in a Wadi Suq form were found in lots 190061, 190074, 190125, 190138, 190193, and in 190217, where a typical small painted beaker rim fragment was recovered.



Figure 18. Umm an-Nar diagnostic sherds from lot 190217.



Figure 19. A black-on-grey ware painted sherd, likely an import from Iran (lot 190233).

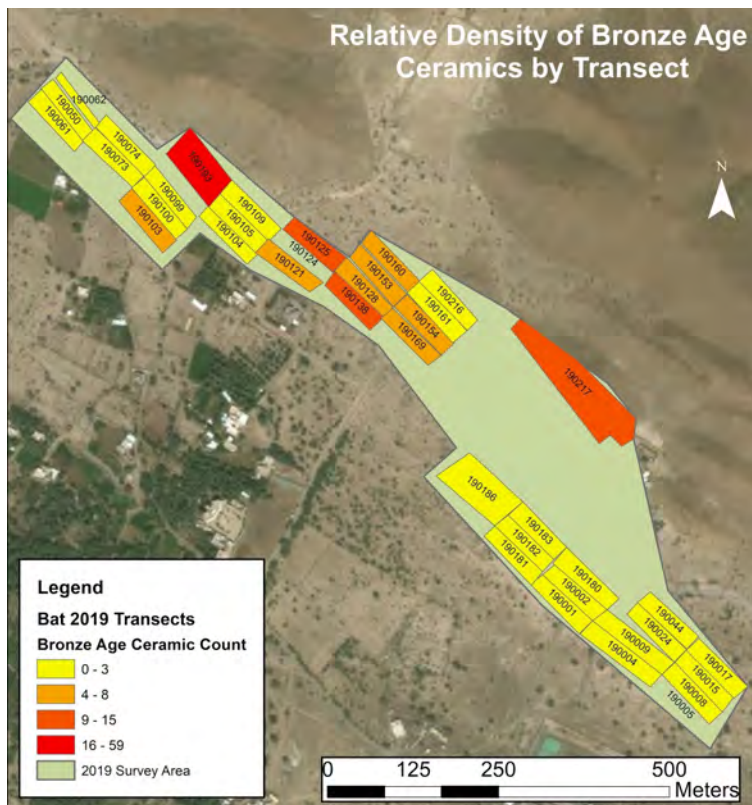


Figure 20. Density of Bronze Age Ceramics within transects.

4.1.2 Ceramic Thin-Section Petrography

A program of ceramic petrography was begun as part of the BAP 2017 Bat-‘Amlah survey program (Figure 21). This technique, involving thinly-sliced portions of ceramic sherds mounted on to slides and examined using a cross-polarizing transmitted light microscope, allows for differences in production techniques and the mineralogy of different clays and fabric inclusions to be observed. This method is being applied to Umm an-Nar period sherds from the Bat region in order to better understand ancient Bat’s economic relationships with surrounding settlements.

Sherds from excavations at Bat, Khutm, and ‘Amlah, and sherds collected during survey operations from ad-Dariz, Bat South, ‘Amlah, and ‘Ablah were exported to the ceramics laboratory at New York University. Forty-one sherds have been thin-sectioned thus far (Table 5). The results of this analysis suggest that at the beginning of the Middle Umm an-Nar period the domestic wares of the Bat region (Bat, al-Khutm, Bat South, ‘Amlah) belonged to a unified production group (Table 6). This production group, termed **PFG 1**, is characterized by quartzes as the most common inclusion, which are elongate angular to equant angular in shape. Other minerals present suggest the debris of mafic or ultramafic rocks, consistent with the geology of the area surrounding the Bat heartland. This is the dominant domestic ware petrofabric across the Bat region.

Later in the Middle Umm an-Nar period, PFG 1 continues to appear. However, two additional petrofabric groups can be identified. The first, **PFG 2**, is distinguishable from PFG 1 by its abundance of small, rounded micritic inclusions and the presence of fragments of red

chert--identifiable because of radiolarian fragments and the known presence of red cherts in the Hamrat Duru geological formation surrounding the Bat heartland (Figure 21). The second group, **PFG 3**, was found only in samples from 'Amlah (Figure 22). This fabric type had fewer voids. Micritic limestone was the most common inclusion, alongside few muscovite fragments and opaques. **PFG 3** was the least sandy fabric examined in this analysis and its groundmass appears to be composed primarily of calcite. Both the criterion of abundance and the presence of micritic limestone in the Sayfam Formation surrounding 'Amlah (Janjou *et al.* 1986) suggest this group was produced near 'Amlah. Full fabric definitions and distribution patterns can be found in Dollarhide (2019).

In summary, the analyzed domestic wares can be divided into three separate petrofabric groups, all of which were present in the Middle Umm an-Nar period. Though it is tempting here to posit a chronological distinction, whereby PFG 2 predates PFG 1 given the spatial distributions of each fabric and the C14 dates available from the Settlement Slope excavations (Swerida 2017: 453), confirming this hypothesis requires additional stratigraphic research to be completed in future season. Geographically, PFG 1 and 2 both seem likely to have been produced at Bat and circulated across the entire Bat region, whereas PFG 3 likely represents a separate group of production centered around 'Amlah that appears to have been dispersed over a more limited area.

Several examples of black-on-red funerary wares were also thin-sectioned and examined. For the present, it is possible to group all the funerary wares examined from the tombs in the Bat region and 'Amlah into a single petrofabric group. Though the fineness of these samples limits the utility of a petrographic approach towards ascertaining their provenance, no visible features of the samples observed here preclude them from having a southeastern Arabian origin. They also share a common set of technological features (e.g., kiln fired above 800C; no inclusions over 150 micrometers; iron-rich groundmass). Additional geochemical analysis on these samples is planned.

The emerging ceramic history of the Bat region suggests a unified production group for the early Umm an-Nar period (as demonstrated by the funerary wares). In the Middle Umm an-Nar, ceramic manufacture becomes more diverse, stylistically and geographically, with the eventual development of a production group at 'Amlah. The analysis of additional sherds in thin section will further elucidate the distinctions noted here.

Table 5. Petrographic thin section samples from the Bat area.

| Sample Number | Site type | Site | Sherd ID | Petrofabric Group | Ware Type |
|---------------|------------|-----------------------------|---------------------|-------------------|-----------|
| MM1 | MM Survey | Bat South | 17.22014.001 | OUTLIER | Domestic |
| MM2 | MM Survey | 'Amlah surface collection | 17.62002.004 | PFG 2 | Domestic |
| MM3 | 'Amlah | 'Amlah settlement | DA1573 (BDC Site 3) | PFG 3 | Domestic |
| MM4 | WaH Survey | Bat Cemetery | 111302 (DA 27060) | Mort. | Funerary |
| MM5 | Khutm | Khutm settlement | 140071-013 | PFG 2 | Domestic |
| MM6 | Bat | Settlement Slope | 131805-005 | PFG 2 | Domestic |
| MM7 | Bat | T. 1146/Trench B | 090307 | PFG 2 | Domestic |
| MM8 | MM Survey | Bat South | 17.22029.004 | PFG 2 | Domestic |
| MM9 | Bat | Settlement Slope | 142817-080 | PFG 2 | Domestic |
| MM10 | Bat | Settlement Slope | 142311-011 | PFG 2 | Domestic |
| MM11 | Bat | Settlement Slope | 142309-043 | PFG 2 | Domestic |
| MM12 | Bat | Settlement Slope | 12SS172 | OUTLIER | Domestic |
| MM13 | Bat | T. 1146/Trench B | 090317 | PFG 2 | Domestic |
| MM14 | Bat | Settlement Slope | 12SS205 | PFG 2 | Domestic |
| MM15 | Bat | Settlement Slope | 142813-023 | Mort. | Funerary |
| MM16 | MM Survey | Survey (surface collection) | 17.64009.010 | Mort. | Funerary |
| MM17 | MM Survey | Survey (surface collection) | 17.64009.009 | Mort. | Funerary |
| MM18 | MM Survey | Survey (surface collection) | 17.05009.001 | OUTLIER | Funerary |
| MM19 | MM Survey | Bat South | 17.22017.001 | PFG 2 | Domestic |
| MM20 | MM Survey | Bat South | 17.22029.001 | PFG 2 | Domestic |
| MM21 | MM Survey | Bat South | 17.21009.001 | PFG 2 | Domestic |
| MM22 | MM Survey | Bat South | 17.22007.001 | PFG 2 | Domestic |
| MM23 | Khutm | Khutm settlement | 140071-012 | PFG 2 | Domestic |
| MM24 | Khutm | Khutm settlement | 140041-031 | PFG 2 | Domestic |
| MM25 | WaH Survey | ad-Dariz tomb | WP86-S.19 | Mort. | Funerary |
| MM26 | WaH Survey | ad-Dariz tomb | 100666 | Mort. | Funerary |
| MM27 | WaH Survey | ad-Dariz tomb | 100318-c1 | Mort. | Funerary |
| MM28 | 'Amlah | 'Amlah tomb | DA1577 (BDC Site 1) | Import. | Indus |
| MM29 | 'Amlah | 'Amlah tomb | DA1051 (BDC Site 1) | OUTLIER | Domestic |

| | | | | | |
|-------------|------------|-------------------|----------------------|---------|----------|
| MM30 | 'Amlah | 'Amlah settlement | DA1573 (BDC Site 3) | PFG 3 | Domestic |
| MM31 | 'Amlah | 'Amlah settlement | DA1573 (BDC Site 3) | PFG 2 | Domestic |
| MM32 | 'Amlah | 'Amlah settlement | DA1573 (BDC Site 3) | PFG 2 | Domestic |
| MM33 | 'Amlah | 'Amlah settlement | DA1320 (BDC Site 1) | Mort. | Funerary |
| MM34 | 'Amlah | 'Amlah settlement | DA1314 (BDC-site 1) | Mort. | Funerary |
| MM35 | WaH Survey | Bat tomb | 110968 (DA 27060) | Mort. | Funerary |
| MM36 | WaH Survey | Bat tomb | 100318 (DA 27060) | Mort. | Funerary |
| MM37 | WaH Survey | Bat tomb | 110987 (DA 27060) | Mort. | Funerary |
| MM38 | WaH Survey | Bat tomb | 110988 (DA 27060) | Mort. | Funerary |
| MM39 | WaH Survey | Bat tomb | 111278 (DA 27060) | Mort. | Funerary |
| MM40 | WaH Survey | Bat tomb | 111278 (DA 27060) | Mort. | Funerary |
| MM41 | WaH Survey | Bat tomb | 110968-c3 (DA 27060) | Import. | Indus |

Note: MM Survey indicates sherds collected during the 2017 Bat-'Amlah area survey program (Dollarhide 2019). WaH Survey indicates sherds collected during the Wadi al-Hijr survey program (Cable 2012).

Table 6. Summary of Domestic Ware petrofabric Groups.

| Ware Type | Petrographic Fabric Groups | Méry (2000) Equivalent Group | Sample Count | Locations Found |
|---------------|----------------------------|------------------------------|--------------|--|
| Domestic ware | PFG 1 | GP=M | 12 | Bat (Settlement Slope, Tower 1146/al-Khafaji, al-Khutm), Bat South, 'Amlah |
| | PFG 2 | GP=N | 5 | Bat (Tower 1146/Khafaji), al-Khutm, Bat South |
| | PFG 3 | GP=P | 2 | 'Amlah |

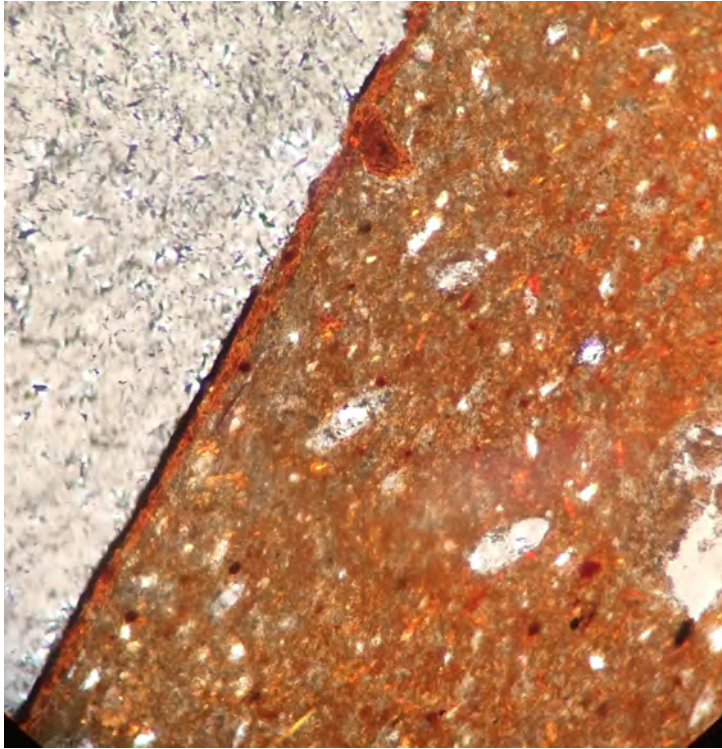


Figure 21. A sherd from Bat South in thin section under 10x magnification and cross-polarized light, belonging to PFG 2. A fine layer of red-slip and black paint are visible to the left.

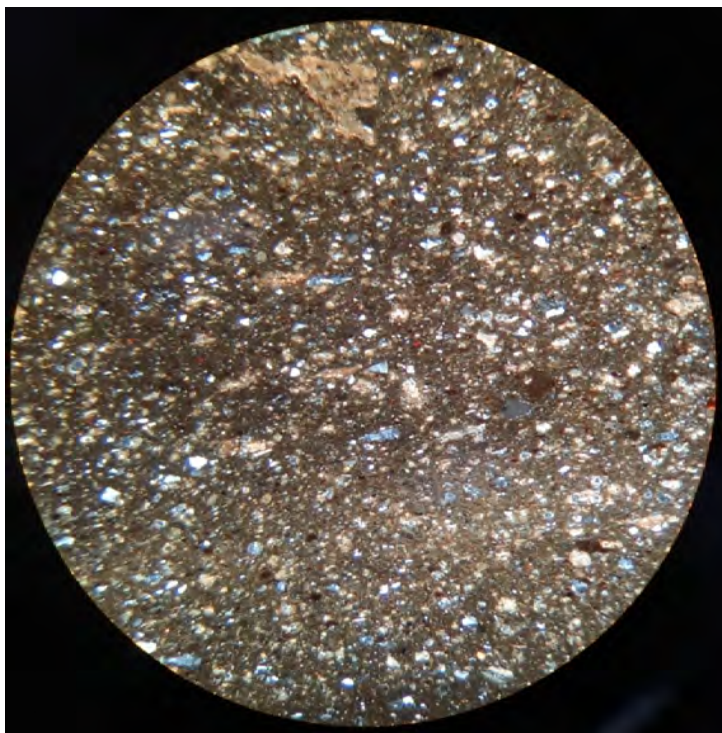


Figure 22. An example of PFG 3 from 'Amlah, 40x magnification in XPL.

4.2 Stone Tools

A total of 1698 lithics were documented in the survey, of which 311 were diagnostic (Table 7). In a preliminary study these were identified primarily as flake tools with and without retouch, with scrapers, drills (or awls), and blade fragments also represented. Cores were quite common and only collected when they exhibited unusual features (e.g., bidirectional flaking).

The raw material varied dramatically in color and while some of the chert appears to have been obtained from the poor-quality bedded radiolarite nearby the vast majority likely came from chert nodules, which are found locally within and eroding from nearby conglomerate outcrops (such as that beneath Qasr al-Sleme and Bat Qala). Several examples of possible Middle Paleolithic Levallois technologies and (Arabian?) bifacial tool fragments speak to the antiquity of the site (Figure 23). Spatially the stone tools are relatively widely dispersed (Figure 24) and appear independent of architectural features.

Table 7. *Lithics by feature.*

| Lot Number | collected | not collected | total lithics |
|-------------------|------------------|----------------------|----------------------|
| 110967 | 1 | 0 | 1 |
| 190001 | 17 | 44 | 61 |
| 190002 | 8 | 56 | 64 |
| 190003 | 1 | 0 | 1 |
| 190004 | 4 | 6 | 10 |
| 190005 | 2 | 0 | 2 |
| 190008 | 9 | 10 | 19 |
| 190009 | 4 | 29 | 33 |
| 190015 | 8 | 32 | 40 |
| 190017 | 16 | 25 | 41 |
| 190018 | 1 | 0 | 1 |
| 190020 | 3 | 0 | 3 |
| 190023 | 2 | 0 | 2 |
| 190024 | 4 | 18 | 22 |
| 190044 | 3 | 22 | 25 |
| 190050 | 15 | 80 | 95 |
| 190061 | 13 | 53 | 66 |
| 190062 | 0 | 6 | 6 |
| 190073 | 13 | 47 | 60 |
| 190074 | 5 | 8 | 13 |
| 190099 | 9 | 16 | 25 |
| 190100 | 6 | 13 | 19 |

| Lot Number | collected | not collected | total lithics |
|-------------------|------------------|----------------------|----------------------|
| 190103 | 7 | 45 | 52 |
| 190104 | 0 | 1 | 1 |
| 190105 | 5 | 6 | 11 |
| 190108 | 1 | 0 | 1 |
| 190109 | 3 | 41 | 44 |
| 190112 | 1 | 0 | 1 |
| 190120 | 3 | 0 | 3 |
| 190121 | 0 | 13 | 13 |
| 190124 | 10 | 30 | 40 |
| 190125 | 9 | 43 | 52 |
| 190128 | 0 | 39 | 39 |
| 190137 | 1 | 0 | 1 |
| 190138 | 6 | 21 | 27 |
| 190153 | 4 | 14 | 18 |
| 190154 | 8 | 35 | 43 |
| 190160 | 6 | 77 | 83 |
| 190161 | 8 | 29 | 37 |
| 190169 | 5 | 39 | 44 |
| 190180 | 5 | 9 | 14 |
| 190181 | 25 | 174 | 199 |
| 190182 | 10 | 89 | 99 |
| 190183 | 12 | 41 | 53 |

| Lot Number | collected | not collected | total lithics |
|------------|-----------|---------------|---------------|
| 190186 | 18 | 133 | 151 |
| 190190 | 1 | 0 | 1 |
| 190193 | 2 | 21 | 23 |
| 190216 | 10 | 19 | 29 |
| 190217 | 4 | 5 | 9 |
| 190220 | 1 | 0 | 1 |

| Lot Number | collected | not collected | total lithics |
|--------------|------------|---------------|---------------|
| 190603 | 4 | 0 | 4 |
| 190702 | 4 | 0 | 4 |
| 190703 | 2 | 0 | 2 |
| 190704 | 3 | 0 | 3 |
| 190705 | 1 | 0 | 1 |
| Total | 323 | 1389 | 1712 |

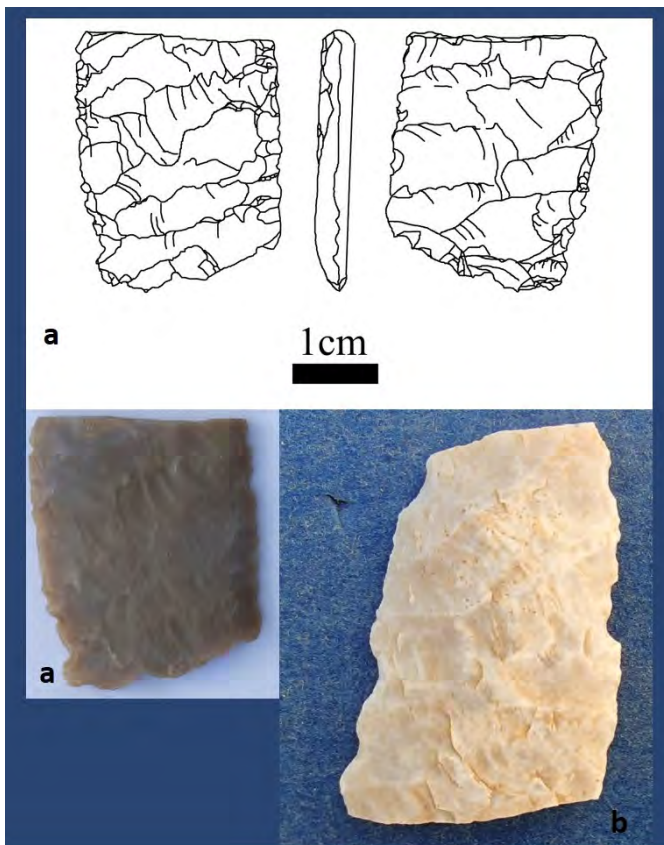


Figure 23. Two examples of broken bifaces found during survey.

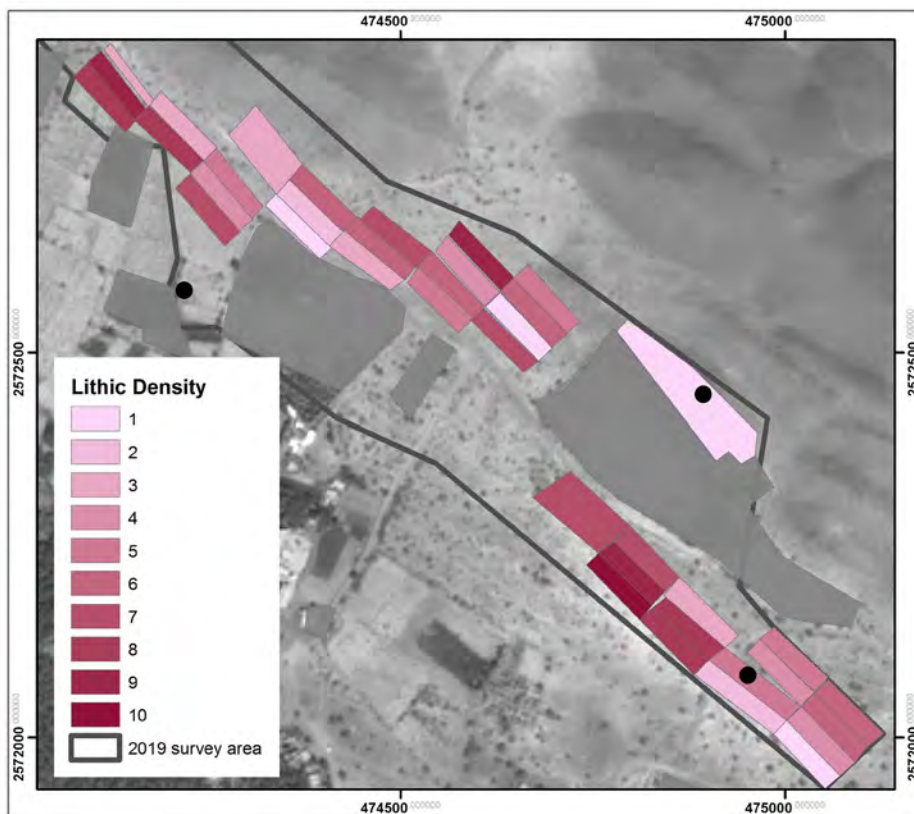


Figure 24. Density of stone tools by transect (normalized for the area covered).

In addition, whetstones ($n = 2$) and grinding stones ($n = 10$) were relatively common (Figure 25). This is unsurprising, as the Bat oasis has a long agricultural history and prehistory (Desroulles *et al.* 2016). The numbers themselves are likely to be low, as even broken grinding and whetstones are known to be removed for personal use by community members today.

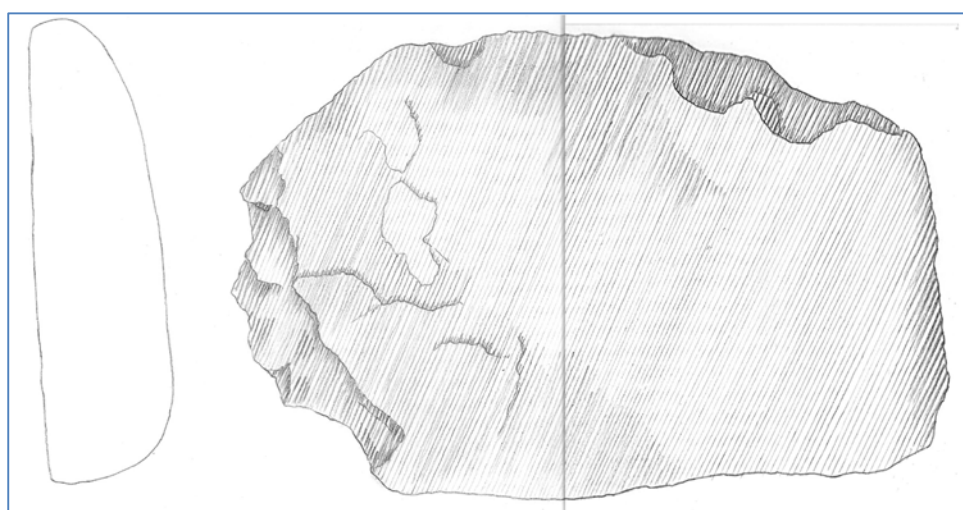


Figure 25. Grinding stone found in feature 190246.

4.3 Other Finds

Artifacts collected on survey are another valuable source of information regarding land use and periodization (Table 8). The modest collection of small finds recovered in the 2018-19 survey demonstrate the longevity of human occupation at Bat – artifact dates range from the Early Bronze Age through the modern era – and included a surprising variety of material and find type (including several fragments of glass bracelets (such as in Figure 26), although the more common beads (Figure 27), shell (Figure 28), and softstone vessel fragments (Figure 29) were also found.

Table 8. Small Finds and Proposed Dates.

| Lot Number | Object Type | Spot Date |
|-------------------|----------------------------|------------------|
| 190015 | Loom weight | Iron Age |
| 190061 | Glass bracelet | Medieval/Islamic |
| 190099 | Pierced shell | Unknown |
| 190121 | Soft stone vessel fragment | Umm an-Nar |
| 190124 | Stone bead | Bronze Age |
| 190124 | Glass bracelet | Medieval/Islamic |
| 190124 | Copper fragment | Unknown |
| 190125 | Carnelian fragment | Unknown |
| 190128 | Carnelian bead | Bronze Age |
| 190128 | Shell bead | Bronze Age |
| 190128 | Medallion | Modern |
| 190154 | Drilled shell | Unknown |
| 190181 | Shell bead | Unknown |
| 190211 | Ashlar block fragments | Umm an-Nar |
| 190217 | Ashlar block fragments | Umm an-Nar |
| 190217 | Soft stone vessel fragment | Umm an-Nar |
| 190248 | Stone bead | Umm an-Nar |

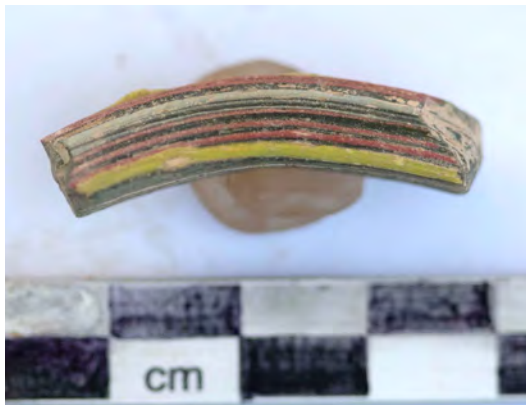


Figure 26. Glass bracelet fragment from Transect 190061.



Figure 27. Shell (left) and carnelian (right) beads from Transect 190128.



Figure 28. Pierced shell fragment from Transect 190099.



Figure 29. Softstone vessel fragment from Lot 190217.

4.3.1 Shell

Fragments of marine shell identified on survey without clear evidence of having been worked were counted in each lot (Table 9). These shells are evidence of regional exchange between the population at Bat and the coast.

Table 9. Unmodified marine shell.

| Lot Number | Shell Total |
|------------|-------------|
| 190001 | 8 |
| 190002 | 16 |
| 190004 | 1 |
| 190017 | 1 |
| 190044 | 2 |
| 190050 | 9 |
| 190061 | 8 |
| 190073 | 16 |
| 190074 | 1 |
| 190099 | 4 |
| 190103 | 7 |
| 190109 | 2 |
| 190121 | 2 |
| 190124 | 5 |
| 190125 | 11 |

| Lot Number | Shell Total |
|------------|-------------|
| 190128 | 5 |
| 190137 | 1 |
| 190138 | 2 |
| 190154 | 11 |
| 190160 | 6 |
| 190161 | 3 |
| 190169 | 4 |
| 190180 | 4 |
| 190181 | 76 |
| 190182 | 28 |
| 190183 | 8 |
| 190184 | 1 |
| 190186 | 25 |
| 190193 | 2 |
| 190216 | 1 |

5 Site Management and Development Bat

Charlotte M. Cable and Jennifer L. Swerida

The Ministry of Heritage & Culture visited Bat on two occasions during the BAP field season, in order to observe the work and to integrate BAP expertise into MHC decision-making for the site. On 22 January representatives from the MHC, headed by Director of UNESCO Sites Sultan al-Moqbali, observed several illegal activities in the UNESCO site and asked for an assessment of archaeological materials that may be affected by encroaching construction works in the area east of Qasr al-Ahliya.

On 29 January Mr Mohammed al-Waili conducted a visit to the site to discuss with the BAP directors areas of the site that should be protected by fencing. These areas include: (1) lands surrounding Matariya; (2) lands surrounding al-Khafaji; and (3) lands surrounding al-Sleme.

5.1 Malakiyaat

The towers of Matariya, al-Khafaji, and al-Sleme have a long and rich history of research beginning with the work of Karen Frifelt. At the request of the MHC a proposed malakiya for each tower was identified: in map form; as coordinates; and on the ground.

On 28 January Charlotte Cable and Asma bint Rashid al-Jassasi surveyed the towers to identify the areas that to be protected under malakiyaat.

Coordinates and maps use the WGS 1984 geographic coordinate system (UTM zone 40Q) and datum. All files are stored first as ArcGIS shapefiles. The coordinates of all proposed malakiyaat should be revised with a more reliable differential GPS receiver.



Special note: the current proposed primary malakiya (for the cemetery area) **does not include the al-Ahliya tower**. Included here are an image created by the MHC showing the location of the 2018 malakiya (with al-Ahliya jebel outside) (Figure 30).

Figure 30. Close-up showing the location of al-Ahliya in relation to the proposed 2018 malakiya. It is inside the original malakiya but outside the new one.

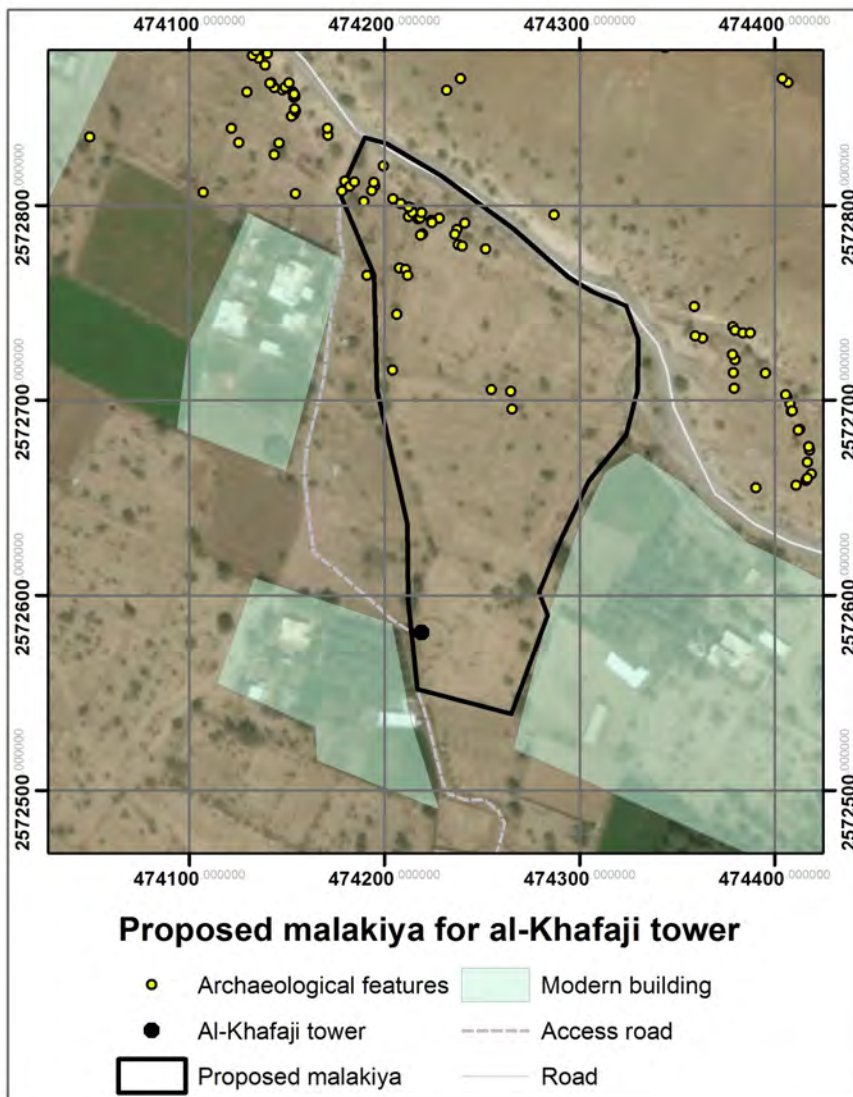
5.1.1 Al-Khafaji malakiya

We advise that the malakiya for al-Khafaji include the entire fallow (unused) land on which it sits, all the way north to the current road and as far west as the dirt access roads to Khalfan’s land (Figure 31).

The farms to the west, south, and east of al-Khafaji form modern boundaries. These do not coincide with the extent of al-Khafaji, particularly on the west side of the tower. Within one meter of the internal walls of al-Khafaji is an unpaved road. In the middle of the road it is possible to see the tops of large stone walls that are part of the ancient tower complex (Figure 32).

The road itself is an important access route for people in Bat. Therefore it is proposed that the malakiya include the road and that upkeep of this section of the road fall under the purview of the MHC.

If this is not possible, the malakiya should continue until the very eastern edge of the road – **in conjunction with excavations by BAP of the tower remains in the road**. The road will then be re-filled using appropriate materials in consultation with the conservation team. In that way all materials can be documented and the road can remain in use.



Area of the proposed
Khafaji malakiya:
25,659.5 m²

Figure 31. Map showing the proposed malakiya (in black) for Khafaji.



Figure 32. Dr Jennifer standing on an exposed al-Khafaji tower wall, in the access road; Aisha's farm is behind her.

5.1.2. Matariya malakiya

The area adjacent to Matariya was intensively surveyed by BAP this season, and the survey area extended to the east slightly in order to inform this proposed malakiya (Figure 33). The area south and east of Matariya is particularly dense with archaeological remains and the size and shape of the malakiya reflects this.

Area of the proposed Matariya malakiya: 127,456.3 m²

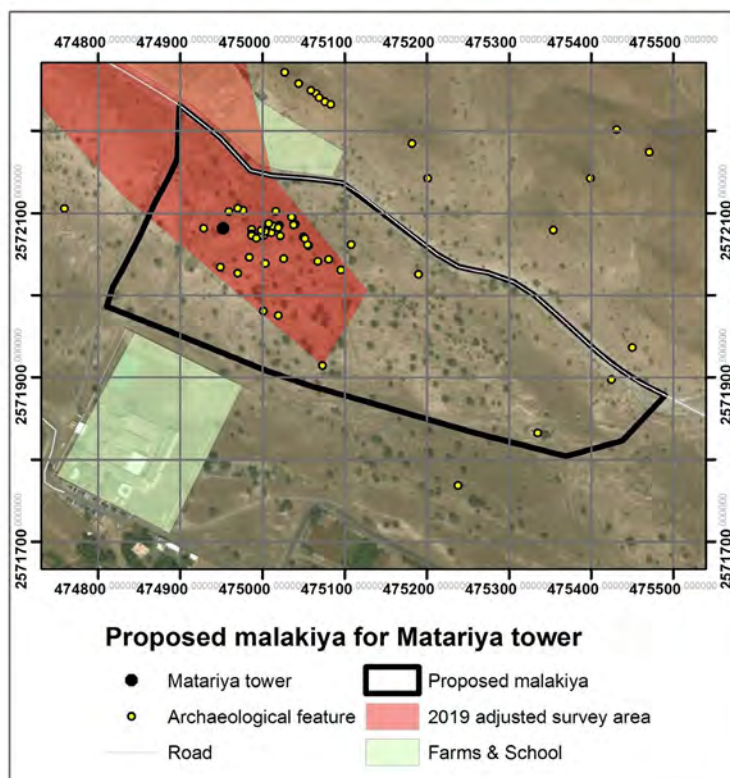
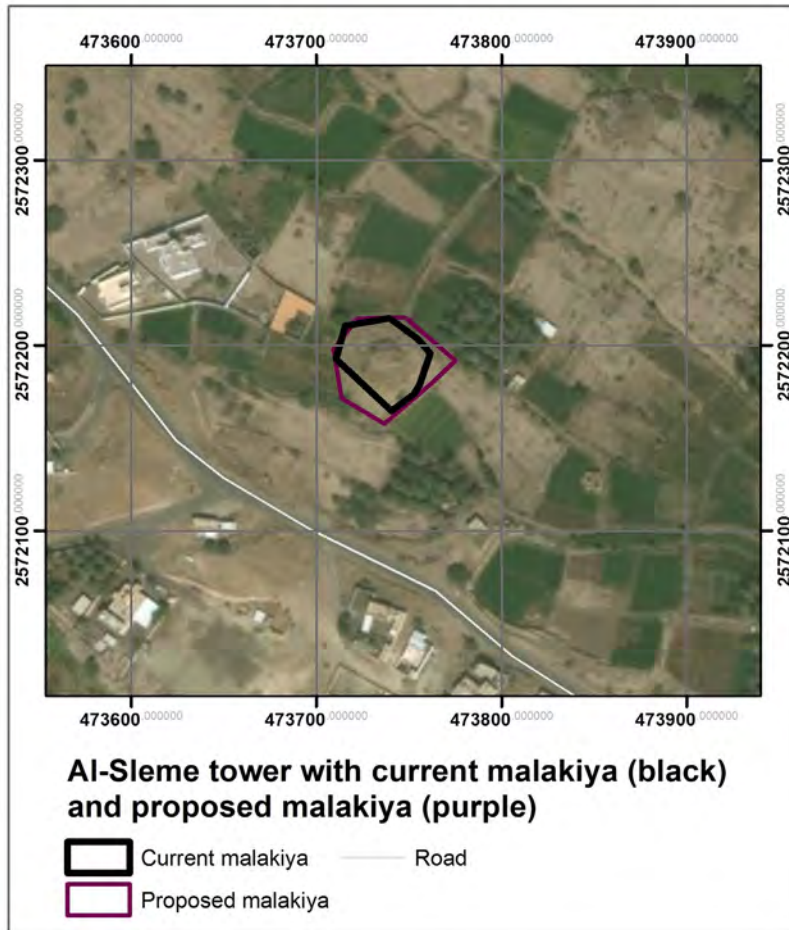


Figure 33. Proposed malakiya (in black) for Matariya.

5.1.2 Al-Sleme malakiya

The following information assumes that the malakiya for al-Sleme is the same as its UNESCO boundary.

The original malakiya (UNESCO boundary) for Qasr al-Sleme follows the precise outline of tower. We propose extending the malakiya, to include the small hill upon which the tower sits (Figure 34). This will increase the size of the malakiya by a small amount.



Area of the current UNESCO boundary (malakiya?): 1,606.1 m²

Area of the proposed al-Sleme malakiya: 2,409.0 m²

Figure 34. Map showing the current malakiya for Sleme (in black) and the proposed additions (in purple).

5.2 Fencing

On 29 January a delegation headed by Mr Mohammed al-Waili visited the site to determine the locations for fencing of al-Khafaji, Matariya, and al-Sleme. Miss 'Asma bint Rashid al-Jasassi acted as the local MHC representative, and Charlotte Cable, Jennifer Swerida, and Eli Dollarhide provided archaeological advice based on their years of fieldwork.

The fencing specialists advised that **no fencing be started until the malakiyaat had been obtained.**

In addition, it is crucially important that **professional archaeologists be present at all times during the construction of the fencing.** Not only are any below-surface features possibly vulnerable, but during construction, workers frequently drive over, remove stones (and artifacts) from, and otherwise irrevocably destroy the features that their fences are intending to preserve.

In the first instance, it is advised that, where fencing is required, it is best if *the fencing encompasses the entire malakiya*. In the second instance—i.e., when that is not possible—the areas below are advised to be fenced.

All perimeter lengths are measured in *linear* meters—changes of elevation are not taken into account and will increase the lengths of the fencing.

5.2.1 Al-Khafaji

The al-Khafaji area is the most difficult of the three towers to enclose (Figure 35). This is because of (1) the road adjacent to the tower and (2) the presence of farms to the west, south, and east. On the north side, a dirt path to the back gate of the farm to the east is visible and the secondary proposed fence follows this path.

Perimeter of the proposed Khafaji malakiya: 729.1 m

Perimeter of the proposed Khafaji fence: 266.6 m

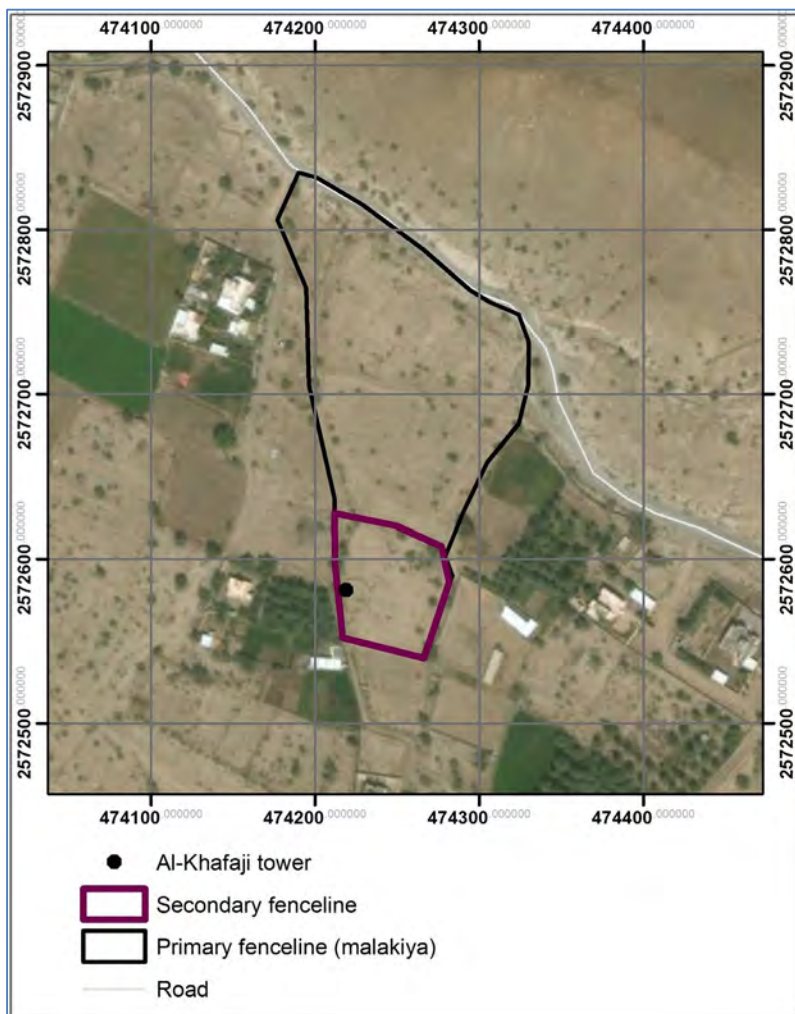


Figure 35. Map showing the preferred fence line (in black) and the secondary fence line (in purple) for Khafaji. The preferred fence line follows the proposed malakiya

5.2.2 Matariya

The area to be fenced around Matariya is the largest of the three towers (Figure 36). That is because the area around Matariya – particularly to the east of the tower – shows considerable prehistoric land use, with walls, mounds, and tombs visible on the surface for at least several hundred meters. The proposed fence line follows this shape, but truncates it to the south and east.

Perimeter of the proposed Matariya malakiya: 443,760.7 m

Perimeter of the proposed Matariya fence: 1,707.9 m

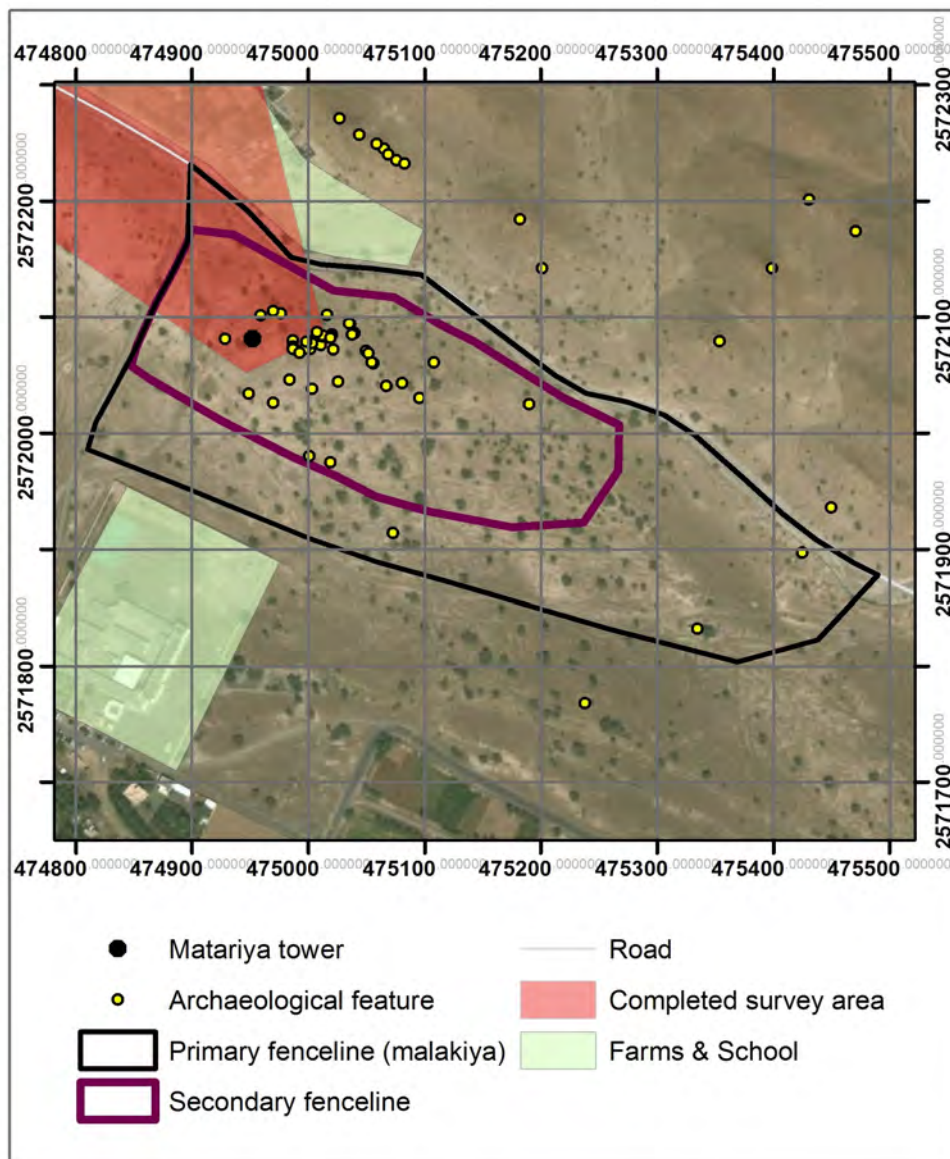


Figure 36. Map showing the preferred fence line (in black) and the secondary fence line (in purple) for Matariya. The preferred fence line follows the proposed malakiya.

5.2.3 Al-Sleme

The site visit on 29 January confirmed that the fence for al-Sleme is both difficult to build and unnecessary. If such a fence were to be made, it should **wait until a larger malakiya has been obtained** (see above). Once the larger malakiya is granted the fence should **follow that new boundary** (Figure 37).

Perimeter of the al-Sleme malakiya (UNESCO boundary): 152.2 m

Perimeter of the proposed al-Sleme fence: 187.7 m

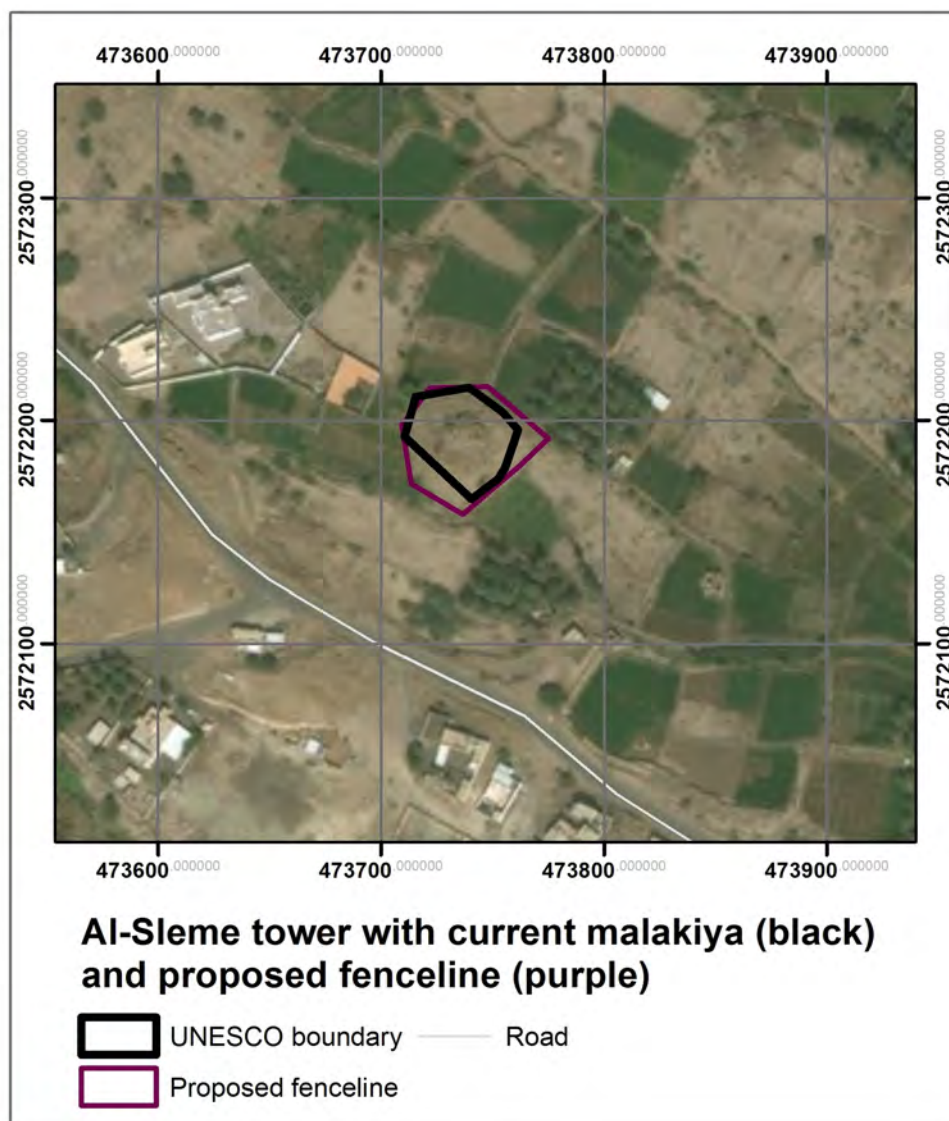


Figure 37. Map showing the proposed fence lines for Sleme. The larger of the two (in purple) will require a new malakiya. The black lines show the current malakiya.

5.3 Assessment of remains on the jebel east of al-Ahliya

On 20 January Director Sultan al-Maqbali requested that BAP review the archaeological materials located on the small jebel east of al-Ahliya (Figure 38). The concern was whether ongoing construction immediately to the southwest posed an immediate threat to the remains.

Based on fieldwork conducted in 2011, there is immediate concern for the archaeological remains in this area. There are at least seven features (and quite probably more) in that area (Figure 39). The features and a brief assessment of each is listed in Appendix 7.4. There is encroaching of private fencing and construction taking place in this area, associated with the expansion of farms on the southwestern slopes of the al-Ahliya jebel.

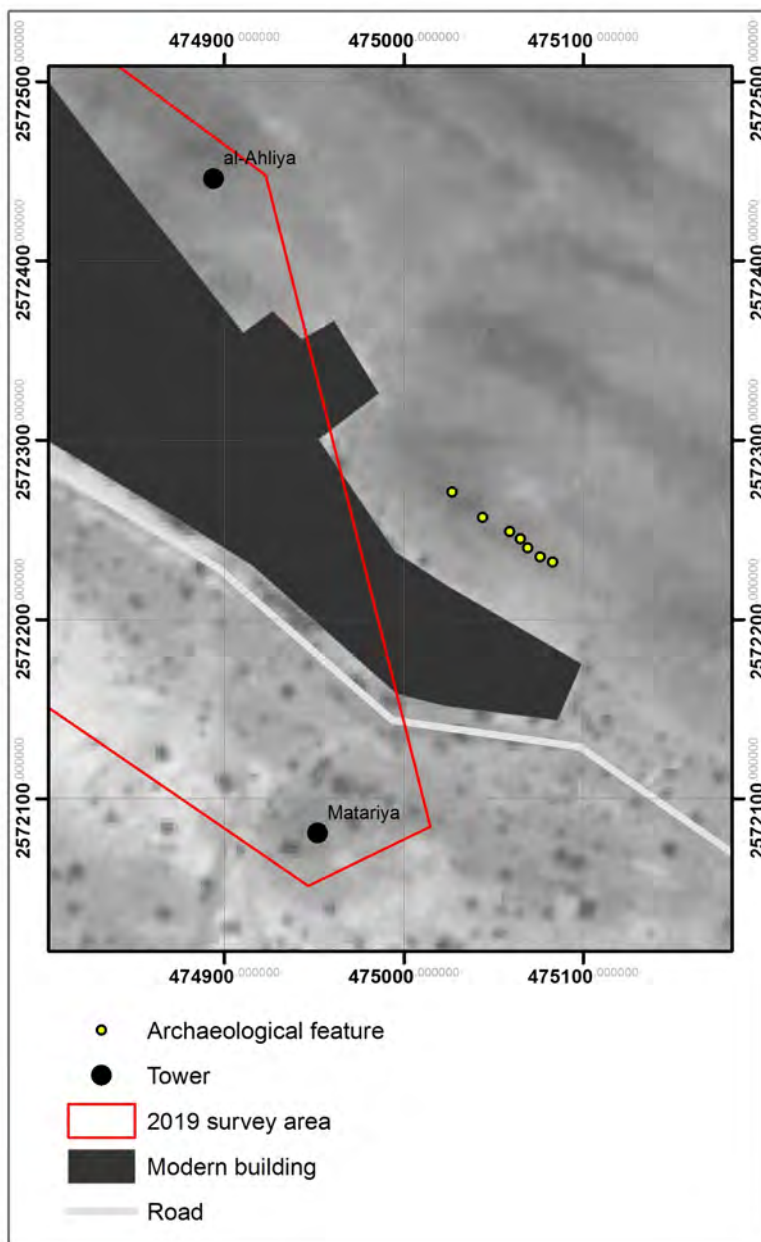


Figure 38. Map showing the location of features, southeast of al-Ahliya, threatened by the illegal construction activities.



Figure 39. Close up images of some of the tombs located on the jebel. They are endangered by the illegal construction a few meters to the south. Also found: a Ministry of Housing survey marker (lower left).

5.4 Khafaji remains outside of the malakiya

Archaeological remains in the form of stone walls are visible in the dirt road immediately south of the al-Khafaji tower. This road is beyond the suggested borders of the malakiya because it is essential to the Bat community members residing in the area. However, the stone walls are of similar construction to others excavated to the north and east of the tower and likely reflect a continuation of the Umm an-Nar settlement known to exist in this area.

The documentation of these remains are of great concern, as they are threatened by the modern road traffic and they exist outside the Khafaji malakiya. It is the suggestion of the Bat Archaeological Project that this section of dirt road be excavated over a short period of time (approximately 1 month) under the direction of Dr. Jennifer Swerida, who has previously led excavations of the Khafaji settlement. Once documented, the archaeological remains beneath the dirt road can be removed and a gravel or paved road can be installed above them. If possible, the locations of the Umm an-Nar walls and any other significant features discovered during excavation can be drawn in paint on the surface of the new road. This drawing will acknowledge the presence of the archaeological remains while allowing the road to continue to be used by the Bat community.

5.5 Disturbances

Disturbances were noted in the al-Qa'a valley, where a bund has been added to surround and protect the al-Qa'a football field. Unfortunately the bund was created by removing soil from the surrounding landscape, in the centre of the UNESCO site (Figure 40). The lands to the north and west of the al-Ahilya tower have also been disturbed by recent rubbish dumping

(Figure 41). This dumping threatens several tombs and possible domestic archaeological remains.



Figure 40. Bulldozing within the UNESCO site. Here the al-Qa'a football field has been surrounded by a protective bund. This bund was made from soil bulldozed from the surrounding area. This entire area should be checked for archaeological remains either exposed or damaged by these activities.



Figure 41. Dumping and bulldozing continues to be a problem in the central part of the UNESCO site. Animal carcasses, cinder blocks, and other household refuse are piled up --- atop likely Bronze Age walls!

5.6 Proposed Bat cemetery interpretive elements and visitor centers feedback

On 3 January the Ministry requested (1) feedback regarding the proposed visitor centre plans at Bat and at Al Ayn (provided to BAP on 25 December 2018); (2) a series of proposed features within the Bat cemetery area that should be highlighted for tourism and interpretation; (3) proposed locations of walking paths between those features and the visitors centre; (4)

suggestions for interpretive media appropriate for the Bat cemetery contents, in conjunction with the other elements; and (5) proposed malakiyaat for the towers that are situated outside of the current UNESCO malakiya. A proposal was hurriedly devised and feedback on the proposed centres provided in a combined report submitted on 6 January. See Appendix 7.3 for the full report.

6 Conclusion and Future Plans

6.1 Excavation plans of the next season

Over the course of the next three seasons, BAP will undertake excavations in five key areas of the site: (1) the “enclosure” near Matariya; (2) the eastern end of the Settlement Slope/al-Qa’a; (3) tombs on the al-Ahliya hilltop; (4) the field east of al-Rojoom; and (5) the settlement contexts at Bat South (Figure 42).

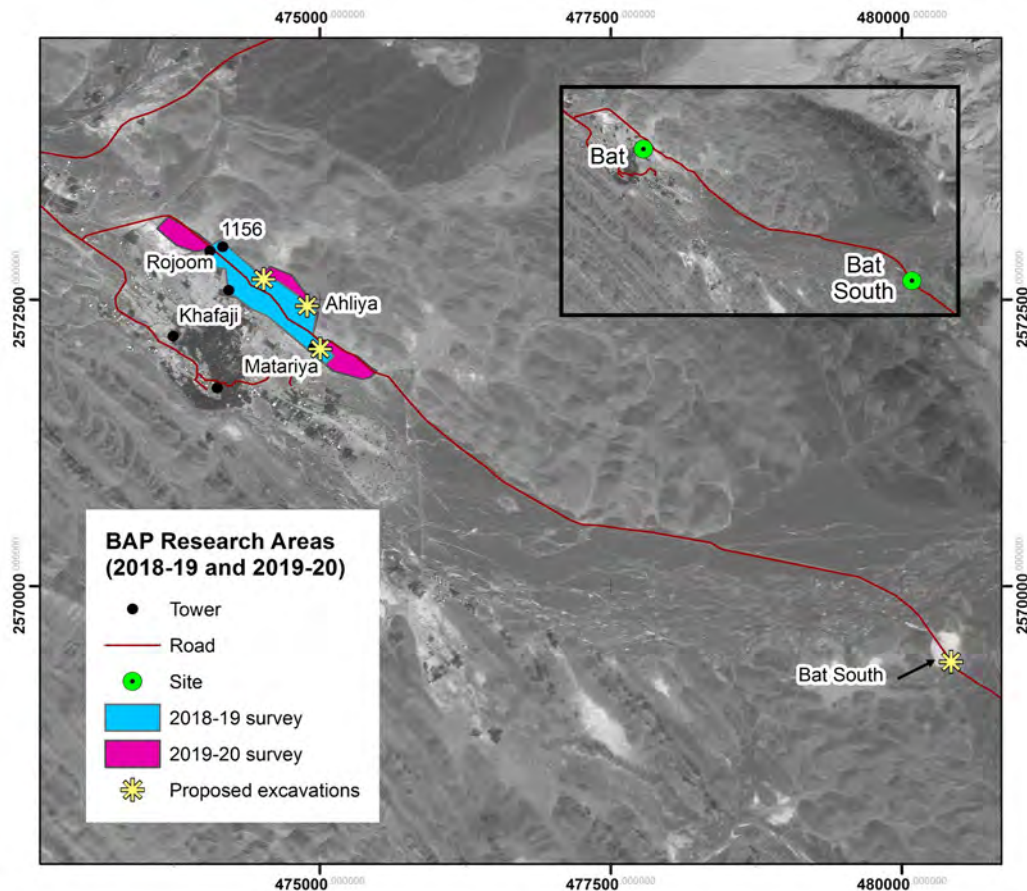


Figure 42. Proposed research for the 2019-20 season.

6.1.1 Matariya Enclosure

The promising results from trenches 67001 and 67002 suggest that the area below the enclosure (1167) at Matariya contains mudbrick architecture dating to the Hafit period. We hypothesize that this architecture is related to the Hafit occupation of the landscape around Matariya tower. Beginning in the winter of 2019-20, BAP will open horizontal excavations in this area with the goal of exposing and dating the mudbrick architecture and assessing the nature of their associated contexts. Excavations will be carried out for one or two seasons.

6.1.2 *Settlement Slope East/al-Qa'a*

Survey on the eastern end of the Settlement Slope hillside extending into the al-Qa'a wadi plain documented a dense concentration of Umm an-Nar architectural fragments and pieces of material culture. Based on this pattern, it is likely that the Umm an-Nar settlement contexts known to exist on the Settlement Slope hillside continue into the area now covered by the sediment of the al-Qa'a wadi plain. In the winter of 2019-20, BAP will begin three seasons of broad horizontal excavations at the base of the eastern Settlement Slope hillside. The objective of these excavations will be to determine if the Umm an-Nar settlement does extend into the al-Qa'a plain and to identify Umm an-Nar domestic contexts. This data will be used to explore Umm an-Nar lifeways, domestic economy, social organization, and settlement ecology.

6.1.3 *Al-Ahliya tombs*

Survey of the al-Ahliya hill between 2011 and 2019 have documented a remarkably dense collection of multi-period remains. This density of remains – especially the multiple Wadi Sûq and at least one Umm an-Nar tomb – makes the Umm an-Nar tower located on the hill crest difficult to document and understand. In the winter of 2019-20, the Bat Archaeological Project will collaborate with Dr. Selin Nugent (University of Oxford) to excavate the tombs located on the al-Ahliya tower. These excavations will enhance our understanding of the Wadi Sûq and Umm an-Nar mortuary traditions at Bat. Once excavated and fully documented, these tombs can be removed to reveal the Umm an-Nar tower below them. Excavation of the tombs will take one to two seasons; cleaning of the tower will take one season.

6.1.4 *al-Rojoom*

The results of Trench 45001 demonstrate that Umm an-Nar contexts exist below the field to the east of Kasr al-Rojoom. The sloping nature of the Umm an-Nar surface identified in this trench also shows that the third millennium landscape in this area was more irregular than the modern landscape. In the 2020-21 season, BAP will open a second trench perpendicular to and west of trench 45001 with the aim of further exploring the ancient topography and to understand better the link between the settlement and the environment. Based on the results of this trench, a further season of excavation may be carried out in the 2021-22 season.

6.1.5 *Bat South*

During our Winter 2016-17 survey season, a new area of domestic structures was identified approximately seven kilometers southeast of the modern Bat settlement (Figure 43, Figure 44). The site is composed of five structures visible on the surface, all organized around an ancient water catchment area. Ceramic analysis of sherd from this area (see section 4.1 above), known as Bat South, suggests that it was occupied during the Middle Umm an-Nar period.

Bat South's unique environmental setting, around an above-ground water source and its placement mid-way between Bat and 'Amlah offer considerable potential to diversify our current understandings of what constitutes an Umm an-Nar period settlement. The targeted excavation of two of these structures next season and a concurrent investigation into the area's ancient hydrological and geological setting offer an exciting opportunity to consider the role of Bronze Age Bat and its environs in a regional perspective. Excavations at Bat South will be

conducted over the course of three seasons, beginning in 2019-20.



Figure 43. Drone-captured aerial image of an Umm an-Nar structure at Bat South.



Figure 44. Structure walls visible on the surface at Bat South.

6.2 Survey plans for the 2019-20 season

The 29 hectare survey area proposed for the 2019-20 field season extends the first survey area in three directions (see Figure 44): (a) to the northwest of Rojoom is an open area that includes multiple Umm an-Nar structures (including Operation A (Possehl and Thornton 2007) and Building II (Döpfer 2018)); (b) to the southeast of the Settlement Slope, the al-Qa'a area includes a small wadi where Brunswig (1989) identified 3rd millennium hydrologic and settlement features; and (c) to the south and east of Matariya is a space that includes possible tombs and a contemporary "enclosure" (Frifelt 2002), in addition to the mudbrick architecture identified in the 2018-19 season.

A MavicPro drone will collect overhead imagery of key locations on the Bat landscape, in addition to all surveyed and excavated areas. Special attention will be paid to: the Settlement Slope and other third millennium architecture identified in 2018-19; al-Ahliya; al-Rojoom; Matariya and the enclosure; and portions of the Bat Cemetery. Although there is little to no obscuring ground cover, overhead imagery is necessary to document difficult-to-access structures in rugged terrain and will help reveal spatial patterns between exigent architecture. Drone survey will be conducted throughout the field season.

7.1 Transect List

| Lot number | Associated lots | Dimensions | Finds | Description |
|------------|--|--|---|--|
| 190001 | South of 190002; West of 190004; East of 190181 | 15 m x 100 m; 6 transect lines at 2 m intervals | Pottery = 37; Lithic = 61; Shell = 8; Other = 1 | There is a concentration of lithics near the gravel road. Also a good number throughout transect. SE corner of transect is the Matariya backsite. No clear architecture or other feature. |
| 190002 | North of 190001; South of 190180; East of 190182; West of 190009; Contains 190003 | 20 m x 100 m; 4 transect lines at 5 m intervals. | Pottery = 52; Lithic = 64; Shell = 16 | Contains a diagnostic chert core (190003). A fair amount of ceramics on surface and a ton of lithics (both flakes and real tools/tool fragments). Shell predominantly appears to be marine, although none is worked. This was counted but not collected. |
| 190004 | South of 190009; East of 190001; West of 190005 | 20 m x 100 m; 4 transects at 5 m intervals. | Pottery = 10; Lithic = 10; Shell = 1 | Flat wadi plain with lithic and ceramic material on the surface. Portions of the transect affected by the Matariya excavations, were not collected. Matariya datum is SW corner. |
| 190005 | South of 190008; East of 190004; Contains 190006 & 190007 | 20 m x 100 m; 4 transects at 5 m intervals. | Pottery = 1; Lithic = 2; Bone | Scrubby landscape SE of Matariya with not much on the surface. Some potentially human bone on surface (not collected) |
| 190008 | North of 190005; South of 190015; East of 190009 | 20 m x 100 m; 4 transects at 5 m intervals | Pottery = 9; Lithic = 19 | Flat wadi with very little on the surface. Western end of transect disturbed by a modern road. No apparent architecture or features |
| 190009 | North of 190004; South of 190024; East of 190002; West of 190008; Contains 190010-190014 | 20 m x 100 m; 4 transects at 5 m intervals | Pottery = 8; Lithic = 33 | Two stone features (190010 & 190011) in western half of transect may be composed of stones from Matariya. Clusters of pebbles and cobbles on otherwise bare wadi silt are recorded as features (190012-14). Some surface pottery and a fair number of lithics. |
| 190015 | North of 190008; South of 190017; East of 190024; Contains 190016 | 25 m x 100 m; 5 transect lines at 5 m intervals | Pottery = 23; Lithic = 40 | Fairly bare transect with no significant surface features, save a collection of lithics located along the edge of a modern field boundary. Some ceramics found on surface. |
| 190017 | North of 190015; East of 190044; Contains 190018-190023 | 25 m x 10 m; 5 transect lines at 5 m intervals | Pottery = 30; Lithic = 41; Shell = 1 | Contains a modern field border (large stones, probably robbed from the tower) not given a number. Contains 2 silt and cobble mounds (190019 + 190020) that may be tombs. Some (3) chunks of white limestone (points taken but not collected) |

| Lot number | Associated lots | Dimensions | Finds | Description |
|-------------------|--|--|--|---|
| 190024 | North of 190009; South of 190044; East of 190180; West of 190015; Contains 190025-29, 190033-35, & 190037-43 | 25 m x 100 m; 5 transects lines at 5 m intervals | Pottery = 10; Lithic = 22 | Contains enclosure and some of Matariya tower- Matariya not given a number or surveyed. Relatively sparse scatter but tons of features and wall fragments. Some features were assigned lot numbers beyond the limits of this transect, because it made sense to consider them together. |
| 190044 | North of 190024; West of 190017; Contains 190030-32, 190036, & 190045-49 | 20 m x 100 m; 5 transects lines at 5 m intervals | Pottery = 14; Lithic = 25; Shell = 2 | Transect including the north edge of the Enclosure (1167). Several features (190045 & 190046 especially) appear to be tombs. Surface had a moderate spattering of finds, mostly lithics. |
| 190050 | North of 190061; South of 190062; West of 190073; Contains 190055-60 | 25 m x 100 m; 5 transects lines at 5 m intervals | Pottery = 609; Lithic = 95; Shell = 9 | Transect in the field to the east of Rojoom. At least some of this area was used as a tilled field in the past 50 years (falaj channels and furrows visible). Lots of ceramics (comparatively few lithics) on surface. Stone walls (features 190052-55) are used to create a field terrace south of the road -- at least some of these walls appear to be Umm an-Nar. At least 75 cm of accumulated soil within them (to the south). Some water-deposited/cemented materials along the north face of walls 190055 & 54. Silt and gravel within the field system. It is possible that some contexts are preserved below the plow zone. |
| 190061 | South of 190050; Contains 190072 | 25 m x 100 m; 5 transects lines at 5 m intervals | Pottery = 551; Lithic = 66; Shell = 8; Other = 1(glass bracelet) | Transect located on the wadi plain to the east of Rojoom. This section of the plain was used as irrigated fields within the past 50 years or so and traces of the furrows and channels are still visible. High density of ceramics on surface (probably plowed up), less lithic and shell. A single large N-S wall (190070) is preserved cutting across the transect. There appear to be some Umm an-Nar style stones in this wall, but it has clearly been modified in recent history. |
| 190062 | North of 190050; West of 190074; Contains 190051-54 & 190063-71 | 15 m x 100 m; 3 transects lines at 5 m intervals | Pottery = 82; Lithic = 6 | Transect is located between the northern edge of 190050 and the southern edge of the road. The sediment north of the road is mostly fine, as accumulated wadi silts with occasional stone features. The area north of wall 190053 is unusually hard and includes a layer of concreted gravel. The stone features in this transect are all disturbed by wadi flow and the road, but may represent walls or graves. |

| Lot number | Associated lots | Dimensions | Finds | Description |
|-------------------|---|--|--|---|
| 190073 | South of 190074; East of 190050; West of 190100; Contains 190075-80 | 25 m x 100 m; 5 transects lines at 5 m intervals | Pottery = 343; Lithic = 60; Shell = 16 | Transect on the flat of the wadi plain. Cut by modern dirt road and disturbed by a modern trash dump. No identified features. |
| 190074 | North of 190073; East of 190062; West of 190099; Contains 190081-98 | 25 m x 100 m; 5 transects lines at 5 m intervals | Pottery = 157; Lithic = 13; Shell = 1 | Transect just south of the road and north of a private house. Silty soil with some gravel and traces of derelict fields. Several large stone walls are visible on the ground surface and are probably late. Large drainage craters have opened up in the space near the road -- these contain stone wall fragments (190081-86) that may date to the Bronze or Iron Age. |
| 190099 | North of 190100; East of 190074 | 25 m x 100 m; 5 transects lines at 5 m intervals | Pottery = 203; Lithic = 25; Shell = 4 | Transect to the north of Khafaji, northeast corner very close to the wadi cut trench. Lots of pottery on the surface, less lithic and shell. Somewhat more Umm an-Nar pottery is on the surface at the eastern end of the trench. |
| 190100 | North of 190103; South of 190099; West of 190073; Contains 190101-102 | 25 m x 100 m; 5 transects lines at 5 m intervals | Pottery = 137; Lithic = 19 | Transect on the field north of Khafajij. Moderately dense surface finds -- more Umm an-Nar sherds in the east half of the transect. Two stone alignment features (190101 & 190102) are probably late. |
| 190103 | South of 190100 | 25 m x 100 m; 5 transects lines at 5 m intervals | Pottery = 308; Lithic = 52; Shell = 7 | Transect to the north of Khafaji. Quite a bit of ceramic on the surface and significantly more lithics than in transects to the north. No visible features on the surface. |
| 190104 | South of 190105 | 25 m x 100 m; 5 transects lines at 5 m intervals | Pottery = 7; Lithic = 1 | Transect in the wadi flat north of the wadi cut. The embedded road cuts through a wide portion of the transect. No visible features and little material culture on surface. Contexts are likely disturbed by the modern road and seasonal wadi flow. |
| 190105 | North of 190104; South of 190109; East of 190193; West of 190121; Contains 109106-108 | 25 m x 100 m; 5 transects lines at 5 m intervals | Pottery = 28; Lithic = 11 | Transect on the wadi flat to the north of the embedded road. A more shallow, smaller dirt road cuts through a portion of the transect. Two stone walls of unclear date are visible in the eastern end of the transect. Some ceramics on the surface, including at least 3 Umm an-Nar body sherds and several rims -- clustering loosely in the eastern half of the transect. Also some beautiful lithics. |

| Lot number | Associated lots | Dimensions | Finds | Description |
|-------------------|---|--|---|---|
| 190109 | North of 190105; East of 190193; West of 190124; Contains 190110-120 | 25 m x 100 m; 5 transects lines at 5 m intervals | Pottery = 85; Lithic = 44; Shell = 2 | Transect on wadi flat and the bottom edge of the southeast Settlement Slope hillside. Several stone walls (190110-120) are visible on the surface and in a wadi channel along the northern edge of the transect. Some nice lithics. Also a cluster of Umm an-Nar sherds in the eastern end of the transect and a mixture of Umm an-Nar and Iron Age sherds throughout (especially along walls 190110-114). |
| 190121 | South of 190124; East of 190105; Contains 190122-123 | 25 m x 100 m; 5 transects lines at 5 m intervals | Pottery = 249; Lithic = 13; Shell = 2; Other = 1 (steatite bowl fragment) | Transect on the wadi flat to the north of (and partially within) the road. A good amount of pottery (much of it Umm an-Nar) and lithic on the surface. Two potential stone features visible in profile in erosion channels along the north edge of the road cut. A good 1.5 m of sediment is visible in the road cut profile. |
| 190124 | North of 190121; South of 190125; East of 190109; West of 190138 | 25 m x 100 m; 5 transects lines at 5 m intervals | Pottery = 272; Lithic = 40; Shell = 5; Other = 3 (metal; stone bead; & glass bracelet fragment) | Transect on the wadi flat north of the road and southeast of the settlement slope hill. No features visible on the surface. Quite a bit of pottery (much of it Umm an-Nar) and some lithic and shell. A square stone bead was found near the western end of the transect. The finds were particularly dense in drainage channels just north of the road cut. |
| 190125 | North of 190124; West of 190128; Contains 190126-127 | 25 m x 100 m; 5 transects lines at 5 m intervals | Pottery = 323; Lithic = 52; Shell = 11; Other = 1 (grinding stone) | Transect located on a terrace north of Khamis Hamed al-Baredi's house and south of the football field (and north of 190124). First transect on this northern line. Transects walked west-east with near 100% ground visibility. Piles of modern rubbish indicate ongoing waste disposal (industrial and agricultural). |
| 190128 | North of 190138; South of 190153; East of 190125; West of 190169; Contains 190129-137 | 25 m x 100 m; 5 transects lines at 5 m intervals | Pottery = 145; Lithic = 39; Shell = 5; Other = 2 (beads) | Transect on the wadi plain south of the main road. Mostly flat wadi surface, but the southern edge is carved with drainage channels flowing down to the embedded road. Surface finds are fairly dense -- plenty of the Umm an-Nar pottery mixed with later periods. Some lithic and ground stone. Also a bead and a historic (1908) Christian medallion. Stone walling and a small Umm an-Nar tomb are exposed in (and damaged by) the drainage channels along the southern edge of the transect. |

| Lot number | Associated lots | Dimensions | Finds | Description |
|-------------------|---|--|--|---|
| 190138 | South of 190128; East of 190124; Contains 190139-152 | 25 m x 100 m; 5 transects lines at 5 m intervals | Pottery = 131; Lithic = 27; Shell = 2 | Transect is cut east-west by the modern road along its southern edge. Erosion is very active along the road -- drainage channels empty to the wadi and have carried artifacts and elements of architecture (large cobbles - Umm an-Nar?) down slope towards the wadi road. |
| 190153 | North of 190128; South of 190160; West of 190154 | 25 m x 100 m; 5 transects lines at 5 m intervals | Pottery = 126; Lithic = 18; Shell = 1 | Transect on the wadi plain to the east of the Settlement Slope. Moderately high density of finds on surface. Pottery in the western half were small and well-worn. The eastern half contained larger sherds and more lithics. No identified features. |
| 190154 | North of 190169; South of 190161; East of 190153; Contains 190155-159 | 25 m x 100 m; 5 transects lines at 5 m intervals | Pottery = 228; Lithic = 43; Shell = 11 | Transect on the wadi flat. Disturbed by modern dirt road, electrical poles, and two wadi channels. A large modern(-ish) well with multiple use phases (190155) is located at the western end of the transect. Moderately dense surface finds, especially near drainage channels. Three mounds of modern(-ish) mudbrick and rubble in the northeast quadrant contain lots of Islamic ceramics. |
| 190160 | North of 190153; West of 190161 | 25 m x 100 m; 5 transects lines at 5 m intervals | Pottery = 184; Lithic = 83; Shell = 6 | Transect on wadi flat. No visible features. Dense concentration of surface finds, especially lithics. Some disturbances from dirt road. |
| 190161 | North of 190154; South of 190216; East of 190160; Contains 190161-168 | 25 m x 100 m; 5 transects lines at 5 m intervals | Pottery = 225; Lithic = 37; Shell = 3 | Transect on the wadi plain, disturbed in several locations by a dirt road and wadi irrigation channels. Moderately dense surface finds. Transect includes two large stone features (190163 & 190165) that may be field irrigation channels (possibly from two different periods based on differences in construction styles). |
| 190169 | South of 190154; East of 190128; Contains 190170-179 | 25 m x 100 m; 5 transects lines at 5 m intervals | Pottery = 112; Lithic = 44; Shell = 4 | Transect along the northern edge of the main road through the site. Terrain is disturbed by a number of wadi drainage channels and a dirt road. Moderate density of surface finds. Stone features are primarily visible where they have been exposed (and usually disturbed) by the wadi channels. |

| Lot number | Associated lots | Dimensions | Finds | Description |
|-------------------|--|--|--|---|
| 190180 | North of 190002; East of 190183; West of 190024 | 25 m x 100 m; 5 transects lines at 5 m intervals | Pottery = 19; Lithic = 14; Shell = 4 | Transect on wadi flat cut by an erosion channel, flowing west from the edge of a north-south dirt road. The cut is about 80 cm deep and its eastern end has been filled with construction rubble (to ameliorate road erosion?). West of the road the ground is compact silty clay, reminiscent of mudbrick melt. East of the road resemble more of a desert pavement, possibly because it is slightly higher (and thus erosion has removed the matrix from around the gravels). |
| 190181 | South of 190182; West of 190001 | 25 m x 100 m; 5 transects lines at 5 m intervals | Pottery = 149; Lithic = 199; Shell = 76; Other = 2 (musket ball, shell bead) | Transect on wadi flat. Lots of lithics and considerably more (and varied) shell, including a fragment of terebralia and a dentalia bead. More ghaf-style shrubs at the western end of the transect. Little ground cover. The compaction and inclusions in the clayey soil suggests that it the area may once have contained mudbrick that has now melted. |
| 190182 | North of 190181; South of 190183; East of 190186; West of 190002 | 25 m x 100 m; 5 transects lines at 5 m intervals | Pottery = 126; Lithic = 99; Shell = 28 | Transect on wadi terrace, cut by large erosion channels. Channels are only about 30 cm deep but are quite long and run south to north towards the road cut, deepening as they gain strength. |
| 190183 | North of 190182; East of 190186; West of 190180; Contains 190184-185 | 25 m x 100 m; 5 transects lines at 5 m intervals | Pottery = 89; Lithic = 53; Shell = 8 | Transect on wadi terrace. Northern and western quadrants have a great deal more gravel (about 20%). Disturbed by erosion cuts flowing to the road (north). Very few medium-sized stones in the erosion cuts' sections, though a gravel layer is visible, sitting on what appears to be a lake deposit (?), and below the mudbrick melt material of the modern surface. |
| 190186 | West of 190182 & 190183; Contains 190187-192 | 50 m x 100 m; 10 transect lines at 5 m intervals | Pottery = 565; Lithic = 151; Shell = 25 | Transect on wadi terrace. Western end includes relatively recent remains of mudbrick, stone, and cinder block construction. Lots of mudbrick melt and, while generally flat, clear low mounds suggesting construction refuse and/or intact wall footings. Deep erosion cuts run south to north to the wadi cut and criss-cross the entire transect, showing about 80 cm of mudbrick-like deposit in section. |

| Lot number | Associated lots | Dimensions | Finds | Description |
|------------|---|---|---------------------------------------|--|
| 190193 | West of 190105 & 190109; Contains 190194-215 & 190234-247 | 50 m x 100 m; 10 transects lines at 5 m intervals | Pottery = 303; Lithic = 23; Shell = 2 | This transect is double-wide (50 x 100 m) and is located along the south edge of the Settlement Slope's eastern end. The road to Matariya cuts through the southern edge of the transect and some contexts are disturbed/exposed by erosion channels. Numerous stone features are visible on the surface and in cuts, including two large Umm an-Nar buildings and 3-4 check dams recorded by Frifelt & Brunswig. Surface had a moderate-high density of ceramics, but fewer lithic and shell. Most ceramics date to the Umm an-Nar. Most architecture appears to date to the Umm an-Nar, some later modifications to Umm an-Nar structures. Transect was surveyed over several days due to its size and the density of finds. |
| 190216 | North of 190161; Contains 190218-219 | 25 m x 100 m; 5 transects lines at 5 m intervals | Pottery = 26; Lithic = 29; Shell = 1 | Transect located on wadi flat with part of a well-constructed barn in it; fenced area to east. Northwest quadrant beneath and surrounding the barn, is rocky (angular limestone fragments), while the areas to the south and east area flatter and sandier. South of 190165 the land appears to have been subdivided into farming plots ("garba"). |
| 190217 | Contains 190220-232, 190248-259, 110966-967, 110973, 110980-982, & 110978-979 | 75 m x 250 m; 7 transect lines at 5 m intervals | Pottery = 42; Lithic = 9; Bone | Large, irregularly shaped transect that includes the whole of the al-Ahliya hill, from the fence line in the south to the bottom of the main hill sope in the west, north, and east. Contains the al-Ahliyatower (110980), multiple tombs of various periods (Umm an-Nar, Wadi Sûq, and Iron Age), and assorted wall fragments. This area was first surveyed by C. Cable in 2011 (feature #s used here). Walked this year in roughly 5m transect lines. Walls mappend in 2013/2014 by Kristen Hopper and Adil were not given new numbers and were considered part of tower 110980. |
| 190233 | N/A | 25 m x 100 m | Pottery = 1 | Transect not surveyed, but an Emir ware (painted rim) sherd was identified and collected. Theoretical transect location (with coordinates) is included on the map, along with the location of the Emir ware find. Several tombs and a wall were also spotted. Full survey reserved for 2020. Closest surveyed transects are 190216 (50 m south) and 190217 (50 m east). |

7.2 Feature list

| Lot number | within transect | Spot date | Description |
|------------|-----------------|-----------|--|
| 190003 | 190002 | unknown | Large, diagnostic core; reddish-brown chert with multiple flake scars and strike marks. A piece of cortex is left on one side. |
| 190006 | 190005 | unknown | Small stone and soil mound. Possibly a tomb, but probably not. Stones are local limestone and too small to be reused from Matariya. |
| 190007 | 190005 | unknown | Mound of stone and soil with tree base at center; probably natural but possibly a tomb remnant. |
| 190010 | 190009 | unknown | Concentration of stones, using stones from Matariya (which is 15 m to the northeast). |
| 190011 | 190009 | unknown | Collection of ~10 stones, probably stones from Matariya (to the northwest), roughly 1.5 m x 1.5 m square. |
| 190012 | 190009 | unknown | Possible feature made up of a concentration of stones (cobble-size only). |
| 190013 | 190009 | unknown | Loose cluster of small stones in an otherwise silty area, with no visible artifacts. |
| 190014 | 190009 | unknown | Loose concentration of wadi cobbles and pebbles in an area of bare silt, with no visible artifacts. |
| 190016 | 190015 | unknown | This feature is a 2 m x 2 m concentration of lithics on the edge of a modern line of field stones; east of Matariya. It is at the beginning of the transect. Lithics are gray and red and show early stage reduction of cobbles. Angular debris is also endemic. |
| 190018 | 190017 | unknown | A small lithic concentration, 1 m in diameter, east of Matariya and south of a mound (possible tomb). |

| Lot number | within transect | Spot date | Description |
|------------|-----------------|------------|--|
| 190019 | 190017 | UAN? | Mound of cobbles (many heat-affected), 40 cm tall and 10 m diameter, including some chunks of white limestone but not visibly worked. |
| 190020 | 190017 | UAN | Mound of silt and wadi cobbles; some architecture visible within mound (possibly a tomb?). The feature is 16.5 m N-S and 20 m E-W. To the northeast is the road. The feature is located just east of the enclosure and north of Manfred's line of stones. Some white stone and an Umm an-Nar wall (190021) means this feature at the very least includes Umm an-Nar dates. |
| 190021 | 190017 | UAN | This feature is a 40 cm wide, double-faced East-West aligned wall; 1.2 m long; very likely Umm an-Nar. It lies on the southeast corner of 190020. Manfred's stones are 5 m South. |
| 190022 | 190017 | unknown | Possible wall on N side of 190020. Alignment of stones (upright on their sides); ~7 m long and (only?) 1 stone wide; visible intermittently on the surface; runs E-W; The highest point on 190020 is the west end of this wall. |
| 190023 | 190017 | Neolithic? | Collection of lithics (diagnostic and nondiagnostic) just north of an intersection of roads. Two concentrations of lithics just south of Manfred's stones, separated by a depression. Tools include an awl, but lots of secondary flakes are associated with this feature. |
| 190025 | 190024 | UAN | The roughly circular, 20 cm diameter wall fragment (what Frifelt called the "enclosure" 1167); severed straight wall fragments interact with or overlap with 190025 and probably represent a later re-use of the feature. The architectural style of these walls (190028-33) appears to be (middle) Umm an-Nar, implying the enclosure wall (190025) may be Early Umm an-Nar |
| 190026 | 190024 | UAN | Stone wall fragment, double-faced with area in center not visible, Umm an-Nar style; between Matariya and circular enclosure (Frifelt 1167); north of series of mounds; end stone visible |
| 190027 | 190024 | UAN | N-S stone wall fragment not in alignment but adjacent to the E end of 190026. Double-faced (ish); ~1.5 m long and 40 cm wide. Probably remodeled from 190025 |
| 190028 | 190024 | unknown | Stones (50 cm x 30 cm stone wall foundation; roughly N-S alignment; 1-2 stones wide. Cuts the "enclosure" ring wall (190025) and abuts E-W wall 190029. Probably a later re-use of the Enclosure context. Local limestone |

| Lot number | within transect | Spot date | Description |
|------------|-----------------|-----------|---|
| 190029 | 190024 | UAN | Stone wall foundation; roughly E-W alignment; 2 stones wide. Cuts the “enclosure” ring wall (190025) and abuts N-S wall 190028. Construction style appears to be Middle Umm an-Nar – suggesting a middle UAN reuse of the earlier enclosure context. Constructed of local limestone. |
| 190030 | 190024 | UAN? | E-W short rectilinear wall fragment that connects part of 190024 with 190031. Originally probably double-faced but most of the S side of the wall is ‘missing’. Western 3 stones are smaller than the eastern 2. ~1.2 m long. Probably later (remodel) from 190031, which is made of larger finer/worked stones. |
| 190031 | 190024 | UAN | Double faced stone wall fragment, ~48 cm across. Mix of medium-large and medium-small stones (40 cm–25 cm across), ~100 cm in length total; seems to form a corner with 190030 with potential remodeling involved. North of the circular (190025). Rectilinear. Angled stones. |
| 190032 | 190024 | UAN | Small preserved segment of stone wall foundations. Middle Umm an-Nar construction style (dovetailed limestones). Cuts the location where the Enclosure ring wall would have originally been. May be preserved further to the NE, where it disappears beneath the ground. Seems to end in the SW. |
| 190033 | 190024 | UAN | Rectilinear double faced wall; not as ruined as lot 190025 but not as straight as the other rectilinear features; eastern face preserved well and made of larger, well placed stones. Western face made of irregular stones of poor quality (one stone facing up, one totally disintegrated). Whole wall ~45 cmx3m. Immediately east three stones similar to those of lot 190025 – could be fall from circular enclosure or part of an observable pattern of wall expansion seen in the layers of 190025. |
| 190034 | 190024 | UAN | Wall fragment abutting part of lot 190026. Large stones and smaller dovetailed stones visible. Between Matariya and circular enclosure north of the series of mounds. Double faced, about ~20 cm across. |
| 190035 | 190024 | unknown | Mound of cobble-sized stones and smaller; longish (c. 15 m long and 4 m wide and ca. 30 cm high); split into two pieces by Frifelts trench; Oriented N-S; cobbles are heat-affected. Few finds on the surface but it’s only ca. 20 m from Matariya so finds may have been collected in previous seasons. |
| 190036 | 190024 | unknown | SW-NE elongated low mound. ca. 50 cm NW of enclosure 190025, ca. 3 m N of wall 190029. Probable tomb. |
| 190037 | 190024 | UAN | Stones ~40 x 20 cm. Small fragment of wall foundation; 2 stones wide. Possibly a Middle Umm an-Nar construction style. There is an accumulation of pebbles and Wadi cobbles in the space to the east of the wall. Located in the space between Maratiya and the Enclosure. |

| Lot number | within transect | Spot date | Description |
|------------|-----------------|-----------|---|
| 190038 | 190024 | UAN | Stones (50 cm x 30 cm). Fragmentary stone wall foundations, 2 stones wide. Possibly Middle Umm an-Nar construction style. Located in the space between Matariya and the Enclosure. Local limestone blocks smashed- possibly driven over. Accumulation of pebbles and Wadi cobbles to the north of the roughly N-S wall. (lot 190038) |
| 190039 | 190024 | unknown | Fragmentary stone wall foundation, roughly E-W alignment; preserved. 1 stone wide. Abuts wall 190038, which appears to be a Middle Umm an-Nar construction style. Local limestone blocks are smashed -- possibly driven over. There is an accumulation of pebbles and Wadi cobbles to the north, beyond the end of wall 190038. Located in the space between Matariya and the Enclosure. |
| 190040 | 190024 | unknown | E-W linear alignment of small mounds between T1147 and S edge of enclosure. Approx. 4 distinct mounds. Some elongated others circular, 1.5-2.5 m diameter. ~2 m S of 190026 (rectilinear wall). |
| 190041 | 190024 | UAN | Double faced short E-W rectilinear wall fragment ~5 m North of T1147. 4-5 distinct stones. Total ~40 x 120 cm. Probably Umm an-Nar. Possible continuation of 190042 to West. |
| 190042 | 190024 | UAN | 40 cm rectilinear wall fragment ~5 m N of T1147. Total ~3.5m x 0.8 m. Probably Umm an-Nar. Double-faced. Possibly continuation of 190041 to E. |
| 190043 | 190024 | UAN | WSW-ENE section of unexcavated ringwall of T1147, ~15 m N of tower wall. W of 2011 excavations. Total ~2 m long. "Inner" (S) edge not clear due to coverage by tower mound; "outer" (N) edge is clear. |
| 190045 | 190044 | unknown | Lot 45 is an oblong/circular raised rubble mound (possible tomb) that is 30-40 cm tall and ~7 m x 11 m. The mound is deflated at the outer edges with tallest point being the center-mound. Consists of small-med sub-angular cobbles (n~300) with no artifacts observed eroding from the mound, though ~5 surface lithics and ~2 ceramics were observed in rubble. No diagnostics were observed. |
| 190046 | 190044 | UAN | Flat, large, Umm an-Nar-style stones under cobble (later), potentially a disturbed tomb with remodeling. In between road and feature 190045. Some stones appear heat-treated. No bones/grave goods found. |
| 190047 | 190044 | unknown | Two large, roughly triangular limestone blocks that appear to form a south-facing wall. A possible burial is located in the space just to the south. The stones are roughly the same size as the Matariya tower stones (ca. 75 x 60 cm). Unclear if the feature continues-- these two stones are preserved ca 15 cm above the modern ground surface. Located north of the Enclosure |

| Lot number | within transect | Spot date | Description |
|------------|-----------------|-----------|--|
| 190048 | 190044 | unknown | 48 consists of an oblong rubble mound (w ~1.5m); length ~3.5 m oriented roughly E-W with 2 large cobbles on west end (possible headstone for potential grave?). 190047 frames feature 48 to the north, roughly 15 cm distance away. 48 is slightly raised/maybe 3-5 cm tall from surrounding surface. Mound consists of approx. 50 small to mid-size angular to subangular cobbles (local materials dominant, though quartzite cobble observed semi-buried). No artifacts observed |
| 190049 | 190044 | unknown | SW-NE running, elongated oval mound; 5-6 m West of mound 190046; covered in angular stones of about 15 x 20 cm; size of mound → 4 m x 6 m; small amounts of clustered limestone. Probable tomb |
| 190051 | 190050 | UAN | 190051 is a wall segment 2-courses tall (h=36 cm) and 3.5 m long 1 m wide. Potentially Umm an-Nar wall (large flat faced stones) one cobble of wall exhibits pecked petroglyph (at least 1 zoomorph-upsidedown. Camel?) Wall may continue to east and west. Additional petroglyphs may be present (stones are faced and pecked similar to sugar cube faced stones. No artifacts, angular, flat, with rubble=small to mid sized sub-angular to rounded. Likely this feature is congruent with 190052. but unsure. |
| 190052 | 190050 | unknown | 190050 is a single-faced stone wall that runs mostly N-S but curves in a large circular enclosure next to the wadi/road which is north of Rojoom. The wall itself is south east of Rojoom. The wall consists of large, flat, faced/prepped cobbles and is stacked 3-5 courses high (h~45 cm), with the highest point measuring 1m tall from variable ground surface. Rubble (consisting of small-med cobbles) fills the wall interior. The ground surface is raised on the interior of the wall, suggesting 1) the wall has protected the interior from erosion and 2) there is depth potential here. Many ceramic sherds were observed on this interior side of the wall and tallied for 190050 (n~85 for this wall section). Wall is approx 45 m long and 1 m wide. |
| 190053 | 190050 | UAN | 190053 is a 1-3 coursed stacked single faced Umm an-Nar wall that abuts or connects with 190052. Southeast of Rojoom tower and West of the Wadi road. If 190052 curves convex in a circle, 190053 is concave (the northwest terminus of 53 forms the middle of a South-trending wall). It is approx. 20 m long and 1 m wide. Like 190051 and 190052, there is rubble on interior side of wall; like 190052, the ground surface on the "interior" side of the wall is taller/higher (roughly 20 cm) than the "outside" side. There is soil deposition on side of the wall is taller/higher (roughly 20 cm) than the "outside" side. There is soil deposition on the "outside" side of the convex curve that has eroded by wadi flooding (originally deposited by wadi alluvial processes, currently eroding away). The road is roughly 10 m to the north east of the wall. Like 190052, ceramic was observed on the surface "interior" side of the wall during transect survey (190050). Southern terminus of 53 connects with 190054 where the wall transforms into a double-faced wall. |

| Lot number | within transect | Spot date | Description |
|------------|-----------------|-----------|---|
| 190054 | 190050 | UAN | 190054 is a semi-collapsed stone wall (Umm an-Nar- single faced) built on top of an interesting, extremely hardpacked and densely gravelled conglomerate concreted matrix (light brown clayey silt with approx. 60% rounded to subrounded gravels (which lays on top of a softer, less gravelly but still compact subsoil-- likely wadi deposited. Matrix continues to slope southeast to nearly the wadi road. Wall is 2-3 courses high roughly 1 m tall (including ~40 cm conglomerate matrix) from variable ground surface and ~5 m long. Ceramic sherds were observed on interior side of wall (n~10) during transect 190050 survey, more likely present. Corner of wall (intersection of 53+54) has semi-collapsed downhill. |
| 190055 | 190050 | UAN | large UAN wall sitting on loosely cemented wadi deposit (visible on the NE face, facing the current wadi road). Large blocks (25 x 35 x 40 cm) make up a double-faced wall 2 stones (ca. 50 cm) tall and 1.3 m wide. W-facing wall side face is hidden by alluvial fill. 8-9 stones long (5.5m) oriented roughly (NNW-SSE). Tumble present in front of the wall, suggesting it was once taller |
| 190056 | 190050 | UAN | Long (ca. 15m), double-faced wall built of limestone blocks. Some blocks appear to be shaped (very rectangular?). Stones ca. 40 x 25 cm. Possibly Umm an-Nar construction? Appears to be cut by wall 190055 in the north. Part of the wall is washed out by modern drainage. The southern end is obscured by a tree, but may be preserved below the surface. The small wall/feature 190057 may be a continuation of this wall further to the South. |
| 190057 | 190050 | unknown | Small cluster of limestone chunks that appear roughly in line with wall 190056, which ends ~2 m to the north. Larger stones possibly broken by plowing. Stones ~15x10 cm |
| 190058 | 190050 | unknown | A line of soil and stones, at the SE edge of the transect area. Slightly mounded. Ca. 3 m long and 1 m wide, made up of disarranged UAN local stones (ca. 30X40 cm). Vehicle tracks go over. Oriented N-S |
| 190059 | 190050 | unknown | Collection of stones in low/gentle mound just S of the electrical line (from the beginning with edge of the transect, location = between 2nd and 3rd electrical poles and 2 m south). Consists of 1 UAN local stone (large) and several smaller blocks (13 x 13 cm). Large UAN stone = 35 x >20 cm (mostly buried). Total dimensions = 1.1 m (N-S) x 70 cm (E-W) |
| 190060 | 190050 | unknown | small pile of stones that is eroding out from an abandoned field end. The stones visible are smaller than 30 x 15 x 15 cm. There are also artifacts and rubbish around this-- possibly due to its location (washed out area). Total visible dimensions are 60 x 40 cm and ~20 cm tall. Some stone-on-stone suggest possible wall. Location: South edge of transect, near a cut-down electrical pole (~3 m to the NE). |

| Lot number | within transect | Spot date | Description |
|------------|-----------------|-----------|--|
| 190063 | 190062 | unknown | Collection of UAN stones mixed with some cement blocks- so probably not a wall BUT most of the material resembles UAN walling exposed along (and by) the wadi track/cut. ca. 50 m east of Rojoom, at the S side of the road ca. L-shaped 1.3 x 1.3 m. Disarranged, possibly pushed from the N (by road crews) but probably fallen from the South. |
| 190064 | 190062 | unknown | collection of limestone blocks and cobbles that may be a washed-out and modified. Two large stones have been arranged to form a "chair" and a modern cinderblock has been used to support the chair "back". Large stones ~80 x 40 x 40 cm; cobbles ~20 x 15 x 15 cm |
| 190065 | 190062 | UAN | Collections of large and BIG stones in disarray by the road/wadi cut. 2 stones = ca. 70 x 40 x 35 cm, roughly faced; the others are ca. 30 x 20 x 20 cm. Whole group = 4 m x 1.5 m (oriented E-W); 'aligned' with road cut (really, exposed by erosion). Alluvial silt is visible above/behind and semi-cemented gravels are in and beneath and on the other (not BIG) rocks. Probably indicates features are buried to the S of them in the alluvium. |
| 190066 | 190062 | UAN? | Stones ~40 x 30 x 30 cm; Several large limestone blocks emerging from the road-cut profile. May be a wall (which was cut by the road). There are additional large stones in line with these on the north side of the road. South of where the profile stones are visible, two cobble accumulations are apparent on the ground surface (ca. 50 cm higher than the stones). These may mark the preserved top of the feature below the modern ground surface. |
| 190067 | 190062 | unknown | 7 x 4 m spread of stone, none particularly large except the ones nearest to the road cut to the North. The bulk of this feature is on the terrace between wall 190052 and the road cut. E of this feature is a "bare spot" ca. 15 m long; natural deposit with some silt runoff? |
| 190068 | 190062 | unknown | Limestone blocks ~75 x 30 x 20 cm. Cobbles ~20 x 15 x 15 cm; Collection of large(-ish) limestone blocks at roughly surface level of the silty area just south of the modern road. The shape sort of looks like a tomb, but it could also be a disturbed wall or stones washed down from wall 190053 (which is higher and located ~7 m south). Smaller cobbles are clustered around the larger stones, but this is probably wash accumulation. |
| 190069 | 190062 | unknown | Pile of ~5 stones under a tree on the alluvial terrace between 190053 and road cut. Stones are disarrayed but their location (next to the tree and on the terrace) suggests they have not been moved recently. Overall dimensions = 1.4 x 0.8 m. Stones are all medium sized (~40 x 30 x 20 cm) |

| Lot number | within transect | Spot date | Description |
|------------|-----------------|-----------|---|
| 190070 | 190062 | unknown | Large stones ~75 x 40 x 25 cm. Concentration of limestone blocks and some cobbles at roughly surface level in the silty area just south of the road. The size and shape of the feature suggests that it might be a tomb. The stones may also be tumbled from wall 190053, which is at a higher elevation and is only ~2 m south. Other tumbled stones are in the general vicinity, but these are isolated, rather than clustered. |
| 190071 | 190062 | UAN? | Line of stones with med-large blocks at S end, at the north-western intersection between the wadi road, the road/path to Khafaji, and the electrical pole (TX-682 F1/13). Stones are disarrayed and at angles. Dimensions of stones vary between (25 x 25 x 20 cm) and (70 x 40 x 30 cm). Several appear roughly faced and shaped. The thick alluvium suggests possibility intact adjacent (or below) deposit. On the terrace slope as opposed to at the road cut. Ca. 7 m long and 1 m wide overall. |
| 190072 | 190061 | unknown | 190072 is a N-S running stone (Umm an-Nar stones?) wall with 75% rubble/collapse that is ca. 5 m wide (max collapse width) and ~25 m long. It appears either collapsed or has been pilfered for good Umm an-Nar stones for the nearby farm walls-- some of these were observed reinforcing a modern ag field fenceline to the south. The wall may be of modern constitution as the stone faces of the wall are wonky/not well placed and look similar to the construction/placement of stones on the western fenceline. The rubble is considerable, however, and may indicate an older date of construction for this wall-- the rubble has collapsed to the east, which is opposite the faced stones. The northern terminus of the wall ends at a modern, well-used dirt two-track road. Lighter soil north of the road may indicate a modern garden wall continues on the same alignment as 190072. The wall termination in the South fades into the ground surface and facing stones are on average ca. 15-20 cm long and portions of the wall show 2-3 levels of coursing. Rubble is dominant and ranges from small to medium subangular to subrounded cobbles. Diagnostic fragments were collected with transect lot number |
| 190075 | 190074 | UAN | 190075 is a north to south trending double-faced Umm an-Nar style stone wall (height unknown) that is below the surrounding ground surface and has been exposed by an erosional cut that has formed to the east of the wall as a result of erosional processes introduced by a dirt driveway (running north to south) parallel to the wall feature from a modern home to the wadi/ road. The wall appears to be rubble filled though modern trash has fallen into the rubble with silty clay sediments that have been carried by erosion from the eroded cut banks. The wall likely continues below the surface to both the north and south. The northern end of which may connect with 190076, an east to west trending wall feature. 190075 is exposed for approx. 3 m of length and appears to be approx. 1 m wide. It consists of medium-large angled cobbles which make up the |

| Lot number | within transect | Spot date | Description |
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| | | | faces of the wall and small-medium cobbles make the rubble fill. Wall collapse has occurred to the west between the road and the wall face. |
| 190076 | 190074 | unknown | 190076 is an east to west running wall that is partially collapsed. It measures approx. 4 m long and the boundaries are unclear, but collapse/mound is approx. 1.5 m wide. There is an upright stone that looks suspiciously like a corner that is approx. 35 cm tall/high. The wall consists of medium to large cobbles with medium cobbles that appear to be either wall collapse or rubble. The western most stone may connect or be associated with 190075. No artifacts observed in the wall matrix which has collapsed/partially collapsed. |
| 190077 | 190074 | unknown | 190077 is a badly eroded stone wall that runs approx. northeast to southwest for approx. 3 m and is approx. 0.5 m wide, and approx. 0.30 m tall. Multiple erosional drainages have fed through the wall alignment to the wadi/road north of the feature. It appears that some stones have been displaced as a result, as the wall shape is somewhat bulged at lower elevations/in these drainages. Modern trash and sediment has also been carried by these drainages and some has collected at intersections with the wall. Wall consists of medium to large cobbles – some are still semi upright and stacked into 1 course. Rubble is not visible on the surface, it has either been obscured by deposited sediments or carried away in seasonal floating through the drainages. No artifacts observed. |
| 190078 | 190074 | unknown | Possible tomb under a tree, ca.20 m N of the NE corner of Khalfan’s house. 2.5 m long, oriented NE-SW, ca. 1.1 m wide made of roughly placed limestone with various orientations (i.e. in line and off-direction; lying flat and on edge). ~40 x 20 x ? cm each. Very likely reused from earlier structures. |
| 190079 | 190074 | unknown | 190079 is an east to west trending single-faced stone wall approx. 2 m long, 0.10 m wide, 0.05 m tall. A drainage cuts the wall in the west, and the wall may continue subsurface to the east. It is mostly buried and ceramic was observed between two face stones (light red naturally abraded body sherd). |
| 190080 | 190074 | unknown | 190080 is a stone feature (wall fragment? Concentration?) that is vaguely circular on the surface and intersects or is part of a bund (maybe same as 190088?) it measures 1 m x 0.75 m and is approx. 8 cm higher than surrounding landscape. It is still mostly buried and is comprised of medium to large cobbles. Naturally abraded ceramic body sherds were observed on the downslope edges of the feature (not collected, but included in tally for 190073 (transect#)) |
| 190081 | 190074 | Islamic | stone wall edge exposed by a large drainage crater. The wall is roughly 3 courses tall (or more), dry-stone masonry, and is built of relatively small, irregular stones. Probably the same wall as 190082 and 190083 to the |

| Lot number | within transect | Spot date | Description |
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| | | | west. An Iron Age (red ware) shard was found within the wall. Approximately 60 cm. below the modern surface. |
| 190082 | 190074 | Islamic | section of East to West running wall visible in erosion cut stones are similar to 190083, as is construction, but erosion damage is greater here than 190083. 2.5 m visible in profile (only approx. 40 cm visible in plan – top obscured by ca. 30 cm of silty clay. Only North face visible ca. 2.5 m then disappears into the erosion "section" on both ends. |
| 190083 | 190074 | Islamic | 4 m long East to West running wall made of local brown stones. Orientation of the stones vary (upright and on end); stones are relatively small (ca. 20-30 cm x 20 cm x 20 cm), visible in profile due to erosion cut. Top of wall is 25 cm below modern surface. South face not visible. At least 3 courses (40 cm) tall. Probably same as 190082. Possibly abuts 190084 but obscured by surface (uneroded). Visible (North) face is irregular. Disappears into East section; West may be the end. |
| 190084 | 190074 | Islamic | Double-faced rubble-filled wall with stones oriented upright; wall oriented N-S; extends into trench 45002 |
| 190085 | 190074 | Islamic | Double-faced rubble-filled wall with stones oriented upright; wall oriented W-E; extends into trench 45002 |
| 190086 | 190074 | unknown | Small stone feature, possibly the end of a stone wall, that is eroding out of the side of a drainage channel. Feature does not appear to continue in the far edge of the drainage channel. Surrounding matrix is almost entirely silt. May just be a collection of stones or may be related to stone archaeological feature further to the south (walls 190084 and 190085). |
| 190087 | 190074 | unknown | The bund (190088) takes a turn to the northeast and eroding out of the North end is a wall stub: collection of small stones (ca. 15 x 20 x 20 cm each) stacked atop each other and falling out appears to be approx. 30 cm wide and 50 cm tall; only approx. 90 cm North to South are visible. Runs North to South; post-3rd millennium. |
| 190088 | 190073 | Modern | Long North to South running bund forming the West edge of now-abandoned agricultural fields (<i>galba</i> and <i>zakiya</i> still visible in places), forming a terrace to the East. Pottery is mixed Bahla, Iron Age, other Islamic wares. Length = at least 50 m long, ca. 2 m wide. Very likely Islamic or pre-modern (if not modern). |
| 190089 | 190074 | Modern | Stone concentration/pile poking out from the northwest-most part of the main bund alignment. Very likely a pile created when the bund was created. 2 x 1.5 x 0.5 m. |

| Lot number | within transect | Spot date | Description |
|------------|-----------------|-----------|---|
| 190090 | 190074 | unknown | Runs East-West, large (40 cm x 40 cm x 20 cm estimated) upright stones aligned (wall?), entire feature very long (ca. 5 m to 7m). Cut by water channel approx. 3 m East of lot 190092; Perpendicular/adjacent to 190091. Lot 190087 is probable continuation of this wall. |
| 190091 | 190074 | unknown | Wall of medium-sized (ca. 20 x 30 cm; depth unknown because buried) stones. Runs North-South (-ish). South end perpendicular to 190090. Approx. 2 m long total. |
| 190092 | 190074 | unknown | Fragmentary double-faced wall composed of two rows of limestone blocks and a rubble/gravel core. Joins with wall 190093 at its northern end. The southern end and part of the eastern face are disturbed. |
| 190093 | 190074 | unknown | Long (ca. 15 m), double-faced wall composed of two parallel rows of limestone blocks and a gravel core. Its western end is cut by the installation of a telephone pole. Joins with wall 190092 at its eastern end. |
| 190094 | 190074 | UAN | UAN-style wall faintly visible in plan through the alluvium fill, just south of the road cut and northwest of the northwest end of bund 190088. Local brown limestone blocks, apparently faced, laid horizontally and possibly dovetailed fabric of pottery (not collected); Iron Age and UAN |
| 190095 | 190074 | unknown | North-south running stone alignment just south of the road, in line with the bund (190088) but on the terrace beyond, under a <i>ghaf</i> tree. Technically outside 190074 (just north of it). Ca. 3 m long, embedded in silt so only tops visible; 30 cm wide? |
| 190096 | 190074 | UAN? | East-west running stone alignment (possible wall), only 4 large stones long (ca. 2.5m). Roughly faced and only 1 width of stone visible. Overall dimensions, 2.5 m x 40 cm; stone dimensions, ca. 45 x 30 x 50 cm. Probably oriented flat initially; some gravel and cobble fill. |
| 190097 | 190074 | UAN? | Small wall fragment, probably originally a double-faced wall with a gravel core. It appears to be the same wall as the better preserved wall 190093 to the east, but the space between them was disturbed by the installation of a telephone pole ca. 4 m. Also probably formed a corner with wall 190098 to the north. |
| 190098 | 190074 | unknown | Long (ca. 15 m) alignment of limestone blocks and gravel, which probably formed a double-faced wall with a gravel core. The north end of the wall is cut by the road. The south end of the wall is also disturbed, but probably joined with wall 190097 |
| 190101 | 190100 | unknown | Upright stone alignment ca. 4 m long made up of ca. 4 limestone blocks abutting end to end with fabric (rags) stuffed in the lacunae roughly oriented NE-SW. Situated on the N end of the uppermost terrace (same one as |

| Lot number | within transect | Spot date | Description |
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| | | | Khafaji, 100 m to the south); very likely that these are reused stones making <i>zakiya</i> channels and are relatively modern (the field is long abandoned). |
| 190102 | 190100 | unknown | Ca. 10 m long. Fragmentary stone wall. Only one stone in width (as visible from the surface). Some evidence that it was reused as an irrigation channel in the recent past (some fabric lining on the northern face of the western end). |
| 190106 | 190105 | unknown | Small, circular concentration of small wadi cobbles and angular stones in an otherwise bare area of wadi flat. A single Umm an-Nar body sherd is embedded in the stone concentration. |
| 190107 | 190105 | unknown | Double-faced stone alignment either wall or dam, oriented W-E. It is made up of stones. 1 m wide with stones in the middle. Stones tend to be medium-sized but some large (ca. 45 x 20 cm). Begins straight and appears to curve but it is likely the curve is the result of remodeling/being pushed out of alignment (just next to dirt path). Stones are all lying flat. |
| 190108 | 190105 | unknown | 190108 is an ephemeral stone alignment feature that spans a well-used two-track road to the northeast of the wadi/road and east of the French 2014 trenches/cut bank. It consists of ca. 13 medium-large cobbles that align roughly NE-SW to join with 190107 in the western terminus. The cobbles are obscured/still in the ground; no stacking is apparent above the surface through some may remain if excavation is undertaken. CMC thinks this may be a modified dam wall/feature/element due to construction and location in wadi. A red chert lithic chopper tool was observed in the center of the feature and center of the road -- it was collected within lot 190108. |
| 190110 | 190109 | unknown | 190110 is an ephemeral stone alignment trending NE-SW that is ca. 7 m long with an unknown width (only large cobbles are observed; majority of these large cobbles are subterranean with only small bits showing above the surface). No artifacts observed along this section of wall, which is differentiated from 190111 by a modern store pile. |
| 190111 | 190110 | unknown | 190111 is a robust wall/rock alignment that is double faced and continues 190110 (wall features) to form a curved wall -- the wall consists of ~70-100 med large angular cobbles with rubble fill that may have been picked thru for good useable stone. Three modern rock piles are along this segment of wall and modern trash is abundant through the rubble in the wall. Approx. 12 m long, ~1.5 m wide, ~0.3 m high on variable heights of ground surface. |

| Lot number | within transect | Spot date | Description |
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| 190112 | 190110 | unknown | 190112 is similar to 190111 in length/width/height, in fact it is indiscernible in style. 190112 curves N-S and is ca. 10 m long (this segment). See 190111 form. |
| 190113 | 190110 | unknown | Pottery and lithic not collected. 190113 is a continuation of 190111 and 190112; a double-faced rock wall that is 1.3-1.5 m wide and ~15 m long. It is ca. 15 m tall from ground surface and filled with rubble. Wall cobbles are med to large angular cobbles and rubble is medium angular to sub-rounded cobbles. Northernmost terminus ends in upright stones. |
| 190114 | 190110 | UAN | Stone alignment along NE edge of terrace S of the Settlement Slope, just next to a <i>shurgi</i> ; currently forms part of the north edge of the terrace. May originally have been 2 stones wide but only the east face is currently in place and many of the blocks have eroded into the <i>shurgi</i> . 1 course tall (~30 cm); ~20 m long. Made up of big local limestone blocks, mostly prismatic/ dovetail shaped and lying flat. Stones are ca. 70 x 40 x 25 cm with the largest being ca. 100 x 50 x 25 cm and roughly faced. N end erodes into the wadi. Ca. 20 m long NNW→SSE. Pecking on the "top" of a block (i.e., UAN style). |
| 190115 | 190110 | unknown | Linear stone alignment oriented N-S, ~20 m long and one stone (~35 cm) wide, situated on the terrace south of the Settlement Slope. Stone are shaped and unshaped, oriented flat and upright, with the "face" primarily to the E; stones vary in size from 20 x 20 x 20 cm to 70 x 50 x 30 cm; appears to be a post- UAN wall made up of UAN and other stones. Possible doorway (~1.5 m wide) on the south end. One white limestone chunk. |
| 190116 | 190110 | UAN | Ca. 4 m long, N-S running stone alignment at the base of the Settlement Slope, eroding into wadi/ <i>shurgi</i> . 1 course thick but large stones (50 x 40 x 20 cm) possible faced on W side. Orientation does not suggest check dam, but the stones do not make a great wall. Stones are laid flat and shaped prismatically (= UAN) |
| 190117 | 190110 | unknown | Stone alignment (W-E) ca. 7 m and 9 stones long. Sits at the N edge of the terrace at the base of the Settlement Slope, near a <i>shurgi</i> (small wadi), and may be the built terrace edge. No real face and only 1 stone wide (~50 cm). Stones are primarily lying flat, with terrace gravels and alluvium built up against the S face. Only 1 course deep, W-E and eroding into small erosion cut. |
| 190118 | 190110 | unknown | Stones ~40 x 30 x 25 cm small section of a stone wall running roughly SW-NE. Preserved two (visible) stone courses high. Exposed in a small wadi drainage channel on the lower edge of the SE settlement slope. No clear date. |

| Lot number | within transect | Spot date | Description |
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| 190119 | 190110 | unknown | Stones ~40 x 30 x 25 cm. Fragment of a small stone wall running roughly NW-SE. Only one course visible. Exposed in a small wadi drainage channel on the lower edge of the SE settlement slope hillside. No clear use date but IA sherds on surface. |
| 190120 | 190110 | unknown | Stones ~50 x 30 cm. Small wall fragment located on the wadi flat, only partially exposed by a shallow wadi drainage channel. |
| 190122 | 190121 | unknown | Concentration of small med. Sized stones eroding out of an erosion channel. Stone is local brown limestone, in disarray, with worn UAN ceramic in a matrix of alluvial silt. Dimension overall ~1.5 x 1.2 m. |
| 190123 | 190121 | unknown | Concentration of medium-sized brown limestone blocks eroding out of the South edge of the terrace. N = 6 with a 7th block visible in an erosion cut 2 m east. Stones are ~30 x 15 x 15 cm. Barely visible from above. |
| 190126 | 190125 | unknown | Stones 40 x 25 x 25 cm. Small, roughly N-S alignment of limestone blocks and angular stones. Possibly disturbed by modern dirt road in the South. A large Umm an-Nar sherd was found just to the NE of the feature but may not be associated. |
| 190127 | 190125 | unknown | Long (ca. 12 m) roughly WNW-ESE linear mound compacted of accumulated silt; wadi cobbles and some limestone blocks. Some Umm an-Nar pottery visible on mound surface, along with modern materials (e.g., glass, cinderblock fragments). |
| 190129 | 190128 | unknown | Relatively recent stone alignment (short) or concentration running ~W-E in low mound. ~1.8 m E-W by 20 cm thick (2 stones). Stones are irregular, placed somewhat haphazardly with a semblance of a SE face. Possibly the result of movement by large modern equipment but not large enough to really say. Fabric and some rubbish present |
| 190130 | 190128 | UAN | 1900130 is a stone alignment (wall) that is Umm an-Nar style construction. ~10 large stone cobbles aligned NW-SE. Total measure = 3.5 m long and ~20 cm wide, ~15 cm deep. Built 1 course high. May have been higher but drainages have destroyed integrity of wall over time and transported sediments and possible rubble (small sub-angular cobbles) downslope along with modern trash. Ceramics and lithics were observed eroding downslope. Drainage ends in the modern wadi road. |
| 190131 | 190128 | unknown | Short, upright stone alignment perpendicular to 190130; single course visible running N-S; approximate length ~40 cm; may connect to the south with 190130; plausible wall. |

| Lot number | within transect | Spot date | Description |
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| 190132 | 190128 | unknown | Cluster of stones; stone misalignment; no obvious facing; NE-SW running; appears to be misaligned due to erosion; drains into wadi; ca. 1 m x 80 cm; possible wall. |
| 190133 | 190128 | unknown | Concentration of limestone blocks and cobbles visible in and disturbed by a drainage channel. Possibly part of a wall. No clear period of use or associated artifacts. |
| 190134 | 190128 | UAN | UAN tomb exposed by erosion. Internal diameter approx. 2.8m. No ashlar visible but the brown limestone slabs (including two courses visible on south side) clearly from an UAN ringwall. Erosion channel cuts through the center of the feature, roughly NE-SW, and no doubt has washed all internal finds away, downslope to the S. No pecking visible on the tops of rocks, suggesting they are not plinth stones. Stone dimensions average 30 x 20 x 15 cm quite uniformly. |
| 190135 | 190128 | unknown | Concentration of limestone blocks visible within and disturbed by a drainage channel. Probably part of a wall. No clear use date or associated artifacts. Stones 40 x 35 x 25 cm. |
| 190136 | 190128 | unknown | Stone concentration (limestone blocks) visible in and disturbed by a drainage channel. Possibly part of a wall. No clear use date or associated artifacts. |
| 190137 | 190128 | unknown | Stone concentration in low mound. Stones are in disarray, varying in orientation, alignment, and size (30 x 1 x 15 cm max). Overall dimensions are 1 x 1 m by 0.20 m in height. |
| 190139 | 190138 | unknown | 190139 is a stone alignment of large upright cobbles (Umm an-Nar, but not laid like Umm an-Nar); straddling a deep (~0.75 m) drainage channel that empties to the southwest to the wadi road. Ceramic body sherds (n = ~5) were observed downslope from feature 190139. The largest cobble measures ~15 cm wide, 25 cm long, and 10 cm thick placed upright so it is ca. 25 cm tall. A large cobble is observed in the deepest cut of the wash, perhaps it has been transferred downslope (~2 m from obvious gap in wall where it may have come from). The entire southern portion of the feature extends out (south) on an eroding toe east of the main wadi road. |
| 190140 | 190138 | unknown | Stone concentration with no clear form, though sub-circular in shape. It consists of local limestone with one white stone; no clear evidence of working on any of the stones. Ceramics were found on top. The entire feature was exposed by wadi erosion. |
| 190141 | 190138 | unknown | 190141 is a large stone/rubble mound (~5.5 m long x ~3 m wide; ~.30-1.5 m tall) consisting of ~9 large angular cobbles and many small cobbles (angular to subangular) on the north, west, and east faces of the |

| Lot number | within transect | Spot date | Description |
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| | | | mound. Is a possible tomb. Ceramic and lithic observed between rubble and stones. Ceramic is probably Umm an-Nar domestic, which may inform to architectural layout, though sherds of Iron age closed mouth jars also observed. Tomb is glacier-bare (no stones) to south. Ground visibility is 80% there, whereas rubble obscures the ground surface (~85%-90% ground surface covered by rubble). Modern arsenical glass was also observed between rubble and stones. |
| 190142 | 190138 | UAN | Heavily disturbed faced wall running NW-SE. Two quarters are visible, consisting of exceedingly large stone blocks (0.8 m x 0.8 m x 0.4 m). This wall runs perpendicular to 190143 and is located approx. 3 m north of mound 190141. Probable wall. |
| 190143 | 190138 | UAN | Northeast–southwest roughly faced alignment of massive rocks (~50 cm x 30 cm x 50 cm), perpendicular to lot 190142. Stones have likely fallen from the section, possibly due to road construction or erosion. |
| 190144 | 190138 | unknown | Roughly ENE-WSW stone alignment with significant deviation from that alignment (up to 40 cm). Stones measure roughly 30 x 30 x 10-20 cm. Total feature length is ~5 m and is located ~5 m east of 190141. The feature slopes down to wadi erosion channel at W side. |
| 190145 | 190138 | unknown | 190145 is a north-south running stone alignment, exposed by (or happenstantially located within) a drainage channel that empties to the southwest. It consists of ~3-4 small-medium subangular cobbles that are half buried in sediment and appear at different angles, but in a line. They may have washed down from the western slope of the hill (north of 190146) or they may be the top of a buried wall, displaced from erosional processes associated with the drainage channel. Angular small cobbles are everywhere on the ground and don not appear to indicate the linear mounds of wall rubble, which suggests that this alignment has been deposited secondarily. Three non-diagnostic sherds of ceramic were observed nearby but not collected. |
| 190146 | 190138 | UAN | This feature consists of a large cobble stacked on the flat side of another large cobble. It has been prepped, faced, and laid in a way consistent with Umm an-Nar construction and likely is the start of a wall that may have connected with 190145 at some point. Two stacked Umm an-Nar rocks on the west side of a drainage. |
| 190147 | 190138 | unknown | Collection of stones in no apparent alignment, though fallen due to erosion into roughly an east-west orientation. The collection is ~1.5 m x 1 m across. Stones ranging in size; the smallest substantial stone measures ~5 cm x 15 cm x 10 cm and the largest measures ~15 cm x 40 cm x 30 cm. Feature was exposed by erosion and potentially construction as it is ~2 m south of a road. |

| Lot number | within transect | Spot date | Description |
|------------|-----------------|-----------|---|
| 190148 | 190138 | unknown | SSW-NNE stone concentration along the bed of an erosion channel. It is a possible alignment but erosion makes this very unclear. Stones ca. 40 x 20 x 15 cm. The feature's total length is ca. 7 m long. It is located ~10 m west of 190150 and 190151. |
| 190149 | 190138 | unknown | The feature consists of 15 stones forming a concentration but without any alignment, exposed within an erosion cut. The blocks are relatively large (~60 x 40 x 20 cm) but vary down to 30 x 20 x 12 cm. Those may have fallen from above as opposed to the soil being removed from them in situ. Slumping over the tops of many of the larger stones further obfuscates the feature. This feature is not recommend for excavation. |
| 190150 | 190138 | unknown | NE-SE running concentration on rough alignment, ~1.5 m long, exposed by wadi erosion channel. Disappears into section at NW end. Stones ~20 cm x 40 cm x 15 cm. SE end eroded away by the Wadi. In the same Wadi channel as 190149 about 3 m East |
| 190151 | 190138 | unknown | Concentration of stones, one the small side (20 x 15 x 12 cm – but various combinations of those dimensions). Fallen into the erosion channel (<i>shiragh</i>), ~50 cm tall, 80 cm long (NW-SE). Unlikely that anything is in situ, but the concentration is 'real'. |
| 190152 | 190138 | unknown | Stone concentration, runs ~NW-SE, ~2 m in length with stones ~20 cm x 30 cm x 15 cm; in rough alignment, exposed by wadi bed, only stones in vicinity, ~5 m south of lot 190151, possibly disappears into section on SE end. |
| 190155 | 190154 | Modern | Well and associated features at the western end of the transect, immediately west of the dirt road. In 3 parts: A = raised lined 5 x 5 m pool; B = well opening (now rubbish dump); C = 7 x 7 m depression (~50 cm below normal surface) with tree on W edge. Remnant irrigation channel to the N. Probably use ended ~80 years ago. |
| 190156 | 190154 | unknown | Linear N-S stone alignment ca. 10 m long. On E edge of well and associated features (lot 190155). Likely irrigation channel. Double-faced, preserved 2-3 courses high. W side disappears into section in places. Some collapse to E side halfway along its length. |
| 190157 | 190154 | unknown | 3.5 m-long linear stone alignment. Stones range from ~15 x 10 x 5 cm to ~30 x 15 x 10 cm. Wadi erosion channel cutting through the middle, causing a cluster of (likely fallen) stones. Small gravel inclusions (of different material than the stones) within a ~1 m radius. |

| Lot number | within transect | Spot date | Description |
|------------|-----------------|-----------|---|
| 190158 | 190154 | UAN | Cluster of large-ish stones, ~4 m in diameter. No order to them; location (near a set of power lines and poles) suggests disarranged – but that UAN deposits may be (have been) below. |
| 190159 | 190154 | unknown | Two roughly parallel stone alignments approximately 1 m apart. Potentially a wall (or other linear feature) disturbed by the wadi drainage channel to the east and/or the installation of the telephone pole to the NW. Likely was once the same features as (or a feature related to) lot 190158 (stone concentration) to the north. No associated finds on surface. |
| 190162 | 190161 | unknown | Small concentration of local limestone in an otherwise flat, featureless wadi plain. |
| 190163 | 190161 | Modern | Long, linear stone feature running roughly N-S. Composed of two parallel rows of small-to-medium limestone blocks with a gap of ~75 cm between them. This feature joins with the similar E-W feature 190165 in the north (although 190165 is constructed with somewhat larger stones). The space between the stone rows is filled with silt. This feature was probably a field irrigation channel. Some pottery found in the silt accumulated between the stone rows. |
| 190164 | 190161 | unknown | Roughly 2m-long alignment of small stones (~15 x 10 x 5 cm) running roughly E-W. It is located ~0.75 m west of lot 190163 at the base of the slope. |
| 190165 | 190161 | Modern | ~84 m-long irrigation channel running roughly NW-SE, Two courses are visible, and the feature consists of two faced sides filled with sediment. At the northeast end two <i>garbas</i> are visible. Part A (see the sketch on the lot form) is less degraded. Part B has few stones left standing and is more of a line of rubble. Stones of varying sizes were used in the feature's construction, most with little sign of working. |
| 190166 | 190161 | unknown | Linear alignment of stones somewhat disarrayed due to an erosion cut but lying flat; some are upright. ~6 m long, faced on NW side; runs NE-SW. Very likely originally double-faced, but in an erosion cut ~20 cm deep. N and S ends disappear into the "sections" of the erosion cut. |
| 190167 | 190161 | unknown | Linear stone alignment or possible irrigation channel, running NE-SW, ~3 m long, made of smallish upright stones, ca. 7 x 12 x 15 cm; possible second part of the feature, parallel, ca. 40 cm east; larger stones there, and much less visible through the alluvium. Small erosion channel has exposed the NW face ~10 cm deep. |
| 190168 | 190161 | unknown | This feature is a roughly N-S running wall that runs parallel to 190166; wall intersects the road that runs to the N of the wall; consists of small-medium sized angular stones (ca.30 x 10 x 10 cm); appears to have some disturbance on the southern end. |

| Lot number | within transect | Spot date | Description |
|------------|-----------------|-----------|--|
| 190170 | 190169 | unknown | Collection of limestone blocks along the edge of a small wadi drainage channel. Possibly originally part of a stone wall or other feature, but now disturbed by wadi drainage. No associated finds or other features. |
| 190171 | 190169 | unknown | Linear collection of stones, ~1.5 m west of 190172; consists of small-medium sized angular stones (approx. 30 x 20 x 10 cm); contains a lot of gravel on the surface made up of small rocks (2 x 1 x 2 cm) |
| 190172 | 190169 | unknown | Linear collection of stones, ~1.5 m west of 190171; ~1.5 m long in total. Stones at largest are ~50 x 15 x 15 cm and smallest are ~20 x 20 x 20 cm. Stones lying horizontally, partially buried. Roughly oriented NE-SW. ~1.5 m away from wadi cut. |
| 190173 | 190169 | unknown | Possibly was once a wall that included feature 190172 to the south. Some pottery (UAN and IA) on surface around the stones. |
| 190174 | 190169 | unknown | Collection of stones located at the base of a tree stump, just west of the dirt road to the football field. Stones are eroding out of the erosion cuts coming from the north. Stones disarranged; sizes vary from ~7 x 15 x 20 to 40 x 30 x 15 cm. Total spread is ~2 m E-W and 1.5 N-S. |
| 190175 | 190169 | unknown | N-S wall stub, unfaced. Comprised of 5 stones, total ca. 80 cm long. Only one course visible half buried. 1 m NNE of 190176. 1 m south and 3 m east of wadi runoff cut. |
| 190176 | 190169 | unknown | Stone concentration, ca. 1 m SW of 190175, in rough sub-circular collection ca.1 m by 80 cm. South edge is adjacent to a wadi runoff channel that flows to the west. Larger runoff channel ca. 3 m to W. Stones all partly buried; northernmost partly exposed in wadi section, probably only 1 course extant. |
| 190177 | 190169 | unknown | Stone concentration eroding out of the exposed slope north of the road. Stones vary in size from 4 x 10 x 10 cm to 30 x 20 x 15 cm; stones lying both upright and flat. Although no clear alignments these may indicate the presence of architecture directly to the north in the higher sediments. |
| 190178 | 190169 | unknown | Short stubby stone wall-like feature. Total length ~1.5 m with stones at largest ~50 x 30 x 20 cm and smallest ~20 x 10 x 15 cm. Runs roughly N-S, ~10 m east of 190175. Wadi erosion cut exposes partial section and surrounding soil. Stones lying on widest part (not standing up; horizontal). |
| 190179 | 190169 | unknown | Stone concentration east of the road to the football field and north of road; furthest east feature in this transect. No apparent alignment. Wadi erosion on both sides. Stone show no sign of working but have natural straight sides. |

| Lot number | within transect | Spot date | Description |
|------------|-----------------|-----------|--|
| 190184 | 190183 | Modern | 6 m-long low linear mound aligned roughly N-S ca. 1.5 m wide and 15 cm tall at the max. Probably a rubbish and/or clearance mound, modern materials (e.g., plastic, glass) interspersed. ~9 m from SW corner of the transect (and ~10 m from the power line in transect 190182). |
| 190185 | 190183 | unknown | Small concentration of stones, no visible alignment. No visible signs of working. Exposed by wadi wash. ~1 m dia. |
| 190187 | 190186 | unknown | Relatively small concentration of limestone blocks and small stones/gravel within a wadi drainage channel. Probably connected to the remains of a mudbrick building located to the north. |
| 190188 | 190186 | Modern | Collection of several clay mounds surround a roughly 10 x 10 m area. Clay mounds contain some large limestone blocks and fragments of cinderblocks. Two large rim sherds of Islamic storage jars were found on the NE-most mound. These mounds likely represent the remains of a relatively recent mudbrick building. Possibly disturbed by the embedded road just to the north. |
| 190189 | 190186 | Modern | Roughly NW-SE alignment of limestone blocks, one stone wide. Partially exposed by a small wadi drainage channel. Cut on its northern end by the embedded road. Some potential collapsed mudbrick located along the western face of the stone alignment, suggesting that the stones were the foundation of a mudbrick wall. A larger piece of cement is located in a cluster of stones at the southeast end of the alignment -- possibly incorporated into a wall corner. |
| 190190 | 190186 | Modern | This feature is a mounded concentration of stones, ceramics, and cinder block fragments embedded in silt. Partially disturbed by a wadi drainage channel. Probably should be connected with the remains of a recent mudbrick and cement building located to the southwest. |
| 190191 | 190186 | unknown | Small alignment of stones, roughly NW-SE. Exposed and partially disturbed by a small wadi drainage channel. No associated finds. Possibly the result of wadi wash. |
| 190192 | 190186 | unknown | Small feature made up of 5 stones organized into a rectangle. No evidence of other features in the adjacent vicinity. Located near a wadi cut. ~75 x 30 cm oriented (archaeological) W-E. ***this is a bit difficult to explain. It was a stand-alone feature that was quite short and organized so possibly a wall stub; but it looks like it was *always* short so kind of a very short stone alignment? |
| 190194 | 190193 | unknown | Roughly N-S check dam located at the far western end of the transect. Composed of large, upturned limestone blocks, which form outer faces and a core (ca.1.5 m wide) of coarse gravel; silt, and small stones. |

| Lot number | within transect | Spot date | Description |
|------------|-----------------|-----------|--|
| | | | Cut at the southern end by the road/wadi cut; fades away at the norther end as it approaches the hill. no associated finds. Unexcavated. Probably documented by Frifelt and Brunswig in their survey. Almost certainly NOT Umm an-Nar. |
| 190195 | 190193 | unknown | Roughly linear, roughly E-W alignment of stones along the edge of the wadi road cut. May be a disturbed wall or dam --- may be collapse from various features. Clearly disturbed by erosion. No associated finds. |
| 190196 | 190193 | UAN | Concentration of limestone blocks and gravel exposed by a wadi drainage channel. There appears to be some NW-SE alignment, but this might be the result of the hillslope. No associated finds. Some stones appear to be typical UAN stones (but small). Possibly a disturbed UAN wall. |
| 190197 | 190193 | unknown | Alignment of relatively small limestone blocks, possibly the remains of an E-W wall. No associated finds. Probably not UAN (later). Alignment is disturbed by erosion off the settlement slope hill and a small wadi drainage channel that cuts through the visible center of the feature. |
| 190198 | 190193 | unknown | This feature is a dense accumulation of limestone blocks of various sizes in a wadi drainage channel. No clear alignment is visible, other than the natural slope of the hill. Possibly an extremely disturbed feature that has eroded down the settlement slope hill. No associated finds. |
| 190199 | 190193 | unknown | This feature consists of a large check dam and two parallel rows of silt, gravel, and small stones --- one row on either side of the dam. The dam is constructed of two rows of facing stones (some upturned and some laid flat) set about 1 m apart. Between them is a core of coarse gravel and small stones. The rows of gravel are each approximately 1.5 m away from the dam and probably represent the backdirt from when the dam was excavated. This dam was probably documented by Frifelt and Brunswig during their survey. It may have been excavated by BAP. The southern end is cut by the road/wadi cut. The northern end tapers off. |
| 190200 | 190193 | unknown | Unimpressive stone alignment along road cut at a dead tree. Roughly 2 m long. E-W alignment with its southern face exposed. No signs of facing of stones; largest stone 40 x 30 cm. |
| 190201 | 190193 | unknown | Three very large stones in a pile. No clear alignment. Largest stone ~ 1 m long and 80 cm wide. |
| 190202 | 190193 | unknown | Stone concentration eroding from cut (n = 6) without a clear alignment. Exposed stones facing to the southeast. largest stone ~60 cm x 50 cm. |

| Lot number | within transect | Spot date | Description |
|------------|-----------------|-------------|---|
| 190203 | 190193 | UAN | Wall running parallel to <i>shurghi</i> erosion. Approximately 12 m long, oriented E-N with a southern face exposed. Northern face not exposed. Facing visible on stones. Largest stone ~80 cm long and 60 cm wide. Tumble from wall may have formed feature 204 below. |
| 190204 | 190193 | unknown | Stone tumble below wall feature 190203. Oriented E-W. Exposed on southern side. Approximately 10 m long. Largest stone ~80 cm long x 60 cm wide. |
| 190205 | 190193 | unknown | Stone alignment ~2 m long, perpendicular to NW (true N) end of 190206. No sign of facing on stones. Southern face exposed. Largest stone ~60 cm long, unknown width. |
| 190206 | 190193 | UAN | Stone wall orientated true N-S (archaeological NW-SE), 3 courses visible in erosion cut. Approximately 4 m long. NW end may abut 190205. Largest stone ~60 cm long. Unknown width. Well sorted stones with moderate facing. Eastern edge exposed. |
| 190207 | 190193 | UAN | Umm an-Nar style wall perpendicular to <i>shurghi</i> cut and at top of erosion layer. 3 m long running approx. north-south; facing is visible on both sides. Notable rubble on the western side, probably repurposed as part of dam 190208. Possible (but unlikely) rubble core. Largest stone 80 x 30 cm with profile visible due to erosion. |
| 190208 | 190193 | unknown | Aligned stone collection but not clearly faced; western sides shows possible facing. Largest stone 80 x 40 cm. Approx. 2 m wide. |
| 190209 | 190193 | late UAN-WS | Unexcavated dam oriented (archaeological) NNE-SSW. UAN- and later style stones ~40 x 30 x 15 cm form the exterior wall stones and angular cobble-sized stones fill the space between. Though the stones are laid flat the construction is less precise than most UAN architecture. ~12 m long and 1.3 m wide. |
| 190210 | 190193 | unknown | Double-faced wall, probably a check dam. Outer wall of large limestone blocks filled with gravel. Southern end cut by wadi, may continue further. Large blocks: ~70 x 20 cm. Likely documented by Frifelt and Brunswig 1975 survey. In very good condition -- unexcavated. Also almost certainly not Umm an-Nar. |
| 190211 | 190193 | unknown | Stone accumulation (n = ~18), medium-sized (~30 x 20 x 15 cm), in disarray and eroding off of the Settlement Slope terrace into the <i>shurghi</i> to the south. The stones are roughly hewn and primarily UAN-style but mixed; some look like tomb stones, others not. ~10 stones fallen into <i>shurghi</i> . ~1.5 x 1 m x 1.5 m deep. |

| Lot number | within transect | Spot date | Description |
|------------|-----------------|-----------|---|
| 190212 | 190193 | UAN | Large collection of stones eroding out of the S side of the <i>shurghi</i> (NW edge of terrace), massively disturbed by (1) acacia in the middle and (2) the <i>shurghi</i> ; ~5 m southeast of 190210. Stones are medium-large (~40 x 40 x 20 cm) and n = 33+ in a space ~3 x 2 x 1 m; therefore, while not <i>in situ</i> , this feature is clearly a "thing". Stones appear to be roughly hewn and primarily UAN-style (rectangular and prismatic blocks). |
| 190213 | 190193 | UAN | Collection of 5 med-large stones, roughly face (i.e., likely UAN), embedded in alluvium and located on the terrace at the SE corner of 190193. Stones do not appear to be in original alignment but unable to determine whether this is due to reuse or simply taphonomic; but hedging towards taphonomic because none are oriented upright and most are flat. ~1.3 x 0.8 m (aligned W-E) |
| 190214 | 190193 | unknown | Local brown limestone blocks, upright and parallel, embedded in terrace alluvium. The clearest part of this feature is only ~60 cm wide and ~1 m long, oriented NW-SE, with stones in disarray to the immediate NW (at the base of a thriving acacia). Possibly the southern end of check dam 190210 (and therefore also related to 190212), roughly 10 m NW on the other side of the <i>shurghi</i> . The feature lies at the E end of transect 190193. |
| 190215 | 190193 | UAN | Alignment of large stones along the southeastern edge of a deep cut wadi channel. No associated finds. Could be Umm an-Nar stones, but almost certainly disturbed by the wadi flow and erosion. |
| 190218 | 190216 | unknown | Short, roughly E-W alignment of small limestone blocks and coarse gravel. No associated finds. Possibly a wall fragment. Possibly the result of wadi wash. |
| 190219 | 190216 | unknown | Curvilinear stone alignment of 7 stones (~3 m long); open side of arc faces south. If intact the feature would have been ~5.5 m. Stones are laid primarily on their side and are fracturing; poor quality quartz veins suggest less careful choice of wall stones. Stones = ~35 x 35 cm. |
| 190220 | 190217 | UAN | Alignment of two large stones (~50 x 40 cm) in proximity to pottery, lithics, and bone suspected as originating from a tomb alignment; may represent the edge of the tomb. Estimated 2.5-3 m in diameter. |
| 190221 | 190217 | UAN | Mound and some wall fragments of a largely disturbed tomb. Located WSW of the larger tomb 110967, on the low west slope of the al-Ahliya hill. Possible N-S interior dividing wall. No finds visible on surface, which is covered in small, angular limestones and gravel. |
| 190222 | 190217 | unknown | Loose alignment of stones. Possibly wall, also possible they are stone tumble from tomb (110973) with path cut through rubble. Roughly 16 m long. n = 18 rocks, largest stone ~80 x 60 cm. probably tumble, from the tomb above, that was pushed into alignment by repeated use of the pathway directly adjacent. |

| Lot number | within transect | Spot date | Description |
|------------|-----------------|-----------|---|
| 190223 | 190217 | unknown | Wall in W-E orientation. Composed of small stones with some signs of facing. Roughly 1.2 m long. Only 1 course of stones exposed. Stones ~30 cm long x10 cm high, depth unknown. |
| 190224 | 190217 | unknown | Accumulation of large stones, possibly in rounded alignment. Rough semicircle facing south, no stones on south face. Largest stone ~80 x 60 cm. N = 6 stones. |
| 190225 | 190217 | UAN | Massive stone wall. Wall constructed of extremely large limestone blocks (probably broken bedrock slabs). Located on the middle slope of the NE al-Ahliya hillside, slightly off-alignment with the hill. No finds associated with this feature. No trace of superstructure. |
| 190226 | 190217 | UAN | Tomb, roughly 6 m in diameter. Possible alignment of large stones in circular shape and covered with irregular shaped small-medium stones. finds not recorded. |
| 190227 | 190217 | unknown | Wall, 2.5 m long. Possible retaining wall. 1 course visible, depth not visible/exposed. Largest stone ~40 x 30 cm. |
| 190228 | 190217 | IA | Semi-circular alignment of large stones in two courses which resembles the partially eroded remains of a tomb. Roughly 2.5-3 m wide. Largest stone 80 x 60 cm. Some signs of facing on stone. Possibly an IA tomb -- comparable to other examples further up slope (i.e., 190255 and 190259). |
| 190229 | 190217 | unknown | Stone wall oriented W-E, ~4.5 m long. Largest stone ~60 x 40 cm ~30 cm depth. No signs of facing. |
| 190230 | 190217 | UAN | Finds not recorded. Possible tomb cross-wall with ashlar. Largest stone roughly 1 m x 30-40 cm; height unknown. Face exposed on south side. |
| 190231 | 190217 | UAN | Bead and bones; finds not recorded. Circular tomb lined by (possibly) 2 courses of stone. Only eastern extent exposed or visible. Largest stone 60 x 40 cm. Some signs of facing, estimated 4-5 m diameter. Bead found in center with some very small bone fragments. |
| 190232 | 190217 | unknown | Fragmentary wall of up-turned stones, running roughly E-W. The wall is north of and bends slightly around the large UAN tomb 110981. Wall 190232 is clearly a later (Wadi Suq? Iron Age?) addition to the site. Stones vary in size from ca. 70 x 40 x 20 cm to ca. 30 x 30 x 20 cm. No finds are associated with the feature and no evidence of a superstructure survives. |

| Lot number | within transect | Spot date | Description |
|------------|-----------------|-------------|---|
| 190234 | 190193 | unknown | Stone wall running ~W-E at base of settlement slope; visible in erosion cut as 1.5 m long and ~50 cm wide; made of roughly faced stones of varying quality, ~30 x 20 x 15 cm, with angular pebble fill. Possibly disturbed due to power line cables ~3 m to SW. |
| 190235 | 190193 | UAN | Short double-faced (UAN-style) wall running N-S; ~0.7 m visible but embedded in soil near the base of the settlement slope -- possibly preserved to the north. Stones are laid flat and dovetail; ~30 x 30 x ? cm; ~45 cm wide. |
| 190236 | 190193 | late UAN-WS | Two upright stones perpendicular to each other forming a (SW) corner. Prob. WS or late UAN. ~90 cm W-E and ~60 cm N-S. Some fill (~10 cm) trapped in the corner (probably from upslope). |
| 190237 | 190193 | late UAN-WS | W-E aligned long, upright stone wall; most visible on the western-most 4 m, then a break until another few stones (same size, position, alignment); in total ~8 m long. Possible cross-wall ~half-way along on N side. Fill on N side but exposed on south side. Prob. WS or late UAN. Non-diagnostic pottery visible in fill (not collected). 1 small turquoise glazed Islamic sherd found ~1 m south of wall (not collected). |
| 190238 | 190193 | unknown | Stone accumulation embedded in alluvium at the base of the slope, just north of check dam (190199) and between several trees and bushes. ~1.5 m in diameter, made up of stones ~30 x 20 x ? cm in no visible alignment. |
| 190239 | 190193 | UAN | Long W-E wall at north end (NW quad) of transect; ~15 m long and likely UAN, with south face on E end eroded out ~50 cm wide; likely remodeled in the late UAN or Wadi Suq. Soil/alluvium built up against the north face of the wall. Abuts 190240 on the west end (forming a NW building corner); buttressing wall (?) (190242) sits against its south face. Located roughly 1/3 up the slope. No finds visible. Stones ~50 x 30 x ? cm. |
| 190240 | 190193 | UAN | N-S running wall of large stones (~70 x 30 x 40 cm blocks) making up a wall ~3.5-4 m long. One large stone wide (~40 cm) with 2-3 stones added to outer face as later addition (?). Stones are flat, with addition stones on end. S end exposed through erosion. Abuts 190239 at its N end and 190241 at its south end; forms W wall of a structure. Probably UAN with later remodeling (late UAN or WS). Diagnostic and non-diagnostic pottery adjacent; not collected with feature (but with transect). |
| 190241 | 190193 | UAN | E-W running wall, ca. 4 m long. Possibly part of a building with 190240 and 190139. Heavily eroded. Composed of large (60 x 60 x 40 cm) limestone blocks, no clear facing. One course visible. |

| Lot number | within transect | Spot date | Description |
|------------|-----------------|-------------|--|
| 190242 | 190193 | late UAN-WS | Buttressing wall for 190239? Short wall-like feature ~3 m long (W-E) and 50-70 cm wide in plan; at least 50 cm tall; parallel to 190239 to the immediate N (upslope). The southern face is partially exposed (due to erosion, downslope). |
| 190243 | 190193 | unknown | North-south running wall, composed of large (40 x 40 x 50 cm) blocks; northern-most end covered by colluvial stones (hill wash). No clear facing. |
| 190244 | 190193 | UAN | Large stones making up a short wall (~2 m long, W-E) with 2 faces; eroding out of a deep cut (Frifelt excavation?). ~2 courses tall (~45 cm), completely exposed on S (downslope) side. Pottery (diagnostic and nondiagnostic) sit behind the wall in the eroded rubble. Just N of two lovely grinding stones. Wall stones are ~50 x 30 x 40 cm. may continue to the east. grinding stones found, photographed, and several collected. |
| 190245 | 190193 | UAN | N-S running wall. Five courses visible, composed of stones of varying sizes smallest 20 x 10 x 10 cm, largest 50 x 60 x 60 cm, facing visible on both side, more so on the west. South end heavily eroded. North end covered by hill wash. |
| 190246 | 190193 | UAN | East-west running wall, three stones still in situ, eastern side heavily eroded. Large stones 80 x 40 x 20 cm. Facing appears to be to the north. Stones in situ are atop fine colluvial deposit not scree. |
| 190247 | 190193 | late UAN-WS | Stone alignment. Upright stones running W-E, with the eastern end adjacent to 190246. Stones = ~50 x 15 x 30+ cm. The western end has slipped slightly downslope, to the south. Probably Wadi Suq. Eastern end eroding into (probable Frifelt excavation) cut. ~4.5 m long. Rim collected against (behind) wall. At very western edge of transect, ~1/4 of the way up the slope. |
| 190248 | 190217 | UAN | UAN tomb with IA reuse. Area of roughly circular stone mounding on plateau east of al-Ahliya tower. A bead with 190249 indicates reuse of this tomb in the IA. Mounding is significantly higher in NW half of feature. Some regularly laid stones suggest the original extent of the feature and are reminiscent of an Umm an-Nar tomb. No clear cross-walls or artifacts visible on surface. |
| 190249 | 190217 | IA | Reused UAN tomb (190248) with IA cultic gifts chamber off the south side. IA pottery and bone. Rough linear double-faced stone wall with a rectangular addition on its south face. Addition is of long, up-turned stones, while the main wall is of horizontal stones. The main wall probably relates to an Umm an-Nar funerary structure (unusually straight for an UAN tomb). The addition is an IA feature, likely also funerary. An IA bowl fragment and fragment of human bone were found just south of the addition. |

| Lot number | within transect | Spot date | Description |
|------------|-----------------|-----------|---|
| 190250 | 190217 | UAN | Largely destroyed UAN tomb. N half better preserved than S. The exterior tomb wall is largely concealed beneath stone rubble and tomb wall collapse. The central SE-NW cross-wall is especially well-preserved and visible in profile. No finds were visible on the surface. |
| 190251 | 190217 | UAN | Roughly circular mound of stones -- some stones are extremely large. No visible walling. Does not look like a tomb but the feature is about the right size... the stones look too large. But likely an anthropogenic feature based on its location just east of the al-Ahliya tower. No artifacts visible in or around feature; no clear walling or intentionally laid stones. |
| 190252 | 190217 | UAN | Large UAN tomb located on the al-Ahliya tower platform (SE quarter of the tower). Portions of the UAN tomb outer wall are visible on its northern and southwestern edges. The interior layout is obscured by rubble and two probable Wadi Suq tombs installed on top of its east half. Wadi Suq tombs are preserved as concentrated mounds of gravel and small limestone blocks. No artifacts are found in association with this feature. |
| 190253 | 190217 | WS | This feature is an oblong Wadi Suq tomb added on the top of the al-Ahliya tower platform. The edge of the tomb structure is suggested by some laid limestone blocks and a possible internal division is suggested by a row of four small, laid stones. The majority of the tomb structure is obscured by gravel and stone rubble. No artifacts were found on the surface. |
| 190254 | 190217 | WS | Wadi Suq tomb located just west of tomb 190253 and constructed on the al-Ahliya platform. The edge of the tomb is suggested by some laid stones, but most of this is obscured by a mound of stone rubble and gravel. A possible internal dividing wall is visible in the NE portion of the mound -- it is also possible that this is the outer edge of the tomb. No artifacts were found in association with this tomb. |
| 190255 | 190217 | IA | Two IA tombs situated on the upper southern slope of the al-Ahliya hill. These are preserved as two circular depressions in the hillside, lined with somewhat regular, small limestone blocks. Much of the tomb structure is obscured by stone rubble, fallen from the hillside above. A single piece of IA pottery was found within the western tomb. This sherd was not collected, as it was non-diagnostic --- a somewhat coarse red ware body sherd (not a typical mortuary sherd). |
| 190256 | 190217 | WS | Wadi Suq tomb on northern portion of al-Ahliya tower platform. Edge of tomb is suggested by several stretches of laid stones. Two stone alignments (N-S) also suggest interior chamber locations. These are largely obscured by a mound of stone rubble and gravel. No artifacts were found in association with this tomb. |

| Lot number | within transect | Spot date | Description |
|------------|-----------------|-----------|--|
| 190257 | 190217 | WS | Largely deconstructed Wadi Suq tomb constructed on the al-Ahliya tower platform (west end). The tomb structure is largely deconstructed and obscured by the larger tomb 190258 immediately north. The edge of the tomb structure is clearly deformed by a U-shaped stone wall. The interior is filled with a limestone gravel. No artifacts were found in association with this feature. |
| 190258 | 190217 | WS | Large Wadi Suq tomb constructed on the al-Ahliya tower platform and partially atop the deconstructed tomb 190257. The tomb appears to have five internal chambers -- these are suggested by gravel-filled depressions on the stone mound. The structure of the tomb is largely obscured by the limestone rubble mounding. No artifacts were found in association with this tomb. |
| 190259 | 190217 | IA | Three IA tombs off the NE side of al-Ahliya tower. Three circular depressions in the rocky upper north slope of the al-Ahliya hill. The depressions are lined with stone rubble and are filled with stone rubble (rubble in rubble). It is possible that these are IA tombs like the 190255 tombs on the south hill slope. If so, the tomb structure is obscured by stones, likely tumbled down the hillslope. No artifacts were found in association with this feature. |

7.3 Report of 6 January, regarding Visitors Center and Site Development

Bat UNESCO Site Development Recommendations

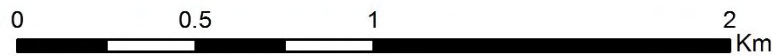
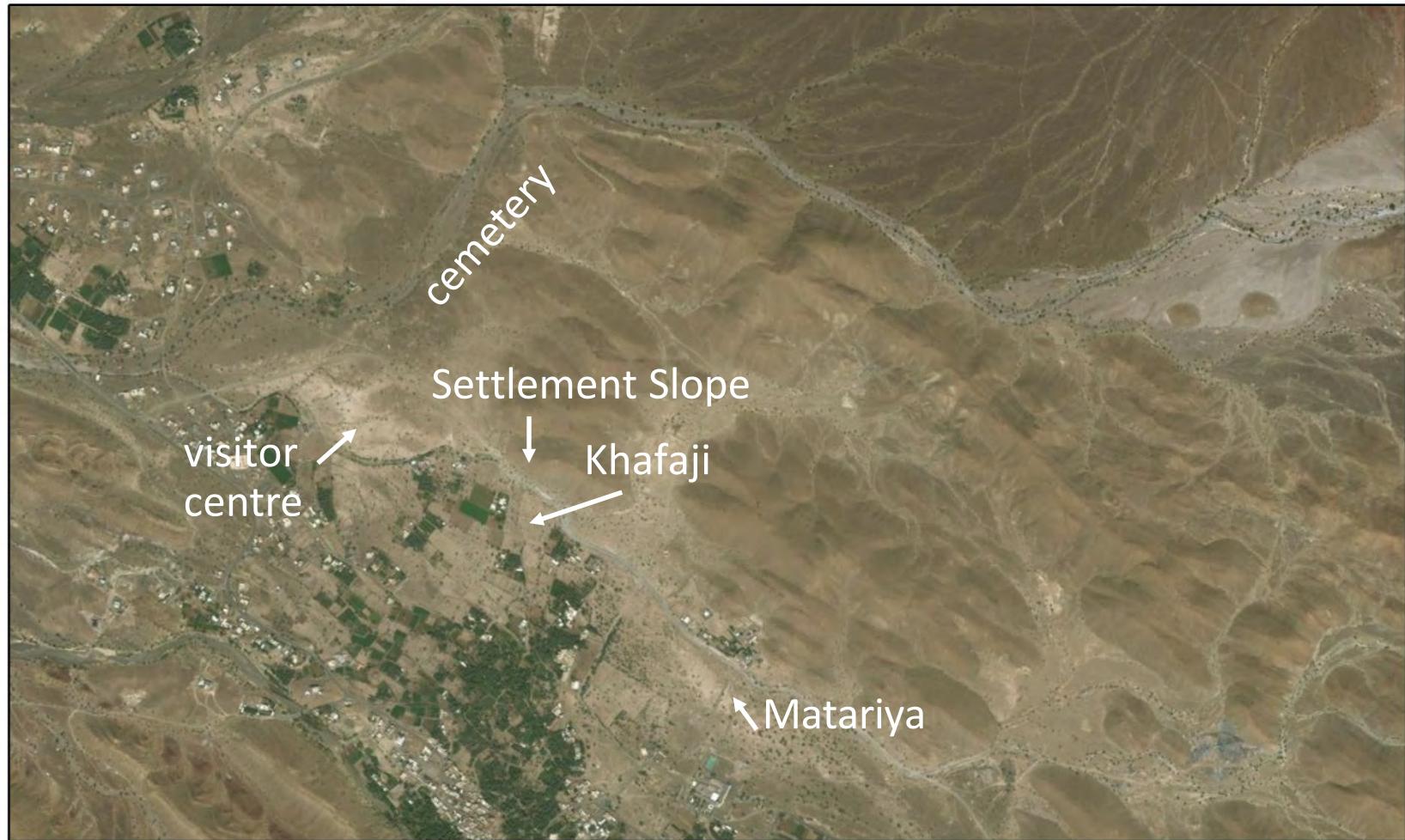
BAT ARCHAEOLOGICAL PROJECT
6 JANUARY 2019

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Contents

- Overview Map
- Visitor Centres
- Archaeological Points of Interest (POIs)
- Pathways
- Malakiya for Khafaji and Matariya
- Fencing
- Technology for Interpretation & Education
- Other Suggestions

Overview map



Visitor Centres – locations

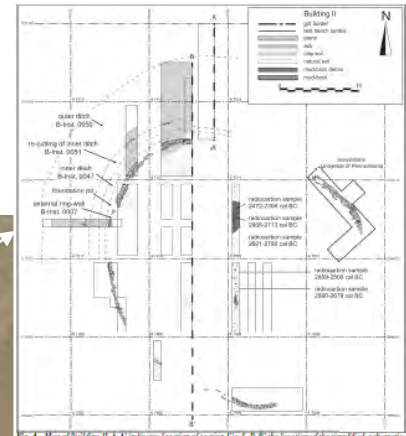
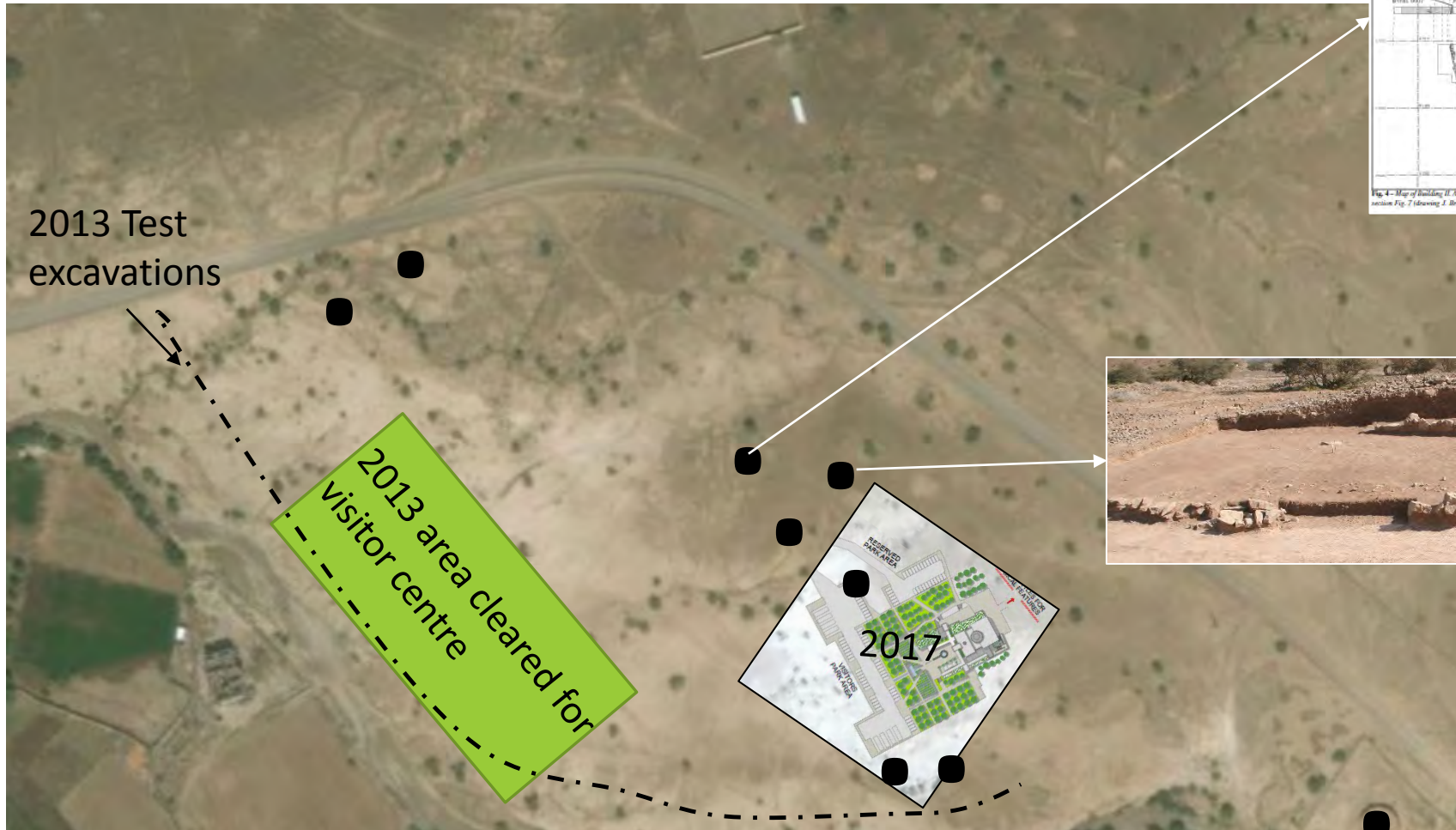


Fig. 4. Map of Building II. A-A' indicates location of section Fig. 5. B-B' the location of the simplified, schematic section Fig. 7 (drawing: J. Bradbury, S. Döpfer, L. Gas, C. Girano, J. Kluge, T. Lorenz, C. Schmidt, M. Walker).

Döpfer 2018

2013 Test excavations

2013 area cleared for visitor centre

2017

● feature

New Bat location destroys archaeology

Visitor Centre location recommendations

Recommendation 1: move the visitor centre location to the south, where there is little chance of destroying any archaeology

Pros: no need to hire archaeologists to excavate; saves the archaeology

Cons: none known

Recommendation 2: hire a team of archaeologists to conduct remediation (excavation exactly in the places of the visitor centre)

Pros: the American Team (BAP) can work with you on this, as it is also part of our 2020 proposed survey and excavation area

Cons: time and money; removal or archaeological features for construction

Recommendation 3: choose another location, such as Location 1 proposed in 2013.

Pros: The area has been surveyed and appears to be void of archaeological features

Cons: it will require new architectural plans

Visitor Centres: Pros (+)

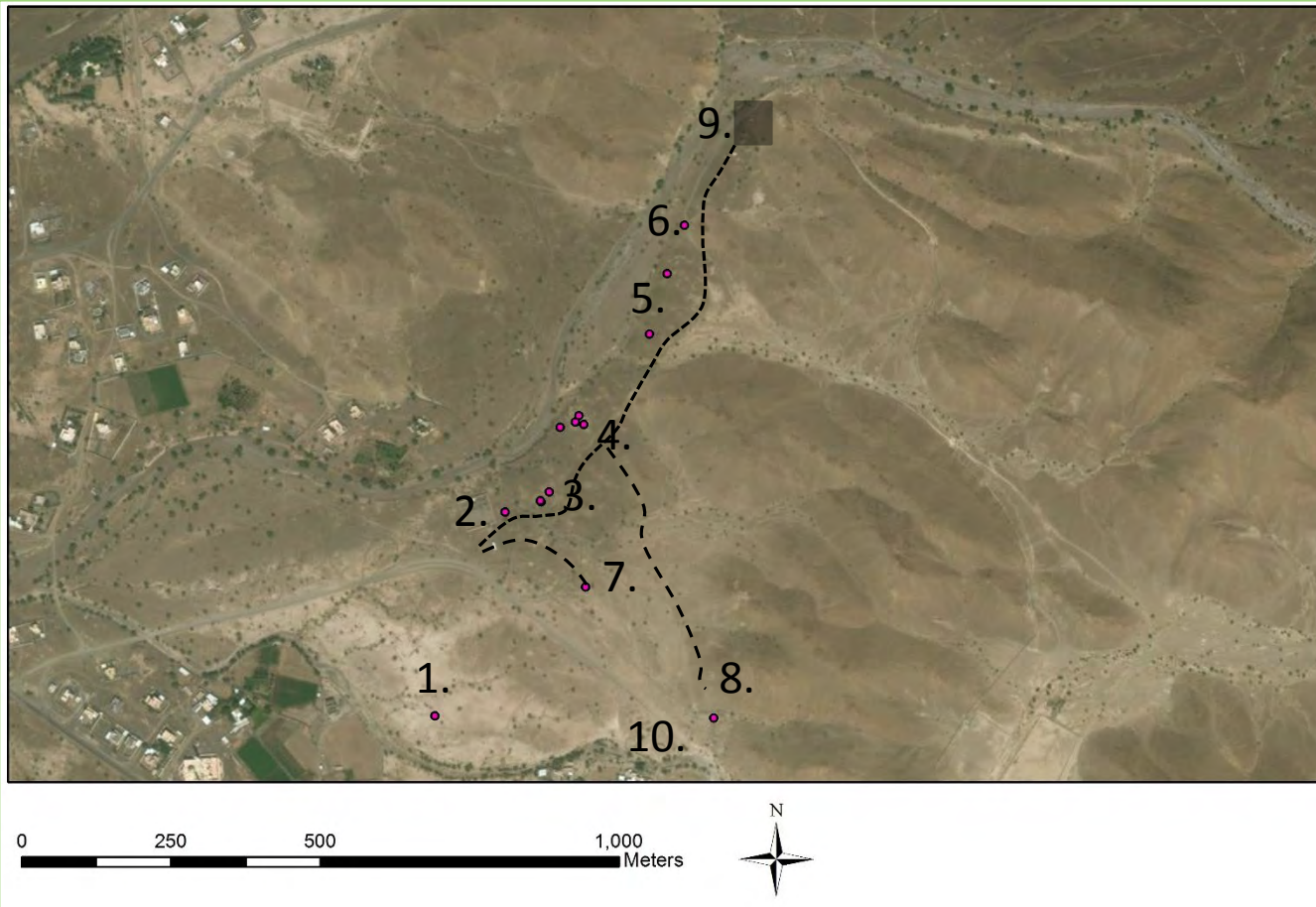
- The architectural plans are lovely. Our favourites:
 - The gardens (and covered seating)
 - The tombs inside (at Bat and Al Ayn)
 - The viewing platform at Bat
 - The ground floor underground at Bat
 - The bookstore & shops
- It looks like there is space for artefact storage. Are these for all Bat artefacts, or only artefacts in display rotation? (more storage for all would be necessary)
- The lab is a great idea! Is this for all teams to use, or only the MHC? (if for all, more laboratory space will be necessary)

Visitors Center: Concerns

- 2017 plan is in a different location from the 2013 tests and will destroy some archaeology
- -2.60m below ground is deep. If the visitor center is located near the shurgi, will this make problems for drainage (and artefact storage)? And, where will the water go in a rain?
- Will the stairs and ramps be made of marble? Marble is beautiful but very dangerous when wet! Tourists are often retired (60+ years) and a fall would be bad.

We have many notes about the Visitor Centres specifications. If you would like to discuss these specifics please contact BAP.

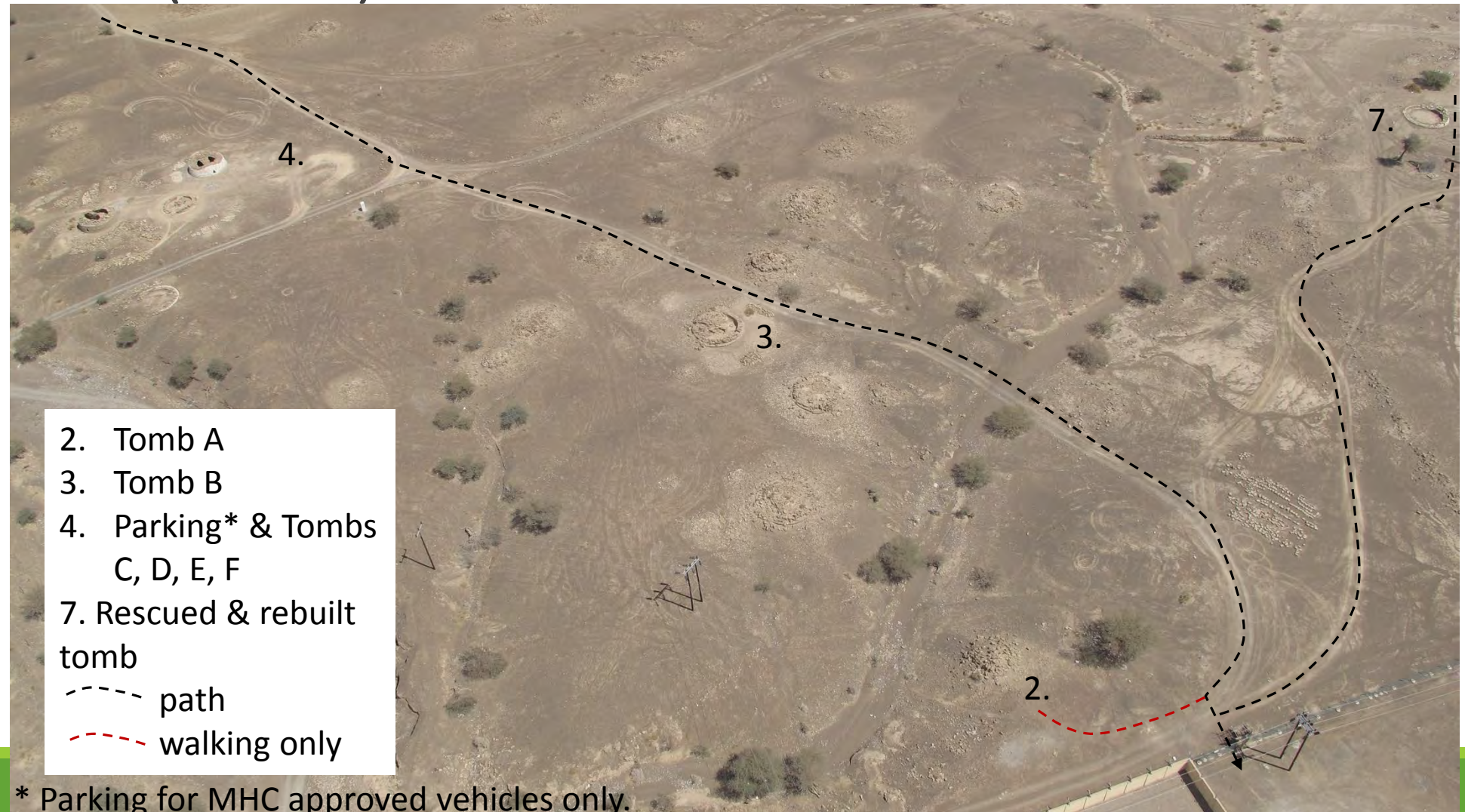
Archaeological Points of Interest (POIs) --- tombs



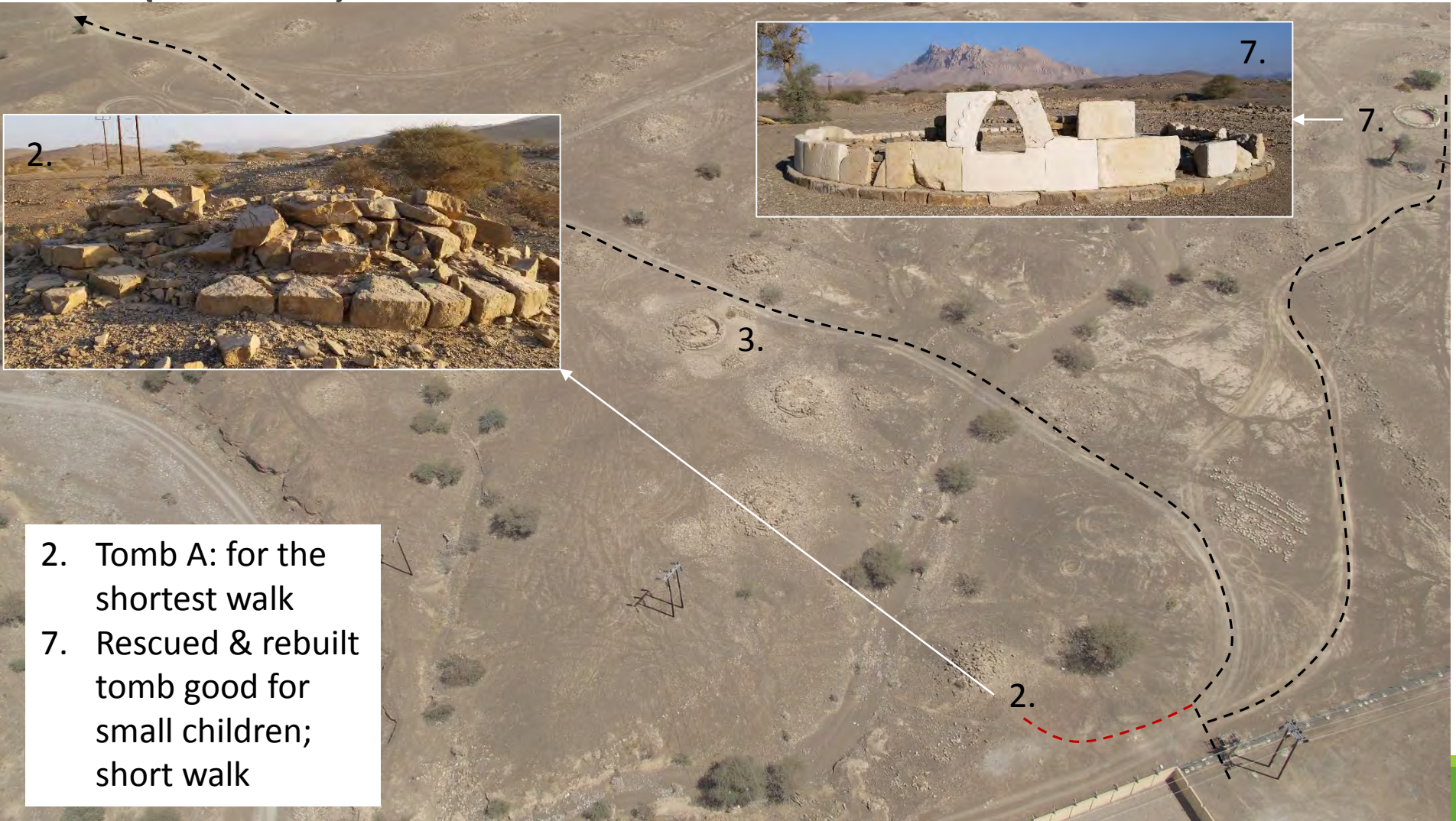
1. Visitor center
2. Tomb A
3. Tomb B
4. Parking* & Tombs C, D, E, F
5. Tomb G
6. Parking* for Tomb G & fenced area
7. Rescued & rebuilt tomb
8. Settlement Slope overlook
9. Fenced, reconstructed Hafit tombs
10. Rojoom & Parking*

* Parking for MHC approved vehicles only.

Archaeological Points of Interest (POIs) --- tombs

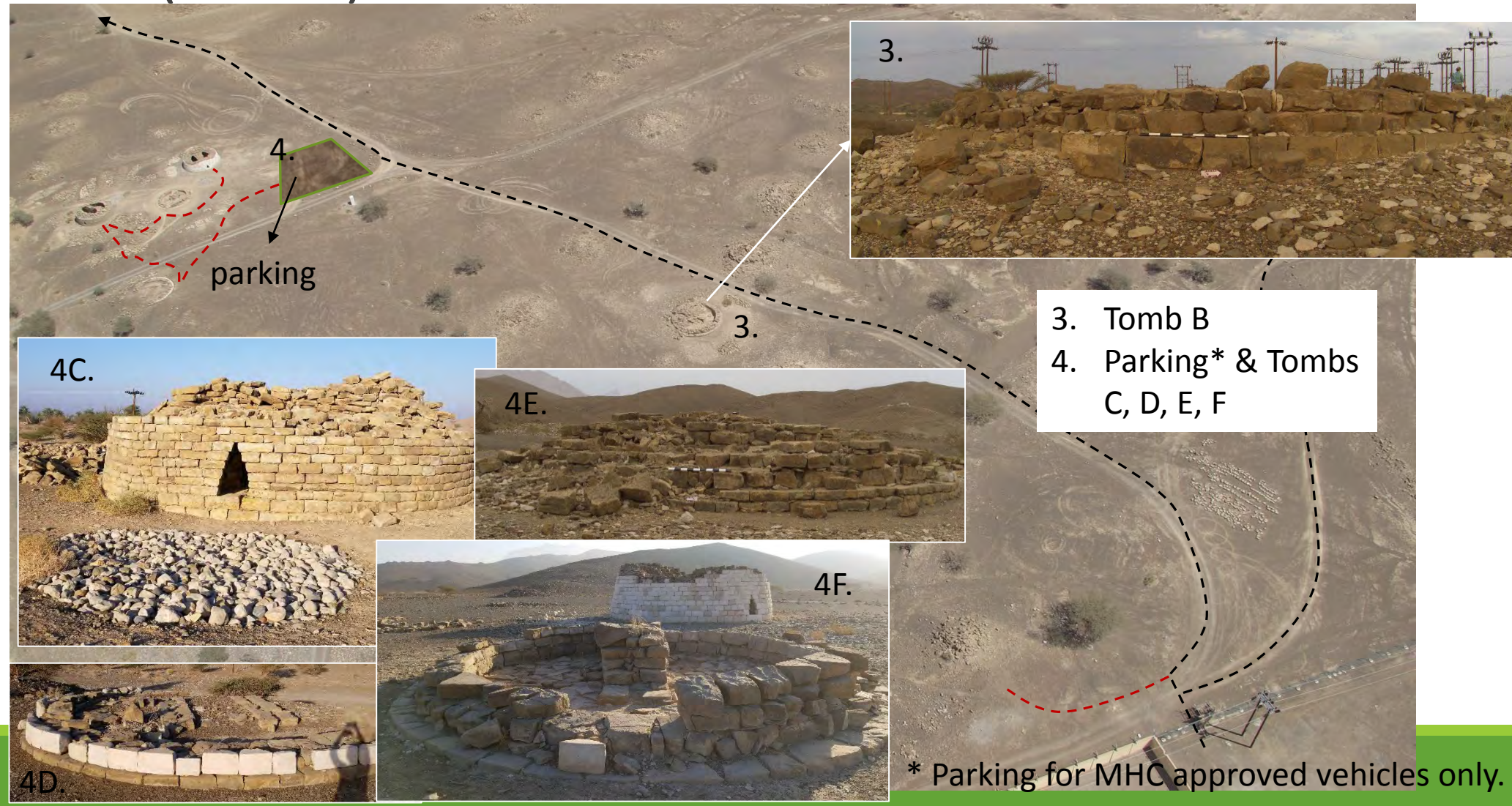


Archaeological Points of Interest (POIs) --- tombs

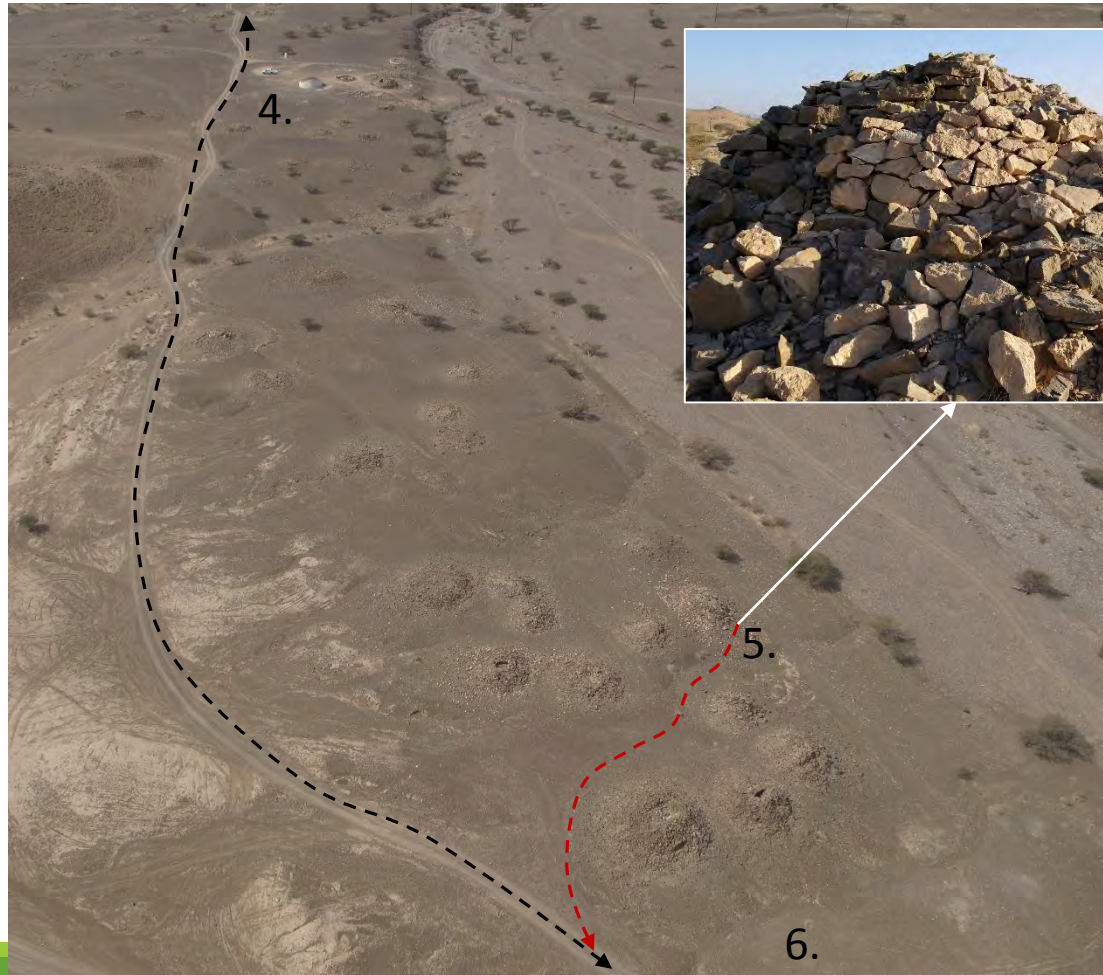


- 2. Tomb A: for the shortest walk
- 7. Rescued & rebuilt tomb good for small children; short walk

Archaeological Points of Interest (POIs) --- tombs



Archaeological Points of Interest (POIs) --- tombs



- 4. Parking* & Tombs C, D, E, F
- 5. Tomb G
- 6. Parking* for Tomb G & walking path to fenced area

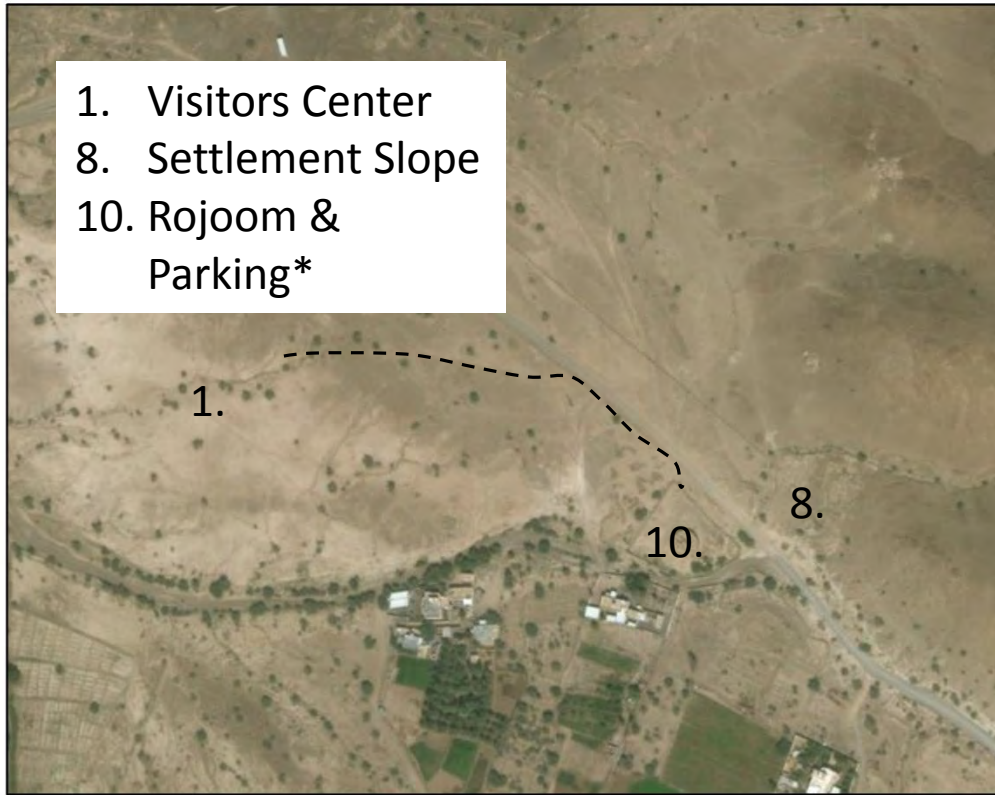


To fenced, reconstructed Hafit tombs

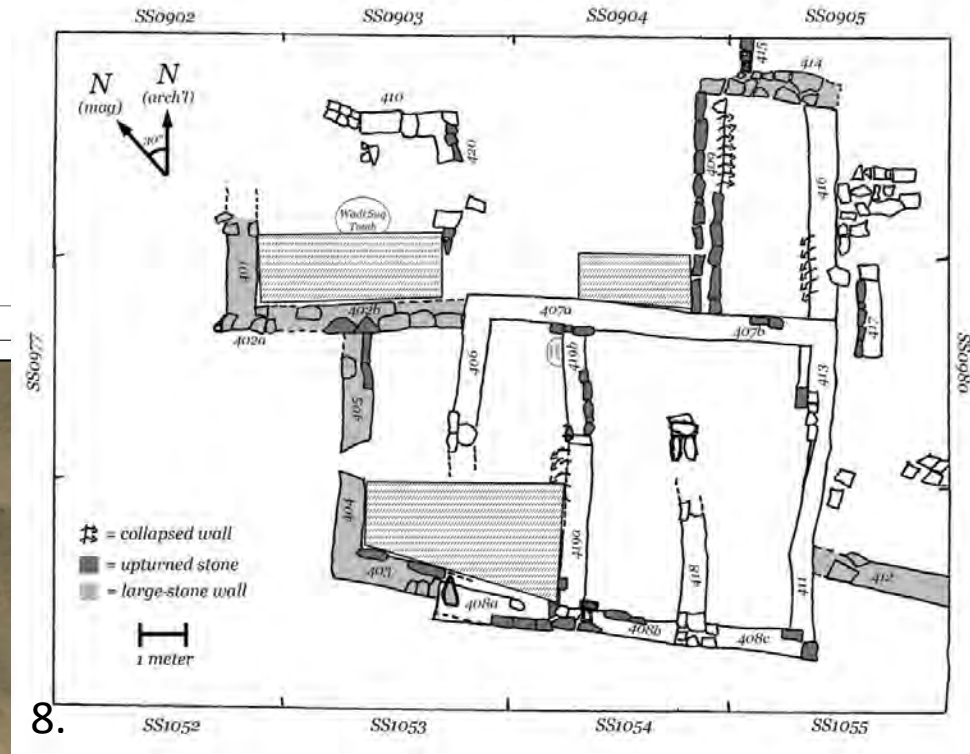
* Parking for MHC approved vehicles only.

POIs -- houses

1. Visitors Center
8. Settlement Slope
10. Rojoom & Parking*



0 100 200 400 Meters



* Parking for MHC approved vehicles only.

POIs --- towers

Proposal: Viewing platform at Khafaji

- Khafaji is only 1m tall now
- Made of stone (durable)
- Near to Rojoom and the Settlement Slope (visible)
- The entire tower interior has been excavated
- It is difficult to understand from pictures but easy to understand when above it!



Bat 2008-2010
Tower 1146

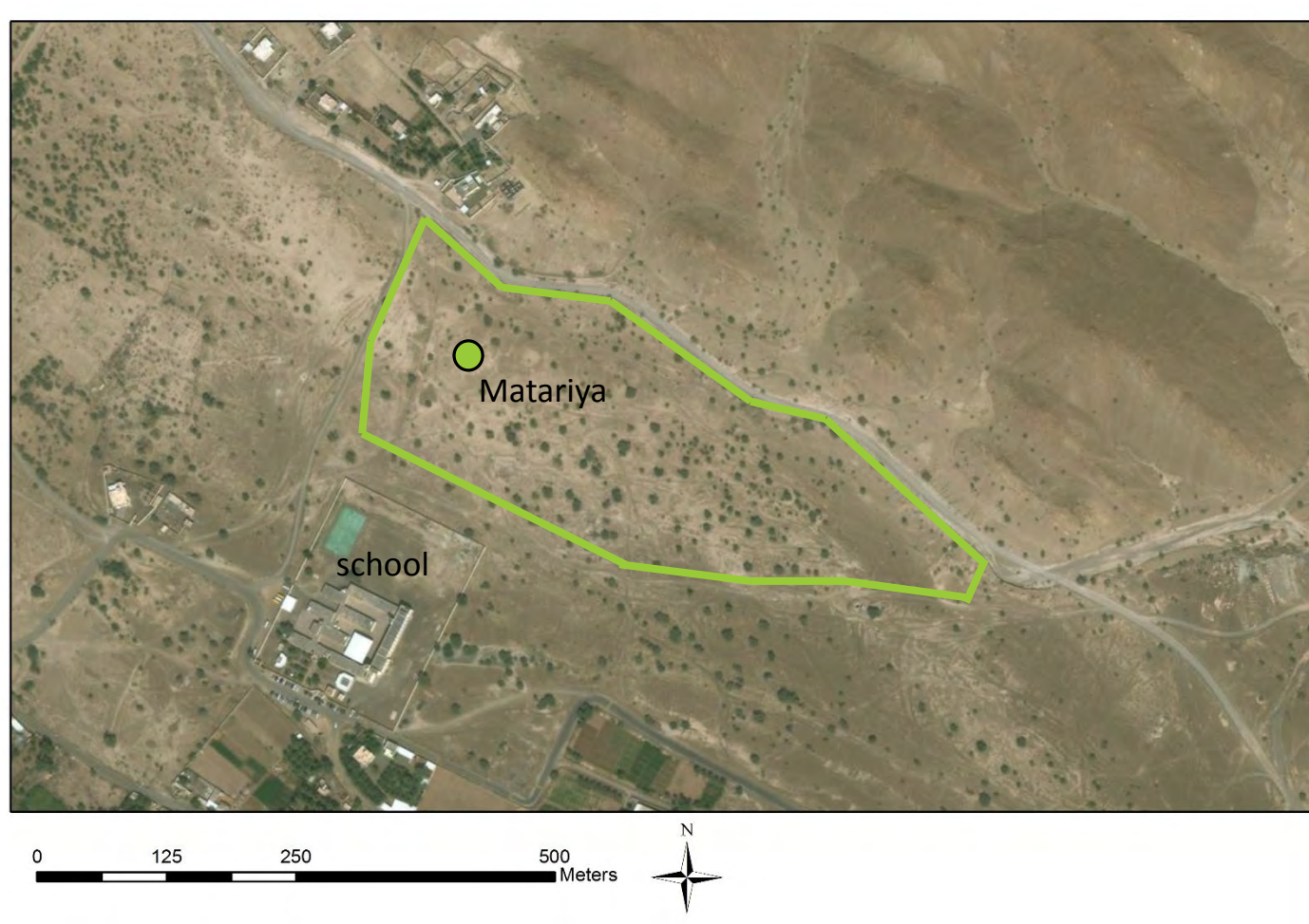
0 5 10 Meters

Pathways -- suggestions

- Follow the paths already present
- Use low-impact vehicles (e.g., golf carts)
- Encourage walking! (pair with Ministry of Health?)
- Fence only endangered or dangerous archaeology
- Provide 1 short walking path (less than 30 minutes)
- Provide 1-2 long walking paths (2 hours each)
- Provide shade & (stone) seating near parking areas
- Bat is beautiful: choose colours and locations that will not affect the views!



Proposed Malakiya for Matariya



Proposed Malakiya for Khafaji



Fencing inside Bat Cemetery

- Allows people (and animals) to move freely without harming the archaeology or themselves
- Only fence excavated tombs with stones that are likely to fall or break; all other tombs focus on preservation



QR codes



Machine-readable unique code of black and white squares; stores URLs or other information for reading by smartphone camera

- **Pros (+):**

- Inexpensive
- Can update/change information
- Uses smart phones
- Can be many languages

- **Cons (-):**

- Uses smart phone

Answer questions (“how many tombs are there in Bat?”)



Words, pictures, & sounds



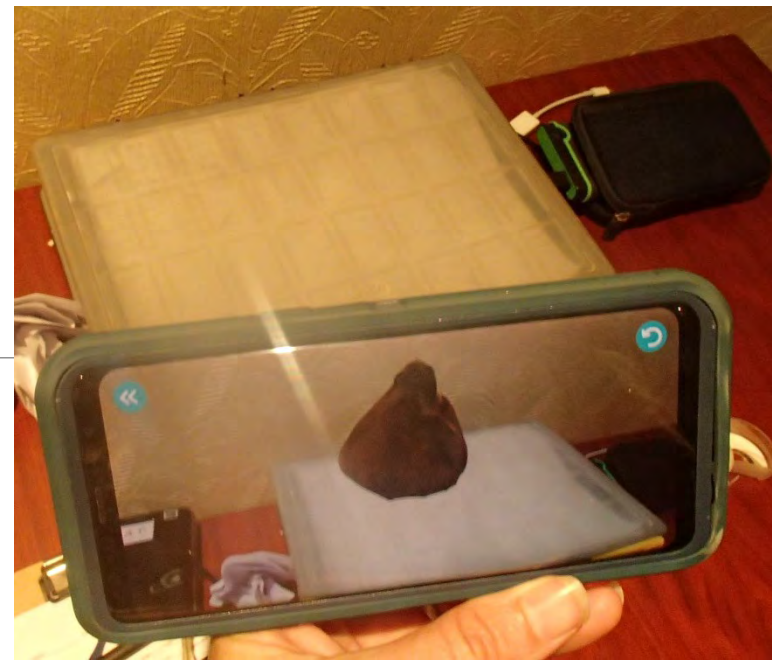
More information than a sign



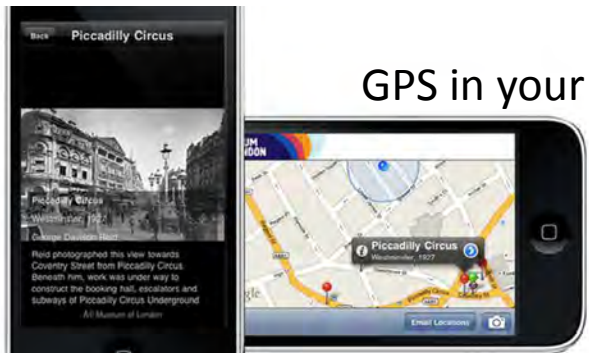
Augmented Reality

Computer-generated image + view of the real world = composite view: "Reality Plus"

- EXAMPLES: QLONE (free app); Museum of London's "Street Museum"
- **Pros:** smartphone-based; can be as detailed as you want, with easy and complex projects
- **Cons:** time-intensive and can be expensive; needs expertise; needs money up front and for maintenance (StreetMuseum is canceled because they can't keep up with mobile phone changes)



Dr Charlotte makes and uses the Qlone app with her phone



GPS in your phone brings up information, sights & sounds of that place

Virtual Reality

3D image; can be interacted with in a seemingly real or physical way by a person using special electronic equipment (e.g., a helmet with a screen inside or gloves fitted with sensors)

- Augmented History (<http://www.augmentedhistory.se/>)
- Pueblo Bonito's "Chronological Virtual Reality": <https://www.archaeologysouthwest.org/virtual-southwest/chronological-virtual-reality-cvr/>
- **Pros:** can see changes over time; immersive!
- **Cons:** lots of information needed; expensive and time-consuming to make; must purchase and maintain special equipment (and pay for programmers)



Ecotourism & mudbrick villages

Bat is beautiful! Combine archaeology with:

- ❖ Abandoned mudbrick village tours (e.g., Al Gish)
- ❖ Geology (Oman is utterly unique in the world!)
- ❖ Guided nature hikes that leave from the Visitors Centre and explore the tufas (natural springs) or go into the mountains to the north and south
- ❖ Omani cultural experiences
 - ❖ Stays in “traditional” Omani style homes
 - ❖ Visiting traditions (dates, coffee, fruit)
- ❖ Plants of Oman --- use the Visitor Centre gardens to show Omani plants and their uses

Development – suggestions

- When people from other cultures come to Oman, they also want to know about daily life. For example:
 - What are aflaj? How do they work? What about wells? Do modern wells compare with Umm an-Nar wells?
 - What does the village look like (add a scale model of the mudbrick village to the visitors centre?)
 - What is school like for children? What games do people play (young and old)?
- Visitors will want a place to stay --- we suggest working with the local people in Bat and al-Wahrah to make a “Bed and Breakfast” just outside of town: guests stay in a home and their food is prepared for them. This could be very nice in some mudbrick homes --- built for the tourists!

7.4 Eli Dollarhide: Dissertation Abstract

Mapping Magan: The Ancient Social Landscape of North-Central Oman

Since the late 1950s, a wealth of archaeological research has shed light on the Bronze Age prehistory of southeastern Arabia (modern Oman and the United Arab Emirates). Much of the work on the region's prehistory—known as *Magan* in Mesopotamian cuneiform texts—has focused on the area's external connections to its better understood Bronze Age/third millennium BCE neighbors in Mesopotamia, Iran, and the Indus Valley. This dissertation takes an alternative, regional perspective on the archaeology of southeastern Arabia by examining connections across ancient settlements within northern Oman.

This dissertation presents the results of an archaeological survey and ceramics study conducted by the author around the UNESCO World Heritage Site of Bat, Oman. A geospatial analysis of the Bronze Age settlements and tombs discovered during this work reveals a temporally-dynamic landscape with changing social boundaries. The results of petrographic thin section analysis of five ceramic collections from the area (the survey zone and previous excavations at the settlements of Bat and 'Amlah) indicate shifting centers of production and the development of new exchange networks at the end of the third millennium BC. In interpreting these results, the theoretical framework of habitat webs is proposed. Based on the writings of John Muir and landscape ecologist Eric Sanderson, these webs of interaction highlight the resources depended upon by particular classes of artifacts and features, offering a multi-scalar model of landscape history. The visualized webs spatially reveal the diversity of interactions between the natural and cultural environments, linking even ancient northern Oman's smallest communities to regional and long-distance exchange networks. Ultimately, it is argued that the depth of these demonstrated connections render the predominant 'tribal' characterization of Bronze Age society in southeastern Arabia untenable.

7.5 List of features in the area east of Ahliya

| Feature ID | Feature Type | Spot Date | Notes |
|------------|--------------|-----------|--|
| 110983 | Tomb | UAN | Both sides of the exterior wall on the west of this tomb are visible, and its interior is probably intact. |
| 110984 | Tomb | UAN | The ringwall of this tomb is visible all the way around - because the top of the monument has been largely removed (as opposed to collapsed) and is therefore quite level. Interior has E-W running wall & N-S running wall giving it a cruciform shape. A plinth is also visible most of way around and is constructed from significantly larger stone blocks than the tomb wall. |
| 110985 | Wall | post-UAN | This is a feature of unknown type, wedged between 2 Bronze Age tombs (features 111001 & 111002). There is a wall visible on the South side. |
| 110986 | Tomb | 3rd mill. | This tomb sits mid-slope and is largely gone. It is possible to see reasonable amounts of ringwall to the north, east, and south. Lots of stone fragments are present. |
| 110987 | Tomb | unk. | This probable tomb includes scatters of human remains to the south and on the feature, which is very poorly preserved. The ringwall is visible to the south and east but dimensions were impossible to identify without excavation. |
| 111001 | Tomb | 3rd mill. | Tomb with 3 cairns on top, meaning that the feature has been radically modified. A possible ringwall is visible. |
| 111002 | Tomb | 3rd mill. | The ringwall is clearly visible in this tomb. |

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