



NON-INVASIVE ARCHAEOLOGICAL
RESEARCH TO DEFINE THE
BOUNDARIES OF WWII MASS GRAVE
SITES IN
ROHATYN, UKRAINE.
ADDENDUM FEBRUARY 2020

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Non-invasive archaeological research to define the boundaries of WWII mass grave sites in Rohatyn, Ukraine. Addendum report February 2020

Introduction

Rohatyn, located in western Ukraine, approximately 80km south-east of Lviv (Figure 1) became, during World War II, a killing and burial place for thousands of Jewish people. On the 20th March 1942, approximately 3500 of the town's Jewish residents were rounded up and shot at two pits to the south of the town by members of the German Gestapo, the police and others. Thousands more from Rohatyn and nearby towns and villages were killed in ad hoc executions throughout 1942-1943, and during a "Final Aktion" in June 1943. The victims of the latter aktion were reportedly buried in a mass grave north of the town. Most of those who survived these aktions were deported to the death camp at Belżec. The two Jewish cemeteries in the town were also desecrated as a way of further attacking the cultural and religious identity of the Jewish community resulting also in the damaging and removal of matzevot (tombstones), and a lack of knowledge concerning the locations of pre-war graves. In May-June 2017 a team from the Centre of Archaeology at Staffordshire University undertook a non-invasive archaeological survey at the south and north memorial areas (the presumed killing sites), as well as in the two Jewish cemeteries in the town (Figure 2). At the suspected mass grave sites and new Jewish cemetery, systematic walkover, topographic and geophysical surveys were employed in order to locate above- and below-ground evidence of the atrocities perpetrated there.

In 2017, the Centre of Archaeology was commissioned by Rohatyn Jewish Heritage, a volunteer-led NGO that works to reconnect the history of Rohatyn's now-lost Jewish community with the people and places of the modern town via heritage and education programs, to carry out a forensic investigation and survey work at each of the sites. A report outlining the results of this work followed. This addendum to that report outlines the results of a further ground penetrating survey undertaken in May 2019 at the site of the northern mass grave.

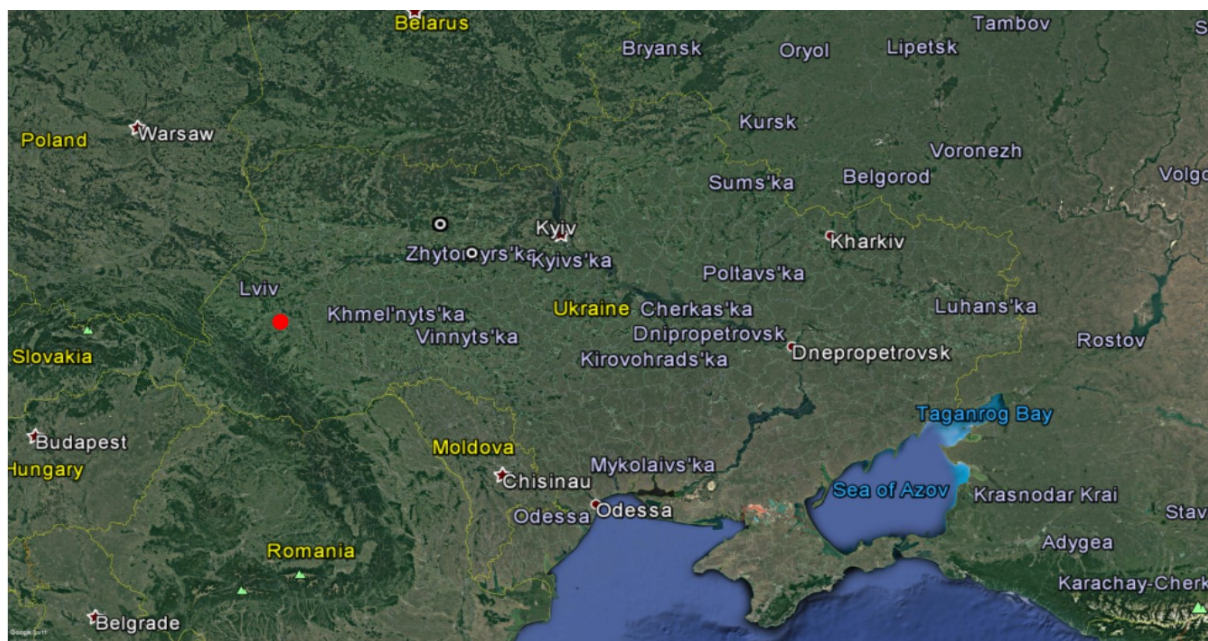


Figure 1: Location plan showing Ukraine and Rohatyn (red marker) (Copyright: Google)



Figure 2: Location plan showing the location of the new Jewish cemetery (orange marker), the north memorial survey area (red marker), the old Jewish cemetery (white marker) and south memorial survey area (black marker) (Copyright: Google and Centre of Archaeology, Staffordshire University)

Aims, methodology and site condition

The aim of the project in 2019 was to complete a GPR survey within an area of the north mass grave site that was previously unavailable. The area lies between two of the previous areas analysed in 2017 (area H, Figure 3). The specific objective of the 2019 work was to identify any buried anomalies and features that may be consistent with burial pits. Witness testimony collected by Rohatyn Jewish Heritage alludes to human remains being discovered in this area during the construction of the nearby greenhouse structures (now derelict). The methodology remained the same as the previous survey. All of the GPR surveys undertaken on the site within this survey grid were undertaken using a GSSI SIR-3000 GPR with 400MHz antenna (Figure 4). A parallel survey methodology with a 0.5m traverse interval was adopted for area H to ensure the greatest coverage within the small defined area. Survey lines were undertaken from northwest to southeast.

It is important to note that the soil in the region appeared to have a high clay content. Hence, it was highly reflective. This had the effect of creating a lot of “background noise” in the data which may have masked other subterranean features. It also made estimating the depth of some features difficult.

Due to extant buildings located on the site it was not possible to survey a fully complete rectangle. The maximum length of the grid was 21m. The maximum width of the grid was 11m. Accounting for the section which couldn't be surveyed, the total area covered by the GPR was 201 sqm.

The survey grid was located to the north of former greenhouses and brick-built outbuilding within a prominent gully. This gully was overgrown with semi-mature trees, saplings and grasses. Prior to the survey the vegetation on the site was extensively cleared by hand, and rubbish, which was scattered across the site, was removed. This allowed for the survey to be undertaken without interruption and for survey lines to remain unbroken. The topography of the area however, presented further survey

issues. A raised slope was located on the northern and eastern site of the grid and a prominent depression ran from east to west. This depression was wider at the eastern end. A set of steps, which was attached to the brick built outbuilding, was located within the southern half of the grid (Figure 4).

This survey grid ran alongside of the former greenhouse building and extant outbuilding. Due to the presence of foundations and the non-removable contents of a covered outbuilding, the survey grid was missing the south western corner.

The topography of the ground was notable, as it was around 1- 1.5m beneath the level of Area F (to the east of Area H and surveyed in 2017). The following features described beneath are present at a depth of around 1.5m below present ground level. However, this is probably close to the original 1940's level as much of the ground appears to have been stripped away in the construction of the brick built outbuilding and greenhouses. This has left a prominent slope.








Key:  Area A  Areas B-E (south to north, inside greenhouses)  Area F  Area G
Area H (2019) 

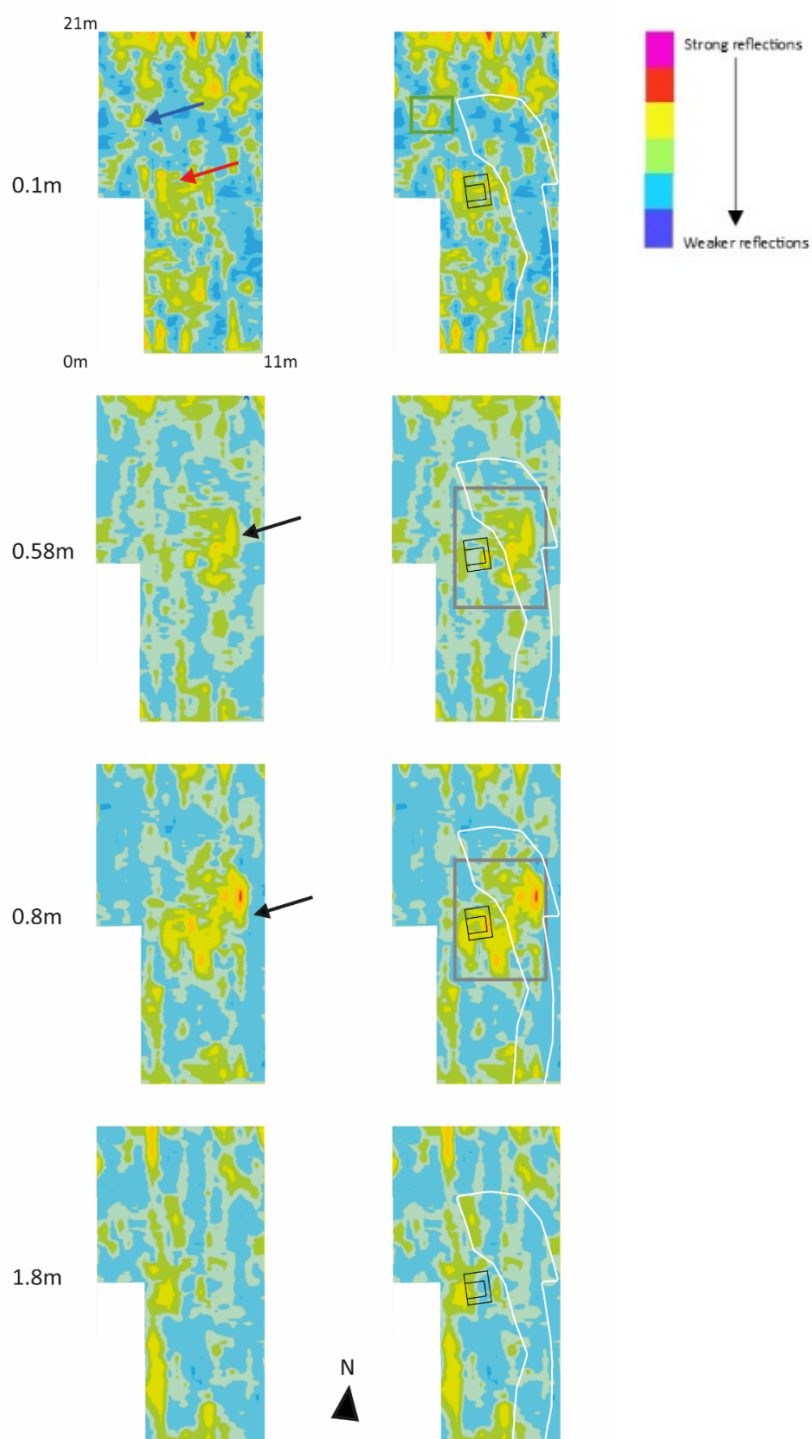
Figure 3: Close-up of the GPR locations at the northern mass grave site. The blue arrow marks the location of the current memorials on the site. (Copyright: ESRI and Centre of Archaeology, Staffordshire University)



Figure 4: Photographs of the northern mass grave site showing survey area H, located to the east of the greenhouses. Undertaken in May 2019 (Copyright: Centre of Archaeology, Staffordshire University)

Results - Area H (May 2019 Survey)

Two probable pits were identified in the GPR results. One (Pit A) was strongly visible in both the 2D profile section lines and the 3D timeslice (birds eye view), whilst a second pit (Pit B) was only clearly visible on the 2D profiles. Figure 5 shows the 3D data results from 4 different depths (0.1m, 0.58m, 0.8m and 1.8m). The location of the concrete steps and the topography is also annotated on this figure. Strong GPR reflections are visible on the 0.58m depth and the 0.8m depth images (black arrows; Figure 5) and these results are consistent with a possible large pit (Pit A). Figure 6 represents a closer image of the 0.8m depth timeslice. The location of Pit A also corresponds to a large depression that was visible on the surface. It is also possible that Pit A has been partially disturbed by the construction of a concrete foundation (red arrow) for the metal steps which are associated with the adjacent structure. Pit A is not visible on the 1.8m depth timeslice. To ascertain a depth for this feature, the individual 2D profile (section) lines were analysed that bisected the pit location. Two profile lines in particular (2m and 5m; Figures 7 and 8) are important. Both profile lines suggest the feature is approximately 1.5m in depth.



- ← = Strong reflection ← = Disturbance caused by construction of steps
 ← = Strong reflection □ = Concrete base of steps □ = Location of large anomaly (Possible pit A).
 □ = Location of small anomaly (Possible pit B) □ Linear depression outlined in white.

Figure 5: The time-slice (birds eye view) GPR data for Area H at depths of 0.1m, 0.58m, 0.8m and 1.8m, repeated with interpretations (right) (Copyright: The Centre of Archaeology, Staffordshire University).

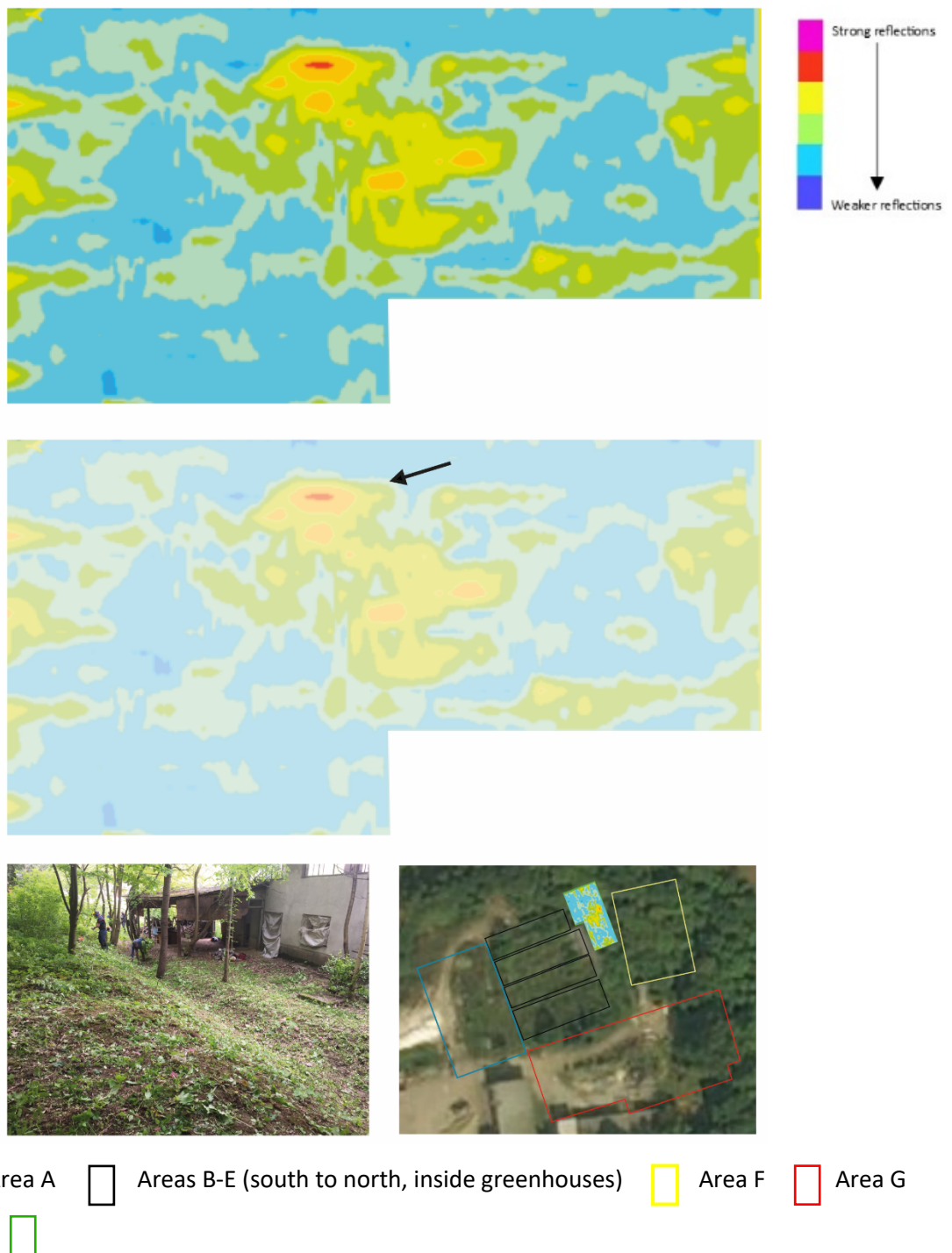


Figure 6: The time-slice (birds eye view) GPR data for Area H at a depth of 0.8m (top), repeated with interpretation (middle showing the anomalous material in the GPR data (possible pit) and photographs of the area and grid location (bottom) (Copyright: The Centre of Archaeology, Staffordshire University and Google Earth (aerial image)).

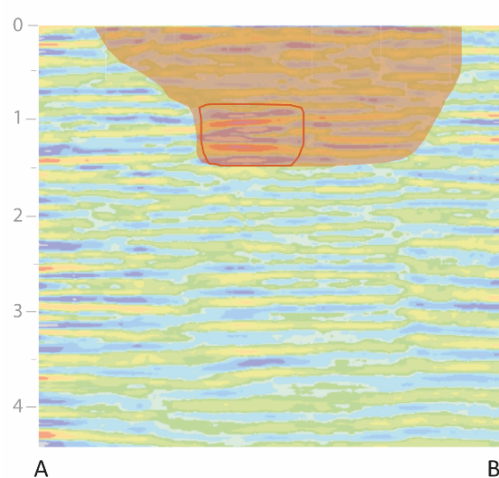
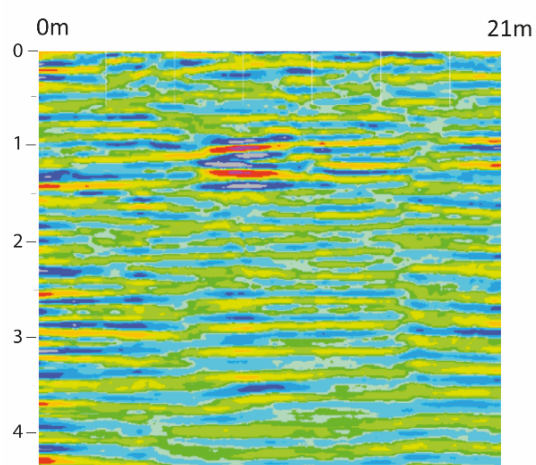


Figure 7: Section profile results from survey line 2m (top) with annotation (middle). A profile of the anomaly (possible pit A) is visible in the section (red) with strong reflection at its base. Depth scale is on the left-hand side of the images. (Copyright: The Centre of Archaeology, Staffordshire University and ESRI GIS base-mapping).

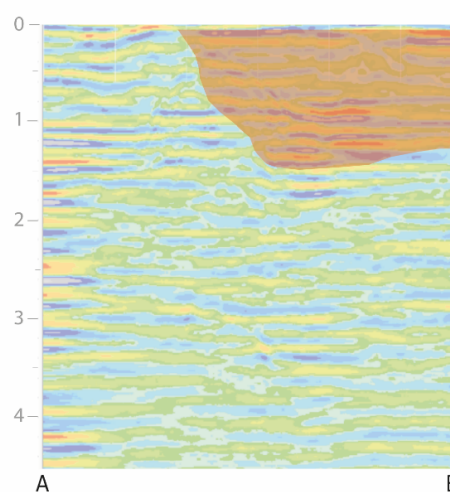
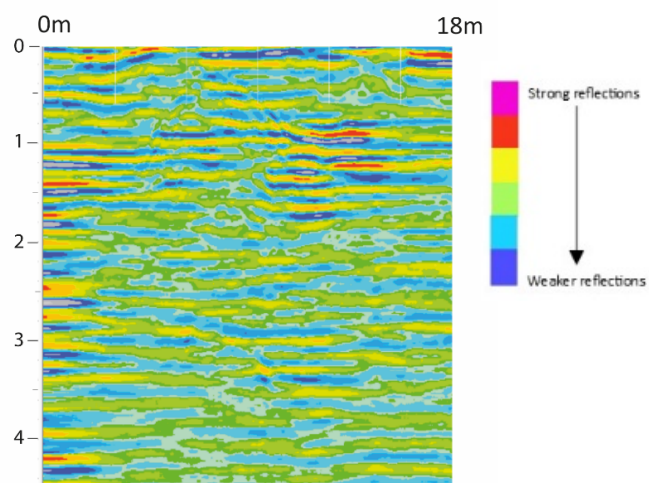


Figure 8: Section profile results from survey line 5m (top) with annotation (middle). A profile of the anomaly (possible pit A) is visible in the section (red). Depth scale is on the left-hand side of the images. (Copyright: The Centre of Archaeology, Staffordshire University and ESRI GIS base-mapping).

As outlined above, a second, smaller area of disturbance (Pit B) was identified in the 2D profiles (the location of which is marked on the 3D timeslices as a blue arrow (Figure 7). The best profile line to illustrate Pit B is line 8 (Figure 9). The feature is approximately 1m in depth.

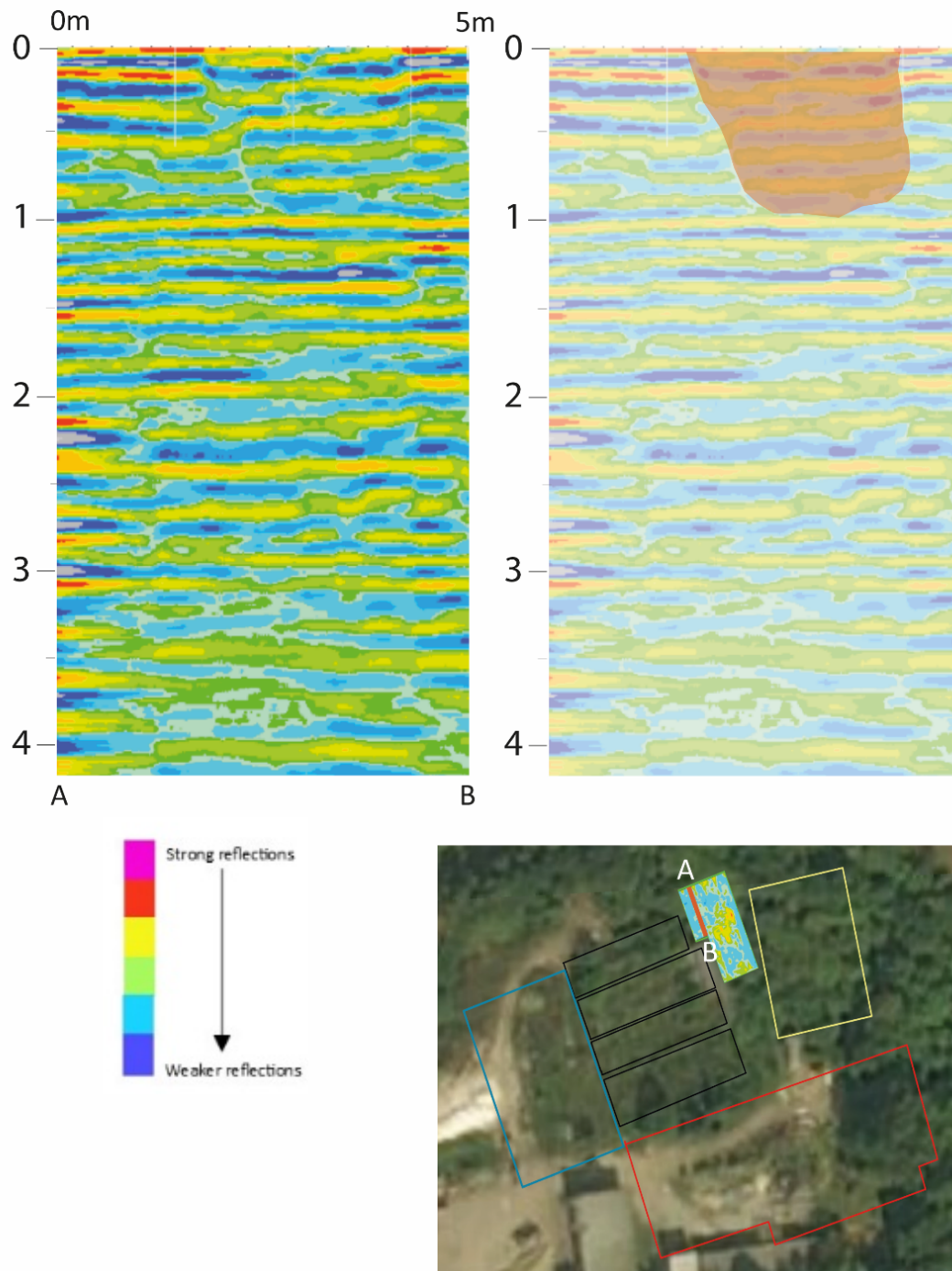


Figure 9: Section profile results from survey line 8m (top left) with annotation (top right). A profile of the shallow anomaly (possible pit B) is visible in the section (red) (Copyright: The Centre of Archaeology, Staffordshire University and ESRI GIS base-mapping).

Discussion

When viewed alongside the results of the surveys undertaken in 2017, new insights into the crimes perpetrated in Rohatyn have been revealed. During the archaeological fieldwork undertaken in 2019, at this north site, the potential site of two further pits were identified. Both Pit A and Pit B are situated in locations that show visible disturbance on the aerial image from 1944 (Figure 10). Also visible on this image is a clear track or pathway leading to this area. Pit A is the larger and deeper of the two pit features and the GPR results suggest that highly reflective materials or remains are present at the base of this feature. Only archaeological excavation would identify the nature of these buried remains, which of course would not be possible due to Halacha Law. The second pit (B) is much smaller and closer to the greenhouse structures. It is possible that this feature represents disturbance associated with the construction of these buildings. As outlined previously, witness testimony does exist which suggests that excavation work in this area did encounter human remains. Therefore, it remains a possibility that either one or both of these pits have been disturbed, particularly at shallow depths, until human remains were revealed. Given these testimonies, and the GPR results from this area, it is our recommendation that this area is protected from any further intrusive works. This additional survey in Rohatyn has again demonstrated the benefits of applying a non-invasive approach to the investigation of Holocaust-era killing and burial sites and it is hoped that this work will inspire new commemorative and educational opportunities in the future.

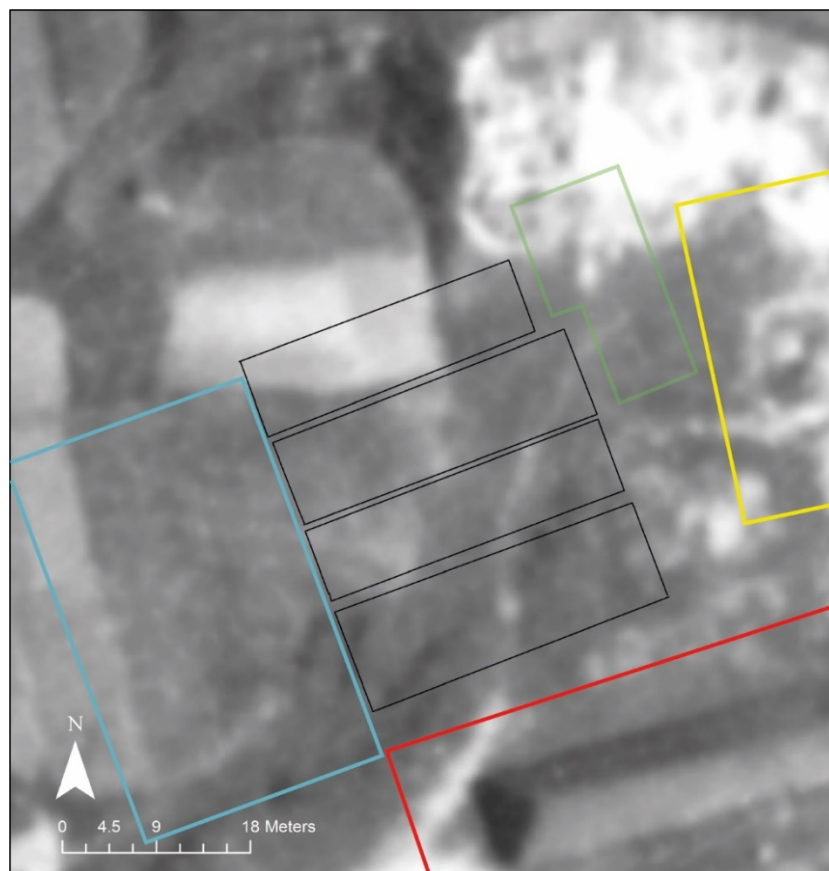


Figure 10: A close-up image showing the location of Areas A to H overlaid on the 1944 aerial photograph (Copyright: The Centre of Archaeology, Staffordshire University)