SOAP
San Diego State University Occasional Archaeological Papers

Archaeological Palimpsests, Historical Maps, and Ground-Penetrating Radar: The SDSU Discovery of the Whaley-House Cistern/Well

Seth Mallios

A team of student and professional archaeologists from San Diego State University recently uncovered the historical Whaley House cistern, located just behind the Whaley House museum in Old Town on San Diego Avenue. During August, September, and October of 2007, the crew from SDSU's South Coastal Information Center—myself, David Caterino, Destiny Larberg, Jaime Lennox, Scott Mattingly, and Hillary Sweeney—spent 12 weeks unearthing this archaeological feature, which was originally used by inhabitants of the Whaley House to collect and store drinking water. The archaeological team recovered over 30,000 artifacts in a large, subterranean cylindrical pit that marked where the cistern once stood. The rich deposit includes numerous intact bottles and a stunning display of pottery, animal bones, architectural debris, and tools (Figure 7.1).

Figure 7.1 Scott Mattingly and Hillary Sweeney carefully remove a complete Whiteware face wash basin from the Whaley-House cistern/well. Courtesy Seth Mallios, David Caterino, and the South Coastal Information Center.

Bruce Coons, Executive Director of the Save Our Heritage Organisation (which operates the County-owned museum), and Dr. Lynne Newell Christenson, San Diego County Historian, contacted me in the late fall of 2006 about conducting an excavation to find and unearth this 19th-century feature on the historic Whaley property. Coons and Christenson have extensive archaeological experience and repeatedly accommodated our team in the logistics of orchestrating the excavation. Once a Memorandum of Agreement was signed by San Diego State University and the County of San Diego in the spring of 2007, preparations for the survey and excavation began.

An 1872 map of the Whaley House (Figure 7.2) identified a contemporaneous feature, marked by a circle inside of a square, approximately 20' behind the house. It was directly in line with the eastern wall of the structure. On the basis of its size, shape, proximity to the main structure, and alignment with the drainage gutters that currently run down the edge of the house, Coons, Christenson, and I deduced this figure to be the cistern.

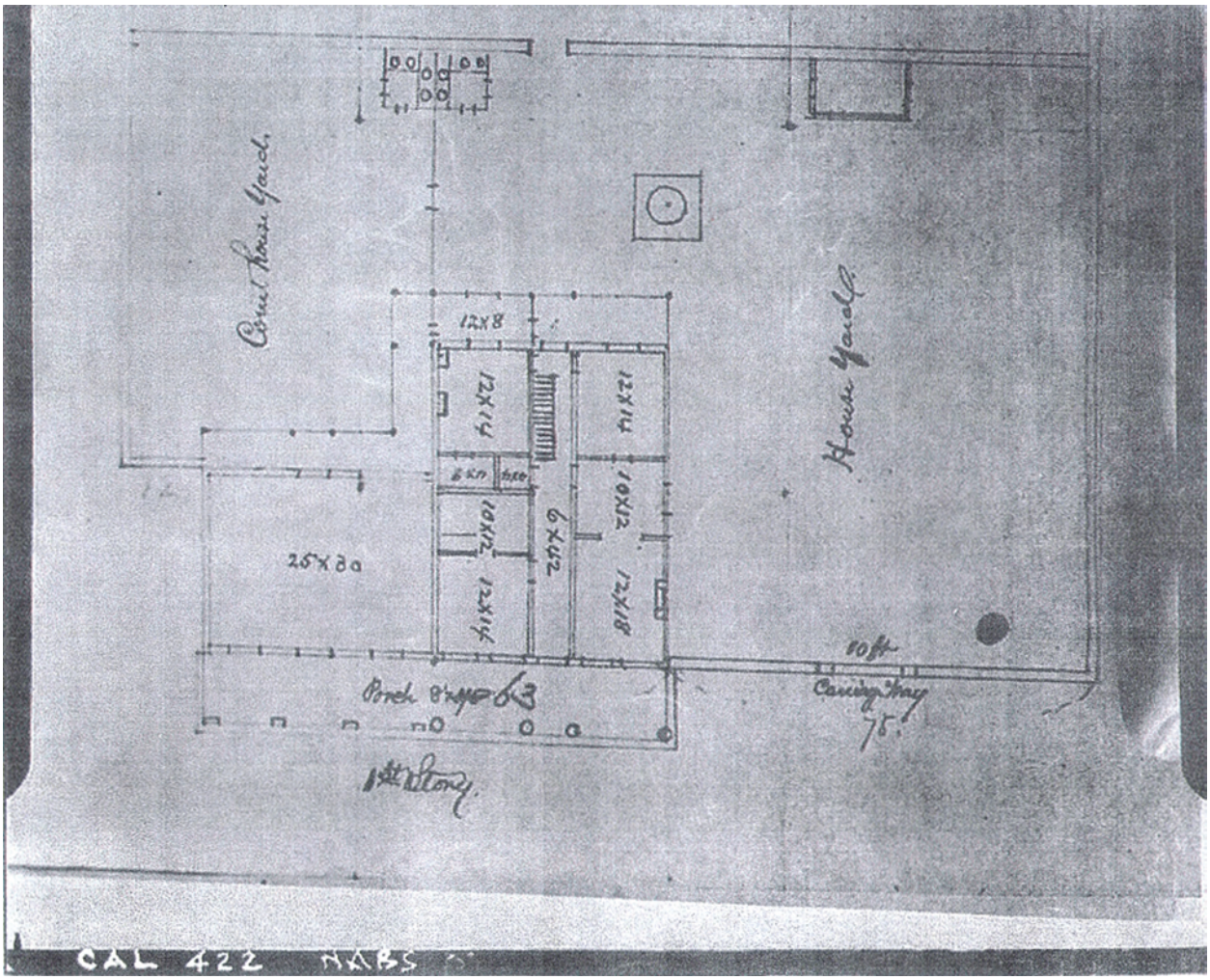


Figure 7.2 Thomas Whaley's 1872 property map. Note the small square with the circumscribed circle just above the main structure. Courtesy Save Our Heritage Organisation.

The cistern played a role in the dark history of the Whaley House. Violet Whaley, Thomas Whaley's second daughter, attempted to commit suicide in late July of 1885 by throwing herself off of the Whaley House and into the well. Violet was rescued, but shot and killed herself three weeks later. In addition to the old map, there are two historical references that suggest that the well was within close proximity to the back of the Whaley House. Both are 19th-century newspaper obituaries for Violet Whaley that described her unsuccessful suicide attempt. The August 20, 1885, *San Diego Union* noted that Violet jumped from the back balcony into the cistern, stating:

> On July 5th, I was harnessing my horse and heard a scream, issuing from the cistern. Went there and found Violet holding to the pipe. Asked if she could hold on. She said yes. I ran to the house and told my wife Violet had jumped into the cistern (Figure 7.3).

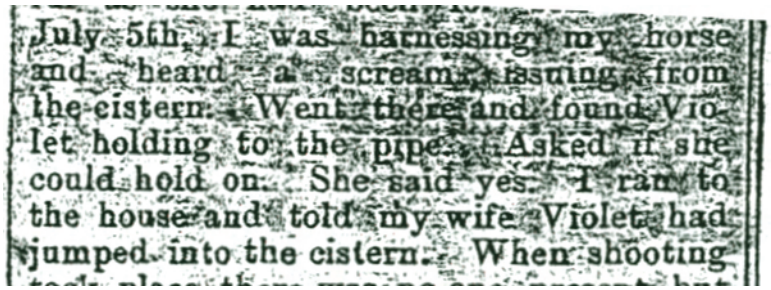

July 5th, I was harnessing my horse and heard a scream, issuing from the cistern. Went there and found Violet holding to the pipe. Asked if she could hold on. She said yes. I ran to the house and told my wife Violet had jumped into the cistern. When shooting

Figure 7.3 An excerpt from the August 20, 1885 San Diego Union *obituary for Violet Whaley. Courtesy Save Our Heritage Organisation.*

The August 22, 1885, San Diego Sun also mentioned the previous suicide attempt and gave details of the Whaley well, reporting:

> However, in addition, it was testified that the deceased [Violet Whaley] had attempted to take her life about three weeks ago by throwing herself into a deep well, from which she was rescued (Figure 7.4).

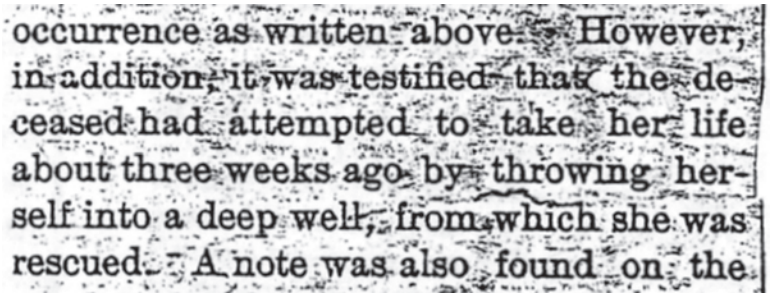

occurrence as written above. However, in addition, it was testified that the deceased had attempted to take her life about three weeks ago by throwing herself into a deep well, from which she was rescued. A note was also found on the

Figure 7.4 An excerpt from the August 22, 1885 San Diego Sun *obituary for Violet Whaley. Courtesy Save Our Heritage Organisation.*

These articles indicate that the cistern/well was close to the back of the house. They also intimate that the terms "cistern" and "deep well" refer to the same structure. Cisterns were used to capture rainwater that was drained from the roof of a building; wells accessed groundwater. Therefore, it is likely that the Whaley water source did both. The proximity of the feature to the building indicates that it was likely a cistern. If excavation of the feature ultimately reaches groundwater, then it will also be well.

At the start of the project in the summer of 2007, the backyard of the Whaley House included a long linear brick-paved walkway and various ornamental plants (Figure 7.5). This walkway connected the eastern edge of the Whaley-House Museum with exterior bathrooms. Other than the brick path, two attached concrete pads, and isolated plants, the area immediately behind the Whaley House seemed to have few modern intrusions into the proposed excavation area.

Even before excavations began, and before I had seen the 1872 Whaley-House map, I had noticed a striking above-ground archaeological clue in the brick pathway that hinted at the nearby location of the historical well. This "palimpsest"—an object, place, or area that reflects its history—took the form of a slight sunken circular indentation in the brick walkway (Figure 7.6). Since deep historical holes, like wells and cisterns, are nearly impossible to keep filled flush to the ground, circular depressions often reveal the hidden location of past water sources. Drawing on first-hand experience in excavating multiple 17th-century wells in Virginia during the 1990s, I was confident that the small brown oval of silt that collected in the circular indentation in the brick pathway marked the old well (Mallios and Fesler 1999, Mallios 2000, Mallios 2001).

Figure 7.5 The back yard behind the Whaley House before archaeological excavations began. Courtesy Seth Mallios, David Caterino, and the South Coastal Information Center.

Figure 7.6 David Caterino stands to the right of an above-ground clue of where the Whaley's cistern is buried. The clue is the small circle of silted-in dirt that rests in a dozen contiguous sunken bricks in the right center of the top right grid square. Courtesy Seth Mallios, David Caterino, and the South Coastal Information Center.

Since the historical map and the above-ground clue so distinctly pinpointed the apparent location of the feature, I decided to use this excavation as a test case for the effectiveness of ground-penetrating radar (GPR) on archaeological features. In order to conduct a GPR survey, the immediate area first had to be cleared of brick, concrete, plants, and other above-ground items that would distort the readings. County workers ridded the excavation area of these impediments (Figure 7.7), enabling GPR specialist Mark Becker of ASM Affiliates, Inc. to survey the area (Figure 7.8).

Figure 7.7 County workers remove the brick path, concrete pads, and plants that would interfere with the ground-penetrating radar. Courtesy Seth Mallios, David Caterino, and the South Coastal Information Center.

Figure 7.8 Scott Mattingly, GPR specialist Mark Becker, and Destiny Larberg conduct the ground-penetrating radar survey. Courtesy Seth Mallios, David Caterino, and the South Coastal Information Center.

Results from the GPR survey indicated two areas of potentially significant anomalies. The map denotes underground hot-spots as yellow and areas with minimal readings in blue (Figure 7.9). On the left side, the GPR identified the location of known modern pipes. On the right side, it pinpointed a large three-circled feature. We dubbed this anomaly "Mickey Mouse" because it resembled a face with two large circular ears protruding from the top.

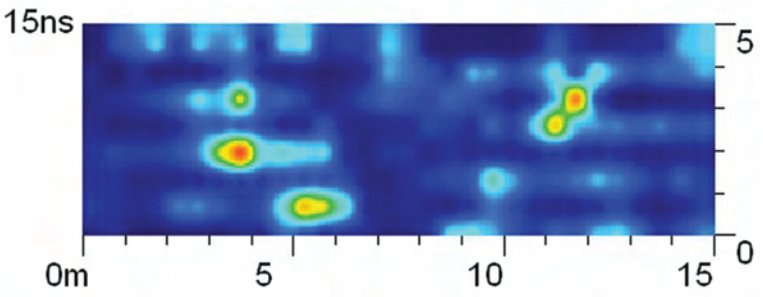


Figure 7.9 A map showing the results of the GPR survey. Note the modern anomalies to the left and the "Mickey-Mouse" anomaly to the right. Courtesy Mark Becker, Scott Mattingly, Seth Mallios, David Caterino, and the South Coastal Information Center.

Figure 7.10 shows the confluence of information from the historical map, the above-ground palimpsest, and the results of the GPR survey. Each of these different lines of evidence pinpointed the same spot as the site of the cistern/well. In addition, Figure 7.11 demonstrates that the GPR survey accurately determined the location of the archaeological feature uncovered in the consequent excavations. The "Mickey Mouse" anomaly successfully identified the location of the cistern/well.

With such clear indicators as to the likely locus of the cistern/well, grid placement for the archaeological excavation became a relatively simple task. I sought to minimize excavation-area size while exposing the full extent of the historical feature. Since the 1872 map apparently depicted an 8.0' square box around a circle 5.0' in diameter, the archaeological grid was placed over the center of the map's circle. A 10.0' square formed the basis of the excavation area and was divided into four 5.0' by 5.0' units. These units were aligned with the historical map and the edge of the Whaley House's eastern wall. In order to ensure accurate recordation of site stratigraphy, the crew left a set of 1.0' wide north/south and east/west balks that separated the four excavation units (Figure 7.12). The standing balks were split in half by each grid line and reduced the size of initial active excavation in each of the four units to 4.5' by 4.5'.

Figure 7.12 The initial site grid, including four 4.5' square units with two perpendicular 1.0' balks. The orange flags near Seth Mallios's feet mark the guesses by each crew member as to the absolute center of the cistern/well. Courtesy Seth Mallios, David Caterino, and the South Coastal Information Center.

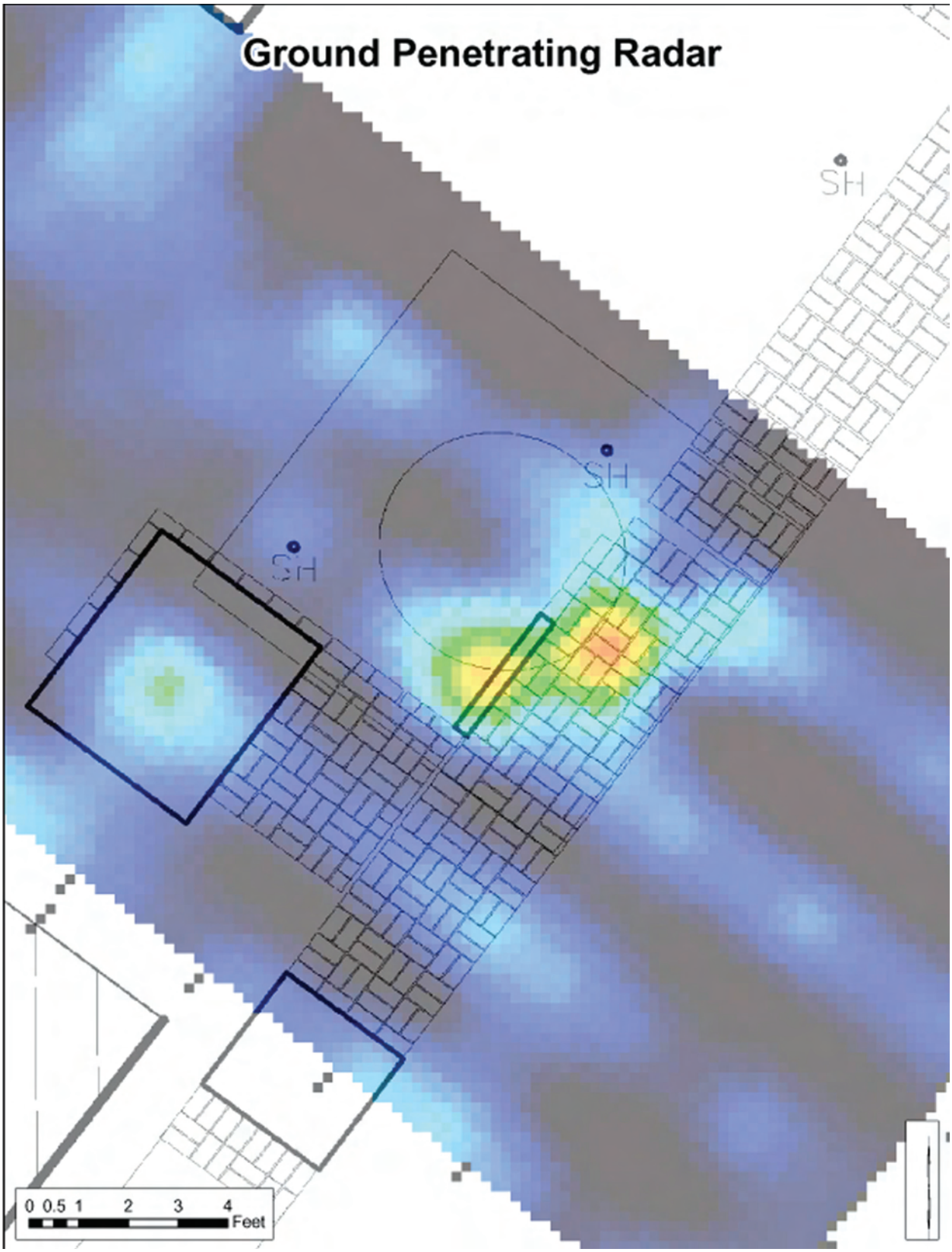


Figure 7.10 The 1872 historical map and the GPR survey map are superimposed on a modern brick-by-brick map of the Whaley back yard. Courtesy Mark Becker, Scott Mattingly, Seth Mallios, David Caterino, and the South Coastal Information Center.

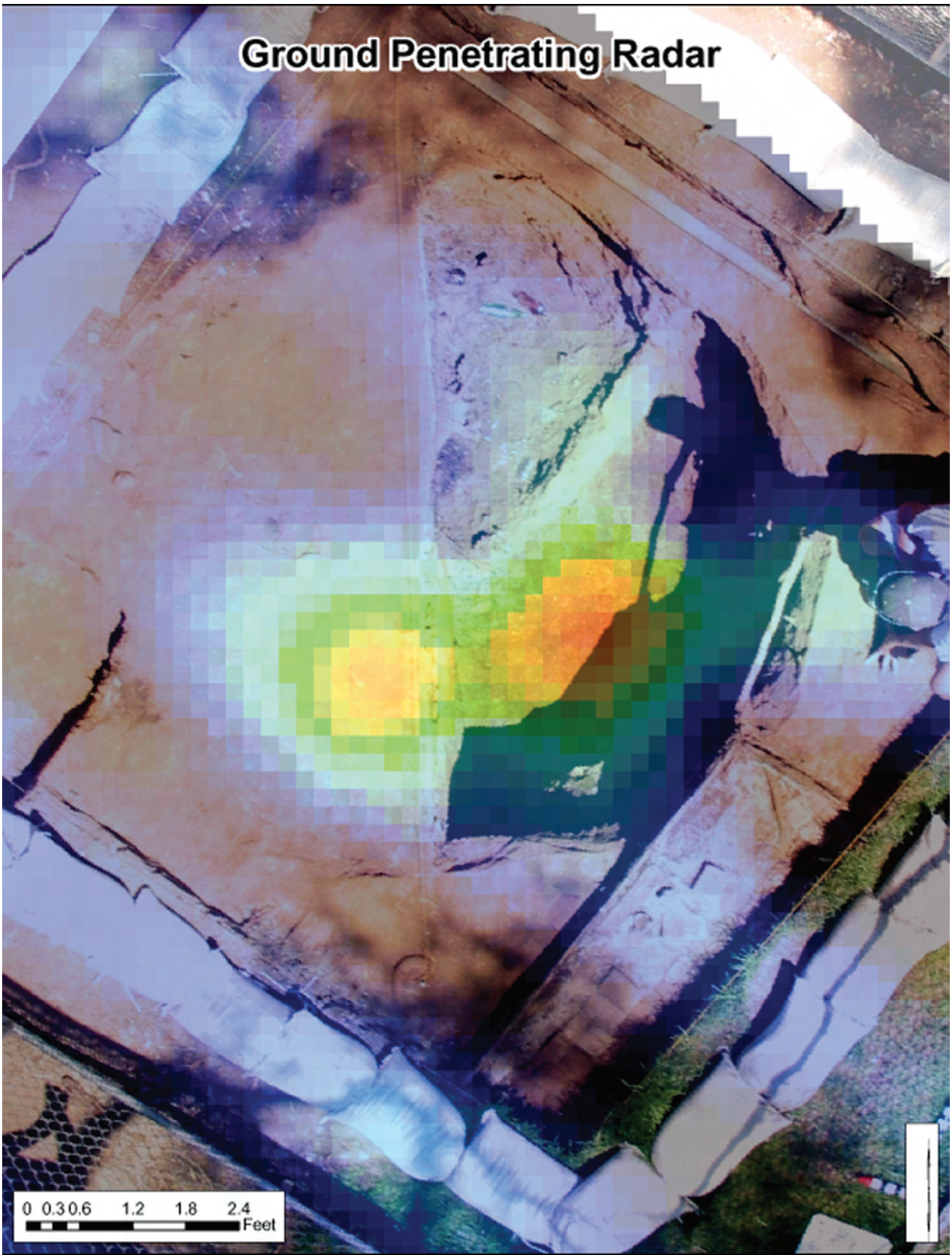


Figure 7.11 The GPR survey is superimposed onto an aerial view of the excavation unit. Courtesy Mark Becker, Scott Mattingly, Seth Mallios, David Caterino, and the South Coastal Information Center.

These balks immediately served their purpose as the first scoops of excavated dirt revealed complex strata within the overall 10.0' excavation area; each of the four units contained different horizontal and vertical layers (Figure 7.13). Between modern flowerbeds, historical brick paths, large empty holes from one of the concrete pads, and trenches containing modern PVC pipes and older pipes as well, the units were very diverse and distinct from one another. As an example, Figure 7.14 shows a unit containing an older brick path that was sealed by a more modern flowerbed (on the basis of the wire nails that held the wooden corner together), both of which were next to a large quarter circle of feature fill (the cistern/well) that cut the natural red clay subsoil.

Figure 7.13 An aerial view of the complex horizontal stratigraphy initially uncovered by the archaeological crew. Courtesy Seth Mallios, David Caterino, and the South Coastal Information Center.

Figure 7.14 From left to right, this unit contained an historic brick pathway, a modern flowerbed, undisturbed subsoil, and the fill of the late 19th-century cistern/well. Courtesy Seth Mallios, David Caterino, and the South Coastal Information Center.

At the outset of excavation, I insisted that the crew piece-plot every artifact and the boundaries of every distinct natural layer that they found with the Topcon total station theodolite (Figure 7.15). In addition, the archaeological team also completed traditional paper maps using stick-rulers and line-levels (Figure 7.16). Excavators troweled and shoveled each layer into buckets and screened 100% of the fill through 1/8" steel mesh. They saved all cultural material. The screened soil was then poured into sandbags and stored at the site (Figure 7.17). This soil archive strategy served multiple purposes. It prevented the excavation from accumulating a back-dirt pile, which I hoped would deter looters from violating the public site. In addition, aside from providing a wealth of soil samples, the dirt remained at the site for protection, shoring, and backfilling considerations.

Figure 7.15 Scott Mattingly shoots in various data points using the laser transit. Courtesy Seth Mallios, David Caterino, and the South Coastal Information Center.

Figure 7.16 Jaime Lennox measures points for a profile map of her unit's sidewall. Courtesy Seth Mallios, David Caterino, and the South Coastal Information Center.

Once each of the four square 4.5' units had clear soil-stain evidence of a large historical feature, the balks were mapped and removed, revealing a large circular feature where the 1872 map, the palimpsest, and the GPR had predicted (Figure 7.18). However, the feature did not exactly match the 1872 map. Instead of a large square around a smaller circle, the archaeological feature was, in fact, a large 8.5' circle around a smaller 4.0' square. In addition, the square was not centered within the circle, but offset to the northwest, adjacent to the northern and western walls of the feature.

Figure 7.17 The crew screens and sandbags their dirt. Courtesy Seth Mallios, David Caterino, and the South Coastal Information Center.

Figure 7.18 The completely uncovered soil stain that marks where the cistern/well once was located. Note the dark squarish stain the top left corner of the larger circular stain. Courtesy Seth Mallios, David Caterino, and the South Coastal Information Center.

We bisected the feature and excavated it by natural layer. At its interface with subsoil, the feature had multiple bullseye layers that tilted in from the south (the direction of the Whaley House). In an effort to prevent the mixing of archaeological contexts, the archaeological crew started excavation with the top natural layer, regardless of the fact that it shared the same elevation with other natural layers that it, in part, sealed. The diagonal profile line was chosen both to respect the direction from which the inner refuse was deposited and to minimize sunlight for profile photographs (Figure 7.19).

Figure 7.19 Seth Mallios excavates the southerly half of the feature. Courtesy Seth Mallios, David Caterino, and the South Coastal Information Center.

Figure 7.20 Seth and Gabriella Mallios, reminiscent of Thunderdome's Master-Blaster, team up to form a relentless digging machine. Note the distinct ashy layers in the feature's profile. Courtesy Seth Mallios, David Caterino, and the South Coastal Information Center.

The initial excavation of the feature quickly revealed distinct natural layers (Figure 7.20). Ash layers, charcoal layers, and loam layers, were entirely different from various clay and sand strata. Many roots from nearby trees followed the edges of the feature and separated fill layers from subsoil. In addition, water slowly percolated in from the edges of the intrusive modern flowerbed feature.

After a few layers of excavation were completed, the crew hit a layer of dark organic fill that contained thousands of artifacts. The sheer quantity of these items forced us to reconsider the piece-plotting mapping strategy. As a tactical compromise, I decided that the crew would digitally map the extent of each natural layer with the total station but would no longer piece-plot each individual artifact in the feature (Figure 7.21).

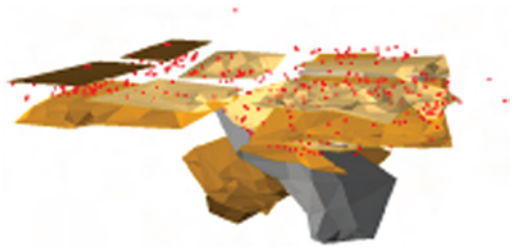


Figure 7.21 A digital map of the cistern/well's distinct layers. The red dots mark the individual plotted artifacts. Courtesy Scott Mattingly, Seth Mallios, David Caterino, and the South Coastal Information Center.

The feature's layers dove down at the north edge of the probable cistern/well. The fill was extremely loose and strikingly different from the clayey dirt on the south side that appeared to be sealed by the loamy and ashy layers. This fill in the northern part of the feature contained many artifacts from the first half of the 20th century, including a car axle, many intact bottles, and a distinctive San Diego Soda Works bottle from the 1920s (Figures 7.22 and 7.23). Although the loose organic layers to the north continued to dive down, we stopped our excavation in that part of the feature at 5.0', respecting OSHA safety laws. We then began to excavate the clay strata to the south, natural layer by natural layer.

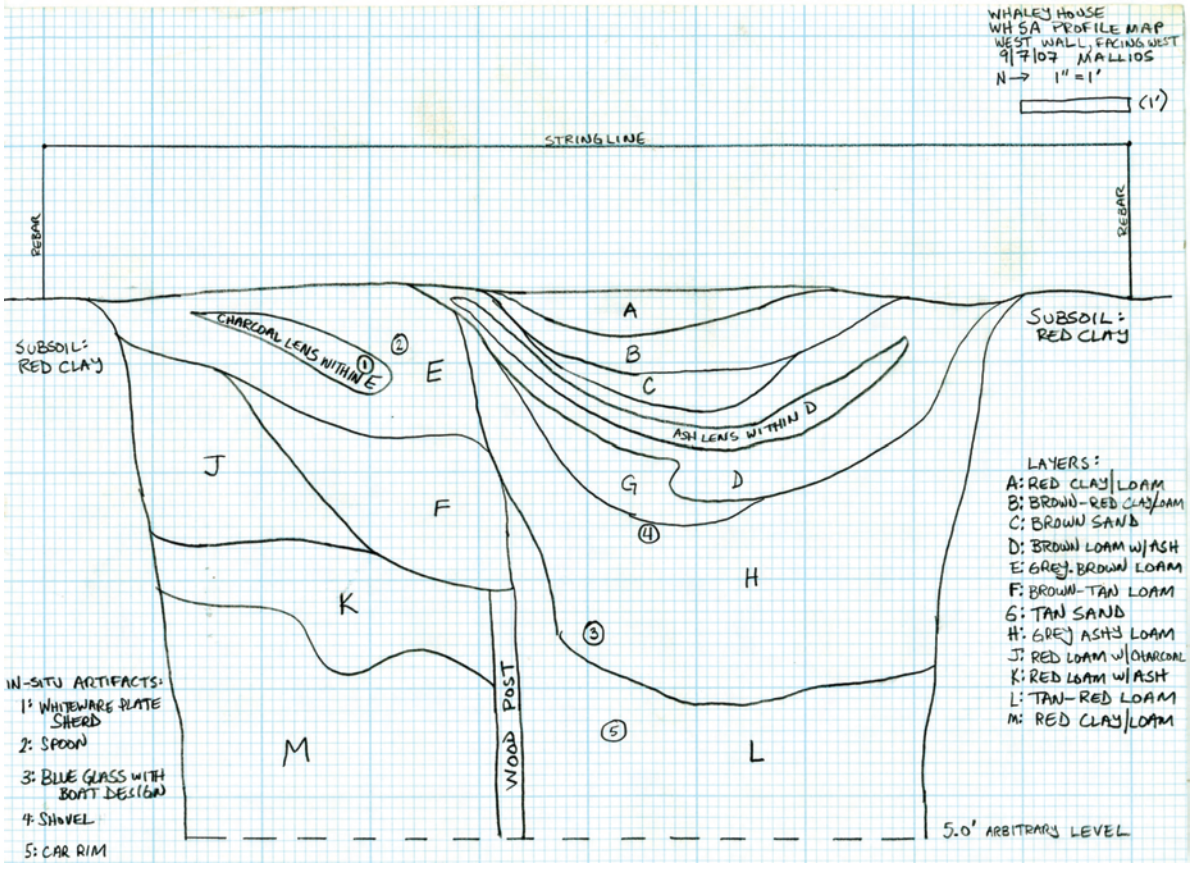
Figure 7.22 Destiny Larberg excavates the soft loam fill on the north edge of the cistern/well. Note the car axle to her right. Courtesy Seth Mallios, David Caterino, and the South Coastal Information Center.

Figure 7.23 The cistern/well contained a complete embossed San Diego Soda Works bottle, dating to the 1920s. Courtesy Seth Mallios, David Caterino, and the South Coastal Information Center.

The more southerly layers in the feature had far fewer artifacts that seemed to date from an earlier time. Although the artifact assemblage has not been fully cataloged or analyzed, preliminary in-field observations hint that these strata reflect a late 19th-century deposition (Figure 7.24a and 7.24b). For example, a late 1800s spice bottle—from Dr. Price's Flavoring Extract Co.—was discovered during the excavation of these layers (Figure 7.25).

Figure 7.25 Crew members uncovered a small bottle from the late 19th century embossed with "Dr. Price's Delicious Flavoring Extracts" in the fill of the cistern/well. Courtesy Seth Mallios, David Caterino, and the South Coastal Information Center.

Figure 7.24a and 7.24b Hillary Sweeney points to the interface between the feature's two distinct sets of layers. Courtesy Seth Mallios, David Caterino, and the South Coastal Information Center.



Once the entire eastern half of the feature was excavated to a depth of 5.0', it became clear that a square box with four vertical corner posts separated the two fill areas. In fact, the fill in this box was the square that was evident at the top of the feature. The loose fill inside of the box was the later fill, and the compact earlier fill was outside of the box. The box did not appear to be tossed into the hole as refuse. It rested squarely against the northern edge of the feature (Figure 7.26). Therefore, it is probable that this box is related to the structure of the feature. The box continues down below the 5.0' mark where excavation stopped.

Figure 7.26 A square wooden box divides the two sets of fill layers in the cistern/well. The flat and flush nature of the box suggests that it was somehow structural and not mere debris. Courtesy Seth Mallios, David Caterino, and the South Coastal Information Center.

Figure 7.29 The west half of the feature also contained numerous complete bottles, most of which dated from the 1920s-40s. Courtesy Seth Mallios, David Caterino, and the South Coastal Information Center.

Once half of the entire feature was completely excavated and photographed, the profile map was constructed both digitally and traditionally (Figure 7.27a-c). Next, the crew dug the second half of the feature, natural layer by natural layer (Figure 7.28). As was the case with the eastern half, the western half contained two distinct sets of fill. The northerly fill was loose and contained later artifacts, including numerous complete bottles (Figure 7.29); the southerly fill was compact and contained earlier artifacts. Crew members uncovered a complete automobile wheel at the bottom of their excavation area in the later fill (Figure 7.30).

Figure 7.27a Scott Mattingly and Hillary Sweeney map the feature's profile with the total station. Courtesy Seth Mallios, David Caterino, and the South Coastal Information Center.

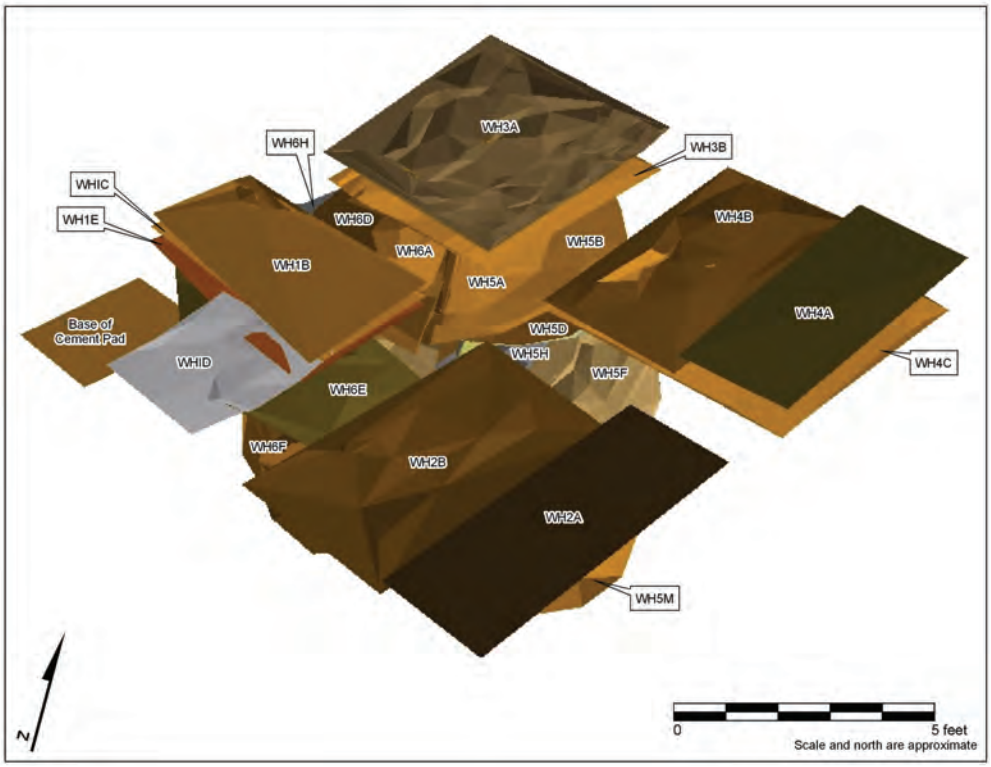


Figure 7.27b A three-dimensional digital map of the cistern/well's distinct layers, including the top strata that sealed the feature. Courtesy Scott Mattingly, Seth Mallios, David Caterino, and the South Coastal Information Center.

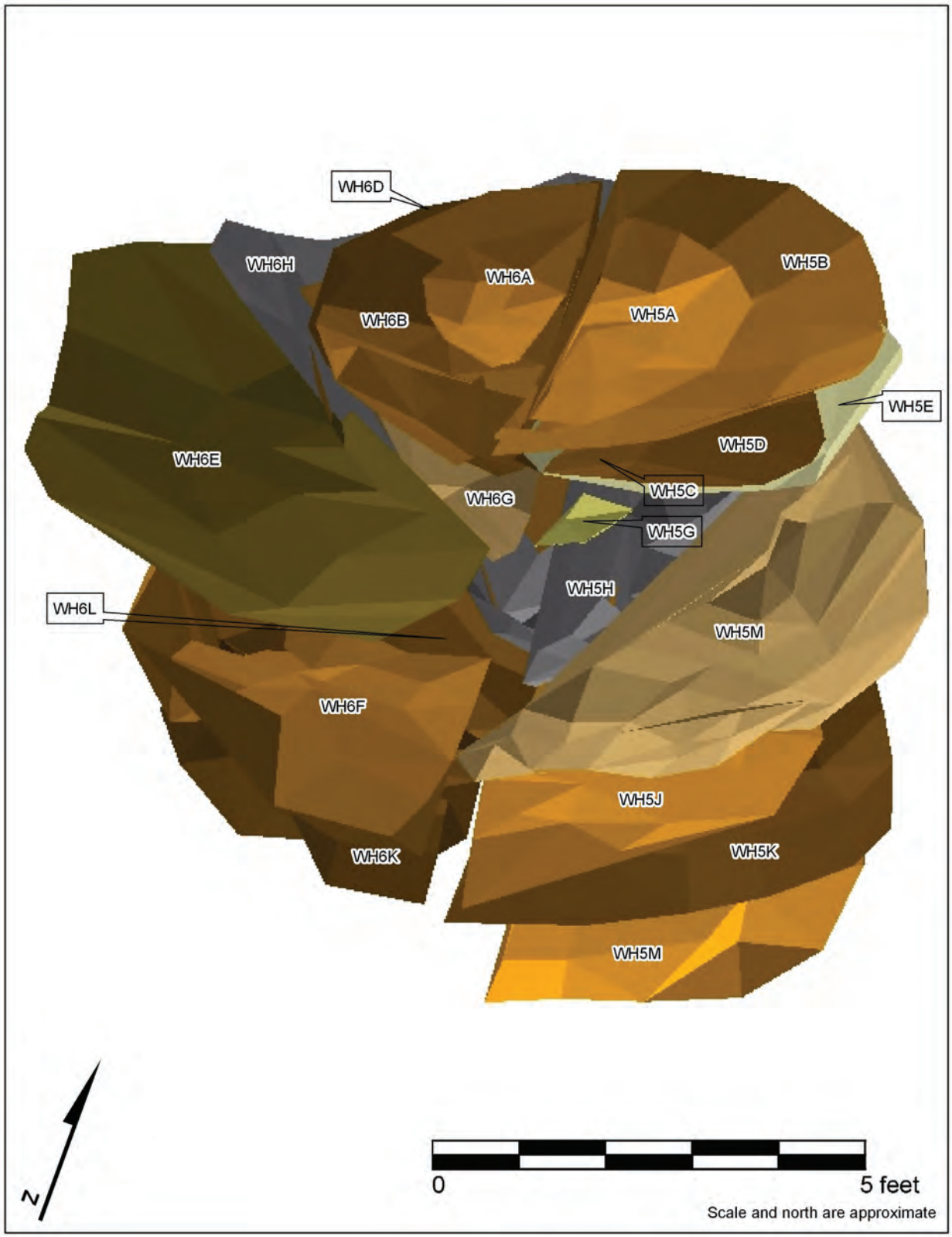


Figure 7.27c A three-dimensional digital map of the cistern/well's distinct layers. WH5 is the eastern half of the feature; WH6 is the western half. Courtesy Scott Mattingly, Seth Mallios, David Caterino, and the South Coastal Information Center.

Figure 7.28 Work on the second half of the feature began with the loose fill at the northerly edge. Courtesy Seth Mallios, David Caterino, and the South Coastal Information Center.

Figure 7.30 Hillary Sweeney removes the automobile wheel from the cistern/well's wooden box. Courtesy Seth Mallios, David Caterino, and the South Coastal Information Center.

As soon as the cistern/well feature was excavated to a complete depth of 5.0' below subsoil, the field season came to a close. The archaeological team is currently developing a shoring system to brace the side walls of the feature for when they re-open the site and excavate further in the coming year. At the end of the 2007 field season, the feature consisted of a large cylindrical hole, flared at the top (Figure 7.31). The diameter ranged from over 8.0' at the top to approximately 6.0' at the bottom. It was 5.0' deep. The box at the northern edge was flush with the northern and

Figure 7.31 The final excavation shot of the 2007 field season. Courtesy Seth Mallios, David Caterino, and the South Coastal Information Center.

Figures 7.32-7.35 The archaeological crew lines and backfills the feature. Courtesy Seth Mallios, David Caterino, and the South Coastal Information Center.

western edges of the feature. It was approximately 3.0' square. Both the feature fill and the box continued downward into unexcavated strata.

The archaeological crew lined the feature with black plastic, perforated to allow for drainage, and filled it with the sandbags that contained the screened dirt (Figures 7.32-7.35). A sandbag from each stratum was taken back to the SDSU North American Archaeology Laboratory for archival purposes and later soil chemical analyses.

Figures 7.32-7.35 The archaeological crew lines and backfills the feature. Courtesy Seth Mallios, David Caterino, and the South Coastal Information Center.

Figures 7.32-7.35 The archaeological crew lines and backfills the feature. Courtesy Seth Mallios, David Caterino, and the South Coastal Information Center.

Figures 7.32-7.35 The archaeological crew lines and backfills the feature. Courtesy Seth Mallios, David Caterino, and the South Coastal Information Center.

Summary

Although the interpretations presented here are preliminary and may be contradicted by ongoing and future analyses at the archaeological laboratory, it is clear that the archaeological team successfully located and uncovered the Whaley House cistern/well. The dual fill of the feature offers insight into the construction and destruction of the feature. Perhaps the fill in the wooden box is destruction fill, and perhaps the fill outside of the box is part of a large builder's trench. Or conversely, all of the fill in the feature may represent destruction rubble. Over 1,000 cumulative person-hours of fieldwork resulted in the recovery of over 30,000 artifacts (Figure 7.36), some of which date to the late 19th century.

We intend to re-open the site and continue excavation in the summer of 2008. The cistern/well is a time capsule that includes a range of materials which can pinpoint when it was built, when it fell into disuse, and when it was ultimately sealed. With its central location, public access, and rich history, the Whaley-House site could become one of the premier programs for urban archaeology in the nation (Figure 7.37). It has remarkable potential for annual summer field schools and year-round research and teaching programs.

References

Mallios, Seth
2000 *At the Edge of the Precipice: Frontier Ventures, Jamestown's Hinterland, and the Archaeology of 44JC802*. The Association for the Preservation of Virginia Antiquities, Richmond, VA.
2001 Every Artifact Counts. In *Jamestown Rediscovery VII*. Edited by William M. Kelso. Richmond, Virginia: Association for the Preservation of Virginia Antiquities. Pp. 23-34.

Mallios, Seth, and Garrett Fesler
1999 *Archaeological Excavations at 44JC568, the Reverend Richard Buck Site*. The Association for the Preservation of Virginia Antiquities, Richmond, VA.

Figure 7.36 An assortment of 19th- and 20th-century artifacts from the Whaley House cistern/well. Courtesy Seth Mallios, David Caterino, Hillary Sweeney, and the South Coastal Information Center.

Figure 7.37 The archaeological field crew in action: Destiny Larberg and Scott Mattingly map in artifacts with the total station, Hillary Sweeney excavates, Jaime Lennox fills out notes for the Excavation Register, and Seth Mallios talks to the public. Courtesy Seth Mallios, David Caterino, and the South Coastal Information Center.