

# **End-of-Fieldwork Report for the Joint Courts Complex Archaeological Data Recovery Project**

by John D. Hall, Scott O'Mack, Michael P. Heilen, Karen Swope, Joseph T. Hefner, Kristin Sewell, and Marlesa Gray

Prepared for the  
Pima County Administrator's Office  
Cultural Resources and Historic Preservation Office  
201 N. Stone Ave., 6th Fl.  
Tucson, AZ 85701-1207



Technical Report 08-50  
Statistical Research, Inc.  
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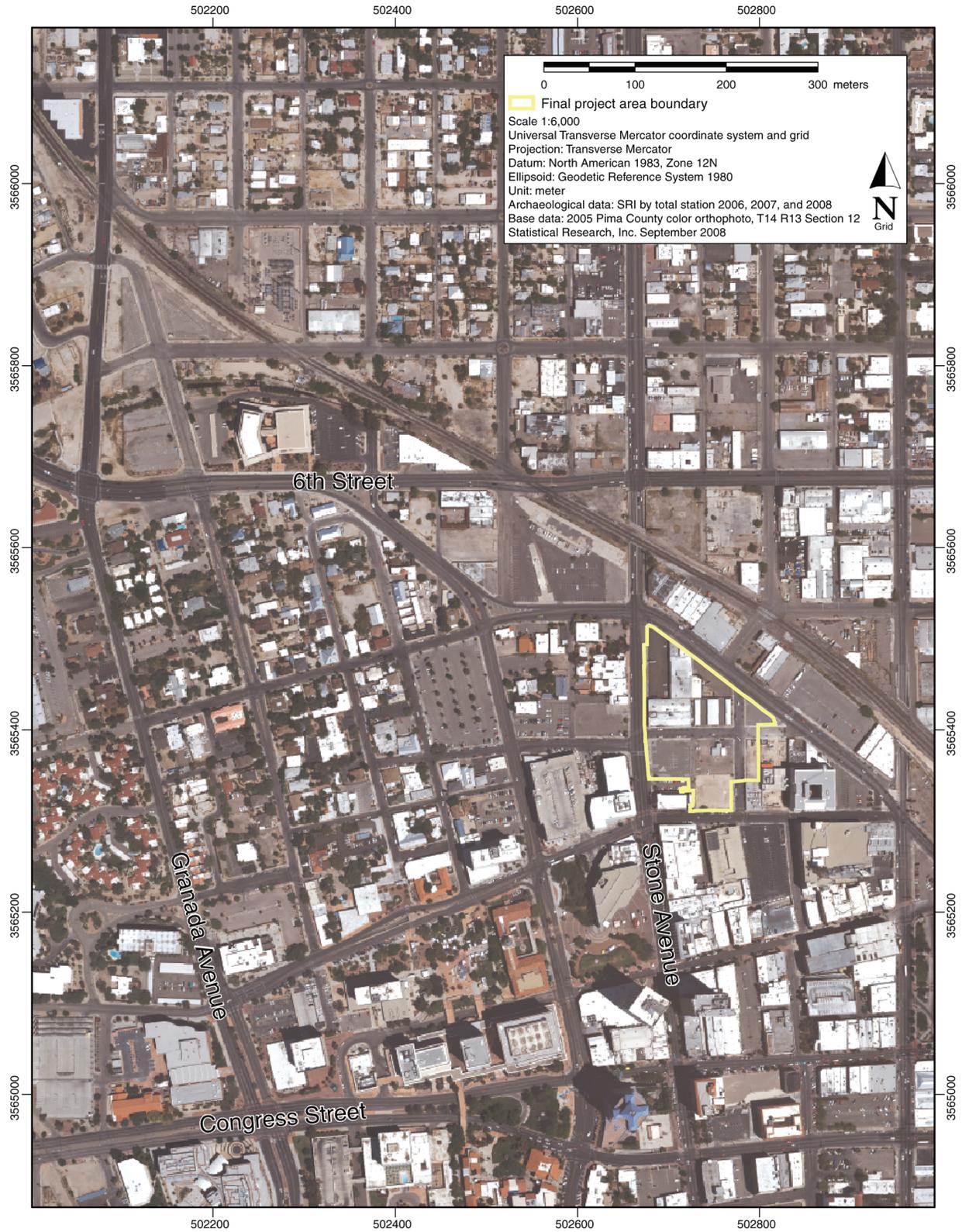
On September 12, 2008, Statistical Research, Inc. (SRI), completed data recovery excavations for the Joint Courts Complex Archaeological Project in downtown Tucson, Arizona (Figure 1). The excavations were carried out in partial fulfillment of a contract with Pima County, in anticipation of construction of the proposed Joint Courts Complex. The archaeological project, which has now entered the analysis and writing stage, is overseen by Mr. Roger Anyon, of the Pima County Cultural Resources and Historic Preservation Office. A treatment plan covering the excavations and all subsequent analyses was prepared by SRI and approved by the Arizona State Historic Preservation Office (SHPO) before excavations began (Beck et al. 2006). The SHPO reference number for the project is SHPO-2005-1616. All fieldwork was conducted under Arizona State Museum (ASM) Permit No. 2006-149ps. The treatment of human remains discovered in the project area has been governed by two separate burial agreements (Arizona Revised Statute [ARS] §41-844, Case No. 06-14 [for historical-period remains], and ARS §41-844, Case No. 06-28 [for prehistoric remains]), Pima County Superior Court Order Case C20064380, and a State of Arizona Disinterment and Reinterment Permit. The archaeological site that corresponds to the Joint Courts Complex (JCC) project area, including both the prehistoric and historical-period components, has been designated AZ BB:13:682 (ASM).

Excavations began on November 6, 2006. By March 14, 2008, the entire 4.33-acre project area had been fully investigated except for a narrow utility corridor occupied by buried electrical transmission lines. This corridor, which ran east-west across the center of the project area, was not accessible for archaeological investigation until August 14, 2008, when the transmission lines were disconnected and removed by their owner. SRI was then able to remove the concrete ductwork that held the lines and excavate the area below, definitively completing fieldwork for the project.

## **Historical Background**

The principal focus of the Joint Courts Complex Archaeological Project is the early Territorial period cemetery, long known informally as the National Cemetery, once located at the northeast corner of Stone Avenue and Alameda Street in downtown Tucson. The history of the cemetery is discussed in two background studies prepared by SRI before the project began (O'Mack 2005, 2006). Much as anticipated, the excavations uncovered a large number of graves associated with the National Cemetery, as well as a large number of postcemetery archaeological features. A small but significant prehistoric component was also documented in the project area; no human remains were found in association with the prehistoric component. As background to a discussion of the excavation results, the following paragraphs briefly summarize the history of the project area, with an emphasis on the cemetery period and the subsequent development of the project area for residential and commercial purposes.

The National Cemetery consisted of a small military cemetery used by the U.S. Army post in Tucson, and a larger cemetery adjacent to it used by the town's civilian population. Both cemeteries were in use by the early 1860s; the earliest use of the civilian cemetery may have been somewhat earlier. It was the military cemetery that was first known locally as the National Cemetery, though it was never so designated officially by the federal government. Eventually, the two cemeteries together were referred to as the National Cemetery, again without any official designation. The City of Tucson, incorporated in 1871, closed the civilian cemetery in 1875; the U.S. Army stopped using the military cemetery in 1881. In 1882, the city published notices requesting that citizens exhume their deceased family members and friends from the



**Figure 1. Location of the Joint Courts Complex Archaeological Project in downtown Tucson, Arizona.**

civilian cemetery because the city would soon subdivide and sell the cemetery land. No systematic removal of burials ever took place in the civilian cemetery, but in 1884 the Army paid a contractor to exhume about 70 soldier burials from the military cemetery. It is now clear from fieldwork for the Joint Courts Complex Archaeological Project that most of the burials in the civilian cemetery were never removed.

No historical records survive that show the locations of individual graves in the cemetery or the names of the people buried there. Substantial records do exist of deaths in Tucson during the period the cemetery was open, but the incomplete nature of these records and their lack of specific locational information has prevented the association of individual names in the records with the burials found in archaeological excavation. A possible exception is the group of burials exhumed from the military cemetery in 1884. An official Army document lists the exhumed burials, which may allow the association of a portion of the names with individual graves. Additional archival research now underway may also help establish the identity of individual burials in the civilian cemetery, but the number of such identifications will likely be small.

The available death records do not indicate locations of individuals within the civilian cemetery, but they do provide general information about the religious and ethnic associations of the overall burial population. This information is consistent with historical accounts of Tucson's living population in the same period. Tucson was a largely Hispanic and Catholic community during the time the cemetery was in use, and a large percentage of the burials in the cemetery undoubtedly consisted of Hispanic Catholics. The community also included Anglo-Americans and other people of European descent representing various religious traditions, as well as Native Americans, including people of Tohono O'odham, Yaqui, and Apache descent. The National Cemetery was Tucson's only cemetery during the time it was open, and the historical record suggests it was used for the burial of people of all religious and ethnic associations present in Tucson at the time.

Development of the former National Cemetery for residential and commercial purposes began in 1890, resulting in the eventual obliteration of all surface features of the cemetery, including walls, fences, headstones, and other grave markers. The following discussion of the project area during the postcemetery period is drawn from previous archival documents prepared for this project (O'Mack 2005). By 1900, the old cemetery had become a largely residential area similar to the older parts of town immediately to the south and west. Immediately to the north and east were the Southern Pacific Railroad tracks and the warehouses and other businesses built after 1880. Over the next 60 years, the character of the project area changed gradually from largely residential to exclusively commercial, an evolution that has been traced through a variety of historical sources and the archaeological record. Archival research has yielded limited biographical information for residents in the project area; the results of ongoing archaeological analyses will assist in the correlation of archaeological features with particular households and enhance the value of our interpretations.

The earliest residential occupation of the project area was composed largely of Anglo-American members of Tucson's middle class. Most of the houses were single-family homes. By 1920, a few commercial structures were present. Newer houses were small and apparently modest in comparison to the larger, earlier houses, and some automobile garages had been erected. The project area in this period retained its general middle-class character, although with a considerable turnover in residents and a slow increase in the number of foreign-born immigrants. A number of less-affluent persons took up residence there, including several Mexican-born or Mexican-American residents and two households with Syrian backgrounds.

The slow but steady transformation from a primarily residential area to an exclusively commercial one was marked first by the removal and replacement of buildings. Earlier houses were refashioned into duplexes, some were razed, and others were replaced by apartments. Among residents, there was a shift from middle-class to blue-collar occupations, concurrent with an increase in the number of Mexican-American residents. By 1930, numerous commercial enterprises were present in the project area, including a laundry, a plumbing and heating company, a merchandise broker, a food broker, a tire and automotive company, and a bowling and billiard parlor. Twenty years later, only a few residential structures remained, and these were occupied by a mix of middle-class and blue-collar residents. Additional

commercial enterprises at that time included a beauty salon, a mining office, an automobile dealership, an automotive supply shop, a service station, and the printing and circulation facility of Tucson Newspapers, Inc. (TNI). The newspaper building had a basement, and archival research indicated that at least 80 and perhaps as many as 150 human skeletons were discovered during the 1953–1954 basement excavations of the TNI building (O’Mack 2005: 113).

By 1960, the project area contained exclusively commercial buildings, with several lots remaining empty following demolition of residential structures. A furniture-storage warehouse and, later, a bank subsequently occupied the building formerly housing the bowling alley and automobile sales facility. A small restaurant operated at the site of an earlier business. Several businesses made additions to existing buildings. In later years, several conjoined buildings were used as a nightclub.

Residential and later commercial activity in the project area was found to have impacted earlier cemetery features. The first residential structures, with smaller, more shallow footprints, resulted in limited impacts. Nevertheless, historical disturbance of burials was noted during archaeological excavation of residential features. Archival research and archaeological excavations revealed that construction of later commercial structures (with broader and deeper footprints) encountered and destroyed many earlier cemetery features and confirmed that many burials were never removed from the cemetery. Archival and archaeological evidence for the historical disturbance of burials will be reported following further analysis.

## **Field Methods**

The original scope of work for the Joint Courts Complex Archaeological Project defined the project area as a 4.2-acre parcel bounded approximately by Stone Avenue on the west, Alameda Street on the south, Toole Avenue on the north, and Grossetta Avenue on the east. The project boundaries changed slightly during fieldwork as construction planning progressed and archaeological discoveries were made. Small parts of the east side of the project area were excluded from consideration, and the western and southern boundaries expanded slightly. The total area of the parcel at the end of fieldwork was approximately 4.33 acres, or 17,534 m<sup>2</sup> (Figure 2).

From the beginning of fieldwork, the goal was complete archaeological excavation of the entire project area. Based on our background research, we were aware of a single area of deep subsurface disturbance that had completely destroyed a portion of the site. This was the basement excavation for the TNI building, first constructed in 1940, expanded in 1953, then completely razed in 1974 (see Figure 2). Our investigation of the area of the TNI basement was limited to mechanical excavation around its perimeter to confirm the depth and extent of disturbance; the total area of the basement excavation was approximately 0.48 acres, or 1,947 m<sup>2</sup> (with the entire excavation extending to at least 3 m below modern street level). The rest of the project area, amounting to 3.85 acres (15,581 m<sup>2</sup>), was fully excavated.

## **Demolition**

When fieldwork began, most of the project area was covered by asphalt or concrete parking surfaces, concrete slab foundations, asphalt streets, and concrete sidewalks (Figure 3). Two single-story commercial buildings (55 East Council Street and 196 North Stone Avenue) had been demolished recently, leaving only the slab foundations. Another single-story building (240 North Stone Avenue) was the only standing structure in the project area. We used this building as a field laboratory for the first 6 months of fieldwork, then demolished it to allow excavation beneath its footprint. All three buildings were recorded and evaluated for eligibility to the National Register of Historic Places (NRHP) during our original background research for the project (O’Mack 2005) and were subsequently judged by SHPO not to be eligible for listing in the NRHP.



**Figure 2. Map of the Joint Courts Complex Archaeological Project, showing the original project area boundaries, the final limit of archaeological excavation, and the limit of subsurface disturbance associated with the TNI building, 1940–1974.**

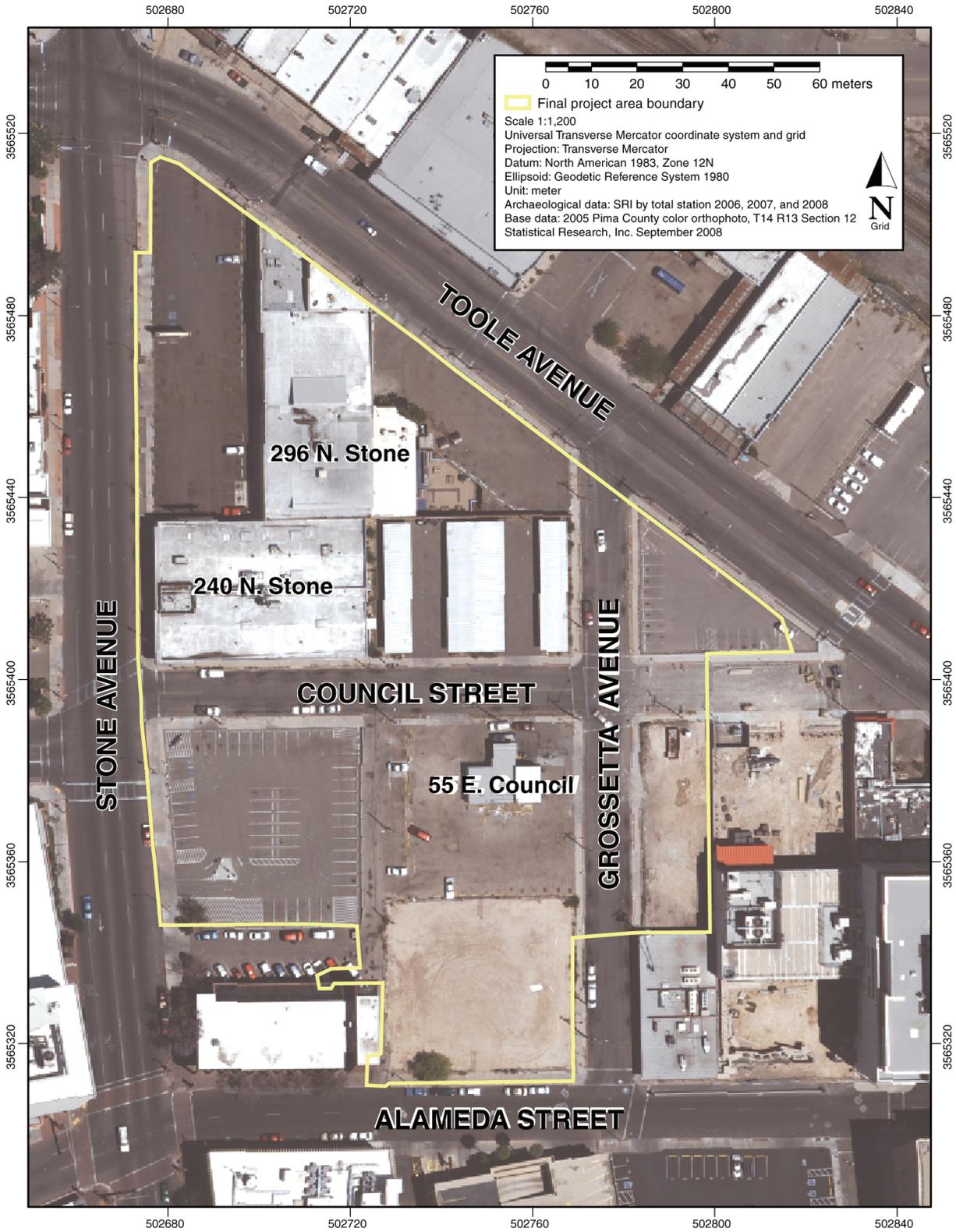


Figure 3. Aerial photograph of the project area in 2005.

Based on our background research, we anticipated a significant number of graves in the former cemetery being quite shallow and skeletal remains possibly being present just below the level of modern surface features. To minimize the amount of time that the upper preserved limits of shallow graves were exposed before archaeological excavation, we scheduled the removal of asphalt and concrete in multiple stages, with each stage generally limited to an area that could be excavated within several weeks. We also minimized the destructive effects of heavy-equipment demolition by saw-cutting the concrete slabs to allow for the controlled removal of small (typically 5-by-5-foot) pieces. This procedure extended to the large slab foundations of 240 North Stone and 296 North Stone, where we encountered two or more layers of concrete, representing successive renovations of each building. Similar measures to minimize the impacts of heavy equipment were taken during the removal of the many concrete footers, piers, and other modern features found in the project area, many of which sat atop or intruded on graves.

## **Mechanical Stripping and Screening of the Overburden**

The postcemetery development of the project area entailed a great deal of disturbance to the surface of the site, beginning in 1890 with the systematic grading of the newly subdivided cemetery and continuing through the twentieth century with a succession of residential- and commercial-construction episodes. In accordance with our treatment plan, we used a backhoe with a specially designed, wide, smooth blade to mechanically strip the disturbed overburden from the site. The stripping allowed visual identification of graves and other features at the interface between the overburden and the intact subsoil, at which point the excavation of individual features could proceed by hand. As with demolition, the mechanical stripping proceeded in stages, to minimize the time that features were exposed before excavation.

In most urban archaeological contexts, the overburden is of little or no analytical interest and would simply be removed and discarded to allow excavation of the intact features below. However, the presence of the former cemetery, combined with the historically documented use of shallow graves, meant that the overburden in the project area possibly held the displaced contents of disturbed graves, including skeletal remains. To avoid the accidental discarding of skeletal remains or burial-associated artifacts, we decided to screen all of the overburden—an enormous volume of material—using a large, diesel-powered mechanical screen. This machine, designed for sorting gravels but adapted for archaeological purposes, allowed rapid but nondestructive screening of the highly heterogeneous overburden, which included everything from modern construction debris to the occasional prehistoric artifact.

All artifacts screened from the overburden were grouped by provenience, then sorted to recover bone and any items with possible burial associations. The bone, all of it fragmentary, was subsequently sorted by an osteologist into human and nonhuman; the human bone and the artifacts with probable burial associations have been retained for eventual reburial or repatriation. The amount of human bone recovered in this way was relatively small, and the number of burial-associated artifacts was quite low, but having screened the overburden gives us confidence in the thoroughness of our effort to fully recover the former cemetery.

The strategy for our initial exploratory excavations was to mechanically strip long, 5-m-wide swaths across different parts of the project area in an attempt to identify the areal extent of the former cemetery. Using a 5-by-5-m square as the basic collection unit, we began this process by stripping the overburden from each square then screening it separately. We hoped that using relatively small collection units would allow us to associate the skeletal remains we recovered from the disturbed overburden with the intact portions of the disturbed graves within the same provenience. We quickly realized that the amount of time and level of coordination necessary to strip, haul, stockpile, and screen what could amount to almost 700 individual 5-by-5-m squares of overburden were far greater than we could reasonably devote to the task, especially given that the typical overburden provenience held very little, if any, human skeletal remains. We soon opted for larger overburden proveniences, initially corresponding to portions of our swaths and later to the extent of the mechanical stripping units, sometimes large and irregular, that we shaped in response to the wide variety of postcemetery features in the project area.

By June 2007, with 7 months of fieldwork behind us, we had established the probable areal extent of the former cemetery, but we still needed a reliable estimate of the total number of graves in order to provide a final budget amendment to Pima County. At that point, the purpose of our mechanical stripping changed from exploration to complete exposure of the cemetery. In order to protect the many graves discovered in this extensive stripping, we mapped each one by total station, then reburied the unexcavated areas in screened soil. These areas were then restripped in stages as our excavation crews finished with features in previously exposed areas.

## **Excavation of Prehistoric Features**

The methods used to excavate the limited number of prehistoric features found in the project area consisted of initial exposure through mechanical stripping, total-station mapping, and hand excavation using standard tools. Documentation consisted of taking notes and completing standardized forms, making hand drawings, and taking digital photographs. The two pithouses found in the project area were also photographed using photogrammetric methods, which allows for accurate digitization of the feature and inclusion of the resulting digital line drawing in a geographic-information-system (GIS) layer. The digital line drawing also serves as the primary nonphotographic image of the feature. Flotation, pollen, archaeomagnetic, and C<sup>14</sup> samples were taken from selected feature contexts.

## **Excavation of Graves and Burials**

Graves, like all other subsurface features found in the project area, were first identified during mechanical stripping of the disturbed overburden. A grave first appeared as a rectangular area of distinctly colored soil surrounded by undisturbed subsoil, at the interface between overburden and subsoil. These soil distinctions faded quickly on exposure, so we used spray paint to trace the perimeter of each feature on the exposed surface. Each grave was assigned a discovery feature number; then its outline was mapped by total station. Hand excavation, using standard archaeological hand tools, usually followed within several days of discovery—or immediately, if the grave was obviously shallow or showed any exposed bone or coffin wood.

Soon after fieldwork began, it was apparent that the hand excavation of relatively deep and narrow grave shafts would be made difficult by the need to lean precariously over the side of the pit to expose the burial at the bottom of the grave. Whenever possible, we eliminated this difficulty by using the backhoe to excavate a large pit immediately adjacent to the grave, removing one wall of the grave pit. In the areas of the former cemetery that were relatively crowded with graves, this often meant removing the balk of intact soil that separated two graves. We recorded the intact grave pits before opening the excavation in this way, and we were careful to protect the contents of graves from inadvertent soil collapse during the backhoe work. Later in the project, once we had discovered that the majority of burials was intact and that the grave fill above a burial was typically devoid of artifacts or any other source of information, we began using the backhoe to remove the upper grave fill, which greatly reduced the amount of hand-excavation time and still left the actual burials undisturbed. The depth of a grave was reliably determined before the removal of the upper fill by inserting a slender soil probe at the margin of the grave as exposed in stripping. In countless uses of the probe to determine whether mechanical removal of the upper fill was called for, we never damaged a burial.

Documentation of a grave and the burial(s) it held consisted, at a minimum, of taking notes and completing standardized forms, making hand drawings (plan, profile, and section), and taking digital photographs. Most articulated burials, and selected previously disturbed burials, were also photographed using photogrammetric methods, which allowed for accurate digitization of the burial and inclusion of the resulting digital line drawing in a GIS layer. In cases when photogrammetry was used, the digital line drawing will serve as the primary nonphotographic image of the burial. Most articulated burials, and selected disturbed burials, were also subject to in situ laser scanning, which yields a highly precise, three-dimensional

digital image of the skeletal remains that can serve for osteological analyses even when the remains are no longer accessible.

For analytical purposes, soil samples of different kinds were taken from many grave contexts. Pollen samples were routinely taken from graves, usually from multiple locations in the vicinity of the skeletal remains. Because of budget considerations, only a portion of the total number of samples will be processed, but the availability of pollen samples from most graves allows us to choose samples from across the cemetery based on other information, such as age, sex, location within the cemetery, and other contextual variables. In the early months of fieldwork, flotation samples were also routinely collected from graves, but storage space quickly became an issue. Recognizing that we would be able to process only a limited number of samples, we changed to a strategy that gave us samples from different parts of the cemetery informed by other discoveries in the graves—most notably, evidence for the possible inclusion of flowers (the usual evidence in this regard was the presence of fine wire fragments in the vicinity of the cranium, probable evidence of a flower garland having been placed on the head of the deceased).

We also routinely took soil samples for parasitological analysis from the abdominal region of the skeletal remains. These small samples will be examined by a parasitologist for evidence of intestinal parasites, a potentially useful piece of evidence when characterizing the health of the burial population. Finally, a few of the soil samples were taken when signs of metal oxidation were evident in the grave fill but the source of the oxidation was uncertain. These samples will be analyzed using X-ray fluorescence, which may allow us to specify the source metal.

## **Excavation of Postcemetery Features**

The postcemetery archaeological features found in the project area included a wide variety of architectural remnants, pits, trash deposits, and other, minor features (see the section Results, below). These features were typically first exposed in mechanical stripping of the overburden then mapped by total station. Documentation of all postcemetery features included taking notes and completing standardized forms, making hand drawings, and taking digital photographs.

Architectural features bearing no artifacts, including many stone-and-mortar and concrete wall footings, were fully exposed with a combination of hand and mechanical excavation. Selected architectural features were photographed using photogrammetric methods, including the use of a balloon-mounted digital camera for overviews of large features, such as complete house foundations. Many of these photogrammetric images have been digitized, and the resulting digital line drawings are the primary nonphotographic images of these features. After documentation, most architectural features were fully removed to allow exploration beneath them. Throughout the area of the former cemetery, architectural features were often found to lie directly over, or to intrude on, graves.

Artifact-bearing pit features, including privy pits and other pits holding, primarily, household trash, were typically excavated by hand, usually in full, but occasionally in a partial, section (typically half of the feature). The treatment plan specified that only a sample of the postcemetery artifact-bearing features would be fully excavated and analyzed, but any pit feature found within the apparent limits of the former cemetery required complete excavation to ensure recovery of any skeletal remains or burial-associated artifacts displaced from graves when the postcemetery feature was created. When we had excavated an excess of our sampling goal for postcemetery pit features, we resorted to purely mechanical (backhoe) excavation for the postcemetery pits remaining within the limits of the cemetery, screening all contents to ensure the recovery of any burial-associated materials. Small amounts of both fragmentary skeletal remains and burial-associated artifacts were in fact found in many of the postcemetery pit features located within the former cemetery.

Because of the need to fully excavate any pit feature found within the apparent limits of the former cemetery, the selection of postcemetery pit features for full artifact analysis was postponed until after excavations had ended. We now have an enormous volume of artifacts from these features, the largest portion being from the several deep privy pits found in the project area.

## Results

The results of the excavations are best summarized with reference to three periods: prehistory, the cemetery period, and the postcemetery period. As discussed in the treatment plan, we considered it possible that we would find historical-period features associated with the years before the cemetery was created, specifically the years of Spanish Colonial (1775–1821) and Mexican (1821–1854) control of Tucson. But we did not find any features or artifacts that can be linked with confidence to either early historical period. We also did not find anything that can be associated with the Native American protohistoric period, or ca. 1540–1775.

### Prehistory

During excavation of the project area, three prehistoric features were uncovered. These include two pit structures and one roasting pit. The pit structures are tentatively assigned to the Late Archaic period, based on the artifacts observed in the field, including two chert projectile points in one structure that conform to the Cienega style that was in use ca. 500 B.C.–A.D. 200. Both pit structures lacked any ceramic artifacts, which became widely used during the Early Formative period in the Tucson Basin, beginning ca. A.D. 200 and corresponding to an intensification of agriculture as a means of subsistence. The overall shape and construction style of the two pit structures also corresponds to the style of dwellings used during the Late Archaic period—a circular pit with a series of perimeter postholes that would have supported a thatched roof. Numerous interior pits were also found, likely used for storage.

The roasting pit was considered to be prehistoric, based on the artifacts present and on its inferred function. The pit was large and relatively shallow, filled with copious fire-cracked rocks, suggesting the pit was used to cook or “roast” edible material. Roasting pits such as this one are common in prehistoric sites, particularly when associated with habitation areas. The roasting pit was consequently believed to be contemporaneous with the pit structures, therefore tentatively assigned to the Late Archaic period as well. Ceramic artifacts were also absent from this feature, further suggesting its association with the pit structures.

As discussed above, one of our initial excavation strategies was to collect all displaced human remains from postcemetery contexts. Prehistoric artifacts were similarly displaced. Numerous prehistoric stone and ceramic artifacts were found in later cemetery and postcemetery contexts. With only a limited number of intact prehistoric contexts, these finds, intrinsic to the site are being evaluated from cemetery and postcemetery contexts and should provide a valuable tool to consider the presence of prehistoric Native Americans in the project area. Though the intact prehistoric features seem to be confined to the Late Archaic period, later Formative period (Hohokam) ceramics were identified in cemetery and postcemetery contexts, indicating that the project area was used to different degrees throughout prehistory.

### Cemetery Period

Our background research indicated that the National Cemetery had an abundance of surface features during its period of use, including an adobe wall enclosing the small military cemetery, another adobe wall enclosing the much larger civilian cemetery, and a variety of grave markers, including headstones, headboards, and at least a few aboveground brick-and-mortar burial vaults. We found virtually no hard evidence of any of these features in our excavations, and it is clear that the entire surface of the former cemetery was drastically altered by postcemetery residential and commercial development. We did find one short alignment of badly deteriorated remnant adobe in the southernmost portion of the project area, in almost exactly the place where we suspected the south wall of the military cemetery once stood. The adobe consisted of a thin, irregular layer of distinctively colored dried mud, apparently laid directly on the unmodified ground surface, probably as preparation for the first course of adobe blocks. This feature was so faint that

it is hard to be certain it was a part of the former military cemetery's wall, but it was the only possible surviving remnant of the former cemetery surface.

We also recorded a large number of postholes in the project area, some of which conceivably represented fence alignments from the period the cemetery was in use. However, it has so far been impossible to distinguish cemetery-related fence alignments from postcemetery examples. Further analysis of the distribution of these features may help identify alignments that date to the cemetery period.

Before fieldwork began, we established guidelines for the excavation and documentation of all feature types potentially represented in the project area, with special attention to the features we expected to find within the former cemetery. To avoid ambiguity in the terminology used to describe cemetery-related features, we decided to use the terms "grave," "burial," and "individual" in specific ways that would accommodate the anticipated variety of features. Our conception of these terms changed slightly as the project progressed, but the basic distinctions among them remained the same.

A grave is simply a pit created to hold human remains, whether or not it is found to hold remains. A burial is the physical evidence, apart from the grave, for the act of interment; the essential physical evidence is a set of skeletal remains, but a burial also includes any other evidence of interment, including all associated artifacts. Before the project began, we anticipated finding the occasional intact burial without a discernible grave, but this never happened. Thus, in the context of this project, every burial both included skeletal remains and was associated with a grave. An individual is a complete or partial set of skeletal remains representing a single individual.

These terms and the distinctions among them helped us sort out the sometimes complicated discoveries we made in the former cemetery. For example, a single grave might hold two individuals associated with a single burial episode. It might hold two individuals associated with two distinct burial episodes. It might hold an articulated burial consisting of a single individual plus the partial remains of another individual whose earlier burial episode can no longer be discerned. It may have been previously exhumed and no longer hold any evidence of a burial. And so on. These distinctions must also be kept in mind when considering the numbers of cemetery-related features reported below: the number of graves will differ from the number of burials, and both will differ from the number of individuals. The number of individuals is also almost certain to change as the postfield osteological analysis proceeds, which will lead to refinements in the identification of partial individuals from disturbed burial contexts.

At the end of fieldwork, the total numbers of graves, burials, and individuals excavated in the project area were as follows:

Graves	1,083
Burials	1,006
Individuals	1,397

As these numbers plainly attest, a substantial part of the former cemetery survived the 130 years of impacts associated with residential and commercial construction, even if the original surface of the cemetery was essentially gone by 1890.

In addition to the basement excavation for the TNI building, graves in the former cemetery were directly impacted to different degrees by a wide range of postcemetery features, including relatively small, residential basements (none of which was represented on Sanborn maps of the project area), foundation trenches, privy pits, cesspits, fuel-tank pits, tree wells, fence postholes, utility-pole holes, and utility trenches. Despite these many disturbances, 48 percent of the graves in the project area (or 523 graves) were essentially undisturbed or showed only minor disturbances below the level of initial discovery of the grave. This relatively high rate of intact burials means that the excavation of the former cemetery has given us an excellent opportunity to study both the biological characteristics of the burial population and the nature of mortuary behavior during the period the cemetery was in use (see the section Analysis, below).

In terms of general characteristics readily observable in the field, the graves and burials of the former cemetery showed a remarkable homogeneity. The typical grave

- lacked evidence of a grave marker;
- was a simple rectangular pit, with its long axis oriented east-west;
- held a homogenous fill of local soil;
- held a simple wooden coffin, poorly preserved, with minimal hardware;
- held a single, complete, well-preserved skeleton, placed supine and fully extended; and
- was limited in burial-associated artifacts to small clothing remnants (usually buttons only) and small personal or religious items.

The most obvious variations among graves were in their horizontal dimensions, which generally varied according to the physical stature of the interred individual, and in their maximum preserved depth below the disturbed overburden. Some graves, holding burials of either adults or children, were less than 10 cm deep, in which case the burial was typically disturbed by postcemetery activities; a few graves exceeded 2 m in depth. The depths of the many other graves were between these two extremes. Other variations in the details of grave design, coffin design, body layout, skeletal preservation, and artifact content were also recorded and are now the subjects of postfield analyses, but the distinct impression from the fieldwork is that, regardless of how diverse the ethnic composition of Tucson in the period the cemetery was in use, no radical differences in burial practices existed among the people who used the cemetery.

The areal extent of the former cemetery and the distribution of graves within it are shown in Figure 4. Our background research had suggested strongly that Stone Avenue and Alameda Street formed the western and southern limits of the cemetery, respectively. This our excavations seem to have confirmed. We found several graves abutting (and a few even extending under) the Stone Avenue curb on the west side of the project area, but none extending beyond the curb, and we found one grave within a few meters of the Alameda Street curb, but none reaching it or extending beyond it. Most of the area immediately south of the TNI basement excavation, corresponding to the current parking lot of Chicanos por la Causa (200 North Stone Avenue), fell outside our project area and remains unexcavated, but this area was also part of the cemetery and probably also holds graves.

The northern and eastern limits of the cemetery are also now well defined and also correspond fairly closely to the limits we anticipated in our background research (see O'Mack 2006:Figures 10 and 20). The easternmost grave discovered in excavation lay just west of modern Grossetta Avenue, and the northernmost grave lay about 50 m south of the intersection of Stone and Toole Avenues.

## **Cemetery Areas**

A number of distinctions can be made in the distribution of graves within the apparent limits of the former cemetery. We have tentatively identified five distinct areas based on the relative spacing and clustering among graves. The limits of the five areas are shown in Figure 5, and a discussion of each area is provided below. The possible significance of these evident spatial distinctions will be explored further during the postfield analysis.

### **Area 1**

Area 1 corresponds to the historically documented military cemetery. The current limits of Area 1 are based on our best approximation of the military cemetery, but it must be noted that our understanding of the location and organization of the military cemetery has evolved as a result of fieldwork and additional archival work conducted over the course of the project. We expect that new insights into the location and organization of the cemetery will emerge as we proceed with analysis.

Prior to fieldwork, SRI located a list of burials in an online compilation of images from *Burial Registers for Military Posts, Camps, and Stations, 1768–1921* (Prechtel-Klusgens 1996). Newspaper articles, council

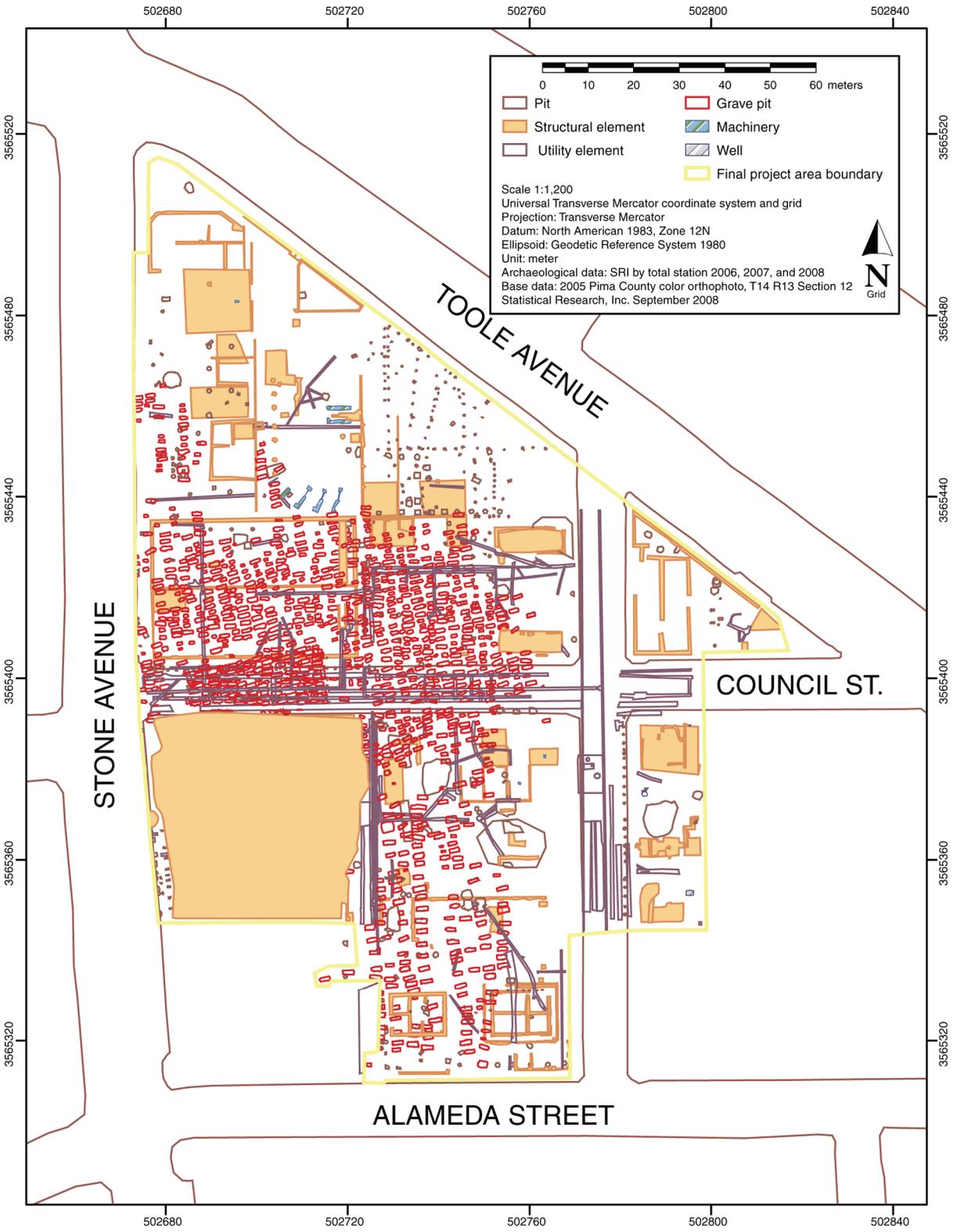
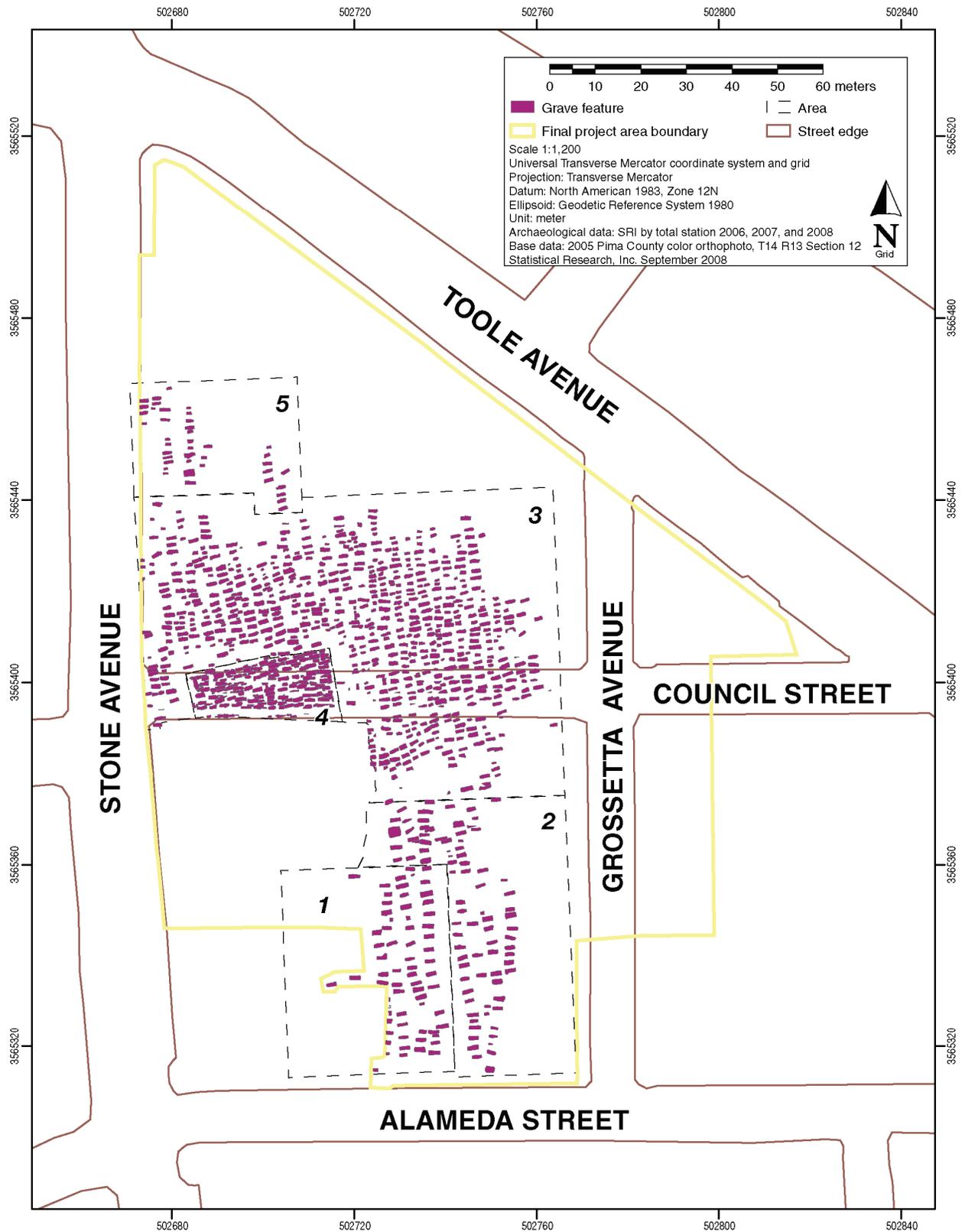


Figure 4. Distribution of graves and major subsurface disturbances in the JCC project area.



**Figure 5. Distribution of graves in the JCC project area, showing the five tentatively designated areas within the former cemetery.**

minutes, photographs, and other documents also provided information on the military cemetery. These documents enabled SRI to develop an excellent approximation of when the cemetery was used, its specific location, the approximate number of burials and their relative locations, attributes of many of the individuals buried in the military cemetery, and other information, such as when the wall around the military cemetery was built. In July 2008, as fieldwork was nearing completion, SRI visited the a National Archives and Records Administration (NARA) facilities in Washington, D.C., seeking additional information on the military cemetery. Until that time, the source that provided us with the most comprehensive information on the layout, chronology, and organization of the cemetery was the burial lists from *Burial Registers for Military Posts, Camps, and Stations, 1768–1921*. Most of the burial registers in the book’s two volumes record burials that occurred between 1860 and 1890. Volume I was begun in 1873 and was updated periodically until 1883 and sporadically until 1932. Volume II was begun in 1883, after the military cemetery in Tucson was closed but prior to the reinterment in 1884 of burials at U.S. Army Fort Lowell, outside Tucson, in 1884. The list for Camp Lowell—the post in Tucson that preceded Fort Lowell—is found on pages 282, 283, and 326 of Volume I and appears to represent a compilation of burial records from 1873, 1879, and 1882. We have previously referred to this list as the 1881 list (O’Mack 2006), but we now know that a related, but different, list was created in 1881. We thus refer to the lists found in *Burial Registers for Military Posts, Camps, and Stations, 1768–1921* here as the 1873–1882 list.

In July 2008, additional burial records were located at NARA in the records of the Office of the Quartermaster General (Record Group 92). Records specifically related to the military cemetery included an 1866 burial report, an 1873 burial list and plat map, an 1881 list and plat map, an 1884 removal report, an 1884 reinterment report, and a plat map of the Fort Lowell cemetery showing where burials removed from the military cemetery were reinterred in 1884. The 1866 burial report, which describes in general the attributes of the cemeteries in Tucson and at Picacho Peak, was apparently accompanied by a burial list when originally sent from the post at Tucson (Camp Lowell) to the Quartermaster General. The accompanying burial list was not found at NARA, but the Honor Roll (Honor Roll XIII, page 119) based on that list was located. The 1866 burial report indicates that 20 individuals were thought to be buried in the military cemetery as of May 1866, although the names of only 6 were known at the time. The precise locations of most of those individuals was also not known, because grave markers survived for only 3. In addition, records sent to Santa Fe in 1864, when the post was briefly closed, could not be relocated. The author of the report, Lieutenant Gilbert C. Smith, the post’s quartermaster, requested the records from Santa Fe, but apparently those records were never relocated.

The burial lists and plat maps of the cemetery obtained from NARA are largely in accord, but numerous minor discrepancies were discerned between the documents. Comparison and compilation of the records has revealed additional details about the military cemetery that were not apparent or easy to interpret using the 1873–1882 list. For instance, between lists or maps, there are discrepancies in name spelling, date of death, company, regiment, or cause of death for the same individual. SRI is currently generating a consolidated burial list based on comparison of the burial lists and plat maps, historical newspaper accounts, enlistment records, post returns, and other sources of information. The compilation of these data has allowed SRI to develop additional information on individuals that can be used to verify and cross-check records, add missing information, and compare historical, archaeological, and osteological information.

The recently located NARA records also provide additional details on the cemetery itself. Based on our prefield background research, we assumed that the former military cemetery measured about 108 by 108 feet, sat more or less at the northern edge of modern Alameda Street, and was set back about 50 feet from the east edge of modern Stone Avenue (O’Mack 2006:22–32). Shortly after our second background report was finalized, we learned more about the wall of the civilian cemetery from a series of brief, early newspaper articles (*Weekly Arizonan* 1870a, 1870b, 1870c, 1870d). These articles announced a request by the county for bids to build an adobe wall around the civilian cemetery incorporating the existing military-cemetery wall (which we know from other documentation to have been built around 1868). The wall specified in the request was apparently never built, at least not in the proposed configuration (the actual civilian cemetery wall, known from other sources, probably resulted from a modification of the same proposal), but the description allowed us to infer the dimensions of the military cemetery as 150 by 150 feet.

The two plat maps of the cemetery, however, indicate that the cemetery measured 120 feet east-west by 150 feet north-south. The discrepancy in the east-west dimension of the cemetery cannot be easily reconciled at this time because the western portion of the cemetery was not excavated or was disturbed through construction of the TNI basement. Thus, no archaeological information could be used to define or verify the cemetery's western limit.

SRI overlaid the 1881 plat map with cartographic information from our excavations in an effort to investigate the correspondence between graves on the historical map and those discovered during excavation. The locations of individual graves and the overall pattern of graves match quite well, though not perfectly, between archaeological and historical maps, suggesting that we will be able to identify the graves of named individuals buried in the military cemetery with some confidence. Many of the graves appear to correspond uniquely to graves discovered during excavation; some historically mapped graves also fit archaeological mapping information closely in grave size, orientation, or both. Distortions in the historical map were expected, depending on how mapping information was measured historically, since both historical maps of the cemetery are sketch maps. The correspondence between archaeological data and the 1881 map thus came as somewhat of a surprise. Nonetheless, interpreting this correspondence is not without complications, specifically in terms of the exact location of the cemetery wall and determination of which graves discovered archaeologically should be included within the military cemetery.

The plat maps indicate that the walled cemetery was divided into four quadrants, separated by walkways. The eastern two quadrants contained 65 documented burials, mostly of enlisted men, but also of at least four citizens, one of whom was formerly a teamster with the Quartermaster Department and another listed as child. The western half of the cemetery contained at least 32 graves, including the graves of commissioned officers or retired officers, family members, and prominent citizens. The removal list indicates that many of the burials in the western half of the cemetery were removed prior to the 1884 military removal effort, as were a few burials in the eastern half.

During our excavations, we discovered three possible adobe-wall segments; we inferred that these could be remaining portions of the military-cemetery wall. Two were located along the eastern edge of the cemetery; another was located at what we inferred to be the southeast corner of the cemetery. The possible wall segments along the eastern edge could be part of the original cemetery wall, given their location and orientation. The eastern limit of the cemetery also appears to be fairly neatly defined by an extended gap between burial rows. The precise northern and southern limits of the cemetery are not entirely clear, however. Despite our original interpretation of one wall segment as the southeast corner of the cemetery wall, the overlay of the historical and archaeological mapping information appear to indicate that the orientation and location of the cemetery walls does not closely match that feature. The wall segment may instead describe the property boundary for a later residence. Moreover, the northern limit of the cemetery as indicated by overlay of historical and archaeological mapping information places five additional graves within the possible limits of the cemetery. Three of these would have been completely or partially overlapped by the historically mapped cemetery wall, based on comparison of mapping information. Unfortunately, interpretation of bioarchaeological and contextual information alone does not allow us to unambiguously determine whether any of those five individuals were deliberately placed within the limits of the military cemetery.

We found four north-south rows of graves in the area we infer to be the eastern portion of the military cemetery. The four rows held a total of 63 graves, all but 5 of which were previously exhumed. The other 4 graves found in Area 1 were located east of these four rows and could not be securely associated with other rows in the field. Three of those graves, however, appear to correspond fairly closely in space to graves shown in the western half of the cemetery on either the 1873 or 1881 plat map. The remaining grave in Area 1 was located in what would have been the southern entrance to the cemetery, making its placement ambiguous with respect to the military cemetery. Although no unambiguous physical evidence of the former military cemetery wall was found, the area of previously exhumed graves was clearly distinct from the areas of mostly unexhumed graves found immediately to the north and east. On the east, a definite spatial gap is evident between the two areas. This gap, 4–5 m wide, is undoubtedly where the former wall stood. On the north, the areas of unexhumed and previously exhumed graves are not separated by any noticeable

**Table 1. Graves in Easternmost Rows of the Military Cemetery**

Row <sup>a</sup> (beginning on east)	Number of Graves in 1881 List	Number of Graves Recorded in Field
1	16	17
2	18	19
3	18	15
4	13	12

<sup>a</sup>The four rows are not numbered in the 1881 list, but the list does number the graves consecutively, from south to north in each row, and from east to west through the four rows. The interpretation of the four rows as represented in the 1881 list is not completely straightforward and depends on a number of simple inferences discussed in our background report (O'Mack 2006:23–27).

change in the spacing between graves. In fact, the previously exhumed graves in the first row are aligned closely with the unexhumed graves immediately to the north, which suggests that these graves, both the unexhumed and the previously exhumed, had been placed with reference to each other and were already there when the military cemetery wall was built in 1868.

The four rows of graves discovered in excavation are clearly rows, but they show irregularities in spacing and alignment. These irregularities can probably be attributed in part to the intermittent, loosely monitored use of the military cemetery and a general lack of durable grave markers (see O'Mack 2006:36). The number of graves in each row as given in the 1881 and 1873–1882 lists differs slightly from the number discovered in the field (Table 1), but the generally close correspondence between lists, maps, and field data indicates that each is a valuable tool for interpreting the other. Some of the discrepancies appear to be accounted for by postcemetery disturbances that may have obscured traces of previously exhumed graves, but it is important to emphasize that the unusually wide spaces between some graves in the rows of graves discovered in excavation reflect an occasionally haphazard placement of graves in the cemetery during its period of use.

The field results correspond with the historical burial records in other specific ways. For example, in the historical lists and maps, the first grave of the third row is indicated to be that of a child; the first grave of the third row in the field was a child-sized grave (one of only a few in the military cemetery). We have not yet made a full comparison of the lists with the results of the excavations, as we expect to uncover additional historical information in the coming months, but we expect that we will be able to identify the names of individuals buried in many of the graves through comparison of archaeological, historical, and osteological information. Thus far, we have been able to identify the names and other personal information for 42 of the 65 historically documented graves in the eastern half of the cemetery. We may also be able to identify the grave of one named individual in the western half of the cemetery.

The 1866 report indicates that 20 individuals, only 6 of whose names were known, were buried in the cemetery as of May 1866. For all but three graves, the precise location of specific individuals was also unknown. Lieutenant Smith may have inferred numbers of graves and names of interred individuals from examination of the ground surface, headboards, and the few available records he could piece together. Based on historical and archaeological information, the graves of these 20 individuals appear to have been placed in the easternmost row and, possibly, in the next row over. The next grave in that series was placed in November 1866, after the 1866 burial report was completed.

We believe our current definition of the military cemetery to be fairly parsimonious, as it is based on the balance of available archaeological, historical, and osteological data. We define the military cemetery by rows of graves but not necessarily by the cemetery wall itself, as the wall was built after the cemetery had been in use for 6 years and may have been built over graves considered outside the military cemetery. This definition of the military cemetery also suggests that, when the wall was built, it may have been built in such a way as to provide a fairly regular spacing between the outermost graves in the cemetery and the cemetery wall, or a spacing of around 5–7 feet.

One of the most interesting aspects of the military cemetery is the evidence we found for the previous exhumations of graves, which we knew from our background research to have been carried out in 1884

under the supervision of a doctor contracted by the U.S. Army. Of the 66 graves we excavated in the military cemetery, the vast majority had been previously exhumed. The primary evidence for exhumation was, in every case, either the complete absence of a skeleton in what was clearly a grave, or the presence in a grave of elements representing only part of the skeleton of a single individual. Complete exhumation was actually rare and occurred in only a single instance. Partial exhumation was the rule, with the skeletal elements left behind ranging from a few small bones to more than half a skeleton. Complete removal of all burial-associated artifacts was also rare. Nearly every grave held at least a few burial-associated artifacts (e.g., coffin wood or nails, coffin hardware, clothing remnants, or personal or religious items), and many still held as many artifacts as the typical unexhumed grave in the larger cemetery.

The incomplete exhumations are interesting as a whole for the information they might provide about attitudes toward the dead in the cemetery period, but also for the leads that specific examples give regarding the identity of individuals buried in the cemetery. For example, we know from our background research that one soldier buried in the military cemetery was exhumed by a close friend just before the exhumations commissioned by the Army took place. The name of the soldier exhumed by his friend is included in the 1881 list as that of one of the burials individuals buried in the four easternmost rows. Based on the place of this grave in the list, and its absence in a comparable list of the burials later reinterred at the new Fort Lowell outside Tucson, it is highly probable that it corresponds to the single instance of complete exhumation. This is of interest first because it shows that the efforts of a private party to exhume a loved one were (perhaps not surprisingly) more thorough than the efforts of a government contractor. More significantly, the apparent link between the burial lists and maps and the graves recorded archaeologically, along with similar links we think we can make, may allow us to reconstruct the history of use of the military cemetery in some detail.

## **Area 2**

Area 2 is the portion of the civilian cemetery located immediately north and east of Area 1, the military cemetery (see Figure 5). The boundary between Areas 1 and 2 corresponds with the presumed alignment of the adobe wall that once enclosed the military cemetery, as discussed above. The eastern limit of Area 2 corresponds with the presumed eastern limit of the cemetery as a whole. The western limit of Area 2 is the eastern margin of the TNI basement excavation, a feature that prevents us from knowing whether the distinctiveness of the area continued farther west.

The northern limit of Area 2 is the southern limit of Area 3. This boundary is drawn somewhat arbitrarily through an area that marks an apparent shift in the density of graves, from a relatively sparse distribution on the south to a relatively dense distribution on the north. No neat line is apparent, but a band of mostly open space runs east-west between the two areas, with a handful of scattered graves not clearly associated with either area. As noted in the discussion of Area 1, Area 2 includes an apparent northward continuation of the alignment of the easternmost row of the military cemetery, which may indicate that the adobe wall separating the two areas was not built until after the graves sharing this alignment were already in place.

Our analyses of the contextual and osteological information from Area 2 graves are not complete, but the preliminary data indicate that an unusually high percentage of the individuals buried in these graves were adult males. Other distinctions, such as in body orientation, may also characterize the area.

## **Area 3**

Area 3 is the largest of the five areas and encompasses the greatest number of graves. Its eastern and western limits are the eastern and western limits of the cemetery as a whole. Its southern limit corresponds in part to the northern limit of Area 2, but it also surrounds the obviously discrete Area 4 on three sides. The original southern limit of Area 3 is unknown because of the intrusion of the TNI basement.

The northern limit of Area 3 corresponds with an obvious break in the density of graves, from its own relatively dense distribution to the distinctive distribution of Area 5, where small numbers of graves are grouped in several clusters near the western limit of the cemetery. Interestingly, the evident boundary between Areas 3 and 5 also corresponds closely with a property boundary first established in 1890, when the former cemetery was first subdivided by the city and sold off to private parties. This was the boundary

between Lot 5 and Lot 6 of Block 252, a line that extended eastward as the boundary between Lot 10 and Lots 11, 12, and 13 of the same block (see O'Mack 2005:Figure 8). This property boundary actually survived to the start of fieldwork—the same line marked the northern edge of the modern parcels that held both the building at 240 North Stone and its parking lot to the east. It is unclear why a line presumably established in 1890 would seem to be reflected in the distribution of graves created at least 15 years earlier. One focus of our postfield research will be the extent to which postcemetery features reflect the earlier use of space in the cemetery, and, conversely, how boundaries in the former cemetery may have influenced the later use of the project area.

The large size of Area 3 undoubtedly glosses over a diversity among graves and burials that we are still unable to recognize. Our ongoing analyses of features, artifacts, and skeletal remains may eventually lead us to subdivide the area, and to elaborate on the nature of the distinctions between Area 3 and the other parts of the cemetery.

#### **Area 4**

In terms of the distribution of graves, Area 4 is by far the most distinctive of the five areas. In the rest of the cemetery, the general pattern is graves spaced more or less evenly in more or less discernible rows, a single individual in each grave, and little intrusion by later graves on earlier graves. Area 4 breaks this pattern almost completely. The general east-west orientation of graves is still the rule (with a few notable exceptions), but the graves are packed tightly together, with little or no intervening space, and with frequent and often drastic intrusion by later graves on earlier graves. Many graves show evidence of multiple burial episodes, sometimes intentional, many times unintentional. The many superimposed graves in Area 4 greatly complicated the process of archaeological excavation, a situation made only more difficult by the many utility trenches that were excavated through the area in the postcemetery period.

The distinctive density of Area 4 is in sharp contrast to the lesser density of the surrounding Area 3. The west, north, and east sides of Area 4 are nearly straight lines, forming right angles at the northwest and northeast corners of the area. The abruptness of the change from Area 4 to the surrounding area strongly suggests that Area 4 was once enclosed by a fence or wall for which we did not find any other evidence. The original southern limit of Area 4 is unknown, because of the intrusion of the TNI basement. Just outside the west, north, and east sides of the area is a band of mostly vacant space, which suggests that a wagon- or walking-path encircled the area.

The significance of Area 4's uniquely dense grave distribution is as yet unknown, but the postfield analyses of contextual and osteological information will hopefully shed some light. Among the possibilities is that Area 4 represents the earliest version of the civilian cemetery, which was used intensively until a much larger cemetery parcel was set aside in the 1872 town site survey. Another possibility is that Area 4 was used by a particular segment of the Tucson population at the same time that the larger civilian cemetery was in use.

#### **Area 5**

Area 5 encompasses the small number of graves that fall in the northernmost portion of the former cemetery, for the most part north of the former property line discussed above (see the Area 3 section). As can be seen in the overall map of graves (see Figure 5), it is hard to establish a clear boundary. The graves included in Area 5 seem to be grouped in several discrete clusters, one of which extends somewhat further south than the others yet still seems to be set apart from the Area 3 graves. If there was in fact a boundary in the former cemetery that somehow influenced the placement of the later property line, perhaps the Area 5 graves date to the years after that boundary ceased to matter. In other words, perhaps graves were originally restricted to the area south of the boundary, but later graves were allowed to be placed on either side of or straddling the boundary.

Another hint of the possibly later date of the Area 5 graves is their orientation. Most graves elsewhere in the cemetery have an orientation that is just slightly off a true east-west line, but most Area 5 graves have a much more precise east-west alignment. One possible interpretation of this difference is that the Area 5 graves were placed with reference to the truly north-south Stone Avenue, which was incorporated into the regularized street grid of Tucson with the 1872 town site survey. Before the town site survey, there

were few if any visual references that reflected a true east-west alignment, which meant that any attempt to lay out graves with an east-west orientation was inevitably approximate.

## **Postcemetery Period**

A total of 752 features from the postcemetery period were identified and investigated during field studies (Figure 6). Table 2 details the feature types and counts; precise counts are subject to change following further analysis.

Analysis aimed at correlating archaeological features with specific residences is ongoing. At the conclusion of fieldwork, it is possible to assign some features to specific lots; however, final findings in this regard must await further detailed examination of historical maps and excavation results.

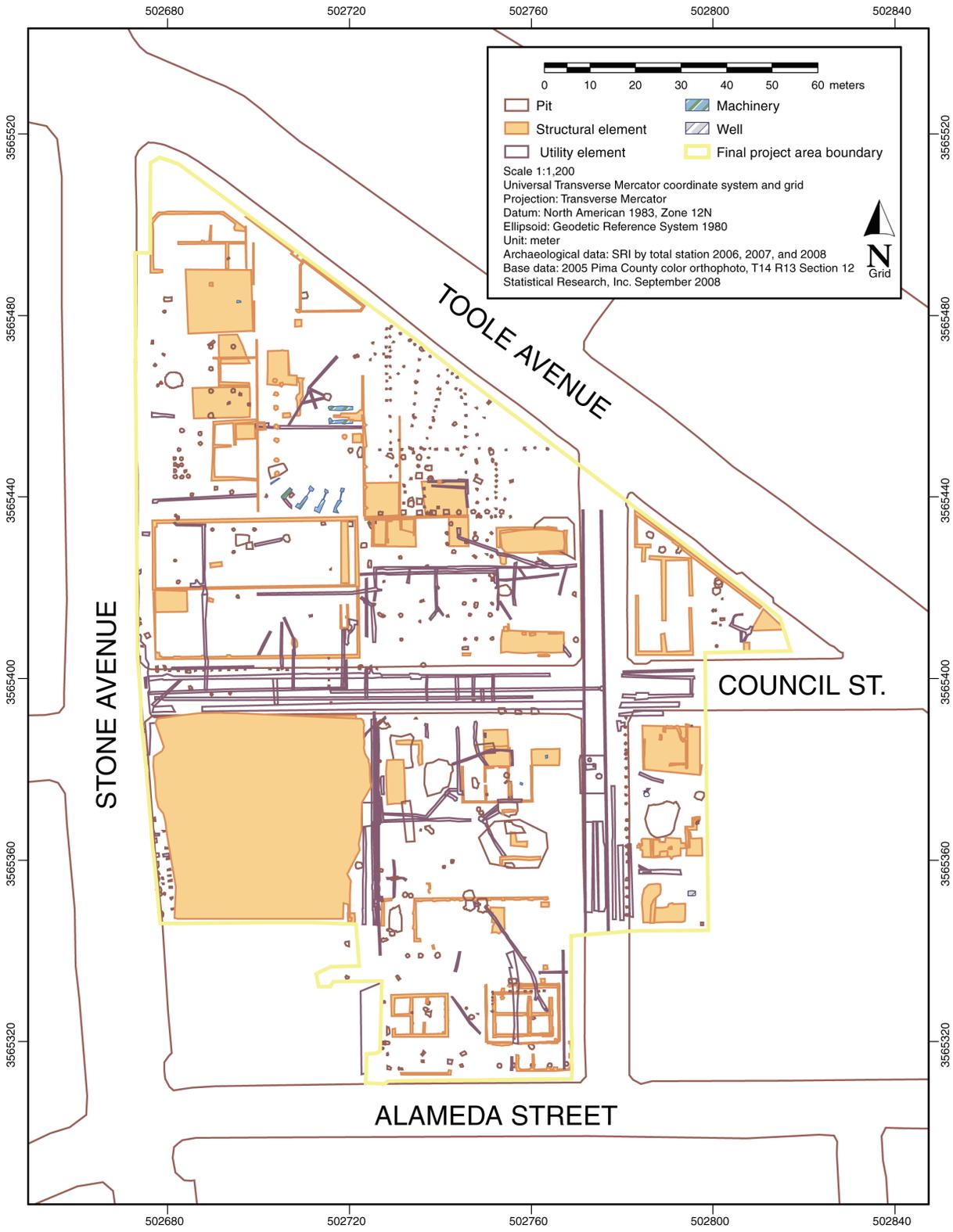
## **Analysis**

### **Prehistory**

In the original research design for the prehistoric/protohistoric component of this project (Beck et al. 2006:11–12) the research goals were to evaluate Pioneer period settlements as well as later interactions between protohistoric groups. The questions framed for prehistoric groups paid particular attention to the domestic organization of Pioneer period settlements in relation to preceding Early Formative and subsequent Colonial period settlements. Questions regarding the protohistoric groups focused on the effects of European contact and the transformation and assimilation of these cultures through time. Over the course of the field investigations it became apparent that few prehistoric and no protohistoric features remained intact. Only three prehistoric features were identified within the project area, including two pit structures and one roasting pit. The two pit structures tentatively date to Late Archaic period. In light of the paucity of Pioneer period or protohistoric remains, the former research questions became moot for this project simply for lack of data. New research questions were instead developed for the prehistory of this project area in order to address Late Archaic lifeways from the unique perspective of people living in a nonriverine context—away from the Santa Cruz River, as well as the changing use of the project area throughout prehistory.

Current research and our understanding of the Late Archaic time frame has made dramatic strides in recent years, with multiple excavations occurring along the middle Santa Cruz River valley near Tucson. With the discovery of two likely contemporaneous pit structures in the JCC project area, we are presented with a unique glimpse of habitation structures located away from the floodplain where so much of the current research is focused. Our research questions, therefore, have been reevaluated to best suit our prehistoric data set, as well as to add to the growing knowledge of the Late Archaic/Early Agricultural Period transition.

1. How do the Late Archaic settlements in the JCC project area differ from those along the Santa Cruz River, or, alternatively, those located in nonriverine contexts?
2. Is there a meaningful difference between our understanding of Late Archaic lifeways and Early Agricultural lifeways in terms of the current research trends that have focused on floodplain agricultural settlements? Could nonriverine settlements appear quite different from their agricultural floodplain counterparts?



**Figure 6. Distribution of postcemetery features (not including Sanborn fire insurance map data).**

**Table 2. Number and Type of All Postcemetery Features Identified in the Project Area**

<b>Feature Type</b>	<b>Number of Features</b>
Animal burial	5
Bank vault	1
Basement	7
Benchmark	1
Building	9
Cesspit	3
Concrete pier	15
Concrete slab	27
Drain	4
Fence	1
Fireplace	2
Foundation, adobe	19
Foundation, concrete, poured	38
Foundation, concrete block	1
Foundation, stone and mortar	23
Freestanding wall	1
Machinery	10
Manhole	3
Pipeline segment	2
Pit	109
Post	6
Posthole	245
Privy pit	9
Stairwell	4
Trash deposit	5
Trash pit	29
Tree pit	56
Trench	109
Underground tank	2
Utility vault	4
Well	2
Total	752

3. Are there any remains (botanical, faunal, or artifactual) that would indicate a different subsistence strategy from that of an early agriculturist living on the Santa Cruz River floodplain?
4. Could the Late Archaic pit structures at JCC represent a transitory location between the riverine habitations found at Las Capas and nonriverine habitations, such as Coffee Camp?
5. What can the prehistoric features and artifacts tell us about the changing use of the project area during prehistory? How are the changes in subsistence strategies from a foraging to farming economy reflected in our data, and how did Native American populations use the landscape through time?

## Cemetery Period

An important, overarching research issue for the period the cemetery was in use is the extent to which the cemetery reflects the dynamic and changing relationship known to have existed between the Mexican and Anglo-American communities in Tucson in the latter half of the nineteenth century. Sheridan (1986) has characterized the 1860s and 1870s—essentially, the years that the National Cemetery was in use—as a period when an important and far-reaching transformation in Mexican-Anglo relations took place in Tucson. The 1860s began with a small number of recently arrived Anglo-American men interacting in a largely amicable and cooperative way with an otherwise purely Mexican population, joining in business ventures with the Mexican elite and marrying Mexican women. In the course of 2 decades, as the Anglo-American population increased and both Mexicans and Anglo-Americans grew more sensitive to infringements on their respective cultural and economic spheres, relations between the two groups steadily deteriorated, which led to a growing social and spatial segregation. The arrival of the railroad in 1880, which brought a major influx of Anglo-Americans and their economic resources, was decisive in this regard, and it is interesting to consider that the railroad's arrival was a kind of tipping point in the fate of both the National Cemetery and Mexican-Anglo relations. It was only after the arrival of the railroad that the city council, composed exclusively of Anglo-Americans for the first time, formally ordered families to remove their deceased from the civilian portion of the cemetery. It will be important to examine how the historically documented changes in Mexican-Anglo relations during the period the cemetery was in use played out in the organization, expansion, and abandonment of the cemetery. The bioarchaeological and mortuary analyses will be important in this regard—to the extent that we are able to establish the religious affinity, ethnicity, date of interment, and other characteristics of individual burials—but the excavations must include a careful search for spatial and stratigraphic clues about the internal organization of the cemetery and the timing of its abandonment.

Six pertinent research questions for the National Cemetery period are outlined in the treatment plan (Beck et al. 2006: 7–9). The following additional research question for the Cemetery period was formulated during our field investigations concerning the subsequent mortuary and osteological analysis.

7. What can historical, bioarchaeological, and mortuary information tell us about the health status, life history, and daily life of individuals interred in the National Cemetery? To what extent does bioarchaeological and mortuary information vary among cemetery areas, cultural affinities, religious backgrounds, or other social distinctions, and how do such differences reflect historically documented social, economic, or demographic processes?

## Bioarchaeology and Mortuary Analysis Research Goals

The National Cemetery was the only cemetery in Tucson during most of its period of use. Hence, the human remains and graves recovered potentially represent a biological and cultural cross section of the entire community. To make the most of their historical value, we will study the excavated interments using the methods and models of two subdisciplines of archaeology: bioarchaeology and mortuary analysis. Bioarchaeology is the study of the biological history of individuals and populations as preserved in their physical remains; mortuary analysis is the study of social, ideological, and cultural identity as revealed in the treatment of the dead. The bioarchaeological study of the human remains recovered from the National Cemetery involves at least six lines of inquiry: paleodemography, pathology, dental anthropology, epigenetic trait analysis, paleonutrition, and behavioral analysis. Below, we discuss the general research issues for the bioarchaeological and mortuary analysis. The specific techniques we use are dictated by the burial agreement designated Case No. 06-14.

## **Bioarchaeology**

The most basic question regarding any cemetery is demographic: who was buried there? A primary goal of our osteological analysis is the reconstruction of the composition of the cemetery population: the age, sex, and group affinity (biological, ethnic, or both) of each individual recovered during the excavations. Documentary sources have provided some idea of who was buried in the National Cemetery; our osteological study is designed to judge the accuracy of that picture or how much it has been altered by the differential removal of burials. It is important to emphasize that making distinctions of cultural affinity based on skeletal morphology can be difficult. To maximize the possibility of establishing cultural affinity, a wide range of skeletal characteristics, including extensive craniometric data, is recorded. Measures of biological distance also will be evaluated for different age and sex groups, to address questions regarding patterns of marriage among the different groups, or populations, living in Tucson.

Our analysis of the pathological conditions represented in the burial population may yield valuable information regarding general health, interpersonal violence, and cultural practices (Ortner 2003; Rogers and Waldron 1995). From documentary sources, we have some information about health problems in Tucson during the period the National Cemetery was in use. The information on skeletal pathologies we gathered during data recovery is an important complement to these sources, providing a tangible means for evaluating the accuracy of reports of infectious diseases and other problems. Smallpox is a notable example: the 1870 federal mortality schedule for Tucson records a brief but devastating smallpox outbreak, and we expect to find skeletal lesions consistent with smallpox among burials dating to the same period. Recent research shows that, in the 1953 discovery of skeletons in the basement excavation for the TNI building, several of the skeletons analyzed by University of Arizona physical anthropologists may have had such lesions; the same skeletons were apparently found in a soil layer deliberately capped by lime. Our osteological analysis includes these and any other skeletal remains from the project area currently held by ASM.

Dental-anthropological analysis provides valuable information regarding nutrition, idiosyncratic behavior, and cultural practices (Capasso et al. 1999; Hillson 1998; Ortner 2003; Scott and Turner 1997). Furthermore, patterns in the frequency of specific morphological traits provide clues about population dynamics, such as familial relationships, by comparing trends within and between populations. Dental anthropology is especially valuable because it can provide such information without the use of destructive techniques.

The potential value of epigenetic (nonmetric) trait analysis is well established (Case and Heilman 2005; Hauser and De Stefano 1989), and we have recorded data on a range of epigenetic traits whenever possible. Although the degree of heritability and significance of such traits is not fully understood, certain traits, such as cleft neural arches, are stable and should exhibit meaningful patterns (Barnes 1994).

Paleonutritional studies are generally syntheses of information drawn from paleodemographic, pathological, and dental-anthropological analyses. Reconstructing the nutritional practices of the individuals buried in the National Cemetery will be a valuable complement to the study of social organization and cultural practices in the community of the time. Skeletal indicators of behavior include not only specific pathological conditions, but also changes in bone geometry, nonpathological bony responses to physical activity, and attrition resulting from specific behaviors (Capasso et al. 1999). The vast majority of behavioral indicators are nonspecific and provide no neat link between a bony response and a single activity, but at the level of a population, the frequencies of specific indicators can reveal populationwide behavioral trends, such as a change in technology. Behavioral indicators can further suggest a range of environments responsible for a pattern. Examination of patterns of asymmetry and biomechanical stress is useful for evaluating the labor-load and physical-activity patterns in a community. For example, documentary sources suggest a division of labor in nineteenth-century Tucson related partly to group affinity: Anglo-Americans were, for a time, the prevailing group in the business sector, whereas much of the physical labor of farming and ranching was done by Hispanics and other non-Anglos. Skeletal analysis with an attention to behavioral correlates should demonstrate physical workload differences among groups. The research questions for our bioarchaeological analysis are provided in the treatment plan (Beck et al. 2006: 3–5).

## **Mortuary Analysis**

To understand more fully how the National Cemetery was used and by whom, we will rely heavily on mortuary analysis—the study of the treatment of individual burials—and what it can tell us about the group affinities and the social and cultural identities of the deceased. It is probable that many of the people buried in the National Cemetery were Hispanic and Catholic, but even among Catholic Hispanic burials, treatment of the dead varied considerably according to social status, place of origin, personal or family preferences, and the circumstances of death. The same variables apply for other religious and cultural traditions, such as Protestant and Jewish burials, or burials made following Native American, Chinese, or African-American traditions. Our mortuary analysis will closely examine the nuances of burial treatment, including the orientation and positioning of the body, the kind of container used, if any, the way the body was dressed, and accompanying funerary objects, such as floral arrangements. Documentary sources on the National Cemetery suggest social status as a major determinant of burial treatment. References range from the elaborate burial of a local dignitary, which undoubtedly included the use of a coffin, a deep grave, and a substantial headstone, to the humble burial of a deceased infant, carried to the cemetery in a blanket and buried in an unmarked shallow grave.

While the National Cemetery was in use, Tucson underwent significant changes in the availability of commercially produced goods as southern Arizona was drawn into the mainstream U.S. economy. The railroad did not reach Tucson until 1880, 5 years after the closing of the nonmilitary portion of the National Cemetery, which means that burials preserved in the National Cemetery are not likely to reflect the gross changes in material culture brought by the railroad. Nevertheless, certain goods probably did become more common in Tucson in the latter years of the cemetery's period of use by virtue of their increased availability in adjacent regions, especially California. This process may be reflected in changes in burial treatment through time in the National Cemetery. For example, commercially manufactured caskets and funeral trimmings were available for shipment from California or the eastern United States. The presence of a manufactured casket and mass-produced, decorative coffin hardware would almost certainly indicate that the deceased was unusually affluent; it may also serve as a useful chronological marker, as manufacture and commercial distribution is relatively well documented. We also expect that personal ornaments and other goods placed with burials would reflect changes in commercial availability through time. The research questions for our mortuary analysis are provided in the treatment plan (Beck et al. 2006: 5–6).

## **Postcemetery Period**

Expectations for archaeological features from the postcemetery period were detailed in the Treatment Plan for the project (Beck et al. 2006:10–11). Upon completion of fieldwork, it was apparent that virtually all physical expectations for this site component had been realized. The research questions posed at the outset remain valid.

Prior to fieldwork, it was assumed that remnant foundations of houses and associated buildings would be discovered. Discovery of below-grade features such as privies and trash pits was expected, and sheet middens were suspected. All of these feature types were identified and investigated during archaeological fieldwork, and all have great data potential to answer the questions outlined above. Field studies provided ample data that are applicable to an understanding of a variety of household types in the project area.

Data collected during field studies are expected to yield important information regarding a neighborhood that, because of the presence of the cemetery, developed later than surrounding areas. As a result, demographics in the project area differ from those of adjacent parcels, and comparison and contrast are likely to reveal new information regarding the composition of this neighborhood.

Archival research and archaeological investigation revealed much about the transition period between residential and commercial use of the project area. It is now known that at least one residence was later used as a place of business. Other residences shared common walls with later commercial buildings. We remain hopeful that further laboratory analyses can address questions regarding the daily lives of the people working in the project area.

Archival documentation and archaeological excavation revealed a wealth of information about changes in business buildings over time. Episodes of expansion, acquisition, and subdivision are now better understood. Subsurface investigations of commercial features were expected to provide important information, and ongoing analysis of those studies continues to promise worthwhile results.

Data from this project, when compared with those from other projects in downtown Tucson will undoubtedly provide new and important information toward an understanding of Tucson's history. It will be possible to compare Tucson with other southwestern cities where multiple cultures coexisted and where the railroad provided a dramatic change in lifeways.

## Report

Based on the results of our field investigations and analytical goals, we developed a thorough final-report outline for the JCC project (see appendix). This report outline is intended to address the research themes in the treatment plan (Beck et al. 2006) and those discussed here, as well as synthesize the data gathered from the field investigations, archival research, and subsequent analyses. The nature of data analysis is such that the content of the report may change slightly in response to new and unpredicted results of our research. SRI is contracted to produce the final report by July 31, 2010.

## Curation

Materials not associated with burials will be curated at ASM. The disposition of human remains and funerary objects will accord with provisions of Burial Agreement Case No. 06-14.

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 1870a Meeting of the Board of Supervisors. 7 May (vol. 3, no. 17), p. 3, col. 4.  
 1870b Request for sealed proposals to build cemetery wall. 7 May (vol. 3, no. 17), p. 2, col. 2.  
 1870c Request for sealed proposals to build cemetery wall. 14 May (vol. 3, no. 18), p. 3, col. 4.  
 1870d Request for sealed proposals to build cemetery wall. 14 May (vol. 3, no. 18), p. 2, col. 3.



APPENDIX

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**Report Outline for The Joint Courts Complex  
Archaeological Data Recovery Project, Tucson,  
Arizona**



# THE JOINT COURTS COMPLEX ARCHAEOLOGICAL DATA RECOVERY PROJECT, TUCSON, ARIZONA

## VOLUME I: HISTORICAL AND ARCHAEOLOGICAL OVERVIEW AND SYNTHESIS

Management Summary

Acknowledgments

### 1. Introduction

Project History

General Research Goals

Descendant Community Consultation

Reburial and Repatriation

Public Outreach

### 2. General Excavation Strategy and Methods

Sampling Strategy and Scheduling

Demolition of Extant Buildings

Mechanical Stripping

Mechanical Screening

Site Mapping and Photography

Database Management

### 3. Environmental and Physical Setting of the Project Area

Geology

Hydrology

Stratigraphy

Flora and Fauna

### 4. Prehistoric Archaeology in the Joint Courts Project Area

Native American Culture History in Southern Arizona

Chronology

Theoretical Framework

Current Research

Research Questions

Excavation Methods (Specific to Prehistoric Features)

Analytical Approaches

Results

Feature Descriptions

Pit Houses

Other Prehistoric Features

Prehistoric Finds in Other Contexts

Artifact Analysis

Ceramics

Flaked Stone

Ground Stone

Faunal Bone

Shell

Other Analytical Results

Macrobotanical Remains

Pollen

- Chronometric Studies
  - Relative Dating
  - Archaeomagnetic Dating
  - Radiocarbon Dating
- Summary: Addressing the Research Questions

## 5. Historical Archaeology of Tucson's National Cemetery

### Historical Background

- Culture and History in Post-Gadsden, Prerailroad Southern Arizona
- The U.S. Army in Southern Arizona
- Cemeteries and Land-Use Practices in Tucson, 1860–1884
- Document-Based Chronology of the National Cemetery
- Closing of the Cemetery and Exhumations

### Archaeological Field Methods (Specific to Cemetery Features)

- Searching for Cemetery Walls
- Grave-Pit and Burial Discovery
- Mechanical Assistance in Grave-Pit Excavation
- Grave-Pit and Burial Excavation and Recording
  - Field Procedures and Forms
  - Hand Mapping
  - Photogrammetry
  - Three-Dimensional Scanning
- Removal

- Excavation and Recording of Previously Exhumed and Disturbed Burials

### Physical Presence of the National Cemetery

- The Military Cemetery
- The Civilian Cemetery
- Walls and Other Boundaries
- Cemetery Use and Growth Patterns
- Internal Organization
- Numbers and Kinds of Grave and Burial Features [basic summary only]
- Differential Grave and Burial Preservation
- Previous Exhumations
- Postcemetery Disturbances

## 6. Mortuary Analysis

- Introduction and Discussion: Field and Lab Recording Methods, Analytic Approaches

### The Grave

- Grave-Pit Preparation
  - Architecture of the Grave
    - Shelves and Head Niches
    - Vaults and Grave Arches

- Placement and Orientation

- Burial Postures/Positions

### Grave Associations and Body Preparations

- Funeral-Associated Artifacts

- Introduction and General Discussion about Funerals and Undertaking in Tucson

- Body Preparations
  - Shrouding
  - Use of Mineral Agents
- Floral Arrangements

- Construction
- Materials
- Results of Pollen Analysis
- Offerings
  - Coins as Funerary Objects
  - Holy-Water Vessels
- Artifacts Incidental to the Funeral
  - Hardware
  - Brick
- Burial Containers
  - Introduction and Discussion of Burial-Container Morphology
    - Wood Types
      - Sources
      - Preservation
      - Condition [charred, etc.]
    - Construction Techniques
      - Shape
      - Joinery
      - Hinges
      - Construction Hardware, Screws and Nails
      - Mass Production vs. Local Manufacture
    - Coffin Hardware
      - Handles
      - Decorative Tacks
      - Coffin Screws
      - Diamond Studs
      - Lining Tacks
    - Surface Treatments
      - Exterior Fabric
      - Paint and Pigment
    - Interior Treatments
      - Pillows
      - Coffin lining
  - Interpretations and conclusions
- Apparel
  - [Introduction and discussion about nineteenth-century trends in clothing and burial dress with regard to age, gender, status, and religion]
  - Garments
    - Preservation
    - Fabric [cotton, silk, wool, etc.]
    - Dyes
    - Beads and Other Decorations
    - Fasteners
      - Buttons and Other Fasteners: Field and Lab Recording Methods
      - Introduction and Discussion: Button Manufacture and Chronology
        - Button Typology
          - Brass Military
          - Metal
          - Prosser
          - Glass
          - Shell

- Bone
- Wood
- Uses of Buttons
  - Pants
  - Shirts and Dresses
  - Underwear
  - Infants and Children
  - Gender-Specific
- Other Fasteners
  - Cinch Buckles
  - Buckles and Braces
  - Hooks and Eyes
  - Studs
  - Straight Pins
  - Other
- Uses of Fasteners
  - Economics and Reuse
  - Infants and Children
  - Gender-Specific
- Footwear
  - [Introduction and brief discussion about history of footwear, manufacture and mortuary-related folklore]
  - Boots: Materials and Parts
  - Shoes: Materials and Parts
  - Slippers, Socks and Baby Booties: Materials and Parts
  - Infants and Children
  - Gender-Specific
- Interpretations and Conclusions
- Jewelry and Personal Adornment
  - Introduction
  - Earrings
  - Rings
  - Brooches
  - Necklaces
  - Hair Pins and Combs
- Religious Items
  - Introduction
  - Rosaries
    - Crosses
    - Crucifixes
    - Medals
      - Materials
      - Types
  - Beads
    - Materials
    - Types
  - Framed Saints Images
  - Artifacts of *Los Angelitos*
  - Interpretations
- Other Personal Items
  - Shell Cases, Poker Chips, Coins, Scissors, Etc.

- Weapons
  - Lithic Projectile Points
  - Bullets
- Intrinsic Artifacts (Precemetery)
  - Ceramic Artifacts
  - Lithic Artifacts
  - Shells
  - Faunal Remains
  - Pollen
  - Interpretations
- Intrusive Artifacts (Postcemetery)
  - Building Materials
  - Utility Pipes
- Spatial Organization of the Cemetery
  - [Introduction and theoretical premises; definitions used]
  - Communal Emphasis of Mortuary Behavior
  - Distributions of Items in the Cemetery
    - [Outline and discussion of differential distributions of different items and sets of items]
  - Overlapping Sets
  - Identification of Distinct Burial Areas
  - Possible interpretations of spatial interpretations
- Cultural and Historical Implications of the Mortuary Analysis
  - Ethnic and Religious Group Identity
  - Social and Economic Stratification
  - Spatial Organization of the Cemetery
  - Religious and Secular Burial Traditions
  - Private and Professional Undertaking
  - Transportation and the Availability of Goods
  - Social and Cultural Change during the Life of the Cemetery

## 7. Historical Archaeology of the Postcemetery Period, 1884–1960

- Historical Background
  - Data Sources (Material Culture, Historical Maps, Archival Documentation, Photographs, Newspapers, Personal Papers, Etc.)
- Residential Period
  - Chronology of Particular Households
- Commercial Period
  - Chronology of Particular Businesses
- Postcemetery Archaeological Features
  - Buildings
    - Excavation and Recording Methods
    - Descriptions
  - Privy Pits
    - Excavation and Recording Methods
    - Descriptions
  - Other Pit Features
    - Excavation and Recording Methods
    - Descriptions
  - Other Features
    - Excavation and Recording Methods
    - Descriptions

General Interpretations of Postcemetery Features in the Project Area

[General discussion of households, residents, and neighborhoods in the project area]

Building Materials (Local, Salvaged, Imported)

[General discussion of commercial development of the project area]

Analysis of Postcemetery Artifacts

Cleaning, Sorting, and Cataloging Methods

Descriptive Analysis for Function, Point of Origin, and Period of Manufacture

Historical Research on the Cultural Context of Purchase and Use

Special Analyses [botanical, parasitological, etc.]

Curation

Artifacts

Household

Glass

Medicine

Toiletries and Cosmetics

Liquor

Beverage

Culinary

Cleaning and Maintenance

Tableware

Lamps and Lanterns

Flat Glass

Nondiagnostic

Indeterminate

Ceramics

Food Containers

Tableware

Storage

Decorative

Other Vessels [ink, etc.]

Personal

Clothing and Clothing Fasteners

Accessories

Adornment

Smoking Paraphernalia

Toys

Dolls

Marbles

Metal

Metal

Cans

Tableware

Personal

Tack

Ammunition

Other

Indeterminate

Hardware and Structure Remains

Transportation

Industrial

Miscellaneous

Correlation of Postcemetery Features and Artifacts to Particular Households  
Correlation of Postcemetery Features and Artifacts to Particular Businesses  
[Brief discussion of findings relative to research questions]

## 8. Summary of Findings and General Conclusions

# **VOLUME II. BIOARCHAEOLOGY OF TUCSON'S NATIONAL CEMETERY**

## 1. Introduction

- Bioarchaeological Research Questions
  - Burial Composition
  - Spatial Distribution and Cemetery Organization
  - Prevalence and Distribution of Disease
  - Prevalence and Distribution: Dental Health
  - Secular Change and Variation in Burial Treatment
- General Observations on the Burial Population
- Organization of the Volume

## 2. Osteological Methods

- Theoretical Foundations
- Recording Standards
  - In-Field
  - Laboratory
- In-Field and Laboratory Analysis
  - Determining primary individual
  - Determining secondary individuals
  - Basic Biological Profile
    - Methods of Age Determination
    - Methods of Sex Determination
    - Methods of Ancestry Determination
      - Metric
      - Nonmetric
    - Methods of Stature Estimation
- Three-Dimensional Scanning
- Photography
- Parasitology

## 3. Demography

- Theoretical Foundations
- Demographic Analysis
  - Hazard Models
  - Mortality Models
  - Results
- Historical Documentation vs. Observed Demography
- Sexual Dimorphism

## 4. Postcranial and Cranial Morphology

- Theoretical Foundations
- Postcranial Morphology
  - Ancestry

- Stature
- Functional morphology and robusticity
- Growth of children
- Cranial Morphology
  - Ancestry
  - Sex
  - Comparison to other populations
- Discussion

## 5. Biological Distance, Ancestry, and Cultural Affinity

- Theoretical Foundations

- Dental

- Craniometric

- Morphoscopic

- Statistical Methods

- DFA, Cluster Analysis, OSSA, K-nearest neighbor

- Spatial Analysis

- Defrise-Gussenhoven, Biodistance, etc.

- Identification of Subpopulations

- Results: Integrating Cranial, Postcranial, and Dental Indicators

## 6. Dentition

- Theoretical Foundations

- Preservation

- Occlusion

- Crowding, Impaction, Ectopic Eruption

- Dental wear

- Dietary Abrasion

- Nondietary Modification

- Antemortem Fractures

- Dental Pathologies

- Antemortem Tooth Loss

- Periodontal Disease

- Caries

- Calculus

- Abscesses

- Developmental Enamel Defects

- Dental Anomalies

- Dental Restorations

## 7. Osseous Pathologies

- Theoretical Foundations

- Joint Disease

- Osteoarthritis

- Osteophytosis

- Schmorl's depressions

- Enthesophytes

- Myositis ossificans

- Dislocation

- Traumatic

- Congenital

Infectious/Inflammatory

Treponematosi

Osteomyelitis

Periostitis

Sinusitis

Metabolic

Cribr orbitalia

Osteoporosis

Neoplasms

Other

Osteochondritis dissecans

Ecto- and endocranial porosity

Generalized Stress Indicators

Adult Stress

Childhood Stress

Results

Patterns and distribution of pathologies

Summary

8. Trauma and Indications of Mechanical Stress

Theoretical Foundations

Antemortem trauma

Spondylolysis

Fractures

Perimortem trauma

Fractures

GSW

SFT

BFT

Distribution

Skeletal Region

Population

Sex

Fluctuating Asymmetry of Bone Cross Sections and Muscle Attachments

Discussion

9. Paleoparasitology

Distribution

Interpretation

Results

10. Summary

Addressing the Research Questions

Burial Composition

Spatial distribution and cemetery organization

Prevalence and distribution of disease

Prevalence and distribution dental health

Secular change and variation in burial treatment

Comparisons with Other Studies

**VOLUME III. ONCE SACRED GROUND:  
THE LIFE HISTORY OF A PLACE AND ITS PEOPLE**

**SECTION ONE  
Introduction**

1. Introduction
  - Definition of the Project and Project Area
  - Purpose of Study
  - Summary of Basic Findings
  - Organization of the Volume

**SECTION TWO  
A Changing Place in a Changing Land**

2. Environmental and Physical Setting of the Project Area
  - Setting within the Tucson Basin / Southeastern Arizona
  - Geology
  - Hydrological and Depositional Context
  - Vegetation
  - Ecology
3. Archaic through Hohokam: Changing Prehistoric Lifeways and Land-Use Patterns
  - Late Archaic Land Use
    - Riverine vs. Nonriverine Settlements
    - Emergence of Agriculture and Sedentism
    - Relationship to Sites in Vicinity of Project Area
    - Discussion of Archaic Period Finds in Project Area
  - Hohokam Land Use
    - Preclassic through the Classic
    - Relationship to Sites in Vicinity of Project Area
    - Hohokam Representation in the Project Area
4. Tucson Before the Cemetery
  - The Spanish Colonial Period in Southeastern Arizona (ca. 1540–1821)
    - Protohistoric / Native American Land-Use Patterns
      - Settlements
      - Relationship to Contemporary Discoveries in Southeastern Arizona
      - Representation in the Project Area
    - The Spanish Mission System
      - El Presidio de San Agustín del Tucson
      - Interactions Among Spanish and Native American Groups
    - Mexican Independence (ca. 1821–1856)
      - Effects of Independence on Tucson
      - Governance and Security
      - Religious, Secular, and Military Activities
5. A Town In Transition: Post-Gadsden, Prerailroad Tucson (ca. 1856–1880)
  - The Demographic Landscape

Tucson's Mexican Community  
Anglo Settlers and the U.S. Military  
Native Americans in Tucson  
    Apache  
    O'odham  
    Yaqui

The Community and its Neighbors: Economic and Social Processes  
    Population Growth, Migration, and Settlement  
    Marriage Patterns and Family Organization  
    Occupations and the Distribution of Wealth  
    Regional Economy and Population Distribution  
    Trade Networks and the Acquisition of Goods and Services  
    Relationships with Other Settlements

### **SECTION THREE**

#### **Death, Dying, and the Organization of the Cemetery**

#### 6. The Origin and Development of Tucson's National Cemetery: Historical and Archaeological Evidence

    Previous Burial in Tucson

        Historical Sources on the Cemetery and the People Buried

            Tucson Diocese Records

            Newspaper Accounts

            Military and Public Records

        The Catholic Cemetery

            Secularization and La Reforma

            The Organization of Mexican Catholic Cemeteries

            Developmental History and the People Buried

        The Military Cemetery

            The Organization of Military Cemeteries

            Developmental History and the People Buried

    Other Burials

        Non-Catholic, Nonmilitary Use of the Cemetery

    Models of Cemetery Formation

        The Closing of the Burial Ground

            Reasons for Closing

            Condition

            Exhumation of Bodies

            Other Disturbances

                To the Ground Surface

                To Burials

            Development of the Court Street Cemetery

        The Individuals Left Behind

#### 7. Cultural Affinity and Relatedness: Distinguishing Groups at the National Cemetery

    Cultural Affinity Defined

        Theory, Method, and Justification

            Brief Explanation of the Lines of Evidence

                Historical – artifact typology, historical documents, etc

                Contextual – orientation, position, mortuary artifacts, etc.

                Osteological – dental, craniometric, morphoscopic

- Methodological integration of the various lines of evidence
  - Modeling affinity
    - Statistical framework
  - Historical Documentation: Ancestral composition of Tucson residents, 1860–1880
    - Diocese records
    - Census data
    - Other historical documentation – newspaper, personal accounts, etc.
  - Mortuary evidence for cultural affinity: The importance of context
- Theory and method
  - Treatment of the deceased
- Artifacts: Funerary, Religious, and Personal Objects
- Cemetery areas
- Spatial relationships
  - Temporal factors
  - Osteological evidence for cultural affinity: Biological variation in Tucson
  - Craniometric
  - Morphoscopic/epigenetic
  - Biological Profile
  - Demographic composition of the cemetery, according to derived cultural affinity
- Hispanic
- Anglo
- Native American
- Culturally unidentifiable
- Relatedness: Biodistance and genetic distance studies
- Theory and method
  - Metric
  - Nonmetric
  - Methods of analysis
- Family groups
- Local migration
- Relationships among individuals and cemetery areas – historical, biological, and archaeological evidence
  - Spatial Clustering and Cemetery Formation

## 8. Life, Death and Dying in Southeastern Arizona, 1860–1880: Historical Accounts and Bioarchaeological Evidence

- Diet and nutrition
  - According to cultural and economic background
- Occupation and health hazards
- Disease
  - Historical evidence for epidemics
  - Chronology of epidemics and their impact
  - Violence and trauma
  - Exposure to risk according to occupation, age, sex, time
  - Historical documentation
  - Distribution
  - Osteological links and positive identification
- Medical beliefs and practices
  - Miasmas, epidemic disease, and treatment of the living and the dead
  - Curatives and other healing practices
    - Surgical and dental procedures

## Historical demography of death

Age, sex, occupations, etc. of the deceased from Diocese and other records

Paleodemography of Tucson's National Cemetery

Introduction to Paleodemography – Brief synopsis of theory and method

Mortality and survivorship

Sex, Age, Cultural Affinity, and inferred Religious, Occupational, or Economic background

Historical documentation vs. observed mortality and survivorship

Population growth/decline/stability in Tucson

Hazard analysis

Comparison to other cemeteries

Implications for interpretation of life history, public health, and cemetery organization

## 9. Bioarchaeological Evidence for Diet, Work, Disease, Trauma, and Surgical Intervention

Diet

Indicators of Diet

Distribution of dietary indicators

Differential impacts by sex, age, and inferred cultural affinity, religious, occupational, or economic background

Spatial distribution

Artifactual indicators

Archival records

Work

Indicators of Repetitive or Stressful Activities

Distribution and types of work

Differential impacts by sex, age, and inferred cultural affinity, religious, occupational, or economic background

Spatial distribution

Artifactual indicators

Archival records

Disease

Indicators of Disease Stress

Distribution and types of disease

Differential impacts by sex, age, and inferred cultural affinity, religious, occupational, or economic background

Spatial distribution

Artifactual indicators

Archival records

Trauma

Indicators of trauma

Distribution and types of trauma

Differential impacts by sex, age, and inferred cultural affinity, religious, occupational, or economic background

Spatial distribution

Artifactual indicators

Archival records

Medical Treatments and Surgical Intervention

Distribution and types of treatment

Differential impacts by sex, age, and inferred cultural affinity, religious, occupational, or economic background

Spatial distribution

- Artifactual indicators
- Archival records
- Combined effects and their distribution
- Historical documentation vs. observed patterns
- Implications for interpretation of life history and cemetery organization

10. Deathways and Tucson's living population 1860–1880

Introduction and definition of terms – the context of this discussion

Nineteenth-century Tucson and the impact of industry and the transcontinental railroad on death practices

Catholic Burial Practices

Cosmology and eschatology

Mortuary ritual

- Ceremonies away from the grave

- Treatment of the body

- Graveside rites

Potential visibility of practices in cemetery

Comparisons: Hispanic and non-Hispanic

- Comparison with other cemeteries

Non-Catholic Christian Burial Practices

Cosmology and eschatology

Mortuary ritual

- Ceremonies away from the grave

- Treatment of the body

- Graveside rites

Potential visibility of practices in cemetery

Comparison with other cemeteries

Brief discussion of Jewish and Muslim traditions in Tucson

Fraternal and Military Funerals

- Mortuary ritual

- Ceremonies away from the grave

- Graveside rites

Potential visibility of practices in cemetery

- Comparison with other cemeteries

Apache Deathways

- Cosmology and eschatology

Mortuary ritual

- Ceremonies away from the grave

- Treatment of the body

- Graveside rites

Potential visibility of practices in cemetery

- Comparison with other cemeteries

O'odham Deathways

Cosmology and eschatology

Mortuary ritual

- Ceremonies away from the grave

- Treatment of the body

- Graveside rites

Potential visibility of practices in cemetery

- Comparison with other cemeteries

Yaqui Deathways

- Cosmology and eschatology
- Mortuary ritual
  - Ceremonies away from the grave
  - Treatment of the body
    - Graveside rites
- Potential visibility of practices in cemetery
  - Comparison with other cemeteries
- Conclusions

## 11. The Organization of the Cemetery and the Life of a Community

- Summary of Basic Findings

- The People buried, their backgrounds and relationships

- The Organization of the cemetery, according to

- Age

- Sex and Gender

- Occupation

- Cultural affinity

- Religious background

- Time

- Treatment of the deceased, according to

- Age

- Sex and Gender

- Occupation

- Cultural Affinity

- Religious background

- Time

- The impacts of life on segments of the community

- Diet

- Work

- Disease

- Trauma

- Combined effects

- Mortality

- The place of the cemetery in the community

- Conclusions

- How analysis of the cemetery and the individuals buried there inform on

- Life history

- Community organization

- Interactions among social groups

- Relatedness and cultural affinity

- Health hazards

- Mortality

- Mortuary behavior

- What the mortuary artifacts can tell us about the broader society

- Implications for future research

## 12. The Broader Significance of the Cemetery Excavations

- Why this cemetery is unique

- Comparison to other cemeteries excavated of the same or similar periods

- How the information from this project can continue to be used in the future

## SECTION FOUR

### Somehow Forgotten: Public Erasure and the Development of An Urban Landscape

13. Households and Residents in the Project Area
  - Differential Architectural Styles Based on Cultural Affiliation (includes construction techniques)
  - Comparison to Adjacent Spaces outside Project Area
  - Consumption Patterns and Trends
    - Foodways
      - Self-Sufficiency vs. Cash-Based Consumerism (Home Canning and Butchering, Hunting, Gardening, Commercially Packaged Products)
      - Local Production vs. Extralocal Production
    - Recycling/Reuse/Discard
    - Household Industry
    - Leisure
    - Consumption Patterns and Trends
    - Foodways, Consumer Goods, Lifestyle, etc.
    - Health and Sanitation
    - Socioeconomic Differences
    - Local and Extralocal Roles and Connections
    - Summary (including any idiosyncratic finds)
  - Social and Economic Indicators
  - Ethnic and Cultural Indicators
    - Ethnic Influences
  - Health and Sanitation
    - Turn-of-the-Twentieth-Century Trends
    - Socioeconomic Differences
    - Home Health Care
    - Traditional Healing Practices
    - Formal Medical Treatment
    - Evidence from Parasitological Analyses
  - Neighborhoods in the Project Area
    - Boundaries
    - Chronology
    - Local and Extralocal Roles and Connections
  - Commercial Development of the Project Area
    - Architectural Styles and Developments through Time
    - Interpretations
    - Work Place Activities
    - Working Conditions
    - Products
    - Local and Extralocal Roles and Connections
    - Summary
14. The Postcemetery Project Area as an Urban Cultural Landscape
  - Land Use and Local Development Trends in the Project Area (Residential to Commercial to Civic)
    - Influence of the Railroad on Land Use
    - Effects of Civic Infrastructure Development on Land Use (Transportation, Utilities)
    - Layout of Streets and Parcels and Changes over Time
  - Contemporaneous Households
  - Contemporaneous Businesses

Tucson Demographics  
Immigration  
The Project Area in Tucson's Urban Landscape, 1890–2010  
Place of Project Area in Tucson and Southern Arizona  
The Built Environment  
The Social and Cultural Environment  
Local, Regional, National, and International Connections

**SECTION FIVE**  
**One Place, Many Uses**

15. The Project Area in a Changing Land  
Summary of basic findings  
Change through time in the use of the project area  
Relevance of the research to history and anthropology  
Relevance of the research to modern social, economic, and demographic issues

**VOLUMES IV AND V. GRAVE AND BURIAL FEATURE DESCRIPTIONS**

[comprehensive descriptions of individual features, each including:]  
Grave-Pit Characteristics  
Burial-Event Characteristics  
Osteological Assessment  
Burial-Associated Artifacts  
Feature-Specific Implications for Mortuary Analysis  
Feature-Specific Historical Research

**VOLUME VI. DATA AND OTHER APPENDICES**