

MUSEUM OF NEW MEXICO

OFFICE OF ARCHAEOLOGICAL STUDIES

A PROPOSED DATA RECOVERY
PROGRAM FOR LA 1051,
EL PUEBLO DE SANTA FE

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ADMINISTRATIVE SUMMARY

At the request of the City of Santa Fe, the Office of Archaeological Studies (OAS), Museum of New Mexico, has developed a data recovery plan (DRP) to conduct archaeological excavations in advance of the construction of a new Civic Center in Santa Fe. Construction plans propose to remove the existing Sweeney Convention Center and build a new two-story building with a below-ground parking garage in the block at the northeastern corner of West Marcy Avenue and Grant Avenue, in the Santa Fe Historic District. This location spatially coincides with a recorded archaeological site, LA 1051, the Pueblo de Santa Fe, which archaeological testing by the OAS has determined contains a

large Coalition and Classic period pueblo, and Colonial Spanish and U.S. Territorial period deposits. The data recovery project will fully investigate the nature, condition, and extent of cultural deposits in the construction area, and will constitute a treatment of those resources. Recommendations for future management of the site will result. Field work is anticipated to begin in June of 2005.

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INTRODUCTION

The Office of Archaeological Studies (OAS), Museum of New Mexico, is responding to a request from the City of Santa Fe, New Mexico, to conduct archaeological data recovery in advance of the construction of a new civic center in Santa Fe. Preliminary plans propose a new 72,500 sq ft, two-story building with a 600-space, two-level, below-ground parking garage next to City Hall, in the area presently occupied by the Sweeney Convention Center and parking lot (Figs. 1 and 2). The total area of disturbance covers roughly 3.5 acres (1.4 ha). This project area encompasses the known area of LA 1051, El Pueblo de Santa Fe, a Coalition–Classic period pueblo (Fig. 3).

This document presents a data recovery plan for the Santa Fe Sweeney Convention Center in compliance with the State Cultural Properties Act of 1969 (as amended). The strategy proposed in this data recovery plan is a combination of expanded testing and data recovery. The data recovery, broken into two phases, involves systematic excavation beneath Areas 1–3 in the parking lot and the Sweeney Convention Center location (Area 4)(Fig. 3). This strategy is designed to systematically expose and document the archaeological features and deposits encountered during the preliminary testing. The testing component of the project involves using a ground penetrating radar system (GPR) to locate resources not documented during the preliminary testing, and to hand excavate two 1-by-2-m test pits beneath the Sweeney Center location (Area 4) to determine if any archaeological deposits exist beneath the building. If cultural resources exist, treatment alternatives will be presented, possibly including additional archaeological and historical studies; avoidance by redesign; or adaptive, benign reuse of cultural deposits or features. This project will be conducted within the frame-

work outlined in this plan and in consultation with the City of Santa Fe, the New Mexico Historic Preservation Division, and the Cultural Properties Review Committee.

Between October 5–15, 2004 and January 19–20, 2005, The Office of Archaeological Studies (OAS), Museum of New Mexico, tested the proposed new civic center site. Ten backhoe trenches of varying lengths, and two 1-by-2-m test pits were used to sample the property. Cultural resources from the modern, historic, and prehistoric periods were encountered. The proposed data recovery project is designed to fully investigate the nature, condition, and extent of cultural deposits in the construction area, and will constitute a treatment of those resources. Recommendations for future management of the site will result. These include a data recovery plan and recommendations for adaptive reuse of selected features of the site.

The first Request for Proposals (RFP #05/07/P) for the testing phase was issued on September 28, 2004 by the City of Santa Fe. Field work occurred between October 5 and October 15, 2004. Testing was limited to mechanical excavation. An amendment was approved by the City to excavate two 1-by-1-m test pits along the west wall of the Sweeney Center. Field work for the hand excavations occurred between January 19 and January 20, 2005.

The City of Santa Fe issued Request for Proposals (RFP #05/014/P) for the data recovery Program on March 28, 2005. It was awarded to the OAS on May 11, 2005.

A detailed report of the findings from the testing phase, data on the environment, and cultural background of the project area are available in Lentz (2005).

The proposed site of the new Santa Fe Civic Center occupies part of the block between West Marcy Avenue on the south,

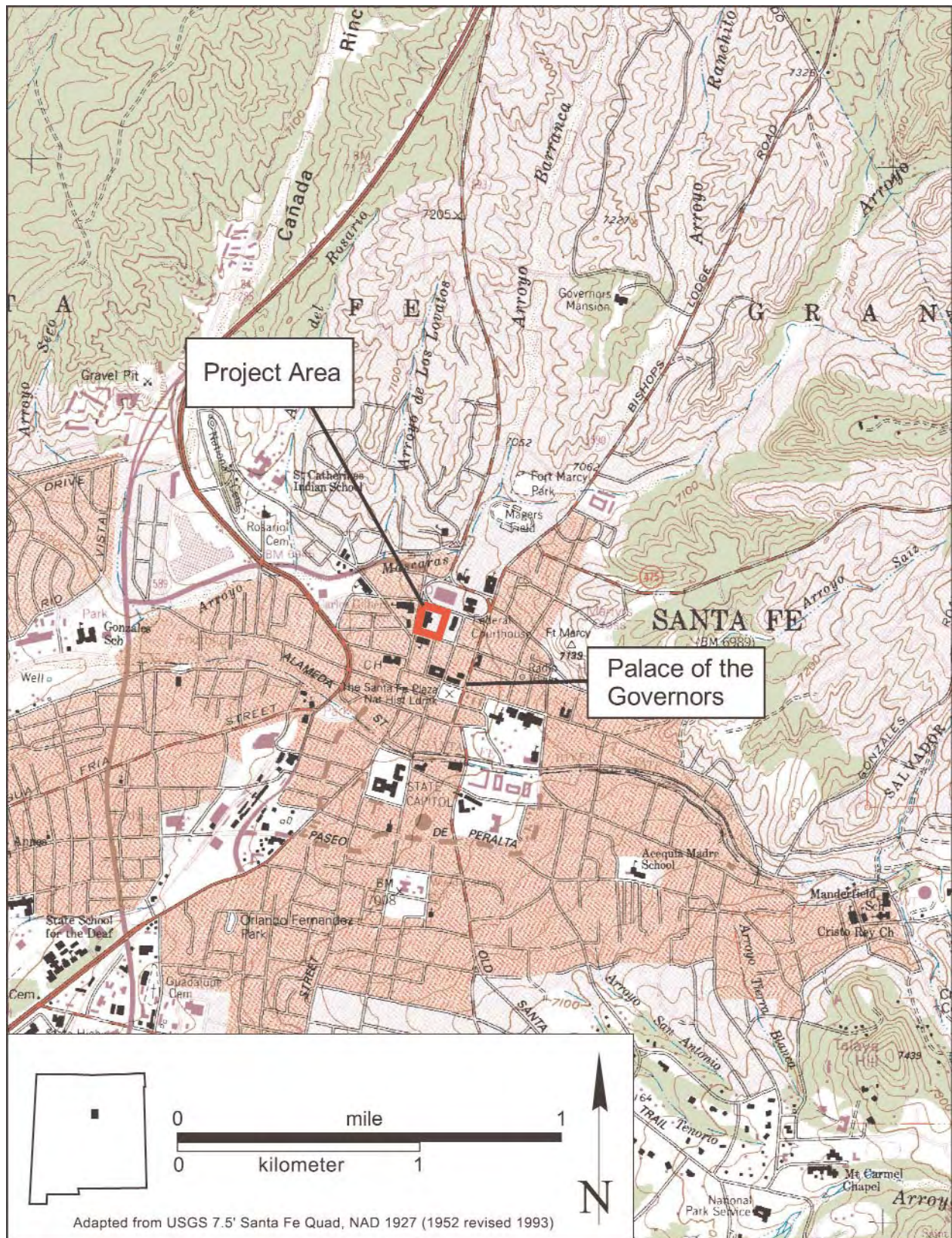


Figure 1. Project location.

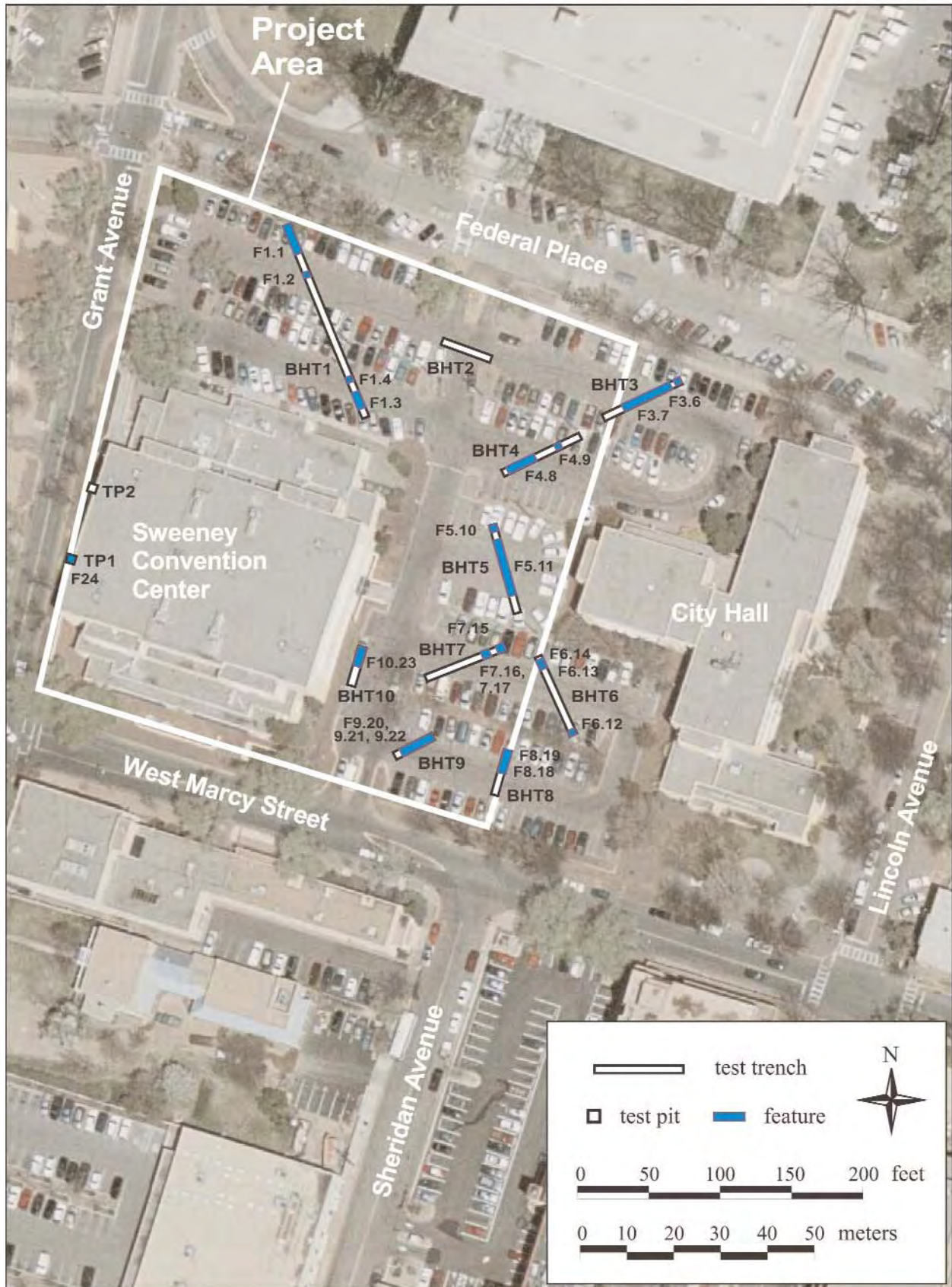


Figure 2. Aerial view of the project area.

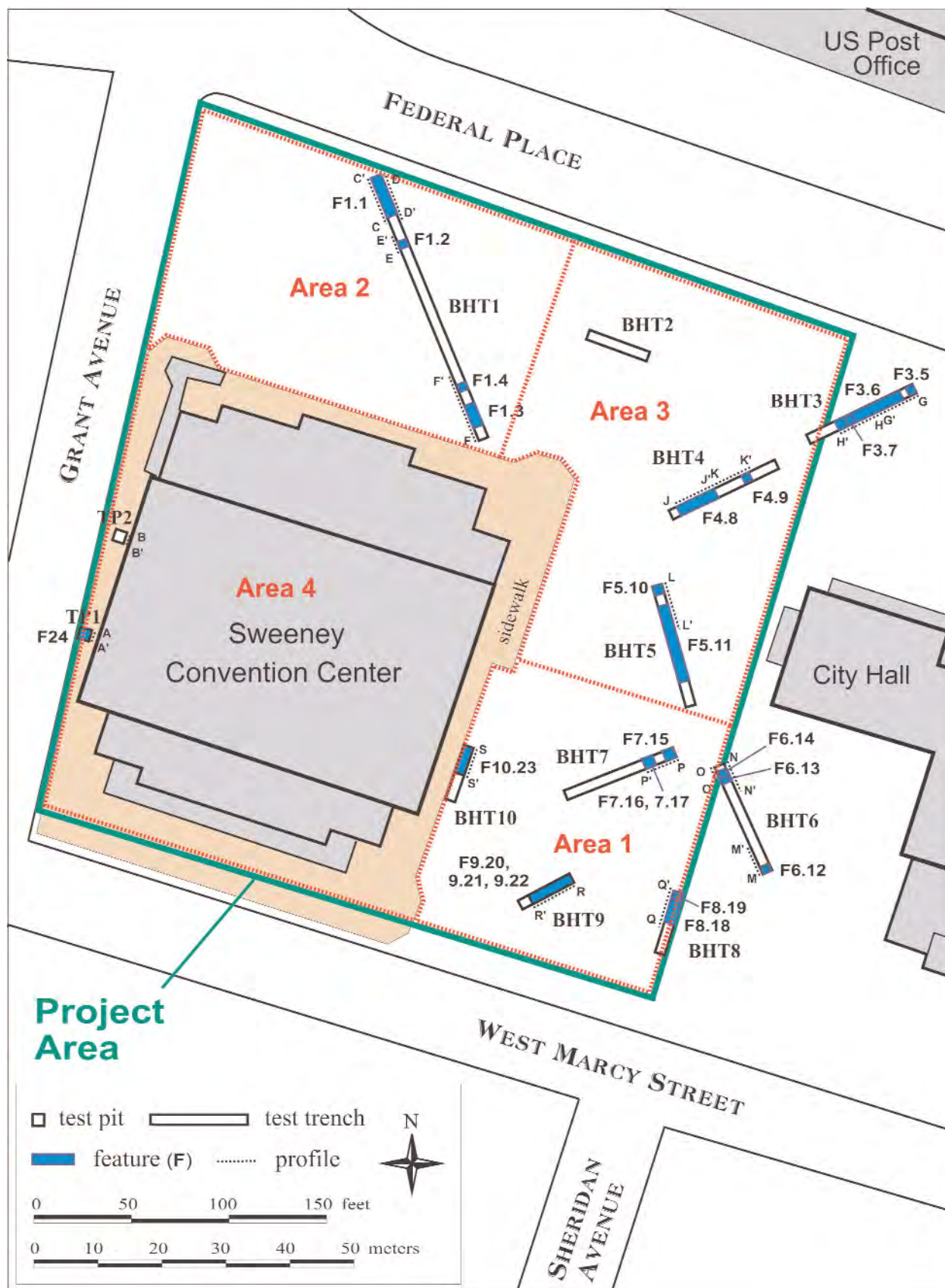


Figure 3. Project area, showing test trenches, features, and major excavation areas.

South Federal Place on the north, Grant Avenue on the west, and Lincoln Avenue on the east, in downtown Santa Fe, New Mexico (Fig. 2). The block is within the unplatted land of the City of Santa Fe Grant in Santa Fe County, NMPM; UTM Zone 13 (NAD 27) [REDACTED] (USGS 7.5' Santa Fe Quadrangle map, 1977; Fig. 1). The city-owned project area consists of a paved parking lot covering roughly 2 acres and the Sweeney Convention Center (covering roughly 1.4 acres). Santa Fe City Hall lies on the eastern end of the block, but is not within the area of potential effect. Work performed by the OAS complies with the provisions set forth in

Section 106 of the National Historic Preservation Act (36 CFR 800), Executive Order 11593 (1972), the National Environmental Policy Act of 1969 (91 Stat 852), and the State Cultural Properties Act of 1969 (as amended).

The project area is within the Historic Downtown Archaeological District and activities undertaken at this location must follow the guidelines included in the Archaeological Review District Ordinance for the City of Santa Fe (adopted October 12, 1987). LA 1051, El Pueblo de Santa Fe, is eligible for inclusion on the *National Register of Historic Places* (NRHP) and the *State Register of Cultural Properties* under Criteria A and D (*National Register Bulletin* 1991:12).

RESEARCH ORIENTATION AND DATA REQUIREMENTS

The initial questions asked by archaeologists when planning excavation of a new site are simple: Who lived here? From where and when did they arrive? To where and when did they go? What was daily life like? What did they eat? What was their society like? What was the environment like? Though the questions are simple, the process of finding answers is challenging. These questions may be addressed through research domains including chronometrics, cultural affiliation, site formation, subsistence adaptations, settlement patterns, social organization, and palaeoenvironment. The recovery of baseline data is a first step in addressing the questions, and archaeologists have developed integrated sets of recovery methods and interpretive techniques for retrieving pertinent data and analyzing it in the context of the above questions. A frequently useful approach to understanding the regional development of settlements and people's relation to the environment is to comparatively analyze the findings from other excavated sites in a region. Thus, multiple inquiries and the application of appropriate techniques guide the proposed site study.

THE PREHISTORIC PERIOD OF LA 1051

We refer to the Late Coalition–Early Classic period components at LA 1051 as El Pueblo de Santa Fe. In the early 1930s, Mera informally referred to these deposits as "the Old Schoolhouse site," but we have not use this name because of possible confusion with the Agua Fria Schoolhouse site (LA 2).

We seek to ascertain the length of occupation of LA 1051, including the time and cause(s) of abandonment. Second, we are interested in knowing if the nature of the site

architecture, the human and faunal remains, and the pottery contain information on the cultural identity of site occupants. Third, we want to determine the extent and scope of any regional interaction between the residents of LA 1051 and other local communities. Fourth, we wish to define the subsistence endeavors of the site occupants. Lastly, analysis of the paleoclimatic record at nearby Arroyo Hondo Pueblo indicates that a frequently depressed and unpredictable moisture regime predominated between A.D. 1325 and 1400. Therefore, we plan to examine the environmental conditions during the period of site occupation, since social and economic networks can fluctuate in size and in intensity of interaction, depending upon climatic circumstances.

Was LA 1051 part of a larger community network of contemporaneous pueblos that may include up to nine contemporaneous villages along the Santa Fe River and its southern tributaries? What was the extent and nature of any interaction sphere? If there was an interaction sphere, was it confined to Late Coalition and Early Classic Tano pueblos along the Santa Fe River, or did it include early Keres villages to the south, such as Cieneguilla or mid-fourteenth-century sites in the Cochiti area, such as LA 6461 or LA 6455 (Lange 1968:73)? Was there interaction, or even some form of alliance, with the Galisteo Basin pueblos to the south? Despite frequent episodes of drought in the later 1300s, several villages in the region were not abandoned. The ceramic assemblage at LA 1051 suggests that occupation may have spanned this period. Why were some pueblos abandoned and others not? How did the repeated environmental perturbations affect Coalition and Classic period subsistence practices and social networks? These, and other questions related to settlement patterns and subsistence within

the project area during the fourteenth and early fifteenth centuries will be addressed in the following research design.

Chronological Data: What were the major periods of occupation of El Pueblo de Santa Fe?

Preliminary analysis of the diagnostic pottery types recovered during testing (Wilson and Lewis 2005) indicated prehistoric occupation of LA 1051 between A.D. 1200 and 1400. This coincides with the Late Coalition and Early Classic time periods (approximately A.D. 1200–1325 [Dickson 1979; Peckham 1984; Wendorf and Reed 1955]). Our goal is to refine the chronological information, extending either the temporal range of site occupation, reducing it, or determining whether there were multiple occupational episodes.

Culturally sterile soils beneath Coalition strata at the site suggest that the Coalition period deposits may be the earliest. These were encountered in auger tests. However, this does not exclude the possibility that earlier cultural horizons exist in areas that were less intensively tested. Therefore, a refinement of chronological placement dates awaits both excavation data and the recovery of datable samples.

Data needed to address this problem: A relative chronological sequence can be obtained by monitoring and measuring both natural and cultural stratigraphic layers. However, if available, appropriate chronometric samples can be retrieved from these layers and provide a more accurate understanding of temporal sequences. If present, chronometric samples will also be taken from each feature encountered. Possible samples include organic material that lends itself to radiocarbon assays, burned or dry wood displaying tree-rings, and if intact and appropriately burned hearths are found, archaeomagnetic samples. Other temporal indicators include projectile point types (which rarely provide rigorous time-sensitive data) and, importantly, diag-

nostic ceramic types (see Wilson, this volume). Independent or comparative use of these data should provide reasonably useful beginning and ending dates for the prehistoric occupation of LA 1051.

It may be that stylistic and typological analyses of pottery are among the most effective methods for determining occupation dates. Wilson (in Lentz 2005 and this volume) reports that the site contains several pottery types that were manufactured as late as A.D. 1450, suggesting an occupation spanning the first 100 years of glaze ware production (Habicht-Mauche 1993; Stubbs and Stallings 1953; Warren 1979). Many Rio Grande pottery types have well-documented dates of manufacture and will provide a useable avenue for determining site history should desirable chronometric samples not be found.

Social Organization: What is the relationship between LA 1051 and other villages of the same period(s) in the northern Rio Grande?

The testing report states that at a minimum, the site has the potential to be of the same level of importance as other landmark sites of the same time period: Pindi Pueblo (LA 1; Stubbs and Stallings 1953), the Agua Fria Schoolhouse site (LA 2; Lang and Scheick 1989) and Arroyo Hondo Pueblo (LA 12; Schwartz 1979)(Lentz 2005:3).

The contemporaneity of these pueblos and LA 1051 is primarily based on ceramic data—that is, they are all dominated by Santa Fe Black-on-white and later, by early glaze wares. The existence of these sites at around the same time period suggests a possible inter-village pattern of community during the Late Coalition and Early Classic periods. The concept of community can be as broadly based as Wills and Leonard's (1994:xiii) definition as a "residential group whose members interact with each other on a regular basis," or as specific as Kintigh's (1994) model of "aggregated and non-aggregated" communities. Adler (1994:98) defines communities as the

"consistently highest level of integrative organization on the social landscape and the most consistent resource access institution on the local level." Communities may be held together organically, spatially, or ideologically.

Each prehistoric village appears to have a parallel history, and most share a distinct demographic downturn in the mid-fourteenth century. During the period of depressed moisture levels in the latter 1300s, some villages continued to survive, such as the Agua Fria Schoolhouse site, and population even grew. In contrast, major construction ceased at Pindi Pueblo in A.D. 1349 (Stubbs and Stallings 1953:14, 25) while Arroyo Hondo Pueblo was virtually abandoned. There was brief reoccupation of Arroyo Hondo Pueblo in the A.D. 1370s, but the pueblo was destroyed by a catastrophic fire in A.D. 1410, possibly precipitated by conflict. The terminal date for occupation of the Agua Fria Schoolhouse site (LA 2) is A.D. 1425 (Lang and Scheick 1989:12). Although the data are inconclusive, there seems to be a demographic decline at most of these pueblos beginning in the mid-fourteenth century. Large pueblos and increased population densities begin to dominate the landscape, especially in the Galisteo Basin. In the Santa Fe area, La Cieneguilla Pueblo was the largest village at A.D. 1420, perhaps occupied by people who had left other Santa Fe River villages.

The favored explanation for aggregation is that it is a response to stress, possibly initiated by decreased amounts of rainfall. In fact, tree-ring data (Dean and Robinson 1977; Maxwell and Blinman 2003; Orcutt 1999; Rose et al. 1981) show a significant drop in moisture in the Santa Fe area beginning around A.D. 1325 and lasting to A.D. 1400. At this point, did the populations existing along the Santa Fe River migrate to the Galisteo Basin? Evidently some did, and some did not. Based on our current knowledge of the site's occupation date, it appears that LA 1051 may be one of the villages that survived the drought. Was this the result of community interdependence,

alliances with neighboring villages, or modification of subsistence practices?

Data needed to address this problem: According to Adler (1994), intercommunity integration combined with hierarchical authority is signaled by the presence of high-level integrative facilities. High-level facilities include subterranean ritual or ceremonial structures. These are utilized for social activities involving larger groups and are often used to integrate one or more communities (Adler 1993:335; Adler and Wilshusen 1990:135). Wilshusen (1988) has developed several categories of pit structures, including those devoted to household use, and integrative structures which serve, but are not limited to, ceremonial or ritual function on a village level. Integrative structures that serve extended communities are commonly referred to as "great kivas."

Several subterranean structures were classified as kivas within the southeastern portion of the LA 1051 project area. As noted (Lentz 2005:1–72), this assessment is subject to further evaluation; it is based solely on the assumption that Classic period subterranean structures were kivas. Only additional excavation can determine the true function of these features. However, with the exception of great kivas, most subterranean rooms of this period serve a multipurpose function, incorporating both domestic and ritual activities. I would suggest that the greatest difference between a kiva and other pit structures is that kivas, particularly those with an integrative function, were specialized *non-habitation* rooms, i.e., not built, occupied, nor maintained by a single family. That is not to imply that individuals did not spend time in these structures, but that residence was limited to short periods, and that time may have been devoted to ceremonial or ritual undertakings. Other indicators of ceremonial use might include architectural or floor features such as rectangular sub-floor pits, altars, shrines, prayer stick holes, and sipapus. Less likely, and more characteristic of later Classic kivas, are resonating pits, ceremonial vaults, and mural paintings. If, in

fact, there is a Coalition–Classic period community along the Santa Fe River, it is likely that substantial movement between these contemporaneous villages occurred. The hosting of neighbors and relatives at LA 1051 might be reflected in details associated with the integrative structures designed for that purpose. Kivas within plazas are predominant features after A.D. 1350. Could kivas indicate former roomblock–plaza layouts? At El Pueblo de Santa Fe, burials are also associated with the occupation surfaces of several of these structures. Burials are relatively common in kivas, and can occur subfloor, in contact with the floor, in features, or in the fill. Any range of individual burials can be found in kivas. This includes "high status" burials, men or women, children, neonates, and, in the case of ceremonial closures, dogs, turkeys, or other animals. Hence, interment in a kiva does not necessarily confer high status on the burial (Schlanger 1992).

Rooms and plazas can also be regarded as integrative facilities (Adler 1989:36), although it is likely the plaza at LA 1051 has been removed during the many construction episodes this location has undergone. If there was in fact a great deal of population interaction during the mid-fourteenth century, we might expect architectural modifications to the kivas, or the addition of larger integrative facilities to accommodate greater information exchange and community interaction.

At Pindi Pueblo, there was a shift to surface kivas, habitation rooms were rectangular and constructed of coursed adobe, and floor features were dominated by basin-shaped firepits. Changes in vernacular and ritual architectural styles at El Pueblo de Santa Fe may be interpreted as reflecting changes in the structure of social and economic relationships between groups, possibly by emphasizing differences through material display. At the same time, architectural change may result from shifts in the role that cultural diversity plays in these transactions during the critical drought period. Monitoring architectural styles, and feature variability within structural components may

reflect the degree of social and economic change within the Santa Fe River community.

Data needed to address this problem: Pottery studies may shed light on the issue of the extent and frequency of intervillage interaction. Studies of paste and temper may reveal patterns that reflect different manufacturing locales or differences in access to varied sources of raw materials. Such differences may indicate trade or kinship-based movement between the villages. Alternatively, homogeneity in pastes and tempers within or across pottery types may reflect self-sufficiency and an autonomous social composition of the LA 1051 occupants. These studies will include microscopic examination of paste and temper, as well as more detailed petrographic analysis of sherd bodies.

Cultural Relationships: Can associations or alliances with other groups be determined?

Archaeological evidence shows that the ruins underlying the proposed civic center constitute a medium to large Classic period village with earlier Coalition period deposits. This may have important cultural implications for local Native American groups seeking ancestral locations. The preliminary ceramic analysis shows an affiliation with Southern Tewa, or Tano groups, from the Galisteo Basin. Since little Galisteo Basin glaze ware is found north of Tesuque Hill, but occurs in abundance to the south in the Galisteo Basin, many researchers hypothesize that populations along the Santa Fe River immigrated into the Galisteo Basin and occupied the large Classic phase sites starting in the mid-fourteenth century.

Habicht-Mauche (1993:94) notes that the boundaries between ceramic and linguistic districts are the same. It is evident that the author is drawing definite correlations between culture groups and the pottery that they use, while refraining from directly stating that pottery styles can be used as identity markers. If, in fact, the Pueblo groups such as

the Tiwa, Tewa, Tano, and Towa can be identified by certain pottery types, then this can be used to track population demographics, or monitor trade and exchange as suggested by Wilson (this volume). The twelfth through the fifteenth centuries in the northern Rio Grande was a time characterized by significant population movements. Since LA 1051 occupies the boundary of the glaze ware area and the northern Biscuit ware area (see Mera 1935, 1937), the question of population movement is particularly relevant to our research objectives. The substantial influx of glaze wares into the Galisteo Basin suggests that contemporaneous groups occupying the Santa Fe River immigrated into the basin in the mid-fifteenth century. In the testing report, Wilson (in Lentz 2005:49-54) describes pottery types identified with Keres and western groups as St. Johns Polychrome, Heshotauthla Polychrome, and glaze wares from Cieneguilla Pueblo. Cieneguilla Pueblo has typically been associated with non-Tewa or Keres influences (Peckham 1984:279). Design styles from the White Mountains and the Four Corners areas are reflected in the copies of these wares that occur on Rio Grande sites, and in the later glaze wares. Such transitional types, for example, Los Padillas Glaze Ware and Wiyo Black-on-white, are present at LA 1051. Pottery does not necessarily equal people. However, in Habicht-Mauche's (1993:94) analysis of the ceramic assemblage from Arroyo Hondo Pueblo, linguistic and ceramic boundaries coincide. Thus, the relative abundance of intrusive pottery types during the twelfth through the fifteenth centuries, coupled with the abandonment of large portions of culture areas to the area, suggests that either nonlocal groups were moving in, or there was a substantial amount of interaction between culture areas during this time. Wendorf and Reed (1955) argue that the relative paucity of transitional forms and "experimentation" with pottery technology and design suggest that people, and perhaps some of their possessions, were moving into the area. However, this only identifies cultural

relations with a precursor or contemporaneous group; it will not tell us if site occupants are today's Tewas, for example.

It must be emphasized that we are not talking about establishing ethnicity or a particular tribal membership when we ask about determining cultural relationships. "Cultural relationship" is not being used as a synonym for "cultural affiliation." As we attempt to trace population movements in this document, we refer to any type of intervillage interaction, be it pottery exchange or kinship-based interaction. By cultural relationships, we refer to boundaries and the crossing of boundaries. In other words, what were the boundaries of the LA 1051 world? Did they have trade alliances with other Santa Fe River Pueblos? Was the boundary of that alliance ever crossed due to the relationship with Galisteo Basin populations? Was there a regional boundary that was crossed by later Puebloan immigrants from the north?

Further, LA 1051 may be the ideal place to test the "tribalization" model (Habicht-Mauche 1993), situated as it is on the southern edge of the Tewa Basin, but with geographical access to the Santa Fe River, the Rio Grande, and the Galisteo Basin. If so, LA 1051 occupies a boundary area, and may share analogous ceramic data with Arroyo Hondo (only 5 miles to the south), and Agua Fria Schoolhouse and Pindi Pueblo, which are downstream to the southwest.

The tribalization model, as argued by Habicht-Mauche (1993), contends that the intensive localized production and widespread trade of glaze ware pottery after about A.D. 1350 is a reflection of the emergence of a regional tribal network of social and economic integration. Further, there was a centralized authority that brought interdependence and stability to intercultural relations in the region (Habicht-Mauche 1993:87-88). Spielmann (1994:45) feels that the concept of tribes with centralized authority is misused in this context, and such organization structures would better be described as "confederacies."

Data needed to address the problem: If two or more culture groups come into contact, they may exploit clearly separate resource niches, they may be in competition for resources along the borders of their territories, they may enjoy an open reciprocal relationship, or they may be interspersed within the same niches and be in at least partial competition for the same resources (Habicht-Mauche 1993). This situation is inherently unstable and alliances sometimes result. These are distinct from other reciprocal arrangements as they tend to be more formalized. People need not be related to form alliances, since the alliances are based on formalized, reciprocal transactions based on complementarity and interdependence (Habicht-Mauch 1993:94; Upham 1982). This is quite different from a more open, casual network of trade among kin-related groups.

Habicht-Mauche (1993) argues that resources in the northern Rio Grande are patchy and widely dispersed. Therefore, balanced reciprocity and interdependence was probably established and maintained through local systems of intensified craft production, resource exploitation, and regional trade. If some form of an alliance were present between Late Coalition–Early Classic sites within the Santa Fe River drainage and the Galisteo Basin, we would expect to see a complementary network of regional interaction through the sudden and widespread distribution of locally circumscribed raw materials (Habicht-Mauche 1993:94–95). For the Santa Fe River settlements, including LA 1051, regional alliances might be indicated by the presence of glaze ware pottery with various igneous or latite tempers or pottery from the Towa area. Thus, the presence of geographically diagnostic materials can provide a measure of the regional extent of contact that occupants maintained with neighbors. Archaeological evidence for the emergence of such a complementary network of regional and economic interdependence is reflected in the sudden widespread distribution of locally circumscribed raw materials, such as turquoise from the Ortiz Mountains and obsidian from the

Jemez caldera, fibrolite axes from the Sangre de Cristo Mountains, travertine from south of Albuquerque, and Pedernal chert from the Jemez Valley (Habicht-Mauche 1993:94–95).

Coalition to Classic Period Transition: How was LA 1051 affected?

The causes of change from the dispersed settlement system of the Coalition period to the later Classic period pattern of aggregation is a venerable research question (e.g., Cordell 1984; Cordell and Gumerman 1989; Habicht-Mauche 1993; Kohler 1989). LA 1051 may be at the nexus of the Classic period prehistoric occupation of the Santa Fe Basin. It may also be one of the latest occupations in the area. The discovery of subterranean structures in the trenches in the southeast corner of the project area is one of the causes for the OAS to suggest the presence of an early Rio Grande Classic pueblo in downtown Santa Fe. Based on pottery analysis, the occupation of this site spans the transition between the Late Coalition and Early Classic periods, which witnessed fundamental transformations in the structure and integration of Rio Grande society. The relationship between these two temporal periods is critical to understanding the transition from the dispersed pithouse settlement pattern of the Coalition period to the above-ground roomblock-and-plaza layout typifying the early Rio Grande Classic Period. As previously stated, this transition has been investigated at Pindi Pueblo (LA 1; Stubbs and Stallings 1953), the Agua Fria Schoolhouse site (LA 2; Lang and Scheick 1989), and Arroyo Hondo Pueblo (LA 12; Schwartz 1979).

Data needed to address the problem: Intriguingly, the OAS testing has shown that there appears to be little, if no, intervening cultural layers between the Coalition and Classic strata, suggesting little time elapsed between the two occupations. Since they appear to be directly superimposed over one another, the assumption that a rapid shift between the two periods occurred at that location is significant. Data

from LA 1051 may be able to provide information on whether there was a hiatus caused by the drought of A.D. 1325–1400, whether a gradual transition took place at that location, or whether there was a quick turnover between the two systems. A rapid transition would be evident in the ceramic assemblage, with no intervening, or transitional types, such as Wiyo Black-on-white merging into Biscuit ware, or Los Padillas Glaze wares evolving into the glaze wares forms. Conversely, a gradual change from one system to the other would include intermediary pottery forms as well as accompanying changes in architecture and material culture. A hiatus would imply a finalization of the archaeological sequence at that location. Supportive data would include chronometric (radiocarbon, tree-ring, archaeomagnetic) data taken from natural stratigraphic layers representing discrete occupational horizons and from archaeological features. Preliminary indications, however, suggest that diagnostic ceramic artifacts are present that span the critical mid-fourteenth-century period, and possibly extend to the early fifteenth century. If so, a gradual in-place cultural development of the village could provide many clues to the causes and consequences of this critical period in prehistory.

Subsistence: The Economic Landscape

By the fourteenth century, dependence on domesticated plants was well established in the pueblos along the Santa Fe River. However, corn was not the only staple, and there is ample material evidence to support a variety of subsistence strategies other than agriculture, including hunting and gathering. After A.D. 1325, contemporaneous villages to El Pueblo de Santa Fe, namely, Arroyo Hondo (LA 12), Agua Fria (LA 2), and Pindi (LA 1), followed similar patterns in response to similar conditions. All experienced population growth during the moderately wet years of the A.D. 1320s. However, LA 1, 2, and 12 declined dramatically during the drought of

A.D. 1325 to A.D. 1340 and eventually stabilized in the later A.D. 1300s. However, all of the early Classic period sites suffered depopulation around A.D. 1420, during the most severe drought in a thousand years (Rose et al. 1981:94–105). In the intervening years, there was a time of variable, but sufficient overall precipitation. By A.D. 1325, Pindi Pueblo was virtually abandoned. Agua Fria and Arroyo Hondo pueblos sustained stable populations, and may have actually grown. However, when the great drought of the early fifteenth century hit, all of these pueblos (and perhaps LA 1051), were abandoned, and the populations immigrated elsewhere. Traditionally, their destination has been ascribed to the Galisteo Basin, but may have also included sites in the Cochiti area, such as LA 6461 or LA 6455, which have Santa Fe Black-on-white and glaze ware pottery (Lange 1968:73). However, the population immigrating to those sites must have been minimal, because the sites are not very large, especially in comparison to the Classic period Galisteo pueblos. Since preliminary ceramic analysis indicates a continuous occupation at LA 1051 from A.D. 1325 through the early 1400s, it is of great interest how LA 1051 was able to sustain itself through fifteen years of drought.

Data needed to address this problem: The environment at the time of occupation must be accurately defined, since many of the research questions outlined in this report are based on the presumed climatic fluctuations that occurred between A.D. 1325 and 1400. Environmental reconstructions for northern New Mexico are summarized in Dean and Robinson (1977), Maxwell and Blinman (2003), Orcutt (1999), and Rose et al. (1981). It will not be possible to directly study changes in subsistence practices by looking at fields or farming technologies, but plant remains may offer clues. Subsistence information can be obtained through the analysis of botanical samples, pollen samples, macrobotanical remains, and faunal remains recovered during excavation. These paleoenvironmental

data may reveal diachronic changes in the immediate environs over time. Macrobotanical remains will be retrieved through the sampling of features, and pollen samples will be systematically taken from features and appropriate strata. Palynological samples may provide clues to the pre-occupation environment, and the ambient paleoenvironment if taken in conjunction with both features and associated stratigraphy. Also, control samples will be taken off-site for purposes of comparison. Pollen data may also be present in coprolites (Holloway, in prep.). The samples will be analyzed by specialists for plant species identification. It is possible that wooden elements will be recovered from the structures which would be amenable to dendrochronological dating. These new samples will be compared to the existing tree-ring curve to evaluate periods of low or high effective moisture within the project area. Should those data supply evidence for drought (as has been found elsewhere in the region), and cultivated plant remains show no signs of stress-induced morphological change, we may be able to infer a change in farming strategies. For example, perhaps floodplain farming posed less risk for crop destruction as moisture levels decreased.

If El Pueblo de Santa Fe were to last through a decade and a half of severe environmental stress, increasingly intensive coping mechanisms must have been used. Storage is usually the major hedge against hard times. However, once stored goods are depleted, other resources must be sought. Populations may turn to an increased reliance on hunting and gathering. In this event, we would expect more wild plant foods to occur in the botanical collection, and an increase in animal species that are resilient to xeric conditions, such as jackrabbits (see Akins, this volume). Large mammals may play a decreasing role in the diet because they were either hunted out or they migrated to more watered areas.

Macrobotanical remains can also provide information on the climate during the period of occupation. For example, increased use of drought-resistant plants, introduction of wild

species, greater reliance on stored foods, and use of lower-ranked foods as indicated in the Diet Breadth Model (Charnov 1976; Krebs 1978; Keegan 1986; Kelly 1995; MacArthur and Pianka 1966) may indicate climatic stress. Conversely, a broad range of botanical species may indicate that many resources are available. In addition to flotation and pollen samples, coprolite data were used effectively to infer the dietary habits of corn-growing Archaic hunters and gatherers in the Sacramento Mountains (Bohrer, in prep.). Mollie Toll, of the OAS staff, will be performing the macrobotanical analysis.

Test excavations showed a substrata of coarse alluvial sands and river cobbles, suggesting that an arroyo may have flowed through the project area from the northeast to the southwest. Because there was a drought, the amount of water in this channel may have been minimal. However, corn fields are recorded historically in the project area, so perhaps some form of water control was used to maximize local water retention and cultivate small subsistence plots. C. Snow (pers. comm., May 18, 2005) believes that there was enough water in Santa Fe to sustain limited agriculture and allow existing populations to survive. An increased reliance on domesticated species, such as turkeys, could be another adaptive response. This could be indicated by sharp increases in turkey bone during the drought interval.

Trade and distribution of goods may be one response to an environmental crisis. Based on fairly skimpy evidence—namely, worked sherds—we suggest that pottery manufacture may have occurred at this locale. Other goods may have been manufactured for trade along the Rio Grande, and perhaps with Pecos, where contact with Plains groups was fairly consistent. Dietary stress may also encourage increased interaction between affines, wider trading networks, and more emphasis on rituals. In extreme cases, raiding and conflict may have occurred. For example, Arroyo Hondo was burned twice, once in A.D. 1370, and again in A.D. 1410, and there is

evidence for violence-induced trauma on the skeletal remains (Creamer 1993:152–153).

The ceramic assemblage from El Pueblo de Santa Fe (Wilson and Lewis 2005:53–55) is diverse, and not only suggests a prolonged occupation through time, but also contact with local and non-local pottery producing sites. Further excavation should reveal whether El Pueblo de Santa Fe was on the receiving end of trade and exchange, or whether it was a center of trade and redistribution. Warren (1970:4) suggests that the Cochiti area was a major trade center for the earlier glazes, such as Agua Fria Glaze and San Clemente Glaze-on-yellow from about A.D. 1325 to 1400. She also hypothesizes that the pottery redistribution centers shifted to the Galisteo Basin between A.D. 1350 and 1450 and engaged in trade in glaze-on-yellows and glaze polychromes. However, since it is unclear whether the Agua Fria Schoolhouse site was actually the "type site" for Agua Fria Glaze wares, it is possible that pottery production may have occurred at LA 1051 or elsewhere. Evidence of those activities in the project area would include pottery-making paraphernalia such as pukis, worked sherds, mis-fired pots, kiln features, palettes and pigment, and stored raw materials.

Do Human Remains Show Evidence of Subsistence Stress?

At Arroyo Hondo Pueblo (Palkovich 1980), the effects of subsistence stress are highly conspicuous on the human remains. Skeletal remains show high incidences of iron deficiency anemia leading to premature death. Malnutrition coupled with disease resulted in the death of over half of the children under the age of five. Anemia is frequently associated with an excessive reliance on a corn diet. A comparison of the human remains from El Pueblo de Santa Fe and Arroyo Hondo would reveal whether similar pathologies affected the occupants of LA 1051. Akins (this volume) will test the pathologies of burials from LA 1051 against a variety of data bases.

Data needed to address this problem: When the burials are removed from Area 1, they will be excavated and analyzed by specialists from the Office of Archaeological Studies, and any pathologies related to environmental stress will be documented and interpreted. Since several of these features are associated with subterranean structures, the context of the burials must first be examined. Mortuary practices are critical to our research objectives and will be carefully documented. This will also allow questions concerning the characteristics of the kivas and their role in the social organization of the pueblo and adjacent contemporary villages to be investigated. Comparison of skeletal remains from the site with those of the Arroyo Hondo population will allow us to evaluate response to subsistence stress from several viewpoints. Do the two populations exhibit similar stress-related pathologies? (see Akins, this volume)

THE HISTORIC PERIOD OF LA 1051

The historic component at LA 1051 represents one of the earliest Spanish settlements in the New Mexico frontier. In 1610, the new governor of New Mexico, Juan de Peralta, moved the provincial capital from San Juan Pueblo to Santa Fe. The justification for selecting Santa Fe as the Spanish economic and social center may parallel the reasons that prehistoric occupants chose the location. The first known map of Santa Fe (Urrutia 1766) shows that the southern portion of the civic center project area was occupied by a substantial structural complex with an unknown number of rooms and two courtyards, surrounded by agricultural plots. After the Pueblo Revolt of 1680, Santa Fe was reoccupied by the Spanish and, in 1789, a presidio that covered the project area was built. General Stephen Watts Kearny and the Army of the West took possession and occupied the Palace of the Governors and the surrounding dilapidated presidio in 1846, eventually converting it into the Fort Marcy military reservation. This included a hospital

(approximately where the current Sweeney Center stands), parade grounds, barracks, and a "post garden." During the Territorial period (1846–1912), increased outside economic influences were introduced via the Santa Fe Trail and, in the 1880s, the railroad. Beginning in 1906, public buildings were built in the project area, beginning with the Catron Grade School, Santa Fe High School (1918) and Seth Hall (1929). Thus, the project area represents an impressive palimpsest of superimposed successive occupations, ending with the modern era.

A Generalized Model of Adaptation to the New Mexico Frontier (adapted from Boyer et al. 1994)

New Mexico was a frontier through most of its history, first as an expansion of New Spain (A.D. 1600 to 1821), then as a part of Mexico (1821 to 1846), and finally as a territory of the United States (1846 to 1912). The goals set by the Spanish crown for New Mexico included missionization, territorial expansion, and exploitation of mineral wealth. Its role as a buffer for the interior provinces of New Spain and Mexico shaped much of its history. It remained a frontier during these periods because of distance from the interior provinces, the cost and difficulty of communication and transport, and continuous conflict with nomadic Indians. Though communication and transport costs decreased during the American Territorial period and conflict with nomadic Indians ended in the late nineteenth century, New Mexico remained a frontier into the twentieth century because of its small population and distance from centers of manufacture and consumption. A general discussion of frontiers follows, succeeded by a model that attempts to apply these ideas to archaeological remains.

Establishment of a frontier is an economic process, where individuals who lack wealth seek a chance to improve their economic situation. Through the process, the socioeconomic-political experiences and standards of indi-

viduals are altered by an environment where a low man-land ratio and the presence of untapped natural resources provides an unusual opportunity for individual self-advancement (Billington 1963:25)

In his discussion of frontiers and boundaries, Kristof (1959:272) notes that: "the frontier has, and always had, a strategic meaning—the defensive line that keeps enemies out—and in this depends on support from the hinterland." Frontiers are also areas of integration, representing a transition from one way of life to another, where traits from both are assimilated (Kristof 1959:273). As a frontier, New Mexico provided a chance for individual economic advancement while serving as a defensive buffer, first for the inner provinces of New Spain and Mexico against the French and later the United States, then for the United States against Mexico. Further, the New Mexico frontier was a place where Spanish, Indian, and Anglo-American cultures overlapped and adapted to one another, producing an amalgam that was neither wholly one nor another. The degree of acculturation probably varied with wealth, the amount of interaction between groups, and cultural biases. Rich individuals, particularly those of high social status, would be less likely to adopt the trappings of another culture, and more likely to try to preserve what they viewed as a traditional lifestyle. Poor people may have had no choice; partial assimilation of another lifestyle may have been necessary for survival.

Because of the nature of expansion, frontiers are spatially and temporally impermanent (Lewis 1977:153). They change over time when events that occurred in the center of an occupied region are repeated on its periphery as the region expands outward (Lewis 1977:153). Chances for economic advancement decrease as frontiers become settled. Unclaimed land becomes scarce and the best agricultural and pastoral areas are already occupied. New settlers begin to press beyond what had been the frontier in search of new economic opportunity. A new frontier is

formed, and the previous frontier becomes part of the core area.

The boundaries of the New Mexican frontier were variable, changing as areas on the fringe of the Spanish-occupied zone were settled or abandoned. The entire territory was a frontier during initial colonization. Later, an economic and political core area developed and expanded as the frontier was pushed outward by those seeking economic improvement. A lack of official support hindered this expansion, causing it to proceed slowly and suffer continual setbacks. This process underwent radical change as the United States came into close contact with New Mexico in 1821. Suddenly, New Mexico was on the frontier of a vast region called the United States, and represented an area that could be exploited for economic gain by a different culture. Led by trappers and traders, Americans began filtering into the region,

Movement onto this frontier increased after the United States acquired the New Mexican province in 1846. These settlers considered both Spanish and Indians to be the native population. Thus, the position of the Spanish inhabitants of New Mexico was suddenly reversed—they were in the same position relative to the American settlers as Pueblo and other Indians had once been to them. Political and economic power had shifted hands, and the Spanish no longer completely controlled either. The process of acculturation began once again as both natives and settlers strove to adapt to these new conditions.

Frontier societies must be flexible. Because of the difficulties involved in transportation and communication, many goods may not be available for long periods, the delivery of goods may be unreliable, or the cost of transport may make them so expensive that only a small part of the population can afford them. When this situation prevails there may be a reverse acculturation—rather than the native population adopting the settler's technology, the settlers may be forced to adopt native technologies. Thus, there is evidence that the first Spanish settlers in New Mexico adopted

native lithic and ceramic technologies to supplement or replace goods that were economically unavailable to them (Levine 1990; Moore 1992).

While frontier models consider adaptational changes in settlers, they are generally silent on corresponding changes in native societies. Obviously, native societies must adapt to the presence of settlers in their midst, and examining these processes is necessary before frontier adaptations can be understood. Native responses to settlement by outsiders should be conditioned by many factors including:

1. The degree of technological and organizational superiority displayed by the settlers.
2. The amount of interaction between the groups.
3. Communication and transport costs between the core area and frontier.
4. Cultural and political attitudes of one group toward the other.
5. The amount of sociocultural disruption caused by contact between settlers and natives.
6. The economic status of natives vis-à-vis settlers.

Overwhelming technological or organizational superiority can result in an initial tolerance of settlers by natives; however, if the deficits associated with colonization outweigh the benefits, organized resistance may eventually occur. Success or failure of colonization are dependent on the degree of technological or organizational superiority possessed by settlers. Initial Spanish settlement of New Mexico met little or no organized resistance. However, as some of the adversity associated with this occupation became clear, the Pueblo people rebelled in 1680 and settlers were displaced for twelve years (Sando 1979; Simmons 1979).

Interaction between natives and settlers and the adoption of aspects of the other's culture can be conditioned by wealth and proximity. Rich individuals have fewer reasons to

interact with the native population than do poor people—they can always hire others to act as go-betweens. Thus, as economic status increases, direct contact with the other population should decrease. Conversely, as economic status decreases, interaction with the alien group should increase. Wealth also allows some native individuals to better maintain the outward trappings of their traditional culture, or to acquire those of another culture. Thus, wealthy settlers can maintain their traditional material culture, while wealthy natives can more easily acquire the settlers' material culture. There often are social differences also occurring at the lower end of the settlers' economic scale. The greatest degree of acculturation to native customs and material culture should occur among poor settlers. Economically, they are less able to maintain their traditional material culture and more prone to adopting aspects of native culture that enhance their prospects for survival. Conversely, the least amount of acculturation in the native population should occur among poorer individuals, who are forced to maintain their traditional material culture because they cannot afford to acquire that of the settlers.

This generalized model applies to frontier adaptations overall. We now turn to a very specific kind of adaptation, which is the lengthy military occupation of the project area, starting with the pre-military era.

The Pioneer or Pre-Presidio Period (1610–1789)

What is the nature of the Pioneer phase occupation of LA 1051? While it is known that LA 1051 was bounded by at least one road leading north to Tesuque and Taos, there is little or no documentary or archaeological evidence of other early Pioneer (1610–1680) and Pueblo Revolt (1680 to 1692) use of the project area. However, land to the north of the *Casas Reales* may have been agricultural or used for live-stock grazing. Even though test excavations in the civic center project area yielded little or no

cultural deposits or material from this period, it is possible that irrigation or farming-related features may be encountered during the excavation.

From 1692 to 1766, Santa Fe expanded from its pre-Pueblo Revolt configuration. During this relatively long period, private citizens laid claim to the land north of the Palace. As shown on a city map prepared by Urrutia in 1766 (Fig. 4), the project area was occupied by a substantial structural complex of an unknown number of rooms, with twin courtyards. This building was surrounded by agricultural plots. Snow and Snow (1992:112) briefly discuss the presence of three dwellings in the proposed presidio area of 1789. Private homes and fields were bought out by the treasury of the *Provincias Internas* for 300 pesos. Regrettably, the names of the property owners who agreed to these transactions are lost, but it is probable that one of the buildings is the one depicted on Urrutia's map and existed within LA 1051. Eighty years later, the large building shown on Urrutia's 1766 map does not appear on Gilmer's 1846 map (Fig. 5) or Emory and Gilmer's 1846 map (Fig. 6). However, Getty's 1868 map (Fig. 7) shows that the layout of the south "Soldier's Qtrs." (enlisted men's barracks) closely emulates the configuration of Urrutia's structure, suggesting that the barracks may have been built on its foundations. A similar configuration appears on the 1885–86 Hartmann map (Fig. 8) and on the later 1902 Sanborn map (Fig. 9). However, there is no further depiction of this structure on any subsequent maps. Years of neglect may have reduced it to an adobe ruin considered unworthy of mapping. It is possible that the Spanish Colonial period deposits found by Viklund (2004) at the Presbyterian Church location were materials associated with that building.

Data needed to address the problem: This early building of unknown function (informally referred to below as the Urrutia building) apparently served some important function, or was owned by a person of high status.

These conclusions are based on a comparison of its size to other dwellings on the Urrutia map (Fig. 4). No evidence of this structure, or the Fort Marcy barracks that may have been built upon its foundation, were encountered during the OAS testing project. However, evidence for its existence, and the existence of other pre-presidio structures or features, will be sought during the data recovery program. If the Urrutia building was destroyed, cultural materials from the projected location of this structure will be compared to Viklund's 2004 findings to determine if the deposits are related to that occupation. Hopefully, these data will also provide insights on the pre-military or Pioneer period of the project area. A comparison of the two assemblages should provide information on both civilian and military adaptation to the same environment.

The Presidio and Fort Marcy

It is of interest that two military groups of different cultures, after a brief hiatus, succeeded one another in the project area. With the founding of the Villa Real de Santa Fe de San Francisco de Assis in 1610, the Spanish construction of *acequias*, fields, and domestic and administrative buildings began. In 1766, the project area was occupied by the Urrutia building discussed above. Construction of the massive Spanish presidio began in 1789 (Fig. 10) and it was anchored by the Palace of the Governors complex along the southeastern corner. There was a vast central parade ground ringed by a continuous block of barracks and officer's quarters, a laundry, commissary, and other facilities. During the brief Mexican period (1821–1846), the presidio apparently fell into ruin and was later mapped by U.S. Army officers Emory and Gilmer in 1846 as a large corn field (Fig. 6).

After the treaty of Guadalupe Hidalgo in 1848, the U.S. Army converted the presidio into the Fort Marcy military reservation (Fig. 11). Many existing buildings were remodeled for use by the U.S. soldiers. A hospital stood where the Sweeney Center is now located.

This change in occupants is compelling on many levels. The military has its own "culture"—there are rules and laws and regulations and standards of conduct that are very different from civilian life, for example, "military justice" or "military music." It is probably a safe assumption that the Spanish garrison was very different from the American one. Yet, since both were military groups, there must also be similarities. Contrasting these two groups will be one of our research objectives. Early U.S. Army accounts of the Mexican garrison describe it as almost comically disorganized. Taylor (1847:146) described the Mexican army as disaffected, ragtag soldiers that barely maintained the appearance of military order. The majority of the enlisted men had not been paid in years while the officers stole from the treasury and ran a form of "company store," keeping most of the soldiers permanently indebted. Totally demoralized, the army retreated to Chihuahua on August 18, 1846, as the U.S. troops of General Stephen Watts Kearny marched into Santa Fe and claimed New Mexico as a territory of the United States.

Thus, between the years 1789 and 1821, Santa Fe held a Spanish military presidio, and between 1821 and 1846, a Mexican army lived among the townspeople. An inability to garrison the military post was common during the Spanish military tenure and precipitated the construction of the new presidio as an incentive to soldiers and their families to move back into town (Moorhead 1974). Sometime before 1821, the Spanish troops again lost interest in residing within the presidio and the grounds were abandoned (Moorhead 1974).

After 1821, the organizational structure of the Mexican army was likely similar to the earlier Spanish army. Historic documents show that the Mexican garrison was composed of regulars, militia, and the Veracruz squadron of dragoons (Jenkins and Schroeder 1974:44). However, since the presidio was in ruins, Mexican soldiers and their families were dispersed among the local populace.

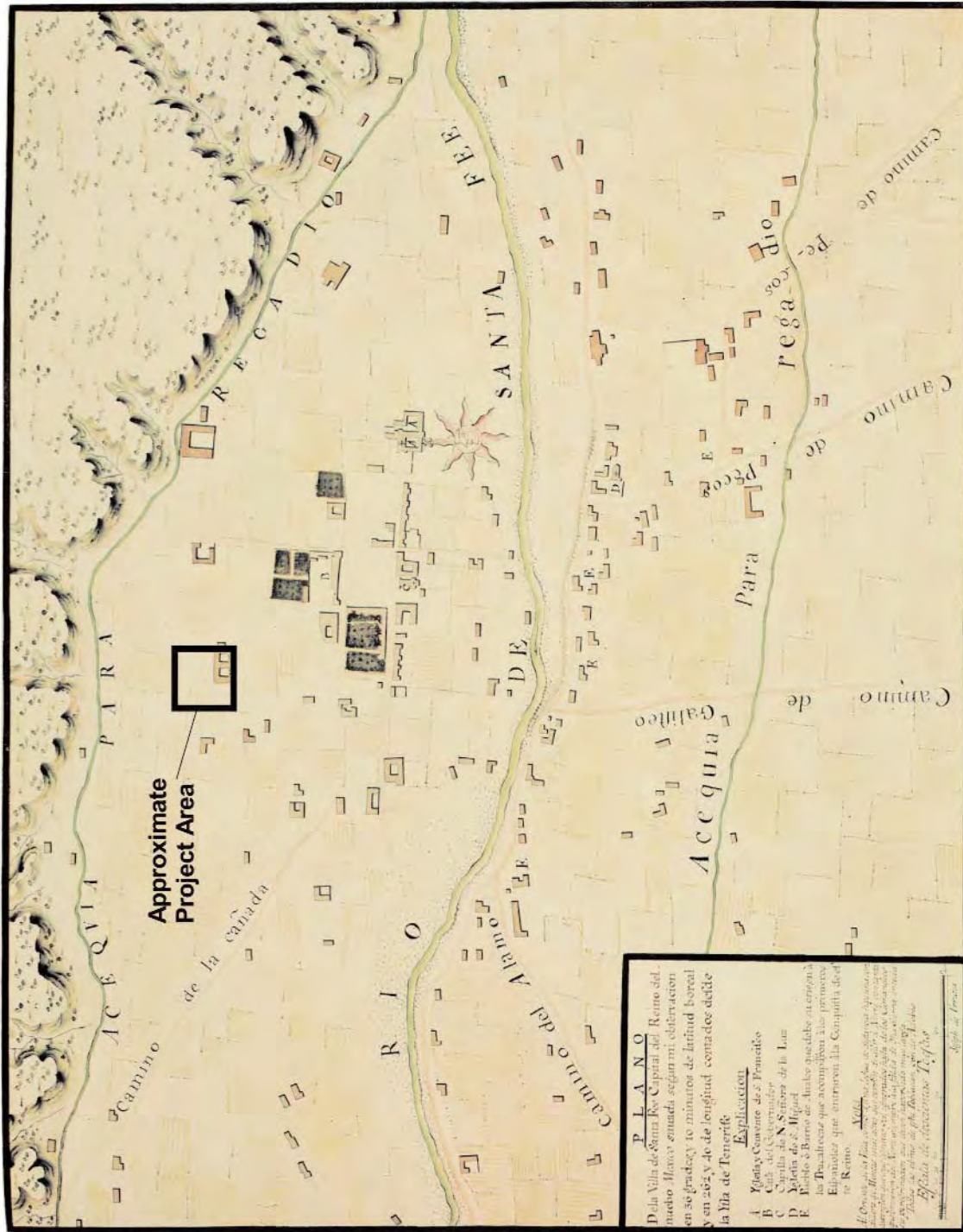


Figure 4. Joseph de Urrutia map of Santa Fe (1766).

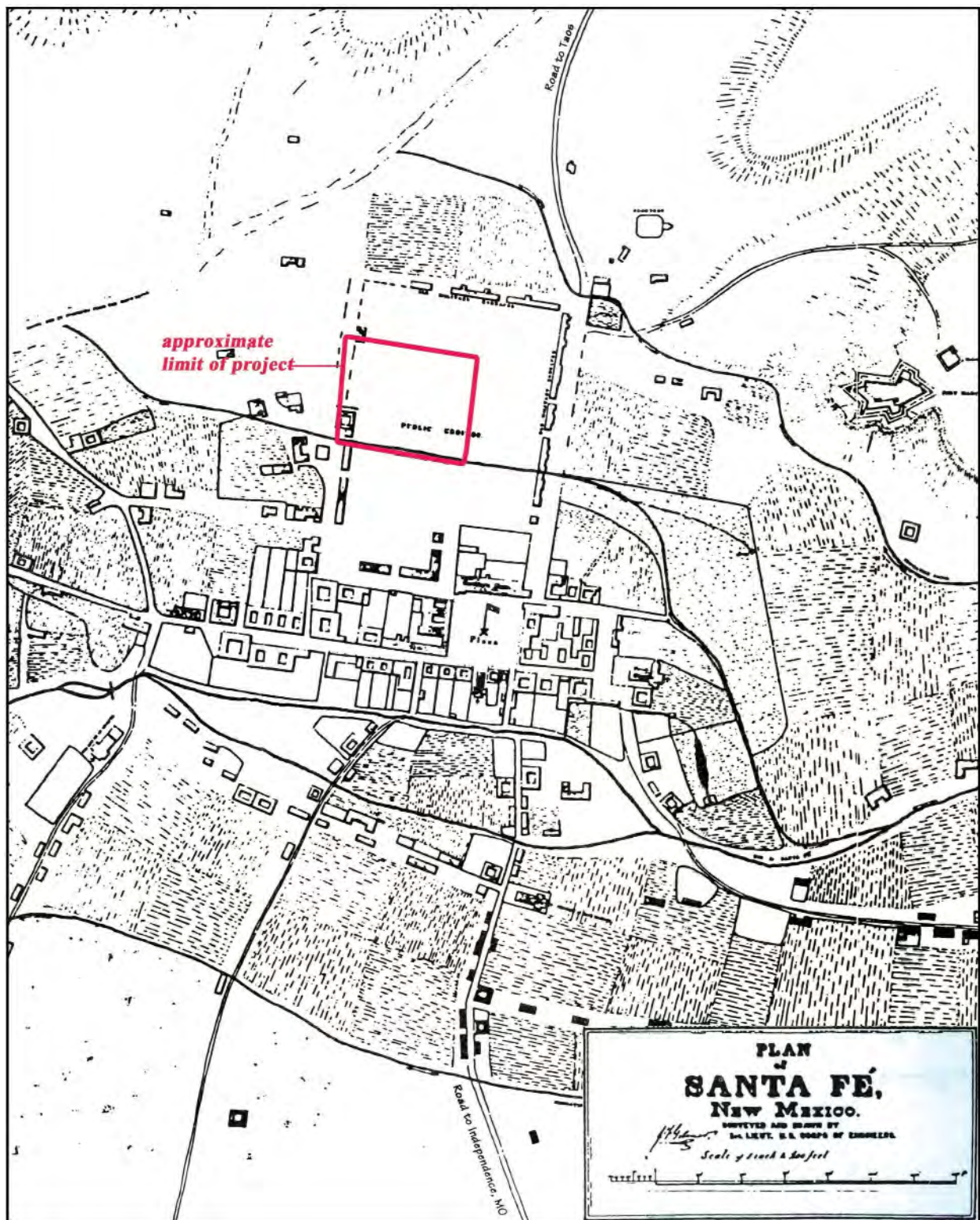


Figure 5. Gilmer map of Santa Fe (1847).

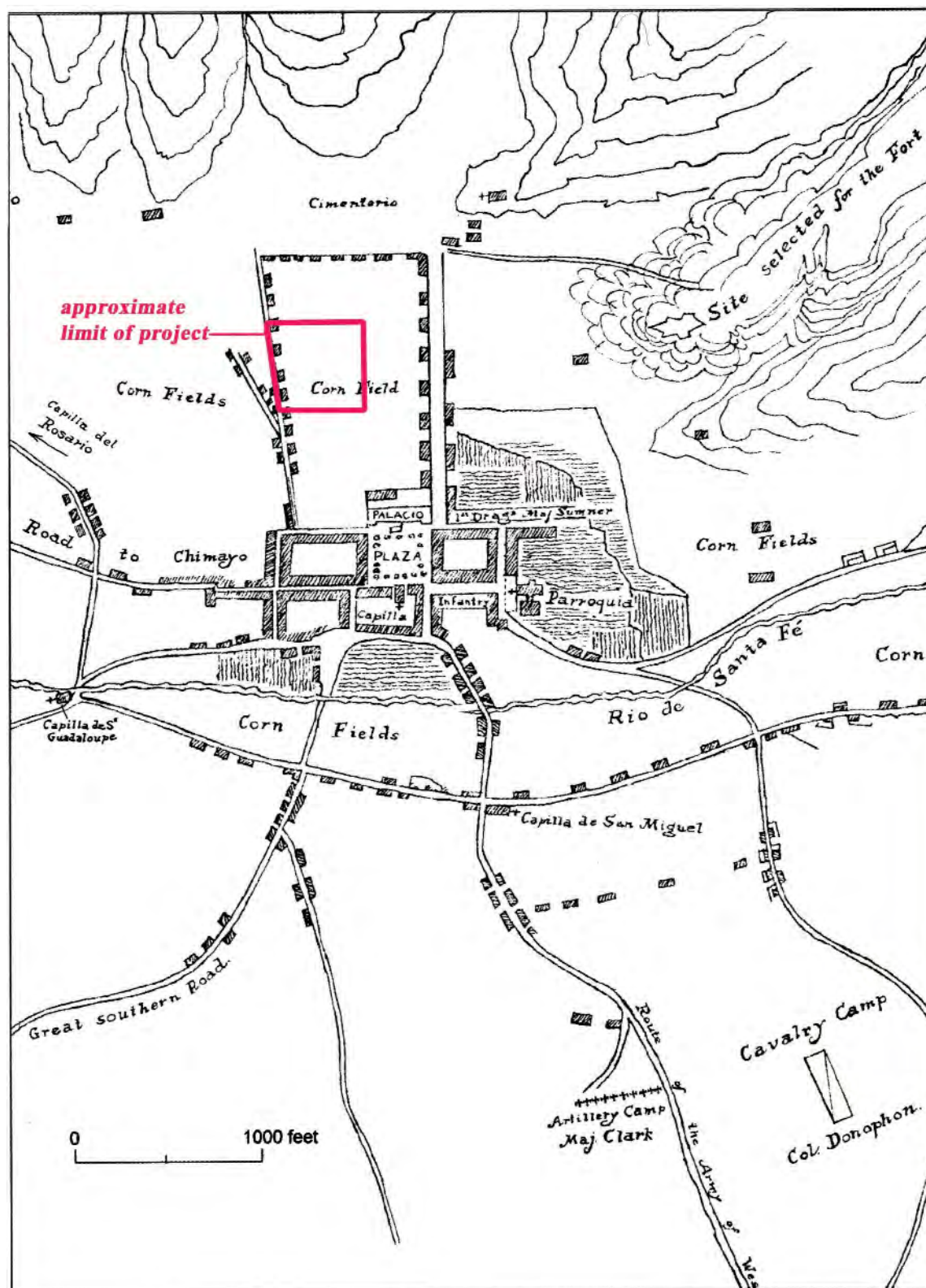
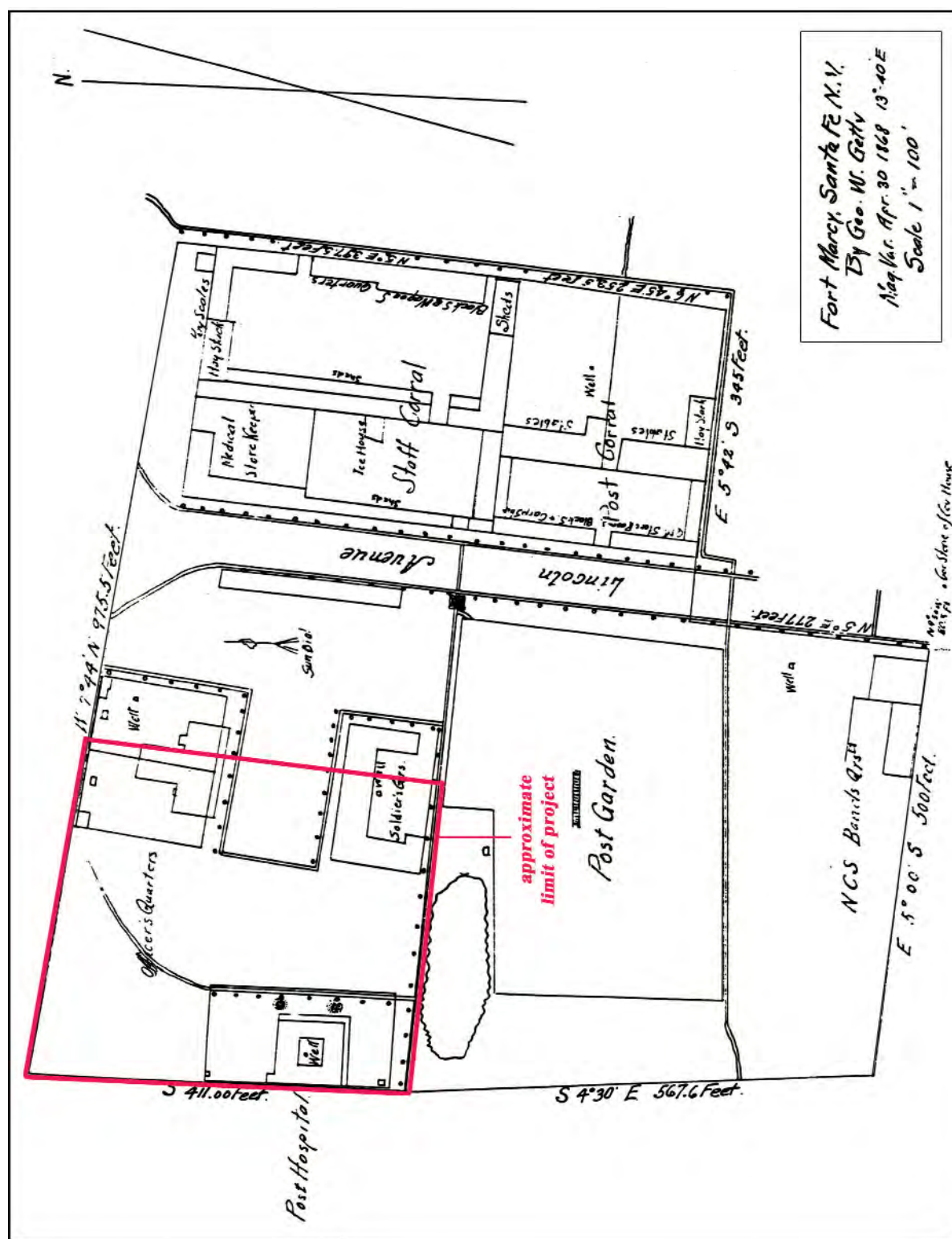


Figure 6. Emory and Gilmer map of Santa Fe (1846).



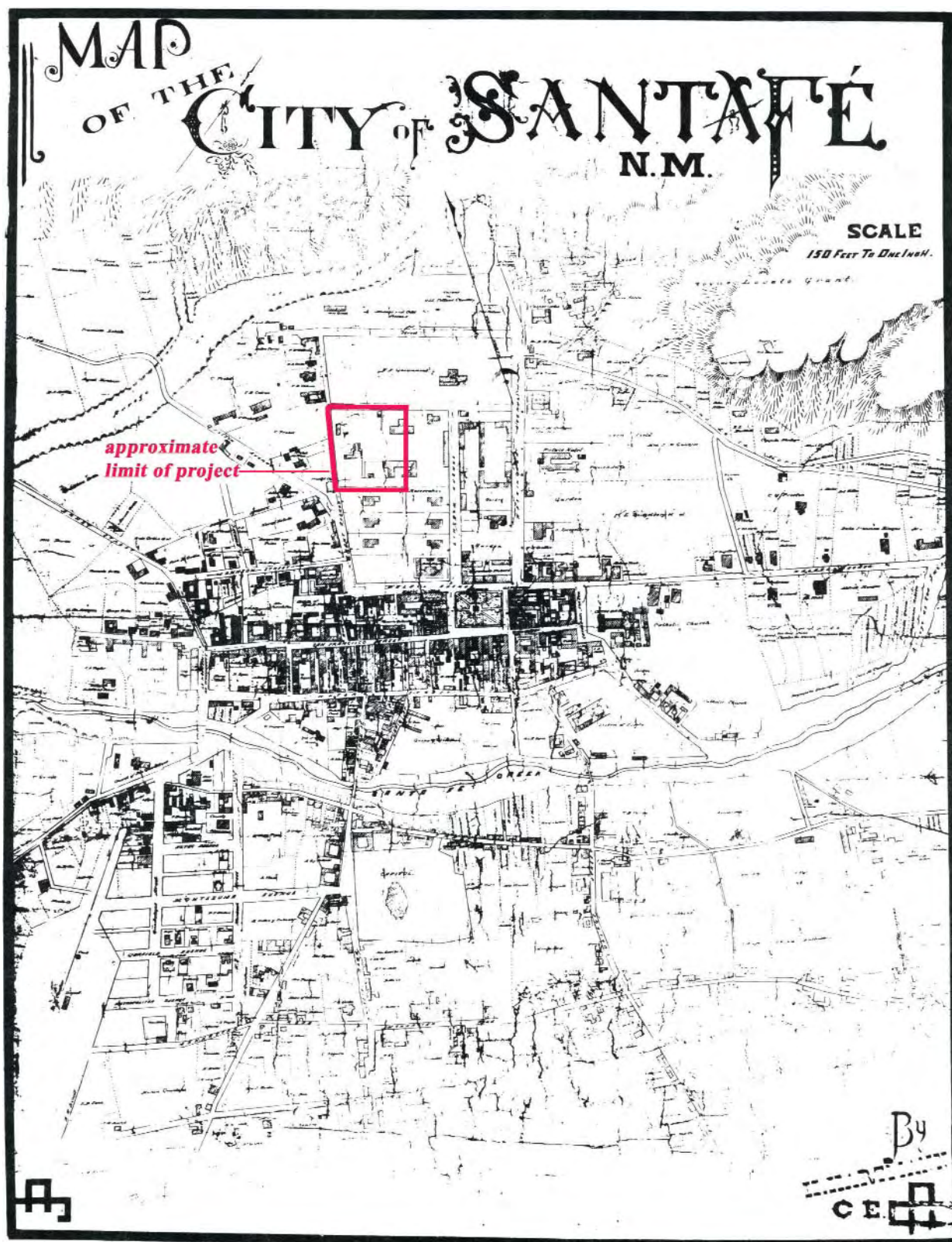


Figure 8. Hartmann map of Santa Fe (1885).

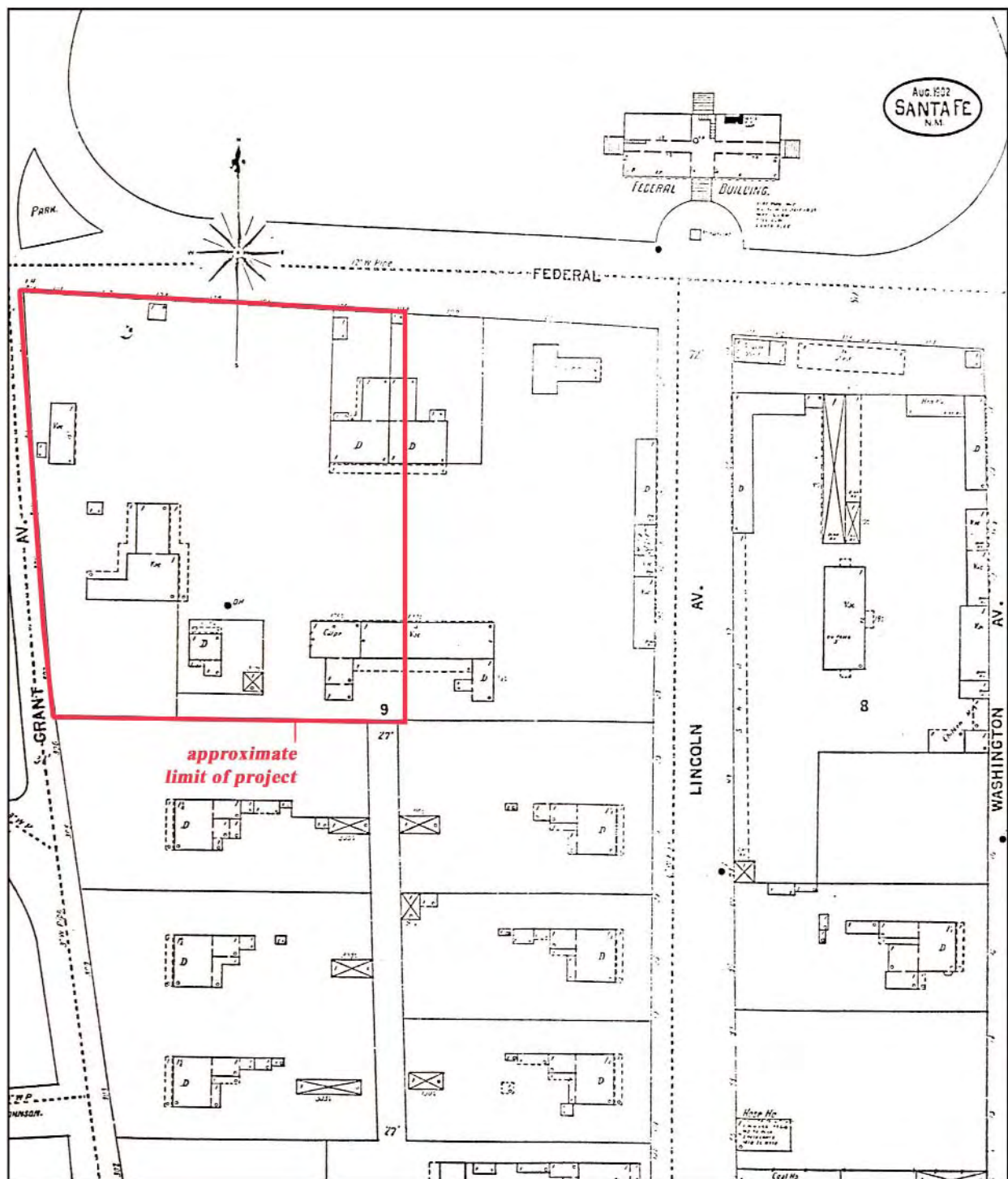


Figure 9. Sanborn map of Santa Fe (1902).

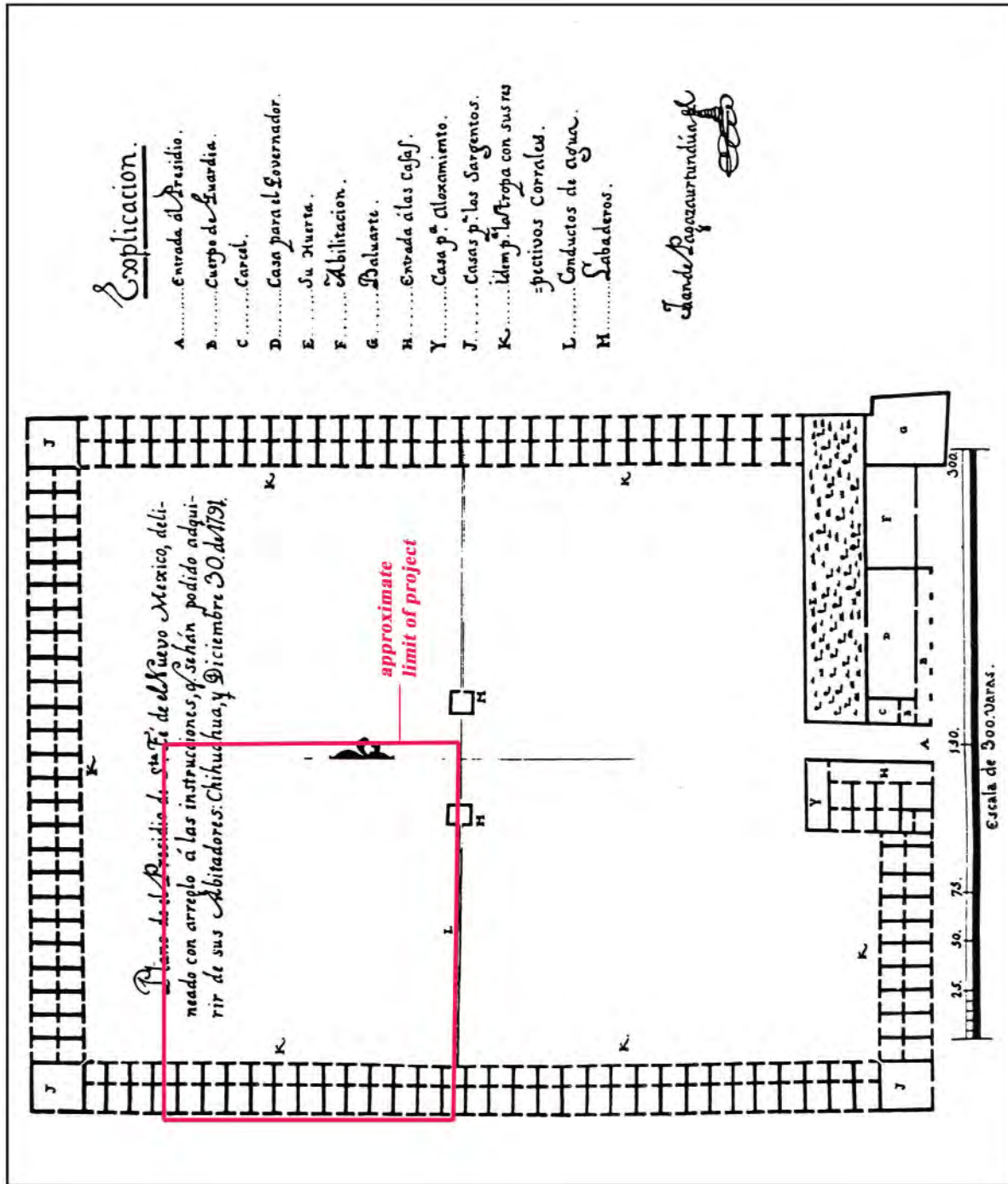


Figure 10. Plan of the presidio (1791).

Since little is known about the first occupying Spanish army, there may be an opportunity to increase our knowledge on that count. Though officers were likely from more populous towns in Mexico, can it be determined if the troops were conscripted or volunteer locals? Did the troops supplement their military allotment of food and supplies by growing their own crops, hunting, and participating in the local economy? To what extent were they dependent on resources from Mexico via the Camino Real, and later the Santa Fe Trail? Did troops marry local Native American women and to what degree did acculturation occur? Though these questions are also applicable to the Mexican army occupation, as stated earlier, historical documents suggest that the Mexican army did not use the project area. To discover otherwise would be a significant contribution to New Mexico history.

The U.S. soldiers were obviously better paid and better provisioned. Though they relied on the support of the United States for their resources, Santa Fe was still a remote outpost. The 1868 map of Fort Marcy by Getty (Fig. 7) shows a large area labeled "post garden," and a well in the middle of the hospital courtyard. Obviously, the military supplemented its stores with freshly grown produce. Unfortunately, eyewitness accounts from the time testify to a complete lack of discipline among the ranks of American soldiers. The second Missouri Volunteers, commanded by Col. Sterling Price, completely disrupted city life. U.S. soldiers were frequently drunk in public, loud and unruly at the fandangos, and bullying to the locals. Eventually, the Army needed to enforce a curfew (Piper 1996:17). Pratt (1992:116) chanced upon an opinion of the Anglo-American population of Santa Fe by George F. Ruxton, who, in 1846, observed: "Neither was the town improved, at the time of my visit, by the addition to the population of some three thousand Americans, the dirtiest, rowdiest crew I have ever seen collected together."

Fort Union was built in 1851, and many

Santa Fe troops, except an artillery unit, were removed to the fort, ostensibly for "Indian fighting." However, the departmental headquarters remained in Santa Fe. The commander of the New Mexico troops (now called the Ninth Military Department), Lt. Col Edwin Sumner, characterized the Army post as a "sink of vice and extravagance." The Union Army abandoned Santa Fe during the Civil War, declaring it "indefensible" and in September of 1867, Fort Marcy was again vacated by the military. However, in 1875, the compound behind the Palace of the Governors was reoccupied (Piper 1996:16–18).

The military history of Santa Fe seems to include a pattern in which soldiers tended to forsake discipline, lose morale, and become disaffected and indolent. On that level, these developments are not a matter of ethnicity or nationality, but the result of context, environment, and social organization. Moreover, these negative characteristics appear to be what all three armies stationed in Santa Fe had in common. On the other hand, since they occupied the study area at very different times, the available technologies are necessarily different. Nevertheless, there may be commonalities in subsistence endeavors and the use of available resources. This might include growing their own crops, exploiting local resources, and integrating into the local culture through intermarriage, business transactions, and shared interests. These similarities and differences between the Spanish and American armies are well worth examining as they occur in the archaeological record.

Data needed to address the problem: What can these archaeological remains tell us about the adjustment by these groups to the frontier? How does the military use of the site and participation in frontier society vary from the previous nonmilitary settlement? What were the subsistence practices of these groups? Recovered material culture will help identify site residents and dates of occupation. When supplemented with documentary information, assemblage data will allow a more com-

prehensive evaluation of the frontier model. Frontier acculturation may be evident in the proportion of imported vs. local goods in the subsistence remains. However, recognizing different cultural groups this way may be difficult. Local militia or residents conscripted into the armed services may have not needed to make any adjustments at all, while Spanish, Mexican, or Anglo-Americans from elsewhere may have had to make substantial lifestyle changes. However, the difference between groups that are already adapted (e.g., recruited from the local citizenry, offspring of immigrants), and those who are not, may be difficult to identify. The premise that access to imported goods is confined to the upper strata of society is an assumption that may need to be tested.

At the level of excavation and analysis, features must be defined that are unambiguously related to each group. A Spanish Colonial period pit, and a pit ascribed to Fort Marcy were both recorded during testing. The Fort Marcy pit contained Bristol glaze ginger beer bottles usually shipped to troops via the Santa Fe Trail and also occur in great quantities at Fort Union. As it currently stands, the tested features are outside the excavation project area. However, additional excavation may yield similar features.

We know that the original presidio was occupied by Spanish troops, their families, servants, slaves, and various other individuals who typically orbit around army encampments. Nearly all socioeconomic classes were represented, from high-ranking officers to Mexican-Indian slaves. Thus, the social rank, ethnicity, and cultural affiliation of the occupants becomes an important factor in determining the composition of the occupants of the presidio. Features or components belonging to members of these economic groups should be relatively easy to distinguish. Many Spanish sites excavated in Santa Fe (Post 2002; Lentz 2005; Moore 1992; Snow 1990) show that there continued to be a heavy reliance on locally produced pottery and the use of lithic artifacts for certain tasks. Chipped stone tools

were used as components in fire-making systems (gun flints and strike-a-light flints), and as replacements for expensive and difficult to acquire metal tools (Moore 1992). Majolica, an elaborately decorated dinnerware produced in the pottery centers of Mexico, occurs on colonial sites, and would suggest the presence of individuals of high social status. Chinese porcelain also occurs, but in lesser quantities. By the middle 1800s, majolica was largely replaced by white, pearl, and stoneware. Conversely, those to whom metal was a luxury frequently transported nodules of Pachuca green obsidian to use instead, as well as Mexican chert bifaces for use as strike-a-lights and gun flints. These show up in Spanish Colonial assemblages with relative frequency (Lentz 2005). The artifact assemblage should provide information on the range of activities that occurred at the site. Information on subsistence should be provided by faunal specimens, botanical samples, and other material remains such as cans and bottles. Pollen and flotation tests will inform on what plants were being consumed. These data are needed to assess the degree of subsistence acculturation demonstrated by site occupants.

With these distinctions in mind, we can generate test implications. Data to be examined include:

1. Artifacts associated with the Spanish garrison

If the occupants were Spanish soldiers, recovered material culture should exhibit:

- a. Colonial-era military items and subsistence items; primarily pottery, ground stone, and possibly metal. While a diverse range of artifacts may represent other activity sets, subsistence activity-related items should comprise a dominant proportion of the assemblage.
- b. A heavy reliance on locally produced pottery should be evident.
- c. Lithic artifacts that reflect fire-making activities. Mexican obsidian may be present.
- d. Imported pottery that may include

Spanish wares.

If some site occupants of the presidio were conscripted native Hispanics or Spanish, Mexican or Mexican Indians of lower socioeconomic class, artifacts specific to each cultural group should be present, for example, green obsidian or native pottery. However, if site occupants were of higher socioeconomic status, majolica, metal, and perhaps Chinese porcelain might be found.

If subsistence needs were left up to individual soldiers who did not buy domesticated animals at the markets, then a higher percentage of wild faunal species should be present. The bones may be axe-cut instead of saw-cut. The overall diet should include less variability in foodstuffs, with a high dependence on carbohydrates, such as corn, beans, and wheat.

If the soldiers were allowed to reside with their families and officers had servants, there should be domestic refuse containing artifacts related to women and children, or servants.

2. Artifacts and features associated with the Anglo-American occupation

- a. There should be a high percentage of mass-produced goods produced in the Eastern United States or Europe. Before 1880, these would have been transported over the Santa Fe Trail and by railroad after that date.
- b. Little locally produced pottery should be present.
- c. Imported pottery should be dominated by American and British produced wares; Spanish wares should be virtually absent.
- d. Aspects of native culture in the assemblage should be subsistence related. These may include specialized tools and foods. Limited numbers of utilitarian objects might also occur.
- e. A uniform button was found during testing, but Bristol glaze containers, metal, and cobble and lime mortar fea-

tures may provide further information on the U.S. Army occupation.

- f. If the U.S. soldiers were indeed "rowdy," then liquor bottles might occur in high frequency.
- g. Only the officers and selected noncommissioned officers were allowed to have families while posted to Fort Marcy. The officer's quarters were outside the project area. Thus, it is unlikely that domestic refuse would contain evidence of women or children's artifacts.
- h. The Anglo-American diet should contain more variability than the Spanish diet, with the inclusion of manufactured foodstuffs shipped from the United States.

Information on the behavioral aspects of the respective groups (such as the reported lack of discipline in both the Spanish and American troops) may be available in documentary resources. While testing the model without documentary data will be partly possible, we need precise information on individual and group activities to verify the information accurately. Lacking documentary information, inferring some behavior may be possible based on artifacts, but this would benefit from confirmation from eyewitness accounts, such as those of Taylor and Ruxton, cited earlier.

Besides understanding the artifact assemblages, we seek to reconstruct the building footprints that existed during each phase. Traces of earlier historic occupations are scant, but historical documents offer some clues. For example, a Spanish building or buildings on the westside of the presidio became the Fort Marcy hospital. It was later incorporated into the original Santa Fe High School and then torn down when the current Sweeney Center was built. Portions of the presidio and Fort Marcy walls may still exist along the northwest corner of the project area (Federal Place and Grant Street) and an old *acequia* used to run on the north side of the project area, along Federal Place (C. Snow, pers. comm., May 2005). The OAS proposes to use ground pene-

trating radar (GPR) to test for subsurface features in this area. This technique will be particularly useful when it comes to defining long linear features, such as historic walls and irrigation ditches. The greatest potential for intact historical deposits is the northeast portion of LA 1051, where there are few modern materials, but good potential for Fort Marcy period deposits. However, we recovered many of the eighteenth and nineteenth-century deposits from disturbed contexts. Disturbance was attributed to twentieth-century activities.

Site Location

At the beginning of this section, we proposed that the project area was consistently chosen through time for settlement. What factors influenced groups from prehistoric times onwards to select this area as a site location? The answer may be the local hydrology and arable land. It's likely that the Santa Fe River floodplain has long been a good location to grow crops, though its flow during drought years is an unknown. Even as late as the 1950s corn fields were planted along Alameda Street next to the Santa Fe River.

Runoff flows down from Fort Marcy Hill toward the City Hall–Sweeney Center, and an arroyo may have crosscut the project area. Other sources of water may have come from the *cienaga* between East Palace and Marcy streets. In prehistoric times, this runoff water (which may have been managed through check dams, cobble-bordered grids, ditches, and other water-control systems), may have aided water-stressed Late Coalition period populations when, during the period between A.D. 1325 and 1375, one drought lasted 17 years (Orcutt 1999:241).

The motives for the Spanish moving the capital from San Juan to Santa Fe in 1609 are unclear. The San Juan colony had been a failure, and the Spanish probably wanted to start afresh. The answer to the choice of the location of the capital may lay in local hydrology. Tigges (1990:75–84) performed soil testing to

document the presence of several large marshes (*cienagas*), one of which dominated large portions of downtown Santa Fe. There was a major *cienaga* in the vicinity of Washington and Palace avenues and Marcy and Nusbaum streets, which lent its name to a street named La Cienega which runs north from East Palace Avenue. Further evidence for the city's past hydrological patterns is Water Street, which is located along the channel once formed by the Rio Chiquito. There were also springs on church property lying south of Saint Francis Cathedral in the Loretto gardens that Archbishop Lamy tended. Tigges (1990:81) identifies the northern boundary of the marsh as East Marcy Street. If so, the project area was well outside the actual marsh.

The main spring (illustrated on Gilmer's 1846 map, Fig. 5) is at the southeast corner of today's *New Mexican* newspaper offices, between East Palace Avenue and Marcy Street. Until the nineteenth century, overflow from this spring was channeled into irrigation ditches. In early Spanish Colonial times, a channel called the Acequia Madre, which furnished water to the Palace of the Governors, originated from this *cienaga*. During the Pueblo Revolt, the channel's water flow to settlers taking refuge within the Palace of the Governors was cut (Lentz 2005), forcing the Spanish to abandon Santa Fe. According to Tigges (1990:5), soil tests show that the *cienaga* land to the west and north of the palace was apparently part of presidio lands. This may be the reason for the fields depicted on the Urrutia map (Fig. 4) and Fort Marcy's well in the hospital courtyard. When the Spanish presidio was temporarily abandoned, locals planted an extensive corn field while later maps of Fort Marcy show a "post garden" (Getty's 1868 map, Fig. 7). These factors, combined with an *acequia* running along the northern boundary of the parcel, a nearby arroyo, and a shallow water table may have created the attraction for settlement at this locale. Tigges (1990:76) questions the Spanish choice of locations for the plaza: "Why didn't the Spanish put the Plaza farther north, near the

site of what is now City Hall, an area with no known cienega soils, no apparent drainage problems and plenty of room for growth? This location appears to have been the site of a sizable pueblo in the 1300s. Why did not the Spanish build on top of it as they did in other areas? (OAS author's emphasis). C. Snow (in Tigges 1990:76), hypothesizes that the Spanish wanted to keep it as an adobe quarry, and presumably "mine" the clay from the prehistoric adobe walls.

Data needed to address this problem: A reexamination of the choices made by the early prehistoric and early Spanish Colonial settlers in selecting the project location may bear revisiting. The center of the original Spanish *Villa Real* is bounded to the north and east by the well-watered, lush *cienega* that provided water for irrigation ditches and animals, and formed a barrier to intruders. On the south was the flood way between the main channel of the Santa Fe River and the secondary channel of the Rio Chiquito. Both rivers provided year-round water and may have served as defensive barriers. A reliable source of water and natural boundaries may have seemed very attractive to both early native and early European settlers.

During data recovery, a geomorphologist will assess the hydrological properties in the project area. This can be accomplished most effectively when there is a deep stratigraphic profile revealed through excavation. Areas 1–3 will be evaluated in this manner. To evaluate Snow's hypothesis of an adobe quarry, the OAS may be able to determine during excavations if large portions of soil deposits were "mined." Modern-day adobe-making activities usually involve drying the bricks near the source of the raw materials. Adobe "borrow" pits may be present. "A hole is a resource" (W. Toll, pers. comm., May 2005), therefore, these pits may also be filled with trash. Dried bricks are more easy to transport than large quantities of soil. Therefore, evidence for adobe making and brick drying may be present. However, given the removal of most of the top layers, there is only a remote

chance that conclusive evidence will be present.

THE MODERN COMPONENT

For the modern period, we distinguish between early modern (beginning with statehood in 1912) and the later modern, or contemporary period, which we date to about 50 years ago. Within the project area, early modern features include the public buildings constructed at the turn of the century, beginning with the new Catron Grade School in 1906, Santa Fe High School in 1908, and Seth Hall in 1929. Late modern features include parking lot surfaces, utility trenches and abandoned utility lines, and trash deposits. However, modern data, in general, are not particularly relevant to our research objectives. Nevertheless, the layout and remodeling of some buildings within the project area may shed light on why this area continued to be exploited.

Data needed to address the problem: The modern component of sites generally provides little useful information. Late modern and even earlier modern artifacts are easily recognizable, since there are many existing analogues. We can address many of the unanswered questions through a combination of historic documents and archival research, coupled with analysis of the recovered historic materials.

Of interest however, is the plethora of construction episodes this relatively small area has experienced over time. Many buildings in the project area have undergone extensive remodeling. This is especially true near the Sweeney Center, which has successively seen the Pueblo de Santa Fe, the presidio barracks, the Fort Marcy hospital, the Catron Grade School, Santa Fe High School, and eventually, the Sweeney Center. This architectural complexity will be a challenge should this area be excavated. To supplement excavation data, documents, architectural plans, photographs, archival materials, and newspaper accounts

of Seth Hall and the high school tennis courts. This helped the OAS explain why there were no remains left at these locations. Should ques-

tions arise concerning ambiguous foundations or deposits, interviews with knowledgeable individuals should prove helpful.

DATA RECOVERY

will be accessed. There are also many individuals still alive who remember the buildings, or attended Santa Fe High School, and have already been useful in pinpointing the location. Preliminary testing within the proposed project area produced cultural materials from the modern era, the Territorial period (1846–1912), the Fort Marcy period (1853–1895), the Colonial period (seventeenth and eighteenth centuries), and the prehistoric Late Coalition–Early Classic periods (A.D. 1200 to 1450). The nature and integrity of the cultural resources encountered have the potential to contribute significantly to our understanding of regional history and prehistory. If the areas of the cultural remains could not be avoided during project development, archaeological data recovery was recommended.

As the contractor, the Office of Archaeological Studies (OAS) proposes to perform a data recovery program at the proposed civic center location in accordance with the treatment plan outlined in this document. The scope of work will comply with standards set by the City of Santa Fe Archaeological Review Committee (ARC), the New Mexico Cultural Properties Review Committee (CPRC), and the New Mexico Historic Preservation Division (HPD). The OAS will consult on a regular basis with the architectural contractors for the City of Santa Fe. The OAS will incorporate recommendations resulting from tribal consultations in its project policies and procedures. The OAS will include a public education/outreach component, and the OAS will be responsible for cutting and removing asphalt and concrete in parking lot areas to be excavated as part of data recovery. The data recovery program will include limited and full excavation in targeted areas to be expanded as deemed necessary. This will include detailed recording, collec-

tion of artifacts and other cultural materials, removal of samples for laboratory analysis, protective measures for cultural deposits and for personnel, and interim and final reports. The OAS will work with the City of Santa Fe staff so that the implementation of the archaeological program minimizes the impact to the occupants and patrons of the Sweeney Center and City Hall, and their associated parking areas. The OAS will also keep the architectural designers informed of discoveries that may have the potential for adaptive reuse in the Civic Center design or construction. At the conclusion of excavation in each area of the site, the OAS will backfill excavations as needed, both mechanically and by hand, returning the site to its original grade in preparation for returning use of the area to the City of Santa Fe. OAS will provide regular progress reports as well as interim reports as phases of the data recovery are completed.

EXCAVATION PLAN

Based on the testing results, the City of Santa Fe recommends that the project area be divided into four primary areas that can be further tested and excavated independently (City of Santa Fe 2005 RFP 05/014/P, p.12). The RFP, Addendum 2, Item 5, specifically excludes BHT 3 and BHT 6 from the scope of work (City of Santa Fe, RFP 05/14/P, Addenda 1–3, February 28–March 17, 2005). The OAS proposes to subdivide the project area into the four quadrants illustrated in Figure 3, and these areas provide the organizational framework for both the work and this proposal.

In undertaking expanded testing and data recovery at the proposed Civic Center location, the OAS proposes to implement a multiple-part field investigation. This will be a phased undertaking as requested by the RFP (City of Santa Fe RFP 05/014/P, p. 13).

The term *phase* in this data recovery plan refers to the sequencing of events and excavations, not the development of additional data recovery plans based on the results obtained. The City of Santa Fe requested a “phased” data recovery plan that would allow them to employ approximate calendar dates to continue scheduling use of Sweeney Convention Center and keep open portions of the parking lot. So the term *phasing* refers to sequences of events and excavations that accommodate City of Santa Fe desires.

In essence, Phase 1 refers to preparation of a data recovery plan, Phase 2 to the reopening of test trenches and the excavation of recorded features, and Phase 3 to expansion of the test trenches and the opening of new areas. Phase 3 incorporates three elements: (1) the sampling of geographical space around known features; (2) the opening of areas that may have important features identified during the ground penetrating radar survey; and (3) possible sampled excavation of any new large features that may be found.

The intent of involving the City of Santa Fe ARC and the CPRC (through HPD staff) in Phase 3 is to discuss sampling strategies in anticipation of data recovery in very large features. The request is to make those consultations part of the submitted “formal data recovery plan,” that is, the plan associated with this application, not a future plan. We wished to make consultation a part of this data recovery plan before undertaking data recovery within a particularly large feature. Though we believe sampled excavation is a viable option, it should be a last option; each feature requires some differential evaluation of how it should be sampled. This approach was successfully used during the Palace of the Governors excavations. We would therefore like the opportunity to discuss the sampling or partial excavation of such a

feature with our permit holders.

The work plan respects the need to have testing completed around and under the Sweeney Center as quickly as possible, and it ensures that at least one-third of the City of Santa Fe parking area is available for use at all times. The phasing in Areas 1, 2, and 3 begins from the known features identified in the testing program (Phase 2 investigations), expanding outward as required by excavation discoveries and other information (Phase 3 investigations). Details of the proposed data recovery activities are described below. To minimize redundancy, more detail is provided in the Area 1 discussions than in subsequent area discussions. Phase 3 activities will be implemented concurrently or subsequently with Phase 2 in each area, depending on the nature and complexity of any structures and features that are encountered during Phase 2 excavations. Overlap between the two phases is expected since it would be inefficient to discontinue excavations after an area has been opened up. Continuous transition between Phase 2 and Phase 3 will also minimize disruption of City Hall functions by reducing the number of changes in parking lot accessibility.

Ground Penetrating Radar

Prior to fielding excavation crews, Areas 1, 2, and 3 will be explored by nondisturbing ground penetrating radar (GPR). This is a Phase 3 activity for budgetary and conceptual purposes because GPR in this context is a testing technique. The GPR survey will have greatest benefit if it is carried out prior to any further trenching or excavation of the ground surface, therefore it needs to be carried out prior to initiating any Phase 3 work outside of the Sweeney Center.

GPR detects subsurface anomalies through differential reflection of radio waves. The locations and qualities of these anomalies can be interpreted in terms of the presence and size of subsurface features and structures. GPR does not “see” through the ground, but it can be effective in focusing attention and

effort efficiently on subsurface features. GPR also has the advantage of working through existing surfaces (such as asphalt) without requiring their removal.

The GPR survey will be conducted over two days, one area per day. This would minimize impact on parking lot availability. The survey results will complement the prior testing observations, allowing more efficient targeting of excavations during the subsequent data recovery activities.

The ground penetrating radar surveyor will be Dr. Larry Conyers, associate professor, University of Denver.

Sweeney Center Testing

Testing under the existing Sweeney Center building will take place concurrently with the initial excavations in Area 1 (described below). Although the original construction of the Sweeney Center may have eliminated cultural deposits in this area of the site, the only deep construction feature of the existing building is a two-story basement in the extreme northeast corner. The remainder of the building is cut to a grade that may or may not allow for the preservation of intact cultural remains. Testing will consist of Test Pits 3 and 4, cut through the floors of storage rooms adjacent to the main hall of the center (Fig. 12). The strategy most likely to provide relevant information is to test along a meridian projected through the Sweeney Center linking Feature 10.23 to the east with Feature 24 to the west (see Fig. 3). This would increase the probability of encountering cultural deposits and determining their extent and condition, if any deposits remain intact. Two areas inside the building were identified by Albert Martinez, Sweeney Convention Center Operations Manager (pers. comm., March 2005) as being best suited for this purpose. The OAS proposes to excavate two 1-by-2 m test pits—one to the east, and the other to the west—in the areas designated in Figure 12. These units may be expanded if features or stratigraphy are encountered which require

further definition to reach a conclusion concerning the nature of the deposits.

Following the removal of sections of the building floor (to be arranged in consultation with Albert Martinez), methods used during the data recovery of the Sweeney Center will follow the same guidelines as those outlined for the initial hand excavations during the preliminary testing phase. Because of the importance of continuity between testing and data recovery, all recording, mapping, and collecting strategies and procedures for test pit excavation will follow standard OAS excavation methods and use standard OAS documentation (Boyer et al. 2000).

It should be noted that results of the testing might not be conclusive. The two test pits (4 sq m) are being used to extrapolate to an area of 56,250 sq ft (5,231 sq m), representing a sample of less than 0.1 percent. If the testing encounters intact deposits, contingency plans can be developed to cope with additional data recovery if building demolition is carried out as part of the Civic Center development. However, if no intact deposits are encountered, and if building demolition occurs, we recommend that additional testing take place following demolition to more confidently confirm the absence of cultural features. The formal Data Recovery Plan for the project (created under Phase 1) must anticipate that intact structures and features may be present so that there will be no permitting delays if the existing building is demolished and if archaeological deposits need to be excavated.

Area 1 Investigations

We propose that excavations in Area 1 begin concurrently with test excavations within the Sweeney Center. Area 1 comprises the southeastern one-third of the parking lot, roughly 44 ft (13.4 m) from the northern end of backhoe trench (BHT) 10 to the southeast end of BHT 9 (see Fig. 3), encompassing approximately 18,125 sq ft (1,686 sq m). This portion of the proposed development area contains the greatest amount and complexity of cultur-

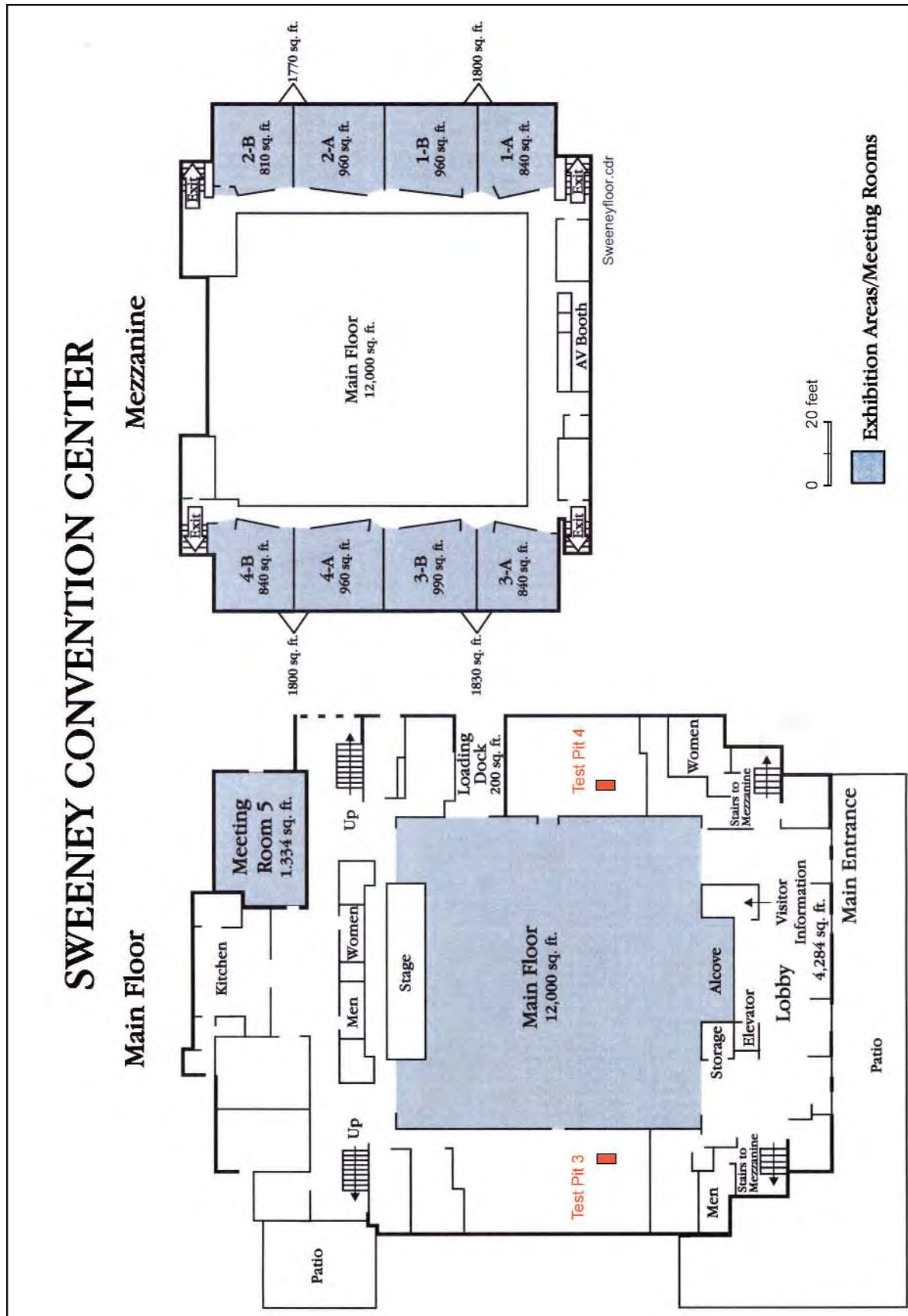


Figure 12. Floor plan of Sweeney Center with proposed Test Pits 3 and 4.

features as identified by the testing effort. Mechanical excavation will be used to reopen trenches used during the testing program.

We suggest that Backhoe Trenches 7, 8, and 9 be the first to be reopened in order to recover known burials and to determine the relationship between the Coalition and overlying Classic period deposits in this portion of the site. Burials 7.15 and 7.16 may be intrusive Classic period (ca. A.D. 1350) features based on their stratigraphic location in relation to Stratum 4, which has been defined as a Late Coalition deposit (A.D. 1200–1325).

Investigation of Stratum 4 will provide information on its function (pit structure? midden deposit?) and on its vertical and horizontal distribution. Associated with Stratum 4 is a possible burial pit, Feature 7.17. Although its age could not be determined with confidence during testing, its placement slightly below Stratum 4 suggests that it may date to the Coalition period.

In BHT 8, Features 8.18 and 8.19 will be given priority. Because of associated pottery (Santa Fe and Wiyo Black-on-white), we surmise that Feature 8.18 is a Coalition phase pit structure. Moreover, there is an associated burial pit (Feature 8.19) on the floor of the structure which also requires removal. The pit structure may retain a high degree of integrity, inviting comparison with the Coalition structure from the Federal building a short distance to the north (Scheick, pers. comm. 2005).

Of particular interest are features in BHT 9, which appear to be at least two subterranean rooms separated by walls carved out of culturally sterile in situ sediments or built up of hand-puddled adobe. These rooms have been tentatively identified as a kiva or kivas and may have great information potential. There are associated human remains, and the rooms are filled with dense cultural and organic deposits. These richly stratified rooms have the potential to yield chronometric and botanical data, information important to understanding the economic and social integration patterns of this time period. These are

the best preserved Classic period remains found in the Santa Fe area. The discovery of these structures in BHT 9 represents the best evidence for the presence of an early Rio Grande Classic pueblo in the Historic Downtown District.

Combined with other data from LA 1051 (particularly BHT 8 and 9), the relationship between these two temporal periods is critical to understanding the transition from the less aggregated, pithouse-dominated Coalition phase, to the above-ground roomblock-and-plaza layout that characterizes the early Rio Grande Classic. This transition has been investigated to a lesser extent at Pindi Pueblo (LA 1; Stubbs and Stallings 1953) and the Agua Fria Schoolhouse site (LA 2; Lang and Scheick 1989). Supportive data from LA 1051 could potentially be of great theoretical and practical value in understanding Puebloan development in the northern Rio Grande.

BHT 6 abuts Area 1 (Fig. 3), but, according to Addendum 2 (City of Santa Fe RFP 05/014/P, Item 5), this trench is excluded from the area of investigation. However, should the project boundary be expanded, an amendment to the approved agreement should be considered. BHT 6 contains Features 12, 13, and 14, a Spanish Colonial trash pit (the only one of its type documented during testing), a Classic period pit and a Classic period hearth (Fig. 3), and superimposed strata from the Classic and Coalition periods in this area of the site would contribute to questions concerning the transition from one period to the other. The Spanish Colonial trash pit has potential to provide comparative data for the spatial pattern of Santa Fe's early history. However, it is excluded from this phase. It may be investigated during future research phases.

To prevent any accidental disturbance, the OAS will erect barriers or fencing. However, if during the course of construction, excavation of these features becomes necessary, the OAS will consult with the City, the HPD, the ARC, and the CPRC for appropriate treatment of these resources.

Phase 2. The first phase of excavation in Area 1 will investigate nine features (Features 7.15–17, Features 8.18–19, Features 9.20–22, and Feature 10.23) identified in the test trenches. Phase 2 will involve at least 325 sq m of parking lot surface (which totals 1,686 sq m in Area 1). However, these are just the features given priority in the RFP. There is a strong possibility that more features will be discovered during the course of the investigations. In which case, the total number of square meters of affected parking lot surface may double.

The objective of this phase is to complete controlled investigation of the known features encountered during testing and to provide data to guide more extensive excavations during Phase 3 activities. Investigating documented features and the removal of known burials will be paramount. All burials identified during testing, and any additional burials encountered during data recovery expansions of Phase 2 will be completely excavated. Full details of burial treatment and disposition consultations are described separately below.

Phase 3. This phase encompasses expansion of the Phase 2 excavations (if necessary), as well as investigations of any subsurface features suggested by the GPR survey within Area 1.

During Phase 2, it is likely that the OAS will have gained enough information to be able to implement a stratified sampling strategy as described by Mueller (1975:17–206) for the remaining resources within the area. This will entail a hierarchical approach, in which the resources with the most information potential will be selected for intensive investigation, and other deposits will be selected for partial investigation. Selection criteria and criteria for determining the extent of partial excavation will be developed in consultation with the ARC, HPD, and CPRC as part of the formal data recovery plan and permitting process prior to the initiation of data recovery. The proposed criteria will consider information potential, the type of data contribution to research questions, and redundancy of infor-

mation.

Area 3 Investigations

Work in Area 3 will begin concurrently with the testing within the Sweeney Center and with the work in Area 1. If the testing within the Sweeney Center proceeds rapidly, the crew members from that operation will join the crew working in Area 3. It is likely that work in Area 3 will be completed before the completion of work in Area 1. If that occurs, Area 3 will be restored to a functioning parking lot, and the crew will then begin work in Area 2.

Area 3 encompasses approximately 32,812 sq ft (3,051 sq m) in the northeastern quadrant of the development area. Four backhoe trenches are within or adjacent to this area, and three of these test trenches encountered cultural features. BHT 4 and BHT 5 are fully within the project area and include four known features (Features 4.8–9, 5.10–11). No features were found in BHT 2 at the northwestern corner of the area. The majority of BHT 3 is outside the currently defined project limits, and all of the cultural features defined by BHT 3 are outside of the project limits. If the project limits are expanded to the east, then additional excavation around BHT 3 will be required. Excavation of Feature 3.7, in particular, will shed light on the Fort Marcy period.

Phase 2. During Phase 2, we propose to expand the test trenches to ensure adequate investigation of all features. Treatment of the targeted portions of Area 3 will require the removal of 400 sq m of parking lot surface, and possibly twice that amount may need to be removed should more discoveries be made. Although no temporal information was available for Feature 4.8 (BHT 4) based on testing observations, this pit contains quantities of charcoal and could be amenable to radiocarbon dating. Feature 4.9 is a Territorial period pit, the excavation of which could inform us on whether it should be placed within the Fort Marcy component of the site,

or other Territorial, nineteenth-century, or early twentieth-century occupations.

Within BHT 5, Feature 5.10 appears to be a pit structure, assignable to the Coalition or perhaps Early Classic period. Not enough of this feature was exposed during testing to allow accurate identification or temporal classification. Feature 5.11, 2 m south of F 5.10, yielded nineteenth-century artifacts, including metal and glass. This feature is extremely broad and is as deep as Feature 5.10. The presence of a Euroamerican feature occurring at the same level as a possible prehistoric pit structure warrants further investigation.

Phase 3. The extent of Phase 3 investigations in Area 3 will depend primarily on the GPR results for the large area between BHT 2, 3, and 4. The area between BHT 5 and BHT 7 of Area 1 could also contain undetected subsurface features. Apart from these possibilities, the likelihood of extensive Phase 3 excavations in Area 3 appears to be less than that in Area 1.

Area 2 Investigations

In order to maintain at least one functioning parking lot for the City Hall and Sweeney Center complex, work in Area 2 can commence only after work has been completed in either Area 1 or Area 3. If Test Pits 3 and 4 are completed rapidly, the crew from the Sweeney Center testing will be relocated to Area 3. If no significant Phase 3 excavations are required in Area 3, it is likely that work in Area 3 will be completed before that in Area 1. Whichever is completed first, that area will be rehabilitated as a parking lot prior to the initiation of excavations in Area 2 (see Estimated Work Schedule).

Phase 2. Area 2 was tested by a single backhoe trench (BHT 1) in the northwest quadrant of the site (see Fig. 3). This area covers 25,000 sq ft (2,325 sq m), and cultural resources encountered in the trench include a mix of prehistoric and historic materials. No

burials or human remains were found in this trench, but the presence of human remains is possible outside of the tested area. The materials encountered in BHT 1 were dominated by Historic period pit features, particularly those of the Territorial period (F 1.1–4).

However, Stratum 4, a Late Coalition period deposit, was encountered in the southeast end of the trench. This was overlain by a possible Classic or Late Coalition period stratum, misidentified as Stratum 2 in the testing report (Lentz 2005:36), but bearing resemblance to Strata 8 and 9 elsewhere on the site. The dating of Strata 8 and 9 as Early Classic period layers is based on pottery types present in the deposit. Stratum 4 and the directly overlying Stratum 2 show no evidence of intervening deposits. This is an important stratigraphic characteristic worth careful investigation because it implies that a continuous transition from Coalition to Classic occurred at this locale. The excavation of the known features in BHT 1 at the northern and southern ends of this trench will require the removal of 450 sq m of parking lot surface. Depending on what is found along Grant Avenue, and within BHT 1, this figure could double or triple its areal extent.

Phase 3. The project area adjacent to the intersection of Federal Place and Grant Avenue (the western one-third of Area 2) was not investigated during the preliminary testing program. However, there is a strong likelihood of historic remains in this area. These would include the Spanish Presidio which began construction in 1789 and was completed in 1791. The Presidio later became the west wall of Fort Marcy garrison (1853–1885). Thus, the potential for encountering Spanish Colonial and Territorial deposits in this area is high. It is possible that the Territorial deposits encountered at the northern end of BHT 10 are associated with similar deposits to the west. We propose to explore this area intensively with ground penetrating radar (described earlier), and Phase 3 investigations will document

any concentrations or linear alignments that may yield information on these periods.

RECAPITULATION OF EXCAVATION PLANS

The following phased activity sequence will be observed during data recovery at the proposed Civic Center: GPR will be used to collect information on subsurface anomalies outside of the tested areas of the site. These observations will be used to guide excavation decisions, especially during Phase 3 activities. Hand excavations will be initiated simultaneously within the Sweeney Center (testing) and within Areas 1 (the southeastern quadrant) and 3 (the northeastern quadrant). The first excavations in Areas 1 and 3 will be Phase 2 investigations of the features, and especially the burials, identified in the backhoe test trenches. Excavation of Phase 2 features will extend out from the test excavations, recovering complete information on the features and gathering information for possible Phase 3 investigations. Phase 3 excavations in both areas will deal with anomalies identified by the GPR survey and will document more extensive structures or features that come to light through the Phase 2 investigations. Phase 3 will be guided by sampling strategies to be developed during formal data recovery plan development with the ARC and CPRC.

Once work is completed for the two test pits within the Sweeney Center, those personnel will be redirected to Area 3 (or Area 1 if Area 3 is at or near completion). Once data recovery work is completed in Area 3 (or Area 1), the completed area will be rehabilitated to serve as a parking lot. Investigations in Area 2 will then commence.

Cultural materials were encountered in all but one of the trenches that were excavated within the proposed Civic Center construction area (Fig. 3). The high frequency of materials, structures, features—particularly the quantity of human remains—implies that significant undiscovered remains exist outside of the tested areas. However, an entire prehistoric pueblo does not appear to be preserved within the site area. It is likely that much of

the ancient construction at the site, especially above-ground rooms and activity areas such as plazas, has been removed by historic construction efforts. These will have left the bases of pre-Spanish features, subterranean structures, architecture, surfaces associated with rooms, and activity areas intact. However, an unknown percentage of these materials have also been disturbed by subterranean utility trenches (such as were located by BHT 1 and 6). A majority of the historic pits encountered by the test trenches appear to be substantially intact. Despite the removal of varying quantities of upper fill, the overall integrity of the below-ground materials appears largely uncompromised, and much information remains to be recovered.

OAS excavations will be carried out by a core crew of archaeologists, including supervisors, assistants, and laborers. All personnel have extensive experience with downtown Santa Fe archaeology, working recently in the contexts of the Plaza, the Palace of the Governors, or the Railyard. All supervisory personnel also have extensive experience in pre-Spanish excavations within the northern Rio Grande region. In addition, specialists with specific skills in remote sensing, burial excavation, botanical recovery, and historic research will be used as needed.

Field work will observe the following order:

1. Remove asphalt from excavation locations and reopen test trenches,
2. Relocate features noted within test trenches,
3. Phase 2: Hand excavate targeted features and burials,
4. Phase 3: Conduct additional excavations based on observations or discoveries during Phase 2 or to determine the nature and significance of anomalies defined by the GPR survey,
5. Backfill excavations and restore parking lot to original grade.

Human Remains, by Eric Blinman

Field Treatment. The existence and loca-

tion of several human burials within the civic center area are known from the results of test excavations. In all cases, test excavations were stopped as soon as skeletal elements were confirmed as human, the remains were left in place, and no further work was done to define the nature and extent of the remains. Although context suggests that most of the burials will be ancestral Native American, Euroamerican burials may also be encountered. OAS proposes to place a high priority on the definition and removal of the suspected human remains that were identified during testing (all human remains known from testing are concentrated in Area 1).

In order to comply with the provisions of the unmarked burial statute of the Cultural Properties Act, the OAS will notify law enforcement, HPD, and the Office of the Medical Investigator upon the exposure of the first set of human remains. Once the formal jurisdiction for the remains is passed from the OMI to HPD, OAS excavation will begin. If the remains are confirmed to be ancestral Native American, notification will proceed both through the normal HPD and Department of Indian Affairs channels as well as direct notification to those tribes who have participated in the pre-excavation consultations (if they desire). Renotification will take place with each additional ancestral Native American burial or with the field identification of proveniences with disarticulated Native American human remains. If Euroamerican remains are encountered in the excavations, efforts will be made to determine and contact descendant communities for consultation concerning final disposition. If no physical or archival evidence is available to define a specific descendant community, available information will be published as a legal notice in the *Santa Fe New Mexican* to give potential descendant groups the opportunity to self-identify.

OAS staff will scientifically excavate each burial (procedures are detailed in the descriptions that follow later in this data recovery plan), document the burial context, and col-

lect and catalog all funerary objects associated with each burial. Once removed, the physical remains will be taken to OAS laboratories for non-destructive descriptive analysis as required by permit stipulations. Photographs, in field and lab, will be taken for documentation purposes only and will not be released to the press or public. At the close of data recovery excavations, a preliminary report will be prepared for HPD that will include all human remains recovered during the course of the project. That report will propose a disposition plan or plans based on the descendant community consultation results. The report and the disposition plan will be the basis for HPD's solicitation of formal disposition consultations from individual tribes or descendant communities. After the required comment period has elapsed, HPD will issue a directive on how to proceed with the final disposition of the remains.

Because of the highly sensitive nature of these remains, the excavations will not be discussed or viewed by any persons not directly connected to the undertaking. Museum of New Mexico policy prohibits public exposure or unofficial photo documentation. No information will be given to the news media concerning the burials or their disposition until after the conclusion of the project and only after appropriate consultations with concerned parties.

Tribal Consultation. The City of Santa Fe has initiated consultations with Native American pueblos and tribes as part of the planning process for the civic center development. The City of Santa Fe has requested that OAS be a party to their consultations concerning civic center design issues, and we will use those consultations to establish frameworks for consultations on burial dispositions, sacred material concerns, and public interpretation. These proactive Native American consultations by both the City of Santa Fe and OAS are not required by the Cultural Properties Act or other applicable historic preservation laws or regulations. However,

the consultations are consistent with the spirit of the Cultural Properties Act and specifically with the goals of the regulations implementing the unmarked burial statute. OAS will use the consultations to guide disposition proposals under the unmarked burial statute, although final disposition decisions may vary from those worked out during the proactive consultations. Tribes who chose not to participate in the proactive consultations cannot be excluded from final disposition decisions. The consultations also are consistent with Governor Richardson's Executive Orders 2005-003 and 2005-004 that mandate New Mexico state agencies (including OAS, but not including the City of Santa Fe) develop policies that promote effective consultation with the Native American pueblos and tribes of New Mexico, especially concerning potential effects of state undertakings on traditional and religious concerns.

The City of Santa Fe's consultation process was initiated by letters sent to all of New Mexico's tribes on November 23, 2004, and the process is ongoing. To date there have been responses from seven tribes (copies of responses are included in Appendix 1). Responses express diverse sentiments, and the responses reveal both confusion and frustration concerning the civic center consultation, design, and construction process.

Pueblo of Tesuque (12/20/04; 2/25/05) – Asserts descendant connection with Santa Fe, and requests consultation; requests that the project be halted due to the presence of human remains and significant cultural items and property.

Jicarilla Apache Nation (12/3/04) – Expresses no immediate concerns, deferring instead to other tribes, pueblos, and nations; expresses continuing interest in the historical ties to the Santa Fe area.

Pueblo of Santa Clara (11/30/04) – Asserts ancestral connections to the area; requests consultation concerning potential sacred

and traditional areas.

San Juan Pueblo (1/5/05) – Asserts descendant connection with Santa Fe; requests consultation concerning potential sacred and traditional areas.

Pueblo of Pojoaque (1/13/05) – Asserts ancestral connections to the area; requests consultation concerning sacred and traditional areas.

Pueblo of Isleta (undated [12/04] phone message synopsis) – Requests viewing of any artifacts recovered; will provide further responses as part of ongoing consultation.

Pueblo of Picuris (5/16/05) – Asserts that the civic center area is of cultural and traditional significance; requests a copy of this data recovery plan; requests notification of the Cultural Properties Review Committee and Archaeological Subcommittee meeting places and times.

An individual of the Pueblo of San Ildefonso has also expressed concerns over the civic center development, but that concern has not yet been expressed in a government-to-government communication.

The Pueblo of Picuris clearly understands the difference between State and Federal frameworks for consultation, but the other expressions of tribal concern explicitly or implicitly assume that Federal regulations and procedures apply to this undertaking. Tribes are familiar with consultation procedures under the National Historic Preservation Act, the National Environmental Policy Act, and the Native American Graves Protection and Repatriation Act, but these do not apply to the civic center development. OAS will, to the extent possible, abide by the spirit of these Federal regulations and encourage the City of Santa Fe to do so as well, but consultations will need to begin with discussions of the nature, limitations, and strengths

of State of New Mexico consultation frameworks.

Since the archaeological testing results clearly anticipate the presence of human remains within the project area, laying the groundwork for burial disposition proposals will be a primary goal of the consultations. Since Federal regulations have led to the expectation of a link between burials and sacred materials within a repatriation context, OAS will work with the tribes and the City of Santa Fe to develop consultation procedures for potentially sacred features and materials encountered both during and after excavation. A final element of the consultations will be the City of Santa Fe's desire to honor and commemorate the ancestral Native American presence in Santa Fe. The archaeological data recovery is viewed by the city as a possible subject for that commemoration, and the civic center design is viewed as an architectural and landscape opportunity for that commemoration. However, it is unclear whether Native American communities share the same vision. The consultations will provide an opportunity to elicit perspectives on what constitutes respectful treatment for the Native American heritage of the downtown area.

OAS proposes to begin the consultations through conversations with tribal officials, following up on the contacts initiated by the City of Santa Fe. These conversations will lay the groundwork for formal contacts, defining expectations, content, and a structure for communication. After this groundwork is in place, bilateral and multilateral discussions will begin on the substantive issues. Since the proactive consultations cannot disenfranchise non-participating tribes in terms of burial disposition under the New Mexico unmarked burial statute, summaries of all substantive discussions and agreements concerning burials will be distributed to all tribes in New Mexico. OAS hopes that this process will improve trust between the parties as well as lead to the expeditious resolution of final burial disposition decisions by the Historic Preservation Division.

PUBLIC EDUCATION/ OUTREACH COMPONENT

It was suggested in the section entitled *Options for Treatment of Resources* (Lentz 2005:75–76), that, since avoidance is not a realistic option under the current design plans, some creative means of preserving and perpetuating the meaning of the resources should be considered. This course of action is obviously preferable to putting "the remains on dusty shelves" (Tesuque Pueblo Governor Mark Mitchell, speaking at the ARC meeting, February 1, 2005). If far-seeing planners had not preserved historic parts of the city at critical times in the past, Santa Fe would not enjoy its current status as a world-class cultural attraction. The "pull" factor has also greatly benefitted our economy. Both the public and private sectors have spoken out in favor of devising a means preserving elements of this invaluable downtown resource. This project presents an exceptional opportunity to honor the hundreds of years of diverse cultures that have contributed to the communal mosaic of the city. Another advantage of the concept of adaptive reuse is to sensitize both locals and visitors to the vital role prehistory has played in the cultural development of the Americas.

The OAS suggests that civic center architects and designers consider preserving portions of the prehistoric resources of the property in situ or through incorporation into the design plans. In-place preservation or adaptive reuse could combine archaeological excavation with in-place preservation of a selected portion of the site. This could include architecture, features, or cultural deposits of particular interest. Not only would this stand as a memorial to the prehistoric past, but it could serve as an interpretive and educational tool—as an example of the reasons our cultural heritage should be valued and preserved. As cautioned above, however, Native American sensitivities concerning public access to appropriate subject matter must be an explicit subject for consultation prior to final design decisions.

The context in which the Pueblo de Santa Fe is presented is an important aspect of the entire treatment process. Other than plexiglass panels displaying the results of excavations (such as at the San Miguel Church or the Palace of the Governors), interpretive artwork, mural paintings (such as at those at the Museum of Indian Arts and Culture), video or montage displays may also be suitable, and certainly more practical to incorporate into a massive parking structure. Therefore, the question of the exact nature of the objects offered for public viewing, and what form these should take is an important issue to be addressed during the course of this project.

To the extent that it is safe and respectful of Native American concerns, OAS will cooperate with the City in planning scheduled "open house" or tour experiences for the public or organized school or civic groups. Similarly, OAS staff will be available for lecture presentations of findings to school and civic groups during and following the excavations. Another productive outreach element is the incorporation of volunteers into the excavation process. This was very effective at the Palace of the Governors, contributing substantially to the efficiency of the archaeology while building a sense of public ownership of the research effort.

MEDIA

The OAS will work with the City to be responsive to media concerns while helping to keep lines of communication open. All media relations will be handled via the Public Works Media Relations Office or the City of Santa Fe Engineering Division. Upon direction from

the City of Santa Fe, OAS personnel will be available for interviews or will prepare draft press releases, as needed.

At this point, the variables involved in the public viewing of archaeological features are numerous. The architect's current plan allows only one small area for the public viewing of archaeological materials. Therefore, it would have to be by chance if an archaeological feature aligns with this space. We have had one meeting with Beverly Spears Architects about incorporating archaeological features into the final plan, and the firm can be somewhat flexible.

CONCLUDING REMARKS

LA 1051 has the potential to shed light on several important periods in the history of Santa Fe through the investigation of the Hispanic Colonial and Euroamerican Territorial period resources present at the proposed Civic Center location. Moreover, there are very few documented prehistoric Rio Grande Classic sites in the Santa Fe area. At a minimum, LA 1051 has the potential to rank along other landmark sites of the same period: Pindi Pueblo (LA 1), the Agua Fria Schoolhouse site (LA 2), and Arroyo Hondo Pueblo (LA 12). LA 1051 may be at the nexus of the Classic period late prehistoric occupation of the Santa Fe Basin. As such, its contribution to Native American culture and the history and prehistory of the Santa Fe area is potentially of great theoretical and practical importance. Granting the great differences in time and culture, the civic life of Santa Fe today may be a mirror for the civic life of almost a millennium ago.

METHODS

RESEARCH OBJECTIVES

The expanded testing results have provided the locations of significant cultural resources. Testing has provided information on the time periods that are represented by the archaeological deposits in the project area. A Late Coalition–Early Classic period Native American occupation is clearly indicated; but is an earlier Developmental period occupation also possible? Are there any underlying deposits that may hold Archaic period (or earlier) materials? Is Late Classic period (i.e., *pre-entrada*) use of the project area indicated? After the preliminary stage of investigation, temporally diagnostic ceramics or projectile points and the stratigraphic relationships among cultural deposits do not indicate the presence of any such earlier deposits, but additional excavation might yield such information.

Similarly, can the general periods of Euroamerican occupation be discerned, and can they be stratigraphically segregated? Are additional foundations, pits, and other feature types present, and can they be related to any Spanish Colonial, Mexican, or U.S. structures depicted on early maps? Are temporally discrete refuse deposits present from one or more time periods? What do these refuse samples tell us about changing lifeways and land use within the Santa Fe Historic District?

RECORDING AND COLLECTION METHODS

To maintain continuity between the testing and the data recovery programs, it is important to observe standardized data collection methods. Therefore, all documentation used during data recovery will be isomorphic with documentation used during testing in order to ensure consistency and seamless data inte-

gration. All data (such as features, structures, and stratigraphic characteristics) will be recorded using standard OAS documentation formats (Boyer et al. 2000).

Feature recording will use forms designed specifically to collect information from activity contexts and will include descriptions of feature type, dimensions, fill characteristics, chronometric and economic samples, and associated materials. Thorough photographic documentation will also be maintained.

Structural forms are designed to monitor architectural characteristics, and are accompanied by detailed maps, plans and profiles, fill characteristics, associated activity areas, floors and features, and associated cultural materials.

Stratigraphic recording will include descriptions of soil type, texture, color, natural and cultural inclusions, and estimated age. Photographs will be taken of each profile to complement the cross-section drawings.

Features, structures, and stratigraphy will be mapped with electronic surveying equipment. Mapped trenches, features, and other map points will be overlain on a master project area map. To the extent possible, master maps will be compatible with those used by the architectural planning team for the civic center.

Artifact recovery techniques will be determined by the needs of the formal research design as approved by the ARC, CPRC, and HPD staff. Proveniences where systematic artifact recovery is essential to interpretation will be screened through one-quarter inch mesh. One-eighth inch mesh will be used to screen proveniences where a higher recovery rate is required for interpretation, and bulk soil samples will be collected in anticipation of any need for flotation or wet screening. Field sampling will be proposed for consider-

ation where the nature and abundance of artifact content suggests that a level of redundant data has been reached for particular proveniences. Artifact and sample laboratory analysis methods are described in a following section, but selected field analysis data will be gathered to support field sampling decisions. These approaches were applied successfully at the Palace of the Governors excavations, resulting in relatively efficient excavation progress with little sacrifice of information.

All trenches will be mechanically back-filled as soon as is practical, and the parking lot surface will be restored to grade in the excavated areas. The asphalt around each excavation area will be removed as needed. Testing revealed that the asphalt is underlain by a "base course." This provides an effective barrier between the asphalt and the underlying natural and cultural deposits. Carefully using the teeth of a backhoe bucket, it is relatively simple to peel back as much or as little of the asphalt as needed to expose the area to be investigated. State law requires that a monitor be present during such activities. The excavation during Phase 2 will not all be hand work. Treatment of the targeted portions of Area 3 will require the removal of 400 sq m of parking lot surface, and perhaps twice that amount may be removed should more cultural features or materials exist. This will also allow for horizontal stripping of the asphalt for discovery purposes.

If archaeological deposits extend below 4 ft (1.2 m) in depth, selected areas will be excavated to 5 ft (1.5 m), or deeper if necessary, to determine the full extent of buried material. Auger tests performed on several features suggest depths of as much as 2 m below the present grade. Excavation of deep deposits will require compliance with existing safety regulations. According to the Occupational Safety and Health Administration (OSHA Reg. 09-19-85 - C.L. 02-00-069 [C.L. 2.69]), excavations that surpass 4 ft (1.2 m) in depth will have to be "stepped back" at the 80 cm level, 1.2 m horizontally in every direction, in the vicinity of the area to be investigated. If stepping is not possi-

ble, deep excavation can only be pursued if shoring is installed within the excavation.

Test Pits within the Sweeney Center

Two 1-by-2 m test pits are scheduled to be excavated within the existing Sweeney Center.

Objectives. The purpose of the test units is to determine whether cultural deposits exist beneath the building. Features located to the west and east of the building (Feature 24 and Feature 10.23) suggest this may be the case.

Methods. To be able to excavate while the building is still standing, two portions of the floor in storage rooms located along the eastern and western walls of the Sweeney Center will have to be removed to reach the underlying soil (see Fig. 12). The areas of flooring to be removed should be larger than the proposed 1-by-2 m units to allow for maneuverability during excavation. Floor cutting operations will be coordinated by Albert Martinez (Sweeney Convention Center Operations Manager). Subsequent archaeological excavation will proceed with hand tools in 10 or 20-cm-thick arbitrary levels unless discrete strata can be defined. If recognizable stratigraphy is present, excavations will proceed according to depositional units. Except for deposits that can be confidently identified as modern or recent disturbances, all hand-excavated fill from general levels will be screened through 1/4-inch-mesh metal hardware cloth, or, in the case of features, through 1/8-inch metal hardware cloth. All artifact and ecofact classes will be retained for analysis. Other samples will be retained from level fill as appropriate (i.e., radiocarbon, flotation, etc.). If discrete features are encountered, the features will be excavated separately, appropriate samples (i.e., radiocarbon, flotation, pollen, or other chronometric samples) will be recovered, and feature fill will be screened through 1/8-inch mesh. Test units will not exceed 1.2 m in depth unless they are located in areas where safe conditions already exist for deeper excavation. These conditions may exist within the Sweeney Center.

At the Sweeney Center, we are initially confined to two test pits, given the character of the building. The goal is to provide a preliminary look at any deposits and, if substantial deposits are found, alert the city that further work will be necessary. However, even if no cultural deposits are found, the OAS will excavate 2 percent of the Sweeney Center footprint after demolition of the building. The City of Santa Fe requires testing of 2 percent of the area to be disturbed during a new construction project; we consider the replacement building to be an analogous situation. This will be a combination of hand-dug and mechanically excavated trenches. If features exist, we expect them to be comparable to those in other areas of the project and will treat them in similar fashion if agreed to by the CPRC (through HPD staff) and the Archaeological Review Committee.

Augering

Auger tests are typically used to supplement hand excavation. During data recovery and testing, auger tests will be used to determine the depth of cultural deposits. This is usually done to confirm, once excavation has been performed, if there is any remaining cultural deposition. The base of all test pits, structures, and large features will be augered, and augering may be used to help develop excavation strategies for larger features.

Archival Research

A crucial component of the expanded testing is the compilation of historic documentary information from archival sources. This will be done by a doctorate level historian/ethnologist certified by the City of Santa Fe.

In addition to the historic maps already noted in the testing plan, the presence and information content of any additional historic maps, records of titles, newspaper articles, and the like will be surveyed and evaluated. At a minimum, the following sources will be consulted:

1. The New Mexico State Records Center and Archives,
2. The New Mexico State Library,
3. The Angélico Chávez History Library,
4. ARMS files and general archaeological reports for Santa Fe (Laboratory of Anthropology or City Planning Department),
5. General Land Office Surveys or Land Grant plats,
6. 1917 Hydrologic Survey (since the project area is adjacent to the acequia now occupied by Paseo de Peralta),
7. The State Register of Cultural Properties, since the project area is within the core historic district (HPD),
8. Information from the title abstract,
9. Deed research at the County Deed Room and City of Santa Fe records.

Information relevant to the functional or temporal interpretation of archaeological structures or features in the project area will be obtained and incorporated into the final testing report.

Excavation Results

Types, distribution, age, integrity, and data potential of the buried archaeological deposits in the project area will be characterized as accurately as possible through data recovery process outlined above. Field notes, maps, profiles, forms, and photographs will be created and maintained as a permanent record of the excavations. Those documents, with the analytic data described in the following section, will be the basis for creating periodic, interim, draft, and final reports. Those reports will satisfy the specific needs of the City of Santa Fe, the Civic Center architectural design team, regulatory agencies (ARC and HPD), scholars, and the interested public.

OAS will prepare all records and documents of the excavations for archiving with the Archaeological Research Collections (ARC) of the Museum of Indian Arts and Culture, Laboratory of Anthropology. Access to these data will be available through ARC or through the Archeological Records Management Section of the State Historic Preservation Division.

UNANTICIPATED DISCOVERIES DURING CONSTRUCTION OF THE CIVIC CENTER

We are confident that the chances of discovering archaeological materials or burials after completion of the data recovery plan are low. However, if such materials are encountered, the OAS is prepared to respond. We advise that city staff specifically remind contractors and subcontractors that such encounters are covered by city and state ordinances, and that work should immediately cease in the area around such discoveries. In addition, city staff must be notified without delay.

If archaeological materials are encountered during the business day, the OAS can have an archaeologist on the scene within a few minutes. However, the city archaeological ordinance requires that an archaeologist from the ARC also view the discovery. The OAS archaeologist will be available to confer with city staff and the committee member on the appropriate steps to take following their assessment of the situation. The OAS will work with the city to minimize

delays. If the discovery occurs on the weekend or a holiday, the OAS will try to have an archaeologist on the scene as soon as possible but can make no commitment other than to arrive on the first business day after the discovery.

The OAS will work with the CPRC and the HPD to accommodate the treatment of new discoveries as part of permitted activities. At this point, no guarantee can be made that these entities will agree to such a proposal, but we will discuss it with the organizations as part of our permit application. The OAS will also meet with the ARC to discuss the possibility of having some form of a treatment plan in place if it is determined that further study is needed.

If a burial is encountered, the OAS will invoke its State of New Mexico burial permit. In advance of the project, the OAS will also ask the ARC if treatment of the burial under these regulations complies with the city ordinance. OAS archaeologists will also comply with any procedures for the treatment of burials that may have been negotiated during consultation with the tribes.

OAS FIELD AND LABORATORY ANALYSES

METHODS

In addition to the project-specific field procedures and strategies outlined above, OAS will follow generic field and laboratory methods, as outlined below.

EXCAVATION PROCEDURES

Hand excavation will maintain horizontal control within an established Cartesian grid system according to standard OAS field methodology. Excavation of units will proceed in 10- to 20-cm-thick arbitrary levels, until stratigraphic layers are defined. Within natural stratigraphic layers, excavation will be bounded by the vertical and horizontal distribution of that layer. Fill that is subject to systematic artifact recovery will be screened through 1/4-inch mesh hardware cloth. Feature fill will be screened through 1/8-inch mesh hardware cloth.

If discrete strata are encountered, excavation of that depositional unit will be the guiding intent. By extension, this relates to the strategy for cultural deposits. More specifically, excavation strategies within structures include removal of fill by shovel from one quadrant by 10 cm arbitrary level until walls and a floor (or living surface) are encountered. Remaining fill will be removed by arbitrary level to within 5-10 cm of the identified floor, and that last layer will be removed by troweling. The horizontal boundaries of observed features will be ascertained by troweling or shovel scraping. Features less than 2 m in diameter will be divided in half, and the first half removed in its entirety or in 10 cm levels. Internal stratigraphy will then be recorded, and the remaining half will be removed using visible strata as a guide. Large

features such as trash middens will be excavated by grid unit. An initial grid will be excavated to determine any natural strata. If natural strata are found, the unit will be dug by those depositional units. If discernible cultural stratigraphy is found, excavation will be by those strata.

Recording will include descriptions of soil, artifact variety and frequency, evidence of disturbance, horizontal and vertical location and associations, and temporal associations. At least one wall of each excavation unit will be profiled. Stratigraphic recording will employ Munsell Color Chart nomenclature for soil color, and standard soil and sedimentological terms will be used to describe soil type, texture, color, natural and cultural inclusions, and estimated age.

Photographs will be taken of the site, of representative examples of backhoe trenches and excavation units, and of all features exposed by mechanical and hand excavation. A final site map will document excavation limits, architectural and other cultural features, and existing buildings adjacent to the excavation area.

LABORATORY ANALYSES

Laboratory analysis will be conducted by the staff of the OAS and by specialized professional consultants where necessary. Analysis procedures will follow those standards established by the OAS. When brought in from the field, artifacts will first be washed or cleaned, sorted according to type, and then catalogued. Many of the analysis procedures and formats have been developed by OAS staff for prehistoric and historic sites in the northern Rio Grande. These discussions are primarily adapted from Moore (2000).

Research Issues to be Examined Using Pottery from LA 1051, by C. Dean Wilson

Pottery trends, indicated by distributions of ceramic types and attributes recorded during the analysis of LA 1051, are used to examine the nature of the occupation at the prehistoric village that stood in what is now downtown Santa Fe (Lentz 2005). Trends will be examined through the comparison of distributions of ceramic types defined during previous investigations of Rio Grande sites (Kidder and Amsden 1931; Kidder and Shepard 1936; Honea 1968; Lambert 1954; Lang 1997; McKenna and Miles 1991; Mera 1935; Stubbs and Stalling 1953), as well as attributes relating to surface treatment, temper, pigment, vessel form, and modification similar to those recorded during other OAS investigations (Wilson, in prep.).

Ceramic Dating. One of the most important issues that will be addressed using ceramic data involves the temporal placement of contexts at this village. While ceramic distributions from most of the contexts recovered during the testing phase of this site indicate an occupation dating to the Early Classic period (Wilson and Lewis 2005), some of the lower deposits appear to date to the Coalition period.

In ceramic assemblages spanning the entire Coalition period (A.D. 1150 to 1350) of the northern Rio Grande region, most of the white ware is dominated by Santa Fe Black-on-white, although associated white ware types change through time (Orcutt 1999). During the earliest spans of this period, from the late twelfth to very early thirteenth century, Santa Fe Black-on-white is commonly associated with the earlier type Kwahe'e Black-on-white. Decorated pottery from most sites dating to the thirteenth century are overwhelmingly represented by Santa Fe Black-on-white. By the beginning of the fourteenth century, new white ware types become more common in various areas of the northern Rio Grande region, and include Wiyo Black-on-white pro-

duced in the northern Pajarito Plateau and Galisteo Black-on-white in the Galisteo Basin. At about the same time, Rio Grande glaze ware appears to have been first produced in areas to the south in the middle Rio Grande region (Vint 1999). By A.D. 1325, Wiyo Black-on-white becomes much more common and occurs along with Santa Fe Black-on-white. The presence of significant frequencies of Wiyo without Biscuit A indicates occupations dating to the late part of the Coalition period, during the middle of the fourteenth century. The only change thus far noted in gray utility wares during the Coalition period appears to be an increase in the overall frequency of Smeared Corrugated as compared to other utility ware forms, and decrease in plain and more indented forms during the later part of this period (Stubbs and Stalling 1953).

Biscuit A appears to have replaced Wiyo Black-on-white at around A.D. 1375, and at about the same time the frequency of Santa Fe Black-on-white significantly diminishes. The end date for Biscuit A is sometime between A.D. 1450 and 1500. The production of Biscuit B, or Bandelier Black-on-white, appears to have begun at about A.D. 1400 and lasted up to A.D. 1550 (Lang 1997). This type appears to have been most abundant at sites dating between A.D. 1500 and 1550. During the Late Classic period, Sapawe Micaceous became the dominant utility ware in many areas of the northern Rio Grande region. Potsuwi Incised also appeared during the later part of the Classic period.

Changes in glaze ware pottery may provide further temporal information about different contexts (Warren 1976). The Early Classic period is characterized by the predominance of glaze-on-red and Glaze A forms. Before the end of the fourteenth century, glaze-painted vessels with white, cream, yellow, or pink slips and Glaze B rims were common. The Intermediate Glaze period (A.D. 1450 to 1600) was characterized by the presence of Glaze C, D, and early E forms and a mixture of red, yellow, and polychrome slips.

Combinations of the pottery types dis-

cussed above will be used to determine the nature of the occupational sequence at LA 1051. Efforts will be made to distinguish combinations of types that may reflect transitional occupations versus those resulting from the mixing of pottery from different temporal components. An important question concerns the presence of an occupational hiatus between Coalition and Classic period components at LA 1051. Such a hiatus may be reflected by evidence of occupations in the early part of the Coalition period only, such as assemblages dominated by Santa Fe Black-on-white with earlier Kwahe'e Black-on-white and the absence of later decorated types. Further evidence of a hiatus would be indicated by the consistent presence of types sometimes dating to the later Coalition period, such as Wiyo Black-on-white, with Biscuit A and early glaze ware types, and an absence of assemblages dominated by Santa Fe Black-on-white. Another important issue concerns the length of the Classic period occupation at this site. Evidence of a longer occupation would be reflected by assemblages with significant amounts of Biscuit B, Sapawe Micaceous, Potsuwi Incised, and glaze-on-yellow, glaze polychrome, and Glaze B, C, and D rim sherds that may indicate occupations into the fifteenth and sixteenth centuries.

Trends Relating to Production and Regional Exchange. Examinations of assemblages from dated components can also be used to examine a variety of issues. An important issue concerns the nature of interaction and exchange with villages in other areas. LA 1051 may be particularly suited for such examinations as it is located between areas historically occupied by Keres groups, such as Cieneguilla and Cochiti pueblos, and the Northern Tewa Pueblos. It is also located about half way between areas of the middle Rio Grande, where, during the Classic period, glaze ware was produced, and the Tewa Basin, where biscuit wares were manufactured during this time.

Recent investigations have described

regional trends relating to the production and distribution of pottery vessels during the Coalition and Classic periods in terms of a model of tribalization (Habicht-Mauche 1993; Powell 2002; Vint 1999). One issue such models attempt to explain involves the determination of how new, large communities that appeared in areas throughout the northern Rio Grande region during the Coalition period were organized and integrated on a regional scale. During the Coalition period, the sharing of information by widely separated communities appears to be reflected by the widespread distribution of similar decorative styles and manipulations in white ware and gray ware pottery (Habicht-Mauche 1993). The high degree of stylistic similarity of Santa Fe Black-on-white produced in different areas of the Rio Grande contrasts with evidence of paste differences at sites located near each other. This indicates that vessels produced over a wide area were decorated in a very similar manner (Habicht-Mauche 1993; Kohler et al. 2004; Powell 2002; Ruscavage-Barz 2002; Vint 1999). The widespread homogeneity in the decoration and texture of Santa Fe Black-on-white and corrugated utility wares at Early Coalition sites over much of the Rio Grande region has been interpreted as reflecting broad, open economic and social networks spread throughout much of the Rio Grande Valley (Habicht-Mauche 1993). This resulting openness may have allowed groups in neighboring territories to access information about the availability and distribution of food resources (Habicht-Mauche 1993). This may indicate a strategy that developed to compensate for spatial, seasonal, and annual variability in resources over a wide area.

Data relating to styles and pastes noted in Santa Fe Black-on-white and corrugated gray wares from Coalition period components at LA 1051 may be used to examine the nature of ceramic production in the Santa Fe area. Temper data recorded during this analysis, as well as small samples sent for petrographic analysis, will provide characterizations of paste that will be compared with locally avail-

able temper and clay samples. The expectations of the previously discussed model would be that Santa Fe Black-on-white and corrugated gray pottery similar to that produced in other areas of the northern Rio Grande was produced locally at LA 1051. In addition, a sample of Santa Fe Black-on-white rim sherds will be subjected to stylistic analysis and compared to those from the Pajarito Plateau and Tewa Basin analyzed during other OAS studies, to determine the degree of regional stylistic variation within contemporaneous white wares. An extremely low frequency of types produced in other regions, such as White Mountain Redwares, San Juan White Wares, Mogollon Brown Wares, Socorro Black-on-white, and Chupadero Black-on-white, is expected to occur in Coalition period components. This would reflect very limited exchange and interaction with distinct regions that appear to be characteristic of the Coalition period occupations.

In contrast, pottery distributions from Classic period components indicate a shift to more diverse and widely exchanged pottery types with restricted production zones (Vint 1999). Regional changes that had begun by the Early Classic period have been interpreted as indicating the emergence and consolidation of, and competition between, distinct regional alliances (Habicht-Mauche 1993; Powell 2002). Such alliances may have been supported by formalized reciprocal transactions (Habicht-Mauche 1993). Patterns of economic specialization and regional integration appear to be reflected in the increased differentiation of pottery produced in different areas of the Rio Grande that began during the late part of the Coalition period. Initially, this differentiation is reflected by the divergence of white wares into different areal varieties such as Galisteo Black-on-white in the Galisteo Basin and Wiyo Black-on-white in the northern Rio Grande region (Habicht-Mauche 1993). In areas of the northern Rio Grande, the tradition of organic painted white wares reflected earlier by Santa Fe Black-on-white and then with the production of Wiyo Black-on-white, con-

tinued with the production of Biscuit ware types throughout the Classic period. A distinct glaze ware technology was introduced to areas in the middle Rio Grande region south of Santa Fe (Habicht-Mauche 1993; Vint 1999). The technology associated with the production of glaze ware pottery did not develop locally in the Rio Grande area but was introduced by groups from the Zuni and Little Colorado regions. This new glaze ware technology was characterized by a range of styles and techniques indicative of experimentation with this new technology (Snow 1982). By the middle of the fourteenth century, glaze ware pottery had become quite standardized, and appears to reflect a level of craftsmanship that surpassed that of any of the preceding decorated pottery forms (Habicht-Mauche 1993). Temper data from sites spread over a very wide area of the northern and middle Rio Grande region indicate that the production of glaze ware vessels found at sites throughout the Rio Grande region may have been limited to a few villages (Habicht-Mauche 1993; Kidder and Shepard 1936; Morales 1997; Shepard 1942; Vint 1999; Warren 1969).

The tribalization model suggests stylistic and technological patterns noted in Classic period pottery may reflect a very different pattern than noted for Coalition period components. A strong possibility is that decorated pottery may not have been produced at LA 1051 during the Classic period. In order to test this possibility, a wide range of locally available temper and clay sources that could have been used to produce Tewa white wares, glaze wares, and gray wares found at this site will be collected and characterized. The absence of matches between ceramic pastes and local resources may indicate that much of the pottery recovered from this site was not locally produced. Evidence in the form of unfired ceramic and pottery making tools may also provide clues about the presence or absence of local pottery production. Temper data from visual characterizations and petrographic data will be used to document patterns of regional differentiation. Evidence that white

ware was not locally manufactured may be further indicated by similarities in pastes with Biscuit wares from sites in the Pajarito Plateau and Tewa Basin, from where such pottery may have been exchanged. Similar comparisons with glaze ware pottery from sites to the south and west may indicate that glaze wares from LA 1051 were produced in the middle Rio Grande region. Changes in the frequency of glaze vs. Tewa white wares may also provide clues concerning shifts in regional exchange systems and alliances during different spans of the Classic period. In addition, tempers in glaze wares from different occupational sequences will be compared to determine possible regional shifts in production and exchange systems. For example, shifts from glaze wares mainly tempered with basalt to those tempered with latite may indicate the emerging importance of Southern Tanoan groups in the Galisteo Basin.

Pastes from samples of Tewa white wares and glaze wares from nearby sites will be examined and compared with those noted from LA 1051. In addition, elaborate and distinct decorative styles associated with different decorated wares may reflect distinctions and conventions resulting from regional specialization. In order to examine the nature of regional influences, samples of Classic period white ware and glaze ware rim sherds will be subjected to stylistic analysis, during which, attributes relating to design decoration and manipulation will be recorded. Tempers and manipulations noted in gray wares from Classic period components will be compared with those from Coalition period components to examine the effect of regional changes on the production of utility wares.

Comparisons of trends in ware and temper distributions noted at LA 1051 and other sites along the middle Santa Fe River, including Pindi Pueblo, Agua Fria Pueblo, and Cieneguilla Pueblo (Lang and Scheick 1991; Smiley et al. 1953; Stubbs and Stallings 1953; Morales 1997), will be used to determine if these pueblos may have been linked together into a distinct alliance. The occupations in the

Agua Fria area ended by the Middle Classic, while Cieneguilla Pueblo continued to be occupied into the historic period. If these villages formed alliances, these pueblos should share similar mixtures of ceramic wares, types, and tempers indicating participation in similar production and trade networks (see *Research Orientation and Data Requirements*). The location of LA 1051 may have made it an important link between Keres villages, which extended as far north as the Santa Fe River, and nearby Northern Tewa villages in the Tewa Basin. Similar boundaries noted in the Pajarito Plateau indicate similar dynamics in areas to the west (Vint 1999). Thus, examinations of ceramic patterns from LA 1051 will often focus on the role of settlements in the downtown Santa Fe area in larger community networks and alliances along the Santa Fe River. Data from LA 1051 may also provide important clues concerning the nature of possible Keres migrations during the Early Classic period and resulting boundaries between the Keres and Northern Tewa Pueblos.

Trends Relating to Vessel Use and Function.

Ceramic distributions from different contexts may also provide clues regarding changes in the use of ceramic containers from the Coalition to Early Classic period. Traits indicative of vessel use are reflected in ceramic ware distinctions and vessel form categories. Distributions of attributes associated with these categories may indicate differences in the kind and range of activities for which ceramic vessels were used in various contexts. Comparisons of functionally related traits in contemporaneous contexts may provide clues concerning the organization of activities and tasks in which pottery was used, and may provide insights relating to broader economic changes.

Previous examinations indicate the overwhelming majority of plain pottery from Coalition period sites. These are represented by two fairly standardized functional groups that include Smeared Corrugated jars (which

make up 80 percent of the total pottery) and white ware bowls (which consist of about 20 percent) (Wilson, in prep.). Patterns noted for Coalition period pottery in the northern Rio Grande reflect widespread sharing of information concerning the appropriate way to both produce and decorate utility and white ware vessels as well as their intended use in very specific and narrow ranges of tasks, such as gray wares for cooking and white wares for serving.

In contrast, decorated wares are much more common and are represented by a wider range of forms in Classic period occupations, and may reflect the use of pottery in a wider range of activities. The decoration of a wider range of forms may indicate an increased importance in conveying information about social or ethnic identity in containers intended for a wider range of activities. This may also partly explain the increased frequency of decorated vessels during the Classic period.

Distributions of ceramic wares and forms from LA 1051 provide an excellent opportunity to monitor the nature of these shifts in vessel form and function from the Coalition to Early Classic period. Insights may be gained through the examination of sherd distributions, may be further tested through the detailed analysis of whole vessels where wear evidence may provide clues to the nature and duration of use, as well as more specific information regarding size and shape. Vessel analysis will involve the detailed recording of shape, size, surface, and use of various whole or partial vessels.

Conclusions. In summary, data relating to the dating, origin, and use of pottery from prehistoric contexts at LA 1051 may provide important clues concerning the changes in material culture that relate to shifts in regional organization and economy from the Coalition to Classic period. Previous models framed in terms of increased tribalization (Habicht-Mauche 1993; Morales 1997; Powell 2002; Vint 1999) propose a shift from fairly self-sufficient communities linked in a region-

wide information network to the emergence of distinct, but widely integrated alliances. Regional patterns characteristic of the Coalition period are thought to be reflected by the occurrence of similar pottery forms produced at communities spread over a wide area. Classic period patterns appear to be characterized by highly specialized pottery forms produced at specific villages. The exchange of pottery over wide areas was facilitated by alliances between widely scattered communities. The location of LA 1051 in close proximity to areas historically occupied by Keres and Northern Tewa groups, each of whom produced distinct decorated pottery, provide an excellent opportunity to examine influences of such a shift in the interaction between two distinct Pueblo groups. Previous discussions attempt to further examine the nature of such shifts by presenting implications of such models in terms of distributions of pottery types, wares, patterns, and forms expected to occur at various contexts from LA1051.

Chipped Stone Analysis

All chipped stone artifacts will be examined using a standardized analysis format (OAS 1994a). This analytic format includes a series of mandatory attributes that describe material, artifact type and condition, cortex, striking platforms, and dimensions. In addition, several optional attributes have been developed that are useful for examining specific questions. This analysis will include both mandatory and optional attributes. While originally developed for prehistoric lithic assemblages, it has been adapted to include the range of morphological and functional variability representative of Spanish Colonial assemblages.

The primary areas that our analysis format explores are material selection, reduction technology, and tool use. These topics provide information about ties to other regions, mobility patterns, and site function. While material selection studies cannot reveal how materials were obtained, they can usually provide some indication of where they were procured. A

study of mobility patterns is not integral to this project, but our analysis of the chipped stone assemblages will provide baseline data useful for evaluating information from other sites. By studying the reduction strategy employed at a site it is possible to compare how different cultural groups approached the problem of producing useable chipped stone tools from raw materials. The types of tools in an assemblage can be used to help assign a function, and to aid in assessing the range of activities that occurred at a site. Chipped stone tools provide temporal data in some cases, but unfortunately they are usually less time-sensitive than other artifact classes like pottery and wood.

Each chipped stone artifact will be examined using a binocular microscope to aid in defining morphology and material type, examine platforms, and determine whether it was used as a tool. The level of magnification will vary between 20X and 100X, with higher magnification used for wear pattern analysis and identification of platform modifications. Utilized and modified edge angles will be measured with a goniometer; other dimensions will be measured with a sliding caliper. Analytic results will be entered into a computerized database to permit more efficient manipulation of the data, and to allow rapid comparison with other databases on file at the OAS.

Attributes that will be recorded for all flakes, angular debris, cores, and tools include material type, material quality, artifact morphology, artifact function, amount of surface covered by cortex, portion, evidence of thermal alteration, edge damage, and dimensions. Other attributes are aimed specifically at examining the reduction process, and can only be obtained from flakes. They include platform type, platform width, evidence of platform lipping, presence or absence of opposing dorsal scars, and distal termination type.

Ground Stone Analysis

Ground stone tools may be recovered from contexts dating from prehistoric and historic contexts, and potentially as late as the middle nineteenth century. It is expected that ground stone tools will inform on economy and production. Ground stone identification and analysis will be conducted by OAS staff.

Ground stone artifacts will be examined using a standardized methodology (OAS 1994b), which was designed to provide data on material selection, manufacturing technology, and use. Artifacts will be examined macroscopically, and results will be entered into a computerized database for analysis and interpretation. Several attributes will be recorded for each ground stone artifact, while others will only be recorded for certain tool types. Attributes that will be recorded for all ground stone artifacts include material type, material texture and quality, function, portion, preform morphology, production input, plan view outline, ground surface texture and sharpening, shaping, number of uses, wear patterns, evidence of heating, presence of residues, and dimensions. Specialized attributes that will be recorded in this assemblage include information on mano cross-section form and ground surface cross-section.

By examining function(s) it is possible to define the range of activities in which ground stone tools were used. Because these tools are usually large and durable, they may undergo a number of different uses during their lifetime, even after being broken. Several attributes are designed to provide information on the life history of ground stone tools, including dimensions, evidence of heating, portion, ground surface sharpening, wear patterns, alterations, and the presence of adhesions. These measures can help identify post-manufacturing changes in artifact shape and function, and describe the value of an assemblage by identifying the amount of wear or use. Such attributes as material type, material texture and quality, production input, preform morphology, plan view outline form, and tex-

ture provide information on raw material choice and the cost of producing various tools. Mano cross-section form and ground surface cross-section are specialized measures aimed at describing aspects of form for manos and metates, because as these tools wear they undergo regular changes in morphology that can be used as relative measures of age.

Historic Artifact Analysis

Euroamerican artifacts that are recovered will be examined using a standardized analysis format (OAS 1994c). The OAS analysis format and procedures have been developed over the last ten years and incorporate the range of variability found in sites dating from the seventeenth to twentieth centuries throughout New Mexico. The detailed recording allows for direct comparisons with assemblages from contemporary sites from other parts of New Mexico and throughout the Greater Southwest.

The main emphasis will be the identification of artifact function. One of the major benefits of this type of analysis is that "... the various functional categories reflect a wide range of human activities, allowing insight into the behavioral context in which the artifacts were used, maintained, and discarded" (Hannaford and Oakes 1983:70). It also avoids some of the pitfalls of an analytic framework that focuses on categorizing artifacts by material type. Material-based analyses frequently include attributes that are appropriate for only some of the functional categories that might be included in a single material class. For instance, variables that are often chosen for analysis of glass artifacts are usually appropriate for glass containers, but they may be inappropriate for flat glass, decorative glass, or items like headlights.

This analytic framework was designed to be flexible, which hopefully enables the avoidance of these and other problems. The function of each artifact is described by a hierarchical series of attributes that classifies it by functional category, type, and specific func-

tion. These attributes are closely related, and provide a chain of variables that will specify the exact function of an artifact, if known.

Ten functional categories will be used in this analysis including economy/production, food, indulgences, domestic, furnishings, construction/maintenance, personal effects, entertainment/leisure, communication, and unassignable. Each category encompasses a series of types, and includes classes of items whose specific functions may be different but are related. An example is a pickle jar and a meat tin, both of which would be included in the food category, but which are made from different materials and had different specific functions.

The exact use to which an artifact was put will be recorded as a specific function within a type. In essence, this attribute represents a laundry list of different kinds of artifacts that may be familiar to most analysts, and is the lowest level of the identification hierarchy. Other variables are recorded to amplify the hierarchy of functional variables, and to provide a more detailed description of each artifact that warranted such treatment. Included in this array of attributes are those that provide information on material type, dating, manufacturer, and what part(s) are represented. Chronological information is available from a variety of attributes, as are data on manufacture and physical descriptions.

Chronological information is available from a variety of descriptive and manufacturing attributes, especially from the latter. If the array of available variables provide enough information to assign beginning and ending dates to an artifact, it is recorded as date. Manufacturer is the name of the company that made an artifact, when known. This type of information can be critical in assigning a specific date to an artifact, because dates for the opening and demise of most manufacturing companies are available. A related attribute is the brand name associated with a product. Many brand names also have known temporal spans. At times, the manufacturer or brand name can be determined from the labeling/let-

tering present on an artifact, which was used to advertise the brand name or describe its contents or use.

The technique used to manufacture an artifact will be recorded, when it can be determined. Since manufacturing techniques have changed through time, this attribute can provide a relative idea of when an artifact was made. A related attribute is seams, which records the way in which sections of an artifact were joined during manufacture. Like manufacturing techniques, the types of seams used to construct an artifact are often temporally sensitive. The type of finish/seal will be recorded to describe the shape of the opening in a container and the means of sealing it. Many finishes and seal types have known temporal spans of limited duration. Related to this attribute is opening/closure, which records the method of retaining or extracting the contents of a container.

In some instances, attributes such as color, ware, and dimensions can provide information on artifact dating. Thus, the current color of an artifact will be recorded if of diagnostic value. A good example of where this attribute applies is glass, where the various colors present at a site can be used to provide some idea of the period of use. Ware refers to ceramic artifacts, and categorizes the specific type of pottery represented, when known. Since temporal information exists for most major ware types, this attribute can provide critical dating information. Dimensions are also of chronologic value, especially when examining artifacts like nails or window glass, where lengths or thicknesses vary through time.

A few attributes will be used to provide information on the manufacturing process. In some instances these attributes also have descriptive value, and can be used to verify functional information. Material records the material(s) from which an artifact was made. Paste describes the texture of clay used to manufacture ceramic objects, and is differentiated by porosity, hardness, vitrification, and opacity. Decoration describes the technique used to decorate an artifact, including pottery.

A simple description of the decoration on an artifact is recorded as design.

In addition to most of the attributes already discussed, several others will be used to provide a more comprehensive description of each artifact. Fragment/part describes the section of artifact represented. Artifacts or fragments of artifacts within a single excavation unit whose functions and descriptions are identical will be recorded together, and the number of specimens present will be listed under count.

Cultural and environmental changes to an artifact will also be recorded. Reuse describes evidence of a secondary function, and any physical modifications associated with that use will be described as condition/modification. If environmental conditions have had any effect on the surface of an artifact, it will be recorded as aging.

Other variables will be used to describe the appearance of an artifact. Shape describes physical contours, and will generally only be recorded if an artifact is whole. Several different measurements will be taken to complete descriptions including volume, length/height, width/diameter, thickness, and weight. Measurements will be taken using industry standards, where appropriate. The entire range of measurements are rarely applicable to a single artifact, and only those that are deemed appropriate will be taken.

Faunal Remains, by Nancy J. Akins

Fauna collected during the test excavations at LA 1051 indicate that both prehistoric and historic period fauna will be encountered during the data recovery phase. Since further excavations will concentrate on the intact deposits dating to the Late Coalition into the Classic period, the focus of the prehistoric research will be on that transition. Bones from cattle, sheep, or pig were found in all of the backhoe trenches except for BHT 8 and BHT 10 (Akins 2005:49). Again, the focus of the historic research will be on intact deposits that most

likely date to the Territorial period with minor amounts from the Spanish Colonial period.

Prehistoric Research Questions. Diagnostic ceramics dating to the Coalition and Classic periods are encountered in almost every project in the vicinity of the project area (Lentz 2005). However, most of the work has been monitoring utility trenches or small-scale feature excavations. While this may provide useful information for some artifact classes, fauna is not one of these, especially where the collections are no more than grab samples from backdirt piles. As a result, we know very little about subsistence in Santa Fe during the Coalition and Classic periods. Providing basic data on these periods from Santa Fe is certainly one of the primary goals of the analysis on material recovered from these excavations. Beyond the presentation of those data, the research orientation will focus on the role of the community that occupied this location at the end of the Coalition and into the Early Classic periods. In particular, we hope to address questions concerning the nature of animal subsistence at the end of the Coalition and the changes that characterize the Classic period. If population increase during the Coalition and Classic periods was the result of immigrations, are there aspects of the faunal assemblage that can inform on where these groups originated? How did increasing aggregation influence hunting patterns and the kinds of animals people ate?

Answering these questions begins with producing the basic data that will allow comparisons within the site and with other local and regional assemblages. Once any patterns in the site data have been established, these can be evaluated and compared. Data gathered from OAS projects to the north, west, and south and well-documented assemblages from other regional sites will be the primary basis for examining these trends. The assemblage from Arroyo Hondo Pueblo is especially useful. Not only is it located nearby but it spans the same time period and has a reasonable sample of bone (Lang and Harris 1984).

Reworking the data from Arroyo Hondo for comparison with Cochiti area sites (Peña Blanca; Akins, in prep a) resulted in an interpretation that differs from that presented by Harris and Lang. Instead of percentages of MNI (minimum numbers of individuals) and calculations of edible meat proportions based on the MNIs, a series of commonly used indices (lagomorph, artiodactyl, and turkey) were calculated to examine the resource mix over time and are visually presented in Figure 13. It shows that the initial response to drought conditions around A.D. 1350 was an increase in the use of jackrabbits as compared to cottontails and an increase in the use of artiodactyls as compared to rabbits. When conditions improve and the population begins to grow, the mix changes back to one that is heavily dependent on cottontail rabbits (considered a good indication of garden hunting, e.g., Linares 1976) and decreased emphasis on artiodactyls and turkeys. The civic center excavations should provide the data to test whether this is a regional response to drought conditions. Another possibility is that somehow the Santa Fe area was buffered from drought conditions and returned to an intensive garden-hunting strategy as a regional response to population growth and aggregation.

Ceramics analyzed for the testing phase (Wilson and Lewis 2005:53–57) indicate substantial contact with glaze-ware producing groups to the south. If LA 1051 had close contacts with southern groups or even came from that direction, we might expect that artiodactyl hunting patterns would reflect these contacts. This would be demonstrated by the presence of significant quantities of pronghorn and bison, suggesting access to the Galisteo Basin for hunting. Access to hunting in the Jemez and Sangre de Cristo Mountains would be shown by elk and bighorn, and more local and northern contacts by an abundance of deer remains.

At LA 3333, an Early Coalition period site in the Galisteo Basin, pronghorn outnumbered deer bone by a ratio of 5.5 to 1 (Akins, in prep.

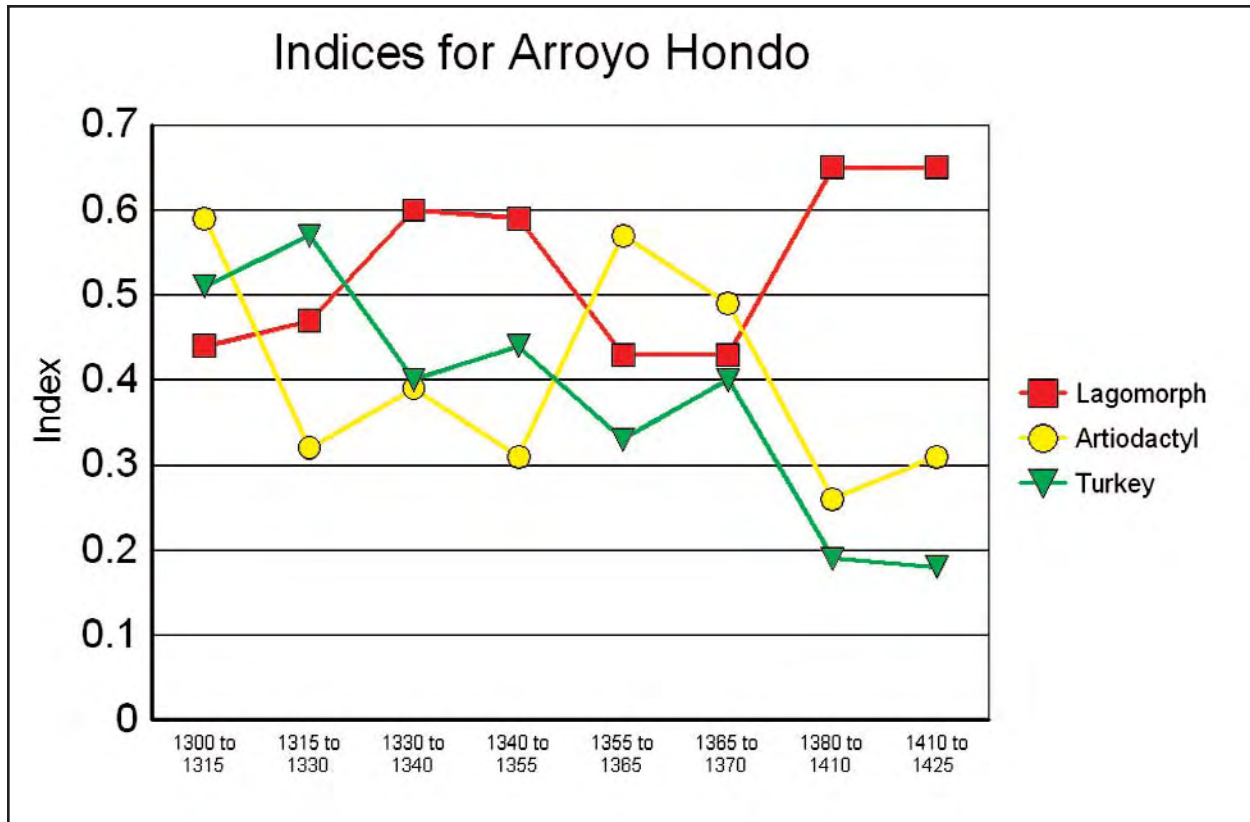


Figure 13. Indices for Arroyo Hondo Pueblo.

b). The small sample from Coalition deposits in the Peña Blanca sites have a ratio of 1.7 pronghorn to 1 deer and no pronghorn in the even smaller Classic sample (Akins, in prep. a). Data from earlier sites to the north along the Pojoaque Corridor all have decidedly more deer than pronghorn. At LA 385 the ratio is 8.3 deer to each pronghorn bone, at LA 391 it is 3.3 deer for each pronghorn bone, and at LA 3119 it is also 3.3 deer for each pronghorn bone (Akins, in prep. c). Examining the proportions and how the artiodactyls were used has the potential to provide information on hunting of artiodactyls and on access to hunting areas throughout the region.

Historic Research Questions. Analysis of the historic fauna recovered from the civic center excavations will augment that recovered during recent excavations at the Palace of the Governors. Broad research topics include the temporal and spatial dimensions of changes in land-use patterns, changes in eco-

nomics strategy, and the relationship between this area and surrounding architectural and land-use patterns (Post 2002:8). A review of historic maps suggests the project area served a number of functions: from an early Spanish presidio (1789) to a corn field (1846) to part of Fort Marcy with a hospital (1853 or 1858 and 1868), and a high school (1912) (Wenker and Lentz 2005:13–21).

As with the Palace of the Governors and the Pojoaque Corridor historic sites, the framework that will be used for analyzing the faunal data from the civic center historic deposits is based in part on one outlined by Huelsbeck (1991:62) that focuses on availability and consumer behavior. It will emphasize the impact of social and economic forces on the acquisition and consumption of animal products as well as on aspects of site structure. Comparisons with faunal assemblages representing demonstrably different types of sites will be made. These include assemblages from isolated homesteads and urban Santa Fe

assemblages from the same time period, assemblages generated by different ethnic and social groups, and assemblages dating before and after this time period are our best means of evaluating the collections from this project. Without this broader context, the data are merely descriptive.

In this framework, availability refers to the range of animals available to the community and to the facility occupying the area at any one time. It will depend, at least in part, on the function of the facility, the groups that utilized the facility, and the markets where food was purchased. The location in the center of Santa Fe should have increased the variety of animals available as well as the likelihood that the site inhabitants participated in the markets and were influenced by market forces. Beyond simple availability, acquisition by purchase or trade raises questions of form (e.g., live animals, cuts of meat, etc.) and concerns the respective relationship between the parties and the quality of the product available.

Consumer choice addresses the species and portions chosen for consumption or use. The status of the consumer may be reflected in the cuts represented and the age of animals selected. Seasonality also plays a part since before refrigeration, larger animals, such as cows, were either divided among many or butchered during the cold season. Choice of preparation method can be indicative of group size and composition. Dietary preferences and butchering practices can also inform on ethnicity.

Trash distribution is seldom a random process so that site structure is reflected in household and community disposal practices. Initial butchering refuse might be deposited in areas distinct from household garbage. Noxious refuse might be burned or taken farther from the residences than material generated by household sweeping or cleaning hearths. Household and community size, spatial arrangement, and local topography will also influence disposal practices. Looking at distributions of taxa, body parts, fragmenta-

tion, and the length and type of exposure can help to distinguish where different activities took place.

Methodology. Sampling may be necessary if large amounts of bone are recovered. If a sampling strategy is used, the proveniences analyzed will include those with the potential to contribute the most high-quality information on species utilization through time.

Specimens chosen for analysis will be identified using the Office of Archaeological Studies' comparative collection supplemented by those at the Museum of Southwest Biology, when necessary. Recording will follow an established OAS computer coded format that identifies the animal and body part represented, how and if the animal and part was processed for consumption or other use, and how taphonomic and environmental conditions have affected the specimen. The following briefly describes the variables.

Provenience Related Variables. Field Specimen (FS) numbers are the primary link to more detailed proveniences within the site. Each line is also assigned a lot number that identifies a specimen or group of specimens that fit the description recorded in that line. It also allows for retrieving an individual specimen if questions arise concerning the coding or for additional study. The count identifies how many specimens are described by that data line.

Taxon. Taxonomic identifications are made as specific as possible. When an identification is less than certain, this is indicated in the certainty variable. Specimens that cannot be identified to the species, family, or order are assigned to a range of indeterminate categories based on the size of the animal and whether it is a mammal, bird, other animal, or cannot be determined. Unidentifiable fragments often constitute the bulk of a faunal assemblage. By identifying these as precisely as possible, the information can supplement that from the identified taxa.

Each bone (specimen) is counted only once, even when broken into a number of pieces by the archaeologist. If the break occurred prior to excavation, the pieces are counted separately and their articulation noted in a variable that identifies conjoinable pieces, parts that were articulated when found, and pieces that appear to be from the same individual. Animal skeletons are considered as single specimens so as not to vastly inflate the counts for accidentally and intentionally buried taxa.

Element (Body Part). The skeletal element (e.g., cranium, mandible, humerus) is identified and then described by side, age, and the portion recovered. Side is recorded for the element itself or for the portion recovered when it is axial, such as the left transverse process of a lumbar vertebra. Age is recorded at a general level: fetal or neonate, immature, young adult (near or full size with unfused epiphysis or young bone), and mature. Further refinements based on dental eruption or wear are noted as comments. The criteria used for assigning an age are also recorded. This is generally based on size, epiphysis closure, or texture of the bone. The portion of the skeletal element represented in a particular specimen is recorded in detail to allow determining how many individuals are present in an assemblage.

Completeness. Completeness refers to how much of that skeletal element is represented by the specimen. It is used in conjunction with the portion represented to determine the number of individuals present. It also provides information on whether a species is intrusive, and on processing, environmental deterioration, animal activity, and thermal fragmentation.

Taphonomic Variables. Taphonomy is the study of preservation processes and how these affect the information obtained by identifying some of the non-human processes that affect the condition or frequencies found in an

assemblage (Lyman 1994:1). Environmental alteration includes degrees of pitting or corrosion from soil conditions, sun bleaching from extended exposure, checking or exfoliation from exposure, root etching from the acids excreted by roots, and polish or rounding from sediment movement. Animal alteration is recorded by source or probable source and where it occurs. Choices include carnivore gnawing or punctures, scatological or probable scat, rodent gnawing, and agent uncertain. Burning, when it occurs after burial, is also a taphonomic process.

Burning. Burning can occur as part of the cooking process, part of the disposal process, when bone is used as fuel, or after burial. The color, location, and presence of crackling or exfoliation are recorded. Burn color is a gauge of burn intensity. A light tan color or scorch is superficial burning, while charred or blackened bone becomes darker as the collagen is carbonized, and when the carbon is oxidized, it becomes white or calcined (Lyman 1994:385, 388). Burns can be graded over a specimen, reflecting the thickness of the flesh protecting portions of the bone, or light on the exterior and black at the core, reflecting burns that occur when the bone is dry. Graded burns can indicate a cooking process, generally roasting; completely charred or calcined bone do not. Uniform degrees of burning are possible only after the flesh has been removed and generally indicate a disposal practice (Lyman 1994:387). Potential boiling or cooking brown is also recorded as brown and rounded, brown with no rounding, rounding only, and waxy.

Butchering. Evidence of butchering is recorded as various orientation of cuts, grooves, chops, abrasions, saws, scrapes, peels, and intentional breaks. The location of the butchering is also recorded. A conservative approach is taken in recording marks and fractures that could be indicative of processing animals for food, tools, or hides because many natural processes result in similar

marks and fractures.

Modification. Other types of modification are indicated through this variable. Manufacturing debris and tool forms are one option as are potential use wear and pigment stains.

Chronometric Dating

Chronometric samples will be collected and used to define the occupation sequence. Absolute dating methods that may be used in this project include dendrochronology, archaeomagnetism, and radiocarbon assays. Other relative dating methods, particularly ceramic stylistic and technological variation and historic artifact manufacture dates are discussed in the appropriate analytical section.

Dendrochronology produces extremely precise and accurate dates when appropriate samples are available. Ideal samples should have at least 15 to 20 years of growth rings, a sensitivity to climate variation that allows the sample to be matched with the regional chronology of climatic variation, qualities of outer surface that allow the outer ring to be interpreted as the death year of the tree, and an archaeological context that supports a linkage between tree death and the cultural behavior that is the target event of the dating effort. Tree-ring dating is most reliable when multiple samples are collected from structural remains where timbers were cut to length. Although construction timber reuse and stockpiling can cause inaccuracies (Graves 1983), patterns of dates from multiple samples usually reveal the presence of remodeling or reuse of wood. Although wood samples from nonarchitectural contexts can be dated, samples from fuel wood in hearth contexts risk the same "old wood" problem that affects radiocarbon samples (Smiley 1985). The University of Arizona Tree-Ring Laboratory in Tucson is the pre-eminent laboratory for this method and they will be performing the analysis if dendrochronological samples are

recovered.

Archaeomagnetism does not have either the potential precision or accuracy of tree-ring dating, but it does have other advantages. Heating allows the field orientations of magnetic particles in earth or rock to become reoriented to the prevailing geomagnetic field when the particles cool (Sternberg 1990; Wolfman 1990). Since the geomagnetic field is constantly changing, features that are burned and cool will retain a distinctive magnetic orientation that is determined by the date of the cooling. Whereas tree-ring dating works best at recording the dates of construction events, archaeomagnetic dates apply to the final use of burned features and are one of the only dating techniques that can inform about abandonment events.

Archaeomagnetic samples are collected from burned cultural features or contexts, the orientation of the sample is measured in the laboratory, and the geomagnetic pole recorded by the feature is compared with the regional pattern of polar movement through time. Problems with archaeomagnetism stem from both measurement factors and interpretation factors, both of which can affect the precision and exclusivity of date interpretations. The precision of a given result is determined by the coherence of the orientations of the individual specimens (usually eight) that make up the sample. Variables affecting coherence include the type, size, and density of magnetic minerals in the earth, the temperature of the burn, and any sources of post-burning disturbance of the feature. Even a very coherent result may have imprecise or multiple date interpretations based on the intersection of the result's oval of confidence with the polar curve for the region. A time of particularly slow polar movement can result in a broad date range, or a region of the pole that is transected by several segments of the polar curve will result in multiple possible date ranges. When an archaeomagnetic sample results in multiple date ranges, independent dating evidence will be required to determine which of the possible date ranges is correct. The great-

est advantage of this technique is that the sampled material is usually unambiguously related to the component being dated, but potential ambiguity of the technique requires that it be used in conjunction with other sources of chronology. The Office of Archaeological Studies Archaeomagnetic Laboratory, directed by Eric Blinman, will be used if appropriate contexts are encountered.

Radiocarbon dating has similar limitations as the first two methods, but it has the advantage that carbon is one of the most abundant sample materials in archaeological contexts (Taylor 2000). Plants incorporate carbon into their tissues through photosynthesis, drawing on the pool of carbon in the atmosphere. Radioactive isotopes of carbon produce cosmic radiation in the upper atmosphere, resulting in a relatively constant proportion of carbon-14 in the atmospheric pool. When plant tissue is no longer actively incorporating carbon, the amount of radioactive carbon declines at a rate consistent with the relatively short half-life of the isotope. The measured amount of radioactive carbon in a sample, the expected amount given the assumed atmospheric pool concentration, and the half-life value for the isotope can be used to calculate a radiocarbon age for the sample. Precision of radiocarbon age estimates is determined by the measurement error associated with determining the radioactive isotope contents. However, the assumption of a constant value for the carbon-14 pool concentration has been shown to be inaccurate, and the radiocarbon age of a sample can only be translated into a calendric age estimate by comparison with carefully derived calibration curves (Stuiver and Reimer 1993). These curves reflect fluctuating pool values, increasing dating accuracy but affecting both precision and exclusivity of radiocarbon date interpretations. A single precise date expressed in radiocarbon years can yield an imprecise calendar date or multiple possible calendar date ranges.

Independent of the technical aspects of dating, radiocarbon samples are not unambiguously associated with cultural contexts.

Although unburned organic materials deteriorate in most archaeological sites, charcoal is inert, and once it is produced, it is only subject to physical damage. Most charcoal results from heating and cooking fuel, but it can also result from the burning of structures and artifacts. Individual pieces of charcoal rarely carry any qualities that can be unambiguously related to a particular cultural event, therefore the integrity of potential samples is dependent on feature contexts. If samples are collected from potentially disturbed contexts, then the resulting dates can only be interpreted in relation to other independent dates. Other problems with radiocarbon dating are the "old wood" issue previously mentioned for dendrochronology and cross-section effects. Long-dead (dry) wood tends to be harvested for fuel, and on Southwestern landscapes, standing dead trees may be sources of fuel for centuries after their death (Smiley 1985). In addition, slow-growing species, such as piñon and juniper, can incorporate centuries of growth into small branches (cross-section effect). These qualities can result in erroneously early radiocarbon dates, even though the sampled material is unambiguously associated with a particular cultural feature and behavior. To lessen the potential risks of these problem, the charcoal selected for dating can be sorted by species and plant part. Small twigs or branches contribute less to cross-section effects because they incorporate fewer years of growth and they persist for shorter periods on standing dead trees. Annual plants and perennial shrubs are better material for radiocarbon dating because they incorporate carbon over smaller numbers of years and are not likely to survive on the landscape a long time after dying. Care in collecting, selecting, and characterizing radiocarbon samples will increase their relevance to particular cultural contexts, but the other limitations of the technique and date interpretation will constrain use and interpretation in some contexts. The Office of Archaeological Studies uses Beta-Analytic, Inc. of Coral Gables, Florida, for all radiocarbon dating.

Archaeobotanical Analysis

Archaeobotanical samples will be collected from specific contexts such as thermal or refuse deposits rich in organic material to inform us on diet and economic pursuits.

Pollen analysis will be conducted by a recognized professional palynologist experienced with prehistoric and historic sites in New Mexico, and particularly, New World domesticates. Pollen analysis methods are not presented here, because they may vary depending on the analyst. The full range of methods that may be applicable to the identification of New and Old World domesticate pollen will be explored in consultation with contract specialists and specialists that are on the Office of Archaeological Studies staff. Pollen wash procedures are included in the following discussion.

Macrobotanical studies will include flotation analysis of soil samples, species identification and (where appropriate) morphometric measurement of macrobotanical specimens, and species identification of wood specimens from both flotation and macrobotanical samples. Flotation is a widely used technique for separation of floral materials from the soil matrix. It takes advantage of the simple principle that organic materials (and particularly those that are non-viable or carbonized) tend to be less dense than water, and will float or hang in suspension in a water solution. Each soil sample is immersed in a bucket of water. After a short interval, heavier sand particles settle out, and the solution is poured through a screen lined with "chiffon" fabric (approximately 0.35 mm mesh). The floating and suspended materials are dried indoors on screen trays, then separated by particle size using nested geological screens (4.0, 2.0, 1.0, and 0.5 mesh), before sorting under a binocular microscope at 7 to 45X.

This basic method was used as early as 1936, but did not become widely used for recovery of subsistence data until the 1970s. Seed attributes such as charring, color, and aspects of damage or deterioration are record-

ed to help in determining cultural affiliation versus post-occupational contamination. Relative abundance of insect parts, bones, rodent and insect feces, and roots help to isolate sources of biological disturbance in the ethnobotanical record.

All macrobotanical remains collected during excavation will be examined individually, identified, repackaged, and catalogued. Condition (carbonization, deflation, swelling, erosion, damage) will be noted as clues to cultural alteration, or modification of original size dimensions. When less than half of an item is present, it will be counted as a fragment; more intact specimens will be measured as well as counted. Corn remains will be treated in greater detail. Width and thickness of kernels, cob length and mid-cob diameter, number of kernel rows, and several cupule dimensions will be measured. In addition, the following attributes will be noted: over-all cob shape, configuration of rows, presence of irregular or undeveloped rows, and post-discard effects.

Pollen washes will be conducted in the laboratory, necessitating certain precautions. Ground stone tools from trash deposits will be placed in plastic bags after removal from the ground, and will be lightly brushed to remove loose soil. A thin cover of dirt will be left on tools found on floors until they are ready for photographing. Loose dirt will be removed prior to photographing, and the artifacts will be placed in plastic bags as soon as is feasible after that procedure is completed. Laboratory processing will proceed as follows: the entire surface of tools will be brushed before samples are collected. Using distilled water and a tooth brush, grinding surfaces will be scrubbed to collect embedded materials. The size of the area sampled will be measured and noted. Wash water will be collected in a pan placed under the sample and packaged for storage. Samples selected for analysis will receive a short (about 10 minutes) acetolysis wash. Under certain circumstances, this may help preserve the cytoplasm in some modern pollen grains, allowing

recent contaminants to be distinguished from fossil pollen. Pollen samples from ground stone artifacts will be subjected to full analysis to attempt to distinguish economically used wild plants as well as cultigens. The analyst will monitor for the occurrence of broken and whole grains and clumps of grains during counting. In addition, evidence for the presence of corn starch in samples will be noted.

Research Issues for Human Remains, by Nancy J. Akins

While human remains are often recovered from prehistoric sites, rarely is the information gained from their study integrated into broader research perspectives, even when the topics relate to subsistence, diet, and demography (Martin 1994:88–89).

Descriptions of mortuary treatment are fairly standard, but few go beyond placing the individual burial into the site context. The potential for understanding social behavior and organization gained from mortuary practices, which change in response to social, demographic, and economic conditions (Brown 1995:7; Larsen 1995:247), is rarely pursued.

Studies of human remains have shifted from constructing cultural sequences and identification of racial groups to identifying broad patterns of social organization and change. Mortuary remains are often highly patterned and reflect social organization more directly than other classes of archaeological remains (Trinkaus 1995:53). Recent mortuary analyses have approached a variety of topics, ranging from individual, gender, ethnic, political, and social identity to interpersonal conflict, resource control, labor and organization, ritual and meaning, social inequality, trade, population dynamics, and residential patterning (Larsen 1995:260).

Advances in the study of human remains provide important insights on health, diet, genetic relationships, microevolution, and population characteristics. Inherited skeletal features are being used to address conflicting land claims by indigenous groups and studies

of past human populations have provided information on inherited predispositions for diseases like diabetes and anemia (Buikstra and Ubelaker 1994:1).

Even the most basic analyses of human remains have the potential to contribute significant information on life during prehistory. Human bones and teeth record conditions during life as well as at death (Goodman 1993:282). Several indicators of physiological stress are routinely monitored to assess general health. These include adult stature, which may result from undernutrition, and subadult size, which can indicate the timing of stress events. Sexual dimorphism tends to decrease with increased stress, or over time, with greater divisions of labor. Enamel defects, hypoplasias, or pitting are associated with specific physiological disruptions and can relatively accurately be assigned an age of onset. Dental asymmetry begins *in utero* and reflects developmental stress, while dental crowding can be nutritional or genetic. Dental caries reflect refined carbohydrates in the diet and can lead to infection and tooth loss. Dental abscessing can become systemic and life-threatening. Osteoarthritis and osteophytosis can indicate biomechanical stress. Osteoporosis, related to calcium loss and malnutrition, can be acute to severe during pregnancy and lactation, and can affect the elderly. Porotic hyperostosis is related to iron deficiency anemia and leaves permanent markers. Periosteal reactions result from chronic systemic infections (Martin 1994:94–95).

Santa Fe Area Data. There are little data on prehistoric burials from Santa Fe proper. Most of those encountered have been during small-scale cultural resource management projects, like the fragmentary remains of as many as ten or eleven individuals recovered during backhoe trenching, monitoring, and screening of backhoe fill from 125 Guadalupe Street and the burial recently removed from near the site area by Abotech. While an effort will be made to compile as much information as possible on burials recovered during these

small projects, populations from Arroyo Hondo and other nearby sites are more likely to provide a basis for comparison.

Research Issues. The primary issues to be addressed by the civic center studies concern the health and biological affinity of the groups occupying the area. In particular, we are concerned with how the drought that occurred during the Coalition period affected the health of the occupants of LA 1051 and whether there is evidence of other groups moving into the area.

Wetterstrom (1986) suggests that the people of Arroyo Hondo faced a series of major droughts and resulting food shortages beginning about A.D. 1335. The cumulative effect would have diminished plant and animal resources and exhausted food stores (Wetterstrom 1986:95–96) and resulted in lower caloric intakes and possibly starvation. These conditions would have had a disproportionate affect on the more vulnerable members of the community and caused a decrease in fertility (1986:111–115). The Arroyo Hondo burials (108 burials dating between A.D. 1300–1370 and A.D. 1370–1425) have evidence of nutritional stress. Infants and children less than 5 years of age account for 42 percent of the deaths and high incidences of endocranial lesions, porotic hyperostosis, bowing of weight-bearing long bones, and periostitis indicates the presence of malnutrition and infectious disease (Palkovich 1980:36–47; Wetterstrom 1986:147–153). A similar drought has been documented for the area beginning around A.D. 1325 (Dean and Robinson 1977). If burials from that era are recovered, these, too, should exhibit similar signs of stress (see *Research Orientation and Data Requirements*).

While the civic center excavations are unlikely to encounter anywhere near that number of burials, age profiles and indications of nutritional stress, infectious disease, trauma, and metric information can be compared with that site and others in the region. Other sources of comparative data include

populations recovered from LA 3333 in the Galisteo Basin, San Cristobal (Stodder 1990), Peña Blanca, and Pojoaque.

A second question concerns population affinity, i.e., whether the prehistoric inhabitants were recent migrants into the area. Early researchers such as Erik Reed (Wendorf and Reed 1955:153, 161) believed that the type of cranial deformation provided a clue to population movements. He suggests that because vertical occipital deformation rarely appeared in populations from the Rio Grande until fairly late, i.e., after A.D. 1300, its origin was to the west or from the Mesa Verde area and its presence was a mark of the arrival of immigrants from those areas. Since Reed's time, the focus of study has shifted from cultural modifications, such as cranial deformation, to studies of genetic similarities based on metric and nonmetric variation. Interest in determining the genetic relationships between prehistoric groups has a long history in the Southwest. As early as 1931, Alex Hrdlicka published cranial measurements for a number of Southwestern prehistoric populations. Relying on population means, he concluded that there were two basic groups but no physical subdivisions related to "cultural taxonomic divisions" (Corruccini 1972:373).

A few of the more recent studies utilizing multivariant techniques have included groups from the Rio Grande. Mackey's study of cranial measurements from 14 widely distributed Southwestern archaeological populations found relatively close relationships between those from Puye (n=28, A.D. 1350–1600), Hopi (n=14, A.D. 1200–1700) and Jemez (n=24, A.D. 1400–1800), while a population from the Cochiti area (n=31, A.D. 1300–1550) was quite distant (Mackey 1977:480–481). A slightly later study with additional populations found Puye most closely related to those from San Cristobal (n=38, late 1500s–1800s) and Kuaua (n=40, 1500s), while an Arroyo Hondo population (n=33, A.D. 1300–1425) was closest to those from Pindi (n= 28, A.D. 1250–1350) and Pecos Mission (n=24, historic) (Mackey 1980:175,

178). Schillaci and colleagues (1998, table 2, fig. 4) report that burials from Otowi (n=9, A.D. 1400+) are most closely related to Neil Judd's Pueblo Bonito burials (n=15, A.D. 920–1120), followed by those from Pot Creek (n=8, A.D. 1250–1320).

These studies suggest that cranial morphometrics have the potential to provide data on the origins and affinities of any human burials recovered by this project. Data on non-metric variation will be collected, but at present, little comparative material is published and the material from LA 1051 will serve mainly to provide baseline data for the area.

DNA analysis, a destructive method, is a more precise method to determine affinities among contemporary, historic, and prehistoric groups (Buikstra and Ubelaker 1994:170). However, the limited application to other prehistoric populations makes it difficult to reach any conclusions. Collection of samples for future studies should be considered.

Another method, which takes but a small amount of bone and dental enamel (1 g each), compares stable strontium isotope ratios to assess whether individuals were raised in the area in which they were buried. Strontium signatures in the teeth reflect the time when the tooth was developed while the signature in bone constantly changes as bone remodels. If the signatures are different, movement from an isotopically distinct location can be inferred (Buikstra and Ubelaker 1994:172).

Finally, an overview of northern Rio Grande mortuary practices will be compiled. According to Wendorf and Reed (1955:142), burial during the Developmental period was flexed inhumation. During the Coalition period it was usually flexed inhumation with some extended burials recorded, but not precisely dated (1955:146). The same pattern was found during the Classic period: flexed inhumation with minor percentages of extended burials (1955:153). Shifting influences and population influxes as well as changes in settlement pattern and population densities should be reflected in the burial practices.

Consultation Procedures. On state and private land, state law (NMSA § 18-6-11.2, 1989 and HPD Rule 4 NMAC 10.11) requires a permit for excavation of unmarked burials. Human remains on state or private land will be excavated under the 2005 annual burial permit issued to the Office of Archaeological Studies. Following the permit provisions, the intent to use the annual permit, including a legal description of the location of the burial, the written authorization to remove the burial from the landowner, a description of the procedures to be implemented to identify and notify living relatives of the burials, certification that the law enforcement agency having jurisdiction in the area has been notified, a list of personnel supervising and conducting excavations of the human burial, and the NMCRIS LA Project/Activity Number for the permitted excavation will be submitted in writing to the State Historic Preservation Officer (SHPO) before excavation of the burials begins. The local law enforcement agency with jurisdiction over the area will be notified to contact the state medical investigator who will determine if the burial is of medico-legal significance. Within 45 days of completing the permitted excavation, recommendations for the disposition of human remains and funerary objects will be made to the SHPO. These recommendations will take into consideration the comments of living persons who may be related to the burial and the wishes of the landowner. The plan will provide a proposed location for reburial or approved curatorial facilities and an inventory of funerary objects, other artifacts found in association, or collected in the course of excavation. The SHPO, after consulting with the State Office of Indian Affairs, will determine the appropriate disposition of the human remains and associated funerary objects. If a final report cannot be completed within a year of the completion of fieldwork, an interim report will be submitted along with an estimated completion date for a final report.

Excavation Procedures. Excavation of human burials will be consistent with current professional archaeological standards. This generally includes the identification of a burial pit and careful removal of fill within the pit. When possible, half the fill will be removed to provide a profile of the fill in relation to the pit and the burial. The pit, pit fill, burial goods, and burial will be examined and recorded in detail on an OAS burial form with special attention paid to any disturbance that may have taken place. Plans, profiles, and photographs will further document the burial and associated objects. Flotation and pollen samples will be taken from all burials.

Disarticulated or scattered remains will be located horizontally and vertically and photographed. Any associated materials and the potential cause of disturbance or evidence of deliberate placement will be recorded in detail.

Analysis Methods. The human analysis will follow the procedures set out in *Standards for Data Collection from Human Skeletal Remains* (Buikstra and Ubelaker 1994). This comprehensive system collects the maximum amount of comparable information by recording the same attributes using the same standards. A series of 29 attachments and documentation on how these should be recorded include the following information.

1. An inventory sheet codes each element that makes up a skeleton. Diagrams of infant, child, and adult skeletons and anatomical parts allow for the location of observations concerning these parts. Another form codes commingled or incomplete remains.
2. Adult sex is determined by examining aspects of the pelvis and cranium. Age changes are documented on the pubic symphysis using two sets of standards, on the auricular surface of the ilium and through cranial suture closure.
3. For immature remains, the age-at-death is determined by scoring epiphyseal union, union of primary ossification centers, and measurements of elements.
4. Recording dental information includes an inventory, pathologies, and cultural modifications. Each tooth is coded and visually indicated for presence and whether it is in place, unobservable, or damaged, congenitally absent, or lost pre-mortem or post-mortem. Tooth development is assessed, occlusal surface wear is scored, caries are located and described, abscesses are located, and dental hypoplasias and opacities are described and located with respect to the cemento-enamel junction. Any pre-mortem modifications are described and located.
5. The secondary dentition is measured and dental morphology scored for a number of traits.
6. Measurements are recorded for the cranium (n=35), clavicle, scapula, humerus, radius, ulna, sacrum, innominate, femur, tibia, fibula, and calcaneus (n=46 postcranial measurements).
7. Nonmetric traits are recorded for the cranium (n=21), atlas vertebra, seventh cervical vertebra, and humerus.
8. Postmortem changes or taphonomy are recorded when appropriate. These include color, surface changes, rodent and carnivore damage, and cultural modification.
9. The paleopathology section groups observations into nine categories: abnormalities of shape, abnormalities of size, bone loss, abnormal bone formation, fractures and dislocations, porotic hyperostosis/cribra orbitalia, vertebral pathology, arthritis, and miscellaneous conditions. The element, location, and other pertinent information is recorded under each category.

10. Cultural modifications such as trepanation and artificial cranial deformation are recorded in another set of forms.

Standards. Buikstra and Ubelaker (1994:174) recommend curating the following samples for future analysis on burials that will be repatriated. The middle portion of a femur midshaft (at least 100 g), which can be used for radiocarbon dating, trace element analysis (diet), stable isotope ratios (climate and diet), strontium (population movement), bone geometry (activity patterns), histomorphometry (age and health), and aspartic acid analysis (age and health). Several teeth (the upper central incisor, lower canines and premolars, and lower second molar), which can be used for histomorphometric analysis, cementum annulation (root), aspartic acid (dentin), isotope studies (enamel), and future studies of linear hypoplasias and enamel microwear patterning. Five grams of trabecular bone for DNA extraction, the middle third of a clavicle and rib six for age-at-death, health studies, and morphological age assessments. Finally, two sections of the right femur and one section each of the humerus or CT scans of both to assess the level and type of behavior. No samples will be collected without the express permission of the SHPO and landowner.

OTHER DELIVERABLES

A deliverable included in the RFP is the production of a popular article at the conclusion of the project. The OAS staff will author such an article, to be published in *El Palacio* (the magazine of the Museum of New Mexico) or a similar publication.

UPDATES AND RESEARCH RESULTS

OAS shall prepare weekly reports detailing the work conducted during that week, an interim report to be prepared following completion of each phase of work, and a draft and a final report.

Further, the weekly reports and interim phase completion reports shall detail the area(s) worked, the type and extent of work conducted, the cultural deposits and materials exposed/recovered, preliminary interpretation of the cultural deposits, any problems (and solutions) encountered, recommendations, and anticipated next steps. These reports, submitted by the OAS (contractor) to the City, will update the City, including historic staff and the ARC chair, and the HPD, on the current progress, finds, and their significance. An interim report shall also be prepared after testing is completed in the location of the current Sweeney Convention center (Area 4). The interim reports shall also include recommendations for continued data recovery or avoidance by redesign, and/or incorporation of the exposed features into the design of the proposed Civic Center. The City of Santa Fe, in consultation with the State Historic Preservation Office, will assess the recommendations and determine the most feasible option. The OAS shall also provide a draft final report to the City, ARC, and HPD presenting the results of the project. The report will be reviewed by the ARC and recommendations will be made for approval or disapproval. This recommendation will be forwarded to the HPD for review and concurrence. If HPD concurs with the ARC approval, construction can proceed. The OAS shall provide a final report incorporating any review comments on the draft report.

ARTIFACT CURATION

All materials generated as the result of this project shall be curated with the Archaeological Research Collections (the repository) at the Museum of Indian Arts and Culture, Laboratory of Anthropology.

The data recovery report will be produced by the Office of Archaeological Studies in the *Archaeology Notes* series. The report will describe the excavations, types of analyses, and present interpretive results and recommendations. It will include photographs, site

and feature maps, and data summaries. Field maps and notes, analytical data sheets, and photographs will be deposited with the Archeological Records Management Section of the State Historic Preservation Division.

PERMIT MODIFICATIONS

If site conditions require modification of the data recovery methods, or if construction plans are modified to either reduce or

increase the affected site area, the OAS requests approval to consult with staff of the Historic Preservation Division (HPD) to determine the appropriateness of alternate data recovery strategies. If HPD staff believe that requested modifications exceed the intent of Cultural Properties Review Committee approval, the OAS will consult with the Cultural Properties Review Committee at their next scheduled meeting.

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