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OFFICE OF ARCHAEOLOGICAL STUDIES

TESTING REPORT AND DATA RECOVERY PLAN FOR SAN ANTONIO DE PADUA, LA 24, BERNALILLO COUNTY, NEW MEXICO

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ADMINISTRATIVE SUMMARY

San Antonio de Padua (LA 24) is a large site with Anasazi components dating to the Late Coalition-Early Classic and to the early Historic periods. It has also been continuously occupied by Hispanic families since the early nineteenth century. The New Mexico State Highway and Transportation Department plans to improve the line of sight at the entrance to the San Antonio de Padua Church on NM 14. These improvements will affect a small portion of the site area that is entirely within the state-owned right-of-way.

The Museum of New Mexico, Office of Archaeological Studies, conducted test excavations at LA 24 between April 14 and 23, 1992. Five test pits were placed south of the turnout and one to the north. All but one of the test pits contained stratified trash deposits. The area north of the turnout, which will be reduced to road grade, contains dense trash, primarily from the prehistoric and early historic components of the site. Human burials are likely to be present in these deposits. The stratified trash deposits have the potential to provide information on local prehistory and history. A data recovery plan discusses the local prehistory and history, the research orientation, and field strategies for this data recovery project.

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INTRODUCTION

LA 24 is a large prehistoric and historic site located adjacent to NM 14 (Fig. 1). Most of the site is in abandoned fields. The exact size is unknown due to the placement of the San Antonio de Padua Church and several modern residences within the site area. In 1973, Peckham (ARMS form) estimated the site area as 200 by 400 m. Office of Archaeological Studies test excavations found that the site extends further south than Peckham's field map indicates.

Field work was carried out between April 14 and April 23, 1992. Nancy J. Akins supervised the excavations, assisted by OAS staff members Lewis Kimmelman and Macy Mensel, and volunteer Cheryl Ford.

The New Mexico State Highway and Transportation Department plans to improve the line of sight at the entrance to the San Antonio de Padua Church by leveling the area within the right-of-way to road grade. The deposits that will be excavated are within a triangle formed by NM 14 and the turnout that provides access to the church and several residences. The Museum of New Mexico excavated the area beneath NM 14 to the west and portions of the area north of the triangle in 1975 (Dart 1980).

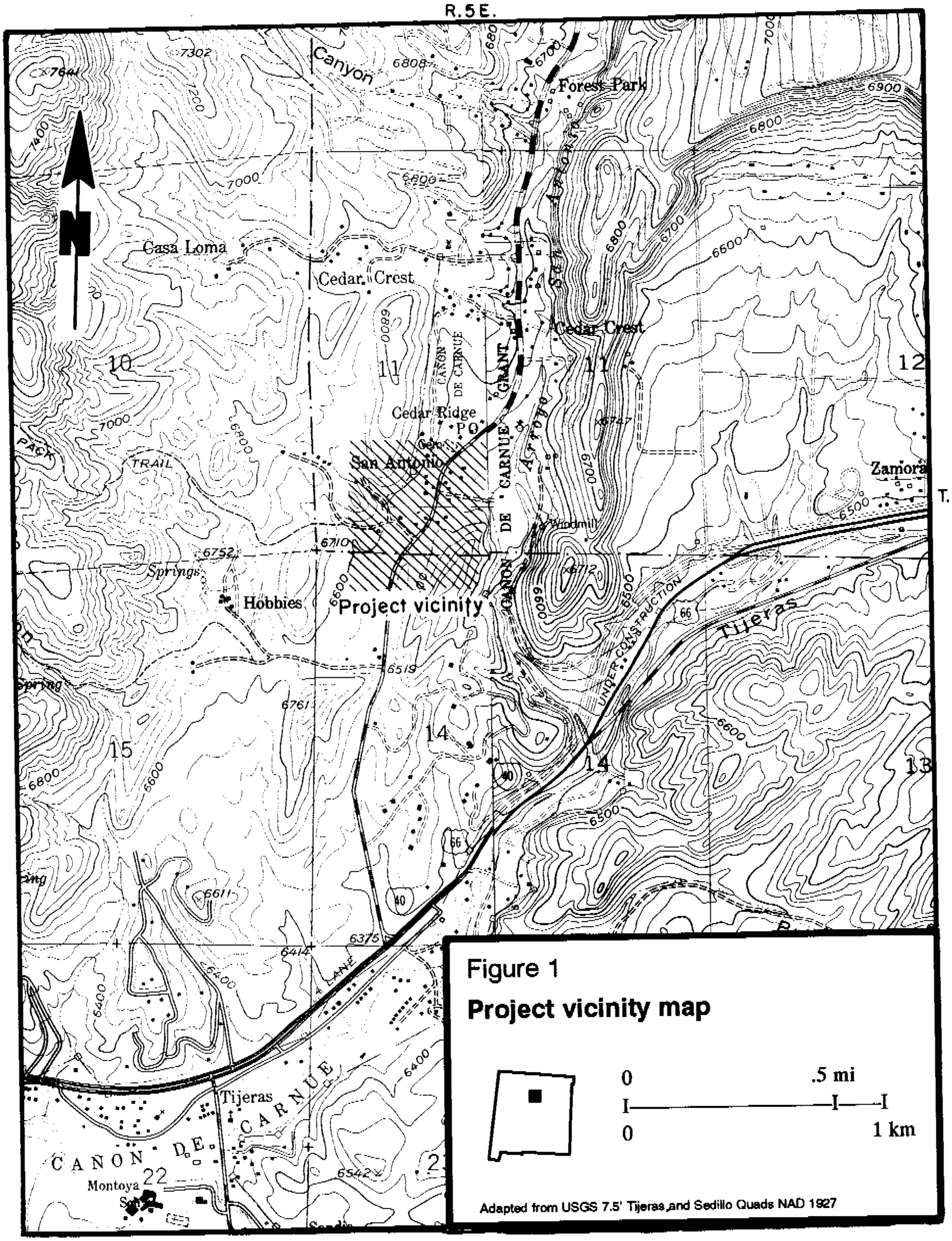

Figure 1
Project vicinity map

Adapted from USGS 7.5' Tijeras and Sedillo Quads NAD 1927

ENVIRONMENT

Tijeras Canyon is the major east-west link between the Rio Grande Valley and the Estancia Basin. It lies between the Sandia and Manzano Mountains, which are oriented north to south and parallel the channel of the Rio Grande. The mountains are fault blocks with outcrops of Precambrian Sandia granite on the steep west face and Pennsylvanian marine and sedimentary deposits on the crests and gentle eastern slopes (Anschuetz 1984:118).

LA 24 (San Antonio) is situated in the widest portion of a small north-south trending valley on the east slope of the Sandia Mountains. Arroyo San Antonio, which drains about a third of the eastern face of the mountains, is .4 km to the east. A tributary to Arroyo San Antonio, about .8 km north of the site, is fed by two springs and runoff from the Sandias (Dart 1980:10). Arroyo San Antonio runs into Tijeras Creek about a kilometer southeast of LA 24. Several perennial springs lie about .8 km above and west of San Antonio (Swadesh 1980:42).

Soils near San Antonio are of the Kolob-Rock Outcrop Association. These are well-drained loamy and stony soils overlying limestone bedrock and suited for wildlife habitat, watershed, recreation, timber, and range (Anschuetz 1984:126, 130; Hacker 1977:7). Soils suited for agriculture are rare in the Tijeras Canyon area. The more productive soils are found along drainages where they are susceptible to flooding from heavy runoff (Anschuetz 1984:131). At the site are red soils, probably those described by Hacker as similar to Travesilla soils but redder, and a clayey soil that is similar to Bond soil but contains 35 to 45 percent clay (Hacker 1977:33).

The Sandia Mountains contain four plant zones: the piñon-juniper zone dominated by piñon and one-seeded juniper; a transition zone with ponderosa pine, Rocky Mountain juniper, and white fir; the mixed conifer zone consisting of aspen, white fir, and Douglas fir; and a spruce-fir zone dominated by Douglas fir, Engleman spruce, corkbark fir, and limber pine. San Antonio is within the piñon-juniper zone but has minor intrusions of Rocky Mountain juniper and ponderosa pine in the general area (Tierney 1980:13-15).

Most of LA 24 is now a fallow field. Within 8 km are piñon-juniper associations, residential gardens, riparian, riparian juniper, and orchard-vineyard vegetation areas. The fallow field association consists of disturbed, but uncultivated fields of several kinds. The present character reflects past utilization, the kind and degree of current disturbance, and natural conditions such as elevation, exposure, and soils (Tierney 1980:32).

At least 73 mammal, over 100 bird, and 51 amphibian and reptile species inhabit or traverse the Sandia Mountains and surrounding area (Dart 1980:34; Young 1980:95-98). Ivey (1957:501) notes that the Sandia and Manzano mountains lack many species usually found in the Rocky Mountains. He suggests that the Sandias and Manzanos became isolated from the Sangre de Cristo range and catastrophic conditions greatly depleted the fauna.

Tijeras Ranger Station, the closest weather recording station, is located 3 km south of San Antonio at an elevation of 1,920 m (6,300 ft). Records indicate a mean annual temperature of 49.3 degrees Fahrenheit (9.6 degrees Centigrade) with a mean January temperature of 28.9 degrees Fahrenheit (-1.7 degrees Centigrade) and a mean July temperature of 70.3 degrees

Fahrenheit (21.3 degrees Centigrade). The average frost-free period is 134 days with frosts generally occurring between May 20 and October 1. Cold air drainage reduces the frost-free season to below that of Sandia Park, 8 km north of San Antonio and at an elevation of 2,137 m. Annual precipitation averages 388 mm (15.3 inches) but is quite variable. The minimum, recorded in 1950, was 171 mm (6.7 inches) and a maximum of 805 mm (31.7 inches) was recorded in 1941. Late summer is the wettest period with 40.6 percent of the annual precipitation falling between July and September (Anschuetz 1984:122-124).

CULTURAL BACKGROUND

Pre-Clovis finds tend to be concentrated at high altitudes in both North and South America. Location of these sites in areas of high ecological diversity suggests a less focal economy than that of later Paleoindian groups. An increase in effective moisture between 9500 and 9000 B.C. changed the Southwestern faunal composition into one more like that of the Plains. This low ecological diversity may have forced an economy focused on large mammals. Clovis sites tend to be located near water sources in areas where game could be trapped (Tainter and Levine 1987:12). Early Paleoindian use of the Middle Rio Grande Valley was minimal (Cordell 1979:12).

A period of decreased moisture caused Late Paleoindian groups, Folsom and Midland, to concentrate at major water sources and to rely on bison as their principal prey species (Tainter and Levine 1987:13). Isolated Folsom points have been found throughout the Rio Grande Valley, including one just west of San Antonio at Carnuel. An open camp site was excavated and a number of localities recorded at Rio Rancho west of Albuquerque and there is a Folsom component in Sandia Cave located on the west face of the Sandia Mountains (Cordell 1979:12; Dart 1980:4).

Subsequent Paleoindian groups faced continued decreases in moisture. Some interpret the paucity of remains from these groups as evidence that drying led to a sparse or intermittent occupation of the west-central part of New Mexico and a decline in the importance of big game hunting. An alternate view holds that Late Paleoindian groups continued to occupy the area but had a less visible adaptation based on smaller fauna and vegetal foods (Tainter and Levine 1987:14-15, 25).

The Early Archaic was characterized by climatic fluctuations followed by a general drying between about 5000 and 3000 B.C. Piñon-juniper savannas alternating with grasslands and decreasing surface water were suited to an unspecialized economy based on small- to medium-sized mammals, gathering, and high residential mobility (Irwin Williams 1979:33; 1984:9).

Increased effective moisture between 3500 and 2500 B.C. allowed Middle Archaic groups to broaden their economic base and to schedule their economic activities. The size of the exploitative territory decreased, and while residential mobility remained the dominant strategy, task specific or logistic forays increased (Irwin-Williams 1984:9). With population growth and the concomitant restraints on mobility, Late Archaic groups were forced to schedule their activities more accurately and to improve their food processing and storage. Early horticulture further reduced mobility with camps being located near horticultural plots. Specialized task groups ranged out from these camps to provide additional resources. Movement from high diversity areas that permit foraging and horticulture to lower diversity areas suited to crop production resulted in full-time sedentism around A.D. 400 to 600 (Irwin Williams 1979:38-40; 1984:9-10).

In the Albuquerque area, Archaic sites are located well above the flood plain on eroded surfaces cut by arroyos and occasionally in rock shelters (Cordell 1979:41). Few Archaic or preceramic sites have been reported for Tijeras Canyon (see Oakes 1979:11-13, 15).

Early agricultural sites (Basketmaker III/Pueblo I or Early Developmental period dating from A.D. 600 to 900) are common on the West Mesa of Albuquerque. Pithouse sites tend to be located near intermittent tributaries of the Rio Grande, often on gravel bluffs or low terraces above the river valley (Cordell 1979:41-43). Storable quantities of agricultural resources often limit a group's ability to obtain resources in other areas. Agricultural stores could either be hidden in caches or a portion of the group may have remained behind while others exploited more distant resources, eventually leading to a sedentary existence (see Wills and Windes 1989:357).

Populations may have expanded into new areas during the Developmental period (Anschuetz 1984:26-27), including Tijeras Canyon. Small transient, small habitation, and two large Developmental sites are reported for Tijeras Canyon (Oakes 1979:18, fig. 3). All are located adjacent to the alluvial soils of Tijeras Creek (Anschuetz 1984:143). Excavations at the Big Boulder site, dating about A.D. 700, revealed two rather crude pit structures and a surface structure from this period (Oakes 1979:42, 44).

Late Developmental period (A.D. 900 to 1200) sites are more numerous and occupy a wider range of environmental zones throughout the Middle Rio Grande area, generally at higher elevations. Tijeras Canyon was inhabited seasonally with sites located on or adjacent to alluvial deposits in the canyon bottoms. Pit structures continued to be built along with above-ground habitation structures; larger communities also occurred (Anschuetz 1984:27-28). Anschuetz believes that during this time, floodplain residents could relocate to Tijeras Canyon when precipitation was inadequate. This population dispersal served as an alternative to labor-intensive strategies, and some valley residents moved seasonally into Tijeras Canyon to dry farm (Anschuetz 1984:189-190).

The Coalition period (A.D. 1200 to 1315) saw substantial population growth evidenced by an increase in the number and size of habitation sites and the expansion of year-round settlement in many areas (Anschuetz 1984:30). In Tijeras Canyon, numerous small settlements were located at lower elevations along alluvial soils. Two of the three larger pueblos in Tijeras Canyon, San Antonio, and Tijeras Pueblo, are believed to have been established during this period (Anschuetz 1984:34).

The Dinosaur Rock site (Oakes 1979) and Coconito Pueblo (Wiseman 1980), excavated by the Museum of New Mexico, are Coalition period sites. Dinosaur Rock was a five-room rectangular adobe pueblo with adobe-covered cobbled floors. The rooms had few features and artifacts, suggesting they were used for storage, while jacal structures with well-used hearths and quantities of trash may have served as habitation rooms (Oakes 1979:51-59, 161). Coconito Pueblo consists of 20 to 25 surface rooms, a kiva, and pit structures; several periods of building and remodeling were evident. Wiseman believes that the site was a farming village occupied from several months to many years at time, interspersed with periods of non-use (1980:148). Walls were adobe, jacal, or rock with abundant mortar. Two rooms had cobbles underlying the floors, again probably an effort to keep rodents from stored foods. Three pit structures were superimposed within the abandoned kiva (Wiseman 1980:38-52).

During the Classic period (A.D. 1315 to 1600), regional population densities reached their greatest level. In Tijeras Canyon, sites continued to occupy areas near reliable water supplies, generally seeps and springs. The aggregated communities of Tijeras Pueblo, San Antonio, and Paa-ko were abandoned by A.D. 1425. San Antonio was reoccupied in the seventeenth century and Paa-ko by 1525 (Anschuetz 1984:35, 39-40).

The Middle Rio Grande Valley was one of the more heavily traveled routes for Spanish explorers, military campaigns, and missionaries. In 1598 the first permanent colony was established at San Juan (Hordes 1989:207, 211). During the seventeenth century, Hispanics tended to settle close to Indian villages that could provide labor for their generally large landholdings. Before the Pueblo Revolt of 1680, Santa Fe was the only organized Hispanic community. Other colonists were concentrated along the Rio Grande between Santa Domingo and Belen and numbered less than 3,000 persons. After the revolt and reconquest, land holdings tended toward dispersed communities of farmers and herders (Cordell 1979:115, 118). Albuquerque was settled in 1706, and the Pueblos and Spaniards formed alliances against attacks from Plains Indian groups (Hordes 1989:211).

Tijeras Canyon was used by Apaches and Comanches as a staging area for attacks on the Rio Grande settlements. Their presence prevented permanent settlement of the canyon into the eighteenth century (Quintana and Kayser 1980:45). The first petition for a grant in Tijeras Canyon, at Carnue, was made by 19 men from the Albuquerque area. Granted in 1763, the settlement was short-lived. Apaches raided Carnue in October of 1770 and the survivors refused to resettle. In 1774 an application by a group from the Puerco Valley was refused because the group had insufficient arms for defense and too few farm animals to clear the land and plant crops. Residents of plazas comprising Albuquerque used the East Mesa for grazing, and it became increasingly difficult to protect herders and their flocks. The need for a buffering community was evident. Two different groups petitioned for the grant in November of 1818 and January of 1819, promising to donate a third of their harvest for the first two years to the royal treasury. The applicants were investigated and the lists consolidated making allotments for two village clusters, San Miguel de Laredo and San Antonio de Padua. A plaza for San Antonio was measured in August of 1819 and each of the 22 settlers received a lot lining the plaza. Additional allotments were made during the next few years. In 1820, the settlers moved to a new plaza 0.4 km northeast of the church plaza (Swadesh 1980:35-41).

Poor harvests and continued Indian attacks caused several settlers to abandon their grants. Fifteen of the original grantees had been dropped from the list of settlers by March of 1820 (Swadesh 1980:44-45). To ensure an adequate buffer community, settlers who refused to return to San Antonio lost their allotments (Quintana and Kayser 1980:48).

The first chapel was started in 1829 but was not completed for several years. A completely enclosed plaza was built in the 1830s or 1840s but was deserted before 1860 and thereafter occupied intermittently (Swadesh 1980:50).

San Antonio was the largest of the Canyon de Carnue Grant villages with 46 households in 1860, 48 in 1870, and 35 in 1880. Residents initially dry farmed and raised livestock, supplemented by hunting bison and trading on the Plains. Later, mining and freighting became important (Swadesh 1980:53-54).

In 1903 the U.S. Congress confirmed only 809 ha (2,000 acres) of the original Canyon de Carnue Grant; 36,437 ha (88,000 acres), including the church plaza and church, were not confirmed. In 1906, large portions of the original grant were incorporated into what is now Cibola National Forest. Grazing rights were canceled and stock removed in the 1950s. Some grazing allotments were reopened in the 1960s but were not reclaimed (Swadesh 1980:54-55).

The San Antonio settlers emphasized livestock raising because poor soil and short growing season made the area marginal for agriculture. Closing the forest to grazing eliminated an option that was vital to the local economy. The declining economy was temporarily boosted in the 1920s when Prohibition made bootlegging an important source of income (Swadesh 1980:56, 59-60). Many families returned to the area during the Depression and practiced subsistence farming and livestock raising when possible (Quintana and Kayser 1980:50).

LA 24 was registered as an archaeological site about 1930, probably by H. P. Mera (Dart 1980:1). LA 24 is on the State Register of Cultural Properties (No. 415); however, the tested portion of LA 24 and the area addressed in this data recovery plan lie outside the area nominated to the State Register. Stewart Peckham recorded the site for the Museum of New Mexico Archaeological Survey in 1973. He estimated the size as 200 by 400 m, and the dates as Late Pueblo III, Early Pueblo IV, and present day.

In 1975, the Museum of New Mexico excavated a 40 by 80 m portion of the site as part of the reconstruction of NM 14 (Fig. 2). The excavated area, comprising between 15 and 35 percent of the site, contained portions of two prehistoric and one historic occupation (Dart 1980:1). The prehistoric component included parts of three room blocks. Room Block 1 was comprised of up to six adobe and jacal rooms. Ceramics were black-on-white wares with no glazes, dating the room block to between A.D. 1300 and 1350. Room Block II was two discontinuous series of adobe rooms. The southern series consisted of eight rooms, some with evidence of remodeling, and no glaze wares. The northern block consisted of at least 18 rooms in a tiered arrangement. Glaze A and black-on-white ceramics were found in the northern block. Fourteen Room Block II rooms were at least partially excavated. Room Block III consisted of seven or more masonry rooms. Walls were rubble core with vertical slab veneer. Glaze A, B, C, E, and F, black-on-white, and matte-painted ceramics were associated with this component dating to the seventeenth century (Dart 1980:67-68).

The Hispanic component was comprised of three clusters of rooms, denoting households that grew with accretion and often had long occupation spans. Most construction was of adobe, but some walls were stone or a combination of adobe and stone. The oldest room (Room 100) was part of the church plaza compound. It was built before 1850 and was still standing in 1975. At least three additional rooms (Rooms 99, 101, and 102) were added over time. The second cluster (Rooms 97, 98, 103, and 104) was constructed after 1860 and was outside of the church plaza compound. The third group (Rooms 91-96, and 106) is northeast of the other two. No construction dates are given (Dart 1980:74).

Large numbers of artifacts were recovered from the excavations. Of the 73,574 ceramics, 10,989 from 26 of the 56 features were analyzed. The sample came from areas with stratigraphic integrity within architecture (Dart 1980:82). A sample of the 15,600 bones was identified and reported (Jarahian 1980:246), as were the 4,781 stone artifacts (Doleman 1980:108), the bone (Dart 1980:160-169) and shell artifacts (Dillon 1980:169-174), and the historic artifacts (Yates 1980:174-218).

Thirty prehistoric human burials and numerous scattered human bones were recovered. These were found primarily in trash-filled rooms and in midden areas beneath and around the two southern groups of Hispanic rooms. Other burials were discovered in 1924 when the highway initially cut through the site. The burials were generally single inhumations placed in scooped-out pits dug into middens (Dart 1980:223). The burials have been examined and reported by Ferguson (1980:121-148) and by El Najjar et al. (1980:224-244).

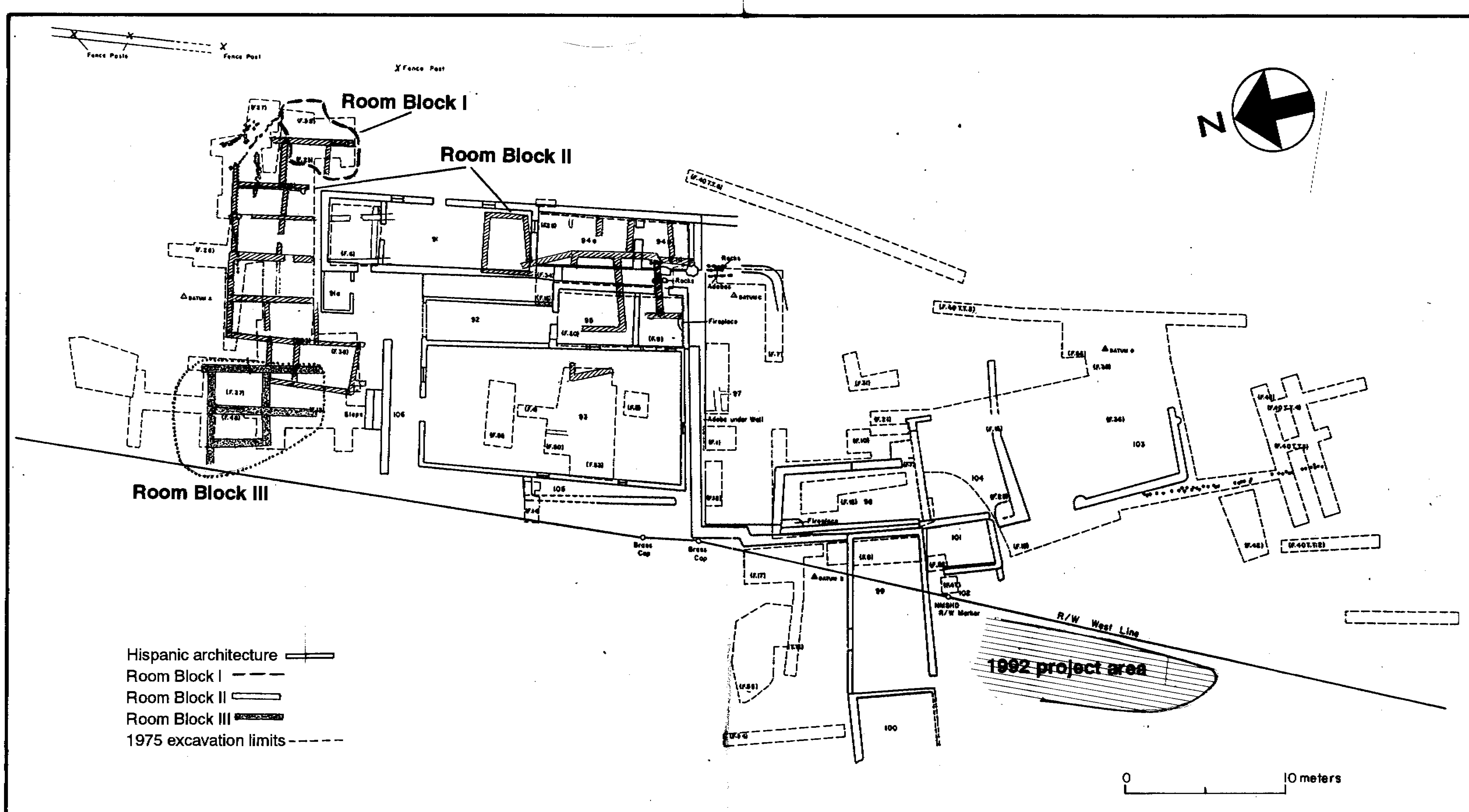

Figure 2. 1975 excavations at LA 24.

TESTING RESULTS

The New Mexico State Highway and Transportation Department proposes to improve the line of sight at the turnout for the San Antonio de Padua de Carnue Church and a number of residences by cutting back the slope within the right-of-way. The area was surveyed and a limited testing program recommended to determine the nature and extent of the deposits (Marshall 1992).

Methods

The Museum of New Mexico, Office of Archaeological Studies testing program began by determining the extent and possible source of the artifacts within the proposed construction area. The right-of-way consists of a terrace slope that parallels NM 14. Just west of the right-of-way, the terrace top had been recently leveled and a series of large pits for planting trees excavated and left open. These five auger pits, running perpendicular to the highway, were 50 cm wide and up to 70 cm deep. Fill was dark trash containing numerous glaze ware sherds, bones, and possible construction rock. Materials on the terrace slope are a continuation of the terrace top deposits. These are probably the remains of a portion of the site that has been modified by historic land use activities.

Table 1. LA 24 Test Pit Characteristics

	Test Pit 1	Test Pit 2	Test Pit 3	Test Pit 4	Test Pit 5	Test Pit 6
number of 10 cm levels	5	14	9	16	9	7
number of layers	5	10	5	11	5	3
lowest level with historic	5	6	8	12	6	7
depth to sterile (cm)	48 - 52	129 - 142	69 - 81	145 - 162	88 - 90	60 - 67
types of disturbance	mechanical	rodent, slope wash	rodent	rodent	rodent	slope wash, mechanical ?

The right-of-way in the area of proposed construction was tested by excavating six 1-by-1-m test pits (Fig. 3). Each pit was hand excavated in arbitrary 10 cm levels and the fill screened through ¼-inch mesh. Excavation continued until sterile clay or bedrock was reached. Table 1 gives the number of arbitrary 10 cm levels and natural layers, depth to bedrock, lowest level containing historic materials such as glass or porcelain, location of sterile beneath the grid

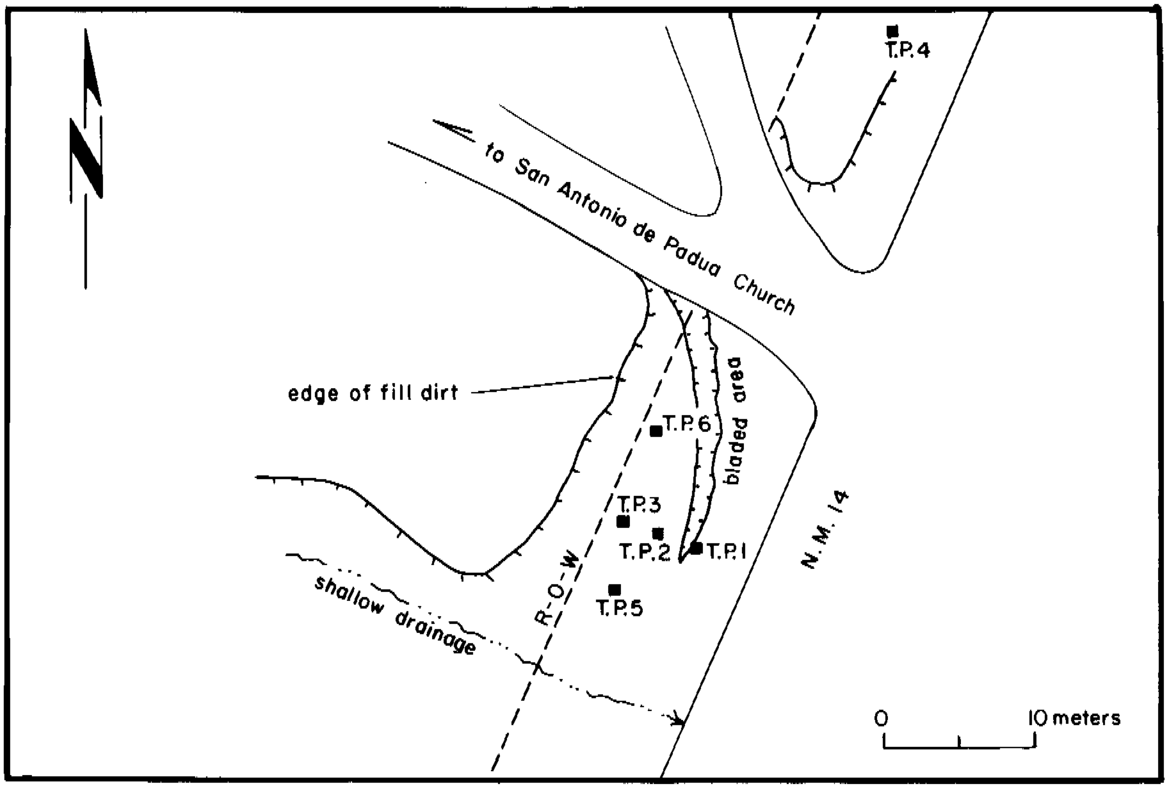

Figure 3. Location of 1992 test pits.

subdatum (northwest corner), and kinds of disturbance observed. Fill characteristics are given in Appendix 1. Test pit and auger test locations, natural and man-made features were mapped using a transit.

Test Pit Descriptions

Test Pits 1 through 3 were placed at the center of the proposed construction area and from the bottom to the top of the terrace slope. Test Pit 1 was approximately 5 m west of the highway curb in an area where runoff is channeled. Small amounts of prehistoric material were found throughout; however, so was modern trash. Layering within the pit seems to reflect the changing coarse of the drainage channel as well as highway construction and maintenance activities.

Test Pit 2 was approximately 3 m upslope from Test Pit 1. The upper three levels had evidence of recent mechanical disturbance including plastic straws and a beer can. Beneath the disturbance is the dark trashy soil characteristic of the prehistoric/early historic deposits. Scattered charcoal and rock were found throughout. A possible use surface consisting of a hard-packed soil with imbedded charcoal was located at 130 cm below the subdatum. No visible break was observed in the test pit profile.

Test Pit 3 was placed 2 m upslope from Test Pit 2 at the edge of the right-of-way. Numerous rocks and sandstone slabs were found in Level 2, possibly debris from structures destroyed when the terrace top was leveled for farming or to construct the church or plaza.

Table 2. Test Pit 4 Materials by Level

Level/Layer	Ceramics	Lithics	Ground stone	Fauna	Human bone	Glass	Euroam. ceramics	Metal	Other
lv 1/ly 1	29	5		20		27	3	11	
lv 2/ly 1	23	3		6		22		3	
lv 3/ly 1, 2	37	1		10		45	2		
lv 4/ly 2	62	12		85	1	33	18	2	button, adobe chunk
lv 5/ly 2	95	8		170		9	12	2	
lv 6/ly 2, 3	200	11	1	130		16	16	6	
lv 7/ly 3	197	19		35		1	1	1	
lv 8/ly 3	340	14	1	21		1	2		
lv 9/ly 4	237	21	2	50		1			glaze or slag
lv 10/ly 4, 6, 8	349	21		59		1			2 corn cobs
lv 11/ly 5-8	212	30	1?	87		2			corn cob
lv 12/ly 9-11	332	33	1	95	3			1	corn cob
lv 13/ly 9-11	148	17		38					
lv 14/ly 9-11	185	17		24					
lv 15/ly 10-11	34	3		3					
lv 16/ly 11	2			1					

Test Pit 4 is the only test pit north of the turnout. A series of auger tests indicated deep trash deposits and the test pit was placed toward the northern extent of the terrace on the edge of the slope. Proximity to the slope resulted in a large amount of rodent disturbance. Large portions of some levels consisted of rodent tunnels and nest material. Levels 5 through 14 contained large numbers of artifacts, especially ceramics and bone (Table 2). Lenses of white ash were observed in Levels 9 through 13. Human bone was found in Levels 4 and 12.

Test Pit 5 is the southernmost of the tests and near the southern limit of the artifact scatter. Although the fill in this area was not as dark as in the more northern tests, artifact densities were fairly high, especially ceramics.

Table 3. Materials Recovered from OAS Testing at LA 24 (field counts)

Artifact type	TP 1	TP 2	TP 3	TP 4	TP 5	TP 6	Auger	Totals
Ceramics	13	339	750	2486	859	413	59	4919
Lithics	11	32	45	215	40	50	4	397
Ground stone		3	4	7	3	2		19
Fauna		52	268	834	242	54	37	1487
Human bone				4				4
Glass	7	5	18	158	31	36	16	271
Euroamerican ceramics	2	3	59	54	12	7	3	140
Metal	1	1	21	26	9	15		73
Other			shoe parts	button, slag or glaze, corn cobs	plastic, shell	shell pendant, slag or glaze		

The final pit was located at the edge of the right-of-way. Like Test Pit 3, its proximity to the terrace top resulted in the presence of rock construction debris. Unlike Test Pit 3, Test Pit 6 had scattered large rocks in Levels 1 through 5. No plaster or mortar was observed. A few of the rocks were burned.

Test Pit Results

The test pits revealed dense trash deposits both north and south of the turnout, especially to the north (Table 3). No architecture or features were located in the tests; however human bone was recovered in Test Pit 4, north of the turnout. The artifacts have not been analyzed, but field analysis suggests that the lowest two or three layers contain black-on-white and Glaze A ceramics indicative of the fourteenth-century occupation. The upper levels have a mix of later glaze wares probably representing the seventeenth-century occupation with some contamination from the Hispanic occupation.

The artifacts recovered from these trash deposits will provide the information necessary to evaluate and compare the trade and subsistence strategies between the thirteenth- and seventeenth-century occupations of LA 24. Ceramic trade wares, exported lithic materials, historic trade goods, and domesticated fauna will be used to determine the extent of trade relationships between the LA 24 and Rio Grande populations. Domestic species acquired from the Hispanic colonists can be used to evaluate trade interactions and the effect these species had on subsistence eocnomics in the later time period. Fauna and flora from the earlier deposits may provide the information necessary to identify the nature of the settlements, permanent aggregated versus seasonal or occasional. They may also provide evidence of the subsistence stress proposed to have led to the expansion of social and trade relations during the thriteenth century.

DATA RECOVERY PLAN

Current State Highway and Transportation Department construction plans will affect only the area north of the turnout. Most of the trash deposits within the right-of-way will be leveled to road grade. The presence of stratified trash deposits, the high probability of finding human burials, and possibly other extramural features, indicates that further work is necessary. The following data recovery plan is designed to maximize the information potential of these trash deposits.

Research Orientation

The prehistory of Tijeras Canyon has been examined by a number of researchers. Studies that result from the University of New Mexico field school at Tijeras Pueblo and Museum of New Mexico projects associated with construction of I-40 and NM 14 provide a number of perspectives (Anschuetz 1984 and 1987; Cordell 1980; Dart 1980; Oakes 1979; Wiseman 1980). A model proposed by Anschuetz (1984) will provide the research questions and test implications for the planned work at San Antonio.

Anschuetz discusses three possible roles for the Tijeras Canyon prehistoric communities. The location of these communities between the Rio Grande Valley and the Estancia Basin has prompted the suggestion that they served as "gateway communities." As such, these communities would have controlled the movement of subsistence goods between the two areas, presumably corn to the basin and bison products to the valley. A second view suggests that settlement in agriculturally poor Tijeras Canyon was made possible by the redistribution of food. Anschuetz rejects both these explanations in favor of one where trade in specialized goods, such as glaze ware ceramics, served only to maintain the networks. The primary purpose of these networks was to allow resettlement during productivity shortfalls. People were redistributed, rather than goods, when conditions were poor or an area could no longer support its population. Social mechanisms not only spread the risk and mitigated the severity of imbalances between households, but were necessary to control social friction associated with aggregated communities (Anschuetz 1984:7-13).

According to Anschuetz, the initial settlement of Tijeras Canyon was a response to lower than average and unpredictable precipitation. Growing populations in the Rio Grande Valley either had to increase agricultural productivity or the hunting and gathering contribution to the subsistence base. Sparse population in Tijeras Canyon allowed movement into the canyon during the Early Developmental period. Although agricultural productivity was lower in the canyon, there was greater access to wild plant and animal resources (Anschuetz 1984:247).

Regional population increases during the Late Developmental and Coalition periods reduced mobility options and increased competition for subsistence resources. A shift to a more stable precipitation pattern in the eleventh century is thought to have allowed groups to become self-sufficient to the point that isolation and territoriality, rather than maintenance of networks, characterized social relations (Anschuetz 1984:247-248). This inward community focus was manifest in the proliferation of locally manufactured ceramic types. Without buffering networks, the segmented groups were more susceptible to the effects of prolonged drought (Anschuetz 1984:76). During this period, Tijeras Canyon was used seasonally to resolve resource imbalance during times of moisture stress. Enough use was made of the area that exclusive control of the territory was maintained (Anschuetz 1984:248).

A prolonged period of greater than average precipitation in the late thirteenth and early fourteenth centuries promoted agriculture in marginal areas and allowed year-round settlement and aggregation. Moist conditions were also favorable for grasslands and grassland fauna such as bison. Precipitation instability between A.D. 1315 and 1425 resulted in less reliable farming conditions and fewer grass-dependant animals (Anschuetz 1984:248-249). About this time, glaze technology and style began to spread rapidly. Production and distribution were dependent on more widespread trade networks. This return to greater regional homogeneity in ceramics is thought to reflect an attempt to reestablish the broad social integrating alliance networks that disappeared during the period of territorial maintenance (Anschuetz 1984:85-90).

Drier conditions forced a portion of the population back into floodplain environments. A brief period of better rainfall around A.D. 1400 permitted some repopulation of Tijeras Canyon but in lower numbers. By A.D. 1425, the canyon was abandoned by permanent residents and once again became hunting and gathering grounds and a seasonal buffer during periods of low precipitation (Anschuetz 1984:249-250). Rainfall increased and was less variable but temperatures were markedly cooler between A.D. 1600 and 1900. Anschuetz believes that these conditions, although favorable for grassland species, were insufficient to allow permanent settlement of the upland drainages (1984:115).

Test Implications

The stratified trash deposits at San Antonio will provide the data necessary to evaluate aspects of Anschuetz's model. According to the model, the pre-glaze A.D. fourteenth century materials should reflect permanent year-round settlement made possible by a prolonged period of greater than average moisture. Later fourteenth-century deposits containing glaze ceramics should evidence a deteriorating environment and an increase in trade items as residents sought to establish trade networks. The seventeenth-century occupation should indicate a return to seasonal and intermittent use of the canyon. As a buffer area for the Middle Rio Grande Valley residents, deposits should show strong ties to that area as well as a diversity of materials used to maintain trade networks. Early Hispanic deposits, if found, should reflect the diverse economy suggested in the ethnohistorical reports (see Swadesh 1980:56-58). Because the area is marginal for agriculture, a heavy reliance on raising livestock, hunting, and trade should be found.

Table 4 outlines the expectations for settlement, social relations, and economic conditions generated by the model and the kinds of archaeological materials that can be used to test these expectations. It then gives the ramifications for each major artifact type.

Table 4. Expectations for Testing Anschuetz's Model

	Fourteenth-century pre-glaze occupation	Late fourteenth-century glaze ware occupation	Seventeenth-century occupation
Settlement	permanent; aggregated	permanent; aggregated	seasonal/occasional?
Social relations	territorial; ties to Middle Rio Grande	trade networks developing; broad relations	broad trade networks; ties with Middle Rio Grande
Economy	high dependence on agriculture; plains mammals hunted	more diverse; indications of subsistence stress	varied; either similar to field house sites or diverse with a heavy reliance on hunting
Archaeological Manifestations			
Architecture	no evidence of repeated use and abandonment; possible remodeling and preplanned construction	like previous period	evidence of intermittent use and abandonment
Ceramics	predominantly local manufacture	glaze wares manufactured at the site; evidence of trade	evidence of much exchange; ties to and similar to Middle Rio Grande
Stone	more local materials and agricultural tools	more diversity in materials and tool types	diverse materials and tool types
Fauna	field pests combined with plains mammals	more diverse; more medium sized and local taxa	diverse local
Flora	more cultivated crops	more reliance on gathered resources	reliance on agriculture and gathered resources
Trade goods	fewer	many and diverse	ties to and similar to Middle Rio Grande
Humans	less stress	moderate to high stress	moderate stress

Model Expectations

Settlement

According to Anschuetz's model, the fourteenth-century occupation of San Antonio was a permanent aggregated population. The seventeenth-century occupants used the site area on a seasonal or occasional basis.

Since our deposits are trash with few, if any, extramural features, data on the settlement intensity will depend largely on an analysis of the 1975 excavation results. Examination of the field notes will be necessary to look for evidence of structure abandonment and reoccupation. Stratigraphic evidence of repeated use and abandonment may be detected in the trash deposits. Seasonal use may be indicated in the faunal and floral assemblages.

Social Relations

The model views the pre-glaze fourteenth-century occupation as strongly territorial. Social ties were with the Middle Rio Grande parent population and the archaeological deposits should indicate little interaction with groups to the north and east. Evidence of broad trade networks should be found in the post-glaze deposits from the fourteenth century if the residents sought to expand their access to resource areas. Expectations for the seventeen-century component depend on whether the site functioned as a fieldhouse or seasonal use-area for valley residents, as Anschuetz believes (1984:115), or had a resident population who exploited a wide range of resources.

Social relations will mainly be addressed through trade items, primarily ceramic wares. Lithic materials, fauna, and other trade goods may also provide information on access to other areas.

Economy

Under Anschuetz's model, favorable agricultural conditions during the pre-glaze era of the fourteenth century allowed a high dependence on agriculture and on bison. As climatic conditions worsened, the economy became more diverse and the use of wild plants and more local mammals increased. If used as a seasonal extraction area, the seventeenth-century deposits should show the concentration on a few seasonal resources. A more permanent population would have a more diverse economy and, perhaps, a greater dependence on domestic crops.

Faunal and floral remains will be the primary indicators of the degree of agricultural dependence. Ground stone and lithic tools may provide additional information.

Archaeological Manifestations

Architecture

Evidence of planned construction, structures with features suggestive of integrative functions, remodeling, and seasonal or intermittent use will be used to assess the settlement patterns reflected at San Antonio. The earliest room block at San Antonio is described as a hodge-podge of adobe and upright posts, coursed adobe, and masonry and adobe walls. The middle-dating rooms are said to have some evidence of preplanning and remodeling. The seventeenth-century rooms were masonry with no plaster (Dart 1980:67-68). These kinds of observations can be related to the settlement intensity and duration, and used to evaluate aspects of the settlement, social, and economic systems.

Ceramics

According to Warren, the quartz-mica-schist temper found in both utility and carbon-painted black-on-white wares indicates production in Tijeras Canyon (1980a:156). Almost half of the carbon-painted wares she examined from San Antonio contained crushed sherd and mica-schist temper. Warren feels that the carbon-painted wares from San Antonio are more like the wares of Tijeras Pueblo, Coconito, and Paa-ko, than those of Galisteo or the Rio Grande Valley (Warren 1980b:392-393). The basis of this observation is not given, nor does she distinguish between the carbon wares in the pre- and post-Glaze A deposits.

Production centers for Glaze A ceramics were in the Galisteo Basin, the Cochiti area, at San Felipe, and at Pottery Mound (Warren 1980a:161-163). Mica-schist temper was found in some of the Glaze A ceramics from San Antonio suggesting local manufacture. Vessels from the Rio Grande villages north of Albuquerque, the Galisteo Basin, and unidentified areas were also found (Warren 1980b:394-395).

In the sixteenth and seventeenth centuries, glaze wares were produced on the Pajarito Plateau, at San Lazaro, and San Marcos in the Galisteo Basin and at Pecos Pueblo. Glaze wares had almost disappeared by the 1700s (Warren 1980a:164). Most Glaze E and F ceramics from San Antonio were imported from the upper Middle Rio Grande, but pots from Galisteo Basin, Pecos, and Quari are present. Other vessels have lamprophyre temper characterized by a light gold mica and white porcelaneous feldspar. This appears to be a local tempering material, possibly from dikes on the east side of the Sandias (Warren 1980b:397).

The San Antonio ceramic analysis will focus on changes in local and trade ceramics as indicated by paste color and tempering material. In particular, sources of carbon-painted black-on-white wares in the pre-glaze and glaze assemblages and shifts in the origin of trade wares between the fourteenth- and seventeenth-century deposits will be examined.

Stone

Stone analysis will consider material type and technology. Doleman's analysis of the lithic artifacts from the 1975 excavations found an increase in the number of obsidian and limestone flakes, fewer flakes with no cortex, and a decrease in the ratio of flakes to angular debris over time. He suggests that a shift in manufacturing stages to include earlier stages of manufacture and an increase in the diversity of tools made at the site accounts for the trends (1980:128-129). In tools, the number of specialized tools declined with a corresponding increase in expedient tools, and an overall increase in the diversity of tool types and tasks performed (Doleman 1980:147). This San Antonio stone analysis will complement Doleman's analysis by emphasizing the use of local as compared to nonlocal materials and tool type diversity.

Fauna

Anschuetz (1984:207, 225) places much emphasis on the role of bison hunting in the early fourteenth century. He feels that when moister conditions increased bison availability, the Tijeras Canyon communities were in a good position to hunt bison and that bison became an important component of the hunting economy (Anschuetz 1984:196). However, few bison bones have been found in the Tijeras Canyon sites (Anschuetz 1984:225-226). This emphasis on bison may be misplaced, at least for the fourteenth-century deposits. Moister conditions would also benefit pronghorn, a species that is consistently found in assemblages from Tijeras Canyon and the Middle Rio Grande Valley (Akins 1987:166-168).

Young's analysis of bone from Coconito, Tijeras Pueblo, and San Antonio found pronghorn elements consistently outnumbered deer. She found this difficult to understand as they are smaller and may require communal hunting. Cordell explains the "phenomenon" as possibly the result of habitat reduction caused by human settlement or that aggregation made group hunting feasible (Young 1980:106). At San Antonio, pronghorn frequencies increase between the early and later fourteenth-century deposits, are much lower in the seventeenth-century deposits, and increase in the Hispanic deposits. Otherwise, the relative frequencies of species exploited are thought to reflect the proximity to the site and relative proportion of potential habitat in the area (Jarahian 1980:244, 272).

The San Antonio faunal analysis will examine species utilization as it relates to settlement intensity, environmental change, and marginal cost analysis (Earle 1980). Settled communities that are highly dependent on agriculture tend to rely more on small mammals. Fields attract and support larger populations of small mammals. When expeditions to procure larger mammals conflict with agriculturally related tasks, the cost of procurement increases. More mobile groups that rely less on agricultural stores are more able to concentrate on large mammal procurement (Akins, in press).

This perspective conflicts with Anschuetz's model, which predicts a greater reliance on herd animals in the early as opposed to the later periods. The alternative model suggests that the later fourteenth century deposits will evidence more large mammal use as the inhabitants diversified their economy in reaction to deteriorating environmental conditions. Furthermore, the cost of large mammal procurement should decrease relative to the cost of agricultural intensification when conditions are poor.

The content of the seventeenth-century deposits will depend on whether the site was a seasonal use area or a more permanent settlement. Fieldhouse sites tend to show a higher reliance on small mammalian field pests than more permanent occupations. The presence of domestic sheep and goats in the San Antonio assemblage indicates the rapid adoption of an advantageous resource. With this additional resource, Pueblo groups may have been able to subsist in what otherwise was an inhospitable environment. Alternatively, valley residents may have started a long tradition of seasonal use of the east mountain area for pasture.

Flora

Relative dependance on agriculture as opposed to hunted and gathered resources will be difficult to access. The model predicts a heavier contribution in the pre-glaze fourteenth-century deposits with more diversity in the other periods. Abundant evidence of agriculture may be found in the seventeenth-century deposits if San Antonio was utilized as a fieldhouse.

No floral material was analyzed from the 1975 excavations. Systematic samples of trash and features from this project will be used to document the diversity of domestic and wild taxa utilized. However, heavy rodent disturbance may limit the utility of this data. To the extent possible, corn cob size and row number will be monitored to see if moisture deficiencies have resulted in agricultural stress (see Anschuetz 1984:230).

Trade Items

The number and variety of trade items reflect the intensity of interaction with surrounding groups. The model predicts strong ties to the Middle Rio Grande in the pre-glaze fourteenth-century and the seventeenth-century deposits. The greatest variety of materials indicative of extensive trade networks should be found in the fourteenth-century glaze assemblages.

The primary trade item examined will be ceramic trade wares. Other potential trade materials, such as shell and turquoise, were found in the 1975 excavations and will further define the presence and extent of trade networks.

Human Remains

The model suggests that the early fourteenth-century occupants of Tijeras Canyon were subject to less dietary stress than later groups. Favorable climatic conditions for agriculture and an abundance of herd animals should have provided a better diet and this should be reflected in the human skeletal remains. Assuming that the later groups faced greater difficulties maintaining an adequate diet, these groups should exhibit more indications of physiological disruption or stress. Dietary stress is manifest in growth disruption, dampened fertility and fecundity, susceptibility to disease, and in death. Skeletal indicators of growth disruption include altered growth curves, dental disruption, and juvenile and premature osteoporosis. Porotic hyperostosis and periostitis, which reflect susceptibility to disease processes, and premature death are other indications (Martin et al. 1985:228-230). Evidence of violence demonstrates the failure of social mechanisms to deal with resource competition and shortage.

While human burials are likely to occur in the area to be excavated, the sample will be small. Data obtained will be used in conjunction with published reports to examine osteological indicators of dietary stress. Ferguson (1980:132) found that porotic hyperostosis, probably caused by iron deficiency anemia, was common in the Tijeras Canyon sites of San Antonio, Tijeras Pueblo, and Paa-ko. Another indication of general health and stress, dental hypoplasia, was not examined, nor were the implications of trauma or temporal differences within the sites. If burials are recovered, the San Antonio analysis will be directed toward determining relative levels of stress between time periods.

Field Methods

On returning to the site, a datum will be established north of the turnout and baselines for a grid system imposed on area. Surface contours and the grid system will be mapped with a transit. A heavy growth of weedy annuals and the potential for surface disturbance in this frequently traversed area make surface collections difficult and of little analytic value. Surface materials will be collected from the excavated grids.

The next stage will consist of at least three 1-by-2-m hand-excavated trenches transecting the trash deposits east to west. Auger tests indicate that the deposits are thickest in the vicinity of Test Pit 4 (160 cm), are at least 60 cm at the west edge of the construction zone, and up to 25 cm deep at the south end. The trenches will document the stratigraphy and disturbance in the construction zone. The first trench will be a continuation of Test Pit 4. The second trench will be placed at the south end of the construction zone near the modern construction debris (Fig. 4). A third trench will be placed approximately halfway between the first two. These three trenches will sample approximately 10 percent of the surface area (10 m sq of an approximately 100 m sq area). Additional pits or trenches will be hand excavated as warranted by the results of the trenching. These will be placed emphasizing the deposits that are intact and have well-stratified deposits or will further expose features encountered in the trenches. Mechanical equipment will be used to further expose deeply buried features. These hand-excavation units will provide information on the depositional history, and the materials collected will provide the artifact assemblage necessary to test the model.

The intensive excavations will be by hand in units no larger than 1-by-2 m and will be excavated in arbitrary 10 cm levels. Our test excavations indicate that the strata are not distinct enough to determine stratigraphic breaks during the excavation process. If distinct strata are encountered, these will be excavated as layers. All fill will be screened through ¼-inch mesh, and the artifacts collected for analysis. Pollen and flotation samples will be taken from major stratigraphic units in each area. Radiocarbon, tree-ring, and archeomagnetic samples will be

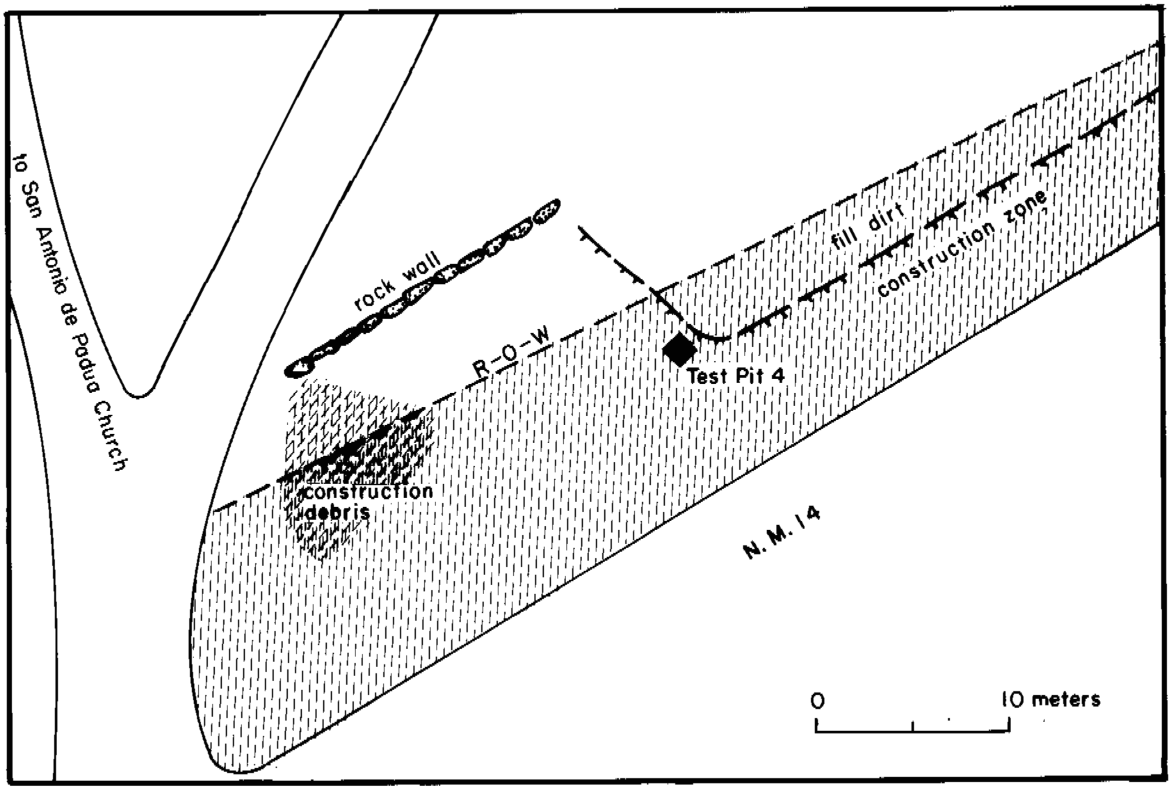

Figure 4. Sketch map of construction zone.

collected as appropriate. Fill will be described, profiles drawn, and photographs taken of each excavated unit. Excavation units will be placed to provide an even sample of the area.

Once the hand tests are completed, mechanical equipment will be used to trench the area at the toe of the slope, north of the triangular area (Fig. 4). The Highway and Transportation Department plans to cut into this area far enough to place cement barriers. The upper slope is artificial fill used to expand the yard of the residence to the west. The slope formed by the artificial fill intersects and rests on intact refuse deposits from the site. Because of the steepness of the slope, a backhoe trench will be used to test this area. Mechanical equipment will also be used to remove the upper levels of trash and insure there are no human burials within the area. Since the bulk of the deposits is from the seventeenth-century occupation, the lower levels of several grids will be hand excavated to provide a larger sample of materials from the fourteenth-century occupation.

Features within the right-of-way will be completely excavated and data concerning technique and style of construction, and of use will be collected. Samples will be collected when appropriate. If human burials are found, local law enforcement officials and the State Historic Preservation Officer will be notified and consultations completed before the remains are excavated. Treatment of sensitive cultural remains will be based on the Museum of New Mexico's policy for *Collection and Display of Sensitive Material* (SRC Rule 11) and *Policy on Collection, Display and Repatriation of Culturally Sensitive Materials* (MNM Rule No. 11, January 1991). If such materials are discovered, members of the public will not be allowed to handle or photograph the remains and no photographs of sensitive material will be released to the media or general public.

Standard archaeological excavation techniques will be employed to remove the burials. The burial pit will be defined, hand tools will expose the skeletal parts, the skeleton and grave goods will be mapped, recorded, and photographed. Pollen and flotation samples will be collected.

If discoveries at the site warrant significant alteration of the scope and intent of this plan, the New Mexico State Highway and Transportation Department and the State Historic Preservation Officer will be consulted.

Analyses

Laboratory analysis will be conducted by Office of Archaeological Studies [OAS] staff and qualified consultants. Analysis forms developed by or for OAS will be adapted for this project and will be comparable with other OAS analyses. The artifact assemblage will be analyzed by general artifact category and the attributes coded for statistical analysis. Samples of representative artifacts will be photographed for inclusion in the final report.

Ceramic Artifacts

Sherds will be classified by type and vessel form. Rim form and cross section, vessel diameter, paste color and texture, temper, surface color and finish, slip, design style, thickness and alterations will be recorded for rim sherds, large painted sherds, and a sample of the remaining sherds. Petrographic analysis on samples of the paste and temper classes identified in the analysis will be used to identify local materials and external areas of manufacture. This analysis will provide information on trade networks, chronology, and, perhaps, site function.

Stone Artifacts

Chipped stone artifacts will provide information on material procurement, technology, and the range of activities at the site. Material type and quality, morphology, cortex proportion, platform characteristics, and wear patterns will be recorded. Special emphasis will be placed on identifying and quantifying local and nonlocal materials as a means of determining trade and interaction networks.

Since the deposits are largely trash, the ground stone recovered is likely to be fragmentary discards and may not yield a great deal of information. The ground stone analysis will monitor material type, texture and quality, preform morphology, weight, mano cross-section form, plan view outline, portion, functional surface cross section, and primary wear.

Fauna

Information on the taxa, parts represented, processing, and taphonomy will be recorded. Patterns of utilization will be examined through the parts returned to and disposed of at the site, the amount of fragmentation, and extent of processing. These will be related to settlement type (permanent versus seasonal habitation), depositional, and environmental factors. Taxa, such as bison, elk, and pronghorn, may indicate the extent of access to resources in other areas or of trade in food resources. Domestic sheep and goat remains in the seventeenth century deposits may contrast with or be similar to the use of wild artiodactyls. The role of domestic species in the early historic economy will be examined.

Flora

Pollen and flotation samples and macrobotanical materials will be collected. These will provide information on the range of resources exploited during the various time periods. The kinds of plants and stages of maturation will furnish information on the season or seasons of site occupation.

Human Remains

Human burials and isolated parts will be analyzed for mortuary practices, natural and unnatural breakage patterns, age, sex, and skeletal anomalies and pathologies. The results will be compared with published reports on other San Antonio burials. Emphasis will be on comparative measures of nutritional stress and trauma between the early and later periods of occupation.

Historic Artifacts

The test excavations suggest that the historic materials in the trash deposits are primarily contaminants rather than a distinct component of the site. If intact historic deposits are found, these will be treated as a component of the site. As contaminants, largely introduced by rodents, this data set is of limited potential, especially given the duration of the historic settlement.

The historic artifacts will be analyzed using a functional classificatory system. The range of activities represented and time frame represented by the artifacts will be determined.

Documentary History

Extensive documentary research and oral histories have already been carried out for the area and are reported in Swadesh (1980) and Quintana and Kayser (1980). Additional research is not anticipated.

Research Results

A final report will be prepared detailing the excavations, data recovery phase, and analysis. The report will be published in the Office of Archaeological Studies *Archaeology Notes* series and will present all important excavation, analysis, and interpretive results. It will include photographs, site and feature plans, and data summaries. Field notes, maps, analysis forms and notes, and photographs will be deposited with the Archaeological Records Management System of the State Historic Preservation Division in Santa Fe.

Artifacts will be stored in the Museum of New Mexico Archaeological Repository. The disposition of human remains will be determined after consultations with concerned parties.

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APPENDIX 1

Test Pit Fill Descriptions

Test Pit 1

Layer	Soil Color	Soil	Thickness (cm)	Rock	Charcoal	Comments
1	10 YR 4/4	sandy clay	8-20	small pebbles		
2	7.5 YR 4/4	clay	12-20		flecks	
3	7.5 YR 3/4	sand and gravel	6-12			stream-like deposit
4	7.5 YR 3/3	sand and clay	11-14			
5	7.5 YR 3/5	sand and gravel	6-10			stream-like deposit

Test Pit 2

Layer	Soil Color	Soil	Thickness (cm)	Rock	Charcoal	Comments
1	5 YR 6/3	sandy clay	10-14		moderate	slope wash, aeolian
2		sand and gravel lens	1-2	gravel with mica		10 cm thick in east wall
3	5 YR 4/3	sandy clay	8-14		sparse	clay platelets
4	2.5 YR 3/3	clay	2		present	small lens
5	7.5 YR 3/3	sandy clay	30-33	tabular	abundant	rock layer
6	5 YR 3/4	sandy clay	19-28		abundant	poorly combined red and brown clays
7	7.5 YR 3/3	sandy clay	4-13		abundant	similar to 6 but more brown clay
8	7.5 YR 3/3	clayey sand	32-54	occasional irregular	less	loose packed sand and gravel
9	7.5 YR 4/6	clay and decomposing siltstone	0-10			
10	5 YR 3/3.5	decomposing silt/sandstone				bedrock

Test Pit 3

Layer	Soil Color	Soil	Thickness (cm)	Rock	Charcoal	Comments
1	10 YR 4/3	fine sand	3-8	large cobbles		
2	10 YR 4/3	sand and clay	13-15	small sandstone cobbles	sparse	
3	10 YR 3/3	sandy clay	25-30	gravel	abundant	charcoal concentration at center
4	10 YR 3/3	sandy clay and gravel lenses	12-18		moderate	
5	10 YR 3/3 sandstone: 2.5 YR 4/0	sand with pockets of white clay and decomposing sandstone				

Test Pit 4

Layer	Soil Color	Soil	Thickness (cm)	Rock	Charcoal	Comments
1	7.5 YR 5/3	aeolian sand and gravel	0-18	occasional	occasional	wash lensing
2	10 YR 5/2	sandy clay	22-32	small sandstone at base	abundant	hard packed; smooth textured
3	10 YR 4.5/2	sandy clay	16-18	smaller pieces	less	
4	10 YR 5/2 ash: 10 YR 7/2	clay	8-22		abundant	ash lenses
5	7.5 YR 5/4	clean sand	0-4			northeast corner
6	10 YR 3/2	sandy clay	8-26		moderate	burned clay chunks, ash
7	10 YR 5/2	gravel, grass and sand	3-8			rodent burrow, loosely packed with modern trash
8	7.5 YR 5/3.5	sand and gravel	3-19		sparse	rodent burrow; platy and layered

Layer	Soil Color	Soil	Thickness (cm)	Rock	Charcoal	Comments
9	10 YR 4.5/3	sandy clay	6-28	present	abundant	hard packed; small pieces of burned clay, ash
10	7.5 YR 4/4	clay and bedrock	0-27		sparse moderate	pockets of trashy soil and ash
11	10 YR 6/3	clay and decomposing bedrock				clean clay with occasional lighter chunks of rock

Test Pit 5

Layer	Soil Color	Soil	Thickness (cm)	Rock	Charcoal	Comments
1	10 YR 4/2	fine sandy clay	2-6	small pebbles		aeolian
2	7.5 YR 4/3	fine sand	16-26	sandstone slabs	abundant	rodent disturbance
3	7.5 YR 5/4	sandy clay	28-30	small pebbles	less	
4	7.5 YR 3/4	sand and clay	20-32		increasing	
5	10 YR 4/3; bedrock: 10 YR 3/1	sand and decomposing bedrock	22+			

Test Pit 6

Layer	Soil color	Soil	Thickness (cm)	Rock	Charcoal	Comments
1	7.5 YR 4/3	sandy clay	34-41	abundant	occasional	smooth texture; possible construction rock
2	10 YR 4/3	sandy clay	16-17	small tabular	more	more clay than L. 1
3	10 YR 4/4	sandy clay and decomposing bedrock	4-10+		decreasing with depth	mottled