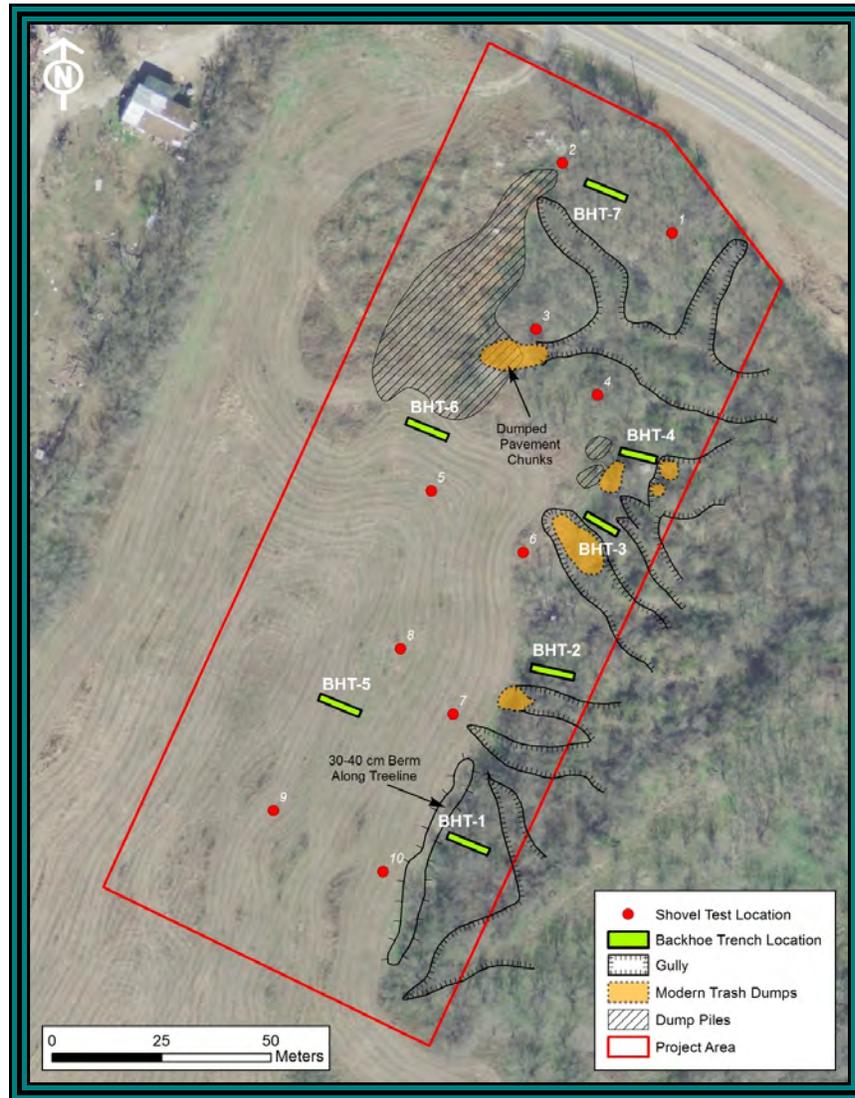


A Cultural Resources Survey of Four Acres for the Cortez-Martinez Properties Subdivision in San Antonio, Bexar County, Texas



Prepared for Bennett Building Systems, Burleson, Texas

by

David L. Nickels, Principal Investigator

Tierras Antiguas Archaeological Investigations Report #363

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Abstract

Bennett Building Systems of Burleson, Texas is the lead agency for a proposed new subdivision to be constructed on 4.0 acres in south San Antonio, Bexar County, Texas. Bennett Building Systems contracted with Tierras Antiguas Archaeological Investigations, LLC to conduct a cultural assessment of the tract. The tract is privately owned, and development, to include infrastructure was entirely privately funded.

Although no public funding was involved that would require either an Antiquities Permit from the Texas Historical Commission or federal review by the State Historic Preservation Officer, and is not within the jurisdiction of the city's Historic Preservation and Design Section of the Unified Development Code, this project was reviewed to fulfill the historic review for the platting (subdivision) process. In that regard, a Scope of Work was submitted to the City for approval before the cultural resources survey began, and this report of investigations was reviewed by the Assistant City Archaeologist.

Tierras Antiguas archaeologists conducted a thorough pedestrian survey of the surface area on February 11, 2015, and ten shovel tests were excavated. On February 13, 2015 archaeologists monitored backhoe trenching operations and screened backdirt samples from seven backhoe trenches excavated across the project area. Finally, on February 19, archaeologists conducted a metal detector survey across the 4-acre tract.

No evidence of either historic or prehistoric cultural material was observed either on or below the surface. As such, Tierras Antiguas recommended that no further investigations are warranted, and that construction of the proposed Cortez-Martinez Subdivision should be allowed to proceed as planned.

However, if any cultural resources were to be encountered during construction, work should immediately be halted in the vicinity until such finds are examined and evaluated by Tierras Antiguas, or by any qualified archaeological consultant, and by the City of San Antonio Historic Preservation Officer.

No artifacts were collected or curated, and no potentially historic structures are adjacent or visible from the Project Area.

Acknowledgments

First and foremost, I express my sincere appreciation to Mr. Jim Snyder, Project Manager for Bennett Building Systems. Jim was extremely helpful and patient in explaining the scope of this project, and he graciously shared previous knowledge of the Project Area.

The backhoe trenching was conducted by Rick Gonzales of Affordable Backhoe Service in San Antonio; thank you Rick. Next, I very much relied upon staff archaeologist Emory Worrell, an archaeological Field Technician for Tierras Antiguas. He is a dedicated individual, and as always, Emory worked meticulously to ensure all aspects of this investigation were thoroughly documented in accordance with the City of San Antonio, Texas Historical Commission, and Council of Texas Archeologists standards.

Finally, I express my gratitude to Mr. Matthew Elverson, City of San Antonio Assistant City Archaeologist, who oversaw this whole process.

Cover Photo - Aerial photo of the Project Area.

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Introduction

Bennett Building Systems, of Burleson, Texas is the lead agency for a proposed new rehabilitation and nursing facility to be constructed on 4.0 acres in south San Antonio, Bexar County, Texas (Figures 1-4), and occasionally hereinafter referred to as the Project Area (PA). Bennett Building Systems contracted with Tierras Antiguas Archaeological Investigations,

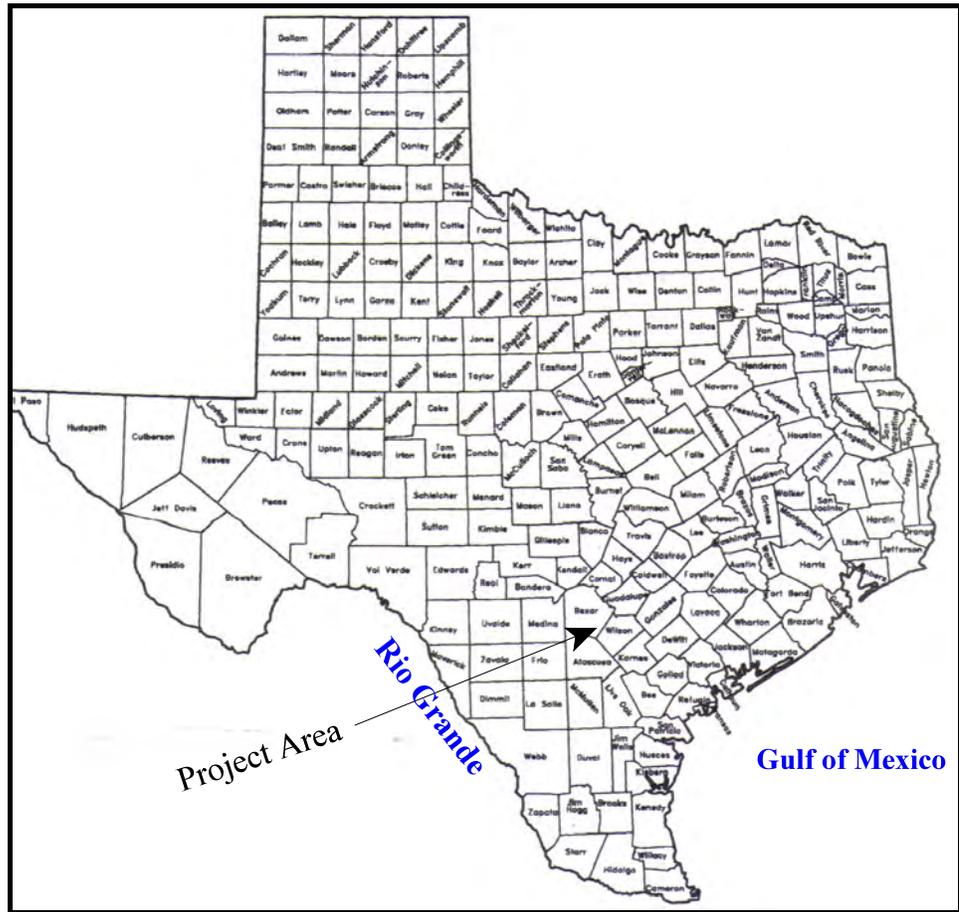


Figure 1. Location of the Project Area in Bexar County and Texas.

The tract is privately owned, and development, to include infrastructure is entirely privately funded.

Although no public funding was involved that would require either an Antiquities Permit from the Texas Historical Commission or federal review by the State Historic Preservation Officer, and is not within the jurisdiction of the city's Historic Preservation and Design Section of the Unified Development Code, this project was reviewed to fulfill the historic review for the platting (subdivision) process. In that regard, a Scope of Work was submitted to the City for approval before the cultural resources survey began, and this report of investigations was reviewed by the Assistant City Archaeologist.

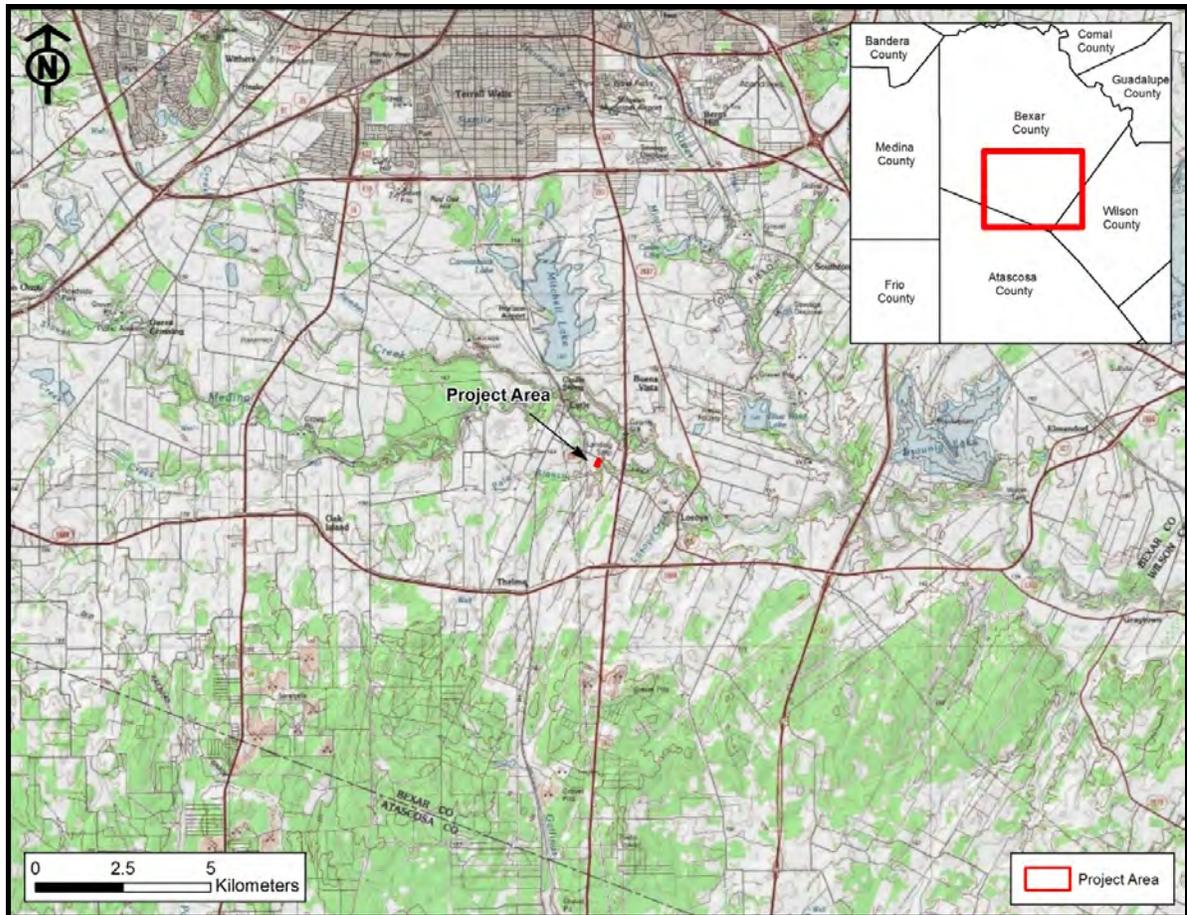


Figure 2. Location of the Project Area in San Antonio on large topographic map.

Tierras Antiguas archaeologists conducted a thorough pedestrian survey of the surface area on February 11, 2015, and ten shovel tests were excavated. On February 13, 2015 archaeologists monitored backhoe trenching operations and screened backdirt samples from seven backhoe trenches excavated across the project area. Finally, on February 19, archaeologists conducted a metal detector survey across the 4-acre tract. The surveys were conducted under the guidelines of the Texas Historical Commission (THC) and the Council of Texas Archeologists.

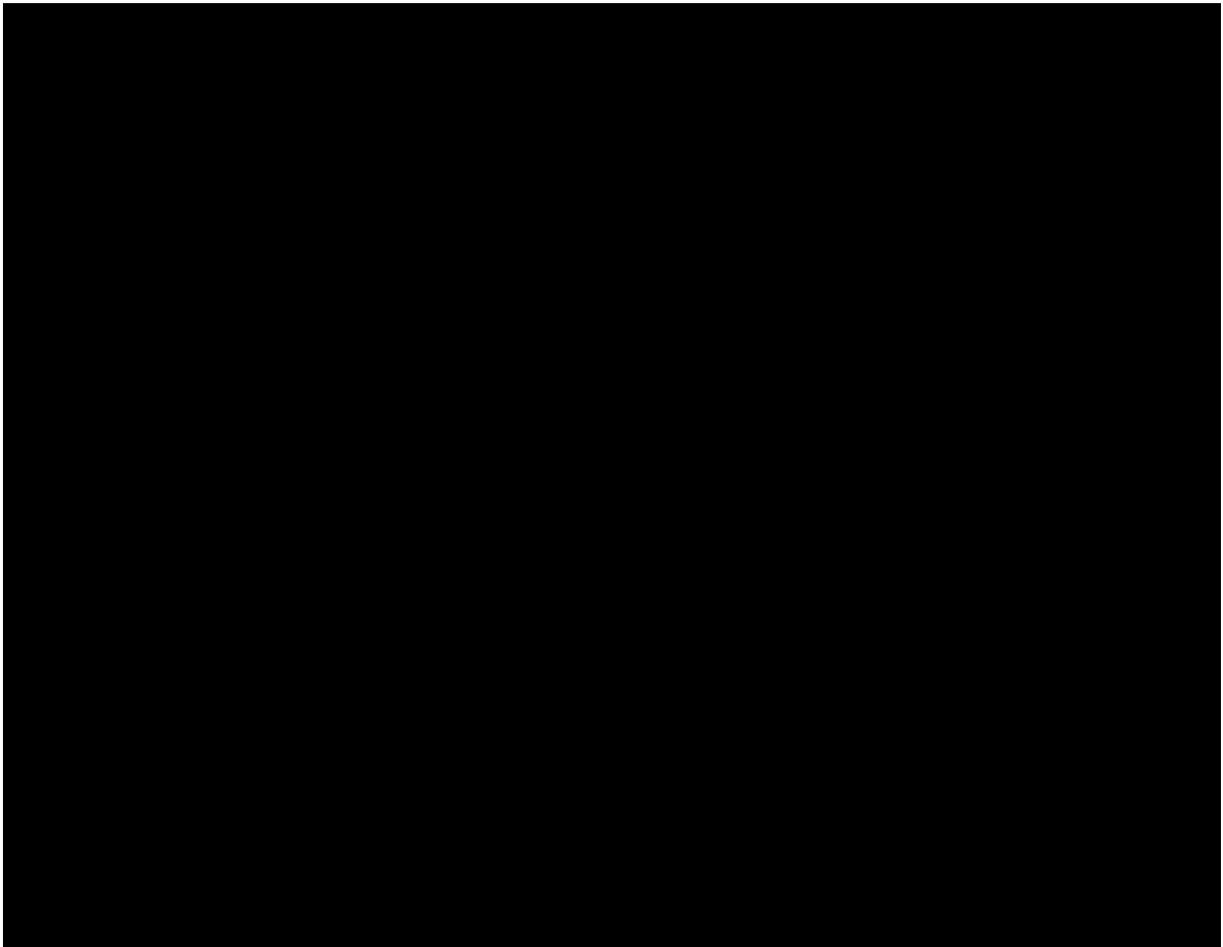


Figure 3. Project Area on Loyosa (1984) USGS 7.5' topographic map.

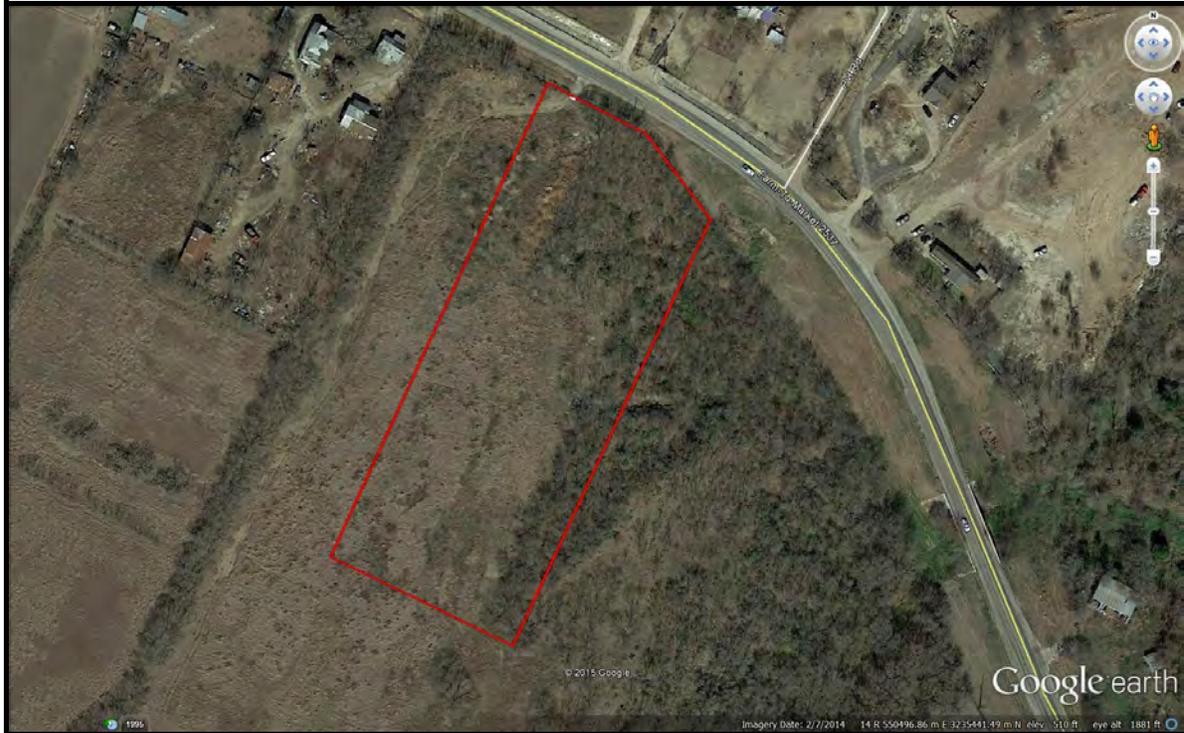


Figure 4. Cortez-Martinez Properties Subdivision site on modern aerial photo.

Project Setting

Geology

The local geology (Barnes 1982) within the Project Area is comprised of Quaternary fluvial terrace deposits (Qt), a combined depositional sequence of chert gravels, sand, silt, and clay. In this area of Bexar County along Palo Blanco Creek the terrace deposits are low, but mostly above the modern flood plain. Edwards chert is a common gravel component across the region, a result of down-cutting of the Edwards Plateau. Edwards chert provided Native Americans a rich resource for lithic tool production.

Soils

There are two soil types to be impacted within the Project Area. The first is Lewisville silty clay (LvB), commonly found on sloping areas joining uplands from nearly level terraces along major drainages in this area of Bexar County. In the upper roughly 20 inches (50 cm) one would expect to see grayish brown silty clay, underlain with limy clay to approximately 37 inches (83 cm) below the surface.

The second soil classification is Venus clay loam (VcA), commonly found on gently sloping, smooth terraces 20 to 40 feet above the San Antonio River flood plain. The typical pedon reveals limy clay in the upper roughly 16 inches (40 centimeters), underlain by about 20 inches (50 centimeters) of clay loam (Taylor et al. 1991; Websoil Survey Online 2015).



Figure 5. Soils map of the Project Area.

Climate, Flora, and Fauna

The physiographic makeup of Bexar County is a combination of four distinct physiographic regions of Texas: the Edwards Plateau, the Balcones Escarpment, the Blackland Prairie, and the South Texas Gulf Coastal Plain (Figure 6). More specifically, the Project Area lies within a transitional zone on the lower Balcones Escarpment region where it gives way to the Blackland Prairie. As such, this micro-environmental zone can still be classified as upland prairie. In addition, the Project Area lies within the Balconian vegetation area as defined by (Blair 1950; Map 2015; Figure 7). The annual average rainfall is about 28 inches (77 centimeters), with 194 growing-season days per year (Taylor et al. 1991).

The Edwards Plateau physiographic region of Texas exists in the northern portion of Bexar

County where the group(s) which occupied it were advantageously able to exploit an ecotone encompassing riverine, upland, and semi-arid adapted plants and animals. The Edwards Plateau, with elevations reaching 2,250 ft. above mean sea level (amsl) in northern Gillespie County (Allison et al. 1975:76), is a hilly region, gradually sloping to the southeast, and ending in the escarpment running across the middle of the sub-region (Figure 6). The most common flora observed on the plateau include juniper (*Juniperus ashei*), plateau live oak (*Quercus fusiformis*), Texas persimmon (*Diospyros texana*), honey mesquite (*Prosopis glandulosa*), and agarita (*Berberis trifoliata*) (Blair 1950:112; Van Auken 1988:45; Simpson 1988). Due to overgrazing by livestock and restricted range fires, much of the plateau has been overtaken by juniper in modern times (Buechner 1944:703-704; Van Auken 1993:199-210).

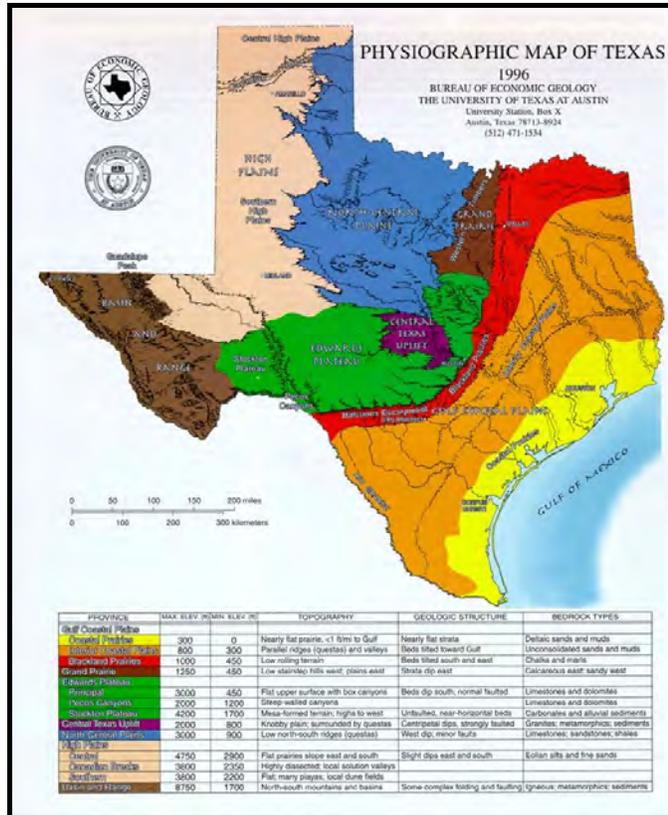


Figure 6. Physiographic regions of Texas (<http://www.lib.utexas.edu/geo/pics/txphysio.jpg>).

The Balcones Escarpment separates the Edwards Plateau from the lower blackland prairies to the east. It is a fault zone, consisting of blocky limestone, chalk, shale, and marl. The escarpment slopes to the southeast from about 700-1,000 feet above mean sea level (Taylor et al. 1991:119). The most economically important floral species are riparian nut trees, including oak, walnut, and pecan that thrive along the rivers and creeks (Van Auken 1988:55). The intertwined diversity in biotic resources existing along the escarpment provides an ecotone in which humans could exploit a wide variety of plants and animals from season to season (Collins 1995:366; 2004). The presence of prehistoric cemeteries found in areas

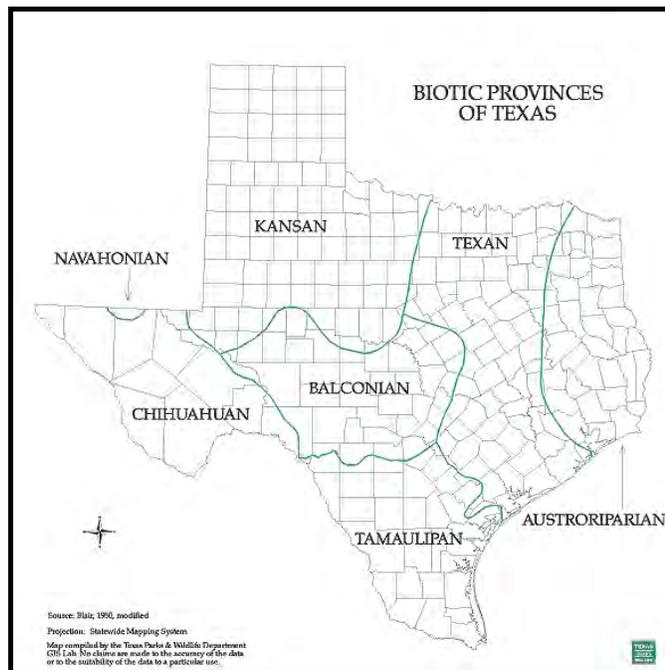


Figure 7. Blair's (1950) biotic provinces of Texas.

along the escarpment where seasonally rich food resources such as nut-bearing species, particularly acorn and pecan trees, and prickly pear tunas may not be just a coincidence (Hall 1995:633-647).

The Blackland Prairie is a rolling and well-dissected plain representing the extension of the true prairie that runs through the center of North America. The prairie was once dominated by tallgrass species such as little bluestem (*Schizachyrium scoparium*), big bluestem (*Andropogon gerardi*), indiagrass (*Sorghastrum nutans*), tall dropseed (*Sporobolus asper*), and silveus dropseed (*Sporobolus silveanus*). Oaks (*Quercus* species), elms (*Ulmus*), cottonwoods (*Populus*), and native pecan (*Carya illinoensis*) are common along the drainages.

The South Texas Plain is the western extension of the Gulf Coastal Plain. It is a nearly level to rolling plain that is moderately dissected by major river drainages through its northern half and by numerous intermittent drainages, and the Bordas Escarpment in the south. It was originally an open grassland mixed with brushy chaparral. Oaks, pecans, and ash (*Zanthoxylum fagara*) were common along streams (Black 1989:12; Hester 1980:31, 33).

Both the plains and the prairies have apparently undergone dramatic vegetational changes over the past 300 years. Due in part to overgrazing and range-fire suppression, much of the original vegetation has been replaced by woody invader species, transforming the grassland into what we know today as the “South Texas Brush Country”, dominated by mesquite, huisache, granjeno or spiny hackberry, brasil, lotebush, whitebrush, and cenizo (Black 1989:14-16; Hester 1980:34-37).

Cultural Context and Chronology

Introduction

The Project Area is located within South-Central Texas, and as such, prehistoric cultural affinities most common to South Texas plains cultures and Central Texas/Edwards Plateau hill country cultures are often manifested in archaeological sites near the Project Area (see Figure 8). The most basic chronology of the Central and South Texas regions can be divided into either: (1) prehistoric cultural groups with no specific tribal affiliation, or; (2) historically documented groups with a designated tribal or band name. Before Spanish soldiers and Catholic missionaries arrived in Texas, the cultural activities of the groups of prehistoric Native Americans who inhabited the two regions can only be surmised from what we can glean from the archaeological records at undisturbed, and well-documented sites. Historic cultural groups are those observed firsthand by the Spanish soldiers and priests beginning in the late 1600s. The Spanish then began recording in writing the names, numbers, and living conditions of the many groups of Native Americans who lived in the regions. However, as we will discuss later in this section, there is a significant transition era between the least archaeologically known prehistoric cultural groups, and the historic Native Americans that the Spanish documented; that transition era occurs in the 1500s when Spanish explorers and treasure seekers ventured through Texas.

The Prehistoric Chronology

Based on research in Texas over the past 70+ years, beginning with professionals from the University of Texas at Austin, archaeologists have been able to segregate the prehistoric period in Central and South Texas into the Paleoindian, Archaic, and Late Prehistoric periods. Although other archaeologists have made significant foundational contributions to our current understanding of how past cultures changed through time (e.g., Story 1985; Prewitt 1981), in our opinion the most current and widely recognized chronologies are those offered by Michael Collins (1995; 2004) for Central Texas, and Thomas Hester (1995; 2004) for South Texas.

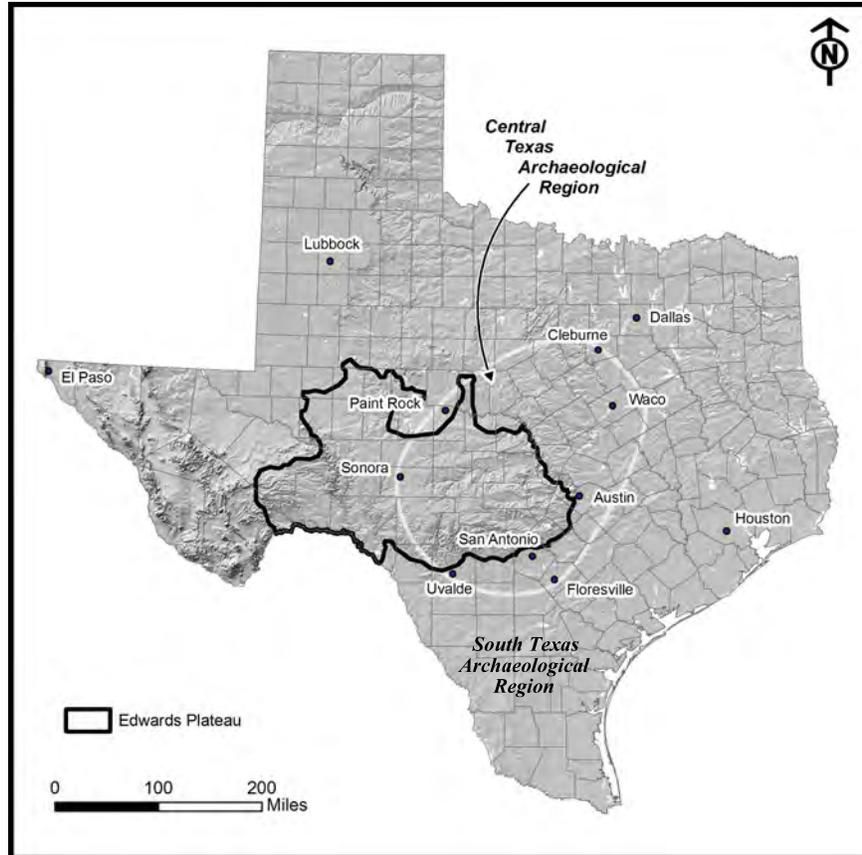


Figure 8. Map of Central and South Texas Archaeological Regions and Edwards Plateau.

Paleoindian Period (11,500-8,800 years ago)

With minor differences observed in the archaeological record across the wide expanse of Central and South Texas, this period spans the past years estimated at between ca. 11,500 and 8,800 years ago (Collins 1995:381–383; Hester 1995:433–436). Diagnostic artifacts include a unique, fluted, finely flaked, and blade-shaped spear or dart point called “Clovis”, other stone tools chipped on both sides, and unique prismatic blade-like flakes systematically knocked off from river cobbles. Archaeologists have documented Clovis-age sites in Central and South Texas such as killsites, quarries, stone tool caches, open campsites, ritual sites, and burials (Collins 1995:381–383; Hester 1995:433–436). A Folsom interval follows the Clovis. Folsom artifacts are fairly common in Central and South Texas; however, no campsites or killsites have been found south of Bexar County (Hester 1995:434–435).

During this 2,700-year Paleoindian period around the Project Area, the Native Americans we term as the Paleoindian culture were likely one of small bands of nomadic, big-game hunters following herds of Late Pleistocene fauna, including mammoth, mastodons, bison, camel, and

horse that are now extinct in North America (Black 1989). Nevertheless, when big game was not available, we have archaeological evidence that the Paleoindian peoples supplemented their diet by eating turtles, tortoises, alligators, mice, badgers, and raccoons (Collins 1995:381).

Archaic Period (8,000-1,200 years ago)

Primarily, by studying the differences in the stone tools, the diversities in campsites or other types of sites, the locations of the sites, as well as many other measurable and analytical observations such as ethnobotanical and faunal remains found at Central and South Texas archaeological sites, archaeologists have been able to dissect about 6,000 years of our past into what we commonly term the “Archaic”. Based on these same aforementioned affinities, the Archaic has further been defined in terms of the Early Archaic, the Middle Archaic, and the Late Archaic.

Early Archaic (ca. 8,800-6,000 years ago)

The region was most probably occupied by small groups who moved almost constantly during the Early Archaic period. Archaeologists have observed a distinctive change in projectile point styles that are unique to this period; they include Early Corner Notched and Early Basal Notched dart points. Although they were still very much hunters and gatherers, the large animals such as mammoths that their Paleoindian ancestors had hunted were by this time extinct. To survive, they capitalized on exploiting the other abundant food resources that Central Texas had to offer Texas—such as deer, fish, rodents, prickly pear tunas, and various plant bulbs and tubers. Archaeologists point to the increased numbers of ground stone, firecracked limestone used in cooking ovens larger in size than normal campfires, and specialized stone processing tools as evidence that Native Americans refocused their pursuit of foodstuffs (Weir 1976; McKinney 1981; Story 1985; Collins 1995; Hester 1995).

Middle Archaic (ca. 6,000-4,000 years ago?)

When this period actually began and ended is always debatable among archaeologists. Some (e.g., Collins 1995) see a significant pattern in the archaeological record between 6,000 and 4,000 years ago, but others (e.g., Hester 1995) don't think the same changes were prevalent until much later in South Texas - about between 4,500 and 2,400 years ago. Nevertheless, the climate began changing in Central and South Texas beginning around 6,000 years ago, and a continuum of dry climate known as the Altithermal, is believed by some archaeologists to have caused the Native Americans to gather in larger groups. They gathered in large groups to exploit plant foods that were more dependable than larger game animals such as bison (Sollberger and Hester 1972:338; Weir 1976:125, 128; Story 1985:40). Archaeologists have found more sites that date to this period, and in Summer seasons the groups apparently took advantage of the numerous prickly pear tunas and pads that thrived in the environs of South-Central Texas, as well as deer and rabbit (Campbell and Campbell 1981:13–15; Collins 1995:383).

Later, they apparently congregated along the many creeks and rivers in the area to gather the abundant and nutritional nuts ripening in the Fall (Black 1989). On the Edwards Plateau, they may have come together to gather acorns, and then built large cooking ovens to steam the tannic acid out of them to make them edible (Weir 1976). The large cooking ovens were apparently used over and over again. Whether they were repeatedly used within just a few years or over

several hundred years is still being debated, but the consensus seems to be that they were used to cook not only deer, but also a great deal of tubers and other plants (Black et al. 1997; Mauldin et al. 2003). These large cooking ovens which contain mounds of accumulated firecracked rocks are called “burned rock middens” in the archaeological community, but are sometimes referred to as “Indian mounds” by artifact collectors.

Late Archaic (4,000-1,200 years ago?)

As with our synthesis of the Middle Archaic period, differences in the traits of Native Americans inhabiting Central and South Texas during the Late Archaic period may have occurred over several hundred years. Whether it was a matter of cultural adaptation or an adaptation to the environment is questionable. In either case, the uniqueness seen in archaeological sites of the two regions imply that change may have been slower in South Texas than in Central Texas.

Collins (1995) dates the final interval of the Archaic in Central Texas to approximately 4,000–1,200 years ago, while Hester (1995) believes the Late Archaic traits seen in South Texas archaeological sites may better be defined as between 2,400–1,300 years ago. The large cooking ovens which after repeated uses coalesced into burned rock middens, intensified during the Late Archaic (Black et al. 1997; Mauldin et al. 2003). Some researchers believe populations increased throughout the Late Archaic (Prewitt 1985), while others feel populations remained the same or fell during this period (Black 1989:30). Although the Native Americans of Central Texas still sought the abundant acorns, prickly pear, and riverine plant foods such as nuts, the slightly cooler and moister climate allowed them to pursue other food goods. Even though by about 1,500 years ago the gregarious, large herds of bison no longer predominated the now-dwindling grasslands of Central and South Texas (Dillehay 1974), the Native Americans still hunted and/or gathered deer and smaller animals such as rabbits, rodents, fish, and turtles (Black 1989:30).

Although farther south, near Brownsville and Rockport, the Native Americans inhabiting those areas began making pottery about 1,800 years ago, those groups farther to the north, around the Southcross Rehab area, either elected not to make pottery vessels, lacked the skills, or because of their generally highly nomadic lifestyle, simply elected not to use the easily breakable vessels until 1,000± years later (Story 1985:45–47). In addition to the uniqueness of Central Texas’ hunter-gatherers not adapting to the use of pottery, archaeologists have also observed a noticeable change in the styles/types of killing dart points used during the Late Archaic. Keep in mind that dart points were manufactured to be used with the atlatl, a spear-like shaft with a dart point attached to it, and thrown or launched from over the shoulder. It would not be until perhaps 1,200 years ago that the bow-and-arrow was adapted for use for hunting in the region. Late Archaic dart points tend to be much smaller than Middle Archaic points, and the most common dart points that are found within the area are what archaeologists call Ensor and Frio types (Turner et al. 2011).

As with most spectrums of scientific research, there is ongoing speculation amongst professional archaeologists as to when, and what traits mark a transition between the Late Archaic, hunter-gatherer practices of Central Texans and the Late Prehistoric peoples who presumably began to settle down into territorial groups claiming a part of the landscape as their own.

Transitional Archaic (2,300 - 1,300 years ago?)

A clear and abrupt transition of Native Americans adapting or developing the traits that archaeologists define as being inclusive to the Late Archaic period, separate from the Late Prehistoric period, around the Project Area is simply not distinct in the many sites that archaeologists have been able to excavate and analyze. In effect, some of the same characteristics that archaeologists see in Late Archaic artifacts and earlier Late Prehistoric assemblages left behind are nearly identical - or at least transitional in technology and style. Therefore, some archaeologists prefer to deem this transitional period as the “Terminal, or Transitional Archaic”, spanning from approximately 1,200 to perhaps as long ago as 2,300 years ago - depending on where in South or Central Texas the groups who left behind the now-present archaeological sites were living (Weir 1976; Hester 1995). Nevertheless, the increased number of burned rock midden sites that archaeologists have documented in Central Texas, and that date to this time period, suggest that people returned time and again to the same sites to once again take advantage of cooking and eating the abundant plants available during this time (e.g., Mauldin et al. 2003).

Late Prehistoric Period (ca. 1,250-300 Years Ago)

Although artifacts commonly associated with earlier Late Archaic occupations are also found on some Late Prehistoric-in-age archaeological sites, archaeologists have documented a distinct change in projectile point styles that Native Americans began manufacturing about 1,250 years ago. These stone points suggest that Native Americans in the Central and South Texas regions surrounding the Gardens at Pinnacle project area adapted the bow-and-arrow as a weapon rather than the shoulder-thrown atlatl with a dart point attached. As such, the stone points devised for killing became much smaller and streamlined. In layman terminology, the smaller, sleeker shafts arrow shafts carried an “arrowhead”, instead of a dart point. Archaeologists have found Edwards and Scallorn arrow points dating to the earliest 600+ years of the period (e.g., Goode 1991:71). Concurrently, excavations by professional archaeologists have provided evidence that Native Americans began using crude clay pottery vessels made from local clays, as well as perhaps trading vessels from the South, Southeast Coastal, and Northeast Texas regions. As with any successful venture, the making of pottery was refined so that vessels were used more, and the technique of firing became perhaps an art (e.g., Story 1985:45-47; Black 1989:32; Hester 1995; Nickels 2000).

Archaeologists probably know more about the Native Americans who lived in Texas during this time than any other time in prehistory (Hester 1995). They continued to build large cooking ovens that we commonly call “Indian Mounds”, or burned rock middens in which they roasted tubers nuts, and some game animals (see for example, Mauldin et al. 2003). During this same period, the inhabitants may have increased their dependence upon bison (Steele and Assad-Hunter 1986:468). Huebner (1991) suggests that the sudden return of bison to South and Central Texas resulted from a more xeric climate in the plains north of Texas, and increased grassiness in the Cross-Timbers and Post Oak Savannah in north Central Texas, forming a “bison corridor” into the South Texas Plain along the eastern edge of the Edwards Plateau (Huebner 1991:354–355).

One theory is that perhaps there were not as many people occupying Central Texas during the Late Prehistoric period (Black 1989:32). We do know that they began occupying the limestone

overhangs and rockshelters created by the many creeks and rivers cutting into the Balcones Escarpment limestone cliffs. Examples of rockshelters occupied by Native Americans along the escarpment include Scorpion Cave beside the Medina River in Medina County (Highley et al. 1978), Classen Rockshelter along Cibolo Creek in northern Bexar County (Fox and Fox 1967), and Timmeron Rockshelter in Hays County (Harris 1985).

Historic Period

Beginning roughly 350 years ago, European explorers, entrepreneurs, Catholic missionaries, and government officials encroached into what is today South and Central Texas in ever-increasing numbers. This transitional end of the Late Prehistoric and beginning of the Historic period in both Central and South Texas is characterized by a continuum of written accounts of European contact with the numerous indigenous, Native American groups encountered in the two regions. In Central Texas, we can be ever grateful to the meticulous writings of the Spanish priests and government officials for their recording of the names, numbers, and lifeways of the indigenous groups. However, South Texas at the time was largely bypassed by early Euro-Americans seeking permanent settlement. As such, the technology and lifestyles of the indigenous groups in South Texas may have been affected by transient European influence, but today we can only observe these changes in the archaeological record because the written accounts simply are not available. Dr. Thomas Hester (1995) is most often credited with recognizing this transitional period between the Late Prehistoric and the Historic, and labels this largely unknown period as the “Protohistoric.”

Traveling northward from present-day central Mexico in the 1500s and 1600s, the Spanish encountered numerous small groups of Coahuilteicans (Campbell 1983; Campbell and Campbell 1985; Hester 1989; John 1975; Newcomb 1961; Swanton 1952). In later years, intrusive groups such as the Tonkawa, Lipan Apache, and Comanche took over the lands roamed by the Coahuilteicans (Ewers 1969; Hester 1989; Jones 1969; Kelley 1971; Newcomb 1961, 1993; Sjoberg 1953a, 1953b).

For example, around A.D. 1700, many south Texas Indian groups were being pushed northward by continual Spanish expansion. But by about 1750, the Apache, adapting to a more Southern Plains-lifeway style of bison hunting, entered what is today’s Texas from the northwest. Their incursion was especially rapid because they had acquired horses from the Spaniards (Campbell and Campbell 1985:27). As if the indigenous groups were not effectively dispersed and disrupted by the Apaches, the remnants of native American cohesion that previously existed in Central Texas were even further disrupted by the nomadic, bison-hunting Comanche from the High Plains of Texas (Campbell 1991:111).

Thus ensued over a century of turmoil for those numerous, but splintered Native American groups who had established a semi-permanent foothold in Central Texas before the arrival of the Apache and Comanche. They must have been heavily traumatized and significantly demoralized over the constant conflicts resulting in death, and the mysterious diseases caused by the forced continual mixing and remixing among ethnicities from around the regions and the world (Bolton 1915; Campbell 1991:345; León et al. 1961). Supposedly, there were dozens if not hundreds of language dialects that were spoken by the earlier inhabitants, but nearly all have been lost (e.g. Johnson 1994; Johnson and Campbell 1992).

Amidst the turmoil, the Spanish Catholic missions became a refuge for many of the otherwise dispersed bands and tribes within Texas. By the early 1700s, several missions had been established, and reestablished within the Nacogdoches and San Antonio areas (Campbell and Campbell 1985; Chipman 1992; de la Teja 1995; Habig 1968a, 1968b; Hard et al. 1995). Those that entered the missions did so usually voluntarily, seeking refuge from more powerful, warring bands or tribes. Others did so because they were starved for food that the protective missions could offer in seasons of natural destitution. Regardless, the Spanish government saw the Catholic religious zeal as a means of peaceful conquest in an otherwise untenable, unsettled, and hostile environment. At the same time, each and every Native American who relied upon support from the Spanish missions became less of a threat to eventual Spanish domination of the region, and infiltration by France or other countries (Campbell 1991:346–347).

Although a treaty with the Apaches in 1749 brought peace for a while, Apaches continued to range over the area between San Antonio and Laredo until the early 1800s, pushed southward by the invading Comanche who had moved into the Hill Country of Central Texas (Campbell and Campbell 1985:27; de la Teja 1995:100). In 1785, a peace treaty was agreed to in Santa Fe, New Mexico between the Spanish Crown and the Comanches. Although the ceremony of this treaty took place hundreds of miles to the west, its signing signaled the opening of a period of peaceful coexistence in what is today Bexar County, in which Comanches brought hides, meat, and tallow to San Antonio to trade for goods and services not available elsewhere, such as blacksmithing and gun repair (Fehrenbach 1983:221-224; Poyo and Hinojosa 1991:125-126).

In 1821, after a hard-fought rebellion, Mexico gained its national sovereignty from Spain; including the vast expanse that was to become the Republic of Texas. After only 15 years, the combined Tejano and Euro-American compatriots rebelled against Mexican rule, and defeated the Mexican army to declare an independent Republic of Texas in 1836. By the 1840s, the city of San Antonio was well-established as the most progressive and most populated city in the newly formed Republic. The image of San Antonio as a metropolitan magnet has been enhanced in a continuum ever since, from Texas' evolution into statehood in 1846, through today.

Previous Archaeological Work in the Area

The first officially recognized local (Bexar County) institution organized to promote an interest in Texas archaeology was the Witte Memorial Museum, established in 1926. The Witte continues to this day to promote to citizens of all ages the need to preserve our cultural resources. Over 45 years ago, in the early 1970s, two other organizations were formed. The Center for Archaeological Research (CAR) at the University of Texas at San Antonio was born in 1973. As the Center's first director, Dr. Tom Hester sought to foster a hand-in-hand relationship among amateur collectors, landowners, and professional archaeologists. As such, he was instrumental in establishing the Southern Texas Archaeological Association (STAA) in 1973, a dedicated bunch of individuals who were (and still are) committed to documenting and preserving archaeological sites throughout Bexar County and South Texas.

While we will never know for sure how many archaeological sites have been destroyed, or how many still remain in Bexar County, we do know that professional and avocational archaeologists have managed to document over 2,000 over the past 40+ years. Although it may seem odd that there have been more sites recorded in Bexar County than in all its surrounding counties, and the reader could presume that there are simply a whole lot more sites in Bexar, there are other factors that influence the documentation of sites. For example, the largest city in the area is San Antonio, and as such the city has many historic structures that qualify as archaeological sites that skew the numbers in favor of Bexar County. Thanks to the city's historic preservation office and codes enacted by the city, many have been recorded over the years.

It also makes sense that the more pieces of property that archaeologists are able to examine, the more sites are likely to be found. Most archaeological projects are undertaken because of Federal and State Antiquity codes that require cultural resource surveys be conducted when public money (tax dollars) are used for construction, such as highways, schools, prisons, etc. In addition, military installations and the National Park Service (NPS) are required by federal law to evaluate any cultural resources within their lands. Because of Bexar County's explosive population growth, many military installations, and the Spanish missions administered by NPS, it seems reasonable that Bexar County should have more archaeological sites documented than in the surrounding counties. In addition, professional and avocational archaeologists and historians have been actively involved for many years in the county.

A review of the Texas Historical Commission's Atlas of Texas Archaeological Sites (Atlas 2015) indicated that the four-acre tract had not been subjected to a cultural resources survey, nor are there any documented archaeological sites within it, nor were there any known and documented potentially significant prehistoric archaeological sites within one mile of the Project Area. However, As shown in Figure 3, multiple cultural resources surveys have been conducted within one mile (1,609 meters) of the current Project Area.

The first survey was conducted in 1991 for the Federal Highway Administration (FHWA) in a broad area where FM2537 crosses Palo Blanco Creek. The second was conducted by Texas Department of Transportation (TxDOT) archaeologists in 1995 prior to improvements along the FM2527 right-of-way. The third was conducted in 2006 by Anthony and Brown Consulting archaeologists for TxDOT in advance of the proposed expansion of the two detached bridges on US 281 crossing the Medina River and the re-aligning of the approaches. As a result, no significant cultural resources were discovered (Anthony and Brown 2007). Finally, as shown in Figure 3, a linear survey was conducted in that same area, but other than its plotting on the Texas Atlas, no other information is available online. However, further research indicates that this was a pipeline survey conducted in 1993 by Center for Archaeological Research - The University of Texas (CAR-UTSA) archaeologists for the San Antonio Water Systems (Cox 1993).

Although there are no known and documented potentially significant prehistoric archaeological sites within one mile of the Project Area, it does lie within an area of south Bexar County that is rich in 1700s thru 1900s history. The absence of historic sites recorded within one mile is more likely a reflection of the paucity of cultural resources surveys in that area that have been conducted that would have identified those historic sites. That said, as shown in Figure 3, there

are three historic markers nearby. They read as follows:

“Battle of Medina - The Battle of the Medina was fought here on August 18, 1813 by an army of Spanish royalists commanded by General Jose Joaquin Arredondo which defeated with terrific slaughter the Republican Army of the North composed of Anglo-Americans, Mexicans and Indians commanded by Jose Alvarez de Toledo. Thus ended an attempt to free Texas and Mexico from Spanish rule”.

“El Carmen Cemetery (Cementerio del Carmen) - Numerous 19th-century journals and other written historical accounts trace the origin of this cemetery to the burial of casualties of the Battle of Medina. Fought on August 18, 1813, the battle was the result of a failed attempt by a Republican Army of the North, consisting of about 1200 to 1500 Mexicans, Anglo-Americans, and Indians, to free Mexico from Royalist Spanish Rule. The Royalist army was victorious, and hundreds of men who died on the battlefield later were interred at this site between 1813 and 1817. The church of Nuestra Senora del Carmen traces its origin to a chapel built over the soldiers’ burial crypt. The burial site became a community cemetery as pioneer settlers established homes in this area. Among those interred in the graveyard are the families of Domingo Losoya and Dionicio Martinez, who received Mexican land grants surrounding the cemetery property. Also buried here are Enrique Esparza, who as a child survived the Battle of the Alamo, and French immigrant Gustave Toudouze, a prominent local naturalist and businessman. A cemetery association formed in 1927 maintains the historic site, which continues in use as a cemetery for the local community”.

“Enrique Esparza (September, 1824-December 20, 1917) Grave Marker - Son of Alamo defender Gregorio Esparaza, 11-year old Enrique, his mother, two brothers, and sister were present at the siege by the Mexican Army (Feb. 23-Mar. 6, 1836). Hidden in a pile of hay, the youth saw his father fall, and witnessed the heroic death of James Bowie on his sick bed. He then watched the bodies of the Texans burn in two huge pyres. Enrique Esparza’s eye-witness story later became invaluable, for he was one of few survivors”.

Historic Maps and Aerial Photographs

In Figure 9, the Project Area is laid over an 1887 map of the vicinity (Maps 1887). At that time, no structures are shown in the area. In Figure 10, the Project Area is shown on a 1904 soils map; once again, no structures were mapped at that time (Maps 1904).

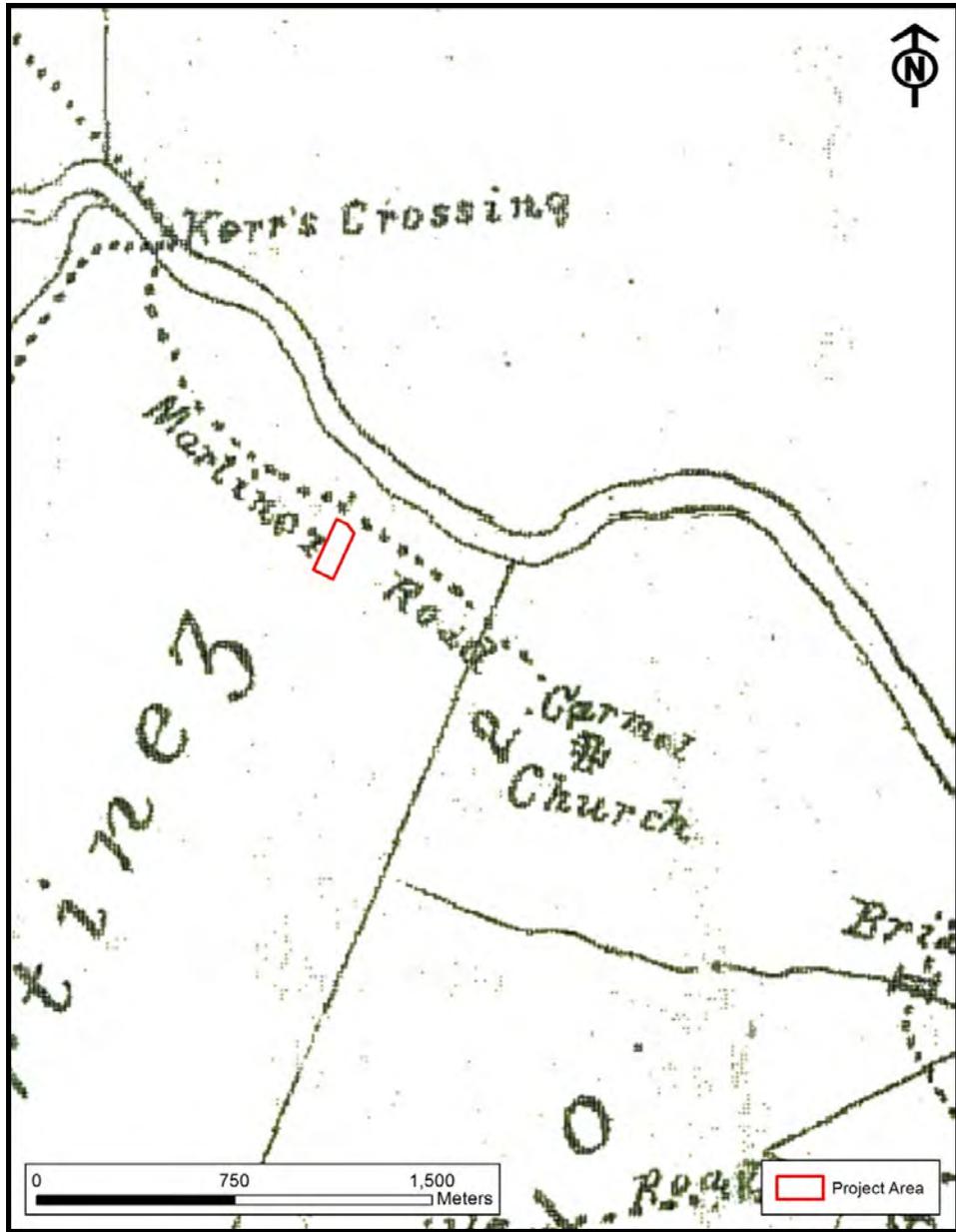


Figure 9. Project Area overlain onto an 1887 map of San Antonio.

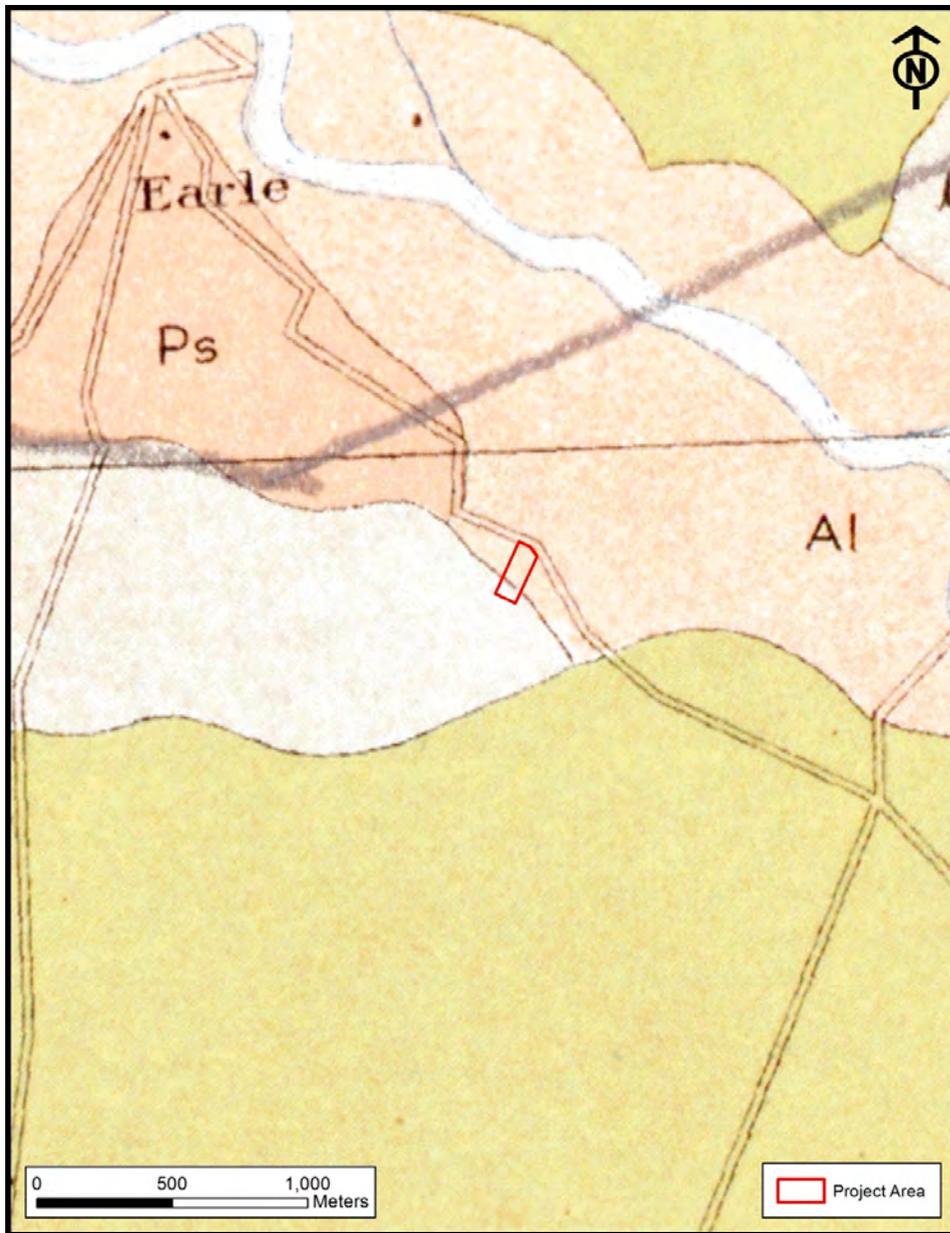


Figure 10. Project Area overlain on a 1904 soils map.

A 1940 Bexar County road map (Figure 11) indicates that the Project Area lies over “a row of dwellings” that supposedly existed at that time, but in fact may have been proposed. However, as we discuss further below, archaeologists found no evidence of construction materials, nor domestic or industrial artifacts of any kind during our 2015 survey. If there was even an ephemeral and temporary occupation of the supposed dwellings, there should have been at the least, some evidence of that. In addition, 13 years later a 1953 map (Maps 1953) shows no evidence of any structures present in the area. As such, we surmise that the 1940 map is either incorrect or shows a row of housing proposed to be constructed.



Figure 11. Project Area overlain on a 1940 road map of Bexar County.

By 1953, an aerial photograph (Figure 12) indicates that much of the Project Area may have been under cultivation, but there is no evidence of any structural remains or roads (Aerial 1953).

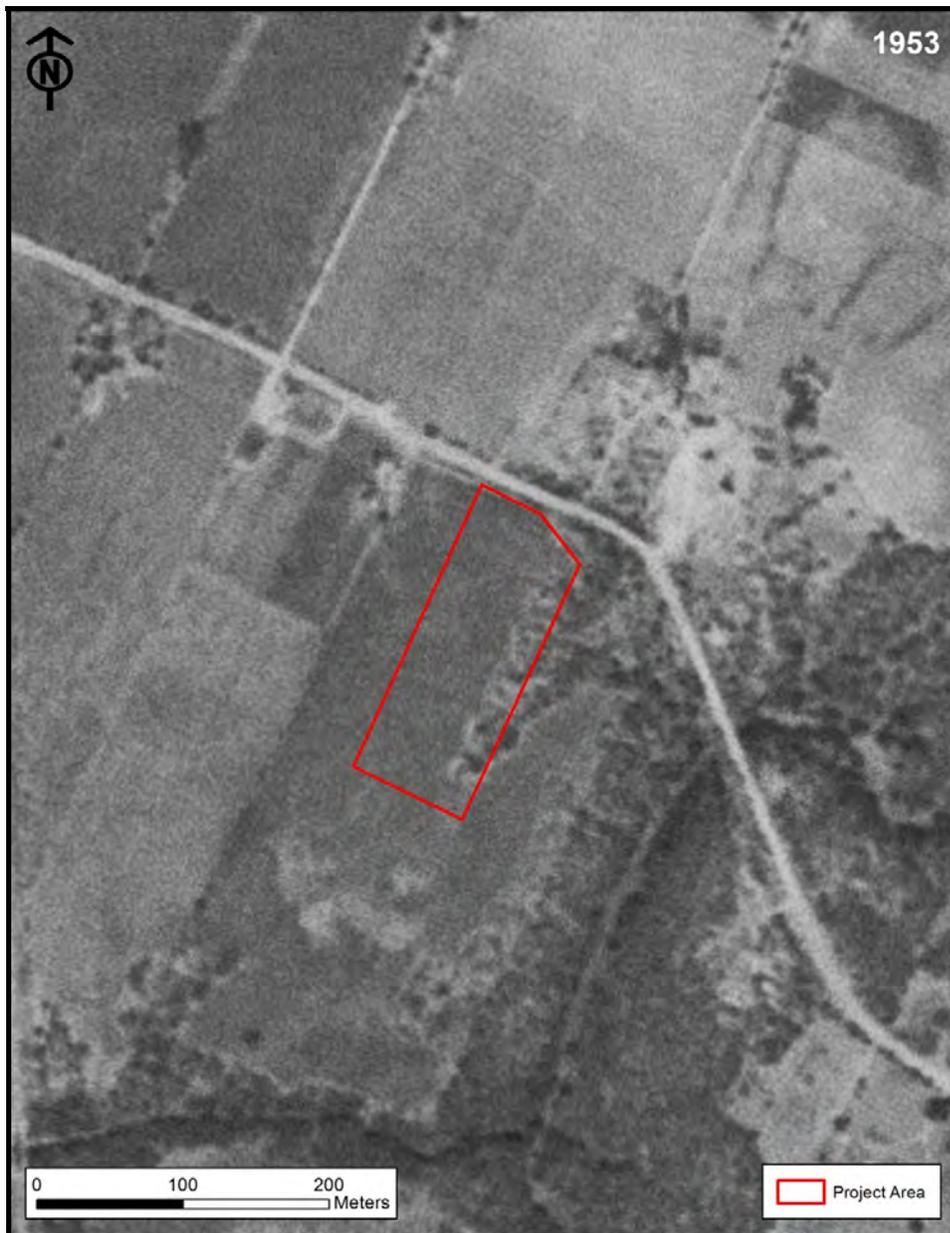


Figure 12. Project Area on a 1953 aerial photograph.

The Project Area is shown on a 1958 topographic map (Maps 1958). Once again, no structures were mapped at that time (Figure 13).

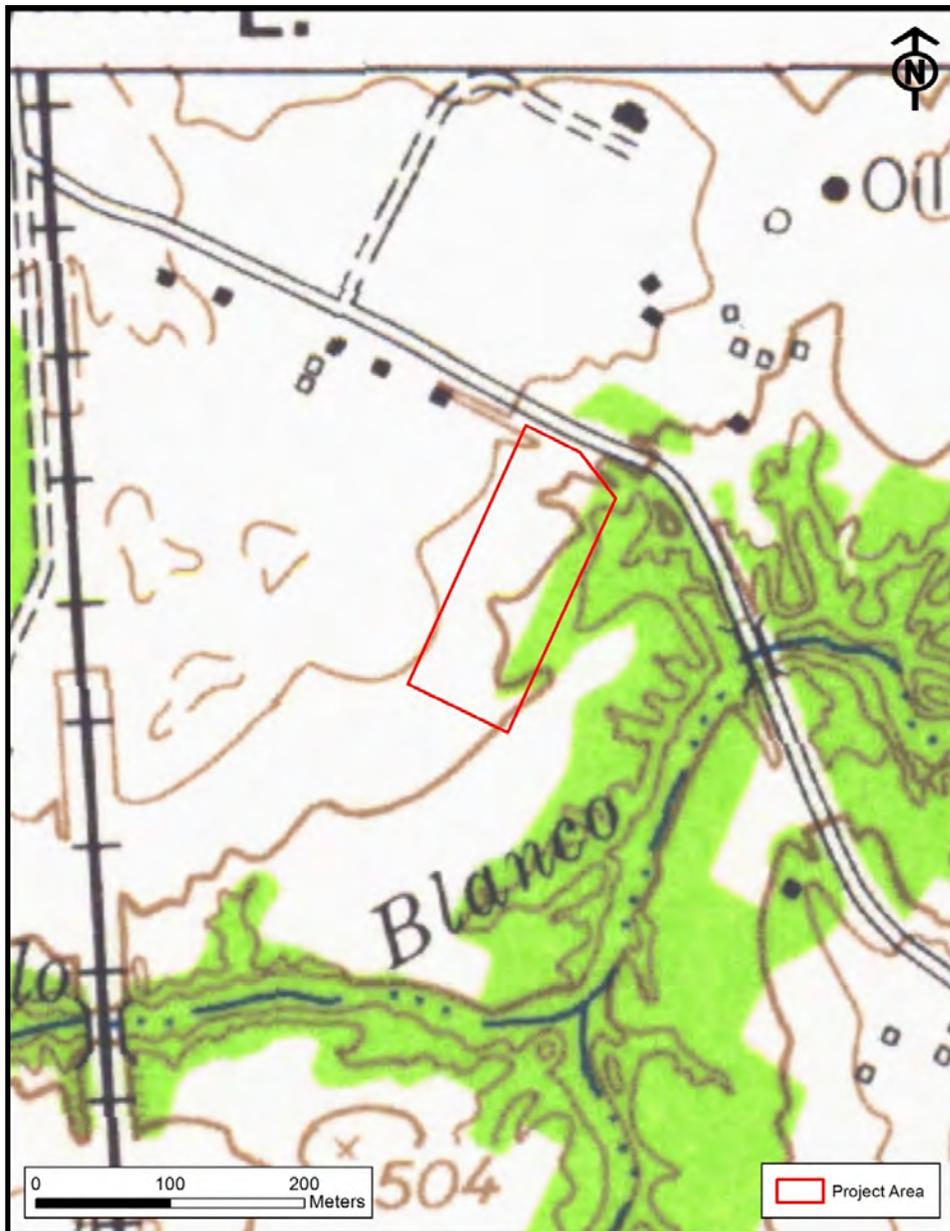


Figure 13. Project Area on 1958 USGS 7.5' topographic map.

Figure 14 shows the Project Area as it appeared in 1963 (Aerials 1963). At that time there appears to have been a two-track along the western and southern edges of the tract, and this aerial more clearly shows the gullies that have eroded into the tract. Also faintly discernible are what may have at one time been bladed north-northwest to south-southeast roads that “may” have been a planned development of row housing as shown on a 1940 road map of Bexar County (see Figure 11).



Figure 14. Aerial photo of the project area in 1963.

Finally, Figure 15 shows the Project Area on a 1966 aerial photograph (Aerials 1966). Once again there are no structures shown, and the tract does not appear to have undergone any sort of development.



Figure 15. Aerial photo of the Project Area in 1966.

Project Goals and Methods

Goals

The project goals focused on archaeological issues that could be addressed by the types of data obtained through pedestrian survey, along with shovel testing and backhoe trenching. The topics addressed were site type, distribution, density, size, depth, and stratigraphy. The prehistoric theoretical framework is structured around patterns of settlement, mobility, subsistence, and social systems for the South-Central Texas region. The historic framework is structured around the settlement along the Balcones Escarpment and adjoining Blackland Prairie as documented in the earliest written accounts by Spanish priests and government representatives, through Mexican and Republic of Texas sovereignty, and into the Texas Statehood period.

The goals of the project were to:

- 1) locate and record cultural locations and sites in the project area using a systematic survey methodology;
- 2) quantify site size, as well as depth, and stratigraphy; and,
- 3) place any diagnostic artifacts within the regional time frame.

Methods and Levels of Effort

Pre-field Preparation

Before the official survey began, the Principal Investigator reviewed previous archaeological and historical reports of investigation, both in hard copy and online, that had been conducted in the area in an effort to better understand the potential and types of cultural resources that could potentially be encountered during the survey. In addition, soils and geological maps were reviewed in order to evaluate the potential depths of archaeological deposits, and the types of both historic and prehistoric features and associated artifacts that may be present.

A review of the Texas Historical Commission's Atlas of Texas Archaeological Sites indicated that the 4.0-acre tract had not been subjected to a cultural resources survey, nor were there any documented archaeological sites within it. However, there were known and documented potentially significant prehistoric archaeological sites in the area, and it lies within an area of San Antonio that is rich in 1700s thru 1900s history.

Based upon modern aerial photographs, it could be surmised that much of the area proposed for development may have been disturbed by cultivation. However, without an on-the-ground physical survey, the potential for intact and possibly significant archaeological deposits could only be surmised.

The Survey

In accordance with Texas Historical Commission (THC) and Council of Texas Archeologists (CTA) Archaeology Survey Standards, a systematic and thorough pedestrian survey of the tract was conducted. In addition, the cutbanks of several gullies that have incised the eastern portion of the tract were carefully examined.

Surface visibility ranged from 10 to 90 percent across the area. Ten shovel tests were placed in a systematic pattern across the area, as were seven backhoe trenches (Figure 16). The results of shovel testing were fully documented on Shovel Test forms, and are described in Appendix A. Shovel tests were dug in 20-cm levels, and all sediments were screened through 1/4-inch wire mesh (Figure 17).

Backhoe trenches were excavated in roughly 30-cm increments, and the sediments and soils removed from the backhoe trenches were scrutinized by two archaeologists. In addition, a 5-gallon bucket sample of each 30-cm increment was screened through 1/4-inch wire mesh (Figure 18). All backhoe trench walls were examined for potentially intact cultural deposits and features, and the walls were photographed and briefly described. Each trench was roughly 6-8 meters in length, and terminated at 5 feet (150 cm) below the surface (OSHA standard). The single exception was in Backhoe Trench 1, where after documenting and photographing the trench wall at five feet, the backhoe operator was asked to dig the trench to 7 feet (213 cm) deep for examination of any subsoils, gravels, or bedrock.

Two archaeologists used two Fisher F2 Model metal detectors with 8" coils to systematically conduct a metal detector survey of the Project Area. Close interval transects roughly 3 meters wide were walked, swinging the detectors in a sweeping fashion so to provide optimum coverage offered within what was for the most part, tall grasses, although some areas were relatively free of vegetation (see for example, Figure 19). Both detectors were set at minimum discrimination levels so that all metal objects (ferrous or otherwise) would be detected. Whenever the detectors sounded off with a beeping sound, archaeologists would then probe the targeted area with either a towel or spade until the targeted object was recovered.

Following our designed research plan, any artifacts recovered from shovel tests, backhoe trenches, or metal detector probes were either (1) to be placed in the upper 10 cm of the backfilled shovel tests and backhoe trenches, back within the metal detector probe, or (2) to be collected and given to the landowner.

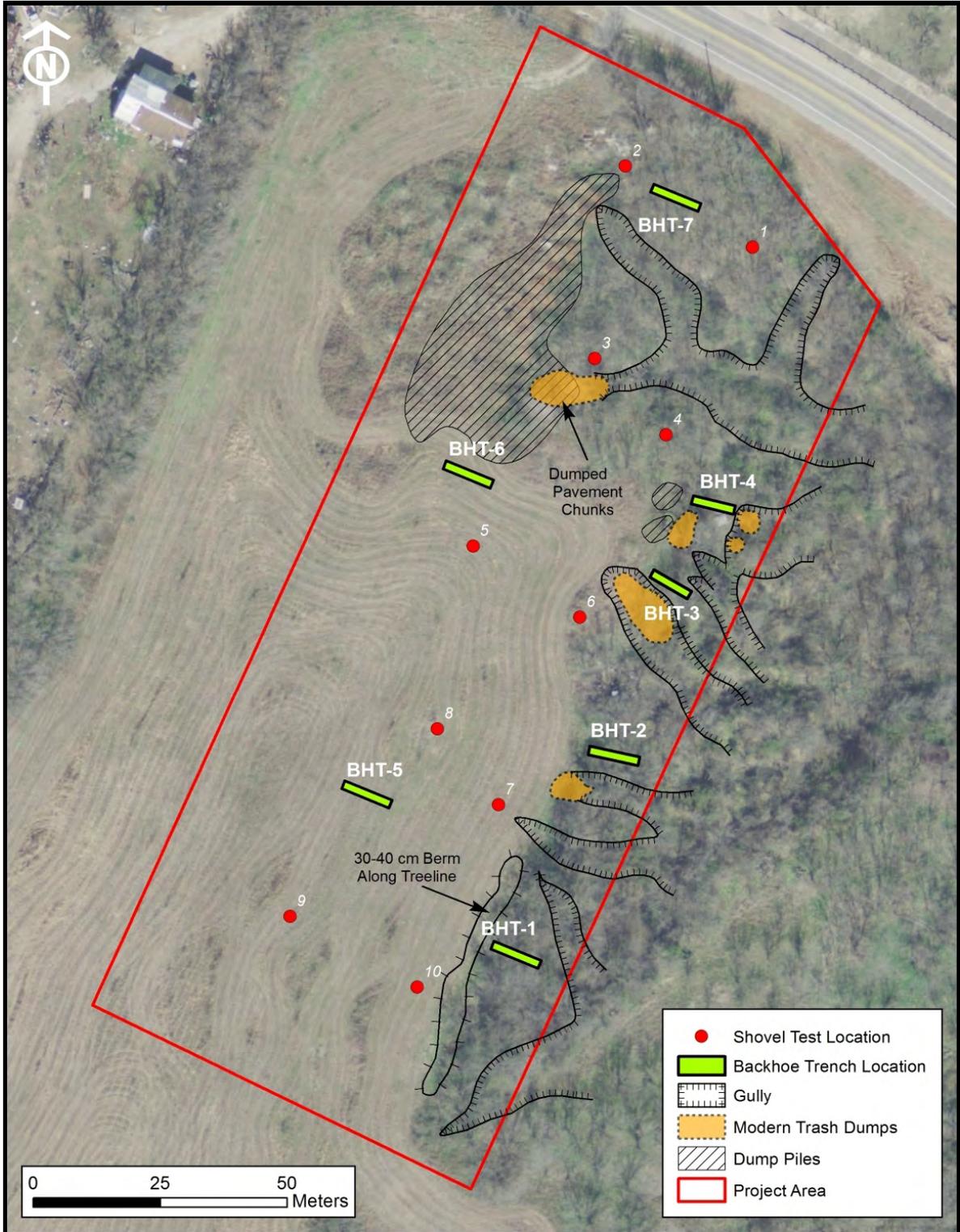


Figure 16. Locations of shovel tests (ST) and backhoe trenches (BHT).



Figure 17. Shovel Test 10; facing north.



Figure 18. Screening backdirt samples from Backhoe Trench 7; facing west.



Figure 19. Metal detecting on the southern portion of the Project Area; facing north-northeast.

Results of the Investigations

Surface Examination and Shovel Testing

A full pedestrian survey of the surface that offered up to 90% visibility was conducted, and the numerous cutbanks on the eastern edge of the Project Area were examined, followed by the excavation of 10 shovel tests and seven backhoe trenches (see Figure 16). As shown in Figures 16 and 20-22 (for examples), much of the Project Area was covered with dump truck loads of dumped dirt, rocks, and pavement. In addition, modern trash has been dumped along the tree line, as well as in virtually all of the numerous gullies.

Typically, deep and relatively undisturbed silty clay loam and clay was observed in the shovel tests, except for a probable disturbed cultivation zone in the upper 10-15 cm in the open grassy areas.



Figure 20. Dump truck piles on the northern portion of the Project area; facing south.



Figure 21. Modern trash dump at the head of a gully between BHT3 and ST6; facing northwest.



Figure 22. Dump truck loads of pavement at the head of a gully near ST3; facing north.

Backhoe Trenching

Backhoe Trench 1

Backhoe Trench 1 (BHT1) was positioned along the eastern edge of the Project Area (see Figures 16 and 23) so to investigate not only any archaeological deposits that could possibly exist, but also the geomorphological profile of a possible T-2/T-3 terrace juncture. As discussed above, sediments and soils were removed in 30-cm increments, they were examined as they were removed, and a 5-gallon sample of each 30-cm level was screened through 1/4-inch wire mesh. Although no cultural material was found, the profile of this 6-meter trench (Figure 24) is briefly described below. Colors are based upon dry soils imposed over a standard Munsell color chart.

Soils in this area revealed a typical pedon of Venus clay loam. That is, from 0 to 53 cmbs was dark grayish brown (10YR 4/2) clay loam with tiny calcium carbonate fines and minute lime concretions <1% by volume; highly fragmented snail shell fragments; common grass rootlets, small tree roots, and worm casts.

From 53 cm to 90 centimeters below the surface (cmbs), the Venus clay loam transitioned from dark grayish brown to dark yellowish brown (10YR4/6) dense clay with fragmented snail shells, few roots, and tiny calcium carbonate nodules <1% by volume; very compact, common slickensides.

From 90 to 121 cmbs, the soils gradually transitioned to brownish yellow (10YR7/6) clay with

highly fragmented snail shells, occasional angular, soft limestone chunks to 1mm in size and roughly 2% by volume; very compact.

From 121 to 150 cmbs, archaeologists observed very pale brown (10YR 8/2) silty clay with common white (10YR 8/1) lime (calcium carbonate) concretions to 15% by volume.

In this case, we excavated the trench to 150 cmbs (five feet) within OSHA standards, and documented the south trench wall. Following that, we elected to dig deeper to 215 cmbs (7 feet) to investigate deeper soils and sediments. Without entering the trench, we examined the trench walls and photographed them from above. In sum, we found subtle changes in the lower 65 cm, revealing gradually lighter clay with an increase in lime concretions.



Figure 23. BHT 1 on tree line edge on the southern portion of the Project Area; facing northwest.



Figure 24. South wall of BHT 1; facing southeast.

Backhoe Trench 2

As with Backhoe Trench 1 (BHT 1), BHT 2 was also situated just inside the treeline on the eastern edge of the Project Area, and between two gullies (see Figure 16). Soils in this area also revealed a non-typical pedon of Venus clay loam. As shown in Figure 25, the trench crosscut the edge of an apparent abandoned, and subsequently in-filled, north-south small channel.



Figure 25. BHT 2 profile; facing south.

To about 35 to 40 cmbs was dark grayish brown (10YR 4/2) clay loam with tiny calcium carbonate fines, minute lime concretions <1% by volume; few whole snails, as well and highly fragmented snail shell fragments; common grass rootlets, and small tree roots.

Sloping from roughly 35 to 40 cm to between 60 to 150 cmbs, the soil abruptly transitioned from dark grayish brown to dark yellowish brown (10YR4/6) dense clay with fragmented snail shells, few roots, and tiny calcium carbonate nodules <1% by volume; very compact, common slickensides.

Backhoe Trench 3

Backhoe Trench 3 was also excavated inside the treeline between gullies along the eastern edge of the Project Area (see Figure 16). As with BHT 2, this trench also crosscut the edge of an apparent abandoned, and subsequently in-filled, north-south small channel. However, in this area, the ancient channel edge is more abrupt (Figure 26).

To about 40 to 50 cmbs was dark grayish brown (10YR 4/2) clay loam with tiny calcium carbonate fines, minute lime concretions <1% by volume; few whole snails, as well and highly fragmented snail shell fragments; common grass rootlets, and small tree roots.

Sloping from roughly 40 to 80 cm to between 60 to 150 cmbs, the soil abruptly transitioned from dark grayish brown to dark yellowish brown (10YR4/6) dense clay with fragmented snail shells, few roots, and tiny calcium carbonate nodules <1% by volume; very compact, common slickensides.

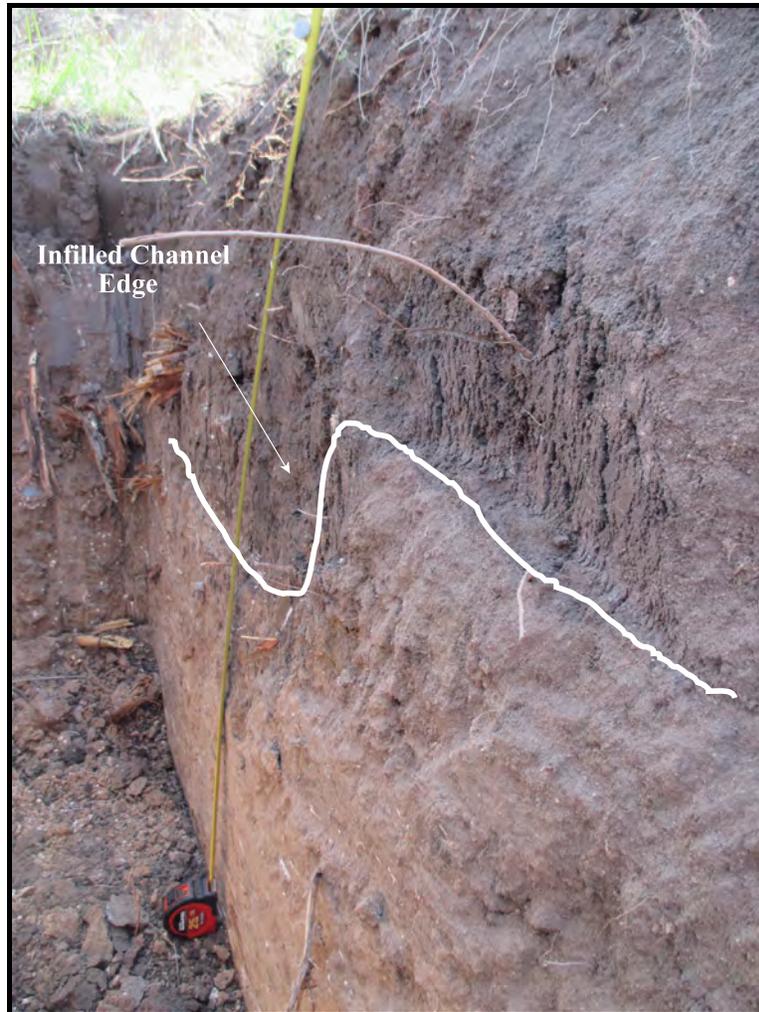


Figure 26. South wall profile of BHT 3; facing southeast.

Backhoe Trench 4

The soils and sediments exposed in this trench (Figure 27 and 28; see also, Figure 16) are very similar to those examined in BHT 1. The subtle difference is that the upper roughly 90 cm appears to have been disturbed. To wit, although the typical dark grayish brown (10YR 4/2) Venus clay loam with tiny calcium carbonate fines, minute lime concretions <1% by volume; few whole snails, as well and highly fragmented snail shell fragments; common grass rootlets, and small tree roots was observed, the consistency within this zone appeared to be mixed and structureless. Otherwise, below approximately 90 cm, archaeologists observed the typical dark yellowish brown (10YR4/6) dense clay with fragmented snail shells, few roots, and tiny calcium carbonate nodules <1% by volume; very compact, common slickensides that were exposed in BHTs 1 thru 3.



Figure 27. Excavating BHT 4 (note two television sets in modern trash dump at the head of a nearby gully); facing west.



Figure 28. South wall profile of BHT 4.

Backhoe Trench 5

As shown in Figure 16, BHT 5 was placed in an open grassy area that is now a fallow, previously cultivated field (Figures 29 and 30; see also, Figure 15). A distinctly notable difference when compared to the sediments and soils observed in BHTs 1-4, is that the upper soils in this area are very dark brown, dense clay; this was also observed in STs 5, 8, and 9.



The upper 30-35 cm consisted of very dark brown (10YR 2/2) weakly structured, but massive clay clods, with common grass rootlets in the upper 20 cm, along with occasional highly fragmented snail shells and very rare and tiny soft limestone inclusions, and common vertical cracks to 1 cm in width; the limestone inclusions may have been brought to the upper zone during years of cultivation and shrink/swell.

Figure 29. BHT 5 in open grassy, fallow cultivated field area; facing southwest.

Below that, from about 35 to 120 cmbs is grayish brown (10YR 5/2) clay, with few and rare highly fragmented snail shells, but with common soft and irregular masses of lime deposits or caliche, as well as calcium carbonate threads and fines. From about 120 to 150 cmbs is brownish yellow (10YR6/6) clay with common calcium carbonate masses and exhibiting common slickensides.



Figure 30. East end of BHT 5.

Backhoe Trench 6
As with BHT 5,
Backhoe Trench
6 was placed in
the open, grassy,
fallow cultivated
field portion of
the PA (Figure
31; see also,
Figure 16).

Nearly the same
profile in this
trench was that
observed in BHT
5, except that the
underlying
brownish yellow
(10YR6/6) clay
with common
calcium
carbonate
masses and
exhibiting
common slickensides was encountered slightly deeper, at a depth of roughly 133 cmbs.



Figure 31. Excavating BHT 6 on the northwestern portion of the Project Area; facing north.

Backhoe Trench 7

In order to get to the location of BHT 7 within a wooded area on the northern portion of the Project Area, the backhoe operator cleared a track through several dump truck piles and vegetation (See Figures 16 and 32). Unlike the other six BHTs, the expected underlying yellowish brown (10YR 5/4) clay with moderately dense soft limestone concretions and limy deposits was not encountered at 150 cmbs in BHT 7. Instead, archaeologists observed dark grayish brown (10YR 4/2) clay loam with rare fragmented snail shells and calcium carbonate fines, and grass rootlets and small roots in the upper 50 cm, underlain with grayish brown (10YR 10YR 5/2) clay with rare snail shell fragments, and calcium carbonate fines and threads throughout (Figure 33). Notably, this BHT was positioned on the highest portion of the landscape, and was the most remote from the modern-day Palo Blanco Creek channel.



Figure 32. Screening backdirt from BHT 7; facing northwest.



Figure 33. East end profile of BHT 7.

Metal Detecting

As stated previously, two archaeologists employed two Fisher Brand, Model F2 metal detectors to sweep the 4-acre tract. A thorough search of the Project Area was impeded by the presence of numerous dump truck piles, modern trash dumps, multiple gullies, and tall grasses (see Figure 16). Nevertheless, in unimpeded areas, archaeologists meandered in a sweeping manner across the surface in close interval transects (2-3 meters) from east to west, and vice versa (see Figure 19).

The Fisher F2 Models with 8-inch coils were set at minimum discrimination so to detect any sort of metal to at least 8 inches below the surface. Following a full day, the only metal detected either on or below the surface was modern trash in the form of aluminum beer and soda cans, aluminum foil, welded ferrous iron plates, buried barbed and smooth wire, ferrous bed springs, modern roofing nails, and a .16-gauge shotgun shell base. With the exception of the shotgun shell base which was uncovered in the center of the open grassy field, all of the metal detector “hits” occurred along the treeline and adjacent to the many modern trash dumps on the property.

Survey Summary, Conclusions, and Recommendations

A thorough pedestrian survey of the surface that offered between 10% and 90% visibility, along with the examination of 10 shovel tests and 7 backhoe trenches within the project area was conducted, but no evidence of either prehistoric or historic occupation was found either on or beneath the surface. In addition, a metal detecting survey of the Project Area yielded only modern trash.

In sum, we recommend that the project should proceed as currently designed by the project sponsor. The project should be considered as having “no effect” on any properties considered as eligible for nomination to the National Register of Historic Places or inclusion in the State Archeological Landmarks Program, and as such, the project should be allowed to proceed without further archaeological work. However, if any cultural resources are encountered during construction, work should immediately be halted in the vicinity until such finds are examined and evaluated by Tierras Antiguas, or by any qualified archaeological consultant, and by the San Antonio Office of Historic Preservation.

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Appendix A. Results of Shovel Testing

The following table presents the results of shovel testing (ST) in centimeters below the surface (cmbs). Soil colors are based upon dry soils compared to a standard Munsell color chart. Notably, no cultural material was found in any of the ten shovel tests excavated within the Project Area.

Table A1. Results of Shovel Testing.

ST 1	<p>0-20 cmbs: Grayish brown (10YR 5/2) silty clay; fine medium, fine; common grass rootlets, rare small and rounded limestone pebbles; clear, smooth lower boundary</p> <p>20-55 cmbs: Brown (10YR5/3) clay loam; blocky, medium, moderate; few <i>Rabdotus</i> shell fragments, few rounded limestone gravels < ½-inch in size; calcium carbonate fines increasing with depth; gradual, smooth lower boundary</p> <p>55-60 cmbs: Light brownish gray (10YR6/6) clay loam; blocky, medium, moderate; few <i>Rabdotus</i> shell fragments, few rounded limestone gravels to 1-inch in size; calcium carbonate fines increasing with depth</p>
ST 2	<p>0-55 cmbs: Brown (10YR5/3) loam; fine medium, fine; common grass rootlets in upper 15 cm; common calcium carbonate fines to threads with depth; gradual, smooth lower boundary</p> <p>55-60 cmbs: Brown (10YR4/3) clay loam; blocky, medium, moderate; few <i>Rabdotus</i> shell fragments; vertical cracking to ⅛-inch wide; few rounded limestone gravels to ½-inch in size, and increasing from 2% to 5% by volume with depth</p>
ST3	<p>0-35 cmbs: Brown (10YR4/3) clay loam; medium, medium, blocky; common grass rootlets, few cedar tree roots increasing with depth, few <i>Rabdotus</i> shell fragments; 2-cm diameter root; gradual smooth lower boundary</p> <p>35-60 cmbs: Grayish brown (10YR5/2) loamy clay; common <i>Rabdotus</i> snail shell fragments; calcium carbonate fines and threads</p>
ST 4	<p>0-20 cmbs: Brown (10YR 5/3) silty loam; friable; blocky, fine, moderate; common fine rootlets, white plastic strip 1-cm long, small modern brown glass sherd; gradual, smooth lower boundary</p> <p>20-40 cmbs: Brown (10YR 4/3) loamy clay; firm; blocky, coarse, strong; two 4-cm diameter root; clear, wavy lower boundary</p>

	40-60 cmbs: Dark grayish brown (10YR 4/2) silty clay; firm; blocky, coarse, strong
ST 5	0-20 cmbs: Very dark grayish brown (10YR 3/2) clay; firm; blocky, medium, moderate; common grass and weed rootlets in upper 15 cm, few round snails, gradual, smooth lower boundary 20-60 cmbs: Very dark grayish brown (10YR 3/2) clay loam; firm; blocky, medium, moderate; few round whole and fragmented snails, few calcium carbonate fines
ST 6	0-20 cmbs: Dark brown (10YR 3/3) silty clay; blocky, coarse, moderate; common rootlets; gradual wavy lower boundary 20-60 cmbs: Dark brown (10YR 3/3) clay; firm; blocky, coarse, moderate
ST 7	0-20 cmbs: Dark brown (10YR 3/3) clay; firm; blocky, coarse, moderate; common grass rootlets; gradual, wavy lower boundary 20-60 cmbs: Light brownish gray (10YR 6/2) clay loam; firm; blocky, coarse, strong; one whole <i>Rabdotus</i> , calcium carbonate fines and masses to 1-cm in size increase with depth
ST 8	0-20 cmbs: Dark brown (10YR 3/3) clay; firm; blocky, fine, moderate; common grass rootlets; gradual, wavy lower boundary 20-60 cmbs: Dark brown (10YR 3/3) silty clay loam; firm; blocky, coarse, strong; calcium carbonate fines and threads increasing in density with depth
ST 9	0-20 cmbs: Dark grayish brown (10YR 4/2) loamy clay; firm, blocky, medium, moderate; common grass rootlets in upper 10 cm, common snail shell fragments throughout, vertical cracking to 15 cmbs; gradual, smooth lower boundary 20-60 cmbs: Dark rayish brown (10YR 4/2) clay; firm, blocky, coarse, strong; common snail shell fragments throughout
ST 10	0-20 cmbs: Pale brown (10YR 6/3) silty clay loam; firm, blocky, medium, moderate; common grass rootlets in upper 10 cm; yellowish brown (10YR 5/4) clay mottling 5-7% by volume in upper 10 cm; gradual, smooth lower boundary 20-60 cmbs: Brown (10YR 5/3) sandy clay loam; firm, blocky, medium, moderate; one angular, red ironstone gravel 3 cm in size between 40-50 cm, common snail shell fragments throughout, calcium carbonate fines and threads <2% by volume below 50 cm