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Archaeological Monitoring and Limited Survey Investigations at 41HY261 and 41HY141 for the Cheatham Street Waterline Improvements Project, San Marcos, Hays County, Texas, for Texas Antiquities Permit No. 8332

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Technical Report No. 78

CENTER FOR ARCHAEOLOGICAL STUDIES
Texas State University-San Marcos

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MANAGEMENT SUMMARY

Project Title: Archaeological Monitoring and Limited Survey Investigations at 41HY261 and 41HY141 for the Cheatham Street Waterline Improvements Project, San Marcos, Hays County, Texas, Texas Antiquities Permit No. 8332

Project Description: Archaeological monitoring.

Local Sponsor: City of San Marcos

Institution: Center for Archaeological Studies, Texas State University

Principal Investigator: Amy E. Reid

Project Archaeologist: Jacob Hooge, Emily McCuistion

Texas Antiquities Permit: 8332

Dates of Work: April 24-27, April 30, May 1-4, May 7 and 8, May 15-17, September 11 and 25, and October 1-5, 2018.

Total Volume of Monitored Excavated Sediment: 718.54 m3

Number of Sites: 2—Site 41HY141 and Site 41HY261

Curation: All artifacts collected, and associated project records were processed and curated at CAS.

Comments: Archaeological monitoring and limited survey investigations for the Cheatham Street Waterline Improvements Project identified and recorded cultural resources associated with sites 41HY141 and 41HY261. These sites are eligible for listing on the NRHP and have SAL status. Due to the limited exposure of intact sediments associated with 41HY141 and 41HY261 during monitoring and limited survey, CAS recommends full regulatory clearance.

ABSTRACT

During the months of April, May, September, and October, the Center for Archaeological Studies (CAS) at Texas State University conducted archaeological monitoring of mechanical excavations for the Cheatham Street Waterline Improvements Project (CSWIP). These excavations were located within archaeological sites 41HY261 and 41HY141, on opposite banks of the San Marcos River. Working under Texas Antiquities Permit 8332, CAS conducted archaeological monitoring and limited survey-level investigations on behalf of the City of San Marcos (the City) to assist them with their regulatory compliance obligations.

The total estimated volume of sediment excavated for this project is 718.54 m3. Cultural deposits were encountered within these excavated sediments in association with both 41HY141 and 41HY261. Due to the limited exposure of intact sediments associated with sites 41HY261 and 41HY141, CAS recommends that no further archaeological investigations are necessary for the CSWIP. However, it is recommended that the City continue to coordinate any developments planned within or in the vicinity of the sites with the Texas Historical Commission (THC) prior to undertaking development. Additionally, future Areas of Potential Effect(s) (APE) should be carefully evaluated to determine whether they have a high probability to contain intact archaeological deposits.

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The Center for Archaeological Studies (CAS) at Texas State University greatly appreciates the support and cooperation provided by the City of San Marcos in protecting and preserving the cultural resources of San Marcos. The authors would also like to thank Jodi Jacobson, Susan Sincerbox, and Taylor Roberts for their assistance with identifying faunal remains, Paul Matchen for assistance with identifying historic artifacts, and Jacob Hooge for his early work on this project. Finally, CAS would like to thank the Texas Historical Commission for their support and assistance.

INTRODUCTION

The Center for Archaeological Studies (CAS) at Texas State University (University) conducted archaeological monitoring and limited survey-level investigations for the Cheatham Street Waterline Improvement Project (CSWIP) on behalf of the City of San Marcos (City). The CSWIP, which aims to improve the municipal water supply system, involved the installation of a 12-inch waterline along Cheatham Street from CM Allen Parkway to an existing tie-in point just west of Riverside Drive (Figure 1) in order to allow for more efficient distribution of water through the City's supply system. Because this segment crosses the San Marcos River, the City used a combination of open trenching and horizontal directional drilling (HDD) to install the waterline beneath the river. CAS archaeologists monitored mechanical excavation of two HDD entry trenches, two HDD drill boxes, two HDD exit trenches, an HDD catchment pit, a manhole box trench, open trenching for the waterline, and two trenches off-shooting from the main waterline trench for the purpose of installing a new fire hydrant and for tying into existing utilities. In addition, the unexpected excavation of a drill rescue trench, necessary to retrieve a lodged HDD drill bit, was monitored and cultural material was identified. Other work completed included controlled manual excavation of a 1-x1-meter unit to determine the nature of deposits to be impacted on the north side of Cheatham Street for a manhole box.

Figure 1. Project location.

The City's standing as a political entity within the State of Texas causes the CSWIP to be subject to provisions of the Antiquities Code of Texas (Code). The Code requires that such an undertaking consider the potential impact on any cultural resources that might be present and that might contribute information that is meaningful or significant to understanding the history and/or prehistory of the state of Texas. No Federal funding or permitting is involved in the project.

Because the project area is located within the boundaries of archaeological sites 41HY141 and 41HY261, it was determined that the CSWIP had a high likelihood of impacting associated archaeological deposits. Furthermore, prompted by the results and recommendations following previous investigations of 41HY261 (see below), CAS conducted archaeological monitoring on behalf of the City to assist them with their regulatory compliance obligations. Work was conducted under Texas Antiquities Permit No. 8332 (Amy E. Reid, Principal Investigator) and in accordance with the guidelines set forth by the Council of Texas Archeologists (CTA) and adopted by the Texas Historical Commission (THC).

PROJECT SETTING

The project area is centrally located within the City of San Marcos, in south-central Hays County, Texas. The project area crosses the San Marcos River, which originates from the base of the Balcones Escarpment, approximately 800 meters upstream from the project area. The Balcones Escarpment was created by uplift during the Miocene and now marks a transition between the Blackland Prairie environment to the east and the Edwards Plateau, or Hill Country, environment to the west. These environmental transitions are known as ecotones, and they are typically high-energy settings capable of supporting richly diverse plants and animals (Crumley 1994). Because of its abundance of stones for tool making and fresh water, as well as a wealth of plants and animals, this particular region was and is an attractive locale for human occupation. The project area is largely restricted to the current road corridor, with three small trenches extending onto introduced, manicured grasses.

Geology and Soils

Bedrock geology of the region is complex because of the Balcones Fault Zone, but the project area, however, is small and situated within Quaternary Alluvium (Qal), as mapped by the Bureau of Economic Geology (Barnes 1974). Qal consists of recent flood deposits. In proximity to the project area, Qal abuts middle Cretaceous limestones, Del Rio Clay and Georgetown Formation undivided (Kdg), and Eagle Ford Group and Buda Limestone undivided (Keb), as well as late Pleistocene Fluviatile terrace deposits (Qt).

Soils of the project area are also the result of flood deposits. The project area is situated on Oakalla soils, frequently flooded (Ok). As described by Batte (1984), Oakalla series soils are typically deep, well drained, calcareous loams that are situated on near-level floodplains. These soils have an A-(B)-C profile, with the A horizon being brown to grayish brown, B horizon (where present) appearing grayish brown to light yellowish brown, and the C horizon being brown to light yellowish brown. As these soils are formed in accumulations of alluvium, they do have the potential to contain stratified cultural deposits.

Climate and Weather

The following weather statistics are based on a 30-year record (1951–1980). Mean maximum temperatures of summers approach 97° F, and winters have mean minimum temperatures of approximately 50° F in Hays County (Bomar 1983). December and January are the only two months on record that have not had temperatures above 90° F, whereas freezing temperatures have been recorded from October through April. The mean annual precipitation recorded for Hays County is 33.75 inches (86 centimeters [cm]). Precipitation in the county is bimodal, with most precipitation occurring in the late spring and in the early fall (Dixon 2000). Weather in this region is dynamic and often marked by severe events. Hazardous weather comes in the form of extraordinary downpours and droughts. With thin soils and high-relief bedrock topography, the Hill Country is notorious for flash flooding. As moisture-rich maritime air approaches the Balcones Escarpment (a prominent topographic feature), the air is lifted, moisture condensed, and

then quickly unloaded (Caran and Baker 1986; Slade 1986). As a result, the affected drainage basins rapidly fill their waterways. Drought can also be an expected feature of Central Texas weather; there is not a decade in the twentieth century that did not include drought (Bomar 1983:153). At a greater temporal scale, the region's climate can be described as moist with mild winters, wet all seasons to dry summers (east to west), and with long hot summers (Köppen Climatic Classification: Cfa-Csa, east to west), but evidence indicates that climates are variable as well (Mauldin et al. 2010).

Flora and Fauna

Floral and faunal characteristics of both adjoining environmental regions (Edwards Plateau and Blackland Prairie) mingle along the Balcones Escarpment. Blair (1950), calling this ecotone the Balconian Province, noted that it contained wildlife from every other region in the state, and also that it contained endemic species. Typical modern fauna found in the region includes armadillo, badger, beaver, black rat, coyote, crayfish, domestic dog, eastern cottontail, eastern gray squirrel, eastern wood rat, horse, muskrat, common opossum, pig, raccoon, red fox, turkey, western diamondback rattlesnake, white-tailed deer, and white-tailed jackrabbit, in addition to bountiful other mammals, birds, reptiles, amphibians, and fish. In prehistory, many of the same animals were present, as were bison and antelope.

The region's natural vegetation is generally a grassland-woodland-shrubland mosaic, where grasslands separate patches of woody vegetation (Ellis et al. 1995). Along the escarpment, mesquite, post oak, and blackjack oaks interrupt patches of bluestems, gramas, and many other types of grass in the Blackland Prairie. These species are also found with the Edwards Plateau's live oak, shinnery oak, junipers, and mesquite (Gould 1962).

The project area is situated adjacent to the banks of the San Marcos River, where the natural vegetation has been modified considerably in order to accommodate various infrastructure constructions and general improvements through the years. Despite changes to the banks, the river remains home to a variety of wildlife and fish, as well as rare or endemic and endangered salamanders, prawn, and wild rice (Kutac and Caran 1994).

CENTRAL TEXAS CULTURAL CHRONOLOGY

Human presence within the region is divided into three periods: Prehistoric (including Paleoindian, Archaic, and Late Prehistoric), Protohistoric and Historic (Table 1). Evidence for prehistoric occupation in and around the San Marcos area extends from the Clovis period, approximately 11,500 radiocarbon years ago up until the arrival of Spanish explorers almost 400 years ago. Historic documents record the use of the San Marcos springs by Spanish and Native American groups in the seventeenth, eighteenth, and nineteenth centuries, and as early as the mid-nineteenth century by Anglo settlers such as General Edward Burleson.

Table 1. Cultural Chronology for Central Texas (from Lohse et al. 2013).

Epoch	Period	Certain Diagnostic Types	Age (Years Before Present)
Holocene	Historic		~AD 1550
	Late Prehistoric/Toyah	Perdiz	650–≤300
	Transitional Archaic/Austin	Darl, Scallorn, Edwards	1270–650
	Late Archaic III	Ensor, Fairland, Frio, Ellis	2150–1270
	Late Archaic II	Montell, Castroville, Marcos	3100–2150
	Late Archaic I	Bulverde, Pedernales, Marshall, Lange, Williams	4200/4100–3100
	Middle Archaic	Early Triangular (Baird, Taylor), Nolan, Travis	5750–4200/4100
	Early Archaic III	Calf Creek (Bell, Andice), Martindale, Bandy	6000(?)–5750
	Early Archaic II	Uvalde, Gower, Hoxie, Jetta	8000–6300 (?)
	Early Archaic I	Angostura	8800–8000
Pleistocene	Late Paleoindian	Golondrina, St. Mary's Hall	10,200–8800
	Early Paleoindian	Clovis, Folsom	13,500–10,200

Prehistoric

The Prehistoric period is divided into three major temporal stages, the Paleoindian, Archaic, and Late Prehistoric. The Paleoindian stage begins with the earliest known human occupation of North America and extends to approximately 8,800 years before present (BP). The Archaic stage follows, extending from ca. 8,800 to 1,250 BP, and is generally seen as a time during which humans made successful adaptations to changing environmental conditions. The Late Prehistoric stage begins ca. 1,250 BP and is characterized by a resurgence of grassland habitats and the development of bow and arrow and ceramic technologies.

Paleoindian

Collins (1995:381–385, 2004) dated the Paleoindian period in Central Texas to 11,500–8800 BP. The Paleoindian period is further divided into Early (ca. 11,500–10,200 BP) and Late (ca. 10,200–8800 BP) phases. Diagnostic Early Paleoindian point types include Clovis, Folsom and Midland. The Clovis culture is also characterized by well-made prismatic blades (Collins 1995; Green 1964). The Early Paleoindian stage is generally characterized by nomadic cultures that relied heavily on hunting large game animals (Black 1989). However, recent research has suggested that early Paleoindian subsistence patterns were considerably more diverse than previously thought and included reliance on local fauna, including turtles (Black 1989; Bousman et al. 2004; Collins and Brown 2000; Hester 1983; Lemke and Timperley 2008). Folsom cultures are considered to be specialized bison hunters, as inferred from the geographic location and artifactual composition of sites (Collins 1995).

The Late Paleoindian substage occurred from ca. 10,200 to 8,800 BP. Reliable evidence for these dates was recovered from the Wilson-Leonard site north of Austin (Bousman et al. 2004; Collins 1998). At Wilson-Leonard, archaeologists excavated an occupation known as Wilson, named for the unique corner-notched projectile point. The dense occupation also included a human burial (Bousman et al. 2004; Collins 1998). In addition to the Wilson occupation, Golondrina-Barber and St. Mary's Hall components, dating between 9500 and 8800 BP, were excavated. Collins (1995) suggested the Wilson, Golondrina-Barber, and St. Mary's Hall components represent a transitional period between the Paleoindian and Archaic Periods due to the subtle presence of notched projectile points and burned rock cooking features.

Archaic

According to Collins (1995, 2004), the Archaic stage in Central Texas lasted approximately 7500 years, from 8800 to 1200/1300 BP. He has divided the stage into Early, Middle, and Late Archaic based on Weir's (1976) chronology. The Archaic stage is characterized by several transitions including a shift in hunting focus from Pleistocene megafauna to smaller animals, the increased use of plant food resources and use of ground stones in food processing, increased implementation of stone cooking technology, increased use of organic materials for tool manufacturing and an increase in the number and variety of lithic tools for woodworking, the predominance of corner- and side-notched projectile points, greater population stability and less residential mobility, and systematic burial of the dead. The markedly increased emphasis on organic materials in tool technologies and diet is likely a reflection of preservation bias. Traditionally, scholars define the end of the Archaic period by the appearance of bow and arrow technology around 1,200 BP. However, Lohse and Cholak (2013) argue that this shift, while important, was relatively insignificant in comparison with other evidence for strong cultural continuity until approximately 650 years ago (Figure 2). Accordingly, the current project considers the Archaic period as the 5,000 years encompassing the end of the Early Archaic to the beginning of the Late Prehistoric Toyah interval (see Table 1). This range is based on the timing of projectile point styles, sporadic periods of bison hunting, and, to a lesser degree, some environmental conditions in the region. The Archaic starts with the Calf Creek horizon (including Bell and Andice types), representing the terminal Early Archaic, and ends with Scallorn.

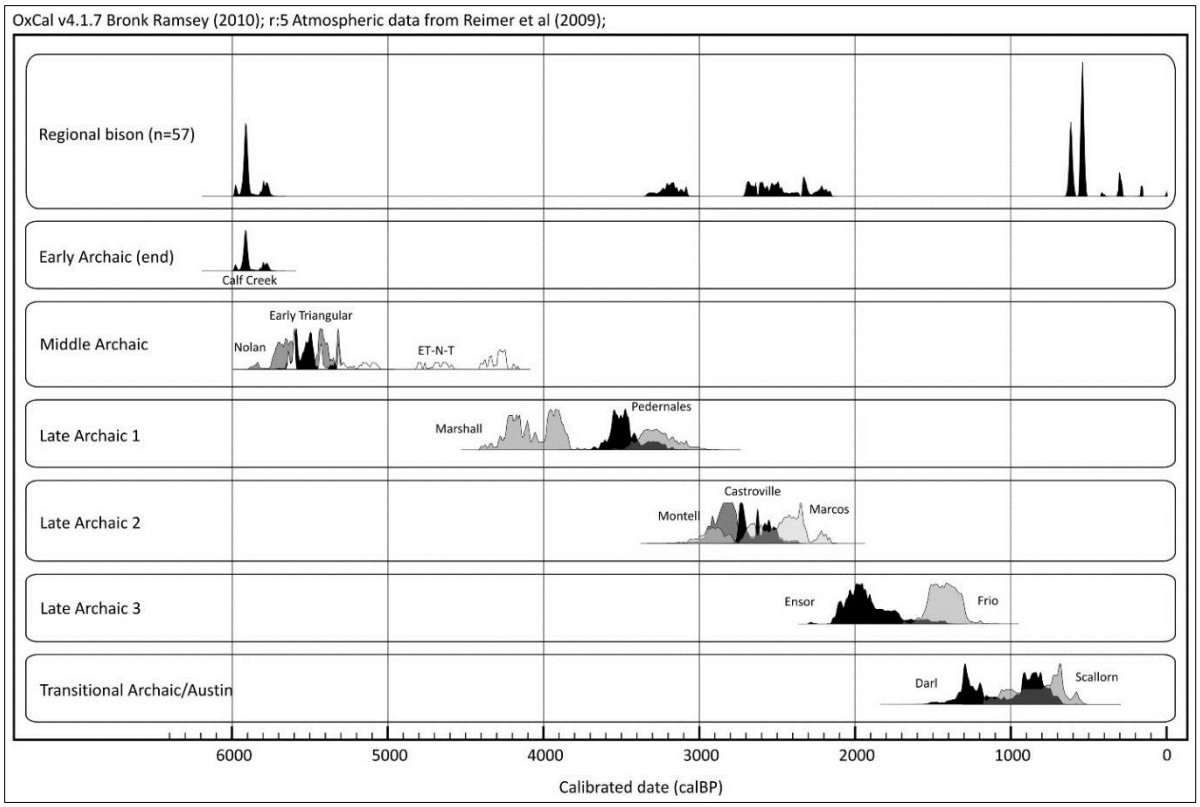

Figure 2. Cultural chronology, shown as published radiocarbon probability distributions for some key point types, for Central Texas for the period from the end of the Early Archaic (Calf Creek horizon) to the end of the Archaic, called the Transitional Archaic/Austin period.

Early Archaic

The Holocene marked a significant climate change associated with the extinction of megafauna, which stimulated a behavioral change in land use. Early Archaic groups focused more intensively on the exploitation of local resources such as deer, fish, and plant bulbs. This dietary adjustment is evidenced by the increased number of ground stone artifacts, burned-rock middens, and wood-working tools such as Clear Fork gouges and Guadalupe bifaces (Turner and Hester 1993:246–256). Projectile points are dominated by bifurcated or split-stem morphologies that often grade into one another in terms of style and design. Dillehay (1974) argued that bison were widely available across Texas, although confirming data are often lacking.

The end of the Early Archaic dates to ca. 5750 BP. (Lohse and Cholak 2013). This date places the wide-spread Calf Creek horizon, a brief period closely associated with bison exploitation across the Southern Plains (Wyckoff 1994, 1995) at the very end of the Early Archaic. This placement reflects the close stratigraphic association at nearby Spring Lake of Calf-Creek-related point types (Bell and Andice) with bison remains as well as immediately preceding types in the regional sequence, including Merrell and Martindale. These two types are typical Early Archaic forms in Central Texas, while the Calf Creek horizon is very poorly dated here; this component at Spring Lake may represent the best known instance in the entire state.

Middle Archaic

The Middle Archaic in Central Texas dates from 5750-4200/4100 BP. and is generally associated with the Altithermal, a prolonged period during which the climate fluctuated from arid to mesic, then back to arid in Central Texas. Vegetation and wildlife regimes all fluctuated in response to these environmental oscillations, with human groups responding accordingly. Large ungulates (bison) are absent from the record during this time. The Middle Archaic is characterized by two primary projectile point style intervals: Early Triangular (Taylor and Baird types), and Nolan and Travis. Taylor bifaces are broad and triangular, similar to the earlier Calf Creek Styles, but lacking any basal notches. By the latter part of the Middle Archaic, Nolan and Travis points predominate; both are technologically and stylistically dissimilar to the preceding styles (Collins 1995, 2004). The Nolan-Travis interval was also a period when temperature and aridity were at their peaks. Prehistoric inhabitants acclimated themselves to peak aridity as seen through increased utilization of xerophytes such as sotol (Johnson and Goode 1994). These plants, typically baked in earthen ovens, also reflect the development of burned rock middens. During more arid episodes, the aquifer-fed streams and resource-rich environments of Central Texas were extensively utilized (Story 1985:40; Weir 1976:125, 128).

Late Archaic

The Central Texas Late Archaic spanned the period of ca. 4200/4100-1270 BP. Bison returned episodically to the southern Plains (Dillehay 1974), strongly influencing subsistence during periods of visibility. Cemeteries at sites such as Ernest Witte (Hall 1981) and Olmos Dam (Lukowski 1988) provide some evidence that populations increased and that groups were becoming territorial (Story 1985:44–45), although this pattern had begun by ca. 6,500-7,000 B.P. (Hard and Katzenberg 2011; Ricklis 2005). Numerous projectile point styles during this period suggest increases in population pressure and social and technological divisions between bands. Common styles include Bulverde, Pedernales, and Marshall (Late Archaic 1); Montell, Castroville, and Marcos (Late Archaic 2); and Ensor, Fairland, and Frio (Late Archaic 3). The Transitional Archaic and Austin periods, together, represent the last phase of Archaic lifeways in the region. Except for the gradual (and poorly dated) appearance of the bow and arrow, subsistence practices, settlement patterns, and technological behaviors appear to change slowly throughout this period (see Black and Creel 1997; Houk and Lohse 1993). Point styles that define this final transitional interval include Darl and Scallorn. Burials from this time reveal a high proportion of arrow-wound deaths (Black 1989; Prewitt 1974), perhaps suggesting some disputes over resource availability.

Late Prehistoric

Historically, following J. Charles Kelley (1947), archaeologists divide the Late Prehistoric is into two phases, Austin and Toyah. However, the present authors consider the Central Texas Late Prehistoric to be limited to the Toyah interval beginning at approximately AD 1300 based on a sudden appearance of bison in the regional record (Table 1). Dating the end of Toyah is complicated, since material traits clearly extend into the early part of the Historic period (Arnn 2012). In general, this period is marked by the (apparently) complete shift away from the dart and atlatl to the bow and arrow, and by the incorporation of pottery throughout the region (Black 1989:32; Story 1985:45–47). Importantly, Toyah peoples were interacting in a broad network of exchange focused on bison and bison by-products. This network appeared in Southern Plains areas to the north (Spielman 1991), stretched from Pueblo areas to the west to

Mississippian villages in the east, and involved agricultural goods, people (especially women), exotic materials like obsidian, ceramics, and other resources. Evidence for the movement of peoples into the study area comes from stable isotope values from a human burial from the University campus; data show this woman from coastal regions had moved to Central Texas as an adult (Muñoz et al. 2011).

The beginning of the Toyah period (650 B.P.) in Central Texas is marked by contracting stem points and flaring, barbed shouldered points. Perdiz is the most common example (Black 1989:32; Huebner 1991:346), and this type occasionally occurs on glass in mission contexts (Lohse 1999:268). Toyah is also characterized by its tools, like prismatic blades and blade cores, which are considered part of a specialized bison hunting and processing toolkit (Black and McGraw 1985; Huebner 1991; Ricklis 1994). However, wide technological variability is present, including both lithics and ceramics, suggesting a diverse social landscape (Arnn 2012).

Protohistoric (Spanish Entrada Period)

In Texas, the Protohistoric period was marked by Spanish entradas, the formal expeditions from established forts and missions in Northern Mexico into Central, Coastal, and East Texas in the late seventeenth and early eighteenth centuries. These encounters began with the venture into Texas by the Spanish explorer Cabeza de Vaca and the Narvaez expedition in 1528. The period is generally dated between AD 1500 and 1700 (or 1528, the date of the Cabeza de Vaca/Narvaez expedition, to the establishment of Mission San Antonio de Valero in 1718).

With Alonso de León's expedition of 1680, El Camino Real (the King's Road) was established from Villa Santiago de la Monclova in Mexico to East Texas. This roadway followed established Native American trade routes and trails and became a vital link between Mission San Juan Bautista in Northern Mexico and the Spanish settlement of Los Adaes in East Texas (McGraw et al. 1991). Spanish priests accompanying entradas provided the most complete information of indigenous cultures of early Texas. Those documented during the early entradas include the Cantona, Muruam, Payaya, Sana, and Yojuane, who were settled around the springs at San Marcos and described as semi-nomadic bands. Other tribes encountered at San Marcos included mobile hunting parties from villages in South and West Texas, including Catequeza, Cayanaaya, Chalome, Cibolo, and Jumano, who were heading toward bison hunting grounds in the Blackland Prairies (Foster 1995:265–289; Johnson and Campbell 1992; Newcomb 1993). Later groups who migrated into the region and displaced the earlier groups or tribes included the Tonkawa from Oklahoma and Lipan and Comanche from the Plains (Campbell and Campbell 1985; Dunn 1911; Newcomb 1961, 1993).

Archaeological sites dated to this period often contain a mix of both European imported goods, such as metal objects and glass beads, and traditional Native American artifacts, such as manufactured stone tools.

Historic

Spanish settlement in Central Texas first occurred in San Antonio with the establishment of Mission San Antonio de Valero (the Alamo) in 1718, and the later founding of San Antonio de Béxar (Bolton 1970; de la Teja 1995; Habig 1977). Some researchers have demarcated the transition in Texas between the Entrada

(Protohistoric) and Historic periods by the construction of the first Spanish missions in Texas. Most knowledge of this period has been gained through the written records of the early Spanish missionaries. Besides the mission town of San Antonio, the only other Spanish settlement in the region was San Marcos de Neve, established in 1808, four miles south of present-day San Marcos. San Marcos de Neve was abandoned in 1812 as a result of constant raids by local tribes (Dobie 1932). During this time, massive depopulation occurred among the Native Americans, mostly due to European diseases to which the indigenous people had little resistance. Those few indigenous people remaining were nearly all displaced to reservations by the mid-1850s (Fisher 1998).

European presence in the region increased as settlers received land grants from the Mexican government until 1835. Settlement was difficult, however, due to continuation of hostilities with and raids by Native American tribes. The Texas Rangers provided protection from these conflicts after Texas secured independence from Mexico in 1836. Settlement in the region increased until 1845, when Texas gained admission to the United States, resulting in the formation of Hays County three years later (Bousman and Nickels 2003).

PREVIOUS ARCHAEOLOGICAL INVESTIGATIONS

The project area is characterized by an extraordinarily high density of cultural resources. Previous investigations in the project area (Cargill and Brown 1997; Jones and Oksanen 2006; Oksanen and Leezer 2006; Yelacic and Leezer 2012; Padilla et al 2013; Reid and Hooge 2015) have recorded multi-component sites 41HY261 and 41HY141. Both sites are listed as State Antiquities Landmarks (SALs) and are eligible for listing in the National Register of Historic Places (NRHP). All previous investigations at these sites have recommended that additional work be conducted in the event of future impacts or developments.

Site 41HY261

Site 41HY261 is a stratified multicomponent prehistoric site with a 19th century mill race, first recorded in 1994 by S.A. Garza Engineers, Inc. Prior work has identified cultural deposits extending perhaps as deep as 20-22 feet beneath the surface and dating back to as many as 10,000 years before present. The site is one of the few known sites in the San Marcos River Valley that contains Paleoindian deposits accessible without SCUBA-gear (Center for Archaeological Studies 2013:5). In addition to this Paleoindian component, Late Archaic, Late Prehistoric, and Historic-period materials have been found. In 2011, the boundaries of 41HY261 were extended as a result of auger investigations and construction monitoring by CAS under Texas Antiquities Permit No. 5943 for the installation of a portion of a storm water outflow and water line along Cheatham Street (Figure 3) (Yelacic and Leezer 2012).

The 2011 auger investigations and trench monitoring along Riverside Drive yielded cultural material, indicating that the site extends beneath Riverside Drive to at least its terminus at Interstate Highway 35. Trenching inadvertently impacted the portion of 41HY261 that extends across Cheatham Street, and approximately 1,350 m^3 of artifact-bearing sediments were disturbed during early phases of the undertaking. In order to alleviate the accumulation of storm water drainage prior to the completion of the final outflow structure, the City installed a temporary drainage line. Excavations for this undertaking increased the estimated volume of displaced sediments containing or having the potential to contain archaeological materials associated with 41HY161 to 2,010 m^3. After these investigations, CAS recommended that 41HY261 is eligible for inclusion in the NRHP under Criterion D (ability to provide information important to prehistory or history of the region), and for designation as a SAL.

After reviewing CAS's 2011 Storm Water Outfall monitoring investigations, the THC concurred with recommendations for eligibility of site 41HY261 for the NHRP and designated the site as a SAL. However, according to the Texas Site Atlas, the historic mill race lacks the structural integrity necessary for inclusion in the NRHP, and the right of way which crosses the site is also not eligible. The THC also determined that earlier impacts to the site, combined with anticipated adverse effects resulting from the City's undertakings, warranted mitigation to offset the cumulative adverse effects to this NRHP-eligible property. For the Storm Water Outfall project to comply with state and federal

laws governing cultural resources on public lands and/or that are affected by undertakings permitted by federal agencies, the US Army Corps of Engineers and THC required the City to develop a research design and scope of work for archaeological work to effectively mitigate the cumulative adverse effects to the site. In January of 2013, CAS presented a proposal for data recovery at Spring Lake to the City and the THC as an off-site mitigation plan. A Memorandum of Agreement (MOA) for the Spring Lake data recovery program was signed by the City on October 18, 2013. Although the proposed research design for off-site mitigation for impacts to Site 41HY261 was accepted by the THC, the THC was clear that any future developments within the boundaries or in proximity to 41HY261 must be assessed and coordinated with professional archaeologists.

In 2012, AmaTerra conducted a survey project along a length of the San Marcos River for a proposed Habitat Conservation Plan for the Edward's Aquifer Authority and the City of San Marcos, under Texas Antiquities Permit No. 6365 (Padilla et al. 2013). For this survey, subsurface archaeological investigations were not conducted within the site boundaries, but coring was conducted adjacent to and upstream of the site to a maximum depth of 1.35 m. Proposed construction within the site consisted of bank stabilization near a footbridge on the south side of the river. Recommendations for site 41HY261 included intensive archaeological survey and backhoe trenching. In addition, it was recommended that future design plans for a proposed retaining wall within site boundaries be reviewed for visual impacts to historic resources at the site.

In 2014, CAS conducted archaeological monitoring of mechanical excavation for the Riverside Drive Reconstruction Project (RDRP), and identified additional archaeological materials associated with site 41HY261 (Reid and Hooge 2015). For the RDRP, Texas Antiquities Permit No. 6202 was issued to Jon C. Lohse, and then transferred to Amy E. Reid, for the monitoring of water main location and installation, outflow reconstruction and culvert replacement, and storm drain pipe installation. The RDRP was considered by the THC to be a separate development (not covered by the MOA) that required archaeological monitoring and would also require mitigation if adverse effects occurred as a result of the project (Denton 2013, Personal communication).

An estimated 770 m^3 of sediment was excavated for the RDRP, approximately 290m^3 of which is believed to have been intact, previously undisturbed sediments (Reid and Hooge 2015). However, the 2014 monitoring effort did not encounter significant deposits or features. In monitoring the storm drainage pipe trench, lithic debitage, and modern and historic refuse were identified. A single prehistoric ceramic sherd was found on the surface next to the storm drainage pipe trench, but it is believed to have been imported in construction fill. During culvert replacement, no cultural materials were found, though a possible marsh paleosol with excellent organic preservation was identified. In monitoring the water main trench, modern and historic refuse was observed, and sparse lithics were found in intact sediment. This intact deposit is believed to be associated with a nearby cut bank that had lithic debitage eroding from it. In sum, the RDRP monitoring demonstrated that intact prehistoric deposits remain at site 41HY261, and that the site's geomorphic setting has potential to bury archaeological deposits in discreet strata with excellent preservation. Specifically, the corner of land containing the Crook's Park parking lot, south of the intersection of Cheatham Street and Riverside Drive, is expected to contain significant cultural deposits. Recommendations stemming from the RDRP included continued coordination between the

City and the THC prior to future developments, and careful evaluation of future projects in light of previous archaeological investigations, to identify areas of potentially intact sediments.

Figure 3. Revised boundaries for site 41HY261, expanded in 2011 (in red).

Site 41HY141

Site 41HY141, located west of the San Marcos River and adjacent to Cheatham Street (formerly Houston Street), was recorded by Jim Warren in 1977. The site was identified in a road cut, and contained lithic debitage, burned limestone, and historic glass, brick, and crockery. Midden sediments and lithics were noted to a depth of 30-40 cm, and a glass bead and lithics were collected. In 1987, the site was listed as contributing to the SAL group of sites associated with the San Marcos River. The THC determined the site to be eligible for listing in the NRHP in both 1987 and 2016. A 2005 Rio Vista Park improvement project report (i.e., Oksanen and Leezer 2006) is denoted in the THC Site Atlas as encompassing the site, though no archaeological investigations took place at site 41HY141 in association with that project. A shovel test for a proposed slab located 120 meters east of the site datum yielded recent historic debris and disturbed sediments, but no prehistoric materials were encountered at the depth tested (50 cm) (Oksanen and Leezer 2006:12). The site boundary for this site has not been defined.

METHODS

A combination of open trenching and horizontal directional drilling (HDD) were used during the 2018 CSWIP. CAS conducted archaeological monitoring of trenching for this project; work included the excavation of two HDD entry trenches, two HDD drill boxes, two HDD exit trenches, an HDD catchment pit, a drill rescue trench, a manhole box trench, open trenching for the waterline, and two trenches off-shooting from the main waterline trench for the purpose of installing a new fire hydrant and for tying into existing utilities (Figures 4-6). In addition, a one-meter square archaeological test unit was excavated to assess the nature of deposits outside the road prior to construction of a manhole access box in the vicinity of 41HY141. Monitoring was necessary due to the project area's location within the boundaries of sites 41HY141 and 41HY261. All work was conducted under Texas Antiquities Permit No. 8332 and in accordance with the guidelines set forth by the CTA and adopted by the THC.

Figure 4. Project Area Overview

Figure 5. Detail of Western Project Area.

Figure 6. Detail of Eastern Project Area.

The monitoring project was undertaken in two periods in 2018. In April and May, monitoring was conducted by Jacob Hooge, David Macias, and Chris Wolf. In September and October, monitoring was conducted by Amy Reid, Emily McCuistion, and Paul Matchen. Field notes, photo logs, and archaeological excavation level forms were used to document the monitoring. Photographs were taken of exposed profiles, and notable deposits and materials were documented. Trench locations were recorded with a Trimble GeoXT handheld GPS device with submeter accuracy. Diagnostic artifacts and a representative sample of other artifacts were collected from intact sediments, as were all artifacts from the 1-meter square excavation unit. All artifacts collected are curated at CAS.

At the outset of the project, HDD was attempted from the west side of the San Marcos River, drilling in an eastward direction, resulting in the mechanical excavation of two entry trenches on the west side of the river and an exit trench on the east side of the river. However, due to an underground void, possibly caused by a long-buried log jam, the HDD could not continue along this course. Ultimately the drilling was completed from east-to-west. The following sub-sections describe each trench in the order in which they were undertaken.

Entry Trench #1

On April 24th, work commenced with the mechanical excavation of a small entry pit (Entry Trench #1) within a paved area of Cheatham Street, just southwest of the Cheatham Street/Reynolds Street intersection (Figure 7). It measured 1.5 m (5 ft) long, 0.5 meters (1.5 ft) wide, and 40 cm deep. The HDD drill entered here at an approximately 20-degree angle. A volume of 0.3 m^3 was removed during construction of this trench.

Figure 7. Entry Trench #1

Drill Box #1/Catchment Pit #1

Also on April 24th, an HDD drill box was mechanically excavated and monitored, approximately 2 meters northeast of Entry Trench #1 (Figure 8). This trench served as a catchment for drilling fluid and saturated sediments during HDD. This trench measured 1.8 m (6 ft) long, 3 m wide (9.8 ft), and was 1.9 meters (6.2 ft) deep. A volume of 10.26 m^3 was removed for this trench.

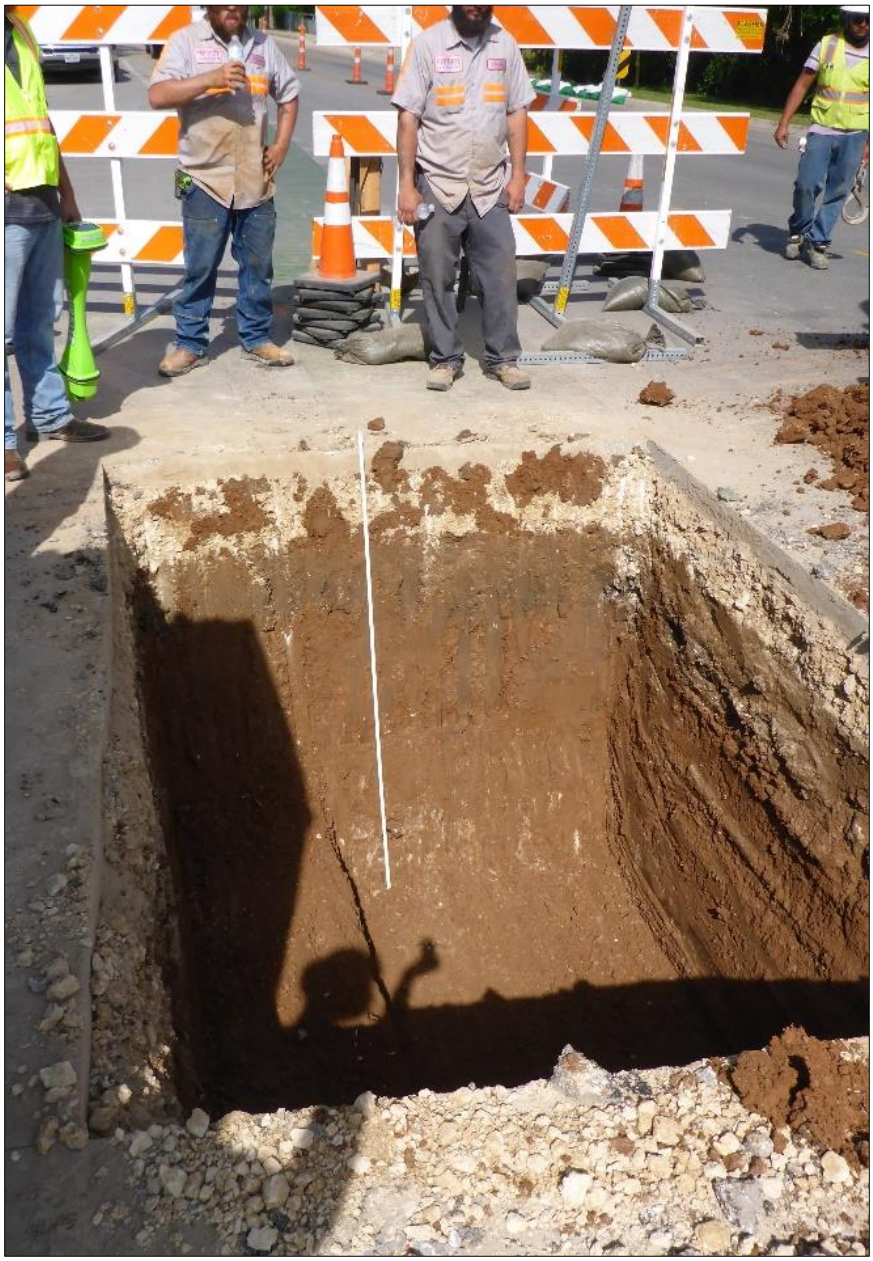

Figure 8. Drill Box #1

Waterline Trench

The waterline trench extended from the intersection of South CM Allen Parkway/Cheatham Street, to the junction of Reynolds Street and Cheatham Street (Figures 9-10). It was mechanically excavated and monitored over the course of eight days between April 27th-May 15th, starting at the west end of the project area and moving east. The waterline trench was 165 m (541 ft) long and 1 m (3.3 ft) wide, and between 1.1 m and 2.8 m (3.6 and 9.2 ft) deep, with the depth averaging around 2 m. An estimated 330 m^3 was excavated for this trench.

Figure 9. West end of waterline trench, taken on April 27th. The fresh asphalt is covering trenches outside the area of potential effects (APE).

Figure 10. Waterline trench, taken on May 7th.

Drill Rescue Trench

On April 30, 2018 an unanticipated trench, referred to herein as the "Drill Rescue Trench" (Figures 11-13), was opened to retrieve an HDD drill bit lodged approximately 5.18 m (17 ft) below ground, due to a void in the sediments into which the drill bit kept dropping. The trench was excavated between April 30th and May 3rd. The trench measured 5.5 m (18 ft) long, 1.2 m (4 ft) wide, and 6.4 m (21 ft) deep. Total volume excavated was 42.2 m^3. Screening was difficult due to the saturation of sediments removed during trenching, and shoring walls made inspection of trench profiles difficult.

Figure 11. The Drill Rescue Trench on April 30th.

Figure 12. Archaeological monitor Jacob Hooge inspects saturated sediments from the Drill Rescue Trench on April 30th.

Figure 13. The Drill Rescue Trench, on May 2nd.

Exit Trench #1

An HDD exit trench located within Cheatham Street's westbound lane, across from the bus turnout on the east side of the river, was mechanically excavated and monitored on May 2nd (Figure 14). It measured 5 m (16.4 ft) feet long, 1 m (3.3 ft) wide, and 1.9 m (6.2 ft) deep. The total volume of sediments removed was 9.5 m^3.

Figure 14. Exit Trench #1

Fire Hydrant Trench

An off-shooting trench, perpendicular to the main waterline trench, was mechanically excavated and monitored for the installation of a new fire hydrant on May 2nd and May 7th (Figure 15). The hydrant is located on the north side of Cheatham Street, located approximately 65 meters west of the Reynolds Street/Cheatham Street intersection. The trench measured 8.2 m (27 ft) length, 1 m (3.3 ft) wide, and approximately 2 m (6.6 ft) deep. An estimated total volume of sediments removed is 16.4 m^3.

Figure 15. Fire Hydrant Trench, taken May 7th.

Drill Box #2

Drill Box #2 was mechanically excavated and monitored on May 8th and was located in the westbound lane of Cheatham Street adjacent to the bus turnout lane on the east side of the river (Figure 16). This trench measures 2.5 m (8.2 ft) by 3 m (9.8 ft) and 2.3 m (7.5 ft) deep, for a total volume of 17.25 m^3.

Figure 16. Drill Box #2

Waterline Offshoot Trench

On May 8th, a trench was mechanically excavated and monitored, off-shooting from the main water line. It was located perpendicular to and south of the main waterline, approximately 63 m southwest of the intersection of Reynolds and Cheatham Streets (Figure 17). The purpose of this trench was to tie into an existing water line. It measured 12.1 m (29.7 ft) long, 1 m (3.3 ft) wide, and 2 m (6.6 ft) deep. Total volume removed was 24.2 m^3.

Figure 17. Waterline Offshoot Trench

Manhole Access Box and Archaeological Excavation Unit

Mechanical excavation for a manhole access box was started on May 15th, on the north side of Cheatham Street on manicured, introduced lawn grass, approximately 30 m west-southwest of the Reynolds Street/Cheatham Street intersection (Figure 18). Work was halted on May 15th when intact soils were discovered. The following day, a one-meter square excavation unit (Unit 1) was placed at that location in order to determine the nature of these deposits and assess potential impacts to archaeological deposits. Unit 1 was placed 1.5 meters north of the sidewalk and was excavated through six ten-centimeter levels. When level six was terminated, the unit was narrowed to a 50 cm square unit in the southwest quadrant. The southwest quadrant was excavated through a total of ten levels. Trowels and shovels were used during excavation, and sediments were screened through ¼ inch mesh.

Mechanical excavation of the manhole access box resumed and was completed after the archaeological excavation unit was completed, on May 17th (Figure 19). Dimensions of the completed box were 2.4 m (7.9 ft) by 2.1 m (6.9 ft) and 1.7 m (5.6 ft) deep. Total volume of the trench was 8.57 m^3.

Figure 18. Manhole Access Box excavation on May 15th.

Figure 19. Manhole Access Box excavation on May 17th, with the remnants of a one-meter excavation unit in top left of trench.

Entry Trench #2

Entry trench 2, used for east-to-west drilling, was excavated in early September without a monitor. Expansions of the entry trench, with monitoring, occurred on September 11th and on October 3rd-5th. Upon completion, the entry trench was shaped irregularly, with a maximum length of 15.8 m (52 ft). The total estimated quantity of sediments removed for this trench is 73.51 m^3. Width and depth of the trench varied considerably (Figure 20):

- The main section of the trench, excavated in early September, was 7 m (23 ft) long and 0.6 m (2 ft) wide, with a depth of 1.83 m (6 ft). The total volume excavated was 7.7 m^3.
- On September 11th, the entry trench was expanded along the south wall, for an additional 0.6 m (2 ft) width for a length of 3.3 m (10.8 ft), and an additional width of 1.8 m (5.9 ft) over 1.4 m (4.6 ft) length. The total volume excavated for this expansion is 8.2 m^3.
- At the northeast end of the trench was the "dead man pit" (Figure 21) which measured 3.9 m (12.8 ft) wide, 3.9 m long, and 0.3 m (1 ft) deep. The total excavated volume was 4.56 m^3.
- In October, the entry trench was expanded again to connect the east end of the new waterline to the existing line located under

the east-bound lane of Cheatham Street (Figures 22-23). Dimensions of the trench expansion were roughly 6 m (20 ft) x 1.8 m (6 ft), with an additional 0.6 m (2 ft) offshoot on the northeast end of the expansion for the purpose of tying in to an existing waterline running parallel to Cheatham Street on the south side of the road. An estimated total volume excavated is 32.59 m^3.

During the October expansion, a portion of waterline was routed underneath a large (48-inch diameter) existing Reinforced Concrete Pipe (RCP) storm drain located approximately 2.7 m (9 ft) below surface. During efforts to expose the storm drain, the construction crew encountered a water leak from the RCP storm drain. A small amount of excavation occurred beneath the storm pipe during these efforts. The trench was approximately 2.7 m (9 ft) deep, except where excavation occurred beneath the storm drain pipe, where the trench is 4.4 m (14 ft) deep, approximately 30-45 cm deeper than the bottom of the pipe.

The backdirt pile from the entry trench were inspected visually and probed by trowel. Sediments from beneath the fill associated with the storm drain were opportunistically screened through ¼ inch mesh. Overall, sediments were heavily saturated and the water pouring from the storm drain pipe made inspection of trench sediments difficult.

Figure 20. Entry Trench #2 with equipment staged around it, taken September 25th.

Figure 21. Shallow “dead man pit” at east end of Entry Trench #2, taken October 3rd.

Figure 22. Expansion of Entry Trench #2 underway, on October 3rd.

Figure 23. Expansion of Entry Trench #2 underway, with leaking storm pipe on left, on October 4th.

Catchment Pit #2

This small square trench in Cheatham Street, east of the San Marcos River, was excavated without a monitor on September 13th (Figure 24). It measured approximately 1.8 m (6 ft) long and 1.8 m wide. This trench extended approximately 1.3 meters deep and was used as a catchment for recycling drilling fluid during HDD. The excavated volume slightly exceeds 3.35 m^3.

Figure 24. Catchment Pit #2, on September 25th.

Exit Trench #2

Exit Trench #2 was mechanically excavated and monitored on September 25th, and October 1st and 2nd (Figures 25-27). It was located near the southwest corner of Reynolds Street and Cheatham Street, in the westbound lane of Cheatham Street. The exit trench served to connect the waterline laid by HDD with that laid during open trenching. Ultimately, approximately 183 m^3 of sediment were excavated from this trench.

The exit trench was deepened on October 1th, though CAS was not alerted until excavation was already underway; the trench measured 3 m (10 ft) in depth upon the monitor's arrival. The trench was excavated with a large bucket, and sediments were placed directly into a truck prior to the monitor's arrival. As a result, the monitor was only able to inspect sediments from the bottom of the trench, which were placed on the road for inspection. The saturated nature of the sediments made screening difficult.

On October 2nd, the exit trench was expanded to the southwest, which increased the width to 0.9 m (3 ft) and depth to 2 m (6.5 ft) below surface. The removed sediments were piled in the street and graded flat. Monitoring consisted of inspecting this pile prior to grading and watching the trench excavation. Later in the day, the deepest, east end of the exit trench was expanded to the south and excavated to a depth of 3 m (10 ft). This work was conducted without a monitor, at the fault of the contractor. Upon arrival of the monitor, trenching temporarily ceased while the monitor inspected sediments piled on the road with the aid of the backhoe operator, who pulled back layers of sediment in the backdirt pile. When trenching resumed, the monitor alternated between watching the trenching and inspecting the backdirt. The southern expansion of the exit trench measured 1.8 m (6 ft) by 3 m (10 ft) and was excavated more deeply than the rest of the exit trench. The depth of the trench exceeded 4 m (13 ft); an accurate depth measurement was unattainable as the water table was reached at 4 m, and cascading imported sediments quickly spilled into the deepest portion of the trench as native sediments were removed. This made differentiating the potentially intact sediments from disturbed sediments nearly impossible.

The last work done on the exit trench consisted of extending the 1 m (3 ft) off-shoot trench to the north, for a length of 6.7 m (22 ft) and widening the trench an additional 1.5 m (5ft) to a total of 2.4 m (8 ft) in width. The depth of this widened area measured just 0.8 m (32 in), in contrast to the 2 m (6.5 ft) depth of the rest of the off-shoot trench.

Figure 25. Exit Trench #2, on September 25th.

Figure 26. Exit Trench #2, on October 1st.

Figure 27. Exit Trench #2, on October 2nd.

RESULTS

Four-hundred-and-four artifacts were collected during trench monitoring (n=65) and archaeological excavation (n=339) from sites 41HY141 and 41HY261. In addition, several non-diagnostic artifacts and artifacts from disturbed contexts were documented but not collected. No cultural features were identified. The following sub-sections describe stratigraphy encountered during this project, as well as artifacts encountered.

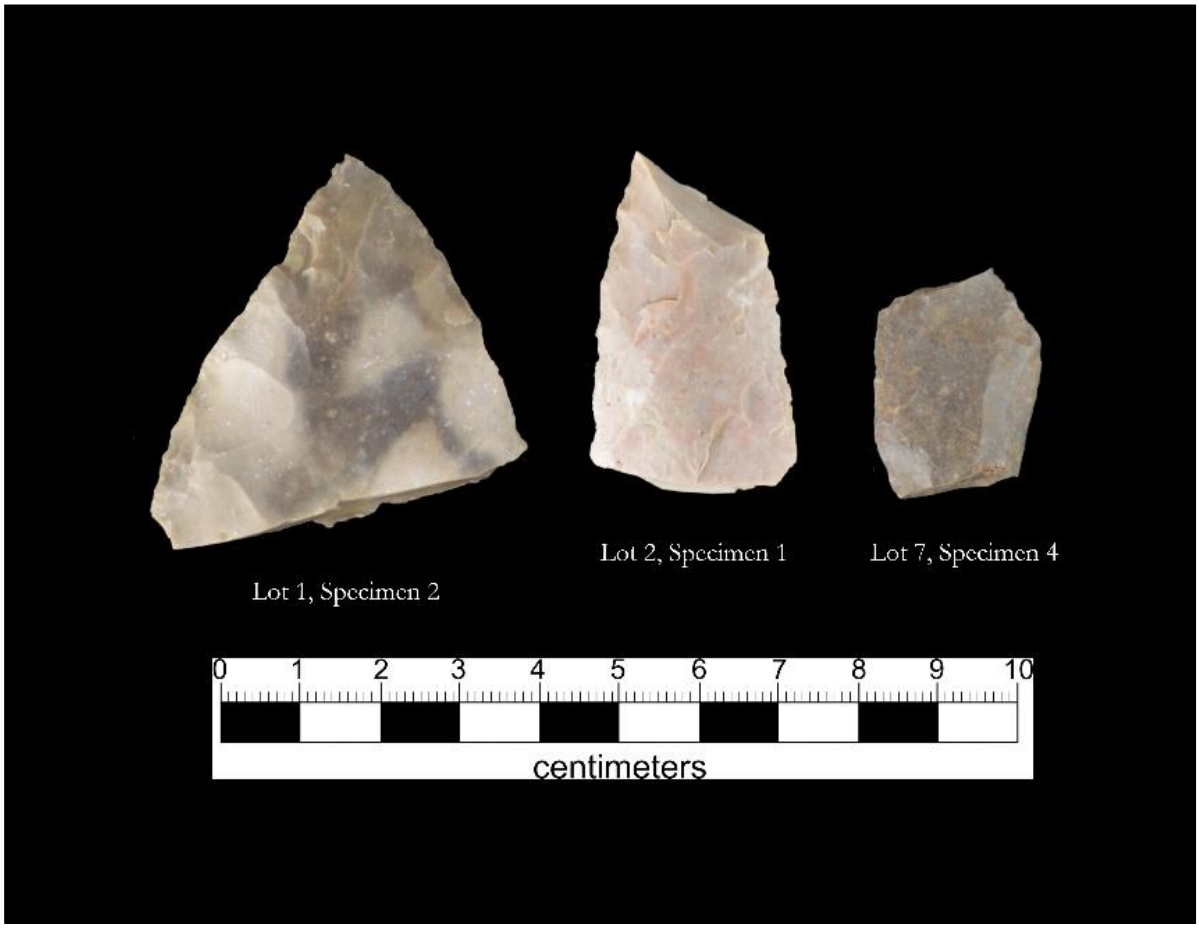

Figure 28. Biface fragments collected during monitoring of the drill rescue trench, waterline, and archaeological excavation.

Entry Trench #1

No cultural materials were found in the small and shallow Entry Trench #1. The excavation extended through road base, barely exposing the top of the disturbed clay stratum below.

Drill Box #1/Catchment Pit #1

No cultural materials were found in Drill Box #1. The stratigraphy at this location consisted of road base below the asphalt to 40 cm below surface (cmbs), overlying angular, blocky 5YR

4/3 reddish brown clay to a depth of 150 cmbs. Below that depth, mottles of highly alkaline soils are apparent; these mottles comprise approximately 10% of this stratum, and are 5-10 cm in size, with abrupt boundaries.

Waterline Trench

Several artifacts, both prehistoric and historic, were identified while monitoring the waterline trench, which transected site 41HY141. These artifacts were not collected, as they were either non-diagnostic, or came from disturbed contexts.

On April 30th, two chert flakes were found in the backdirt from beneath a storm drain elbow in the waterline trench near the west end of the project area, at a depth of 280 cmbs. Another chert flake and a colorless glass bottle base fragment were encountered in 5YR 4/3 reddish brown clay backdirt from a location nearby a relic sidewalk at the intersection of South CM Allen Parkway and Cheatham Street. The bottle base fragment was embossed with: [SAN MA]RCOS TEX. (Figure 29).

On May 2nd, a single chert flake was found in disturbed fill in the waterline, roughly 50 m southwest of the intersection of Cheatham Street and Reynolds Street. The same day, 1 fragment of colorless glass, 14 flakes (Figure 29), and 1 medial section of a biface, likely a projectile point (collected), were found over a 30 m section of trench, the center-point of which was approximately 58 m from the Reynolds Street intersection. The artifacts came from disturbed fill material.

On May 15th, two fragments of amber glass were found in the trench near the intersection of Cheatham and Reynolds Streets, in an area of previous disturbance.

Stratigraphy for this trench varied somewhat over its length (Figure 30). Asphalt and road base accounted for upper stratum, generally extending to 35 cmbs. From 35 cmbs to 40 cmbs was 7.5YR 3/2 dark brown clay. The third and lowest stratum encountered was angular blocky clay, described variously as 5YR 3/2 dark reddish brown and 5YR 4/3 reddish brown. Several areas of clearly disturbed fill, including sediments mixed with broken ceramic sewer pipe, low-grade concrete fill overlying the older water line, a buried oiled-road surface, and mottled sediments, were commonly encountered along the waterline trench.

Figure 29. A sample of artifacts found in disturbed sediments in the waterline trench: (left to right) “San Marcos” bottle base, debitage found May 2nd.

Figure 30. Waterline trench profile, taken on May 2nd.

Drill Rescue Trench

Cultural materials were encountered during monitoring of mechanical excavations for the Drill Rescue Trench. The nature and potential significance of these finds (described below) prompted CAS to submit an inadvertent finds letter to the THC (Appendix I).

Sixty-four artifacts were collected from backdirt of the deepest gravel-dominated stratum, consisting of lithics, faunal bone, and burned or fire cracked rock (FCR). Lithic artifacts include a Paleoindian projectile point with a concave base, oblique parallel flaking, and ground lateral edges, tentatively typed as St. Mary's Hall type (Figure 31), a Middle-Archaic stemmed projectile point of the Nolan type (Figure 32), a 14 cm long biface (Figure 33), and a large bifacial hand axe (Figure 34). Other lithics collected include a biface fragment, a uniface, two flake tools, a core, a possible core tool, and debitage (n=35). Faunal remains recovered and collected consist of a bison axis vertebra (Figure 35), an unidentified very large mammal bone fragment (Figure 36), a Perissodactyla (Pleistocene horse or tapir) bone fragment with a diagnostic end, an unidentified mammal bone, and two unidentified, mineralized bone fragments. Faunal analyst Dr. Jodi Jacobson identified a possible stone tool scrape on the lateral ventral surface the of the dens segment of the bison axis vertebra. No other marks were found on the bones.

Asphalt, road base, and fill comprised the upper 175 cmbs. These imported and disturbed sediments overlaid intact organic-rich dark grey clay with lighter grey mottles from 175-285 cmbs) (Figure 37). Below this, a transition zone with diffuse boundaries which were not able to be measured from outside the trench were observed; the mottled dark grey clay transitioned to a highly organic-rich peat, and below this, an organic-rich sand. All of these strata were sterile of cultural material, though screening was difficult do to saturation of the sediments. Channel gravels and water table were encountered at 390 cmbs. All artifacts observed from the trench were recovered from a mixed context within the gravels. It is likely that this gravely sediment represents a buried gravel bar, suggesting the San Marcos River channel extended into this area at one time. The lower boundary of the gravels could not be determined; however, by the base of the trench at 550 cmbs, bedrock reminiscent of Del Rio Clay had been encountered.

Also contained within the channel gravel were numerous preserved wood logs up to 3 m in length and 60 cm wide. Several appeared blackened, but there was no evidence for human modification. The logs may have caused the void space which the HDD bit to track off its targeted path. The void in the lowest stratum, beneath the logs, measured 1-meter wide. The depth of the void could not be determined; however, a worker reached a 6-foot pole into it without reaching bottom.

Although all cultural material was encountered within the channel gravel, this sediment does not have clear stratigraphic context given the mixing of diagnostic stone tool types; the Nolan projectile point was located in a similar context to the Paleoindian projectile point and the gravels were intermixed with Pleistocene fauna. The gravel likely represents an environment of deposition very near to the stream thalweg, and in close proximity to important archaeological sites. The overlying sediments formed in bog-like depositional environments likely unsuitable to most human activities, and without the fluvial-energy to transport materials such as artifacts.

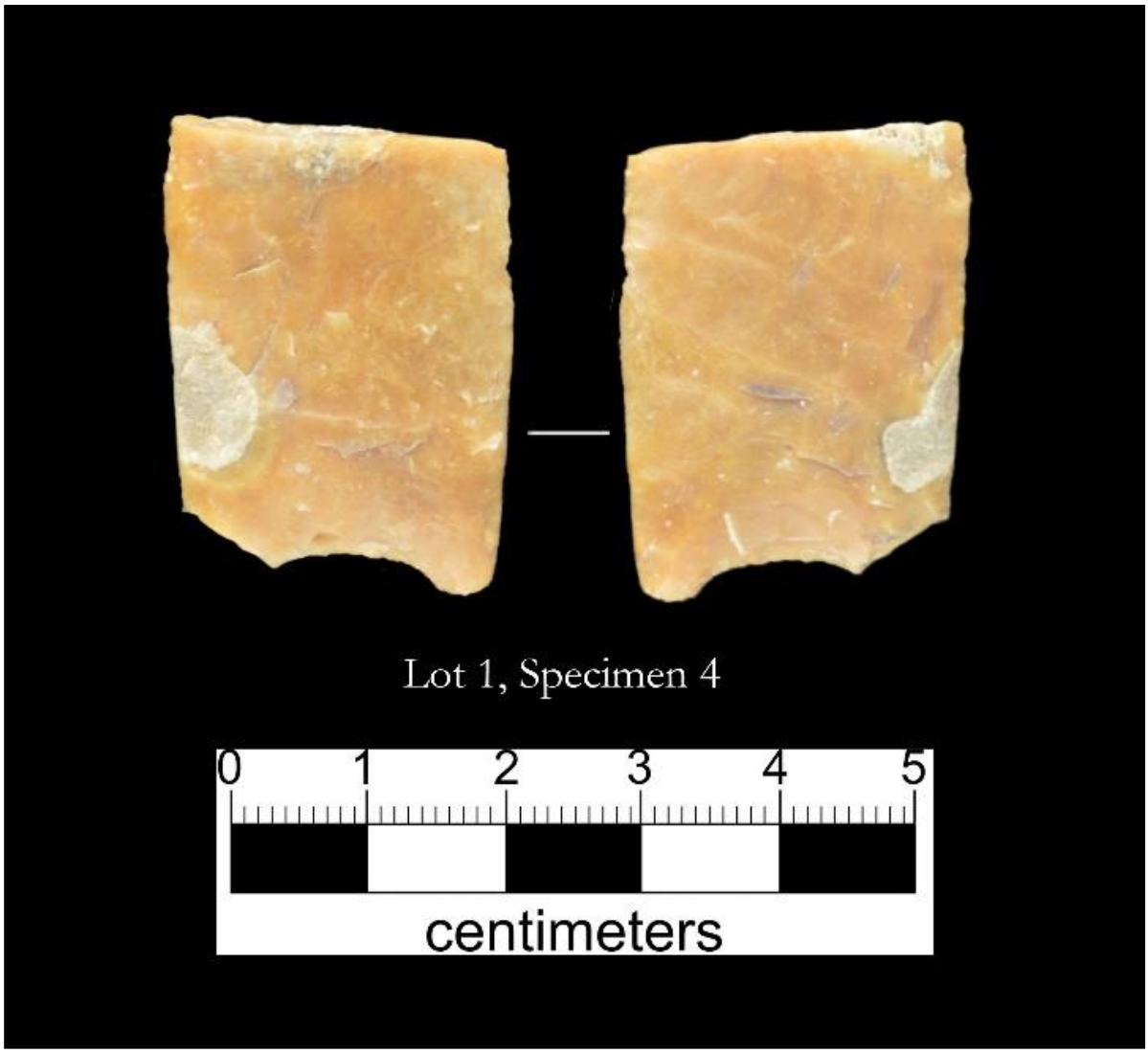

Figure 31. Tan chert projectile point base with oblique parallel flaking and lateral grinding; Paleoindian St. Mary's Hall dart point, collected from Drill Rescue Trench.

Figure 32. Dark grey chert projectile point, Nolan type, collected from Drill Rescue Trench.

Figure 33. Large tan chert biface collected from Drill Rescue Trench.

Figure 34. White cherty-limestone bifacial hand axe with cortex, collected from Drill Rescue Trench.

Figure 35. Bison axis vertebra with possible human modification as indicated, collected from Drill Rescue Trench.

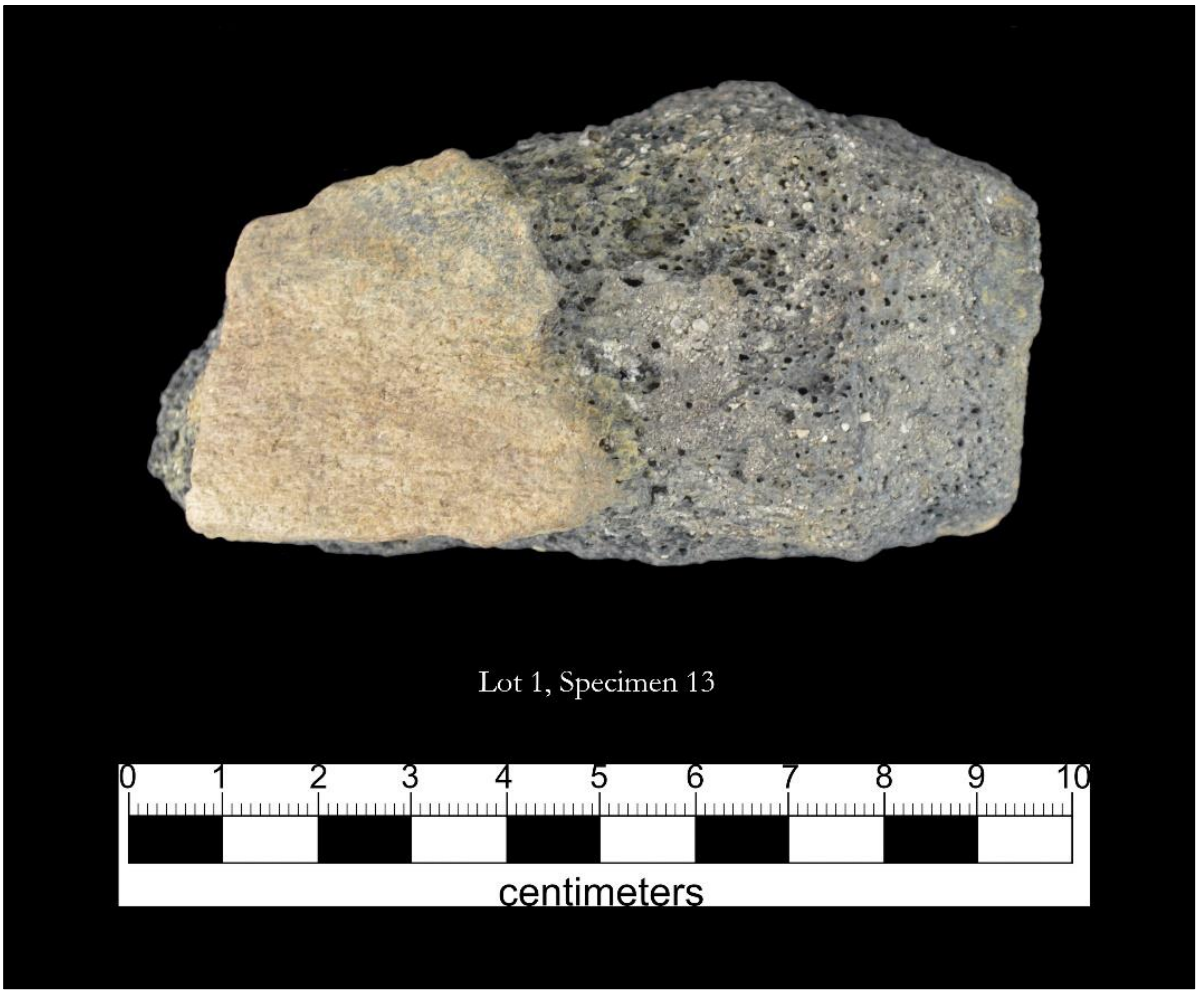

Figure 36. Very large mammal bone collected from Drill Rescue Trench.

Figure 37. Drill Rescue Trench profile, taken April 30th.

Exit Trench #1

No cultural materials were encountered in this trench. The upper 160 cm consisted of asphalt, road base, and fill. From 160 to 190 cmbs was 5YR 4/3 reddish brown clay, with chunks of asphalt and road base intermixed.

Fire Hydrant Trench

Two flakes were found in disturbed sediment above a buried oiled road surface. A yellow brick marked "GULCO" was found at 100 cmbs, in sediment that appeared to be undisturbed (Figure 38). However, ceramic sewer pipe fragments were found at 120cmbs, and the abandoned sewer-line was visible at a depth of 115 cmbs. Where the old fire hydrant line met the waterline, sediments were disturbed to a depth of 180 cm. The oiled road surface was observed between 50-55 cmbs.

On the manicured grass on the north side of Cheatham street, into which the trench extended, a horizon soil was present but possibly not intact. Historic refuse was found at the upper stratum, consisting of 1 fragment of colorless glass, 1 fragment of whiteware, and 1 flake, all found in the screen. This horizon soil was 7.5YR 3/2 dark brown. The boundary between this and the clay below was gradual. The underlying clay was sterile of cultural material.

Figure 38. GULCO brick found in fire hydrant trench.

Drill Box #2

No cultural materials were encountered in this drill box. Asphalt and road base were encountered to a depth of 200 cmbs. From 200-230 cmbs was 10YR 4/3 brown gravelly clay, which appeared to be an intact river deposit. This stratum was comprised of very poorly sorted rounded gravel, with approximately 50% coarse fragments.

Waterline Offshoot Trench

Several artifacts were found in this trench, though all came from disturbed deposits. Artifacts consisted of a GULCO brick, 2 flakes, and 2 pieces of fire cracked rock (FCR) (Figure 39). The upper sediments in which the artifacts were found was 7.5YR 3/2 dark brown gravelly clay, clearly disturbed. The lower stratum extended to 200 cmbs, and was 5YR 4/3 reddish brown clay with fragments of asphalt and base intermixed.

Figure 39. Debitage and FCR encountered in Offshoot Trench.

Manhole Access Box and Archaeological Excavation Unit

During monitoring of excavation of the manhole access box, the monitor found 10 flakes in the upper soil horizon. As a result, the excavation was halted, and a one-meter square archaeological excavation unit (Unit 1) was placed at the northwest corner of the manhole access box location.

The archaeological unit yielded prehistoric debitage and modern and historic refuse (Table 2). Ten levels were excavated, to a depth of 108 cmbd. Levels 1-3 were excavated in the northern half of the unit, because the ground surface sloped to the south. Levels 7-10 were only dug in the southwest quadrant of the unit, for expediency. All artifacts from the unit were collected and are curated at CAS.

All lithics recovered are chert and cherty-limestone, and all burned rock is limestone. No temporally diagnostic lithic artifacts were found in the excavations. Historic artifacts were found to a depth of 68 cmbd, indicating disturbance in the upper deposits in this area. Historic and modern refuse are highly fragmentary and largely non-diagnostic or are diagnostic of periods of time too broad to be of great use for discussing historic use of the locality. An amethyst glass fragment was recovered, a material type often associated with sites dating to between 1890 and 1920, though a longer time range is possible (Lindsey 2019). The whiteware may date as early

as 1820 (Texas Archeological Stewardship Network 2006).

After completing the archaeological excavation unit, mechanical excavation of the manhole access box was resumed. As expected, a small amount of lithic debitage was encountered during this excavation. The vast majority of cultural materials were found in the upper 50-80 cm. The lowest stratum encountered, 5YR 4/3 reddish brown clay, was almost devoid of artifacts.

Table 2. Excavation Unit 1 Results by Level.

Level	Depth (cmbd)	Sediment	Artifacts
1	8-18	7.5YR 3/2 clay loam, subangular and blocky	debitage (63); modified flake (1); likely burned limestone (2); unidentified burned bone (1), unidentified unburned bone (1), unidentified unburned bone with striations (1), possible hollow bone beads (3, 2 refit) (Figure 40); colorless possible bottle base fragment (1) and unidentified (1), pane glass: colorless (2) and greenish tint (3); historic ceramics: porcelain (1) and whiteware (1)
2	18-28	7.5YR 3/2 silty clay, angular and blocky	debitage (43), some burned; modified flake (1); possibly burned limestone (2); UID very thin colorless glass (1), amethyst glass (1), possibly pane, aqua glass (1), possibly bottle glass
3	28-38	5YR 3/2 clay, angular and blocky	debitage (31); burned limestone (5); broken piece of burned clay; small-to-medium mammal vertebrae (4), medium-to-large mammal vertebra (1), possible fish bone (1), possible rabbit or fish bone, hollow (1), possible fish bone (1), unidentified unburned bone (2); colorless pane glass (1); green laminate (1); aluminum fragment with lithography (1); ferrous metal fragments: crown bottle cap (3) and unidentified (2)
4	38-48	5YR 3/3 clay, angular and blocky	debitage (33); modified blade (1); burned limestone (6); deer or pronghorn phlanx (1); colorless pane glass (1), amber bottle glass (1), and colorless bottle glass (1)
5	48-58	5YR 3/3 clay, angular and blocky	debitage (19); modified flake (1); medial biface fragment (1); untyped triangular projectile point (1) (Figure 41); burned limestone (14); small fragment of unburned longbone (1); crown bottle cap fragments (3)
6	58-68	5YR 3/3 clay, angular and blocky	debitage (26), some burned; modified flake (1); burned limestone (15); unidentified burned bone (1) and unidentified unburned longbone fragments (2); colorless glass with iridescence (1)
7	68-78	5YR 3/3 clay, angular and blocky	debitage (5); burned limestone (2)
8	78-88	5YR 3/3 clay, angular and blocky	debitage (3); unidentified medium-to-large mammal bone fragment (1); burned limestone (4)
9	88-98	5YR 4/3 clay, angular and blocky	debitage (2)
10	98-10	5YR 4/3 clay	debitage (4); unidentified bone fragment (1)

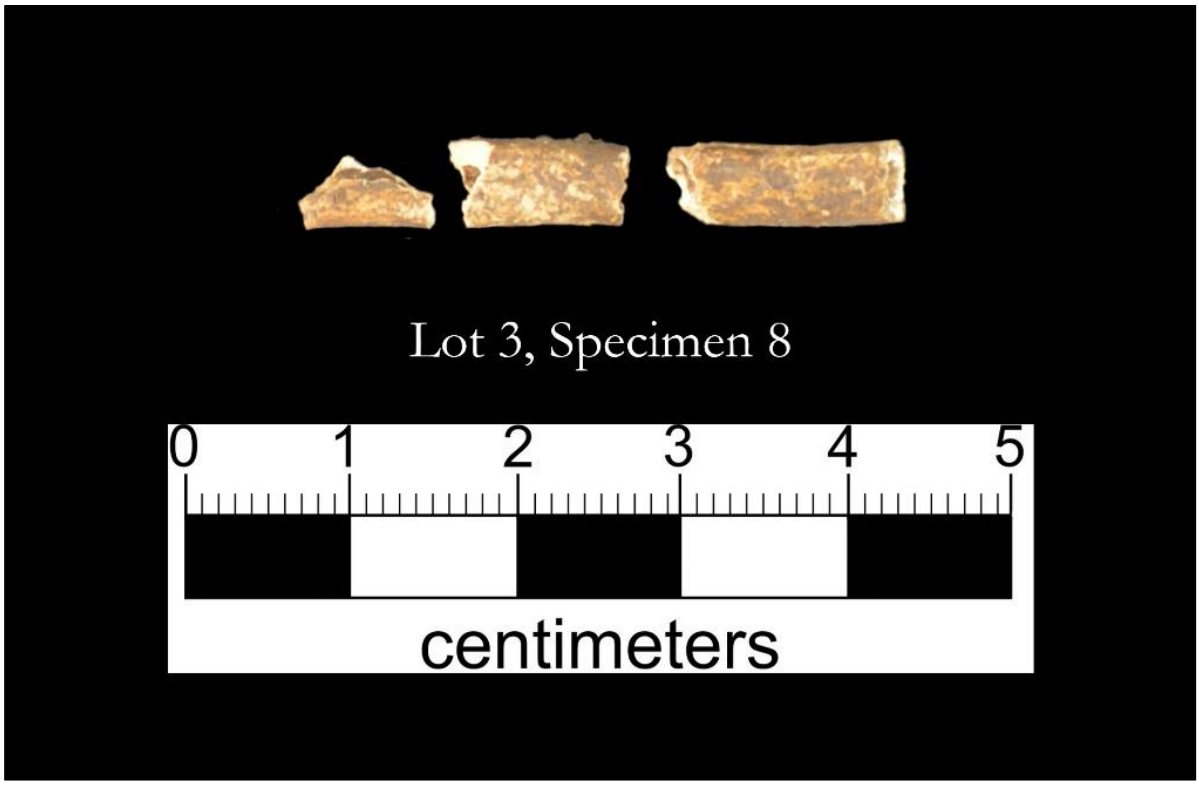

Figure 40. Modified bone from archaeological excavation unit, possibly bead fragments.

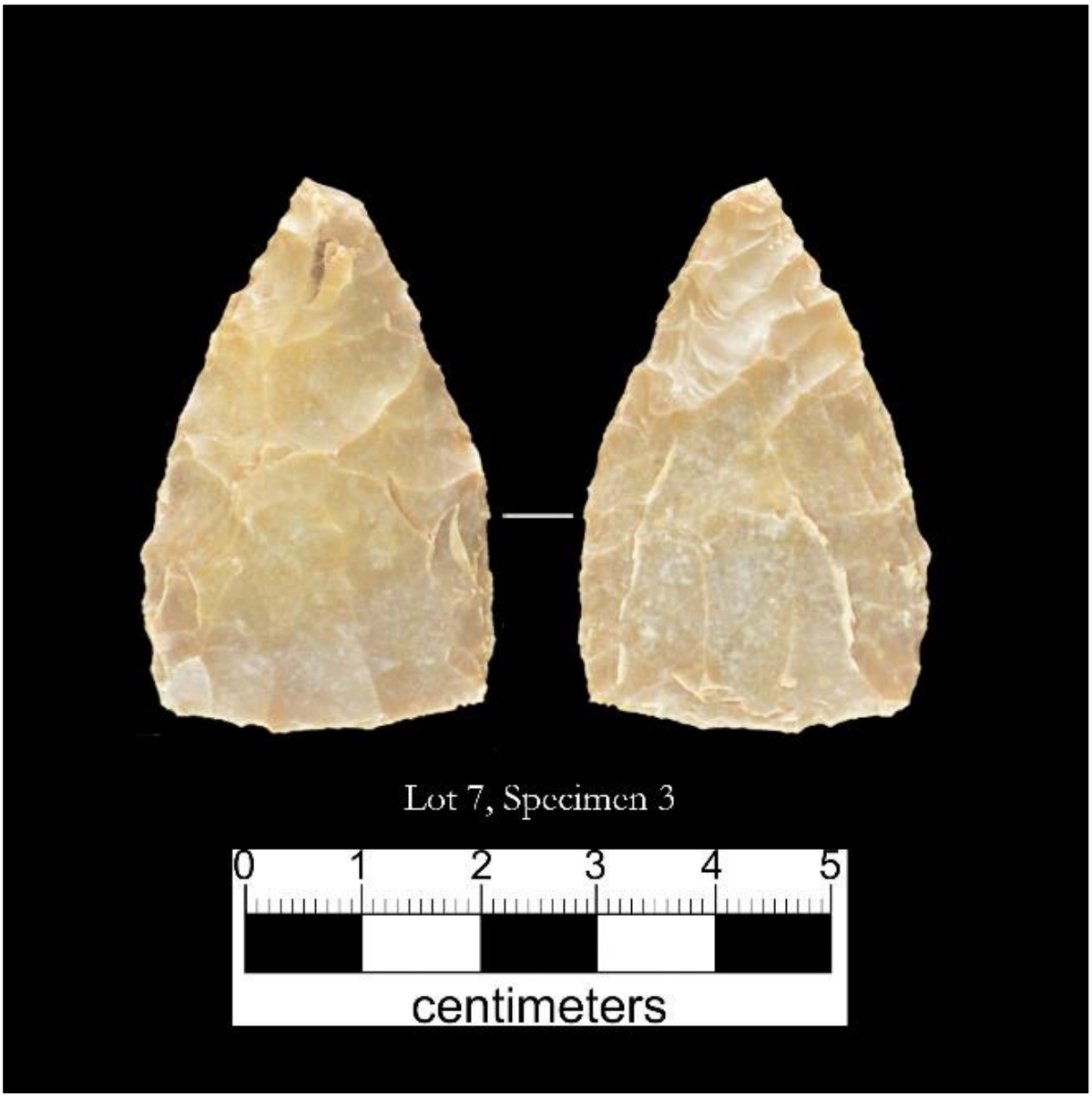

Figure 41. Untyped triangular projectile point from archaeological excavation unit.

Entry Trench #2

This entry trench, located at the far eastern end of the project area, yielded no cultural materials. The "dead man" portion of the trench went no deeper than the imported road base. The remainder of the trench was dug through both disturbed and possibly undisturbed materials.

The upper-most stratum, from surface to 46 cmbs, consisted of road base and gravels. Below that, to 61 cmbs, was a 10YR 4/2 dark grayish brown clay with no gravels. From 61 to 275 cmbs was a 7.5YR3/3 dark brown clay devoid of gravels. A 12-inch diameter waterline was located within this layer at between 215 and 250 cmbs. The RCP encountered was located from approximately 150 to 275 cmbs, and the sediments beneath it were associated fill, to a depth of 305 cmbs. Sediments beneath 305 cmbs are likely to be intact.

Catchment Pit #2

This pit was not monitored, as it was not intended to extend deeper than road base. In reality, the pit was dug below the road base. Asphalt and road base account for the upper 50 cm. Below that, disturbed clay with abundant gravel lies from approximately 50 to 75 cmbs. The final stratum visible above the water line is dark brown clay. Trench profiles were inspected; no cultural material or intact sediments were noted.

Exit Trench #2

No artifacts were found in monitoring the trench, though several chert pieces, some with flake attributes, were noted. However, these materials were consistent with the imported chert gravels used as fill material, and not chert types that are characteristic of the area (i.e., Edwards chert). Large chert cobbles were identified in the lowest stratum of the trench, though no artifacts were found intermixed.

The trench stratigraphy (Figure 42) was approximately 30 cm of road base beneath asphalt, overlying 10 cm of mottled dark reddish brown disturbed clay. From 40 cmbs to approximately 350-400 cm was reddish brown clay mottled with grey; the mottling is consistent with redoximorphic features, a product of saturated sediments. In the north wall of the trench, disturbed sediments and concrete blocks were apparent to a depth of 215 cm. Between 330 cm and 400 cm is a transition to light grey sediments with abundant cobbles. The depth of this deposit did not allow for close inspection, and the sediments removed from this layer were mixed with imported fill which was also contained a high percentage of gravels and cobbles. The water table was encountered at 400 cm, inhibiting observation of sediments beneath this level.

The stream-rolled limestone cobbles encountered in the lowest stratum (Figure 43 and 44) was of a size class much larger than the imported cobbles, and likely represents river bed alluvium, indicating an ancient course or tributary of the San Marcos River.

Figure 42. Trench profile of deepest, eastern portion of Exit Trench #2.

Figure 43. Chert cobbles (mixed with imported gravels) from lowest stratum of Exit Trench #2.

Figure 44. Large chert cobble found in the lowest stratum of Exit Trench #2, fractured by the excavator bucket.

GEOARCHAEOLOGY

Geoarchaeological investigations in the San Marcos River watershed have focused on the area around the headwaters, the San Marcos Springs (Arnn and Kibbler 1999; Goelz 1999; Nickels and Bousman 2010). Adjacent to and forming a confluence just downstream from the headwaters is Sink Creek, a primary source for the alluvial geomorphology in the San Marcos River Valley. The CSWIP area is located approximately 1.9 kilometer (1.2 river miles) downstream from the headwaters.

Through time, the landscape of the San Marcos River valley has changed considerably. Through an intensive coring regime, Nordt (Nickels and Bousman 2010) reconstructed the processes that led to the formation of the modern landscape. Citing similarities with other drainage systems in Central Texas, the headwaters of the San Marcos River and Sink Creek incised very late in the Pleistocene. Following incision, the streams supported a marsh environment and slowly deposited fine-grained sediments through flooding. In the early Holocene, another period of stream incision was followed by similar marsh formation and slow aggradation of flood deposits. The middle Holocene is marked by abandonment of marsh environments and relatively great aggradation of sediments, attributable to flooding of Sink Creek and/or slackwater deposits from the Blanco River. The confluence of the San Marcos and Blanco Rivers is approximately five to six kilometers downstream from the CSWIP area. Accumulation of sediment slowed during the late Holocene, and Sink Creek once again incised. This last period of channel entrenchment (ca. 3300 years before present), and the subsequent gradual accumulation of flood deposits, form the modern surface. The stratigraphic clarity of this period is poorly resolved. Prior work at Spring Lake, however, has suggested that many of these important temporal intervals can be recognized given appropriate horizontal and vertical sampling.

In 2012, AmaTerra Environmental took core samples from the bottom of San Marcos river to identify whether archaeological deposits associated with known terrestrial sites might be buried in the river channel, and thus at risk for destruction by proposed dredging (Padilla et al. 2013). Five cores were taken upstream of the CSWIP area, adjacent to Rio Vista Park. AmaTerra researchers placed cores closer to the river bank than the thalweg, and drove them as deeply as they could—between 110 and 200 cm. All five cores consisted of introduced fine silt deposited by moving water. They identified these silts as a product of modern deposition, and thus lacking potential for containing significant archaeological materials.

The geologic deposits at sites 41HY261 and 41HY141, at least in the road corridor where CSWIP was focused, can be characterized as disturbed fill overlying clay (in most areas the O and A horizon were truncated by previous construction in the road corridor). In most areas of the project, these clays are reddish-brown or dark reddish brown, and often have grey redoximorphic features. However, as seen in the Drill Rescue Trench, organic-rich clays and sand exists, as well as a peat stratum, which indicate a bog or marsh-like environment once existed in that area east of the current San Marcos River channel. In 2015, a similar organic-rich stratum with excellent organic preservation was identified in this vicinity, where the millrace is drained through culverts under Cheatham Street, approximately 55 meters northeast of the Drill

Rescue Trench. In both the Drill Rescue Trench and Exit Trench #2, alluvial deposits were encountered at approximately four meters below road surface. The water table is also located at this depth. These sediments may represent old San Marcos River channel gravels or gravel bars, possibly Early Holocene in age. The lowest stratum encountered in the project area is consistent with Del Rio Clay.

DISCUSSION AND RECOMMENDATIONS

The Cheatham Street Waterline Improvement Project (CSWIP) was monitored by CAS in two periods of 2018 (April and May, and September and October) for the City of San Marcos. The project area crossed two sites: 41HY261 and 41HY141. The quantity of sediment removed during this project totals approximately 718.54 m^3. Of this, the majority showed disturbance from previous construction. This disturbance was evidenced by buried road surfaces, introduced gravel fill, and construction debris intermixed with historic and prehistoric artifacts. Nevertheless, deeply buried cultural deposits associated with both 41HY261 and 41HY141 were recorded during monitoring and limited survey level investigations for the CSWIP.

On the northeast side of the San Marcos River, monitoring revealed remarkable cultural materials located from within a buried gravel bar. This concentration of cultural material is associated with 41HY261. Site 41HY261 has had multiple archaeological investigations stemming from previous projects requiring regulatory compliance (i.e., Cargill and Brown 1997; Jones and Oksanen 2006; Yelacic and Leezer 2012; Reid and Hooge 2015). The results of archaeological monitoring for CSWIP supports previous findings and adds to our knowledge of this site. Specifically, artifact bearing deposits of San Marcos River alluvium were found in two locations monitored for the CSWIP: in the Drill Rescue Trench, east of the bridge crossing the river, and in the Exit Trench #2 located at the junction of Reynolds Street and Cheatham Street. This context is interpreted as a buried gravel bar suggesting the San Marcos River channel extended into this area at one time. Paleoindian artifacts, large mammal bones (including Pleistocene fauna), and a Middle-Archaic projectile point indicate that significant archaeological deposits are present within this alluvium. However, due to the unstable depositional environment typical of river channels, these deposits do not have stratigraphic integrity.

At site 41HY141, non-diagnostic cultural materials were found in a small exposure of intact sediments. Just one archaeological investigation has taken place in the vicinity of site 41HY141 (i.e., Oksanen and Leezer 2006) since initial recording in 1977; the extent of the site is unknown. The CSWIP is the first archaeological investigation to be undertaken at the site since its recording. Lithic debitage was identified from potentially intact soils during monitoring, and a one-meter archaeological excavation unit was hand-excavated to assess the nature of those deposits. Artifacts from both historic and prehistoric periods were recovered. Historic-period artifacts recovered are highly fragmentary and many were non-diagnostic. The artifacts that were diagnostic represented time ranges so broad and were therefore of limited use in discussing historic use of the area. The prehistoric artifacts recovered are temporally non-diagnostic, and consist primarily of lithic debitage, bifaces, flake tools, faunal bone, and burned limestone rock. Modified bone, possibly fragments of a broken bead, was also recovered. The current investigations have demonstrated that while the upper-most deposits of this site are mixed and disturbed, there are deeply buried cultural deposits associated with 41HY141 located here.

Due to the limited exposure of intact sediments associated with 41HY261 and 41HY141, CAS recommends no further

archaeological investigations are necessary for the CSWIP. CAS recommends that the City continue to coordinate any development planned within or near the boundaries of both 41HY141 and 41HY261. Additionally, future Areas of Potential Effect(s) (APE) should be carefully evaluated to determine whether they have a high probability to contain intact archaeological deposits associated with these sites.

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APPENDIX A: INADVERTENT FINDS LETTER

TEXAS STATE UNIVERSITY
SAN MARCOS
The rising STAR *of Texas* ™

May 1, 2018

Ms. Tiffany Osburn
Texas Historical Commission
Archaeology Division
PO Box 12276
Austin, Texas 78711-2276

RE: Inadvertent Discovery during Archaeological Monitoring for the Cheatham Street Waterline Improvement Project, Permit No. 8332, Hays County, Texas.

Dear Ms. Osburn:

This notification is sent to you as a requirement of Texas Antiquities Permit No. 8332 for the Cheatham Street Waterline Improvement Project. On April 30, 2018 CAS archaeologists encountered cultural material while monitoring a new trench excavated to retrieve an HDD drill bit which had become lodged approximately 17 feet beneath paved surface. Initial trenching had reached a depth of approximately 390 cmbs revealing a profile of former pavement beneath current and sterile soil before encountering an intact clay rich sediment above a strata containing a high volume of gravels. It is likely that this gravely sediment represents a buried gravel bar suggesting the San Marcos River channel extended into this area at one time. From within the gravel bar a bison axis vertebra, another large mammal bone fragment, a large 14 cm long 8 cm wide biface blank, the base of a Paleoindian dart point (possible St. Mary's Hall or Plainview) and 5 flake tools were encountered (Figures 1 and 2). Analysis of the bison bone revealed a stone tool scrape on the lateral ventral surface the of the dens segment of the bone. Any length extension of the trench was halted, and an email notification was sent to Tiffany Osburn in your office to alert THC to the inadvertent finds discovery.

On May 1st an additional 2-ft length of trench was carefully excavated to make room for 12-ft shoring walls and CAS used this opportunity to determine the depths of the deposits and the potential for any vertical integrity (Figures 6 and7). Shoring the trench was necessary to stabilize the trench walls due to a void/sinkhole and because the water table was reached. Unfortunately, the shoring limited visibility of profiles. Asphalt, roadbase, and fill extends to 175 centimeters

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below surface (cmbs). The uppermost intact soil (175-285 cmbs) is an organic-rich dark gray clay with lighter gray mottles, followed by a transitional zone from 285 to 390 cmbs showing a change from the above clay, to a highly organic-rich peat, to organic-rich sand—the boundaries between could not be determined from the surface. All of the above soils were found to be sterile of cultural material. However, despite thorough monitoring, screening was difficult due to the saturation of these soils (Figure 8). Channel gravels and water table were encountered at 390 cmbs. All artifacts observed from the trench were recovered in a mixed context within the gravels. The lower boundary of the gravels could not be determined; however, by the base of the trench at 550 cmbs bedrock reminiscent of Del Rio Clay had been encountered.

Additional cultural material including a Nolan Middle Archaic stemmed/dart point, hand ax, 1 biface fragment, and a perissodactyl (Pleistocene horse or tapir) metapodial were recovered in a mixed context from within the channel gravel following installation of the shoring walls Figures 3-5). Also contained within the channel gravel were numerous preserved wooden logs up to 3 m in length and 60 cm wide with several appearing blackened (Figure 9). There was no evidence for human modification to the wood. The wood seems to have been the source of the void space whereby a roof of wooden logs had allowed an approximately 1-meter wide sink hole to form in the clay bedrock. The depth of the sink hole could not be determined; however, a worker was able to reach a 6-foot pole into it without feeling a bottom.

Although all material recovered was restricted to the channel gravel, this sediment does not seem to have clear stratigraphic context given that the Nolan point was located in a similar context to the Paleo point and the gravels were intermixed with Pleistocene fauna. The gravel likely represents an environment of deposition very near to the stream thalweg, albeit in close proximity to important cultural sites. The overlying sediments were also formed in bog-like depositional environments unsuitable to most human activities but without the energy to transport stone tools and faunal remains.

At this time construction plans include realignment of the HDD drill bit with continuation of the HDD at 14.5 feet below surface, to begin to angle up within 50 linear feet for slow increase to eventual 4 feet below grade approximately 200 feet northeast of the current trench along Cheatham Street.

CAS will continue to conduct archaeological monitoring of the Cheatham Street Waterline Improvements project under Texas Antiquities Permit 8332. The results will be reported upon in a letter report as well as a detailed technical draft report and submitted to the THC for comment. If additional trenching is required by the COSM for this undertaking that has not been previously coordinated, CAS recommends that the project be re-reviewed by the THC.

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Thank you for your attention to this project, and please do not hesitate to contact me if you have any questions regarding this correspondence.

Sincerely,

Amy E. Reid
Principle Investigator
Center for Archaeological Studies
Texas State University

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Figure 1. Large biface and proximal fragment of a Paleoindian dart point.

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Figure 2. Bison axis vertebrae and other large mammal bone.

Figure 3. Nolan dart point, complete.

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Figure 4. Lithic tool, large bifacial hand axe.

Figure 5. Perissodactyl metapodial

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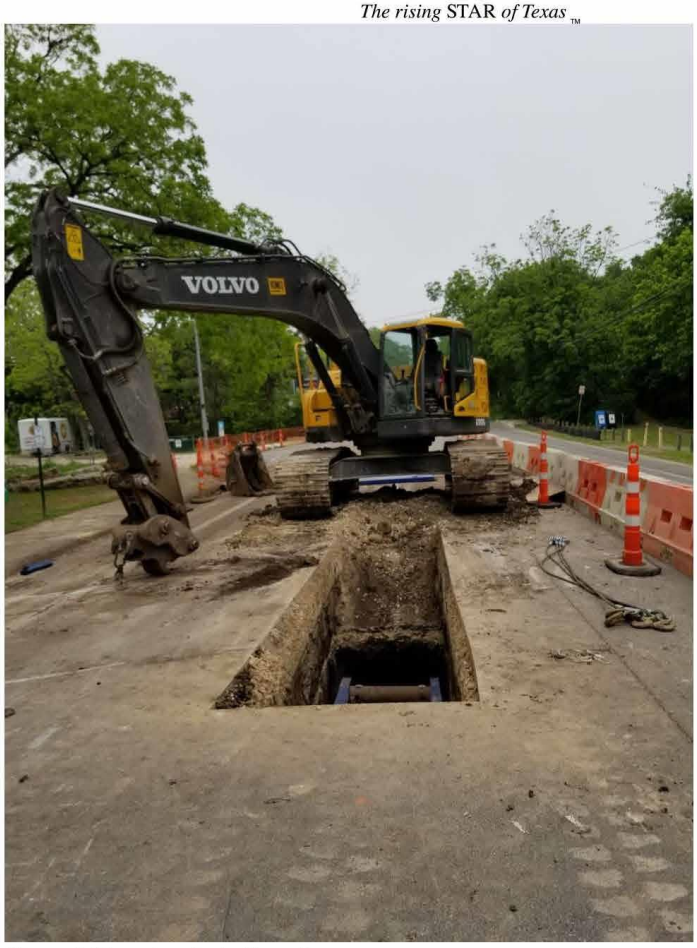

Figure 6. Overview shot of trench.

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Figure 7. Trenching overview.

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Figure 8. Highly saturated back dirt pile.

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Figure 9. Wood from Trench.

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