Intensive Pedestrian Survey and Construction Monitoring along a Portion of Trail 11 in Brackenridge Park, San Antonio, Bexar County, Texas

by

Kristi Miller Ulrich, Jennifer L. Thompson,
Steve Ahr, and Justin Blomquist

Texas Antiquities Committee Permit No. 5883

Non-Restricted

Principal Investigator
Steve A. Tomka

Prepared for:
R. L. Worth and Associates
7373 Broadway, Suite 201
San Antonio, Texas 78209

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Prepared by:
Center for Archaeological Research
The University of Texas at San Antonio
One UTSA Circle
San Antonio, Texas 78249
Archaeological Report, No. 416

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Abstract:

In November of 2011, the Center for Archaeological Research (CAR) at The University of Texas at San Antonio (UTSA) conducted an intensive pedestrian survey of a portion of the new hike and bike trail to be located behind the old ButterKrust Bakery building along the Brackenridge Municipal Golf Course. CAR was contracted by R. L. Worth and Associates. The backhoe trenches (BHTs) excavated at the locations of the proposed light posts revealed that there was disturbance in the upper levels of the soil. The presence of metal pipes and fill to depths of 70 cm below the surface (cmbs; 27.6 in.) indicated the extent of disturbance. Below the disturbance, intact soils were encountered, although no significant cultural deposits were found. One site, 41BX1899, was recorded during the course of the project as five flakes and one core were recovered from two BHTs within 40 m (137 ft.) of each other. The eligibility of the site is unknown and would require additional testing to determine. The work was conducted under Texas Antiquities Permit No. 5883. Dr. Steve A. Tomka, CAR Director, served as Principal Investigator, and Kristi Miller Ulrich served as Project Archaeologist.

The deposits of site 41BX1899 would have been disturbed by the originally proposed pole designs and their installation since the depths of impact would have extended to 2.4 m (8 ft.) below surface. However, after consultation with the City of San Antonio's Office of Historic Preservation, the Texas Historical Commission (THC), and the project sponsor, the light posts and their installation procedures were redesigned. The new designs called for shallow excavations down to only 1.2 m (4 ft.) below the surface, terminating about 0.6-0.8 m (2-2.5 ft.) above the archaeological deposits. The excavation of the light pole trenches and the installation of the poles was monitored, and the inspection of the trench walls and backdirt revealed that no archaeological deposits were disturbed during the installation activities.

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Acknowledgements:

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Chapter 1: Introduction

The Center for Archaeological Research (CAR) at The University of Texas at San Antonio (UTSA) was contracted by R. L. Worth and Associates to conduct archaeological investigations along a proposed trail in Brackenridge Park in San Antonio, Bexar County, Texas. The trail development is part of the Museum Reach-Park Segment of the San Antonio River Improvements Project that has been undertaken by the City of San Antonio to improve the San Antonio River Corridor.

As part of this project, CAR conducted the pedestrian archaeological survey of a proposed hike and bike path (Trail Segment 11/ButterKrust Bakery building) in Brackenridge Park during May 2011. The work was conducted under Texas Antiquities Permit No. 5883. Dr. Steve A. Tomka, CAR Director, served as Principal Investigator, and Kristi Miller Ulrich served as Project Archaeologist.

Area of Potential Effect

The current Area of Potential Effect (APE) is highlighted on the "San Antonio East" (2998-133) 7.5 minute USGS Quadrangle map (Figure 1-1). The site is located within Brackenridge Park, along the west side of Avenue B and between Mill Race Road and an area just north of US Highway 281. While the current APE is only a small segment of Trail 11, which continues north of Mill Race Road, this northern segment had undergone an archaeological survey conducted by a different firm and under a different permit (Personal Communication, Kay Hindes April 2011).

The Brackenridge Golf Course is located just to the west of the current APE. The river was channelized in 1931 to its present location; however, the old channel of the San Antonio River would have run almost parallel to the APE (Figure 1-2).

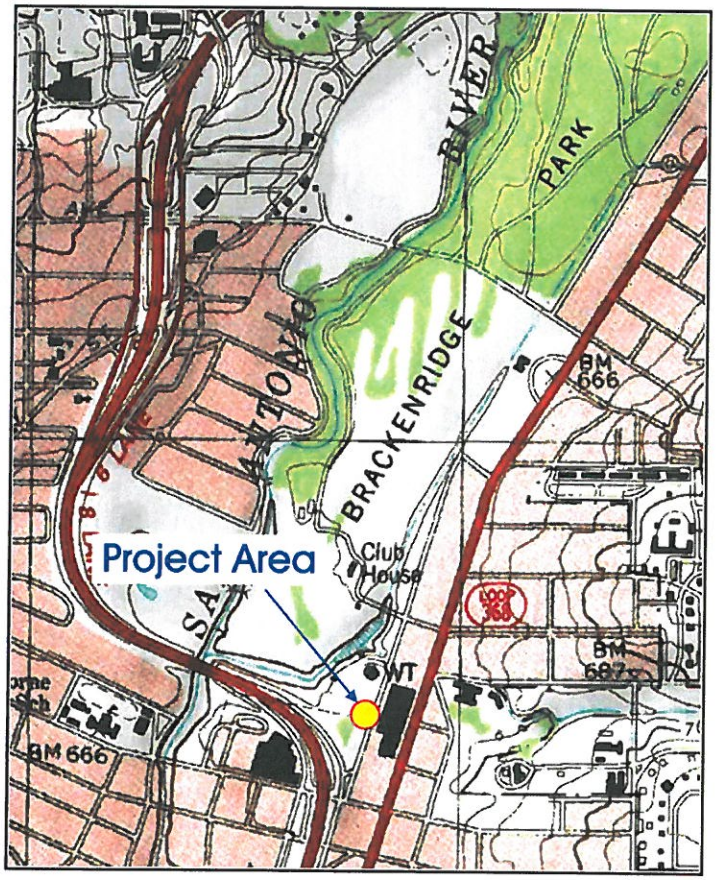

Figure 1-1. *The Area of Potential Effect on the "San Antonio East" (2998-133) 7.5 Minute USGS Quadrangle map.*

The Catalpa-Pershing storm drainage channel, which runs through the northern portion of the APE, was constructed in 1977 to help with the drainage in the area.

Impacts to the APE

Originally proposed impacts associated with the path would have consisted of the installation of thirteen light posts, 40.6 cm (16 in.) in diameter, located 18.3 m (60 ft.) from each other. These plans were later amended to include a fourteenth light post (Figure 1-2). The impacts associated with the light post installation were projected to reach to a depth of 2.4 m (8 ft.). In addition to the deep trenches needed for the posts, shallow, 20.3 cm (8 in.), and narrow, 10.2-cm (4-in.) wide, trenches were to be excavated with a ditch witch to allow for the installation of conduits leading from existing electrical lines along Avenue B to the light posts. Finally, shallow grading was to be carried out to prepare the projected path of the hike and bike trail along portions of its route.

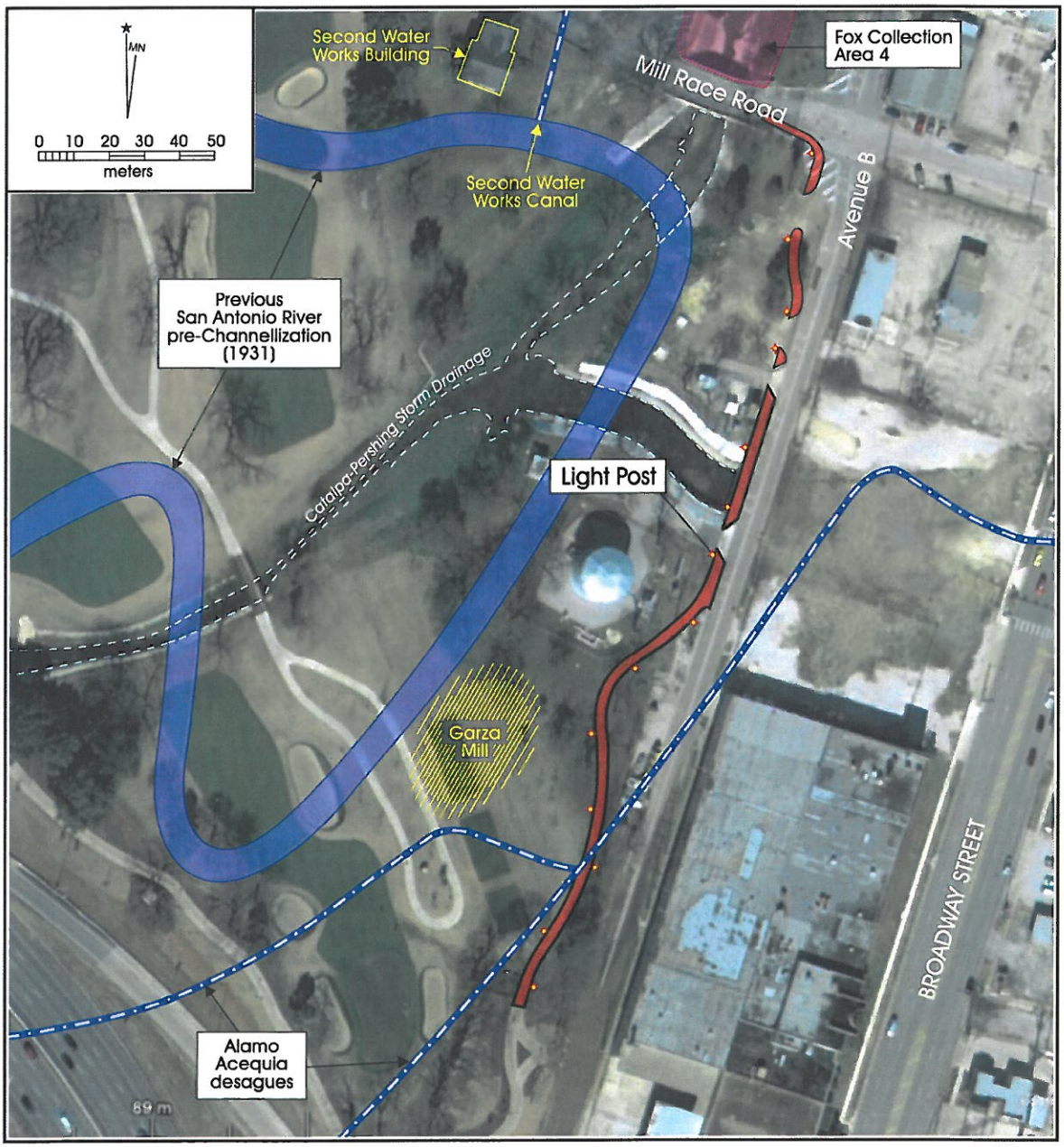

Figure 1-2. *Area of Potential Effect along Avenue B and immediately east of the Brackenridge Municipal Golf Course.*

Chapter 2: Environmental Setting

The project area lies within Brackenridge Park, a 340-acre recreation area in the heart of San Antonio. Though the park is home to many native flora and fauna, it is within an urban area and has been altered for the enjoyment and convenience of the public. The park is bounded by Hildebrand Avenue on the north and Broadway Avenue on the east. Highway 281 wraps around the park to the south and west. The APE has been impacted by road construction, utilities, and development of park amenities like the golf course and a small-gauge train.

Brackenridge Park and Bexar County sit at the edge of the Edwards Plateau on the Balcones Escarpment that encompasses parts of the Gulf Coastal Plain, the Hill Country and the Edwards Plateau, thereby offering a suite of wildlife and natural resources, which were exploited by inhabitants of the area throughout the region's human history (Figure 2-1).

The project area is located immediately east of the Balcones Escarpment. The escarpment is a line of hills and cliffs that extends through Central Texas and serves as a dividing line between the ecological zones of the Edwards Plateau and the Blackland Prairie. It is the surface expression of the Balcones fault zone, which is a series of faults running from Del Rio to Waco that divides limestones on the west from claystones, chalks, and marls on the east. Numerous caves and springs exist along the fault zone, which feed rivers and provide fresh water sources that encourage human settlement of the area. These spring-fed rivers offer fresh, alkaline, and very hard water derived from rainwater percolating through Edwards limestone into the Edwards Aquifer. The landscape changes dramatically moving from east to west across the escarpment. To the west, the Edwards Plateau is rugged with thin, stony soils supporting a juniper-live oak savannah that is best suited for ranchlands.

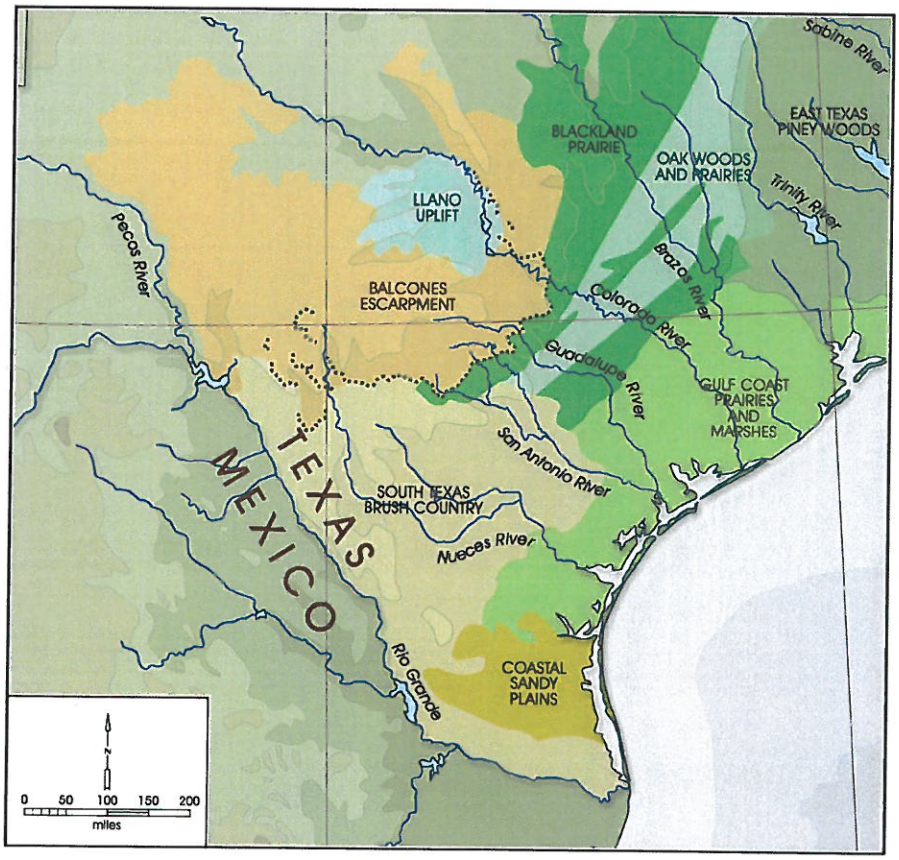

Figure 2-1. *Geological map of Central Texas showing the Edwards Plateau, Blackland Prairie, the Balcones Escarpment, and major rivers.*

To the east, the Blackland Prairie features rolling hills, broad rivers, and fertile clays that support native prairie grasslands and modern agricultural land use (Woodruff and Abbott 1986).

The San Antonio River crosses through the project area. Its headwaters are commonly reported to be the San Antonio Springs located 1.6 km (1 mi.) north of the park at the "Blue Hole." Numerous springs rising from the Edwards Aquifer feed the river within the Olmos Creek catchment basin to the north. The greater San Antonio River Basin drains 6,727 sq. km (4,180 sq. mi.) of land into the San Antonio River, which flows into the Guadalupe River and finally into San Antonio Bay. The San Antonio River is 289.7-km (180-mi.) long stretching from downtown San Antonio to Tivoli, where it empties into the Guadalupe River. The Medina River and Cibolo Creek are its two major tributaries (SARA n.d.).

Geology

The geology of San Antonio is the result of Miocene uplifting that formed the Edwards Plateau and the Balcones Escarpment. The specific descriptions of formations in the area were taken from data published online by the USGS (2010) and exported for mapping over the project area (Figure 2-2). Brackenridge Park consists of Holocene Alluvium floodplain and Pleistocene Fluviatile terrace deposits composed of gravel, sand, silts, and clays. The current study falls entirely within a Quaternary alluvium floodplain. To the southwest and northeast above the terrace are the Navarro Group and Marlboro Marl formations composed of marl, clay, sandstone, siltstone, and limestone concretions. The Austin Chalk deposits in the western edge of the park in the Sunken Garden area contain chalks, marls, and limestone, which were mined during the historic period. The Uvalde Gravel formation lies just to the east of the park.

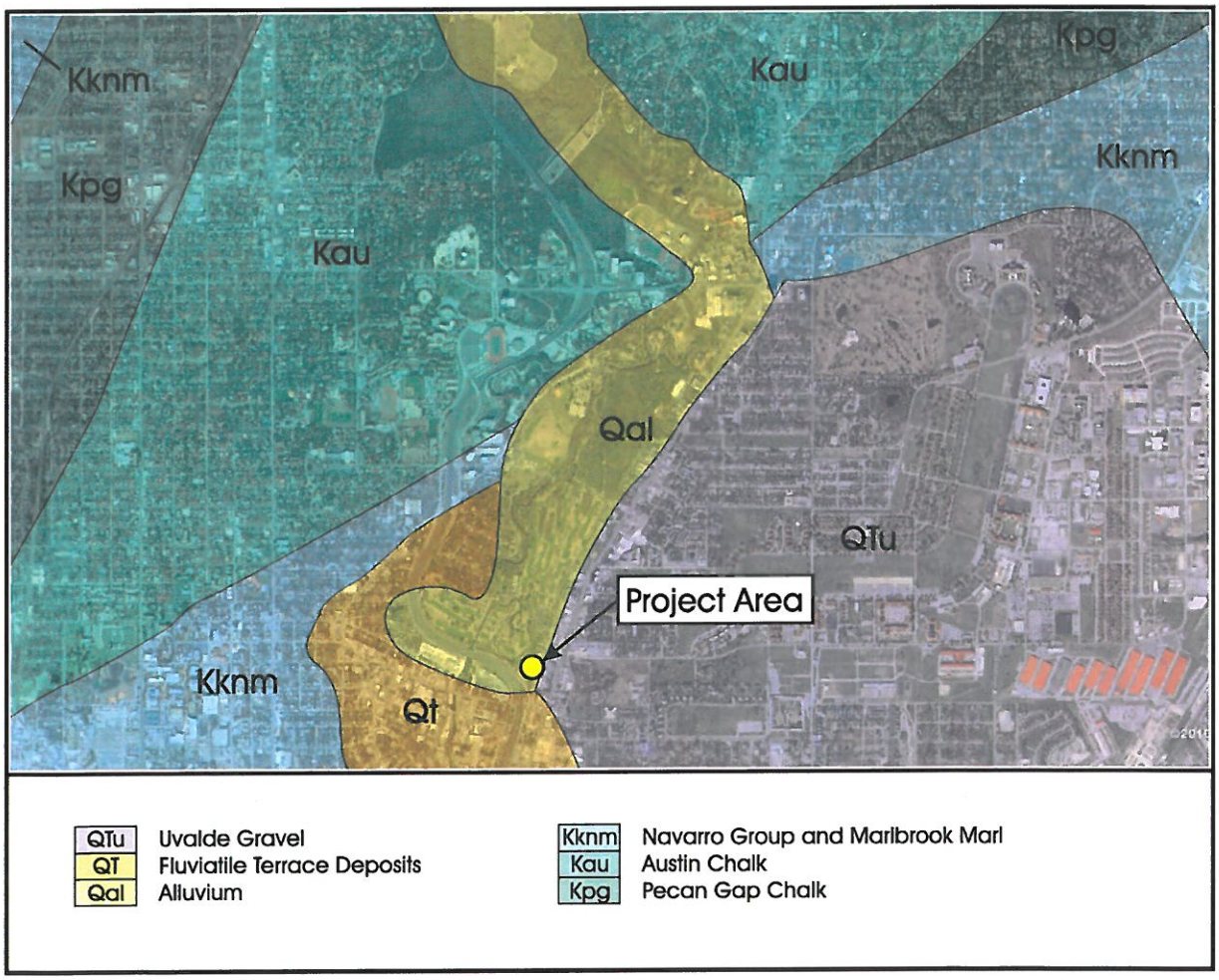

Figure 2-2. *Geological map of the project area.*

These gravels include cobbles of chert, quartz, limestone, and igneous rock. Chert cobbles in this formation, as well as in the Edwards Limestone formation in the Balcones fault zone to the north of the APE, were an important raw material for prehistoric inhabitants of the area.

Soils

Soil units in the project are defined by the Soil Conservation Service (Taylor et al. 1962; Soil Survey Staff 2010). The project area passes through Lewisville, Trinity, and Frio soils. The Lewisville soils are found on stream terraces above the Trinity and Frio floodplain soils. The western end of the APE, as it skirts the driving range, is classified as Lewisville silty clay, 0-1 percent slopes (LvA). Lewisville silty clay, 1-3 percent slopes (LvB), is in the extreme eastern section of the APE in the northeast corner of the golf course. Lewisville soils are deep, well-drained soils common on stream terraces. Profiles depict brown, subangular blocky silty clay over reddish-yellow silty clays with calcium carbonate nodules. The center of the survey area and area of data recovery fall within the Trinity and Frio soils. Trinity and Frio soils are deep, slowly permeable, calcareous clays and clay loams. Trinity soils are clays derived from Holocene age clayey alluvium. A typical profile is clay to 2.0 m (6.6 ft.) with 25 percent $CaCO_3$. Frio soils are also Holocene aged with a typical profile of silty clay loam to 1.27 m (4.2 ft.) and clay loam to 2.0 m (6.6 ft.) and 40 percent $CaCO_3$.

Flora and Fauna

A high percentage of animals found in Texas inhabit the Balconian biotic zone (Blair 1950), and a large proportion of them are found along the Balcones Escarpment. Many of these animals are constricted geographically and live either east or west of the escarpment but not both (Neck 1986). Common mammals include white-tailed deer (*Odocoileus virginianus*), opossum (*Didelphis virginiana*), raccoon (*Procyon lotor*), nine-banded armadillo (*Dasypus novemcinctus*), which is a relatively new migrant, and the black-tailed jackrabbit (*Lepus californicus*). Large mammals that once were commonly found in the area include mountain lion (*Puma concolor*) and black bear (*Ursus americanus*), both driven westward to mountainous regions of Texas, and bison, now only found in captivity (Davis and Schmidley 1997).

Over 80 species of fish live in the San Antonio River Basin. Fish species recorded in the San Antonio River include Bluegill (*Lepomis macrochirus*), Channel Catfish (*Ictalurus punctatus*), Red Shiner (*Cyprinella lutrensis*), Yellow Bullhead (*Ameiurus natalis*), Largemouth Bass (*Micropterus salmoides*), Green Sunfish (*Lepomis cyanellus*), Texas Shiner (*Notropis amabilis*), Gizzard Shad (*Dorosoma cepedianum*), Spotted Gar (*Lepisosteus oculatus*), and Central Stoneroller (*Campostoma anomalum*) (SARA n.d.).

Common migratory birds in the park are the Belted Kingfisher (*Megaceryle alcyon*), Great Blue Heron (*Ardea herodias*), Night Heron (*Nycticorax nycticorax*), White-winged Dove (*Zenaida asiatica*), and Turkey Vultures (*Cathartes aura*). Birdwatchers frequent the project area and have recorded Red-shouldered Hawk (*Buteo lineatus*), Golden-fronted (*Melanerpes aurifrons*) and Ladder-backed Woodpecker (*Picoides scalaris*), Wood Duck (*Aix sponsa*), Green Heron (*Butorides virescens*), and many other riparian and open field birds (San Antonio Audubon Society).

Native trees common along the river corridor are Black Willow (*Salix nigra*), Cedar Elm (*Ulmus crassifolia*), hackberry (*Celtis* spp.), Pecan (*Carya illinoinensis*), and Sycamore (*Platanus occidentalis*). Shrubs and vines include Baccharis (*Baccharis* sp.), Bluewood Condalia (*Condalia* sp.), Buttonbush (*Cephalanthus* sp.), Mustang Grape (*Vitis mustangensis*), and Roughleaf Dogwood (*Cornus drummondii*). Common forbs are Arrowhead bush (*Sagittaria* sp.), Sunflower (*Helianthus annuus*), Frogfruit (*Phyla* sp.), Pickerelweed (*Pontederia cordata*), and Water Primrose (*Lugwigia* sp.). Grasses and sedges along the river are Bushy Bluestem (*Andropogon glomeratus*), Eastern Gamagrass (*Tripsacum dactyloides*), Inland Sea Oats (*Chasmanthium latifolium*), Switchgrass (*Panicum virgatum*), and wildrye (*Elymus* sp.). The uplands to the west support ash and juniper woodlands as well as shrubs. Common species include Texas persimmon (*Diospyros texana*), agarita (*Mahonia trifoliolata*), and prickly pear (*Opuntia* spp.). Vegetation in the Blackland Prairie to the east includes hickory (*Carya* spp.), red oak (*Quercus* spp.), and hackberry (*Celtis* sp.) trees (Gould 1969).

Chapter 3: Cultural History and Previous Archaeology

Cultural History

The project area is situated on the edge of Central and South Texas, so the following cultural history emphasizes Central Texas although reference is made to trends in South Texas as well. The discussion is based primarily on the chronologies developed by Black (1989a), Collins (1995), Johnson and Goode (1994), and Prewitt (1981) for Central Texas with observations from Hester (1995) for South Texas. Four major time periods define South Central Texas: Paleoindian, Archaic, Late Prehistoric, and Historic. These periods are further divided into sub-periods that are based on particular subsistence strategies and material culture. A brief description of each period follows to illustrate the archaeological potential of the region.

Paleoindian

The Paleoindian period, 11,500-8800 BP, is divided into early and late portions, and each is characterized by particular projectile point styles and subsistence patterns (Collins 1995). The period begins at the close of the Pleistocene, which has provided the earliest evidence of humans in the Central Texas region. Clovis and Folsom point types, bifacial Clear Fork tools, and finely flaked end scrapers characterize the early Paleoindian (Black 1989a). The first stemmed points (i.e., Wilson), as opposed to lanceolate points (i.e., Angostura and Golandrina), begin to appear during the late Paleoindian. In the past, Paleoindian populations have generally been characterized as hunter-gatherers ranging over wide areas in pursuit of now extinct megafauna, such as mammoth and bison (*Bison antiquus*). However, research from the Wilson-Leonard site in Central Texas (Collins 1998) and other perspectives on Paleoindian adaptations (Tankersley and Isaac 1990) indicate that the diet of these early inhabitants may have been much broader. Although Late Pleistocene megafauna may have constituted a part of Paleoindian subsistence, these peoples are perhaps better characterized as more generalized hunter-gatherers, exploiting a wide variety of plants and animals including large herbivores, like deer and bison, and small animals, such as turtles, alligators, rabbits, and raccoons (Collins 1995; Nickels 2000).

In south-central Texas, many of the sites containing Paleoindian materials are found on high terraces, valley margins, and upland locations (Black 1989a). This seems to fit with a broader pattern of Paleoindian site distributions where sites are located on landforms that provide views of the surrounding landscape, are centered on critical resource zones, or are found in highly productive resource areas (Tankersley and Isaac 1990). Paleoindian artifacts are commonly recovered as isolated finds or from lithic scatters that lack good stratigraphic context including kill, quarry, cache, camp, ritual, and burial sites (Collins 1995). No mammoth kill or butchering sites attributable to the Paleoindian period have been found in South Texas (Hester 1995).

Archaic

The Archaic period, 8800-1200 BP, is marked by intensification of hunting and gathering of local resources, changes in projectile points, and a broader array of material culture (Collins 1995; Prewitt 1981; Weir 1976). A change in food processing is evident from a widespread increase in hearth, oven, and midden features. During this period, large cemeteries were formed indicating an increasing population and the subsequent establishment of territories (Black and McGraw 1985). Collins (1995) and Johnson and Goode (1994) subdivided the Archaic into Early, Middle, and Late sub-periods. These sub-periods are distinguished by variances in climate conditions, resource availability, subsistence practices, and diagnostic projectile point styles (Collins 1995; Hester 1995).

Early Archaic

In Central Texas, the Early Archaic dates from 8800 to 6000 BP (Collins 1995). Changing climate and the extinction of megafauna appear to have initiated a behavioral change by the prehistoric peoples of Texas. Because of the necessary economic shift away from some level of dependence on big game hunting, local resources in Central Texas, such as deer, fish, and plant bulbs, were more intensively exploited. This behavioral change is indicated by greater densities of ground stone artifacts, burned rock cooking features, and more specialized tools, such as Guadalupe bifaces and Clear Fork gouges (Turner and Hester 1993). Projectile point styles found in sites from this period include Angostura, Early Split Stem, and Martindale-Uvalde (Collins 1995). Open-air campsites, including Loeve, Richard Beene, Wilson-Leonard, Jetta

Court, Sleeper, Camp Pearl Wheat, Youngsport, and Landslide, and the Hall's Cave site contain notable Early Archaic components (Collins 1995).

Weir (1976) concludes that the Early Archaic groups were highly mobile and small. He bases this inference on the fact that Early Archaic sites are sparsely distributed and that projectile points are widely distributed across most of Texas and northern Mexico. The decline in bison numbers on the plains suggested to Hurt (1980) that the inhabitants were forced to utilize the same or a slightly more expended effort to broaden their diets to include animals and plants that produce equivalent amounts of calories and protein. Story (1985) concurs with Weir that population densities were low during the Early Archaic. She suggests that groups were made up of small bands of related individuals with "few constraints on their mobility" (Story 1985:39), who subsisted on a broad range of resources, such as prickly pear, lechugilla, rodents, rabbits, and deer.

Middle Archaic

The Middle Archaic, 6000 to 4000 BP (Collins 1995), appears to have been a period of increasing population, based on the large number of sites documented from this time in South and Central Texas (Story 1985; Weir 1976). Projectile point variation at the Jonas Terrace Site suggests a period of "ethnic and cultural variety, as well as group movement and immigration" (Johnson 1995:285). Point styles from this period include Bell, Andice, Calf Creek, Taylor, Nolan, and Travis (Collins 1995). Exploitation of broadly scattered, year-round resources such as prickly pear, deer, and rabbit continued (Campbell and Campbell 1981) with the addition of seasonal nut harvests from the riverine settings of the Balcones Escarpment (Black 1989a, 1989b). Weir (1976) posits that the expansion of oak on the Edwards Plateau and Balcones Escarpment resulted in intensive plant gathering and acorn processing that may have been the catalyst for the merging of the widely scattered bands, which were prevalent in the Early Archaic, into larger groups. These larger groups likely shared the intensive labor involved with the gathering and processing of acorns. Some investigators believe burned rock middens resulted from acorn processing (Creel 1986; Weir 1976) although others (e.g., Black et al. 1997; Goode 1991) question this argument. Black et al. (1997) suggest that the burned rock middens of Central Texas accumulated as a result of the baking of a relatively broad range of resources in rock/earth ovens. These resources potentially included carbohydrate laden nuts, bulbs, roots, and pads as well as various vertebrate and invertebrate animals.

Late Archaic

The Late Archaic in Central Texas dates from 4000 to 1200 BP (Collins 1995). There is not a consensus among researchers as to population size in this sub-period. Prewitt (1981) posits an increase while Black (1989a) believes the population remained the same or decreased. There is also disagreement as to the continuing use of burned rock middens. Prewitt (1981) suggests the near cessation of the midden construction, whereas excavations at a number of sites document large cooking features up to 15 m (49.2 ft.) in diameter (Black and Creel 1997; Houk and Lohse 1993; Johnson 1995; Mauldin et al. 2003). Bison reemerge during this sub-period in Central Texas (Mauldin and Kemp 2005) after evidence of a definitive decrease during the Middle Archaic (Dillehay 1974). Points from the Late Archaic sub-period are generally smaller than those of the Middle Archaic and include Bulverde, Pedernales, Kinney, Lange, Marshall, Marcos, Montell, Castroville, Ensor, Frio, and Darl types (Collins 1995; Turner and Hester 1993). During this period, large cemeteries were formed indicating an increasing population and the subsequent establishment of territories (Black and McGraw 1985). The earliest occurrences are at Loma Sandia (Taylor and Highley 1995), Ernest Witte (Hall 1981), Hitzfelder Cave (Givens 1968), and Olmos Dam (Lukowski 1988).

Some researchers describe the last 1,000 years of the Late Archaic as Transitional Archaic (Turner and Hester 1993) or Terminal Archaic (Black 1989a) because they found the dart point forms (i.e., Darl, Ensor, Fairland, and Frio) similar to early arrow point forms and thought they may have overlapped. More commonly, researchers extend the dates of the Late Archaic and add additional style intervals (Collins 1995). This designation is not universally recognized. It corresponds with Johnson and Goode's (1994) Late Archaic II. Investigators at 41BX323 use the Transitional Archaic designation in the Archaeological Investigations section below.

Late Prehistoric

The Late Prehistoric period, 1200-350 BP, in Central Texas marks a distinctive shift from the use of the atlatl and dart to the use of the bow and arrow (Black 1989a; Collins 1995; Hester 1995; Story 1985). The Late Prehistoric is subdivided into early and late sub-periods termed Austin and Toyah Phases, respectively. Temporal diagnostics, including Scallorn and Edwards arrow points, define the Austin Phase, 1200-650 BP (Prewitt 1981). Burned rock midden use may have reached a peak during

this phase (Black and Creel 1997). The subsequent Toyah Phase spans 650-350 BP and includes the first occurrence of pottery in South Texas (Black 1989a). Characteristic artifacts of this phase include Perdiz and Cliffton arrow points (Black 1986). Material culture associated with the Late Prehistoric period suggests increasing complex subsistence patterns and large prehistoric populations (Black 1989a; Collins 1995).

Historic

The Historic period in Texas begins with the arrival of Europeans. Although the Historic period theoretically begins in Texas with the shipwreck of the Narvaez expedition along the Texas coast in 1528, the majority of the inhabitants of Texas were Native Americans until the late eighteenth century. From AD 1550 to the late 1600s, European forays into South and Central Texas were infrequent. René Robert Cavelier, Sieur de La Salle, established a French settlement, Fort St. Louis, along Matagorda Bay on the Texas coast in 1685. Hunger, disease, and escalating hostilities between the French and the Karankawas subsequently destroyed the colony. In 1690, as a result of the discovery of the remains of the LaSalle colony, the Spanish began securing the northern border of New Spain, expanding their interests in East Texas to counter any French expansion across the Mississippi River (Foster 1998). The first Europeans settled in the region in early AD 1700 (Taylor 1996). The southward incursion of the Comanche and Apache and the northward expansion of Spanish influence led to the displacement of many of the area's indigenous groups. Decimated by disease brought by Europeans, many of the remaining groups sought refuge in the numerous Spanish missions established early in the eighteenth century. The move to the missions significantly impacted the hunter-gatherer way of life and the material culture. Artifacts from the Historic period reflect European influences and include metal, glass, and ceramics along with pre-Hispanic Goliad wares and lithic arrow points, tools, and gunflints (Taylor 1996; Wade 2003).

History of Brackenridge Park

The APE falls within the boundaries of Brackenridge Park, a 340-acre park in central San Antonio just south of the headwaters of the San Antonio River. The park is full of historic and prehistoric cultural resources, and most of those discussed are shown in Figures 3-1, 3-2, and 3-3. Many of the historic features of the park are related to the river. During the early years of San Antonio de Bexar, the property was owned and managed by the Spanish Missions. Two *acequias* started near the headwaters of the river and flowed through the modern boundaries of the park. The first *acequia* constructed was the *Acequia Madre* (1719-1720). It was located on the east bank of the San Antonio River in the vicinity of Witte Museum (Figure 3-4). A large dam was constructed to divert the water from the river into the *acequia*, which flowed to the south following the path of Broadway Road, and returned to the river south of Mission San Antonio de Valero (Figures 3-1 and 3-2). The water from the *acequia* was used to irrigate the Mission Valero croplands (Cox 2005). Recent investigations there have uncovered part of the dam and two channels of the *acequia* (Ulrich 2011).

The second *acequia* was built much later and is known as the Upper Labor *Acequia* (ca. 1776). This *acequia* was constructed closest to the headwaters of the San Antonio River with its beginning located south of Hildebrand Avenue and north of the San Antonio Zoo. The Upper Labor Dam was constructed to divert the water from the river into the *acequia*. The *acequia* flows along the west side of the San Antonio River and re-enters the river north of Mission Valero (Cox 2005). The Spanish Colonial dam was found in 1996 during excavations near Hildebrand Avenue (Cox et al. 1999). The limestone dam had been repaired in the nineteenth century by German masons. Brackenridge Park remained a rural, agricultural area with scattered dwellings until after Texas joined the Union in 1846. The river and Spanish-built *acequias* continued to provide water for farmers and households. Travelers passed east and west of the park on roads leading to Austin and Fredericksburg, and land to the north was used for farming and ranching (Pfieffer n.d.).

San Antonio grew from 3,488 to 12,256 residents between 1850 and 1870 (Pfieffer n.d.). The demands of this growing population ultimately led to the park's transformation from an area of irrigated farmland to an area used for industrial and commercial purposes. This process began in the early 1850s and accelerated during and after the Civil War. Limestone bluffs on the western edge of Brackenridge Park were quarried by German stonemasons to build many of San Antonio's earliest buildings in the 1880s. As the city's population grew, demand for stone grew to the point that the city began to lease quarries. Rock Quarry Road (now North St. Mary's) connected the city to the quarries. The limestone quarry business increased again with the invention of Portland cement. William Lloyd and George Kelteyer founded the Alamo Roman and Portland Cement Company in 1880, which leased the city's quarry until 1908 (Pfeiffer n.d.). This was the first cement company of its kind west of the Mississippi River. In addition to the cement business, the

company also sold lime and building stone. The facility included stone quarries, kilns, mills, and houses for the workers. The location in Brackenridge Park served as the company's headquarters until 1908, when it moved to Alamo Heights. The quarries were later incorporated into the Park's Sunken Gardens. Between 1917 and 1947, the park was the site of a Mexican market (Katz and Fox 1979).

In the early years of statehood, the City Council planned to sell surplus tracts of city-owned property to meet its growing budgetary needs. Because records of the original town tract boundaries had been lost, the city entered into a lawsuit to re-establish its claims and hired Francois Giraud to complete a new survey of the town tract. Land sales finally began in 1852 (Pfieffer n.d.).

The majority of land in Brackenridge Park was already privately owned, but the 1852 land sale included property immediately to the north and east where springs forming the San Antonio River were located. The "head of the river," as it came to be called, was purchased by City Alderman James Sweet in 1852 at a public auction (BCDR K2:506-509). This sale put the source of the city's water supply under the control of a private enterprise where it would remain for several years.

During the Civil War, 78 acres of Brackenridge Park was sold to the Confederate States of America for $5,000 (Katz and Fox 1979:18). The confederates built a tannery to "fill footwear, harness and saddlery needs of the South" (marker text). Unlike many tanneries, this facility operated year round and was able to treat 6,000 hides at a time. A cotton and woolen mill, run by water power from the San Antonio River, was also built here. After the Civil War, the land was given to the Freedman's Bureau. In 1868, the land went up for auction and was purchased by the City of San Antonio for $4,500.

The park's namesake, George Brackenridge, moved to San Antonio in late 1865. His success as a cotton trader during the Civil War and connections with political and business leaders both statewide and nationally served him well. In early 1866, Brackenridge established the San Antonio National Bank that became the foundation of his extensive business holdings. Three years later, he purchased a 108-acre tract and antebellum home at the head of the San Antonio River from J. R. Sweet. Because the word "bracken" was the Scottish word for "fern," Brackenridge named his new home "Fernridge" (Sibley 1973:91). The property acquired by Brackenridge contained springs that fed the river and the city's two major *acequias*, which were located a short distance to the south.

The issue of a privately held water source came to the forefront when, in the aftermath of the cholera epidemic of 1866, local physicians argued for construction of a safe municipal water system. Progress on this issue was slowed by Reconstruction politics and an overall lack of public support (Pfeiffer n.d.). Years later, a local newspaper began to campaign for repurchase of the head of the river property in 1872, leading the city to begin negotiations with George Brackenridge. Although a $50,000 contract was accepted by the City Council, public outcry over Brackenridge's potential profit eventually voided the sale in April 1872, and he retained control of the headwaters (Sibley 1973:128-130; CCM D:36-37).

The City had failed to reacquire the headwaters and was making no progress in establishing a public water system. It was in this context that George Brackenridge began to purchase additional riverfront land. The acquisition of the riverfront property would play an important role in the City's water management in future years (Pfeiffer n.d.). George Brackenridge acquired four of the upper five riverfront lots when the City placed ten lots from the Confederate Tannery property up for auction in 1875. These included lands in Kohler Park, Allison Park, and the Polo Field. He purchased the fifth lot in 1881. Brackenridge made his most significant purchase in June 1876, when he and his brother, John, paid Mary A. Maverick $25,000 for a wooded 200-acre tract on the east side of the river that ran from the head-gate of the *Acequia Madre* ditch south to the property of Francois Guilbeau. The land was bounded on both the west and north by the river and on the east by the *Acequia Madre* (BCDR 4:473; BCDR 25:612).

J. B. LaCoste began the privately owned San Antonio Water Works Company after constructing a pump house and canals in 1877-1878 one-half mile from the Blue Hole on land leased from Brackenridge in the northern section of Brackenridge Park. The facility pumped water into a reservoir in Mahncke Park at the current site of the botanical gardens (Figure 3-2). The company did not do well and controlling interest went to Brackenridge in lieu of rent in 1883 (Pfeiffer n.d.). Brackenridge expanded the facility by building a second pump house at the south of the park near the current Golf Course Club House and additional canal to connect both pump houses. The city's growing water need outpaced Brackenridge's ability to supply enough water, despite additional drilling. The

original springs on his Fernridge property dried up by the turn of the century, but he continued to run the water works until 1906.

George Brackenridge donated 199 acres of riverfront land to the City of San Antonio for use as a park in 1899. The gift, accepted by the City Council on December 4, 1899, was celebrated in both the San Antonio *Light* and *Daily Express*.

> This place [sic] of property is one of the loveliest pieces of land of Texas and for beauty is unrivaled. It is the largest natural park in the south controlled by a city, its scenery back on the river bank being unsurpassed. (San Antonio *Light* Nov. 7, 1899)

> Outside of Fairmount Park in Philadelphia, there is probably no city park that is in any way comparable to it. (San Antonio *Daily Express* Nov. 11, 1899)

The gift of the Water Works property was generous but tightly constrained by reservations and restrictions. These caveats were at least partially attributable to years of distrust between Brackenridge and the City over financial dealings. The Water Works Company retained a 76-m (250-ft.) wide strip running the length of the property along the west side of River Avenue and a 7.6-m (25-ft.) strip along each side of the river and the east bank of the Upper Labor ditch. The company retained full control of ingress and egress to the park as well as the banks of the river and *acequia*. A fence was built around the park and access was restricted to two locations. The issue of access remained unresolved until after Brackenridge sold the Water Works in 1906. Perhaps most notably, the bequest was restricted by its prohibition of the sale or consumption of alcoholic beverages in the park (BCDR 185:183; CCM N:284, 291, 304-305).

Brackenridge also donated land that is Mahncke Park and the former Polo Field (Figure 3-2). The Polo Field was created ca. 1952 when the San Antonio Polo Club leased the field from the City for five years. After the Polo Club's lease expired, the field was then leased as a driving range. The field is now home to the Polo Field Golf Center.

Other Brackenridge Park benefactors include Emma Koehler, who donated lands west of the river, the site of the Confederate Tannery, and Bexar County, which contributed 10 acres west of the river, south of Mulberry Avenue, in honor of Judge James Davis (Pfeiffer 2010).

Historic Park Attractions

The project area crosses the northern portion of the Brackenridge Park Golf Course, which is the oldest municipal course in the state (Figures 3-2 and 3-3). The course was constructed under the direction of City Parks Commissioner Ray Lambert in 1915 and completed by 1917. A. W. Tillinghast of Philadelphia designed the course to incorporate the river's meanders (Pfeiffer 2010). A golf clubhouse was constructed in 1923 replacing a two-story building used by the San Antonio Jockey Club, which was organized in 1889. The Jockey Club and track were popular in the 1890s and early 1900s for both horse and bicycle racing. Weekly horse races were held on the track, which continued until 1910 (Katz and Fox 1979:19).

Under Ray Lambert, numerous other park attractions were developed, including Lion's Field playground (1916), Joske Pavilion (1926), the Municipal Zoo (1914), Eleanor Brackenridge playground, and a swimming beach (Figure 3-1 to 3-3). The Lambert bathing beach was opened in 1917 and remained open until 1950. Donkey rides were sponsored by the Rotary Club in the 1920s. The stone donkey barn today houses the Parks and Recreation offices. Lambert also converted the abandoned quarry into the Sunken Garden amphitheatre attraction and the surrounding buildings into a local crafts market (Pfeiffer 2010). He created the Japanese Garden, a lily pond, on the northern end of the Sunken Gardens, and to the south, he had the Texas Star Garden designed with rock and flowers (Pfeiffer 2010).

Few changes have occurred to Brackenridge Park since the 1940s. Construction on US 281 altered the golf course, the zoo has expanded, and new concessions and pavilions have been built (Pfeiffer 2010). The bulk of park property is still on land south of the river donated by George Brackenridge and land on the north side contributed by Emma Koehler and the original Spanish grant.

Archaeological Investigations in Brackenridge Park

Numerous archaeological projects have occurred in and near Brackenridge Park due in part to its wealth of historic and prehistoric resources. Much of this work was conducted by CAR and SWCA Environmental Consultants. The current study area crosses two sites (41BX264 and 41BX1396) previously examined by SWCA and others.

Brackenridge Park Survey

In 1977, Katz and Fox (1979) of CAR conducted an archaeological survey of Brackenridge Park to inventory all prehistoric and historic resources in the park. This included a pedestrian survey of the entire park but did not include subsurface excavations. They documented 4 prehistoric archaeological sites, 11 collecting localities (CLs), and 27 historic sites (Figure 3-1 to 3-3). The collecting localities were areas where artifacts were observed in quantities too low to be considered a site. The four prehistoric sites (41BX264, 41BX321, 41BX322, and 41BX323) contained debitage, stone tool fragments, and burned rock dating from the Early to the Transitional Archaic. From site 41BX264, the Polo Field Site, Katz and Fox recovered multiple tools including Pedernales, Nolan, and Castroville points, bone, mussel shell, debitage, and hearth features. Sites 41BX321 and 41BX322 were small lithic scatters, but site 41BX323, the Paddle Boat Concession Site, was more substantial and has seen additional archaeological excavations (see Houk et al. 1999; Meskill et al. 2000; Miller et al. 1999; Houk and Miller 2001; Houk 2002b; Figueroa and Dowling 2007). It was recorded as a large lithic scatter (300-x-75 m; 984-x-246 ft.) with at least 30 cm (11.8 in.) of cultural deposits below the ground surface, and it contained one Late Archaic Frio point.

The historic features included water control features, industrial features, and recreational features. Katz and Fox (1979) recommended nomination of Brackenridge Park to the National Register of Historic Places (NRHP) as a Historic District.

SWCA Water Main Survey

SWCA performed the archaeological survey and backhoe trench excavations ahead of installation of a 40.6 cm (16 in.) San Antonio Water System (SAWS) water main (Houk 2002a). This survey crossed three site boundaries (41BX264, 41BX1396, and 41BX321) discussed individually below. The pipeline began west of the San Antonio River on East Mulberry and was bored under River Road and the river. Then, on the east side of the San Antonio River, the pipeline was bored beneath large trees on the north edge of the golf course (and through the current APE and 41BX1396) and exited near the Catalpa-Pershing storm drainage channel at the northeast corner of the golf course. The pipeline turned south through the golf course, parallel to the ditch, and passed through site 41BX321. Extending southward, the pipe crossed the ditch, running parallel to the eastern side of Mill Race Road, and finally turned into the parking lot of the Brackenridge Golf Course Club House. SWCA did not recommend any archaeological work along the pipeline segment that ran through the current study area along Mulberry Avenue east of the river. They did excavate one backhoe trench west of the river on Mulberry and a series of backhoe trenches along the pipeline parallel to the ditch within the golf course (Figure 3-1). Cultural materials related to both 41BX264 and 41BX321 were observed in the backhoe trenches. Houk (2002a:10) found the paucity of materials, lack of buried features, and disturbed subsoil (in the case of 41BX321) did not warrant eligibility status as a State Archeological Landmark (SAL) or listing in the NRHP for either site based on his findings.

The Polo Field Site, 41BX264

The western portion of the current APE crosses site 41BX264, which is on the Brackenridge Driving and Practice Range and former Polo Field (Figure 3-2). The site was examined by Dunphy in 1963, by Fox and Katz in 1976 (Katz and Fox 1979), by Miller of SWCA in 2001 (Miller and Barile 2002), and by Uecker and Molineu (2004) of South Texas Archeological Research Services (STARS) in 2003. The site boundaries were determined by Katz and Fox based on a surface scatter of stone tools, faunal remains, debitage, and burned rock features. These boundaries were expanded after subsurface trenching during a renovation project of the driving range by Miller and Barile (2002), whose work included a surface survey and mechanical trenching of a 20-acre project area that encompassed the driving range from Mulberry Avenue in the south to the train track in the north and from North St. Mary's on the west to the San Antonio River on the east.

This project was undertaken ahead of construction on the driving range that involved extensive modifications to the landscape and renovations to the club house. Surface visibility was poor, but debitage was noted in the northern portion of the project area within the boundaries of site 41BX264. Eight backhoe trenches revealed a low density of lithic debitage, burned rocks, and tools, including one Langtry projectile point, from 5-130 cmbs (2.0-51.2 in.). However, most of these artifacts were within the upper 60 cm (23.6 in.) of disturbed deposits. SWCA concluded that, though intact cultural materials may remain on some portions of the site, they would not yield information important to prehistory, and therefore, the site was not recommended for listing on the NRHP or considered eligible as a SAL. This work revealed a larger site boundary than previously recorded though the northern extent remained undefined. They recommended monitoring during construction. This monitoring was

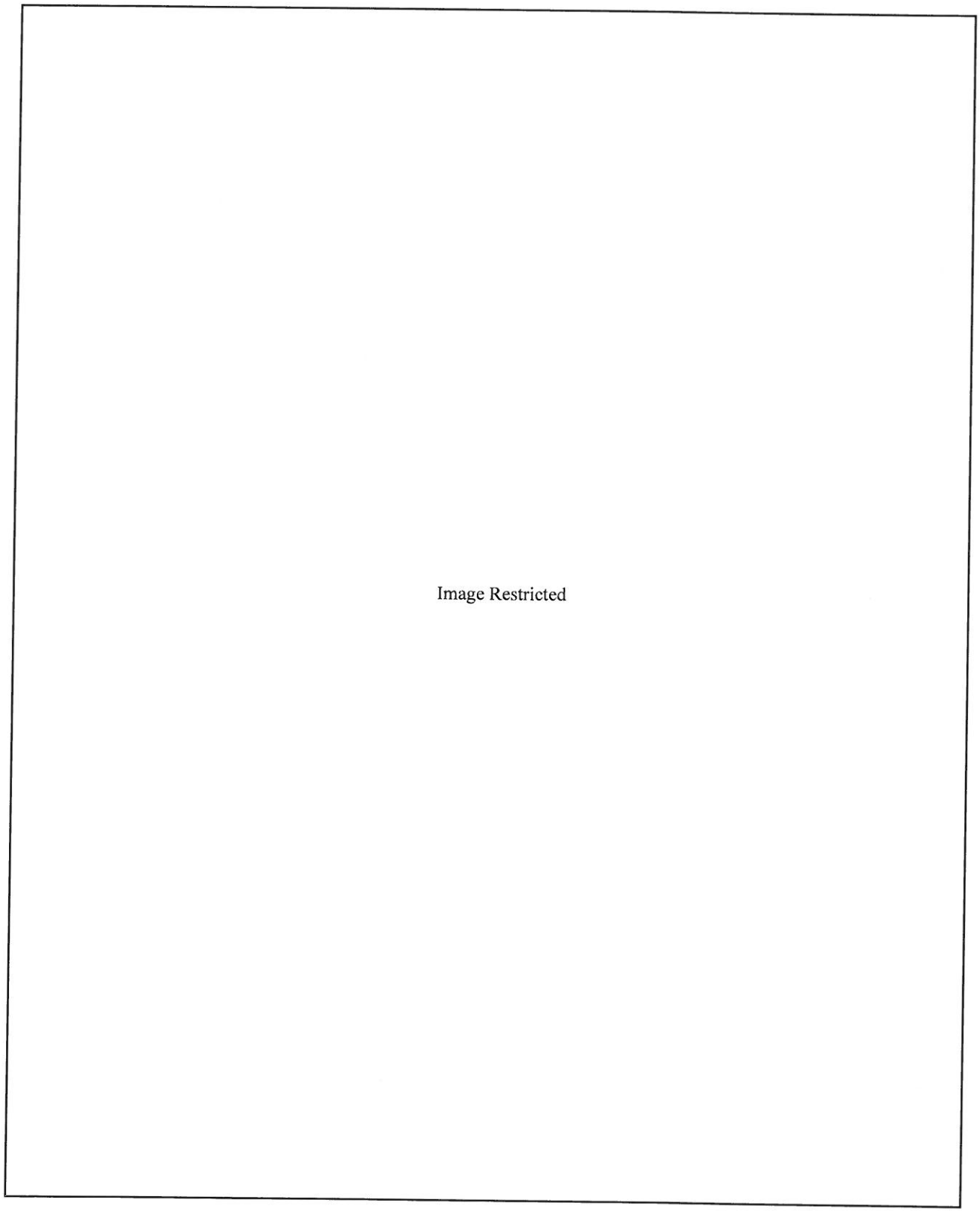

Figure 3-1. *Location of the backhoe trenches and pipeline in Brackenridge Golf Course.*

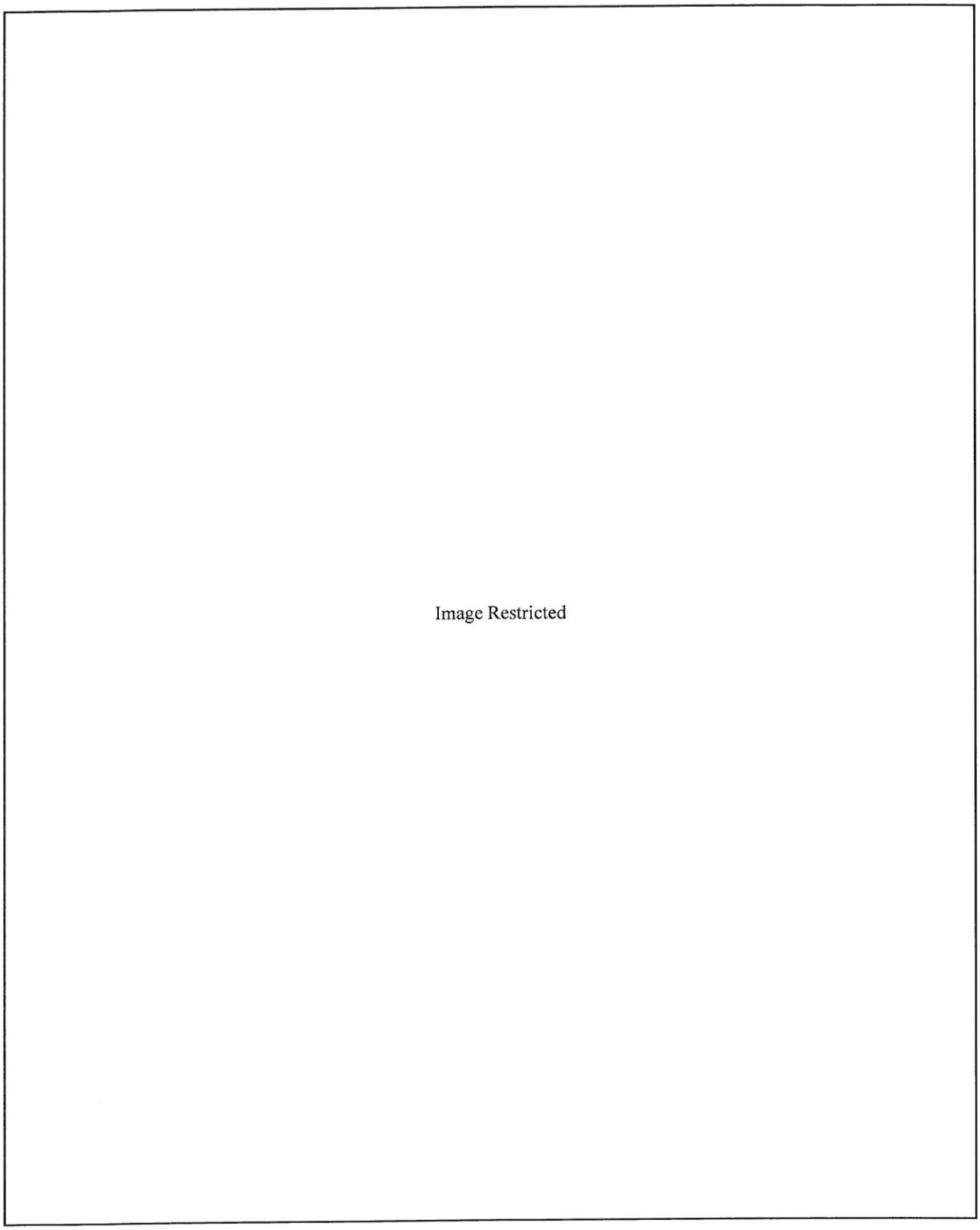

Figure 3-2. *Location of previous work at 41BX264.*

conducted by Uecker and Molineu (2004) in 2003. In the interim, Houk (2002a) recorded artifacts he considered part of 41BX264 south of Mulberry in a backhoe trench along a proposed pipeline.

Uecker and Molineu (2004) monitored excavations that exceeded 40 cmbs (15.8 in.) and conducted some data recovery excavations of features observed during scraping and trenching. They noted three distinct areas of cultural materials in the eastern portion of the site near the San Antonio River. Area A contained 36 burned rock clusters and associated cultural materials that were uncovered by paddle scraping. Three such clusters were identified in Area C from ground scraping. In Area B, two small burned rock clusters with other artifacts were identified in a trench wall. Features in Areas A and C were mapped and recorded but not investigated. These areas were covered with sterile sand and topsoil in efforts to preserve the deposits for future work. Limited data recovery efforts were conducted on features in Area B, which were hand excavated in a 1-x-2 m (3.28-x-6.56 ft.) unit. Artifacts recovered from scraping in Areas A and C include projectile points dating to the Middle to Late Archaic and to the Late Prehistoric periods. Some of the typed points include Marshall, Pedernales, Castroville, Langtry, Noland, and Travis. A Guadalupe tool fragment was also found. These investigations confirmed what previous archaeologists had reported, clusters of burned rock and associated chipped stone artifacts, which were also heat altered, scattered across the landform. Though the research potential was considered low, preservation of the deposits below the construction impact and outside the project area was deemed sufficient to recommend eligibility as a SAL, especially within 150 m (492 ft.) of the center of the river channel. The site also has historic elements that contributed to the site's eligibility for inclusion on the NRHP, SAL, and the City of San Antonio Historic Landmark or Heritage Property list. Historic overviews of the Polo Field are provided in Miller and Barile (2002), Houk (2002b), and Uecker and Molineu (2004).

41BX1396

In 2002, SWCA also conducted archaeological investigations in Brackenridge Golf Course for SAWS Water Recycling Program (Miller and Barile 2002). This work involved shovel testing and monitoring along a water line running parallel to the cart path at the 9th hole in the vicinity of two CLs (1 and 3) recorded by Katz and Fox (1979; Figure 3-1). Miller and Barile (2002) formally recorded 41BX1396 after observing an area dense with lithic materials including stone tools around Katz and Fox's CL1 and CL3 (1979).

Further impacts to 41BX1396 occurred with the installation of a 40.6-cm (16-in.) water main installed by SAWS in 2002 (Houk 2002a). As described above, a 40.6 cm (16 in.) water main was bored under the river and through the boundaries of 41BX1396 (Figure 3-3).

Site 41BX1396 was investigated by SWCA again in 2008 in conjunction with restoration of the golf course to its original design (Carpenter et al. 2008). This project involved complete assessment of cultural resources in the golf course, including sites 41BX1396, 41BX13, and 41BX321, and involved pedestrian survey, shovel testing, and data recovery. Backhoe trenches exposed cultural material (burned rock, debitage, tools, and bone) from the surface to approximately 70 cmbs (27.6 in.), the upper portions of which had been impacted by previous projects on the golf course. The data recovery excavations occurred to explore deeper deposits, 50-70 cmbs (19.7-27.6 in.). Carpenter et al. (2008) recommended the site is eligible for designation as a SAL.

During November 2010, CAR conducted a pedestrian archaeological survey of a proposed hike and bike path and in 2011, data recovery excavations of portions of site 41BX1396 in Brackenridge Park, San Antonio, Bexar County, Texas. The archaeological investigations were conducted under contract with Ford, Powell, and Carson Architects and Planners, Inc. and were sponsored by the San Antonio River Authority (SARA n.d.).

The APE of the project included a linear path along Mulberry Avenue in Brackenridge Park. The proposed trail routes 12 and 12b run along the south side of Mulberry Avenue from Avenue A to Avenue B on the northern edge of the Brackenridge Golf Course and along the north side of Mulberry from Red Oak to the Polo Field Golf Center. The impacts associated with the path included the installation of four light posts, three on the south side of Mulberry and one on the north side, installation of a fence line separating the south path from the golf course, the construction of stone retaining walls along the south route between the edge of Mulberry Avenue and the path, and the construction of a pedestrian bridge across the location of a historic water canal. Engineering plans showed that the southern path, utility trenches, retaining wall, fence posts, and one of the proposed light poles would transect the boundaries of site 41BX1396, a SAL. The path, a light post, and utilities passed through the boundaries of site 41BX264.

The pedestrian survey included 20 shovel tests (STs), 6 backhoe trenches (BHTs), and a visual inspection of the ground surface. Backhoe trenches were placed in areas of deep impact at three of the proposed locations of light posts, each side of the pedestrian footbridge, and directly across the roadway from site 41BX1396 to explore the extent of the site

boundaries. A backhoe was also used to expose a wing wall of the canal.

Two shovel tests along the trail section passing through 41BX264 contained cultural materials in disturbed strata. The integrity of the deeper deposits on 41BX264 within the APE is unknown in part because backhoe trenching was not possible here due to limited space. Backhoe trenching at the location of the light post was canceled because the APE was too narrow to investigate the deposits while also avoiding buried electric lines which run through the APE. Other investigators found cultural materials and features 40-60 cmbs (15.7-23.6 in.) at 41BX264. However, any deposits within the upper 1 m (3.28 ft.) of the site within the APE may have been disturbed from road, train track installation, and utility work here. Deeper impacts, such as those planned for light post installation, might disturb any archaeological deposits that could have survived because of their depth.

Data recovery excavations on site 41BX1396 included one backhoe trench and two 1-x-1 m (3.28-x-3.28 ft.) units excavated to approximately 2.45 m (8 ft.) below the surface. Early Archaic and possibly Late Paleoindian period artifacts were recovered from approximately 30-235 cmbs (11.8-92.5 in.), including three Guadalupe adzes, one small triangular dart point, one Gower dart point, one large adze fragment, and a rejuvenated Angostura dart point. Burned rock features were also documented at approximately 55 cmbs (21.7 in.; Features 1 and 2) and 115 cmbs (45.3 in.; Feature 3).

After the initial data recovery efforts, monitoring of the grading of the path of the trail occurred in March of 2011. The results of the monitoring were reported in a separate report as that portion of the project was done under an additional permit number. Several features relating to the Early Archaic period were encountered, recorded, and removed during the monitoring portion. The features were excavated in whole and returned to the CAR laboratory for to be screened, washed, and processed.

In addition to the monitoring, investigations were requested in areas to be deeply impacted with the installation of light posts. In April of 2011, three light post locations were singled out as having a high potential for producing intact deposits. One location was investigated with an auger test. Two other light post locations were investigated through the hand excavation of 4 1-x-1 m (3.28-x-3.28 ft.) units. All locations were excavated to an approximate depth of 2.5 m (8.2 ft.) below the surface. During the course of the excavations, two additional units were opened to further investigate a Paleoindian component encountered in Test Units 5 and 6. Artifacts recovered from the six units excavated during this next phase in the data recovery included a Clearfork Adze, Guadalupe tools, Angostura point, St. Mary's Hall points, and a Dalton point.

41BX13

Site 41BX13 was recorded in 1966 by Witte Museum staff. No other work is noted until SWCA's investigation in 2008 prior to the golf course restoration project noted above (Carpenter et al. 2008). At this time, the site boundaries were redefined based on surface inspection and backhoe trenching (Figure 3-1). Most cultural materials were found in a buried stratum 60-100 cmbs (23.6-39.4 in.) of the T2 terrace, though scattered burned rock and debitage were also noted eroding out of the surface of the T1 terrace in disturbed areas. The integrity of the deeper deposits contributed to the site's SAL eligibility.

41BX293

Site 41BX293 is located to the northwest of the APE and is situated on the San Antonio River's west bank. The prehistoric site was recorded in 1975 based on lithic debris and points uncovered in a flower bed of a private residence. No formal excavations were conducted at the site.

41BX321

In their survey of Brackenridge Park in 1976, Katz and Fox (1979) recorded 41BX321 on the eastern edge of the golf course (Figure 3-1). They noted the site was damaged by the large drainage ditch and sewer line but observed artifacts 30 cmbs (11.8 in.). The site was mentioned again in 2002 during backhoe trenching for the water main (Houk 2002a). Cultural materials seen in BHTs 5 and 6 of this work were attributed to 41BX321, though the site boundaries were not revised (Figure 3-3). A few artifacts were noted 80-100 cmbs (31.5-39.4 in.) in these trenches. The quality of the deposits and the quantity of artifacts were not sufficient to recommend further testing. Houk (2002a) did not recommend SAL eligibility for 41BX321.

Site boundaries were explored in 2008 when SWCA returned for the golf course restoration project (Carpenter et al. 2008). Three backhoe trenches excavated here revealed 20-50 cm (7.9-19.7 in.) of fill, some debitage, and burned rock. The burned rock was found in Trench 3, 110 cmbs (43.3 in.). Carpenter et al. (2008) concurred with Houk's (2002a)

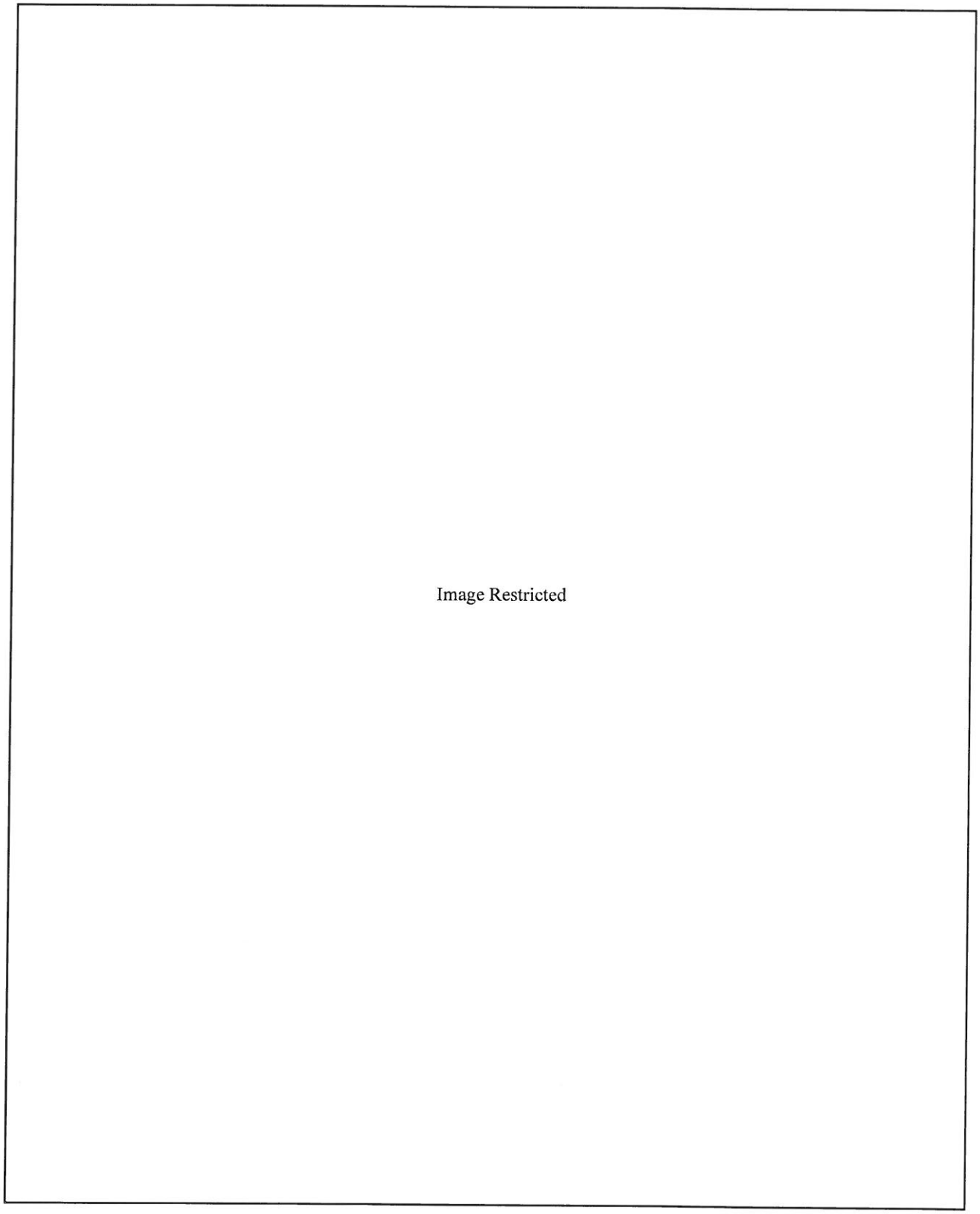

Figure 3-3. *Location of previous work at 41B1396.*

previous recommendations that the site was ineligible for SAL status.

The Paddle Boat Concession Site, 41BX323

Site 41BX323 has seen excavation by CAR, the Texas Archeological Research Laboratory (TARL), and SWCA since it was first identified in 1979 during the Brackenridge Park Survey (Katz and Fox 1979). TARL conducted testing and data recovery excavations on the eastern portion of the site in 1995 for the Witte Museum H.E.B. Science Tree House (Meskill and Frederick 1998; Meskill et al. 2000). These archaeological and geological investigations identified Archaic components with burned rock features, lithics, and floral and faunal remains in twenty-three test units. Meskill et al. (2000) concluded that the site had been impacted by natural erosion and bioturbation.

From 1997 to 1999, SWCA conducted testing and data recovery at the site ahead of construction of the proposed water pipeline for the SAWS Water Recycling Program. The initial testing included backhoe trenches, mechanical augering, and hand excavation of test units (Houk et al. 1999; Miller et al. 1999). Chipped stone and lithic tools, burned rock features, and ceramics were found across the tested area. The results suggested that Early Archaic and Late Prehistoric materials were compressed within the upper 1 m (3.28 ft.) of the site's deposits. Miller et al. (1999) determined that the site was potentially eligible for listing as an SAL and recommended avoidance of the site for data recovery.

Houk et al. (1999) report on the data recovery that followed these recommendations. They targeted Archaic deposits with intact burned rock features in two locales (including a burned rock midden) and a shallow Late Prehistoric component in another. The block excavations found the site dates primarily to the Middle Archaic but also has Late and Transitional Archaic components with a near-surface Late Prehistoric component.

Nordt (1999) conducted a geomorphological study of the site during the data recovery excavations. He observed the site occupied two terrace landforms which were associated with four stratigraphic units. Lower levels of Unit 3 date to the Middle and Late Archaic periods, and the upper portion of Unit 3 date to the Late Prehistoric. Compression and bioturbation were again observed and thought to have negatively affected the deposits. The site was determined to be a SAL after this data recovery work.

SWCA returned to 41BX323 in 2000 to conduct auger testing as part of the Brackenridge Park Rehabilitation Project Survey (Houk and Miller 2001). The auger testing confirmed that intact deposits were located in the western portion of the site, which prompted additional testing in 2002 (Houk 2002b). Testing concluded that Late Prehistoric materials may be better preserved on the site south of Tuleta Drive, where minimal park development and erosion occurred.

In 2007, CAR conducted eligibility testing at 41BX323 at the location of a proposed parking garage facility (Figueroa and Dowling 2007). CAR's testing expanded the site boundaries south with evidence of Late Prehistoric and Archaic occupations recovered. Artifact recovery was sparse, and the southeastern portion of the site was not found to contribute to the site's significance.

Second Water Works and Canal

The Second Water Works Canal is a long, linear, earthen canal that extends from Tuleta Drive south through the park to Mulberry Avenue where it is exposed as it crosses into the golf course, heads to the site of the Second Water Works building, and re-enters the San Antonio River (Figure 3-1). Although the feature is sometimes referred to as a "mill race", it was not connected to a mill. Canal width varies from 10-30 m (32.8-98.4 ft.) with 2-3 m (6.6-9.8 ft.) high berms on each side in a section north of Mulberry Avenue (Miller et al. 1999:3; Figure 3-4). The berms were likely constructed from intact deposits within the canal. Wing walls of this canal are exposed within the current APE just south of Mulberry Avenue on the northern edge of the golf course. A good view of the canal route appears on a 1905 map of the area. The canal is associated with the Second Water Works that was started in 1886 after the previous water works system failed.

The first water works system built in 1877-1878 included a pump house and series of canals that pumped water to a reservoir in Mahncke Park. Water flowed downhill to customers through cast iron mains. The first water works system failed to attract enough customers, so ownership transferred to George Brackenridge, who successfully ran the Second Water Works from 1883 until the turn of the century. Brackenridge expanded the system by constructing a two-story limestone structure and canals which connected the original pump house in the north to this new structure in the south. The second pump house stands south of the golf course and was listed on the NRHP in 1981 (Figure 3-5). Demand eventually outpaced the Second Water Works capacity, and the entire operation closed at the turn of the twentieth century (Katz and Fox 1979:14). The city purchased the water works in 1925.

SWCA conducted archaeological investigations of the Second Waterworks Canal in 1997 (Miller et al. 1999). This was to record the structure and to assess its preservation.

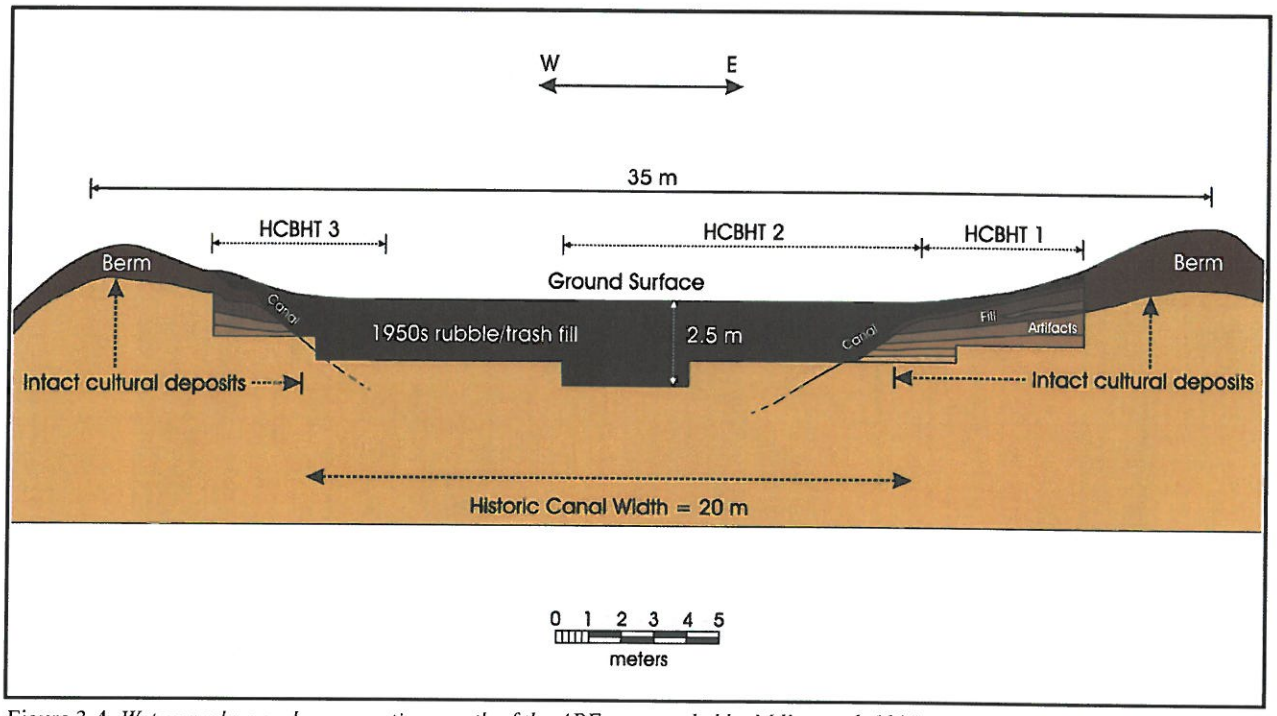

Figure 3-4. *Water works canal cross section, north of the APE as recorded by Miller et al. 1999.*

Three backhoe trenches were excavated in the northern end of the canal near its juncture with the San Antonio River. Two more trenches were placed near Mulberry Avenue. These provided a cross-sectional view of the canal and berms between Mulberry Avenue and Tuleta. Miller et al. (1999:43) reported the canal narrows from 20 m to 10 m as it approaches Mulberry and reaches depths below 2.5 m (8.2 ft.). The ground surface on which the berms were constructed was evident in the berm profiles as were intact prehistoric deposits beneath the berms along the canal (Miller et al. 1999:43). They found the canal was filled in the 1950s or 1960s with modern concrete, limestone blocks, asphalt, gravels, and recent trash (Miller et al. 1999:45).

Historic Properties

There are several historical properties located in the vicinity of the APE but not associated with the park. The river crossing Paso de Tejas was thought to be in the area and has been mentioned in historic documents (Cooley 1900; Cox 2005). These anecdotal accounts place the crossing at two different locations, one north and one south (near Lone Star Brewery) of the APE. However, one map dated 1879 shows the crossing within the site boundary of 41BX1396 near Katz and Fox's CL 1 and to the north of the Zambrano House. While this is the only definitive location pinpointed on a map based on the historical record, it should not automatically discount other sources mentioning the crossing. It is possible that the same or similar names were used for multiple crossing locations along the river in San Antonio.

Located to the west of the current APE is the San Antonio Water Works Pump Station No. 2, also known as the Millrace Building. The structure is listed on the National Register of Historic Places. The structure was constructed of rough faced limestone and a wooden frame addition. The stone portion of the building was constructed in 1885. The building was used as the Millrace Pump Station until 1915. Later, the building was occupied by Gutzon Borglum, a renowned sculptor, and was used as a studio until 1934. After the departure of Borglum, the Witte Museum convinced the City to allow the structure to continue to be used as an art studio. In 1934, the studio was converted into an art school, which was later moved to the McNay property in 1942, however, the building reverted back to being used as a studio until 1961 when it was finally vacated.

To the west of the APE is the possible location of the Garza Mill. Not much is known about the mill, but historic records indicated that the Garza family purchased a parcel of land in the southern portion of what is today Brackenridge Park. The family is said to have built a gristmill on the eastern bank of the river sometime after 1823 (Cox et al. 2002). The exact location has yet to be determined.

A lateral branch of the *Acequia Madre* (Alamo *Acequia*) runs near the current APE. The construction of the *Acequia Madre* began in 1719 and was the major source of water to the crop lands located in the vicinity as well as for the community that grew up around San Antonio de Bexar. The lateral branch runs through the southern portion of the APE and connects into another lateral branch located to the southwest before re-entering the San Antonio River. Recent excavations on the Witte grounds found evidence of the head of the *Acequia Madre*. The *acequia* would have originated at the Alamo Dam and traveled south to re-enter the river south of Mission San Antonio de Valero. Several *desagues* and inlets were located along the path of the *acequia* to control the flow of water. The portion of the *Acequia Madre* that runs through the current APE is one of the *desagues* that would have allowed water to flow back into the River at a point north of the modern I-35.

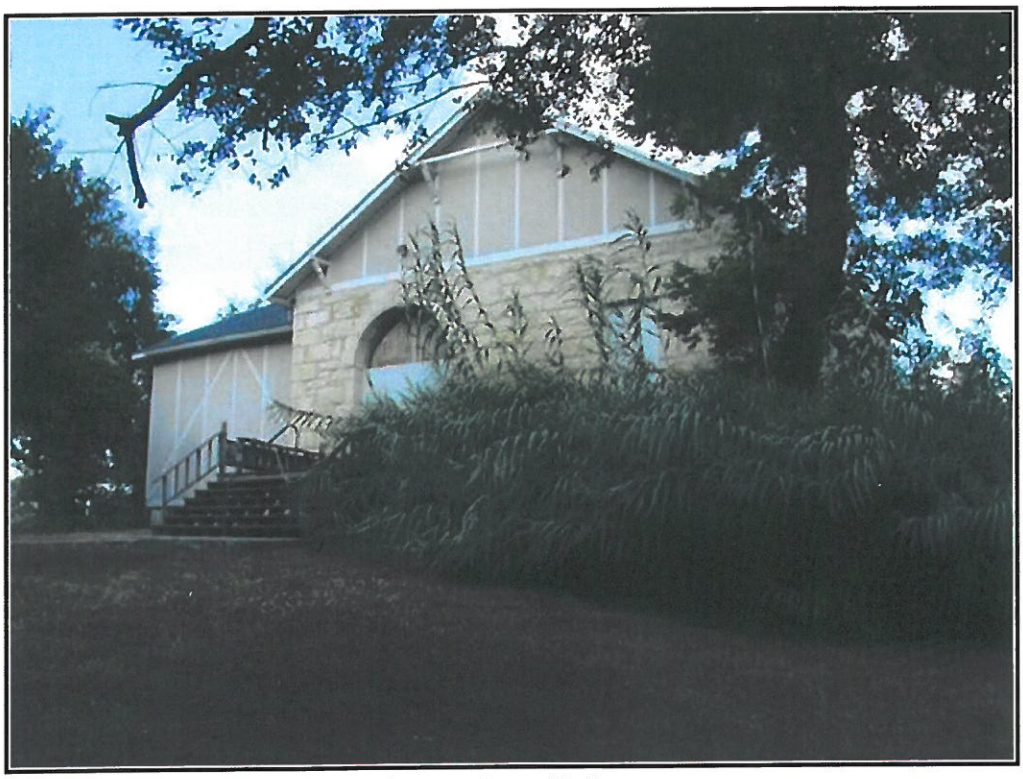

Figure 3-5. *The San Antonio Water Works Pump Station No. 2.*

Chapter 4: Archaeological Field and Laboratory Methods

Field Methods

CAR investigated the APE through backhoe trenching. Eleven backhoe trenches were initially proposed. Each trench was at the location of a light post, except for the two posts that are located on either side of the Catalpa-Pershing drainage channel and one near the intersection of Mill Race Road and Avenue B (Figure 1-2). These were not excavated due to the extensive construction disturbance in the vicinity of the ditch. The locations of the light posts were determined by the master plan of the hike and bike trail. Following the Dig Test inspection of the APE by several agencies, it became evident that the northern portion of the APE was heavily impacted by the installation of buried utilities, and as a result, it was deemed both unsafe to investigate and unlikely to expose undisturbed deposits. Therefore, the backhoe trenching concentrated on the excavation of the five light post locations found within the Golf Course proper and at the southern end of the project area.

All trenches excavated during the project were approximately 1 m (3.3 ft.) in width, 1.6 m (6 ft.) in depth, and 3 m (9.9 ft.) in length. Both walls of each trench were examined for the presence of cultural materials and features. Selected representative portions of one wall of each trench were profiled, and all artifacts and features present in the wall were noted. The backdirt that resulted from the excavations was also observed to determine if any cultural material was present. No screening of soil was conducted during the course of the project. All cultural materials were returned to the CAR laboratory for processing and analysis. Following analysis, all materials were curated at the CAR facility.

Laboratory Methods

All diagnostic cultural materials and records obtained and generated during the project were prepared in accordance with federal regulation 36 CFR part 79, and THC requirements for State Held-in-Trust collections. Additionally, the materials have been curated in accordance with current guidelines of the CAR. The materials collected and processed in the CAR laboratory were washed, air-dried, and stored in 4-mil ziplocking archival-quality bags. Acid-free labels were placed in all artifact bags. Each laser-printed label contains provenience information and a corresponding lot number. Artifacts were separated by class and stored in acid-free boxes identified with standard tags. Field notes, forms, photographs, and drawings were placed in labeled archival folders. Digital photographs were printed on acid-free paper, labeled with archivally appropriate materials, and placed in archival-quality sleeves. All field forms were completed with pencil. Any soiled forms were placed in archival-quality page protectors. Ink-jet produced maps and illustrations also were placed in archival-quality page protectors. All collected materials and project related documentation are permanently housed at the CAR.

Chapter 5: Results of Investigations

During the course of one day, five backhoe trenches were excavated in the area of the APE that was not riddled with utilities. These trenches were located at the sites of the proposed light posts that were to be placed south of the water tower (Figure 5-1). This area was cleared by Texas One Call and SAWS prior to trenching. Discussion with Chuck Luedemann at the site indicated that the light posts were only to impact approximately 1.8 m (6 ft.) below the surface. The proposed trail was to follow a path that would run past each of the light post locations.

Each trench was approximately 3 m (9.8 ft.) in length. Depths varied from 160-180 cmbs (63-70.9 in.). After each trench was examined, they were backfilled. No trench was left open at the finish of the project. The location of each trench was marked by the client prior to the arrival of CAR archaeologists.

Backhoe Trench 1

Backhoe Trench (BHT) 1 was located nearest the end of the portion of the finished trail, just to the southeast of the tee box. BHT 1 was orientated east/west. The trench was excavated to a maximum depth of 180 cm (70.9 in.) below the surface. The trench was approximately 3-m (9.8-ft.) long and 70-cm (27.6-in.) wide with one side benched for better access. The upper layers of the trench appeared to exhibit disturbance (Figure 5-2). The upper 20 cm (7.9 in.) contained leaf litter and modern trash. In the eastern portion

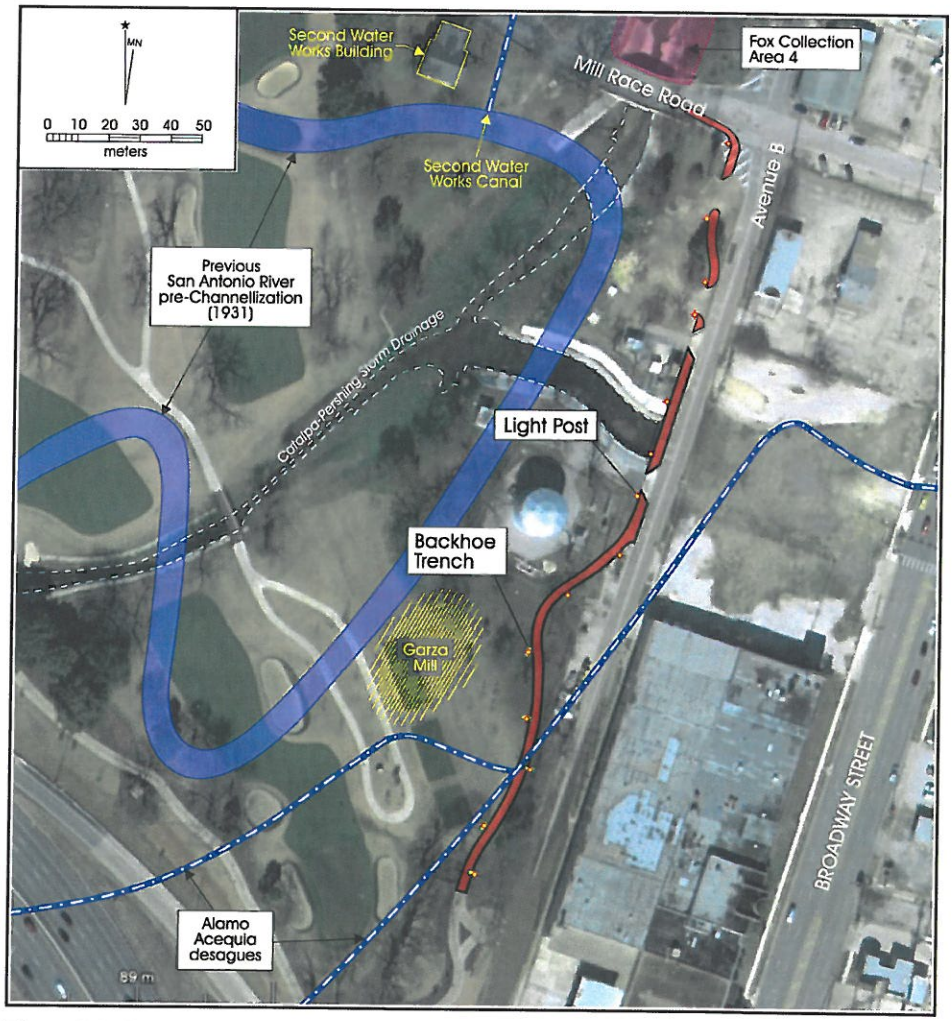

Figure 5-1. *Location of the proposed trail and light posts and the excavated backhoe trenches.*

of the trench, a metal pipe was encountered. At the time, the use of the pipe was not known, and it was speculated that it could be an old gas line. The soil from 20 cm (7.9 in.) to approximately 75 cm (29.5 in.) below the surface appears to have evidence of disturbance with the presence of pull tabs and other modern trash.

Below the disturbed soils, excavations revealed a lighter reddish soil. This layer extended from approximately 75 cmbs (29.5 in.) to 140 cmbs (55 in.). The soil gets lighter as it gets deeper (note transition in profile), and this may be related to an increase in snail shell fragments as it nears 140 cmbs (55 in.). Beneath the reddish soil was a caliche soil that extended to a depth of approximately 175 cmbs (68.9 in.). Four lithic flakes were recovered from the backdirt that are possibly related to the area of the soil change at approximately 140 cmbs (55 in.). No large concentrations of lithics were encountered, and it appeared that the few flakes recovered from the backdirt may represent an ephemeral lithic scatter. The layer did not appear to have significant cultural remains. A light, reddish soil was noted just below the caliche, approximately 5-10 cm (2-4 in.) thick, but this level appeared to have no cultural material. The matrix at this level was a fine, compacted silt.

Backhoe Trench 2

Backhoe Trench 2 was located to the north of BHT 1. The trench was situated on the eastern edge of the berm for the tee box. BHT 2 was orientated north/south. Although the trench was benched on both sides, it was approximately 3 m (9.8 ft.) in length, 70 cm (27.6 in.) in width, and 160 cm (63 in.) in depth. The upper layers of soil were disturbed. A few burned rock fragments were noted during the excavation but were deemed to be in mixed context once a layer of red sand was encountered. The red sand layer was located approximately 70 cm (27.6 in.) below the surface and was approximately 8 cm (3.1 in.) thick (Figure 5-3). Below the sand layer, a layer of compacted soil that is likely related to the sand is present. This level is approximately 8 cm (3.1 in.) thick as well. Below this compacted layer, the soils appeared to be a dark clay loam. The remainder of the profile comprises two layers. Although it is suspected that the soils are native, these layers contained no significant cultural deposits.

BHT 2 did not produce any significant cultural material. The presence of the red sand indicates the amount of disturbance related to the construction of the berm for the tee box to a depth of approximately 90 cm (35.4 in.) below the surface.

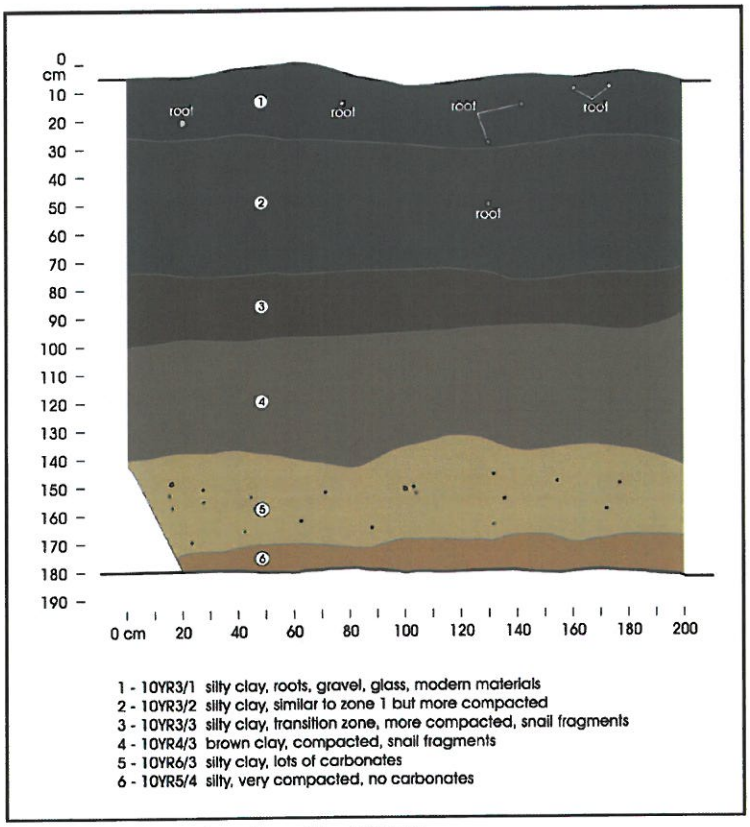

Figure 5-2. *The south wall profile of BHT 1.*

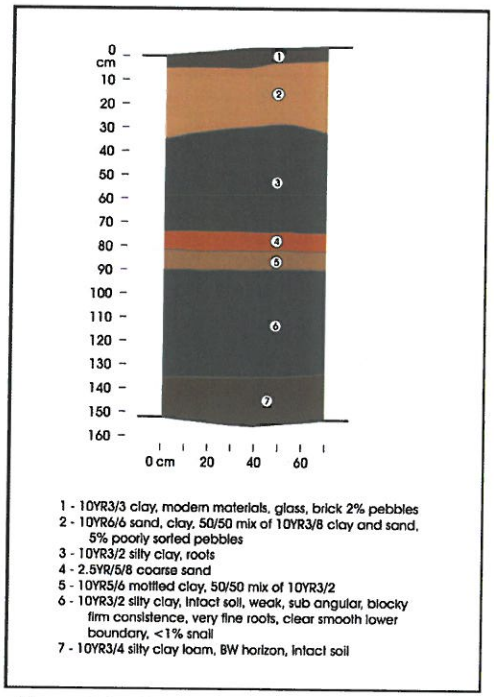

Figure 5-3. *The south wall profile of BHT 2.*

Backhoe Trench 3

Backhoe Trench 3 was located to the northeast of BHT 2. This trench was located closer to the current fence line along Avenue B. The trench was situated in a northeast/southwest direction and was approximately 3 m (9.8 ft.) in length. The trench was approximately 70-cm (27.6-in.) wide with a bench on one side. The trench was excavated to a depth of 170 cm (67 in.) below the surface. Four stratigraphic layers were noted in this trench. The soil was dark brown throughout with slight variations in color and texture or inclusions (Figure 5-4). The upper 60 cm (23.6 in.) was composed of the mixed soils that exhibited both modern trash (glass fragments, metal fragments, and pull tabs) and a lithic core. The core was recovered from the profile at approximately 50 cm (19.7 in.) below the surface. A lithic flake was recovered from the wall at approximately 160 cm (63 in.) below the surface. The flake was noted during the profile of the trench.

In the eastern portion of the trench, a metal pipe was encountered. It is likely that this pipe is the same as the one encountered in BHT 1. The pipe was located approximately 40 cm (15.7 in.) below the surface. The trench was moved slightly to the east to avoid the pipe as it was not known whether the pipe was still active.

No significant cultural material was noted in the backdirt. The upper layers of soil removed had modern trash in the form of glass fragments, pull tabs, plastic wrappers, and bottle caps. No other material was noted in the backdirt.

Backhoe Trench 4

Backhoe Trench 4 was located north of BHT 3 along the fence line adjacent to Avenue B. The trench was approximately 3 m (9.8 ft.) in length, 70 cm (27.6 in.) in width, and 180 cm (70.9 in.) in depth. The soils resembled those which were in BHT 3. The upper layers were humus rich and contained modern trash in the form of clear and brown glass, pull tabs, soda can fragments, and plastic wrappers. As the trench was excavated, the soil encountered continued to be strong brown in color, and the clay content increased. No other material was noted in the backdirt or in the profile of the trench. Due to the similarities, the trench was not profiled.

A metal pipe was encountered in the eastern portion of the trench. The pipe was located approximately 30 cm (11.8 in.) below the surface. When the backhoe encountered the pipe, the pipe was caught in the bucket teeth and was pulled. The end of the pipe was noted at this point and indicated that the pipe was no longer active. This is likely the same pipe that was encountered in BHTs 1 and 3. It is possible that it is an old gas line that is no longer in use.

Backhoe Trench 5

Backhoe Trench 5 was located north of the large pecan tree, which is south of the water tower and utility area. The trench was approximately 3 m (9.8 ft.) in length, 160 cm (63

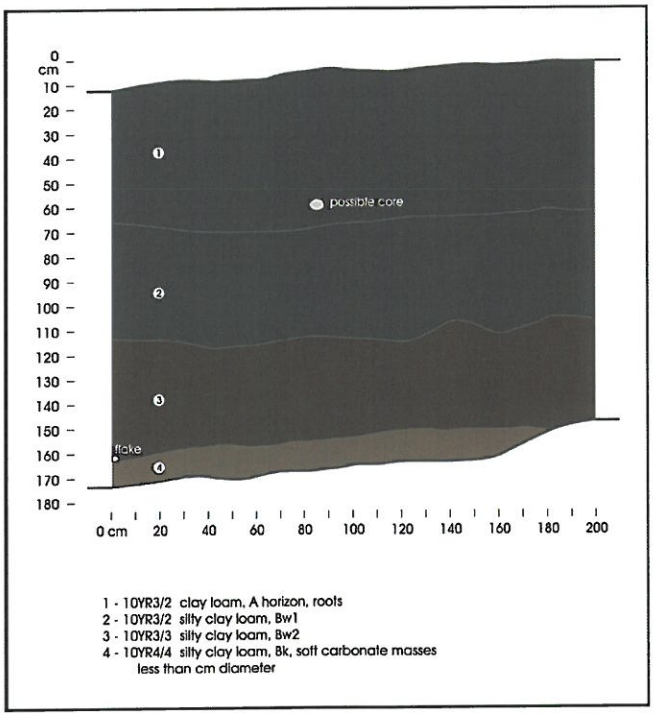

Figure 5-4. *The south wall profile of BHT 3.*

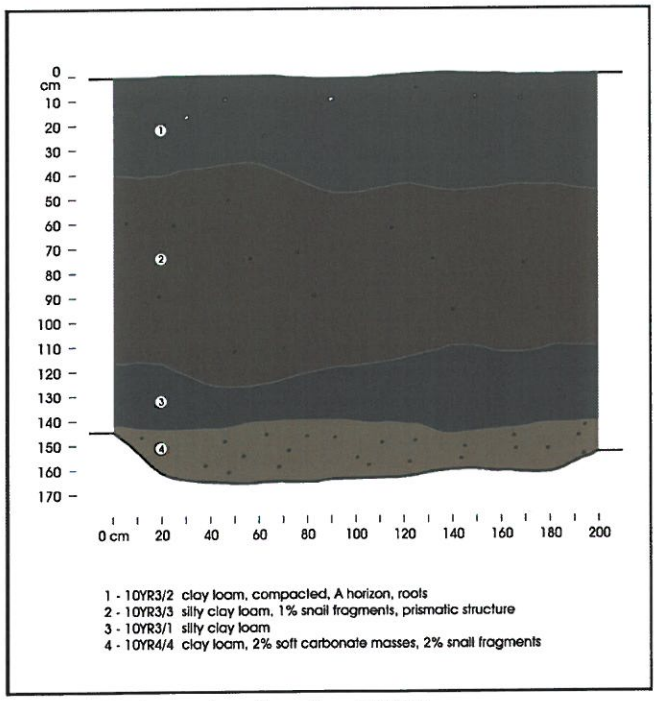

Figure 5-5. *The south wall profile of BHT 5.*

in.) in depth, and 70 cm (27.6 in.) in width with benching on one side. The soils in this trench were very similar to those encountered in BHTs 3 and 4. The humus rich upper layers contained modern trash. Material encountered, but not collected, included a plastic comb, clear and brown glass fragments, bottle caps, and plastic fragments.

The soils consisted of dark brown clay loams with the last 25 cm (9.8 in.) of the trench consisting of soil that exhibited carbonates (Figure 5-5). No significant cultural material was encountered during the excavation of the trench or noted in the backdirt.

Site 41BX1899

Site 41BX1899 was designated as a prehistoric archaeological site (Figure 5-6). Its limits are defined strictly on the presence of buried artifacts in the two backhoe trenches excavated along the hike and bike trail. The deposits are distributed over an area measuring roughly 50 m (164 ft.) in length. BHTs 1 and 3 produced a total of six prehistoric artifacts. Four artifacts were recovered from BHT 1 in a transitional zone between a reddish soil and a caliche deposit. These artifacts consisted of three lithic flakes and one retouched flake. The artifacts were recovered from the backdirt but likely originated approximately 140 cm below surface. Two artifacts were recovered from the profile of BHT 3. No cultural material was recovered from the backdirt. At approximately 50 cm (19.7 in.) below the surface, a lithic core was encountered in the trench profile. At approximately 160 cm (63 in.) below the surface, one lithic flake was recovered from the wall. None of the artifacts are temporal diagnostics, and therefore, it is not possible to determine the age of the prehistoric component. However, given that at least some of the artifacts appeared to sit within a transition zone that was also noted at 41BX1396 at the north end of the Municipal Golf Course, it is possible that the cultural materials are of Early Archaic affiliation.

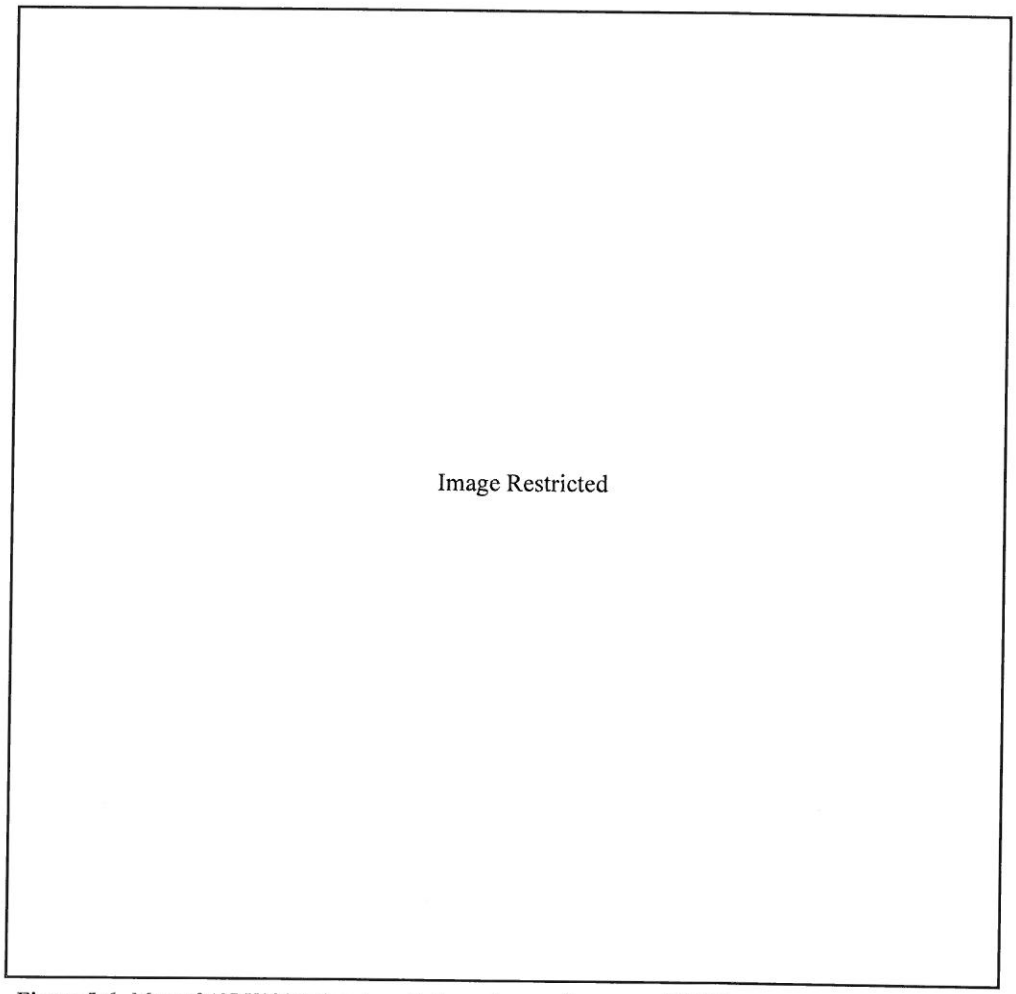

Figure 5-6. *Map of 41BX1899 showing site boundary and excavated BHTs.*

Chapter 6: Geomorphological and Geoarchaeological Investigations

Introduction and Objectives

This section documents the results of geomorphological and geoarchaeological studies conducted concurrently with an intensive archaeological survey of a portion of Trail 11 in Brackenridge Park, San Antonio, Bexar County, Texas. The project area is located within Brackenridge Park, along the west side of Avenue B, and between Mill Race Road and an area just north of US Highway 281. Given the unknown thickness of Holocene-age alluvial deposits in this area, a geomorphological and geoarcheological assessment was conducted. The overall purpose of these investigations is to provide a stratigraphic and pedologic framework for evaluating the potential for archeological site visibility and preservation. Toward this end, the specific objectives are to: 1) construct a geomorphic map of the study area, 2) conduct field morphological descriptions of soils and alluvial stratigraphic units, and 3) develop a model to predict the presence/absence of cultural materials by reconstructing the alluvial history of the study area.

Physical Setting

Background research has indicated that the original San Antonio River channel alignment was channelized in 1931. Prior to this date, the channel would have run nearly parallel to and approximately 50 m (164 ft.) west of the APE. While the entire surrounding area has been completely urbanized and modified, soil-geomorphic relationships could be established through comparisons of USGS topographic maps, aerial photographs, *Geologic Atlas of Texas* sheets from the Bureau of Economic Geology, and the United States Department of Agriculture-Natural Resources Conservation Service (USDA-NRCS) soil survey for Bexar County, Texas. Such analysis is useful for differentiating the extent of various geomorphic surfaces (i.e., terraces, floodplains) in order to facilitate geomorphic interpretations.

The San Antonio River begins in northwestern Bexar County where it drains primarily shales, siltstones and limestones of the Upper Cretaceous Eagle Ford Group (Kef), chalk and chalky marl from the Pecan Gap Chalk (Kpg), and marl, clay, sandstone, and siltstone from the undivided Upper Cretaceous Navarro Group and Marlbrook Marl (Kknm) (Barnes 1974). In the upper portion of the stream reach, Quaternary terrace deposits flank the modern stream channels and are narrowly confined by resistant bedrock valley walls. Downstream from the study area laterally extensive Quaternary-age terrace deposits occur to the west with Uvalde Gravel deposits (Qtu) widely distributed to the east. South of the project area these deposits unconformably overlie progressively younger and more easily erodible fluvial-deltaic deposits associated with the Eocene-age Wilcox and Midway Groups. The Wilcox Group (Ewi) consist mostly of mudstone with varying amounts of sandstone, while the Midway Group comprises light gray to dark gray clay, sand, sandy silt, and mudstone (Barnes 1974).

Along the San Antonio River, terrace soils are well-drained and are mapped mainly as Lewisville silty clay (LvA), which formed in Quaternary-age alluvium (Taylor et al. 1962). The Lewisville series consists of moderately deep, dark colored, nearly level alluvial soils that occur on terraces bordering the San Antonio and Medina Rivers (Taylor et al. 1962). Descriptions of this series indicate a grayish brown silty clay surface layer 61-cm (24-in.) thick, over a brown silty clay subsurface layer. Lewisville soils are not found directly within the APE but do occur on the adjacent terrace landforms that are mapped immediately to the south of the project area. Frequently flooded, Trinity and Frio soils (Tf) are commonly mapped along floodplains in the northern and central parts of Bexar County, and these soils are generally flooded at least once a year. The surface layer ranges from clay loam to gravelly clay with a clayey subsurface layer. Parent materials for these soils are Holocene age clayey alluvium (Taylor et al. 1963). As such, they are presumed to have high geoarchaeological potential. The project APE is entirely within an area mapped as Trinity and Frio soils.

Methods

Five backhoe trenches (BHTs) were excavated in the APE to depths ranging from 150-180 cmbs (59-70.9 in.). A representative profile section within each trench was hand-cleared and plucked, and standard field morphological attributes were recorded. The soil column was subdivided into genetic soil horizons based on observable soil properties. Each horizon was described following the USDA-NRCS standards for soil profile descriptions (Schoenberger et al. 2002). These descriptions included horizon, color, texture, roots, structure, consistence, percentage of coarse fragments, carbonate abundance, type, and morphology (e.g., stage), the presence/absence of features, and any other salient pedogenic features. Each profile was photographed, and trenches were backfilled after field descriptions were completed.

Alluvial Stratigraphy

The major geomorphic landforms within and adjacent to the study area include a Pleistocene age terrace (T-1) underlain by Unit I alluvium and a Holocene age floodplain (T-0) consisting of Unit II alluvium that is inset to and overlies portions of T-1 (Figure 6-1). Intervening uplands between major drainages consist of Upper Cretaceous Navarro Group and Marlbrook Marl (Kknm). East of the study area these uplands are mantled with a lag deposit of Plio-Pleistocene Uvalde Gravel deposits.

Terrace (T-1)

The surface expression of the T-1 terrace is located adjacent to the south end of the APE. This terrace is represented on *Geologic Atlas of Texas* maps as fluviatile terrace deposits (Qt) that are late Pleistocene age. These terraces are described as occurring mostly above flood levels along entrenched streams. Fluvial morphological features such as point bars, oxbows, and abandoned channels segments are often preserved in these deposits (Barnes 1974). The T-1 terrace lies stratigraphically below and post-dates the extensively distributed Uvalde Gravel deposits located to the east. Remnants of the T-1 terrace are mapped on both sides of the river in the study area, which indicates an ancient valley width of at least 1 km (0.6 mi.). Unit I alluvium beneath the T-1 terrace most likely rests unconformably on the Upper Cretaceous Navarro Group and Marlbrook Marl bedrock though the depth of this unconformable contact is currently unknown. A truncated portion of the terrace was encountered near the base of the backhoe trenches beneath a wedge of Holocene-age floodplain alluvium (Figure 6-2). While the lower facies of Unit I were not observed during the

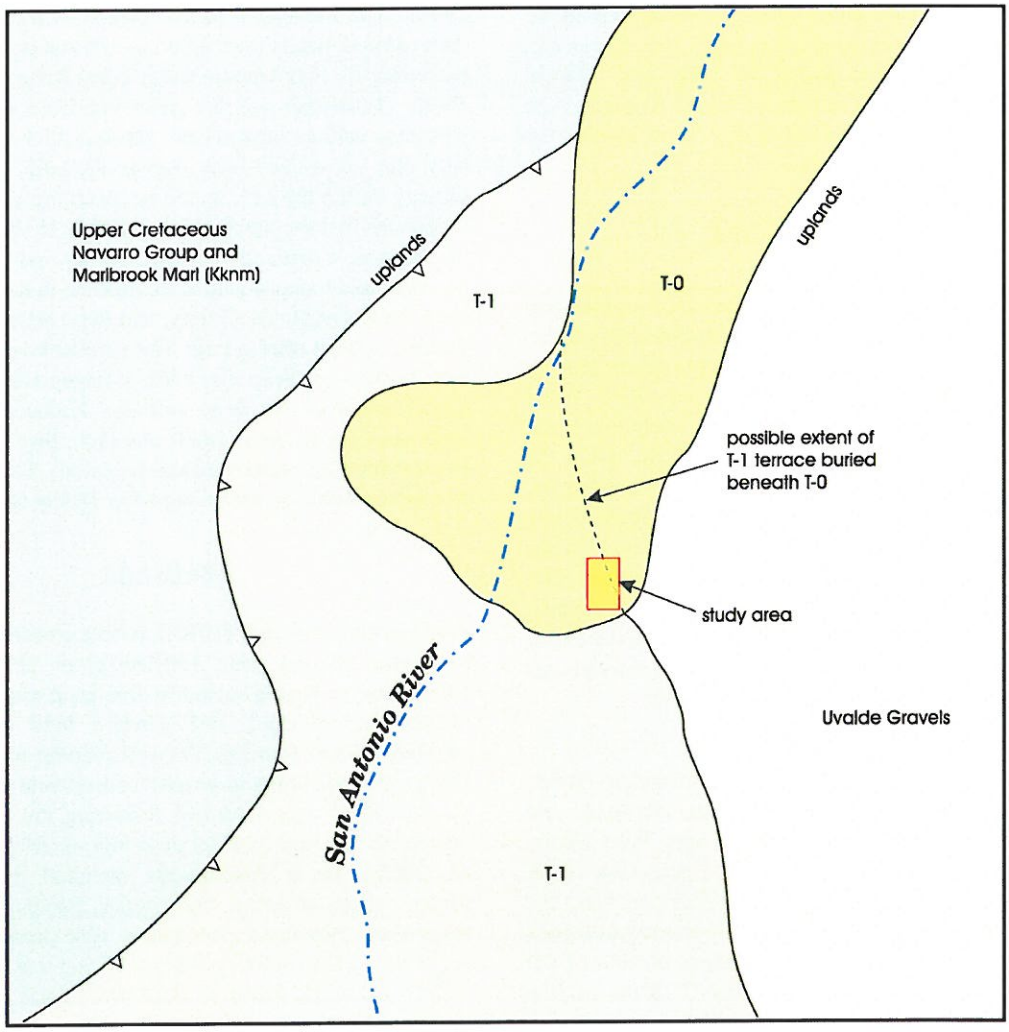

Figure 6-1. *Geomorphic map of the study area.*

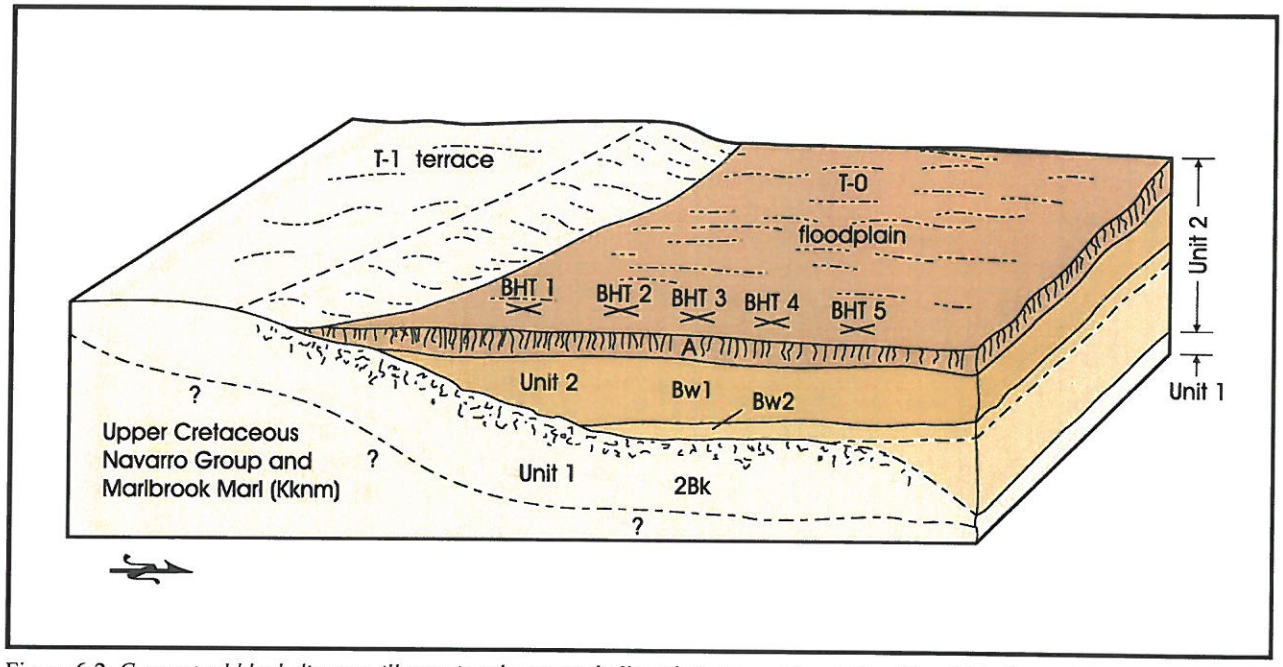

Figure 6-2. *Conceptual block diagram illustrating the general alluvial stratigraphic relationship within the project area.*

project, geologic descriptions suggest that they likely consist of laterally accreted channel gravels that fine upward into vertical accretion facies of sands, silts, and loams (Barnes 1974). The upper facies of Unit I were encountered in the lower reaches of BHTs 1 and 3-5 though it appears that it was previously scoured and truncated and thus lacks any vestiges of older A horizons (Figure 6-3). The observable portion of Unit I alluvium consists of a dark yellowish brown clay loam 2Bk horizon (2=discontinuity) exhibiting weak fine subangular blocky structure and firm consistence. Inclusions of common to many secondary soft masses and nodules, <5 mm (<0.2 in.), of pedogenic calcium carbonate were observed. No cultural materials were identified within the Unit I deposits.

Floodplain (T-0)

The floodplain (T-0) consists of a thick wedge, 140-160 cm (55-63 in.), of Holocene-age Unit II alluvium. This unit is laterally inset to and partially overlies portions of Unit I within the T-1 terrace (Figure 6-2). All backhoe trenches (BHTs 1-5) penetrated the depth of these T-0 deposits, which consist of fine-grained, vertically accreted overbank clay loams and silty clay loams. A moderately developed soil has formed through Unit I and exhibits an A-Bw1-Bw2 horizon sequence. This soil sequence unconformably overlies the 2Bk horizon developed within the Unit I alluvium of the T-1 terrace. This horizon sequence was documented in each of the trenches, which suggests that the floodplain soils in the study area exhibit similar pedogenic histories and are of similar age (Figure 6-3). Soil colors range from dark brown (10YR 3/2 to 3/3) in the A horizons, which gradually transitions to brown (10YR 3/4) in the Bw horizons. Weak fine granular ped structure is found within the A horizons, and this transitions into a moderate medium subangular and angular blocky structure in the Bw horizons. *Rabdotus* sp. snail shell density was consistent throughout each of the profiles, generally ranging from 1-2 percent by volume. Prehistoric cultural materials, including one retouched flake and three unmodified flakes, were identified within the backdirt pile for BHT 1 but, based on adhering sediments, can be confidently assigned to a depth range of approximately 140-150 cmbs (55-59 in.), which is near the contact between Unit I and Unit II. BHT 3 yielded a single core, in situ, at 50 cmbs (19.7 in.), and one in situ flake at 150 cmbs (59 in.); both of which are associated with Unit II alluvium.

Late Quaternary Alluvial History

Although no absolute ages were obtained for this project, a generalized model of late Quaternary landscape evolution can still be constructed based on an understanding of local geology, lithology, and previously estimated ages of mapped Quaternary formations in the study area (Barnes 1974). Following the deposition of the Plio/Pleistocene-age Uvalde Gravels, which armor the intervening uplands to the east of the study area, stream networks were migrating gulfward

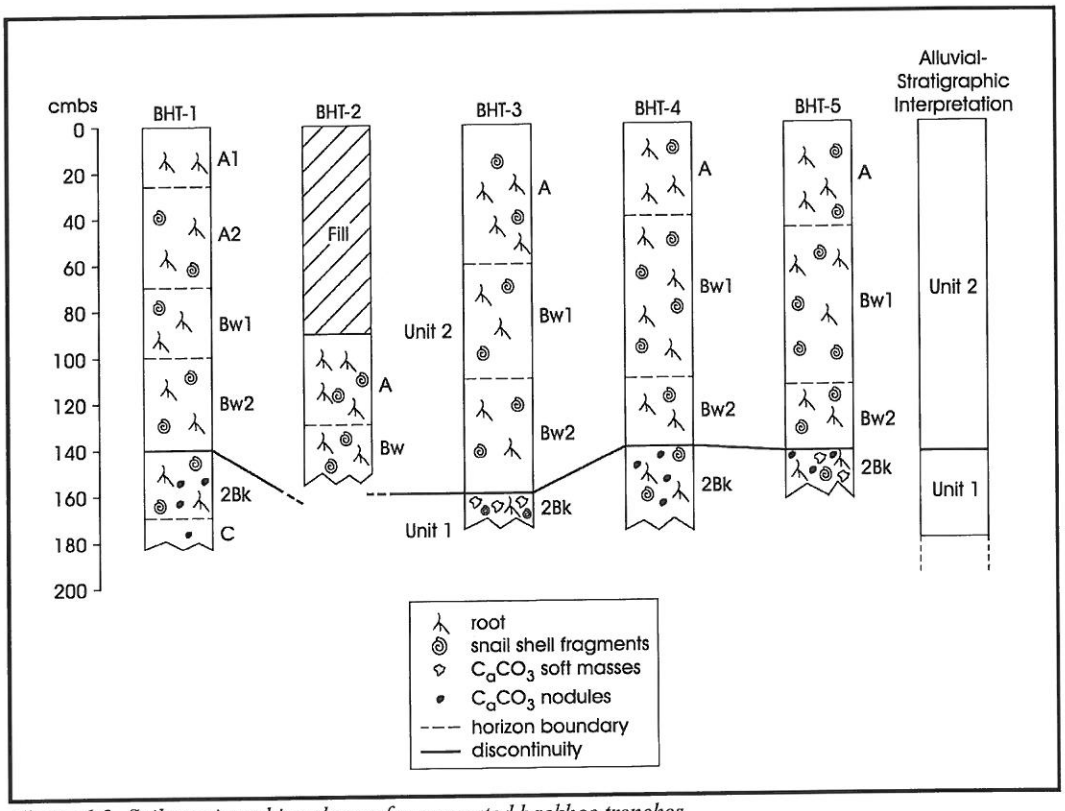

Figure 6-3. *Soil stratigraphic columns for excavated backhoe trenches.*

as they incised Upper Cretaceous and Eocene bedrock formations. During the Pleistocene, greater stream competence facilitated the construction of the gravelly alluvial T-1 terrace fill (Unit I), which occurs below the level of the older Uvalde Gravels. Any T-1 preserved terrace remnants in the project vicinity would have likely undergone intense pedogenic weathering. Subsequent to the construction of the T-1 terrace, channel incision, possibly in response to climate change, was followed by renewed floodplain (T-0) construction and deposition of Unit II during the Holocene. This Unit II alluvium was deposited unconformably upon an eroded section of Unit I along the T-1 terrace margin, and some portions of Unit II may also rest upon Cretaceous deposits as well. Unit II alluvium was found to contain prehistoric materials throughout the entire depth range of deposits. The exact timing of deposition of Unit II in the study area is unknown. However, based on soil colors, moderate ped development, and lack of any secondary carbonates observed in profile, it is estimated that deposition of Unit II began no later than the middle Holocene.

Geoarchaeological Interpretations

Since radiocarbon assays were unavailable to constrain the chronological position of each alluvial unit, landform ages were based on their relative geomorphic positions and the degree of soil profile development. Two major geomorphic landforms (T-1 and T-0) are present within the proposed project limits. Construction of the T-1 terrace likely began sometime during the Pleistocene. The leading edge of this terrace appears to have undergone erosion during a period of channel incision and downcutting near the end of the Pleistocene, which was then followed by deposition of Unit II alluvium and subsequent soil formation during the Holocene.

Urbanized disturbances are extensive on the T-1 terrace surface in the project vicinity. Archaeological assemblages representing all cultural periods could potentially be found on the surface of the T-1 terrace, however, it is highly unlikely that any of these artifacts would be found

in a deeply buried context or otherwise undisturbed from modern developments.

T-0 floodplain deposits (Unit II) that overlie older Pleistocene terrace fill likely began aggrading no later than the middle Holocene. Cultural materials were found throughout the vertical extent of this unit during the survey, but no diagnostic artifacts or features were identified. Given the fine-grained nature of the overbank sediments, which are approximately 1.5-m (4.9-ft.) thick, multiple-component cultural deposits could be well-preserved and vertically separated into stratigraphically distinct cultural occupation zones.

Summary

Geomorphological and geoarcheological investigations revealed two primary geomorphic landforms in the study area. These include one Pleistocene terrace (T-1) and one Holocene-age floodplain (T-0). Unit I alluvium occurs beneath T-0 and T-1, and Unit II alluvium occurs beneath T-0 only. Unit I is presumed to be Pleistocene in age, based on soil development and its geomorphic position, and as such, exhibits no potential for containing buried and vertically stratified prehistoric cultural materials. No cultural materials were found buried within Unit I deposits.

Unit II contains prehistoric artifacts and exhibits darker soil colors and moderate structural ped development. Unit II lacks significant secondary pedogenic carbonate development, as was observed in Unit I. Given these observations, deposition of Unit II alluvium and construction of T-0 likely began sometime during the Holocene, perhaps as late as the mid-Holocene. The potential for well-preserved and vertically separated cultural occupation zones in good context is considered high for Unit II.

Chapter 7: Discussion and Recommendations

Five trenches were excavated within the southern portion of the project area. The locations of these five trenches were staked prior to the arrival of the CAR archaeologists (Figure 7-1). The stakes represented the location of the proposed light posts. The trenches were excavated to depths varying between 160 cm (63 in.) and 180 cm (70.9 in.) below the surface. Results from the excavation of the trenches led to the designation of one site. Three of the excavated trenches did not produce artifactual material. These three trenches exhibited modern trash but no evidence of historic or prehistoric material. The other two trenches produced some prehistoric material.

Recommendations

The buried surface noted in BHTs 1 and 3 is the same as that noted in nearby site 41BX1396. At that site, the surface appeared to represent a stable depositional unit with Early Archaic materials (an Angostura component). While only a small number of units were excavated down to this surface at 41BX1396, the research potential of the materials buried on this surface appeared to be high, and their age ranged from 8180-8390 yrs. BP.

In summary, three of the five BHTs excavated within the southern half of the APE were negative for cultural deposits. The remaining two, BHTs 1 and 3, encountered buried prehistoric cultural materials. Given the number of prehistoric artifacts recovered from BHTs 1 and 3 and since they are only separated by approximately 40 m (131 ft.), the artifacts recovered from these trenches represent an archeological site. Furthermore, the deepest materials found in these two positive trenches are sitting on an apparent Pleistocene surface. The finding is congruent with the results of other investigations within Brackenridge Park that show the presence of a relatively stable surface of Early Archaic-late Paleoindian age (6000-8500 yrs. BP) across much of the upper San Antonio River Basin

IMAGE RESTRICTED

Figure 7-1. *Aerial of the APE showing the location of 41BX1899.*

Given these findings, CAR recommended that additional investigations, representing NRHP eligibility testing, be conducted in the vicinity of BHTs 1, 2, and 3 if adjustments in post installation designs cannot be accommodated or the post locations themselves cannot be moved so that they do not impact these deep deposits. Specifically, CAR recommended that post installation impacts not exceed 130 cm (51.2 in.) below the surface in BHT 1 and 150 cm (59 in.) below the surface in BHT 3. In BHT 2, installation impacts should not extend to more than 170 cm (67 in.) below the surface. In addition, the posts should be installed in the backhoe trenches already excavated to limit the impacts to areas already disturbed by the archaeological investigations.

These recommendations were discussed with Ms. Kay Hindes, City Archaeologist with the Office of Historic Preservation, and she, in turn, recommended that CAR staff monitor the excavation of the trenches that fell within the site boundaries. Mark Denton of the Texas Historical Commission reviewed and approved this approach.

As a result, on April 9, 2012, the monitoring of the installation of four light posts was performed along Trail 11 adjacent to Avenue B and west of the ButterKrust Building (Figure 7-2).

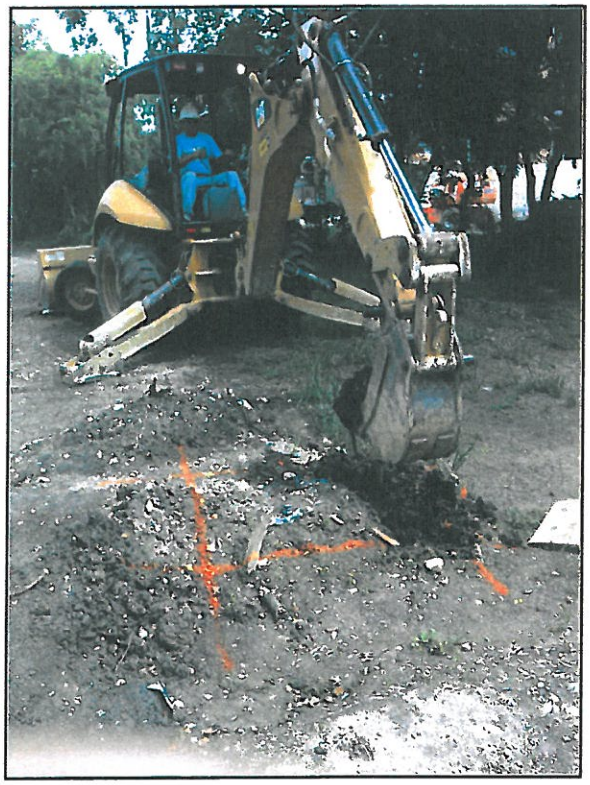

Figure 7-2. *Backhoe excavating trenches for the installation of light posts along the hike and bike trail.*

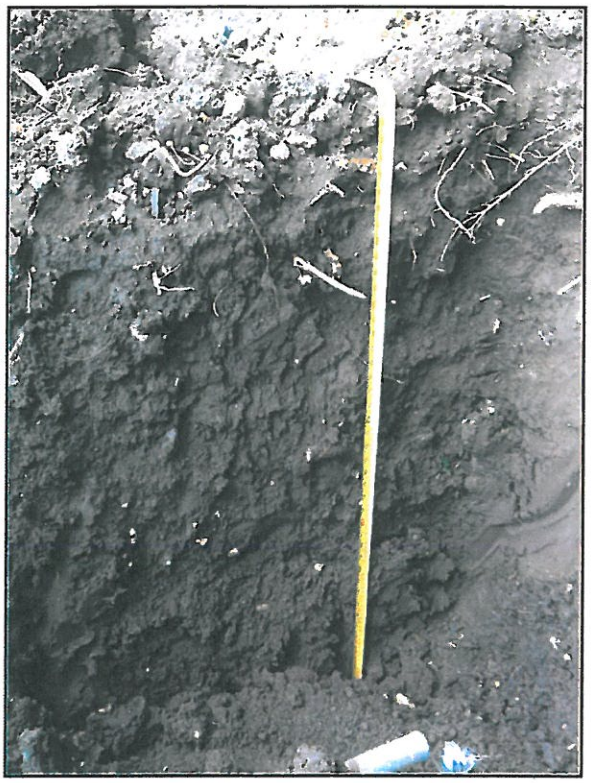

Figure 7-3. *Completed trench associated with Light Post 3. Reached a terminal depth of 115 cmbs (45.3 in.) cmbs with no cultural material.*

Prior to the inception of the backhoe trenching, the monitor inspected the recently graded trail surface for any prehistoric or historic artifacts. The graded trail easement measures approximately 70 m (229.7 ft.) in length and 10 m (32.8 ft.) in width. The shallow grading only disturbed roughly 7.62 cm (3 in.) below the modern surface, and therefore, no cultural materials were noted along the graded area.

Prior to the inception of the trenching for the post installations, the backhoe operator was instructed to maintained a depth of approximately 1.2 m (4 ft.) when digging the trenches for each light post. The light posts (LP) were numbered 1-4, with LP 1 located at the southern portion of the site boundary.

Light post locations were first excavated with a backhoe bucket, and then, the hole was formed for the base of the post by hand-excavation. The maximum depth that was reached in the excavation of the light posts was 115 cm (45.3 in.) below the surface (Figure 7-3). All four trenches encountered disturbed deposits in the upper portions of the trenches. No cultural materials were noted in the trench profiles or within the backdirt derived from the trenches.

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