Cultural Resources Investigations for the Espada Trail Portion of the Howard Peak Greenway Project in South San Antonio, Bexar County, Texas

Texas Antiquities Permit 7758
SWCA Cultural Resources Report No. 16-562

April 2017

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CULTURAL RESOURCES INVESTIGATIONS FOR THE ESPADA TRAIL PORTION OF THE HOWARD PEAK GREENWAY PROJECT IN SOUTH SAN ANTONIO, BEXAR COUNTY, TEXAS

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ABSTRACT

At the request of J and L Consulting and on behalf of the City of San Antonio (COSA), SWCA Environmental Consultants (SWCA) conducted intensive cultural resources investigations for the proposed Espada Trail Section of the Howard Peak Greenway Project in south San Antonio, Texas. The project is sponsored by COSA, a political subdivision of the State of Texas; therefore, it is subject to review under the Antiquities Code of Texas and COSA's Office of Historic Preservation (SA-OHP) per COSA's Historic Preservation and Design Section of the Unified Development Code (Article VI 35-630 to 35-634). Additionally, as the proposed construction may require a permit from the U.S. Army Corps of Engineers, investigations were conducted in compliance with Section 106 of the National Historic Preservation Act (16 United States Code 470) and its implementing regulations (36 Code of Federal Regulations [CFR] 800). SWCA conducted investigations under Texas Antiquities Permit Number 7758.

COSA proposes to construct a section of hike and bike trail in south San Antonio that will connect the Medina River Greenway System to the Mission Trail System. The proposed Espada Trail section measures approximately 4.2 miles (6.75 kilometers [km]) in length and is no wider than 50 feet (15 meters [m]), encompassing approximately 25.5 acres. The estimated depths of impacts will normally be approximately 5 inches throughout the trail, with deeper impacts of 8 to 24 inches for beams along the trail's edge, and up to 48 inches depth at three proposed pedestrian bridge locations. In addition to the proposed 4.2-mile project area, a potential alternate route around Cassin Lake has been proposed. The alternate route is approximately 0.93 mile (1.5 km) in length and includes four drainage crossings and/or possible bridge crossings. Therefore, in total the combined area of potential effects (APE) for the proposed project encompasses 31 acres. SWCA's investigations of the proposed project encompassed roughly 5.13 miles (8.25 km) or 62 acres within a typical 100-foot-wide (30-m) survey corridor.

Investigations included a background literature review and an intensive pedestrian survey supplemented by shovel testing, and backhoe trenching within the APE. The background identified 16 previously conducted surveys, 13 previously recorded archaeological sites, one cemetery, one Official Texas Historic Marker, one National Registered District, 417 historic age buildings, two historic age trails, and one historic age railroad within a 1-mile radius of the project area. Four of the 16 previously conducted surveys intersect the project area. These intersecting surveys were conducted in advance of various development projects and intersect along the western and eastern portions of the project area. Of the 13 previously recorded archaeological sites identified within 1 mile of the project area, only a portion of site 41BX269 was located within the project area.

Subsurface investigations involved the excavation of 69 shovel tests, the excavation of eight backhoe trenches, and extensive examination of exposed cut bank profiles along the Minita Creek, the San Antonio River, and the Espada Acequia. As a result of the investigations, SWCA recorded the Cassian Lake Dam and spillway, two new sites (41BX2143 and 41BX2144), revisited site 41BX269, and documented one isolated archaeological find (IF 1). These four cultural resources were assessed with regard to eligibility for inclusion to the National Register of Historic Places (NRHP) and designation as a State Antiquities Landmark (SAL) using the guidelines promulgated in 36 CFR 60.4(a-d). The summary and recommendations are as follows.

The Cassin Lake Dam and Spillway, constructed in 1907 by William Cassin, has good integrity of location, design, setting, materials, and association. William Cassin was a prominent member of the local farming community and the dam is the only remaining structure associated with him. SWCA recommends the Cassin Lake Dam and Spillway as ELIGIBLE for NRHP listing for local significance under criteria A and B. The project as planned should have no adverse effect on the NRHP eligibility of the structure, although an avoidance strategy is recommended for any work that will directly impact the dam and spillway.

Site 41B2143 is a surficial prehistoric lithic scatter of unknown specific age or cultural affiliation. Based on the lack of diagnostic artifacts, cultural features, and buried cultural material, the site is unlikely to provide additional data that would contribute to the understanding of local or regional prehistory. As such, site 41BX2143 is assessed as being NOT ELIGIBLE for the NRHP and no further work is recommended.

Site 41BX2144 is a subsurface historic artifact scatter and is likely the remains of a mid-twentieth-century structure shown on the Southton 1953 topographic map. Due to the lack of any standing structures or other cultural features, and the limited number and undistinctive artifacts, site 41BX2144 is assessed as being NOT ELIGIBLE for the NRHP and no further work is recommended.

Site 41B269 (Espada Ditch) is a Spanish Colonial irrigation ditch that dates to the 1740s. The Espada Ditch meets the listing requirements of Criteria A, B, and D of the NRHP and is included in the World Heritage Designation of the San Antonio Missions. As such, SWCA recommends AVOIDANCE of the feature. Currently a pedestrian bridge is proposed for crossing the ditch, pilings will be placed at a significant distance from the crossing so the acequia feature is not impacted. Given the landscape context, SWCA believes that this will be sufficient to avoid visual and direct impacts and have assessed the undertaking as having NO ADVERSE EFFECT.

IF 1 is a piece of whiteware encountered within the APE. It is a single occurrence, isolated find that does not warrant site designation or further investigations.

In accordance with 33 CFR 800.4, SWCA has made a reasonable and good faith effort to identify cultural resources properties within either the direct or indirect APE. Based on the results of these investigations and proposed avoidance measures, it is SWCA's professional opinion that the proposed action would have NO ADVERSE EFFECT (per 36 CFR 800.5[b]) on any properties listed or otherwise eligible for the NRHP. SWCA recommends that no further cultural resources investigations are warranted within the APE, as currently defined.

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INTRODUCTION

At the request of J and L Consulting and on behalf of the City of San Antonio (COSA), SWCA Environmental Consultants (SWCA) conducted an intensive cultural resource investigations for the proposed Espada Trail Section of the Howard Peak Greenway Project in south San Antonio, Texas (Figure 1). The project is sponsored by COSA, a political subdivision of the State of Texas; therefore, it is subjected to review under the Antiquities Code of Texas and COSA's Office of Historic Preservation (SA-OHP) per COSA's Historic Preservation and Design Section of the Unified Development Code (Article VI 35-630 to 35-634). Additionally, as the proposed construction may require a permit from the U.S. Army Corps of Engineers, investigations were conducted in compliance with Section 106 of the National Historic Preservation Act (NHPA; 16 United States Code 470) and its implementing regulations (36 Code of Federal Regulation [CFR] 800). SWCA conducted investigations under Texas Antiquities Permit Number 7758.

The purpose of this investigation was (a) to identify and assess any cultural resources, such as historic and prehistoric archeological sites and historic buildings, structures, objects, and sites (such as cemeteries) that might be located within the boundaries of the proposed undertaking, and (b) to evaluate the significance and eligibility of these cultural resources for their eligibility for inclusion to the National Register of Historic Places (NRHP) or designation as a State Antiquities Landmark (SAL). Investigations consisted of an intensive archaeological survey with shovel testing of the proposed project area. All investigations were conducted in accordance with the Texas Historical Commission (THC) and Council of Texas Archeologists (CTA) standards, as well as the guidelines provided in Section 106 of the NHPA (National Park Service 1983).

PROJECT PERSONNEL

Rhiana D. Ward, M.A., served as Principal Investigator and Antonio E. Padilla, M.A., RPA, served as Project Manager for the duration of the project, overseeing overall logistics and organization, managing reporting, and agency consultation. The survey was completed by Antonio E. Padilla, M.A., RPA and Archaeologists Kirsten M. Atwood Ph.D., Kathleen Jenkins, and Charles Benton from August 24-26, and 29, 2016. Backhoe trenching was conducted by Antonio E. Padilla and Austin Parisi on September 14 and 15, 2016, under Texas Antiquities Permit No. 7758. Jason Kainer produced all field and report maps for the project and Joy Hengst provided technical editing and document preparation.

PROJECT AREA DESCRIPTION

COSA proposes to construct a section of hike and bike trail in south San Antonio that will connect the Medina River Greenway System to the Mission Trail System. The proposed Espada Trail section measures approximately 4.2 miles (6.75 kilometers [km]) in length and is no wider than 50 feet (15 meters [m]), encompassing approximately 25.5 acres. The estimated depths of impacts will normally be approximately 5 inches throughout the trail, with deeper impacts of 8 to 24 inches for beams along the trail's edge, and up to 48 inches deep at three proposed pedestrian bridge locations. In addition to the proposed 4.2-mile project area, a potential alternate route around Cassin Lake has been proposed. The alternate route is approximately 0.93 mile (1.5 km) in length and includes four drainage crossings and/or possible bridge crossings (Figure 2). Therefore, in total the combined area of potential effects (APE) for the proposed project encompasses 31 acres. SWCA's investigations of the proposed project encompassed roughly 5.13 miles (8.25 km) or 62 acres within a typical 100-foot-wide (30-m) survey corridor.

A review of aerial imagery of the project area shows that a majority of the area is comprised of agricultural lands with the exception of the western portion of the trail that begins at the Mission Del Lago Municipal Golf Course and is surrounded by residential and commercial development. Additionally, historic maps revealed that the eastern portion of the proposed trail intersects the Espada Ditch and parallels multiple lateral ditches connected with the Spanish Colonial drainage system (see Figure 2).

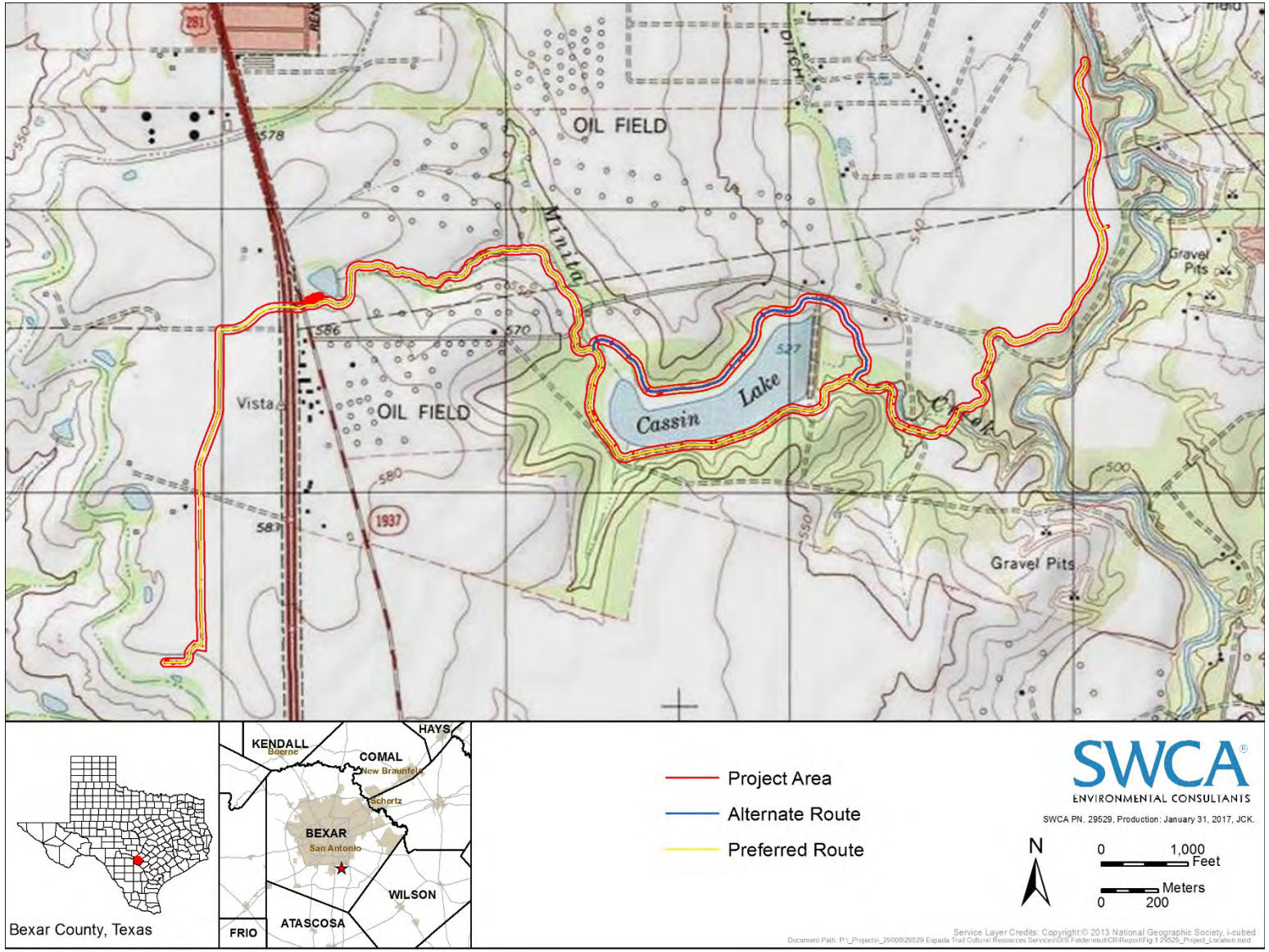

Figure 1. Project location map.

Figure 2. Project area and associated features.

ENVIRONMENTAL DESCRIPTION

The project area is situated within the Blackland Prairie, a distinct physiographic sub-region within the Gulf Coastal Plains region. A key characteristic of the Gulf Coastal Plains and Blackland Prairie physiographic regions are the fine-textured clayey soils. Formation of the Blackland Prairie is attributed to the erosion of soils of the Edwards Plateau deposited by a combination of eolian and colluvial processes across an existing eroding parent material, accumulating to great depths (Black 1989a). Geographically, the Blackland Prairie is characterized as an area of low topographic relief and poor drainage that is prone to frequent flooding (Collins 1995).

GEOLOGY

The underlying geology of the project area is comprised of three geological formations. The western portion of the project area is underlain by the Leona Formation (Qle). The central portion of the project area is underlain by the Midway Group (PAmi), and the eastern portion is underlain by Terrace Deposits (Qt). The Leona Formation is a Quaternary-age formation comprised of silt, sand, clay, and gravels derived from fluviatile terrace deposits. The Midway Group is Tertiary-age formation comprised of beds of clay, sand, and silt. Terrace deposits are Holocene deposits of sand, clay, silt, and gravels (Barnes 1983).

SOILS

Soils encountered within the project area are comprised of predominately clay to clay loams from eight different soils series. Their pedons are characterized as deep to very deep, reaching depths ranging from 178 to 203 centimeters (cm) (Natural Resources Conservation Service 2016). Table 1 illustrates the soils encountered within the project area and their characteristics.

Table 1. Soils encountered within the project area.

Mapping Symbol	Mapping Symbol	Percent of Slope
HtA	Houston Black clay	1–3
HsB	Branyon	0–1
HnC2	Heiden clay	3–5
HoD3	Heiden-Ferris complex	5–10
Tf	Tinn and Frio soils	0–1
Fr	Loire clay loam	0–2

CULTURAL BACKGROUND AND SETTING

The following prehistoric cultural sequence is divided into three periods: Paleoindian, Archaic, and Late Prehistoric. The Archaic period is subdivided into four subperiods: Early, Middle, Late, and Transitional. The Historic period follows the Late Prehistoric, announcing the arrival of Europeans to central Texas.

PALEOINDIAN PERIOD

Human occupation of the Central Texas archaeological region is thought to have begun approximately 11,000 years ago. This period correlates with the end of the late Pleistocene, the last ice age in North America. These "early Texans" are characterized by small but highly mobile bands of foragers who are lauded as specialized hunters of Pleistocene megafauna; however, Paleoindians probably used a much wider array of resources including small fauna and plant foods (Bousman et al. 2002; Bousman et al. 2004; Bever and Meltzer 2007; Dering 2007; Meltzer and Bever 1995). Faunal remains from Kincaid Rockshelter and the Wilson-Leonard site (41WM235) support this view (Collins 1998; Collins et al. 1989). Longstanding ideas about Paleoindian technologies also are being challenged.

Surficial and deeply buried sites, rockshelter sites, and isolated artifacts can represent Paleoindian occupations in the central Texas region. Although Paleoindian site types are not well documented in this study region, they can be generally classified according to broad site type categories extrapolated from nearby regions. Both open and protected (rockshelter) types are known. Usually these sites are near permanent sources of water such as tributary creeks or springs. Bison kill sites, open and protected campsites, and non-occupation lithic sites are known from the Paleoindian period in Texas. Intra-site features include hearths and isolated burials. The Wilson-Leonard site (41WM235), 41BX52, and 41BX229 contain stratified Paleoindian deposits (Hester 1980). The lower component at the Wilson-Leonard site contained a Paleoindian burial (Collins et al. 1998).

Collins (2004) divides the Paleoindian period into early and late subperiods. Two projectile point styles, Clovis and Folsom, are included in the early subperiod. Clovis chipped stone artifact assemblages, including the diagnostic fluted lanceolate Clovis point, were produced by bifacial, flake, and prismatic-blade techniques on high-quality and oftentimes exotic lithic materials (Collins 1990). Along with chipped stone artifacts, Clovis assemblages include engraved stones, bone and ivory points, stone bolas, and ochre (Collins 1995:381; Collins et al. 1992). Clovis points are found evenly distributed along the eastern edge of the Edwards Plateau, where the presence of springs and outcrops of chert-bearing limestone are common (Meltzer and Bever 1995:58). Sites within the area yielding Clovis points and Clovis-age materials include Pavo Real, Kincaid Rockshelter (Collins et al. 1989), and San Marcos Springs (Takac 1991). Analyses of Clovis artifacts and site types suggest that Clovis peoples were well-adapted, generalized hunter-gatherers with the technology to hunt larger game but not solely rely on it.

In contrast, Folsom tool kits—consisting of fluted Folsom points, thin unfluted (Midland) points, large thin bifaces, and end scrapers—are more indicative of specialized hunting patterns, particularly for bison (Collins 2004:117). Folsom point distributions, both in frequency and spatial patterning, differ from the Clovis patterns, suggesting a shift in adaptation patterns that correlates to the end of Wisconsin glacial episode (Bever and Meltzer 2007; Meltzer and Bever 1995:60 and 74). Folsom points appear more frequently in the coastal plain as well as the South Texas plain, which encompasses the southern half of the IIIC alignment. As Folsom points are almost exclusively found in plains settings (they are conspicuously lacking in the Edwards Plateau), the technology perhaps marks a more specialized adaptation, likely to a more intensive reliance on *Bison antiquus*.

ARCHAIC PERIOD

The Archaic period for the Central Texas archaeological region dates from ca. 8800 to 1300–1200 B.P. (Collins 2004) and generally is believed to represent a shift toward hunting and gathering of a wider array of animal and plant resources and a decrease in group mobility (Willey and Phillips 1958:107–108). In the eastern and southwestern United States and on the Great Plains, development of horticultural-based, semi-sedentary to sedentary societies succeeded the Archaic period. In these areas, the Archaic truly represents a developmental stage of adaptation as Willey and Phillips (1958) define it. For central Texas, this notion of the Archaic is somewhat problematic. An increasing amount of evidence suggests that Archaic-like adaptations were in place before the Archaic (Bousman et al. 2002; Collins 2004:117–118, 1998; Collins et al. 1989) and that these practices continued into the succeeding Late Prehistoric period (Collins 2004:118–119; Prewitt 1981:74). In a real sense, the Archaic period of central Texas is not a developmental stage, but an arbitrary chronological construct and projectile point style sequence. Establishment of this sequence is based on several decades of archaeological investigations at stratified Archaic sites along the eastern and southern margins of the Edwards Plateau. Collins (2004) and Johnson and Goode (1994) have divided this sequence into three parts—early, middle, and late—based on perceived (though not fully agreed upon by all scholars) technological, environmental, and adaptive changes. However, Turner and Hester (1999) and Black (1989b) have designated another period to mark its end, referred to as Transitional Archaic or Terminal Archaic.

EARLY ARCHAIC

The Early Archaic period (8800–6000 B.P.) is better documented than the Paleoindian period; however, a complete understanding of cultural patterns still does not yet exist. Early Archaic sites are small, and their tool assemblages are diverse (Weir 1976:115–122), suggesting that populations were highly mobile and densities low (Prewitt 1985:217). It has been noted that Early Archaic sites are concentrated along the eastern and southern margins of the Edwards Plateau (Johnson and Goode 1994; McKinney 1981). This distribution may indicate climatic conditions at the time, given that these environments have more reliable water sources and a more diverse resource base than other parts of the region.

Artifact assemblages of the Early Archaic include projectile points styles such as Hoxie, Bulverde, Gower, Wells, Martindale, and Uvalde, as well as early split stem projectile points. A variety of choppers and gouges, such as the triangular, concave based bifaces known as Guadalupe tools, and the distally beveled Clear Fork unifaces are present in the archaeological record. A variety of expediency tools, often nothing more than utilized flakes, are increasingly present in the Early Archaic (Black 1989b).

Significant Early Archaic sites include the Icehouse Site in Hays County (Oksanen 2008), Richard Beene site in Bexar County (Thoms and Mandel 2007), the Camp Pearl Wheat and Gatlin sites in Kerr County (Collins et al. 1990; Houk et al. 2008), and the Jetta Court site in Travis County (Wesolowsky et al. 1976).

MIDDLE ARCHAIC

Cultural patterns during the Middle Archaic period (6000–4000 B.P.), point toward an increased sedentary population intensively harvesting acorns, prickly pear "tuna," and pecans, and hunting small and medium-size game such as deer and turkey. The increase in the number of Middle Archaic sites and burials supports the concept of a larger, more sedentary population (Black and McGraw 1985; Prewitt 1981:73; Weir 1976:124, 135). Large bands may have formed at least seasonally to occupy a single area, or small groups may have used the same sites for longer periods (Weir 1976:130–131).

Sites of the Middle Archaic are numerous and often large in size. Burned rock middens are found at many sites with Middle and Late Archaic components in the Central Texas archaeological region. The development of burned rock middens toward the end of the Middle Archaic suggests a greater reliance on plant foods, although tool kits still imply a considerable dependence on hunting (Prewitt 1985:222–226). Middle Archaic projectile point styles include Bell, Andice, Calf Creek, Taylor, Nolan, and Travis. Other artifacts from the Middle Archaic are choppers, gouges, and expediency tools such as the small, bifacial and unifacial Clear Fork tools. Grinding stones and bases, referred to as manos and metates, show up in Middle Archaic artifact assemblages as well as a number of perforators, drills, and awls. Chipped, polished, and ground stone artifacts are common in central Texas and surrounding regions. Less frequently encountered artifacts include tools and ornaments of bone, antler, and marine shell (Turner and Hester 1999).

LATE ARCHAIC

During the succeeding Late Archaic period (4000 to 1300–1200 B.P.), populations continued to increase (Prewitt 1985:217). As evidenced by stratified Archaic sites such as Loeve-Fox, Cibolo Crossing, and Panther Springs Creek, the Late Archaic components contain the densest concentrations of cultural materials of all the Archaic periods. Establishment of large cemeteries along drainages also suggests certain groups had strong territorial ties (Story 1985:40).

Middle Archaic subsistence technology, including the use of rock and earth ovens, continues into the Late Archaic period. Collins (2004:121) states that, at the beginning of the Late Archaic period, the use of rock ovens and the resultant formation of burned rock middens reached its zenith and that the use of rock and earth ovens declined during the latter half of the Late Archaic. A picture of prevalent burned rock midden development in the eastern part of the Central Texas archaeological region after 2000 B.P. is gradually becoming clear. This scenario parallels the widely recognized occurrence of post-2000 B.P. middens in the western reaches of the Edwards Plateau (Goode 1991).

TRANSITIONAL ARCHAIC

As Collins (2004:122–123) notes, diverse and comparatively complex archaeological manifestations toward the end of the Late Archaic attest to the emergence of kinds of human conduct without precedent in the area. This period (2250–1250 B.P.), referred to as the Transitional Archaic (Turner and Hester 1999) or Terminal Archaic (Black 1989b), is not recognized by all researchers. Other chronologies terminate the Late Archaic at around 1200–1250 B.P. (Collins 2004; Johnson and Goode 1994) to encompass this later subperiod. In two recent chronologies for central Texas, Collins (2004) does not include the Transitional as a subperiod of the Archaic, and Johnson and Goode (1994) separate the Late Archaic into two subperiods designated Late Archaic I and Late Archaic II. The Transitional Archaic, as it is used here, closely corresponds to Johnson and Goode's (1994) Late Archaic II, but begins after the appearance of Marcos points, not with it. In this scheme, the Transitional Archaic coincides with the last two style intervals recognized by Collins (2004) for the Late Archaic subperiod.

During the Transitional Archaic, smaller dart point forms such as Darl, Ensor, Fairland, and Frio were developed (Turner and Hester 1999). These points were probably ancestral to the first Late Prehistoric arrow point types and may have overlapped temporally with them (Carpenter et al. 2006; Hester 1995; Houk and Lohse 1993).

Overall, the Archaic period represents a hunting and gathering way of life that was successful and remained virtually unchanged for more than 7,500 years. This notion is based in part on fairly consistent artifact and tool assemblages through time and place and on resource patches that were used continually for several millennia, as the formation of burned rock middens show. This pattern of generalized foraging, though

marked by brief shifts to a heavy reliance on bison, continued almost unchanged into the succeeding Late Prehistoric period.

LATE PREHISTORIC PERIOD

Introduction of the bow and arrow then ceramics into the Central Texas archaeological region marks the Late Prehistoric period (1250–350 B.P.). Population densities dropped considerably from their Late Archaic peak (Prewitt 1985:217). Subsistence strategies did not differ greatly from the preceding period, although bison again became an important subsistence and economic resource for study area populations during the latter part of the Late Prehistoric period (Prewitt 1981:74). Rock and earth ovens were utilized for plant food processing (Black et al. 1997; Kleinbach et al. 1995:795). Horticulture came into play very late in the region but was of seemingly minor importance to overall subsistence strategies (Collins 1995:385).

Artifact assemblages include Scallorn, Perdiz, and Edwards projectile points, worked stone, thermally altered stone, hematite, bone, and shell. The points are associated with the use of the bow and arrow in the region, probably introduced sometime around 1350–1150 B.P.

The earlier Austin phase (identified by Scallorn and Edwards points) and the later Toyah phase (defined through Perdiz points) divide the Late Prehistoric period throughout central Texas (Black 1989b; Story 1990). These divisions were originally recognized by Suhm (1960) and Jelks (1962), and remain an accepted separation of the period. Although a distinct change in the material culture between the two phases can be seen in the archaeological record, there is some debate over the cultural underpinnings that prompted the change. The different arrow point styles (and other associated artifacts in the assemblage) may represent distinct cultural groups (Johnson 1994), but others challenge this view (e.g., Black and Creel 1997), and attribute the change to a spread of new technological ideas in response to the increase of a different economic resource in bison populations (Ricklis 1992). Nevertheless, prehistoric communities traced through cultural remains assigned to the Austin phase (1250–650 B.P.), like many of the Archaic period cultures before them, relied on a hunting and gathering subsistence with more of an emphasis on gathering (Prewitt 1981:83). Communities attributed to the Toyah phase (650–200 B.P.) relied more on bison procurement (Prewitt 1981:84).

Around 1000–750 B.P., slightly more-xeric or drought-prone climatic conditions returned to the region, and bison came back in large numbers (Huebner 1991; Toomey 1993). Using this vast resource, Toyah peoples were equipped with Perdiz point-tipped arrows, end scrapers, four-beveled-edge knives, and plain bone-tempered ceramics. Toyah technology and subsistence strategies represent a completely different tradition from the preceding Austin phase. Collins (1995:388) states that formation of burned rock middens ceased as bison hunting and group mobility obtained a level of importance not witnessed since Folsom times. Although the importance of bison hunting and high group mobility hardly can be disputed, the argument that burned rock midden development ceased during the Toyah phase is tenuous. A recent examination of Toyah-age radiocarbon assays and assemblages by Black et al. (1997) suggests that their association with burned rock middens represents more than a “thin veneer” capping Archaic-age features. Black et al. (1997) claim that burned rock midden formations, although not as prevalent as in earlier periods, was part of the adaptive strategies of Toyah peoples.

HISTORIC CULTURE SETTING

The earliest mentioning of San Antonio River Valley exploration was first documented during the 1691 explorations of the Governor of the Spanish Province of Texas, Domingo Terán de los Ríos, and Father Damián Massenet. The pair traveled to the San Antonio River Valley where they encountered a hunter-gathering tribe named Payaya. In their village named Yanaguana, the Payaya lived in simple huts made of

brushwood and grass. The river and village were renamed after San Antonio de Padua by Terán and Massenet (Johnston 1947).

Spanish exploration to the San Antonio area continued in 1709 during the Espinosa-Olivares-Aguirre entrada, which consisted of Friar Isidro Felix de Espinosa, Friar Antonio de San Buenaventura y Olivares, and Capitan Pedro de Aguirre. Espinosa, the chronicler of the entrada, first named and described the area of San Pedro Springs, San Pedro Creek, and the San Antonio River in April of 1709. He described the setting as "a luxuriant growth of trees…watered by a copious spring which rises near a populous rancheria of Indians..." (Tous 1930:5a). Espinosa also recorded information regarding the native population to the area, however, there discrepancies with the interpretation or translation of the historic records. Further explorations to the San Antonio River Valley occurred in 1716 under the command of Don Domingo Ramon and Father Espinosa on an expedition to the east Texas settlements. Espinosa's written accounts continued to dote upon the thriving environment of river valley, suggesting the San Pedro Springs area as a sufficient location for a new mission (Cox 1999, Fehrenbach 2016, Johnston 1947, Tous 1930a, Mauldin et al. 2015).

SPANISH MISSIONS

During the seventeenth and early eighteenth centuries, a series of Spanish missions and presidios were established in west Texas along the Rio Grande and in east Texas near modern day Nacogdoches. The missions laid claim to territory for New Spain against French influence and fortified ties to Mexico. By 1718 the Spanish government attempted to increase its stronghold in the New World by establishing a way point between the east and west Texas missions. Taking into consideration Massenet, Ramon, and Espinosa's earlier accounts, a 1718 entrada led by Martin de Alarcon and Father Antonio de San Buenaventura Olivares traveled to the San Antonio River Valley and began to settle several families along San Pedro Creek and San Pedro Springs (Chipman 1992; Mauldin et al. 2015).

Mission San Antonio de Valero was founded on May 1, 1718 and the Presidio de Béxar and the civil settlement, Villa de Béxar, was constructed four days later. Based on an account by Father Pedro Perez de Mezquia–whom also accompanied the Alarcon entrada–the villa and presidio were first settled adjacent to the San Pedro Spring, about 1,000 feet from the San Antonio River. However, prior to 1722 a fire had destroyed the wattle and daub huts of first presidio, and construction for a new location had begun. The new presidio was situated between the San Pedro Creek and San Antonio River, beneath the modern day location of the Plaza de Armas Building on Dolorosa. The square-shaped presidio was constructed of adobe bricks with a bastion at each corner so that the fortress could be defended with few men from opposing corners. The villa too was relocated to this new location to house the families of the soldiers that serviced the new presidio (Chipman 1992, Hoffman 1938, Mauldin et al. 2015, McKenzie et al. 2016, Nichols 2015, Tous 1930b).

The first location of the Mission San Antonio de Valero was established "three-fourths of a league down the [San Pedro] creek" on a prominent hill near the modern day location of the Christopher Columbus Italian Society. The mission remained in this location for only a year or two before being relocated to the east bank of the San Antonio San Antonio River in 1719. The second location is hypothesized to be the modern day location of Saint Joseph's Church on East Commerce Street. The mission was relocated for a third and final time in 1724 to its current location after a disastrous storm destroyed the second location. By 1731, a group of Canary Islanders arrived to the area and encouraged the growth of the San Antonio area (Chipman 1992, Cox 1999, Cox 2005, Cruz 2016, Habig 1968, Nichols 2015, Schoelwer 2016, Tous 1930b).

There is little available information on aboriginal groups and their ways of life except for the fragmentary data Spanish missionaries gathered. The general project area was reportedly inhabited by several aboriginal

groups, which included Tonkawa, Lipan Apache, Comanche, Jumano, Catqueza, and Karankawa (Cecil and Greene 2016; Foster 1995; Newcomb 2002). In the San Antonio area and areas to the south, these groups have been referred to collectively as Coahuiltecans because of an assumed similarity in way of life, but many individual groups may have existed (Campbell 1988). Particular Coahuiltecan groups, such as the Payaya and Juanca, have been identified as occupying the San Antonio area (Campbell 1988).

Establishment of the mission system in the first half of the eighteenth century to its ultimate demise around 1800 brought the peaceful movement of some indigenous groups into mission life, but others were forced or moved in to escape the increasing hostilities of southward-moving Apaches and Comanches. Many of the Payaya and Juanca nations lived at Mission San Antonio de Valero, but many more also died there and their numbers declined rapidly (Campbell 1988:106, 121–123). By the end of the mission period, European expansion, disease, and intrusions by other Native American peoples had decimated many Native American groups. The small numbers of surviving Payaya and Juanca were acculturated into mission life. The last references to the Juanca and Payaya were recorded in 1754 and 1789, respectively, in the waning days of the mission (Campbell 1988:98, 123). By that time, intrusive groups such as the Tonkawa, Apache, and Comanche had moved into the region to fill the void. Outside of the missions, few sites attributable to these groups have been investigated. To complicate matters, many aboriginal ways of life endured even after contact with the Spanish. For example, the manufacture of stone tools continued for many groups settling in the missions (Fox 1979).

San Antonio became the capital of Spanish Texas in 1773. By 1778, the settlement had a population of 2,060 including those Indians living in the missions. However, conditions within the settlement were often described as poor, resulting from its location at the edge of Spanish-controlled Texas. The population was comprised of a mix of Europeans, mestizos, and a few slaves. By 1795, all the missions in San Antonio were secularized and Mission San Antonio de Valero, later called the Alamo, was converted to a military barracks (Fehrenbach 1978).

MISSION SAN ANTONIO FRANCISCO DE LA ESPADA

This 1731 mission is the southern "link" in the "chain" of the San Antonio missions. Located on the west bank of the river, the mission compound has been extensively restored. Foundations of a large eighteenth-century church were uncovered and raised in the south portion of the compound by Harvey P. Smith, Sr. with the W.P.A. in the 1930s. A small stone chapel now in use has been restored at least twice. On the southeast corner of the compound is the only known surviving, unaltered bastion dating from the Spanish Colonial period in Texas. East of the mission complex are five lime kilns which are deteriorating very rapidly.

ESPADA DITCH (41BX269)

As the Spanish established missions in Bexar County, they also devised an irrigation and water supply system using spring water. Friars supervised the labor of Indians, settlers, and soldiers to construct acequias, or canals, and dams (Cox 2005). The system distributed water for agriculture, personal consumption, and other household uses (Porter 2009:48). Thus, the system represents the first municipal water system in what would become the United States.

Unlike the other acequias in San Antonio, the Espada Ditch (also known as the Espada Acequia) and its associated Espada Dam and aqueduct, is the only one still functioning today (Cox 2005; Porter 2009). The exact date of its construction is unknown. The acequia began on the western bank of the San Antonio River between Mission San Jose and Mission San Juan Capistrano at a dam that spanned the river (Cox 2005). From its headgate near the Espada Dam, the acequia runs through Mission Espada and reenters the San Antonio River further south and is approximately 3.25 miles (5.2 km) in length. One of the astounding

aspects of the Espada Ditch is the accuracy of its grade to maintain flow and prevent erosion, although it was developed and implemented using relatively basic engineering equipment (Porter 2009). The Espada Dam, also serving as a weir, is the only still-functioning Spanish Colonial era dam in San Antonio with arches and constructed of limestone and lime mortar. The dam continues to lift water into the head gate of the acequia (Cox 2005; Porter 2009). During the 1730s, a stone aqueduct was constructed 1.49 miles (2.4 km) down the acequia to carry water over Piedras (Six-Mile) Creek (Cox 2005). Considered one of the finest examples of Spanish colonial engineering and construction, the aqueduct is still in use and constructed of stone and ground limestone mortar (Porter 2009). The "diamond point" feature within the central pier is a pointed projection that diverts pressure from the stream away from the support of the two adjacent arches (Cox 2005). Approximately 15 feet (4.5 m) above the creek bed, the aqueduct has survived multiple flood episodes, including those that have submerged the structure to a depth of six feet (1.8 m) (Porter 2009).

MODERN PERIOD (1900–1950)

According to one source, a few events occurred within San Antonio in the early 1900s, however the project area itself was not the focus of these activities. In May of 1903, the second Annual Horse Show was held on Alamo Plaza. In 1924, a 13-story Medical Arts Building was built on the corner of Houston Street and Avenue E. In addition, the San Antonio Express dedicated a new building located on the corner of Avenue E and 3rd Street (Heusinger 1951).

In 1921, a disastrous overbank flood engulfed Houston and St. Mary's Street with approximately 2.7 m of water. The Olmos Dam was built in response to this event to prevent further flooding. Sections of the San Antonio River were straightened and widened in areas to control water flow. Another recommendation was to construct an underground channel in downtown San Antonio and to cover portions of the river with concrete. This last idea upset some people, but a compromise was eventually agreed upon to create a Riverwalk with shops and restaurants along the water channel. Construction of this Riverwalk was completed in 1941 (House 1949; Long 2016).

As the United States entered World War II, San Antonio became an important military center and other city activities and construction ceased for nearly five years (Heusinger 1951). Although Fort Sam Houston was established in 1876, and Kelly, Randolph, and Brooks Air Force bases were established prior to 1930, all area military facilities experienced growth during World War II. Lackland Air Force Base was created from a portion of Kelly in 1942. With the exception of Kelly, all remain active military training centers.

Tourism is one of San Antonio's most important industries drawing tens of thousands of visitors every year. More recent features include theme parks, zoos, museums, gardens, parks, and sporting attractions. The Riverwalk, also known as the Paseo del Rio, consists of over 2.5 miles (4 km) of shops and is probably one of San Antonio's most visited attractions. The missions in San Antonio are another huge tourist attraction. San Antonio Missions National Historical Park includes The Alamo (1718), Mission Concepción (1731), Mission San José (1720), Mission San Juan Capistrano (1731), and Mission San Francisco de la Espada (1741) (Fehrenbach 2016). Visitors also enjoy other architecturally important historic structures like San Fernando Cathedral (1758), the Spanish Governor's Palace (1749), the Quadrangle at Fort Sam Houston (1878), and the Bexar County Courthouse (1891) (Fehrenbach 2016). In 2015 UNESCO listed the San Antonio Missions as the 23rd World Heritage Site. Components of the designation include, but are not limited to, the five missions, their associated lands, and their associated irrigations systems (National Park Service 2016).

BACKGROUND REVIEW METHODS AND RESULTS

BACKGROUND REVIEW METHODS

SWCA performed a cultural resources records review to determine if the proposed APE had been previously surveyed for cultural resources or if any archaeological sites have been recorded within or adjacent to the APE. To conduct this review, an SWCA archaeologist reviewed the Southton (2998-132) U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle map on the THC's online Texas Archeological Sites Atlas (THC 2016) database, including searching for pertinent records pertaining to the project area. These sources provided information on the nature and location of previously conducted cultural resources surveys, previously recorded historic and/or prehistoric archeological sites, National Register of Historic Places (NRHP) districts and/or properties, SALs, Official Texas Historical Markers (OTHMs), Registered Texas Historic Landmarks (RTHLs), cemeteries, and local neighborhood surveys within or near the project area. In addition to these sources, SWCA also reviewed Bexar County-specific data sources (Bexar County Clerk Records, Stoner System Maps, and historic aerial photography) to review the history of the project area. This task allowed SWCA to identify areas within the property that could have the potential to contain significant, undocumented cultural resources. As part of the review, a SWCA archaeologist examined the Texas Department of Transportation's (TxDOT) Texas Historic Overlay (THO), a mapping/geographic information system database with historic maps and resource information covering most portions of the state (Foster et al. 2006). Other critical factors that were examined include the level of previous disturbances from residential and commercial development, types of soils present, and any obvious standing structures which appear on USGS topographic maps.

BACKGROUND REVIEW RESULTS

The background review revealed a total of 16 previously conducted surveys, 13 previously recorded archaeological sites, one cemetery, one OTHM, and one National Registered Historic District within a 1-mile radius of the project area (Figure 3). Four of the 16 previously conducted surveys identified intersect the project area (Table 2). These intersecting surveys were conducted in advance of various development projects and intersect along the western and eastern portions of the APE. Of the 13 previously recorded archaeological sites identified within 1-mile of the project area (Table 3), only a section of site 41BX269 was located within the APE.

SITE 41BX269, THE ESPADA DITCH

Site 41BX269, also known as the Espada Ditch or Espada Acequia, is a Spanish Colonial irrigation ditch first recorded during the Mission Parkway Survey Project in 1975. The projected route of the ditch begins roughly 2.2 miles (3.5 km) northwest of the project area, near the Espada Dam (41BX244) on the southwest bank of the San Antonio River. The ditch directs south/southeast of its headwaters for roughly 4.35 miles (7 km), passing Mission Espada (41BX4) and eventually re-entering the San Antonio River within the project area to the east of Cassin Lake. The Espada Ditch is known to have been altered and further developed by the Espada Ditch Company from 1895 (Hutson 1898:45) to the 1970s (Briscoe Center for American History 2016). Atlas depicts archaeological feature 41BX269 as a single location point; however, the projection of Espada Ditch is depicted on modern topographic maps. No eligibility determination has been made for 41BX269, but the ditch is a component of the UNESCO World Heritage Site designation for the San Antonio Missions (THC 2016).

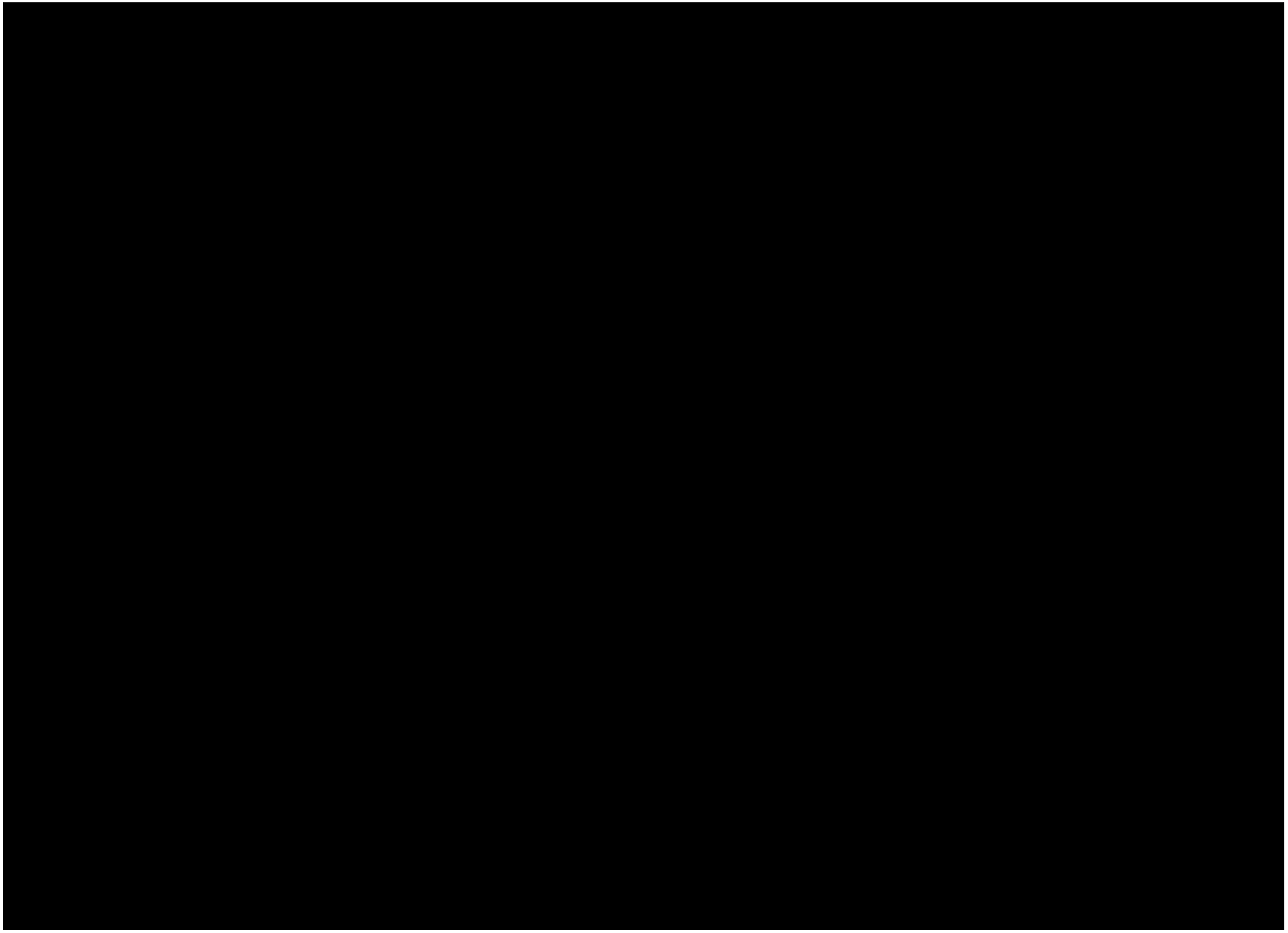

Figure 3. Location of cultural resources within 1-mile of the project area.

Table 2. Previously conducted cultural resources surveys within 1 mile of the project area.

[redacted]

Table 3. Cultural resources within 1 mile of the project area.

Resources	Distance (miles)	Resource Type	Time Period	Eligibility	Comments
41BX4	0.47	Mission Espada	Spanish Colonial	Eligible 1998 and 1998 THC	State Antiquities Landmark
41BX252	0.99	Jacal	Historic	Undetermined	Only historic trash, barb wire, mound where structure use to be
41BX269	*Intersects*	*Acequia/Ditch*	*Spanish Colonial*	*Eligible*	*Not verified by THC*
41BX340	0.67	Multicomponent	Prehistoric	Undetermined	Chipped stone, Anglo ceramics, glass, and metal. Close proximity to Mission Espada
41BX341	0.7	Multicomponent	Prehistoric/Historic	Undetermined	Historic scatter, subsurface prehistoric lithic present
41BX706	0.67	Multicomponent	Prehistoric/Historic	Undetermined	Lithic scatter, structure, chimney, unrecorded portion of Espada Acequia
41BX1626	0.91	Lithic Scatter	Prehistoric	Ineligible 2007 THC	Small scatter, little research potential
41BX1780	0.91	Farmstead	Historic	Undetermined 2008 THC	House, barns, pump house, and push piles

Resources	Distance (miles)	Resource Type	Time Period	Eligibility	Comments
41BX1781	0.47	Multicomponent	Prehistoric/Historic	Undetermined 2008 THC	Historic scatter and buried prehistoric campsite
41BX1782	0.22	Acequia	Historic	Undetermined 2008 THC	Portion of the San Juan Acequia
41BX1783	0.52	Artifact Scatter	Historic	Undetermined 2008 THC	Historic artifact scatter
41BX1784	0.8	Farmstead	Historic	Undetermined 2008 THC	1950's home, cistern, artifact scatter, concrete slabs, and chicken sheds
41BX1796	0.45	Historic Ditch (Don't Ditch Murry)	Historic	Eligible 2009 THC	Heavily disturbed due to agriculture and cattle
Espada	0.83	Cemetery	Historic	Undetermined	Not verified by THC
Mission San Francisco de la Espada	0.57	Historical Marker	N/A	N/A	Documents establishment of Mission Espada
National Historic District	0.14	Mission Parkway Historic-Archaeological District	Historical	Listed	N/A
Road/Railroads	N/A	Old Presidio Rio Grande Road Branch of Old Presidio Rio Grande Road, and Southern Pacific Railroad	Historic	N/A	Branch of Old Presidio Rio Grande Road intersects project area
THO	N/A	Structures	Historic	N/A	417 total, 10 within or adjacent to the project area

HISTORIC MAP REVIEW

A review of the THO maps revealed 417 historic-age buildings, two historic trail routes, one historic-age railroad alignment, and an earthen dam within a 1-mile radius of the project area (see Figure 3). Of the 417 historic-age buildings identified, 10 are located within the project area (see Figure 3). The two historic trails identified consist of the main trunk of the Presidio Del Rio Grande Road, mapped approximately 1,133 feet (345 m) west of western portion of the project area, and an eastern branch of the Presidio Del Rio Grande Road that intersects the eastern portion of the project area before it turns north (see Figure 3). The railroad identified is the Southern Pacific and is still in use today. Additionally, the earthen dam and spillway identified is the dam and spillway created during the construction of Cassin Lake. Aerial photographs dating from 1955 to 2012 show the project area as predominately agricultural and ranch land with concentrations of vegetation around creeks, drainages and Cassin Lake.

PRESIDIO DEL RIO GRANDE ROAD

El Camino Real and the Old San Antonio Road were a network of trails and roads, rather than a single road. Officially established as a Royal Road in 1691 (McGraw 2002), these trail systems were often established along pre-existing Native American trails and trade routes, buffalo trails, and later silver-mining trade and travel routes (McGraw 2002). The trail network was developed as a means to facilitate communication, transportation, and trade between established Spanish occupations in order to bolster Spanish land claims

in opposition to French incursions (TxDOT n.d.). El Camino Real and the Old San Antonio Roads originated at San Juan Bautista Mission and Presidio in Guerrero, Coahuila, Mexico, and passed through San Antonio de Valero (the Alamo) before ending at the presidio in Los Adaes in Louisiana (McGraw 2002). The roads ultimately served and a means to connect Texas to Mexico City, but also served as political boundaries.

FIELD SURVEY METHODS

PEDESTRIAN SURVEY AND SHOVEL TESTING

SWCA's investigations consisted of an intensive pedestrian survey supplemented by shovel testing and backhoe trenching investigations within the project area. Archaeologists examined the ground surface and extensive erosional profiles and exposures along Minita Creek, the San Antonio River and Espada Acequia for cultural resources. Subsurface investigations consisted of systematic shovel test excavations and backhoe trenching. For a linear corridor survey, THC survey standards minimally require that for every 100 feet (30 m) of survey corridor width, 16 shovel tests need to be excavated every mile. For a project of this size (i.e., 4.95 miles [7.96 km]), the shovel test investigations would require 80 shovel tests. Archaeological sensitive areas were present in the APE and more shovel tests were excavated in those areas.

In accordance with professional standard practices, SWCA archaeologists employ both metric (centimeters and meters) and English units of measurement (inches and feet). Investigations such as shovel tests, auger probes, and backhoe trenches are recorded using metric units. Prehistoric archaeological resources, such as camp sites, features, and artifacts, are also recorded using metric units, while historic resources, such as farmsteads and associated historic features, are recorded using English units; no conversions for these measurements are provided.

Shovel testing was primarily used when the corridor crossed topography with a potential for buried sites according to the crew leader's expertise, and where surface visibility was less than 30 percent. Where performed, shovel tests were systematically excavated along the easement and additional shovel tests were used to define site boundaries. The number of shovel tests varied in an area depending on the level of ground disturbances, the nature of the soils, and the topographic setting. Shovel testing was not conducted in areas where steep slopes (i.e., greater than 20%) were encountered, where impervious substrates (i.e., caliche, concrete, and/or compact gravel) were present, within well-defined surface (i.e., runoff) drainage gullies, where evidence of extensive ground surface disturbance was observed, within 16.4 feet (5 m) of any identified/marked buried utility markers, or within 16.4 feet (5 m) of any paved/graveled road edges. Shovel tests were excavated in approximately 20 cm (7.9 in) arbitrary levels to 100 cm (39.4 in) in depth or to culturally sterile deposits, whichever came first.

The matrix was hand screened through ¼-inch metal mesh. The location of each shovel test was plotted using a hand-held sub-meter accurate global positioning system (GPS) receiver and was recorded on appropriate project forms in SWCA's field tablets. SWCA conducted a non-collection survey. Artifacts, had any been encountered, would have been tabulated, analyzed, and documented in the field, but not collected. Following the review and acceptance of the final cultural resources report, all archaeological records and photographs were curated in accordance with the CTA guidelines.

BACKHOE TRENCHING

Backhoe trench placement was based on proposed deep impact locations, ground disturbance levels within that area, the location of buried utilities and pipelines, and impenetrable vegetation impeding the equipment. Additionally, at the request of the SA-OHP, trenches were not placed in areas where the acequia and

associated lateral ditches would be affected. Trenching involved close coordination with third-party locators where the proposed alignment was in close proximity to existing buried utilities and pipelines. If there were doubts that a trench could be safely excavated (i.e., without hitting a buried utility line or existing pipeline), the trench was moved to a location where all underground utilities were located with confidence.

Backhoe trenches were excavated to a depth sufficient to determine the presence/absence of buried cultural materials and to allow for the complete recording of all features and geomorphic information to the ultimate depths of project impacts. Generally, trenches were first excavated to a depth of 1.2–1.5 m (4 to 5 feet) and measured 7 m (25 feet) in length and 0.75 m (2.5 feet) wide. Back dirt from the backhoe bucket was sifted and selectively screened to assess presence or absence of cultural materials. Once the trench was excavated, an archaeologist scraped down both walls of the trench, examining the profiles for artifacts, features, or other cultural manifestations. Stratigraphic descriptions were recorded for each trench. Once finished with documenting the trench at this level, excavations continued to a depth of 2.7 m (9 feet) to 3.7 m (12 feet) below the surface to assess the potential for deeply buried cultural deposits.

All trenching was monitored by an experienced archaeologist while excavations were underway and were performed in accordance with Occupational Safety and Health Administration (29 CFR Part 1926) and the Texas Trench Safety Act (H. B. 1569). Upon completion of excavation, all trenches were backfilled, leveled, and returned, as much as possible, to their original state.

SITE DOCUMENTATION

Newly discovered cultural resources required additional shovel testing to explore the nature and extent of the cultural deposits. Discovered archaeological sites were defined and recorded following standard federal and state guidelines. All recorded sites were mapped in detail with a GPS unit and plotted on USGS 7.5-minute topographic maps with a GPS unit and appropriate project maps for planning purposes.

HISTORIC STANDING STRUCTURES

The cultural resources staff were instructed to record all above-ground resources (i.e., buildings, standing structures, and/or objects) greater than 45 years in age that were located within the direct APE or within 164 feet (50 m) of the direct APE boundaries (i.e., the indirect APE). The recording procedures for architectural resources follows the guidelines established in the "*National Register Bulletin 24: Guidelines for Local Survey – A Basis for Preservation Planning*" (National Park Service 2000). Specific information related to building materials, foundation type, structural form, architectural style, associated outbuildings, and observed alterations would be collected to assess whether the property should be considered eligible, not eligible, or not assessed for the purposes of the NRHP criteria for evaluation (36 CFR 60.4 [a-d]). The evaluation of the NRHP status for buildings or structures identified in this study would have been based on the best available information at the time the survey was completed; however, any future physical changes to the integrity of the resources, for better or worse, could affect the evaluations of the properties. No resources that met the criteria of being a potential historic property were identified.

NRHP CRITERIA FOR EVALUATION

The quality of significance in American archaeology, architecture, and history is present in sites, districts, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and meet the following criteria for evaluation (36 CFR 60.4 [a–d]):

A. that are associated with events that have made a significant contribution to the broad patterns of our history;

B. that are associated with the lives of persons significant in our past;

C. that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

D. that have yielded or may be likely to yield, information important in prehistory or history.

NRHP CRITERIA CONSIDERATIONS

Ordinarily cemeteries, birthplaces, graves of historical figures, properties owned by religious institutions or used for religious purposes, structures that have been moved from their original locations, reconstructed historic buildings, properties primarily commemorative in nature, and properties that have achieved significance within the past 50 years should not be considered eligible for the NRHP. However, such properties can qualify if they are integral parts of districts that do meet the criteria or if they fall within the following categories:

a) A religious property deriving primary significance from architectural or artistic distinction or historical importance;

b) A building or structure removed from its original location but which is primarily significant for architectural value, or which is the surviving structure most importantly associated with a historic person or event;

c) A birthplace or grave of a historical figure of outstanding importance if there is no appropriate site or building directly associated with his or her productive life;

d) A cemetery which derives its primary importance from graves of person of transcendent importance, from age, from distinctive design features, or from association with historic events;

e) A reconstructed building when accurately executed in a suitable environment and presented in a dignified manner as part of a restoration master plan, and when no other building or structure with the same association has survived;

f) A property primarily commemorative in intent if design, age, tradition, or symbolic value has invested it with its own exceptional significance; or

g) A property achieving significance within the past 50 years if it is of exceptional importance.

UNANTICIPATED DISCOVERIES

In the unlikely event that unanticipated human remains or burials are encountered during subsequent construction activities, J and L Consulting, or their designated representative, will immediately cease all work within 100 feet (30.5 m) of the discovery. All human burials in the state of Texas are protected by law, as per the Texas Health and Safety Code Section 711 General Provisions Relating to Cemeteries (herein referred to as Section 711) and the Texas Administrative Code (TAC) Title 13, Texas Historical Commission, Chapter 22 Cemeteries (13 TAC §§22.1–22.6). Immediately upon discovery, J and L Consulting, or their designated representative, should cover the burial with impermeable plastic sheeting and mark it with lathing stakes or fencing. J and L Consulting, or their designated representative, should immediately notify both local law enforcement and the THC. The Bexar County Sheriff's office should be contacted to determine if the remains represent a modern crime scene. If the sheriff and/or Bexar County Coroner determine that the human remains represent a crime scene, then they will assume control of the discovery. If the human skeletal remains appear to be from an unregistered grave that does not represent a crime scene, then the coroner shall notify the THC within 24 hours. Under Section 711 and the Texas Antiquities Code (13 TAC §§ 22.1–22.6), the county clerk shall be notified within 10 days of the discovery

of the grave or graves. Finally, if the human remains are determined to be Native American, they will be handled in accordance with procedures established through coordination with the THC. Work in the affected area could only resume per THC authorization.

FIELD SURVEY RESULTS

SWCA conducted an intensive pedestrian survey augmented by shovel testing of the proposed Espada Trail Portion of the Howard Peak Greenway on August 24, 25, 26, 29 and September 13, 2016, and backhoe trenching on September 14 and 15, 2016 (Appendix A). The APE was found to be extensively disturbed and modified throughout the years by the construction of water management features, road construction, agricultural activity, residential and commercial development, oil pipeline installation, underground utilities, and land clearing activities. The western portion of the APE overlies Clubhouse Road and Del Lago Parkway and has been extensively modified by residential development and associated road construction (Figure 4). The ground surface at this location largely consists of either a concrete sidewalk or asphalt road (see Figure 4). As the project alignment progresses eastward it crosses U.S. Hwy 281 into a privately owned ranch and follows a tree line for approximately 459 feet (140 m) where it then proceeds north, crossing a narrow unnamed tributary of Minita Creek (Figure 5). After crossing the tributary, the APE continues east, paralleling the northern side of the unnamed tributary, eventually re-crossing the tributary as the APE directs south-by-southeast toward Cassin Lake. As the alignment reaches Cassin Lake, the project area splits into two alignments—the preferred route to the south of Cassin Lake, and the Alternate Route to the north of the lake. The APE surrounding Cassin Lake has been extensively modified to create an artificial berm that also serves as a two-track road (Figure 6). The two alignments reconvene on the eastern end of Cassin Lake and project east along a two-tract road to the north of Minita Creek before redirecting northeast to parallel the western bank of the San Antonio River. The APE terminates at the existing trailhead for the Mission Trail System.

Figure 4. Overview of the APE along Clubhouse Boulevard, facing north.

Figure 5. Overview of second crossing of unnamed tributary of Minita Creek, facing south.

Figure 6. Overview of berm road surrounding Cassin Lake, facing east.

The topography of the area is generally low-lying and dominated by natural and modified bodies of water and water management features. The topography associated with Minita Creek and the San Antonio River exhibited greater variation in topography than the area surrounding Cassin Lake. Cut banks within the APE were examined and revealed that the banks of both the Espada Ditch and San Antonio River cut out by erosion over the years (Figures 7 and 8). Vegetation for the project area consists of open grass fields bordered by moderately dense to dense scrub, mesquite, and mixed hardwood riparian forest. General ground surface visibility is 0–10 percent, increased to as much as 85 percent in select areas due to cattle grazing, riparian environments, or the presence of road gravel impeding vegetation growth.

The general setting of the APE has been subject to land modification for well over two hundred years, beginning with Spanish Colonial mission farmland. The project area was likely utilized as agricultural lands for Mission Espada during the mid-to-late eighteenth century, when the Espada ditch is believed to have been constructed by Franciscan missionaries. Additional land modifications to impact the project area occurred with the construction of Cassin Lake, an artificial lake that was constructed in order to facilitate the irrigation of agricultural land in the surrounding area (Handbook of Texas Online 2016a). A north-to-south dam constructed at the lakes eastern extent allows water to collect from Minita Creek, which enters at the northwestern point of Cassin Lake and exits at the southeastern point of Cassin Lake. Cassin Lake is surrounded by an artificial berm/two-track road with a gravel surface.

The APE measures 100 feet (30.48 m) wide and 4.2 miles (6.76 km) in length, with an alternate alignment around the northern side of Cassin Lake measuring 0.93-miles (1.50 km) in length. This linear project was adjudged to require a single transect in order to be acceptably evaluated for cultural resources. Shovel testing was conducted at 100 m (328 foot) intervals within the APE. Shovel testing was reduced to 20 m intervals in areas where historic-age resources were identified during the review of the TxDOT Historic Overlay. Overall, SWCA investigations documented one surficial prehistoric lithic scatter (41BX2143), one historic scatter (41BX2144), and one isolated find (IF 1) within shovel test CB01, and revisited a portion of site 41BX269 (Espada Ditch) within the APE.

During the subsurface testing, a total of 109 shovel tests were attempted; however only 69 were excavated while 40 shovel tests (AP22–30, KA04–13, KA20–29, and KJ01–11) were not excavated due the presence of artificial surfaces such as asphalt, a concrete sidewalk, or an artificial berm road (see Appendix A: Sheets 1–14 and Appendix B). The 69 shovel tests that were excavated reached depths between 10 and 80 cm below surface (bs), and were terminated due to compacted gravels and compacted gravels (see Appendix B). The general soil profile for the APE consisted of very dark brown (10YR 2/2) clays or clay loams over very dark brown (10YR 2/2) sandy brown sandy clays or clays. Of the 69 shovel tests excavated, only three (KA16, KJ23, and CB01) were positive for subsurface cultural materials.

Figure 7. Espada Ditch Cut banks where the APE crosses the ditch, facing southwest.

Figure 8. Western Cut Bank of the San Antonio River paralleling the APE, facing southeast.

CASSIN LAKE DAM AND SPILLWAY

During survey investigations, crews documented the Cassin Lake Dam and Spillway, which forms the eastern bank of Cassin Lake in the center of the project area (see Appendix A: Sheets 8–11). Archival research and a review of historic maps determined that the dam was constructed in 1907 by a local farmer William Cassin, likely to provide irrigation to his land. The construction of the dam resulted in the formation of Cassin Lake within the Minita Creek drainage near the center of the project area. The dam consists of an earthen berm approximately 24 feet high, 15 feet wide, and 1,180 feet long in a north to south orientation. A 10-foot-wide, two-track access road spans the entire length of the berm apex (see Figure 6). The heavily sloped (20 to 45 degree slope) sides of the berm are covered in dense vegetation with high concentrations of limestone gravels, cobbles, and large rocks at ground surface. The spillway is located at the southern point of the dam and consists of a cascading wall of stacked quarried sandstone blocks that range from 2 to 3 feet in length and 8 to 12 inches thick (Figure 9). It is unclear if the materials used to compose the dam and spillway were imported to the dam site, or were sourced from the immediate surroundings.

The lake is named for William Cassin, an Irish immigrant born in 1847, who owned the land with his wife Charlotte N. Cassin, a native Texan (Ancestry.com 2016d; Bexar County Records 2016; Handbook of Texas 2016a). The couple settled in the area around 1900 and William Cassin is attributed with constructing the dam in 1907 (Ancestry.com 2016d; Handbook of Texas 2016a). According to Bexar County Deed Records and the Stoner Systems Maps, the couple purchased land in southern San Antonio along the lower terraces of the San Antonio River (1885 Bexar County Records Deed Book 45:260-261; Stoner Systems Maps 1:1112). William Cassin was listed as a farmer on U.S. Federal Census Records in 1900 and 1910, and he along with wife, three children, and a household of servants, became prominent farmers in the local community, having the small flag-stop town of Cassin named in their honor (Ancestry.com 2016d; Ancetery.com 2016e; Cameron 2016). William passed away in 1917, and the Cassin family estate was left in the care of his wife Charlotte until her death in 1938 (Ancestry.com 2016a, 2016b, 2016c).

The Cassin Lake Dam and Spillway has good integrity of location, design, setting, materials, and association. William Cassin was a prominent member of the local farming community and the dam is the only remaining structure associated with him. SWCA recommends the Cassin Lake Dam and Spillway as ELIGIBLE for NRHP listing for local significance under criteria A and B. The project as planned should have no adverse effect on the NRHP eligibility of the structure, although an avoidance strategy is recommended for any work that will directly impact the dam and spillway.

Figure 9. Cassin Lake Dam Spillway, facing southeast.

NEWLY RECORDED ARCHAEOLOGICAL SITES

41BX2143

Site 41BX2143 is a low-density surficial lithic scatter measuring approximately 100 x 26 m (328 x 87 feet) and is located on an eroding gravel surface of a small upland landform approximately 56 m (184 feet) west of Minita Creek (see Appendix A: Sheet 6 and Figure 10). Vegetation consisted of mesquite, cacti, grasses, and scrub, providing ground surface visibility ranging from 50–100 percent (Figure 11). Disturbances observed consisted of a cattle path and/or the construction of a disused two-track road running through the site (Figure 12). Artifacts observed on the surface consisted of an estimated 50 primary flakes, 50–75 secondary flakes, 50 tertiary flakes, 40–50 modified flakes, 20–30 fragments of cultural shatter, one distal biface fragment (Figure 13), and one medial and distal projectile point fragment (Figure 14).

Subsurface testing at the site consisted of the excavation of five shovel tests (AP31, AP32, KA18, KA19, and KJ25; see Figure 10 and Appendix B). All shovel tests were negative for cultural material. Shovel tests reached depths ranging from 30 to 50 cmbs, (11.8 to 19.7 inches below surface [inbs]) and were terminated upon reaching marl or excessively compact soil. A typical shovel test profile consisted of a brown (10YR 4/3) loam intermixed with gravels, underlain by a dark yellowish brown clay loam intermixed with gravels. The percentage of gravels increased with depth and ranged in size from 3 to 8 cm (1.2 to 3.15 in).

Site 41BX2143 is a surficial prehistoric lithic scatter of unknown specific age or cultural affiliation. Based on the lack of diagnostic artifacts, cultural features, and buried cultural material, the site is unlikely to provide additional data that would contribute to the understanding of local or regional prehistory. As such, site 41BX2143 is assessed as NOT ELIGIBLE for the NRHP and no further work is recommended.

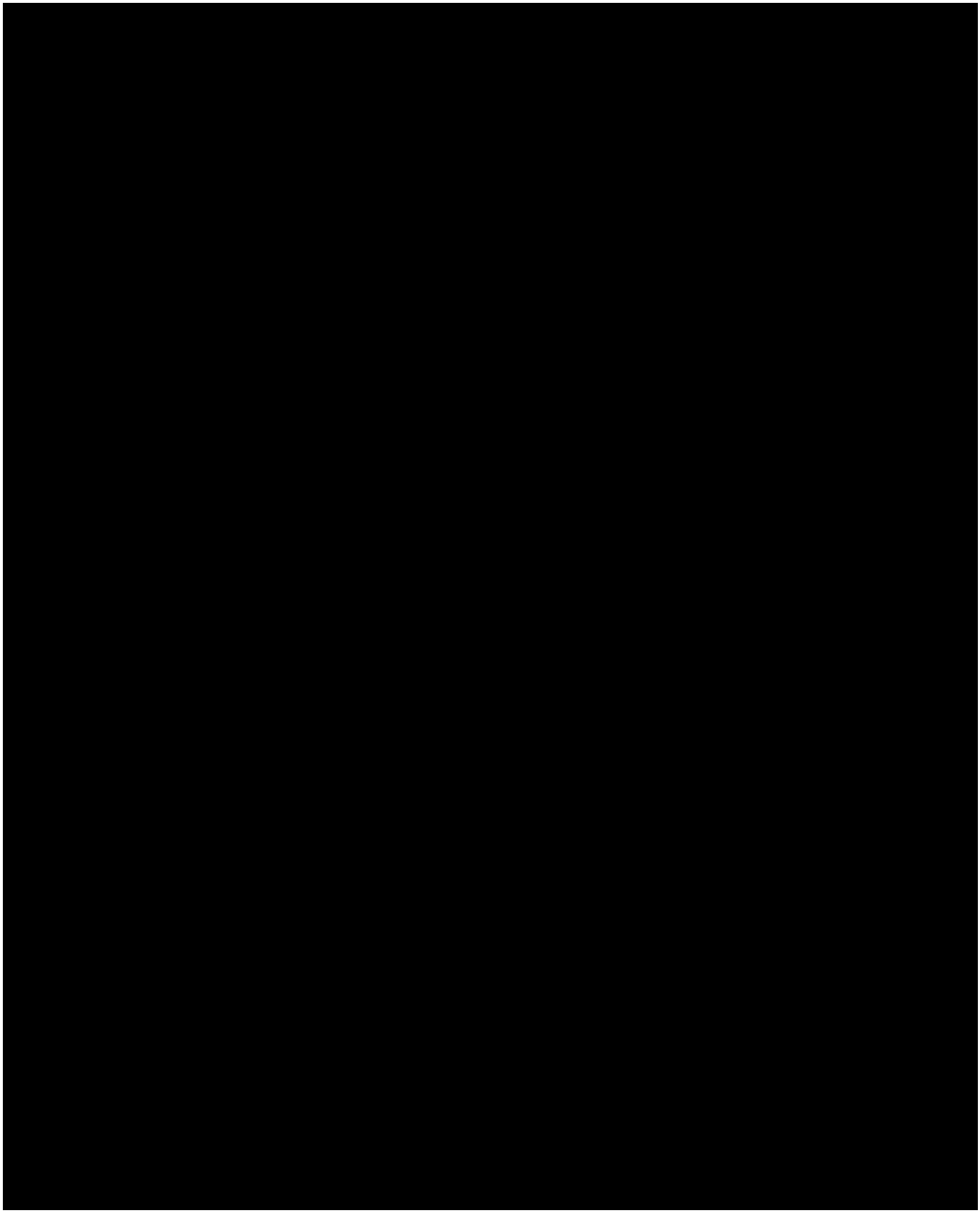

Figure 10. Map of site 41BX2143.

Figure 11. Overview of setting of site 41BX2143, facing east.

Figure 12. Disturbances observed at site 41BX2143, facing northeast.

Figure 13. Distal portion of a biface encountered on the surface at site 41BX2143.

Figure 14. Medial section of a projectile point encountered on the surface at site 41BX2143.

41BX2144

Site 41BX2144 is a subsurface historic artifact scatter measuring 100 x 48 m (328 x 157 feet) located on the northeastern shore of Cassin Lake (Figure 15). The site is situated in an area with relatively flat topography that slopes slightly upwards to the north (see Appendix A: Sheets 9 and 10). The dominant vegetation is comprised of short grasses with a stand of trees approximately 25 m (82 feet) west of the site area. Ground surface visibility was 0–10 percent.

The site area has been subjected to repeated land clearance activities and is currently in use as a cow pasture (Figure 16). Additional disturbances observed at the site include a well-traveled, gravel two-track road and cattle trampling. Cultural materials observed on the surface consisted of a very sparse scatter of brick fragments, as well as modern trash.

The site was investigated closely in an attempt to locate a potential historic-age structure identified on the TxDOT Texas Historic Overlay (see Figure 15 and Appendix B). Two shovel tests were excavated approximately 20 m (65.6 feet) apart at the location of the structure on the map. One shovel test (KJ16) was positive for cultural material. An additional seven shovel tests (AP17–20, KA15–17, KJ24) were then excavated to delineate the positive shovel test but only one (KA17) contained cultural material.

Shovel tests varied ranging from 40 to 75 cmbs (15.7 to 29.5 inbs) and were terminated due to compacted soil and clay. A typical shovel test profile encountered a dark brown (2.5YR 3/3) silty loam over a yellowish brown (2.5YR 5/4) loam that transitions to a clay of the same color. Cultural materials encountered within the two positive shovel tests include: one whiteware body sherd, four clear container glass fragments, one green container glass fragment and a metal screw (Figure 17). Cultural materials were encountered in the upper 30 cm (11.8 in) of the shovel tests (see Appendix B).

In addition to the eight shovel tests excavated at the site a backhoe trench (BHT06) was excavated near shovel test KA15. During the trenching pieces of a ceramic pipe were encountered at a depth of 35 cmbs (13.8 inbs) (Figure 18). No features were encountered during the excavation of the backhoe trench.

Site 41BX2144 is a subsurface historic artifact scatter and is likely the remains of an historic-age structure shown on the Southton 1953 topographic map. The site is probably associated with a historic farmstead that likely dates to the early- or mid-twentieth century. Due to the lack of any standing structures or other cultural features, the limited number and non-distinctive artifacts, the site has little potential to provide additional information that may contribute to the understanding of local and/or regional history. As such site 41BX2144 is assessed as being NOT ELIGIBLE for the NRHP and no further work is recommended.

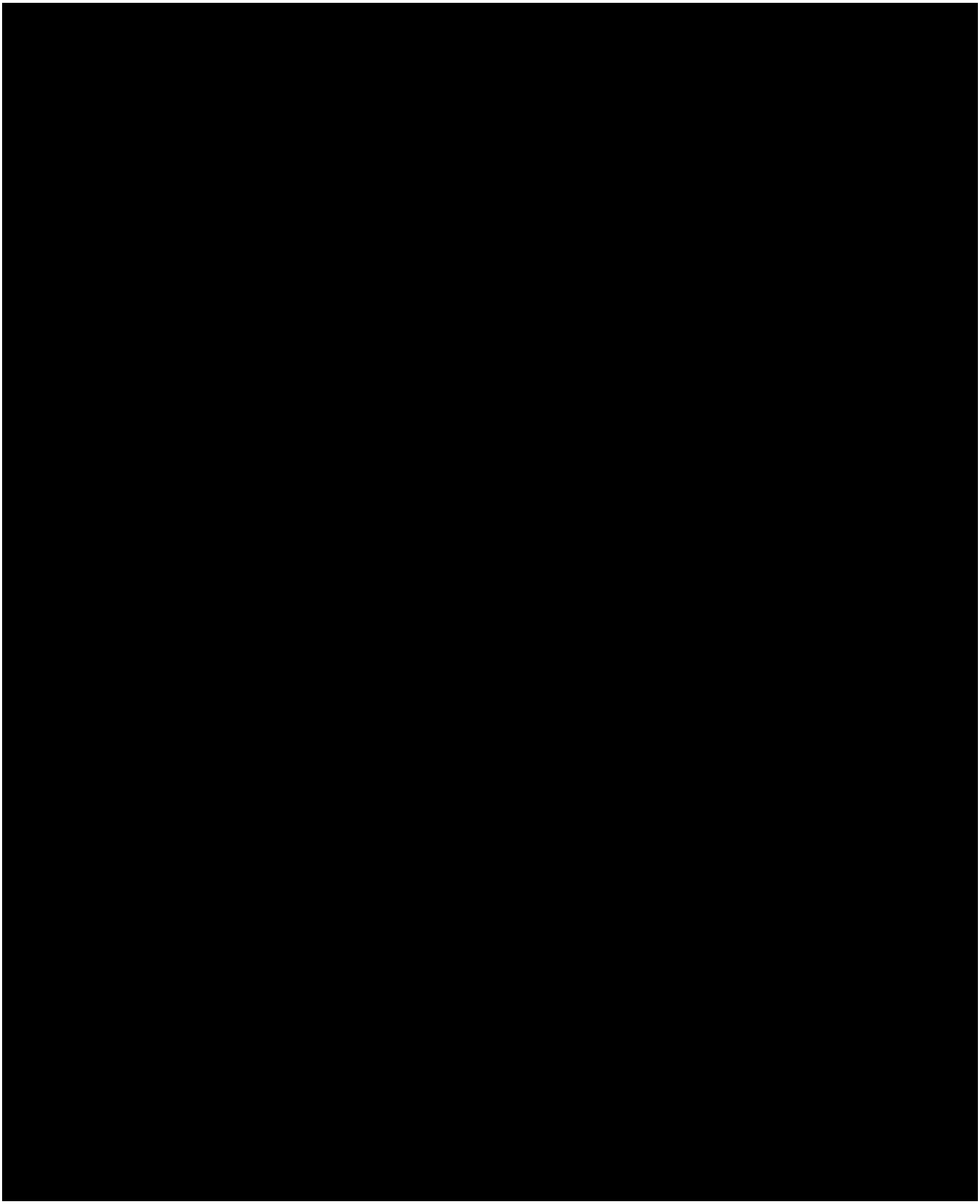

Figure 15. Site map of 41BX2144.

Figure 16. Overview of the setting of site 41BX2144, facing northwest.

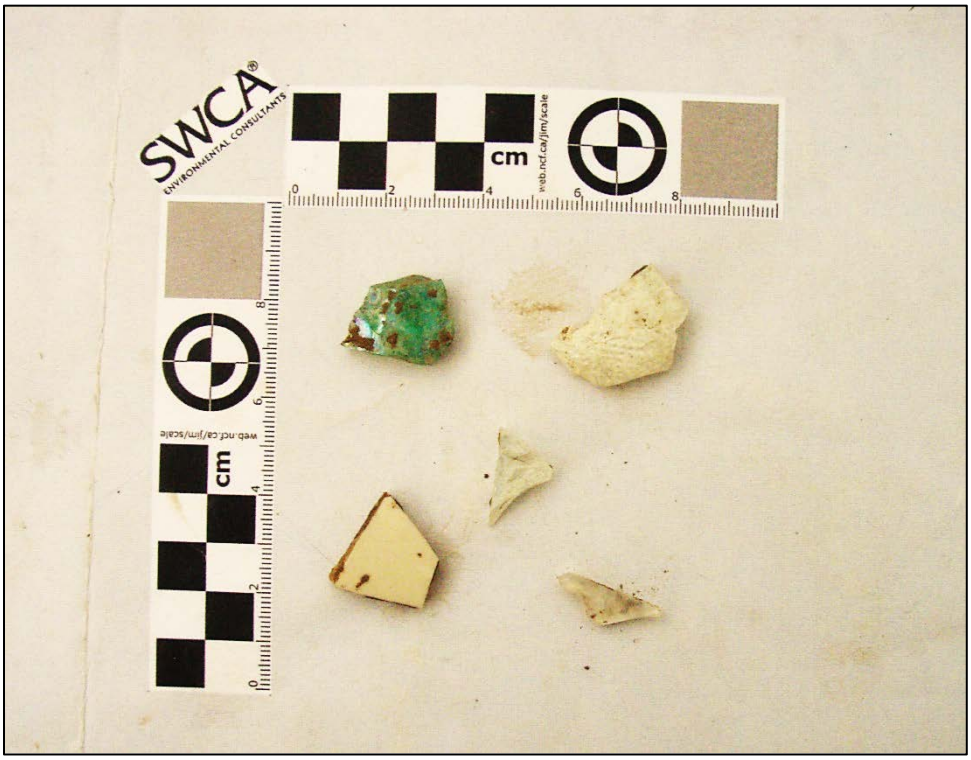

Figure 17. Cultural material at site 41BX2144 from KA16.

Figure 18. Ceramic pipe fragments encountered within site 41BX2144, from BHT06.

REVISITED ARCHAEOLOGICAL SITES

SITE 41BX269 (ESPADA DITCH)

In 2016 J and L Consulting conducted investigations to confirm the location of the Espada Ditch located on the 1953 Southton USGS topographic map. During their investigations J and L Consulting walked the length of the ditch and recorded it using a GPS. Additionally, J and L Consulting also documented a system of abandoned irrigation laterals associated with the Espada ditch (see Appendix A: Page A-1). The J and L Consulting investigations were conducted for the purpose of better understanding the extent of the historic features in relation to the proposed project (Scott 2016).

The eastern portion of the APE crosses the Espada Ditch approximately 686 feet (209 m) northwest of the San Antonio River (Figure 19; see Appendix A: Sheet 12). The ditch is located within a riparian setting with vegetation comprised of hardwood, vines, and short grasses. The ditch was found to be an unlined ditch of variable depth and width, reaching a maximum depth of 3.5-m (11.48 feet) and a maximum width of 5-m (16.4 feet) within the APE (Figure 20). No water was present within the ditch; however, evidence of flash flooding from storm events was observed. Cultural materials observed consisted of only of modern trash along the sloping banks and on the surface (Figure 21).

Investigations associated with the ditch consisted of the excavation of four shovel tests (AP13, AP14, CB10, and KJ21) and one backhoe trench (BHT05). All excavations were negative for cultural material. Soils within the shovel test were moist due to recent rains and displayed a profile consisted of a dark brown (10YR 3/3) clays that reached a depth of 40 cmbs (15.7 inbs).

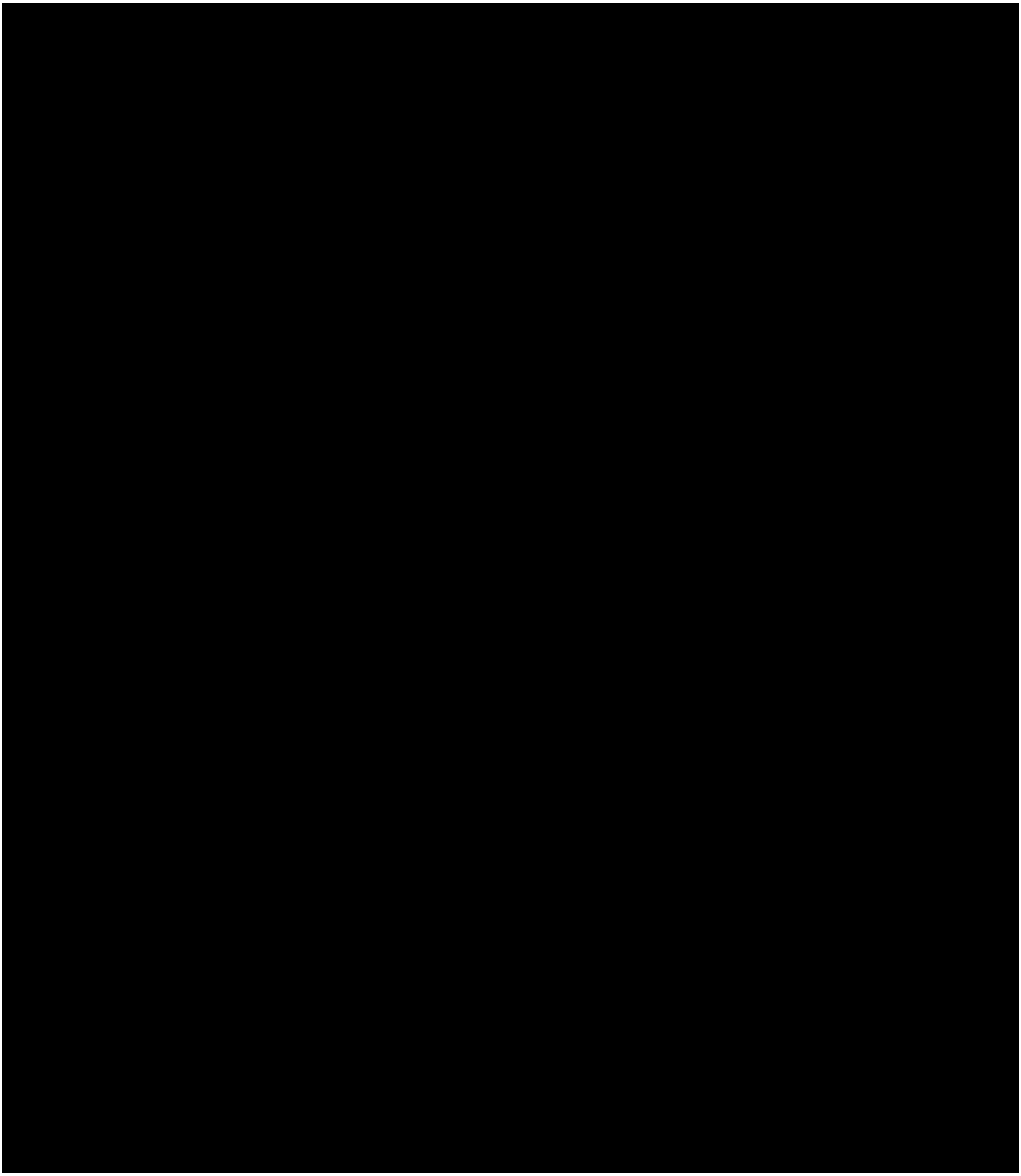

Figure 19. Site Map of 41BX269 (Espada Ditch).

Figure 20. Northeastern bank of the Espada Ditch, facing northeast.

Figure 21. Modern trash observed on the southwestern bank of the Espada Ditch, facing southwest.

Site 41B269 (Espada Ditch) is a Spanish Colonial irrigation ditch that originated in the 1740s. The Espada Ditch is a tangible material culture reminder of San Antonio's Spanish Colonial past. The ditch is believed to have been constructed by Franciscan missionaries by 1745 in order to provide water for agricultural irrigation. It later was altered and further developed by the Espada Ditch Company from 1895 (Hutson 1898:45) to the 1970s (Briscoe Center for American History 2016). Site 41BX269 meets the requirements of Criterion A, B, and D of the NRHP and is included in the World Heritage Designation of the San Antonio Missions. As such, SWCA recommends AVOIDANCE of the acequia feature. Currently a single platform pedestrian bridged with abutments installed 10-15 feet from the acequia is proposed for crossing the ditch (Appendix D). The abutments will be placed at a significant distance from the crossing so the feature is not negatively impacted. Given the landscape context, SWCA believes that this will be sufficient to avoid visual and direct impacts and have assessed the undertaking as having NO ADVERSE EFFECT.

ISOLATED FIND

ISOLATED FIND 1

Isolated Find 1 is a piece of whiteware encountered within shovel test CB01 at a depth between 0 and 20 cmbs (0 and 7.9 inbs) (Figure 22). IF-1 is located on a heavily vegetated, low lying terrace approximately 25 m (84 feet) south of an artificial pond created from damming an unnamed tributary of Minita Creek (see Appendix A: Sheets 3 and 4). Investigations at IF-1 consisted of visual inspection of the ground surrounding the positive shovel test and the excavation of six additional shovel tests (AMP03–AMP08), which were all negative for cultural material. IF-1 was designated an isolated find not warranting site designation or further investigations.

Figure 22. Piece of white ware encountered in CB01, 0–20 cmbs.

BACKHOE TRENCHING RESULTS

Portions of the project encompass topographic settings that have the potential for containing deeply buried archaeological sites (e.g., the four proposed pedestrian bridges at creek and acequia crossings and areas parallel to existing lateral ditches; see Appendix A: Sheets 5, 6, and 12–14). Impacts up to 4 feet (1.2 m) are planned at each pedestrian bridge location; therefore, the subsurface investigations at these locations required deep testing via a backhoe. At these locations, trenches were excavated in areas that were easily accessible by the backhoe; however one bride location (see Appendix A: Sheets 5 and 6) was not investigated due to the presence of an existing gas pipeline. In all a total of eight trenches were excavated within the project area (see Appendix A: Sheets 3, 4, and 12–14).

BACKHOE TRENCHES 1–4

Backhoe trenches (BHTs) 1–4 were excavated within the project corridor along the eastern portion of the proposed alignment between the terminus of the APE and the Espada Ditch (see Appendix A: Sheets 13 and 14). BHT 1 is located on the southwestern side of a proposed bridge crossing at an existing lateral ditch, BHTs 2–4 were excavated within the proposed alignment that parallel the same lateral. BHTs 1–4 encountered a very similar natural stratigraphy (Figures 23–26). A brown (10YR 5/3) silty loam plow zone was observed in the excavation that extended to roughly 20 to 25 cmbs (7.9 to 9.8 inbs). Below this was a grayish brown to pale brown (10YR 5/2 to 10YR 6/3) loam down to 150 cmbs (59.1 inbs). Underlying these strata was a very compact light yellowish brown (10YR 6/4) fine sandy clay that reached a depth of 2 m (6.6 feet) below the surface and terminated on a dense lens of gravels (Appendix C). No cultural materials were encountered in the screen or observed in these trenches.

Figure 23. Southeast wall profile of BHT 1, facing southeast.

Figure 24. East wall profile of BHT 2, facing east.

Figure 25. East wall profile of BHT 3, facing east.

Figure 26. Southeast wall profile of BHT 4, facing southeast.

BACKHOE TRENCH 5

BHT 5 was excavated on the southeastern side of a proposed bridge crossing the Espada Ditch (site 41BX269) (see Appendix A: Sheet 12). The stratigraphy of BHT 5 was slightly different from BHTs 1–4. The upper strata is comprised of a dark gray (10YR 4/1) loamy clay that extended to 105 cmbs (41.3 inbs). The upper strata is underlain by brown (10YR 4/3) clay that extends to approximately 1.55 m (5.1 feet) below surface (Figure 27). This second strata was underlain by a yellowish brown (10YR 5/4) clay that extended to a depth of 2 m (6.6 feet) below surface. The trench was terminated at 200 cm (78.7 in) when gravels were encountered (see Appendix C). No cultural materials were encountered in the screen or observed in the trench.

Figure 27. Northwest wall profile of BHT 5, facing northwest.

BACKHOE TRENCH 6

BHT 6 was excavated within the site boundaries defined for site 41BX2144, along the alternate route of the project area within a cattle pasture (see Appendix A: Sheet 10). Excavations of BHT 6 revealed a total of three stratum. The upper strata is a brown (10YR 5/3) silty loam plow zone that reaches a depth of 35 cmbs (13.8 inbs). This strata is underlain by a pale brown (10YR 6/3) loam deposit intermixed with caliche nodules to a depth of 140 cmbs (55.1 inbs) (Figure 28). Underlying these two stratum is a third strata consisting of a light yellowish brown (10YR 6/4) silty loam that continued to the maximum excavated depth of 2 m (6.5 feet) below surface (see Appendix C). During the excavations a ceramic pipe was encountered at a depth of 30 cm (11.8 in) below surface, described above in the site summary discussion. No other cultural material was encountered within the screen or observed in the trench.

Figure 28. Southeast wall profile of BHT 6, facing Southeast.

BACKHOE TRENCHES 7 AND 8

BHTs 7 and 8 were excavated south of Minita Creek at the south end of a proposed bridge crossing (Figures 29 and 30). BHT 7 was located approximately 47 feet (14 m) from the creek while BHT 8 was located approximately 175 feet (54 m) from the creek (see Appendix: Sheet 4). Excavations of the two trenches identified four similar stratum, with minimal differences in the middle two stratum. The upper strata in both trenches reaches a depth of 35 cmbs (13.8 inbs) and consists of a reddish brown (10YR 5/3) loam (see Appendix C). This strata is underlain by a deposit of a mottled pale brown (10YR 6/3) to brown yellowish (10YR 6/6) hydric clay, possibly representing a flood event. Thickness of the deposit observed in the two trenches varied. In BHT 7 the deposit measured approximately 25 cm (9.8 in) thick, while in BHT 8 the deposit was thinner, only measuring approximately 15 cm (5.9 in) thick. Underlying the flood deposit in BHT 7 was a very dark brown (10YR 2/2) clay reaching a depth of 1.7 m (5.6 feet) below surface. Within BHT 8 this strata was comprised of a dark grayish brown (10YR 4/2) clay that reached a depth of 1.5 cm (4.9 feet) below surface. The final strata observed in both trenches is comprised of mottled gray (10YR 6/1) and yellowish brown (10YR 5/8) redoximorphic clays that reached the termination depth of trenching approximately 2 m (6.6 feet) below surface. No cultural materials were encountered in the screen or observed in the two trenches.

Figure 29. East wall profile of BHT 7, facing east.

Figure 30. West wall profile of BHT 8, facing west.

SUMMARY AND RECOMMENDATIONS

At the request of J and L Consulting and on behalf of the City of San Antonio (COSA), SWCA Environmental Consultants (SWCA) conducted intensive cultural resource investigations for the proposed Espada Trail Section of the Howard Peak Greenway Project in south San Antonio, Texas. The project is sponsored by COSA, a political subdivision of the State of Texas; therefore, it is subject to review under the Antiquities Code of Texas and COSA's Office of Historic Preservation (SA-OHP) per COSA's Historic Preservation and Design Section of the Unified Development Code (Article VI 35-630 to 35-634). Additionally, as the proposed construction may require a permit from the U.S. Army Corps of Engineers, investigations were conducted in compliance with Section 106 of the National Historic Preservation Act (16 United States Code 470) and its implementing regulations (36 Code of Federal Regulations [CFR] 800). SWCA conducted investigations under Texas Antiquities Permit Number 7758.

COSA proposes to construct a section of hike and bike trail in south San Antonio that will connect the Medina River Greenway System to the Mission Trail System. The proposed Espada Trail section measures approximately 4.2 miles (6.75 km) in length and is no wider than 50 feet (15 m), encompassing approximately 25.5 acres. The estimated depths of impacts will normally be approximately 5 inches throughout the trail, with deeper impacts of 8 to 24 inches for beams along the trail's edge, and up to 48 inches depth at three proposed pedestrian bridge locations. In addition to the proposed 4.2-mile project area, a potential alternate route around Cassin Lake has been proposed. The alternate route is approximately 0.93 mile (1.5 km) in length and includes four drainage crossings and/or possible bridge crossings. Therefore, in total the combined area of potential effects (APE) for the proposed project encompasses 31 acres. SWCA's investigations of the proposed project encompassed roughly 5.13 miles (8.25 km) or 62 acres within a typical 100-foot-wide (30-m) survey corridor.

Investigations included a background literature review and an intensive pedestrian survey supplemented by shovel testing, and backhoe trenching within the APE. The background identified 16 previously conducted surveys, 13 previously recorded archaeological sites, one cemetery, one Official Texas Historic Marker, one National Registered District, 417 historic age buildings, two historic age trails, and one historic age railroad within a 1-mile radius of the project area. Four of the 16 previously conducted surveys intersect the project area. These intersecting surveys were conducted in advance of various development projects and intersect along the western and eastern portions of the project area. Of the 13 previously recorded archaeological sites identified within 1 mile of the project area, only a portion of site 41BX269 was located within the project area.

Subsurface investigations involved the excavation of 69 shovel tests, the excavation of eight backhoe trenches, and extensive examination of exposed cut bank profiles along the Minita Creek, the San Antonio River, and the Espada Acequia. As a result of the investigations, SWCA recorded the Cassian Lake Dam and spillway, two new sites (41BX2143 and 41BX2144), revisited site 41BX269, and documented one isolated archaeological find (IF 1). These four cultural resources were assessed with regard to eligibility for inclusion to the National Register of Historic Places (NRHP) and designation as a State Antiquities Landmark (SAL) using the guidelines promulgated in 36 CFR 60.4(a-d). The summary and recommendations are as follows.

The Cassin Lake Dam and Spillway, constructed in 1907 by William Cassin, has good integrity of location, design, setting, materials, and association. William Cassin was a prominent member of the local farming community and the dam is the only remaining structure associated with him. SWCA recommends the Cassin Lake Dam and Spillway as ELIGIBLE for NRHP listing for local significance under criteria A and B. The project as planned should have no adverse effect on the NRHP eligibility of the structure, although an avoidance strategy is recommended for any work that will directly impact the dam and spillway.

Site 41B2143 is a surficial prehistoric lithic scatter of unknown specific age or cultural affiliation. Based on the lack of diagnostic artifacts, cultural features, and buried cultural material, the site is unlikely to provide additional data that would contribute to the understanding of local or regional prehistory. As such, site 41BX2143 is assessed as being NOT ELIGIBLE for the NRHP and no further work is recommended.

Site 41BX2144 is a subsurface historic artifact scatter and is likely the remains of a mid-twentieth-century structure shown on the Southton 1953 topographic map. Due to the lack of any standing structures or other cultural features, and the limited number and undistinctive artifacts, site 41BX2144 is assessed as being NOT ELIGIBLE for the NRHP and no further work is recommended.

Site 41B269 (Espada Ditch) is a Spanish Colonial irrigation ditch that dates to the 1740s. The Espada Ditch meets the listing requirements of Criteria A, B, and D of the NRHP and is included in the World Heritage Designation of the San Antonio Missions. As such, SWCA recommends AVOIDANCE of the feature. Currently a pedestrian bridge is proposed for crossing the ditch, pilings will be placed at a significant distance from the crossing so the acequia feature is not impacted. Given the landscape context, SWCA believes that this will be sufficient to avoid visual and direct impacts and have assessed the undertaking as having NO ADVERSE EFFECT.

Isolated Find 1 is a piece of whiteware encountered within the APE. It is a single occurrence, isolated find that does not warrant site designation or further investigations.

In accordance with 33 CFR 800.4, SWCA has made a reasonable and good faith effort to identify cultural resources properties within either the direct or indirect APE. Based on the results of these investigations and proposed avoidance measures, it is SWCA's professional opinion that the proposed action would have NO ADVERSE EFFECT (per 36 CFR 800.5[b]) on any properties listed or otherwise eligible for the NRHP. SWCA recommends that no further cultural resources investigations are warranted within the APE, as currently defined.

REFERENCES

Ancestry.com

2016a Charlotte N Cassin, *1920 U.S. Federal Census*. Available at: http://search.ancestry.com/cgi-bin/sse.dll?indiv=1&db=1920usfedcen&h=77423412&tid=&pid=&usePUB=true&usePUBJs=true&rhSource=7884. Accessed December 6, 2016. Published by Provo, UT, USA: Ancestry.com Operations Inc.

2016b Charlotte N Cassin, *1930 U.S. Federal Census*. Available at: http://search.ancestry.com/cgi-bin/sse.dll?indiv=1&db=1930usfedcen&h=65597346&tid=&pid=&usePUB=true&usePUBJs=true&rhSource=6061. Accessed December 6, 2016. Published by Provo, UT, USA: Ancestry.com Operations Inc.

2016c Charlotte Newton Cassin, *Texas, Death Certificates, 1903-1982*. Available at: http://search.ancestry.com/cgi-bin/sse.dll?indiv=1&db=txdeathcerts&h=23635450&tid=&pid=&usePUB=true&usePUBJs=true&rhSource=6224. Accessed December 6, 2016. Published by Provo, UT, USA: Ancestry.com Operations Inc.

2016d William Cassin, *1900 U.S. Federal Census*. Available at: http://search.ancestry.com/cgi-bin/sse.dll?indiv=1&db=1900usfedcen&h=78923687&tid=&pid=&usePUB=true&usePUBJs=true&rhSource=7884. Accessed December 6, 2016. Published by Provo, UT, USA: Ancestry.com Operations Inc.

2016e William Cassin, *1910 U.S. Federal Census*. Available at: http://search.ancestry.com/cgi-bin/sse.dll?indiv=1&db=1910USCenIndex&h=27705445&tid=&pid=&usePUB=true&usePUBJs=true&rhSource=7602. Accessed December 6, 2016. Published by Provo, UT, USA: Ancestry.com Operations Inc.

Barnes, V. E.

1983 Geologic Atlas of Texas, San Antonio Sheet. Bureau of Economic Geology, The University of Texas at Austin.

Bever, M. R. and D. J. Meltzer

2007 Exploring Variation in Paleoindian Live Ways: The Third Revised Edition of the Texas Clovis Fluted Point Survey. *Bulletin of the Texas Archeological Society* 78:65–99.

Bexar County Records

2016 Deeds Records–Bexar County Clerks Office. Available at: https://govapps1.propertyinfo.com/wam3/SearchMenu.asp?iCntyNum=17&iApplNum=17001. Accessed December 6, 2016. Published by PropertyInfo Corporation.

Black, S. L.

1989a South Texas Plains. In *From the Gulf to the Rio Grande: Human Adaptation in Central, South and Lower Pecos Texas*, by T. R. Hester, S. L. Black, D. G. Steele, B. W. Olive, A. A. Fox, K. Reinhard, and L. C. Bement, pp. 39–62. Research Series No. 33 Arkansas Archeological Survey, Fayetteville.

1989b Central Texas Plateau Prairie. In *From the Gulf to the Rio Grande: Human Adaptation in Central, South, and Lower Pecos, Texas*, by Thomas R. Hester, Stephen L. Black, D. Gentry Steele, Ben W. Olive, Anne A. Fox, Karl J. Reinhard, and Leland C. Bement, pp. 17–38. Research Series No. 33. Arkansas Archeological Survey, Fayetteville.

Black, S. L., and D. C. Creel
1997 The Central Texas Burned Rock Midden Reconsidered. In *Hot Rock Cooking on the Greater Edwards Plateau: Four Burned Rock Midden Sites in West Central Texas*, Volume 1, by S. L. Black, L. W. Ellis, D. G. Creel, and G. T. Goode, pp. 269-306. Studies in Archeology 22. Texas Archeological Research Laboratory, The University of Texas at Austin. Archeology Studies Program, Report 2. Environmental Affairs Department, Texas Department of Transportation, Austin.

Black, S. L., L. W. Ellis, D. G. Creel, and G. T. Goode
1997 *Hot Rock Cooking on the Greater Edwards Plateau: Four Burned Rock Midden Sites in West Central Texas*, Volumes 1 and 2. Studies in Archeology 22. Texas Archeological Research Laboratory, The University of Texas at Austin. Archeology Studies Program, Report 2. Environmental Affairs Department, Texas Department of Transportation, Austin.

Black, S. L., and A. J. McGraw
1985 The Panther Springs Creek Site: Cultural Change and Continuity within the Upper Salado Creek Watershed, South-Central Texas. Archeological Survey Report No. 100. Center for Archeological Research, The University of Texas at San Antonio.

Bousman, C. B., B. W. Baker, and A. C. Kerr
2004 Paleoindian Archeology in Texas. In *The Prehistory of Texas*. Edited by Timothy K. Pertulla, pp. 15–97. Texas A&M University Press, College Station.

Bousman, C. B., M. B. Collins, P. Goldberg, T. Stafford, J. Guy, B. W. Baker, D. G. Steele, M. Kay, A. Kerr, G. Fredlund, P. Dering, V. Holliday, D. Wilson, W. Gose, S. Dial, P. Takac, R. Balinsky, M. Masson, and J. Powell
2002 The Palaeoindian-Archaic Transition in North America: New Evidence from Texas. *Antiquity* 76:980–990.

Briscoe Center for American History,
2016 A Guide to the Espada Ditch Company Minute Book, 1894-1970 (Accessed Sept 29, 2016) The University of Texas at Austin Libraries.

Cameron, M. B.
2016 Cassin, Texas, *Handbook of Texas Online*. Available at: https://tshaonline.org/handbook/online/articles/hrc30. Accessed December 6, 2016. Published by the Texas State Historical Association.

Campbell, T. N.
1988 *Indians of Southern Texas and Northeastern Mexico: Selected Writings of Thomas Nolan Campbell*. Texas Archeological Research Laboratory, with the cooperation of the Department of Anthropology, the College of Liberal Arts, and the Institute of Latin American Studies, The University of Texas at Austin.

Carpenter, S., M. Chavez, K. Miller, and K. Lawrence
2006 The McKinney Roughs Site 41BP627: A Stratified Late Archaic II Site on the Colorado River Terraces Bastrop County, Texas. SWCA Cultural Resources Report No. 02-313, SWCA Environmental Consultants, Austin.

Cecil, P. F., and D. P. Greene
2016 "Hays County", *The Handbook of Texas Online.* Available at: http://www.tshaonline.org/handbook/online/articles/hch11. Accessed September 19, 2016. Published by the Texas State Historical Association.

Chipman, D. E.
1992 *Spanish Texas, 1519-1821*. University of Texas Press, Austin.

Collins, M. B.
1990 *The Archeological Sequence at Kincaid Rockshelter, Uvalde County, Texas*. Transactions of the Twenty-Fifth Regional Archeological Symposium for Southeastern New Mexico and Western Texas, pp. 25–34.

1995 Forty Years of Archeology in Central Texas. *Bulletin of the Texas Archeological Society* 66:361–400.

1998 *Early Paleoindian Components. In Wilson-Leonard: An 11,000-Year Archeological Record of Hunter-Gatherers in Central Texas*, Volume I, edited and assembled by Michael B. Collins, pp. 123–159. Studies in Archeology 31. Texas Archeological Research Laboratory, The University of Texas at Austin. Archeology Studies Program, Report 10. Environmental Affairs Division, Texas Department of Transportation.

2004 Archeology in Central Texas. In *The Prehistory of Texas*. Edited by Timothy K. Pertulla, pp. 101–126. Texas A&M University Press, College Station.

Collins, M. B., B. Ellis, and C. Dodt-Ellis
1990 Excavations at the Camp Pearl Wheat Site (41KR243): An Early Archaic Campsite on Town Creek, Kerr County, Texas. Studies in Archeology 6. Texas Archeological Research Laboratory, The University of Texas at Austin.

Collins, M. B., G. L. Evans, T. N. Campbell, M. C. Winans, and C. E. Mear
1989 Clovis Occupation at Kincaid Rockshelter, Texas. *Current Research in the Pleistocene* 6:3–4.

Collins, M. B., J. Guy, and S. W. Dial
1998 The Archaic Period, 8800 to 1300 B.P. In Wilson-Leonard: An 11,000-Year Archeological Record of Hunter-Gatherers in Central Texas, Volume I, edited and assembled by Michael B. Collins, pp. 211–270. Studies in Archeology 31. Texas Archeological Research Laboratory, The University of Texas at Austin. Archeology Studies Program, Report 10. Environmental Affairs Division, Texas Department of Transportation.

Collins, M. B., T. R. Hester, and P. J. Hedrick
1992 Engraved Cobbles from the Gault Site, Central Texas. *Current Research in the Pleistocene* 9:3–4.

Cox, I. W.
1999 *Historic Period. In Archeological Survey and Testing in San Pedro Park (41BX19), San Antonio, Texas,* by B.A. Houk, pp. 6-11 Archaeological Survey Report, No. 289. Center for Archaeological Research, The University of Texas at San Antonio, San Antonio.

2005 *Spanish Acequias of San Antonio.* Maverick Publishing Company, San Antonio.

Cruz, G. R.
2016 San José y San Miguel de Aguayo Mission, *Handbook of Texas Online*. Available at: http://www.tshaonline.org/handbook/online/articles/uqs23. Accessed September 19, 2016. Published by the Texas State Historical Association.

Dering, P.
2007 Assessment of Botanical and Faunal Assemblages from Paleoindian and Early Archaic Components on the Periphery of the Southern Plains. *Bulletin of the Texas Archeological Society* 78:177–195.

Fehrenbach, T. R.
1978 Lone Star: A History of Texas and the Texans. Macmillan. New York.

2016 San Antonio, TX, Handbook of Texas Online. Available at: http://www.tshaonline.org/handbook/online/articles/hds02. Accessed September 19, 2016. Published by the Texas State Historical Association.

Foster, T. R., T. Summerville, and T. Brown
2006 *The Texas Historic Overlay: A Geographic Information System of Historic Map Images for Planning Transportation Projects in Texas.* Prepared for the Texas Department of Transportation by PBS&J, Austin.

Foster, W. C.
1995 *Spanish Expeditions into Texas, 1689–1768*. University of Texas Press, Austin.

Fox, A. A.
1979 *A Survey of Archaeological, Architectural, and Historical Sites on the San Antonio River from Olmos Dam to South Alamo Street and on San Pedro Creek from San Pedro Park to Guadalupe Street.* Archaeological Survey Report No. 80. Center for Archaeological Research, The University of Texas, San Antonio.

Goode, G. T.
1991 Late Prehistoric Burned Rock Middens in Central Texas. In *The Burned Rock Middens of Texas: An Archeological Symposium*, edited by Thomas R. Hester, pp. 71–93. Studies in Archeology 13. Texas Archeological Research Laboratory, The University of Texas at Austin.

Habig, M. A.
1968 *The Alamo Chain of Missions: A History of San Antonio's Five Old Missions.* Franciscan Herald Press, Chicago.

1990 *Spanish Texas Pilgrimage.* Franciscan Herald Press, Chicago.

Handbook of Texas Online
2016a Cassin Lake. Available at: http://www.tshaonline.org/handbook/online/articles/roc07. Accessed September 28, 2016. Published by the Texas State Historical Association.

2016b Old San Antonio Road. Available at: http://www.tshaonline.org/handbook/online/articles/exo04. Accessed September 28, 2016.

Hester, T. R.
1980 A Survey of Paleo-Indian Remains Along the Texas Coast. In *Papers on the Archaeology of the Texas Coast*, edited by L. Highley and T. R. Hester, pp. 1–22. Special Report 11. Center for Archeological Research, The University of Texas at San Antonio.

1995 The Prehistory of South Texas. *Bulletin of the Texas Archeological Society* 66:427–459.

Heusinger, E. W., F.R.G.S.
1951 A Chronology of Events in San Antonio: Being a Concise History of the City Year By Year: From the Beginning of its Establishment to the End of the First Half of the Twentieth Century. Standard Printing Co., San Antonio, Texas.

Hoffman, F. L. (translation)
1935 *Diary of the Alarcon Expedition into Texas, 1718-1719*, by Fray Francisco. The Quivira Society, Las Angeles.

Houk, B. A., and J. C. Lohse
1993 Archeological Investigations at the Mingo Site, Bandera County, Texas. *Bulletin of the Texas Archeological Society* 61:193–247.

Houk, B. A., K. A. Miller, and E. R. Oksanen
2008 *The Gatlin Site (41KR621): Investigating Archaic Lifeways on the Southern Edwards Plateau of Central Texas*. Texas Department of Transportation Archeological Studies Program No. 108, SWCA Cultural Resources Report No. 149, SWCA Environmental Consultants, Austin.

House, B.
1949 City of Flaming Adventure: The Chronicle of San Antonio. The Naylor Company, San Antonio, Texas.

Huebner, J. A.
1991 Late Prehistoric Bison Populations in Central and South Texas. *Plains Anthropologist* 36(137):343–358.

Hutson, W. F.,
1898 Irrigation Systems in Texas. United States Geographical Survey. Water-supply and Irrigation Paper of the United States Geological Survey, No. 13. Government Printing Office, Washington D.C.

Jelks, E. B.
1962 *The Kyle Site: A Stratified Central Texas Aspect Site in Hill County, Texas*. Archaeology Series No. 5. Department of Anthropology, The University of Texas at Austin.

Johnson, L., Jr.
1994 *The Life and Times of Toyah-Culture Folk As Seen from the Buckhollow Encampment, Site 31KM16, of Kimble County, Texas*. Office of the State Archeologist Report 38. Texas Department of Transportation and Texas Historical Commission, Austin.

Johnson, L, and G. T. Goode
1994 A New Try at Dating and Characterizing Holocene Climates, as well as Archeological Periods, on the Eastern Edwards Plateau. *Bulletin of the Texas Archeological Society* 65:1–51.

Johnston, L. C.
1947 *San Antonio St. Anthony's Town.* Librarian's Council, San Antonio, Texas.

Kleinbach, K., G. Mehalchick, J. T. Abbott, and J. M. Quigg
1995 Other Analyses. In *NRHP Significance Testing of 57 Prehistoric Archeological Sites on Fort Hood, Texas*, Volume II, edited by James T. Abbott and W. Nicholas Trierweiler, pp. 765–842. Archeological Resource Management Series, Research Report No. 34. United States Army Fort Hood.

Long, C.
2016 Paseo del Rio (River Walk), *Handbook of Texas Online*. Available at: http://www.tshaonline.org/handbook/online/articles/hpp01. Accessed September 19, 2016. Published by the Texas State Historical Association.

Mauldin, R., S. Smith, S. Wigley, A. Figueroa, and C. McKenzie
2015 *Archaeological Investigations within San Pedro Springs Park (41BX19), San Antonio, Bexar County, Texas.* Archaeological Report No. 443. Center for Archeological Research, The University of Texas at San Antonio.

McGraw, A.
2002 Origins of the Camino Real in Texas, Texas Almanac. Available at: http://texasalmanac.com/topics/history/origins-camino-real-texas. Accessed September 28, 20, 2016. Published by the Texas State Historical Association.

McKenzie, C., L. Martinez, and R. Mauldin
2016 *Archaeological Monitoring and Test Excavations at the 1722 Presidio San Antonio de Bear (Plaza de Armas Buildings), San Antonio, Bexar County, Texas.* Archaeological Report No. 445. Center for Archeological Research, The University of Texas at San Antonio.

McKinney, W. W.
1981 Early Holocene Adaptations in Central and Southwestern Texas: The Problem of the Paleoindian-Archaic Transition. *Bulletin of the Texas Archeology Society* 52:91–120.

Meltzer, D. J., and M. R. Bever
1995 Paleoindians of Texas: An Update on the Texas Clovis Fluted Point Survey. *Bulletin of the Texas Archeological Society* 66:47–81.

National Park Services
1983 Archeology and Historic Preservation: Secretary of the Interior's Standards and Guidelines. Federal Register 48 (190): 44734-44742.

2000 *Guidelines for Local Survey: A Basis for Preservation Planning*. National Register Bulletin 24. U.S. Department of the Interior National Park Service, Interagency Resources Division.

2016 Press Release. Available at: https://www.doi.gov/pressreleases/secretary-jewell-applauds-designation-san-antonio-missions-texas-nation%E2%80%99s-23rd-world-heritage-site. Accessed on September 5 2016. Published by the National Park Services, U.S. Department of the Interior.

Natural Resources Conservation Service (NRCS)
2016 Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. *Web Soil Survey of Bexar County*. Available at http://websoilsurvey.nrcs.usda.gov/. Accessed July 28, 2016.

Newcomb, W. W., Jr.
2002 *The Indians of Texas.* University of Texas Press, Austin.

Nichols, K. M.
2015 *Archaeological Investigations at the Christopher Columbus Italian Society Property and Columbus Park: 41BX1968, the Possible First Site of Mission San Antonio de Valero.* Archaeological Report No. 432. Center for Archeological Research, The University of Texas at San Antonio.

Oksanen, E. R.
2008 Archaeological Investigations at the Icehouse Site, 41HY161: A Reevaluation of Early Archaic Technology, Subsistence and Settlement Along the Balcones Escarpment and Central Texas. Unpublished Master's Thesis, Department of Anthropology, Texas State University, San Marcos.

Porter, C. R.
2009 *Spanish Water, Anglo Water: Early Development in San Antonio*. Texas A&M University Press, College Station.

Prewitt, E. R.
1981 Cultural Chronology in Central Texas. *Bulletin of the Texas Archeological Society* 52:65–89.

1985 From Circleville to Toyah: Comments on Central Texas Chronology. *Bulletin of the Texas Archeological Society* 54:201–238.

Ricklis, R. A.
1992 The Spread of Late Prehistoric Bison Hunting Complex: Evidence from the South-Central Coastal Prairie of Texas. *Plains Anthropologist* 37(140):261-273.

Schoelwer, S. P.
2016 San Antonio de Valero Mission, *Handbook of Texas Online*. Available at: http://www.tshaonline.org/handbook/online/articles/uqs08. Accessed September 19, 2016. Published by the Texas State Historical Association.

Scott, A. M.,
2016 Letter Report: Findings of Preliminary Investigations of Historic Ditch Features for Espada Trail Environmental Study. J and L Consulting.

Story, D. A.
1985 Adaptive Strategies of Archaic Cultures of the West Gulf Coastal Plain. In *Prehistoric Food Production in North America*, edited by R. I. Ford, pp. 19–56. Anthropological Papers 75. Museum of Anthropology, University of Michigan, Ann Arbor.

1990 Cultural History of the Native Americans. In *The Archeology and Bioarcheology of the Gulf Coastal Plain*, by Dee Ann Story, Janice A. Guy, Barbara A. Burnett, Martha Doty Freeman, Jerome C. Rose, D. Gentry Steele, Ben W. Olive, and Karl J. Reinhard, pp. 163–366. Research Series No. 38. Arkansas Archeological Survey, Fayetteville.

Suhm, D. A.
1960 A Review of Central Texas Archeology. *Bulletin of the Texas Archeological Society* 29:63–107.

Takac, P. R.
1991 Underwater Excavations at Spring Lake: A Paleoindian Site in Hays County, Texas. *Current Research in the Pleistocene* 8:46–48.

Thoms, A. V. and R. D. Mandel
2007 Archaeological and Paleoecological Investigations at the Richard Beene Site South-Central Texas Volume I: Paleoecological Studies, Cultural Contexts, and Excavation Studies. 2 vols. Reports of Investigations 8. Center for Ecological Archaeology. Texas A&M University, College Station.

Texas Department of Transportation
N/D "El Camino Real de los Tejas" *The Portal to Texas History* (texashistory.unt.edu/ark:/67531/metapth661997/m1/2/?q=el%20camino%20real) accessed September 28, 2016. University of North Texas Libraries Government Documents Department. 16.

Texas Historical Commission (THC)
2016 *Texas Archeological Sites Atlas* restricted database, Texas Historical Commission. Available at http://nueces.thc.state.tx.us/. Accessed July 28, 2016.

Toomey III, R. S.
1993 *Late Pleistocene and Holocene Faunal and Environmental Changes at Hall's Cave, Kerr County, Texas*. Vols. 1 and 2 Unpublished Ph.D. dissertation, Department of Geology, The University of Texas at Austin.

Tous, G. (translator)
1930a The Espinosa-Olivares-Aguire Expedition of 1709. *Preliminary Studies of the Texas Catholic Historical Society* 1(3):3-14.

1930b Ramon's Expedition: Espinosa's Diary of 1716. *Preliminary Studies of the Texas Catholic Historical Society* 1(4):4-24.

Turner, E. S., and T. R. Hester
1999 *A Field Guide to Stone Artifacts of Texas Indians.* Third Edition. Texas Monthly Field Guide Series. Gulf Publishing Company, Houston, Texas.

Weir, F. A.
1976 *The Central Texas Archaic*. Ph.D. dissertation, Department of Anthropology, Washington State University, Pullman.

Wesolowsky, A. B., T. R. Hester, and D. R. Brown
1976 Archeological Investigations at the Jetta Court Site (41TV151) Travis County, Texas. *Bulletin of the Texas Archeological Society* 47:25–87.

Willey, G. R., and P. Phillips
1958 *Method and Theory in American Archaeology*. University of Chicago Press, Chicago.

APPENDIX A

ALIGNMENT SHEETS

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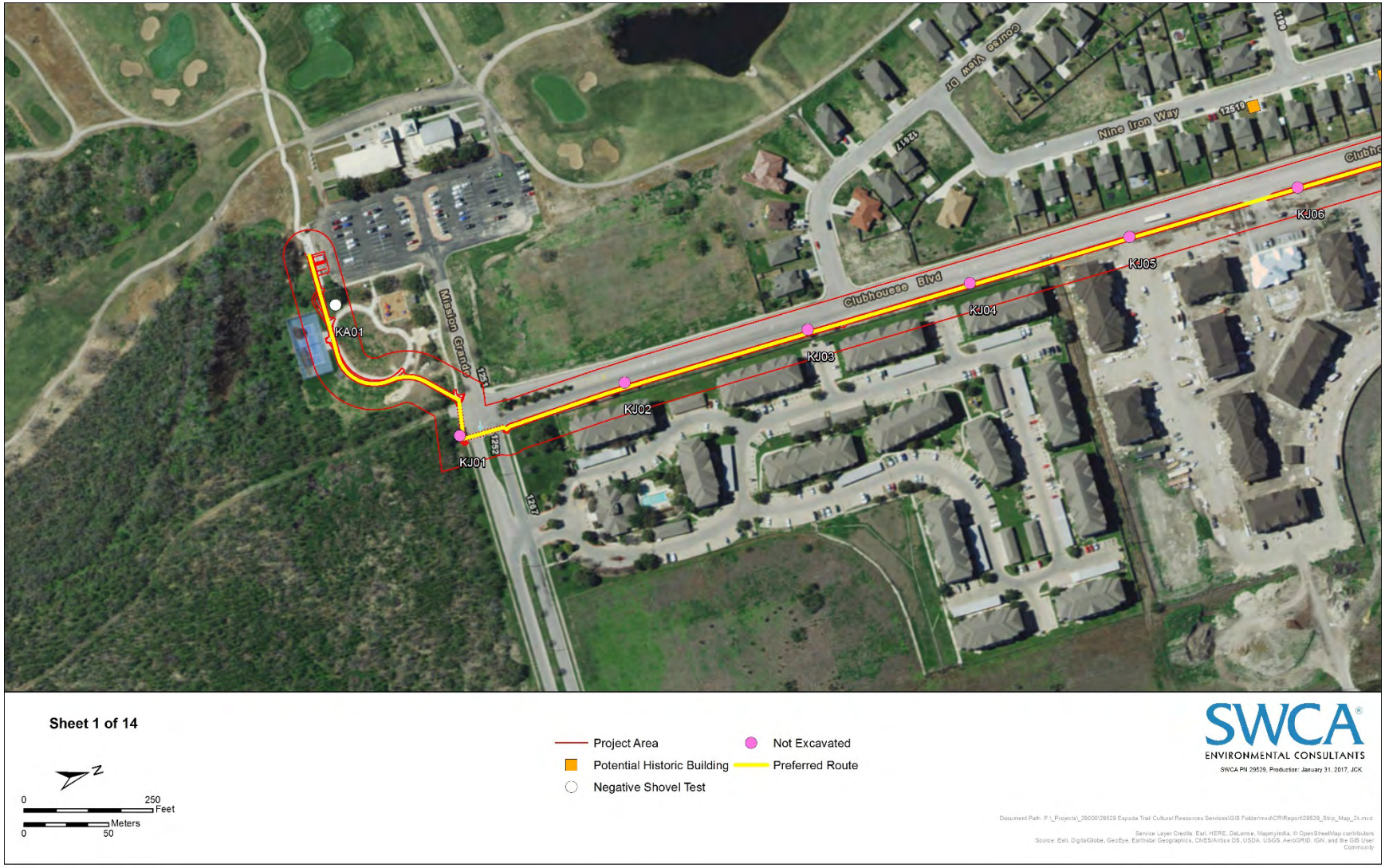
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Sheet 2 of 14

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Project Area

Potential Historic Building

Not Excavated

Preferred Route

SWCA ENVIRONMENTAL CONSULTANTS

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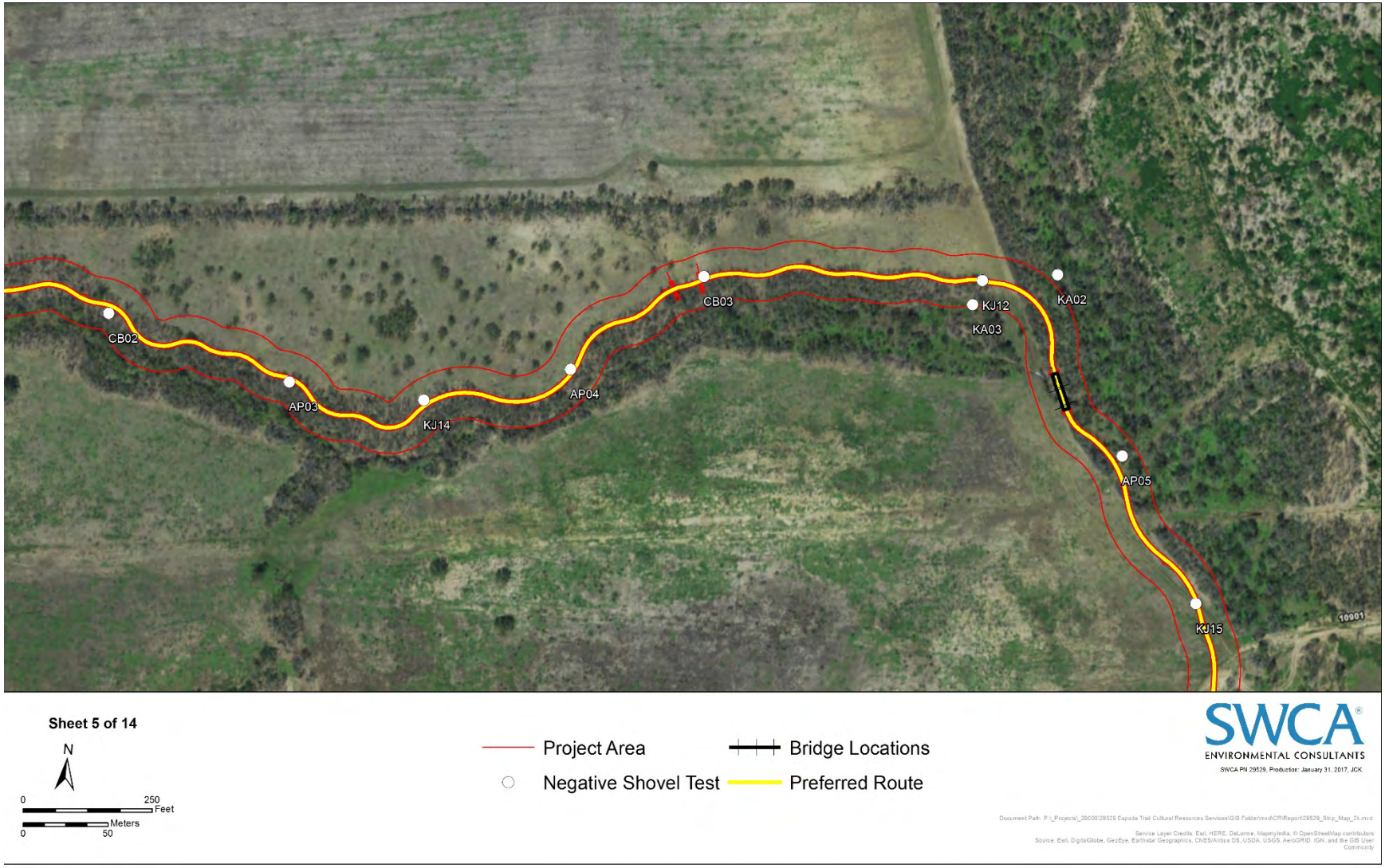
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Preferred Route
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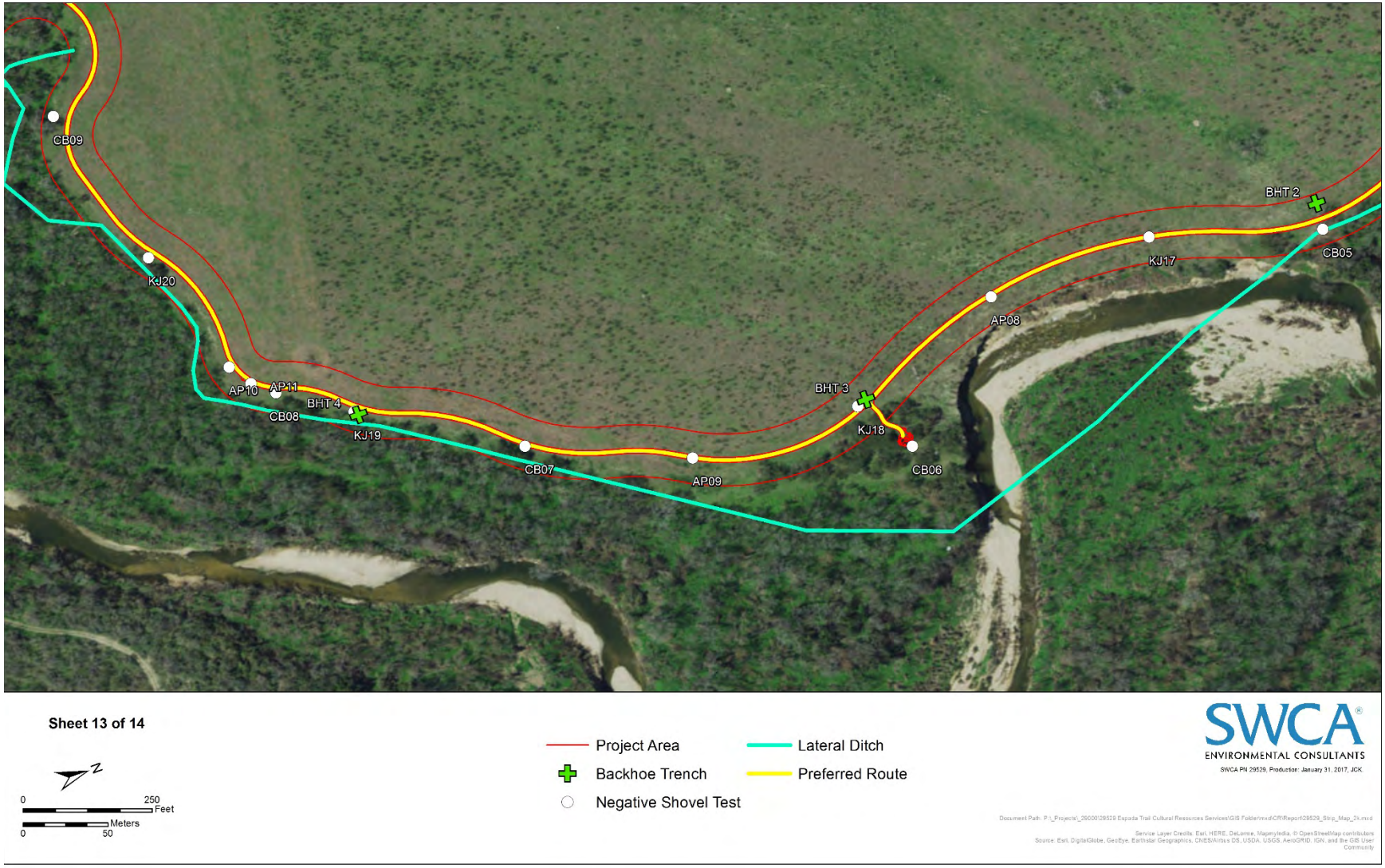
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Sheet 13 of 14
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Project Area
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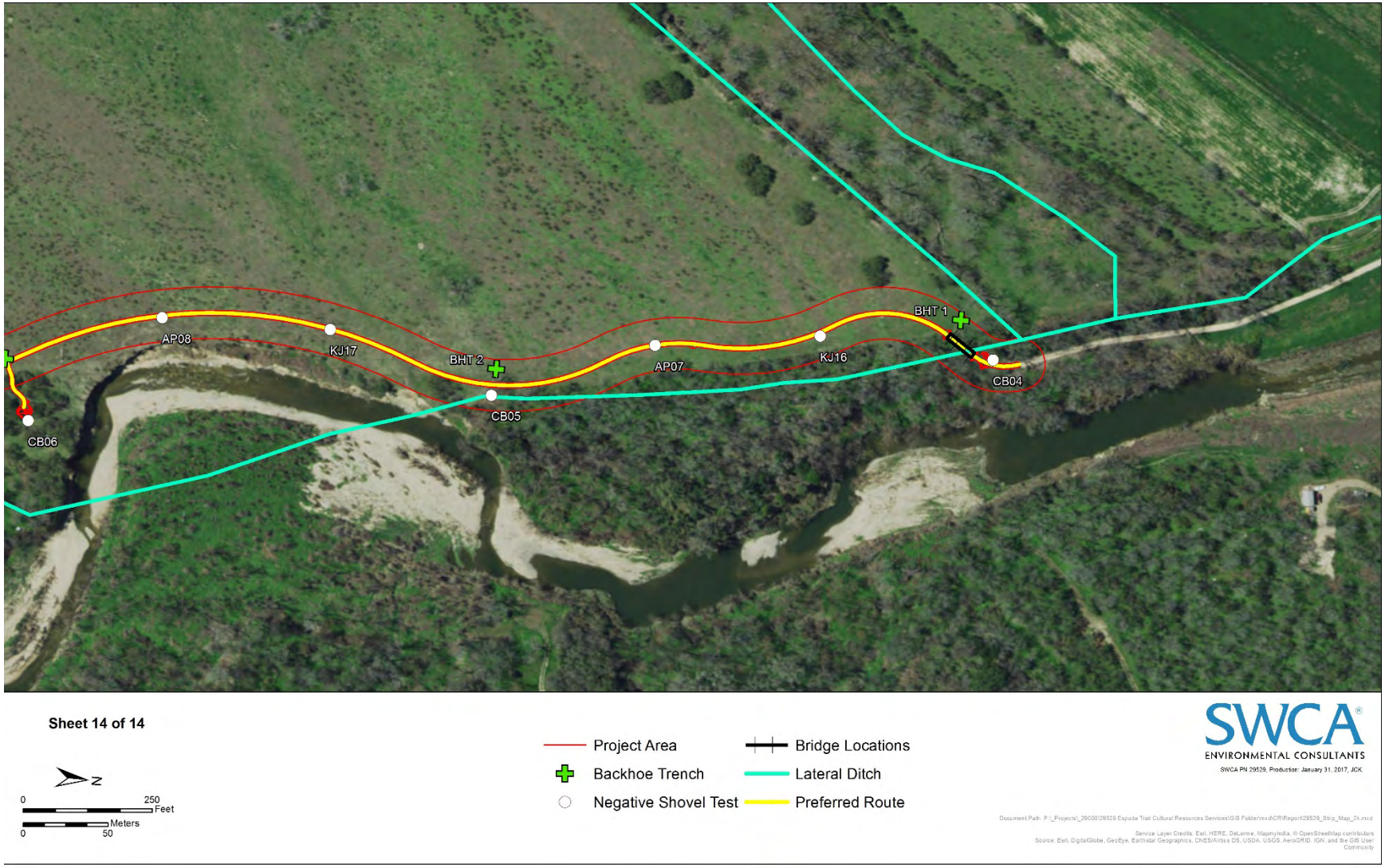
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Project Area
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Bridge Locations
Lateral Ditch
Preferred Route
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APPENDIX B

SHOVEL TEST LOG

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Shovel Test Log

ST No.	Site Trinomial	County	Depth (cmbs)	Munsell	Soil Color	Soil Texture	Inclusions	Positive/Negative	Comments/Reason For Termination
AP01	-	Bexar	0-20	10YR4/4	Dark Yellowish Brown	Clay Loam	10% gravel	Negative	
			20-10	10YR3/2	Very Dark Grayish Brown	Clay Loam	10% gravel	Negative	
			40-60	10YR2/1	Black	Clay Loam	10% gravel	Negative	Terminated due to compact soil
AP02	-	Bexar	0-20	10YR2/1	Black	Clay	Rootlets	Negative	
			20-40	10YR2/1	Black	Clay	Rootlets	Negative	Terminated due to compact clay
AP03	-	Bexar	0-20	10YR2/1	Black	Clay	Rootlets	Negative	
			20-40	10YR2/1	Black	Clay	Rootlets	Negative	Terminated due to compact clay
AP04	-	Bexar	0-20	10YR2/1	Black	Clay	5% gravel	Negative	
			20-40	10YR2/1	Black	Clay	1% gravel	Negative	Terminated due to compact clay
AP05	-	Bexar	0-20	10YR2/1	Black	Clay	Rootlets	Negative	
			20-40	10YR2/1	Black	Clay	Rootlets	Negative	Terminated due to compact clay
AP06	-	Bexar	0-20	10YR4/3	Brown	Silty Loam	10% gravel	Negative	
			20-40	10YR4/3	Brown	Sandy Loam	10% gravel	Negative	Terminated due to compact clay
AP07	-	Bexar	0-20	10YR2/2	Very Dark Brown	Sandy Clay	Rootlets	Negative	
			20-40	10YR2/2	Very Dark Brown	Sandy Clay	Rootlets	Negative	
			40-60	10YR2/2	Very Dark Brown	Sandy Clay	Rootlets	Negative	
			60-70	10YR2/2	Very Dark Brown	Sandy Clay	Rootlets	Negative	Terminated due to compact soil

Shovel Test Log

ST No.	Site Trinomial	County	Depth (cmbs)	Munsell	Soil Color	Soil Texture	Inclusions	Positive/Negative	Comments/Reason For Termination
AP08	-	Bexar	0-20	10YR2/2	Very Dark Brown	Sandy Clay	Rootlets	Negative	
			20-40	10YR2/2	Very Dark Brown	Clay	Rootlets	Negative	Terminated due to compact soil
AP09	-	Bexar	0-20	10YR2/2	Very Dark Brown	Sandy Clay	Rootlets	Negative	
			20-40	10YR2/2	Very Dark Brown	Sandy Clay	Rootlets	Negative	
			40-60	10YR2/2	Very Dark Brown	Sandy Clay	Rootlets	Negative	Terminated due to compact soil
AP10	-	Bexar	0-20	10YR2/2	Very Dark Brown	Clay	Roots	Negative	
			20-40	10YR2/2	Very Dark Brown	Clay	Roots	Negative	Terminated due to compact soil
AP11	-	Bexar	0-20	10YR4/2	Dark Grayish Brown	Clay	Roots	Negative	
			20-40	10YR4/2	Dark Grayish Brown	Clay	Roots	Negative	Terminated due to compact soil
AP12	-	Bexar	0-20	10YR2/2	Very Dark Brown	Clay	Roots	Negative	
			20-40	10YR2/2	Very Dark Brown	Clay	Roots	Negative	Terminated due to compact soil
AP13	41BX269	Bexar	0-20	10YR2/2	Very Dark Brown	Clay	Rootlets	Negative	
			20-40	10YR2/2	Very Dark Brown	Clay	Rootlets	Negative	Terminated due to compact clay
AP14	41BX269	Bexar	0-20	10YR2/2	Very Dark Brown	Clay	Root	Negative	
			20-40	10YR2/2	Very Dark Brown	Clay	Root	Negative	Terminated due to compact clay

Shovel Test Log

ST No.	Site Trinomial	County	Depth (cmbs)	Munsell	Soil Color	Soil Texture	Inclusions	Positive/Negative	Comments/Reason For Termination
AP15	-	Bexar	0-20	10YR4/2	Dark Grayish Brown	Clay	Root	Negative	
			20-40	10YR4/2	Dark Grayish Brown	Clay	Root	Negative	Terminated due to compact soil
AP16	-	Bexar	0-10	10YR6/3	Pale Brown	Silty Loam	35% gravel	Negative	Terminated due to compact gravel
AP17	-	Bexar	0-20	2.5YR3/3	Dark Reddish Brown	Sandy Loam	Roots	Negative	
			20-40	2.5YR3/3	Dark Reddish Brown	Sandy Loam	Roots	Negative	
			40-60	2.5YR5/4	Reddish Brown	Sandy Loam	Roots	Negative	
			60-70	2.5YR5/4	Reddish Brown	Loam	Roots	Negative	Terminated due to compact soil
AP18	-	Bexar	0-20	2.5YR5/4	Reddish Brown	Sandy Loam	Roots	Negative	
			20-40	2.5YR5/4	Reddish Brown	Sandy Loam	Roots	Negative	
			40-50	2.5YR5/4	Reddish Brown	Sandy Loam	Roots	Negative	Terminated due to compact soil
AP19	-	Bexar	0-20	10YR5/4	Yellowish Brown	Sandy Loam	Roots	Negative	
			20-40	10YR5/4	Yellowish Brown	Sandy Loam	Roots	Negative	
			40-50	10YR5/4	Yellowish Brown	Sandy Loam	Roots	Negative	Terminated due to compact soil

Shovel Test Log

ST No.	Site Trinomial	County	Depth (cmbs)	Munsell	Soil Color	Soil Texture	Inclusions	Positive/Negative	Comments/Reason For Termination
AP20	-	Bexar	0-20	10YR3/3	Dark Brown	Sandy Loam	Rootlets	Negative	
			20-40	10YR3/3	Dark Brown	Sandy Loam	Rootlets	Negative	
			40-60	10YR3/3	Dark Brown	Loam	Rootlets	Negative	Terminated due to compact soil
AP21	-	Bexar	0-20	10YR4/3	Brown	Sandy Loam	Rootlets	Negative	
			20-40	10YR4/3	Brown	Sandy Loam	Rootlets	Negative	
			40-60	10YR4/3	Brown	Sandy Loam	Rootlets	Negative	Terminated due to compact soil
AP22	-	Bexar	0-10	-	-	-	100% gravel	Negative	No dig due to existing berm road
AP23	-	Bexar	0-10	-	-	-	100% gravel	Negative	No dig due to existing berm road
AP24	-	Bexar	0-10	-	-	-	100% gravel	Negative	No dig due to existing berm road
AP25	-	Bexar	0-10	-	-	-	100% gravel	Negative	No dig due to existing berm road
AP26	-	Bexar	0-10	-	-	-	100% gravel	Negative	No dig due to existing berm road
AP27	-	Bexar	0-10	-	-	-	100% gravel	Negative	No dig due to existing berm road
AP28	-	Bexar	0-10	-	-	-	100% gravel	Negative	No dig due to existing berm road
AP29	-	Bexar	0-10	-	-	-	100% gravel	Negative	No dig due to existing berm road
AP30	-	Bexar	0-10	-	-	-	100% gravel	Negative	No dig due to existing berm road
AP31	41BX2143	Bexar	0-20	10YR 4/3	Brown	Loam	85% gravel	Negative	
			20-40	10YR4/3	Brown	Clay Loam	90% gravel/ mottled marl	Negative	Terminated due to compact marl and gravel
AP32	41BX2143	Bexar	0-20	10YR4/3	Brown	Loam	85% gravel	Negative	
			20-40	10YR4/3	Brown	Clay Loam	90% gravel	Negative	Terminated due to compact marl and gravel
KA01	-	Bexar	0-20	2.5YR5/3	Reddish Brown	Clay	1-5% gravel	Negative	

Shovel Test Log

ST No.	Site Trinomial	County	Depth (cmbs)	Munsell	Soil Color	Soil Texture	Inclusions	Positive/Negative	Comments/Reason For Termination
			20-80	10YR2/1	Black	Clay Loam	1-5% gravel	Negative	In park/Terminated due to compact soil
KA02	-	Bexar	0-40	7.5YR5/3	Brown	Clay Loam	10% caliche	Negative	
			40-50	10YR4/1	Dark Gray	Clay	10% caliche	Negative	East of stream/ Terminated due to soil stickiness
KA03	-	Bexar	0-20	2.5YR3/2	Dusky Red	Clay Loam	0%	Negative	
			20-40	7.5YR3/2	Dark Brown	Clay Loam	0%	Negative	
			40-50	10YR3/1	Very Dark Gray	Silty Loam	0%	Negative	Just south of stream with visible brick on the surface both at KJ12 and in road/ Terminated due to soil stickiness
KA04	-	Bexar	0-10	-	-	-	100% gravel	Negative	Artificial berm, shovel turn only, disturbed/ no dig
KA05	-	Bexar	0-10	-	-	-	100% gravel	Negative	Berm with gravel, shovel turn/ no dig
KA06	-	Bexar	0-10	-	-	-	100% gravel	Negative	Berm turn/ no dig
KA07	-	Bexar	0-10	-	-	-	100% gravel	Negative	Berm turn/ no dig
KA08	-	Bexar	0-10	-	-	-	100% gravel	Negative	Berm road/ no dig
KA09	-	Bexar	0-10	-	-	-	100% gravel	Negative	Berm road, shovel turn/ no dig
KA10	-	Bexar	0-10	-	-	-	100% gravel	Negative	Located at the lake, shovel turn/ no dig
KA11	-	Bexar	0-10	-	-	-	100% gravel	Negative	Shovel turn, berm road with gravel/ no dig
KA12	-	Bexar	0-10	-	-	-	100% gravel	Negative	Shovel turn, berm road with gravel/ no dig
KA13	-	Bexar	0-10	-	-	-	100% gravel	Negative	Shovel turn, berm road with gravel/ no dig
KA14	-	Bexar	0-20	10YR3/3	Dark Brown	Sandy Clay	5% gravel	Negative	North of lake in cow pasture/ terminated due to limestone

Shovel Test Log

ST No.	Site Trinomial	County	Depth (cmbs)	Munsell	Soil Color	Soil Texture	Inclusions	Positive/Negative	Comments/Reason For Termination
KA15	-	Bexar	0-20	2.5YR3/3	Dark Brown	Clay Loam	1-5% gravel	Negative	
			20-70	2.5YR5/4	Yellowish Brown	Clay Loam	1% gravel	Negative	
			70-75	2.5YR5/4	Yellowish Brown	Clay Loam	20% caliche	Negative	Cow and horse pasture, located in possible historic structure site/ Terminated due to basal clay
KA16	41BX2144	Bexar	0-25	2.5YR3/2	Dusky Red	Clay Loam	1-5% gravel	Positive	Three clear container glass fragments, 1 green container glass fragment, 1 whiteware body sherd found 0-20cm
			25-65	2.5YR5/4	Reddish Brown	Clay Loam	1% gravel	Positive	
			65-70	2.5YR5/4	Reddish Brown	Clay Loam	20% caliche	Positive	Terminated due to compact clay
KA17	-	Bexar	0-35	10YR4/3	Brown	Sandy Clay	1-5% gravel	Negative	
			35-40	10YR3/2	Very Dark Grayish Brown	Clay	0%	Negative	Terminated due to basal clay
KA18	41BX2143	Bexar	0-30	10YR4/3	Brown	Sandy Loam	30-40% gravel	Negative	
			30-40	10YR4/3	Brown	Sandy Loam	40% marl	Negative	Surface scatter, two secondary flakes on surface/ terminated due to marl
KA19	41BX2143	Bexar	0-40	10YR4/3	Brown	Sandy Loam	30-40% marl	Negative	Surface scatter, exposed gravel on surface, no artifacts
			40-50	10YR4/3	Brown	Clay Loam	30-40% marl	Negative	Terminated due to marl
KA20	-	Bexar	0-10	-	-	-	100% gravel	Negative	Berm road, artificial gravel, located near lake/ no dig
KA21	-	Bexar	0-10	-	-	-	100% gravel	Negative	Berm road, artificial gravel, located near lake/ no dig
KA22	-	Bexar	0-10	-	-	-	100% gravel	Negative	Berm road, artificial gravel, located near lake/ no dig

Shovel Test Log

ST No.	Site Trinomial	County	Depth (cmbs)	Munsell	Soil Color	Soil Texture	Inclusions	Positive/Negative	Comments/Reason For Termination
KA23	-	Bexar	0-10	-	-	-	100% gravel	Negative	Berm road, artificial gravel, located near lake/ no dig
KA24	-	Bexar	0-10	-	-	-	100% gravel	Negative	Berm road, artificial gravel, located near lake/ no dig
KA25	-	Bexar	0-10	-	-	-	100% gravel	Negative	Berm road, artificial gravel, located near lake/ no dig
KA26	-	Bexar	0-10	-	-	-	100% gravel	Negative	Berm road, artificial gravel, located near lake/ no dig
KA27	-	Bexar	0-10	-	-	-	100% gravel	Negative	Berm road, artificial gravel, located near lake/ no dig
KA28	-	Bexar	0-10	-	-	-	100% gravel	Negative	Artificial berm around lake/ no dig
KA29	-	Bexar	0-10	-	-	-	100% gravel	Negative	Artificial berm around lake/ no dig
KJ01	-	Bexar	0-10	-	-	-	-	Negative	Clubhouse Rd. urban area/ no dig
KJ02	-	Bexar	0-10	-	-	-	-	Negative	Clubhouse Rd. urban area/ no dig
KJ03	-	Bexar	0-10	-	-	-	-	Negative	Clubhouse Rd. urban area/ no dig
KJ04	-	Bexar	0-10	-	-	-	-	Negative	Clubhouse Rd. urban area/ no dig
KJ05	-	Bexar	0-10	-	-	-	-	Negative	Clubhouse Rd. urban area/ no dig
KJ06	-	Bexar	0-10	-	-	-	-	Negative	Clubhouse Rd. urban area/ no dig
KJ07	-	Bexar	0-10	-	-	-	-	Negative	Clubhouse Rd. urban area/ no dig
KJ08	-	Bexar	0-10	-	-	-	-	Negative	Clubhouse Rd. urban area/ no dig
KJ09	-	Bexar	0-10	-	-	-	-	Negative	Clubhouse Rd. urban area/ no dig
KJ10	-	Bexar	0-10	-	-	-	-	Negative	Clubhouse Rd. urban area/ no dig
KJ11	-	Bexar	0-10	-	-	-	-	Negative	Clubhouse Rd. urban area/ no dig
KJ12	-	Bexar	0-35	7.5YR6/3	Light Brown	Sandy Clay	0%	Negative	Terminated due to compact soil
KJ13	-	Bexar	0-20	10YR5/4	Yellowish Brown	Clay Loam	0%	Negative	
			20-45	10YR5/4	Yellowish Brown	Clay Loam	0%	Negative	Terminated due to compact soil

Shovel Test Log

ST No.	Site Trinomial	County	Depth (cmbs)	Munsell	Soil Color	Soil Texture	Inclusions	Positive/Negative	Comments/Reason For Termination
KJ14	-	Bexar	0-20	10YR2/2	Very Dark Brown	Clay Loam	0%	Negative	
			20-40	10YR2/2	Very Dark Brown	Clay Loam	0%	Negative	Terminated due to compact soil
KJ15	-	Bexar	0-20	10YR2/2	Very Dark Brown	Clay	10% gravel	Negative	
			20-40	10YR2/2	Very Dark Brown	Clay	10% gravel	Negative	Terminated due to compact soil
KJ16	-	Bexar	0-20	10YR2/2	Very Dark Brown	Sandy Clay	10% gravel	Negative	
			20-55	10YR2/2	Very Dark Brown	Sandy Clay	10% gravel	Negative	Terminated due to compact soil
KJ17	-	Bexar	0-20	10YR5/3	Brown	Sandy Clay	10% gravel	Negative	
			20-40	10YR2/2	Very Dark Brown	Sandy Clay	10% gravel	Negative	
			40-70	10YR2/2	Very Dark Brown	Sandy Clay	10% gravel	Negative	Terminated due to compact soil
KJ18	-	Bexar	0-20	10YR4/3	Brown	Sandy Clay	0%	Negative	
			20-35	10YR2/2	Very Dark Brown	Sandy Clay	0%	Negative	Terminated due to compact soil
KJ19	-	Bexar	0-20	10YR4/3	Brown	Clay	5% gravel	Negative	
			20-50	10YR2/2	Very Dark Brown	Clay	5% gravel	Negative	Terminated due to compact soil
KJ20	-	Bexar	0-20	10YR3/3	Dark Brown	Clay	5% gravel	Negative	
			20-40	10YR3/3	Dark Brown	Clay	5% gravel	Negative	
			40-60	10YR3/3	Dark Brown	Clay	5% gravel	Negative	Terminated due to large rock and compact soil
KJ21	41BX269	Bexar	0-20	10YR3/3	Dark Brown	Clay	5% gravel	Negative	
			20-40	10YR3/3	Dark Brown	Clay	5% gravel	Negative	Terminated due to compact soil

Shovel Test Log

ST No.	Site Trinomial	County	Depth (cmbs)	Munsell	Soil Color	Soil Texture	Inclusions	Positive/Negative	Comments/Reason For Termination
KJ22	-	Bexar	0-20	10YR2/2	Very Dark Brown	Clay	0%	Negative	
			20-40	10YR2/2	Very Dark Brown	Clay	0%	Negative	Terminated due to large rock and compact soil
KJ23	41BX2144	Bexar	0-30	10YR5/4	Yellowish Brown	Clay Loam	10% gravel	Positive	0-30cm one clear glass piece, one screw
			30-40	10YR5/4	Yellowish Brown	Clay Loam	10% gravel	Negative	Terminated due to compact soil
KJ24	-	Bexar	0-30	10YR4/3	Brown	Clay Loam	10% gravel	Negative	
			30-40	10YR4/2	Dark Grayish Brown	Clay Loam	10% gravel	Negative	
			40-60	10YR4/2	Dark Grayish Brown	Clay Loam	5% gravel	Negative	Terminated due to compact soil
KJ25	41BX213	Bexar	0-30	10YR4/4	Dark Yellowish Brown	Clay Loam	40% gravel	Negative	Surface scatter, gravel/ Terminated due to compact soil
CB01	-	Bexar	0-20	10YR4/3	Brown	Clay Loam	Mottled	Positive	0-20 cmbs whiteware sherd
		Bexar	20-40	10YR2/2	Very Dark Brown	Clay	Mottled	Negative	
		Bexar	40-50	10YR2/2	Very Dark Brown	Clay	10% gravel	Negative	Terminated due to compact hydric soil
CB02	-	Bexar	0-25	10YR4/2	Dark Grayish Brown	Silty Loam	Root	Negative	Terminated due to compact soil and root
CB03	-	Bexar	0-20	10YR2/2	Very Dark Brown	Clay	Roots	Negative	
			20-45	10YR2/2	Very Dark Brown	Clay	Roots	Negative	Terminated due to compact and sticky soil

Shovel Test Log

ST No.	Site Trinomial	County	Depth (cmbs)	Munsell	Soil Color	Soil Texture	Inclusions	Positive/Negative	Comments/Reason For Termination
CB04	-	Bexar	0-20	10YR5/3	Brown	Sandy Loam	5% gravel	Negative	
			20-40	10YR5/3	Brown	Sandy Loam	5% gravel	Negative	
			40-60	10YR5/3	Brown	Sandy Loam	5% gravel	Negative	
			60-70	10YR5/3	Brown	Sandy Loam	5% gravel	Negative	Terminated due to grove of roots
CB05	-	Bexar	0-20	10YR3/2	Very Dark Grayish Brown	Sandy Loam	0%	Negative	
			20-40	10YR3/2	Very Dark Grayish Brown	Sandy Loam	0%	Negative	
			40-60	10YR3/2	Very Dark Grayish Brown	Sandy Loam	0%	Negative	
			60-75	10YR2/2	Very Dark Brown	Clay Loam	0%	Negative	Terminated due to compact soil
CB06	-	Bexar	0-20	10YR4/3	Brown	Loam	0%	Negative	
			20-40	10YR2/2	Very Dark Brown	Clay Loam	0%	Negative	
			40-55	10YR2/2	Very Dark Brown	Clay Loam	0%	Negative	Terminated due to compact soil
CB07	-	Bexar	0-20	10YR2/2	Very Dark Brown	Clay Loam	0%	Negative	
			20-40	10YR2/2	Very Dark Brown	Clay Loam	0%	Negative	
			40-65	10YR2/2	Very Dark Brown	Clay Loam	0%	Negative	Terminated due to compact soil

Shovel Test Log

ST No.	Site Trinomial	County	Depth (cmbs)	Munsell	Soil Color	Soil Texture	Inclusions	Positive/Negative	Comments/Reason For Termination
CB08	-	Bexar	0-20	10YR2/2	Very Dark Brown	Clay Loam	0%	Negative	
			20-40	10YR2/2	Very Dark Brown	Clay Loam	0%	Negative	Terminated due to compact soil
CB09	-	Bexar	0-20	10YR2/2	Very Dark Brown	Clay	0%	Negative	
			20-40	10YR2/2	Very Dark Brown	Clay	0%	Negative	
			40-55	10YR2/2	Very Dark Brown	Clay	0%	Negative	Terminated due to compact soil
CB10	41BX269	Bexar	0-20	10YR6/3	Pale Brown	Clay Loam	0%	Negative	
			20-30	10YR2/2	Very Dark Brown	Clay	0%	Negative	Terminated due to compact soil
CB11	-	Bexar	0-20	10YR4/2	Dark Grayish Brown	Silty Loam	0%	Negative	
			20-45	10YR4/2	Dark Grayish Brown	Silty Loam	0%	Negative	Terminated due to compact soil
CB12	-	Bexar	0-20	10YR2/2	Very Dark Brown	Clay	0%	Negative	
			20-30	10YR2/2	Very Dark Brown	Clay	0%	Negative	Terminated due to compact soil
AMP01	-	Bexar	0-20	10YR4/2	Dark Grayish Brown	Clay Loam	10% gravel	Negative	
			20-40	10YR4/2	Dark Grayish Brown	Clay Loam	15% gravel	Negative	Terminated due to compact soil
AMP02	-	Bexar	0-20	10YR4/2	Dark Grayish Brown	Clay Loam	100% gravel	Negative	
			20-30	10YR4/2	Dark Grayish Brown	Clay Loam	100% gravel	Negative	Terminated due to compact soil and roots

Shovel Test Log

ST No.	Site Trinomial	County	Depth (cmbs)	Munsell	Soil Color	Soil Texture	Inclusions	Positive/Negative	Comments/Reason For Termination
AMP03	-	Bexar	0-20	10YR4/2	Dark Grayish Brown	Clay	10% gravel	Negative	
			20-40	10YR4/2	Dark Grayish Brown	Clay	10% gravel	Negative	Terminated due to compact clay
AMP04	-	Bexar	0-20	10YR4/2	Dark Grayish Brown	Clay	15% gravel	Negative	
			20-40	10YR4/2	Dark Grayish Brown	Clay	10% gravel	Negative	Terminated due to compact clay
AMP05	-	Bexar	0-20	10YR4/3	Brown	Silty Clay	10% gravel	Negative	
			20-40	10YR4/3	Brown	Silty Clay	10% gravel	Negative	Terminated due to compact clay
AMP06	-	Bexar	0-20	10YR4/3	Brown	Sandy Clay	15% gravel	Negative	
			20-40	10YR4/3	Brown	Clay	20% gravel	Negative	Terminated due to mottled soil
AMP07	-	Bexar	0-20	10YR4/3	Brown	Clay	10% gravel	Negative	
			20-40	10YR4/3	Brown	Clay	15% gravel	Negative	Terminated due to mottled soil
AMP08	-	Bexar	0-20	10YR4/4	Dark Yellowish Brown	Clay	10% gravel	Negative	
			20-40	10YR4/4	Dark Yellowish Brown	Clay	15% gravel	Negative	Terminated due to mottled soil
AMP09	-	Bexar	0-20	10YR4/6	Dark Yellowish Brown	Loam	5% gravel	Negative	Terminated due to compact soil

Shovel Test Log

ST No.	Site Trinomial	County	Depth (cmbs)	Munsell	Soil Color	Soil Texture	Inclusions	Positive/Negative	Comments/Reason For Termination
AMP10	-	Bexar	0-20	10YR4/4	Dark Yellowish Brown	Silty Loam	5% gravel	Negative	
			20-40	10YR4/4	Dark Yellowish Brown	Loam	5% gravel	Negative	
			40-50	10YR4/4	Dark Yellowish Brown	Loam	5% gravel	Negative	Terminated due to compact soil
AMP11	-	Bexar	0-20	10YR4/4	Dark Yellowish Brown	Loam	0%	Negative	
			20-40	10YR4/4	Dark Yellowish Brown	Clay Loam	0%	Negative	Terminated due to compact soil

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APPENDIX C

BACKHOE TRENCH LOG

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Backhoe Trench Log

Trench	Strata	Depth (cmbs)	Munsell	Soil Color	Texture	Inclusions	Lower Boundary	Comments
BHT01	I	0-20	10YR 5/3	Brown	Silty Loam	Rootlets	Wavy	Heavy vegetation; mostly medium grasses.
	II	20-150	10YR 5/2	Pale Brown	Loam	Rootlets	Wavy	
	III	150-200	10YR 6/4	Yellowish Brown	Fine Sandy Clay	20% gravels	Abrupt	Terminated due to a thick gravel lens.
BHT02	I	0-25	10YR 5/3	Brown	Silty Loam	Rootlets	Wavy	Heavy vegetation; mostly medium grasses.
	II	25-145	10RY 5/3	Pale Brown	Loam	Rootlets	Wavy	
	III	145-200	10YR 6/4	Yellowish Brown	Fine Sandy Clay	40% gravels	Abrupt	Terminated due to a thick gravel lens.
BHT03	I	0-25	10YR 5/3	Brown	Silty Loam	Rootlets	Wavy	Heavy vegetation; mostly medium grasses.
	II	25-155	10YR 5/2	Pale Brown	Loam	Rootlets	Wavy	Heavy vegetation; mostly medium grasses.
	III	155-200	10YR 6/4	Yellowish Brown	Fine Sandy Clay	30% gravels	Abrupt	
	IV	200-250	10YR 7/2	Light Gray	Gravels	100% gravels	N/A	Terminated due to a thick gravel lens.
BHT04	I	0-20	10YR 5/3	Brown	Silty Loam	Rootlets	Wavy	Heavy vegetation; mostly medium grasses.
	II	20-150	10YR 5/2	Pale Brown	Loam	Rootlets	Wavy	
	III	150-200	10YR 6/4	Yellowish Brown	Fine Sandy Clay	20% gravels	Abrupt	Terminated due to a thick gravel lens.
BHT05	I	0-105	10YR 4/1	Dark Gray	Loamy Clay	Rootlets	Wavy	Heavy vegetation; short grasses.
	II	105-155	10YR 4/3	Brown	Clay	Rootlets	Wavy	
	III	155-200	10YR 5/4	Yellowish Brown	Clay	15% gravels	Abrupt	Terminated due to a thick gravel lens.

Backhoe Trench Log

Trench	Strata	Depth (cmbs)	Munsell	Soil Color	Texture	Inclusions	Lower Boundary	Comments
BHT06	I	0-35	10YR 5/3	Brown	Silty Loam	Rootlets	Wavy	Short grasses; a ceramic pipe was encountered.
	II	35-140	10YR 6/3	Pale Brown	Loam	N/A	Wavy	
	III	140-200	10YR 6/4	Light Yellowish Brown	Silty Loam	40% caliche	N/A	
BHT07	I	0-35	10YR 5/3	Reddish Brown	Loam	Rootlets	Abrupt	Heavy vegetation within floodplain.
	II	35-60	10YR 6/3 10YR 6/6	Pale Brown Brownish Yellow	Clay	60% gravels	Wavy	
	III	60-170	10YR 2/2	Very Dark Brown	Clay	N/A		
BHT08	I	0-35	10YR 5/3	Reddish Brown	Loam	Rootlets	Abrupt	Heavy vegetation within floodplain.
	II	35-50	10YR 6/3	Pale Brown		60% gravels	Wavy	
	III	50-150	10YR 6/1 10YR 5/8	Gray Yellowish Brown	Clay	N/A	N/A	

APPENDIX D

ACEQUIA CROSSING BRIDGE DESIGN

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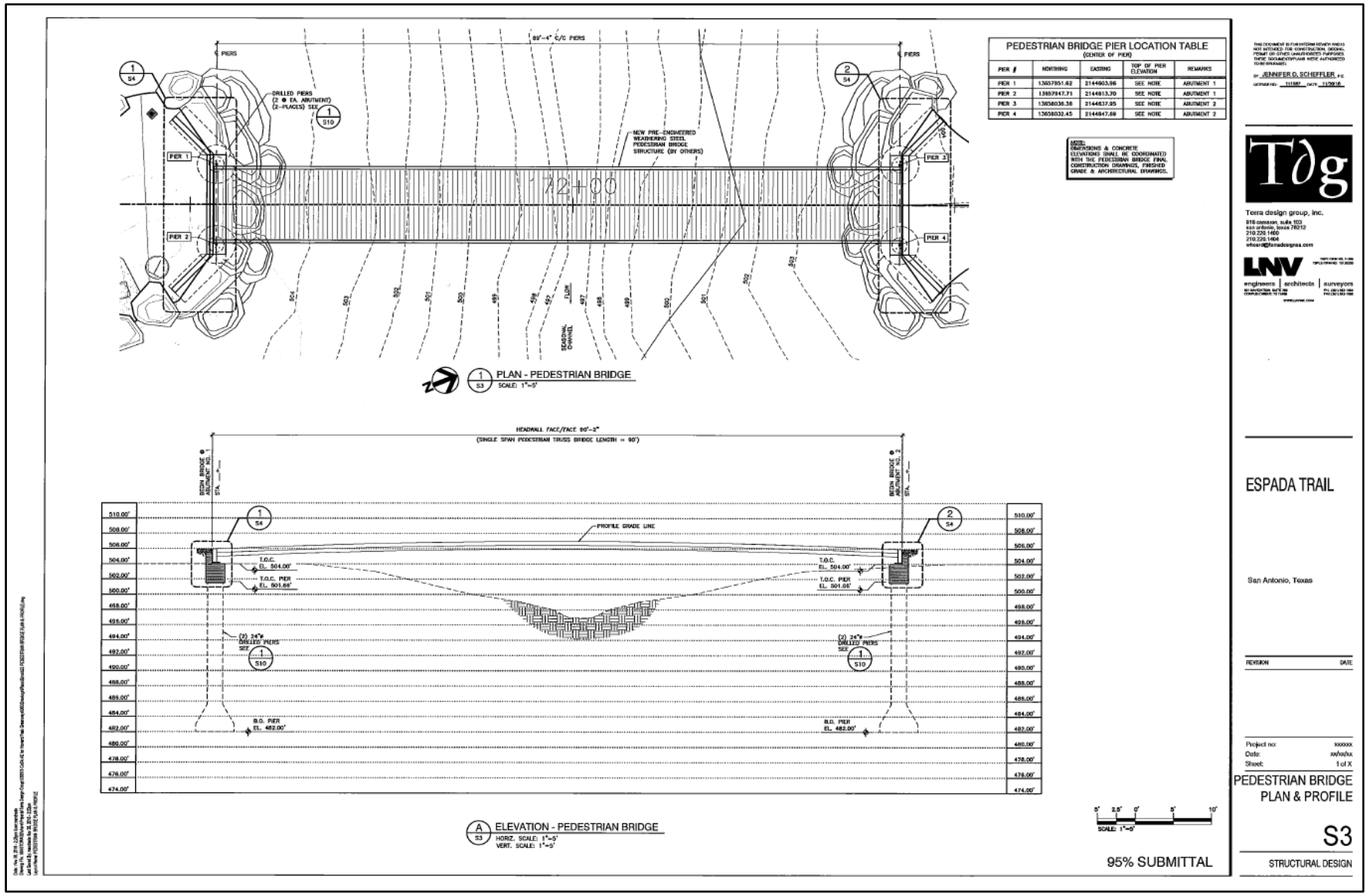
PEDESTRIAN BRIDGE PIER LOCATION TABLE
(CENTER OF PIER)
PIER # | NORTHING | EASTING | TOP OF PIER ELEVATION | REMARKS
PIER 1 | 13657951.62 | 2144603.96 | SEE NOTE | ABUTMENT 1
PIER 2 | 13657947.71 | 2144613.70 | SEE NOTE | ABUTMENT 1
PIER 3 | 13658036.36 | 2144637.85 | SEE NOTE | ABUTMENT 2
PIER 4 | 13658032.45 | 2144647.69 | SEE NOTE | ABUTMENT 2
NOTE:
DIMENSIONS & CONCRETE ELEVATIONS SHALL BE COORDINATED WITH THE PEDESTRIAN BRIDGE FINAL CONSTRUCTION DRAWINGS, FINISHED GRADE & ARCHITECTURAL DRAWINGS.
89'-4" C/C PIERS
PIER 1
PIER 2
PIER 3
PIER 4
DRILLED PIERS (2 @ EA. ABUTMENT) (2-PLACES) SEE
NEW PRE-ENGINEERED WEATHERING STEEL PEDESTRIAN BRIDGE STRUCTURE (BY OTHERS)
72+00
SEASONAL CHANNEL
PLAN - PEDESTRIAN BRIDGE
SCALE: 1"=5'
HEADWALL FACE/FACE 90'-2"
(SINGLE SPAN PEDESTRIAN TRUSS BRIDGE LENGTH = 90')
BEGIN BRIDGE @ ABUTMENT NO. 1
BEGIN BRIDGE @ ABUTMENT NO. 2
PROFILE GRADE LINE
T.O.C. EL. 504.00'
T.O.C. PIER EL. 501.85'
(2) 24"ø DRILLED PIERS
B.O. PIER EL. 482.00'
ELEVATION - PEDESTRIAN BRIDGE
HORIZ. SCALE: 1"=5'
VERT. SCALE: 1"=5'
95% SUBMITTAL
Terra design group, inc.
LNV
engineers | architects | surveyors
ESPADA TRAIL
San Antonio, Texas
REVISION
DATE
Project no: xxxxxx
Date: xx/xx/xx
Sheet: 1 of X
PEDESTRIAN BRIDGE PLAN & PROFILE
S3
STRUCTURAL DESIGN