Archaeological Investigations of the Alamo Dam and Upper Labor Dam, Brackenridge Park, San Antonio, Bexar County, Texas

by
Clinton M. M. McKenzie
with contributions by
C. Stephen Smith

Texas Antiquities Permit No. 6449

Volume 1

REDACTED

Principal Investigator
Raymond Mauldin

Original Principal Investigator
Steve Tomka

Prepared for:
Ford, Powell & Carson
Architects and Planners
1138 East Commerce Street
San Antonio, Texas 78205

Center for Archaeological Research
Preserving Cultural Resources
The University of Texas at San Antonio

Prepared by:
Center for Archaeological Research
The University of Texas at San Antonio
One UTSA Circle
San Antonio, Texas 78249-1644
Archaeological Report, No. 444

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Abstract:

From February 2013 to November of 2014, the Center for Archaeological Research (CAR) at The University of Texas at San Antonio (UTSA) conducted archaeological monitoring and test excavations within the boundaries of Brackenridge Park, 4.8 km north of downtown San Antonio, Bexar County, Texas. The project was contracted by Ford, Powell and Carson, Architects and Planners, Inc. (FPC), under contract with the San Antonio River Authority (SARA), in advance of planned park improvements along the east and west banks of the San Antonio River. These improvements consisted of pathways, lighting, and interpretive features. Brackenridge Park is listed on the National Register of Historic Places (NRHP) with numerous contributing resources including historic buildings, cultural properties, and prehistoric and historic archaeological sites. In addition, Brackenridge Park is a State Antiquities Landmark (SAL). The park is owned by the City of San Antonio and additionally is a part of the City of San Antonio's (COSA) San Antonio River Improvement Overlay (SA-RIO). Improvements within the boundaries of the SA-RIO are subject to review by the City's Historic and Design Commission. The COSA is subject to compliance with the Antiquities Code of Texas. Both the Texas Antiquities Code and Chapter 35 of the Local Government Code of the City of San Antonio require coordination with the City's Office of Historic Preservation and both the Texas Historical Commission Division of Archeology and Division of Architecture. CAR conducted these investigations under Texas Antiquities Permit Number 6449. Dr. Steve A. Tomka served as the Principal Investigator for the majority of the fieldwork. Following Dr. Tomka's departure from UTSA early in 2014, Dr. Raymond P. Mauldin became Principal Investigator. Charles Stephen Smith served as Project Archaeologist for the field portion of the excavations, initial analysis, and production of several interim field reports. Clinton M. M. McKenzie served as Project Archaeologist for the final analysis, description of materials collected, and assembly of the final report.

Principal activities undertaken included the monitoring of trenches and the excavation of both hand-dug trenches and units within two defined Areas of Potential Effect (APEs). APE 1 was focused on the Alamo Dam, and APE 2 was focused on the Upper Labor Dam (APE 2). Excavations documented the remains of both of the Spanish Colonial dams. CAR staff identified several buried twentieth-century walls in APE 1 and APE 2. Within APE 1, CAR identified a remaining portion of the Spanish Colonial Alamo Dam. Within APE 2, CAR identified architectural components related to improvements made to the Upper Labor Dam and related Headworks during the Civil War by the Confederate States of America (CSA). The work within APE 2 demonstrates that, despite numerous late nineteenth- and twentieth-century impacts, there are substantial remains of the Spanish Colonial and Civil War dam complex that warrant protection and further investigation. CAR recommends that prior to any impacts within either APE additional work should be undertaken on these features. In communications delivered in December 2016, the Texas Historical Commission (THC) and City of San Antonio Office of Historic Preservation concurred with these recommendations.

Artifacts and records generated during this project were prepared for curation according to THC guidelines and are permanently curated at the CAR at UTSA.

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Chapter 1: Introduction and Project Overview

Introduction

In 2012, the Center for Archaeological Research (CAR) of The University of Texas at San Antonio (UTSA) was contracted by Ford, Powell and Carson, Inc. (FPC) to conduct archaeological services associated with planned improvements along the San Antonio River within the boundaries of Brackenridge Park in Bexar County, San Antonio, Texas. The park is owned by the City of San Antonio. Archaeological services were provided to ensure that significant archaeological deposits known to exist within the park would not be negatively impacted. Further, if possible, it was anticipated that investigated archaeological resources be incorporated into the visitor experience at the park. This current report details the archaeological investigations related to two historic resources: the Alamo Dam, originally known as the Presa de Valero or the Valero Dam; and the Upper Labor Dam and Acequia, originally known as the Presa de Labores de Arriba or the Upper Labor Dam, and the Acequia de Labores de Arriba or the Upper Labor Acequia (Pfieffer et al. 2011:9-10). These resources are only a part of the larger work associated with the City of San Antonio's redevelopment plans located within Brackenridge Park. A second report, focused on the prehistoric resources, is in preparation.

Areas of Potential Effect

The two Areas of Potential Effect (APEs) are within the confines of Brackenridge Park, a 343-acre public park of the City of San Antonio (Figure 1-1). APE 1 was located on the west bank of the San Antonio River, opposite the Witte Museum, to search for the west side of the Alamo Dam. APE 2 was at the Lily Pond and Upper Labor Dam just south of Hildebrand Avenue.

Project Overview

The current investigations took place between February and May of 2013. Services were performed under Texas Antiquities Permit Number 6449 issued to Dr. Steve A. Tomka, former CAR Director, who acted as Principal Investigator and Stephen Smith who acted as Project Archaeologist. Dr. Raymond Mauldin assumed the role of Principal Investigator in early 2014. Permit 6449 covered all work performed within Brackenridge Park related to the City of San Antonio's redevelopment plans. At the request of the City, this current volume focuses exclusively on the two captioned features. A second volume summarized the other archaeological work conducted. The work reported here consisted of backhoe trenching and hand-excavated test units. The work was required to address the Texas Antiquities Code (Texas Natural Resource Code, Title 9, Chapter 191) and the City of San Antonio Unified Development Code Chapter 35.

There were several goals for these investigations. For APE 1, the goal was to identify structural remnants of the Alamo Dam on the west bank of the San Antonio River in order to verify the dam alignment noted in an earlier report (Ulrich 2011). The investigations in APE 2 were interested in documenting the length of the Upper Labor Dam and further defining the post-Spanish Colonial modifications that had been identified in 1996 (Cox et al. 1999). Further, CAR wanted to determine when features within APE 2 were built. This timeline would assist in any future plans.

Both APE 1 and APE 2 included the possibility of finding prehistoric materials and remnants of the corral and potential ancillary structures associated with the Confederate States of America (CSA) Tannery. This facility drew its waterpower from the Upper Labor Dam and Acequia and operated adjacent to the Alamo Dam site on the west side of the San Antonio River (City Council Minute Books [CCMB] 5:83).

Archaeological work near the anticipated western end of the Alamo Dam was prompted by the proposed construction of a Wetland Area by the Witte Museum in conjunction with the installation of new trails on the west bank of the San Antonio River. Work in this area was accomplished with backhoe trenching and subsequent shovel and trowel exposure of structural elements.

Redevelopment plans in the vicinity of the Lily Pond included the installation of a walking path adjacent to the Upper Labor Dam and Acequia. If a significant portion of the dam and the original *acequia* were found to be intact, these Spanish Colonial and Civil War to late nineteenth-century features could be integrated into an interpretive experience associated with the history of the area. To determine the presence or absence of the dam and its full extent, CAR worked in two areas: 1) the Lily Pond and retaining wall and 2) the articulation between the Upper Labor Dam and Acequia immediately adjacent. CAR first exposed the west side of the existing Lily Pond retaining wall to determine its mode of construction and establish if it required any stabilization measures prior to the installation of the walking path. CAR

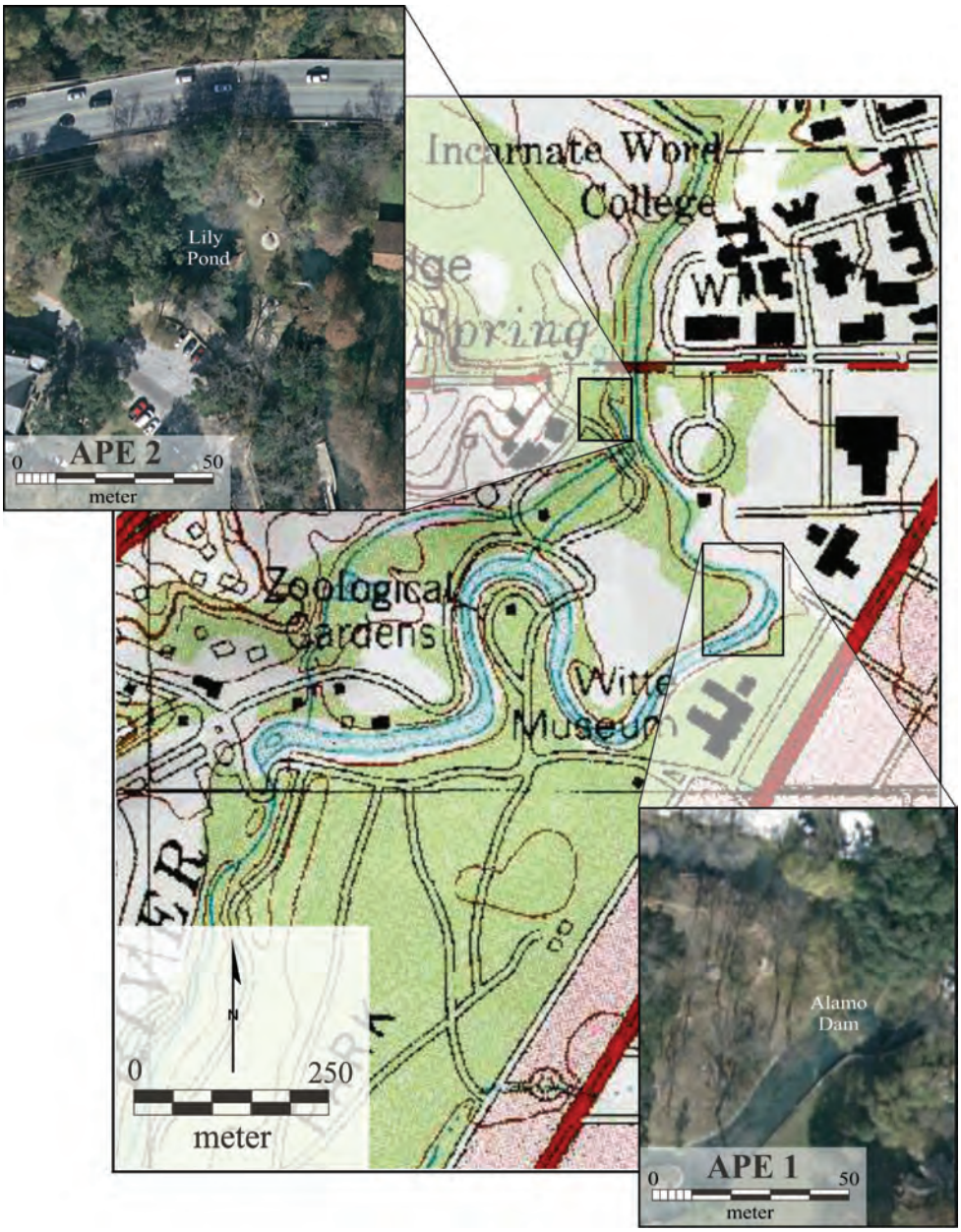

Figure 1-1. APE 1 and APE 2 as seen on the San Antonio East (2998-133) 7.5-minute quadrangle map.

personnel also exposed the Upper Labor Dam and the Acequia through the removal of several concrete picnic pads and soil overburden. The excavations in APE 2 consisted of trench work and test units followed by hand-cleaning and exposure of the dam, headgate, and *acequia*.

Project Results

In APE 1, CAR recovered structural remnants of the Alamo Dam on the west bank of the river. These remnants, together with archival research and recent work by Pape-Dawson Engineering on the eastern bank, have allowed CAR to unravel two contradictory late nineteenth-century maps. Further, no definitive remnants of the tannery operations were identified during the investigations in APE 1. These results are further expanded on in Chapter 7.

In APE 2, CAR was able to identify the length of most of the Spanish Colonial dam and the full extent of the nineteenth-century structural elements at the site of the Upper Labor Dam and Acequia. The vertical extent of the colonial portion could not be determined across the length of the dam due to the water table inundating the trenches. The vertical extent of the upper modifications was determined as these

improvements were above the water line. CAR was able to expose the headgate and its articulation with both the dam and *acequia*. The investigations also defined the post-Spanish Colonial modifications to the Upper Labor Dam identified in 1996 (Cox et al. 1999). Based on archival and historical information collected during the project, CAR has identified that the post-Spanish Colonial improvements to the Upper Labor Headworks, which collectively consist of the dam, headgate, and *acequia*, were made during the Civil War and were associated with the operation of the CSA Tannery.

No intact prehistoric deposits were identified in either APE. However, evidence of mixed prehistoric deposits were noted in APE 2 between the Lily Pond retaining wall and adjoining parking lot.

Report Organization

The report is divided into seven chapters. Following this introduction, Chapter 2 deals with previous archaeological investigations in the two APEs. Chapter 3 outlines the archival and historical background of the APEs and discusses the history of the Brackenridge Park. Chapter 4 identifies the field and laboratory methods used on this project. Chapter 5 presents the results of the archaeological investigations. Chapter 6 is a brief discussion of recovered artifacts and is followed by the project summary and recommendations in Chapter 7. Two appendices are included in the report. Appendix 1 consists of a lexicon of common terms used in the report. Appendix 2 enumerates all of the recovered artifacts from both APE 1 and APE 2.

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Chapter 2: Project Setting and Previous Archaeology

Project Setting

This chapter presents an overview of the environmental conditions prevailing in the project area including a brief discussion of the physiographic setting, climate, geology, soils, flora, and fauna.

The project areas are located within the San Antonio watershed in central San Antonio, Bexar County, Texas, within Brackenridge Park, only 4.8 km (3 mi.) north of the downtown business district. Despite the park's urban setting and its frequent modification over the years to accommodate public use, Brackenridge Park remains home to numerous flora and fauna species native to the South and Central regions of Texas. The park is bounded on all sides by major city thoroughfares and one U.S. Highway. Hildebrand Avenue marks the northern boundary with Broadway Avenue on the east and U.S. Highway 281 to the south and west. Over the years, the park has been affected by building, road, and utility construction in addition to the development of park amenities. Some of these numerous subsurface impacts are discussed in the Previous Archaeology section of this report, as well as in the three preceding interim reports regarding this project (Smith 2013a, 2013b; Tomka and Smith 2014).

Current Environment

The project areas are situated approximately 213 m (700 ft.) above mean sea level. Brackenridge Park uniquely sits astride the conjunction of these two discrete biotic provinces. The project areas are located at the boundary of the Tamaulipan and Balconian biotic provinces (Blair 1950). The park straddles the edge of the Balcones Escarpment, which forms the northern edge of the Tamaulipan province. The Tamaulipan biotic province extends from the east-west portion of the Balcones Escarpment to the eastern Sierra Madre in northeastern Mexico. Plants and animals are a mixture of those typical of semitropical Mexico, the semiarid southern Plains, and the humid southeastern United States. Thorny brush dominates vegetation type of the Tamaulipan province of Texas (Blair 1950:103). The Balconian biotic province consists of the majority of the Edwards Plateau, which is characterized as a semiarid area composed of up-lifted limestone and covered by vegetation dominated by various species of oak, ash juniper (Texas Cedar), and mesquite with an undergrowth of several varieties of native grasses (Blair 1950; Hester et al. 1989).

Climate

The San Antonio area is a subtropical humid climate characterized by cool winters and hot summers (Norwine 1995). Average annual rainfall measures 29.1 inches (National Oceanic and Atmospheric Administration [NOAA] 2013a) and monthly temperatures range from 37.9°F in January to 95°F in July (Bomar 1995). The growing season for Bexar County averages 265 days with the frost-free period extending from March 6 to November 26 (Natural Fibers Information Center [NIFC] 1987). The mean annual temperature for Bexar County is 69°F (NFIC 1987). The warmest months are July and August while the coolest are December and January. Average annual temperature in San Antonio for the period 1981-2010 was 69.42°F. Calculated monthly norms for temperature and precipitation in San Antonio between 1981 and 2010 demonstrate a bimodal distribution of rainfall with peaks in April-May and September-October (Southern Regional Climate Center [SRCC] 2014). Generally, one more inch of rain fell during the May to June peak than during the October to November peak. Regardless, annual rainfall totals were nearly equal May to June as July to December of any given year. The hurricane season occurs during the second half of the year from June through November (NOAA 2013b) and may help to explain this pattern. Average annual rainfall amounts to 32.27 inches for these decades. The driest periods occurred from winter to early spring in the months of December, January, February, and March, with each averaging less than two inches of rain. Rainfall is not consistent across the area. A transition line separates the moister eastern half of the region from the drier western half of the region cutting across the San Antonio area (Houk et al. 1999).

Brackenridge Park lies within the area of Texas referred to as Central Texas. The Central Texas environment is a vast area encompassing sections of the upper Gulf Coastal Plain, the Texas Hill Country, and the Edwards Plateau (Figure 2-1). Much like the biotic provinces, these three major geographic regions meet in Bexar County. These regions are the Edwards Plateau, the Blackland Prairie, and the South Texas Brush Country (Nickels et al. 1997).

Bexar County lies at the southeastern edge of the Edward's Plateau and Balcones Escarpment. The escarpment marks the break between two major physiographic divisions in North America: the Great Plains Province on the west and the Coastal Plains to the east (Abbott and Woodruff 1986). The escarpment is a geological fault zone several miles wide extending from Del Rio to the Red River and dividing the

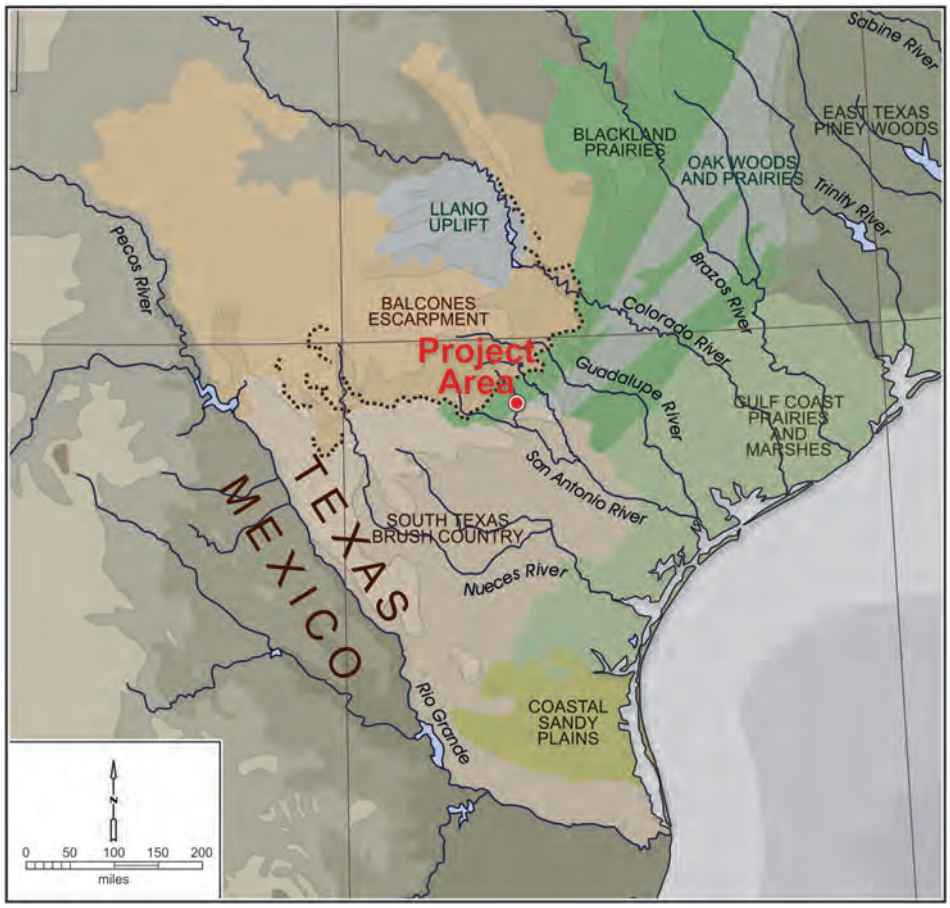

Figure 2-1. Physiographic map of Central Texas showing the project area, Edwards Plateau, Balcones Escarpment, Blackland Prairie, and major rivers.

Edwards Plateau from the southern Coastal Plains (Collins and Laubach 1990:2). Viewed from the plains, the escarpment is a low ridge of wooded hills (Abbott and Woodruff 1986). However, underneath the surface, the Balcones zone is the major rift line along a series of *en echelon* faults that occurred when older limestone displaced younger claystone, chalk, and marl. The bulk of this tectonic displacement is thought to have occurred during the late Oligocene or early Miocene, about 24 million years ago (mya; Collins and Laubach 1990:3). The youngest sediments that geologists can definitely say were offset by the Balcones fault occurred during the Eocene (55-34 mya; Brown et al. 1974).

Descriptions of the Texas region often appear in terms of "biotic provinces" (Blair 1950). Classification of the environmental zones have also been based on "broad and general" distribution patterns of "plant communities" distinguishable by their "physiographic and biological differences" (Ellis et al. 1995:404). More recently, descriptions of the area have been structured around soil types and plant communities with the state divided into eleven distinct "natural regions". Overlap between "natural regions" and "biotic provinces" has been noted (Johnson School of Public Affairs 1978:Table 1), and the literature often uses the terms "regions" and "provinces" interchangeably as a result. Central Texas resides in six of these eleven natural regions. These are the Llano Uplift, Rolling Plains, Oak Woods and Prairies, Blackland Prairie, Gulf Coast Prairies and Marshes, and South Texas Brush Country. All six of these "natural regions" contain subregions with distinctive patterns of plant and animal life. Central Texas lies within the Great Plains physiographic province and makes up the southern end of the Great Plains (Carr 1967). Throughout much of Central Texas several varieties of oak—principally Live Oak and Scrub Oak, ash juniper, mesquite, cedar elm, and other hardwoods are the dominate vegetation. Mesquite, thorny scrub, and cacti dominate plant types in the South Texas Brush Country, and the prairies support grass with very little tree cover (Kenmotsu and Boyd 2012).

Balcones Escarpment

The project area is approximately 18 km (11 mi.) southeast of the formal edge of the Balcones Escarpment. The Balcones fault zone extends south from the escarpment edge and is clearly seen as the low limestone bluffs that frame the western

side of Brackenridge Park. These limestone deposits were utilized as quarries in the eighteenth and nineteenth centuries. These same quarries now house the San Antonio Zoo, Sunken Gardens Theater, and Japanese Tea Gardens (Pfeiffer 2011; Pfeiffer et al. 2011).

The visible above-ground portion of the Balcones fault zone extends in a curved line across Texas running from the southwest part of the state near Del Rio to the north central region near Waco (Grimshaw and Woodruff 1986). Generally, the exposed surface to the west of the fault zone consists of harder rocks than the nonresistant chalk and calcareous clay composition of the east side of the fault zone, and consequently, the east has sustained greater erosion. This erosional difference produced the steep sloped face of the Balcones Escarpment, which is as much as 305 m (1,000 ft.) high near its western terminus at Del Rio while only 91 m (300 ft.) high between San Antonio and Austin (Abbott and Woodruff 1986). The soils east of the escarpment are deep and well developed, and this area is used predominately for agricultural cropland. Soils to the west of the escarpment are thin and rocky, and ranching predominates in this area (Grimshaw and Woodruff 1986).

The Balcones Escarpment also plays a major role in weather production in Central Texas (Abbott and Woodruff 1986). Although the relief in Central Texas ranges from 100 to 500 feet, the escarpment is the first topographic break inland from the Gulf of Mexico, making its orographic influence on the unstable, moisture saturated Gulf air more pronounced (Caran and Baker 1986:Figure 1). Major flooding occurs along the Balcones Escarpment more often than any other place in the United States, and precipitation intensity and discharge rates are close to the highest in the world (Caran and Baker 1986). Additionally, the region lies in a "zone of convergence" (Orton 1966:10-11). When southbound high-pressure air masses (cold fronts) and westward-moving low-pressure troughs (warm fronts) meet over Central Texas, the resulting atmospheric instability can trigger massive rainfall with potentially devastating consequences (Caran and Baker 1986). The most severe rainstorm ever recorded in the continental United States occurred on September 9 and 10, 1921, in Thrall, Williamson County, north of Austin (Jennings 1950; Larkin and Bomar 1983). A world record 36.4 inches of rain fell in an 18-hour period during this storm (Abbott and Woodruff 1986). The 24-hour rainfall total of 38.2 inches eclipsed the average precipitation expected for the entire year in the area (Larkin and Bomar 1983). The storm took the lives of 215 people and resulted in over $19 million in property damage (Bomar 1978:1). Regarded as possibly the greatest rainstorm in Texas history, the storm began as a hurricane on the eastern Mexican coast before producing torrential rains resulting in the deadly flooding (Larkin and Bomar 1983). The 1921 storm covered more than 25,900 km^2 (10,000 mi.^{2}) along the Balcones Escarpment extending from Temple, Texas, southwestward beyond San Antonio, Texas. The area of maximum rainfall followed the Balcones Escarpment and affected seven counties: Bell, Bexar, Comal, Hays, Milam, Travis, and Williamson (Ellsworth 1923:4 Plate 1).

The city of San Antonio was the most heavily populated and developed area affected by the 1921 storm where 51 deaths and over $3 million in property damage occurred (Ellsworth 1923). The 1921 flood was not the only such event in San Antonio. The city is one of the most "flash-flood prone" areas in North America, and flooding is so common in the Central Texas region that it has been called "Flash Flood Alley" (SARA 2014). More recently, severe flooding struck San Antonio and surrounding areas in October 1998 and again in June and July of 2002 (SARA 2014). Flash flooding in Central Texas is all too prevalent, and unfortunately, the steep rocky terrain combined with urbanization in the region exacerbate this phenomenon and can turn an already dangerous situation into an even more violent and deadly one (Baker 1975, 1976; Patton and Baker 1976).

Hydrology

The Edwards Aquifer is the source for numerous springs outcropping at the edge of the Balcones Escarpment. One of the most productive carbonate aquifers in the United States, the Edwards (Stein and Ozuna 1995) gives rise to the San Antonio river system. Bexar County spring water is alkaline and very hard due to its high calcium carbonate content (Brune 1981:70) with the water becoming more saline to the southeast (Houk et al 1999). The San Antonio Springs is in reality a complex of three springs, the largest one being the so-called Blue Hole. Historically, over 100 springs existed in this immediate area (Brune 1981). The northern edge of the project area sits about 305 m (1,000 ft.) south of the original headwaters area. Nearby springs include the Olmos Springs, Panther Springs, Salado Springs, San Pedro Springs, and Walker Springs (Houk et al. 1999). In addition, a number of smaller streams flow into the San Antonio River such as the Calaveras, Helotes, Leon, and Salado creeks (Long 2014).

The Edwards Aquifer is a cavernous zone of water-bearing permeable limestone 91-213 m (300-700 ft.) thick (Menard 1995). Composed of Cretaceous-era limestone, the Edwards Aquifer dips coastward, and its southern and eastern edge mark the transition line from fresh to saline aquifer water. Water-bearing formations beneath the Edwards Plateau are interrupted by the Balcones fault that acts to release water to the surface forced there under artesian pressure. The San Antonio Springs, Barton Springs, San Marcos Springs, and Comal Springs are examples of these artesian springs. The Edwards Aquifer extends along the fault zone from Kinney

County through Uvalde, Medina, Bexar, and Comal counties before ending in Hayes County (Eckhardt 2014). The aquifer outflows along its northern and western boundaries in the form of springs. Water enters the aquifer within a geographically constrained recharge zone as rain and stream loss through solution cavities that occur along fractures in the limestone surface (Menard 1995). Water in the aquifer moves in a general east-west direction across the region from the semi-arid western half of the fault zone to the sub-humid eastern watersheds. Water is also released from the aquifer though pumping (Stein and Ozuna 1995). These springs and seeps influenced both prehistoric and historic settlement patterns across the entire area (Gerstle et al. 1978:26).

The San Antonio River Basin drains 10,826 km^2 (4,180 mi.^{2}) of land (SARA 2014). Beginning in Kerr and Medina counties, the basin extends southeast toward the Gulf of Mexico. Bedrock forms the river basin and consists of shale, siltstone, limestone, chalk, and sandstone (Barnes 1974). Quaternary terrace deposits structured the original river channel (Barnes 1974), and this remains substantially true within the project area. However, river channeling, bank stabilizing, dredging, filling, and damming have obscured the ancient river channel throughout the remainder of its course through the city thereby making its original course virtually invisible today (Loucks 2011:427). Sections of the river channel south of Bexar County remain unmodified by human hands and follow a pattern common to sandy bottom meandering streams, complete with oxbow bends, sand bars, pools, and riffles (Ritter 1978:236).

Geology

The geology of the APEs resulted from the same uplifting that formed the Edwards Plateau and the Balcones Escarpment. Figure 2-2 depicts the geology of Brackenridge Park and the surrounding area. The APEs fall within a Quaternary alluvium floodplain of Holocene and Pleistocene gravel, sand, silts, and clay deposits (United States Geological Survey [USGS] 2015). To the southwest and northeast rests the Navarro Group and Marlboro Marl formations, which are composed of marl, clay, sandstone, siltstone, and limestone concretions. The Austin Chalk deposits in the western edge of the park in the Sunken Garden area contain chalks, marls, and limestone. To the east of the park, lies the Uvalde Gravel formation that is characterized by gravel containing chert, quartz, and limestone cobbles. Chert cobbles from this formation, as well as the Edwards Limestone formation in the Balcones fault zone, were used by prehistoric inhabitants as a source of lithic material (Ulrich et al. 2012:4-5).

Soils

Soils in the project area include Lewisville, Trinity, and Frio soils (Taylor et al. 1991). Soil locations and descriptions were taken from these sources (Figure 2-3). Lewisville soils are found on stream terraces located above the Trinity and Frio floodplain soils. Along the western end of the APEs is Lewisville silty clay that is characterized by nearly flat 0-1 percent slopes (LvA). Lewisville silty clay soils skirt the

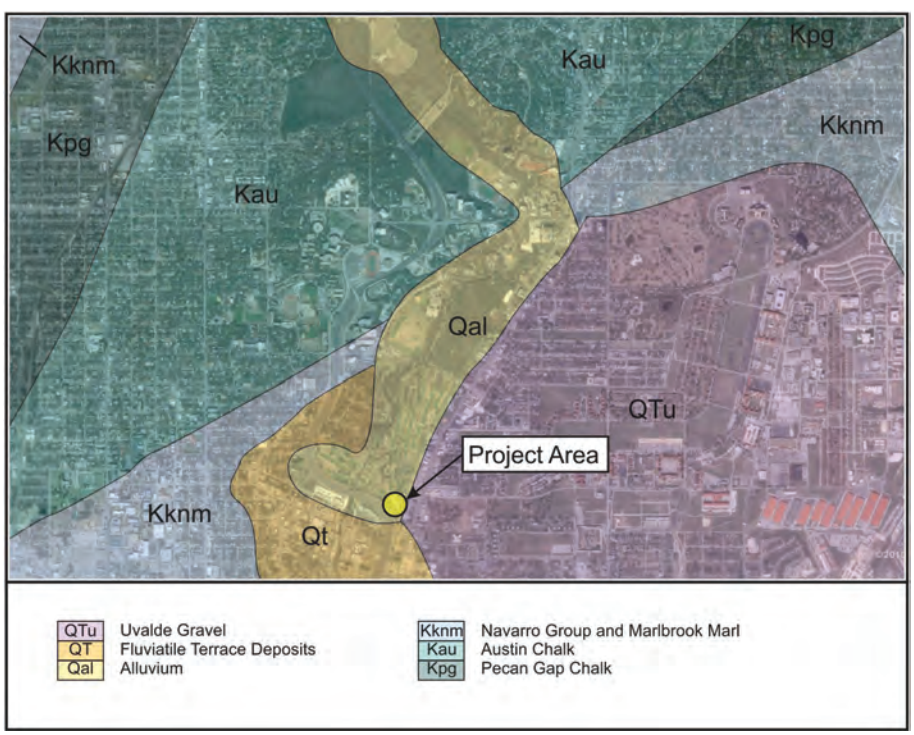

Figure 2-2. Geological map with project area highlighted in yellow.

Brackenridge golf course. Lewisville silty clay, 1-3 percent slopes (LvB), are found in the extreme eastern section of the APE, which approximates the northeast corner of the golf course. Lewisville soils are described as deep, well-drained soils common to stream terraces. Their profile is characterized by brown, subangular, blocky, silty clay over reddish-yellow silty clays with calcium carbonate nodules. The areas upslope, both east and west from APE 1 and APE 2, fall within Trinity and Frio soil types. Trinity and Frio soils are deep, slowly permeable, calcareous clays and clay loams. Trinity soils are clays derived from Holocene age clayey alluvium. A typical profile is clay to 2.0 m (6.6 ft.) with 25 percent $CaCO_3$. Frio soils are also Holocene in age with a typical profile of silty clay loam to 1.27 m (4.2 ft.) and clay loam to 2.0 m (6.6 ft.) and 40 percent $CaCO_3$ (Taylor et al. 1991). The soil survey for Bexar County reports that along the San Antonio River in the project area, Venus clay loam, 1-3 percent slopes (VcB), occupies the river terrace above the floodplain (Taylor et al. 1991).

This soil series is the dominate soil found in the two APEs constituting over 90 percent of the project area. Venus series soils consist of very deep and well-drained soils found in nearly level to moderately steep stream terraces or slopes of valleys and ridges (Taylor et al. 1991). The surface to about 30 cm beneath consists of dark grayish brown (10YR 4/2) loam. Underneath the upper layer is hard brown (10YR 5/3) loam

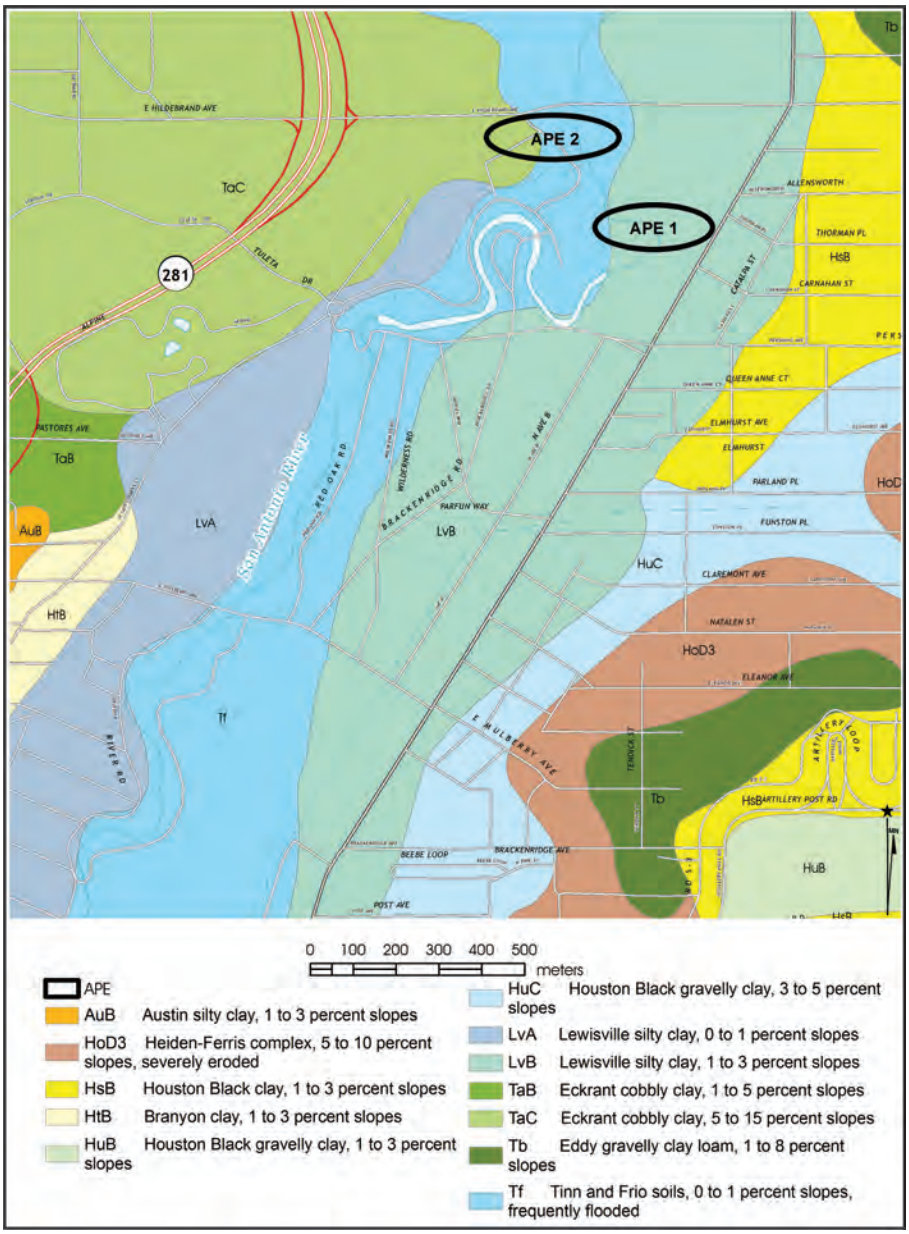

Figure 2-3. Soil types in project area with general area of excavation circled in black.

containing films and threads of calcium carbonate 50 percent by weight down to a depth of approximately 53 cm below the surface. The next approximate 100 cm of matrix consists of very pale brown (10YR 7/4) loam that is only slightly hard in nature, but very friable, and in common with the immediately preceding level, contains calcium carbonates reaching 65 percent by weight. The next 30 cm of depth consists of very pale brown (10YR 7/4) loam that is very friable with the same approximate calcium carbonate as the immediate level above. Parent materials for these soils are loamy alluvial sediments that are high in calcium carbonate (Taylor et al. 1991). In the study area, Loire series soils (Fr) are found within the San Antonio River floodplains and low terraces.

Flora and Fauna

The Balcones fault zone is a major physical factor in the distribution of animals in Central Texas (Neck 1986). Blair (1950) created the Balconian Biotic Province in recognition of the role the escarpment plays in biotic distribution for the region. Analysis of "herpetofauna" in Central Texas demonstrated that the range of 77 percent of reptile and amphibian species are limited (either eastward or westward) by the Balcones Escarpment (Smith and Buechner 1947). Buechner (1946) reported that 56 percent of the bird species in Central Texas are limited by the escarpment. Of the 128 mammal species Davis (1974) lists for Texas, 50.8 percent occur along the escarpment. Of these species, 52.9 percent occur only west of the escarpment, and 35.3 percent are found only east of that barrier. Some of the mammals common in this area include white-tailed deer (*Odocoileus virginianus*), opossum (*Didelphis virginiana*), raccoon (*Procyon lotor*), nine-banded armadillo (*Dasypus novemcinctus*), cottontail rabbit (*Sylvagus virginiana*), and the black-tailed jackrabbit (*Lepus californicus*). Large mammals once found in the area include mountain lion (*Puma concolor*) and black bear (*Ursus americanus*). Bison (*Bison bison*) were also once a common land mammal but are found today only in captivity (Davis and Schmidley 1997).

The San Antonio River Watershed hosts over 70 species of fish (Gonzales 1988; SARA 1996). However, many of these species are not native but have been introduced. Within the San Antonio River Basin, SARA routinely monitors fish species diversity and fish community composition in the San Antonio River and tributaries (SARA 1992, 1994, 1996, 2000) and uses fish as biotic indicators of aquatic ecosystem health (SARA 1988, 1996, 2000). Some common fish species recorded in the San Antonio River include Bluegill (*Lepomis macrochirus*), Channel Catfish (*Ictalurus punctatus*), Blue Catfish (*Ictalurus natilis*), Red Shiner (*Cyprinella lutrensis*), Yellow Bullhead (*Ameiurus natalis*), Largemouth Bass (*Micropterus salmoides*), Green Sunfish (*Lepomis cyanellus*), Texas Shiner (*Notropis amabilis*), Gizzard Shad (*Dorosoma cepedianum*), Spotted Gar (*Lepisosteus oculatus*), and Central Stoneroller (*Campostoma anomalum*; SARA 1996).

Common migratory birds in the park are the Belted Kingfisher (*Megaceryle alcyon*), Great Blue Heron *(Ardea herodias*), Night Heron (*Nycticorax nycticorax*), White-winged Dove (*Zenaida asiatica*), and Turkey Vultures (*Cathartes aura*). Birdwatchers frequent the project area and have recorded Red-shouldered Hawk (*Buteo lineatus*), Golden-fronted (*Melanerpes aurifrons*) and Ladder-backed Woodpecker (*Picoides scalaris*), Wood Duck (*Aix sponsa*), Green Heron (*Butorides virescens*), and many other riparian and open field birds (San Antonio Audubon Society 2005).

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

Previous Archaeology

This section discusses historical archaeological work performed within Brackenridge Park and the surrounding area. The review, focused only on historic resources, includes discussion of prior investigations of the Alamo Dam, the Upper Labor Dam, and the Upper Labor Acequia, as well as Olmos Basin and Brackenridge Park resources. Table 2-1 lists selected historical sites in the lower Olmos Basin and Brackenidge Park areas, and the locations of the APEs are shown on Figure 2-4.

Olmos Basin

There are currently six recorded historical archaeological sites within the lower Olmos Basin. Five of these (41BX283, 41BX284, 41BX285, 41BX287, and 41BX289) are listed

Table 2-1. List of Recorded Trinomial Sites in the Lower Olmos Basin and Brackenridge Park Area

Trinomial	Date	Area	Site Name or Description	Designation, Eligibility Status, Notes*
41BX8	1966	Brackenridge Park	Alamo Madre or Alamo Acequia (Madre de Valero)	RTHL
41BX170	1971	Brackenridge Park	Lime Kiln site	Unknown
41BX171	1971	Within a half mile	Historic late nineteenth- to early twentieth-century dump	Unknown
41BX283	1975	Olmos Basin	Historic quarry site	NRHP (site no longer extant)
41BX284	1975	Olmos Basin	Historic “Mill” site	NRHP
41BX285	1975	Olmos Basin	Historic foundations and dump site	NRHP (site no longer extant)
41BX287	1975	Olmos Basin	Historic dump	NRHP, SAL
41BX289	1975	Olmos Basin	Fernridge (G. W. Brackenridge Villa)	NRHP
41BX1273	1999	Brackenridge Park	Upper Labor Dam (Presa de Labor de Arriba)	Potential SAL
41BX1425	2001	Brackenridge Park	Multi-component prehistoric and historic site	Unknown
41BX1754	2008	Brackenridge Park	Miraflores multi-component prehistoric and historic site	SAL
41BX1798	2009	Brackenridge Park	Multi-component prehistoric and historic waterworks site	Unknown
41BX1892	2013	Brackenridge Park	Multi-component historic quarry site	Potential SAL
41BX2007	2014	Brackenridge Park	Multi-component prehistoric and historic site	Unknown
41BX2043	2014	Brackenridge Park	Linear historic canal	Potential SAL
41BX2056	2014	Brackenridge Park	Historic site Alamo Madre Dam	Potential SAL

*National Register of Historic Places (NRHP); Registered Texas Historic Landmark (RTHL); State Antiquities Landmark (SAL)

Redacted Content

Figure 2-4. Historic archaeological sites within the Lower Olmos/Upper San Antonio River Basins.

on the National Register of Historic Places (NRHP). These sites are contributing resources to the "Source of the River Archaeological District" and were enrolled on the NRHP in 1978 (National Register Nomination Form 1978). These five sites were recorded in 1975 by Fox who conducted the first survey of the Olmos Basin (Fox 1975:Figure 1). The sixth site, 41BX2008, was recorded by CAR in 2014 (Wigley et al. 2014). The multi-component site lacks specific temporal details on the historic material and is located roughly 2 km to the north of the APEs. The site is not shown on Figure 2-1 and is not discussed further.

41BX283

This historic quarry site (Table 2-1, Figure 2-4) was recorded by Fox who noted,

> Judging from old maps and aerial photos, this was probably the last quarry worked in the area. There is no indication on early maps that the quarry existed in 1890, and on an aerial view taken in 1938 it appears to have but recently ceased operations [Fox 1975:4].

No further archaeological work occurred at the site. The University of the Incarnate Word (UIW) has apartment-style housing on the site that has removed all traces of the quarry. The site no longer exists.

41BX284

This site was investigated by the 1978 Incarnate Word College Field School (Table 2-1, Figure 2-4). According to Stothert, "This ruin consists of some broken walls, the remains of a foundation situated across a now intermittent stream which is a tributary of the San Antonio River" (Stothert 1989:64). The site has been interpreted as a mill, as a guardhouse, or possibly as part of the CSA Tannery complex (Fox 1975:4-5; Kemp 2008:1; Stothert 1989:64). Archival research conducted on the current project suggests the site is Alsbury's Mill, constructed by Hanson Alsbury and Francois Marchant in 1853 (Bexar County Deed Records [BCDR] M1:191). Additional supporting evidence for its identification as a mill is an advertisement from the *San Antonio Herald* of November 26, 1858, for the "E. P. Alsbury Mill" listed as a "Corn & Flour Mill at the head of San Antonio river" (*San Antonio Herald* 26 November 1858:4).

41BX285

This site (Table 2-1, Figure 2-4) consisted of limestone foundation walls that in 1975 were projecting from a trash dump behind the Incarnate Word Convent (Fox 1975:5). In 2007, CAR performed a survey that focused on the site of a proposed dormitory that abutted the side of 41BX285. Investigations documented that 41BX285 is no longer extant (Kemp 2008:1).

41BX287

This site (Table 2-1, Figure 2-4) on a small knoll on the west side of the basin consisted of a collection of mid- to late nineteenth-century ceramics, glass, and brick (Fox 1975:7). No structural remains were noted, and no further work has been performed at this location.

41BX289

Site 41BX289 (Table 2-1, Figure 2-4) was originally owned by J. R. Sweet who constructed the first residence on the property in 1852 (Fox 1975:4). In 1869, George Brackenridge "…purchased property with an antebellum home at the head of the San Antonio River. Because the word 'bracken' was the Scottish word for 'fern,' Brackenridge named his new home 'Fernridge'" (Pfeiffer 2011:13; Sibley 1973:91). Fernridge is essentially two homes—the original single-story Sweet Home of 1852 and the subsequent three-story Brackenridge home built in 1886 (Dunn 1975:11; Stothert 1989:69). In 1897, the building and grounds were deeded by Brackenridge to the Sisters of Charity of the Incarnate who maintained the structure as a convent (Stothert 1989:70). The Sisters continue to hold title to the home and use the site as a museum. No formal archaeological work has been performed at 41BX289.

Areas Noted but Not Recorded as Sites in the 1975 Survey

In addition to the surveyed and recorded trinomials, Fox identified five areas where there were reported finds or where a previously destroyed site was located (Fox 1975:10). These included the following:

1. The site of Worth's Spring on the north and immediate east side of Olmos Dam (Fox 1975:Figure 1, Area D). The spring was named for U.S. General William Jenkins Worth, a prominent military commander during the U.S. – Mexican War, who constructed a camp and quartered his troops at this location.

2. A location immediately south of Hildebrand Avenue within Brackenridge Park on the west bank of the river (Fox 1975:Figure 1, Area E). An old dam located at this point by Orchard in a hand-drawn map (Fox 1975) may be the one also mentioned in a letter of agreement between F. Giraud and G. W. Brackenridge

of September 30, 1874, "a dam erected during the Civil War - for the purpose of supplying the Confederate Tannery" (Fox 1975:10-11). This is the same site that constitutes APE 2 of the current report.

3. Fox (1975) lists another site identified on Figure 1 as Area F but provides no information on this location. Likewise, this site is shown on Stothert's (1989) Figure 8 but with no description or discussion. Whatever is represented in these figures has been impacted by construction on the UIW campus, and no published work has been performed at the location.

Brackenridge Park

There are nine recorded historical archaeological sites within Brackenridge Park and one additional site within 0.8 km. Six of these sites are multi-component, containing both historic and prehistoric materials, and three sites are listed as solely historic.

No formal archaeological work was performed within the park prior to the 1976 CAR survey (Katz and Fox 1979). This initial survey work was performed for the City of San Antonio prefatory to the development of a Brackenridge Park Master Plan and covered the entire park property. The 1976 survey identified 27 historic buildings or features (Katz and Fox 1979:12-22). Information regarding these historic resources can be found in Pfieffer (2011) and Pfieffer et al. (2011).

41BX170

The trinomial for 41BX170 (Table 2-1, Figure 2-4) was assigned in 1971-1972 (Fox 1972; Texas Sites Atlas [TSA] 2014). The site (Katz and Fox 1979:Figure 1) consists of historic foundations, evidence of a lime kiln, and assorted nineteenth-century artifacts. It is part of and abuts the Alamo Roman and Portland Cement Company site. No other work has been performed since the site was identified in 1971-1972.

41BX171

Recorded in a 1971 survey and subsequently excavated, this site is a late nineteenth- to early twentieth-century municipal dump (Table 2-1, Figure 2-4). The dump used the abandoned historic limestone quarries as a landfill. Testing was done using heavy equipment, and no screening through hardware cloth was performed. As a result, only whole bottles, diagnostic glass, metal, and ceramic sherds were collected, as noted by the author (Clark 1984:1, 4). While a late historic site (1893-1922), the site does offer insight into regional and national trade networks, diet and food, as well as trash disposal patterns (Clark 1984:117).

41BX1754: Miraflores Park Site

Trinomial 41BX1754 (Table 2-1, Figure 2-4) was assigned to Miraflores Park as a result of work performed by CAR in 2008 (Ulrich and Figueroa 2008). The site is multi-component. CAR recommended that any subsurface work potentially impacting historic features be archaeologically monitored (Ulrich and Figueroa 2008; see also Tomka and Dowling 2009).

41BX1798: Miraflores Park Bridge Replacement Site

Trinomial 41BX1798 (Table 2-1, Figure 2-4) was assigned to Miraflores Park as a result of work performed by CAR in 2009 (Tomka and Dowling 2009). The site is multi-component with evidence of both prehistoric and historic use. Historic remains included a 12-x-3 m limestone cobble dam construction that was attributed, based on its components and placement, as a diversionary or cofferdam associated with the San Antonio Water Works Raceway, immediately south of the construction (Tomka and Dowling 2009:29) Excavation results indicate that much of the prehistoric deposits at the site are inversely deposited materials from an upstream source. CAR recommended that any subsurface work impacting historic features be archaeologically monitored (Tomka and Dowling 2009).

41BX1892

This historic site (Table 2-1, Figure 2-4) was recorded by STARS, LLC as part of a currently unpublished report associated with municipal redevelopment on the site of the old City Animal Control Facility, commonly known as "The Pound," just south of the main entrance to the San Antonio Zoo (Herbert G. Uecker, personal communication July 2014). The recordation is assigned to the quarry face and associated tool marks along this section below Alpine Drive and running south to the Alamo Roman and Portland Cement Company site. The site dates from the Spanish Colonial through the late nineteenth century.

41BX2007

This site was recorded by SWCA in 2014 and is located across Broadway Avenue from the park proper (Table 2-1, Figure 2-4). The multi-component site features historic materials in the upper deposits overlying a buried lithic scatter (Ward 2014).

Sites in the APEs

Alamo Dam (41BX2056)

Investigations performed on the grounds of the Witte Museum (Table 2-1, Figure 2-4) on the east bank of the river by CAR in 2011 identified the presence of a layer of stone approximately 100 cm below the surface (cmbs). This layer of stone was documented by probing as the trench quickly filled with water. Considering its linear extent (7 m) and its apparent alignment with historic maps, it was suggested that this feature was the remains of the Madre Dam on the east bank (Ulrich 2011:56).

Alamo Acequia (41BX8)

Site 41BX8 is the historic the Alamo Madre or Alamo Acequia (Table 2-1, Figure 2-4). This irrigation structure began at the Alamo Dam and then continued south to the east of the San Antonio River. There have been numerous excavations along the route of the *acequia*, several of which were within Brackenridge Park.

Ulrich (2011) documented two instances of the *acequia* near the presumed site of the headgate. These excavations showed the *acequia* was not lined with stone. Cox (1985:3) also uncovered an unlined portion of the *acequia* in 1984. In 1997, the *acequia* was investigated in the downtown area as it passed through the Hampton Inn property between Bowie Street and the highway access road, north of Star Street. The *acequia* in this location was lined with stone sometime after 1840 (Renner et al. 1997). Recent work by Pape-Dawson Engineers, Inc., Raba Kistner, Inc., and CAR in 2016 documented four other portions of the Alamo *acequia* system. Pape-Dawson located a side branch, just west and north of the intersection of Martinez Street with South Alamo Street (unpublished manuscript 2016). Raba Kistner uncovered an unlined portion of the Alamo Acequia Madre on the site of the former Playland Park, just east and north of the intersection of Broadway and North Alamo streets, and a second stone-lined portion of the *acequia* on the site of the current San Antonio Convention Center expansion, just south and east of the intersection of Commerce and South Alamo streets (K. Nichols, Raba Kistner Engineering, personal communication December 2, 2016). The stone-lined portion identified by Raba Kistner matches the alignment of a portion of the same stone-lined *acequia* branch identified by CAR on the grounds of St. Joseph's Roman Catholic Church earlier in 2016 (Zapata 2017).

Upper Labor Dam (41BX1273)

The dam was inadvertently discovered in 1995 after torrential downpours in San Antonio resulted in a wash-out of the culvert between the Lily Pond and San Antonio River at the northern end of the Brackenridge Park (Table 2-1, Figure 2-4). Local architect Steve Tillotson discovered that a dressed stone construction had been revealed and contacted both the City Parks Department and Historic Preservation Office. The City contracted with CAR to investigate and document the structure in September of 1996.

Excavations confirmed that the structure was the remains of the Upper Labor Dam. The structure consisted of an earlier rough limestone block Spanish Colonial component topped by a later dressed stone portion set at a slightly different angle than the earlier colonial stonework (Cox et al. 1999:12). The 1996 excavations only identified the northern terminus of the dam and the first 6.5 m of the northern portion of the dam. No further work was performed at the site until the present undertakings.

Cox traced the courses of the many Spanish *acequias* in San Antonio (Cox 2005), and the Upper Labor Acequia route is well documented. The *acequia* starts at the Lily Pond, runs south, and cuts west under the Dionosio Rodriguez Bridge and Brackenridge Drive. It then crosses into the San Antonio Zoo where some portions have been used as part of the zoo's water features.

The Upper Labor Acequia has been sporadically documented along portions of its route around the western edge of Brackenridge Park and then south-southwestward to its confluence with San Pedro Creek just below the springs of the same name. There have been numerous investigations of the *acequia* and related structures in the past twenty-five years (Cox et al. 1999; Fox and Cox 1988; Shafer and Hester 2010, 2012).

In 1988, a portion of the *acequia* was encountered during the monitoring of construction for drainage trenches along St. Mary's Street between Ashby and Park avenues. The only trace of the *acequia* was observed near the intersection of West Myrtle and St. Mary's streets, and Fox and Cox described it as "…a broad sloping ditch [seen in profile]… dropped to a depth of approximately five feet and a width of about 20 feet" (Fox and Cox 1988:5).

Additional portions of the Upper Labor Acequia were documented in 2010 and 2012 by Abasolo Archaeological Consultants (Shafer and Hester 2010). The 2010 undertaking included the monitoring of sediment and fill removal from the 131-m section of the *acequia* running between Brackenridge Drive and the San Antonio Zoo, immediately to the west of APE 2. Monitoring determined that the current stone lining dates to the WPA era and that the last period of clean-out dates

sometime in the late 1960s or early 1970s (Shafer and Hester 2010:11). No Spanish Colonial artifacts were recovered, and no definable traces of the original channel were present due to the construction of the stone walls and the periodic clean-out of the channel. The 2012 (Shafer and Hester 2012) work consisted of monitoring and documentation of a *desagüa* (discharge channel; see Cox 2005:5-6) off of the main channel of the *acequia* on the west side of Allison Park. The project entailed the monitoring of the removal of fill within the *desagüa* as well as the stone-lined walls and brick-lined floor of the channel so that they could be subsequently stabilized (Shafer and Hester 2012). No Spanish Colonial period artifacts were recovered.

41BX1425

Nearly the entirety of APE 1 is within the site boundaries of 41BX1425 (Table 2-1, Figure 2-4). This is a multi-component site, recorded by SWCA (Houk and Miller 2001), and includes a portion of Katz and Fox's Collecting Locality 10 (Katz and Fox 1979). The site lies on the west bank of the San Antonio River opposite 41BX323 (Houk and Miller 2001). SWCA subsequently tested the site in 2002 and described it as "… generally low-density and dispersed prehistoric materials [that] have a Transitional Archaic component…draped by scattered historic and modern artifacts" (Houk 2002:53). They further stated that most of the deposits were disturbed and represented potentially inverted fill or spoil from the adjacent drainages/canals (Houk and Miller 2002:60).

Summary

The earliest archival records show that the headwaters of both the San Antonio River and San Pedro Springs were the deciding factor for settlement of the San Antonio River Valley in 1718. The historical archaeological resources within Brackenridge Park span the entire historic period, from 1718 to the present day. The Alamo Dam was begun in January of 1719 and represents the beginning of mission *acequia* agriculture in San Antonio and the first documented historic modification to the area that is now the park. In the past forty years, archaeological investigations have documented much of the historical uses within the park. Both the sites of the Alamo Dam and headworks and that of the Upper Labor Dam and headworks are now clearly known. In addition to the numerous extant historical features within the park, many buried components remain that have been archaeologically documented. Coupled with the abundance of investigated prehistoric sites, no other location in San Antonio contains so varied and rich archaeological resources as Brackenridge Park.

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Chapter 3: Historical and Archival Research

Historical and Archival Background

This section first details the common history of the Spanish Colonial *acequia* systems in San Antonio from the eighteenth century through to their general abandonment in the twentieth century. Following that discussion, the unique histories of the Alamo Dam and its Acequia and the Upper Labor Dam and its Acequia will be presented, followed by a brief history of the park itself. Appendix 1 of this report contains definitions of the various sociocultural, engineering, and architectural terms associated with the Spanish Colonial *acequia* systems in San Antonio.

The headwaters area has been amply described during the historic period by both the Spanish and their successors as lush and verdant with abundant springs, copious amounts of water, and teeming with both flora and fauna endemic to the area. In 1709, Father Isidro Felix Espinosa, who was a diarist of the Espinosa-Olivares-Aguirre Entrada, described "…a luxuriant growth of trees, high walnuts, poplars, elms and mulberries watered by a copious spring…" (Tous 1930a:5). Perhaps the most praiseworthy description comes from Frederic Law Olmstead who visited San Antonio in 1854:

> The San Antonio Spring may be classed as the first water among the gems of the natural world. The whole river gushes up in one sparkling burst from the earth. It has all the beautiful accompaniments of a smaller spring, moss, pebbles, seclusion, sparkling sunbeams, and dense overhanging luxuriant foliage. The effect is overpowering. It is beyond your possible conceptions of a spring. You cannot believe your eyes, and almost shrink from sudden metamorphosis by invaded nymphdom [Olmstead 1860:156].

Water from the river and springs was utilized for consumption, irrigation, manufacturing, and hydraulic power. Extensive use and depletion of the Edwards Aquifer since the twentieth century has reduced artesian flow to intermittent periods. Today, spring flow is directly associated with rises in the aquifer due to heavy and consistent rainfall. As such, the once numerous springs have been reduced to virtually zero. The main spring, eponymously titled the San Antonio Spring (also referred to as the "Blue Hole" and by the Spanish as the Ojo de Agua), on the campus of the UIW flows only every few years, and then only briefly (Fisher 2006).

Overview of the Spanish Colonial Dams and Irrigation Canals of San Antonio

San Antonio retains portions of four Spanish Colonial dams: the Alamo Dam, the San Juan Dam, the Espada Dam, and the Upper Labor Dam. The dams considered no longer extant include the San Pedro Dam (also known as the Principal), the Concepción Dam, the San Jose Dam, and the Arocha Dam. The San Pedro Dam was located in San Pedro Park and diverted a portion of the copious spring waters into the San Pedro Acequia. The area of the dam has been investigated numerous times, but no trace of it has yet been definitively identified (Houk 2001; Mauldin et al. 2015). The Concepción Dam was demolished in 1869 in an attempt to alleviate flooding in the lower reaches of the city (Cox 2005:52). The Arocha Dam was located on San Pedro Creek just below the current boundaries of San Pedro Park. This dam was made of wood and diverted water into the Arocha Acequia constructed by Francisco Arocha, ca. 1743-1745 (McKenzie 2015:10). An eighth dam, the San Jose, located below the confluence of the Concepción Creek with the San Antonio River, was destroyed in the flood of 1865 and not rebuilt (Cox et al. 1999:6).

The first of these dams was located in San Pedro Springs Park and diverted the spring headwaters of the San Pedro Creek into the San Pedro Acequia. As noted above, the Arocha Dam was also located on San Pedro Creek. The remaining six dams were all placed on the San Antonio River. Three of these, the Alamo, Concepción, and Espada dams, spanned the full channel of the river and are referred to as weir dams. As described from archival sources, Cox (2005:29, 32, 77) attributed the San Jose Dam, San Juan Dam, and Upper Labor Dam, in their original configurations, as projecting from a single bank rather than spanning the entire channel. These types of dams are referred to as wing dams. Both kinds of dams (weir and wing) served the same purpose: the diversion of water into an excavated channel.

Each of the Spanish Colonial dams had a corresponding *acequia* or irrigation canal system that it supplied with water. In turn, each of these systems served defined geographic areas by providing irrigation to abutting property. Five of these *acequia* systems were associated with the five San Antonio missions, and four of them were named after the mission that it served. The fifth, the Concepción Acequia was most often referred to as the Pajalache. The Pajalache was the name of one of the three principal Native American

tribes present at the founding of the mission in 1731, and they most likely excavated the canal (Habig 1968). The five other *acequia* systems, the Principal (also known as the San Pedro), the Navarro, the Arocha, and the Upper Labor, either served the citizens of the Villa de San Fernando de Bexar, which was founded May 9, 1731, with the arrival of the Canary Islanders (de la Teja 1995:10) and/or in the case of the San Pedro Acequia, the first villa and presidio. This new settlement was located adjacent to the Presidio San Antonio de Bexar. The original settlement of Villa de Bexar started by Alarcon in 1718 essentially merged with the new official civil settlement. By the close of the eighteenth century, the different names—San Antonio de Bexar the former Villa de Bexar, and the new Villa de San Fernando—merged, and the settlement was called San Antonio de Bexar (de la Teja 1995:32).

These improvements continued in use throughout the Spanish Colonial period, from 1718-1719 when the San Pedro and Alamo *acequias* were begun until 1821 when Mexico became independent of Spain. A major change was the secularization of the five missions between 1793 and 1824 and the assumption of ditch maintenance by the Ditch Companies composed of abutting property owners (Cox 2005:8). These companies maintained the mission ditches primarily for agricultural pursuits. However, from 1810 through 1850, the San Pedro and Upper Labor *acequias* progressively fell into a state of disrepair through lack of use and maintenance. This was a direct result of political turmoil and demographic displacement. Numerous insurrections, Mexican Independence, and the Texas Revolution all had a negative impact on San Antonio's population (Chipman 1992:240-241). For example, following the Royalist victory of 1813, Governor Arredondo was forced to suspend administering the oath of allegiance as the settlements were nearly depopulated (Hatcher 1908:236). Arredondo himself had dramatically purged San Antonio de Bexar where "[H]is soldiers indiscriminately arrested about seven hundred male residents…" (Almaraz 1971:179). The lack of population directly affected the need for and the maintenance of the old Spanish irrigation systems.

Between 1820 and 1830, San Antonio's population fluctuated between 1,750 and 2,000 (de la Teja and Wheat 1985:10-11). Following Texas independence in 1836 and subsequent accession to the United States in 1846, the population of San Antonio steadily grew. By the time of the 1860 United States Census, San Antonio had a total population of 8,235, making it the largest city in the state. The population was classified at that time as consisting of 7,643 whites (Hispanics and Anglo-Americans) and 592 slaves (United States Census Record 1864:487). The burgeoning population between 1836 and 1860 resulted in demands for both land and water. Land was needed for homes, farms, and other industry, and water was needed for drinking, sanitation, irrigation, and power.

The City addressed the need for land in 1845 by asserting its claim to the *ejidos*, or common public lands, within the 1731 eight-league royal grant from the King of Spain (Corner 1890:37-38). To accomplish that end, the City initiated a survey in 1846 and sued parties that claimed lands within that boundary. After the City's claim was affirmed by the Texas Supreme Court in 1851, a final survey was completed by Francois Giraud, at that time the City Surveyor, and in 1852, the *Plat of the City Tract of San Antonio de Bexar* was drawn by the artist Jore Gentilz, who utilized Giraud's survey notes (Corner 1890:37-38).

Water needs began to be addressed in an ad hoc fashion shortly after the Texas Revolution. The first recorded municipal action was in 1838 when the City Council appointed a committee to oversee the intermittent "…cleaning of the ditch that runs through town…" (CCMB I:31). While unnamed, it is a certainty that the ditch in question was the San Pedro Acequia, which ran through the heart of the city. In 1840, "the ditch of the Alamo" was added along with provision for the appointment of a Ditch Commissioner (CCMB I:37). As the city continued to grow, the need for water and water control increased. It is apparent from numerous City Council Minute Book entries during the period from the 1840s to 1860s that repairs to ditches were on a case-by-case basis and predicated on available funds and need rather than foresight. The stone lining of portions of the urban ditches occurred during this period (Cox 1985:2).

In 1857, the City Council directed "that the City Surveyor be required to examine the old irrigation ditch for the Upper Labor with the view of reopening the same, and…the practicability and probable cost of reopening the same…" (CCMB C:95). City Council minutes from December of 1860 and 1862 indicate that effort was expended to bring the Upper Labor back into active use, but the nature and extent is not recorded in the minutes (CCMB C:340; Cox et al. 1999:6).

The single greatest event to impact the *acequias* and dams was the March 26, 1865, flood that covered the downtown area under some 4.6 m (15 ft.) of water and caused major civic and economic losses. It damaged most of the dams and *acequias*, in particular the Alamo, Upper Labor, and San Pedro *acequias*, and nearly obliterated the San Jose Dam located below the confluence of the San Pedro Creek with the San Antonio River (CCMB C:475, 481, 491, 496). A City Council appointed committee consisting of Gustav Schleicher (Chair), Francois Giraud (Member), and Victor Considerant (Member) was tasked to investigate the causes of the flooding and report back to City Council with recommendations. Their report was made to Council on April 31, 1865, and published in the *San Antonio Semi-Weekly News* as well as appended

to the City Council Minutes (CCMB C:475). Their report singled out three main causes for the flooding: 1) the stone diversion dam for the Concepción Acequia raised the river level by over 1 meter; 2) the numerous water walls erected along the San Pedro Creek impeded flow and caused flooding; and 3) the bridges crossing both the river and creek needed to be replaced to allow more water to flow beneath them. Their immediate recommendations were to remove the Concepción Dam, the water walls on the San Pedro Creek, and to replace obstructing bridges (CCMB C:475). They also recommended that the City Surveyor and Engineer establish the flood profile of the San Antonio River and report back to the City Council "with dispatch" (CCMB C:475). Another consideration was the possibility of adding a new ditch above the Upper Labor to handle excess floodwater and to open up additional land on the east side for farming. Aside from directing the flood profile to be completed, the City Council undertook none of the actions recommended at the time of the report. The City Council, however, did make numerous authorizations for payment of expenditures to Ditch Commissioner G. A. Wurzbach for repairs to the ditches and dams in the months of May, June, and August of 1865 (CCMB C:481, 491, 496).

During the remaining years of the nineteenth century, many of the original recommendations of the Schleicher Commission were ultimately instituted: the Concepción Dam was removed in 1869; the water walls along the San Pedro were ordered removed; new bridges were erected that lessened impediment to stream flow; and not only the recommended eastern ditch but also a western ditch was constructed—the Valley Ditch on the east side and the Alazan on the west. Both ditches were essentially extensions of the Alamo and Upper Labor *acequias*, respectively (Cox 2005:57-59).

With the advent of a public water system and the increasing urban nature of the city, the need and use of the old Spanish *acequias* declined. All those within the downtown area had ceased operation by 1913 and were simply left to function as storm drains or ready-made ditches for utility lines (Cox 2005). However, the rural and agricultural *acequias* continued to see use. The San Juan and Espada *acequias* remained in operation into the twentieth century, and the Espada continues to irrigate farms to the present day. The San Juan Acequia has recently been reopened and provides water for the National Park Services Demonstration Farm.

Alamo Dam and Acequia

The Alamo Dam was the second of two Spanish Colonial dam and *acequia* systems constructed in San Antonio beginning in January of 1719, the second system being that of the San Pedro Acequia (Hoffman 1935:86). The Alamo Dam and its corresponding *acequia* system watered the fields that supported the Mission San Antonio de Valero. The dam and headworks were located at the first right-angle bend of the San Antonio River below the headwaters. The alignment of the river in this location has remained more or less static based on the known maps of the area (Figures 3-1, 3-2, 3-3, and 3-4).

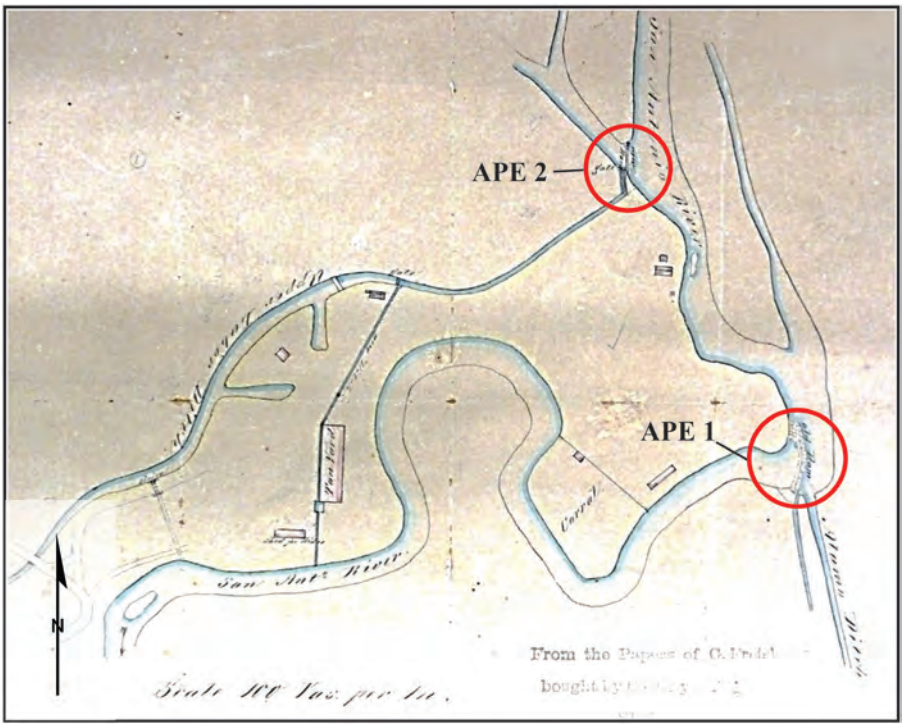

Figure 3-1. Freisleben CSA Tannery Map, ca. 1865-1868, with both APEs identified.

Figure 3-2. Freisleben Plat of Lots 1-10, January 1875, with both APEs identified.

The earliest recorded mention of the dam comes from the Inspection Report of 1761-1762 by Fray Mariano Francisco de los Dolores. In that report, he states that San Antonio de Valero has "a beautiful main irrigation canal with a dam of stone, for the watering of the farm fields, which are themselves fenced" (Dolores 1762). The record, however, is silent on the type of dam first constructed, i.e., a wing or a weir dam. Certainly, by the mid-nineteenth century, the Alamo Dam was a weir dam that crossed from the east to the west bank of the river. The 1852 Survey Map shows a dotted line crossing the river in the location of the Alamo Dam, the Alamo Acequia, and a sizable pool of water north of the structure (Figure 3-5). The map also clearly shows the west branch springs as separate from the east branch, the route of the Upper Labor Acequia and the location of the Upper Labor Dam. The Alamo Dam retention pool raised the level of the river and diverted waters into the Alamo Acequia on the east bank. In addition to the 1852 Survey Map, the Freisleben Tannery sketch map of 1865-68 and the two Freisleben Plat of the Lands of the Upper Part of the Labor de Arriba maps of January and May of 1875 show the Alamo Dam as a weir dam and the articulation of the dam with the headworks and *acequia* (Figures 3-6, 3-7, and 3-8).

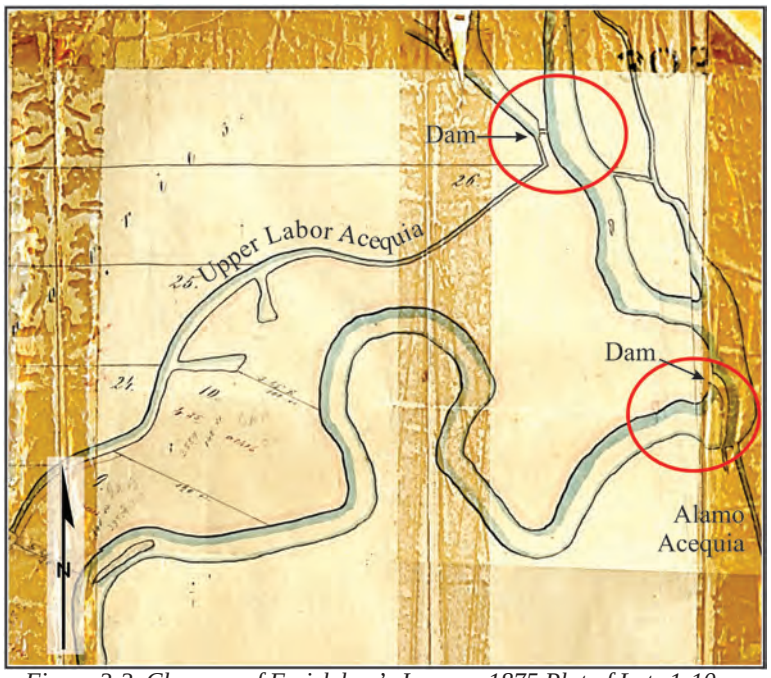

Figure 3-3. Close-up of Freisleben's January 1875 Plat of Lots 1-10, APEs 1 and 2 (circled in red).

The three Freisleben Maps (Figures 3-1 through 3-3) show the location of the Alamo Dam at the first bend, the Alamo Dam crossing the river from bank to bank, and the articulation of the headworks with the Alamo Acequia. There are differences, however, between the three maps regarding the dam. The 1865-68 Tannery Sketch Map and the January 1875 Upper Part of the Labores de Arriba Map, as well as the 1879 Giraud Water Works Map, indicate a curvilinear structure (Figures 3-6, 3-7, 3-8, and 3-9). Only the May 1875 Freisleben Map shows the dam as a straight-line rock structure.

Figure 3-10 is a chronological comparison of three Freisleben maps; the Tannery Map of ca. 1865-1868; the January of 1875 plat; and the Plat of May of 1875. This montage has expanded views of the Alamo Dam and Upper Labor Dam sites, respectively. A visual inspection permits identification of a number of similarities and differences:

1. All three maps are in general agreement about the alignment of the river and the siting of the Alamo Dam at the first primary bend below the headwaters;

2. All three show the Alamo Dam as a weir dam that spans the entire river (three indicate a curvilinear structure while one indicates a straight alignment); and

3. All three place the headworks of the Alamo Acequia in the same general location (east bank) with one map showing a single ditch (Freisleben May 1875) and two maps showing a double ditch (Freisleben 1865-1868 and January 1875).

As such, the maps are more in agreement than disagreement. The Giraud Map of 1879 (Figure 3-9) postdates the last Freisleben map by four years and also shows a curvilinear Alamo Dam and a single ditch. The most probable reasons for the variations between these maps as to dam alignment and the number of ditches may simply be a reflection of vagaries in the production of the maps; or that only one of the two ditches were extant at a given period; or that Freisleben or Giraud simply overlooked details that were not relevant to the purposes of the maps to begin with.

The Alamo Acequia system converted from an agricultural system to an urban system over time with the increased growth of the city following Texas independence. As previously noted, the Alamo Acequia was added to those overseen by the City along with the appointment of a Ditch Commissioner in 1840 (CCMB I:37). City Council Minutes from 1840 through the 1860s include regular reports from appointed Ditch Commissioners regarding expenses, maintenance, and water rents for the Alamo Ditch.

The original dam may have only been a wing dam to divert water into the ditch, which then flowed south some 5.5 km through the farmlands of Mission San Antonio de Valero before returning to the San Antonio River in the vicinity of the current Hyatt River Walk Hotel. This original system was expanded and elaborated in the following century to a length in excess of 16 km of canals (Cox 2005:22). The extension of the system may have necessitated the expansion, both in breadth and height, of the dam in order to create a pool of

Figure 3-4. Freisleben's May 1875 Plat of Lands of the Upper Part of the Labor de Arriba.

water sizable enough to feed the entire system and to account for the large dashed-line and large pool of water shown on the 1852 Town Tract Survey map (see Figure 3-5).

The dam's expansion to a weir dam that spanned the channel of the river is also documented by the 1867 report of a committee constituted to inspect the old Alamo Dam and Acequia with an eye to adding the proposed East Side or Valley Ditch:

> Your committee *after crossing the River upon the Dam* inspected the head Water gates, which they found in good condition except a wash in the bottom which can be easily filled up. Said Gate is a double gate; about 8 feet in width and six feet in depth, and is of sufficient capacity, having now about four feet head of water, to add an abundance of water for the old and new ditches [CCMB C:581; emphasis added].

The committee report indicates that the dam could be traversed simply by walking across the top of the structure from bank to bank. This same committee reported on several dimensions of the dam and its composition:

> …that the Dam rests upon a rock foundation of from fifteen to near forty feet broad, and is sufficient to be easily repaired, the fissures and

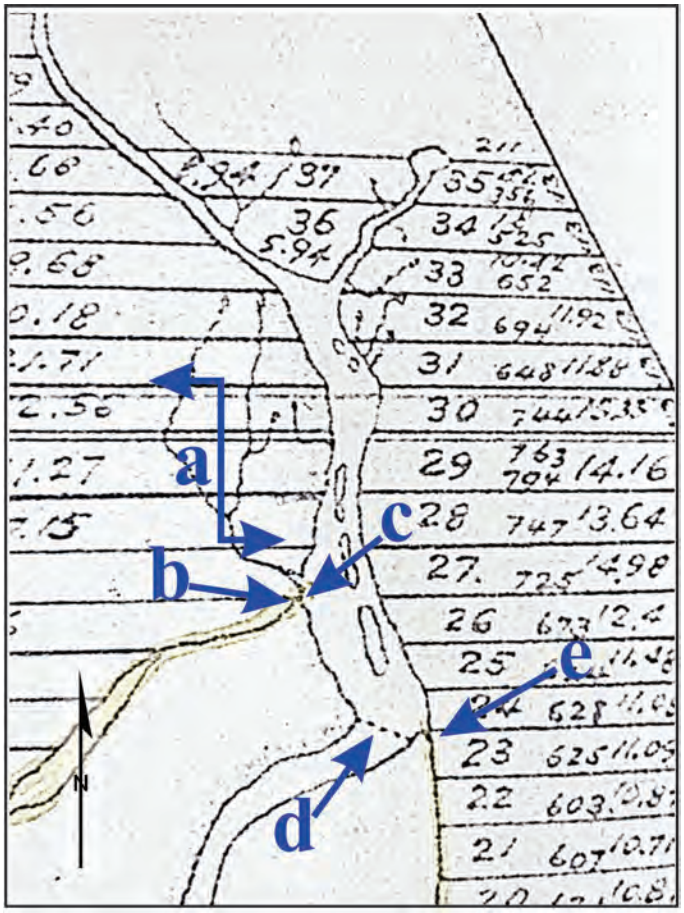

Figure 3-5. The 1852 Town Tract Survey: a) West Branch Springs, b) Upper Labor Dam, c) Upper Labor Acequia, d) Alamo Dam, and e) Alamo Acequia (single).

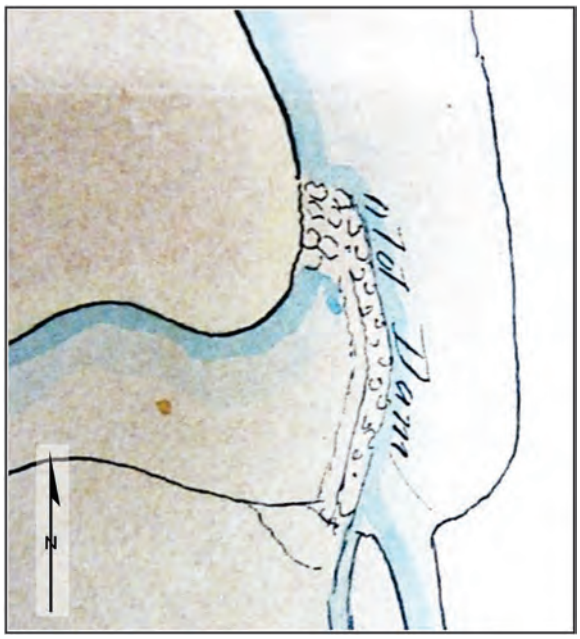

Figure 3-6. Close-up of APE 1, Freisleben, 1865-1868, curvilinear Alamo Dam, double ditch.

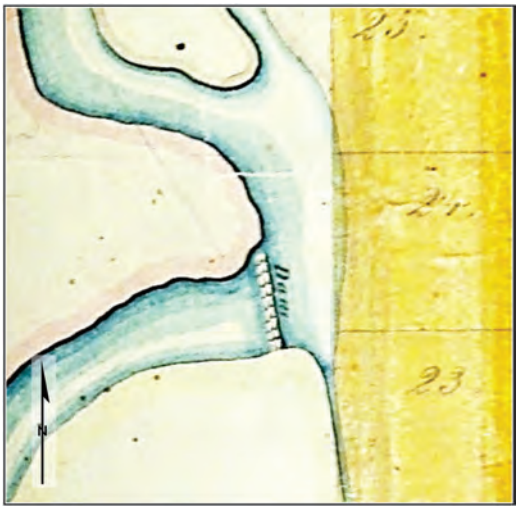

Figure 3-7. Close-up of APE 1, Freisleben, May 1875, straight-line Alamo Dam, single ditch.

Figure 3-8. Close-up of curvilinear Alamo Dam on Freisleben's January 1875 map, double ditch.

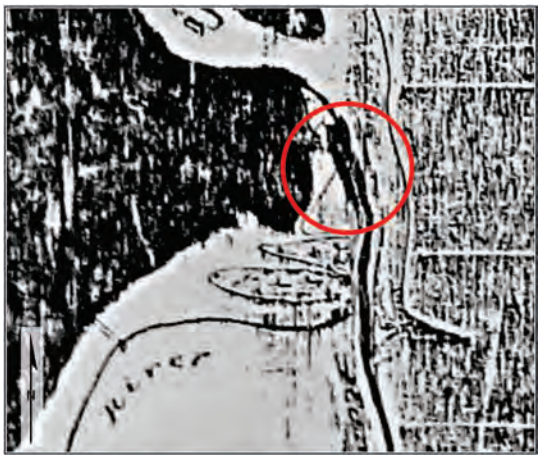

Figure 3-9. Close-up of curvilinear Alamo Dam (circled in red) on Giraud's 1879 map, single ditch.

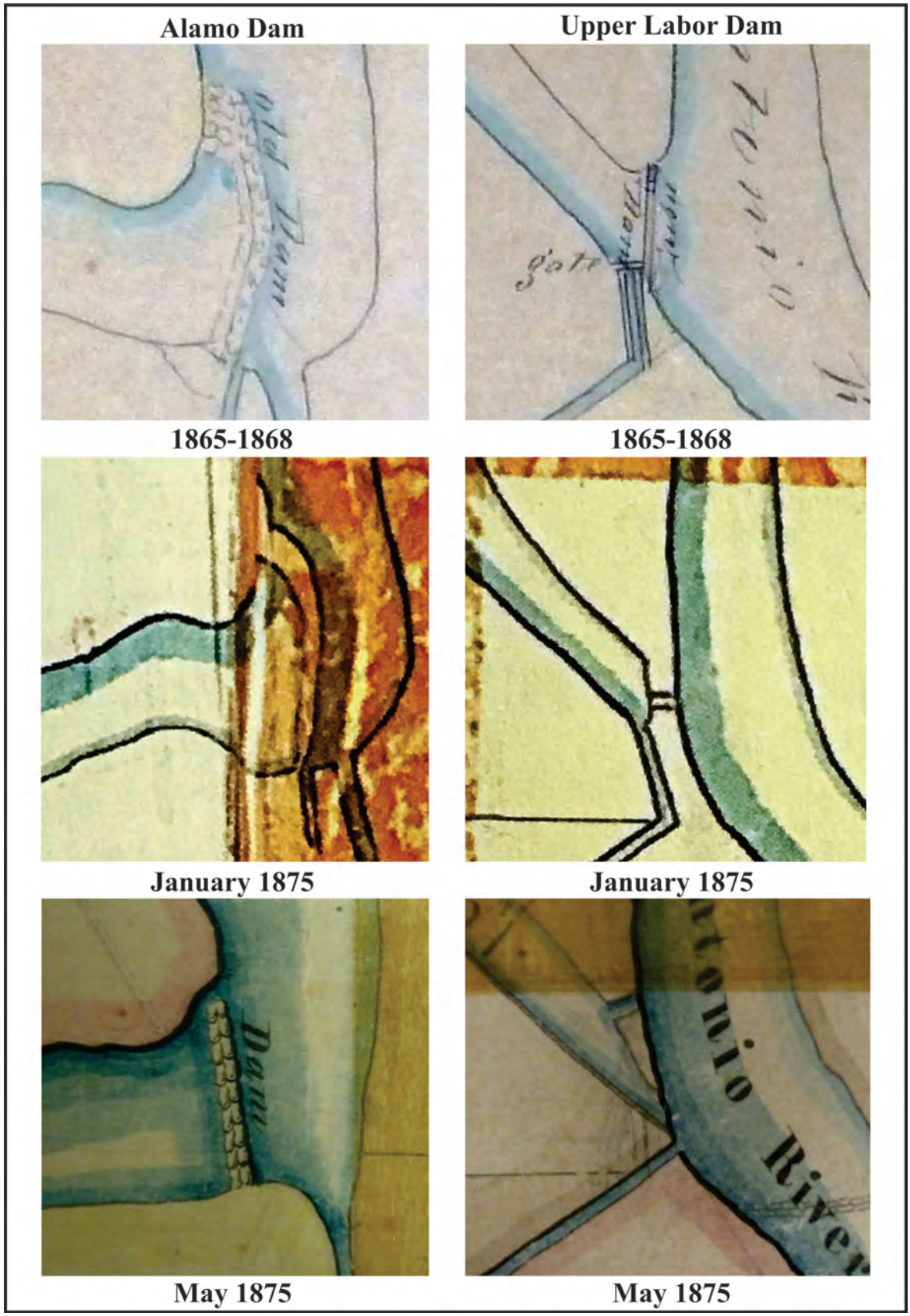

Figure 3-10. Montage of Freisleben Maps showing alignments of dams and acequias 1865-1875.

> leaks stopped, and by removing the upper course of small loose rock, and replacing them with one layer of large rock, it will be high enough to furnish an abundance of water for labors [farms] of the Alamo and the new branch Ditch [CCMB C:580-581].

The Alamo Dam and Acequia system continued in operation until 1905 when it was closed by order of the City. By that time, the Spanish *acequia* was being used as a storm run-off channel and disposal site. The *acequia* itself was filled and disappeared from view, and the dam was subsequently removed, but precisely when is currently not known. There is a consolidated mass of rubble set in cement that is visible in the river at this location and may very well represent a portion of the alignment of the Alamo Dam as it crossed from east to west.

APE 1 consists of the area where the western end of the dam intruded into the west bank of the San Antonio River. Investigations by CAR in 2011 identified a portion of the dam's eastern embankment (Ulrich 2011). Subsequent investigations on the east bank performed by Pape-Dawson in 2015 have verified a small, intact portion of the dam immediately adjacent to the area in which CAR had excavated in 2010 (Dr. N. Anderson, Pape-Dawson Engineering, personal communication October 2015).

Upper Labor Dam and Acequia

The lands that ultimately became the Labores de Arriba de Nuestra Senora de los Dolores, or Upper Farms of Our Lady of Sorrows, were part of the lands of the Villa of San Fernando set aside in 1731. In that year, the lands west of the river and north of the Presidio were reserved for the residents of the villa to accommodate the influx of the Canary Islanders, a group of some sixteen families (Austin 1908:338-339).

Prior to the construction of the Upper Labor Dam and Acequia, the lands that became the Upper Farms were used as a commons for grazing pursuant to Viceroy Juan de Acuña y Bejaraño, Marqués de Casa Fuerte's Dispatch of 1731:

> [The Governor]…shall set apart a sufficient amount for commons [*ejidos*], so that if the population increases, the people will have ample recreation grounds, and room for the stock to graze without doing any damage. In addition to these commons, he shall lay off sufficient lands for pastures [*dehesas*] on which to keep the work oxen, the horses, the stock for the slaughter-houses that may be subsequently built, and the other stock which by law the settlers are required to keep [Austin 1908:340].

The Villa de Bexar, subsequently renamed the Villa de San Fernando with the arrival of the islanders, was irrigated by the San Pedro Acequia. This irrigation system was completed and in operation by January of 1734 and served the needs of the settlers (Leal 1986).

As a result of the growth of the villa and the pressing need for new arable lands, Governor Angel Martos y Navarette initiated a site selection process for the construction of a new dam and *acequia* in 1762. This project was not carried out until 1776 by Governor Juan Maria Vicencio Baron de Ripperda (Wright 1916:117). Begun in July 1776, the Upper Labor Dam and its adjoining Acequia was the last *acequia* irrigation system in San Antonio constructed during the Spanish Colonial period. The system was completed by March 10, 1778, and irrigated some 600 acres of land between what are now the old quarries and the San Antonio River, below Hildebrand Avenue and above Ashby Place (Arneson 1921:124-125). The *acequia*, once fully operational in 1778, irrigated 52 *suertes* (tracts) of land owned by residents of the Villa de San Fernando and also for several displaced residents from Los Adaes.

The Upper Labor Dam was constructed just below the mouth of the western branch headwaters of the San Antonio River and on the west bank. The dam diverted water from a group of springs that formed the west branch of the headwaters of the San Antonio River into the Upper Labor Acequia (see Figure 3-5 a). Dams that divert the flow of water, rather than impound water, are referred to as diversion dams and come in a variety of types such as weir or wing dams. As originally designed by the Spanish, a portion of the water flow was diverted by the Upper Labor Dam into the *acequia* while excess water flowed around the end of the dam and down the San Antonio River channel. The *acequia* was a gravity-fed, dirt-lined, irrigation canal that carried water from the west branch headwaters, irrigated adjoining land along its route, and returned excess water into the San Pedro Creek. Villa residents who owned tracts abutting the *acequia* had rights to draw water at specified times to irrigate their fields. The Upper Labor Acequia, after passing through what is now the west side of Brackenridge Park, then traveled along the route of what is now North St. Mary's Street. The somewhat meandering course of North St. Mary's Street as it curves from beneath U.S. Highway 281/37 to its junction with Ashby Street is because it follows the old *acequia* alignment. At Ashby Street, the *acequia* began to head west-southwest following the contour line around the east and south side of Tobin Hill. It then travelled to a point just south of San Pedro Springs near the current intersection of North Flores Street

and Fredericksburg Road, crossed the San Pedro Acequia via a wooden "canoa," and returned its surplus water to the San Pedro Creek (Cox et al. 1999:5-6).

The Upper Labor Acequia was maintained during its period of use by the abutting property owners as ordered by Governor Domingo Cabello in 1784: "…each individual partner is to take care to repair the water gates and whatever deterioration may occur in the part that belongs to him" (Cabello 1784; Cox et al. 1999:6). The annual maintenance of the *acequia* continued throughout the Spanish Colonial period from 1778 to ca. 1810. Like the San Pedro and Alamo *acequias*, the Upper Labor fell in to disrepair from lack of use and maintenance during the three decades that followed.

The APE 2 property was not originally assigned as a *suerte* and had the status of *ejidos* (common lands). While these lands were held in common, only the *suerte* of Mariano Rodriguez abutted the land. The Rodriguez *suerte* later became the property of the Zambrano estate. This tract was one of nine that Pedro Flores acquired during the period from 1838 to 1857. Five of these tracts were from the estate of Juan Flores, one from the Zambrano estate, and the others from various other families (BCDR F1:151; BCDR I1:1; BCDR O2:524). Flores also purchased one lot west of the Upper Labor from the City in 1852 (BCDR K2:428-429). Flores's acquisition of these lots gave him substantial use rights on the common lands that included APE 2, and it appears that Flores farmed both his titled lands and the 75 acres of commons (Pfeiffer 2011:10).

In December of 1860, the City attempted to sell Lots 20 through 27 on the west side of the Upper Labor Acequia (BCDR S3:85-88). These lots comprised some 180 acres and were part of the Upper Labor Farms commons. Some 75 acres of adjoining lots, including the Upper Labor Dam lot, were actively being farmed by Flores at this time (Pfeiffer 2011:10). The City asserted its claim to the 75 acres of common lands above the Flores Tract that included APE 2. The City made the claim pursuant to the Texas Supreme Court decision of 1851 to the common lands (Corner 1890:36). It appears that Flores disputed the City's claim to ownership as both Flores and the City mutually agreed upon sale of the property to the CSA in January of 1863, with the City and Flores each accepting $5,000 for the 75 acres (BCDR S2:497-498; BCDR S2:498-499; City Council Ordinance Books 1:166-167).

In addition to the lands below the Upper Labor Dam and west of the Upper Labor Acequia sold by the City in 1852, there were five lots above the dam sold that same year. These lots were numbered 28 through 32 with Lot 28 sold to Gregoire Hermann, Lot 29 to Hanson Alsbury, Lots 30 and 31 to Francois Marchant, and Lot 32 to Andrew Neill (BCDR K2:367; BCDR T1:157; BCDR K2:362; BCDR K2:446; BCDR K2:412-413). These five lots controlled the springs and waters of the western branch of the San Antonio River immediately above the Upper Labor Dam on Lot 27 (Figure 3-11; see also Figure 3-5 a).

Several maps from the nineteenth and early twentieth century clearly show the separate springs and channels of the west branch, or portions thereof, e.g. *The 1852 Town Tract Survey Map* and *the Head of the San Antonio River, City Rock Quarries, Academy of the Incarnate Word and St. Anthony College Map of 1939* (Figures 3-11 and 3-12). The waters from these springs were the near exclusive source of water for the Upper Labor Acequia. By 1854, Alsbury and his wife Harriet had obtained both the Marchant and Neill lots and controlled Lots 29 through 32, with Hermann maintaining control of Lot 28 (BCDR M1:189-191).

In addition to the 1854 sale of the lots, Marchant separately conveyed "…unto the said Alsbury, all my right, interest in and for a certain mill, situated upon the San Antonio River above the City of San Antonio on Lot 29…together with all its fixtures and appliances" (BCDR M1:191). The remains of Alsbury's Mill are undoubtedly 41BX284 and resolve the question of the function of the structural remains located on the UIW campus across Hildebrand Avenue just north of APE 2. The Alsburys and Hermann operated the mill and controlled the western branch headwaters. Harriet Alsbury sold the mill and Lot 29 to Hermann in October of 1868 (BCDR U1:563). Hermann, in turn, sold Lots 28 and 29 to Brackenridge in 1871 (BCDR W2:171-172).

The CSA controlled the 75 acres of property immediately south of the Alsbury and Hermann tracts between 1863 and the end of the Civil War in 1865. The CSA's expressed purpose for acquiring the land was the development of a tannery to supply leather for shoes, boots, and other military uses (Pfeiffer 2011:10). The CSA made major improvements to the 75-acre tract, in particular on Lots 23 to 27 on the west side of the Upper Labor and on what subsequently became Lots 9 and 10 lying between the Upper Labor and the San Antonio River (see Figure 3-1). The CSA also performed work on the Upper Labor Headworks and Acequia and, in April of 1863, were authorized by City Council to "quarry hard rock from [the] No. 24 and 25 quarries at no charge for constructing their works at the head of the San Antonio River" (CCMB C:392).

A sketch map of the tannery property was made by City Engineer Freisleben, ca. 1865-1868 (see Figure 3-1). Although undated, it is likely that the map was made as part of the plan submitted to the City Council in June of 1868

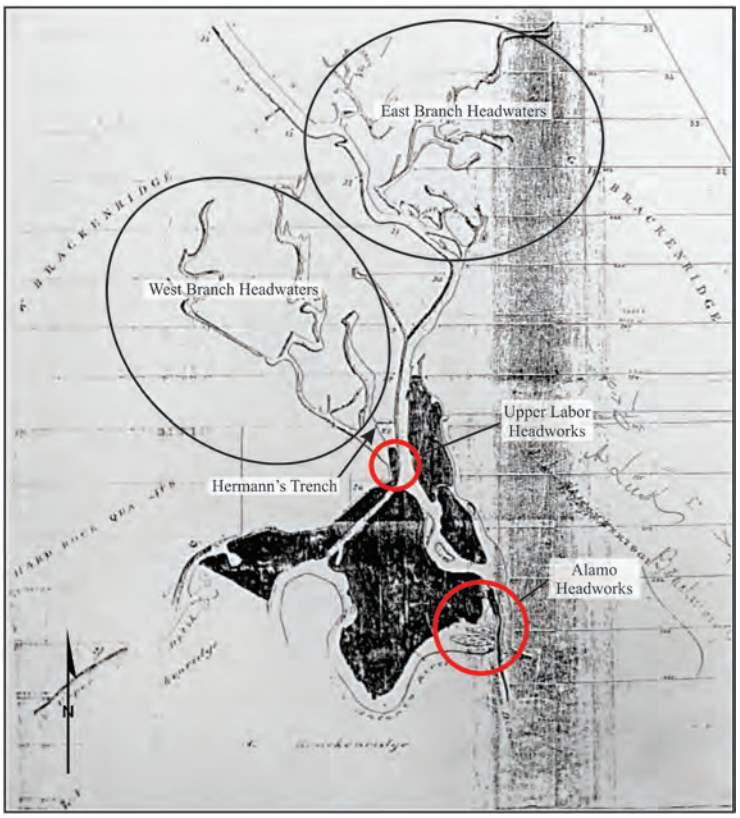

Figure 3-11. Giraud map showing property the City leased to the San Antonio Water Works Co. 1879; APEs identified (red circles).

for flood improvements or was prepared when the City was seeking to obtain the property from the U.S. Government in 1867-68 (CCMB D:579, 583, 588). In addition to the tannery buildings and sluices, the map shows the headworks and upper channel of the *acequia* lined with stone. The map also shows that the Upper Labor Dam extended across the full width of the west branch of the San Antonio River headwaters. In so doing, the CSA directed 100 percent of the west branch springs into the Upper Labor Acequia. Further evidence that the CSA dam diverted all the waters of the west branch is found in the June 7 and 20, 1864, City Council minutes. In early June, the Council appointed a committee to examine the dam and gave them authority to "create a gap in the dam 15' by 2,'" and the same committee reported back on June 20 as having done so (CCMB C:436-437).

At the time of the 1996 excavations and subsequent report, Cox et al. (1999) utilized available archival and historical resources to arrive at several conclusions that have since been further refined or replaced as a result of the current excavations and new documentation:

1. The 1996 excavations were unable to specifically determine the date and who had made the improvements to the Upper Labor Dam (Cox et al. 1999:i, 12);
2. The 1999 report was clear in its determination that the Upper Labor Dam was originally designed as a wing dam and that the subsequent post-1860 additions did not change that condition (Cox et al. 1999:12); and
3. The extant headworks and *acequia* channel of the Upper Labor were installed as part of the 1935 WPA improvements (Cox 2005:72; Cox et al. 1999:12; *San Antonio Express News* [*SAEN*] 4 August 1935).

Archival searches performed in relation to the 1999 report did not discover evidence of specific work performed by the CSA, or any other contractor, on the dam or headworks. The ashlar dressed stones that comprise the upper coursing of the dam were presumed to date after 1860 and were attributed to German stonemasons (Cox et al. 1999:12).

Research performed under the current permit uncovered an agreement executed in 1875 between Brackenridge and the City of San Antonio that demonstrates the upper portion of the dam was constructed by the CSA:

> Agreement made this sixteenth day of January, 1875 between the City of San Antonio…, in the first part, and G. W. Brackenridge…of the second part, whitherforto:

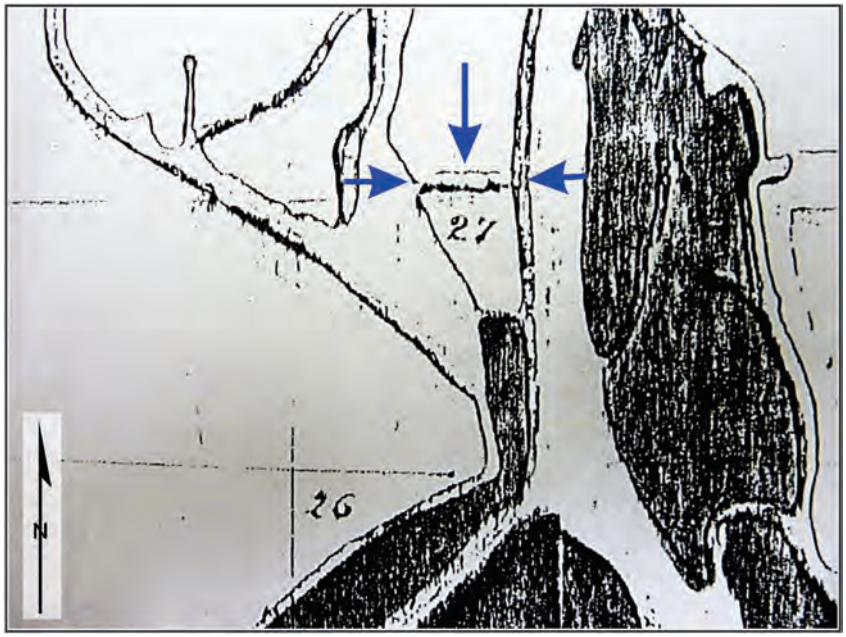

Figure 3-12. Close-up of 1879 Giraud Water Works map indicating alignment of Hermann's trench.

> 1st, The City consents to the permanent closing and abolishing of the street or road 20 varas wide…between the lots No. 29 and 30…
>
> 2nd, in consideration of the foregoing, G. W. Brackenridge agrees to the opening of a street… running along the south boundary line of lot 28… lying on the west side of the river between said river and the branch below and adjoining a trench cut by G. Hermann.
>
> 3rd, G. W. Brackenridge agrees that the City has the right to build a gate in said trench and to raise the water of said spring branch, which feeds the Upper Labor Ditch to the height of the dam and no higher.
>
> 4th, G. W. Brackenridge renounces the right and authority given him by decree of the District Court Bexar County in case No. 4511, January 10, 1872 to abate or remove *the aforesaid dam erected during the Civil War near the mouth of said spring branch* for the purpose of supplying the Confederate Tannery with waters… [BCDR V3:217; emphasis added].

The 1875 agreement consisted of four parts. Stipulations 1 and 2 concerned the route of what became Hildebrand Avenue and moved its course south by one full lot, from the line between Lots 29 and 30 to the line between Lots 28 and 29. Stipulations 3 and 4 were associated with water access and control related to the Upper Labor Dam and Acequia. The language in stipulations 2, 3, and 4 provide new information concerning water access from the west branch and identify that the CSA constructed the upper, ashlar dressed course of the dam. Stipulations 2 and 3 indicate that Hermann had cut an east-west aligned trench along the south property line of Lot 28, and stipulations 3 and 4 confirm that the west branch was, at that time, the sole source for the Upper Labor's waters.

A second reference to Hermann's trench appeared in Freisleben's report to City Council from June 2, 1874 (CCMB D:111). This report was on the practicability of the Hartnett Plan for the Alazan Acequia as recommended by the Schleicher Commission Report of 1865. Freisleben was critical of the plan created by Hartnett, who had replaced him as City Engineer during the period from 1870 to 1872 (CCMB D:51; Cox 1999:7). In his report, Freisleben mentioned, "Without consent [from the abutting property owners] the whole plan is impracticable; *the new channel just above the lower line of Brackenridge prevents raising the water*" (CCMB C:D111; emphasis added). This reference to a "new channel" along the south line of Lot 28 corresponds with Hermann's trench alignment, and this was the lower lot owned by Brackenridge at that time as he had obtained the property from Hermann in 1871 (CCMB C:D111). It appears that in order to obtain water from the east branch, or possibly in a bid to control access to water, Hermann cut a trench to bring additional flow into the west branch from the east branch, or vice versa. As such, Hermann could control the water flow to the Upper Labor Headworks—supplying or denying access via his trench across Lot 28.

The Giraud *Water Works Map of 1879* shows the ownership of the various parcels along both sides of the San Antonio River and its headwaters (Figure 3-11). This 1879 map shows Hermann's trench connecting the two branches and in the correct position along the south line of Lot 28 (Figure 3-12). Additionally, the Giraud map demonstrates that the west branch springs and channels are completely separate from those of the east branch, which is formed by the Blue Hole and associated springs as well as the outflow of Olmos Creek. Hermann most probably excavated the trench to obtain water from the east branch when west branch flows were diminished. Hermann, and the Alsburys before him, controlled the property and springs that fed the Upper Labor between 1852 and 1871. The City's right to build a gate in the trench indicates that Hermann's trench controlled water flow into and down the west branch.

Unfortunately, District Court Bexar County case No. 4511 only provides the judgment and none of the arguments or facts of the case (Stewart Title Collection 1872). Additionally, the construction of Hildebrand Avenue and subsequent reconstruction of the street and elevated roadway have more than likely obliterated any archaeological evidence of Hermann's trench and other modifications to Lot 28. What little is left of Alsbury's Mill (41BX284) on the UIW campus should receive further investigation prior to potential impacts in light of the new evidence.

Additional supporting evidence of the dam's modification from a weir dam to an impoundment dam is found on the Freisleben Tannery map of 1865-1865 (Figure 3-13). This map shows the dam as an impoundment that crosses and closes the mouth of the west branch. Further, the map shows the upper portion of the *acequia* lined with stone and the gate clearly marked. Another factor advocating for a CSA attribution to the headworks and stonework of the upper portion of the *acequia* is the quality and construction. The stonework is of dressed ashlar construction and does not match the rather crude, irregular, stone-faced wall construction typical of the WPA work found in Brackenridge Park and throughout the city. The smooth, ashlar dressed stones of the headworks, along with the cut articulations for the headgate itself, demonstrate that this was a working gate and not a replica.

Work performed by the San Antonio Zoo in 2014 uncovered portions of one of the tannery sluices that lay on Lot 9 (V. Kay Hindes, City Archaeologist, personal communication, December 2015). While this work was not archaeologically documented, photographs of the sluice stonework match that of the headgate. It is the opinion of H. Ray Smith, a well-regarded local stonemason and avocational archaeologist who was present at both the sluice and Upper Labor Dam excavations, that the work is contemporaneous and performed by the same masons (H. Ray Smith, personal communication January 2016).

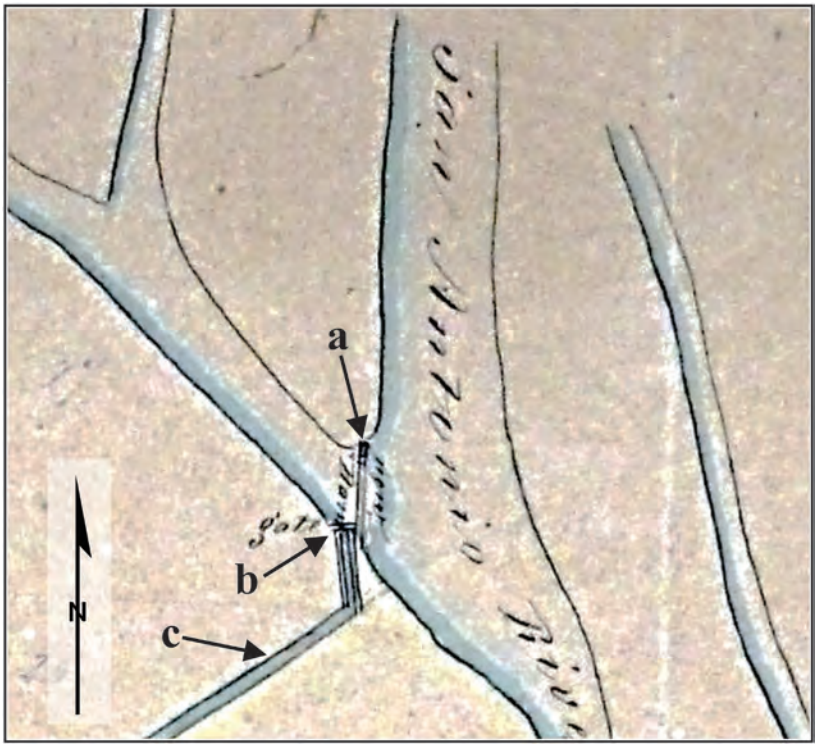

Figure 3-13. Close-up of Freisleben tannery sketch map, ca. 1865-1868: a) Upper Labor Dam, b) Headworks, and c) Acequia.

In 1867, the control of the property became clouded when the United States Bureau of Refugees, Freedmen, and Abandoned Lands (BRFAL) claimed title to the now valuable property along with all of its improvements (CCMB D:579, 583, 588). The City entered into negotiations with the BRFAL to recover the property, and the Freisleben tannery map may have been produced during this period. City Council minutes of January 1867 demonstrate that Mayor Giraud wrote a letter to U.S. Army General Joseph Barr Kiddoo at Galveston seeking to obtain the land (CCMB D:579). General Kiddoo was the official in charge of the BRFAL. This letter was followed by a visit by S. G. Newton in February and an offer of $25,000 in May of the same year (CCMB D:583, 588).

Negotiations between the parties, however, were preempted by yet another devastating flood that hit the city in May of 1868 and destroyed most of the tannery improvements. It was not until 1869 that the City re-acquired the property from the U.S. Government via the BRFAL for the sum of $4,500, the price having been reduced as a result of the loss of improvements in the flood of 1868 (BCDR U2:593-594; CCMB C:655). After gaining control of the property in 1869, the City leased it to the firm of Bennett and Thornton from 1871 to 1874, but the firm's use of the property was not recorded (BCDR V3:146-147; CCMB D:14).

The City determined to plat and sell a 44.48-acre portion of the former tannery property in December 1874, ordering the City Engineer, Freisleben, to make a plat containing 10 lots ranging in size from 3-7 acres each (see Figures 3-2 and 3-3; CCMB D:134). The sale of these lands was to satisfy a $6,300 debt incurred by the City from F. Groos and Company in September of 1873 and secured by the land in question. City Marshal John Dobbins sold the lots via public auction in January of 1875. Lots 1, 3, and 4 were sold to J. H. Kampmann (BCDR 2:249-250); Lots 2 and 5 to F. Groos and Co. (BCDR 4:99-100); Lots 6, 7, 9, and 10 to G. W. Brackenridge (BCDR 2:236-237); and Lot 8 to the firm of Lockwood and Manning (BCDR 2:243-244). The City retained the property containing both APE 1 and APE 2 as these lands were not included in the sale. From 1719 to the present, APEs 1 and 2 have been publicly owned. Both were part of the common lands during the Spanish Colonial period and continued to be farmed by Pedro Flores as late as 1862-63 when they were part of the 75 acres conveyed to the CSA. Following the Civil War, the title passed from the CSA to the BRFAL in 1865, and from the BRFAL to the City in 1869, which continues ownership to the present day.

A comparison of the Freisleben *Tannery Map of 1865-1868* with the Freisleben *Plat of January 1875* (Figure 3-14) indicates possible changes at the Upper Labor Dam. The two principal changes are the presence in the 1875 map of a spillway or opening between the west branch and the east branch of the river, and secondarily, the orientation of the dam itself appears to have shifted. It is important to note that the 1865-1868 map is more highly detailed as to improvements and features because it was drawn to specifically show the tannery operation and not simply the landform. Both the January and May 1875 plats, in comparison, are primarily documents to delineate lots and not improvements. Additionally, Lot 27, and the land for APEs 1 and 2 were not part of the lots sold by the City in 1875. Freisleben's

Figure 3-14. Comparison of Freisleben 1865-68 map (left) with January 1875 map (right).

focus was on a plat of accurate lot lines and acreages for Lots 1-10. For this reason, the 1875 maps, as they relate to the Upper Labor and Alamo dams, should be considered an approximation of conditions and not necessarily an accurate depiction of those features.

The dam in the 1865-68 map is drawn as a rock structure oriented north-northeast, the dam and gate are shown and labeled as such, and the upper channel of the *acequia* is stone lined (see Figure 3-14, left). There does appear to be a faint channel or spillway on the northern end of the dam; however, this is not noted nor is it colored blue like the spillway in the 1875 maps.

The 1875 map shows the dam as a simple spit of land with a north-northwest alignment and an opening on the north end. The map does not show stones drawn on the dam footprint, a headgate, or a stone lining of the ditch. The absence of these details in the 1875 map is most likely because an accurate depiction of these features was not important or related to the plat for the sale of the lots. The change in alignment may represent the accumulation of sediment along the eastern face of the dam, or it may simply reflect a lack of accuracy as it was an unnecessary element. The spillway on the 1875 map is significant as it indicates that although this area was not being sold the feature was prominent enough for Freisleben to include it in the plat. The spillway likely reflects the City's determination to rejoin the west branch to the east while still maintaining a head of water for the Upper Labor Acequia.

In 1874 and 1875, the City created an extension of the Upper Labor Acequia, which had originally been recommended by the Schleicher Report of 1865 (Cox 2005:57-58), in an attempt to alleviate flooding. This extension was named the Alazan Acequia as it carried excess flood waters from the Upper Labor Acequia around and above the San Pedro Springs and drained them into Alazan Creek on the west side of the city. In order for the plan to be put into effect, it required deepening the channel of the Upper Labor Acequia to support the increased flow (CCMB D:147). It is important to note that the City Council Minutes only speak to the deepening of the Upper Labor Acequia, giving specifications for the amount of stone in perches and the location where these were to be laid. No mention is made or specifications given for any alterations to the headworks or dam. This would be consistent with the plan of the Alazan Acequia; it was not to add water for irrigation or increase the pressure for irrigation purposes, which raising the dam height or surrounding walls would accomplish. Rather, it was to assist in flood control by allowing the Upper Labor Acequia channel to carry more water, which deepening the channel by raising the wall heights would accomplish. Despite the improvements, the Alazan Acequia was by almost any definition a failure as it was plagued with design, construction, and functional problems. As a result, the Alazan Acequia extension was abandoned in 1894 after less than 20 years of operation (Cox 2005:57-58; Cox et al. 1999:8).

The Upper Labor Dam and Acequia continued in operation after the 1894 closure of the Alazan extension, but a series of factors resulted in its complete closure shortly after the turn of the century. The primary factors that closed the Upper Labor were common to all the urban Spanish Colonial *acequias*: the cost of maintaining the systems exceeded their water rents; the flow of water from the old springs decreased as a direct result of the drop in the water table caused by the intrusion of artesian wells into the Edwards Aquifer; and the ditches had ceased to be sanitary and were effectively no more than storm water run-off and sewage canals (Cox 2005:60-70; Cox et al. 1999:8-9).

APE 2 became part of Brackenridge Park following Brackenridge's donation of land to the City in 1897. With the closure of the *acequia* around 1904, the former diversion/impoundment pool simply became another water feature within the park. The configuration of the pool varied considerably prior to becoming the Lily Pond after 1940. A City map attributed to 1926 shows the dam pool with notation "DAMS" and what appear to be the *acequia* and two small spillways articulating the west branch with the east branch of the river (Figure 3-15). The *City Map of the Headwaters* (1939) demonstrates that these dams, spillways, the pool, and island are gone by 1939 (Figure 3-16).

Excavations under the current project's permit documented the WPA-style stonework that enclosed the sides of the pond. However, it is clear that this work was not performed in 1935 as it is not listed in the *San Antonio Express News* article nor is it shown in its current configuration on the 1939 map (see Figure 3-16; *SAEN* 4 August 1935). The stone lining of the Lily Pond occurred after 1939 and may represent an as yet undocumented WPA project or Parks Department project. By the 1950s, the Lily Pond as it is known today was extant. The Upper Labor Dam was present, but it is not shown or not clearly shown on any of the twentieth-century maps of the park. It is possible that the dam is not shown because it was either submerged in the river at that time or had been buried.

The last half of the twentieth century was not particularly kind to the Upper Labor Dam. Once the Lily Pond had been enclosed with walls, a combination of intentional leveling by human design and additional deposition by fluvial and colluvial sediment completed the process of obscuring the dam from sight. Additionally, improvements to the park required the intrusion of various utilities and drains that directly impacted the dam in various places along its alignment. The intruding utilities and drains are discussed further in Chapters 5 and 7.

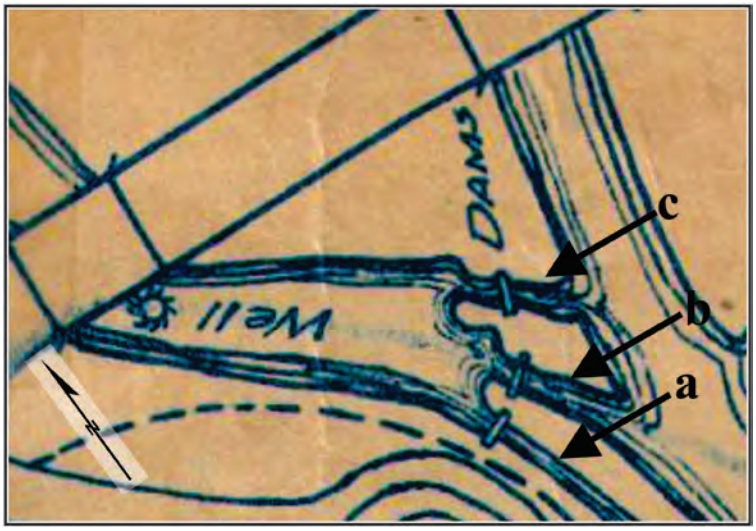

Figure 3-15. The 1926 Brackenridge and Koehler Park Map, close-up of APE 2 showing the (a) acequia, (b, c) two other channels, and the notation of "DAMS".

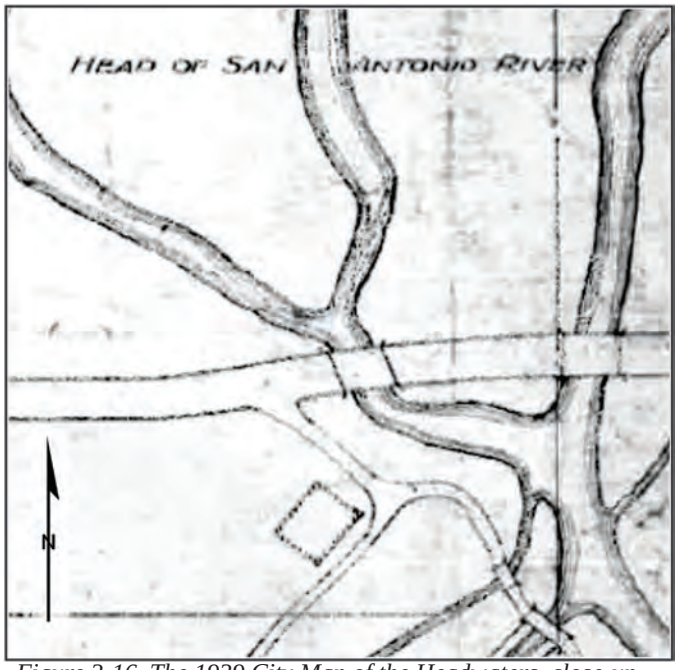

Figure 3-16. The 1939 City Map of the Headwaters, close-up of APE 2.

Brief History of Brackenridge Park

The history of Brackenridge Park and the important individuals who were central to its history and formation are well documented. Readers interested in a more detailed history than that provided here are directed to Pfeiffer's *Brackenridge Park: A History* (2011) as well as to the National Register Nomination for the park, completed by Pfeiffer, Tomka, and Leibowitz (2011).

Before the Park to 1875

Starting in the seventeenth century, the headwaters of the San Antonio River and San Pedro Creek, close to where Brackenridge Park is located today, began attracting the attention of passing Spanish *entradas*, or expeditions (Chipman 1992; Hoffman 1935; Tous 1930a, 1930b). In 1709, the Espinoza-Olivares-Aguirre *entrada* discovered and named both the San Antonio Springs and San Pedro Creek

(Tous 1930a). In 1716, on the way to East Texas, the Ramon *entrada* passed through the area stopping first in the San Antonio River Valley (Tous 1930b). What they saw there so impressed them that it contributed to the area being selected as a site for future settlement (Mauldin et al. 2015). Two years later in May of 1718, a third *entrada* under the direction of Governor Don Martin de Alarcon reached the San Antonio River. Alarcon established Mission San Antonio de Valero, the Presidio San Antonio de Bexar, and the Villa de Bexar, and he began constructing infrastructure including Spanish *acequias* to supply water to these settlements (Schuetz 1966:3-4). The two *acequias* that are the focus of this report originate in the area Brackenridge Park now occupies (de la Teja 1995).

The headwater's area remained essentially rural until after the United States annexed Texas in 1845. By 1852, most of the land comprising Brackenridge Park had private owners as the result of City land sales (Pfeiffer 2011). However, not all of the land owned by the City went up for sale. The bluffs west of the river and the Upper Labor Acequia were composed of high-quality hard limestone, and City-owned and leased rock quarries operated here supplying stone for local construction. Undoubtedly, the stones used in the construction of both the Alamo and Upper Labor dams were quarried from these bluffs by the Spanish in the preceding century.

Brackenridge Water Works 1875-1899

Following the Civil War, the City of San Antonio re-acquired the CSA tannery complex from the Federal government, but by 1875, it had subdivided the majority of the tract and sold the lots to private investors. As previously noted in this report several of these lots were sold to Brackenridge (Pfeiffer 2011). Brackenridge had moved to San Antonio late in 1865 and purchased a residence at the headwaters of the San Antonio River (Sibley 1973). Over the next 20 years, Brackenridge acquired more than 1,600 acres of land along the San Antonio River and Olmos Creek (Pfeiffer 2011:14).

On April 3, 1877, City Council approved a contract to construct a municipal water system (Pfeiffer 2011). Construction began immediately with the building of a raceway and pump house near the old tannery and Upper Labor Acequia, and by July 5, 1878, the water works plant was operational. A deal involving exchange of stock in the water works for cash loans resulted in Brackenridge obtaining controlling interest of the San Antonio Water Works, as the business was then called, by 1883 (Sibley 1973).

Brackenridge's earlier purchases of large blocks of riverfront land allowed for the rapid expansion of his water works, and in 1885, he added a second pump house (Pfeiffer 2011:16). Besides the water works, numerous other businesses opened in what is today Brackenridge Park from 1875-1899, for example: the Alamo and Roman Cement Works; the Ilka Nursery, and the San Antonio Jockey Club (Pfeiffer 2011:17-19).

The Creation of the Park to the Present

Brackenridge sold the headwater property to the Sisters of Charity of the Incarnate Word in May 31, 1897, and two years later, he donated 199 acres of riverfront land to the City for use as a public park with the City Council accepting the gift on December 4, 1899 (Pfeiffer 2011:19). Brackenridge's bequest contained a reversion clause stating that should alcohol be sold or consumed on the premises the property would revert to the State of Texas for the benefit of the University of Texas (Pfeiffer 2011:20). Ludwig Mahnke, the Chairman of the Parks and Plazas Committee, began developing the park in 1900. In 1914, City Council approved the creation of a zoological garden and natural history museum on 12 acres of the old tannery property making use of the rock quarry for large animal exhibits (Pfeiffer 2011:24, 27; *San Antonio Express* 19 May 1914). The outline of the present park took shape through the depression-era and post-World War II renovations of the 1960s, and the park continues to be shaped through today's on-going renovations ever acting as an "evolutionary landscape" preserving the "public needs and political will" of its time (Pfeiffer 2011:1).

Chapter 4: Field, Laboratory, and Curation Methods

Field Methods

Four primary methods were utilized to discover, attribute, and record the archaeological resources within APE 1 and APE 2. Initial methodology consisted of a pedestrian survey of both APEs to assess ground conditions and orient subsequent work with the prior excavations performed near APE 1 (Houk and Miller 2001, 2002; Ulrich 2011) and APE 2 (Cox et al. 1999). No artifacts were observable on the surface at either site.

The Principal Investigator in consultation with the Project Archaeologist determined the course of action for each APE. Four additional methods were determined for application at both APEs. These consisted of backhoe trenches, hand-excavated trenches, 1-x-1 m excavation test units, and hand-cleaning of architectural and archaeological features. Each APE will be discussed separately to avoid confusion between the two areas.

APE 1: Alamo Dam Site

Backhoe Trenches

Ten backhoe trenches were excavated at APE 1. These trenches are labeled Trench 1 (T 1) through Trench 10 (T 10). The 10 trenches reported here were excavated with a standard backhoe bucket (76.2 cm; 30 in.) and opened to average width of 1 m. The trenches ranged in both length and depth, resulting in differing approximate volumes of excavated material.

These trenches were monitored during excavation and photographed. They were visually inspected, and a typical section of the trench was profiled. Any artifacts noted from the trench spoil or recovered from the trench walls were noted as to provenience and bagged for subsequent laboratory processing at the CAR facility. The location of each trench was recorded with field notes and GPS by CAR staff and with TDS by engineers working with FPC. Utilizing a combination of field notes, GPS, and TDS, a plan map of APE 1 was produced.

There were no hand-dug trenches or hand-excavated 1-x-1 m test units placed within APE 1.

Hand Cleaning of Features

Two main features were identified within APE 1: a twentieth-century park wall and a portion of the Alamo Dam. These features were initially identified through backhoe trenching and subsequently cleaned by hand to prevent damage and to expose the top and sides of each feature. Both of these features are more fully described in Chapters 5 and 6.

APE 2: Upper Labor Dam and Acequia Site

Backhoe Trenches

Twelve trenches were excavated in APE 2. The trenches were numbered consecutively regardless of whether they were hand dug and/or mechanically excavated. Only Trench 11 was excavated utilizing a standard backhoe. The 11 hand-excavated trenches reported here were excavated through a combination of small a backhoe with a standard 25 cm (10 in.) backhoe bucket, which opened to average width of 25-30 cm, and hand excavation. The use of the backhoe was limited to identifying buried, stone remnants of the Upper Labor Dam at which time field crew then hand excavated utilizing shovels to expose the full trench and any encountered structural remains. The trenches ranged in both length and depth, resulting in differing approximate volumes of excavated material.

As in APE 1, these trenches were monitored during excavation and photographed. They were visually inspected, and where and when appropriate, a typical section of the trench was profiled. Any artifacts noted from the trench spoil or recovered from the trench walls were noted as to provenience and bagged for subsequent laboratory processing at the CAR facility. The location of each trench was recorded with field notes and GPS by CAR staff and with TDS by engineers working with FPC. Utilizing a combination of field notes, GPS, and TDS, a plan map of APE 2 was produced. It should be noted that a combination of both equipment failures and operator error resulted in a loss of some control points in the mapping. However, a combination of the remaining reliable points, field notes, and photographs has ensured the accuracy of the maps in this report.

Hand-Excavated Units

CAR staff hand excavated 63 levels from 11 1-x-1 m units in APE 2. The arbitrary unit depth was 20 cm, and sediment from each level was screened through ¼-in. hardware cloth. The features encountered were documented using standard archaeological procedures including feature forms, measured plan and profile drawings, and digital photography. Soil, mortar, and wood samples were taken from the Upper Labor Dam. All of the excavations were recorded utilizing hand-held GPS units and correlated with pre-existing project maps of the excavations conducted by Cox et al. in 1997 (Cox et al. 1999).

Laboratory Methods

All artifacts, soil samples, mortar samples, and organic samples recovered from backhoe trenches, hand-excavated units, or hand cleaning at both APE 1 and APE 2 were transported to the CAR laboratory on a daily basis for processing and safe-keeping. Daily records of excavations and submission of artifacts were recorded in the field and upon their receipt in the CAR laboratory. This double-blind method included verification of unit provenience, bad contents, and attribution to field forms. All mortar, soil, and wood samples were removed from their plastic bags and allowed to desiccate prior to curation. Artifactual materials were allowed to accumulate until such time as there were enough to warrant cleaning and washing by CAR laboratory staff. Following hand washing, artifacts were air dried prior to processing. Processing included separation of artifacts into broad classes by material (bone, ceramic, glass, lithics, metal, etc.) before being further refined for analysis.

Curation Methods

All records obtained and/or generated during the portion of the project that occurs on public property have been prepared in accordance with federal regulations 36 CFR Part 79 and THC requirements for State Held-in-Trust collections. Field forms were printed on acid-free paper and completed with pencil. Artifacts brought to the CAR laboratory were (after cleaning and analysis) stored in 4-mil zip-locking archival-quality bags. Any materials needing extra support were double-bagged, and acid-free labels were placed in all artifact bags. These labels were printed using a laser printer and contained provenience information and lot numbers. Where appropriate, artifacts were separated by class, stored in acid-free boxes, and labeled with standard archival paper tags. Project documentation, such as field notes, forms, photographs, and drawings, were placed in labeled archival folders. Digital photographs were printed on acid-free paper and placed archival-quality page protectors.

In consultation with the THC, and subsequent to proper analyses and/or quantification, artifacts recovered from Brackenridge Park possessing little scientific value were discarded pursuant to Chapter 26.27(g)(2) of the Antiquities Code of Texas. Artifact classes discarded specific to this project included, but were not limited to, burned rock, snail shell, unidentifiable metal, soil samples, and recent (post-1950) materials. In all instances, however, discarded materials were recorded, and their counts were included in this final report and in the curation documentation.

Chapter 5: Excavations

As noted, discussion of the investigation's results is organized by the respective APE 1 and APE 2 designations. This chapter presents the record of excavations by methods employed and features encountered.

APE 1: Investigation of the West Side of the Alamo Dam

CAR excavations on the east bank of the river in 2011 (Ulrich 2011) discovered what appeared to be in situ remains of the eastern side or terminus of the Alamo Dam. As the 2011 excavations were directly across the river from APE 1, CAR undertook excavations to determine if any portion of the original dam remained on the west bank. As noted in the previous chapter, excavations within this APE consisted of a series of 10 backhoe trenches designated T 1 through T 10 (Figure 5-1). These were associated with Features (F) 1, 2, and 3 (Table 5-1). Group 1 (T 1, T 2, and T 3) and Group 2 (T 4, T 5, T 8, T 9, and T 10) were both established to search for the Alamo Dam and document a partially buried wall. These groups are associated with F 2 and F 1, respectively (Table 5-1). Trench Group 3 (T 6 and T 7) is associated with F 3, and these trenches were established to search for extensions to the colonial dam.

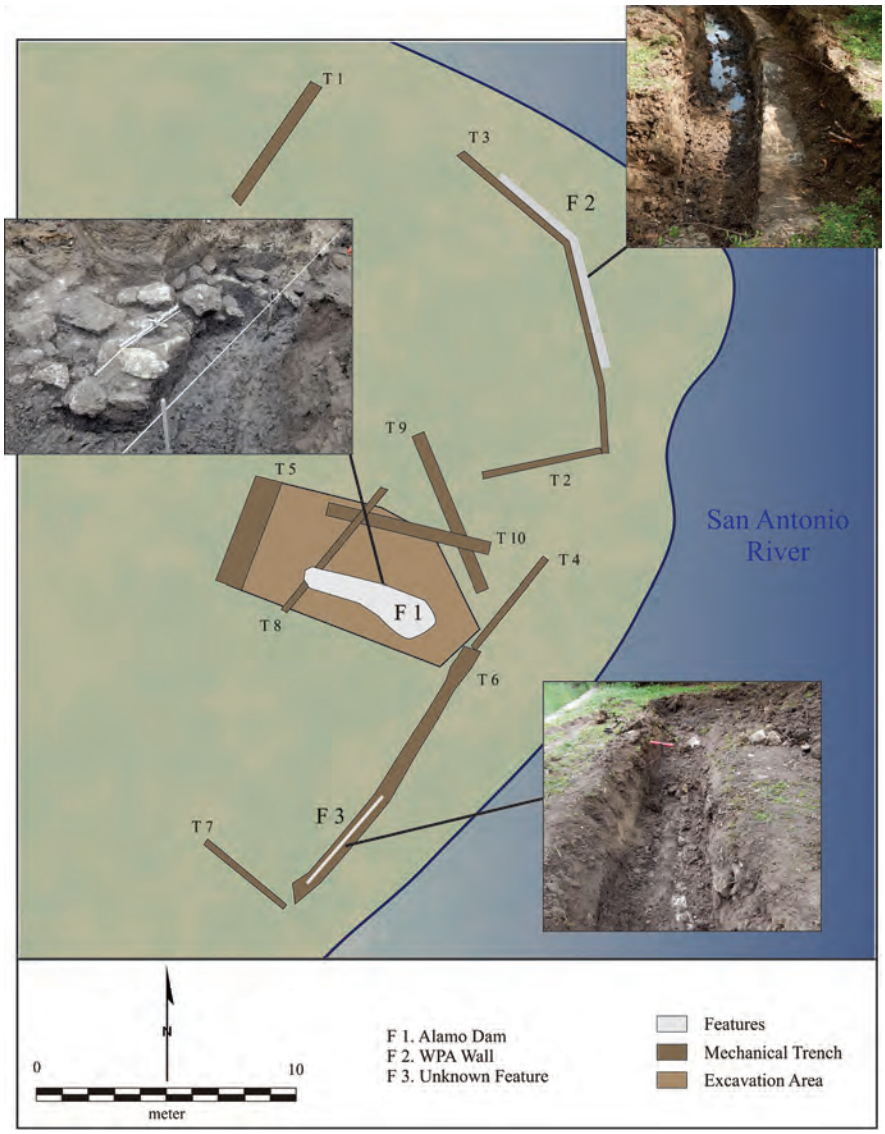

Figure 5-1. Excavations within APE 1.

Table 5-1. Trench Groups and Their Respective Features and Trench Numbers

Trench Group	Feature	Trench Number
Trench Group 1	Feature 2	Trench 1
		Trench 2
		Trench 3
Trench Group 2	Feature 1	Trench 4
		Trench 5
		Trench 8
		Trench 9
		Trench 10
Trench Group 3	Feature 3	Trench 6
		Trench 7

Trench Group 1: Feature 2 – Partially Buried Mid-Twentieth-Century Wall

Group 1 (T 1, T 2, and T 3) was a series of three trenches excavated in the northern section of the APE. The three trenches were excavated to determine the boundaries of a partially buried wall, Feature 2 (F 2), that ran parallel to the San Antonio riverbank. Trench 1 was excavated to document the north end of F 2; T 2 to document the southern end of F 2; and T 3 to expose the top and sides of F 2. Trench 3 was excavated to follow the slightly curvilinear alignment of F 2 and to expose the route of the wall. Further excavations performed within T 2 documented that the wall was pointed with Portland cement mortar and footed with loose rubble, indicating a mid-twentieth-century construction associated with the WPA or later.

Trench Group 2: Feature 1 – The Alamo Dam

Trench Group 2 (T 4, T 5, T 8, T 9, and T 10) were those trenches excavated in the central portions of the APE specifically looking for possible remnants of the Alamo Dam. Trenches 4 and 5 were the first trenches excavated in this group and exposed a large limestone rubble mass that was similar to the limestone rubble discovered on the east bank in 2011 (Ulrich 2011). Trenches 8 and 9 were opened to investigate this rubble mass, and both trenches located additional, large, irregular limestone blocks. Considering their size and linear alignment, these blocks were attributed as remnants of the Alamo Dam and labeled Feature 1 (F 1).

The next trench, T 10, was placed to expose the western extent of the dam and was subsequently expanded to expose the top and all four sides of the construction, forming the large excavation area shown on Figure 5-1 and as exhibited in Figure 5-2. As these trenches were excavated, a constant challenge was the shallowness of the water table that necessitated the use of pumps to keep trenches exposed long enough to document the dam and related profiles.

Trench Group 3: Feature 3 – Undetermined Stone Construction

Group 3 (T 6 and T 7) was composed of two trenches in the southern sector of the APE. Trenches 6 and 7 were opened running southwest from the T 10 excavation area. These excavations encountered a limestone feature, Feature 3 (F 3), at approximately 60-65 cm below the datum (cmbd). Concerns of the City Arborist limited the depth of these trenches as they were close to the drip line of a native pecan (*Carya illinoiensis*). No further excavations were performed. Considering the feature is located adjacent and parallel to the river, the greatest probability is that F 3 may be a buried wall like F 2 or possibly represents a portion of the Alamo Dam and/or some remnant of the dam through various construction/rehabilitation sequences.

APE 2: Investigations at the Lily Pond and Upper Labor Headworks

Excavations took place within APE 2 to investigate the Lily Pond walls and the structural components of the Upper Labor Headworks (dam, headgate, and *acequia*). Excavations consisted of 12 trenches excavated through a combination of mechanical backhoe and hand excavation, and 11 hand-excavated 1-x-1 m units (Table 5-2). Archaeologists identified six distinct features (F 1 through F 6) during these excavations. A plan map of the excavations and features is shown in Figure 5-3.

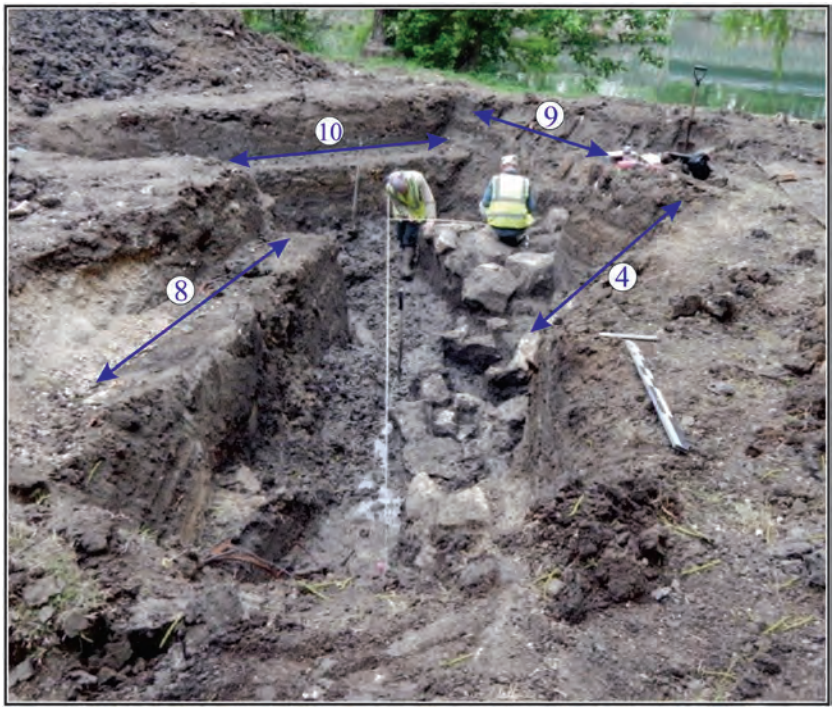

Figure 5-2. Alamo Dam exposed in T 4, T 8, T 9, and T 10, looking northeast.

Table 5-2. APE 2 Excavations, Respective Trenches and Units with Associated Features

Excavation	Associated Feature(s)
Trench 1	
Trench 2	Feature 2
Trench 3	
Trench 4	Feature 6
Trench 5	Feature 6
Trench 6	Feature 6
Trench 7	Feature 5
Trench 8	Feature 5
Trench 9	Feature 6
Trench 10	Feature 6
Trench 11	Feature 6
Trench 12	
Unit 1	Feature 1
Unit 2	Feature 1
Unit 3	Feature 3
Unit 4	Feature 2
Unit 5	Feature 2
Unit 6	Feature 4
Unit 7	Feature 4
Unit 8	Feature 4
Unit 9	Feature 2
Unit 10	Feature 6
Unit 11	

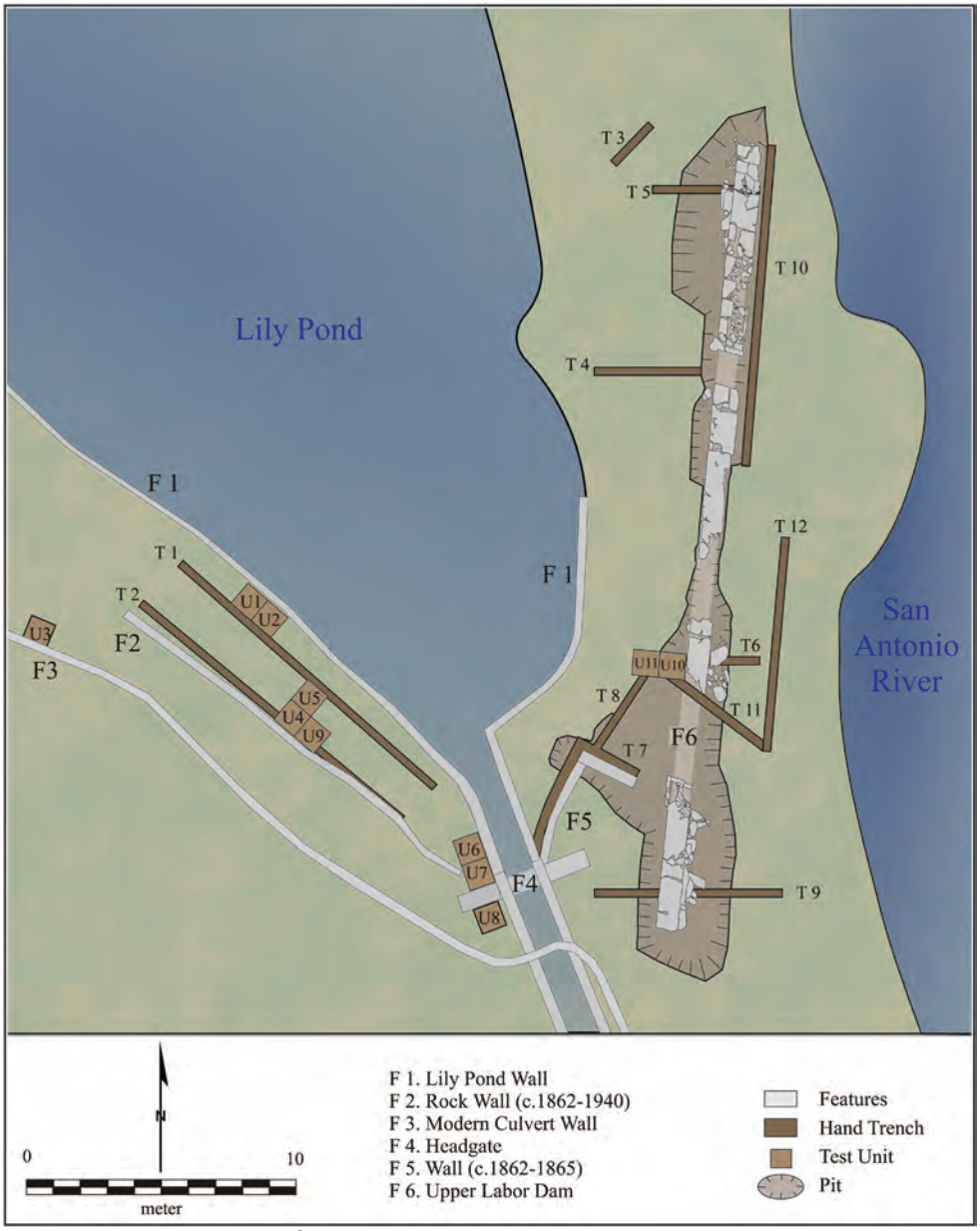

Figure 5-3. Excavations within APE 2.

Excavation by Type

Mechanical and Hand-Excavated Trenches

Twelve trenches were excavated within APE 2. Eleven were excavated utilizing a small backhoe in combination with hand clearing using shovels. One wide trench (T 10) was excavated with a standard backhoe to expose the east and west sides of the dam.

Trench 1 was excavated approximately 1.2 m from the face of the Lily Pond wall in a northwest-southeast alignment and helped expose structural components of the Lily Pond wall. The Lily Pond wall was designated Feature 1 (F 1).

Trench 2 was opened to investigate a perceived stone alignment partially visible on the surface. Work in T 2 quickly verified the presence of a stone wall running in a northwest-southeast alignment and more-or-less parallel to the Lily Pond wall. This buried stone wall was designated Feature 2 (F 2).

The remaining trenches, T 3 to T 12, were excavated on the east side of the Lily Pond and principally focused on relocating the Upper Labor Dam. Eight of these trenches (T 3, T 4, T 5, T 6, T 9, T 10, T 11, and T 12) specifically targeted the dam structure. These eight trenches relocated the dam, and it was labeled as Feature 6 (F 6).

Trenches 7 and 8 were excavated to determine the nature of a stone alignment encountered on the west side of the Upper Labor Headgate. This angled, stone wall alignment was labeled as Feature 5 (F 5).

The twelve trenches were generally shallow, 10-20 cm in depth, and dug east-west along the expected alignment of the dam. Exceptions to depth include T 7 and T 10, both of which exceeded a meter in depth to expose the structural remains encountered in those trenches.

Trench 11 was the only trench excavated utilizing a regular backhoe with a standard-size bucket. This trench was excavated along portions of the top and along the east and west faces of the Upper Labor Dam. Trench 11 was not a unified, monolithic trench, as it was excavated in portions at different times throughout the project. Nevertheless, the result was a large trench/pit exposing the top and portions of the sides of the dam structure.

Hand-Excavated Test Units

Eleven hand-excavated 1-x-1 m test units (U) were placed within APE 2 and labeled as U 1 through U 11. The placement of these units was determined through ongoing consultation between the Principal Investigator and Project Archaeologist. The placement of the units was intentional to determine the age, construction, condition, and depth of the Upper Labor Dam, Upper Labor Headgate, and the retaining walls of the Lily Pond. Several features were identified in the hand-excavated units, specifically, Features 3 and 4 (F 3 and F 4). These were a mid-twentieth-century or later wall along the parking lot perimeter and the west side of the Upper Labor Headgate, respectively.

Six features were identified within APE 2: 1) a twentieth-century (presumed WPA or later, i.e., post-1940) retaining wall; 2) a buried mid-nineteenth-century wall; 3) the Lily Pond wall, 4) the Upper Labor Dam; 5) the Upper Labor Headgate; and 6) a revetment extending between the east side of the headgate and dam. These features were initially identified through visual inspection as surface features and through hand excavation or limited backhoe trenching. Once exposed, these features were cleaned by hand to prevent damage and to expose the sides of each feature.

Feature 1: Lily Pond Retaining Wall

The Lily Pond wall was designated Feature 1 (F 1). Units 1 and 2 comprised a 1-x-2 m excavation on the east side of the Lily Pond wall and reached a maximum depth of 2.4 m. These units adjacent to F 1 were excavated in an effort to determine the original construction method(s) employed to build the wall, to assign a temporal affiliation, and to allow engineers to assess its structural integrity. Units 1 and 2 were excavated immediately behind the Lily Pond wall at this location. Further, T 1 was excavated immediately west of U 1 and U 2.

Trench 1 and U 1 exposed a rudimentary deadman buttress of concrete and stone (Figure 5-4). The purpose of a deadman buttress is to anchor a wall from the back side. This method of construction obviates the need for buttresses on the face of the wall.

Unit 2 was excavated 2.4 m to the base of the wall and exposed the east face of F 1. The wall was in good condition and composed of small, irregular limestone fragments, roughly

Figure 5-4. Buried deadman buttress associated with F 1 in U 1, facing north.

dressed on the exposed west face and variously dressed (a mix of both rough, rough dressed, and dressed) on the back face. The entire construction was joined with Portland cement mortar and exhibited multiple episodes of repair and repointing, as evidenced by the presence of concrete and differing mixes of cement mortars. No diagnostic artifacts earlier than the twentieth century were identified in association with F 1, and it appears to be entirely of WPA-era or later construction.

Feature 2: Buried Wall

Approximately 2.75 m due west of the Lily Pond retaining wall (F 1), crew members noticed a partially exposed, parallel stone wall alignment. This wall alignment was investigated by the combination of a hand-excavated trench (T 2) and three hand-excavated 1-x-1 m units (U 4, U 5, and U 9) as shown in Figure 5-3. The trench, T 2, revealed a buried stone wall designated Feature 2 (F 2).

Trench 2 exposed the top of the buried wall and followed it south toward the Upper Labor Acequia. A small section of the F 2 wall was destroyed by a transecting 20.3-cm (8-in.) water main. Units 4 and 5 were opened in the mid-section of the exposed wall's route to determine the original construction method(s) and assign a temporal affiliation. The excavation extended to a depth of 1.9 m below the surface and revealed that the upper 40 cm of the wall consists of medium-to-large-sized irregular pieces of limestone laid and mortared with Portland cement. Beneath this coursing is a distinctly different coursing consisting of a combination of dry-stacked, rough and dressed ashlar limestone blocks 60-70 cm in depth and 10 cm wider than the irregular pieced limestone upper wall. This coursing, in turn, is footed on a course of progressively larger, irregular limestone boulders comprising the bottom 1.0 m of F 2. In a small section of the excavation, pieces of wood planking were noted sitting on edge and apparently placed against the wall. The wood planking appears at approximately 95 cm below the top of the wall, at roughly the same elevation as the deepest ashlar blocks. No associated diagnostic artifacts were discovered during excavation of the buried wall.

Feature 3: Parking Lot Low Wall

A single 1-x-1 m test unit, U 3, was placed on the east side of the existing low stone and cement wall that separates the parking area from the slope above the Lily Pond. This low wall was designated Feature 3 (F 3). The unit was excavated to verify the construction method(s) employed to build the wall, to assign a temporal affiliation, and to determine if there were any earlier wall components sub-surface. Excavations terminated at 40 cmbd and verified the wall is of twentieth-century construction, has no formal footing, and has no underlying earlier components.

Feature 4: Upper Labor Acequia Headgate

Field crews encountered a finely dressed ashlar block at the southern terminus of the F 2 wall in T 2. Subsequent removal of overburden exposed a group of large, ashlar dressed limestone blocks aligned roughly east-west and perpendicular to the Upper Labor Acequia. These blocks compose the west side of the Upper Labor Headgate and were designated Feature 4 (F 4). To further expose F 4, field personnel excavated U 6 and U 7 perpendicular to the stone blocks on the north side to a depth of roughly 140 cmbs. A single test unit, U 8, was excavated on the south side of F 4. These excavations exposed four courses of finely dressed ashlar limestone blocks. A single course of narrower limestone tops these four larger ashlar courses on the west side of the headgate while only the four larger courses remain on the eastern side. It is not possible to determine the original height of the headgate, but it is probable that the thinner top course represents the finish height.

The north face of the headgate is finely dressed limestone ashlar blocks while the southern face is rough dressed. At the time that the headgate was constructed, the finely dressed blocks would have been visible while the rough face was buried. The treatment of the headgate stones matches that of the CSA sluice gate uncovered by H. Ray Smith of San Jacinto Materials on the west side of Lot 9 in November of 2012. The CSA Tannery sluice gate is clearly shown in G. Freisleben's *Confederate Tannery Sketch Map* (see Figure 3-13). Both constructions were executed in finely dressed limestone ashlars with the smooth face exposed and the rough, unfinished face buried (see Figure 5-5, for comparison).

The mouth of the headgate has two finely carved vertical grooves, one on each side, cut into the stone (groove on west side shown in Figure 5-6). This pair of grooves allowed the headgate to be held in a fixed position and provided a means for lowering and raising the headgate to regulate water. In addition, a single, iron eye-bolt remains in place on the western side of the headgate, and it is 2.5 cm in advance (upstream) of the cut groove (Figure 5-7). While this is the only remaining eye-bolt, a single hole for an additional bolt is still extant, 2.5 cm behind the groove. There are no holes drilled into the east side of the headgate nor are there any remaining bolts on the upper western side as that portion of the upper block is no longer present. These eye-bolts may have acted as pivot hinges that could have supported additional gates or doors for closing the mouth of the channel to maintain, service, or replace the headgate.

Figure 5-5. Upper Labor Headgate wall (left) and CSA Tannery Sluice walls (right). Comparison of Upper Labor Headgate ashlars to CSA Tannery sluice from Lot 9 exhibiting similar construction. CSA Tannery photograph courtesy of H. Ray Smith and San Jacinto Materials.

Figure 5-6. West side of headgate exhibiting carved headgate groove and lower eye-bolt.

Figure 5-7. Hand-wrought eye-bolt on lower west wall of headgate (top); close-up of eye-bolt (bottom).

Further investigation of the headgate structure was obstructed by two modern overlapping concrete slabs about 2-m wide by 2.5-m long and 20-cm thick. These slabs were formed and poured in-place at some period in the mid-to-late twentieth century to permit transit over the *acequia* channel. The concrete slabs were removed by veteran stonemason H. Ray Smith and a crew from San Jacinto Materials. The removal of the concrete slabs fully exposed the headgate and *acequia* channel as shown in Figure 5-8.

The current *acequia* channel projects north of the headgate to where it ties in with the WPA-era Lily Pond walls (Figure 5-9). The construction methods used for these two forward walls differ from the headgate and walls of the lower *acequia* channel (Figure 5-9 a, b). These forward walls were badly damaged. The limestone ashlars in this upper portion of the channel are a combination of complete blocks and partial blocks and have a rough ashlar dressed face (Figure 5-10). Those in the lower channel are a combination of whole blocks of varying sizes and both rough and fine ashlar dressed (Figure 5-11). The walls formed by these blocks are narrower in thickness (Figure 5-9 d) than those of the headgate (Figure 5-9 b) and the lower channel (Figure 5-9 c). The damage to this forward section might have occurred during installation of the concrete slabs or subsequently due to the movement of heavy equipment across the slabs to access the property on the east side of the *acequia*.

Another interesting feature is the angled slide-block on the west side of the channel immediately in front of the headgate itself. This construction is visible to the right in Figure 5-8. The slide-block is at an angle of 110 degrees. The purpose of this construction was to allow for a slide down into which an obstruction wider than the mouth of the *acequia* channel could be fitted into place. This temporary watertight obstruction permitted the installation of all of the tannery stonework under dry conditions. Following completion of the work, the obstruction was removed, and water was then controlled by means of the slide-block mounted within the headgate structure. This slide-block remained in place for future use should repairs be necessary to the headgate or along the channel.

Figure 5-8. Headgate and fore channel of Upper Labor Acequia after removal of concrete slabs.

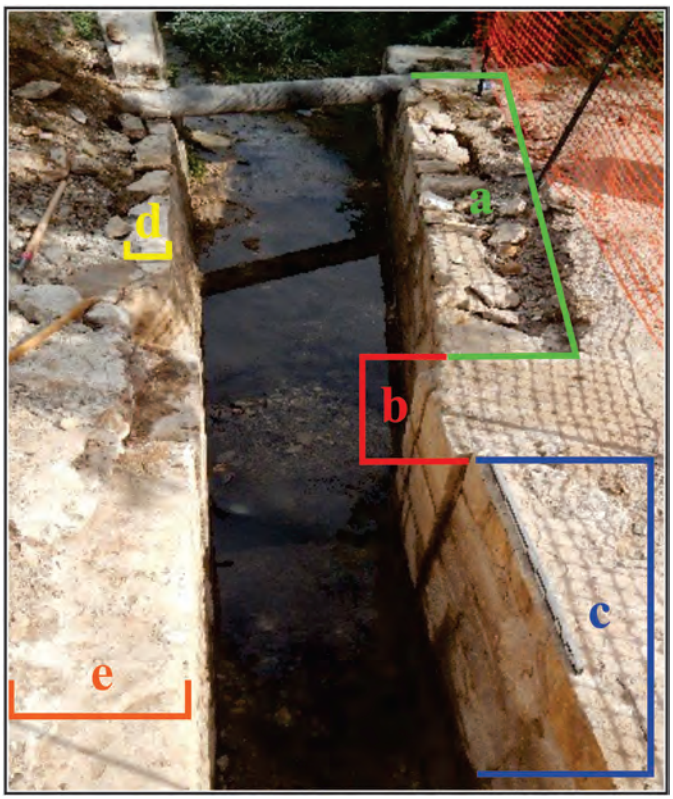

Figure 5-9. a) Upper Acequia walls, b) headgate, c) lower walls, and d, e) wall width.

Figure 5-10. Upper channel wall (east) showing mixed construction and visible damage.

Figure 5-11. Lower channel wall (east) showing whole block construction.

Feature 5: Buried Eastern Revetment

Hand clearing of the top of the ashlars blocks on the east side of the headgate of the Upper Labor Acequia exposed another buried wall that was designated Feature 5 (F 5). Trenches 7 and 8 were excavated to investigate this alignment. The top of F 5 is shown in Figure 5-12. A large pecan tree had overgrown this feature making excavation and interpretation of the structure difficult. Additional concerns from the City Arborist over root-damage precluded the use of mechanized equipment within the drip line of the tree; therefore, F 5 was excavated by hand.

Feature 5 is constructed of dressed ashlar limestone with the blocks oriented along two alignments joined at an angle. The angle peaks north between the dam on the east and the headgate on the west. The southwest to northeast leg of F 5 is 4.15 m in length (see Figure 5-2). The northwest to southeast leg is approximately 2.25 m in length. The masonry is of the same rough ashlar dressed limestone as the lower *acequia* channel walls of the headgate (F 4), the lower part of the buried wall (F 3) on the west bank, and the upper coursing on the Upper Labor Dam (F 6) itself.

Although many details of the wall are obscured by tree roots, it is a minimum of three ashlar courses deep. The western end of the wall terminates on the east side of the headgate, which it directly abuts. A foundation of intermediate limestone rubble is beneath the blocks of the eastern leg. Limitations on excavation in the vicinity of the pecan tree prevented determination of the temporal affiliation of this lower limestone rubble mass. It is possible that it may be colonial in age, or it may simply be foundation material for the CSA walls. The eastern leg of F 5 must have engaged the

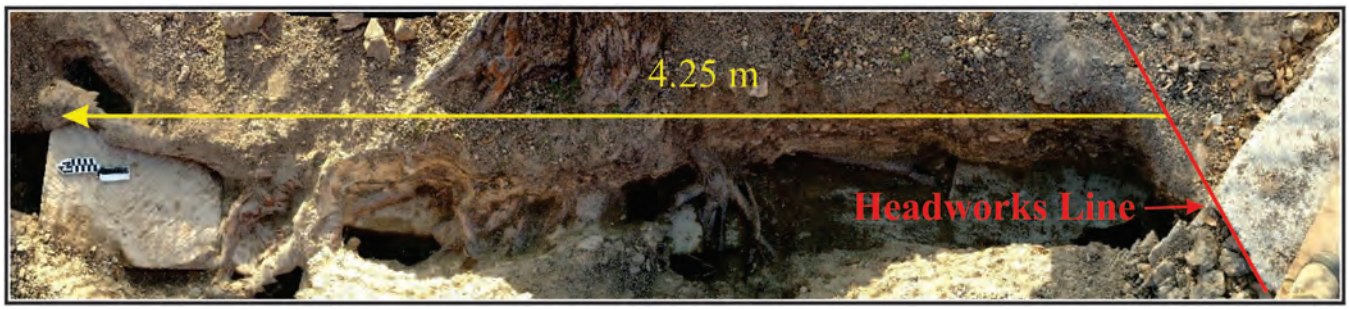

Figure 5-12. Top of F 5 wall between headgate and dam on east side of acequia.

western face of the dam, but an approximately 1.25-m section is missing. This missing section of the wall corresponds with the large gap in the dam caused by an unknown event. This gap, referred to as Gap 5, and five others are more fully discussed under Feature 6. At present, it is not certain why this angled revetment was constructed rather than a straight wall running from the headgate to the dam. It may have acted as a breakwater or strong point considering its placement in the angle of the dam and headgate. The F 5 wall is slightly curved, but this curvature is a result of deformation caused by the taproot and root system of the pecan tree and not an original design element.

Feature 6: Upper Labor Dam

The discussion of the Upper Labor Dam excavations is organized into three sections. The first section addresses attempts to find the dam and the exposure of the structure as well as its composition, form, and alignment. The second section addresses adverse impacts to the dam construction, and the third section addresses unique elements identified during the excavations.

Relocation and Exposure

Five picnic sites consisting of picnic tables, barbecue pits, trash stations, and concrete pads occupied the landform between the current Lily Pond and San Antonio River. Three of these pads traced the approximate course of the Upper Labor Dam and were situated directly above the buried structure. Following removal of the park furniture and pads, CAR exposed the entire length of the Upper Labor Dam along the top (Figure 5-13) before exposing major portions of the east and west faces as well as the northern and southern ends of the structure. The dam was designated as Feature 6 (F 6). The excavation process for the dam began by placing a series of shallow, hand-dug, east-west trenches to verify the dam's depth and alignment. The dam varied in depth from 10-30 cm, and its alignment agreed with the position fixed by Cox et al. (1999). The top of the dam was fully exposed using shovels. The dam's total length is 30.12 m, and the width across the top is 92 cm (approximately 100 ft. by 3 ft., or 35.5 *varas* by 1.10 *varas*). Figure 5-14 provides a final excavated plan view of the Upper Labor Dam (not including the headgate and *acequia*). Figure 5-15 provides a cross section of the dam at Gap 3.

Excavation efforts concentrated on exposing the Spanish Colonial dam and its nineteenth-century additions. A mini-excavator opened a trench parallel to the western dam face, beginning at the northern end of the feature. This trench was excavated to the base of the structure, and subsequent hand cleaning exposed the west face of the dam. The exposed face of the dam (Figure 5-16) revealed two courses of ashlar dressed stone forming the top of the dam as identified by Cox et al. (1999). The top course of ashlars is approximately 20-cm thick, and the second course is approximately 40-cm thick. Below the two courses of ashlars was a zone of large, irregular (not dressed) limestone blocks approximately 1.1-m deep. This underlying course of irregular limestone blocks, as noted by Cox et al. (1999), is slightly set off from the overlying ashlars. The ashlars angle northeastward toward the San Antonio River channel while the underlying blocks maintain a north-south alignment.

Adverse Impacts to the Upper Labor Dam

As previously noted, six distinct gaps, or breaks, in the dam were identified in the process of exposing the top and sides of the Upper Labor Dam. These gaps are numbered 1 through 6 from north to south (Figures 5-17 and 5-18). Each gap is described based on its distance from the northern terminus, its width, and whether it is partial (leaving courses below) or complete (no intact structural remains).

Gap 1 is a partial gap in the dam some 3 m from the northern end. This gap is 3.55-m wide and 20-cm deep. No attribution for the gap can be made.

Figure 5-13. Top of Upper Labor Dam, looking north-northeast from southern end.

Gap 2 is a complete break in the dam located 7.45 m south of the northern terminus. This gap is the direct result of the intrusion of a concrete culvert through the dam to drain the Lily Pond. It was likely intruded following abandonment of the *acequia* for use as a storm run-off and the enclosure of the Lily Pond itself sometime in the 1940s. The culvert is 1.10-m wide. The culvert and concrete encasing raise above the dam on either side by approximately 20 cm.

Gap 3 is a partial gap in the dam that begins at the southern edge of Gap 2. It is 8.55 m from the terminus and, like Gap 1, is 3.55-m wide and 20-cm deep.

Gap 4 is 15.45 m south of the northern end. The gap is 2.35-m wide, but whether this is a partial or complete gap is unknown as CAR did not fully excavate due to the active utility lines crossing through the gap. These two lines, a 20.32-cm (8-in.) water line and an electrical line encased in concrete aggregate, are the most probable cause for the gap sometime in the mid-to-late twentieth century. The water line originates beyond the north end of the dam and parallels the eastern face of the structure before penetrating the dam, transiting subsurface across the landform, and returning to the surface where it crosses the *acequia* before returning underground to the fire hydrant adjacent to the parking lot above the Lily Pond.

Gap 5 is 21.45 m from the northern end of the dam. This gap ranges in width from 3-3.5 m and is a complete gap. This is the single largest adverse impact to the Upper Labor Dam having removed at least 7.5 m^3 of limestone blocks and rubble. The remains from the impact are strewn throughout the profile and spill over to the western side. This wide gap may correspond with the first gap or spillway shown on the 1926 Koehler and Brackenridge Park map (see Figure 3-14). This gap appears to have affected the colonial portion of the dam, since the stones in this gap match those of the colonial section of the dam to the north.

Gap 6 is a narrow, partial gap in the dam 28.6 m from the northern terminus and 1.65 m from the southern end. The gap is 80 cm in width and 40 cm in maximum depth. It appears to be related to a trench seen in the eastern profile of the excavation trench. Most likely this gap was for another utility line that was since removed or relocated.

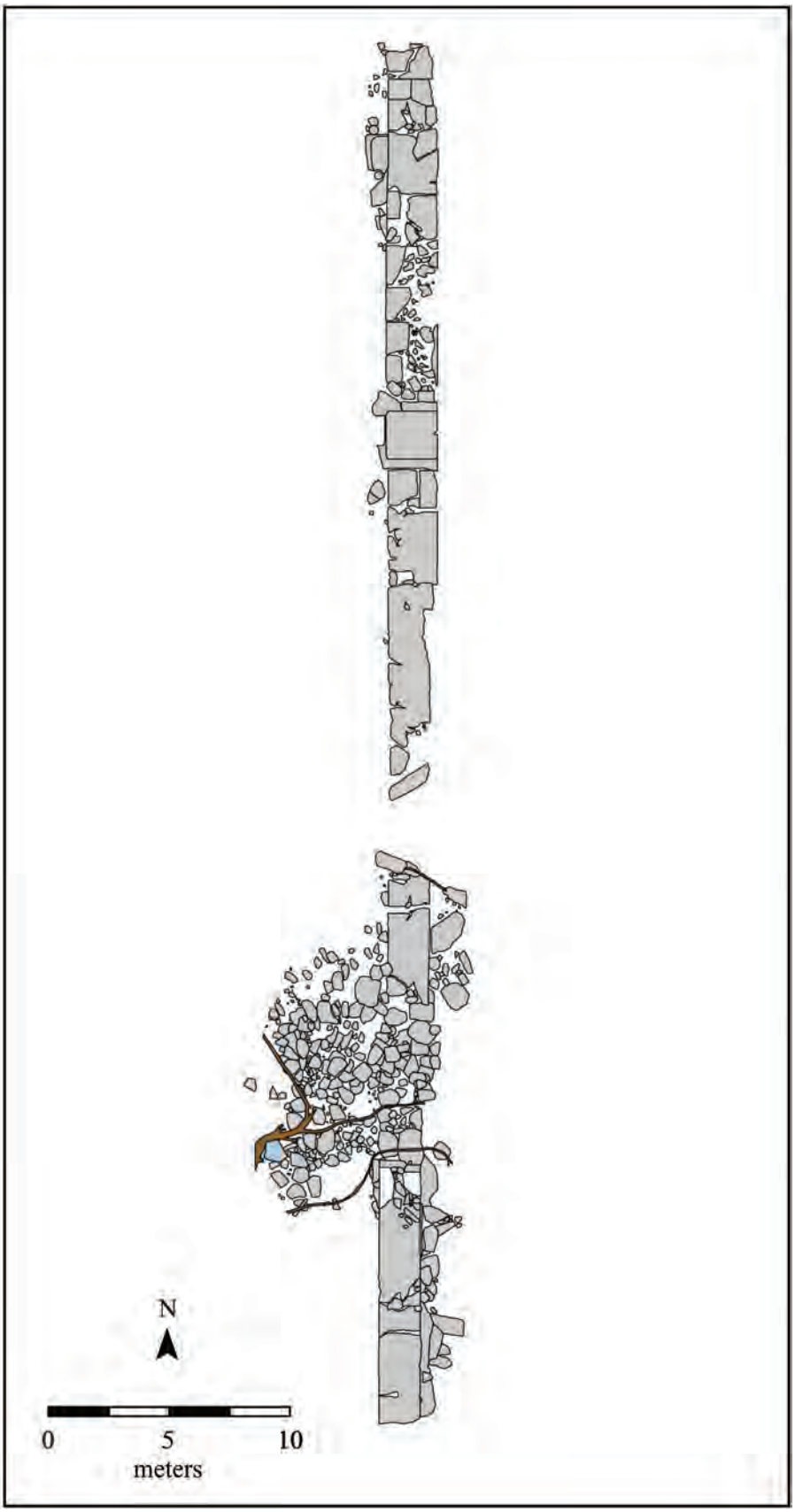

Figure 5-14. Plan view of Upper Labor Dam.

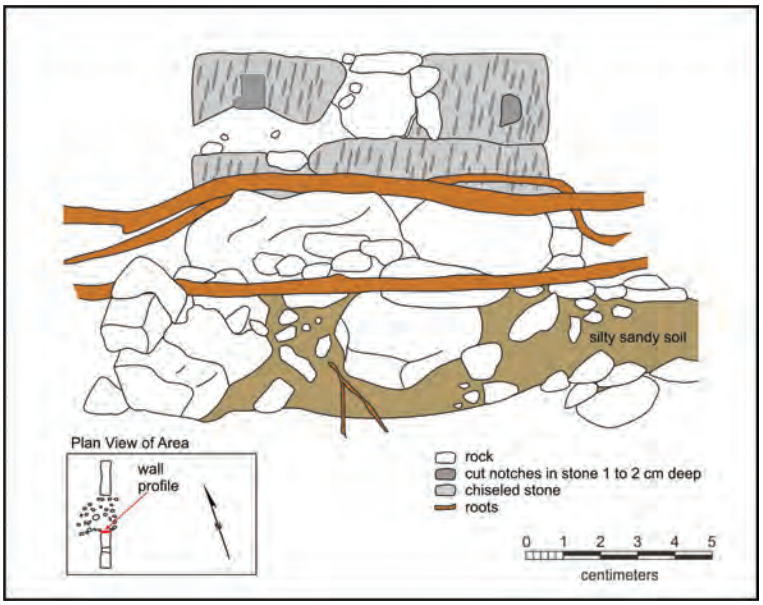

Figure 5-15. Cross section of dam.

Figure 5-16. Northern terminus, west face. Nineteenth-century ashlars superimposed on eighteenth-century Spanish Colonial dam.

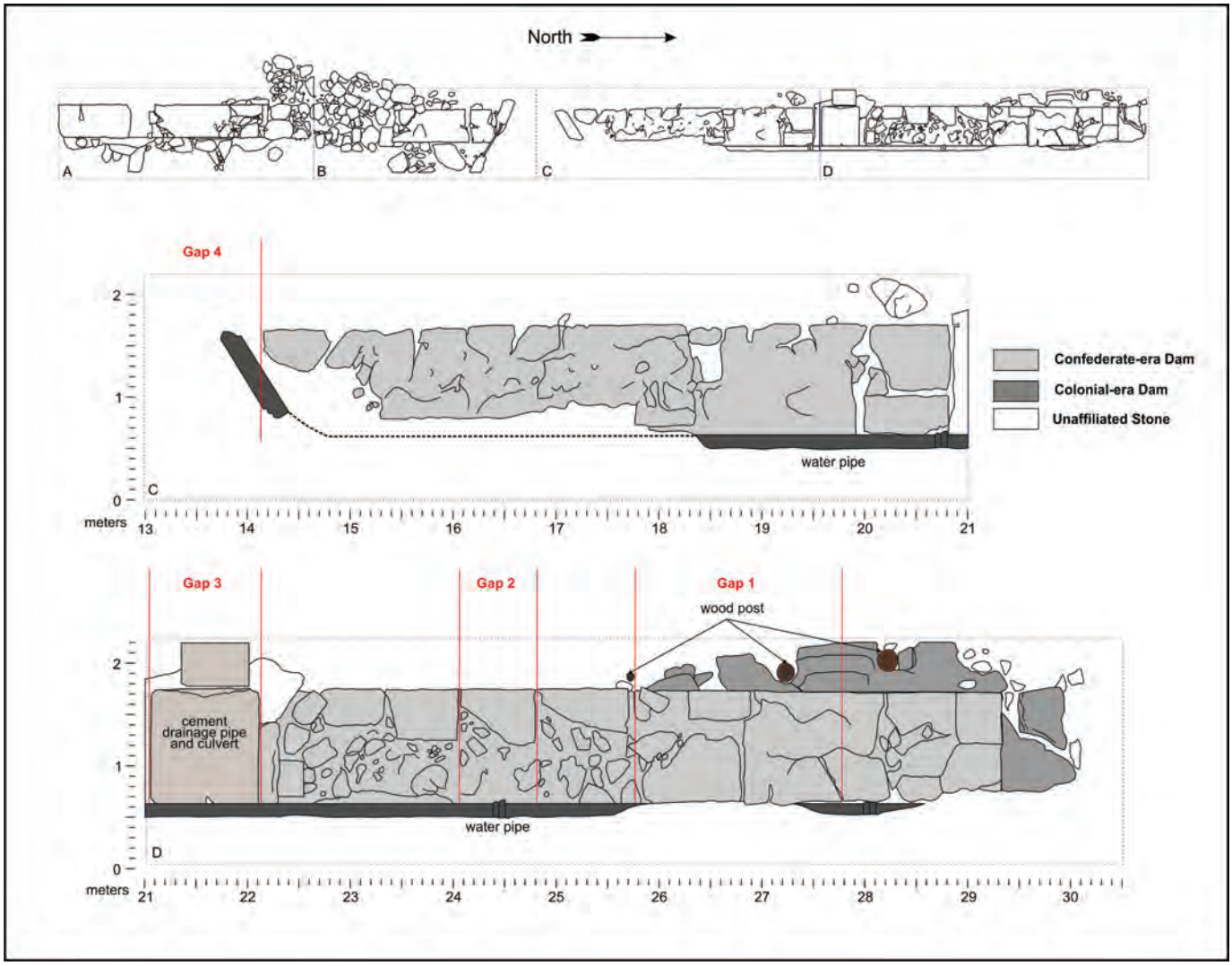

Figure 5-17. Sequential plan view of north half of Upper Labor Dam showing Gaps 1, 2, 3, and 4.

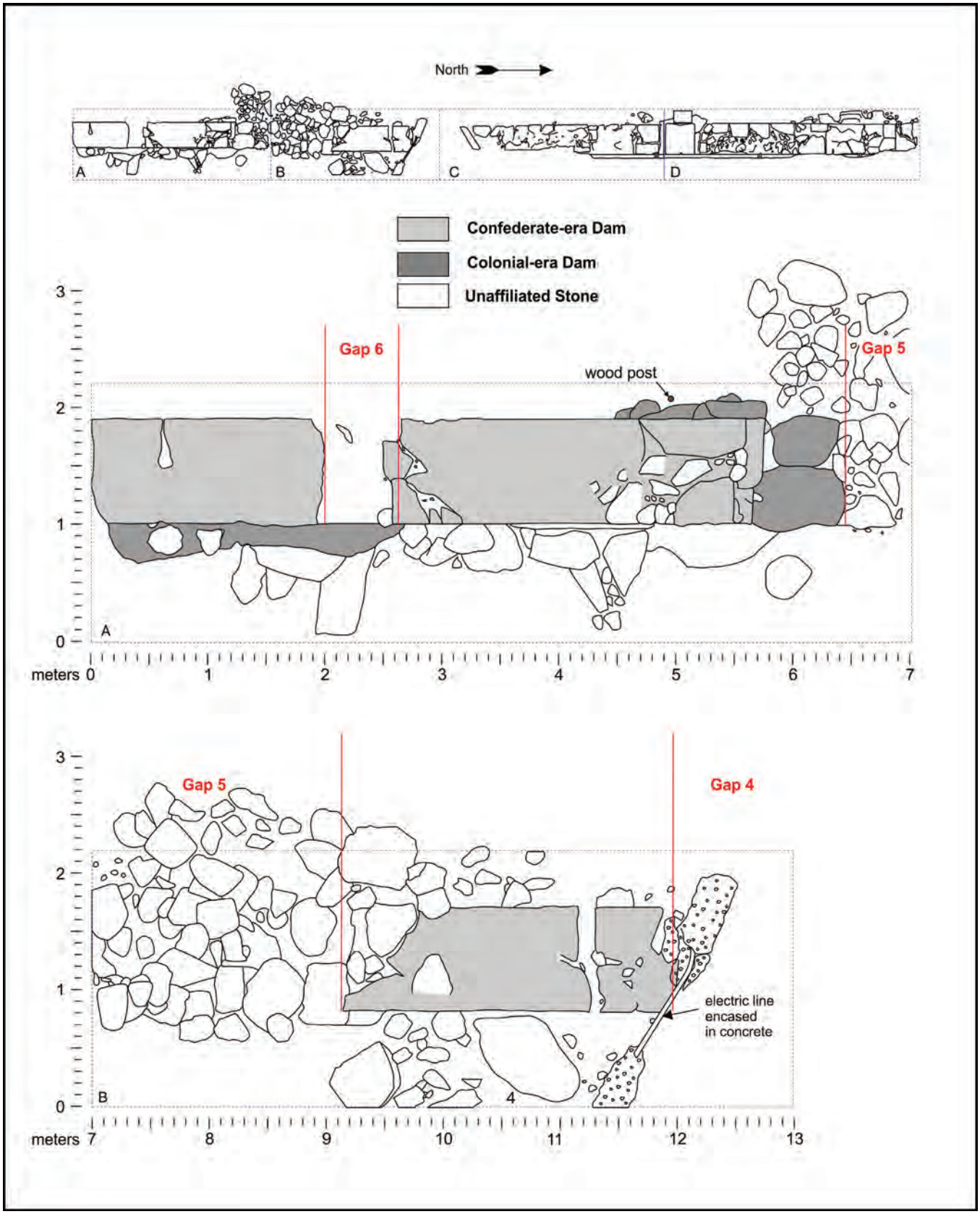

Figure 5-18. Sequential plan view south half of Upper Labor Dam showing Gaps 4, 5, and 6.

Unique Attributes

Notched Stone

Just north of Gap 5 and on the west face of the dam are intentionally notched limestone blocks. The notches persist through the top course and the second course of blocks (Figure 5-19). A possible interpretation of theses notches would be to accommodate some sort of wooden superstructure.

Another deliberate notch or cut in an ashlar block is present on the north face of Gap 5 in F 6. This may be a quarry mark, or it may have had a material function in the dam.

Wooden Posts

At five locations along the western face and in one location on the eastern, the remains of wooden posts were encountered. These wooden posts were circular in cross section and ranged from 7.5-12 cm in diameter. These posts had been set into holes cut into the limestone boulders that formed the Spanish Colonial base of the dam. At the northern end of the west face of the dam are four posts spaced approximately 1 m apart. The decayed remains of a plank of wood, placed on its edge, runs along these posts (Figures 5-20 and 5-21). The planking along the dam is similar in placement to the planking noted along the eastern face of F 3. An additional post was encountered on the western face at the southern end of the dam (Figures 5-22 and 5-23). No additional plank work was encountered in these other locations. Samples of both the posts and planking were taken for future analysis. A metal bolt associated with the wood planking was not hand wrought but appeared to date to the nineteenth century, possibly suggesting that the planking was added at the time that the CSA raised the dam. However, the posts appear to have been intruded into the stone, suggesting they were added at a later time.

Miscellaneous

In addition to Features 1 through 6, two other matters of interest were identified by CAR personnel. The first of these is a stone wall or dam alignment south and east of the current dam footprint and along a different alignment from the dam (Figure 5-24). CAR personnel hand excavated along the side

Figure 5-19. West face of F 6 with notches in yellow and set stones noted by red arrows.

Figure 5-20. Spanish Colonial alignment with vertical wood posts and planking, north end of dam.

Figure 5-21. Close-up of posts and plank intruding/abutting the Spanish Colonial dam.

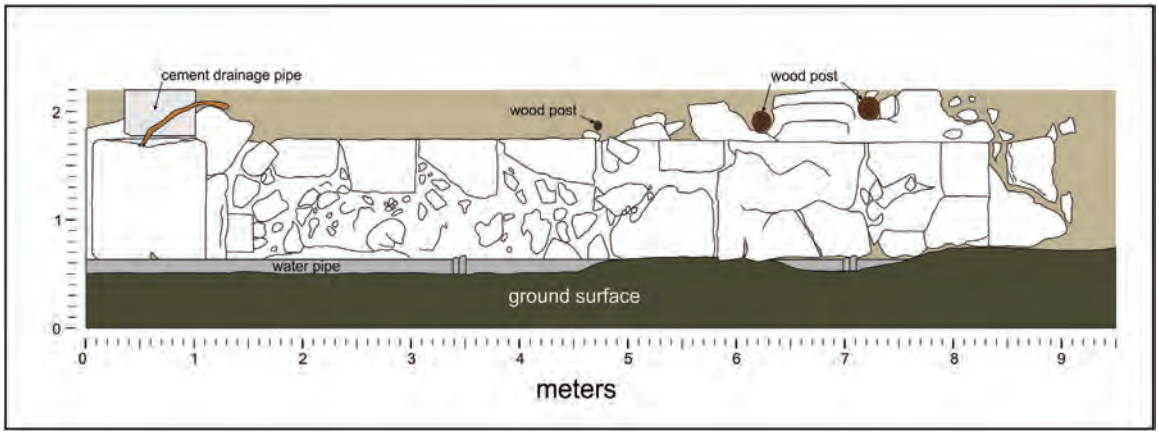

Figure 5-22. Plan view of northern end of dam with wood posts noted on western face.

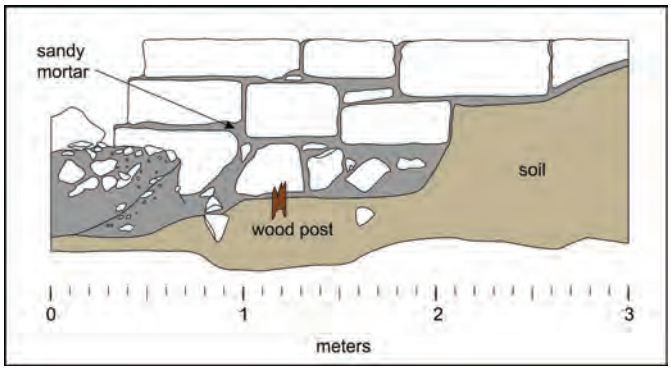

Figure 5-23. Profile of west face of southern end of dam showing wood post and Gap 6.

Figure 5-24. Two limestone blocks south and east of dam.

of the blocks and determined that they were only one course thick. The function of this stone alignment, its temporal association, or its relation to the dam are not known.

A second matter of interest is the presence of scattered rough and smooth ashlar blocks at various locations within the APE. They are concentrated in two areas. One area is on the northwest bank of the Lily Pond, and the second is immediately east of the southern terminus of the dam, both on the bank and lying in the San Antonio River channel (Figure 5-25). These appear similar to the ashlar blocks of the headworks and are likely associated with the late nineteenth-century work in this area. The blocks at the northwest end of the Lily Pond may reflect ashlars tumbled downslope from the continuation of the F 2 wall that formed the western side of the diversion pool during the Civil War through the late nineteenth century. Those blocks scattered in the river or partially buried along the river embankment likely represent portions of the CSA dam that were blown-out by whatever created Gaps 2, 4, and 5.

Figure 5-25. Ashlars in river (top) and on west bank of Lily Pond (bottom).

Chapter 6: Artifacts Recovered

This chapter is divided according to APE with artifacts described by feature and/or class. In most cases, cultural material was from mixed contexts. Despite the contextual shortcomings, individual artifacts and groups of artifacts do provide some level of interpretation for the areas.

APE 1: Alamo Dam

Only T 5, T 10, and T 11 in this excavation produced artifacts, and all were directly associated with the Alamo Dam. With a single exception, artifacts were recovered from back dirt. No stratigraphic associations were apparent, and the deposits around the dam are highly mixed. Recovered materials date from the Spanish Colonial period through the mid-twentieth century. Only a single prehistoric artifact was recovered in this APE.

Ceramics

Forty-two ceramic sherds were recovered from the three trenches (Table 6-1). These sherds ranged in age from the Late Spanish Colonial into the early twentieth century with the majority ranging from 1875 to 1925.

Two potentially Spanish Colonial sherds were noted: a rim sherd of polychrome majolica (Figure 6-1) and an orange lead glazed sherd. Orange lead glazed sherds are ubiquitous in Spanish Colonial as well as later sites. The majolica sherd recovered is of the Aranama variety, which have dates from 1750 through the 1850s (Fox and Ulrich 2008:86; Goggin 1968:196-198). Aranama polychromes are distinguished by their color pallet that consists of orange, yellow, green, umber, and blue. Decoration is often bands of orange or yellow bounded by umber lines below the rim with floral dot and scroll motifs on the body. The sherd recovered in these excavations is unique in that it most closely conforms to a type not previously recovered in San Antonio or in a Texas context. The decoration, polychrome colors, glaze, and paste are similar to Mayorazgo majolica identified by Siefert (1977). This sherd has no orange or yellow bounded band, and it exhibits a yellow and green decoration bounded by umber lines. Mayorazgo is broadly dated from 1800 to 1900, and its place of production is attributed to Mexico City (Siefert 1977).

A number of definitively nineteenth- to twentieth-century ceramics were recovered. These include numerous samples of European refined earthenwares, most of which are of English or American manufacture. Clear examples are the two ironstone plate sherds with makers' marks. The earlier of the two is a John Wedge Wood mark that dates between 1841 and 1860 (Godden 1964:687). The second mark is from an American pottery, the Potters Cooperative Company of East Liverpool, Ohio, which was active from 1882 to 1925 (Gates 1954).

Table 6-1. Ceramics Recovered in APE 1

Unit	Depth (cm)	Class	No.	Comments
T 5	back dirt	Spanish Colonial Tin Glazed	1	rim sherd of Mayorazgo Polychrome or Aranama variant
T 5	back dirt	English Whiteware	1	refined earthenware (ironstone) plate bottom with John Wedge Wood maker's mark in the "Pearl" pattern which dates to 1841-1860
T 5	back dirt	English Whiteware	1	rim sherd of refined earthenware (ironstone) with a Blue on White transfer pattern
T 5	back dirt	English Whiteware	2	joinable sherds of molded refined earthenware - ironstone
T 5	back dirt	English Whiteware	1	small ironstone platter sherd (refined earthenware - undecorated whiteware)
T 5	back dirt	Porcelain	1	rim sherd of a porcelain cup (demitasse)
T 5	back dirt	English Whiteware	2	refined earthenware (ironstone) sherds
T 5	back dirt	English Whiteware	1	sherd of refined earthenware (ironstone)
T 10	back dirt	English Whiteware	1	transferware - Mulberry
T 10	back dirt	English Whiteware	1	undecorated ironstone - MM "The Potters Co-operative Co. USA East Liverpool OHIO, Semi-Vitreous, Z232"
T 10	north end, wall	Earthenware	1	semi-porcelain, rim
T 10	back dirt	Earthenware	1	semi-porcelain

Table 6-1. Ceramics Recovered from APE 1, continued....

Unit	Depth (cm)	Class	No.	Comments
T 10	back dirt	Stoneware	1	undecorated stoneware
T 10	back dirt	English Whiteware	1	undecorated ironstone
T 11	back dirt	Spanish Colonial Lead Glaze	1	lead glaze rim fragment
T 11	back dirt	Porcelain	3	porcelain plate fragments
T 11	back dirt	Porcelain	1	porcelain cup fragment
T 11	back dirt	Porcelain	1	molded porcelain mug rim fragment
T 11	back dirt	English Whiteware	6	undecorated whiteware plate fragments
T 11	back dirt	English Whiteware	2	undecorated whiteware cup base and body fragment
T 11	back dirt	English Whiteware	2	undecorated whiteware platter rim fragments
T 11	back dirt	English Whiteware	1	undecorated whiteware - molded
T 11	back dirt	English Whiteware	1	undecorated whiteware plate fragment
T 11	back dirt	English Whiteware	1	undecorated whiteware body fragment
T 11	back dirt	English Whiteware	1	soft paste - modern
T 11	back dirt	English Whiteware	3	stoneware w/black-brown interior slip
T 11	back dirt	English Whiteware	2	stoneware w/light brown interior slip
T11	back dirt	English Whiteware	1	soft past earthenware - light matte green slip body fragment

Figure 6-1. Sherd attributed as Mayorazgo Polychrome. Images show sherd from side paste (left), reverse (center), and obverse (right).

Other temporally diagnostic ceramics include a sherd of Mulberry transferware and a sherd of Blue on White transferware. Both of these have date ranges from the early nineteenth into the twentieth century, as do the numerous European or American stoneware sherds recovered.

Glass

Thirty-five glass artifacts were recovered (Table 6-2), including three whole bottles. Glass is broadly time diagnostic based on changes in production morphologies. Though less specific than many ceramics, glass in the form of whole bottles, as well as bottles with embossing or other distinguishing attributes, can greatly narrow the production period. The glass recovered in APE 1 provides several clear temporally diagnostic examples broadly dating from the mid-nineteenth century into the mid-twentieth century.

No definitively Spanish Colonial glass was identified in the project area, but there are several glass artifacts that have dates in the Civil War to the close of the nineteenth century. Among these are an intact aqua coffin flask and the base of a dark brown case gin bottle. An unusual glass artifact is a substantial portion of a light amethyst colored cuspidor that dates to the same time period, ca. 1870 to 1900, as the aqua coffin flask (Lindsey 2015b). The rest of the datable glass suggest a time span ranging from 1875 to 1960 and consist of primarily container glass. Diagnostic fragments dating from 1875 to 1925 include the base of a Kerr Mason jar (post-1915; Lindsey 2015d), one pressed glass goblet fragment of the Late Paneled Grape variety dating between 1890 and 1930 (Lee 1958:204-207), two whiskey glass tumbler fragments, and a “Febriline” medicine bottle. Later twentieth-century diagnostic glass include several fragments of post-World War II soda bottles including the base of a 1952 7UP® bottle.

Table 6-2. Glass Recovered in APE 1

Unit	Depth (cm)	Class	No.	Comments
T 5	back dirt	Container/Vessel	1	whole aqua coffin flask, 3 part mold
T 5	back dirt	Container/Vessel	1	dark brown gin bottle base
T 5	back dirt	Container/Vessel	2	blue glass body panel fragments
T 5	back dirt	Container/Vessel	1	fragment of olive green body panel
T 5	back dirt	Container/Vessel	3	clear glass fragments - base (1) and body (2)
T 5	back dirt	Container/Vessel	1	fragment of aqua body glass
T 10	back dirt	Container/Vessel	1	clear glass, incised diamond pattern
T 10	back dirt	Container/Vessel	1	aqua container base, embossed “A B CO S”
T 10	back dirt	Container/Vessel	1	aqua soda bottle base, embossed “SAN ANTO TEXA”
T 10	back dirt	Container/Vessel	1	aqua bottleneck
T 11	back dirt	Container/Vessel	1	light amethyst glass cuspidor
T 11	back dirt	Container/Vessel	1	amethyst Lee Pattern 73 “Late Paneled Grape” fragment
T 11	back dirt	Container/Vessel	2	clear whiskey glass fragments (2)
T 11	back dirt	Container/Vessel	1	whole machine-made clear “Febriline” medicine bottle
T 11	back dirt	Container/Vessel	1	unknown mfg. olive green body fragment
T 11	back dirt	Container/Vessel	1	machine-made clear bottom - embossed “Kerr Glass Mfg Co”
T 11	back dirt	Container/Vessel	4	unknown mfg. clear body fragments
T 11	back dirt	Other Glass Objects	3	unknown mfg. molded/ribbed clear fragments
T 11	back dirt	Container/Vessel	1	machine-made soda green 7UP® base
T 11	back dirt	Container/Vessel	1	neck - machined lip - olive green
T 11	back dirt	Container/Vessel	1	light green body fragment
T 11	back dirt	Container/Vessel	1	emerald green base fragment “M” on bottom
T 11	back dirt	Container/Vessel	1	whole machine-made clear “Aseptic” medicine bottle
T 11	back dirt	Chimney	1	molded milk glass light shade fragment
T 11	back dirt	Chimney	1	milk glass light shade fragment
T 11	back dirt	Other Glass Objects	1	molded milk glass slipped in pink glass

Nearly half (46 percent) of the identified containers held beverages, and 25 percent held medicines. Of the remaining glass artifacts, 20 percent were fragments of drinking glasses or pitchers utilized in the service and consumption of beverages. The remaining items (9 percent) were not specifically attributable. Not included in these totals were several fragments of chimney glass that indicate the use, breakage, and discard of lighting sources such as kerosene or oil lamps and lanterns.

Metal Objects

Only two metal artifacts were recovered in APE 1 and consisted of the end of a ferrous scythe blade and a piece of twisted wire. These objects date from 1875 to the early twentieth century.

Lithics

A single lithic artifact was recovered in APE 1. This was identified as an Early Triangular dart point based on its morphology and the presence of a series of parallel oblique flakes on the obverse of the specimen and basal thinning flakes (Figure 6-2). This dart point conforms closely to the described type found in *Stone Artifacts of Texas Indians* and dates to the latter part of the Early Archaic Period, ca. 3900 B.C. or earlier (Turner et al. 2011:88-89). Considering that APE 1 contains the recorded multi-component site of 41BX1425, it is not unusual to have recovered this dart point.

Organics

Only three organic items were recovered in APE 1. There were two fragments of faunal bone and a single fragment of freshwater mussel shell. The larger of the two bone fragments is a long bone from a large mammal, most likely cattle (*Bos taurus*). The smaller bone is a rib fragment from a small-to-medium-sized mammal, most likely a goat (*Capra hircus*).

Summary of APE 1

The artifacts recovered from APE 1 are indicative of the long-term use of the site from the prehistoric through historic period. That the artifacts are in mixed context is not

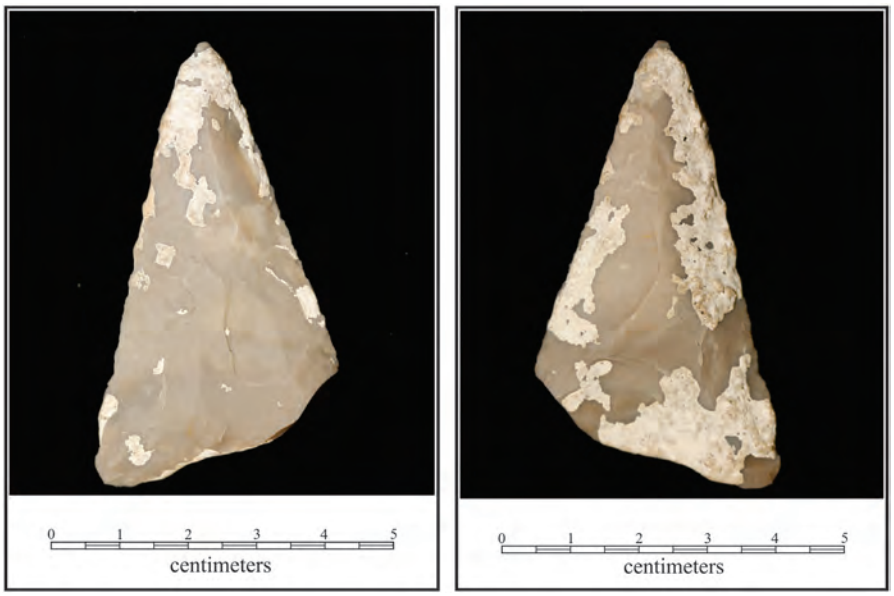

Figure 6-2. Early Triangular dart point. Images show point from obverse (left) and reverse (right).

surprising considering the site's use (not occupational) and location (adjacent to a river and within an active floodplain). The historic artifacts attest to the use of the APE and the dam site as a destination for outings to the dam and later park, and the preponderance of alcohol/beverage bottles, glass drinking vessels, and serving plates support this contention.

APE 2: Upper Labor Headworks

This section offers brief descriptions of artifacts uncovered during the Upper Labor Dam and Headgate portion of the excavation. The large number of artifacts recovered requires that the master table be presented as a separate appendix (Appendix 2). The discussion of the APE 2 artifacts reviews the cultural materials according to the following broad categories: ceramics, glass, construction, metal, lithics, and organics. The artifacts will be discussed collectively within these categories followed by a brief summary.

Ceramics

Table 6-3 depicts the 63 ceramic artifacts found in the Upper Labor Headworks excavations. The ceramics span the time period beginning in the late eighteenth century through the mid-twentieth century.

Eight sherds of orange lead glaze are the only examples of ceramics from APE 2 that could possibly date to the Spanish Colonial period (Figure 6-3). Seven of these eight sherds are all from a single shallow vessel, and all seven sherds can be rejoined. Lead-glazed ware has production dates from the sixteenth to twentieth century, but those recovered likely date in the nineteenth century.

Other highly probable nineteenth-century ceramics included numerous sherds of European/American stoneware. There are two sherds of Dutch Gin Jug stoneware (Lindsey 2015a; Switzer 1974), an unusual light green, wheel-thrown sherd of stoneware of unknown provenience, and examples of Albany Brown glazed with Bristol White glaze. Also recovered was a sherd of matte brown stoneware with a partial stamp of "LO" that most likely is either from the Melcher or Doane potteries of Louisville, Kentucky, which may represent a Civil War period import from the time of the site's use by the CSA as a tannery operation (Kleber 2015:173). Additionally included in the mid-nineteenth-century component is a white earthenware rim sherd with cut sponge decoration dating from 1845 to ca. 1870.

The significant number of various white European/American earthenwares, refined earthenwares, porcelains, and semi-porcelains all have date ranges from the early nineteenth century through to the present.

Glass

One hundred and thirty glass artifacts were recovered (Table 6-4), including four whole bottles. The APE 2 glass dates from the mid-nineteenth into the mid-twentieth century. No glass recovered in APE 2 was definitively Spanish Colonial in age.

The recovered glass broadly fell into two temporal categories with a great deal of overlap. There are several examples of mid-nineteenth-century glass (1850-1875) to late nineteenth-century glass (1875-1900) and a diversity of specifically twentieth-century glass (post-1900).

Table 6-3. Ceramic Artifacts Recovered in APE 2

Unit	Depth (cmbd)	Class	No.	Comments
GAP 5	back dirt	Spanish Colonial Lead Glaze	1	lead glaze
N End of Dam	back dirt	Spanish Colonial Lead Glaze	7	lead glaze
U 6	Level 2 (40-60)	Other Ceramics	1	terracotta
U 9	Level 2 (30-50)	Other Ceramics	1	terracotta
U 1	Level 2 (40-60)	European Stoneware	1	stoneware
U 1	Level 3 (60-80)	European Stoneware	1	stoneware
U 2	Level 2 (30-50)	European Stoneware	1	stoneware
U 2	Level 3 (50-70)	European Stoneware	1	sewer pipe - stoneware
U 2	Level 3 (50-70)	European Stoneware	1	stoneware
U 2	Level 4 (70-90)	European Stoneware	1	stoneware
FEATURE 4	back dirt	European Stoneware	1	stoneware
GAP 5	back dirt	European Stoneware	2	stoneware
GAP 5	back dirt	European Stoneware	1	Albany Brown with Bristol White glaze
GAP 5	back dirt	European Stoneware	1	stoneware - Schiedam Gin Jug
GAP 5	back dirt	European Stoneware	2	stoneware sherd
GAP 5	back dirt	European Stoneware	1	matte brown with “LO”
GAP 5	back dirt	European Stoneware	1	Schiedam Gin Jug sherd
U 2	Level 3 (50-70)	European Semi-Porcelain	1	semi-porcelain
GAP 5	back dirt	European Semi-Porcelain	2	semi-porcelain
GAP 5	back dirt	European Semi-Porcelain	3	semi-porcelain
U 1	Level 2 (40-60)	European Porcelain	4	porcelain
U 1	Level 3 (60-80)	European Porcelain	1	porcelain
U 1	Level 3 (60-80)	European Earthenware	1	creamware - undecorated
GAP 5	back dirt	European Earthenware	2	low-fired soft paste earthenware
GAP 5	back dirt	European Earthenware	4	semi-porcelain decalcomania
GAP 5	back dirt	European Earthenware	15	undecorated whitewares
GAP 5	back dirt	European Earthenware	2	soft paste earthenware
GAP 5	back dirt	European Earthenware	1	yellow ware with alkaline slip
GAP 5	back dirt	European Earthenware	1	soft paste earthenware with green glaze
GAP 5	back dirt	European Earthenware	1	sponge decorated rim sherd

Mid-nineteenth-century glass and late nineteenth-century glass have a great deal of overlap as bottle production methods remained similar throughout much of the nineteenth century (Lindsey 2015e).

Several fragments of blown-in-mold (BIM) bottles were recovered. These can range in date from as early as 1830 to ca. 1900. BIM bottles often lack uniform thickness, which distinguishes them from uniform machine-made bottles. Several hand-blown green glass bottle fragments with various applied or machine-tool-finished lips were also recovered and have similar dates as BIM bottles, ranging throughout most of the nineteenth century.

Distinctively twentieth-century glass included three of the four whole bottles. These three bottles include a 4-oz. cork-top medicine bottle, an Eagle Brand Shoe Polish Bottle, and a crown cap brown beverage bottle. All of these bottles are mass produced machine-made bottles, the first two with cork fasteners and the third utilizing a crown cap (Lindsey 2015f). The medicine bottle and shoe polish bottle are from 1900-1925, and the brown beverage bottle is from 1915 or later.

In addition to these intact specimens, numerous time diagnostic fragments of medicine and soda water bottles were recovered. A nearly intact 4 oz. medicine bottle and a similar Norwich medicine bottle both date to the first quarter of the

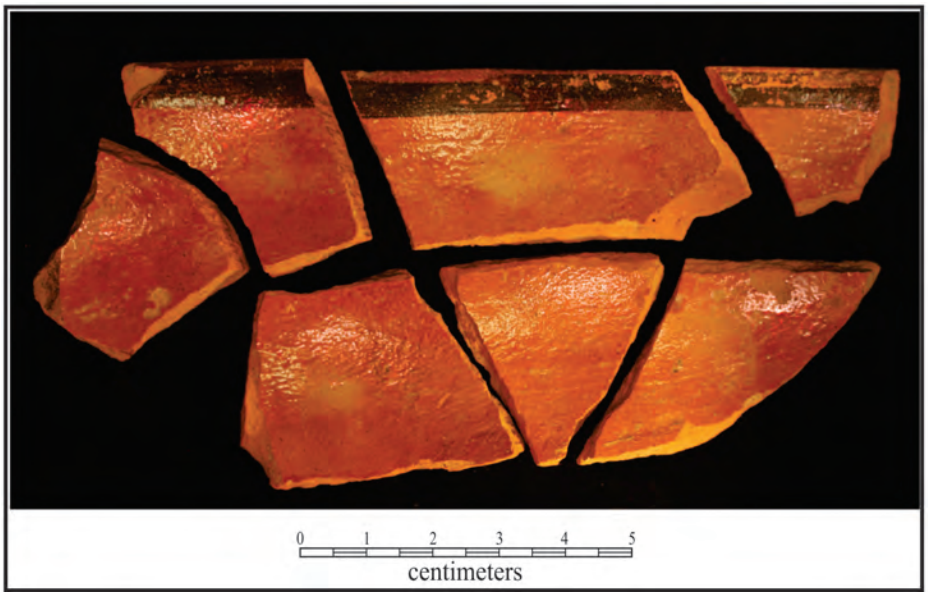

Figure 6-3. Seven sherds of orange lead glaze.

Table 6-4. Glass Recovered in APE 2

Unit	Depth (cmbd)	Class	No.	Comments
GAP 5	back dirt	Chimney	2	molded milk glass fragments - lamp or chimney
GAP 5	back dirt	Container/Vessel	2	top to shoulder and base of three-part mold aqua bottle w/tooled lip
GAP 5	back dirt	Container/Vessel	4	top to shoulder, base and panel fragments (2) of a three-part mold clear patent medicine bottle with a machine-tooled lip
GAP 5	back dirt	Container/Vessel	8	clear glass medicine bottle fragments; machine-made bottles: 1 large (5 fragments) and 1 small bottle (3 fragments)
GAP 5	back dirt	Container/Vessel	1	whole complete Eagle Brand Shoe Polish bottle (clear)
GAP 5	back dirt	Container/Vessel	5	misc. amethyst glass: fragment of pressed Late Paneled Grape Pattern (1); mug base (1); body panel fragments (3)
GAP 5	back dirt	Container/Vessel	1	emerald green body fragment of BIM bottle
GAP 5	back dirt	Container/Vessel	2	olive green body fragment (1); light green body fragment (1)
GAP 5	back dirt	Container/Vessel	2	machine-made crown cap top brown beverage bottle (1) and machine-made brown body fragment (1)
GAP 5	back dirt	Container/Vessel	5	Duraglass fragments (5) base has a date code of 1953 and was produced in the Fairmont WV plant; most likely 7UP®
GAP 5	back dirt	Container/Vessel	1	fragment of clear chimney glass
GAP 5	back dirt	Container/Vessel	6	lip and neck fragment (1) of a machine-made three-part mold bottle with a machine-tooled lip (aqua) and aqua body fragments (5)
GAP 5	back dirt	Container/Vessel	1	early whole clear glass medicine bottle; machine-made three-part mold with hand-tooled neck and lip
GAP 5	back dirt	Container/Vessel	10	clear glass fragments: drinking glass fragments - lip (1) and base (1); molded glass lid fragment (1); shoulder fragments (3) representing at least 2 different vessels; body fragments (4), one embossed “(o)NE QUART”
GAP 5	back dirt	Flat/Window	3	clear flat glass fragments
U 2	Level 2 (30-50)	Container/Vessel	1	fragment of brown bottle glass
U 4	Level 10 (170-190)	Container/Vessel	1	light aqua green soda bottle fragment - shoulder
U 4	Level 3 (50-70)	Container/Vessel	1	olive green body fragment

Table 6-4. Glass Recovered in APE 2, continued....

Unit	Depth (cmbd)	Class	No.	Comments
U 4	Level 5 (90-110)	Container/Vessel	2	fragments of brown bottle glass - fragment (1) is melted
U 4	Level 7 (110-130)	Container/Vessel	1	emerald green 7UP® bottle neck fragment with decal lettering
U 4	Level 7 (110-130)	Container/Vessel	1	clear medicine bottle (small) base and body
U 4	Level 9 (150-170)	Container/Vessel	1	light aqua green soda bottle fragment - shoulder with lettering
U 4	Level 8 (130-150)	Container/Vessel	1	fragment of brown bottle glass
U 4	Level 9 (150-170)	Container/Vessel	3	clear body fragments (3) and one pint whiskey base embossed with "FILL PINT" and mold No. "2"
U 4	Level 10 (170-190)	Container/Vessel	1	aqua rim/neck fragment - crown cap bottle
U 4	Level 10 (170-190)	Container/Vessel	1	emerald green 7UP® bottle body fragment
U 4	Level 9 (150-170)	Flat/Window	1	clear flat glass fragment
U 4	Level 7 (110-130)	Other Glass Objects	1	light bulb fragment
U 4	Level 8 (130-150)	Other Glass Objects	1	light bulb fragment with metal socket screw base
U 4	Level 8 (130-150)	Other Glass Objects	36	light bulb fragment
U 5	Level 3 (50-70)	Container/Vessel	1	fragment of brown bottle glass
U 5	Level 3 (50-70)	Container/Vessel	1	clear body fragment
U 5	Level 6 (110-130)	Container/Vessel	1	fragment of brown bottle glass
U 5	Level 6 (110-130)	Container/Vessel	1	fragment of brown bottle glass
U 5	Level 6 (110-130)	Container/Vessel	1	olive green body fragment
U 5	Level 6 (110-130)	Container/Vessel	1	light aqua green soda bottle fragment - neck
U 5	Level 3 (50-70)	Container/Vessel	1	light aqua green soda bottle fragment - body
U 5	Level 6 (110-130)	Flat/Window	2	aqua flat glass
U 6	Level 1 (10-30)	Container/Vessel	1	emerald green 7UP® bottle body fragment
U 6	Level 2 (40-60)	Container/Vessel	1	fragment of brown bottle glass
U 6	Level 3 (60-80)	Container/Vessel	1	whole brown glass bottle – machine-made with crown cap
U 6	Level 4 (80-100)	Container/Vessel	1	basal fragment of machine-molded brown bottle glass
U 6	Level 5 (100-120)	Container/Vessel	1	fragment of brown bottle glass
U 6	Level 5 (100-120)	Flat/Window	1	clear flat glass fragment
U 7	Level 4 (70-90)	Container/Vessel	3	fragments of brown bottle glass
U 7	N/A	Container/Vessel	4	clear medicine bottle fragments "Patent No. 105321" embossed on base fragment indicates this was a Norwich Pharmaceutical Bottle manufactured 1916+
Wall Trench 2	N/A	Container/Vessel	1	heel and body wall fragment of brown BIM bottle glass - heavily patinated

twentieth century (Lindsey 2015g). Soda bottles include fragments of at least two 7UP® bottles and one Barq's® Root Beer bottle, which date to 1920-1960 (Lindsey 2015c). Other clearly twentieth-century glass items included a light bulb base and 36 fragments of light bulb glass.

As was the case in APE 1, nearly half (47 percent) of the identified containers held alcohol or non-alcoholic beverages. The number of identified medicine bottles was slightly lower at 20 percent. Utility wares, such as drinking glasses or pitchers, constituted 16 percent of the glass assemblage. Only 4 percent of the assemblage was attributable to lighting—either chimney, lamp, or light bulb glass. The remaining items (10 percent) were not specifically attributable. The 36 fragments of light bulb glass were not included to avoid skewing the results. The percentages of glass types between APE 1 and APE 2 are very similar.

Construction Related Artifacts

Construction related artifacts recovered from APE 2 are listed in Table 6-5. These included two brick fragments, both of which date to the late nineteenth century or later. One is a fragment of lettered, red D'Hanis Brick that dates after the

Table 6-5. Construction Related Artifacts from APE 2

Unit	Depth (cmbd)	Class	No.	Comments
FEATURE 2	NE-SW (N/A)	Mortar/Plaster	1	mortar sample
GAP 5	back dirt	Brick	1	half of a red D'Hanis brick
GAP 5	back dirt	Mortar/Plaster	1	mortar sample
U 2	N/A	Mortar/Plaster	1	concrete/cement sample
U 2	N/A	Mortar/Plaster	1	concrete/cement sample
U 2	N/A	Mortar/Plaster	1	concrete/cement sample
U 2	N/A	Mortar/Plaster	1	concrete/cement sample
U 2	N/A	Mortar/Plaster	1	concrete/cement sample
U 4	Level 9 (150-170)	Brick	1	possibly fire brick
U 4	Level 8 (130-150)	Mortar/Plaster	1	mortar sample
U 4	Level 8 (130-150)	Mortar/Plaster	1	concrete/cement sample
U 4	Level 9 (150-170)	Mortar/Plaster	1	concrete/cement sample
U 6	Level 1 (10-30)	Asphalt	1	asphalt

founding of the company in 1883 (Steinbomer 1983), and the other appears to be a light buff colored unadorned fragment of fire brick with no known attribution. Aside from a single fragment of late twentieth-century asphalt, the remaining construction artifacts consist of mortar and cement samples retained as comparative index materials for the respective features within APE 2.

Organics

Three pieces of unidentified animal bone were recovered along with four snail shells and one mussel shell fragment. The remainder of the organics found consisted of wood samples taken from the planks in Feature 2 (buried western wall) and Feature 6 (Upper Labor Dam).

The faunal bone consisted of one large mammal bone, presumably cattle (*Bos taurus*), and two small mammal bones of unknown attribution.

The four snail shells represent two species, *Rumina decollata* and *Melanoides tuberculatus*. Both of these are invasive species with relatively long histories in the United States and Texas. *R. decollata* was first introduced into Charleston, South Carolina, from its native range in the Mediterranean ca. 1800 and had spread to Texas by 1900 where it was noted along both banks of the San Antonio River (Batts 1957:74). This is an aggressive predator of other snails, and it has decimated local snail populations across much of the United States (Fisher et al. 1980:18-20).

The second invasive species, *Melanoides tuberculatus*, is native to portions of Asia as well as northern and eastern Africa. It was introduced to the United States in the 1930s as a decorative snail for aquaria and subsequently released into the wild (Karatyev 2008:184). Initial colonies were found in Florida in 1952. These snails were first found in the headwaters of the San Antonio River in 1964 (Murray 1964:15-16). *M. tuberculatus* is an egg predator of native snails and also acts as the intermediate host for *Centrocestus formosanus* trematodes that infect the gills of native fish, ultimately killing them or degrading their activity and thus making them an easier prey species (Fleming et al. 2011:117-118; Ladd and Rogowski 2012:287-288; Mitchell et al. 2005:11-12). While the specimen recovered from APE 2 was found at a depth of 100-120 cmbs, the habits of this species include burrowing to depths of as much as 2 m (Dr. David Huffman, Texas State University, personal communication of April 5, 2016).

The single mussel shell fragment is from a freshwater species, but it is too small to make a definitive attribution.

The wood samples taken from Features 2 and 6 were inspected. The posts are made of Texas Cedar (*Juniperus asheii*), and the planks are composed of at least two different woods, one of which is Texas Cypress (*Taxodium distichum*). Two of the three plank samples were too degraded to identify. All of the samples are retained within the CAR collections and may be subjected to future analysis.

Metal Objects

Fifty-three metal objects were recovered from APE 2 (Table 6-6). Most are ferrous nails or spikes (n=25). Of the twenty-five nails, three are cut nails, six are spikes, and 16 are wire nails. The next largest group consists of unidentified metal objects (n=12). In addition, a mule shoe or horseshoe, a corroded nickel-lead padlock with a ferrous hasp, a cuprous or brass button, and a cuprous ring finding/setting were recovered. These objects date within the use range of APE

2, 1776-1960. Also included here is a broken Champion Spark Plug that dates as early as 1908, though the specific date of this specimen could not be determined (Sparkplugs Limited 2014).

Lithics

Thirty-five lithic artifacts were recovered from APE 2 (Table 6-7). The majority (n=34) are prehistoric in age. A single historic lithic is a whetstone or knife sharpening stone recovered from the back dirt of Gap 5. A single time-diagnostic prehistoric lithic, a Guadalupe tool, was discovered during excavation in APE 2 (Figure 6-4). The tool was found in U 6, Level 2 (40-60 cmbd). Guadalupe tools date to the Early Archaic Period, ca. 3500 B.C. or earlier (Turner et al. 2011:232-233). As was noted in the introduction to this section, the tool is from a mixed context, and an aluminum pull-tab was recovered in the next level of the same unit. Other lithic artifacts found included a biface recovered from

Table 6-6. Metal Artifacts from APE 2

Unit	Depth (cmbd)	Class	No.	Comments
U 4	Level 5 (90-110)	Containers/Caps	1	oxidized ferrous can remnants
U 4	Level 5 (90-110)	Containers/Caps	1	cap - ferrous
U 5	Level 6 (110-130)	Containers/Caps	1	crown cap - ferrous
U 6	Level 1 (10-30)	Containers/Caps	1	pull tab - aluminum
U 7	wall clean	Containers/Caps	1	pull tab - aluminum
GAP 5	back dirt	Farm/Ranch/Tack	1	mule shoe or horseshoe
U 1	Level 4 (80-100)	Fastener	1	bracket or hinge - ferrous
U 4	Level 7 (110-130)	Fastener	1	iron object with concrete attached
U 5	Level 6 (110-130)	Fastener	1	lead seal/pipe solder
U 4	Level 11 (190-210)	Fastener	1	hinge fragment - ferrous
GAP 5	back dirt	Fastener	1	cuprous or brass button
GAP 5	back dirt	Household Items	1	padlock ferrous bail and nickel/lead alloy lock
GAP 5	back dirt	Jewelry	1	cuprous ring finding/setting
U 4	Level 3 (50-70)	Nails	2	cut nails - ferrous
U 4	Level 3 (50-70)	Nails	1	wire nail - ferrous
U 5	Level 5 (90-110)	Nails	1	wire nail - ferrous
U 4	Level 7 (110-130)	Nails	2	wire nail - ferrous
U 7	Level 4 (70-90)	Nails	1	wire nail - ferrous
U 4	Level 8 (130-150)	Nails	3	wire nail - ferrous
U 4	Level 9 (150-170)	Nails	4	wire nail - ferrous
U 4	Level 10 (170-190)	Nails	2	wire nail - ferrous
U 4	Level 11 (190-210)	Nails	1	large wire nail - ferrous
T 10	back dirt	Nails	6	ferrous spikes
GAP 5	back dirt	Nails	1	large wire nail
GAP 5	back dirt	Nails	1	square cut nail
U 4	Level 10 (170-190)	Other Metal Objects/Unknown	1	unidentified ferrous
GAP 5	back dirt	Other Metal Objects/Unknown	8	ferrous concretions - one appears to be an ornamental fence spear/spike
GAP 5	back dirt	Other Metal Objects/Unknown	1	unidentified ferrous object
GAP 5	back dirt	Other Metal Objects/Unknown	1	section of metal pipe (1 of 2)
GAP 5	back dirt	Other Metal Objects/Unknown	1	section of metal pipe (2 of 2)
U 5	Level 3 (50-70)	Wire	1	wire - ferrous
U 4	Level 8 (130-150)	Wire	1	wire - ferrous
U 4	Level 9 (150-170)	Wire	1	wire - ferrous and insulated
U 4	Level 11 (190-210)	Other Metal Objects	1	Champion Sparkplug (1908 or later) nickel electrode and ferrous base with semi-porcelain insulator

Table 6-7. Lithics from APE 2

Unit	Depth (cmbd)	Class	No.	Comments
T 10	back dirt	Edge-modified flakes	2	edge modified flakes
T 10	back dirt	Debitage	2	stream-rolled flakes
GAP 5	back dirt	Biface	1	bifacial tool
GAP 5	back dirt	Debitage	6	flakes
GAP 5	back dirt	Other Groundstone	1	whetstone (historic)
S. End of Dam	back dirt	Cores	1	core
U 1	Level 1 (20-40)	Uniface	1	uniface with retouched edge
U 2	Level 4 (70-90)	Burned Rock	1	burnt chert cobble
U 2	Level 6 (110-130)	Debitage	2	flakes
U 4	Level 8 (130-150)	Core	1	core
U 4	Level 7 (110-130)	Biface	1	medial biface fragment
U 5	Level 6 (110-130)	Debitage	1	flake
U 5	Level 6 (110-130)	Debitage	1	stream-rolled flake
U 6	Level 1 (10-30)	Debitage	1	primary cortex flake
U 6	Level 5 (100-120)	Debitage	1	flake
U 6	Level 2 (40-60)	Specialized Tools	1	Guadalupe Tool
U 7	Level 2 (30-50)	Debitage	4	tertiary flakes
U 7	Level 5 (90-110)	Debitage	1	secondary cortex flake
U 7	Level 7 (130-150)	Debitage	1	secondary cortex flake
U 8	Level 1 (0-20)	Debitage	4	secondary (3) and tertiary (1)
U 9	Level 2 (30-50)	Debitage	1	flake

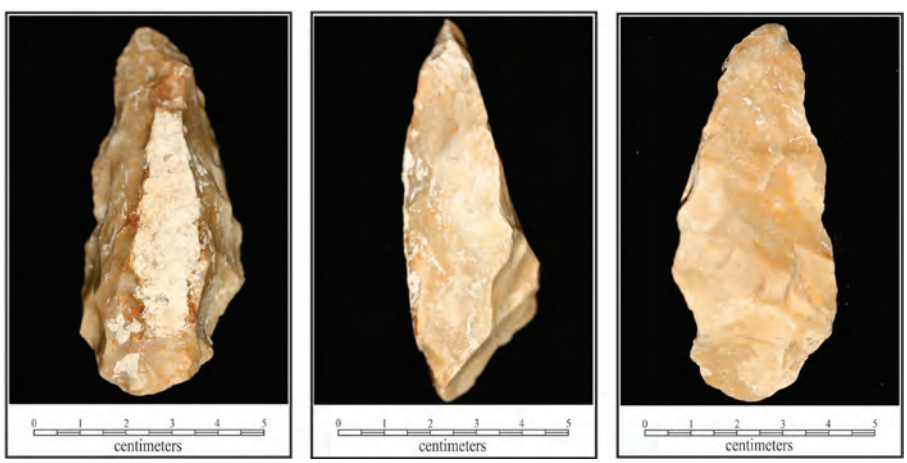

Figure 6-4. Guadalupe Tool/Adze. Images show tool from obverse (left), side (center), and reverse (right).

Gap 5 of this excavation, and a core recovered near the south end of the Upper Labor Dam. Twenty-five chipped stone flakes were also found. Two of these flakes appeared to have been edge-modified, and several appear stream-rolled.

Summary of APE 2

Similar to the artifacts recovered from APE 1, the artifacts recovered within APE 2 are indicative of the long-term use of the site from the prehistoric through historic period. Also similar to APE 1, the vast majority of the artifacts recovered in APE 2 are in mixed or disturbed contexts. The few exceptions are the in situ wood posts and plank samples taken from the east and west faces of the dam and the single plank sample from the buried west wall of the current Lily Pond.

All of the excavation areas represent investigations in disturbed and redeposited sediment for the construction of walls, dams, and the headgate by backfilling on the back side of these structures. Further, the excavations along the

faces of the dam exposed buried sediments. Some of these had accumulated over time, but others undoubtedly were deposited intentionally by the City to level the landform between the Lily Pond and river. Artifacts within these contexts may have origins that predate the location of their secondary or tertiary deposition within APE 2. For example, the Early Archaic Guadalupe Tool found in U 6 at a depth of 40-60 cmbd is indeed an ancient stone tool, but historic glass, metal, and ceramic artifacts were recovered above, within, and below this level, indicating mixed and disturbed deposits

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Chapter 7: Summary, Conclusions, and Recommendations

This chapter provides summary remarks and conclusions about the resources in each APE and recommendations for further investigation. The limited extent and nature of the Alamo Dam in APE 1 affects reporting accordingly, and the majority of this chapter and report are dominated by discussion on APE 2 and its numerous resources.

APE 1: The Alamo Dam

The primary goal for APE 1, the location and identification of structural remnants of the Alamo Dam on the west bank of the San Antonio River, was achieved. There are definitive in situ remains of the Spanish Colonial structure, and these have been archaeologically documented within this report. The remnants of the west side of the Alamo Dam are of typical Spanish Colonial construction and consist of large limestone rubble placed in alignment to form a weir dam across the San Antonio River. The remnants documented in this report are almost certainly part of that original construction begun in 1718-1719 or at least early in the Spanish Colonial period. That more of the dam has been removed is consistent with the reinterpretation of CAR's work on the east bank in 2011 (Ulrich 2011) and Pape-Dawson's current undertakings. The breaching of the weir dam and the use of the dam rubble as fill to raise the height of the east bank has removed nearly all traces of the once impressive structure. This destructive episode took place sometime after 1935. The few remnants buried on the west bank should continue to be protected as some of the only evidence of this important Spanish Colonial structure.

In addition to the remains of the dam, the unidentified wall or structure labeled as APE 1, Feature 3, should be avoided or subsequently investigated to determine construction and temporal affiliation.

As noted in Chapter 6, none of the artifacts recovered during the excavations of the Alamo Dam site are in primary context, and none directly support interpretation of the dam or other features encountered in APE 1. The artifacts range in age from the prehistoric through the modern period as would be expected given the sites long-term use and context.

APE 2: Upper Labor Acequia, Headworks, and Dam

The investigations in APE 2 documented what appears to be the entire length of the Upper Labor Dam, some 30.5 m, north-south. The exposure of the dam allowed CAR to address several of the research questions: both the extent of the structure and the demarcation of differing construction periods (colonial versus post-colonial), and the identification of a number of adverse impacts to the structure over time. All of the excavations within APE 2 allow for the attribution of the late nineteenth-century modifications of the Upper Labor Headworks to the Civil War period. The modifications do not appear to have any relation to the Alazan Acequia improvements of 1876. Further, it was hoped that temporal associations could be attributed to the numerous extant features to allow for the development of hypothetical plan maps of APE 2 over time. On the basis of the archival documentation presented herein and the excavation results, CAR has produced five maps of the APE representing five periods: Period 1: Prehistoric to 1776; Period 2: Spanish Colonial to Civil War (1776-1863); Period 3: The Civil War and Post-War Period (1863-1875); Period 4: Late Nineteenth to Early Twentieth Century (1875-1940); and Period 5: Current (1940-2016). Each of these periods will be discussed individually along with their associated features.

Period 1: Prehistoric to 1776

The west branch of the San Antonio headwaters where it joins the east branch (without any infrastructure improvements) constitutes the hypothetical plan view of what is now APE 2 (Figure 7-1). This would have been the general site plan from the prehistoric period through to initiation of construction on the Upper Labor in July of 1776.

Cox et al. (1999:12) identified a buried prehistoric component during their excavations in 1996. Work performed by CAR in advance of the Miraflores Bridge project recovered numerous time diagnostic prehistoric artifacts, but these were deemed to be redeposited materials from an upstream context. This work took place immediately adjacent and south of the current APE. Like the work performed for Miraflores, the current excavations encountered time diagnostic prehistoric artifacts (see Chapter 6). In all cases, these artifacts were recovered from mixed contexts. It is probable that these represent the same redeposited materials as those recovered in the Miraflores work.

Period 2: Spanish Colonial to the Civil War (1776-1863)

This plan view is an approximation of what the site looked like following the construction of the Spanish Colonial Headworks and Acequia (Figure 7-2). Distinguishing

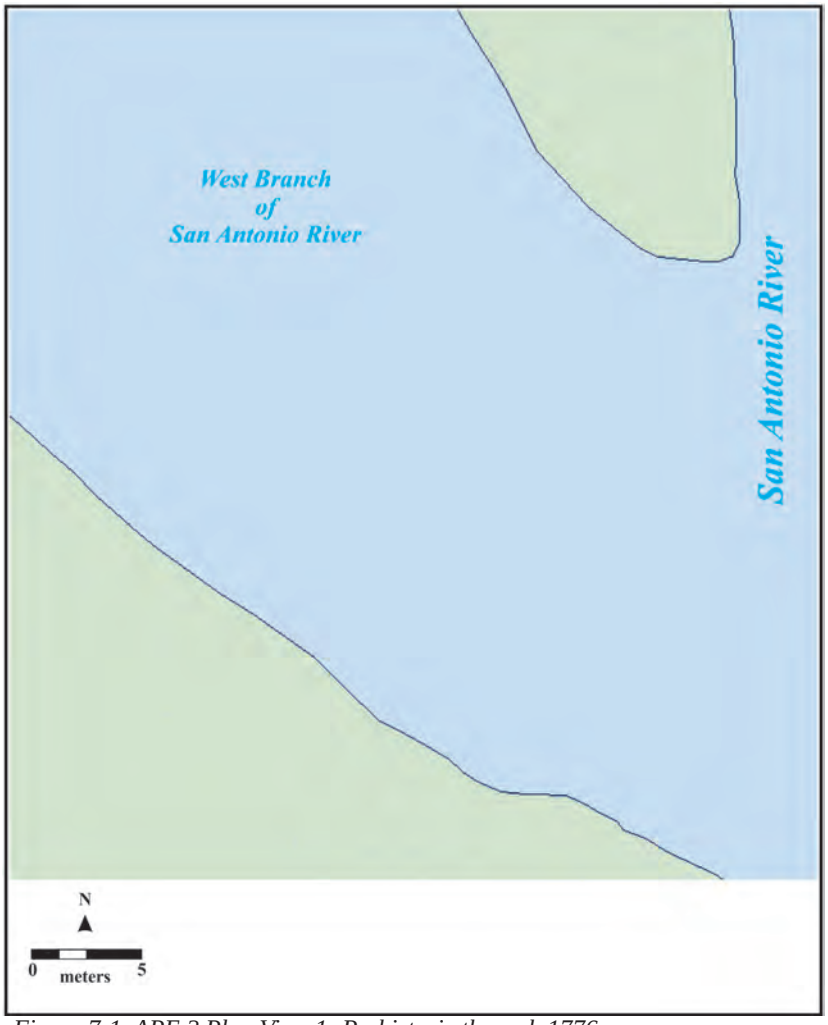

Figure 7-1. APE 2 Plan View 1: Prehistoric through 1776.

features are the rubble dam and unlined *acequia* and headgate. The dam is shown as a weir dam and not a wing dam, as the rubble that distinguishes the Spanish Colonial construction is present at both ends of the 30-m alignment. The placement of the headgate is approximate as its original location and construction were obliterated by the late nineteenth-century improvements.

The determination that the dam is a weir dam that crossed the west branch confluence resolves the question of it being either a wing dam or a weir dam (Cox et al. 1999:12). The archival and archaeological investigations demonstrate that the colonial dam was repurposed as a foundation to raise the height of the dam for the CSA Tannery. The CSA work appears to lie atop the colonial, presumably along the full length of the dam, as it is present at both the northern and southern ends. The archival record documents that the CSA improvements to the dam diverted the entire flow of water from the west branch springs. Therefore, the Spanish Colonial dam must have also spanned the entire opening of the west branch at its confluence with the San Antonio River. Further, there is no distinction made in the Spanish archival accounts as to the type of dam that was constructed. The main distinction between the two dams is that the colonial dam was a weir dam that created a diversion pool as a result of the placement of a rubble construction that raised the height of the water and directed flow into the *acequia* system. Excess water still flowed over the top of this construction and down the river. The subsequent CSA dam was an impoundment dam that captured all of the water and redirected it into the Upper Labor Acequia system, leaving none to return to the San Antonio River (except the excess which flowed into San Pedro Creek and then back into the San Antonio River just west of Mission Concepción, a bypass of some 15 km).

Period 3: The Civil War and Post War Period (1863-1875)

Features 2, 4, 5, and 6 all appear, on the basis of construction materials, style, and articulation with one another, to be

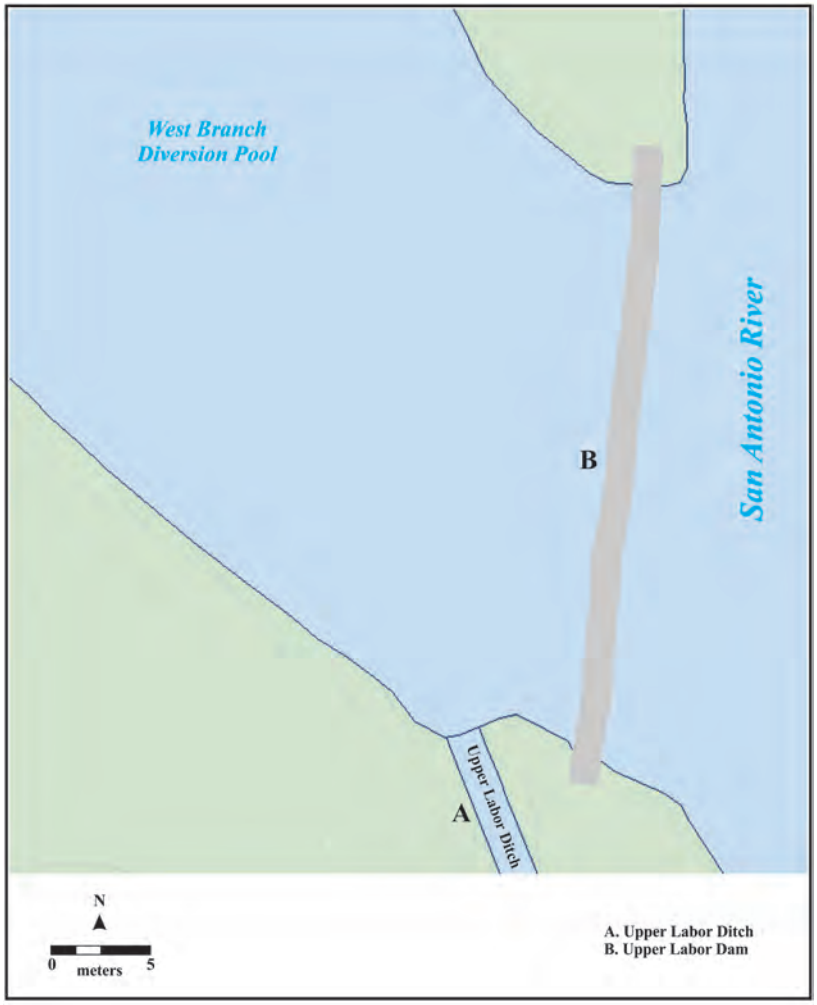

Figure 7-2. APE 2 Plan View 2: Spanish Colonial through the Civil War (1776-1863).

directly associated with the CSA improvements of 1863-1864. In all cases, these features are composed of a combination of dressed ashlar limestone blocks in similar styles. These features articulate with one another and allow for the formation of a site plan during the Civil War period (Figure 7-3).

The plan as drawn has notable similarities and differences from the Spanish Colonial. Similarities include the continued use of the *acequia* system, the presence of a headgate, and the repurposing of the dam using the same alignment and raising it 0.5 m or more. Differences include the use of ashlar dressed limestone for the construction of the headgate, *acequia* walls, upper portion of the dam, the western wall, and the revetment.

The lower portions of the Feature 2 wall most likely represent a retaining wall along the west bank of the diversion pool. The purpose of the wall was twofold. The lower portions framed the west side of the diversion pool. However, as the wall is clearly elevated above the pool along most of its distance and considering the steepness of the slope, the wall may have served both as a retaining structure and shoulder for a path or road for access. The presence of strewn ashlars along the northwestern area of the former Lily Pond may represent remnants of the retaining wall that have subsided and tumbled downslope.

The revetment, Feature 5, most likely represents the desire to strengthen and protect the angle of the dam and headgate from flood pressure flows. The unfortunate circumstance of the mature pecan tree that is deforming and displacing the feature prevented a more accurate understanding of this construction.

The CSA modifications to the dam required the stones to be laid and mortared in a dry environment. To accomplish this, the masons chiseled holes into the original Spanish construction, inserted posts, and then laid planking across and between the posts to create a coffer dam to divert the water while they laid the new stone courses to raise the height of the dam. This accounts for the presence of the remaining wood posts encountered in 1996 by Cox et al. (1999) and during the current excavations.

Figure 7-3. APE 2 Plan View 3: The Civil War through the Post War Period (1863-1875).

As noted in the discussion of Period 2, the CSA dam spanned the opening of the west branch and diverted all of the flow into the Acequia system. That the opening was blocked is evidenced by the City Council ordering 4.5-x-0.6 m gaps cut into the structure as mentioned in Chapter 3. Further, the agreement between the City and Brackenridge from 1875 refers to the dam as "that built by the Confederates" as well as to placing a gate in Hermann's trench (BCDR V3:217).

The majority of the CSA improvements are still extant, albeit evidencing numerous adverse impacts in the past 150 years.

Period 4: Late Nineteenth to Early Twentieth Century (1875-1940)

With the cessation of the tannery as a working proposition following the flood of 1868, the next major impact to the Upper Labor system was the creation of the Alazan Acequia. This ditch, as discussed in Chapter 3, was designed for flood control and extended the Upper Labor Acequia westward from its former terminus on San Pedro Creek to a point on the Alazan Creek. It is clear from the City Council minutes for the period that the channel of the Upper Labor was deepened, and specific mention is made of where these improvements took place as well as their material and labor costs. No improvements are listed for the Upper Labor Headworks.

The Alazan Acequia ended as a failure, and the last quarter of the nineteenth century saw a steady decline in use for the Upper Labor system. By the end of the century, Brackenridge's Water Works had made major changes within the current park boundaries related to the extraction and movement of water, but no improvements were made on the City-owned Upper Labor Headworks property not controlled by Brackenridge. The APE 2 site was most likely affected to some degree as the 1908 City Engineers Office Map showing Brackenridge and Mahncke Parks indicates that the west branch is completely open at that time.

The first quarter of the twentieth century saw the complete abandonment and disregard for the Upper Labor as an irrigation or flood control system, and it is a near certainty that one or more of the current gaps in the dam structure were made during this period. Figure 7-4 is conjectural and shows sediment accumulation along the face of the headworks, the contraction of the size of the pool, and Gaps 1, 3, and 5 open.

The 1930s WPA improvements to Brackenridge Park also passed the Upper Labor by with no improvements listed as being made. The 1926 Koehler and Brackenridge Park map (Figure 3-14) shows an enclosed pool with several open gaps along the dam alignment as well as the *acequia* channel open. That map and the 1939 Headwaters map (Figure 3-15) also show that the headgate was still adjacent to the pool and not recessed.

Period 5: Current (1940-2017)

The exact date of the building of the extant Lily Pond walls is not known except that it was after 1940. Figure 7-5 demonstrates that the Lily Pond, as currently configured, required the installation of new walls in advance of the old CSA western wall, the CSA headgate, and in advance of the dam. It is suggested that it was during this period that the fore channel of the *acequia* between the CSA headgate and the Lily Pond walls was installed. This set the stage for a long static period where the landform and use largely remained the same. While the use remained static, a number of major impacts occurred in this period. The culvert that created Gap 2 was punched through the dam to allow for the flow of well water from the pond to escape back into the San Antonio River. The large well beneath the Hildebrand Avenue Bridge supplied water to augment the river level until the installation

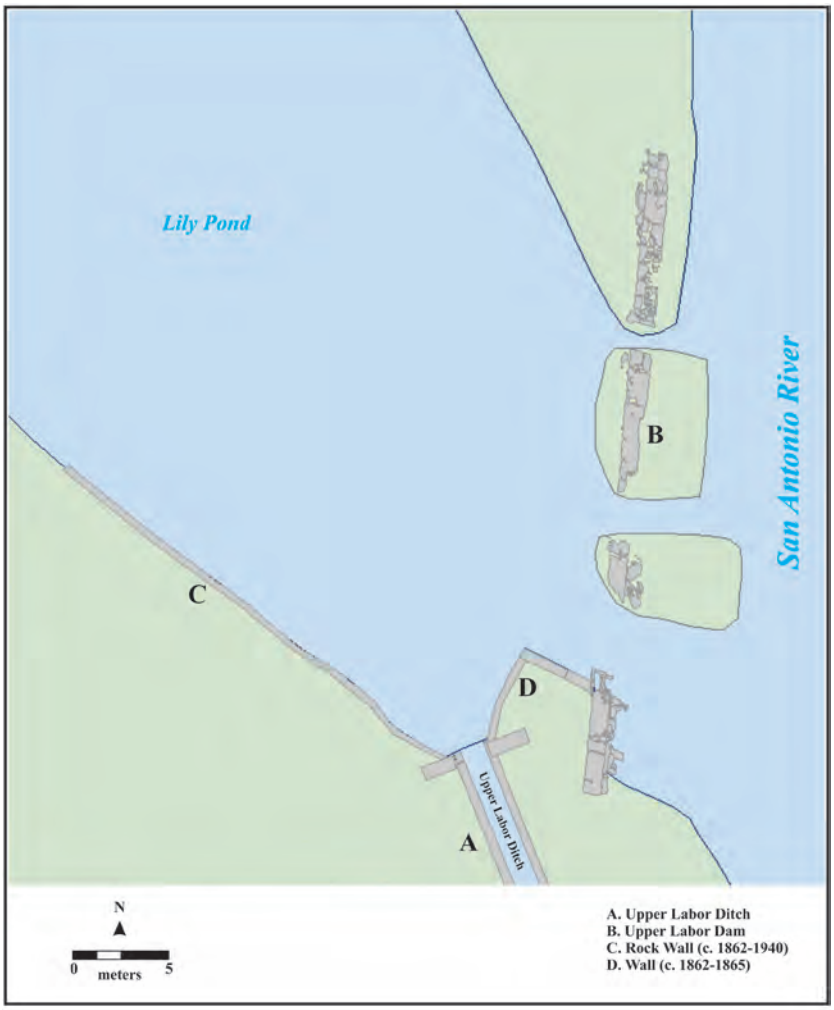

Figure 7-4. APE 2 Plan View 4: Late Nineteenth to Early Twentieth Century (1875-1940). N.b. While the dam is shown, it was most likely partially to completely buried during this period.

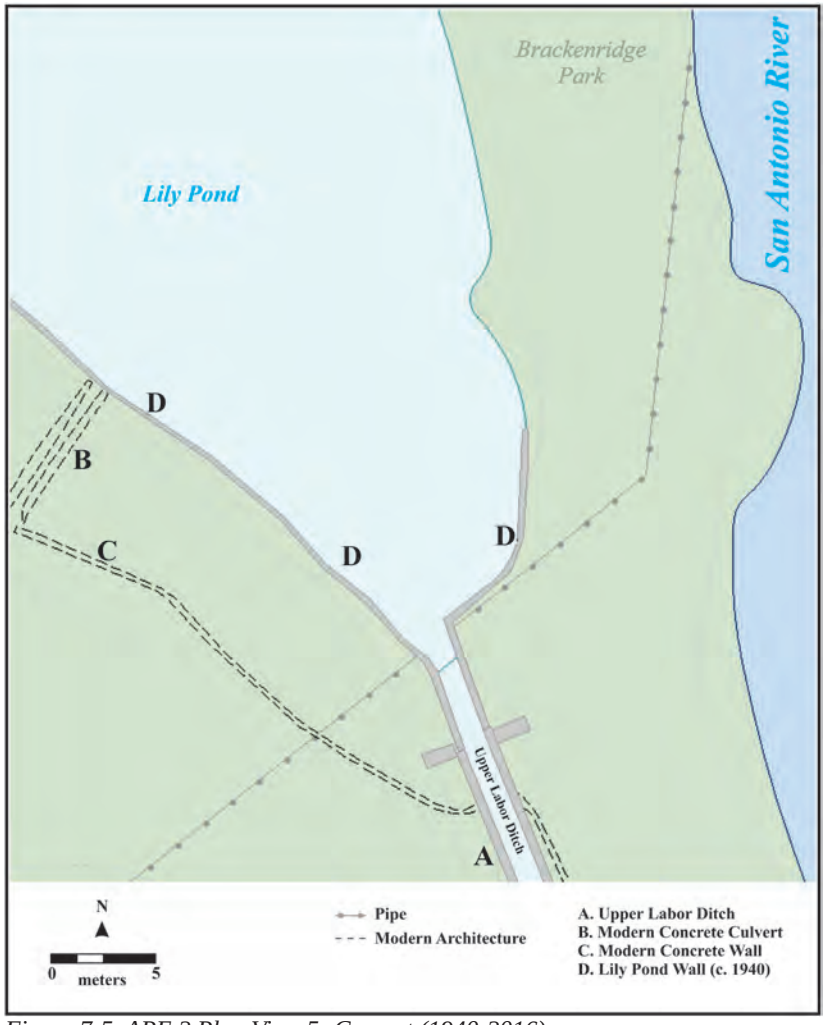

Figure 7-5. APE 2 Plan View 5: Current (1940-2016).

of recycled water in 2000 (Eckhardt 2015). The water and electrical lines that run through Gap 4 were intruded during this period as well as whatever created Gap 6.

Summary of APE 2

The following are conclusions concerning the Upper Labor Headworks and areas immediately adjacent. These result from archival and archaeological work performed under this permit.

1. The ashlar dressed limestone blocks that compose the top of the Upper Labor Dam date to the period 1863-1864 when the CSA modified the headworks of the Upper Labor to supply water to the tannery.

2. The CSA dam construction appears to overlay the Spanish-Colonial dam from north to south.

3. The dam is 30.5-m long, and this measurement conforms to the Spanish archival information that anticipated a dam of 29.5 m.

4. The Spanish construction was a traditional weir dam that crossed the entire opening of the west branch and raised and diverted water into the headgate of the Upper Labor Acequia. This weir dam created a diversion pool but allowed excess water to flow over the top of the weir dam into the main channel of the San Antonio River.

5. The CSA dam was an impoundment dam that created an impoundment pool that diverted the west branch flow into the old Spanish *acequia* system.

6. In addition to the dam and headgate, the CSA erected an angled revetment between the dam and headgate as well as a wall along the west side of the impoundment pool.

7. The fore channel of the current *acequia* that engages with the Lily Pond walls is most likely contemporaneous with their construction (post-1940) and not associated with the CSA improvements.

8. The Lily Pond walls are not a product of the 1930s WPA improvements to Brackenridge Park and are not shown on the *1939 Headwaters Map* indicating a construction date of post-1940. Further, the extant headgate was installed by the CSA and is not a WPA construction.

9. There have been no less than six adverse impacts that have created partial to complete gaps in the dam.

10. The western branch springs were completely separate from the eastern branch and Olmos Creek. These springs were jointly controlled from 1851 to 1872 by Hanson and Harriet Alsbury and Gregoire Hermann.

11. The Alsburys operated a mill on their property that corresponds with 41BX189 on the UIW campus north of Hildebrand Avenue.

12. Hermann, at some point, opened a trench along his southern property line (Lot 28) that drew water from the San Antonio River. This trench is shown on the L. Giraud *Water Works Map of 1879* and referenced in the 1875 Agreement between the City and G. W. Brackenridge. By means of this trench, Hermann could control the water flow in either direction, diverting all west branch waters into the San Antonio River or diverting east branch waters into the Upper Labor.

In addition, CAR identified several areas for new research should future impacts within APE 2 necessitate exploration. These include:

1. Investigation of the strewn ashlar blocks within the APE to determine association.

2. Exposure of the mid-section of the dam on both the east and west faces to obtain a complete profile and verify the presence of underlying Spanish Colonial construction.

3. Investigate on either side of the *acequia* below the CSA headgate to attempt to find remnants of the original Spanish Colonial headgate.

4. Determine the alignment of the remaining portion of the Feature 2 west wall.

5. Any work along Hildebrand Avenue in the vicinity of Hermann's trench should be monitored for possible evidence of the structure.

6. Additional archival and historical research to more accurately determine the particulars of the contention between the City and the CSA regarding water access and the use of the tannery during the Civil War.

The Upper Labor Headworks is a unique historical and cultural resource. In a single area, there is evidence of prehistoric occupation dating back to the Early Archaic, ca. 6000 B.P.; Spanish Colonial structural remains from the original construction of the Upper Labor weir dam and *acequia*; and one of the few purpose-built constructions remaining from the Civil War period in San Antonio. The site holds the possibility of providing a visual interpretive experience for both citizens and visitors to see how an *acequia* system operates.

The Upper Labor Headworks property has been in the public domain nearly since it was first set-aside as public land by the Spanish Crown. While the construction has seen numerous adverse impacts, the fact that it is still extant should not be taken for granted. The eastern face of the dam is less than 2.5 m from the San Antonio River, and the potential for damage from flooding cannot be discounted. It was the flooding of 1995 that exposed the dam to view after it had been buried for more than half a century.

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1864	Book	T1	Page 157	February 11, 1864
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1864	Book	C	Page	437	June 20, 1864
1865	Book	C	Page	475	April 3, 1865
1865	Book	C	Page	481	May 1, 1865
1865	Book	C	Page	491	August 1, 1865
1865	Book	C	Page	496	September 19, 1865
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1867	Book	D	Page	579	January 26, 1867
1867	Book	D	Page	583	February 4, 1867
1867	Book	D	Page	588	February 26, 1867
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1871	Book	D	Page	14	February 1871
1872	Book	D	Page	51	November 12, 1872
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Appendix 1:
Common Terms Used in This Report

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Appendix 1: Common Terms Used in This Report

The primary purpose of this appendix is to promote understanding of terms used in this report by providing definitions. The terms are each noted as to source and are taken from relevant fields that include civil engineering, architecture, Spanish Colonial and Spanish language studies, and selected historical documents and/or reports. After each entry is the particular citation(s) from which the definition is taken and, where appropriate, the relevant pages.

acequia: from the Arabic – Al as-sāqiya, meaning the "water canal"; a Hispanicized word to designate an irrigation canal or ditch. These ditches, or canals, were hand-dug and part of a larger system of water control predominantly used for agricultural purposes (Baker et al. 1974; Cox 2005; Merriam-Webster [MW]; Spanish Dictionary [SD]).

artesian: Descriptive of springs, wells, and aquifers that are distinguished by the upward movement of water under hydrostatic pressure in rocks or unconsolidated material beneath the Earth's surface. San Antonio is perched above the Edwards Aquifer, and the springs that formed the headwaters of the San Antonio River and San Pedro Creek were regular flowing artesian springs. The San Antonio River's water supply is dominated by artesian water drawn from the aquifer (Eckhardt 2016a; MW).

ashlar: Dressed stonework of any type, where the blocks have squared sides and carefully squared corners, and they are laid in regular courses, usually with fine joints. Ashlar faced stone can have a variety of finishes, but the most common varieties are smooth and rough/rock-faced. Other types are commonly associated with decorative work or detailing around windows, doors, and margins (Grieve 2008; Harris 1993; MW).

canal: An artificial waterway for irrigating land and sometimes referred to as an irrigation canal or ditch (MW).

canoa: Spanish for "canoe"; the term *canoa* denotes the shape and material of the open-ended wooden channel used to transit water from one *acequia* channel to another or across one channel as a type of conduit or expedient aqueduct (MW; SD).

coffer dam: A watertight enclosure placed or constructed in waterlogged soil or under water and pumped dry so that construction or repairs can proceed under normal conditions (Lerner and Lerner 2004).

crest: The top of a dam structure (Flynn 1892).

deadman: In civil engineering, a deadman is a type of anchor or tie for retaining walls. A buried beam is engaged with the backside or face of the wall and extended into the slope. The principle is that the same pressure pushing against the wall is pushing and holding the deadman and, therefore, the wall in place (Harris 1993).

***desa**güe*: Spanish, literally "outflow"; *desagües* are the individual branch ditches off of the *acequia* channels to bring water to particular parcels (MW; SD).

diversion dam: Diversion dams divert a portion of water from one place to another. Diversion dams only redirect a portion of flow, not 100 percent of the flow like an impoundment dam. There are many types of diversion dams, but chiefly in discussing the Spanish Colonial dams of San Antonio, they are referring to weir dams or wing dams (Eckhardt 2016a, 2016b; Flynn 1892; Lerner and Lerner 2004).

diversion pool: The pool of water formed behind a diversion dam and utilized to divert water into a canal. Excess water from the diversion pool flows over or around the diversion dam and returns to the original route of the river or stream (Cox 2005; Lerner and Lerner 2004).

headgate: The headgate is the main regulating apparatus at the head of a canal or *acequia*. Operation of the gate regulates the flow of water into the canal (Cox 2005; Flynn 1892).

headwaters: The source of a river or creek, in the case of the San Antonio River, the San Antonio Springs and associated springs located on the UIW campus. Likewise, the San Pedro Springs are the headwaters of San Pedro Creek.

headworks: The physically constructed infrastructure at the head of a canal for controlling the quantity of water required to be admitted to it. It consists of a diversion dam across the river, by which the water is checked and diverted into it, and a gate or regulator across the head of the canal, by which the proper quantity of water is admitted. In Spanish Colonial systems, the headworks consists of the diversion dam, the headgate, and *acequia* mouth (Cox 2005:1-9; Flynn 1892:79-80).

impoundment dam: These types of dams capture 100 percent of the flow of water that they interrupt. The captured water is collected in an impoundment pool and then redistributed through canals or irrigation pipes (Lerner and Lerner 2004).

impoundment pool: The catchment pool formed behind an impoundment dam (Lerner and Lerner 2004).

labor/labores: Spanish, literally "work/works"; Idiomatically, the term refers to the farms within an *acequia* system, e.g. Labores de Arriba (the upper farms) or Labores de Valero (the Valero Farms) (MW; SD).

Madre (**Ditch**): Spanish for "mother"; a Madre Acequia describes the main ditch of any large *acequia* system. There are *madre* ditches for all five of the San Antonio Spanish Missions (MW; SD).

Ojo de Agua: Spanish, literally the "Eye of Water"; describes a natural, spring-fed pool. In the case of San Antonio, it is used in reference to both the "Blue Hole" or San Antonio Springs and San Pedro Springs.

Paso de Tejas: Spanish, literally "The Texas Pass"; This was an historic ford on the San Antonio River in what is now Brackenridge Park. Its precise location has been a matter of debate with arguments for a Hildebrand Avenue or Tuleta Avenue crossing. A single late nineteenth-century map, Freisleben's *Location of Rock Quarry Road* Map of March 1879, has the notation "Old Texas Ford" at what later became the Tuleta Avenue River crossing (Freisleben 1879; MW; SD).

revetment: A revetment is a structure erected to prevent erosion by deflecting or absorbing the energy of water. In the case of the revetment described in this report, it is essentially a "buttress" designed to break up or dissipate the power/energy of flowing water (Harris 1993).

Saca de Agua: Spanish, literally "The Sack of Water"; this refers to the individual water rights for each parcel along the *acequia* system. Each parcel had dedicated rights to fixed amounts of water draws from the *acequia* with which to water their fields (SD).

sluice/sluice gate: Generally synonymous term for the headgate regulating water into a canal system (Flynn 1892:128-129).

spillway: A passageway through which surplus water escapes from a reservoir, lake, or the like. The word's origins are from the late nineteenth century, and it is not a term commonly used to describe Spanish Colonial features (MW).

suertes: Spanish, literally "chances"; the name given to the lottery system of land distribution used by the Spanish to assign land lots and accompanying water rights within *acequia* farm systems. These lots took their name from this practice and are often referred to in Spanish documents and later English documents by this term (SD).

toe: The lowest foundation or course of a wall that projects outward from the embankment. In dam construction, this refers to the juncture between the dam structure itself and the downstream ground surface (MW).

vara/varas: Spanish, literally for "rod/rods"; the standard Spanish unit of measurement, nearly equivalent to the English "yard". A *vara* is generally considered 33.33 inches in length.

water doors: The actual physical door(s) of the headgate at the mouth of a canal. Commonly referred to as the headgate.

water rents: The system of payments for water use from the municipal ditches during the Texas Republic through the late nineteenth century. The maintenance of the urban ditches was dependent on water rents in this period.

weir dam: A type of diversion dam that spans a river or creek and interrupts flow for a specific purpose. Some types of weir dams are used to reduce water velocity. In relation to the Spanish Colonial dams of San Antonio, the term describes dams that

cross or partially cross a stream or river, raising the height of the water behind the structure and diverting it into an *acequia* system (Cox 2005; Flynn 1892).

wing dam: A specific type of weir dam that consists of a structure projecting from a single bank for the purpose of diverting and directing flow into the mouth of an *acequia* system (Cox 2005; Flynn 1892; MW).

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Appendix 2:
Master Tables of Artifacts APE 1 and APE 2

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Table A2-1. Artifacts Recovered from APE 1

Unit/Trench	Superclass	Class	No.	Comments
T 5	Ceramic	Spanish Colonial Tin Glazed	1	majolica rim sherd (Mayorazgo/Aranama)
T 5	Ceramic	European Earthenware	1	refined earthenware (ironstone) plate bottom with John Wedge Wood maker's mark in the "Pearl" pattern which dates to 1841-1860
T 5	Ceramic	European Earthenware	1	rim sherd of refined earthenware (ironstone) with a blue on white transfer pattern
T 5	Ceramic	European Earthenware	2	joinable sherds of molded ironstone
T 5	Ceramic	European Earthenware	1	small ironstone platter sherd (refined earthenware – undecorated whiteware)
T 5	Ceramic	Porcelain	1	rim sherd of porcelain cup (demitasse)
T 5	Ceramic	European Earthenware	2	refined earthenware (ironstone) sherds
T 5	Ceramic	European Earthenware	1	sherd of refined earthenware (ironstone)
T 5	Glass	Container/Vessel	1	whole aqua coffin flask, three-part mold
T 5	Glass	Container/Vessel	1	dark brown gin bottle base
T 5	Glass	Container/Vessel	2	blue glass body panel fragments
T 5	Glass	Container/Vessel	1	fragment of olive green body panel
T 5	Glass	Container/Vessel	3	clear - base (1) and body (2)
T 5	Glass	Container/Vessel	1	fragment aqua body glass
T 5	Metal	Wire	1	twisted ferrous wire
T 10	Ceramic	European Earthenware	1	transferware (Mulberry)
T 10	Ceramic	European Earthenware	1	undecorated ironstone with maker's mark "The Potters Co-operative Co. USA East Liverpool OHIO, Semi-Vitreous, Z232"
T 10	Ceramic	Earthenware	1	semi-porcelain, rim*
T 10	Ceramic	Earthenware	1	semi-porcelain
T 10	Ceramic	Stoneware	1	undecorated stoneware
T 10	Ceramic	European Earthenware	1	undecorated ironstone
T 10	Glass	Container/Vessel	1	clear glass, diamond pattern
T 10	Glass	Container/Vessel	1	aqua container base, embossed "A B CO S"
T 10	Glass	Container/Vessel	1	aqua soda bottle base, embossed "SAN ANTO TEXA"
T 10	Glass	Container/Vessel	1	aqua bottleneck
T 10	Lithics	Biface	1	biface
T 10	Metal	Farm/Ranch/Tack related	1	scythe/sickle blade tip
T 10	Organics	Faunal Bone	1	faunal long bone
T 10	Organics	Faunal Bone	1	faunal bone
T 10	Organics	Mussel Shell	1	umbo
T 11	Ceramic	Spanish Colonial Lead Glaze	1	lead glaze rim sherd
T 11	Ceramic	European Porcelain	3	porcelain plate sherd
T 11	Ceramic	European Porcelain	1	porcelain cup sherd
T 11	Ceramic	European Porcelain	1	molded porcelain sherd
T 11	Ceramic	European Earthenware	6	undecorated whiteware
T 11	Ceramic	European Earthenware	2	undecorated whiteware cup base and body sherds
T 11	Ceramic	European Earthenware	2	undecorated whiteware platter rim sherds

*recovered from north end of wall

Table A2-1. Artifacts Recovered from APE 1, continued.

Unit/Trench	Superclass	Class	No.	Comments
T 11	Ceramic	European Earthenware	1	undecorated molded whiteware
T 11	Ceramic	European Earthenware	1	undecorated whiteware
T 11	Ceramic	European Earthenware	1	undecorated whiteware
T 11	Ceramic	European Earthenware	1	earthenware
T 11	Ceramic	European Earthenware	3	stoneware
T 11	Ceramic	European Earthenware	2	stoneware
T 11	Ceramic	European Earthenware	1	earthenware sherd
T 11	Glass	Container/Vessel	1	light amethyst glass cuspidor
T 11	Glass	Container/Vessel	1	light amethyst goblet fragment Lee, Late Paneled Grape Pattern 73
T 11	Glass	Container/Vessel	2	clear whiskey glass fragments
T 11	Glass	Container/Vessel	1	whole machine-made clear “Febriline” medicine bottle
T 11	Glass	Container/Vessel	1	unknown mfg. olive green body fragment
T 11	Glass	Container/Vessel	1	machine-made clear bottom - embossed “Kerr Glass Mfg Co”
T 11	Glass	Container/Vessel	4	unknown mfg. clear body fragments
T 11	Glass	Other Glass Objects	3	unknown mfg. molded/ribbed clear fragments
T 11	Glass	Container/Vessel	1	machine-made soda green 7UP® base
T 11	Glass	Container/Vessel	1	neck - machined lip - olive green
T 11	Glass	Container/Vessel	1	light green body fragment
T 11	Glass	Container/Vessel	1	emerald green base fragment “M” on bottom
T 11	Glass	Container/Vessel	1	machine-made clear “Aseptic” medicine bottle
T 11	Glass	Chimney	1	molded milk glass light shade fragment
T 11	Glass	Chimney	1	milk glass light shade fragment
T 11	Glass	Other Glass Objects	1	molded milk glass slipped in pink glass

*recovered from north end of wall

Table A2-2. Artifacts Recovered from APE 2

Unit/Trench	Depth (cmbd)	Superclass	Class	No.	Comments
U 1	Level 1 (20-40)	Lithics	Uniface	1	uniface with retouched edge
U 1	Level 2 (40-60)	Ceramic	European Porcelain	4	porcelain
U 1	Level 2 (40-60)	Ceramic	European Stoneware	1	stoneware
U 1	Level 3 (60-80)	Ceramic	European Earthenware	1	creamware - undecorated
U 1	Level 3 (60-80)	Ceramic	European Porcelain	1	porcelain
U 1	Level 3 (60-80)	Ceramic	European Stoneware	1	stoneware
U 1	Level 4 (80-100)	Metal	Fastener	1	bracket or hinge - ferrous
U 2	Level 2 (30-50)	Ceramic	European Stoneware	1	stoneware
U 2	Level 2 (30-50)	Glass	Container/Vessel	1	fragment of brown bottle glass
U 2	Level 3 (50-70)	Ceramic	European Semi-Porcelain	1	semi-porcelain
U 2	Level 3 (50-70)	Ceramic	European Stoneware	1	sewer pipe - stoneware
U 2	Level 3 (50-70)	Ceramic	European Stoneware	1	stoneware
U 2	Level 4 (70-90)	Ceramic	European Stoneware	1	stoneware
U 2	Level 4 (70-90)	Lithics	Burned Rock	1	burnt chert cobble
U 2	Level 6 (110-130)	Lithics	Debitage	2	flakes
U 2	Level 7 (130-150)	Organics	Mussel shell	1	shell fragment
U 3	Level 2 (20-40)	Organics	Faunal Bone	1	large mammal bone
U 4	Level 10 (170-190)	Glass	Container/Vessel	1	light aqua green coke bottle fragment - shoulder
U 5	Level 3 (50-70)	Glass	Container/Vessel	1	fragment of brown bottle glass
U 5	Level 3 (50-70)	Glass	Container/Vessel	1	clear body fragment
U 5	Level 3 (50-70)	Metal	Wire	1	wire - ferrous
U 4	Level 3 (50-70)	Glass	Container/Vessel	1	olive green body fragment
U 4	Level 3 (50-70)	Metal	Nails	2	cut nails - ferrous
U 4	Level 3 (50-70)	Metal	Nails	1	wire nail - ferrous
U 4	Level 5 (90-110)	Glass	Container/Vessel	2	fragments of brown bottle glass - 1 fragment is melted
U 4	Level 5 (90-110)	Metal	Containers/Caps	1	oxidized ferrous can remnants
U 4	Level 5 (90-110)	Metal	Containers/Caps	1	crown cap - ferrous
U 4	Level 6 (106-116)	Samples	Macrobotanical	1	wood sample
U 4	Level 6 (110-130)	Other	Unknown	1	not asphalt; hard to determine, appears organic; also found in level 11
U 5	Level 5 (90-110)	Metal	Nails	1	wire nail - ferrous
U 4	Level 7 (110-130)	Glass	Container/Vessel	1	emerald green 7UP® bottle neck fragment with decal lettering
U 4	Level 7 (110-130)	Glass	Container/Vessel	1	clear medicine bottle (small) base and body
U 4	Level 7 (110-130)	Glass	Other Glass Objects	1	light bulb fragment

Table A2-2. Artifacts Recovered from APE2, continued...

Unit/Trench	Depth (cmbd)	Superclass	Class	No.	Comments
U 4	Level 7 (110-130)	Lithics	Biface	1	medial biface fragment
U 4	Level 7 (110-130)	Metal	Fastener	1	iron object with concrete attached
U 4	Level 7 (110-130)	Metal	Nails	2	wire nail - ferrous
U 4	Level 9 (150-170)	Glass	Container/Vessel	1	light aqua green soda bottle fragment - shoulder with lettering
U 5	Level 6 (110-130)	Glass	Container/Vessel	1	fragment of brown bottle glass
U 5	Level 6 (110-130)	Glass	Container/Vessel	1	fragment of brown bottle glass
U 5	Level 6 (110-130)	Glass	Container/Vessel	1	olive green body fragment
U 5	Level 6 (110-130)	Glass	Flat/Window	2	aqua flat glass
U 5	Level 6 (110-130)	Lithics	Debitage	1	flake
U 5	Level 6 (110-130)	Lithics	Debitage	1	stream-rolled flake
U 5	Level 6 (110-130)	Metal	Containers/Caps	1	crown cap - ferrous
U 5	Level 6 (110-130)	Metal	Fastener	1	lead seal/pipe solder
U 6	Level 1 (10-30)	Construction	Asphalt	1	asphalt
U 6	Level 1 (10-30)	Glass	Container/Vessel	1	emerald green 7UP® bottle body fragment
U 6	Level 1 (10-30)	Lithics	Debitage	1	primary cortex flake
U 6	Level 1 (10-30)	Metal	Containers/Caps	1	pull tab - aluminum
U 6	Level 1 (10-30)	Samples	Macrobotanical	1	wood sample
U 8	Level 1 (0-20)	Lithics	Debitage	4	secondary (3) and tertiary (1)
T 2	N/A	Glass	Container/Vessel	1	heel and body wall fragment of brown BIM bottle glass - heavily patinated
U 6	Level 2 (40-60)	Ceramic	Other Ceramics	1	terracotta
U 6	Level 2 (40-60)	Glass	Container/Vessel	1	fragment of brown bottle glass
U 6	Level 2 (40-60)	Lithics	Specialized Tools	1	Guadalupe Tool
U 6	Level 2 (40-60)	Samples	Macrobotanical	1	wood sample
U 7	Level 2 (30-50)	Lithics	Debitage	4	tertiary flakes
U 7	Level 4 (70-90)	Glass	Container/Vessel	3	fragments of brown bottle glass
U 7	Level 4 (70-90)	Metal	Nails	1	wire nail - ferrous
U 7	Level 4 (70-90)	Organics	Snail	1	*Rumina decollata* shell
U 4	Level 8 (130-150)	Construction	Mortar/Plaster	1	mortar sample
U 4	Level 8 (130-150)	Construction	Other	1	cement
U 4	Level 8 (130-150)	Glass	Container/Vessel	1	fragment of brown bottle glass
U 4	Level 8 (130-150)	Glass	Other Glass Objects	1	light bulb fragment with metal socket screw base
U 4	Level 8 (130-150)	Glass	Other Glass Objects	36	light bulb fragment
U 4	Level 8 (130-150)	Lithics	Core	1	core
U 4	Level 8 (130-150)	Metal	Nails	3	wire nail - ferrous
U 4	Level 8 (130-150)	Metal	Wire	1	wire - ferrous
U 4	Level 8 (130-150)	Organics	Snail	2	*Rumina decollata* shells
U 7	Level 5 (90-110)	Lithics	Debitage	1	secondary cortex flake
U 6	Level 3 (60-80)	Glass	Container/Vessel	1	whole brown glass bottle – machine-made with crown cap
U 4	Level 9 (150-170)	Construction	Brick	1	possibly fire brick
U 4	Level 9 (150-170)	Construction	Other	1	cement

Table A2-2. Artifacts Recovered from APE2, continued...

Unit/Trench	Depth (cmbd)	Superclass	Class	No.	Comments
U 4	Level 9 (150-170)	Glass	Container/Vessel	3	clear body fragments and one pint whiskey base embossed with “FILL PINT” and mold No. “2”
U 4	Level 9 (150-170)	Glass	Flat/Window	1	clear flat glass fragment
U 4	Level 9 (150-170)	Metal	Nails	4	wire nail - ferrous
U 4	Level 9 (150-170)	Metal	Wire	1	wire - ferrous and insulated
U 5	Level 6 (110-130)	Glass	Container/Vessel	1	light aqua green soda bottle fragment - neck
U 6	Level 4 (80-100)	Glass	Container/Vessel	1	basal fragment of machine-molded brown bottle glass
U 7	Wall Fall	Glass	Container/Vessel	4	clear medicine bottle fragments “Patent No. 105321” embossed on base fragment indicates this was a Norwich Pharmaceutical Bottle manufactured 1916+
U 7	Wall Clean	Metal	Containers/Caps	1	pull tab - aluminum
U 7	Level 7 (130-150)	Lithics	Debitage	1	secondary cortex flake
U 7	Level 7 (130-150)	Samples	Macrobotanical	1	wood sample
U 4	Level 10 (170-190)	Glass	Container/Vessel	1	aqua rim/neck fragment - crown cap bottle
U 4	Level 10 (170-190)	Glass	Container/Vessel	1	emerald green 7UP® bottle body fragment
U 4	Level 10 (170-190)	Metal	Nails	2	wire nail - ferrous
U 4	Level 10 (170-190)	Metal	Other Metal Objects/Un-known	1	unidentified ferrous
U 5	Level 3 (50-70)	Glass	Container/Vessel	1	light aqua green soda bottle fragment - body
U 6	Level 5 (100-120)	Glass	Container/Vessel	1	fragment of brown bottle glass
U 6	Level 5 (100-120)	Glass	Flat/Window	1	clear flat glass fragment
U 6	Level 5 (100-120)	Lithics	Debitage	1	flake
U 6	Level 5 (100-120)	Organics	Snail	1	*Mealnoides tuberculatus*
U 4	Level 11 (190-210)	Metal	Fastener	1	hinge fragment - ferrous
U 4	Level 11 (190-210)	Metal	Nails	1	large wire nail - ferrous
U 4	Level 11 (190-210)	Metal/Ceramic	Other Metal Objects/ Unknown	1	Champion Sparkplug, 1908 or later, nickel electrode and ferrous base with semi-porcelain insulator
U 4	Level 11 (190-210)	Other	Unknown	1	This is not asphalt. Hard to determine. Appears organic. Also found in level 6
U 9	Level 2 (30-50)	Ceramic	Other ceramics	1	terracotta
U 9	Level 2 (30-50)	Lithics	Debitage	1	flake
U 4	Level 12 (210-230)	Samples	^{14}C	1	bag of collected charcoal
FEATURE 4	N/A back dirt	Ceramic	European Stoneware	1	stoneware
U 11	70-90	Samples	Macrobotanical	1	wood sample
T 10	N/A back dirt	Lithics	Edge-modified flakes	2	two edge-modified flakes
T 10	N/A back dirt	Lithics	Debitages	2	stream-rolled flakes
T 10	N/A back dirt	Metal	Nails	6	ferrous spikes
T 10	N/A back dirt	Organics	Faunal Bone	1	small mammal rib fragment
GAP 5	N/A back dirt	Organics/ Metal	Wooden Objects and Nail	1	wood with metal fastener
FEATURE 2	NE-SW	Construction	Mortar/Plaster	1	mortar sample

Table A2-2. Artifacts Recovered from APE2, continued...

Unit/Trench	Depth (cmbd)	Superclass	Class	No.	Comments
GAP 5	N/A West wall	Personal	Jewelry	1	cuprous ring setting
S. End of Dam	N/A back dirt	Lithics	Cores	1	core
GAP 5	N/A back dirt	Ceramic	European Earthenware	2	low-fired soft paste earthenware
GAP 5	N/A back dirt	Ceramic	European Earthenware	4	semi-porcelain decalcomania
GAP 5	N/A back dirt	Ceramic	European Earth-enware	15	undecorated whitewares
GAP 5	N/A back dirt	Ceramic	European Earthenware	2	soft paste earthenware
GAP 5	N/A back dirt	Ceramic	European Earthenware	1	yellow ware with alkaline slip
GAP 5	N/A back dirt	Ceramic	European Earthenware	1	stoneware with green glaze
GAP 5	N/A back dirt	Ceramic	European Earthenware	1	sponge decorated rim sherd
GAP 5	N/A back dirt	Ceramic	European Semi-Porcelain	2	semi-porcelain
GAP 5	N/A back dirt	Ceramic	European Semi-Porcelain	3	semi-porcelain
GAP 5	N/A back dirt	Ceramic	European Stoneware	3	stoneware
GAP 5	N/A back dirt	Ceramic	European Stoneware	1	stoneware - Schiedam Gin Jug
GAP 5	N/A back dirt	Ceramic	European Stoneware	3	stoneware sherd (1 brown with “LO” stamped
GAP 5	N/A back dirt	Ceramic	European Stoneware	1	Schiedam Gin Jug sherd
GAP 5	N/A back dirt	Ceramic	Spanish Colonial Lead Glaze	1	lead glaze
GAP 5	N/A back dirt	Construction	Brick	1	half of a red D’Hanis brick
GAP 5	N/A back dirt	Construction	Mortar/Plaster	1	sample bag of mortar
GAP 5	N/A back dirt	Glass	Chimney	2	molded milk glass fragments - lamp or chimney
GAP 5	N/A back dirt	Glass	Container/Vessel	2	top to shoulder and base of three-part mold aqua bottle w/tooled lip
GAP 5	N/A back dirt	Glass	Container/Vessel	4	top to shoulder, base and panel fragments (2) of a three-part mold clear patent medicine bottle with a machine-tooled lip
GAP 5	N/A back dirt	Glass	Container/Vessel	8	clear glass medicine bottle fragments (2) machine-made bottles; 1 large (5 fragments) and 1 small bottle (3 fragments)
GAP 5	N/A back dirt	Glass	Container/Vessel	1	complete Eagle Brand Shoe Polish Bottle (clear)
GAP 5	N/A back dirt	Glass	Container/Vessel	5	misc. amethyst glass: fragment (1) of pressed Late Paneled Grape Pattern; mug base (1); body panel fragments (3)
GAP 5	N/A back dirt	Glass	Container/Vessel	1	emerald green body fragment of BIM Bottle
GAP 5	N/A back dirt	Glass	Container/Vessel	2	olive green body fragment (1); light green body fragment (1)

Table A2-2. Artifacts Recovered from APE2, continued...

Unit/Trench	Depth (cmbd)	Superclass	Class	No.	Comments
GAP 5	N/A back dirt	Glass	Container/Vessel	2	machine-made crown cap top brown beverage bottle (1); machine-made brown body fragment (1)
GAP 5	N/A back dirt	Glass	Container/Vessel	5	Duraglass fragments (5), base has a date code of 1953 and was produced in the Fairmont WV plant. Most likely 7UP®
GAP 5	N/A back dirt	Glass	Container/Vessel	1	fragment of clear chimney glass
GAP 5	N/A back dirt	Glass	Container/Vessel	6	lip and neck fragment (1) of a machine-made three part mold bottle with a machine-tooled lip (aqua) and aqua body fragments (5)
GAP 5	N/A back dirt	Glass	Container/Vessel	1	nearly whole clear glass medicine bottle; machine-made three-part mold with hand-tooled neck and lip
GAP 5	N/A back dirt	Glass	Container/Vessel	10	clear glass fragments: drinking glass fragments - lip (1) and base (1); molded glass lid fragment (1); shoulder fragments (3) representing at least 2 different vessels; body fragments (4), one embossed "(o)NE QUART"
GAP 5	N/A back dirt	Glass	Flat/Window	3	clear flat glass fragments
GAP 5	N/A back dirt	Lithics	Biface	1	bifacial tool
GAP 5	N/A back dirt	Lithics	Debitage	6	flakes
GAP 5	N/A back dirt	Lithics	Other Groundstone	1	whetstone (historic)
GAP 5	N/A back dirt	Metal	Farm/ Ranch/Tack	1	mule shoe or horseshoe
GAP 5	N/A back dirt	Metal	Fastener	1	cuprous or brass button
GAP 5	N/A back dirt	Metal	Household Items	1	padlock ferrous bail and nickel/lead alloy lock
GAP 5	N/A back dirt	Metal	Nails	1	large wire nail
GAP 5	N/A back dirt	Metal	Nails	1	square cut nail
GAP 5	N/A back dirt	Metal	Other Metal Objects/ Unknown	8	ferrous concretions - one appears to be an ornamental fence spear/spike
GAP 5	N/A back dirt	Metal	Other Metal Objects/ Unknown	1	unidentified ferrous object
GAP 5	N/A back dirt	Metal	Other Metal Objects/ Unknown	1	section of metal pipe (1 of 2)
GAP 5	N/A back dirt	Metal	Other Metal Objects/ Unknown	1	section of metal pipe (2 of 2)
GAP 5	N/A back dirt	Organics	Faunal Bone	1	*Bos taurus* long bone - missing epiphyses
GAP 5	N/A back dirt	Organics	Faunal Bone	1	*Bos taurus* rib
GAP 5	N/A back dirt	Organics	Faunal Bone	26	fragmentary bone - 1 bag of 26 count
GAP 5	N/A back dirt	Personal	Other	1	unknown material - may be *gutta percha*
N End of Dam	N/A back dirt	Ceramic	Spanish Colonial Lead Glaze	7	lead glaze
Plank - Dam	N/A 110 cm from N End	Samples	Macrobotanical	1	wood sample from plank at N end of dam

Table A2-2. Artifacts Recovered from APE2, continued....

Unit/Trench	Depth (cmbd)	Superclass	Class	No.	Comments
Post - Dam	N/A 4th post from end	Samples	Macrobotanical	1	wood sample from 4th post from N end of dam
Post - Dam	N/A S End	Samples	Macrobotanical	1	wood sample from post at S end of dam
U 2	N/A	Construction	Mortar/Plaster	1	concrete/cement sample
U 2	N/A	Construction	Mortar/Plaster	1	concrete/cement sample
U 2	N/A	Construction	Mortar/Plaster	1	concrete/cement sample
U 2	N/A	Construction	Mortar/Plaster	1	concrete/cement sample
U 2	N/A	Construction	Mortar/Plaster	1	concrete/cement sample