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Archeological Survey Of The Jefferson Street Lift Station Force And Gravity Main Corridors And Louise Hays And Lehmann-Monroe Parks, City Of Kerrville Kerr County, Texas

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ARCHEOLOGICAL SURVEY OF THE JEFFERSON STREET LIFT STATION FORCE AND GRAVITY MAIN CORRIDORS AND LOUISE HAYS AND LEHMANN-MONROE PARKS, CITY OF KERRVILLE, KERR COUNTY, TEXAS

by

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TABLE OF CONTENTS

LIST OF FIGURES

ABSTRACT

In April 2013, personnel with Prewitt and Associates, Inc., performed an archeological survey for proposed sewer and water main improvements and park improvements in the City of Kerrville, Texas. The work was done for Freese and Nichols, Inc., and the City of Kerrville, under Texas Antiquities Permit No. 6508. Three contiguous project areas totaling 96 acres were surveyed: the Jefferson Street lift station force main corridor, the Jefferson Street gravity main and water line corridor, and Louise Hays and Lehmann-Monroe Parks. In total, 62 shovel tests and 4 backhoe trenches were excavated. No new archeological sites were found. Two previously recorded sites (41KR105 and 41KR677) were shovel tested and evaluated. Both are disturbed, sparse lithic scatters and lack important information; they are considered ineligible for listing in the National Register of Historic Places or designation as State Archeological Landmarks.

Survey determined that the modern Guadalupe River floodplain at Kerrville consists of extensive gravel deposits that appear to be the result of recent high-energy deposition associated with periodic scouring of the river valley. Given its age and the depositional/erosional context, this floodplain is very unlikely to contain intact archeological sites. The south end of the Jefferson Street lift station force main, ca. 80 percent of Louise Hays and Lehmann-Monroe Parks, and all of the gravity main and water line corridor are in this floodplain setting; no further archeological work is warranted in any of these areas. The west edge of the park area and the north part of the force main corridor are on higher terraces with a greater potential for archeological sites, but survey indicates that both areas are substantially disturbed and do not contain intact archeological sites. Hence, no further archeological work is recommended in either area.

ACKNOWLEDGEMENTS

The success of this project was due to the assistance of many individuals. John Dockall served as the project archeologist and principal author of this report. In the field, colleagues Eloise Gadus and Karl Kibler provided able assistance during survey, shovel testing, and backhoe trenching. Ross C. Fields served as principal investigator. Stafford Gunning, project coordinator at Freese and Nichols, Inc., provided project alignment maps and information in addition to assisting with property access. Kyle Barrow, project engineer with the City of Kerrville, provided valuable assistance in coordination and project area background. Stuart Barron, Water/Wastewater Manager for the City of Kerrville, provided useful information on the water right and dam location in Louise Hays Park. Also critical were the efforts of City of Kerrville backhoe operators Louis Fender, Matthew Zapata, and Jeremy Wood. Sandra L. Hannum produced all field maps and illustrations for this report, and Mr. Fields and Elaine Robbins provided editorial assistance.

INTRODUCTION

In April 2013, personnel with Prewitt and Associates, Inc., conducted an intensive pedestrian cultural resources survey for three contiguous projects consisting of proposed sewer and water line corridors and park improvements in the City of Kerrville, Texas (Figure 1). Fieldwork for all projects was done at the same time, and all three are incorporated into this report.

The first project area consists of the 3,300-ft-long Jefferson Street lift station force main corridor (see Figure 1). The corridor starts just south of the Guadalupe River at FM 394 (Francisco Lemos Street), crosses the river, and proceeds northeast just west of and along Town Creek. Most of the southern part (ca. 850 ft) will be in the existing 50-ft-wide right of way of Lowry Street; the remainder will have a 20-ft permanent easement and a 20-ft temporary construction easement. The total horizontal Area of Potential Effect (APE) encompasses about 2 acres, and the vertical APE is 5–6 ft.

The second project area consists of the 91-acre Louise Hays and Lehmann-Monroe Parks (see Figure 1). It is just south and west of the Guadalupe River and north and east of Thompson Drive. The two parks are contiguous, with State Highway 16 (Sidney Baker Street) bisecting the north portion. Proposed improvements include renovation of a large pavilion and barbecue facility, construction of a new amphitheater, construction of a new sprayground with parking, construction of trailheads to the River Trail, improvement of existing parking facilities, construction of roads and river access, construction of additional playgrounds and picnic areas, and restroom and utility upgrades and improvements. Most of these improvements will be in a ca. 20-acre area along Thompson Drive. Specific data regarding the depths of impacts for the various park improvements are not available, but most impacts, with the exception of construction of the amphitheater, should go no deeper than 1.5 ft. Hence, within areas with existing facilities, impacts will not exceed the existing disturbance depth.

The third project area consists of a 6,770-ft-long gravity main and water line corridor, most of which is within Louise Hays Park (Figure 1). The corridor is just south and west of the Guadalupe River on the 100-year floodplain; its north terminus abuts the south end of the Jefferson Street lift station force main corridor immediately north of FM 394 (Francisco Lemos Street), and its south end is immediately south of G Street. Where it crosses private land, the corridor will have a 25-ft-wide permanent easement and an adjacent 20-ft-wide temporary construction easement; the same 45-ft-wide construction limit will apply where it crosses city-owned land. The total horizontal Area of Potential Effect will be 7 acres. The vertical APE will vary from 3.5 ft to 14.5 ft.

The project was completed for the City of Kerrville under a subcontract with Freese and Nichols, Inc., and under Texas Antiquities Permit No. 6508 issued by the Texas Historical Commission. The survey was conducted to comply with the requirements of the Antiquities Code of Texas (Texas Natural Resource Code of 1877, Title 9, Chapter 191, as amended) and the implementing regulations (36 CFR 800) for Section 106 of the National Historic Preservation Act of 1966.

ENVIRONMENTAL BACKGROUND

The project area is in the east-central portion of Kerr County, Texas, within the city limits of Kerrville. The area lies within the Balconian biotic province of Texas (Blair 1950:112–115). This province includes a diverse array of faunal resources associated with adjacent biotic provinces but is characterized by a unique floral community. Because of urban development, however, the project area reflects only a small portion of the environmental diversity associated with the Balconian region.

Geology and Soils

Kerr County is within the limits of the Edwards Plateau, a part of the Great Plains physiographic province (Dittemore and Coburn 1986:76). The Balcones Escarpment fronts the Edwards Plateau to the south and east. The regional geology is dominated by lower Cretaceous limestone formations such as the Fort Terrett and the upper member of the Glen Rose Limestone, but the immediate project area contains the floodplain of the Guadalupe River and Quaternary terrace deposits. The channel of the Guadalupe River is incised into the Glen

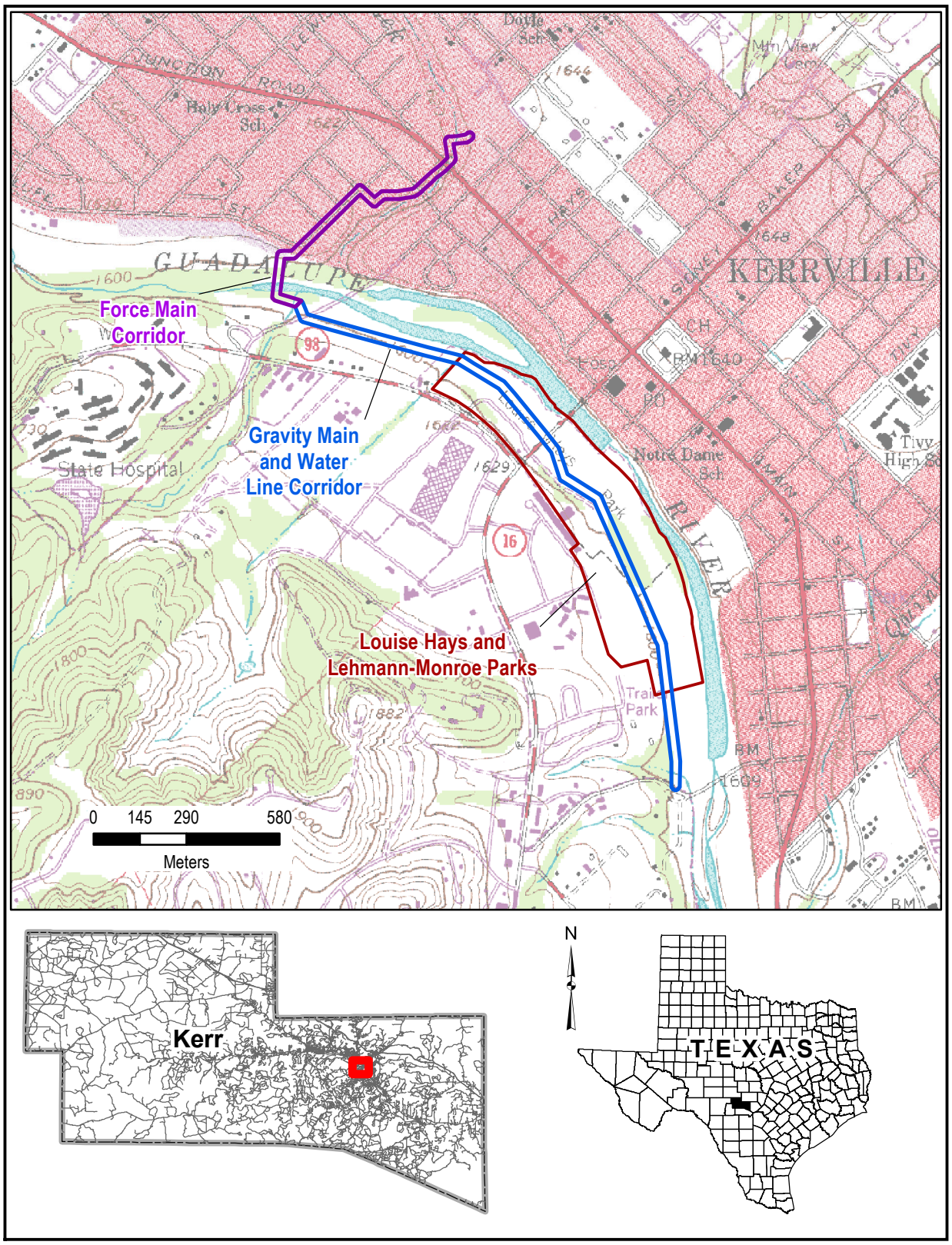

Figure 1. Project location map.

Rose limestone (Bureau of Economic Geology 1981). Topography consists of steep narrow canyons deeply eroded into the surrounding Cretaceous carbonate bedrock separated by broad gently rolling stream divides and eroded uplands. Larger streams have broad valleys with Quaternary alluvial sequences (Dittemore and Coburn 1986:76).

Project area soils are dominated by both terrace and stream-course deposits associated with Town Creek and the Guadalupe River. The northern third of the project area along the Jefferson Street force main includes primarily Boerne series soils along Town Creek to its confluence with the Guadalupe River. Boerne soils are loamy alluvial sediments, frequently flooded and situated on floodplains and stream terraces with 1 to 5 percent slopes (Dittemore and Coburn 1986:62). The lower two-thirds of the project area are directly along the present floodplain of the Guadalupe River and include portions of Orif-Boerne association soils and Urban Land-Oakalla complex soils. Soils of the Orif-Boerne association are frequently flooded and consist of loamy and gravelly deposits on floodplains to a height of 3–6 ft above stream channels. Exposures parallel the stream channels, and slopes are 1 to 5 percent. A small area of Urban Land-Oakalla complex soils is present on the south end of the project area. These soils are level to gently sloping and are situated within urban areas of Kerrville and along the Guadalupe River (Dittemore and Coburn 1986:36). Slopes vary between 0 and 1 percent. The Oakalla portion is a well-drained dark gray brown silty clay loam and is only slightly prone to flooding.

Geomorphology and Alluvial Geology of the Guadalupe River Valley

Much of the project area parallels the Guadalupe River and is situated on the modern floodplain, a higher alluvial surface, and the scarp that separates the two constructional surfaces. The higher alluvial surface on the south and west side of the river, designated T_1, is a Holocene terrace. Louise Hays and Lehmann-Monroe Parks are mostly (ca. 80 percent) on the modern floodplain, with the remainder on the T_1 surface. The gravity main and water line corridor from Francisco Lemos Bridge to the G Street lift station is entirely within the active floodplain of the Guadalupe River.

The T_1 surface stands 5–6 m above the Guadalupe River. Based on investigations conducted ca. 3.3 km upstream from the project area, Abbott (2008) notes that the T_1 surface was abandoned around 5,000 years ago. Abbott (2008) notes the presence of two depositional units below this surface: Unit 2, a late Pleistocene fill; and Unit 3, a late Pleistocene to early Holocene fill. Radiocarbon ages on bulk humates collected from several core samples were inconclusive regarding the age of Unit 2, but Abbott (2008:20) suggests its deposition ceased by around 15,000 to 18,000 years ago. At that time, the Guadalupe River downcut, incising the bedrock an additional 2.0 to 2.5 m. The system started to aggrade again around 13,000 years ago based on radiocarbon ages from Unit 3. Unit 3 "incorporates a diverse suite of sediments dominated by thick gravels that fine upward into loams" (Abbott 2008:12). Similar deposits were observed in T_1 exposures throughout the project area. The Gatlin site (41KR621), an Early to Late Archaic campsite ca. 3.3 km upstream from the project area, occupies the T_1 terrace of the Guadalupe River (Houk et al. 2008).

Most of the Jefferson Street lift station force main corridor north of the river is on a terrace that may be comparable to the T_1 to the south and west, although it has not been investigated sufficiently to be certain, or within the narrow valley of Town Creek incised into this terrace. Bore hole data indicate that there are 7–9 ft of terrace sediments and introduced fill above limestone bedrock here. The south end of the force main corridor is on the modern floodplain below Lowry Street.

Abbott (2008:17) defined the deposits of the modern river floodplain as Unit 4, consisting of brown and light gray loamy gravel covered by a thin deposit of brown sandy loam. No radiocarbon ages were derived for Unit 4, but he noted that the potential for archeological materials in good context in Unit 4 is very poor because of its gravelly nature indicating high-energy deposition. Investigation conducted during the projects reported here confirms this conclusion and suggests that these gravel deposits are mostly or entirely of recent age and thus unlikely to host intact archeological sites. These gravelly deposits have been reworked

frequently by substantial flood events. Historic floods are known to have inundated the area now occupied by Louise Hays Park, and a major flood in 1932 created the flood chute north of the park. Much of the material retained by the existing dam and spillway in the park is also probably relatively recent and considerably reworked. A series of six bore holes in the gravity main and water line corridor indicate that this portion of the floodplain contains 7–13 ft of mostly gravelly deposits above limestone bedrock.

Climate

Summers in Kerr County typically are hot, and winters are warm with occasional short-duration cold periods. The average winter temperature is 47ºF with an average daily minimum temperature of 33ºF. Summer temperatures average 80ºF with an average daily maximum of 92ºF (Dittemore and Coburn 1986). Total annual precipitation is about 30 inches, with 60 percent falling between April and September. Snowfall is a generally rare occurrence.

Flora and Fauna

Characteristic plant associations in the region include cedar (*Juniperus mexicana*), Texas oak (*Quercus texana*), and stunted live oak (*Quercus virginiana*). Vegetation patterns and plant communities along much of the project area are dominated by streamside species such as bald cypress (*Taxodium disticum*), sycamore (*Platanus occidentalis*), and some black willow (*Salax nigra*). Floodplains support combinations of oak, elm, and hackberry. Other species include pecan (*Carya illinoiensis*), eastern cottonwood (*Populus deltoides*), live oak, Texas oak, chinkapin oak (*Quercus muhlenbergii*), ash (*Franixus pennsylvanica*), American elm, and cedar elm (Riskind and Diamond 1986:24–25). Steep slopes and uplands support a more-woodland community that varies from evergreen junipers to mixed oaks-hardwoods.

Blair (1950:112–115) includes 57 mammal species, 3 species of lizards, 36 snake species, 15 anuran species, and 7 species of urodeles in the Balconian province. The species variety is reflective of populations from the adjacent Austroriparian, Tamaulipan, Chihuahuan, and Kansan biotic provinces. Many of these were part of the diet of Native Americans in the region. Important subsistence-related species included bison (*Bison bison*), antelope (*Antilocapra americana*), and white-tailed deer (*Odocoileus virginianus*).

ARCHEOLOGICAL BACKGROUND

Previous Research

The Texas Historical Commission's Archeological Sites Atlas shows two previously recorded archeological sites (41KR105 and 41KR677) within the project area and seven within 1 km of it. Site 41KR105 is a diffuse scatter of lithic material across a flat level surface capped by Orif-Boerne soils on the lower riverside portion of Louise Hays Park. Site 41KR677 is a heavily disturbed, diffuse lithic scatter located atop a level surface capped with Urban Land-Oakalla complex soils above the Guadalupe River at the south end of Lehmann-Monroe Park. The seven sites within 1 km of the project area consist of three prehistoric sites (41KR93, 41KR118, and 41KR534), three historic sites (41KR707, 41KR532, and 41KR702), and one site with historic and prehistoric components (41KR533). All three prehistoric sites are burned rock middens. Site 41KR118 has been destroyed by construction of an apartment complex. The three historic sites include two late-nineteenth-century to early-twentieth-century trash dumps (41KR707 and 41KR702) and the remains of a nineteenth-century saloon (41KR532). Site 41KR533 is a nineteenth-century house that also has a subsurface prehistoric component.

Recent investigations at the nearby Gatlin site (41KR621), 3.3 km upstream from the present project area, recovered significant data about area prehistory. Those excavations documented four distinct occupation zones representing Early Archaic, Middle Archaic, and mixed Middle and Late Archaic subperiods (Houk et al. 2008). The lowermost occupation zone (OZ1) represents the lower Early Archaic and was radiocarbon dated between 6,600 and 6,060 B.P.; it was associated with Early Barbed, Martindale, and Gower dart point types. Occupation Zone 2 also represents the Early Archaic period but was dated on the basis of projectile point styles like Gower,

Martindale, Bandy, and Baker. Occupation Zone 3 appears to span the transition between the Early and Middle Archaic based on dart point styles like Early Triangular, Nolan, and Bell/Andice. Radiocarbon assays from this zone range from 4,500 to 3,850 B.P. The youngest component (OZ4) represents a considerably mixed occupation record from the Middle to Late Archaic periods associated with an extensive burned rock midden and nine other features. Radiocarbon dates span a time interval from 3,900 to 1,290 B.P.

Culture History

The project area cultural chronology is typical of the Edwards Plateau and central Texas regions, which has been subdivided into three archeological periods: Paleoindian, Archaic, and Late Prehistoric. The cultural sequence and typical characteristics of each period have been defined and refined by Collins (1995, 2004) and Johnson and Goode (1994).

Paleoindian Period

Collins (1995, 2004:116–119) defines the Paleoindian period as lasting from ca. 11,500 to 8,800 B.P. and proposes a two-part subdivision into early and late subperiods or horizons characterized by distinctive styles of projectile points and stone tool technologies: Clovis and Folsom. Clovis horizon data from central Texas and elsewhere strongly suggest a generalized hunting and gathering life supported by technology to exploit larger game. In contrast, sites with Folsom components indicate a subsistence system and associated technology strongly oriented to large game.

Also significant is the evidence for an onset of an Archaic way of life within the terminus of the Late Paleoindian period (Collins 2004:118–119; Masson and Collins 1995). This transition is readily observed in the technological differences between projectile point styles such as Wilson, Golondrina-Barber, and St. Mary's Hall. The presence of other point styles like Angostura within Late Paleoindian and Early Archaic contexts indicates the existence of a defined transition between these periods (Collins 2004:118; Dockall and Pevney 2005; McKinney 1981; Thoms 1995a, 1995b; Thoms et al. 1996).

Archaic Period

The Archaic is recognized as a period of intensification of subsistence patterns that began during the Late Paleoindian period and is marked by increasing diversity in material culture and ground stone technology (Collins 2004:119). In central Texas, the extensive use of various types of heated rock features for preparation of root foods is a significant hallmark. The Archaic period of central Texas is divided into early, middle, and late subperiods (Collins 2004; Johnson and Goode 1994; Prewitt 1981, 1985).

The Early Archaic subperiod dates from ca. 8,000 to 6,000 B.P. and is divided into three point style intervals: Angostura, Early Split Stem, and Martindale-Uvalde (Collins 2004:119). Human groups were loosely organized into small mobile hunter-gatherer band units (Weir 1976:115–122). Sites of this subperiod are often small, broadly scattered, and isolated on prominences or terraces. Broadly scattered sites and greater technological diversity suggest a high degree of group mobility. Various point styles are included, such as Angostura, Gower, Jetta, Martindale-Uvalde, and other split-stem forms. Other artifact types include Clear Fork and Guadalupe bifaces, Waco sinkers and grooved bola stones, and a wide diversity of unifacial and unretouched implements. Early Archaic components have been documented principally along the southern and eastern margins of the Edwards Plateau (Collins 2004:119; Johnson and Goode 1994; Kibler and Scott 2000; McKinney 1981). This general distribution pattern may represent a response to various environmental or climatic factors and the use of well-watered areas within the live oak savannahs (Collins 2004:120). The Early Archaic components at Gatlin and other sites contain burned rock features such as middens, hearths, and pits, and technological diversity suggests exploitation of a range of resources, especially roots, nuts, and bulbs. The specialized cooking and processing facilities at many of these sites represent precursors of the larger burned rock middens that have become the hallmark of the Middle and Late Archaic in central Texas and the Edwards Plateau (Collins 2004:120).

The Middle Archaic subperiod has an age range of ca. 6,000 to 4,000 B.P. and is further subdivided into three projectile point style

intervals: Bell-Andice-Calf Creek, Taylor, and Nolan-Travis (Collins 2004:120). Commonly, sites of this time are larger and more abundant and exhibit a broader geographic distribution, implying increased populations (Prewitt 1981:73; Weir 1976:124–126). These characteristics could also suggest larger hunter-gatherer group size or increasing sedentism. A documented shift from a mesic environment to drier conditions and a possible expansion of the ranges of succulent plant foods like sotol and lechuguilla may explain some of the changes in cooking and food processing technologies evident during the Middle Archaic. A reliance on hunting and extensive processing of plant foods is indicated by changes in both chipped and ground stone technologies.

The Late Archaic subperiod extends from ca. 4,000 to 1,300 or 1,200 B.P. (Collins 2004:121) and was associated with a gradual return to more-mesic conditions from the more-xeric setting at the end of the Middle Archaic. Collins (2004) proposes six projectile point style intervals for this portion of the Archaic: Bulverde, Pedernales-Kinney, Lange-Marshall-Williams, Marcos-Montell-Castroville, Ensor-Frio-Fairland, and Darl. With the exception of Bulverde, all intervals are represented by well-stratified and dated components at a number of sites. The subsistence economy of the Late Archaic represents a continuance of Middle Archaic practices involving the use of heated rock cooking facilities (Collins 2004:121). In general, the trends that emerge for the Late Archaic include increased population, continued and intensified use of various burned rock features, further diversification of projectile point styles, and participation of central Texas groups in an interregional exchange system involving much of southeastern North America.

Late Prehistoric Period

The Late Prehistoric period is divided into early and late subperiods and two projectile point style intervals (Collins 2004:113, 122–123), spanning from ca. 1,200 B.P. to the Historic period. A date of A.D. 1600 is often used as a terminus for the Late Prehistoric period (Black 1989:32). The early subperiod (Austin) is associated with the Scallorn arrow point style, and the late subperiod (Toyah) with the Perdiz style. The most distinctive break from the Late Archaic is the technological shift from dart points to arrow points. Otherwise, there was a continuation of the basic pattern of hunting and gathering subsistence from the Late Archaic.

PROJECT DESIGN AND METHODS

The file search and literature review for the project area and surrounding region conducted prior to fieldwork indicated the presence of a number of prehistoric and historic archeological sites, and thus the opportunity to encounter additional archeological remains was considered good. This was suggested especially by the recent investigations upstream at the Gatlin site (41KR621) (Houk et al. 2008).

Fieldwork consisted of intensive pedestrian survey with both shovel testing and backhoe trenching. Two-person crews did the work on April 9–12 and April 16–19, 2013. Intensive pedestrian survey was performed by two archeologists who walked over 100 percent of the three project areas, except for ca. 750 ft of the gravity main and water line corridor where right of entry had not been obtained (i.e., the Rio Robles tract), at intervals of 15 m or less, examining the ground surface and existing subsurface exposures, such as cut banks, for archeological materials. Shovel tests and backhoe trenches were excavated in areas that were judged to have the potential for buried archeological remains and where ground surface visibility was less than 30 percent. Shovel tests were about 30 cm in diameter and were excavated to depths of 20–100 cm. The sediments removed were screened through 1/4-inch-mesh hardware cloth or sorted through carefully with a trowel to search for artifacts. Backhoe trenches were 5.3 to 9.0 m long, averaging 6.4 m, and about 0.6 m wide. They were excavated to depths of 0.9–2.2 m, where basal gravels and sands were encountered. Due to safety concerns, the portions of trenches that extended below 1.5 m were assessed from the ground surface. The sediments removed from the trenches were not screened, but the trench walls and backdirt piles were examined for artifacts and other cultural materials.

A total of 64 shovel tests and 4 backhoe trenches were excavated throughout the three project areas, which total 96 acres. Also, five stratigraphic profiles were cut and documented

along selected cut banks to determine the depositional history and nature of the deposits. This level of subsurface inspection exceeds the requirements of the Texas Historical Commission's Archeological Survey Standards for Texas for projects of this size (1 test per 2 acres), particularly given the extent of disturbance and the fact that much of the area surveyed is on the modern Guadalupe River floodplain consisting of recent gravel bar deposits and numerous areas scoured by flooding. The original survey design called for much more trenching, with ca. 20 trenches at 100-m intervals along the gravity main and water line corridor. This plan was altered, however, when surface survey and shovel testing and then initial trenching revealed that the modern floodplain has little or no potential for intact archeological sites. Ultimately, almost all of the shovel testing and trenching was done within the Louise Hays and Lehmann-Monroe Parks project area, as the gravity main and water line route is restricted to the modern floodplain and the force main route is extensively disturbed.

SURVEY AREA DESCRIPTIONS AND RESULTS

This survey was conducted in two phases. The first phase involved intensive pedestrian survey and shovel testing of all three project areas (minus ca. 750 ft of the gravity main and water line corridor where right of entry had not been obtained). Shovel testing was conducted within Louise Hays and Lehmann-Monroe Parks, and two previously recorded archeological sites (41KR105 and 41KR677) were investigated by pedestrian survey and shovel testing. The second phase was limited to backhoe trenching along segments of the proposed gravity main and water line corridor.

Jefferson Street Lift Station Force Main Corridor

This project area consists of the 3,300-ft-long sewer force main corridor beginning on the south side of the Guadalupe River at FM 394 and going northeast along Town Creek until it terminates at the Jefferson Street lift station. At its south end, the corridor is on the active river floodplain. From there, it climbs up onto the terrace surface west of Town Creek before dropping into the narrow, deeply incised creek valley. The 12-inch force main will be in a ditch that is 5–6 ft deep. Survey revealed that the project corridor near the Jefferson Street lift station is dominated by dumped construction debris, concrete, road asphalt fragments, ceramic sewer line fragments, scrap metal, and earth fill. This material was placed to reinforce the banks of Town Creek and stabilize the area of the lift station. Similar material was documented to a depth of 10 ft in engineering bore hole data at the lift station and also was observed eroding out of the stream bank and at the surface near the lift station. Bank slopes are gullied, exposing silty clay loam to silty clay with lenses of sands and gravels. From the lift station, the force main corridor crosses to the west side of Town Creek and parallels the creek and an existing sewer line passing beneath bridges at Main Street and Water Street (Figure 2). Examination of the banks indicated the upper 2 m in this area consists of dumped broken concrete, earth fill, and mixed construction debris that provides the substrate for adjacent business parking lots (Figure 3). The project corridor has been disturbed by the existing sewer line at midslope between the stream channel below and the introduced fill above. Based on the extensive introduced fill and existing adjacent sewer line, there is no potential for intact archeological remains in this area, and thus no shovel tests or trenches were excavated here.

Beyond Water Street, the corridor is adjacent to the incised channel of Town Creek for ca. 100 m and then turns upslope into a residential area and follows southwest within the right of way of Lowry Street and the existing sewer line. Lowry Street is paved and passes through a developed residential area with buried and above-ground utilities. Given the amount of development and existing buried utilities, there is very little chance that placement of the force main will impact intact archeological remains; because this segment of the route is extensively disturbed, no shovel tests or trenches were excavated.

At the end of Lowry Street, the project corridor descends onto the Guadalupe River floodplain. The 20-ft-high terrace face on the north side of the river is gullied and sporadically covered in dumped concrete rubble, construction waste, and large limestone boulders; the upper portion along Lowry Street appears to have

Figure 2. View to the west of the Jefferson Street force main corridor from the Water Street bridge. Town Creek and the existing sewer line access road are to the left, and a parking lot atop introduce fill is to the right.

Figure 3. Erosional cut along Jefferson Street force main corridor showing dumped construction debris on the north bank of Town Creek west of Water Street.

been mechanically leveled. The floodplain on both sides of the river consists of dissected, braided deposits of alluvial sands and gravels, flood chutes, and bars, all clearly reflecting recent flooding. The force main will involve directional drilling beneath the river channel to the other side at the Francisco Lemos Street bridge. Engineering bore hole data indicate that the floodplain deposits here consist of 15 ft of mostly gravelly deposits atop Glen Rose Formation limestone. No shovel testing or trenching was done on the upper terrace immediately north of the river because it has been disturbed by concrete and construction rubble dumping and gullying or on the active floodplain on either side of the river because these deposits appear to be of recent age and have been considerably reworked by flooding. There is no possibility of intact archeological deposits in either setting.

Louise Hays and Lehmann-Monroe Parks

This project area consists of 91 acres within contiguous Louise Hays and Lehmann-Monroe Parks. The parks extend from the west edge

of the river channel and include the modern floodplain (ca. 80 percent) and T_1 surface (ca. 20 percent) on the west to Thompson Drive. The 4,398-ft-long central section of the gravity main and water line corridor project area passes through the park area. The parks are different in character, including the degree of construction-related surface modification. The 64-acre Louise Hays Park was constructed on April 26, 1950, on land donated by Robert S. Hays of San Antonio. Stipulations for the land donation were that the park be named after his wife, Louise, and that the park construction be completed in one day. Park design called for considerable alteration of the original ground surface, and facilities included an arched entryway, picnic tables, pontoon bridge, playground area, and a large concrete dance slab. Oral, photographic, and written accounts of the park history all mention substantial effort in manpower and mechanical equipment to accomplish the task (http://joeherringjr.blogspot.com/2013/01/kerrvilles-louise-hays-park-built-in-day.html, accessed May 21, 2013). A dam and spillway previously associated with a turn-of-the-century lumber mill are on the river in the central part of the park area, and portions of the dam may have been modified around the time the park was constructed or a few years thereafter. Although the construction date for the dam is unknown, a water right dated April 4, 1914, appears to refer to it (Stuart Barron, personal communication 2013). A large flood chute north of the park on the west side of the river was created by the flood of July 1, 1932.

Lehmann-Monroe Park, situated on the south end of Louise Hays Park, was donated to the city in 1991 and has improvements completed in 2008. Virtually all of this 27-acre park lies on the T_1 surface. Portions are developed with parking areas, trails, pavilions, playground, and a sand volleyball court. Most improvements proposed by the City of Kerrville will be sited here and in an area of existing facilities in adjacent Louise Hays Park.

Shovel testing and pedestrian survey included all accessible areas within both parks as well as areas of future improvements, subsurface exposures, and existing archeological sites 41KR105 and 41KR677. Of the 62 shovel tests within the park areas, 12 were at 41KR105 and 10 at 41KR677. Neither site had been shovel tested prior to this survey.

Shovel Testing on Previously Recorded Sites

Site 41KR105 was recorded in 1971 as sitting on a high rocky hill overlooking the Guadalupe River and consisting of a few flakes and one untyped projectile point that had been disturbed by landscaping associated with a golf course. The plotted site location actually is on the floodplain on the west side of the river channel in the lower part of Louise Hays Park, however, suggesting either that the plotting is erroneous or that incorrect information ended up on site form (there is no hill or golf course there). Regardless, this survey found artifacts at the plotted location, although their context is dubious. The area presently is vegetated in short grasses and is part of the maintained park grounds (Figure 4). Of the 12 shovel tests excavated, 7 were positive for prehistoric and historic material. Historic material was recovered in 2 shovel tests and consisted of a piece of glass and a round wire nail, both within the upper 20 cm. Prehistoric lithic debitage was obtained from 5 tests, with all artifacts recovered in the upper 20 cm. Prehistoric artifacts from shovel tests consist of nine chert flakes and two pieces of chert shatter. An expended chert core was observed on the surface. Eight flakes are small interior flakes with no cortex, and one is a biface-thinning flake. Some chert shatter and possible flake fragments were observed on the surface, but it was difficult to segregate this material from occasional pieces of mechanically crushed rock and chert associated with nearby roadways and driving paths in the park. Concrete, asphalt and gravel road material, and crushed rock were recovered in Shovel Tests J6 and J7. None of the artifacts were collected. No features were encountered, and no scattered fire-cracked rocks were observed on the surface or in any of the shovel tests.

The deposits exposed in shovel testing consisted of an upper 10–20 cm of medium to dark brown silty loam or silty sandy loam and mixed small gravels. Below this, at 20–30 cm, was a very dense, hard-packed zone of small to cobble-sized waterworn gravels and sandy gravels that could not be penetrated to any significant depth. Shovel tests varied between 20 and 45 cm in depth and averaged 28 cm. Trenching (discussed below) confirmed that these gravels represent the upper part of thick

Figure 4. View of 41KR105 looking northeast to the Sidney Baker Street bridge and existing parking area.

alluvial gravels and point bar deposits that are present throughout the floodplain portion of Louise Hays Park and that appear to be of recent age. This suggests that the flakes observed could be out of context, perhaps having been introduced during ground surface leveling when the park was constructed in 1950. Site 41KR105 is a small, highly disturbed, perhaps not in situ lithic scatter with no isolable components; it lacks sufficient integrity to contain important information, and thus it is not eligible for listing in the National Register of Historic Places or designation as a State Archeological Landmark.

Site 41KR677 was recorded in 2009 as a lithic scatter with associated fire-cracked rocks. This site is atop the T_1 surface. The site was found within a mechanically created drainage ditch to control runoff. Observed artifacts included two conjoined fire-cracked rocks and widely scattered lithic debitage embedded in silty clay loam. Deposit depth was recorded as 40 cm, and the site dimensions were 5 m north-south by 24 m east-west. Aerial images of the area on Google Earth from 1995 to 2005 do not show the ditch, and thus it appears to have been created between 2005 and 2009. As of 2013, the drainage ditch had been filled in with crushed rocks (a mix of limestone, chert, and cherty limestone) and an asphalt/concrete mix, the side slopes had been graded and straightened, and alternating rectangular rock and wire mesh water flow breaks had been installed. This modification removed any indications of the site that could have been observed in the drainage or on its side slopes (Figure 5). Occasional crushed limestone and chert rock fragments are visible on the surface and probably are related to filling of the ditch and a small access road or path. The surface is level with grass cover and scattered oak trees and good visibility. A vehicle path created of dumped crushed limestone and chert and waterworn gravels begins at the park road on the north end of the field and ends on the surface in the plotted location of 41KR677. The road appears to have been used to move equipment through the field to create and maintain the drainage ditch. A shallow drainage ditch parallels each side of this path.

Shovel testing focused on the north side of the drainage, which appeared to have a greater potential for subsurface cultural material since the south side consists of a narrow strip of mechanically sloped and leveled land between the ditch and a recreational vehicle parking lot. Of the 10 tests excavated, 4 contained prehistoric lithic artifacts: 8 pieces of lithic debitage at 0–20 cm and 4 pieces at 20–40

Figure 5. View to the west of the large drainage ditch at 41KR677. The site was originally recorded exposed in this drainage.

cm (none were collected). One test yielded styrofoam fragments at 15 cm and pieces of orange flagging tape at 20 cm. No fire-cracked rocks were found in any of the shovel tests or on the surface, and no cultural features were identified. Shovel tests varied in depth between 30 and 50 cm, averaging 35 cm, and exposed dark to medium brown silty clay loam with occasional carbonate filaments and nodules and some small to cobble-sized gravels; the gravels appeared unsorted or only moderately sorted. A chert core and small flake were observed on the surface at the base of a cut bank about 25 m east of the site; the original location of the core and flake could not be determined. No other cultural materials were exposed in the cut bank or in a cleaned profile east of the site.

As part of the 41KR677 investigations, a stratigraphic profile was cleaned on the cut bank face east of the site to expose the deposits below the T_1 surface. This exposure exhibited deposits characteristic of an alluvial terrace. The sequence consists of an upper 20-cm-thick zone of dark brown silty clay loam with weak blocky structure and some gravels. At 20–55 cm is a medium brown silty sandy loam with prismatic blocky structure and some waterworn gravels. At 55–110 cm, the deposits are silty tan sands, some gravels, and a few carbonate nodules/filaments. Below 110 cm, the deposits are laminated coarse to fine sands and sorted gravels sitting atop a very coarse unsorted gravel bar deposit of small gravels, cobbles, and boulders. The entire profile is a typical upward-fining sequence of deposition. Geomorphically, this corresponds to Unit 3 as identified by Abbott (2008) at the Gatlin site upstream from the current project area.

Site 41KR677 is a small, highly disturbed lithic scatter with no isolable components. It lacks the capacity to contain important information and thus is not eligible for listing in the National Register of Historic Places or designation as a State Archeological Landmark.

Nonsite Shovel Testing and Survey

Additional shovel testing and survey were conducted across both parks (Figure 6). There are two open fields within Louise Hays Park separated by the Sidney Baker Street bridge. In addition to the 12 shovel tests placed on 41KR105, 18 tests were excavated in these areas between Thompson Drive and the west bank of the Guadalupe River. Four of these tests were on the T_1 surface. Shovel Tests (J31, J32, E27, and

E28) had thin deposits of brown to dark brown silty clay loam and abundant densely packed small gravels and some carbonates covered by a thin layer of grass and sod. Test depths varied from 10 to 30 cm. Surface evidence indicates that the T_1 surface beginning on the north end of Louise Hays Park and paralleling Thompson Drive south to the Sidney Baker Street bridge has been mechanically leveled and shaped with occasional large pieces of concrete, limestone, and fragments of road material incorporated into the surface, and it has been further impacted by tree removal, landscaping, picnic facilities, horseshoe pitching pits, and subsurface utilities for irrigation. Other utilities are present along Thompson Drive. No cultural materials were observed on the surface or in the shovel tests on the T_1 surface.

Fourteen tests were on the level modern floodplain area east of the T_1 surface, 9 on the northern field and 6 on the southern field (south side of Sidney Baker Street Bridge). These tests varied from 10 to 35 cm deep (averaging 25 cm) and encountered densely packed small alluvial gravels associated with gravel bars. These gravels were capped by a thin deposit (<25 cm) of medium to dark brown silty loam to silty clay loam with gravels. The deposits are identical to those described above for 41KR105. None of these shovel tests contained prehistoric or historic cultural materials.

Shovel testing within Lehmann-Monroe Park included the work at 41KR677 discussed above and 11 more tests placed in the open field on the south end of the park (see Figure 6). The 11 nonsite tests were 22–55 cm deep, averaging 41 cm. The deposits across this portion of the park are similar to those at 41KR677, consisting of an upper stratum of medium to dark brown dense silty loam and clay loam with gravels and occasional carbonate nodules and filaments above a dense zone of unsorted or poorly sorted gravels.

Survey also was done in areas where future facilities and improvements are planned. Most of the planned improvements will be on the south end of Louise Hays Park and in adjacent Lehmann-Monroe Park, which already have seen considerable infrastructure and facilities construction. The proposed redevelopment project includes construction of an amphitheater/stage, sprayground, trailheads, improvements to existing parking and roads, more restrooms and picnic areas, and additional renovations. The amphitheater is the most-substantial structure that will be added to the existing park facilities and will be placed in a central area that is mostly already developed. Part of the proposed amphitheater location consists of paved park access roads and a path and sits on an area of construction fill capped with soil and grass. Concrete, broken road pavement, ceramic tile and brick fragments, and gravels can be seen exposed in areas of good visibility, and large pieces of concrete are exposed around the bases of large cypress trees (Figures 7 and 8). Shovel Tests E18, E29, and J21 in the vicinity of the amphitheater site revealed construction fill containing crushed and broken asphalt, concrete fragments, large limestone cobbles, and mottled orange clay with gravels.

Finally, Shovel Tests E14, E15, E16, and J19 were excavated on the south end of the park property just east of the gravity main and water line corridor. Each of these tests confirmed the presence of alluvial gravels, laminated sands and gravels, and typical gravel bar deposits, with none containing cultural materials.

Gravity Main and Water Line Corridor

The entire course of the proposed 6,770-ft-long gravity main and water line corridor from Francisco Lemos Street to G Street is within the active floodplain of the Guadalupe River. The 21–24-inch gravity main and 16-inch water line will be in trenches that are 3–4 ft wide and 3.5–14.5 ft deep and ca. 10 ft apart. The 1,610-ft-long segment between Francisco Lemos Street and the north end of Louise Hays Park is along the edge of a large flood chute created by a 1932 flood event. The surface in this area is scoured and has exposed gravels and sand bars with some exposed limestone bedrock; hence, surface visibility was good. Trench 4 was excavated southeast of the Francisco Lemos Street bridge at the sloping interface between the modern floodplain and the T_1 surface (Figure 9). It exposed grayish brown gravelly loam and sandy gravel extending to a depth of at least 180 cm; no archeological remains were observed. No other trenches or shovel tests were placed along this segment of the corridor because Trench 4, other trenches and tests downstream, and

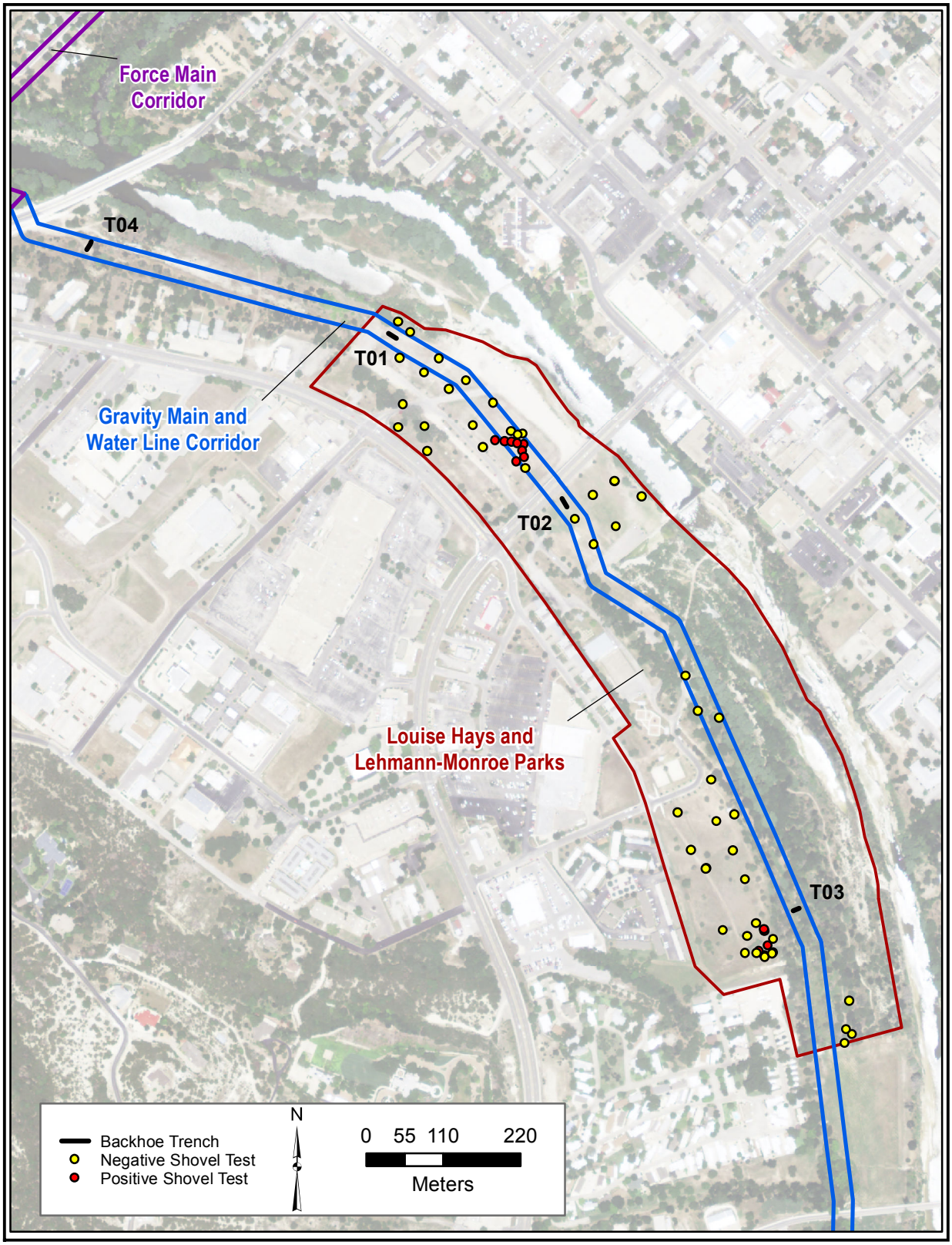

Figure 6. Map showing the locations of shovel tests and backhoe trenches in Louise Hays and Lehmann-Monroe Parks. Site locations are not shown in report copies for public distribution.

Figure 7. View to the southeast of proposed amphitheater location. Note slope and existing road and facilities. Back of the amphitheater will be approximately at graveled parking area in center of image.

Figure 8. Area of dumped concrete behind proposed amphitheater location. Gravel parking area is to the right of the figure. Note large concrete fragments exposed around base of cypress trees on left.

surface evidence all indicate that the gravelly fill here is recent.

Almost two-thirds (4,190 ft) of the gravity main and water line route is within Louise Hays Park, and surface survey of that segment was done as the park was being covered. This part of the project corridor is similar geomorphically to the segment north of the park. It consists of active floodplain, parts of which have been covered over with sod and maintained as

Figure 9. South wall of Trench 4 showing gravelly deposits at the interface between the modern Guadalupe River floodplain and the T_1 surface.

Figure 10. West wall of Trench 2 showing upward-fining sequence of alluvial gravels and sands on the modern Guadalupe River floodplain.

landscaped park area. Within the park north of the spillway and dam, gravels are exposed across much of the surface of the corridor, and visibility was fair to good with only thin patchy grass cover. South of the spillway and dam, the terrain drops about 2 m to the existing active floodplain consisting of scoured gravel and sand deposits.

Trenches 1 and 2 were placed along the gravity main and water line corridor in the north part of the park and were excavated to depths of 180 and 150 cm, respectively. Both trenches revealed packages of upward-fining sandy gravels interbedded with gravelly sandy muds (Figure 10), confirming that the corridor traverses modern floodplain gravel bar deposits with no potential for intact archeological sites.

Trench 3 was excavated along the corridor in the south part of the park in a backswamp or flood chute environment. The sediments consisted of brown muddy sand (0–29 cm) and very dark gray sandy loam (29–30 cm) sitting on limestone bedrock; the water table was encountered just above the bedrock. These deposits contained metal cans indicating the recent age of the sediments and that this portion of the floodplain is periodically scoured.

A number of the shovel tests excavated during survey of the park areas were within or adjacent to the gravity main and water line corridor. These include all of those at 41KR105, 12 other tests in the north part of the park, 3 tests in the central part, 2 tests in the south-central part north of 41KR677, and 4 at the south end of the park. Other than those at 41KR105, none contained cultural materials, and all confirmed the presence of recent gravel deposits.

The 970-ft-long segment of the gravity main and water line corridor downstream from the park area is also within the Guadalupe River floodplain, and much of it (i.e., the ca. 750 ft on the Rio Robles tract) has been leveled and modified to sustain grass cover and serve as a recreational area for residents who live nearby. Only the southern 220 ft flanking G Street could be surveyed, but it is clear from surface observations made there that the same recent alluvial gravels and sands observed in the park area to the north extend beneath the surface to the G Street lift station.

It is likely that most of the gravelly deposits on the modern floodplain upstream from the dam in the park postdate construction of the dam in the early twentieth century, with the dam acting as a sediment trap. Downstream from the dam, much of the floodplain has been scoured. In both areas, the floodplain has been modified in places through the addition of fill to level the surface. Hence, the full length of the gravity main and water line corridor, approximately 80 percent of the park acreage, and the south end of the force main route are in contexts that are too recent to contain intact archeological remains. Even if some of the deposits are older than this, though, their consistently gravelly nature indicates a high-energy depositional and erosional environment that precludes the preservation of archeological sites.

ASSESSMENTS AND RECOMMENDATIONS

This project consisted of three contiguous survey areas for proposed sewer, water, and park improvements for the City of Kerrville, Texas. Intensive pedestrian archeological survey with shovel testing and limited backhoe trenching did not identify any new archeological sites. Two previously recorded sites (41KR105 and 41KR677) were shovel tested; both are disturbed lithic scatters and are considered ineligible for listing in the National Register of Historic Places and designation as State Archeological Landmarks. Assessments and recommendations for each project area are discussed below.

Jefferson Street Lift Station Force Main Corridor

The full length of the Jefferson Street lift station force main corridor has been so extensively disturbed that there is little or no potential for intact archeological sites. Most of the route is adjacent to an existing sewer line, and the northern part is within the incised Town Creek valley, which has been altered by dumping of construction debris and construction of retaining walls to support adjacent parking lots. The portion of the corridor along Lowry Street is within the existing road right of way with buried utilities, and adjacent lands have been developed as a residential area. Where it leaves Lowry Street, the corridor traverses the steeply sloping face of a high terrace that has been altered by gullying, dumping of rubble and debris, and mechanical leveling. Beyond that, it drops onto the active Guadalupe River floodplain, which appears to be of recent age and has been scoured by flooding. This project will not impact any archeological sites that are eligible for National Register listing or State Archeological Landmark designation, and no further archeological work is recommended.

Louise Hays and Lehmann-Monroe Parks

Pedestrian survey, shovel testing, and backhoe trenching within Louise Hays and Lehmann-Monroe Parks revealed that most of the park areas (ca. 80 percent), including all of the gravity main and water line route through the park area, is on extensive gravel deposits associated with the modern Guadalupe River floodplain. They appear to be the result of recent high-energy deposition by the river and to have been associated with periodic scouring of the river valley. Park-related construction, including introduction of rubble fill to level the surface, has further disturbed much of the area. Hence, most of the park area has no potential for intact archeological sites. Previously recorded site 41KR105, which is in this setting, was revisited and shovel tested and found to be a sparse, disturbed lithic scatter; given its setting, the cultural materials there may not be in situ. Site 41KR105 is considered ineligible for National Register listing or State Archeological Landmark designation.

The western edge of the park areas (ca. 20 percent) is on an older landform (T_1 surface) with a higher potential for archeological sites. Much of this area has been disturbed by initial construction in both parks and later installation and renovation of existing and newer facilities, roads, and paths, however, and no new sites were found in survey of this terrace. Shovel testing of the open field area encompassing 41RK677 on this landform yielded no additional cultural material and no new archeological sites. Site 41KR677 has been heavily impacted by mechanical and natural processes. No cultural features or isolable temporal components were identified, and the site does not contain

information that would make it eligible for National Register listing or State Archeological Landmark designation.

The City of Kerrville parks redevelopment project proposes a number of new facilities and improvement of existing facilities and utilities within both parks. Impacts will be largely confined to areas that have existing park trails, infrastructure, and buildings. An exception is the proposed amphitheater location in the central part of the park. Survey and shovel testing of this location, which is on the modern floodplain, determined that the area is composed of leveled and capped construction debris, concrete, composite road material, ceramic pipe fragments, and gravel. Given the amount of disturbance and the setting, none of the park improvements will impact any intact archeological resources. No further archeological work is recommended.

Gravity Main and Water Line Corridor

All of the gravity main and water line corridor is on gravel deposits that are associated with the modern Guadalupe River floodplain and that likely are the result of recent high-energy deposition by the river associated with periodic scouring of the river valley. Survey identified no archeological sites along the corridor, and the geomorphic setting indicates that none are likely to be present. Hence, no further archeological work, including pedestrian survey of the 750 ft of the corridor that was not surveyed (the Rio Robles tract), is warranted here.

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